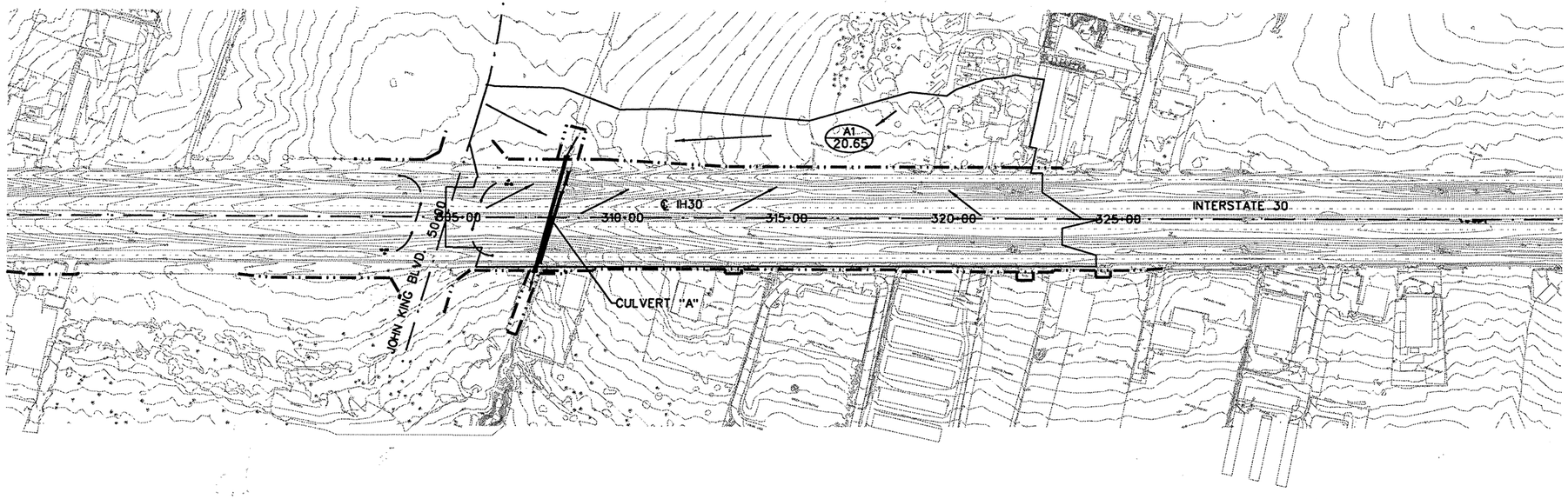


LEGEND

DRAINAGE BOUNDARY

XX / XXX — DRAINAGE AREA NUMBER / DRAINAGE AREA (ACRES)

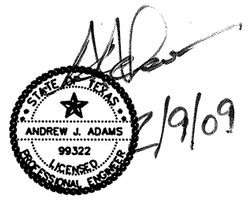
DRAINAGE FLOW DIRECTION



200 100 0 200 400

SCALE FEET

SEE CULVERT DATA SHEET FOR FURTHER INFORMATION



NO.	REVISION	BY	DATE

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IH 30 AT JOHN KING BLVD.

EXTERIOR DRAINAGE AREA MAP

Designed: GBC	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn: GBC	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073		228

SHEET 1 OF 1

2/9/2009 3:09:13 PM aadams p:\Active Projects\TXD0643\TXD0643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.06 Drainage\435TDM01.400

5/19/2009 1:58:17 PM aadams p:\Active Projects\TXD0643\TXD0643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.06 Drainage\435TDC01.999

CULVERT COMPUTATIONS

CULVERT NUMBER	LOCATION	DRAINAGE AREA NUMBER	TOTAL DRAINAGE AREA (ACRES)	GRASS C=0.45 AREA (ACRES)	PAVEMENT C=0.96 AREA (ACRES)	INDUSTRIAL C=0.70 AREA (ACRES)	RATIONAL METHOD								
							DESIGN STORM FREQ (YR)	COMPOSITE RUNOFF COEFF. "C"	TC USED (MIN)	INTENSITY (IN/HR)	Q (CFS)	*TW (FT)	HW (FT)	ALLOWABLE HW (FT)	OUTLET VELOCITY (FT/SEC)
A	℄ IH30 STA. 308+42.48	A1	20.65	7.10	11.75	1.8	50	0.76	10	10.46	164.46	572.11	578.11	578.11	12.63
							100	0.76	10	11.48	180.63	572.16	578.11	578.66	12.98

*THE 50-YEAR AND 100-YEAR ELEVATIONS WERE DETERMINED BY A NORMAL DEPTH COMPUTATION, AND ASSUMING CHANNEL BEDSLOPE OF 0.0165.

STATE OF TEXAS
ANDREW G. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
5/20/09

NO.	REVISION	BY	DATE

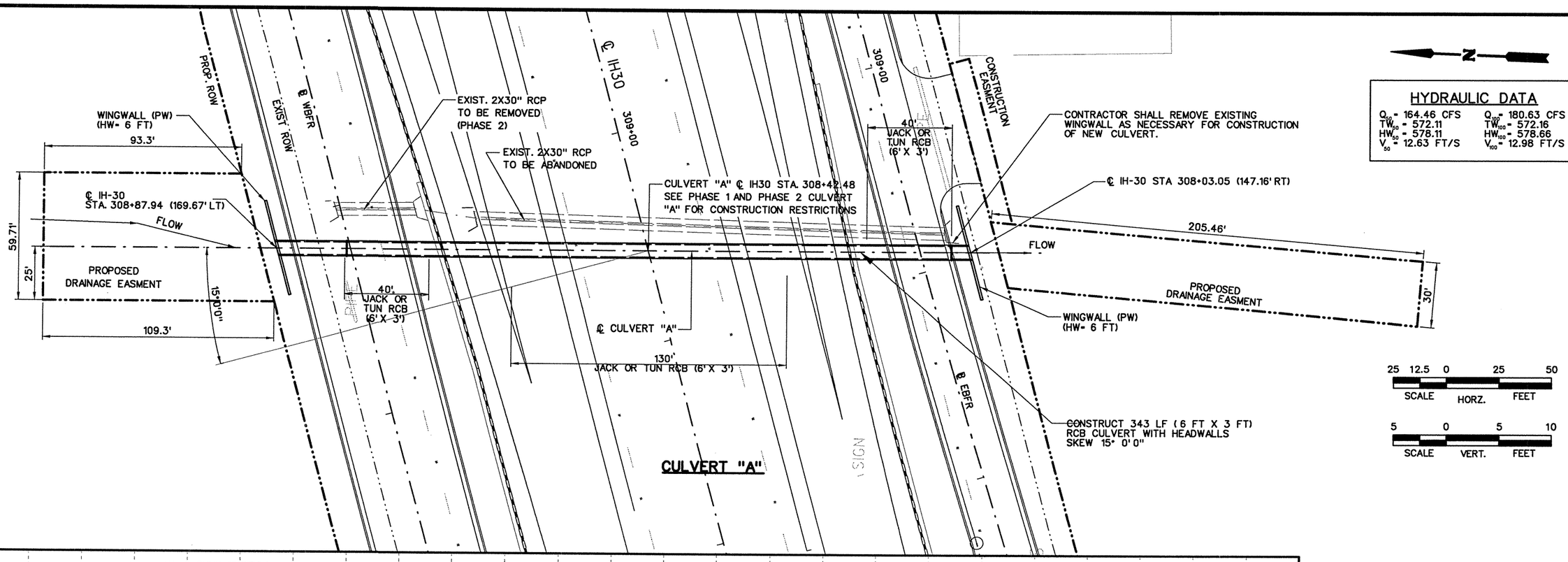
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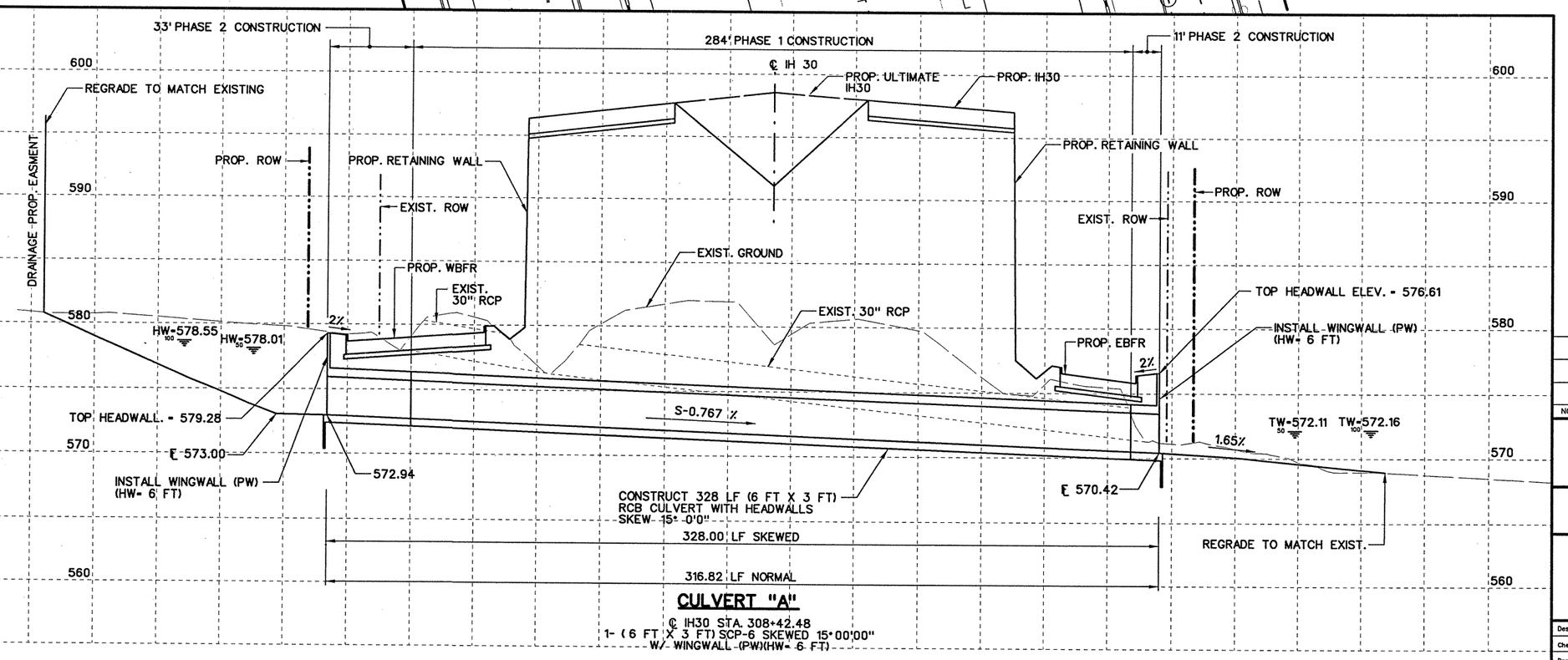
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IH 30 AT JOHN KING BLVD.

CULVERT DATA

Designed:	GBG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	GBG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	223





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5/20/09

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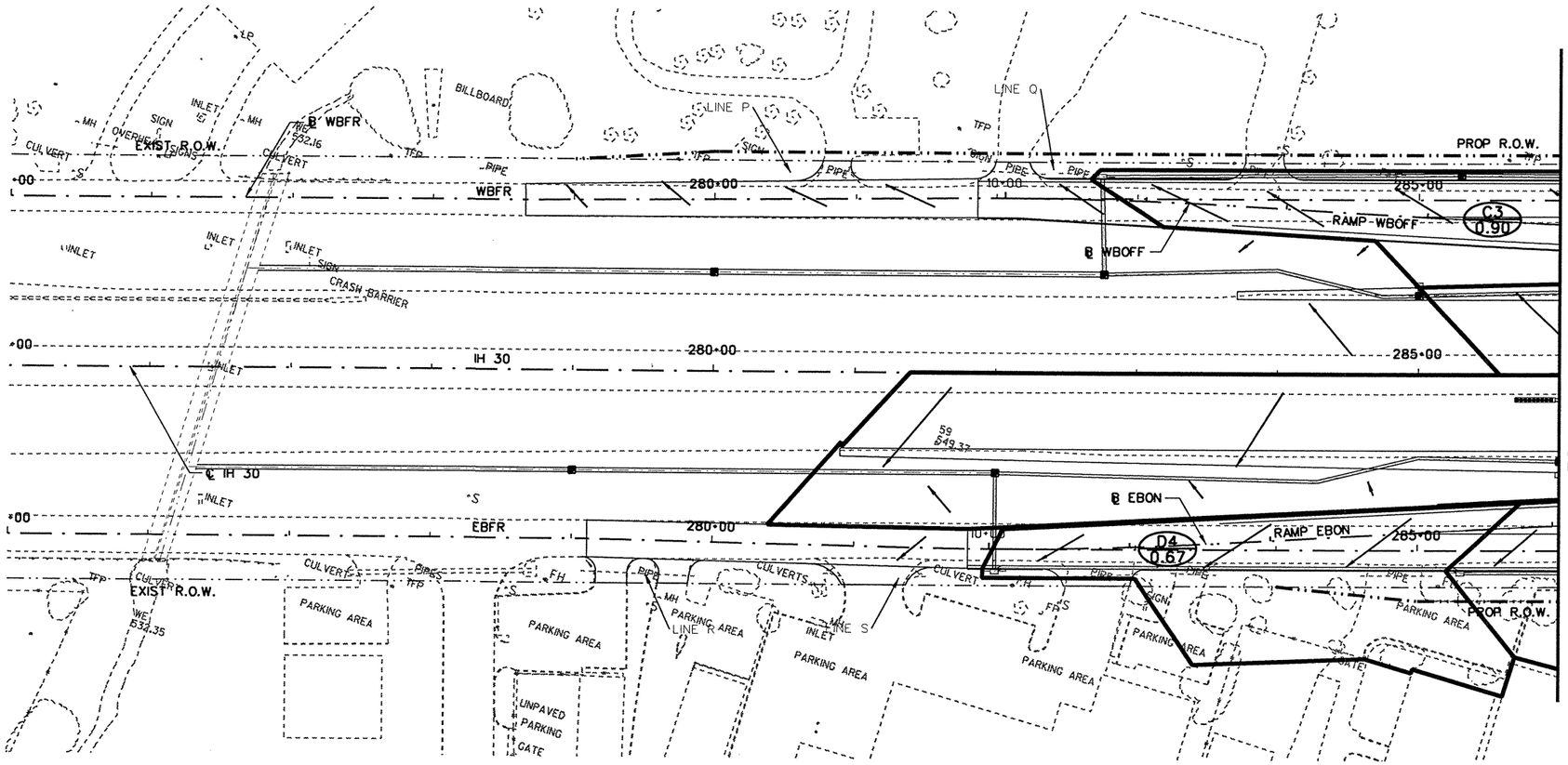
IH 30 AT JOHN KING BLVD.

CULVERT LAYOUT
CULVERT "A"

Designed: GBG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: GBG	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	224

SHEET 1 OF 1

5/19/2009 9:49:51 AM aadams px:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TDN01.100



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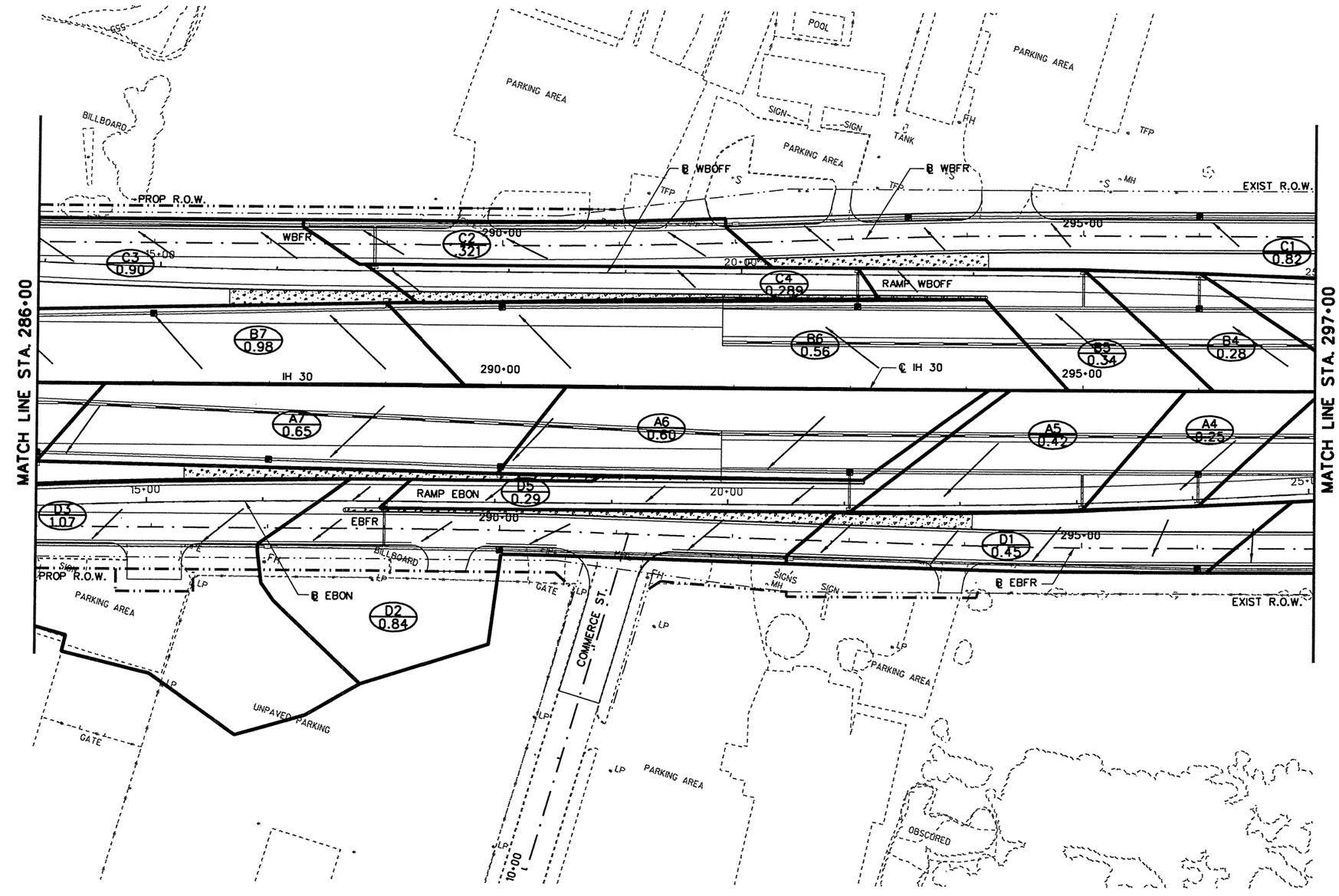
INTERIOR DRAINAGE AREA MAP

BEGIN PROJECT TO STA. 286+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	225

SHEET 1 OF 6

2/9/2009 6:35:48 AM aedams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TD101.100



N

50 25 0 50 100

SCALE FEET

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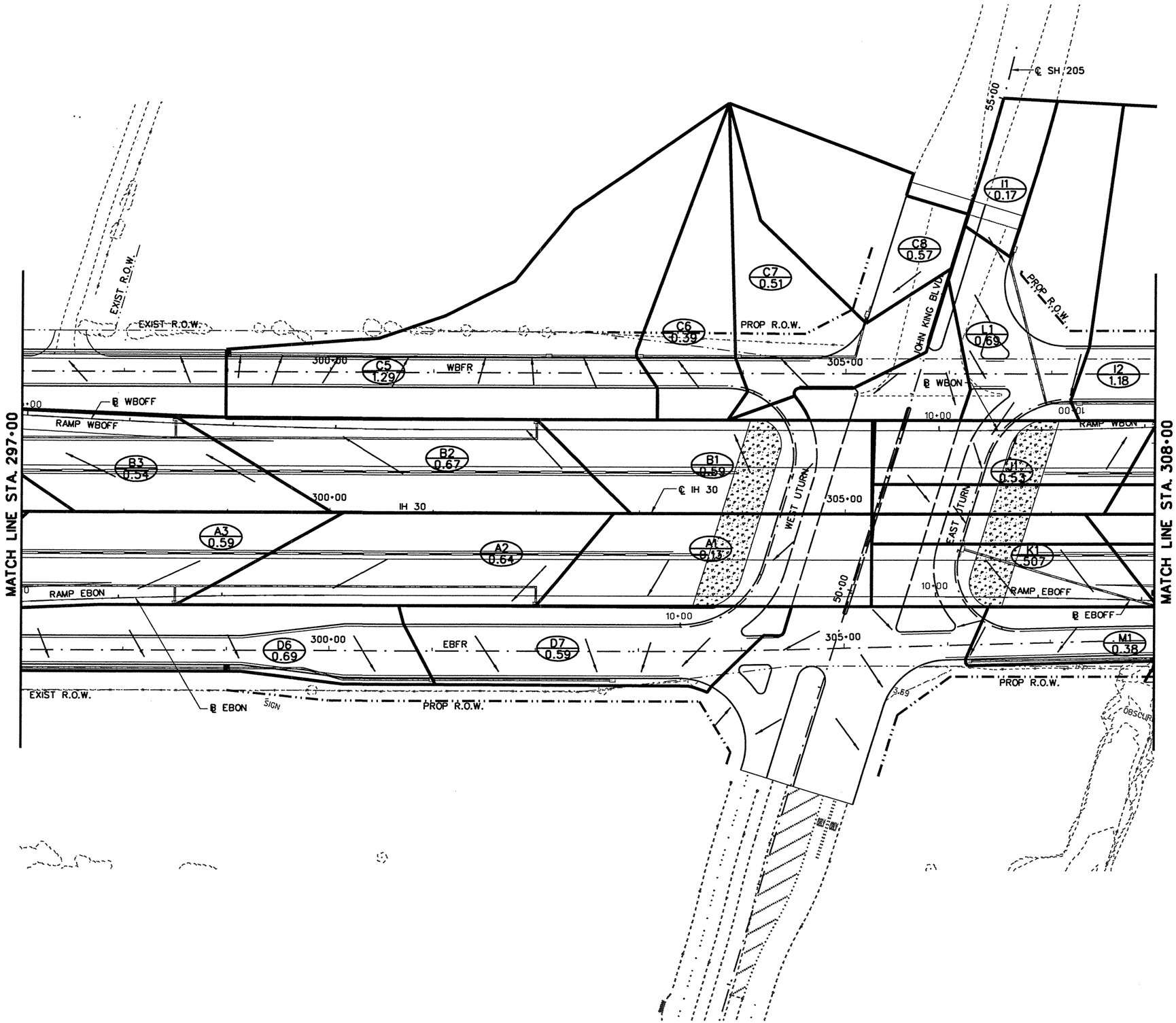
INTERIOR DRAINAGE AREA MAP

STA. 286+00 TO STA. 297+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	226

SHEET 2 OF 6

2/9/2009 6:35:52 AM adams pw:/Active Projects/TX00643/TX00643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TD102.100



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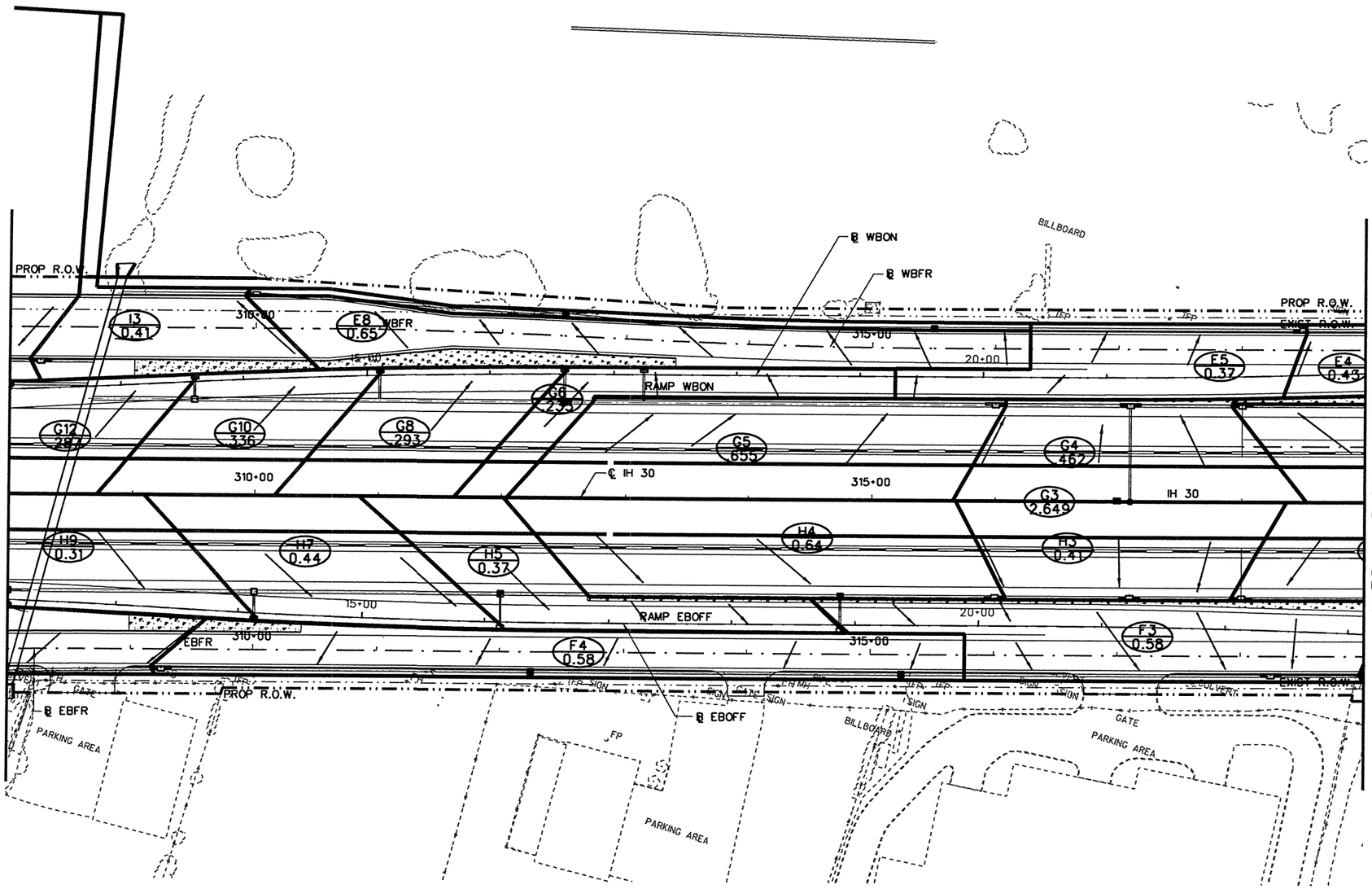
INTERIOR DRAINAGE AREA MAP

STA. 297+00 TO STA. 308+00

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	227

SHEET 3 OF 6

pw:/Active Projects/TX00643/TX00643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TD103.100
2/9/2009 6:35:59 AM aadams



MATCH LINE STA. 319+00

N

50 25 0 50 100

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IH 30 AT JOHN KING BLVD.

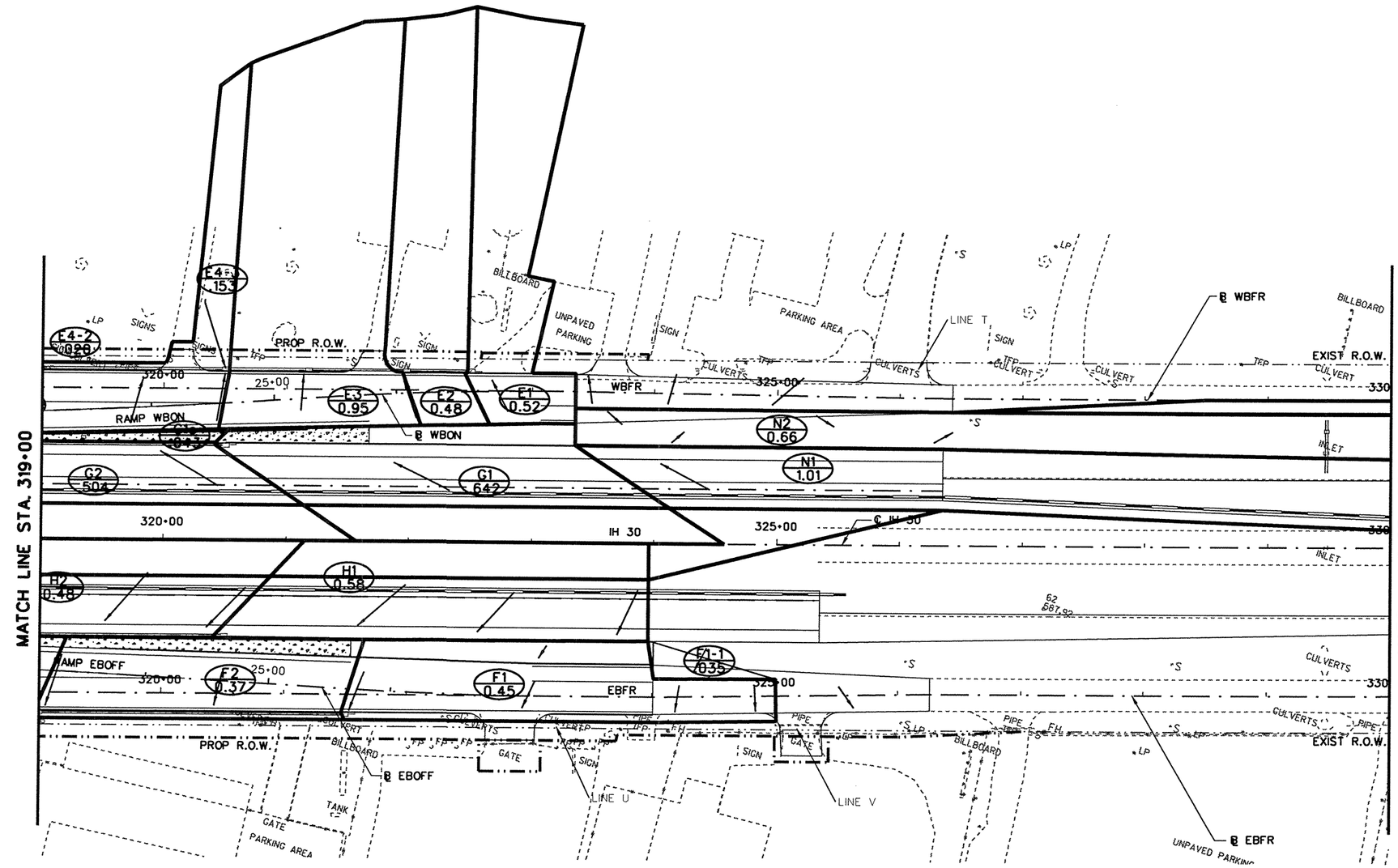
INTERIOR DRAINAGE AREA MAP

STA. 308+00 TO STA. 319+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073		228

SHEET 4 OF 6

2/9/2009 6:36:04 AM aadams p:\Active Projects\TXD0643\TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TD104.100



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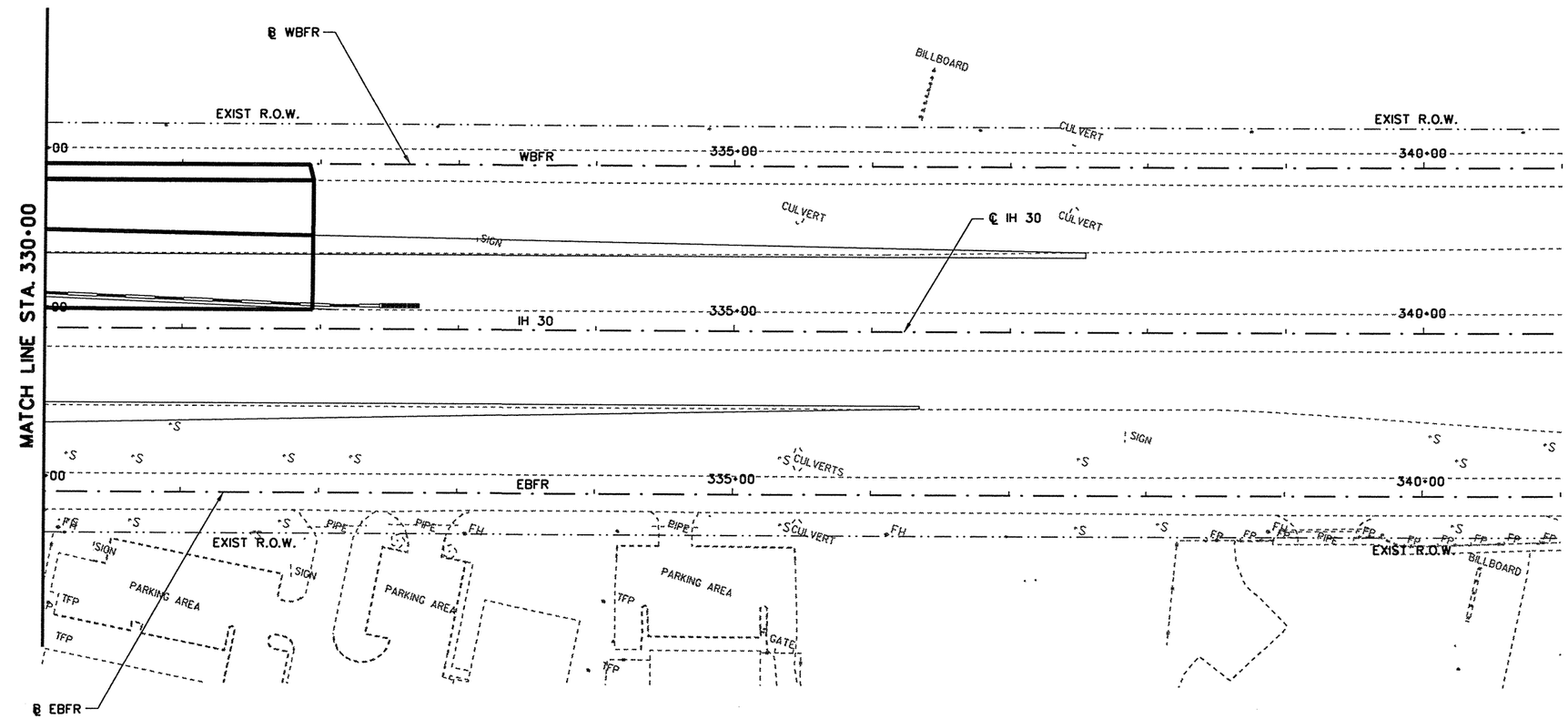
INTERIOR DRAINAGE AREA MAP

STA. 319+00 TO STA. 330+00

		FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Designed:	AWD	6	TEXAS	SEE TITLE SHEET			IH 30
Checked:	AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Drawn:	CADD	DAL	ROCKWALL	0009	12	073	229
Checked:	RRH						

SHEET 5 OF 6

2/9/2009 6:36:08 AM adams p:\Active Projects\TXD0643\TXD00643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.05 Drainage\425TD105.100



N

50 25 0 50 100

SCALE FEET

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IH 30 AT JOHN KING BLVD.

INTERIOR DRAINAGE AREA MAP

STA. 330+00 TO END PROJECT

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	230

SHEET 6 OF 6

2/9/2009 6:36:13 AM aadams p:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TDI06.100

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 10 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
BWI-A1	0.96	0.60	10.00	10.00	7.98	0.000	4.612
	0.96	0.60	Pavement				
BWI-A2	0.96	0.64	10.00	10.00	7.98	0.000	4.903
	0.96	0.64	Pavement				
BWI-A3	0.96	0.59	10.00	10.00	7.98	0.000	4.504
	0.96	0.59	Pavement				
BWI-A5	0.96	0.25	10.00	10.00	7.98	0.000	1.907
	0.96	0.25	Pavement				
BWI-A6	0.96	0.42	10.00	10.00	7.98	0.000	3.217
	0.96	0.42	Pavement				
CI-A8	0.96	0.61	10.00	10.00	7.98	0.000	4.635
	0.96	0.61	Pavement				
CI-A11	0.96	0.65	10.00	10.00	7.98	0.000	4.979
	0.96	0.65	Pavement				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
BWI-A1	Combi	5.00	1.31	2.00	0.014	0.25	1.49	Parall	22.00	596.62
BWI-A2	Combi	5.00	2.73	2.00	0.014	0.25	1.49	Parall	22.00	589.54
BWI-A3	Combi	5.00	2.74	2.00	0.014	0.25	1.49	Parall	22.00	582.08
BWI-A5	Combi	5.00	2.40	2.00	0.014	0.25	1.49	Parall	22.00	579.43
BWI-A6	Combi	5.00	1.94	2.00	0.014	0.25	1.49	Parall	13.00	575.17
CI-A8	Curb	15.00	2.08	2.00	0.014	0.25	n/a	n/a	13.00	569.55
CI-A11	Curb	15.00	2.30	2.00	0.014	0.25	n/a	n/a	12.00	560.83

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
BWI-A1	Combi	4.612	3.072	0.250	1.539	BWI-A2	0.00	5.00	11.55
BWI-A2	Combi	6.442	3.648	0.250	2.794	BWI-A3	0.00	5.00	11.40
BWI-A3	Combi	7.299	3.929	0.250	3.370	BWI-A4	0.00	5.00	11.95
BWI-A5	Combi	1.907	1.725	0.250	0.183	CI-A5	0.00	5.00	7.40
BWI-A6	Combi	3.217	2.639	0.250	0.579	CI-A6	0.00	5.00	9.40
CI-A8	Curb	4.635	4.522	0.250	0.113	CI-A7	17.18	15.00	10.60
CI-A11	Curb	4.979	4.749	0.000	0.231		18.33	15.00	10.70

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
BWI-A1	Combi	0.960	0.60	10.00	7.98	0.000	0.00	4.612
BWI-A2	Combi	0.960	0.64	10.00	7.98	0.000	0.00	4.903
BWI-A3	Combi	0.960	0.59	10.00	7.98	0.000	0.00	4.504
BWI-A5	Combi	0.960	0.25	10.00	7.98	0.000	0.00	1.907
BWI-A6	Combi	0.960	0.42	10.00	7.98	0.000	0.00	3.217
CI-A8	Curb	0.960	0.61	10.00	7.98	0.000	0.00	4.635
CI-A11	Curb	0.960	0.65	10.00	7.98	0.000	0.00	4.979
LAT-A2	Junct	0.960	1.24	10.77	7.73	0.000	0.00	9.222
MH-A4	CircMh	0.960	1.83	11.21	7.60	0.000	0.00	13.356
MH-A12	CircMh	0.960	3.75	12.77	7.17	0.000	0.00	25.851
MH-A13	CircMh	0.960	3.75	12.77	7.17	0.000	24.26	50.111
LAT-A5	Junct	0.960	2.08	11.38	7.55	0.000	0.00	15.077
MH-A7	CircMh	0.960	2.50	11.69	7.46	0.000	0.00	17.908
MH-A9	CircMh	0.960	3.10	12.18	7.33	0.000	0.00	21.839
MH-A14	CircMh	0.960	3.75	12.77	7.17	0.000	24.26	50.111
MH-A10	CircMh	0.960	3.10	12.18	7.33	0.000	0.00	21.839
OUT	Outlt	0.960	3.75	12.77	7.17	0.000	24.26	50.111

Conveyance Configuration Data

Run#	Node US	Node DS	I.D.	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	BWI-A1	LAT-A2		592.12	583.31	Circ 1	0.00	1.50	367.00	2.40	0.013
3	BWI-A2	LAT-A2		585.04	583.31	Circ 1	0.00	1.50	16.98	10.24	0.013
4	LAT-A2	MH-A4		583.31	577.31	Circ 1	0.00	1.50	250.02	2.40	0.013
5	BWI-A3	MH-A4		577.58	576.62	Circ 1	0.00	1.50	25.44	3.78	0.013
6	MH-A4	LAT-A5		576.62	574.40	Circ 1	0.00	2.00	100.03	2.22	0.013
7	BWI-A5	LAT-A5		574.93	574.40	Circ 1	0.00	1.50	29.39	1.80	0.013
8	LAT-A5	MH-A7		574.40	570.35	Circ 1	0.00	2.00	191.91	2.11	0.013
9	BWI-A6	MH-A7		570.67	570.35	Circ 1	0.00	1.50	32.33	0.99	0.013
10	MH-A7	MH-A9		570.35	564.74	Circ 1	0.00	2.00	299.86	1.87	0.013
13	CI-A8	MH-A9		565.05	564.74	Circ 1	0.00	1.50	7.93	3.91	0.013
14	MH-A9	MH-A10		564.74	560.38	Circ 1	0.00	2.00	200.20	2.18	0.013
15	MH-A10	MH-A12		560.38	556.03	Circ 1	0.00	2.00	199.88	2.18	0.013
16	CI-A11	MH-A12		556.33	556.03	Circ 1	0.00	1.50	9.70	3.09	0.013
17	MH-A12	MH-A13		556.03	543.38	Circ 1	0.00	2.00	402.34	3.15	0.013
18	MH-A13	MH-A14		541.88	537.69	Circ 1	0.00	3.00	300.00	1.40	0.013
19	MH-A14	OUT		536.19	532.49	Circ 1	0.00	3.00	272.27	1.36	0.013

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	592.67	584.12	0.193	0.55	0.81	7.92	4.75	4.61	16.28	0.000
3*	585.49	584.12	0.218	0.39	0.81	13.55	5.05	4.90	33.62	0.000
4*	584.12	578.12	0.771	0.81	0.81	9.49	9.49	9.22	16.28	0.000
5*	578.10	577.50	0.184	0.48	0.88	9.27	4.18	4.50	20.42	0.000
6*	577.50	575.35	0.348	0.88	0.95	10.11	9.06	13.36	33.71	0.000
7*	575.36	575.35	0.033	0.37	0.95	5.58	1.61	1.91	14.11	0.000
8*	575.35	571.44	0.444	0.95	1.09	10.23	8.60	15.08	32.87	0.000
9*	571.47	571.44	0.094	0.57	1.09	5.21	2.33	3.22	10.45	0.000
10*	571.44	565.92	0.626	1.09	1.18	10.21	9.29	17.91	30.95	0.000
13*	565.94	565.92	0.195	0.48	1.18	9.47	3.11	4.63	20.78	0.000
14*	565.92	561.56	0.932	1.18	1.18	11.33	11.33	21.84	33.39	0.000
15*	561.56	557.21	0.932	1.18	1.18	11.33	11.33	21.84	33.38	0.000
16*	557.22	557.20	0.225	0.53	1.17	8.88	3.37	4.98	18.48	0.000
17*	557.20	544.55	1.305	1.17	1.17	13.57	13.57	25.85	40.13	0.000
18*	543.61	539.42	0.564	1.73	1.73	11.83	11.83	50.11	78.84	0.000
19*	537.94	534.24	0.564	1.75	1.75	11.69	11.69	50.11	77.77	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 10 Years
Capacity of grade inlet exceeded at inlet Id= BWI-A1
Capacity of grade inlet exceeded at inlet Id= BWI-A2
Capacity of grade inlet exceeded at inlet Id= BWI-A3
Capacity of grade inlet exceeded at inlet Id= BWI-A5
Capacity of grade inlet exceeded at inlet Id= BWI-A6
Capacity of grade inlet exceeded at inlet Id= CI-A8
Capacity of grade inlet exceeded at inlet Id= CI-A11
Discharge decreased downstream node Id= MH-A10 Previous intensity used.
Discharge decreased downstream node Id= MH-A13 Previous intensity used.
Discharge decreased downstream node Id= MH-A14 Previous intensity used.
Tailwater set to uniform depth elevation = 534.24(ft)

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
5/20/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS

LINE A

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	231

5/19/2009 3:51:36 PM aadams p:\Active Projects\TXD0643\TXD0643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.06 Drainage\435TOF01.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 10 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
BWI-B1	0.96	0.59	10.00	10.00	7.98	0.000	4.497
	0.96	0.59	Pavement				
BWI-B2	0.96	0.67	10.00	10.00	7.98	0.000	5.140
	0.96	0.67	Pavement				
BWI-B3	0.96	0.54	10.00	10.00	7.98	0.000	4.160
	0.96	0.54	Pavement				
BWI-B5	0.96	0.28	10.00	10.00	7.98	0.000	2.168
	0.96	0.28	Pavement				
BWI-B6	0.96	0.34	10.00	10.00	7.98	0.000	2.597
	0.96	0.34	Pavement				
CI-B9	0.96	0.90	10.00	10.00	7.98	0.000	6.894
	0.96	0.90	Pavement				
CI-B11	0.96	0.63	10.00	10.00	7.98	0.000	4.826
	0.96	0.63	Pavement				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
BWI-B1	Combi	5.00	1.31	2.00	0.014	0.25	1.49	Parall	12.00	596.62
BWI-B2	Combi	5.00	2.73	2.00	0.014	0.25	1.49	Parall	12.00	589.52
BWI-B3	Combi	5.00	2.74	2.00	0.014	0.25	1.49	Parall	22.00	581.99
BWI-B5	Combi	5.00	2.40	2.00	0.014	0.25	1.49	Parall	22.00	579.38
BWI-B6	Combi	5.00	2.10	2.00	0.014	0.25	1.49	Parall	12.00	575.14
CI-B9	Curb	15.00	2.30	2.00	0.014	0.25	n/a	n/a	22.00	567.60
CI-B11	Curb	15.00	2.30	2.00	0.014	0.25	n/a	n/a	12.00	558.50

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
BWI-B1	Combi	4.497	3.025	0.250	1.471	BWI-B2	0.00	5.00	11.45
BWI-B2	Combi	6.612	3.698	0.250	2.913	BWI-B3	0.00	5.00	11.55
BWI-B3	Combi	7.073	3.857	0.250	3.216	BWI-B4	0.00	5.00	11.80
BWI-B5	Combi	2.737	2.166	0.250	0.571	BWI-B5	0.00	5.00	8.50
BWI-B6	Combi	2.597	2.108	0.250	0.489	BWI-A6	0.00	5.00	8.55
CI-B9	Curb	6.894	5.988	0.250	0.906	CI-B7	22.19	15.00	12.10
CI-B11	Curb	4.826	4.633	0.250	0.193		18.01	15.00	10.60

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
BWI-B1	Combi	0.960	0.59	10.00	7.98	0.000	0.00	4.497
BWI-B2	Combi	0.960	0.67	10.00	7.98	0.000	0.00	5.140
BWI-B3	Combi	0.960	0.54	10.00	7.98	0.000	0.00	4.160
BWI-B5	Combi	0.960	0.28	10.00	7.98	0.000	0.00	2.168
BWI-B6	Combi	0.960	0.34	10.00	7.98	0.000	0.00	2.597
CI-B9	Curb	0.960	0.90	10.00	7.98	0.000	0.00	6.894
CI-B11	Curb	0.960	0.63	10.00	7.98	0.000	0.00	4.826
LAT-B2	Junct	0.960	1.26	10.77	7.74	0.000	0.00	9.343
MH-B4	CircMh	0.960	1.80	11.20	7.61	0.000	0.00	13.151
LAT-B5	Junct	0.960	2.08	11.37	7.56	0.000	0.00	15.116
MH-B7	CircMh	0.960	2.42	11.70	7.46	0.000	0.00	17.357
MH-B8	CircMh	0.960	2.42	11.70	7.46	0.000	0.00	17.357
LAT-B9	Junct	0.960	3.32	12.31	7.29	0.000	0.00	23.262
MH-B12	CircMh	0.960	3.95	12.87	7.15	0.000	0.00	27.118
MH-B13	CircMh	0.960	3.95	12.87	7.15	0.000	29.65	56.768
MH-B14	CircMh	0.960	3.95	12.87	7.15	0.000	29.65	56.768
MH-B10	CircMh	0.960	3.32	12.31	7.29	0.000	0.00	23.262
OUT	Outlt	0.960	3.95	12.87	7.15	0.000	29.65	56.768

Conveyance Configuration Data

Run#	Node US	Node DS	I.D.	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	BWI-B1	LAT-B2		592.12	582.94	Circ 1	0.00	1.50	367.08	2.50	0.013
2	BWI-B2	LAT-B2		583.52	582.94	Circ 1	0.00	1.50	18.17	3.19	0.013
3	LAT-B2	MH-B4		582.94	576.69	Circ 1	0.00	1.50	249.98	2.50	0.013
4	BWI-B3	MH-B4		576.99	576.19	Circ 1	0.00	1.50	29.53	2.71	0.013
5	MH-B4	LAT-B5		576.19	574.24	Circ 1	0.00	2.00	99.96	1.95	0.013
6	BWI-B5	LAT-B5		574.88	574.24	Circ 1	0.00	1.50	31.75	2.02	0.013
7	LAT-B5	MH-B7		574.24	570.46	Circ 1	0.00	2.00	194.48	1.94	0.013
8	BWI-B6	MH-B7		570.64	570.46	Circ 1	0.00	1.50	32.33	0.56	0.013
9	MH-B7	MH-B8		570.46	563.58	Circ 1	0.00	2.00	305.50	2.25	0.013
10	CI-B9	LAT-B9		561.10	560.65	Circ 1	0.00	1.50	7.40	6.09	0.013
11	MH-B8	LAT-B9		563.08	560.65	Circ 1	0.00	2.00	99.83	2.43	0.013
12	LAT-B9	MH-B10		560.65	555.80	Circ 1	0.00	2.00	200.21	2.42	0.013
13	MH-B10	MH-B12		554.80	550.62	Circ 1	0.00	2.00	191.91	2.18	0.013
14	CI-B11	MH-B12		551.00	550.62	Circ 1	0.00	1.50	7.42	5.13	0.013
15	MH-B12	MH-B13		549.12	544.12	Circ 1	0.00	2.00	225.60	2.22	0.013
16	MH-B13	MH-B14		541.12	538.36	Circ 1	0.00	3.00	276.75	1.00	0.013
17	MH-B14	OUT		536.86	532.26	Circ 1	0.00	3.00	331.96	1.39	0.013

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	592.65	583.75	0.183	0.53	0.81	7.99	4.65	4.50	16.62	0.000
2*	584.12	583.75	0.239	0.54	0.81	9.06	5.32	5.14	18.77	0.000
3*	583.75	577.50	0.791	0.81	0.81	9.66	9.66	9.34	16.61	0.000
4*	577.52	577.09	0.157	0.50	0.90	8.05	3.73	4.16	17.29	0.000
5*	577.09	575.22	0.338	0.90	0.98	9.61	8.63	13.15	31.60	0.000
6*	575.29	575.22	0.043	0.39	0.98	6.01	1.78	2.17	14.92	0.000
7*	575.22	571.47	0.446	0.98	1.01	9.92	9.46	15.12	31.55	0.000
8*	571.48	571.47	0.061	0.59	1.01	4.01	2.04	2.60	7.84	0.000
9*	571.47	564.59	0.589	1.01	1.01	10.86	10.86	17.36	33.96	0.000
10*	561.87	561.84	0.431	0.53	1.19	12.41	4.60	6.89	25.93	0.000
11*	564.09	561.84	0.589	0.99	1.19	11.19	8.93	17.36	35.30	0.000
12*	561.84	556.99	1.057	1.19	1.19	11.97	11.97	23.26	35.22	0.000
13*	556.03	551.85	1.057	1.23	1.23	11.47	11.47	23.26	33.40	0.000
14*	551.46	551.08	0.211	0.46	0.46	10.55	10.55	4.83	23.79	0.000
15*	550.48	545.48	1.437	1.36	1.36	11.93	11.93	27.12	33.69	0.000
16*	543.25	540.49	0.724	2.13	2.13	10.56	10.56	56.77	66.62	0.000
17*	538.75	534.15	0.724	1.89	1.89	12.13	12.13	56.77	78.53	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 10 Years
Capacity of grade inlet exceeded at inlet Id= BWI-B1
Capacity of grade inlet exceeded at inlet Id= BWI-B2
Capacity of grade inlet exceeded at inlet Id= BWI-B3
Capacity of grade inlet exceeded at inlet Id= BWI-B5
Capacity of grade inlet exceeded at inlet Id= BWI-B6
Capacity of grade inlet exceeded at inlet Id= CI-B9
Capacity of grade inlet exceeded at inlet Id= CI-B11
Discharge decreased downstream node Id= MH-B8 Previous intensity used.
Discharge decreased downstream node Id= MH-B10 Previous intensity used.
Discharge decreased downstream node Id= MH-B13 Previous intensity used.
Discharge decreased downstream node Id= MH-B14 Previous intensity used.
Tailwater set to uniform depth elevation = 534.15(ft)

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED PROFESSIONAL ENGINEER
5/20/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE B

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn: AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073		232

SHEET 2 OF 12

5/19/2009 3:46:42 PM adams pw:Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435T0F02.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
ANALYSYS FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1-C8	0.889	0.82	10.00	10.00	6.93	0.000	5.060
	0.96	0.46	Pavement				
	0.82	0.27	Concrete				
	0.74	0.10	Industrial				
C1-C10	0.911	0.32	10.00	10.00	6.93	0.000	2.026
	0.96	0.24	Pavement				
	0.82	0.04	Concrete				
	0.74	0.05	Industrial				
C1-C12	0.917	0.92	10.00	10.00	6.93	0.000	5.841
	0.96	0.68	Pavement				
	0.82	0.16	Concrete				
	0.74	0.08	Industrial				
BW1-C9	0.96	0.29	10.00	10.00	6.93	0.000	1.922
	0.96	0.29	Pavement				
C1-C4	0.771	1.29	10.00	10.00	6.93	0.000	6.911
	0.96	0.28	Pavement				
	0.82	0.29	Concrete				
	0.7	0.67	Business				
	0.45	0.06	Grass				
C1-C3	0.757	0.39	10.00	10.00	6.93	0.000	2.055
	0.96	0.06	Pavement				
	0.82	0.05	Concrete				
	0.7	0.28	Business				
C1-C2	0.803	0.51	10.00	10.00	6.93	0.000	2.838
	0.96	0.20	Pavement				
	0.82	0.01	Concrete				
	0.7	0.30	Business				
C1-C1	0.761	0.57	10.00	10.00	6.93	0.000	3.005
	0.96	0.13	Pavement				
	0.7	0.44	Business				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
C1-C8	Curb	15.00	1.55	2.00	0.014	0.25	n/a	n/a	14.00	569.21
C1-C10	Curb	5.00	2.30	2.00	0.014	0.25	n/a	n/a	14.00	561.29
C1-C12	Curb	15.00	2.30	2.00	0.014	0.25	n/a	n/a	14.00	547.11
BW1-C9	Combi	5.00	2.80	2.00	0.014	0.25	1.49	Parall	13.00	563.66
C1-C1	Curb	15.00	1.97	1.00	0.014	0.25	n/a	n/a	13.00	577.53
C1-C2	Curb	5.00	0.41	1.61	0.014	0.25	n/a	n/a	14.00	575.85
C1-C3	Curb	5.00	4.10	2.00	0.014	0.25	n/a	n/a	14.00	575.59

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C1-C8	Curb	5.060	4.954	0.250	0.106	C1-C2	16.98	15.00	11.60
C1-C10	Curb	2.026	1.343	0.250	0.683	C1-C2	11.02	5.00	7.65
C1-C12	Curb	5.841	5.345	0.250	0.496		20.11	15.00	11.35
BW1-C9	Combi	1.922	1.722	0.250	0.200	C1-C3	0.00	5.00	7.20
C1-C1	Curb	3.005	3.005	0.000	0.000	C1-C7	15.08	15.00	14.10
C1-C2	Curb	3.626	2.394	0.250	1.232	C1-C6	11.08	5.00	15.03
C1-C3	Curb	2.256	1.281	0.250	0.975	C1-C5	13.42	5.00	7.15

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
C1-C4	Curb	15.00	n/a	0.50	2.00	0.50	2.00	0.014	1.50	0.50	575.29

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
C1-C4	Curb	15.00	n/a	n/a	6.911	14.393	0.307	12.45	12.45

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1-C8	Curb	0.799	3.59	13.80	6.00	0.000	0.00	17.203
C1-C10	Curb	0.819	4.20	14.40	5.87	0.000	1.26	21.455
C1-C12	Curb	0.837	5.12	15.18	5.72	0.000	1.26	25.764
BW1-C9	Combi	0.960	0.29	10.00	6.93	0.000	0.00	1.922
LAT-C9	Junct	0.811	3.88	14.31	5.89	0.000	1.26	19.796
MH-C11	CircMh	0.819	4.20	14.40	5.87	0.000	1.26	21.455
C1-C1	Curb	0.761	0.57	10.00	6.93	0.000	0.00	3.005
C1-C2	Curb	0.781	1.08	10.55	6.77	0.000	0.00	5.711
C1-C3	Curb	0.775	1.47	10.84	6.69	0.000	0.00	7.633
C1-C4	Curb	0.773	2.77	11.08	6.63	0.000	0.00	14.178
MH-C7	CircMh	0.773	2.77	11.08	6.63	0.000	0.00	14.178
MH-C6	CircMh	0.773	2.77	11.08	6.63	0.000	0.00	14.178
MH-C5	CircMh	0.773	2.77	11.08	6.63	0.000	0.00	14.178
OUT	Outlt	0.837	5.12	15.18	5.72	0.000	1.26	25.764

Conveyance Configuration Data

Run#	Node US	Node DS	I.D.	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1-C1	C1-C2		573.03	571.85	Circ 1	0.00	1.50	154.13	0.77	0.013
2	C1-C2	C1-C3		571.85	571.09	Circ 1	0.00	1.50	95.00	0.80	0.013
3	C1-C3	C1-C4		571.09	570.29	Circ 1	0.00	1.50	88.39	0.91	0.013
4	C1-C4	MH-C5		569.79	568.14	Circ 1	0.00	2.00	311.61	0.53	0.013
5	MH-C5	MH-C6		568.14	566.39	Circ 1	0.00	2.00	300.00	0.58	0.013
6	MH-C6	MH-C7		566.39	564.66	Circ 1	0.00	2.00	251.15	0.69	0.013
7	MH-C7	C1-C8		564.66	563.71	Circ 1	0.00	2.00	148.91	0.64	0.013
8	C1-C8	LAT-C9		563.71	557.90	Circ 1	0.00	2.00	310.76	1.87	0.013
9	BW1-C9	LAT-C9		559.16	558.02	Circ 1	0.00	1.50	31.92	3.57	0.013
10	LAT-C9	C1-C10		557.90	556.79	Circ 1	0.00	2.00	59.21	1.88	0.013
11	C1-C10	MH-C11		556.79	549.81	Circ 1	0.00	2.00	300.19	2.33	0.013
12	MH-C11	C1-C12		549.81	543.11	Circ 1	0.00	2.00	254.83	2.63	0.013
13	C1-C12	OUT		542.61	541.62	Circ 1	0.00	2.50	70.02	1.41	0.013

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	573.62	572.69	0.082	0.59	0.84	4.64	2.94	3.01	9.19	0.000
2*	572.69	572.07	0.296	0.84	0.98	5.58	4.65	5.71	9.40	0.000
3*	572.07	571.27	0.528	0.98	0.98	6.21	6.21	7.63	9.99	0.000
4	571.23	569.52	0.393	1.44	1.44	5.87	5.87	14.18	16.46	0.000
5	569.52	567.75	0.393	1.38	1.38	6.16	6.16	14.18	17.28	0.000
6*	567.69	565.99	0.393	1.30	1.33	6.58	6.40	14.18	18.78	0.000
7*	565.99	565.04	0.393	1.33	1.33	6.40	6.40	14.18	18.07	0.000
8*	564.78	559.06	0.578	1.07	1.16	10.10	9.10	17.20	30.94	0.000
9*	559.49	559.06	0.033	0.32	1.04	7.10	1.47	1.92	19.86	0.000
10*	559.06	557.95	0.766	1.16	1.16	10.48	10.48	19.80	30.98	0.000
11*	557.93	550.95	0.899	1.14	1.14	11.59	11.59	21.45	34.51	0.000
12*	550.91	544.21	0.899	1.10	1.10	12.15	12.15	21.45	36.69	0.000
13*	543.90	542.91	0.394	1.29	1.29	10.10	10.10	25.76	48.78	0.000

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years
Capacity of grade inlet exceeded at inlet Id= C1-C8
Capacity of grade inlet exceeded at inlet Id= C1-C10
Capacity of grade inlet exceeded at inlet Id= C1-C12
Capacity of grade inlet exceeded at inlet Id= BW1-C9
Capacity of grade inlet exceeded at inlet Id= C1-C1
Computed ponded width exceeds allowable width at inlet Id= C1-C1
Capacity of grade inlet exceeded at inlet Id= C1-C2
Computed ponded width exceeds allowable width at inlet Id= C1-C2
Capacity of grade inlet exceeded at inlet Id= C1-C3
Discharge decreased downstream node Id= MH-C5 Previous intensity used.
Discharge decreased downstream node Id= MH-C6 Previous intensity used.
Discharge decreased downstream node Id= MH-C7 Previous intensity used.
Discharge decreased downstream node Id= MH-C11 Previous intensity used.
Tailwater set to uniform depth elevation = 542.91(ft)

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE C

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	233

STATE OF TEXAS 99322 LICENSED PROFESSIONAL ENGINEER
2/9/09

SHEET 3 OF 12

2/9/2009 6:36:50 AM aadams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TOF03.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
ANALYSYS FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1-D5	0.896	0.45	10.00	10.00	6.93	0.000	2.769
	0.96	0.25	Pavement				
	0.82	0.15	Concrete				
	0.8	0.05	Business				
C1-D8	0.792	0.84	10.00	10.00	6.93	0.000	4.615
	0.96	0.33	Pavement				
	0.82	0.06	Concrete				
	0.7	0.39	Industrial				
	0.45	0.06	Grass				
C1-D9	0.783	1.07	10.00	10.00	6.93	0.000	5.804
	0.96	0.34	Pavement				
	0.7	0.73	Industrial				
C1-D10	0.816	0.67	10.00	10.00	6.93	0.000	3.780
	0.96	0.30	Pavement				
	0.7	0.37	Industrial				
BWI-D7	0.96	0.29	10.00	10.00	6.93	0.000	1.922
	0.96	0.29	Pavement				
C1-D2	0.858	0.69	10.00	10.00	6.93	0.000	4.098
	0.96	0.37	Pavement				
	0.82	0.25	Concrete				
	0.45	0.07	GRASS				
C1-D1	0.894	0.49	10.00	10.00	6.93	0.000	3.029
	0.96	0.34	Pavement				
	0.82	0.12	Concrete				
	0.45	0.03	GRASS				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
C1-D5	Curb	15.00	1.15	2.00	0.014	0.25	n/a	n/a	14.00	571.78
C1-D8	Curb	15.00	2.29	2.00	0.014	0.25	n/a	n/a	14.00	564.46
C1-D9	Curb	15.00	2.29	2.00	0.014	0.25	n/a	n/a	14.00	558.29
C1-D10	Curb	15.00	2.29	2.00	0.014	0.25	n/a	n/a	14.00	551.02
BWI-D7	Combi	5.00	2.90	2.00	0.014	0.25	1.49	Parall	13.00	567.44
C1-D2	Curb	5.00	0.54	2.00	0.014	0.25	n/a	n/a	14.00	572.01

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C1-D5	Curb	2.769	2.769	0.250	0.000	C1-D2	11.21	15.00	9.80
C1-D8	Curb	4.615	4.475	0.250	0.140	C1-D3	17.51	15.00	10.40
C1-D9	Curb	5.804	5.322	0.250	0.482	C1-D4	20.03	15.00	11.35
C1-D10	Curb	3.780	3.769	0.000	0.011		15.61	15.00	9.65
BWI-D7	Combi	1.922	1.719	0.250	0.202	C1-D2	0.00	5.00	7.15
C1-D2	Curb	4.301	2.619	0.250	1.682	C1-D7	12.30	5.00	13.30

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
C1-D1	Curb	10.00	n/a	0.50	2.00	0.50	2.00	0.014	1.50	0.50	572.86

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
C1-D1	Curb	10.00	n/a	n/a	3.029	10.327	0.221	9.10	9.10

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1-D5	Curb	0.879	1.63	13.69	6.02	0.000	0.00	8.599
C1-D8	Curb	0.861	2.76	15.05	5.75	0.000	0.00	13.640
C1-D9	Curb	0.839	3.83	15.50	5.67	0.000	0.00	18.189
C1-D10	Curb	0.836	4.49	15.98	5.58	0.000	0.00	20.957
MH-D6	CircMh	0.879	1.63	13.69	6.02	0.000	0.00	8.599
LAT-D7	Junct	0.891	1.91	14.75	5.81	0.000	0.00	9.908
BWI-D7	Combi	0.960	0.29	10.00	6.93	0.000	0.00	1.922
C1-D2	Curb	0.873	1.18	10.82	6.70	0.000	0.00	6.894
C1-D1	Curb	0.894	0.49	10.00	6.93	0.000	0.00	3.029
MH-D3	CircMh	0.873	1.18	10.82	6.70	0.000	0.00	6.894
MH-D4	CircMh	0.873	1.18	10.82	6.70	0.000	0.00	6.894
OUT	Outlt	0.836	4.49	15.98	5.58	0.000	0.00	20.957

Conveyance Configuration Data

Run#	Node I.D. US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1-D1	C1-D2	568.01	567.36	Circ 1	0.00	1.50	175.00	0.37	0.013
2	C1-D2	MH-D3	567.36	566.14	Circ 1	0.00	1.50	201.38	0.61	0.013
3	MH-D3	MH-D4	566.14	564.68	Circ 1	0.00	1.50	300.00	0.49	0.013
4	MH-D4	C1-D5	564.68	562.78	Circ 1	0.00	1.50	350.44	0.54	0.013
5	C1-D5	MH-D6	562.78	561.07	Circ 1	0.00	1.50	249.68	0.68	0.013
6	MH-D6	LAT-D7	560.57	560.01	Circ 1	0.00	2.00	100.03	0.56	0.013
7	BWI-D7	LAT-D7	562.44	560.01	Circ 1	0.00	1.50	36.26	6.72	0.013
8	LAT-D7	C1-D8	560.01	559.46	Circ 1	0.00	2.00	99.82	0.55	0.013
9	C1-D8	C1-D9	559.46	553.79	Circ 1	0.00	2.00	270.02	2.10	0.013
10	C1-D9	C1-D10	553.29	545.02	Circ 1	0.00	2.00	330.00	2.51	0.013
11	C1-D10	OUT	544.02	542.38	Circ 1	0.00	2.00	70.00	2.34	0.013

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	568.74	568.41	0.083	0.73	1.05	3.57	2.28	3.03	6.40	0.000
2	568.41	567.29	0.431	1.05	1.15	5.19	4.75	6.89	8.18	0.000
3	567.29	565.78	0.431	1.15	1.15	4.75	4.75	6.89	7.33	0.000
4	565.78	564.00	0.431	1.10	1.22	4.96	4.48	6.89	7.74	0.000
5	564.00	562.21	0.670	1.22	1.22	5.59	5.59	8.60	8.69	0.000
6*	561.58	561.12	0.144	1.01	1.11	5.42	4.81	8.60	16.93	0.000
7*	562.72	561.12	0.033	0.27	1.11	8.87	1.37	1.92	27.23	0.000
8*	561.12	560.57	0.192	1.11	1.11	5.54	5.54	9.91	16.79	0.000
9*	560.36	554.69	0.363	0.90	0.90	9.97	9.97	13.64	32.79	0.000
10*	554.30	546.03	0.646	1.01	1.01	11.44	11.44	18.19	35.82	0.000
11*	545.14	543.50	0.858	1.12	1.12	11.56	11.56	20.96	34.64	0.000

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years
Capacity of grade inlet exceeded at inlet Id= C1-D8
Capacity of grade inlet exceeded at inlet Id= C1-D9
Capacity of grade inlet exceeded at inlet Id= C1-D10
Capacity of grade inlet exceeded at inlet Id= BWI-D7
Capacity of grade inlet exceeded at inlet Id= C1-D2
Discharge decreased downstream node Id= MH-D3 Previous Intensity used.
Discharge decreased downstream node Id= MH-D4 Previous Intensity used.
Discharge decreased downstream node Id= MH-D6 Previous Intensity used.
Tailwater set to uniform depth elevation = 543.50(ft)

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
5/20/09

NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE D

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: AWD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	234

SHEET 4 OF 12

5/18/2009 1:59:51 PM adams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435T0F04.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
ANALYSYS FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1-E1	0.739	0.52	10.00	10.00	6.93	0.000	2.655
	0.96	0.08	Pavement				
	0.7	0.44	Industrial				
C1-E2	0.729	0.48	10.00	10.00	6.93	0.000	2.410
	0.96	0.05	Pavement				
	0.7	0.42	Industrial				
C1-E3	0.748	0.95	10.00	10.00	6.93	0.000	4.924
	0.96	0.17	Pavement				
	0.7	0.78	Industrial				
C1-E4	0.843	0.43	10.00	10.00	6.93	0.000	2.506
	0.96	0.26	Pavement				
	0.7	0.15	Industrial				
	0.45	0.02	Grass				
C1-E5	0.909	0.37	10.00	10.00	6.93	0.000	2.316
	0.96	0.34	Pavement				
	0.35	0.03	Grass				
C1-E8	0.891	0.65	10.00	10.00	6.93	0.000	3.991
	0.96	0.56	Pavement				
	0.45	0.09	Undeveloped				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
C1-E1	Curb	10.00	0.35	2.00	0.014	0.25	n/a	n/a	14.00	588.50
C1-E2	Curb	10.00	0.24	2.00	0.014	0.25	n/a	n/a	14.00	588.35
C1-E4	Curb	10.00	0.35	2.00	0.014	0.25	n/a	n/a	14.00	588.32
C1-E5	Curb	10.00	0.35	2.00	0.014	0.25	n/a	n/a	14.00	588.97
C1-E8	Curb	15.00	1.99	2.00	0.014	0.25	n/a	n/a	14.00	581.16

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C1-E1	Curb	2.655	2.655	0.250	0.000	C1-L4	8.44	10.00	12.05
C1-E2	Curb	2.410	2.410	0.250	0.000	C1-E3	7.33	10.00	12.45
C1-E4	Curb	2.506	2.506	0.250	0.000	C1-E3	8.15	10.00	11.80
C1-E5	Curb	2.316	2.316	0.250	0.000	C1-E2	7.78	10.00	11.45
C1-E8	Curb	3.991	3.980	0.250	0.011		15.60	15.00	10.10

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
C1-E3	Curb	15.00	n/a	0.17	2.00	0.17	2.00	0.014	1.50	0.50	588.25

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
C1-E3	Curb	15.00	n/a	n/a	4.924	14.393	0.245	13.40	13.40

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1-E1	Curb	0.739	0.52	10.00	6.93	0.000	0.00	2.655
C1-E2	Curb	0.734	1.00	10.25	6.86	0.000	0.00	5.014
C1-E3	Curb	0.741	1.95	10.59	6.76	0.000	0.00	9.751
C1-E4	Curb	0.759	2.38	10.83	6.70	0.000	0.00	12.080
C1-E5	Curb	0.779	2.74	11.53	6.52	0.000	0.00	13.932
MH-E6	BoxMh	0.779	2.74	11.53	6.52	0.000	0.00	13.932
MH-E7	BoxMh	0.779	2.74	11.53	6.52	0.000	0.00	13.932
C1-E8	Curb	0.801	3.39	14.02	5.95	0.000	0.00	16.157
OUT	Outlt	0.801	3.39	14.02	5.95	0.000	0.00	16.157

Conveyance Configuration Data

Run#	Node US	Node DS	I.D.	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1-E1	C1-E2		584.00	583.82	Circ 1	0.00	1.50	50.18	0.35	0.013
2	C1-E2	C1-E3		583.35	583.07	Circ 1	0.00	1.50	79.79	0.35	0.013
3	C1-E3	C1-E4		582.75	582.52	Circ 1	0.00	2.00	67.84	0.35	0.013
4	C1-E4	C1-E5		582.32	581.62	Circ 1	0.00	2.00	200.00	0.35	0.013
5	C1-E5	MH-E6		581.47	580.27	Circ 1	0.00	2.00	300.00	0.40	0.013
6	MH-E6	MH-E7		579.96	578.77	Circ 1	0.00	2.00	299.34	0.40	0.013
7	MH-E7	C1-E8		578.50	576.12	Circ 1	0.00	2.00	250.48	0.95	0.013
8	C1-E8	OUT		575.66	572.83	Circ 1	0.00	2.00	113.37	2.50	0.013

Conveyance Hydraulic Computations. Tailwater = 574.827 (ft)

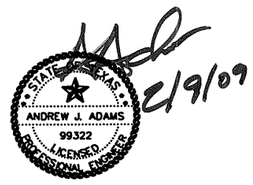
Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	584.68	584.44	0.064	0.68	0.68	3.41	3.41	2.66	6.22	0.000
2	584.38	584.03	0.228	1.03	1.03	3.87	3.87	5.01	6.21	0.000
3	584.03	583.82	0.186	1.27	1.31	4.65	4.49	9.75	13.37	0.000
4	583.82	583.06	0.285	1.50	1.50	4.78	4.78	12.08	13.39	0.000
5	583.06	581.61	0.379	1.59	1.59	5.19	5.19	13.93	14.31	0.000
6	581.56	580.11	0.379	1.59	1.59	5.19	5.19	13.93	14.31	0.000
7*	579.65	577.27	0.379	1.16	1.16	7.40	7.40	13.93	22.06	0.000
8*	577.11	574.83	0.510	0.94	2.00	11.08	5.14	16.16	35.78	0.000

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years
Capacity of grade inlet exceeded at inlet Id= C1-E8
Discharge decreased downstream node Id= MH-E6 Previous intensity used.
Discharge decreased downstream node Id= MH-E7 Previous intensity used.



NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE E

Designed: AJA	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn: AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073		235

2/9/2009 6:37:01 AM aadams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TOF05.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
CI-F1	0.903	0.45	10.00	10.00	6.93	0.000	2.789
	0.96	0.40	Pavement				
	0.45	0.05	GRASS				
CI-F2	0.913	0.37	10.00	10.00	6.93	0.000	2.340
	0.96	0.34	Pavement				
	0.45	0.03	GRASS				
CI-F3	0.921	0.58	10.00	10.00	6.93	0.000	3.681
	0.96	0.53	Pavement				
	0.45	0.04	grass				
CI-F6	0.864	0.58	10.00	10.00	6.93	0.000	3.466
	0.96	0.49	Pavement				
	0.35	0.09	GRASS				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
CI-F1	Curb	10.00	0.35	2.00	0.014	0.25	n/a	n/a	14.00	582.88
CI-F2	Curb	10.00	0.35	2.00	0.014	0.25	n/a	n/a	14.00	582.00
CI-F6	Curb	15.00	1.60	2.00	0.014	0.25	n/a	n/a	14.00	578.50

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
CI-F1	Curb	2.789	2.789	0.250	0.000	CI-F2	8.69	10.00	12.25
CI-F2	Curb	2.340	2.340	0.250	0.000	CI-F1	7.83	10.00	11.45
CI-F6	Curb	3.466	3.466	0.250	0.000		13.71	15.00	10.00

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
CI-F3	Curb	15.00	n/a	0.50	2.00	0.50	2.00	0.014	1.50	0.50	581.87

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
CI-F3	Curb	15.00	n/a	n/a	3.681	14.393	0.201	9.80	9.80

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
CI-F1	Curb	0.903	0.45	10.00	6.93	0.000	0.00	2.789
CI-F2	Curb	0.908	0.82	11.22	6.60	0.000	0.00	4.884
CI-F3	Curb	0.913	1.39	11.54	6.51	0.000	1.02	9.308
MH-F4	CircMh	0.913	1.39	11.54	6.51	0.000	1.02	9.308
MH-F5	CircMh	0.913	1.39	11.54	6.51	0.000	1.02	9.308
CI-F6	Curb	0.899	1.97	14.77	5.80	0.000	1.02	11.308
OUT	Outlt	0.899	1.97	14.77	5.80	0.000	1.02	11.308

Conveyance Configuration Data

Run#	Node US	Node DS	I.D.	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	CI-F1	CI-F2		578.38	577.51	Circ 1	0.00	1.50	250.00	0.35	0.013
2	CI-F2	CI-F3		577.50	577.24	Circ 1	0.00	1.50	75.23	0.35	0.013
3	CI-F3	MH-F4		576.87	575.82	Circ 1	0.00	2.00	299.80	0.35	0.013
4	MH-F4	MH-F5		575.40	574.35	Circ 1	0.00	2.00	299.97	0.35	0.013
5	MH-F5	CI-F6		574.34	573.29	Circ 1	0.00	2.00	300.00	0.35	0.013
6	CI-F6	OUT		573.00	570.60	Circ 1	0.00	2.00	120.19	2.00	0.013

Conveyance Hydraulic Computations. Tailwater = 572.598 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	579.08	578.51	0.070	0.70	1.00	3.43	2.22	2.79	6.22	0.000
2	578.51	578.09	0.216	1.01	1.01	3.87	3.87	4.88	6.21	0.000
3	578.09	576.91	0.169	1.22	1.22	4.64	4.64	9.31	13.38	0.000
4	576.62	575.56	0.169	1.22	1.22	4.64	4.64	9.31	13.39	0.000
5	575.56	574.38	0.169	1.22	1.22	4.64	4.64	9.31	13.39	0.000
6*	574.21	572.60	0.250	0.82	2.00	9.32	3.60	11.31	32.00	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years
Discharge decreased downstream node Id= MH-F4 Previous intensity used.
Discharge decreased downstream node Id= MH-F5 Previous intensity used.

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE F

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn: AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073		236

SHEET 6 OF 12

p:\Active Projects\TXD0643\TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TOF06.999 2/9/2009 6:37:07 AM aadams

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 10 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1-G5	0.96	0.66	10.00	10.00	7.98	0.000	5.018
	0.96	0.66	Pavement				
C1-G4	0.96	0.44	10.00	10.00	7.98	0.000	3.378
	0.96	0.44	Pavement				
C1-G2	0.96	0.50	10.00	10.00	7.98	0.000	3.861
	0.96	0.50	Pavement				
C1-G1	0.96	0.64	10.00	10.00	7.98	0.000	4.918
	0.96	0.64	Pavement				
BW1-G6	0.96	0.23	10.00	10.00	7.98	0.000	1.785
	0.96	0.23	Pavement				
BW1-G8	0.96	0.29	10.00	10.00	7.98	0.000	2.245
	0.96	0.29	Pavement				
BW1-G10	0.96	0.34	10.00	10.00	7.98	0.000	2.574
	0.96	0.34	Pavement				
BW1-G12	0.96	0.29	10.00	10.00	7.98	0.000	2.199
	0.96	0.29	Pavement				
SD-G3	0.45	2.65	10.00	10.00	7.98	0.000	9.512
	0.45	2.65	Undeveloped				
SD-G1A	0.96	0.04	10.00	10.00	7.98	0.000	0.329
	0.96	0.04	Pavement				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
C1-G5	Curb	15.00	6.01	2.00	0.014	0.25	n/a	n/a	22.00	585.40
C1-G2	Curb	15.00	0.50	2.00	0.014	0.25	n/a	n/a	22.00	585.30
C1-G1	Curb	15.00	0.50	2.00	0.014	0.25	n/a	n/a	22.00	586.55
BW1-G8	Combi	5.00	0.65	2.00	0.014	0.25	1.49	Parall	22.00	589.71
BW1-G10	Combi	5.00	1.70	2.00	0.014	0.25	1.49	Parall	22.00	592.31
BW1-G12	Combi	5.00	1.70	2.00	0.014	0.25	1.49	Parall	22.00	594.99

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C1-G5	Curb	5.018	4.291	0.250	0.727	C1-G3	22.79	15.00	8.95
C1-G2	Curb	3.861	3.861	0.250	0.000	C1-G3	11.35	15.00	12.95
C1-G1	Curb	4.918	4.918	0.250	0.000	C1-G2	13.11	15.00	14.20
BW1-G8	Combi	2.245	2.283	0.250	0.000	BW1-G5	0.00	5.00	10.05
BW1-G10	Combi	2.574	2.330	0.250	0.244	BW1-G6	0.00	5.00	8.85
BW1-G12	Combi	2.199	2.118	0.250	0.080	BW1-G7	0.00	5.00	8.35

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
C1-G4	Curb	15.00	n/a	0.50	2.00	0.50	2.00	0.014	1.50	0.50	585.07
BW1-G6	Combi	5.00		0.50	2.00	0.50	2.00	0.014		0.50	589.71
SD-G3	Grate	9.67	5.83	0.50	2.00	0.50	2.00	0.014	n/a	0.50	581.85
SD-G1A	Grate	0.50	5.83	0.50	2.00	0.50	2.00	0.014	n/a	0.50	584.29

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
C1-G4	Curb	15.00	n/a	n/a	3.378	14.393	0.190	9.50	9.50
BW1-G6	Combi	5.00	1.24	1.85	2.029	6.261	0.236	7.85	7.85
SD-G3	Grate	n/a	9.67	5.83	9.512	5.275	0.467	14.00	14.00
SD-G1A	Grate	n/a	0.50	5.83	0.329	0.546	0.357	3.95	3.95

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1-G5	Curb	0.686	4.93	11.44	7.54	0.000	0.00	25.517
C1-G4	Curb	0.644	4.28	11.17	7.61	0.000	0.00	20.989
C1-G2	Curb	0.960	1.19	10.86	7.71	0.000	0.00	8.797
C1-G1	Curb	0.960	0.64	10.00	7.98	0.000	0.00	4.918
BW1-G6	Combi	0.960	0.23	10.00	7.98	0.000	0.00	1.785
BW1-G8	Combi	0.960	0.29	10.00	7.98	0.000	0.00	2.245
BW1-G10	Combi	0.960	0.34	10.00	7.98	0.000	0.00	2.574
BW1-G12	Combi	0.960	0.29	10.00	7.98	0.000	0.00	2.199
J-G7	Junct	0.699	5.17	12.24	7.31	0.000	0.00	26.393
MH-G9	CircMh	0.713	5.46	12.36	7.28	0.000	0.00	28.322
J-G11	Junct	0.727	5.80	12.77	7.17	0.000	0.00	30.216
J-G13	JnctBx	0.738	6.08	13.10	7.09	0.000	0.00	31.812
SD-G3	Grate	0.450	2.65	10.00	7.98	0.000	0.00	9.512
J-G1A	Junct	0.960	0.69	10.40	7.85	0.000	0.00	5.162
SD-G1A	Grate	0.960	0.04	10.00	7.98	0.000	0.00	0.329
OUT	Outlt	0.738	6.08	13.10	7.09	0.000	0.00	31.812

Conveyance Configuration Data

Run#	Node I.D. US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1-G1	J-G1A	581.05	580.36	Circ 1	0.00	1.50	115.95	0.60	0.013
2	C1-G2	C1-G4	579.30	578.94	Circ 1	0.00	2.00	90.95	0.40	0.013
3	C1-G4	C1-G5	577.82	577.15	Circ 1	0.00	2.50	109.19	0.61	0.013
4	C1-G5	J-G7	577.15	576.15	Circ 1	0.00	3.00	285.94	0.35	0.013
5	BW1-G6	J-G7	579.28	577.15	Circ 1	0.00	1.50	26.83	7.97	0.013
6	J-G7	MH-G9	576.15	575.54	Circ 1	0.00	3.00	64.05	0.95	0.013
7	BW1-G8	MH-G9	584.21	581.53	Circ 1	0.00	1.50	26.79	10.05	0.013
8	MH-G9	J-G11	575.54	575.01	Circ 1	0.00	3.00	149.94	0.35	0.013
9	BW1-G10	J-G11	578.31	575.76	Circ 1	0.00	1.50	24.18	10.62	0.013
10	J-G11	J-G13	575.01	574.14	Circ 1	0.00	3.00	149.95	0.58	0.013
11	BW1-G12	J-G13	586.99	584.83	Circ 1	0.00	1.50	18.02	12.07	0.013
12	SD-G3	C1-G4	579.85	577.82	Circ 1	0.00	1.50	77.50	2.62	0.013
13	J-G13	OUT	574.14	572.29	Circ 1	0.00	3.00	86.67	2.14	0.013
14	SD-G1A	J-G1A	580.79	580.36	Circ 1	0.00	1.50	5.65	7.69	0.013
15	J-G1A	C1-G2	580.36	579.56	Circ 1	0.00	1.50	134.05	0.60	0.013

Conveyance Hydraulic Computations. Tailwater = 575.288 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	581.89	581.22	0.219	0.84	0.87	4.80	4.65	4.92	8.12	0.000
2	580.43	579.99	0.151	1.13	1.13	4.83	4.83	8.80	14.31	0.000
3*	579.29	578.91	0.262	1.47	1.76	6.97	5.69	20.99	32.13	0.000
4	578.91	577.78	0.146	1.76	1.76	5.93	5.93	25.52	39.45	0.000
5*	579.54	577.53	0.029	0.25	0.38	9.23	5.15	1.78	29.65	0.000
6*	577.53	577.42	0.157	1.33	1.88	8.72	5.68	26.39	65.10	0.000
7*	584.47	581.79	0.046	0.26	0.26	10.69	10.69	2.24	33.31	0.000
8	577.42	576.73	0.180	1.88	1.88	6.09	6.09	28.32	39.55	0.000
9*	578.61	576.68	0.060	0.28	0.92	11.39	2.27	2.57	34.24	0.000
10*	576.68	575.97	0.205	1.66	1.83	7.51	6.69	30.22	50.90	0.000
11*	587.24	585.08	0.044	0.25	0.25	11.37	11.37	2.20	36.50	0.000
12*	580.67	579.29	0.820	0.80	1.47	9.88	5.40	9.51	17.01	0.000
13*	575.97	575.29	0.227	1.18	3.00	12.35	4.50	31.81	97.52	0.000
14*	581.22	581.22	0.001	0.11	0.87	5.50	0.31	0.33	29.13	0.000
15*	581.22	580.43	0.241	0.87	0.87	4.88	4.86	5.16	8.12	0.000

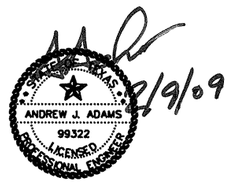
END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 10 Years
Capacity of grade inlet exceeded at inlet Id= C1-G5
Capacity of grade inlet exceeded at inlet Id= BW1-G10
Capacity of grade inlet exceeded at inlet Id= BW1-G12
Grate inlet in sag Id=SD-G3 has a % reduction safety factor = 50
Capacity of sag inlet exceeded at inlet Id= SD-G3
Drop flowline elevation. Downstream HGL set to uniform depth elevation at Run# 11
Drop flowline elevation. Downstream HGL set to uniform depth elevation at Run# 7



NO.	REVISION	BY	DATE

CP&I
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE G

Designed: AJA	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO. SEE TITLE SHEET			HIGHWAY NO. IH 30
Checked: RRH						
Drawn: AJA	DIST. DAL	COUNTY ROCKWALL	CONTROL NO. 0009	SECTION NO. 12	JOB NO. 073	SHEET NO. 237
Checked: RRH						

SHEET 7 OF 12

P:\Active Projects\TXD0643\TXD0643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.06 Drainage\435T0F07.999 adams 2/9/2009 6:37:13 AM

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 2 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 2 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1-H4	0.96	0.64	10.00	10.00	5.43	0.000	3.331
	0.96	0.64	Pavement				
C1-H3	0.96	0.41	10.00	10.00	5.43	0.000	2.127
	0.96	0.41	Pavement				
C1-H2	0.96	0.48	10.00	10.00	5.43	0.000	2.497
	0.96	0.48	Pavement				
C1-H1	0.96	0.58	10.00	10.00	5.43	0.000	3.024
	0.96	0.58	Pavement				
BW1-H5	0.96	0.37	10.00	10.00	5.43	0.000	1.918
	0.96	0.37	Pavement				
BW1-H7	0.96	0.44	10.00	10.00	5.43	0.000	2.294
	0.96	0.44	Pavement				
BW1-H9	0.96	0.31	10.00	10.00	5.43	0.000	1.595
	0.96	0.31	Pavement				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
C1-H4	Curb	15.00	0.60	2.00	0.014	0.25	n/a	n/a	14.00	585.40
C1-H2	Curb	15.00	0.50	2.00	0.014	0.25	n/a	n/a	14.00	585.30
C1-H1	Curb	15.00	0.50	2.00	0.014	0.25	n/a	n/a	14.00	586.55
BW1-H5	Combi	5.00	1.29	2.00	0.014	0.25	1.49	Parall	22.00	585.11
BW1-H7	Combi	5.00	1.70	2.00	0.014	0.25	1.49	Parall	22.00	590.57
BW1-H9	Combi	5.00	1.70	2.00	0.014	0.25	1.49	Parall	22.00	594.09

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C1-H4	Curb	3.331	3.331	0.250	0.000	C1-H3	10.83	15.00	11.85
C1-H2	Curb	2.497	2.497	0.250	0.000	C1-H3	8.78	15.00	11.00
C1-H1	Curb	3.024	3.024	0.250	0.000	C1-H2	9.82	15.00	11.80
BW1-H5	Combi	2.035	2.053	0.250	0.000	C1-H4	0.00	5.00	8.55
BW1-H7	Combi	2.294	2.177	0.250	0.117	BW1-H5	0.00	5.00	8.45
BW1-H9	Combi	1.595	1.739	0.250	0.000	BW1-H6	0.00	5.00	7.40

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
C1-H3	Curb	15.00	n/a	0.50	2.00	0.50	2.00	0.014	1.50	0.50	585.07

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
C1-H3	Curb	15.00	n/a	n/a	2.127	14.393	0.140	8.00	8.00

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1-H4	Curb	0.960	2.11	12.00	5.00	0.000	0.00	10.115
C1-H3	Curb	0.960	1.47	11.57	5.09	0.000	0.00	7.165
C1-H2	Curb	0.960	1.06	11.19	5.17	0.000	0.00	5.252
C1-H1	Curb	0.960	0.58	10.00	5.43	0.000	0.00	3.024
BW1-H5	Combi	0.960	0.37	10.00	5.43	0.000	0.00	1.918
BW1-H7	Combi	0.960	0.44	10.00	5.43	0.000	0.00	2.294
BW1-H9	Combi	0.960	0.31	10.00	5.43	0.000	0.00	1.595
MH-H6	CircMh	0.960	2.47	12.44	4.92	0.000	0.00	11.681
MH-H8	CircMh	0.960	2.91	13.39	4.75	0.000	0.00	13.282
JB-H10	JnctBx	0.960	3.22	14.05	4.64	0.000	0.00	14.330
OUT	Outlt	0.960	3.22	14.05	4.64	0.000	0.00	14.330

Conveyance Configuration Data

Run#	Node US	I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1-H1	C1-H2	581.05	580.17	Circ 1	0.00	1.50	250.00	0.35	0.013
2	C1-H2	C1-H3	579.80	579.48	Circ 1	0.00	2.00	90.81	0.35	0.013
3	C1-H3	C1-H4	579.07	578.69	Circ 1	0.00	2.00	109.19	0.35	0.013
4	C1-H4	MH-H6	578.40	577.96	Circ 1	0.00	2.50	125.00	0.35	0.013
5	BW1-H5	MH-H6	579.61	577.62	Circ 1	0.00	1.50	27.54	7.25	0.013
6	MH-H6	MH-H8	577.62	576.66	Circ 1	0.00	2.50	274.98	0.35	0.013
7	BW1-H7	MH-H8	584.57	580.82	Circ 1	0.00	1.50	26.76	14.15	0.013
8	MH-H8	JB-H10	576.65	575.95	Circ 1	0.00	2.50	199.93	0.35	0.013
9	BW1-H9	JB-H10	584.09	581.98	Circ 1	0.00	1.50	21.10	10.05	0.013
10	JB-H10	OUT	575.55	570.98	Circ 1	0.00	2.50	178.25	2.57	0.013

Conveyance Hydraulic Computations. Tailwater = 573.482 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	581.79	580.84	0.083	0.74	0.74	3.49	3.49	3.02	6.22	0.000
2	580.67	580.29	0.054	0.88	0.88	3.97	3.97	5.25	13.39	0.000
3	580.12	579.64	0.100	1.05	1.05	4.30	4.30	7.16	13.38	0.000
4	579.53	579.03	0.061	1.13	1.13	4.68	4.68	10.12	24.26	0.000
5*	579.89	578.85	0.033	0.26	1.23	9.14	1.24	1.92	28.29	0.000
6	578.85	577.98	0.081	1.23	1.32	4.86	4.45	11.68	24.26	0.000
7*	584.82	581.07	0.048	0.25	0.25	12.17	12.17	2.29	39.53	0.000
8	577.98	577.17	0.105	1.33	1.33	5.01	5.01	13.28	24.27	0.000
9*	584.31	582.20	0.023	0.22	0.22	9.70	9.70	1.60	33.31	0.000
10*	576.83	573.48	0.122	0.79	2.50	10.70	2.92	14.33	65.70	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 2 Years
Capacity of grade inlet exceeded at inlet Id= BW1-H7
Drop flowline elevation. Downstream HGL set to uniform depth elevation at Run# 9
Drop flowline elevation. Downstream HGL set to uniform depth elevation at Run# 7

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINE H

Designed: AJA	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	236

SHEET 8 OF 12

2/9/2009 6:37:18 AM aadams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435T0F08.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
C1-11	0.565	0.76	10.00	10.00	6.93	0.000	2.986
	0.96	0.17	Pavement				
	0.45	0.59	Undeveloped				
C1-12	0.668	0.73	10.00	10.00	6.93	0.000	3.371
	0.96	0.31	Pavement				
	0.45	0.42	Undeveloped				
C1-13	0.834	0.41	10.00	10.00	6.93	0.000	2.356
	0.96	0.31	Pavement				
	0.45	0.10	Undeveloped				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
C1-11	Curb	15.00	1.97	2.00	0.014	0.25	n/a	n/a	22.00	579.75
C1-12	Curb	15.00	0.36	2.00	0.014	0.25	n/a	n/a	22.00	576.54
C1-13	Curb	15.00	1.53	2.00	0.014	0.25	n/a	n/a	22.00	577.50

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
C1-11	Curb	2.986	2.986	0.000	0.000		13.20	15.00	9.10
C1-12	Curb	3.371	3.371	0.000	0.000		9.75	15.00	13.10
C1-13	Curb	2.356	2.356	0.250	0.000	C1-12	10.89	15.00	8.70

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
C1-11	Curb	0.565	0.76	10.00	6.93	0.000	0.00	2.986
C1-12	Curb	0.615	1.49	10.61	6.76	0.000	0.00	6.200
C1-13	Curb	0.662	1.90	11.00	6.65	0.000	0.01	8.378
OUT	Outlt	0.662	1.90	11.00	6.65	0.000	0.01	8.378

Conveyance Configuration Data

Run#	Node I.D. US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	C1-11	C1-12	575.75	573.95	Circ 1	0.00	1.50	185.20	0.97	0.013
2	C1-12	C1-13	573.79	573.44	Circ 1	0.00	2.00	98.22	0.35	0.013
3	C1-13	OUT	573.00	572.54	Circ 1	0.00	2.00	46.63	1.00	0.013

Conveyance Hydraulic Computations. Tailwater = 574.449 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	576.30	574.75	0.081	0.55	0.80	5.08	3.13	2.99	10.35	0.000
2	574.75	574.51	0.075	0.95	1.07	4.20	3.63	6.20	13.39	0.000
3*	574.51	574.45	0.137	0.84	1.91	6.65	2.71	8.38	22.62	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years*

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2/9/2009 6:37:24 AM aadams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Dr

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS

LINE I

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
2/9/09

Designed: AJA	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO. SEE TITLE SHEET			HIGHWAY NO. IH 30
Checked: RRH						
Drawn: AJA	DIST. DAL	COUNTY ROCKWALL	CONTROL NO. 0009	SECTION NO. 12	JOB NO. 073	SHEET NO. 239
Checked: RRH						

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
BWI-J1	0.96	0.53	10.00	10.00	6.93	0.000	3.491
	0.96	0.53	Pavement				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
BWI-J1	Combi	5.00	1.12	2.00	0.014	0.25	1.49	Parall	22.00	597.24

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
BWI-J1	Combi	3.491	2.852	0.250	0.640		0.00	5.00	10.70

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
BWI-J1	Combi	0.960	0.53	10.00	6.93	0.000	0.00	3.491
OUT	Outlt	0.960	0.53	10.00	6.93	0.000	0.00	3.491

Conveyance Configuration Data

Run#	Node US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	BWI-J1	OUT	591.74	572.52	Circ 1	0.00	1.50	66.29	30.30	0.013

Conveyance Hydraulic Computations. Tailwater = 573.540 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	591.99	573.54	0.110	0.25	1.02	18.06	2.72	3.49	57.83	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years
Capacity of grade inlet exceeded at inlet Id= BWI-J1
*

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 10 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
BWI-K1	0.73	0.93	10.00	10.00	7.98	0.000	5.385
	0.96	0.51	Pavement				
	0.45	0.42	Undeveloped				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
BWI-K1	Combi	5.00	1.11	2.00	0.014	0.25	1.49	Parall	22.00	597.24

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
BWI-K1	Combi	5.385	3.640	0.250	1.745		0.00	5.00	12.65

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
BWI-K1	Combi	0.730	0.93	10.00	7.98	0.000	0.00	5.385
JB-K2	CircMh	0.730	0.93	10.00	7.98	0.000	0.00	5.385
OUT	Outlt	0.730	0.93	10.00	7.98	0.000	0.00	5.385

Conveyance Configuration Data

Run#	Node US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	BWI-K1	JB-K2	591.74	588.78	Circ 1	0.00	1.50	11.84	25.82	0.013
2	JB-K2	OUT	578.63	570.98	Circ 1	0.00	2.00	21.85	37.36	0.013

Conveyance Hydraulic Computations. Tailwater = 572.981 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	592.06	589.10	0.263	0.32	0.32	19.39	19.39	5.38	53.39	0.000
2*	579.45	572.98	0.057	0.27	2.00	21.29	1.71	5.38	138.30	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 10 Years
Capacity of grade inlet exceeded at inlet Id= BWI-K1
Discharge decreased downstream node Id= JB-K2 Previous intensity used.
Drop flowline elevation. Downstream HGL set to uniform depth elevation at Run# 1
*

NO.	REVISION	BY	DATE

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED PROFESSIONAL ENGINEER
2/9/09

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS
LINES J AND K

Designed: AJA	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	240

SHEET 10 OF 12

2/9/2009 6:37:29 AM aadams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TOF10.999

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
CI-L1	0.667	0.73	10.00	10.00	6.93	0.000	3.358
	0.96	0.31	Pavement				
	0.45	0.42	Grass				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
CI-L1	Curb	15.00	0.91	2.00	0.014	0.25	n/a	n/a	22.00	573.69

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
CI-L1	Curb	3.358	3.358	0.250	0.000		11.90	15.00	11.00

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
CI-L1	Curb	0.667	0.73	10.00	6.93	0.000	0.00	3.358
OUT	Outlt	0.667	0.73	10.00	6.93	0.000	0.00	3.358

Conveyance Configuration Data

Run#	Node I.D. US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	CI-L1	OUT	571.62	570.89	Circ 1	0.00	1.50	209.57	0.35	0.013

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	572.41	571.67	0.102	0.79	0.79	3.59	3.59	3.36	6.21	0.000

END

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years
Tailwater set to uniform depth elevation = 571.67(ft)

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 5 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 5 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
CI-M1	0.9	0.38	10.00	10.00	6.93	0.000	2.368
	0.96	0.34	Pavement				
	0.4	0.04	Grass				

On Grade Inlet Configuration Data

Inlet ID	Inlet Type	Inlet Length (ft)	Slopes Long (%)	Slopes Trans (%)	Gutter n	Gutter Depr. (ft)	Grate Width (ft)	Grate Type	Pond Width Allowed (ft)	Critic Elev. (ft)
CI-M1	Curb	10.00	0.41	2.00	0.014	0.25	n/a	n/a	22.00	573.65

On Grade Inlets Conmputation Data.

Inlet ID	Inlet Type	Total Q (cfs)	Intercept Capacity (cfs)	Q Bypass Allow (cfs)	Q Bypass Actual (cfs)	To Inlet ID	Required Length (ft)	Actual Length (ft)	Ponded Width (ft)
CI-M1	Curb	2.368	2.368	0.250	0.000		8.16	10.00	11.20

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
CI-M1	Curb	0.900	0.38	10.00	6.93	0.000	0.00	2.368
OUT	Outlt	0.900	0.38	10.00	6.93	0.000	0.00	2.368

Conveyance Configuration Data

Run#	Node I.D. US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
1	CI-M1	OUT	571.46	570.81	Circ 1	0.00	1.50	184.20	0.35	0.013

Conveyance Hydraulic Computations. Tailwater = 572.310 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1	572.38	572.31	0.051	0.64	1.50	3.26	1.34	2.37	6.22	0.000

END

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 5 Years

p:\Active Projects\TXD0643\TXD0643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.06 Drainage\435TOF11.999
2/9/2009 6:37:37 AM aadams

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IH 30 AT JOHN KING BLVD.

HYDRAULIC COMPUTATIONS

LINES L AND M

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
2/9/09

Designed: AJA	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO. SEE TITLE SHEET	HIGHWAY NO. IH 30
Checked: RRH				
Drawn: AJA	DIST. DAL	COUNTY ROCKWALL	CONTROL NO. 0009 / SECTION NO. 12 / JOB NO. 073	SHEET NO. 241
Checked: RRH				

PROJECT NAME : IH 30@SH 205 Bypass
JOB NUMBER : TXD064305
PROJECT DESCRIPTION : 009-12-073
DESIGN FREQUENCY : 10 Years
MEASUREMENT UNITS: ENGLISH

OUTPUT FOR DESIGN FREQUENCY of: 10 Years

Runoff Computation for Design Frequency.

ID	C Value	Area (acre)	Tc (min)	Tc Used (min)	Intensity (in/hr)	Supply Q (cfs)	Total Q (cfs)
SD-N1	0.772	1.78	10.00	10.00	7.98	0.000	10.962
	0.96	1.12	Pavement				
	0.45	0.66	Undeveloped				

Sag Inlets Configuration Data.

Inlet ID	Inlet Type	Length/ Perim. (ft)	Grate Area (sf)	Left-Slope Long (%)	Left-Slope Trans (%)	Right-Slope Long (%)	Right-Slope Trans (%)	Gutter n	Gutter DeprW (ft)	Depth Allowed (ft)	Critic Elev. (ft)
SD-N1	Grate	9.00	5.00	0.50	2.00	0.50	2.00	0.014	n/a	0.50	584.16

Sag Inlets Computation Data.

Inlet ID	Inlet Type	Length (ft)	Grate Perim (ft)	Grate Area (sf)	Total Q (cfs)	Inlet Capacity (cfs)	Total Head (ft)	Ponded Width Left (ft)	Ponded Width Right (ft)
SD-N1	Grate	n/a	9.00	5.00	10.962	4.911	0.538	14.80	14.80

Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr.Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply Q cfs)	Additional Q in Node (cfs)	Total Disch. (cfs)
SD-N1	Grate	0.772	1.78	10.00	7.98	0.000	0.00	10.962
OUT	Outlt	0.772	1.78	10.00	7.98	0.000	0.00	10.962

Conveyance Configuration Data

Run#	Node US	Node I.D. DS	Flowline Elev. US (ft)	Flowline Elev. DS (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n value
1	SD-N1	OUT	581.84	580.79	Circ 1	0.00	2.00	30.00	3.50	0.013

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Gradeline US Elev (ft)	Hydraulic Gradeline DS Elev (ft)	Fr.Slope (%)	Depth Unif. (ft)	Depth Actual (ft)	Velocity Unif. (f/s)	Velocity Actual (f/s)	Q (cfs)	Cap (cfs)	Junc Loss (ft)
1*	582.54	581.48	0.235	0.69	0.69	11.31	11.31	10.96	42.34	0.000

END

* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

Warning Messages for current project:

Runoff Frequency of: 10 Years
Grate inlet in sag Id=SD-N1 has a % reduction safety factor = 50
Computed right ponded width exceeds allowable width at inlet Id= SD-N1
Computed left ponded width exceeds allowable width at inlet Id= SD-N1
Capacity of sag inlet exceeded at inlet Id= SD-N1
Tailwater set to uniform depth elevation = 581.48(ft)

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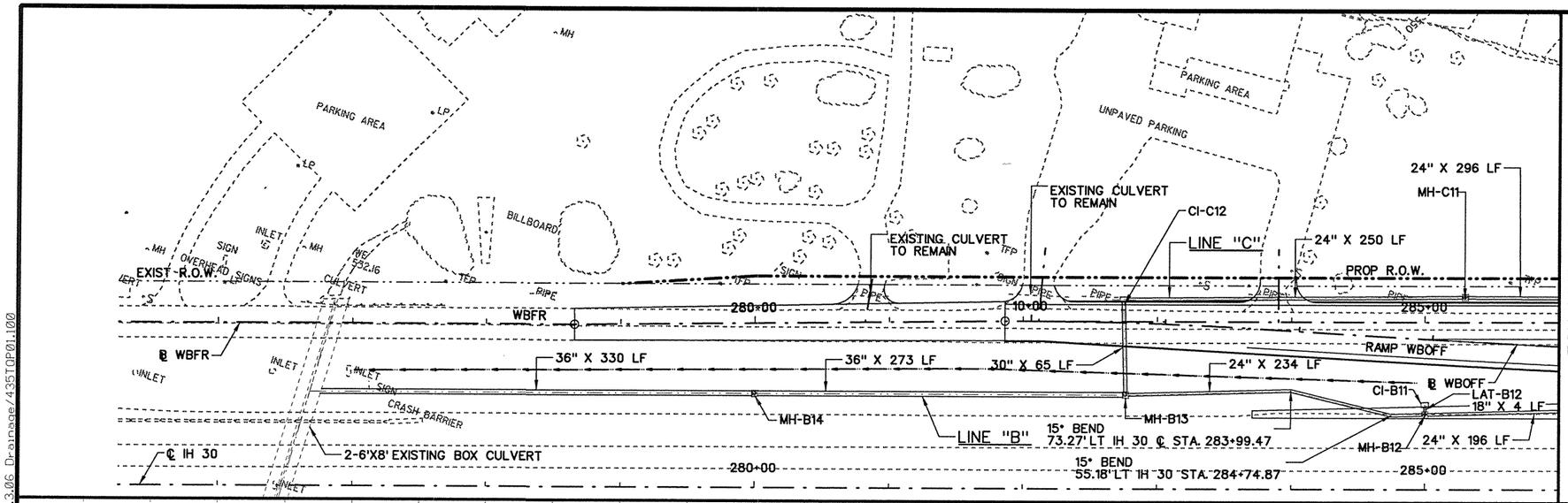
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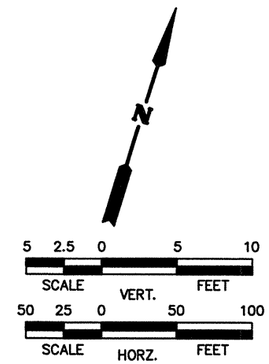
IH 30 AT JOHN KING BLVD.

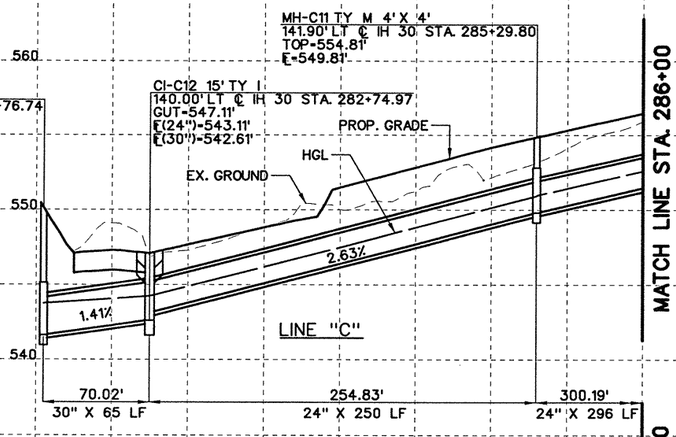
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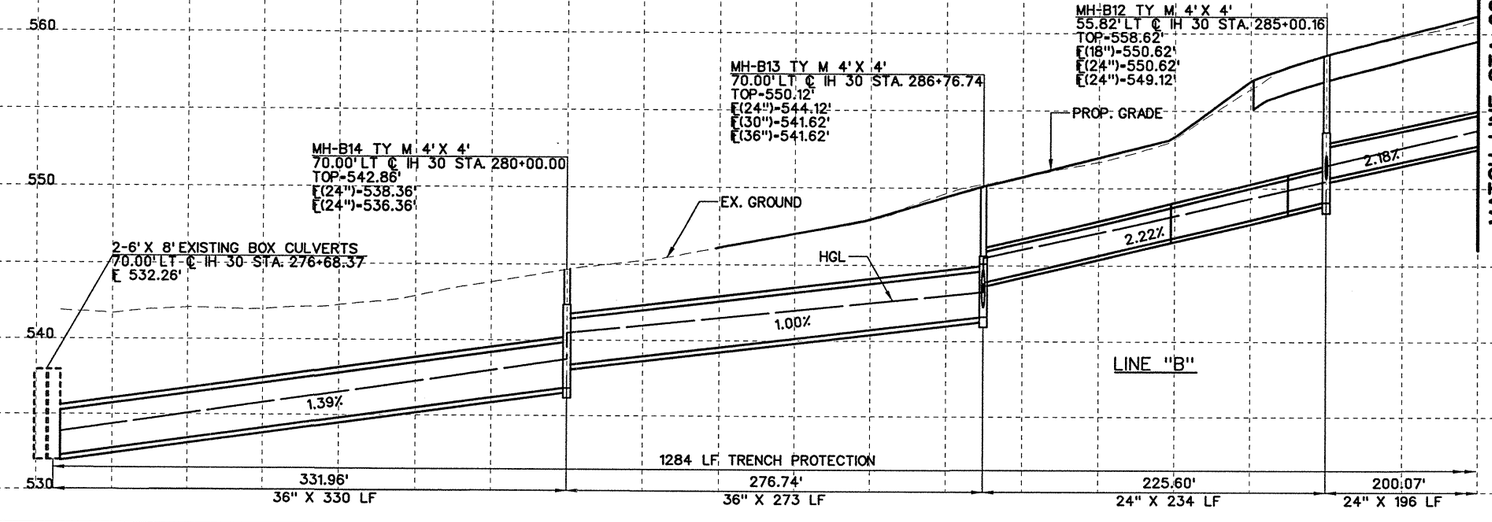
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Checked	RRH	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn	AJA	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked	RRH	DAL	ROCKWALL	0009	12	073	242









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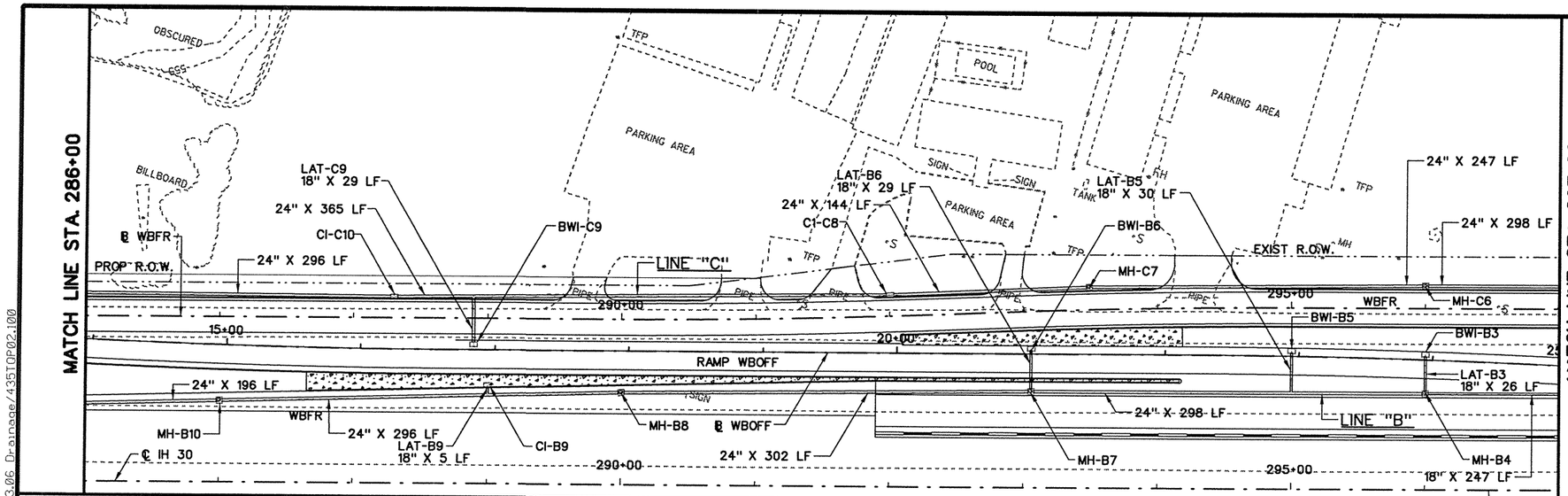
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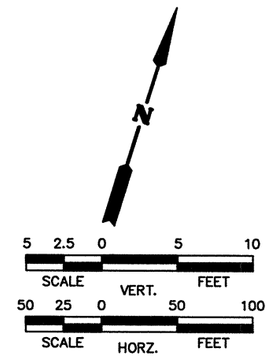
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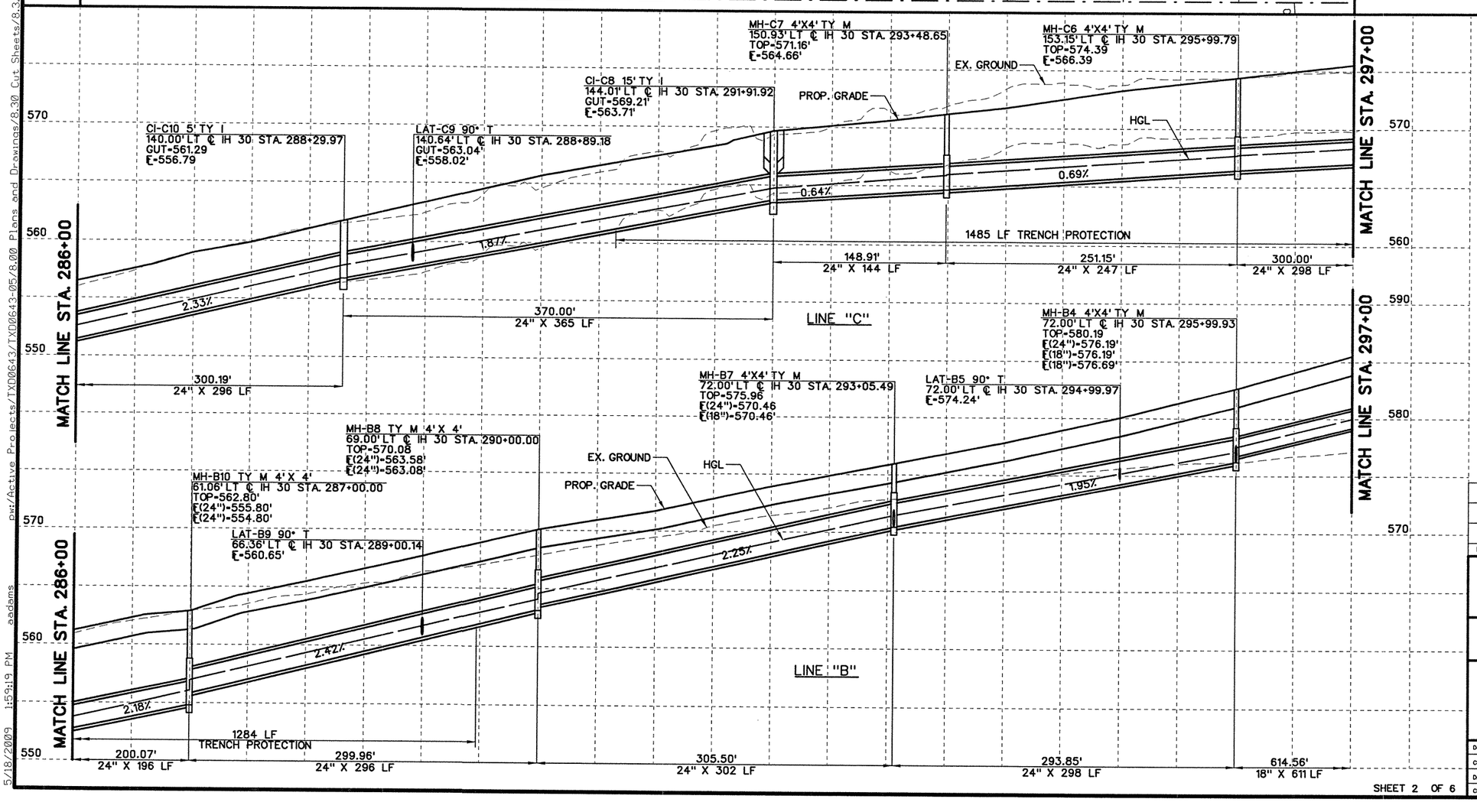
STORM SEWER PLAN AND PROFILE
WESTBOUND DRAINAGE
BEGIN PROJECT TO STA. 286+00

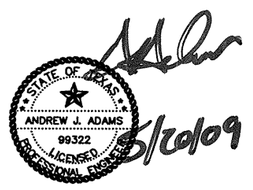
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STORM SEWER PLAN AND PROFILE

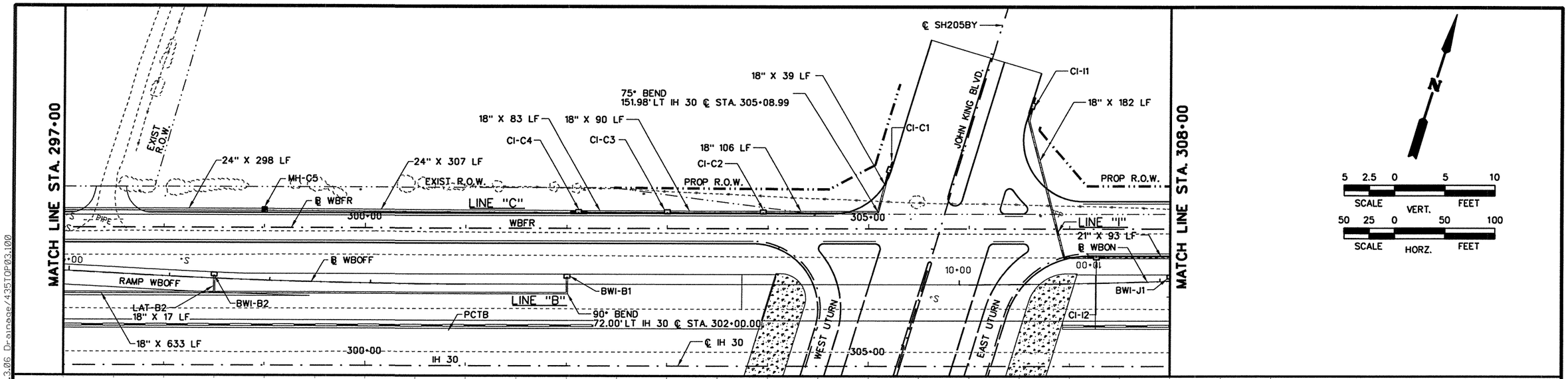
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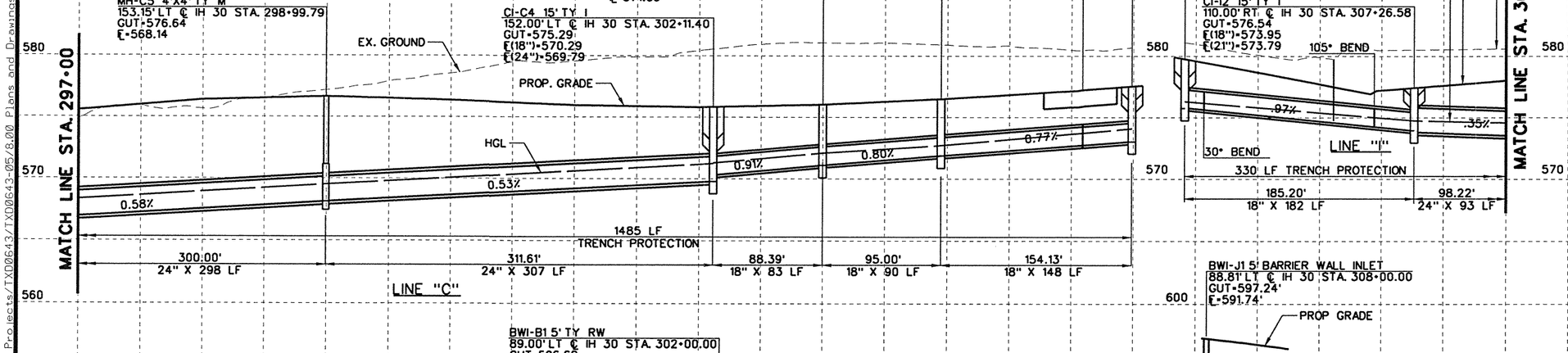
STA. 286+00 TO STA. 297+00

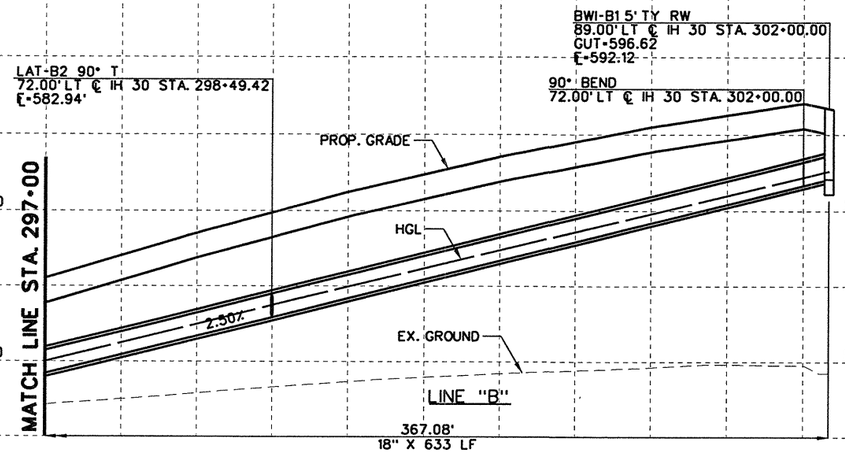
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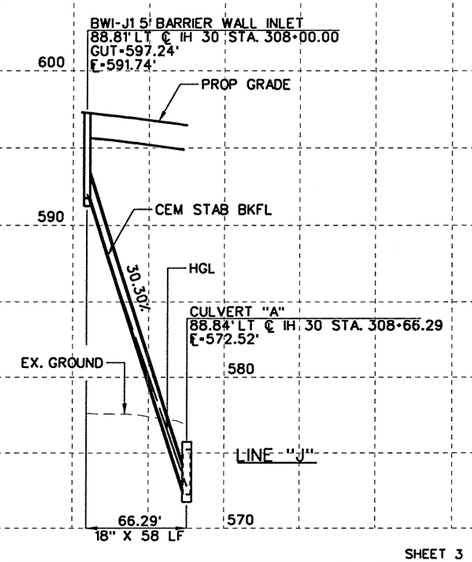
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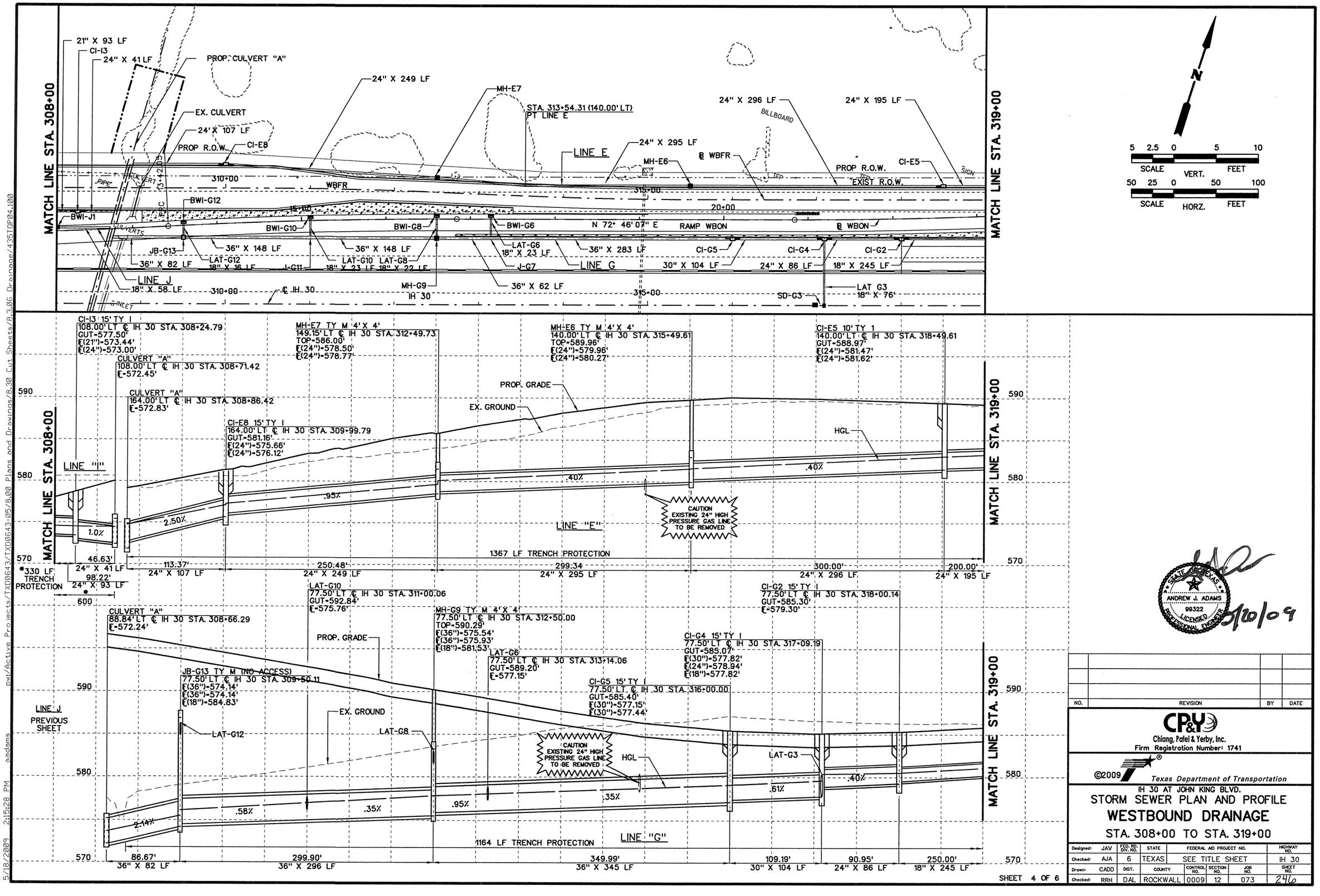
IH 30 AT JOHN KING BLVD.

STORM SEWER PLAN AND PROFILE
WESTBOUND DRAINAGE
STA. 297+00 TO STA. 308+00

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Checked:	RRH	DAL	ROCKWALL	0009	12	073	245

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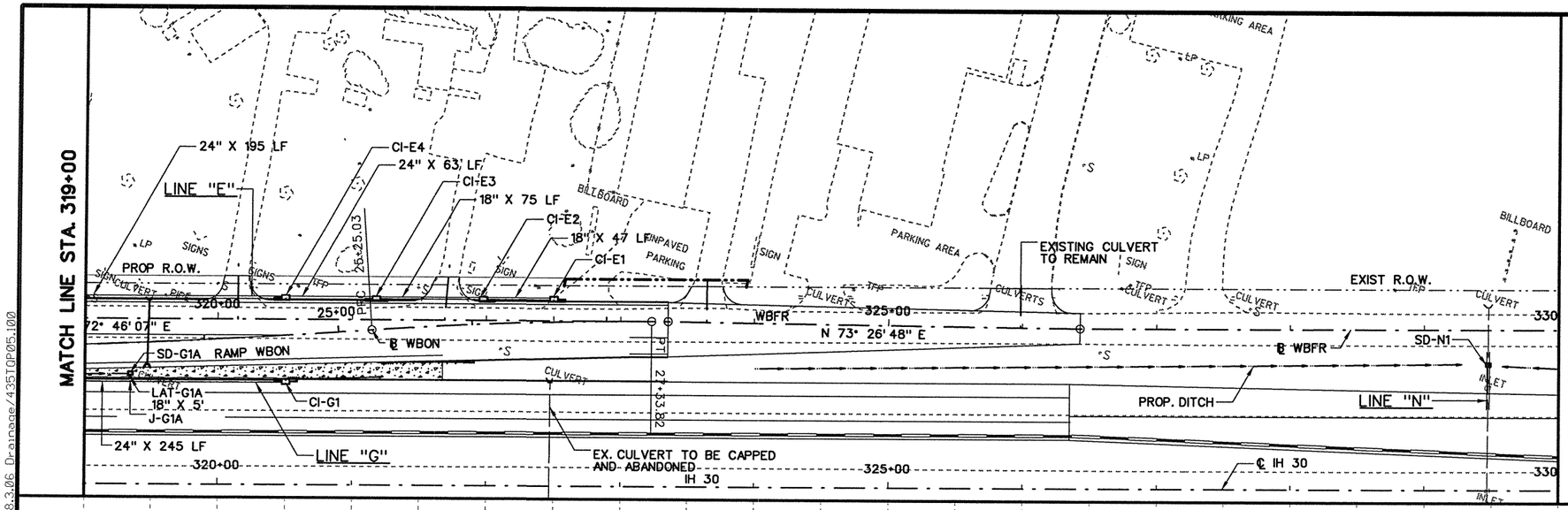
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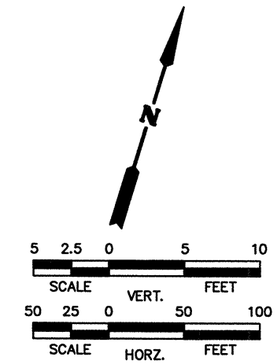
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WESTBOUND DRAINAGE
STA. 308+00 TO STA. 319+00

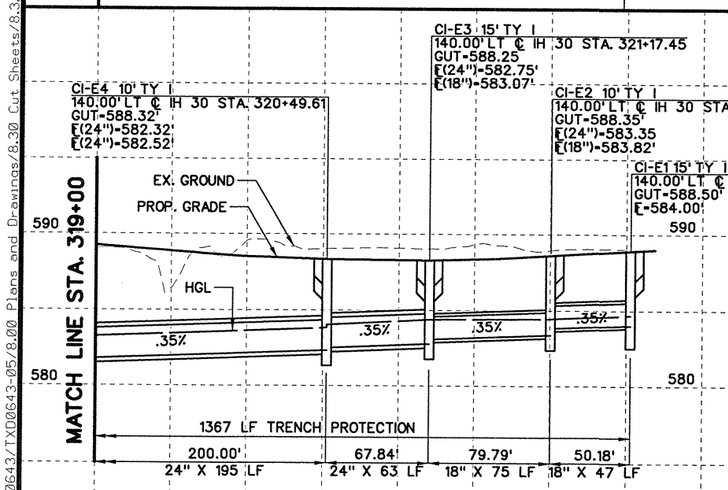
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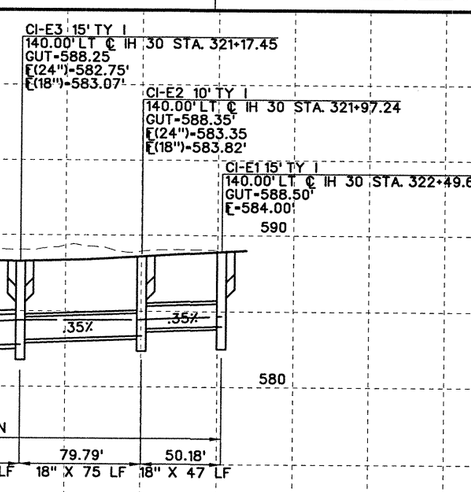
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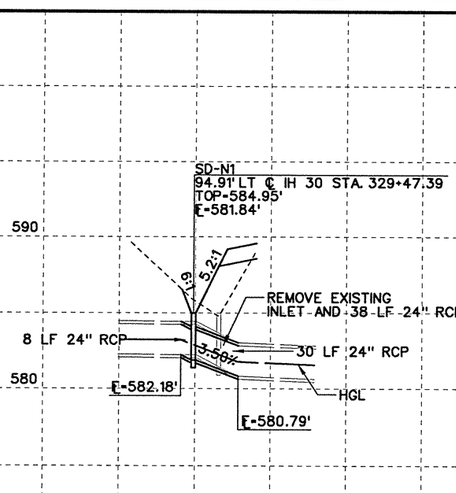
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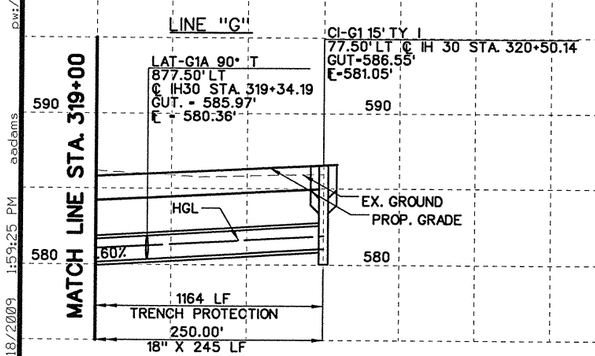












SHEET 5 OF 6



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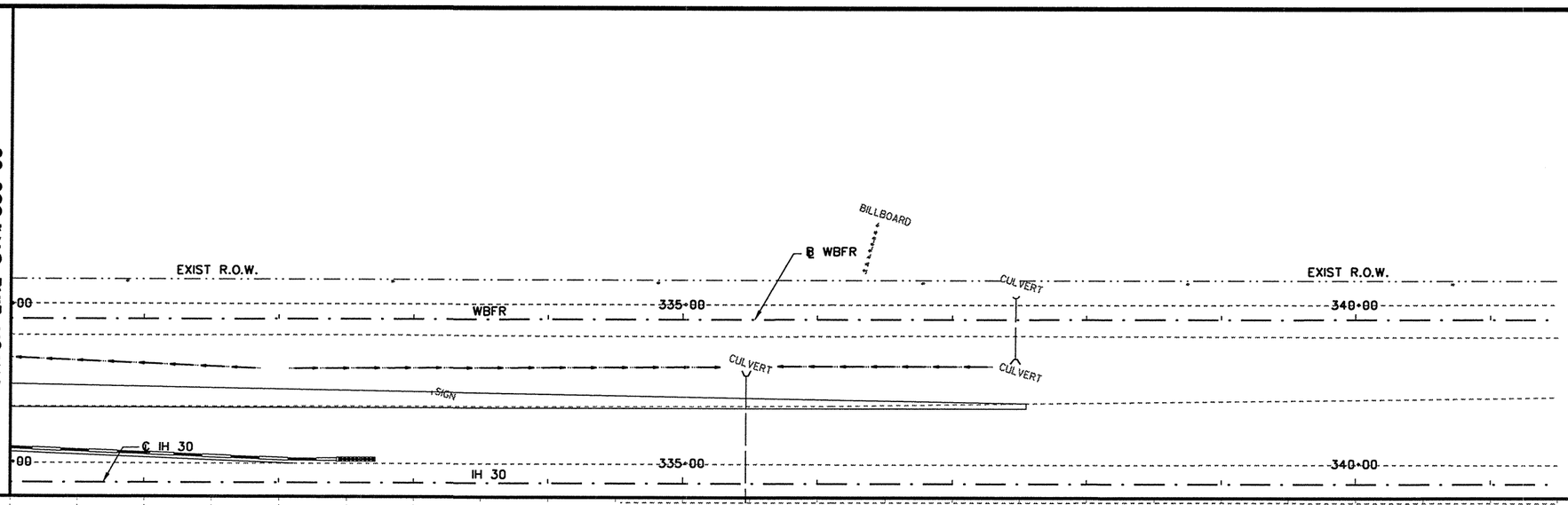
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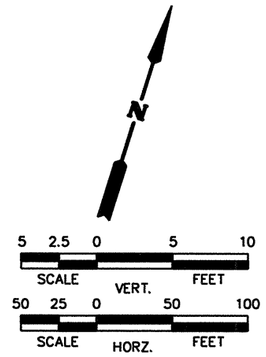
IH 30 AT JOHN KING BLVD.

STORM SEWER PLAN AND PROFILE
WESTBOUND DRAINAGE
STA. 319+00 TO STA. 330+00

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Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
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Checked:	RRH	DAL	ROCKWALL	0009	12	073	247

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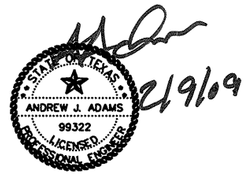


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SHEET 6 OF 6



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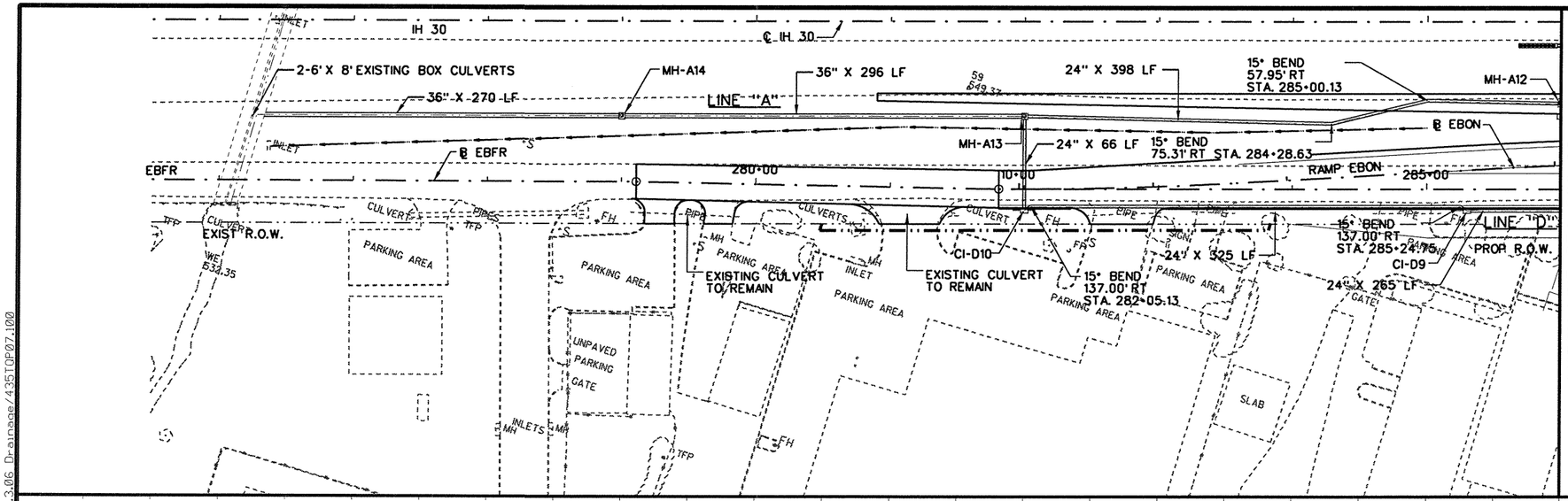
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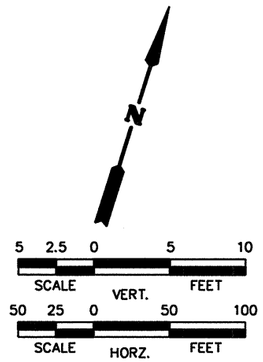
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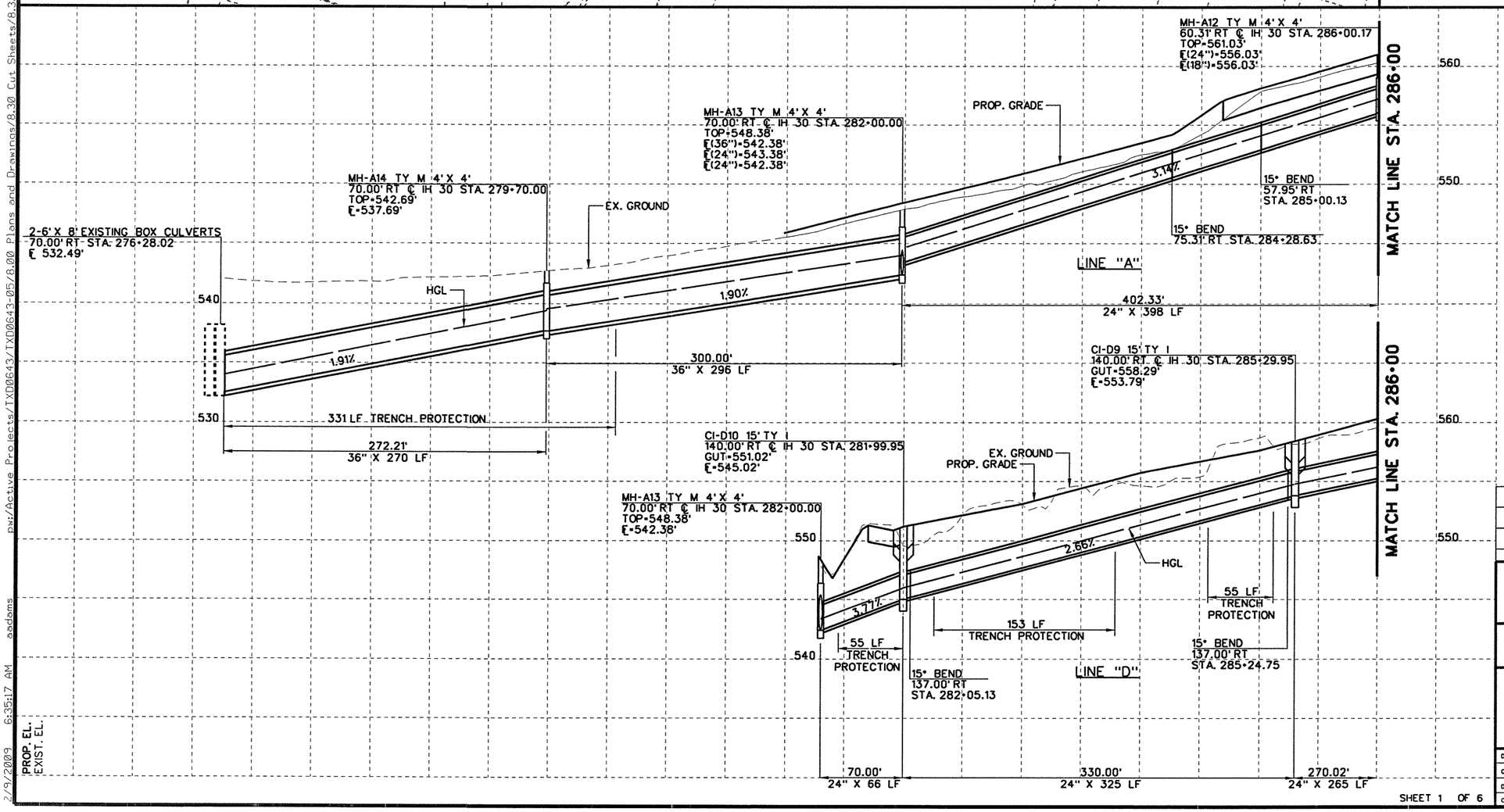
STORM SEWER PLAN AND PROFILE
WESTBOUND DRAINAGE
STA. 330+00 TO END PROJECT

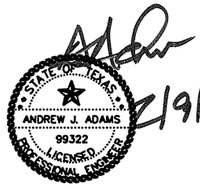
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Checked:	RRH	DAL	ROCKWALL	0009	12	073		248

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STORM SEWER PLAN AND PROFILE

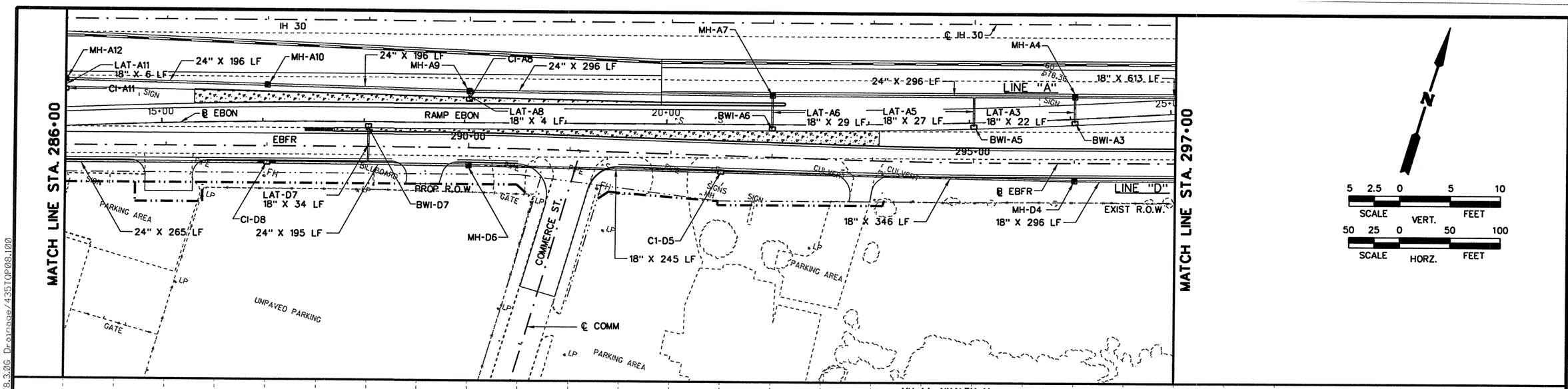
EASTBOUND DRAINAGE

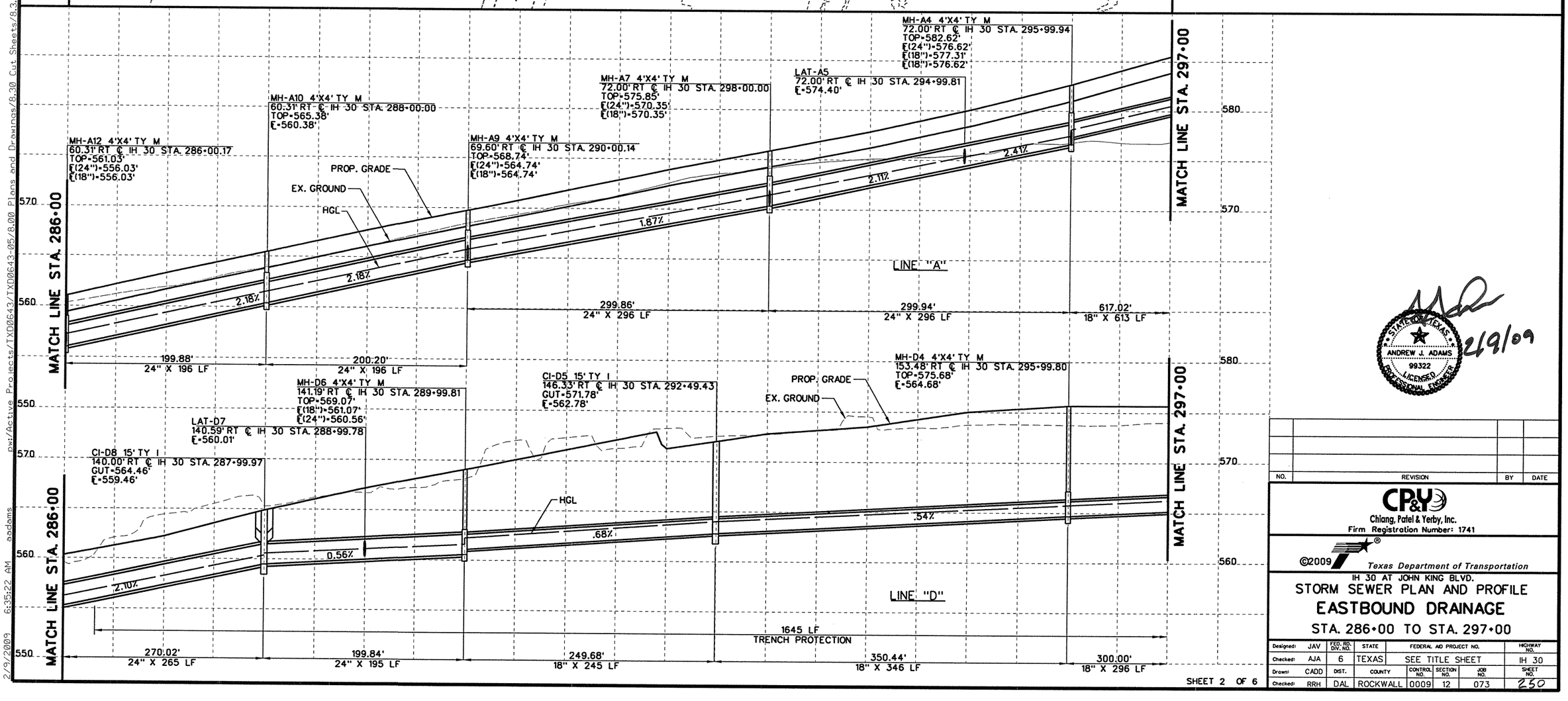
BEGIN PROJECT TO STA. 286+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
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Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	249

SHEET 1 OF 6

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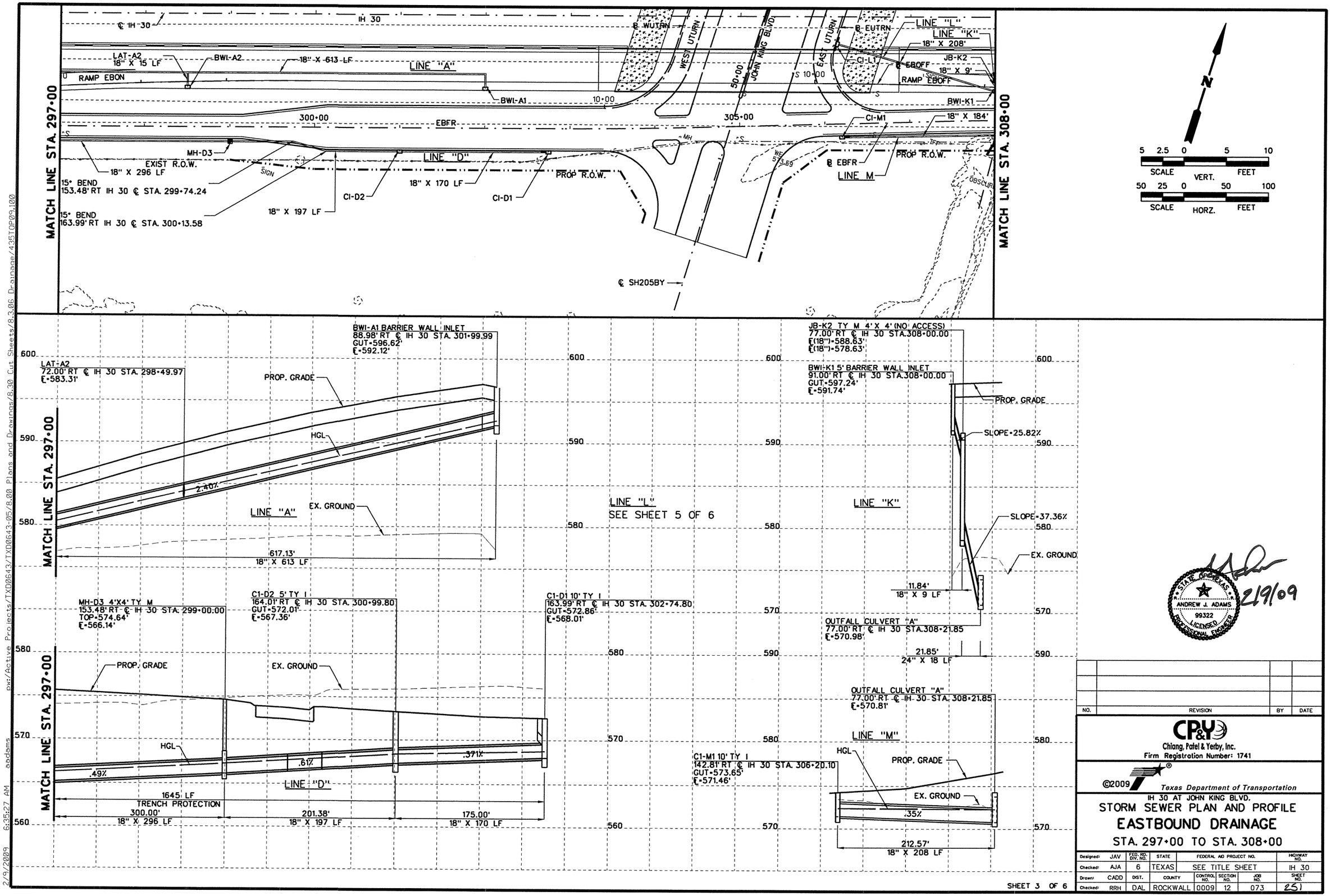
IH 30 AT JOHN KING BLVD.

STORM SEWER PLAN AND PROFILE
EASTBOUND DRAINAGE
STA. 286+00 TO STA. 297+00

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SHEET 2 OF 6

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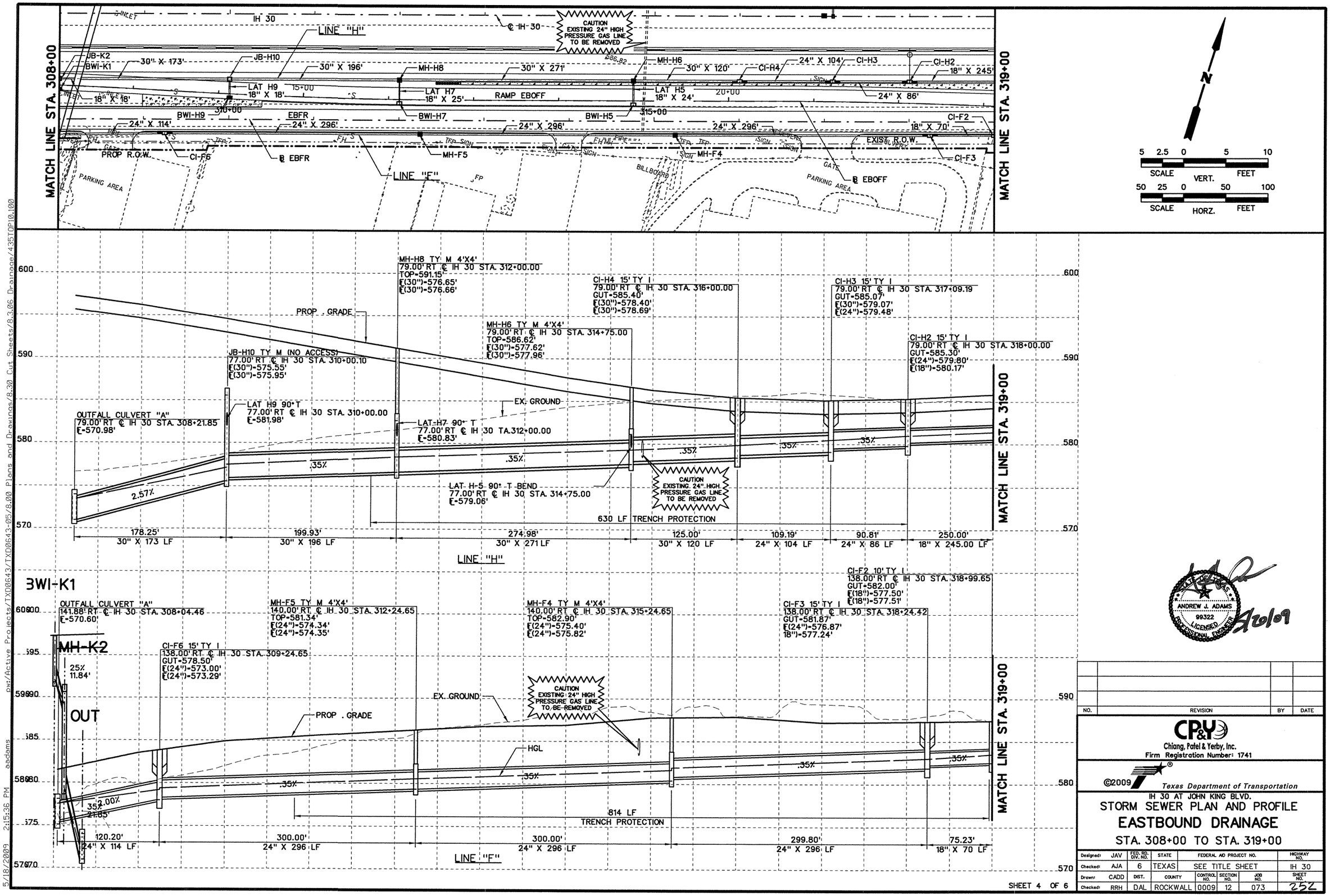
STORM SEWER PLAN AND PROFILE

EASTBOUND DRAINAGE

STA. 297+00 TO STA. 308+00

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Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	251

2/9/2009 6:35:27 AM aadams pw:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/435TOP09.100



STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
4/20/09

NO.	REVISION	BY	DATE

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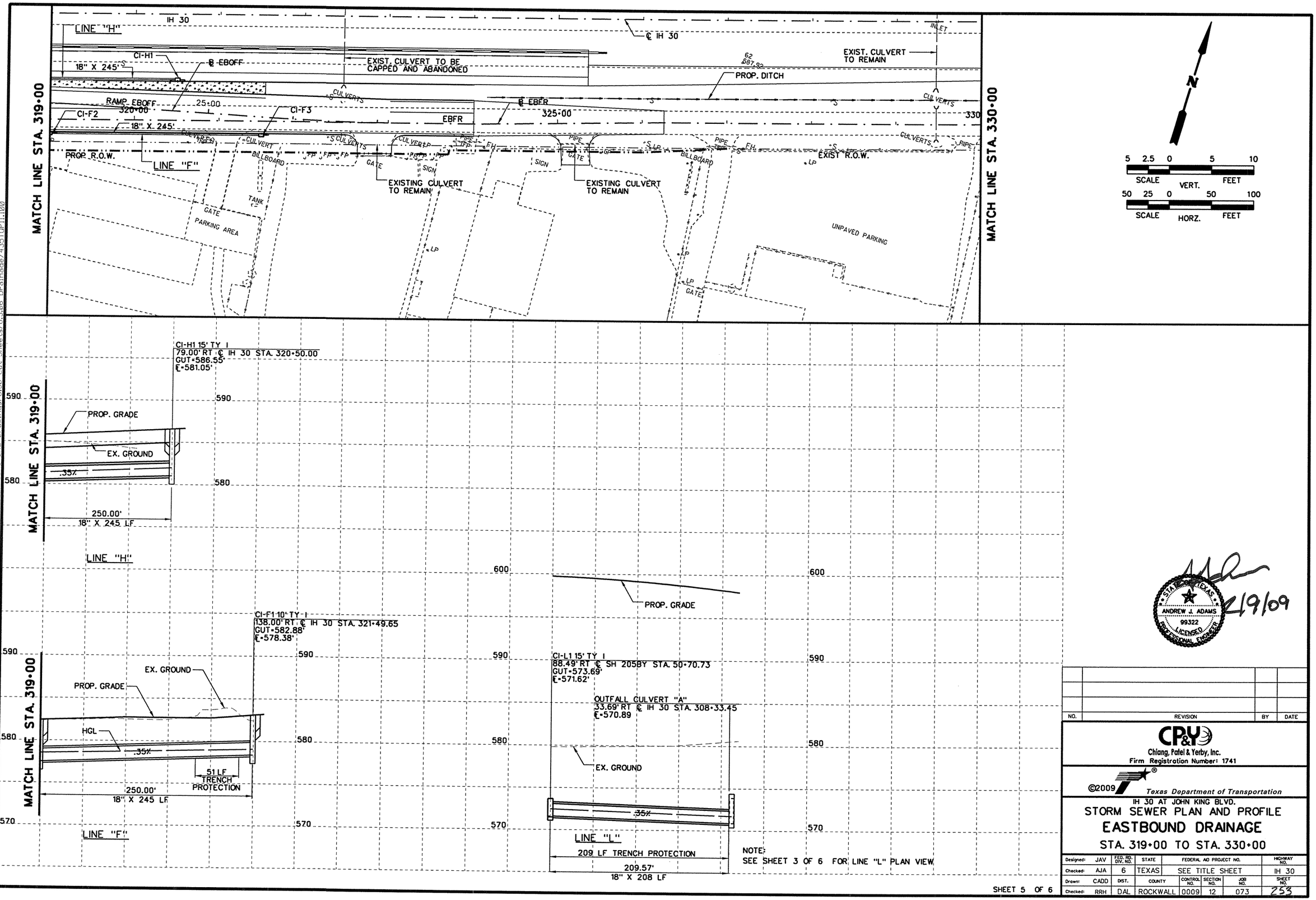
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STORM SEWER PLAN AND PROFILE
EASTBOUND DRAINAGE
STA. 308+00 TO STA. 319+00

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Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	252

5/18/2009 2:15:36 PM adams
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NOTE:
SEE SHEET 3 OF 6 FOR LINE "L" PLAN VIEW

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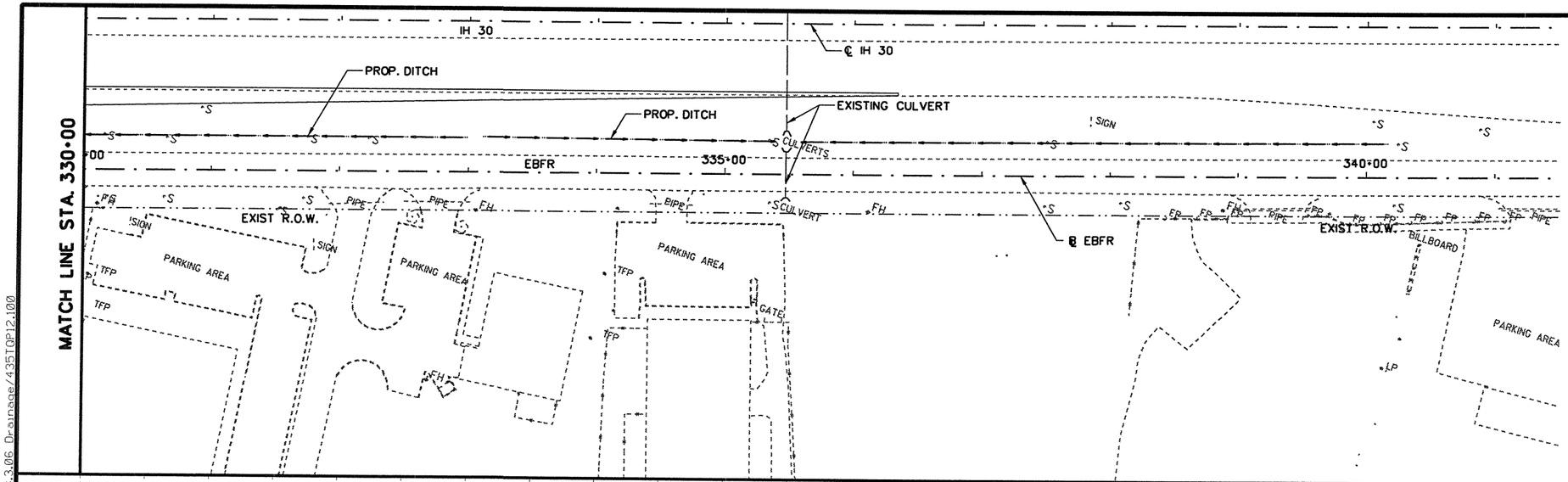
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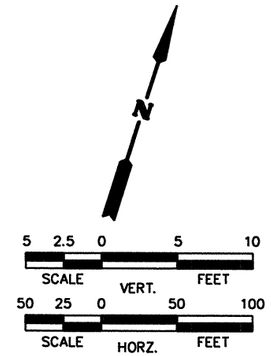
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STORM SEWER PLAN AND PROFILE
EASTBOUND DRAINAGE
STA. 319+00 TO STA. 330+00

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STORM SEWER PLAN AND PROFILE

EASTBOUND DRAINAGE

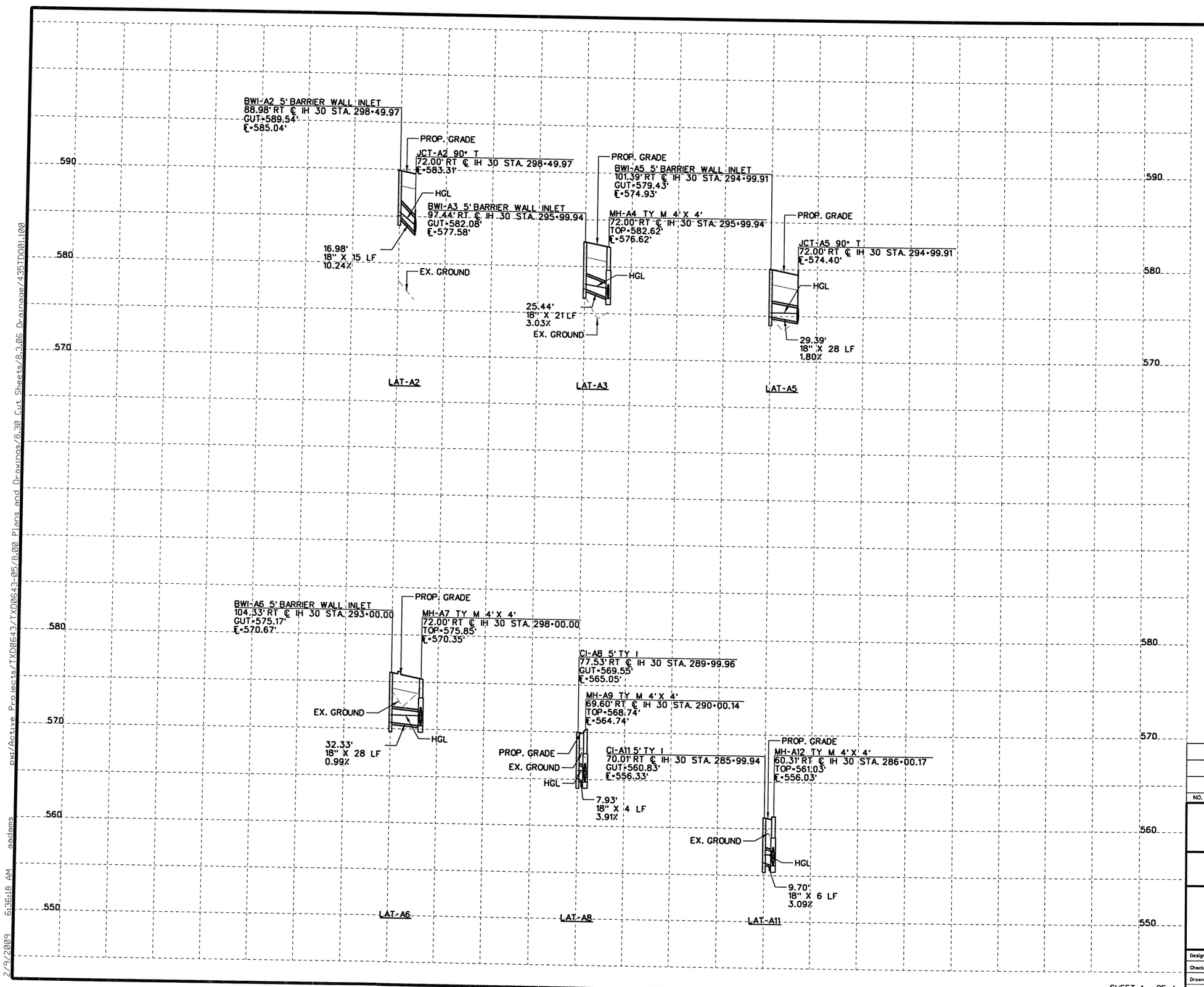
STA. 330+00 TO END PROJECT

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Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	254

PROP. EL.
EXIST. EL.

SHEET 6 OF 6

2/9/2009 6:35:44 AM aadams pw:/Active Projects/TX00643/TX00643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.306 Drainage/435TOP12.100



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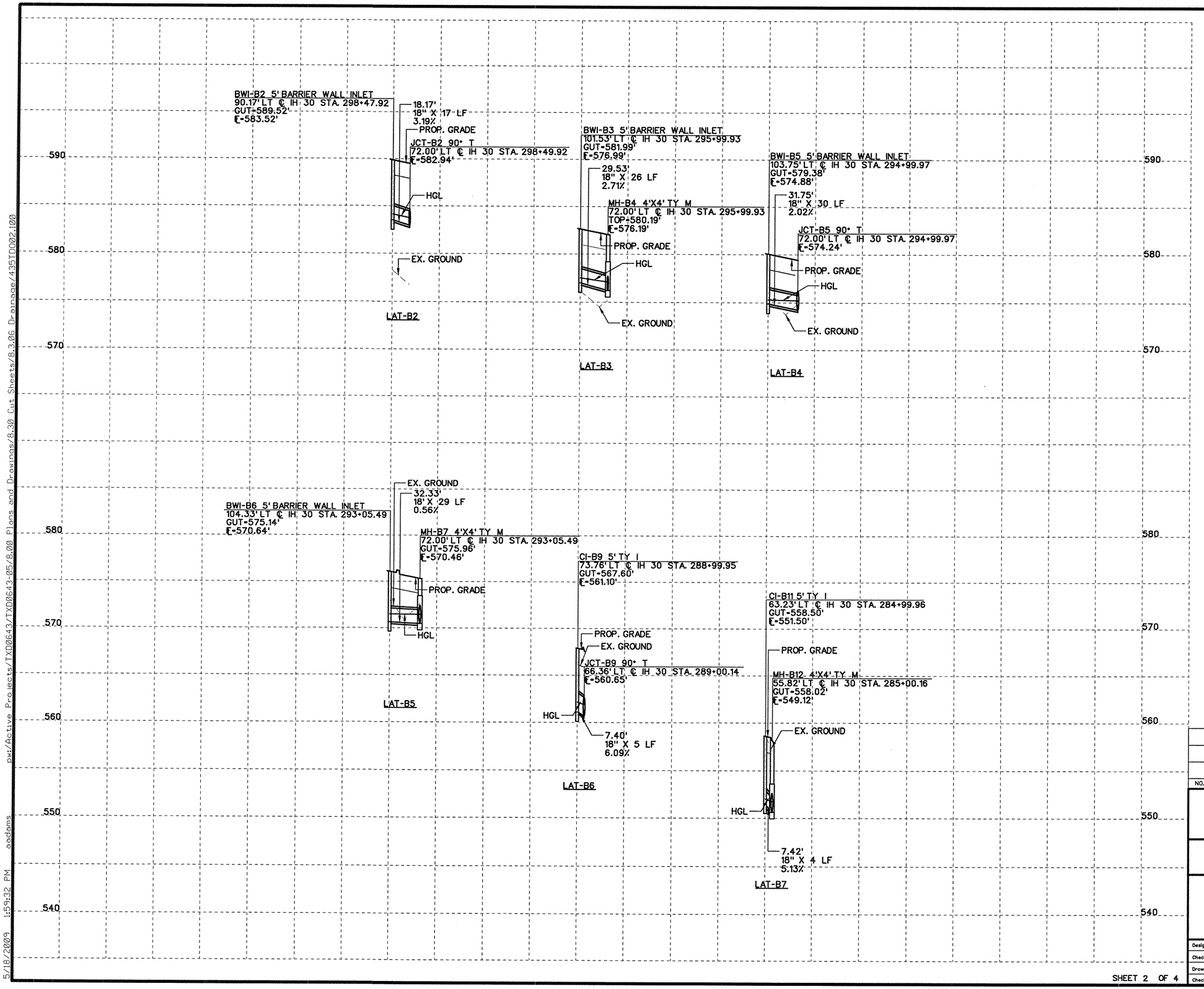
DRAINAGE

LINE A LATERALS

STORM SEWER LATERAL PROFILES

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Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	29 E

2/9/2009 6:36:18 AM adams pw:Active Projects/TX00643/TX00643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/4351D001.100



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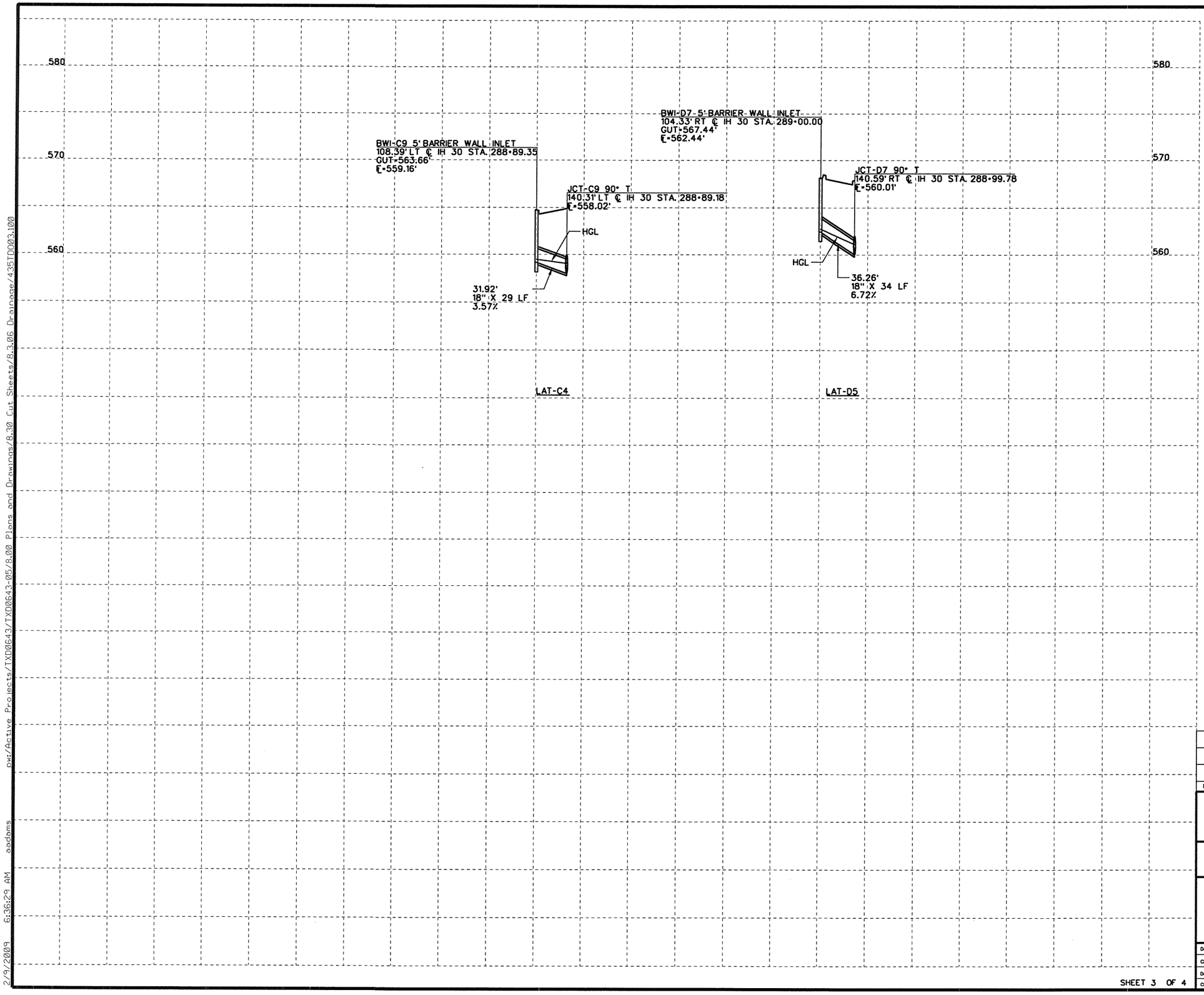
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DRAINAGE
LINE B LATERALS
STORM SEWER LATERAL PROFILES

Designed: JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
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DRAINAGE

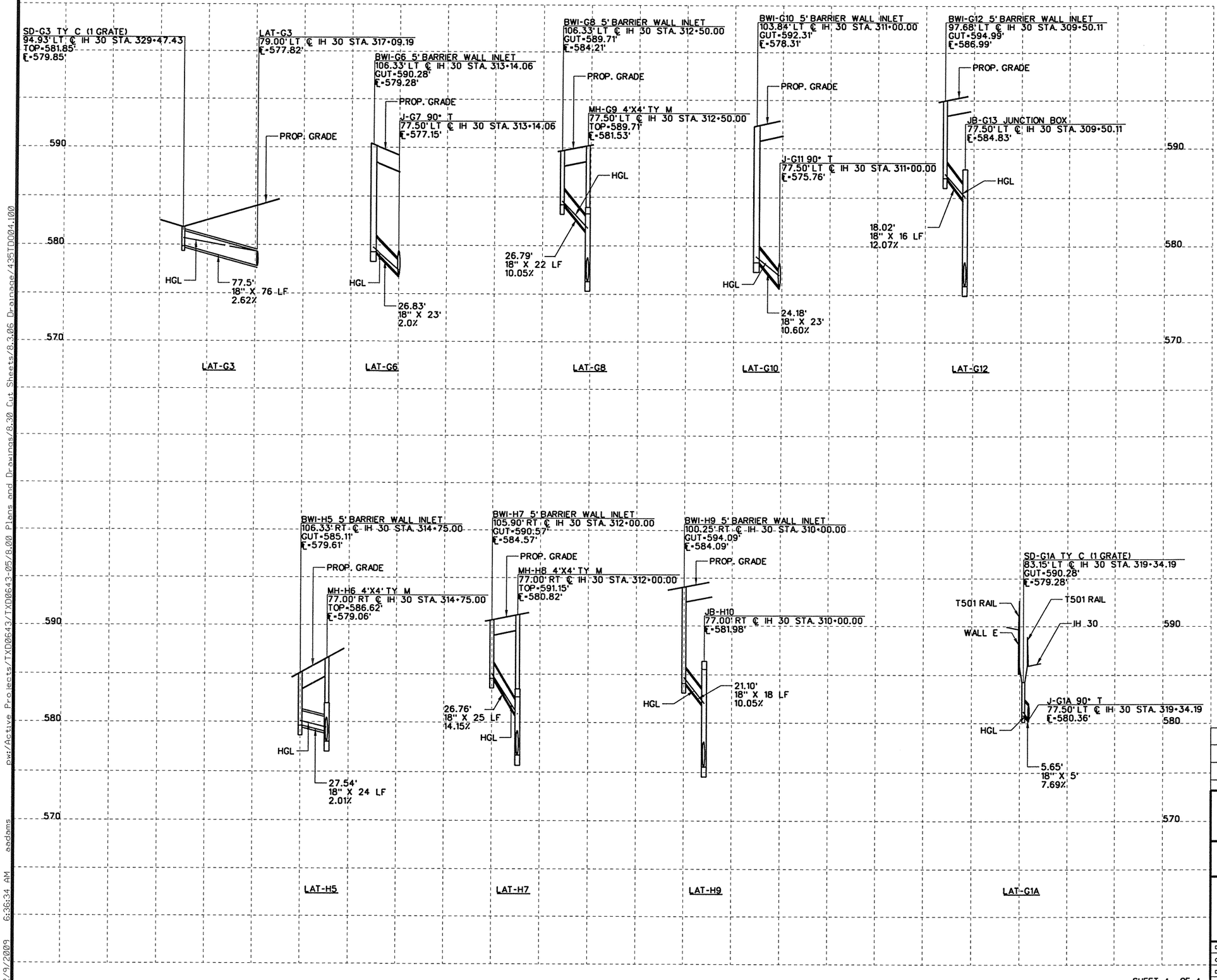
LINE C AND D LATERALS

STORM SEWER LATERAL PROFILES

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2/9/2009 6:36:34 AM eadams



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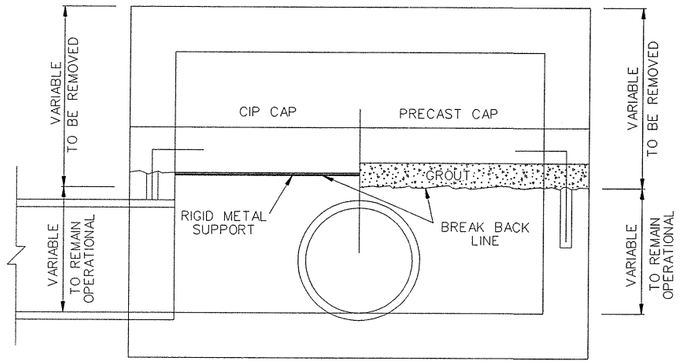
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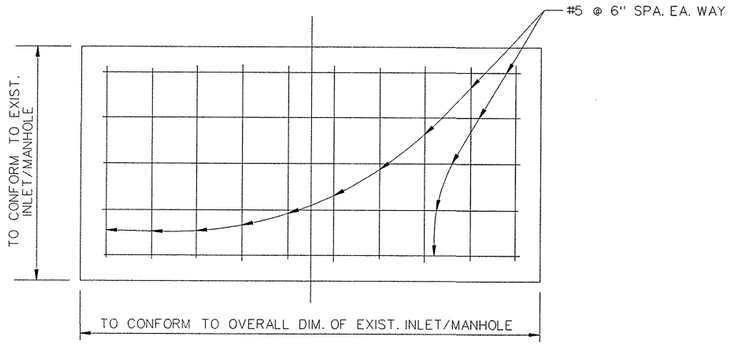
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DRAINAGE
LINE G AND H LATERALS
STORM SEWER LATERAL PROFILES

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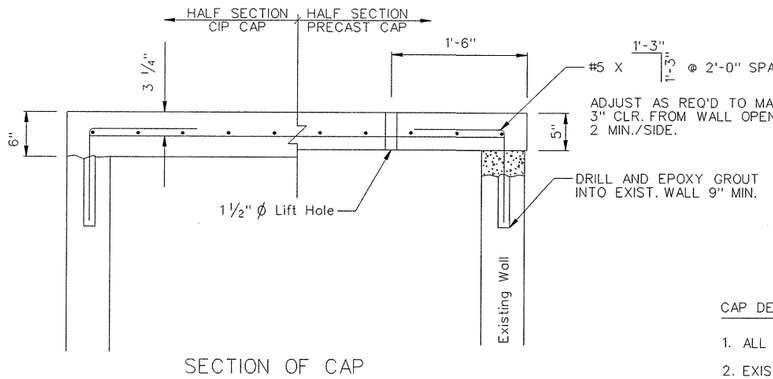
SHEET 4 OF 4



ELEVATION OF CAPPED INLET/MANHOLE



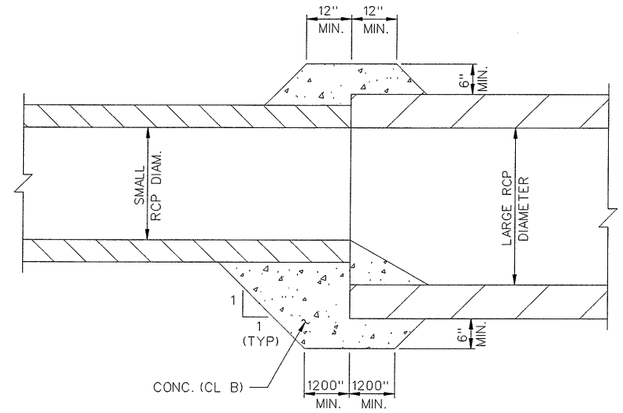
PLAN VIEW OF CAP



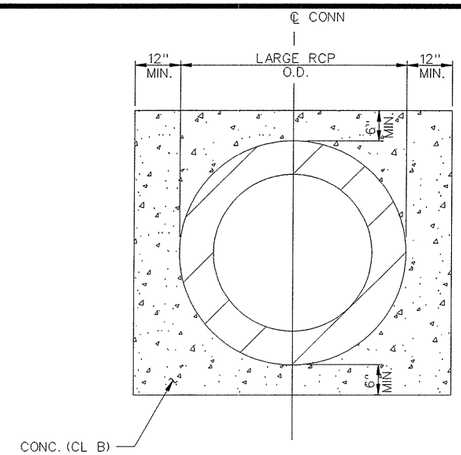
SECTION OF CAP

A INLET CAP DETAIL

SCALE: NTS



SIDE SECTION



END SECTION

END - END CONNECTION

SIDE SECTION

END SECTION

END - SIDE CONNECTION

B CONCRETE COLLAR DETAIL

SCALE: NTS

NOTE: DETAIL TO BE USED WHEREVER PRECAST FITTINGS ARE NOT UTILIZED.

CAP DETAIL NOTES

1. ALL CONCRETE SHALL BE CLASS "A".
2. EXISTING INLET/MANHOLE TO BE CAPPED SHALL BE FITTED WITH EITHER A PRECAST OR CAST IN PLACE CAP. NONCORRODING RIGID METAL SHALL BE USED TO FORM THE BOTTOM OF THE CAST IN PLACE CAP. THE SIZE AND SHAPE SHALL CONFORM TO THE OUTSIDE DIMENSIONS OF THE INLET/MANHOLE AND THE FORM SHALL BE SUSPENDED SUCH THAT NO INSIDE SUPPORT WILL BE REQUIRED.
3. PAYMENT FOR EXISTING INLET/MANHOLE TO BE CAPPED SHALL BE IN ACCORDANCE WITH ITEM 479, "ADJUSTING MANHOLES AND INLETS".
4. INLETS/MANHOLES SHOWN TO BE REMOVED MAY BE CAPPED IF REMAINING STRUCTURE WILL NOT INTERFERE WITH ANY FURTHER CONSTRUCTION AND AS DIRECTED BY THE ENGINEER.
5. EXCAVATION AND BACKFILL, FRAMES, GRATES, RINGS, AND COVERS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT, BUT WILL BE CONSIDERED SUBSIDIARY TO ITEM 465, "MANHOLES AND INLETS".

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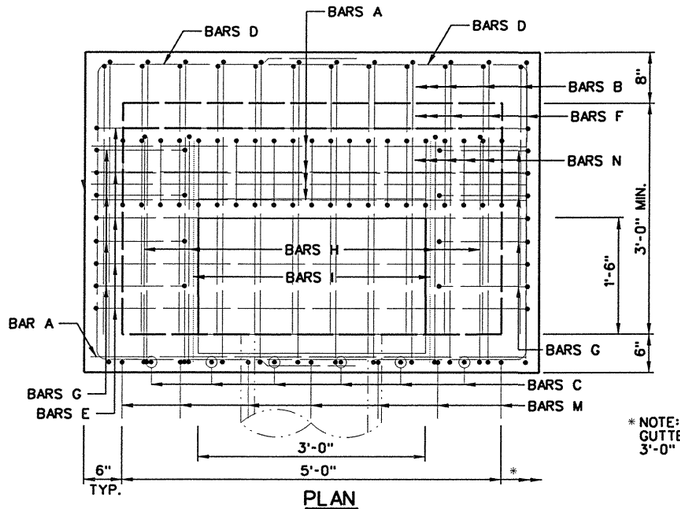
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MISCELLANEOUS DRAINAGE DETAILS

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Checked:	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	DAL	ROCKWALL	0009	12	073	259

SHEET 1 OF 1

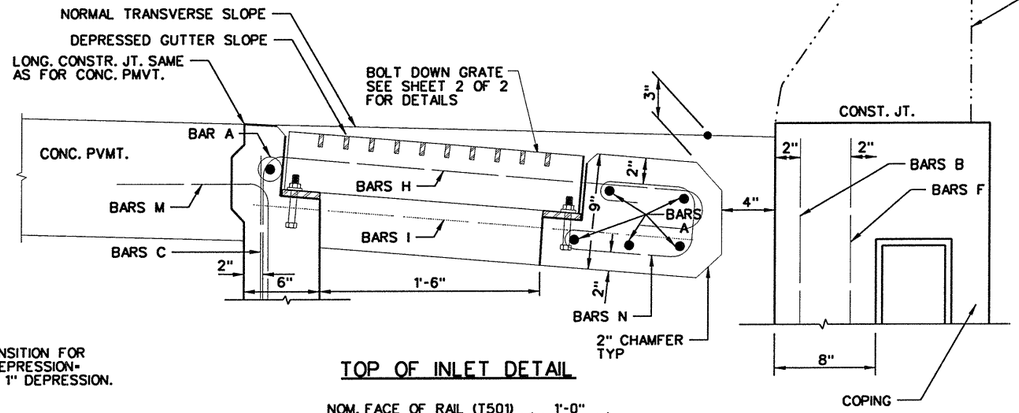
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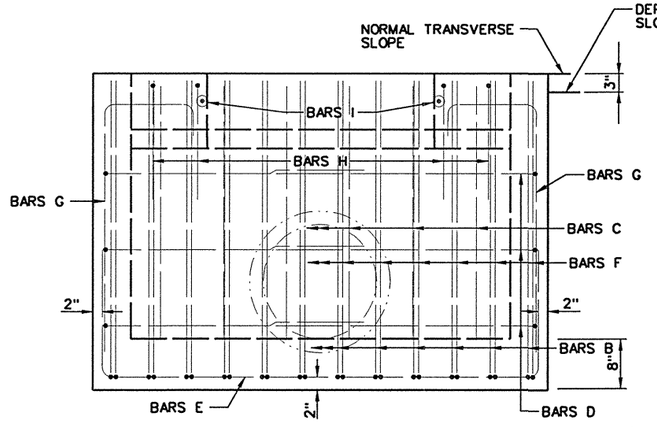
PLAN

BOLT DOWN GRATE AND CONC. RAIL NOT SHOWN FOR CLARITY.

* NOTE: TRANSITION FOR GUTTER DEPRESSION- 3'-0" PER 1" DEPRESSION.

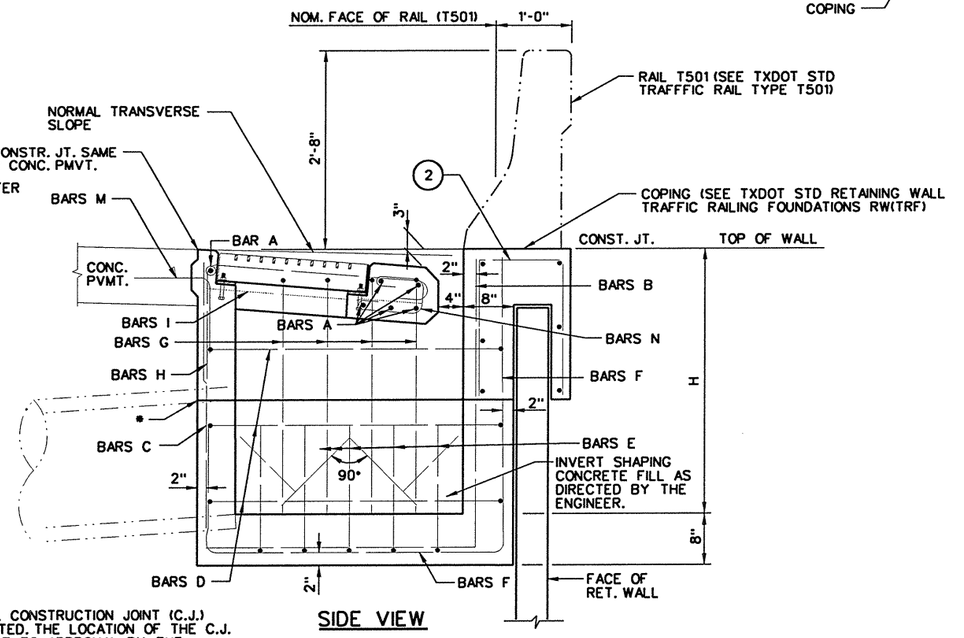


TOP OF INLET DETAIL



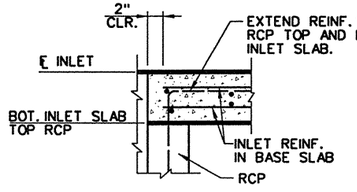
ELEVATION

BOLT DOWN GRATE AND CONC. RAIL NOT SHOWN FOR CLARITY.

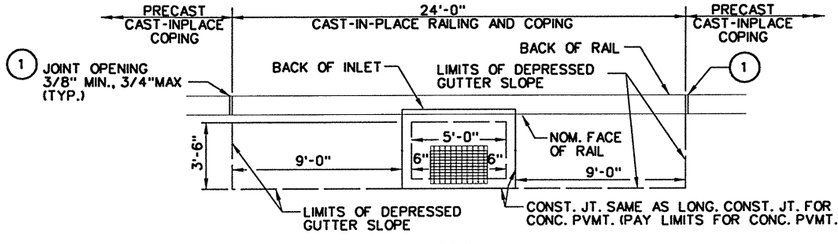


SIDE VIEW

* ONE HORIZONTAL CONSTRUCTION JOINT (C.J.) WILL BE PERMITTED. THE LOCATION OF THE C.J. WILL BE SUBJECT TO APPROVAL BY THE ENGINEER. REINFORCEMENT EXTENDING ABOVE THE C.J. MAY BE BENT IN A MANNER ACCEPTABLE TO THE ENGINEER TO PROVIDE CLEARANCE FOR PAVING OPERATIONS. IN LIEU OF BENDING THE REINFORCEMENT, THE CONTRACTOR MAY PROVIDE A MINIMUM 1'-0" LAP SPLICE TO THE LOWER REINFORCEMENT.



RCP - SLAB DETAIL



5' INLET

PLAN OF INLET

SPECIAL NOTES

(1) MATERIAL USED IN FORMING JOINT MAY BE LEFT IN PLACE IF IT IS COMPRESSIBLE AND LIGHT IN COLOR SUCH AS: POLYSTYRENE, SPONGE, MOLDED CORK GRANULES OR RUBBER SHEETS. IF FORMING MATERIAL IS NOT LEFT IN PLACE, THE BOTTOM 6" SHALL BE PLUGGED WITH CONCRETE OR SLAB JOINT SEALING COMPOUND.

(2) RAIL CONNECTION TO COPING AND INLET SHALL BE ACCORDING TO TXDOT STANDARD T501 AND RW(TRF) FOR THE PROPRIETARY RETAINING WALL SYSTEM USED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS "C".
4. ALL EXPOSED CORNERS SHALL BE CHAMFERED ¾".
2. ALL REINFORCING STEEL SHALL BE GRADE 60. USE # 5 BARS @ 6" OC. MAX., UNO
3. DIMENSIONS RELATING TO REINFORCEMENT ARE TO THE CENTER THE BARS, UNO. IN AREAS OF CONFLICT BETWEEN THE REINFORCEMENT. BLOCKOUTS, PIPES, ANCHOR BOLTS, OR OTHER REINFORCEMENT, THE REINFORCEMENT SHALL BE BENT OR ADJUSTED TO CLEAR AS DIRECTED BY THE ENGINEER.
5. COPING, WALL PANEL, AND INLET DETAILS SHALL CONFORM TO THE RETAINING WALL AND INLET SHOP DRAWINGS.
6. LONGITUDINAL STEEL SHALL BE CONTINUOUS WITHIN LIMITS OF INLET - NO LAPS OR SPLICES ALLOWED, UNO.
7. REINFORCEMENT SHALL BE CUT 2" CLR. FROM ANY WALL OR FLOOR PENETR. AND 1 ADD'L. BAR ADDED AT 3" CLR. AROUND PENETRATION.
8. BAR DETAILS SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE A HORIZONTAL CONSTRUCTION JOINT IF USED. REINFORCEMENT SHALL BE CUT OR BENT AT PIPE OPENINGS. THE REINFORCEMENT SHOWN ON THESE DETAILS ARE IN ADDITION TO REINFORCEMENT FROM CURB, PAVEMENT OR CONCRETE RAIL.
9. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A 36.
10. INLET STEPS SPACED 10" C.C. AND LOCATED AS DIRECTED BY THE ENGINEER, SHALL BE PROVIDED AND INSTALLED IN ALL INLETS WHERE THE DEPTH EXCEEDS 5'-0".
11. MATERIALS, CONSTRUCTION AND FINISH FOR STRUCTURAL STEEL GRATES SHALL CONFORM TO THE REQUIREMENTS OF ITEM 471, "FRAMES, GRATES, RINGS AND COVERS.
12. PAYMENT FOR INLET SHALL BE IN ACCORDANCE WITH ITEM 465, "MANHOLES & INLETS".
13. COPING DIMENSIONS ARE APPROXIMATE AND CONTRACTOR SHALL ADJUST FOR ACTUAL COPING DIMENSIONS.
14. ALL WORK AND MATERIALS REQUIRED FOR CONSTRUCTION OF THE INLET INCLUDING EXCAVATION, BACKFILL, FRAMES, GRATES, ETC. WILL NOT BE MEASURED FOR PAYMENT BUT WILL BE CONSIDERED SUBSIDIARY TO ITEM 465 - "MANHOLES AND INLETS".
15. PAYMENT OF THE CONCRETE TRAFFIC BARRIER PLACED ON THE BACK WALL OF THE INLET WILL BE AT THE UNIT PRICE BID FOR "CONCRETE TRAFFIC BARRIER" OF THE TYPE SPECIFIED IN THE PLANS.



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BARRIER WALL INLET

Designed: MBG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: GRB	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	260

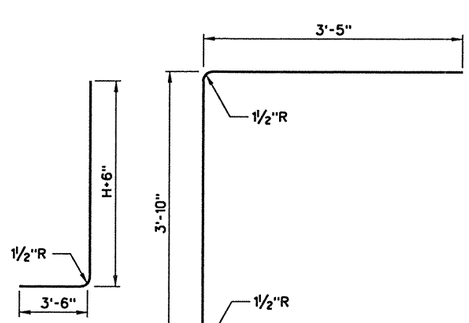
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PROP. EL.
EXIST. EL.

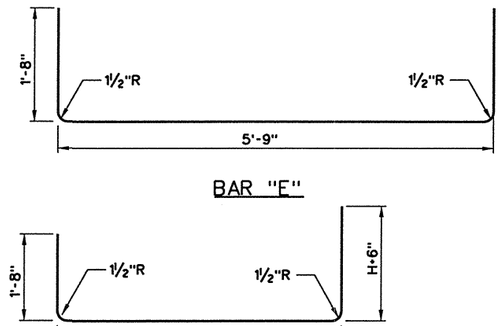
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REINFORCING STEEL AND CONCRETE FOR 5' INLET

INLET SIZE		BAR "A"						BAR "B"						BAR "C"						BAR "D"						BAR "E"						BAR "F"						BAR "G"						BAR "H"						BAR "I"						BAR "M"						BAR "N"						TOTALS	
HEIGHT FT	WIDTH FT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	NO	SIZE	TY	SPACING	LENGTH	WT	STEEL LBS	CONC CY
2.5	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	6'-6"	81	10	#5	ST	6" C-C	2'-10"	30	6	#4	BT	8" C-C	10'-8"	43	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	8'-6"	106	10	#5	BT	6" C-C	3'-10"	40	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	444	1.63
3.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	7'-0"	88	10	#5	ST	6" C-C	3'-4"	35	9	#4	BT	8" C-C	10'-8"	64	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	9'-0"	113	10	#5	BT	6" C-C	4'-4"	45	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	488	1.80
3.5	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	7'-6"	94	10	#5	ST	6" C-C	3'-10"	40	9	#4	BT	8" C-C	10'-8"	64	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	9'-6"	119	10	#5	BT	6" C-C	4'-10"	50	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	511	1.96
4.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	8'-0"	100	10	#5	ST	6" C-C	4'-4"	45	12	#4	BT	8" C-C	10'-8"	86	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	10'-0"	125	10	#5	BT	6" C-C	5'-4"	56	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	556	2.13
4.5	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	8-6"	106	10	#5	ST	6" C-C	4'-10"	50	12	#4	BT	8" C-C	10'-8"	86	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	10'-6"	131	10	#5	BT	6" C-C	5'-10"	61	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	579	2.30
5.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	9'-0"	113	10	#5	ST	6" C-C	5'-4"	56	15	#4	BT	8" C-C	10'-8"	107	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	11'-0"	138	10	#5	BT	6" C-C	6'-4"	66	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	623	2.47
5.5	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	9'-6"	119	10	#5	ST	6" C-C	5'-10"	61	15	#4	BT	8" C-C	10'-8"	107	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	11'-6"	144	10	#5	BT	6" C-C	6'-10"	71	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	646	2.63
6.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	10'-0"	125	10	#5	ST	6" C-C	6'-4"	66	18	#4	BT	8" C-C	10'-8"	128	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	12'-0"	150	10	#5	BT	6" C-C	7'-4"	76	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	690	2.80
7.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	11'-0"	138	10	#5	ST	6" C-C	7'-4"	76	21	#4	BT	8" C-C	10'-8"	150	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	13'-0"	163	10	#5	BT	6" C-C	8'-4"	87	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	757	3.13
8.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	12'-0"	150	10	#5	ST	6" C-C	8'-4"	87	24	#4	BT	8" C-C	10'-8"	171	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	14'-0"	175	10	#5	BT	6" C-C	9'-4"	97	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	825	3.47
9.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	13'-0"	163	10	#5	ST	6" C-C	9'-4"	97	27	#4	BT	8" C-C	10'-8"	192	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	15'-0"	188	10	#5	BT	6" C-C	10'-4"	108	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	892	3.80
10.0	3'-0"	6	#6	ST	AS SHOWN	5'-9"	52	12	#5	BT	6" C-C	14'-0"	175	10	#5	ST	6" C-C	10'-4"	108	30	#4	BT	8" C-C	10'-8"	214	5	#4	BT	7" C-C	9'-1"	30	12	#5	BT	6" C-C	16'-0"	200	10	#5	BT	6" C-C	11'-4"	118	4	#4	BT	AS SHOWN	5'-0"	13	2	#4	ST	AS SHOWN	2'-11"	4	7	#4	BT	10" C-C	2'-0"	9	21	#4	BT	3" C-C	2'-7"	36	959	4.14



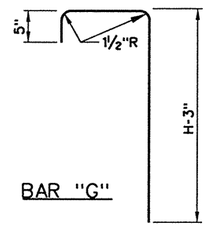
BAR "B"



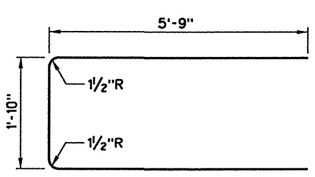
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BAR "E"

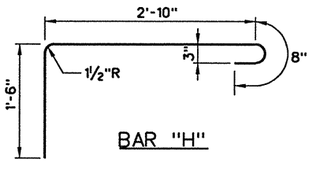
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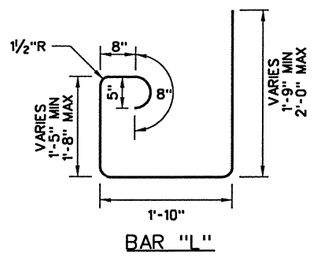
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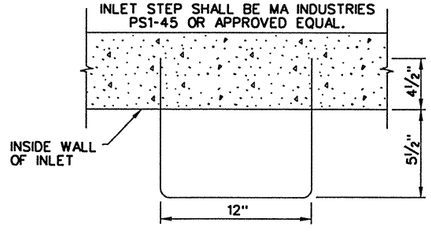
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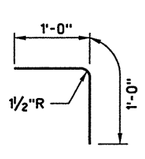
BAR "H"



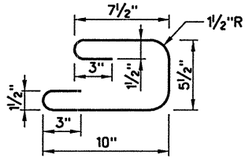
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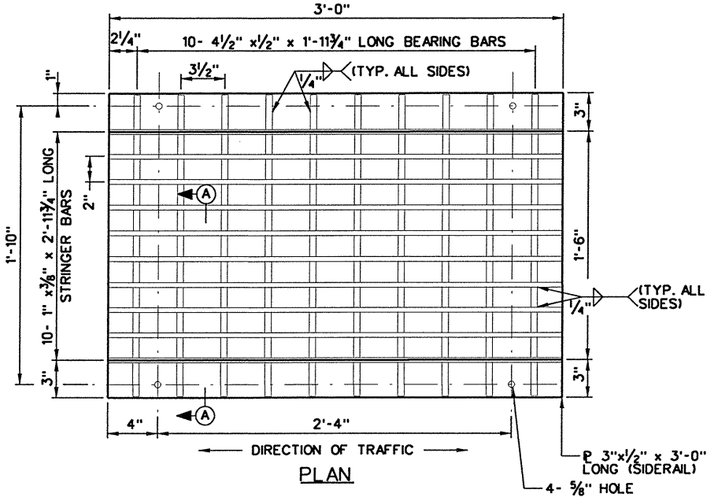
DETAIL OF INLET STEP



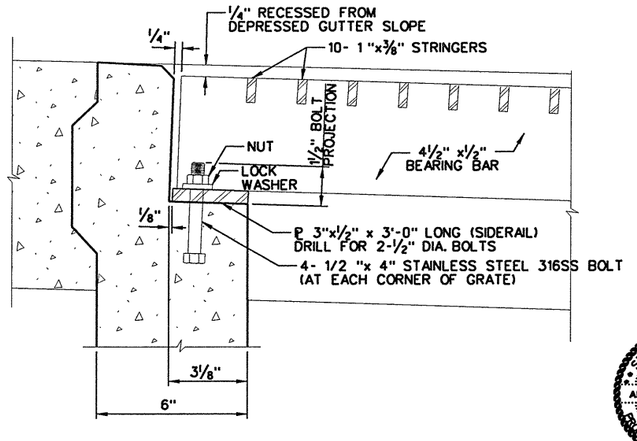
BAR "M"



BAR "N"



PLAN



SECTION A-A

BOLT DOWN GRATE DETAIL

STRUCTURAL STEEL FOR 3' x 2' BOLT DOWN GRATE

BAR	NO	SPACING	LENGTH	WEIGHT
3"x½" SIDERAIL	2	AS SHOWN	3'-0"	31
4½"x½" BEARING BAR	10	AS SHOWN	1'-11¾"	152
1"x⅜" STRINGER BAR	10	AS SHOWN	2'-11¾"	38
TOTAL STRUCTURAL STEEL (LBS)				221

CONCRETE TO BE DEDUCTED FOR PIPES (ONE PIPE)

PIPE SIZE	CONC. C.Y.
15"	0.04
18"	0.05
21"	0.07
24"	0.09
27"	0.11
30"	0.14
36"	0.20

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

BARRIER WALL INLET

STATE OF TEXAS
ANDREW J. ADAMS
99322
LICENSED
PROFESSIONAL ENGINEER
2/9/09

Designed: MBG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: GRB	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: GRB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	261

SHEET 2 OF 2

pw:/Active Projects/TX00643/TX00643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.06 Drainage/bwall inlet02.999
2/9/2009 6:38:13 AM aadams

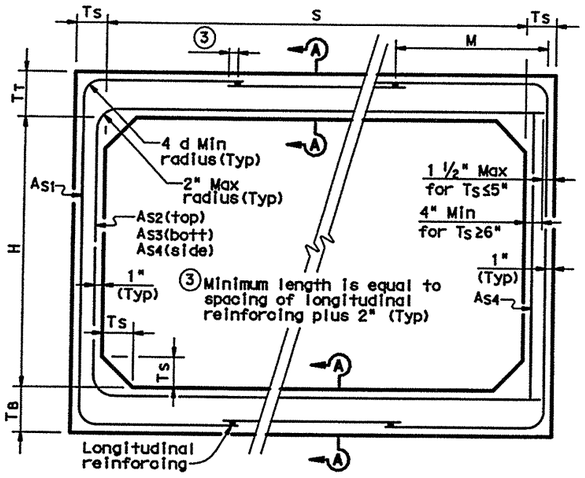
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

BOX DATA

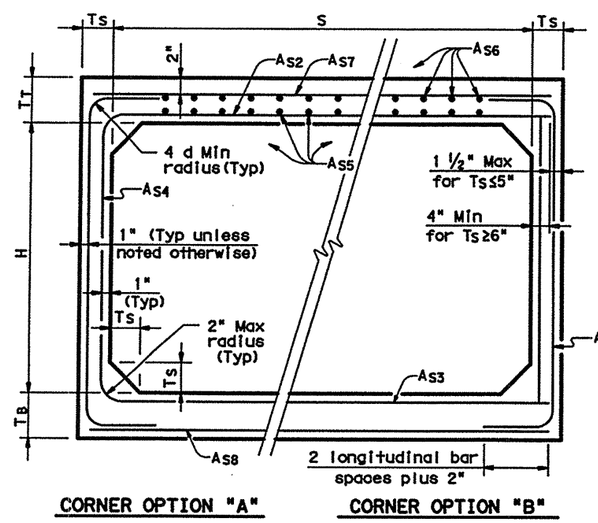
SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (in^2/ft) ②								① Lift Weight (Tons)
S (ft)	H (ft)	T_T (in)	T_B (in)	T_S (in)	(ft)	(in)	A_{S1}	A_{S2}	A_{S3}	A_{S4}	A_{S5}	A_{S6}	A_{S7}	A_{S8}	
6	3	8	7	7	<2	-	0.23	0.45	0.20	0.17	0.19	0.19	0.19	0.17	7.9
6	3	7	7	7	2<3	43	0.24	0.30	0.20	0.17	-	-	-	-	7.5
6	3	7	7	7	3-5	40	0.17	0.17	0.17	0.17	-	-	-	-	7.5
6	3	7	7	7	10	39	0.17	0.20	0.20	0.17	-	-	-	-	7.5
6	3	7	7	7	15	38	0.23	0.27	0.28	0.17	-	-	-	-	7.5
6	3	7	7	7	20	38	0.30	0.35	0.36	0.17	-	-	-	-	7.5
6	3	7	7	7	25	38	0.36	0.44	0.44	0.17	-	-	-	-	7.5
6	3	7	7	7	30	38	0.43	0.52	0.52	0.17	-	-	-	-	7.5
6	3	7	7	7	35	38	0.50	0.60	0.60	0.17	-	-	-	-	7.5
6	4	8	7	7	<2	-	0.19	0.49	0.23	0.17	0.21	0.19	0.19	0.17	8.6
6	4	7	7	7	2<3	43	0.21	0.33	0.23	0.17	-	-	-	-	8.2
6	4	7	7	7	3-5	40	0.17	0.17	0.17	0.17	-	-	-	-	8.2
6	4	7	7	7	10	39	0.17	0.22	0.23	0.17	-	-	-	-	8.2
6	4	7	7	7	15	38	0.20	0.30	0.31	0.17	-	-	-	-	8.2
6	4	7	7	7	20	38	0.25	0.39	0.40	0.17	-	-	-	-	8.2
6	4	7	7	7	25	38	0.30	0.48	0.49	0.17	-	-	-	-	8.2
6	4	7	7	7	30	38	0.36	0.57	0.58	0.17	-	-	-	-	8.2
6	4	7	7	7	35	38	0.42	0.66	0.67	0.17	-	-	-	-	8.2
6	5	8	7	7	<2	-	0.19	0.52	0.25	0.17	0.22	0.19	0.19	0.17	9.3
6	5	7	7	7	2<3	52	0.19	0.36	0.26	0.17	-	-	-	-	8.9
6	5	7	7	7	3-5	43	0.17	0.19	0.19	0.17	-	-	-	-	8.9
6	5	7	7	7	10	39	0.17	0.23	0.24	0.17	-	-	-	-	8.9
6	5	7	7	7	15	38	0.17	0.32	0.33	0.17	-	-	-	-	8.9
6	5	7	7	7	20	38	0.22	0.41	0.43	0.17	-	-	-	-	8.9
6	5	7	7	7	25	38	0.26	0.51	0.52	0.17	-	-	-	-	8.9
6	5	7	7	7	30	38	0.31	0.60	0.61	0.17	-	-	-	-	8.9
6	5	7	7	7	35	38	0.36	0.69	0.71	0.17	-	-	-	-	8.9
6	6	8	7	7	<2	-	0.19	0.54	0.27	0.17	0.23	0.19	0.19	0.17	10.0
6	6	7	7	7	2<3	52	0.17	0.38	0.28	0.17	-	-	-	-	9.6
6	6	7	7	7	3-5	52	0.17	0.20	0.20	0.17	-	-	-	-	9.6
6	6	7	7	7	10	43	0.17	0.24	0.26	0.17	-	-	-	-	9.6
6	6	7	7	7	15	39	0.17	0.33	0.35	0.17	-	-	-	-	9.6
6	6	7	7	7	20	38	0.19	0.43	0.44	0.17	-	-	-	-	9.6
6	6	7	7	7	25	38	0.23	0.52	0.54	0.17	-	-	-	-	9.6
6	6	7	7	7	30	38	0.27	0.61	0.63	0.17	-	-	-	-	9.6
6	6	7	7	7	35	38	0.32	0.71	0.73	0.17	-	-	-	-	9.6

① For Box Length = 8'-0"

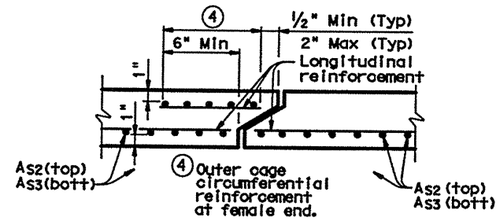
② As1 thru As4, As7 and As8 are minimum required areas of reinforcement per linear foot of box length. As6 and As5 are minimum required areas of reinforcement per linear foot of box width.



FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT



SECTION A-A

(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:

Designs shown conform to ASTM C1433. Refer to ASTM C1433 for information or details not shown.

All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.

See SCP-MD standard sheet for miscellaneous details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structures".

HS20 LOADING

Texas Department of Transportation
Bridge Division

SINGLE BOX CULVERTS PRECAST
6'-0" SPAN

SCP-6

FILE: scp06ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 06-06 - Revised reinforcing. 06-07 - General notes.				267
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0034	12	067	

ACC:
PLAYED
LEVEL
1

Culvert Station and/or Creek name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans - Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard ④	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw ① Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (C.Y.)	Class "C" Conc (Curb) ② (C.Y.)	Class "C" Conc (Wingwall) ③ (C.Y.)	Total Wingwall Area (S.F.)
CULVERT A, STA. 308+42.48 (BOTH)	1 - 6' X 3'	23	SCP-6	PW	15	3:1	7	7	2.500	6.083	N/A	N/A	18.894	7.419	N/A	0.0	1.4	30.2	460

NOTES:

Skew Angle = 0° for SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standards.
30° Maximum for Safety End Treatment

SL:1 = Horizontal:1 Vertical
Side Slope at culvert for Flared or Straight Wingwalls. Channel Slope for Parallel Wingwalls.
Slope shall be 3:1 or flatter for Safety End Treatments.

T = Box Culvert Top Slab Thickness. Dimension can be found on the applicable Box Culvert Standard.

U = Box Culvert Wall Thickness. Dimension can be found on the applicable Box Culvert Standard.

C = Curb Height.

See applicable wing or end treatment standards for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.
Hw = Height of Wingwall.
A = Distance from Face of Curb to End of Wingwall (Not applicable to Parallel or Straight Wingwalls).
B = Offset of End of Wingwall (Not applicable to Parallel or Straight Wingwalls).
Lw = Length of Longest Wingwall.
Ltw = Length of Culvert Toewall (Not applicable when using Riprap Apron).
Atw = Length of Anchor Toewall (Applicable to Safety End Treatment only).
Total Wingwall Area = Wingwall area in S.F. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

① The wall heights shown will be rounded to the nearest Foot for bidding purposes.

② Concrete volume shown is for box culvert curb only. For curbs using the RAC standard, quantities shown must be increased by a factor of 2. If Class "S" concrete is required for the top slab of the culvert, the curb concrete shall also be Class "S". Curb concrete is considered part of the Box Culvert for payment.

③ Concrete volume shown is total of wing, footing, culvert toewall (if any), anchor toewall (if any) and wingwall toewall. Riprap apron, culvert and curb quantities are not included.

④ Regardless of the type of culvert shown on this sheet, the Contractor shall have the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it shall be the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

SPECIAL NOTE:

This sheet is a supplement to the Box Culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the Box Culvert Wingwalls and Safety End Treatments.

An Excel 97 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet shall be signed, sealed, and dated by a licensed Professional Engineer.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
6/17/09

1 REPLACED 6-29-09 BB.

Texas Department of Transportation
Bridge Division

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

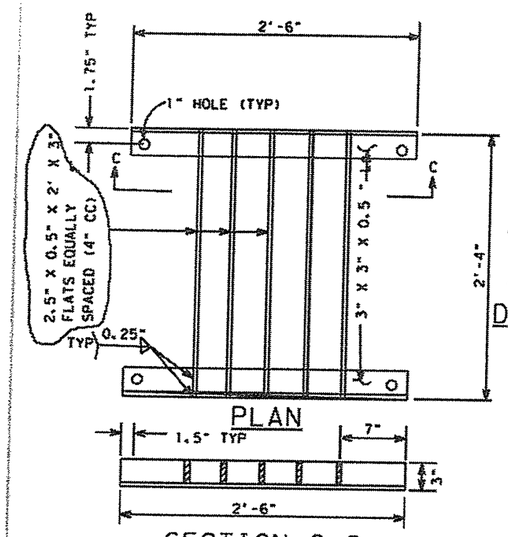
BCS

FILE: bcsstdel.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
© TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	18			263
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0009	12	075	IH30

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COMMENTS:

LEVELS DISPLAYED
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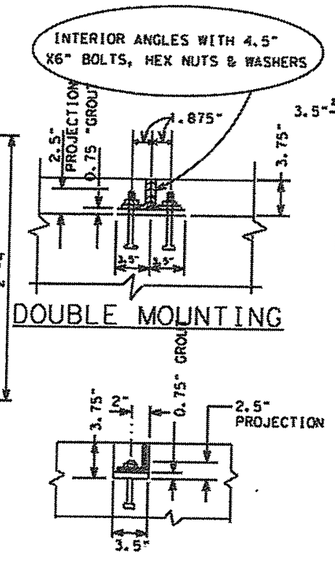


PLAN

SECTION C-C

GRATE DETAILS TYPE C

SC: 1.5" = 1'-0"

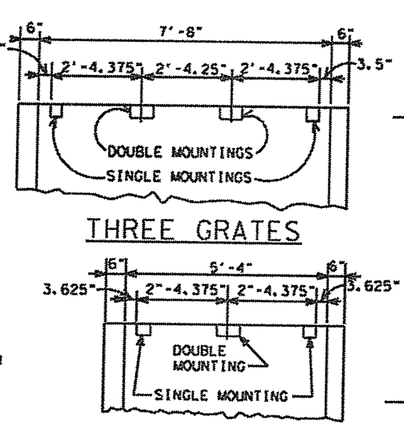


DOUBLE MOUNTING

SINGLE MOUNTING

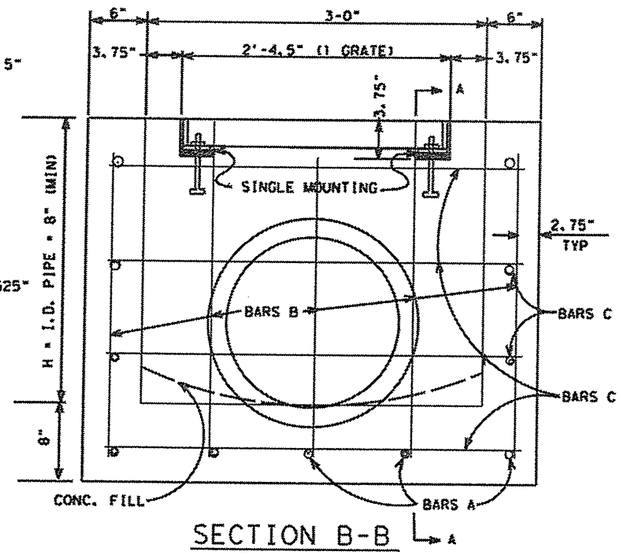
GRATE MOUNTING DETAILS

SCALE: 1.5" = 1'-0"

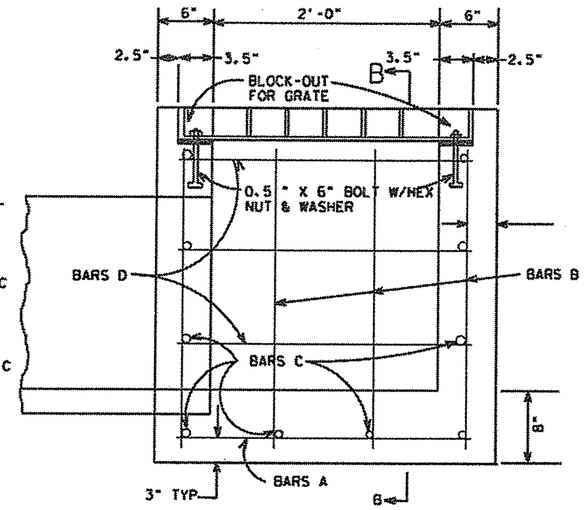


MULTIPLE GRATE INLET DETAILS

SCALE: ½" = 1'-0"



SECTION B-B



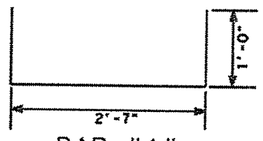
SECTION A-A

INLET DETAILS TYPE "C"

SCALE : 1.5" = 1'-0"

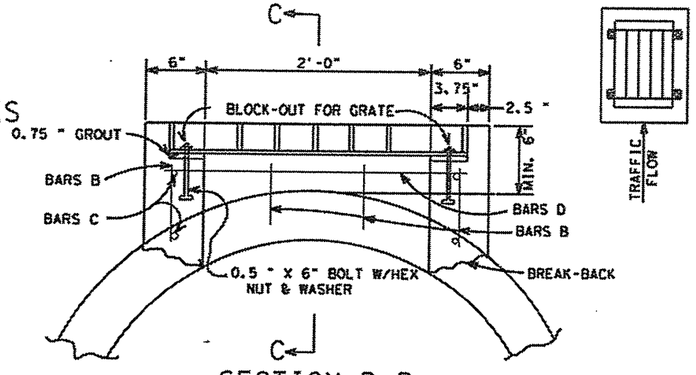
PIPE SIZE	CONC. C.Y.
15"	0.04
18"	0.05
21"	0.07
24"	0.09
27"	0.11
30"	0.14
33"	0.17
36"	0.20
39"	0.23
42"	0.26
48"	0.34

CONCRETE TO BE DEDUCTED FOR PIPES

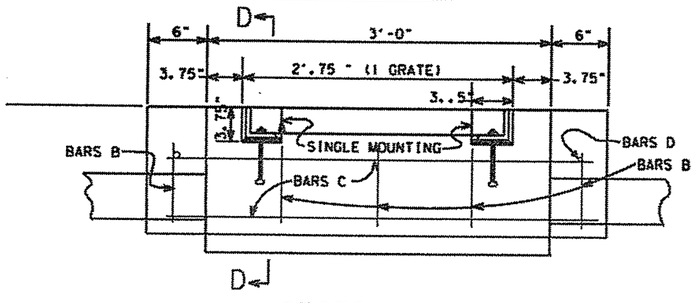


BAR "A"

TWO GRATES



SECTION D-D



SECTION C-C

INLET DETAILS TYPE "G"

FOR USE WITH PIPES GREATER THAN 30" DIAMETER

BILL OF REINFORCING STEEL FOR TYPE "C" INLETS

	H	BARS A 12" C.C. NO.	LENGTH	SIZE	WT.	BARS B 12" C.C. NO.	LENGTH	SIZE	WT.	BARS C 12" C.C. NO.	LENGTH	SIZE	WT.	BARS D 12" C.C. NO.	LENGTH	SIZE	WT.	REINF. STEEL LB.	CL "A" CONC. C.Y.	GRATE
1 GRATE	2'-6"	5	4'-7"	4	15	14	2'-8"	4	25	10	3'-8"	4	24	6	2"-8"	4	11	75	0.85	95#
	3'-0"	5	↑	↑	15	14	3'-2"	↑	30	10	3'-8"	↑	24	6	↑	↑	11	80	0.96	
	3'-6"	5			15	14	3'-8"		34	12	3'-8"		29	8			14	92	1.07	
	4'-0"	5			15	14	4'-2"		39	12	3'-8"		29	8			14	97	1.18	
	4'-6"	5			15	14	4'-8"		44	14	3'-8"		34	10			18	111	1.29	
	5'-0"	5			15	14	5'-2"		48	14	3'-8"		34	10			18	115	1.40	
2-GRATE	3'-0"	7			21	18	3'-2"		38	10	6'-0"		40	6			11	110	1.38	190#
	3'-6"	7			21	18	3'-8"		44	12	6'-0"		48	8			14	127	1.53	
	4'-0"	7			21	18	4'-2"		50	12	6'-0"		48	8			14	133	1.68	
	4'-6"	7			21	18	4'-8"		56	14	6'-0"		56	10			18	151	1.83	
	5'-0"	7			21	18	5'-2"		62	14	6'-0"		56	10			18	157	1.98	
	5'-6"	7			21	18	5'-8"		68	16	6'-0"		64	12			21	174	2.13	
3-GRATE	4'-0"	10			31	24	4'-2"		67	12	8'-4"		67	8			14	178	2.22	285#
	4'-6"	10			31	24	4'-8"		75	14	8'-4"		78	10			18	202	2.41	
	5'-0"	10			31	24	5'-2"		83	14	8'-4"		78	10			18	210	2.60	
	5'-6"	10			31	24	5'-8"		91	16	8'-4"		89	12			21	232	2.79	
	6'-0"	10	↓	↓	31	24	6'-2"	↓	99	16	8'-4"	↓	89	12	↓	↓	21	240	2.98	
	6'-6"	10	4'-7"	4	31	24	6'-8"	4	107	16	8'-4"	4	100	14	2"-8"	4	25	263	3.17	

* DOES NOT INCLUDE QUANTITY FOR SHAPING OR DEDUCTION FOR PIPES

GENERAL NOTES

1. EXPOSED EDGES SHALL BE CHAMFERED 0.75".
2. ALL CONCRETE SHALL BE CLASS "A".
3. ALL DIMENSIONS TO BE REINFORCING STEEL ARE TO CENTERS OF BARS.
4. 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.
5. IF POSSIBLE HORIZONTAL GRATE INLET SHOULD BE ORIENTED SUCH THAT BOTH TRAFFIC AND DITCH WATER APPROACH PARRALLEL TO BARS ON GRATE. IF THIS IS NOT POSSIBLE ORIENTATION SHOULD FAVOR TRAFFIC FLOW WHERE PIPE SIZES PERMIT.
6. STRUCTURAL STEEL FOR GRATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A-36 OR AISI DESIGNATION m1010-m1020. PAYMENT FOR GRATES SHALL BE MADE UNDER THE BID ITEM "GRATE (TY C)." QUANTITIES FOR CONCRETE & STEEL ARE FOR CONTRACTOR'S INFORMATION ONLY.
7. PAYMENT FOR INLETS SHALL BE MADE UNDER THE BID ITEM "INLETS (COMP) (TY C-1 GRATE), (TY C-2 GRATE), (TY C-3 GRATE) OR (TY G-1 GRATE)."
8. EXISTING BARS EXPOSED BY BREAK -BACK SHALL BE CLEANED AND BENT INTO POSITION TO PROVIDE A TIE TO THE NEW CONCRETE EXTENSION FOR TYPE "G" INLET.

DROP INLET TYPE C & G DETAILS

TXDOT DISTRICT 18 STANDARD

264

Rockwall 000912 075

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

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

TABLE OF WINGWALL REINFORCING (2-Wings)

Bar	Size	No.	Spa
DL	#5	~	1'-0"
DS	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
RS	#5	3	~
RL	#5	3	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

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

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

Hw = H + T + C - 0.250'
A = (Hw - 0.333') (SL)
B = (A) [Tangent (Θ + 15°)]
Lw = (A) ÷ [Cosine (Θ + 15°)]

For Cast-in-place culverts:

Ltw = [(N) (S) + (N+1) (U)] ÷ (Cosine Θ)

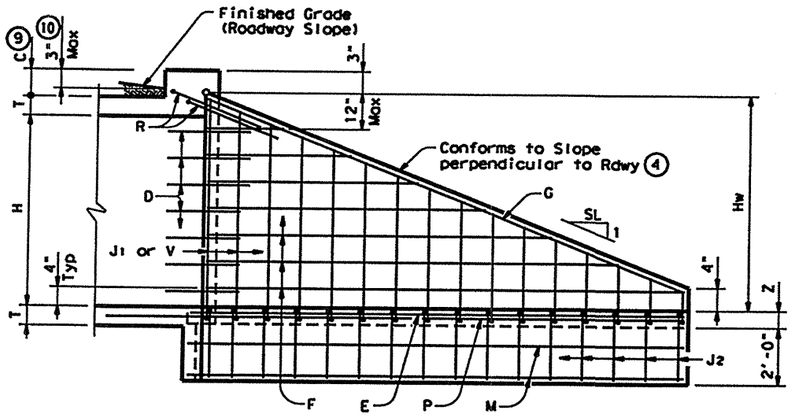
For Precast culverts:

Ltw = [(N) (2U+S) + (N-1) (0.500')] ÷ (Cosine Θ)

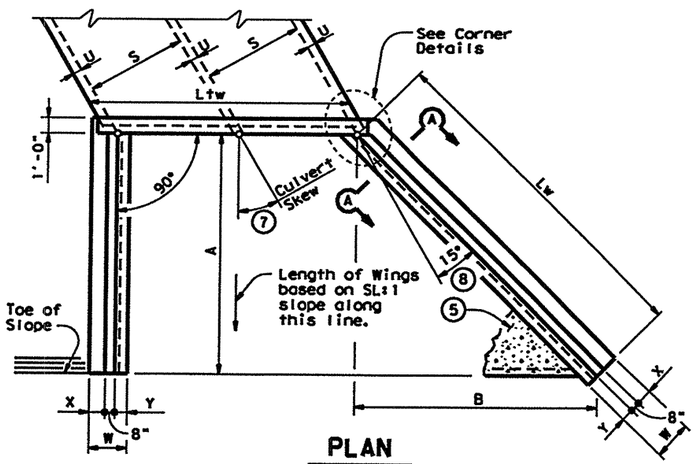
Total Wingwall Area (Two Wings ~ S.F.) = (0.5) (Hw + 0.333') (Lw + A)

Hw = Height of Wingwall
SL:1 = Side Slope Ratio (Horizontal:1 Vertical)
A = Length of Short Wingwall
Lw = Length of Long Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
Θ = Culvert Skew

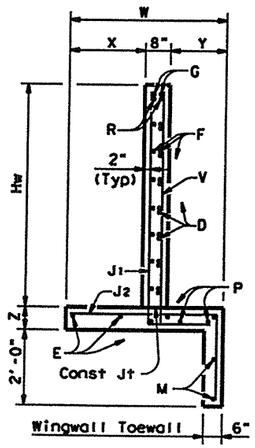
See applicable box culvert standard for H, S, T, and U values.



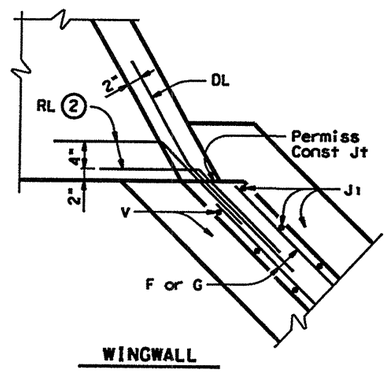
INSIDE ELEVATION
(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



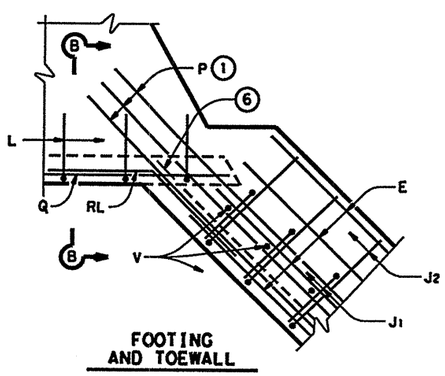
PLAN
(Showing dimensions and 30° Skew.)



SECTION A-A

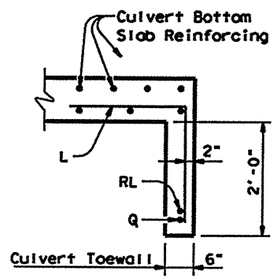


WINGWALL

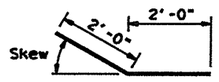


FOOTING AND TOEWALL

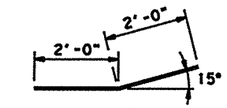
CORNER DETAILS
(Culvert and Culvert Toewall reinforcing not shown for clarity.)



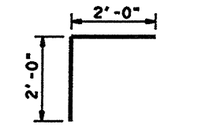
SECTION B-B (5)



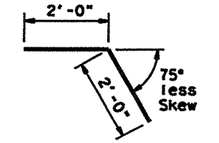
BARS DS
(Short Wing)



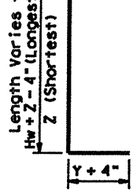
BARS DL
(Long Wing)



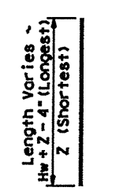
BARS RS
(Short Wing)



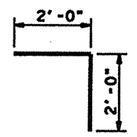
BARS RL
(Long Wing)



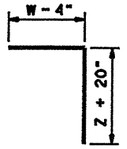
BARS J1



BARS V



BARS L



BARS J2

1. Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.
2. Adjust to fit as necessary to maintain 1 ¼" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by 0.5 x (A+Lw).
4. Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.
5. When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required. Payment for riprap shall be as required by Item 432, "Riprap".
6. At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.
7. Applicable values of of Skew are: 15°, 30°, and 45°.
8. Typical wingwall angle for all skews.
9. 0" min to 5'-0" max. For T6 or C6 Rail, see T6-CM standard for additional details. For all other rail types, refer to the RAC standard. For curbs without rail and greater than 1'-0" high, see ECD standard for additional details. Estimated curb heights are shown elsewhere in the plans.
10. For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

All reinforcing bars shall be adjusted to provide a minimum of 1 ¼" clear cover.

When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.

See BCS sheet for additional dimensions and information.

The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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COMMENTS:

ED

LEVELS

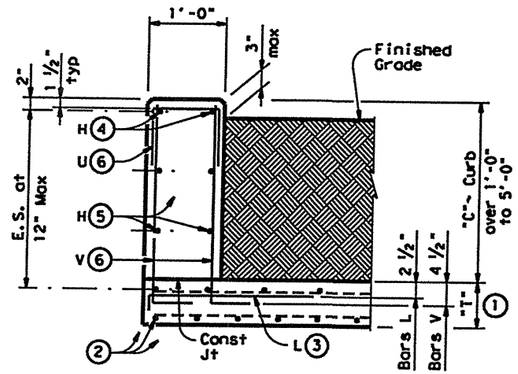
Texas Department of Transportation
Bridge Division

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS

FW-S

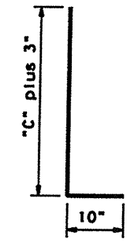
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©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				265
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
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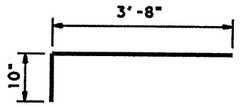
TYPICAL SECTION

Used for Curbs over 1'-0" to 5'-0"



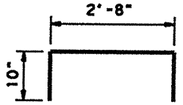
BARS V (#5) (6)

Spaced at 12" max



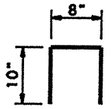
BARS L (#5) (3)

Spaced at 12" max



OPTIONAL BARS L (#5) (3) (7)

Spaced at 12" max



BARS U (#4) (6)

Spaced at 12" max

(1) "T" is equal to the culvert top slab thickness. For Precast Boxes with slabs less than 7", see SCP-MD Standard for additional details.

(2) Normal culvert slab bars adjusted as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H (#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H (#4) as required to maintain 12" max spa.

(6) Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for contractor's information only. Quantities are per linear foot of curb length. The values for each section type in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	8.9
1'-6"	0.056	14.3
2'-0"	0.074	15.4
2'-6"	0.093	17.7
3'-0"	0.111	18.8
3'-6"	0.130	21.2
4'-0"	0.148	22.2
4'-6"	0.167	24.6
5'-0"	0.185	25.6

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.

These extended curb details have sufficient strength to allow for future retrofit of Type T6 railing. These details are not suitable for the mounting of other rail types. For new construction using T6 railing, use the T6-CM standards.

All reinforcing shall be Grade 60. Adjust reinforcing as necessary to provide 1 ¼" cover.

All concrete for curbs shall be Class "C" with a minimum compressive strength of 3600 psi.

This Curb shall be considered as part of the Box Culvert for payment.

For vehicle safety, the top of the curb shall project no more than 3" above the finished grade.

LEVEL PATH: TED

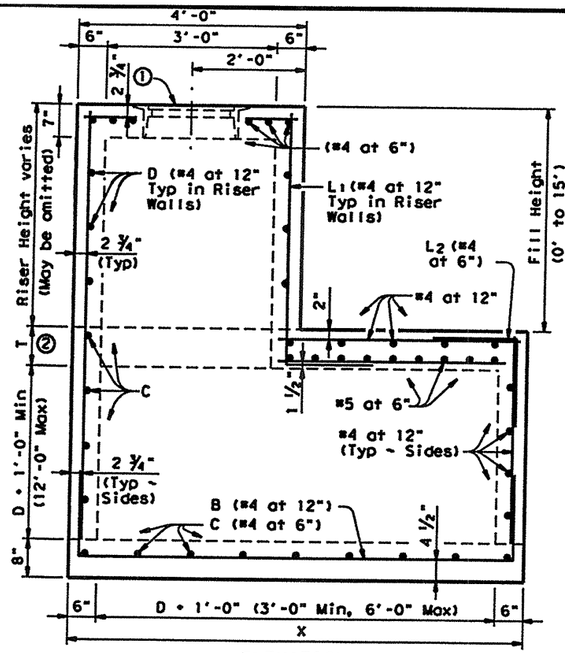
Texas Department of Transportation
Bridge Division

EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE: ecdsfdet.dgn	DN: GAF	CK:	DW: TxDOT	CK: GAF
©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				21 of 21
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0252	07		

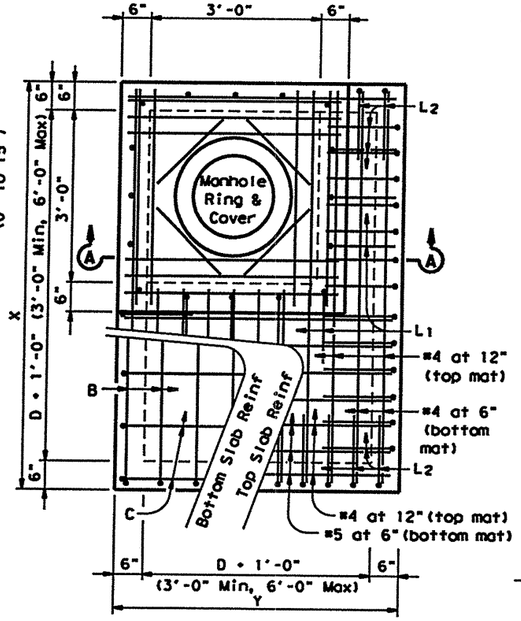
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ELEVATION

D = Maximum inside diameter of any Pipe entering the side shown or the opposite side

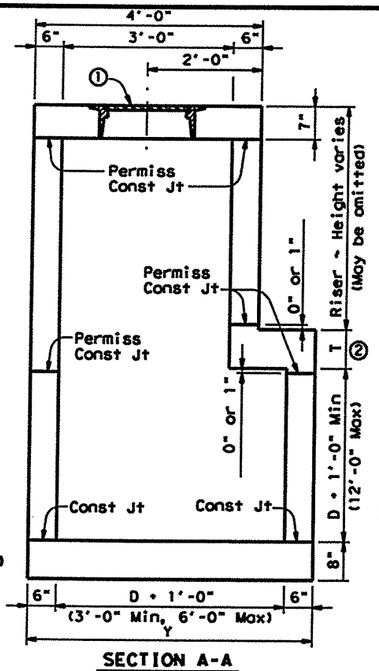
① See Ring and Cover Details



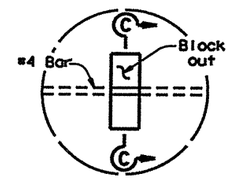
PLAN

MANHOLE WITH CAST-IN-PLACE RISER

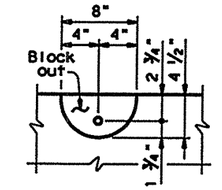
② For Fill Height less than or equal to 10', T=8".
For Fill Height between 10' and 15', T=10".



SECTION A-A

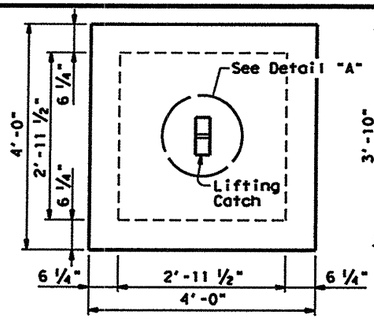


DETAIL "A"

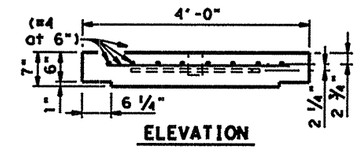


SECTION C-C

LIFTING CATCH

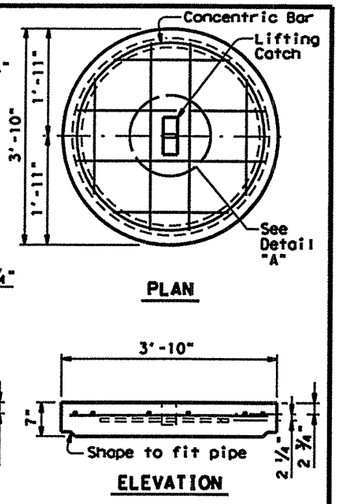


PLAN



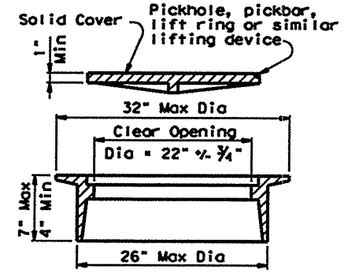
ELEVATION

CAST-IN-PLACE RISER COVER



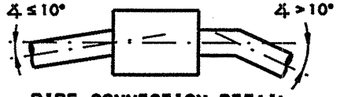
CONCRETE PIPE RISER COVER

OPTIONAL PRECAST CONCRETE LIFT-OFF COVERS



RING AND COVER DETAILS

Approximate Weight = 245 lb



PIPE CONNECTION DETAIL

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.

GENERAL NOTES:

Unless otherwise shown in the plans, payment will be made for each manhole of the Type M.

When approved, precast inlets with equivalent structural capacity may be furnished. Sealed engineering calculations and drawings shall be submitted for approval prior to construction.

Shop drawings will not be required.

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

The riser may be constructed of reinforced concrete as shown or of Reinforced Concrete Pipe, Class III, in accordance with ASTM Designation C-76. If pipe is used, joints shall conform to the Item "Reinforced Concrete Pipe Culverts". Precast Concrete Lift-Off Cover may be substituted for Ring and Cover.

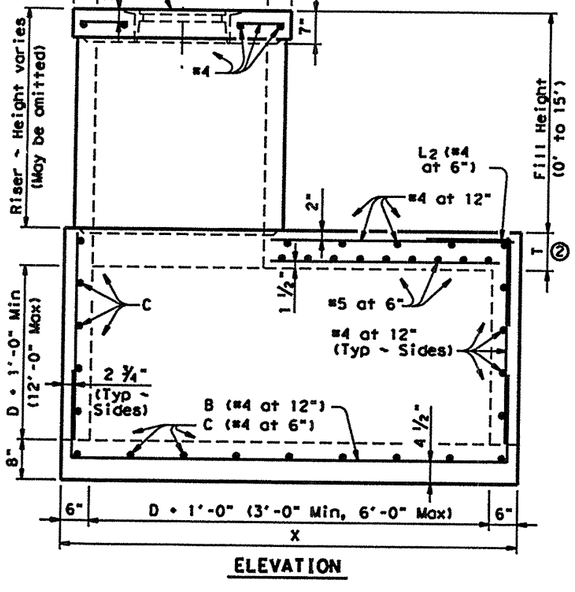
The riser, either cast-in-place or concrete pipe, may be located in any corner.

All reinforcing steel shall be #4 unless otherwise noted.

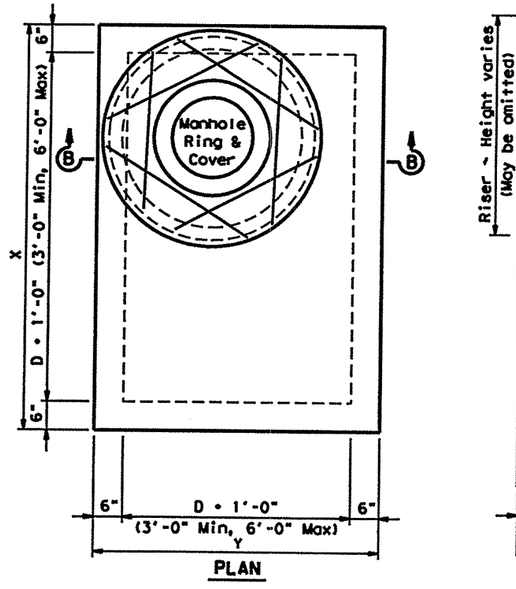
Pipes may enter any or all walls. The maximum size of pipe that can be accommodated is 60". More than one pipe may enter a side, subject to the maximum box dimension shown. The clear distance between adjacent pipes should be 9" minimum.

Ring and cover shall conform to the requirements of AASHTO M306, "Standard Specification for Drainage Structure Castings". Materials shall conform to ASTM A48, Class 35B for gray iron castings or ASTM A536, Grade 65-45-12 for ductile iron castings. Aluminum alloy castings shall not be permitted.

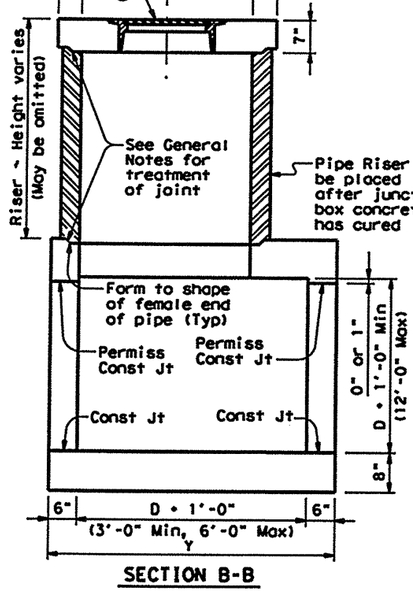
All concrete shall be Class "A" (f'c = 3000 psi).



ELEVATION

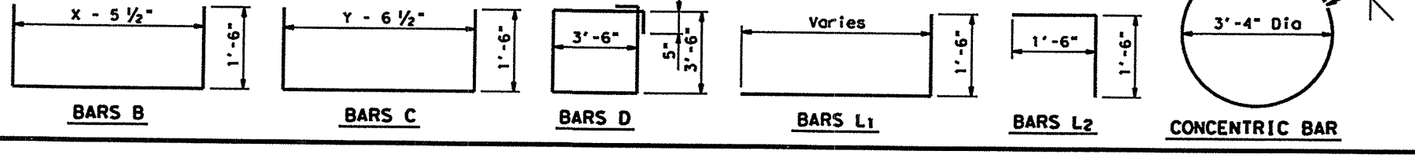


PLAN



SECTION B-B

OPTIONAL MANHOLE WITH CONCRETE PIPE RISER



Texas Department of Transportation
Bridge Division

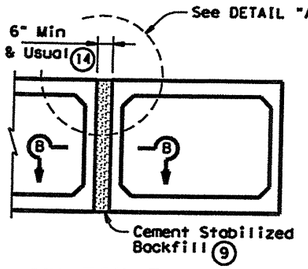
MANHOLE TYPE M
(JUNCTION BOX WITH ACCESS)
15' MAX FILL

MH-M

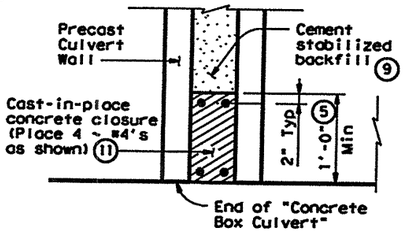
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©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET	
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	Johnson	2009	12	62	

ACC:
LAYED
LEVEL
1

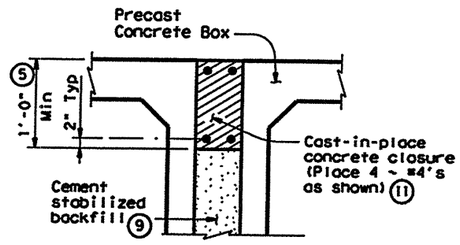
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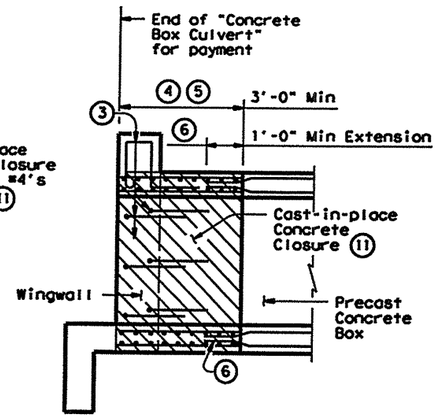
MULTIPLE UNIT PLACEMENT



SECTION B-B

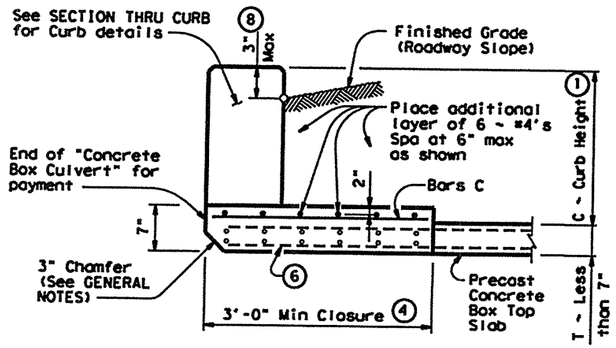


DETAIL "A" (13)

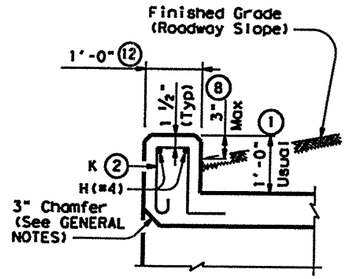


WINGWALL CONNECTION

(Also applies to Safety End Treatment)

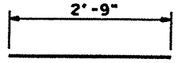


SECTION THRU TOP SLABS LESS THAN 7"

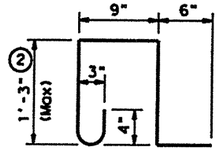


SECTION THRU CURB

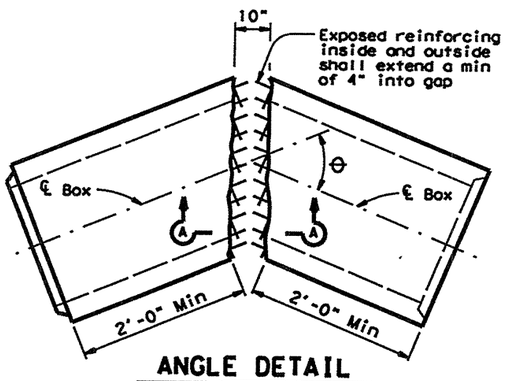
(10) QUANTITIES PER FOOT OF CURB	
Reinforcing Steel	4.18 Lb
Concrete	0.037 CY



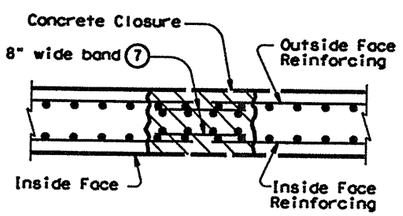
BARS C ~ #4
(Spa = 1'-0" Max)



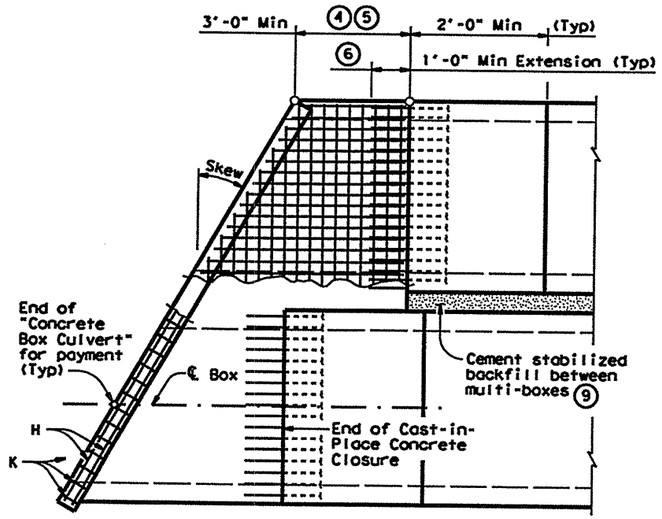
BARS K ~ #4
(Spa = 1'-0" Max)
(Length = 4'-3")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement)

1. 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with bridge rail, other than T6, refer to RAC standard.
2. For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
3. Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.
4. Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.
5. For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B-B detail when interior walls are cast full length.
6. Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).
7. Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
   - For structures with bridge rail, curbs shall be flush with finished grade.

   Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
9. Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.
10. All curb concrete and reinforcing is considered part of the Box Culvert for payment.
11. Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
12. 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.
13. For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".
14. This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.

All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Structures".

Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

Refer to the Single Box Culverts Precast standard for details not shown.

The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.

HS20 LOADING

Texas Department of Transportation
Bridge Division

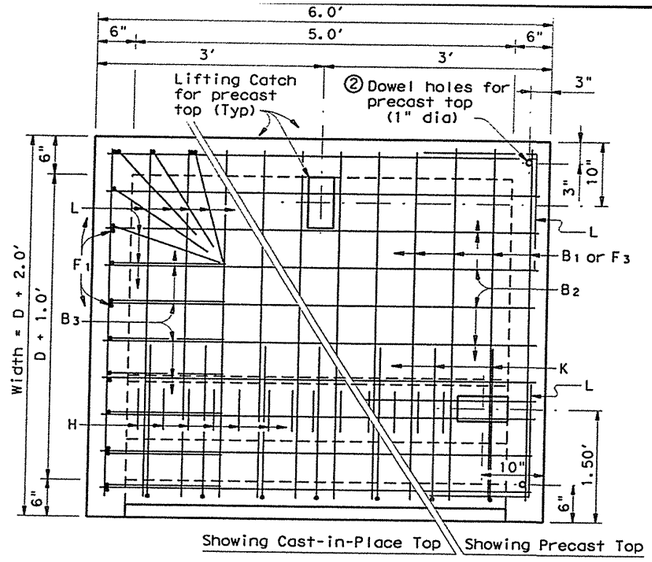
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

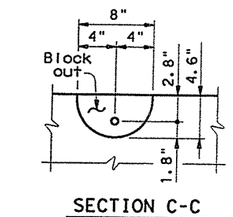
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©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT			SHEET
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08-07: Bars H size.	COUNTY		CONTROL	SECT	JOB	HIGHWAY
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LEVEL

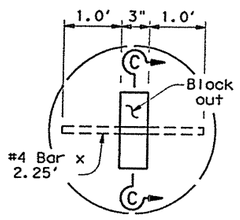
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PLAN



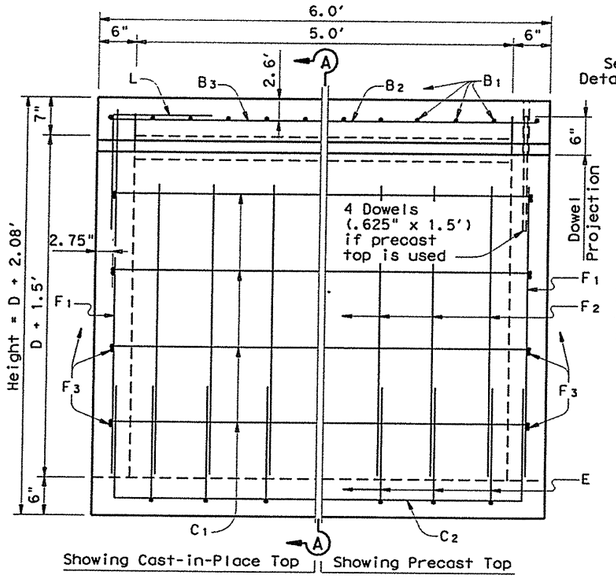
SECTION C-C



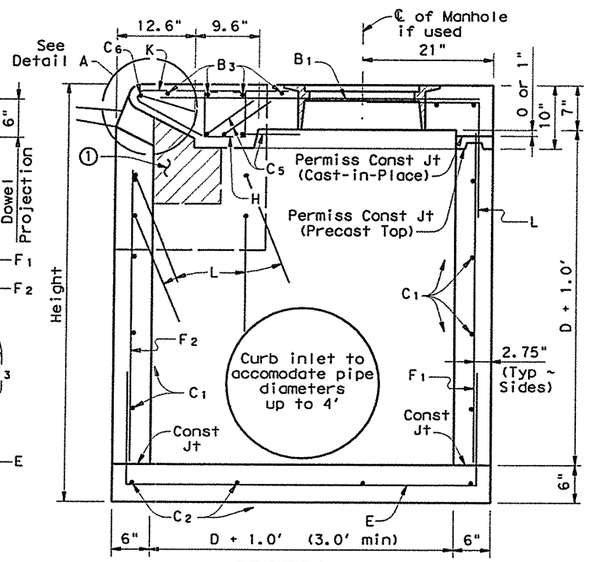
DETAIL "A"

LIFTING CATCH

② If precast top is used, provide .625" dia x 1.5' smooth bars in inlet walls for 1" dia holes

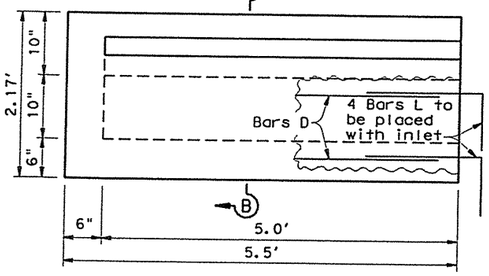


ELEVATION

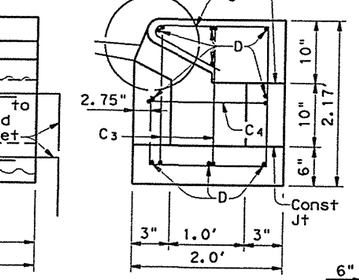


SECTION A-A

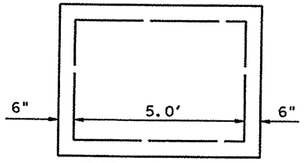
① Block out to accomodate extension if used and to place 4 Bars L



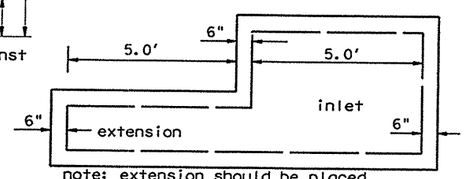
EXTENSION ELEVATION



SECTION B-B

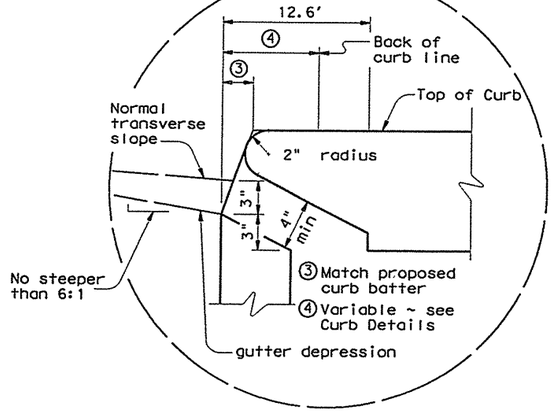


REGULAR INLET

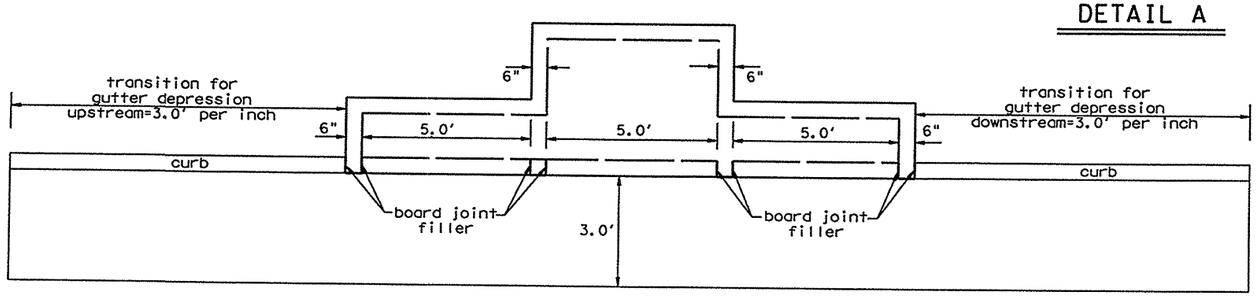


note: extension should be placed on upstream side of inlet.

INLET WITH ONE EXTENSION



DETAIL A



INLET WITH TWO EXTENSIONS

PLAN OF INLET AND EXTENSIONS

DALLAS DISTRICT STANDARD

GENERAL NOTES:

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

Engineer has the option of specifying top with manhole or removable precast top as specified elsewhere in plans.

Exposed edges shall be chamfered 0.75'.

Alternate design drawings bearing the seal of a registered professional engineer will be acceptable for precast construction of inlets.

When approved by the Engineer opening configurations of equivalent hydraulic design may be furnished.

Shop drawings will not be required.

The Contractor may with the approval of the Engineer furnish inlets of equivalent structural design.

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.

Texas Department of Transportation
Design Division (Bridge)

CURB INLET TYPE 1 DETAILS
(5 FT INLET)

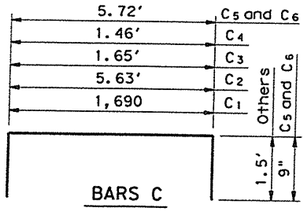
SHEET 1 OF 2

ORIG DATE: APR 97	DIST	FED REG	FEDERAL AID PROJECT #	SHEET
REVISIONS	18	6	STP 2001(123) MM	269
	COUNTY		CONTROL SECT JOB	HIGHWAY
	Dallas		0009 12 079	

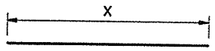
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

(LV=1,2 for English; 1,3 for Metric)

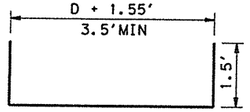
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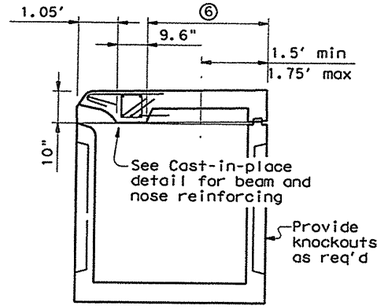
BARS C



BARS D

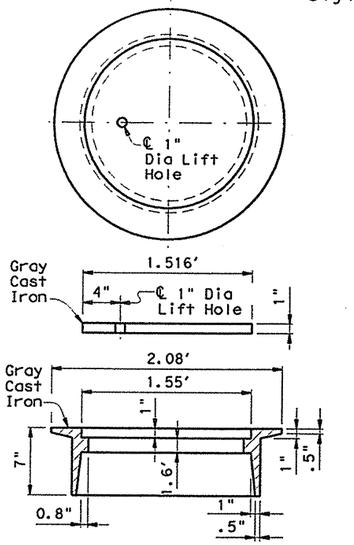


BARS E



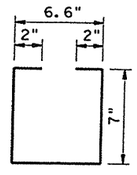
PREFABRICATED INLET

⑥ For reinforcing steel and dimensions not shown, see fabricators design drawing. Structure shall be of the size required to accomodate size of pipe shown elsewhere in the plans. Length of inlet = 5.0'.

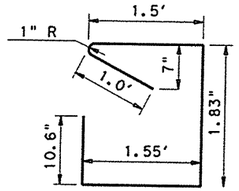


RING AND COVER DETAILS

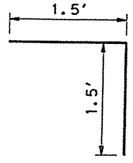
Approximate Weight = 198 LBS



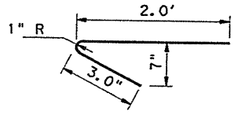
BARS H



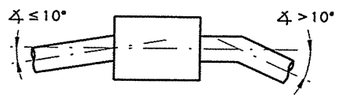
BARS G



BARS L



BARS K



PIPE CONNECTION DETAIL

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.

ESTIMATED QUANTITIES ⑧

Pipe Size = D	Height	For 4.0' Width		Per 6" Add'l Width		Per 1.0' ⑦ Add'l Height	
		Cl "A" Conc	Reinf Steel	Cl "A" Conc	Reinf Steel	Cl "A" Conc	Reinf Steel
IN	FT	YD³	LBS	YD³	LBS	YD³	LBS
18	3.58	1.56	315	--	--	.33	33
24	4.08	1.95	328	--	--	.33	33
30	4.58	2.34	345	.18	20	.33	33
36	5.08	2.73	361	.20	20	.36	35
42	5.58	3.12	378	.20	22	.39	35
48	6.08	3.51	392	.21	22	.40	37

⑦ For Width 4' min = D+2'

⑧ Does not apply to prefabricated inlets

REINF STEEL

Bar	Size	Spacing
B_1	#4	6"
B_2	#5	6"
B_3	#4	6"
C_{1-2}	#4	1.0'
C_{3-4}	#4	⑨
C_5	#6	⑨
C_6	#4	⑨
D	#4	⑨
E	#4	1.0'
F_{1-3}	#4	1.0'
G	#4	6"
H	#3	4"
K	#4	9"
L	#4	6"

⑨ As shown

EXTENSION QUANTITIES

Ext	length	Cl "A" Conc	Reinf Steel
No.	FT	YD³	LBS
1	5.0'	0.65	103

(LV=1,2 for English; 1,3 for Metric)

LAYER: 1 3 58

Texas Department of Transportation
Design Division (Bridge)

CURB INLET TYPE 1 DETAILS (5 FT INLET)

DALLAS DISTRICT STANDARD

SHEET 2 OF 2

ORIG DATE: APR 97	DIST	FED REG	FEDERAL AID PROJECT #	SHEET
REVISIONS	18	6	XXX	270
	COUNTY		CONTROL SECT JOB	HIGHWAY
	Rockwall		0009 17 073	

TEMPLATE FOR IH 30 & 549 - ROCKWALL COUNTY, TEXAS

UTILITY	SYMBOL	LEVEL	COLOR	LINE WEIGHT	LEVEL B LINE STYLE	LEVEL C & D LINE STYLE
COMMUNICATIONS						
AT&T BURIED CABLE	T1	1	6	1	T1	T1
TEXT, NOTES		9	0	1		
CITY OF ROCWALL						
2" & UNDER WATER LINE	W	10	1	1	W	W
6" WATER LINE	W1	11	17	1	W1	W1
8" WATER MAIN	W2	12	33	1	W2	W2
12" WATER LINE	W3	13	49	1	W3	W3
16" WATER LINE	W4	14	65	1	W4	W4
30" WATER LINE	W5	15	103	1	W5	W5
36" WATER LINE	W6	16	7	1	W6	W6
TEXT, NOTES		19	0	1		
ATMOS ENERGY						
2" AND UNDER GAS LINE	G	20	84	1	G	G
4" GAS LINE	G1	21	116	1	G1	G1
6" GAS LINE	G2	22	132	1	G2	G2
24" LONESTAR HPG GAS LINE	G3	23	148	1	G3	G3
TEXT, NOTES		29	0	1		
CITY OF ROCKWALL						
WASTE WATER	WW	30	2	1	WW	WW
TEXT, NOTES		33	0	1		
CATV						
COMCAST OVERHEAD CABLE	C	40	10	1	C	C
TEXT, NOTES		44	0	1		
ONCORE ELECTRIC						
OVERHEAD ELECTRIC	OE	51	3	1	E	E
TEXT, NOTES		55	0	1		
STREET NAMES		59	0	1		
SURVEY CONTROL		60	0	1		
SURVEY POINTS		61	0	1		
POINT NUMBERS		62	0	1		

LEGEND

- TELEPHONE PEDESTAL
- TELEPHONE HANDHOLE
- TELEPHONE MANHOLE
- TELEPHONE MARKER
- TELEPHONE CABINET
- TELEPHONE POLE W/RISER
- CABLE PEDESTAL
- WM WATER METER
- WATER VALVE
- FIRE HYDRANT
- GM GAS METER
- GAS VALVE
- GAS MARKER
- CLEAN OUT
- SANITARY MANHOLE
- POWER POLE WITH RISER
- EM ELECTRIC METER
- POWER POLE
- LIGHT POLE
- PB PULL BOX
- STUBOUT
- VENT PIPE

NOTES:

1. ALL SUE LEVEL "C" AND "D" UTILITIES ARE TAKEN FROM RECORDS RESEARCH, VISIBLE SURFACE FEATURES, AND PERSONAL TESTIMONY FROM UTILITY REPRESENTATIVES. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
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3. ALL PIPE SIZES WERE TAKEN FROM UTILITY RECORDS WHERE POSSIBLE.
4. ALL DEPTHS OF COVER GIVEN ARE TAKEN FROM GEOPHYSICAL INSTRUMENTATION AND ARE NOT TO BE CONSIDERED ACCURATE FOR DESIGN PURPOSES.
5. TRAFFIC SIGNAL AND LIGHTING CONDUIT ARE NOT INCLUDED AS SUE DESIGNATED UTILITIES.
6. ATMOS POLYETHYLENE GAS LINES WERE NOT DESIGNATED. THE TRACER WIRE BURIED WITH THE GAS LINE WAS DESIGNATED. GAS LINES SIZES WERE NOT DISCLOSED BY CENTERPOINT BUT MAY BE DETERMINED WITH ADDITIONAL TEST HOLES.
7. SUE DRAWINGS DEPICT EXISTING UTILITIES NO LATER THAN JULY 15, 2008.

SUBSURFACE UTILITY ENGINEERING

CobbFendley
Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfen.com

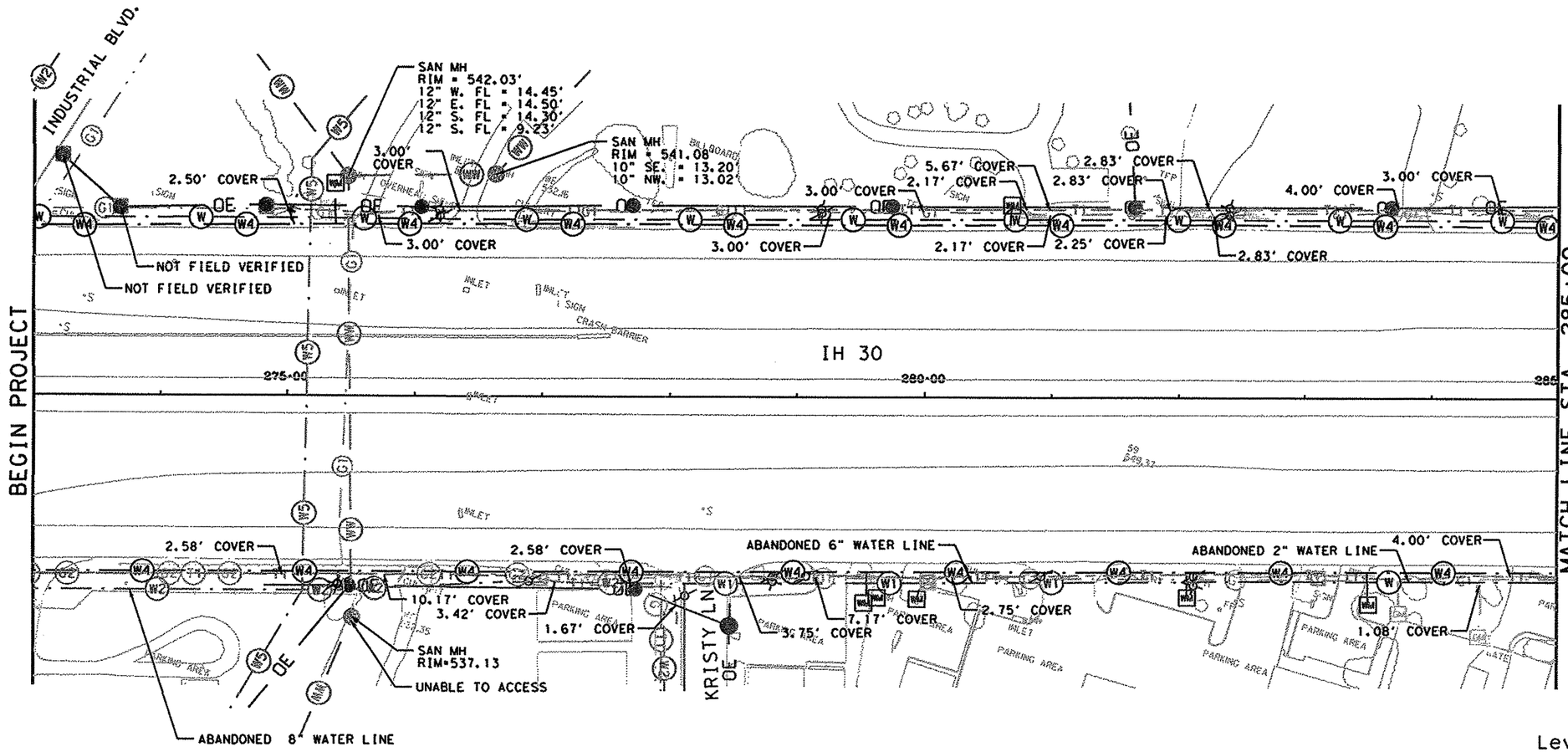
Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
IH30 & 549
CODE PAGE

Sheet 2 of 13 Sheets Scale: 1" = 100'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SD	CHECKED: RZ/MB	
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				2
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0008	12	673	IH 30

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



Level B = 3,287 LF.
Level C&D = 9,922 LF.

NOTES:

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STATE OF TEXAS
ROBERT C. NAGEL
65432
REGISTERED
PROFESSIONAL ENGINEER

Robert C. Nagel
7/09
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13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfen.com

Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
IH 30 & 549
BEGIN PROJECT TO STA. 285+00

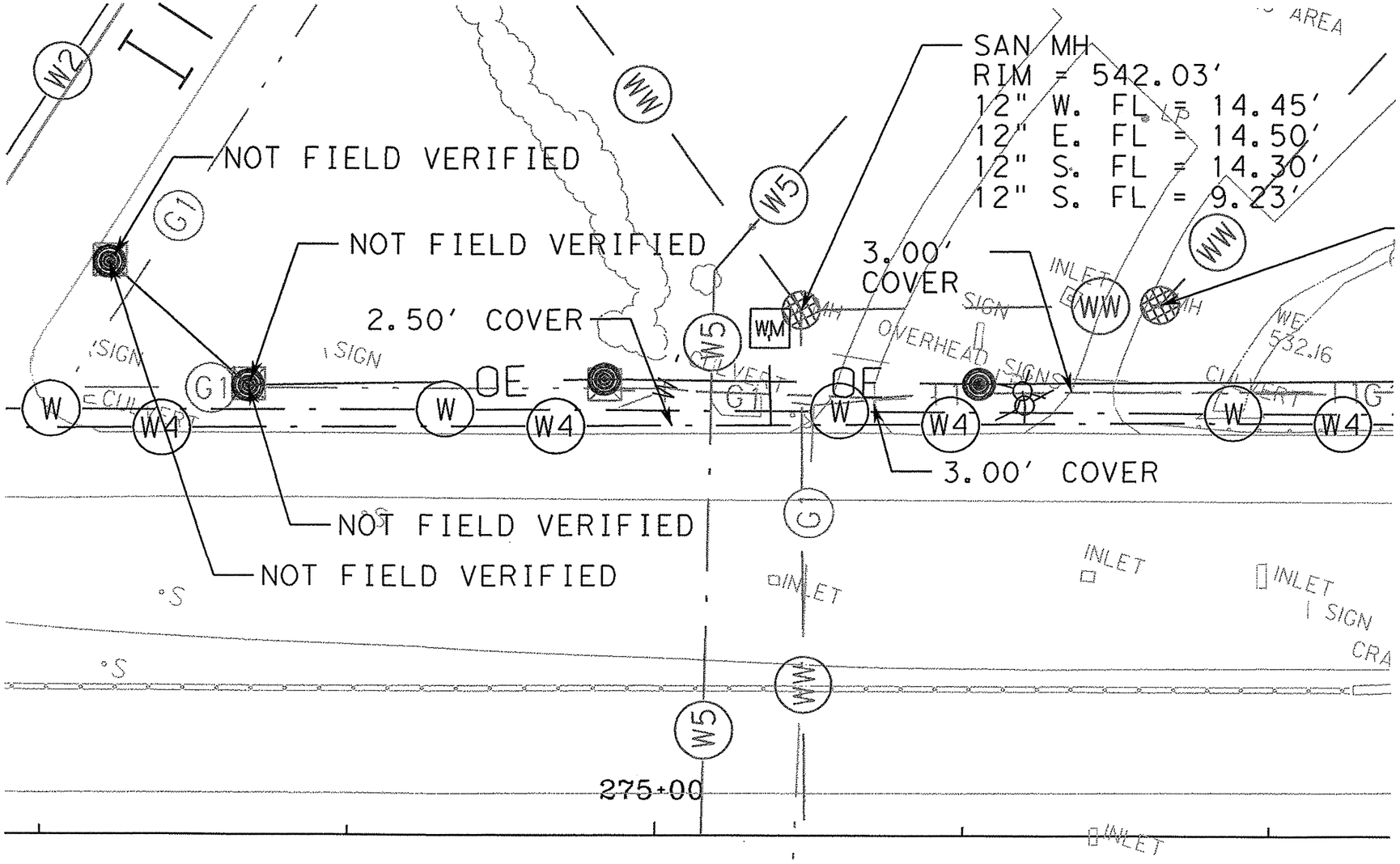
Sheet 3 of 13 Sheets Scale: 1" = 100'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SD	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				272

COUNTY	CONTROL	SECT	JOB	HIGHWAY
ROCKWALL	0009	12	073	IH 30

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



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STATE OF TEXAS
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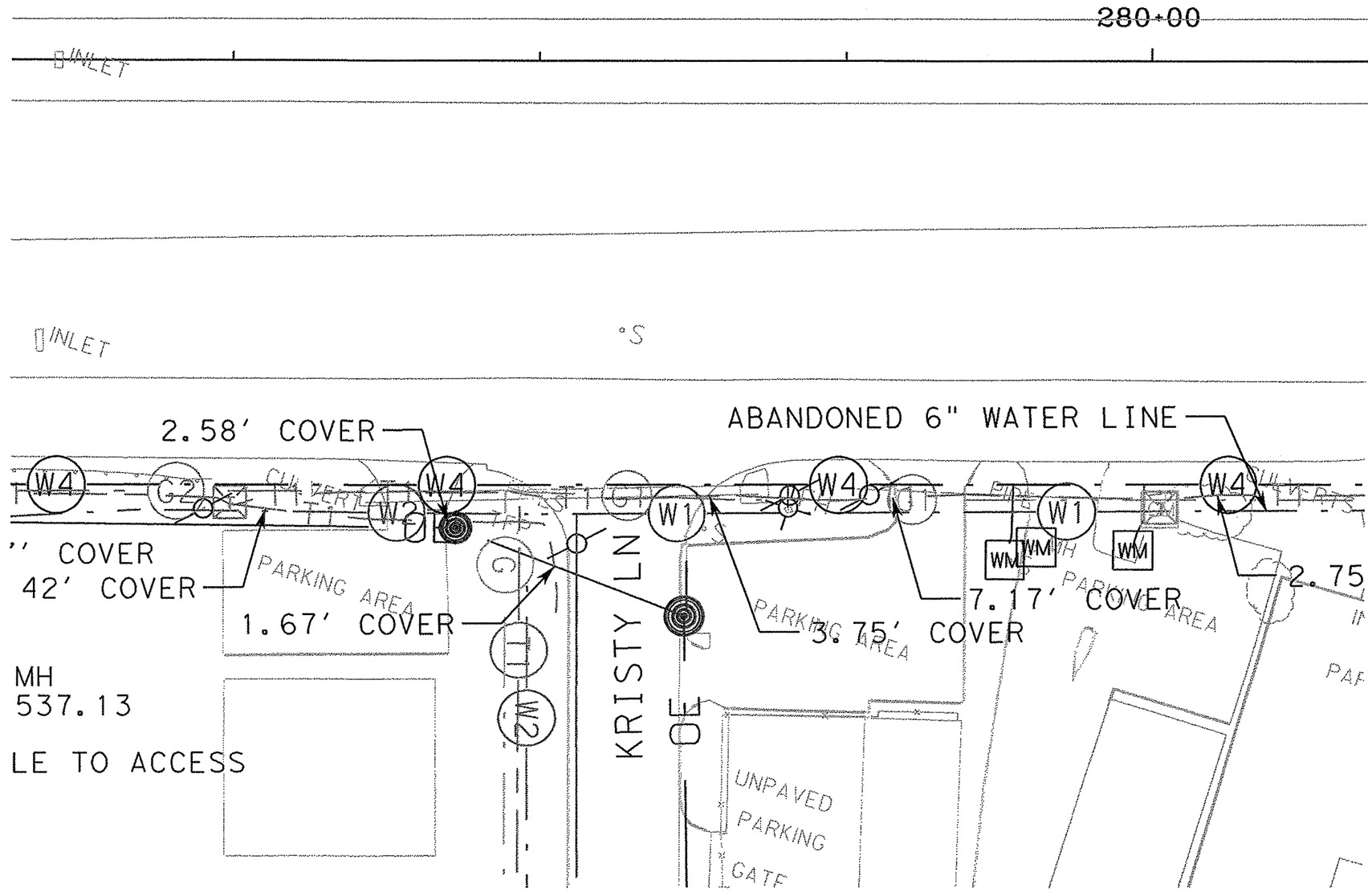
Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
STA. 274+00-275+00
NORTH

Sheet 3A of 13 Sheets Scale: 1" = 40'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT
REVISIONS			SHEET 273
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0008	02	157	

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



NOTES:

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STATE OF TEXAS
ROBERT G. NAGEL
65432
REGISTERED PROFESSIONAL ENGINEER

Robert G. Nagel 7/09

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Texas Department of Transportation

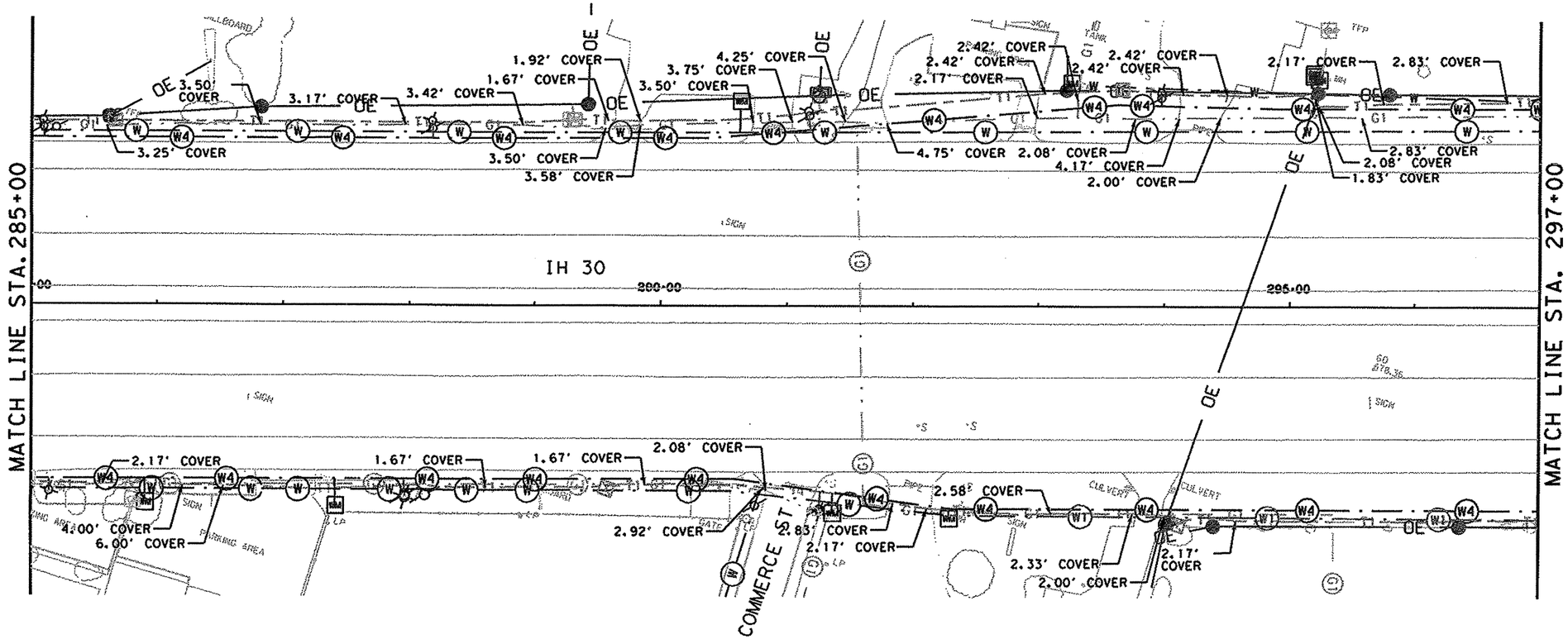
SUBSURFACE UTILITY ENGINEERING PROJECT
STA. 277+00-280+00
SOUTH

Sheet 3B of 13 Sheets Scale: 1" = 40'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB	
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				274
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0009	01	015	

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



Level B = 4,594 LF.
Level C&D = 7,816 LF.

NOTES:

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STATE OF TEXAS
ROBERT G. NAGEL
65432
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PROFESSIONAL ENGINEER

Robert G. Nagel
2/7/09
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Texas Registration No. 274
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262 | www.cobbfen.com

Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
IH 30 & 549
STA. 285+00 TO 297+00

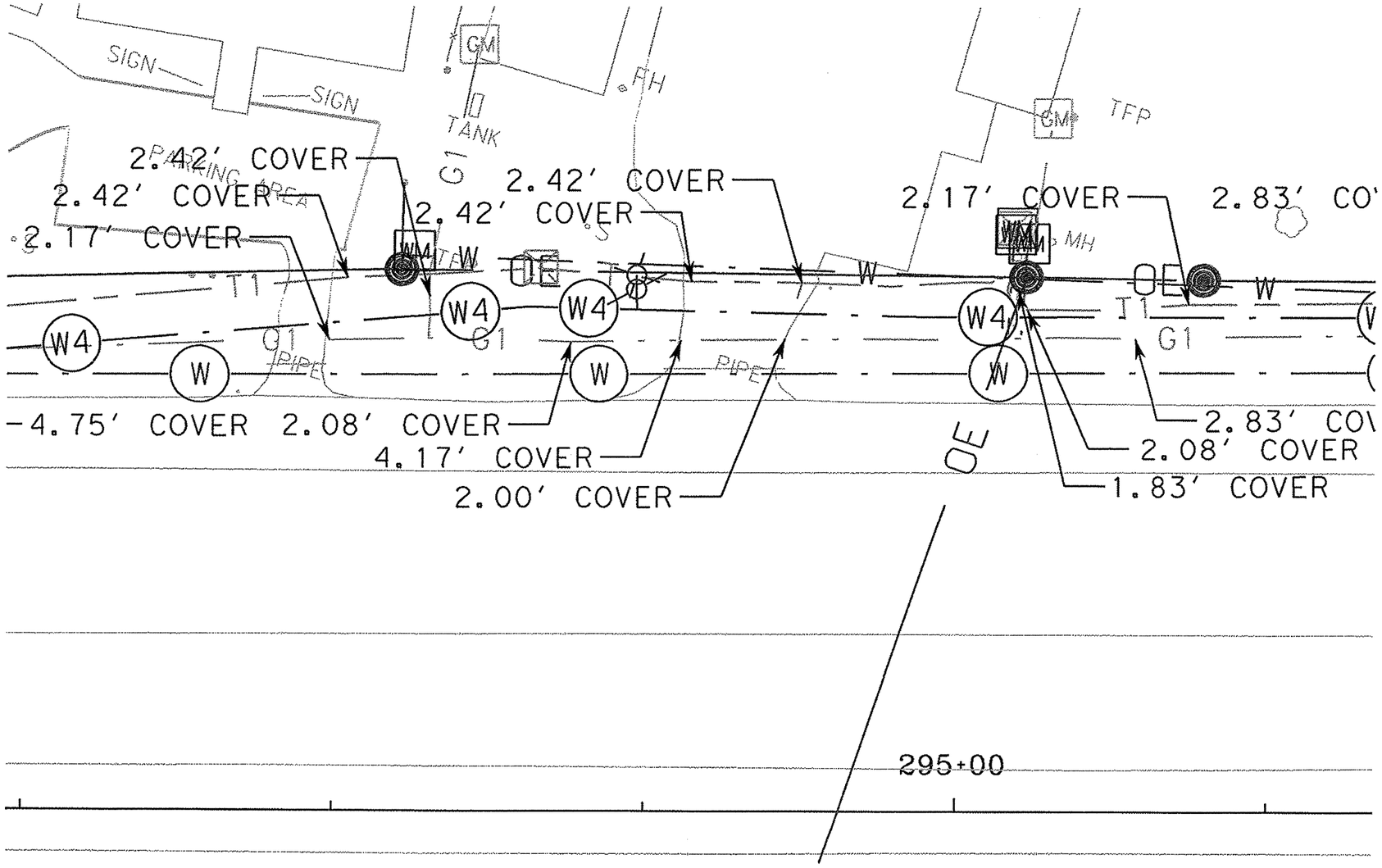
Sheet 4 of 13 Sheets Scale: 1" = 100'

DESIGNATED: MC	CHECKED: RZ/MB	DRAWN: SO	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				275

COUNTY	CONTROL	SECT	JOB	HIGHWAY
ROCKWALL	0009	12	073	IH 30

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



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STATE OF TEXAS
ROBERT G. NAGEL
65432
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Robert G. Nagel
2/7/09

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Texas Department of Transportation

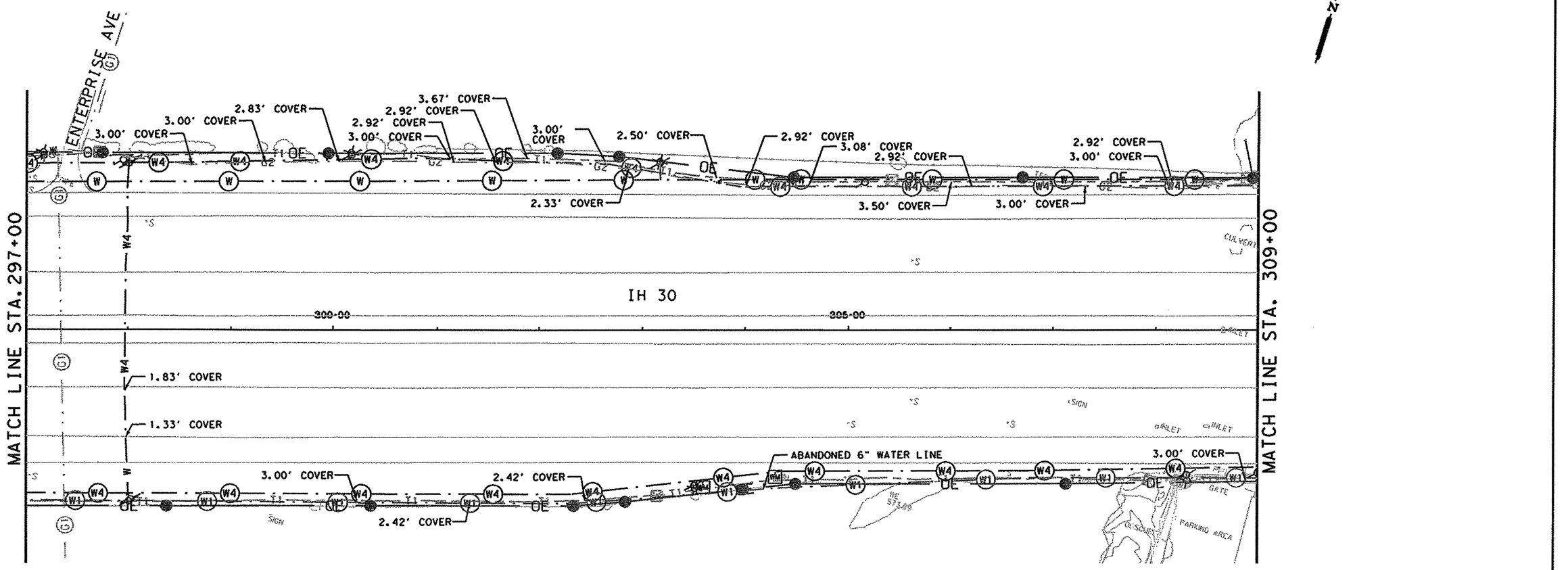
SUBSURFACE UTILITY ENGINEERING PROJECT
STA. 293+00-296+00
NORTH

Sheet 4A of 13 Sheets Scale: 1" = 40'

DESIGNATED: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB	
ORIG DATE:	DIST	FED REC	FEDERAL AID PROJECT	SHEET
REVISIONS				276
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0009	12	079	

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



Level B = 3,956 LF.
Level C&D = 8,346 LF.

NOTES:

1. ALL SUE LEVEL "C" AND "D" UTILITIES ARE TAKEN FROM RECORDS RESEARCH, VISIBLE SURFACE FEATURES, AND PERSONAL TESTIMONY FROM UTILITY REPRESENTATIVES. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
2. DUE TO LIMITATIONS OF ELECTRONIC LOCATING EQUIPMENT, LEVEL "B" UTILITY LINES MAY NOT BE ACCURATE IN CONGESTED AREAS. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
3. ALL PIPE SIZES WERE TAKEN FROM UTILITY RECORDS WHERE POSSIBLE.
4. ALL DEPTHS OF COVER GIVEN ARE TAKEN FROM GEOPHYSICAL INSTRUMENTATION AND ARE NOT TO BE CONSIDERED ACCURATE FOR DESIGN PURPOSES.
5. TRAFFIC SIGNAL AND LIGHTING CONDUIT ARE NOT INCLUDED AS SUE DESIGNATED UTILITIES.
6. ATMOS POLYETHYLENE GAS LINES WERE NOT DESIGNATED. THE TRACER WIRE BURIED WITH THE GAS LINE WAS DESIGNATED. GAS LINES SIZES WERE NOT DISCLOSED BY CENTERPOINT BUT MAY BE DETERMINED WITH ADDITIONAL TEST HOLES.
7. SUE DRAWINGS DEPICT EXISTING UTILITIES NO LATER THAN JULY 15, 2008.

STATE OF TEXAS
ROBERT G. NAGEL
65432
REGISTERED PROFESSIONAL ENGINEER

SUBSURFACE UTILITY ENGINEERING

CobbFendley
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Houston, Texas 77040
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Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
IH 30 & 549
STA. 297+00 TO 309+00

Sheet 5 of 13 Sheets Scale: 1" = 100'

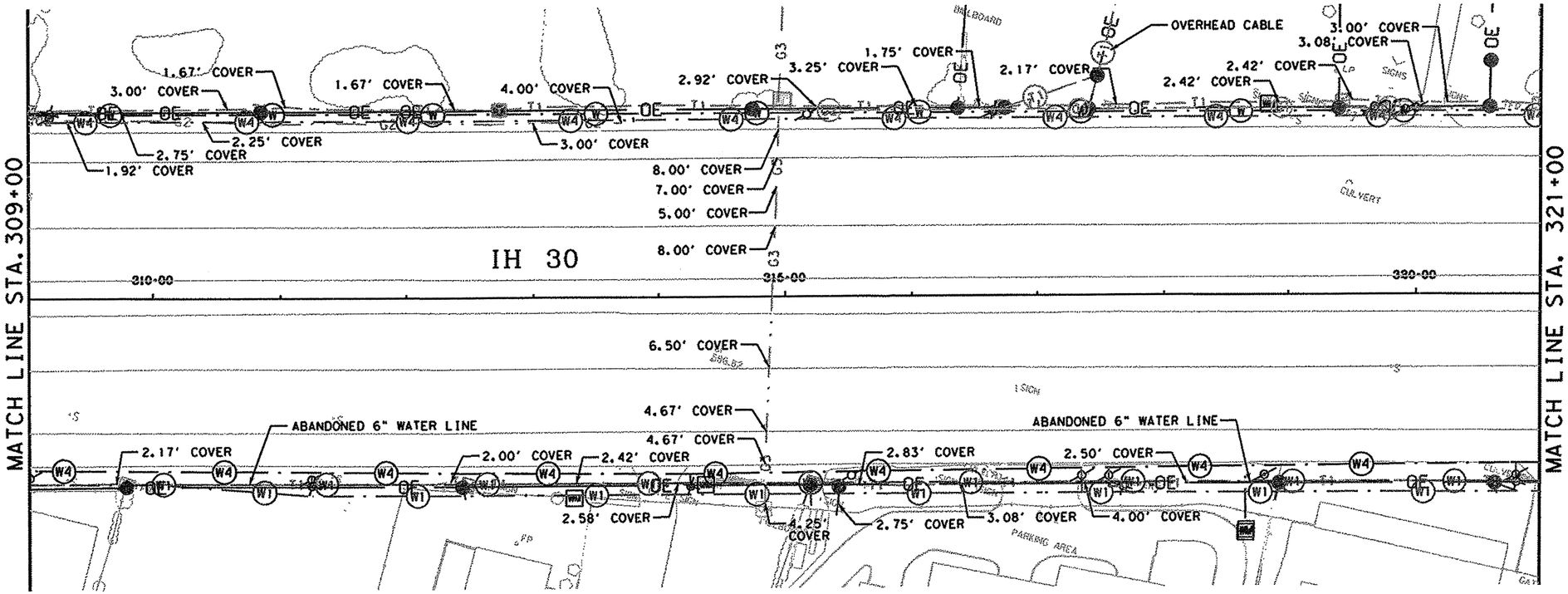
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ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				277

COUNTY	CONTROL	SECT	JOB	HIGHWAY
ROCKWALL	0009	12	073	IH 30

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



Level B = 3,275 LF.
Level C&D = 10,624 LF.

NOTES:

1. ALL SUE LEVEL "C" AND "D" UTILITIES ARE TAKEN FROM RECORDS RESEARCH, VISIBLE SURFACE FEATURES, AND PERSONAL TESTIMONY FROM UTILITY REPRESENTATIVES. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
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7. SUE DRAWINGS DEPICT EXISTING UTILITIES NO LATER THAN JULY 15, 2008.

STATE OF TEXAS
ROBERT G. NAGEL
65432
REGISTERED PROFESSIONAL ENGINEER

Robert G Nagel
27109

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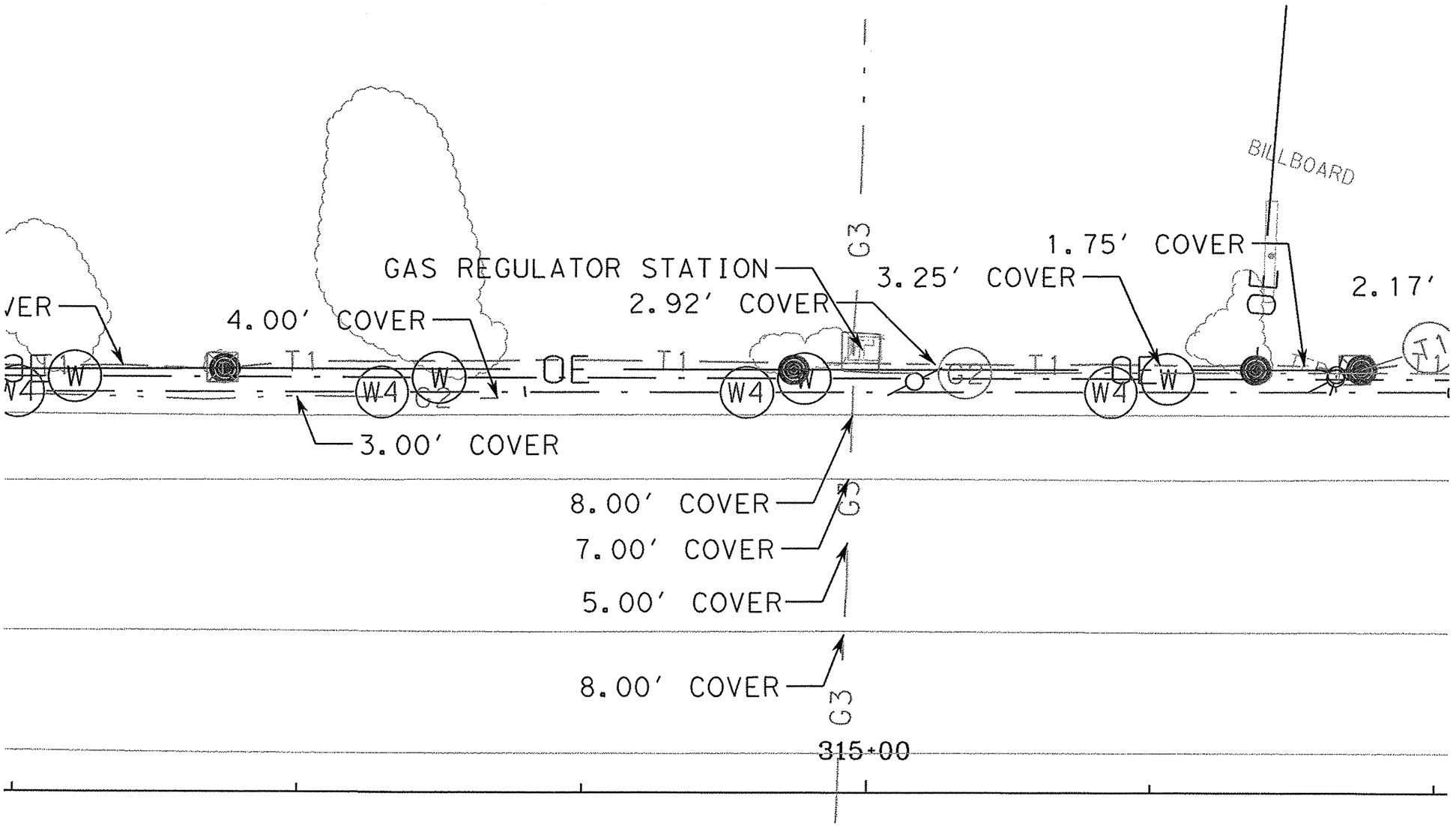
Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
IH 30 & 549
STA. 309+00 TO 321+00

Sheet 6 of 13 Sheets Scale: 1" = 100'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				276
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



NOTES:

1. ALL SUE LEVEL "C" AND "D" UTILITIES ARE TAKEN FROM RECORDS RESEARCH, VISIBLE SURFACE FEATURES, AND PERSONAL TESTIMONY FROM UTILITY REPRESENTATIVES. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
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7. SUE DRAWINGS DEPICT EXISTING UTILITIES NO LATER THAN JULY 15, 2008.

STATE OF TEXAS
ROBERT G. NAGEL
65432
REGISTERED
PROFESSIONAL ENGINEER

Robert G. Nagel
2/7/09

SUBSURFACE UTILITY ENGINEERING

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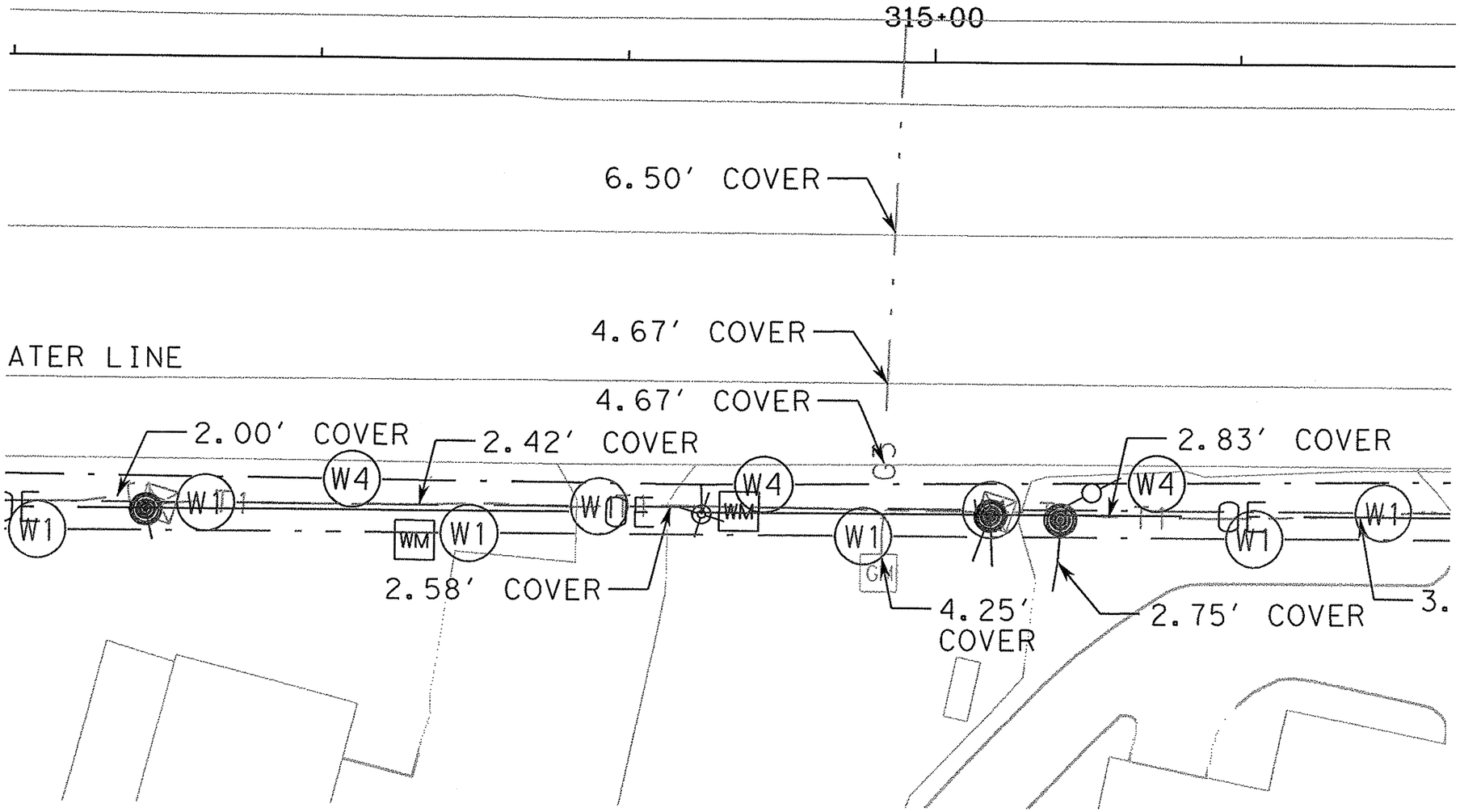
SUBSURFACE UTILITY ENGINEERING PROJECT
STA. 314+00-316+00
NORTH

Sheet 6A of 13 Sheets Scale: 1" = 40'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				279
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0009	16	073	

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



NOTES:

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2/7/09

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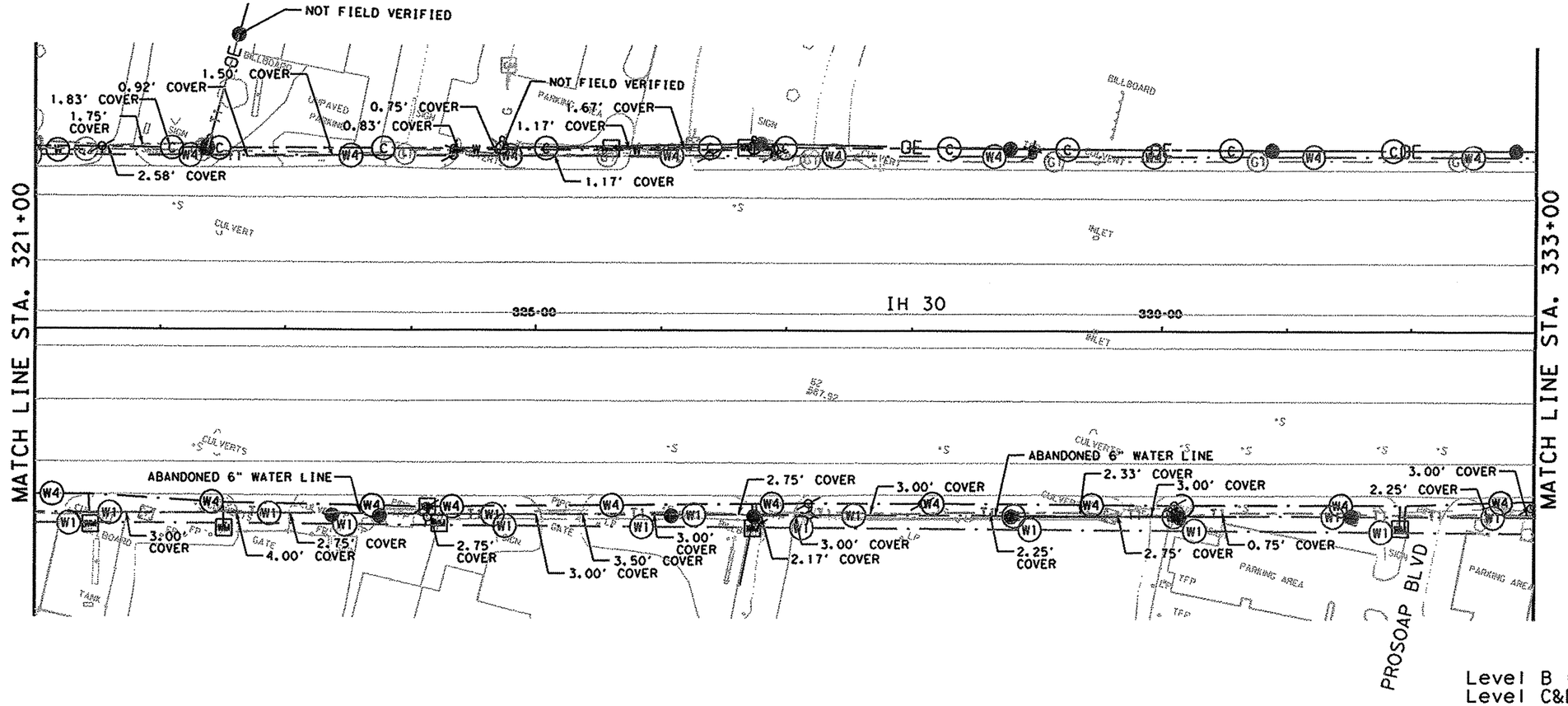
Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
STA. 314+00-316+00
SOUTH

Sheet 6B of 13 Sheets Scale: 1" = 40'

DESIGNATED: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				280
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0004	12	073	

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



Level B = 1,962 LF.
Level C&D = 10,250 LF.

NOTES:

1. ALL SUE LEVEL "C" AND "D" UTILITIES ARE TAKEN FROM RECORDS RESEARCH, VISIBLE SURFACE FEATURES, AND PERSONAL TESTIMONY FROM UTILITY REPRESENTATIVES. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
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7. SUE DRAWINGS DEPICT EXISTING UTILITIES NO LATER THAN JULY 15, 2008.

STATE OF TEXAS
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65432
REGISTERED PROFESSIONAL ENGINEER

Robert G. Nagel
2/7/09

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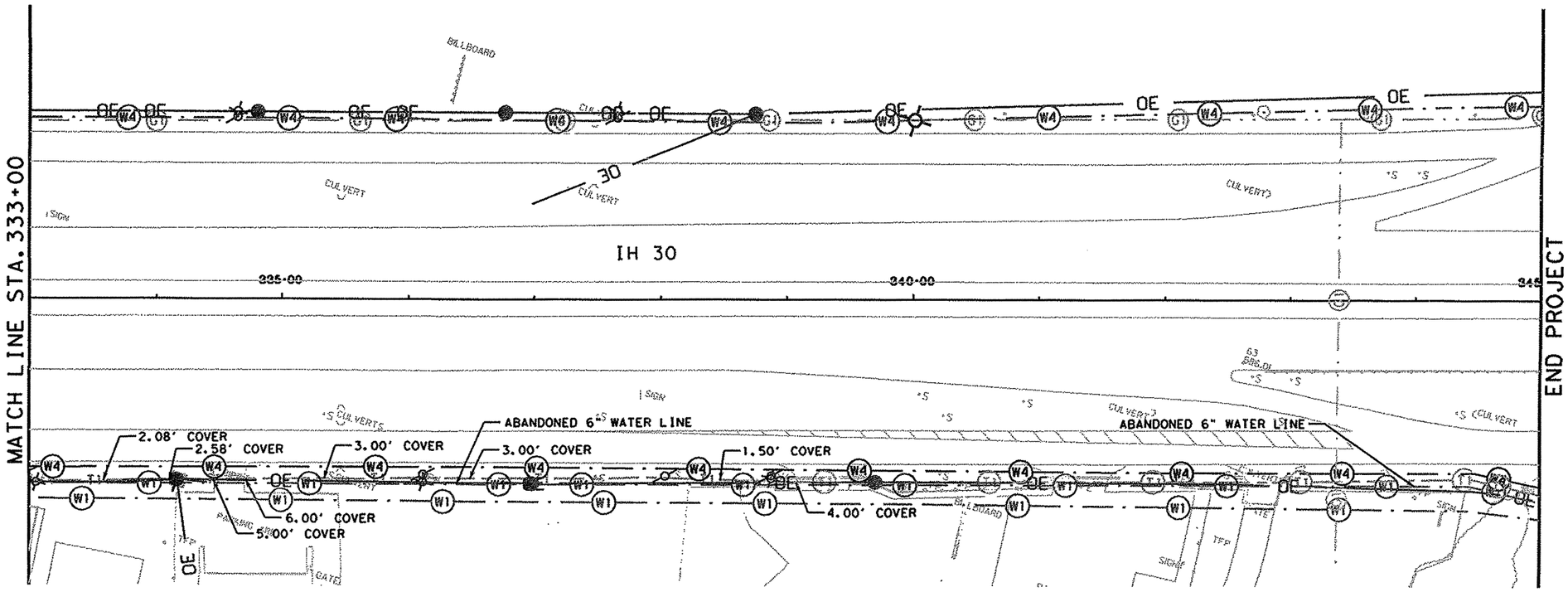
Texas Department of Transportation
SUBSURFACE UTILITY ENGINEERING PROJECT
IH 30 & 549
STA. 321+00 TO 333+00

Sheet 7 of 13 Sheets Scale: 1" = 100'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB
ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT	SHEET
REVISIONS				281
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

LEGEND

FOR LEGEND INFORMATION SEE SHEET 2 OF PLAN SHEETS.



Level B = 609 LF.
Level C&D = 10,700 LF.

NOTES:

1. ALL SUE LEVEL "C" AND "D" UTILITIES ARE TAKEN FROM RECORDS RESEARCH, VISIBLE SURFACE FEATURES, AND PERSONAL TESTIMONY FROM UTILITY REPRESENTATIVES. MORE PRECISE LOCATION MAY BE DETERMINED WITH TEST HOLES.
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STATE OF TEXAS
ROBERT G. NAGEL
65432
REGISTERED PROFESSIONAL ENGINEER

Robert G. Nagel 2/7/09

SUBSURFACE UTILITY ENGINEERING

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Texas Department of Transportation

SUBSURFACE UTILITY ENGINEERING PROJECT

IH 30 & 549

STA. 333+00 TO END OF PROJECT

Sheet 8 of 13 Sheets Scale: 1" = 100'

DESIGNATE: MC	CHECK: RZ/MB	DRAWN: SO	CHECKED: RZ/MB

ORIG DATE:	DIST	FED REG	FEDERAL AID PROJECT			SHEET
REVISIONS						282
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		0009	12	073	IH 30

User: aelsaad
FILE: T:\DALBRDG\IH30 @ John King Blvd (0009-12-073)\Qnty.dgn
TIME: 12:13:49 PM
DATE: 2/6/2009

SUMMARY OF ESTIMATED QUANTITIES

NATIONAL BRIDGE INVENTORY NUMBER	ITEM DESCRIPTION CODE	416-2001	416-2004	420-2003	420-2004	420-2033	422-2001	425-2004	428-2001	442-2005	450-2007	454-2001
	STRUCTURE	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	CL C CONC (BENT)	CL S CONC (APPR. SLAB)	REINF CONC SLAB	PRESTR CONC BEAM (Ty IV)	CONC SURF TREAT (CL I)	STRUCTURAL STEEL MISC ✳	RAIL (TY T501)	SEALED EXPANSION JOINT (4") (SEJ-A)
		LF	LF	CY	CY	CY	SF	LF	SY	LB	LF	LF
18-199- 0- 0009-12-475	IH 30 EB ML OVER JOHN KING BLVD											
	2 - ABUTMENTS	74	605	60.2		125.0					26.0	
	2 - BENTS		392		95.4							
	1 - PCB Ty IV UNIT						10920	1674.61	1147	431	420.0	106
	1 - SPAN						4680	717.27	492		180.0	53
	TOTAL	74	997	60.2	95.4	125.0	15600	2391.88	1639	431	626.0	159
18-199-0-0009-12-476	IH 30 WB ML OVER JOHN KING BLVD											
	2 - ABUTMENTS	65	450	60.2		125.0					26.0	
	2 - BENTS		288		95.4							
	1 - PCB Ty IV UNIT						10920	1674.61	1147	431	420.0	106
	1 - SPAN						4680	717.27	492		180.0	53
	TOTAL	65	738	60.2	95.4	125.0	15600	2391.88	1639	431	626.0	159
	GRAND TOTAL	139	1735	120.4	190.8	250.0	31200	4783.76	3278	862	1252	318

✳ - See BMCS Standard sheet for (Quantity of str. steel MISC.)

DISPLAYED

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
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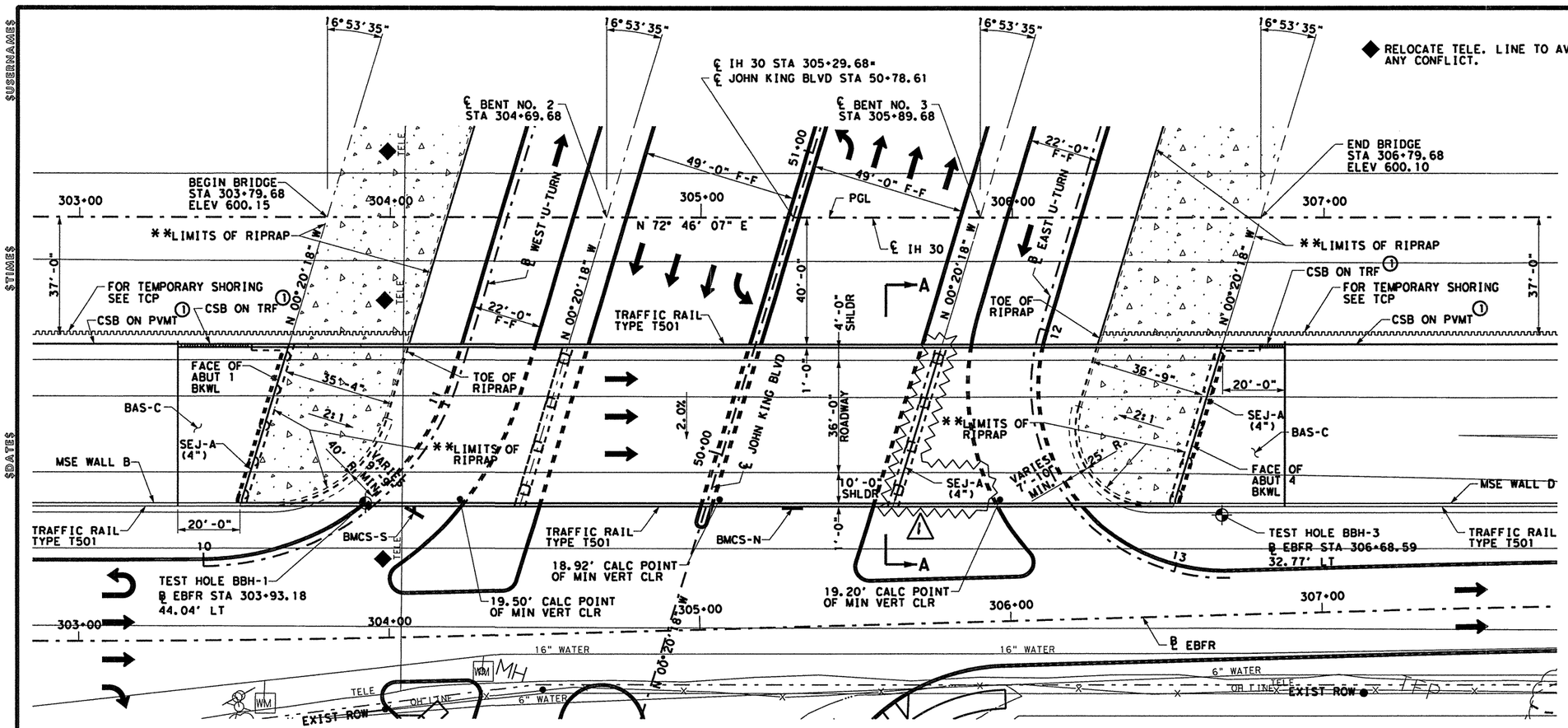
Sheet 1 of 45 Sheets

Texas Department of Transportation
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IH 30
EB / WB MAINLANES
OVER JOHN KING BLVD
SUMMARY OF ESTIMATED QUANTITES

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT	TEXAS	DALLAS	ROCKWALL	283
GRAPHICS	CONTROL	SECTION	JOB	
ADS	0009	12	073	
GRPH CHECK				
SNP				

$USERNAME$ $TIME$ $DATE$ $FILE$



IH 30 VERTICAL CURVE DATA

VPI STA 303+65.00
EL = 606.91
VC = 1165.00'
E = (-)6.85
K = 248
(+)3.000 (-)1.702

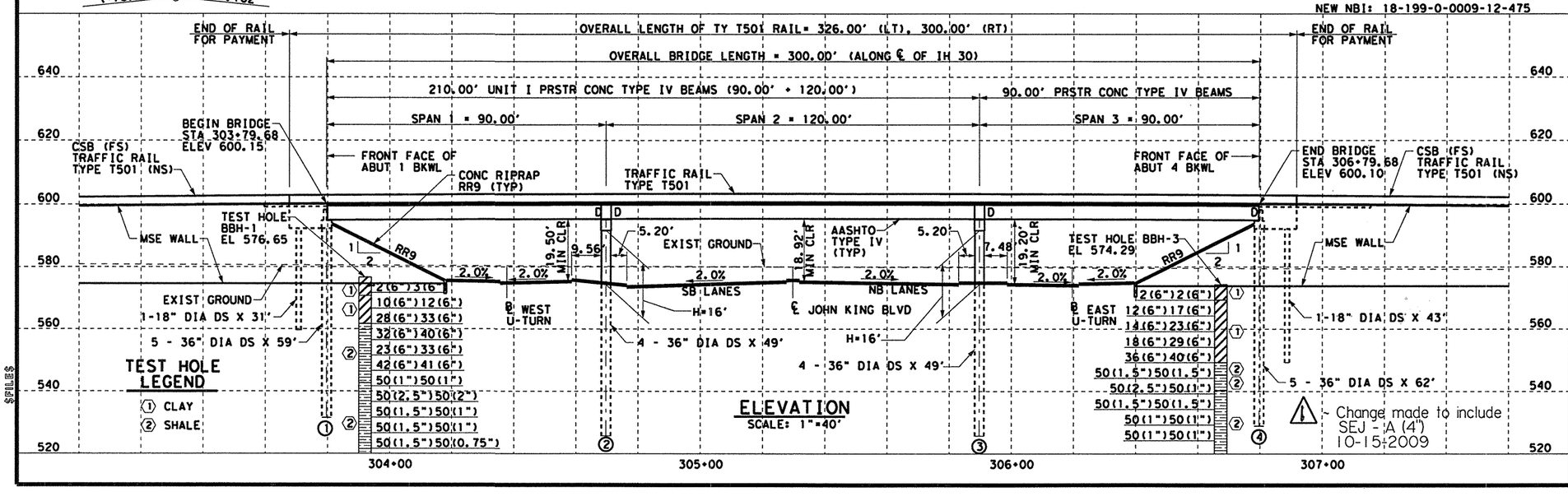
**SEE ROADWAY PLANS FOR LIMITS & QUANTITIES

PLAN

SCALE: 1"=40'

FOUNDATION NOTES:
FOUND DRILLED SHAFTS AT ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE THE FOLLOWING MINIMUM DISTANCES:
ABUTMENTS - 3'
BENTS - 3'

NEW NBI: 18-199-0-0009-12-475



TEST HOLE LEGEND

① CLAY
② SHALE

ELEVATION

SCALE: 1"=40'

Change made to include SEJ-A (4") 10-15-2009

① - SEE ROADWAY PLANS FOR DETAILS AND QUANTITIES

DESIGN NOTES:
BRIDGE DESIGNED FOR HL 93 LOADING IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS, 4TH EDITION.

Design Speed = 70 MPH
ADT = 13800 (1997)
ADT = 42800 (2027)
FUNCTIONAL CLASS = INTERSTATE

NOTE:
1. REFER TO RETAINING WALL PLAN AND ELEVATION SHEETS FOR LIMITS OF MSE WALLS.
2. SEE SHEET 2 OF 2 FOR SECTION A-A.
3. REFER TO THE CORE BORING SHEETS FOR BORING INFORMATION.
4. REFER TO THE WALL FORM LINER PLAN SHEETS FOR AESTHETIC GUIDELINES AND ADDITIONAL INFORMATION.

20 10 0 20 40
SCALE FEET

STATE OF TEXAS · AFISU OLABINTAN · 63663 · LICENSED PROFESSIONAL ENGINEER
10-15-09 ,P.E.
Signature of Registrant & Date

STATE OF TEXAS · SUNIL N. PATEL · 85345 · LICENSED PROFESSIONAL ENGINEER
Foundation only

STATE OF TEXAS · ADNAN AHMAD EL-SAAD · 87977 · LICENSED PROFESSIONAL ENGINEER
Foundation only
10-15-09

~ FIELD CHANGE # : _____

Sheet 2 of 45 Sheets

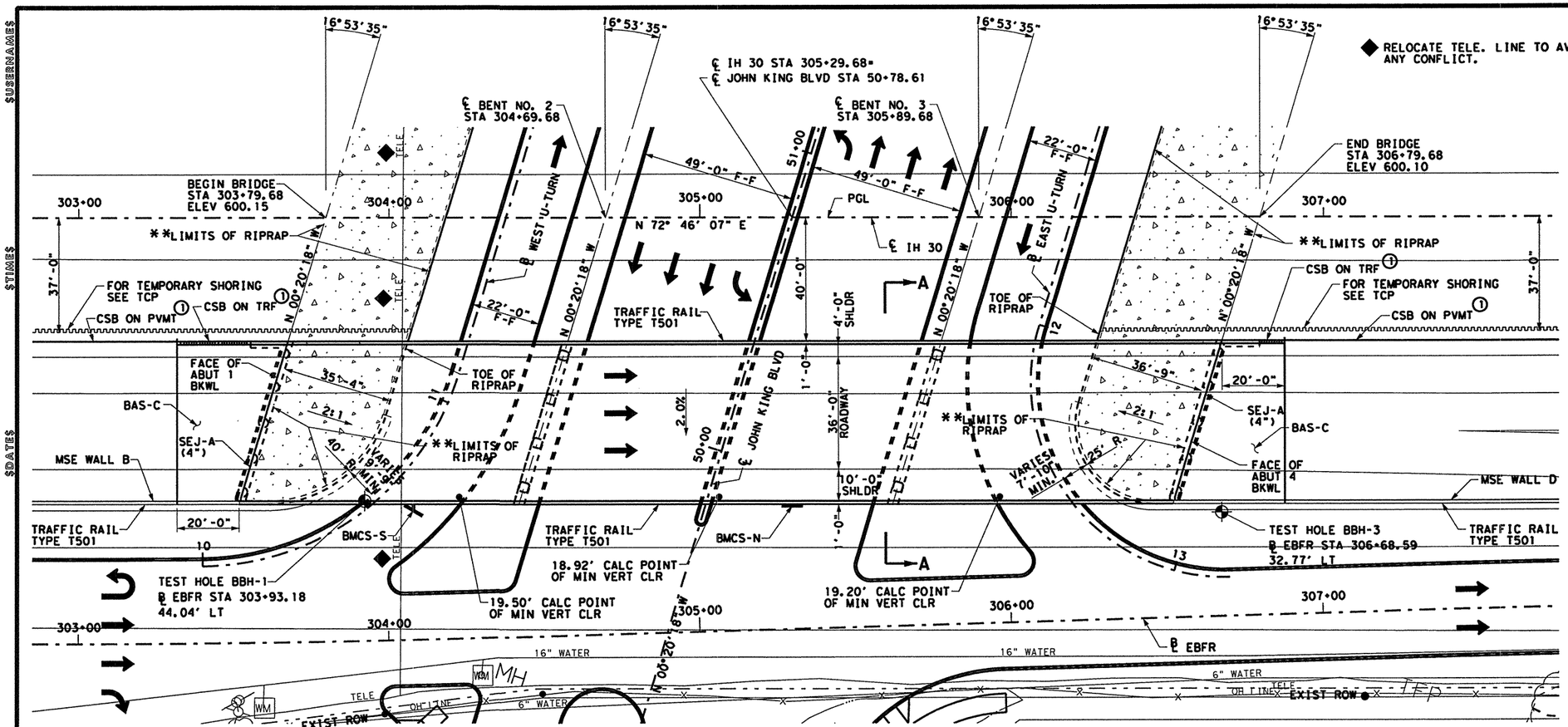
APM & Associates, Inc.
Engineering • Planning • CM Services

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IH 30
EB MAINLANES
OVER JOHN KING BLVD
BRIDGE LAYOUT

Designed: DJP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: ACO	6	TEXAS	(SEE TITLE SHEET)				IH 30
Drawn: TFT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: JLC	DAL	ROCKWALL	0009	12	073		284A

$USERNAME$
$TIME$
$DATE$



IH 30 VERTICAL CURVE DATA

VPI STA 303+65.00
EL = 606.91
VC = 1165.00'
E = (-)6.85
K = 248
(+)3.000 (-)1.702

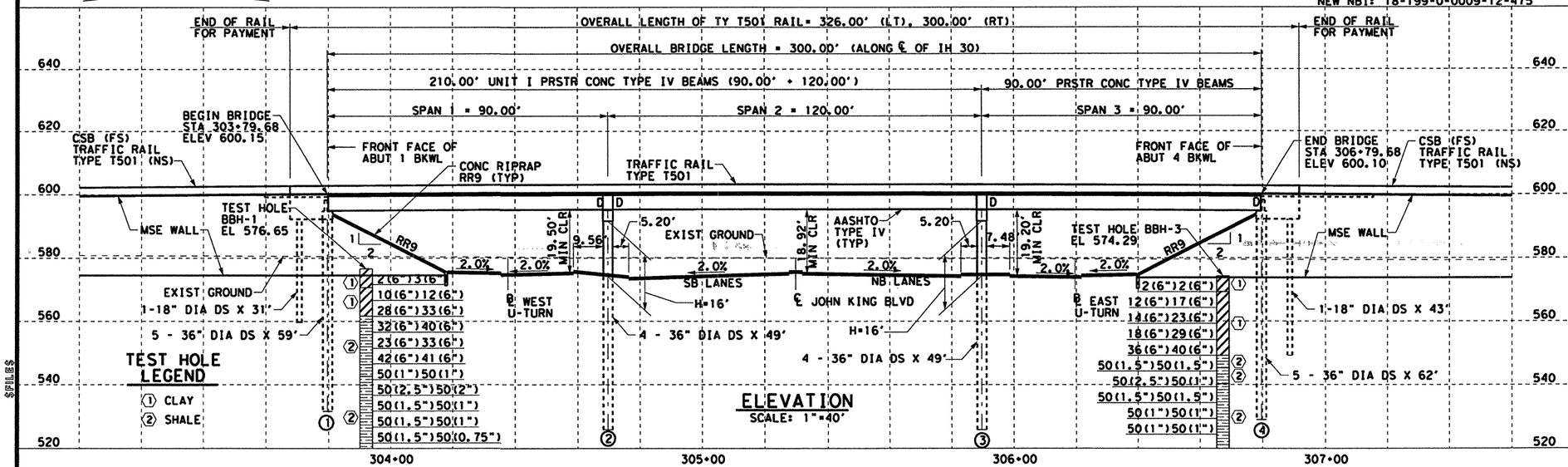
**SEE ROADWAY PLANS FOR LIMITS & QUANTITIES

PLAN

SCALE: 1"=40'

FOUNDATION NOTES:
FOUND DRILLED SHAFTS AT ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE THE FOLLOWING MINIMUM DISTANCES:
ABUTMENTS - 3'
BENTS - 3'

NEW NBI: 18-199-0-0009-12-475



TEST HOLE LEGEND

① CLAY
② SHALE

①	②	③	④
2(6")3(6")	23(6")33(6")	2(6")2(6")	2(6")2(6")
10(6")12(6")	42(6")41(6")	12(6")17(6")	14(6")23(6")
28(6")33(6")	50(1")50(1")	14(6")23(6")	18(6")29(6")
32(6")40(6")	50(2.5")50(2")	18(6")29(6")	36(6")40(6")
	50(1.5")50(1")	36(6")40(6")	50(1.5")50(1.5")
	50(1.5")50(1")	50(1.5")50(1.5")	50(2.5")50(1")
	50(1.5")50(0.75")	50(2.5")50(1")	50(1.5")50(1.5")
		50(1.5")50(1.5")	50(1")50(1")
		50(1")50(1")	50(1")50(1")

ELEVATION

SCALE: 1"=40'

20 10 0 20 40
SCALE FEET

N

STATE OF TEXAS
AFISU OLABIMTAN
63663
LICENSED PROFESSIONAL ENGINEER
P.E. 2-9-09
Signature of Registrant & Date

① - SEE ROADWAY PLANS FOR DETAILS AND QUANTITIES

DESIGN NOTES:
BRIDGE DESIGNED FOR HL 93 LOADING IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS, 4TH EDITION.

Design Speed = 70 MPH
ADT = 13800 (1997)
ADT = 42800 (2027)
FUNCTIONAL CLASS = INTERSTATE

NOTE:
1. REFER TO RETAINING WALL PLAN AND ELEVATION SHEETS FOR LIMITS OF MSE WALLS.
2. SEE SHEET 2 OF 2 FOR SECTION A-A.
3. REFER TO THE CORE BORING SHEETS FOR BORING INFORMATION.
4. REFER TO THE WALL FORM LINER PLAN SHEETS FOR AESTHETIC GUIDELINES AND ADDITIONAL INFORMATION.

2-6-09
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Foundation only

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ADNAN AHMAD EL-SAAD
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2/6/09

Sheet 2 of 45 Sheets

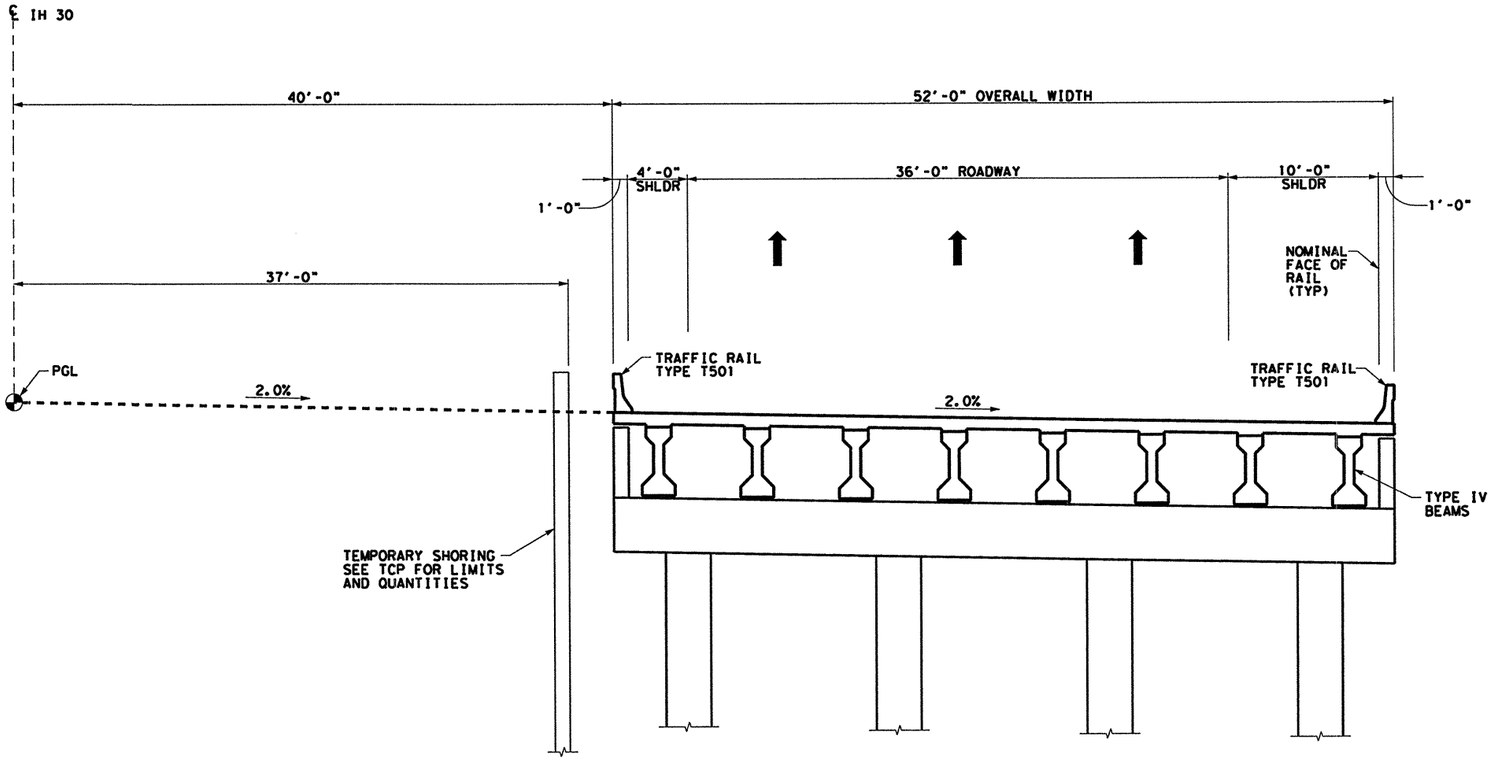
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IH 30
EB MAINLANES
OVER JOHN KING BLVD
BRIDGE LAYOUT

Designed: DJP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ACO	6	TEXAS	(SEE TITLE SHEET)			IH 30
Drawn: TFT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JLC	DAL	ROCKWALL	0009	12	073	28A

$FILE$



TYPICAL SECTION A-A

SCALE: 1"=10'

STATE OF TEXAS
AFISU OLABIMTAN
63663
LICENSED PROFESSIONAL ENGINEER

, P.E. 2-9-09

Signature of Registrant & Date

STATE OF TEXAS
ADNAN AHMAD EL-SAAD
87977
LICENSED PROFESSIONAL ENGINEER

2/6/09

Sheet 3 of 45 Sheets HL93 LOADING

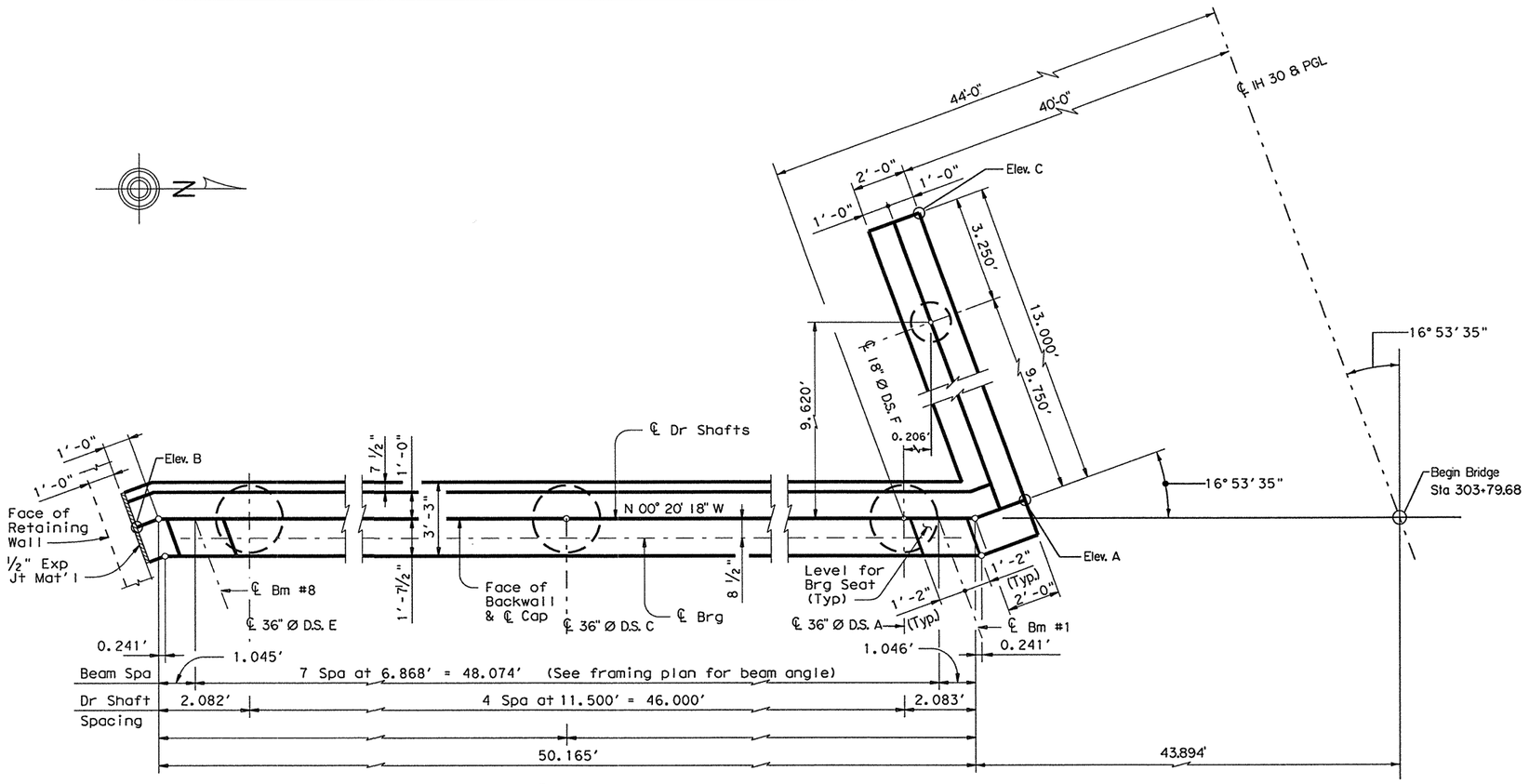
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IH 30
EB MAINLANES
OVER JOHN KING BLVD
TYPICAL SECTIONS

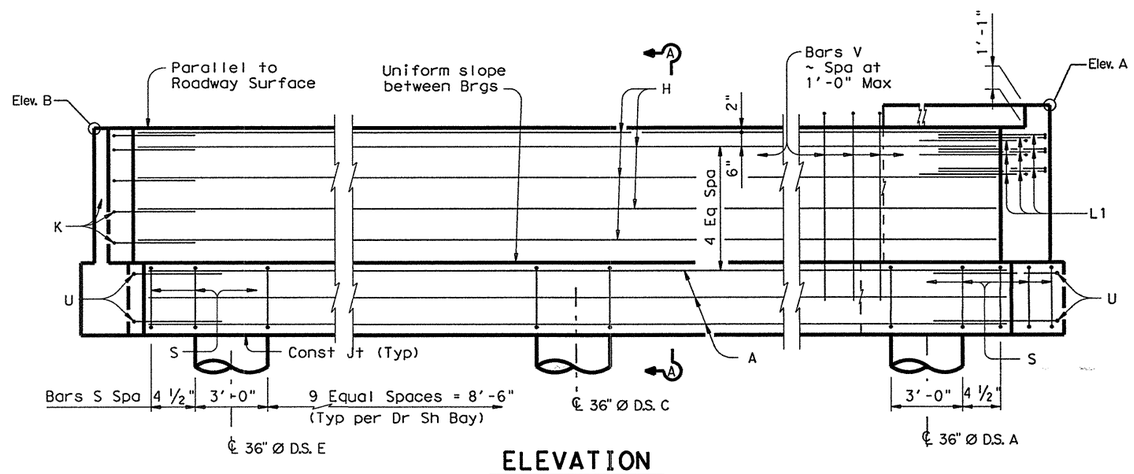
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Checked: JLC	DAL	ROCKWALL	0009	12	073		285

$USERNAME$
$TIME$
$DATE$
$FILE$



PLAN

NTS



ELEVATION

NTS

BEARING SEAT ELEVATIONS

Bm #1	Bm #2	Bm #3	Bm #4	Bm #5	Bm #6	Bm #7	Bm #8
593.66	593.51	593.37	593.22	593.08	592.93	592.79	592.64

TOP OF DS ELEVATION

D.S. A	D.S. B	D.S. C	D.S. D	D.S. E	D.S. F
591.00	590.76	590.52	590.28	590.03	591.00

CONTROL ELEVATIONS

EL. A	EL. B	EL. C
599.28	597.07	599.19

TABLE OF ESTIMATED QUANTITIES

(Reinforcing quantitites shown for Contractor's information only)

Bar	No.	Size	Length	Weight
A	8	#11	50'- 2"	2132
H	10	#6	50'- 2"	754
K	5	#5	5'-11"	31
L1	9	#6	5'-9"	78
S	48	#4	10'- 8"	342
U_1	2	#6	9'- 3"	28
U_2	2	#6	11'- 3"	34
V	53	#5	13'-11"	769
wH_1	7	#6	14'- 3"	150
wH_2	12	#6	12'- 8"	228
wS	14	#4	7'- 9"	72
wV	14	#5	14'- 2"	207
■ Reinforcing Steel			Lb	4825
Class "C" Concrete			CY	30.1

■ ~ For contractor's Information only

General Notes:

Provide spiral steel with one extra turn at the top, bottom, and at splices.

Include the reinforcing extending from the shaft into the cap in the price bid per foot of DRILL SHAFT.

Finish Bearing Seats with a wood float.

Provide Grade 60 reinforcing for the Cap and walls.

Drilled Shaft reinforcing may be Grade 40.

For framing details not shown, see Framing Plan.

Calculated Drilled Shaft Foundation Load = 108 Tons/Drilled Shaft.

For Dr. Sh reinforcement see FD standard sheet.

For Details not shown See " ABUTMENT MISC DETAILS" Sheet.

Sheet 4 of 45 Sheets

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IH 30

EB MAINLANES OVER JHON KING BLVD

ABUTMENT - 1 DETAILS

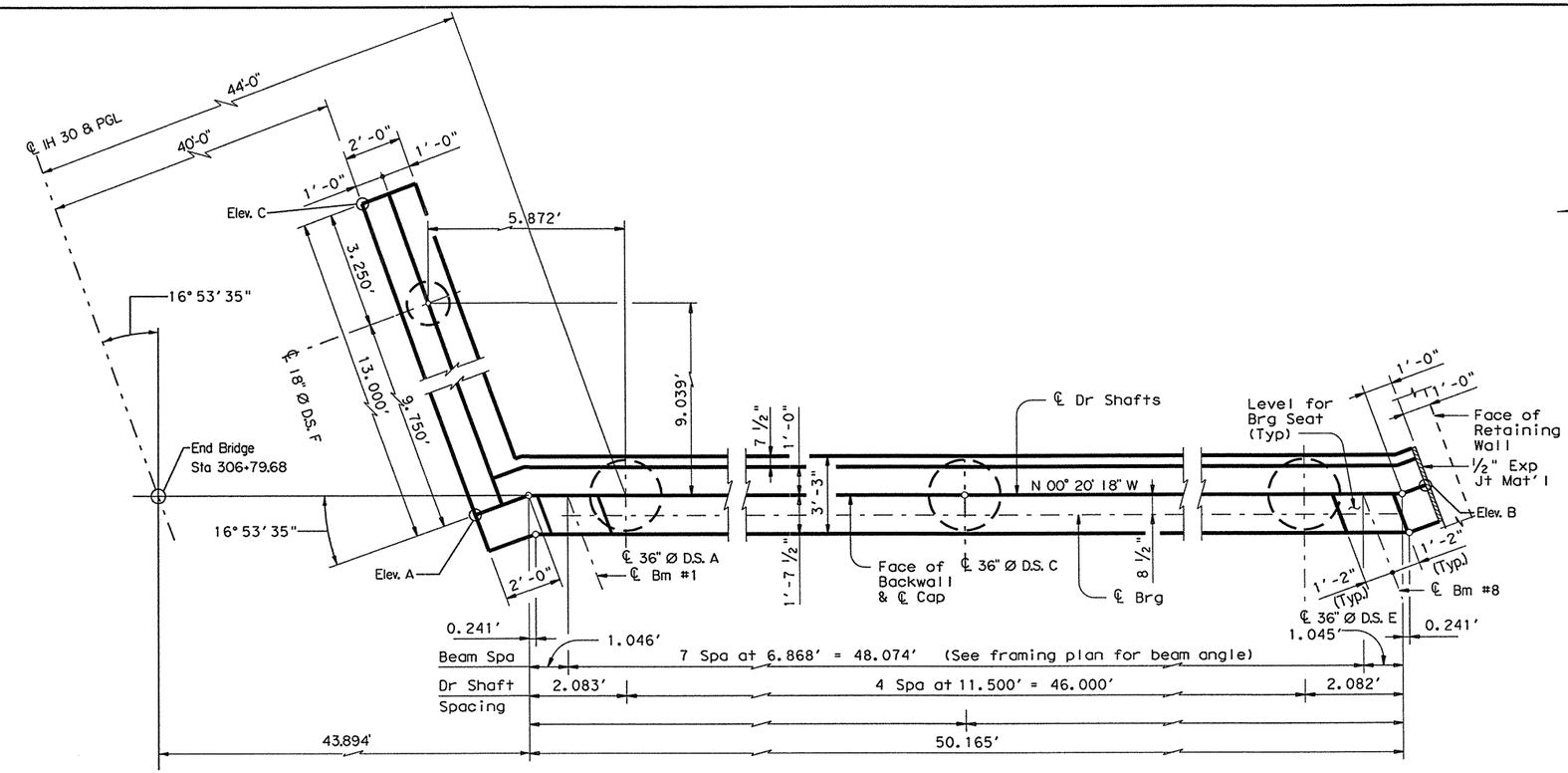
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SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
GRAPHICS SNP	TEXAS	DALLAS	ROCKWALL	286
GRPH CHECK	CONTROL	SECTION	JOB	
ADS	0009	12	073	

2-6-09

STATE OF TEXAS
SUNIL N. PATEL
85345
LICENSED
PROFESSIONAL ENGINEER

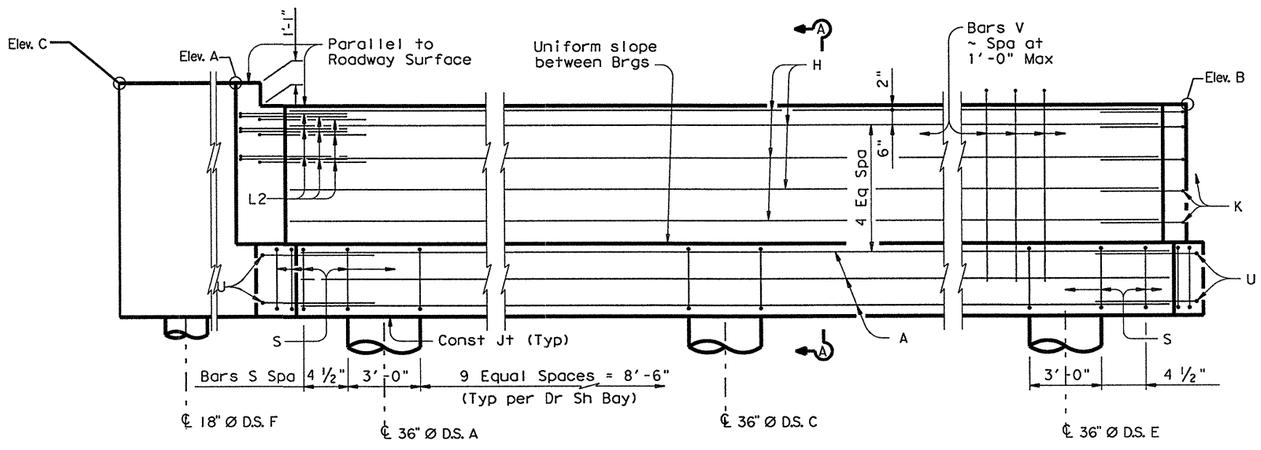
S.N. Patel

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TIME: 12:08:59 PM
DATE: 2/6/2009



PLAN

NTS



ELEVATION

NTS

BEARING SEAT ELEVATIONS

Bm #1	Bm #2	Bm #3	Bm #4	Bm #5	Bm #6	Bm #7	Bm #8
593.77	593.64	593.52	593.40	593.28	593.16	593.04	592.91

TOP OF DS ELEVATION

D.S. A	D.S. B	D.S. C	D.S. D	D.S. E	D.S. F
591.12	590.91	590.71	590.51	590.31	591.12

CONTROL ELEVATIONS

EL. A	EL. B	EL. C
599.38	597.36	599.31

TABLE OF ESTIMATED QUANTITIES

(Reinforcing quantitites shown for Contractor's information only)

Bar	No.	Size	Length	Weight
A	8	#11	50'- 2"	2132
H	10	#6	50'- 2"	754
K	5	#5	5'-11"	31
L1	9	#6	5'-9"	78
S	48	#4	10'- 8"	342
U_1	2	#6	9'- 3"	28
U_2	2	#6	11'- 3"	34
V	53	#5	13'-11"	769
wH_1	7	#6	14'- 3"	150
wH_2	12	#6	12'- 8"	228
wS	14	#4	7'- 9"	72
wV	14	#5	14'- 2"	207
Reinforcing Steel			Lb	4825
Class "C" Concrete			CY	30.1

■ ~ For contractor's Information only

General Notes:

Provide spiral steel with one extra turn at the top, bottom, and at splices.

Include the reinforcing extending from the shaft into the cap in the price bid per foot of DRILL SHAFT.

Finish Bearing Seats with a wood float.

Provide Grade 60 reinforcing for the Cap and walls.

Drilled Shaft reinforcing may be Grade 40.

For framing details not shown, see Framing Plan.

Calculated Drilled Shaft Foundation Load = 109 Tons/Drilled Shaft.

For Dr. Sh reinforcement see FD standard sheet.

For Details not shown See " ABUTMENT MISC DETAILS" Sheet.

Sheet 5 of 45 Sheets

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IH 30

EB MAINLANES OVER JOHN KING BLVD

ABUTMENT - 4 DETAILS

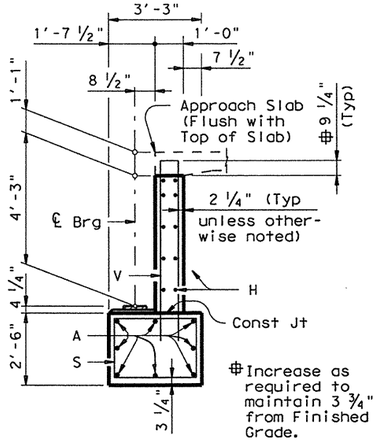
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SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
GRAPHICS SNP	TEXAS	DALLAS	ROCKWALL	287
GRPH CHECK	CONTROL	SECTION	JOB	
ADS	0009	12	073	

2-6-09

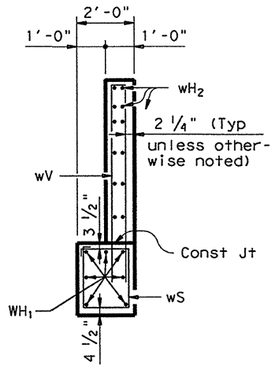
STATE OF TEXAS
SUNIL N. PATEL
85345
LICENSED PROFESSIONAL ENGINEER

S.N. Patel

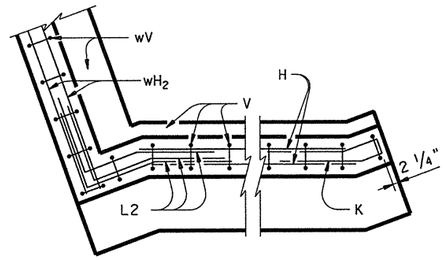
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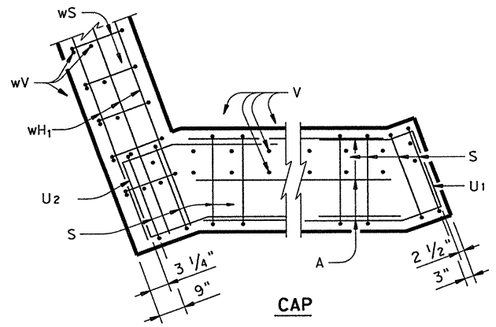
SECTION A-A



SECTION B-B

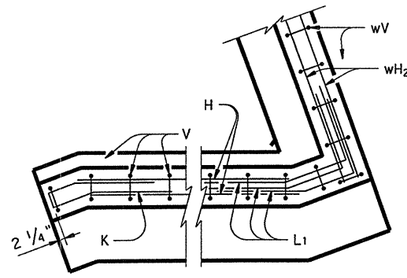


BACKWALL

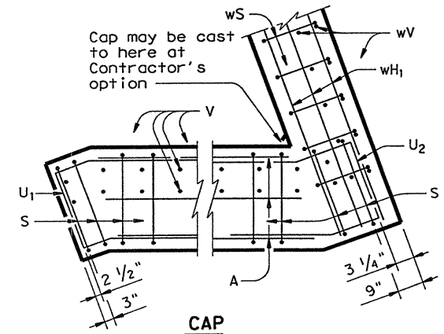


CAP

CORNER DETAILS

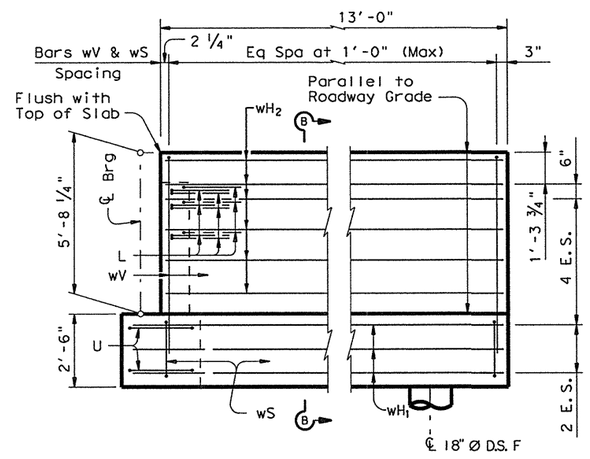


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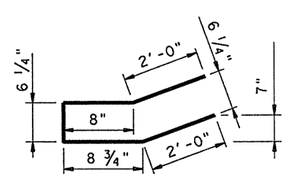


CAP

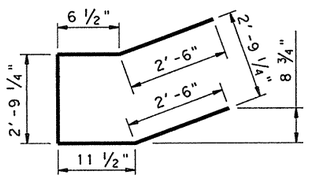
CORNER DETAILS



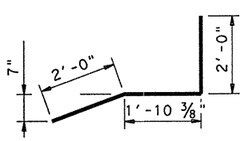
WINGWALL ELEVATION



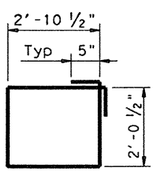
BARS K



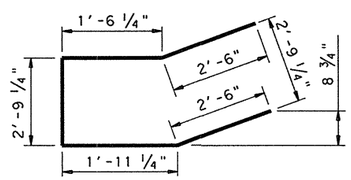
BARS U1



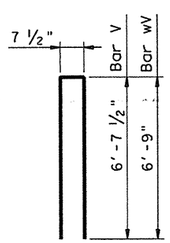
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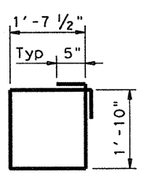
BARS S



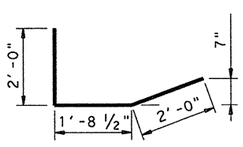
BARS U2



BARS V & wV



BARS wS



BARS L1

2-6-09

STATE OF TEXAS
SUNIL N. PATEL
85345
LICENSED PROFESSIONAL ENGINEER

Sheet 6 of 45 Sheets

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IH 30

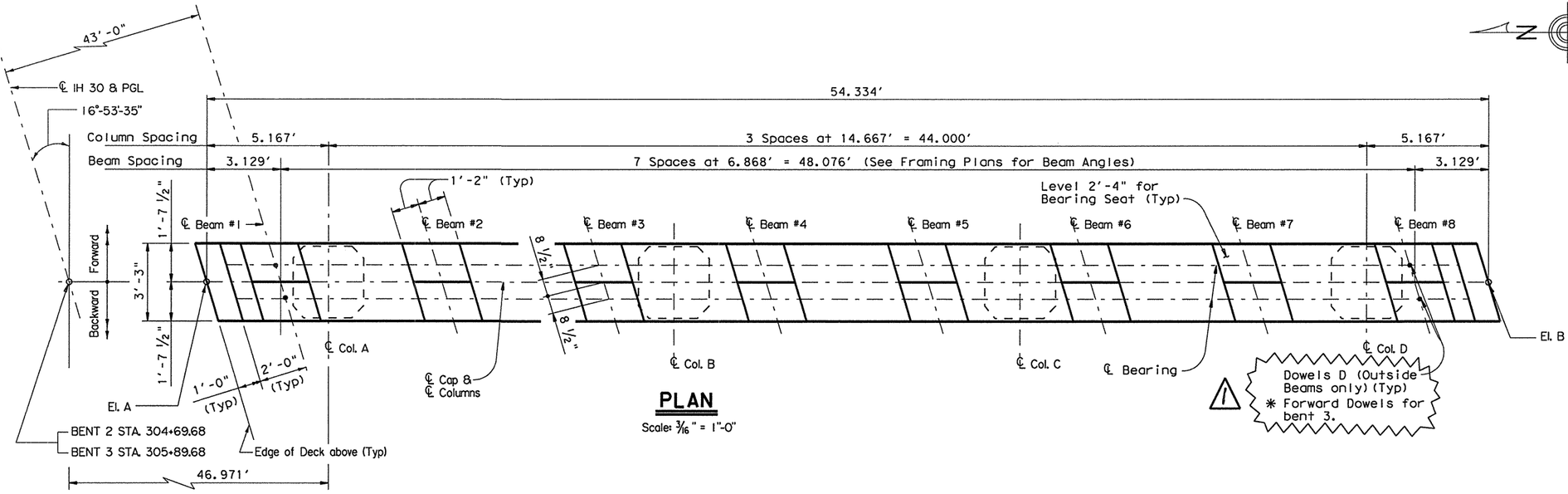
EB MAINLANES OVER JHON KING BLVD

ABUTMENT MISC. DETAILS

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DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
SNP	TEXAS	DALLAS	ROCKWALL	288
GRAPHICS	CONTROL	SECTION	JOB	
SNP	0009	12	073	
GRPH CHECK				
ADS				

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User: wfisher
DATE: 10/15/2009 TIME: 3:41:23 PM FILE: T:\DALBRDG\IH30 @ John King Blvd (0009-12-073)\DETAILS\Bent.dgn



PLAN

Scale: 3/16" = 1'-0"

TABLE OF ESTIMATED QUANTITIES (ONE BENT)				
Bar	No.	Size	Length	Weight
A	8	#11	54'-0"	2,295
B	6	#11	54'-0"	1,721
D	4	1¼"D	1'-8"	28
H	8	#5	2'-11"	24
M	4	#5	14'-8"	61
S	89	#5	14'-0"	1,300
S1	2	#5	14'-4"	30
T	10	#5	54'-0"	563
◆ Reinforcing Steel			Lb	6,022
Class "C" Concrete (Cap)			CY	27.6

△1 ◆ - For Contractor's information only.

△1 * - Deduct 14 lbs for bent 3.

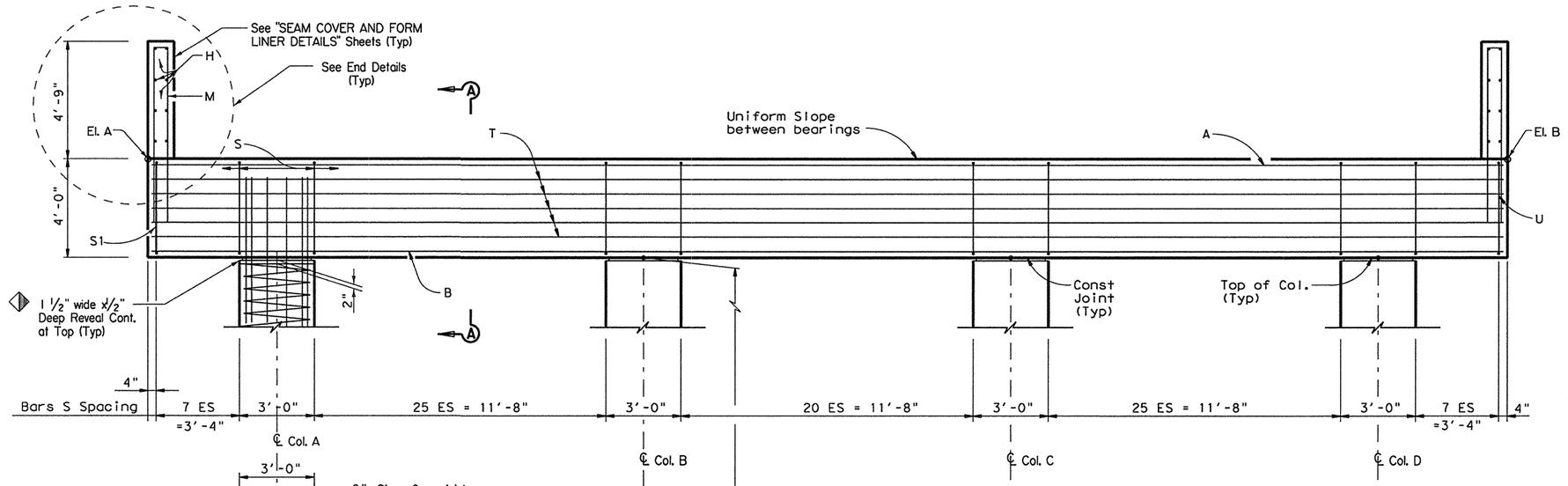
ESTIMATED QUANTITIES

ITEM	UNIT	BENT 2	BENT 3
DRILL SHAFT (36")	LF	196	196
CL C CONC (BENT)	CY	47.7	47.7
□ REINF STL	LB	9,070	9,056

□ - For Contractor's information only.

△1

△ ~ FIELD CHANGE # : _____



ELEVATION

Scale: 3/16" = 1'-0"

△1 ~ Change made to accomodate the SEJ - A (4") 10-15-2009

General Notes:

Include the reinforcing extending from the shaft into the Column in the price bid per foot of DRILL SHAFT.

Provide spiral steel with one extra turn at the top, bottom, and at splices.

For framing details not shown, see Framing Plan.

Provide Grade 60 reinforcing for the Cap.

Drilled Shaft reinforcing may be Grade 40.

Finish Bearing Seats with a wood float.

Calculated Drilled Shaft Foundation Load: Bent 2 = 305 Tons/Dr. Shaft.
Bent 3 = 305 Tons/Dr. Shaft.

For Bearing seat elevations, Control elevations, Column schedule and other Details not shown, see "BENT MISC. DETAILS" sheet.

STATE OF TEXAS
ADNAN AHMAD EL-SAAD
87977
LICENSED PROFESSIONAL ENGINEER

10-15-09

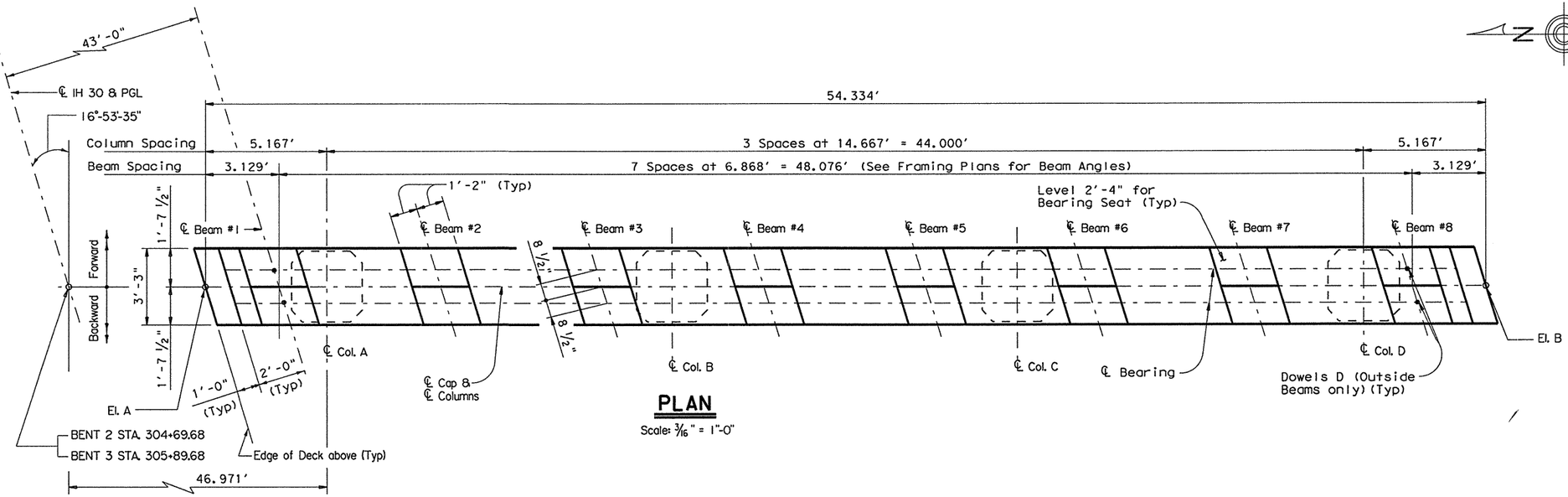
Sheet 7 of 45 Sheets

Texas Department of Transportation
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IH 30
EB MAINLANES
OVER JOHN KING BLVD
BENT 2 & 3 DETAILS

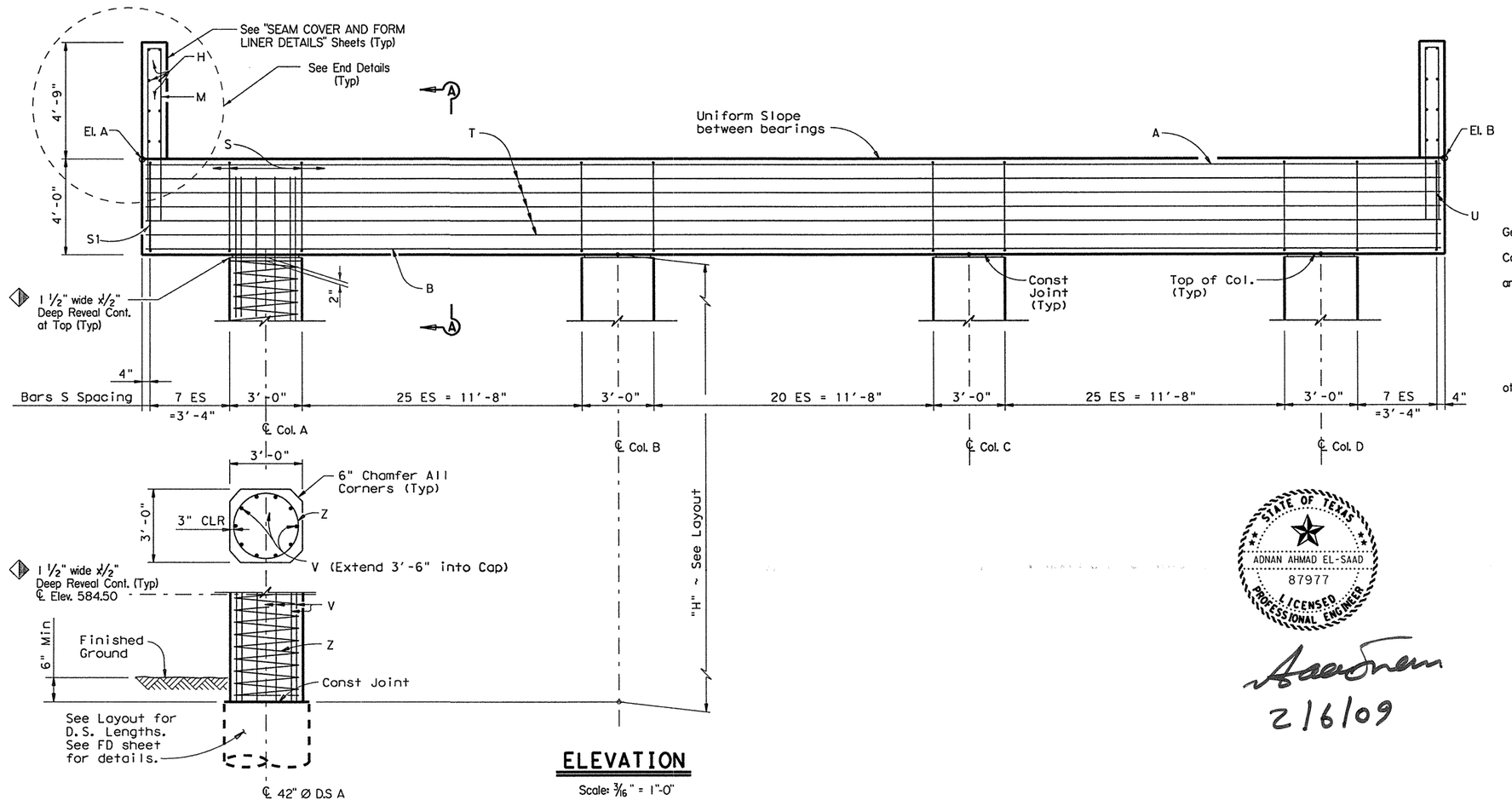
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ADS	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
MBP	TEXAS	DALLAS	ROCKWALL	
GRAPHICS	CONTROL	SECTION	JOB	289A
ADS	0009	12	073	
GRPH CHECK				
SNP				

User: aelsaad
DATE: 2/6/2009 TIME: 12:05:52 PM FILE: T:\DALBRDG\IH30 @ John King Blvd (0009-12-073)\DETAILS\Bent.dgn



PLAN

Scale: 3/16" = 1"-0"



ELEVATION

Scale: 3/16" = 1"-0"

TABLE OF ESTIMATED QUANTITIES (ONE BENT)

Bar	No.	Size	Length	Weight
A	8	#11	54'-0"	2,295
B	6	#11	54'-0"	1,721
D	4	1¼"D	1'-8"	28
H	8	#5	2'-11"	24
M	4	#5	14'-8"	61
S	89	#5	14'-0"	1,300
S1	2	#5	14'-4"	30
T	10	#5	54'-0"	563
◆ Reinforcing Steel			Lb	6,022
Class "C" Concrete (Cap)			CY	27.6

◆ ~ For Contractor's information only.

ESTIMATED QUANTITIES

ITEM	UNIT	BENT 2	BENT 3
DRILL SHAFT (36")	LF	196	196
CL C CONC (BENT)	CY	47.7	47.7
□ REINF STL	LB	9,070	9,070

□ ~ For Contractor's information only.

◆ See "SEAM COVER AND FORM LINER DETAILS" Sheets (Typ)

General Notes:

Include the reinforcing extending from the shaft into the Column in the price bid per foot of DRILL SHAFT.

Provide spiral steel with one extra turn at the top, bottom, and at splices.

For framing details not shown, see Framing Plan.

Provide Grade 60 reinforcing for the Cap.

Drilled Shaft reinforcing may be Grade 40.

Finish Bearing Seats with a wood float.

Calculated Drilled Shaft Foundation Load: Bent 2 = 305 Tons/Dr. Shaft.
Bent 3 = 305 Tons/Dr. Shaft.

For Bearing seat elevations, Control elevations, Column schedule and other Details not shown, see "BENT MISC. DETAILS" sheet.

STATE OF TEXAS
ADNAN AHMAD EL-SAAD
87977
LICENSED PROFESSIONAL ENGINEER

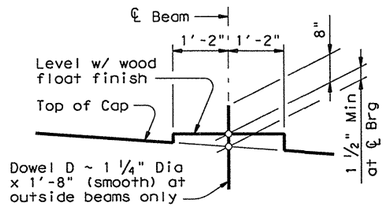
2/6/09

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IH 30
EB MAINLANES
OVER JOHN KING BLVD
BENT 2 & 3 DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ADS	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
MBP	TEXAS	DALLAS	ROCKWALL	289
GRAPHICS	CONTROL	SECTION	JOB	
ADS	0009	12	073	
GRPH CHECK				
SNP				

User: aelsaad
DATE: 2/6/2009 TIME: 12:05:56 PM FILE: T:\DALBRDG\IH30 @ John King Blvd (0009-12-073)\DETAILS\Bent.dgn



BEARING SEAT DETAIL

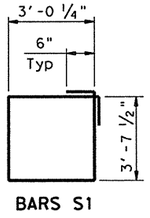
(Bearing surface shall be clean and free of all loose material before placing bearing pad.)

BEARING SEAT ELEVATIONS

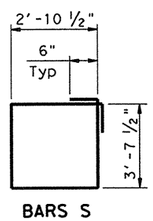
BENT	Bm #1	Bm #2	Bm #3	Bm #4	Bm #5	Bm #6	Bm #7	Bm #8
2	594.06	593.93	593.79	593.65	593.51	593.38	593.24	593.10
3	594.11	593.98	593.85	593.72	593.60	593.47	593.34	593.21

CONTROL ELEVATIONS

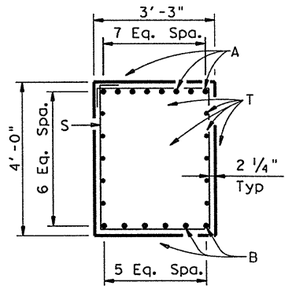
	Top of Cap			
Bent	El. A	El. B		
2	594.00	592.91		
3	594.04	593.03		
	Top of Col.			
Bent	Col. A	Col. B	Col. C	Col. D
2	589.90	589.60	589.31	589.02
3	589.94	589.67	589.40	589.13



BARS S1



BARS S

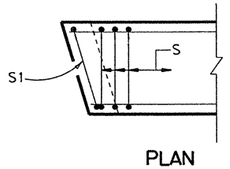


SECTION A-A

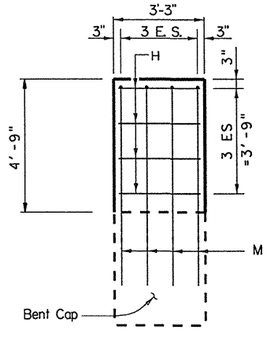
COLUMN SCHEDULE - ONE COLUMN

"H"	Bars V - 10-#9		Bars Z - #3 Spiral		Est. Quant.-4 Col. Reinf. Steel	Est. Quant.-4 Col. Class C Concrete
FT	Length	Weight	Length	Weight	LBS	CY
13	16'- 6"	561	215	81	2,568	16.4
14	17'- 6"	595	231	87	2,728	17.6
15	18'- 6"	629	247	93	2,888	18.9
16	19'- 6"	663	262	99	3,048	20.1
17	20'- 6"	697	278	105	3,208	21.4
18	21'- 6"	731	294	111	3,368	22.7
19	22'- 6"	765	310	117	3,528	23.9

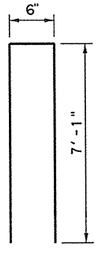
Adjust spiral Z length by 8.0 Ft. and bars V length by 0.5 Ft. for each 0.5 Ft. variation in "H" value.
Adjust Estimated Quantity of Concrete for each column by 0.2 CY for each 0.5 Ft. variation in "H" value.
Adjust Estimated Quantity of Reinforcing Steel for each column by 20.0 Lb for each 0.5 Ft. variation in "H" value.



PLAN



ELEVBATION



BARS M

END DETAILS



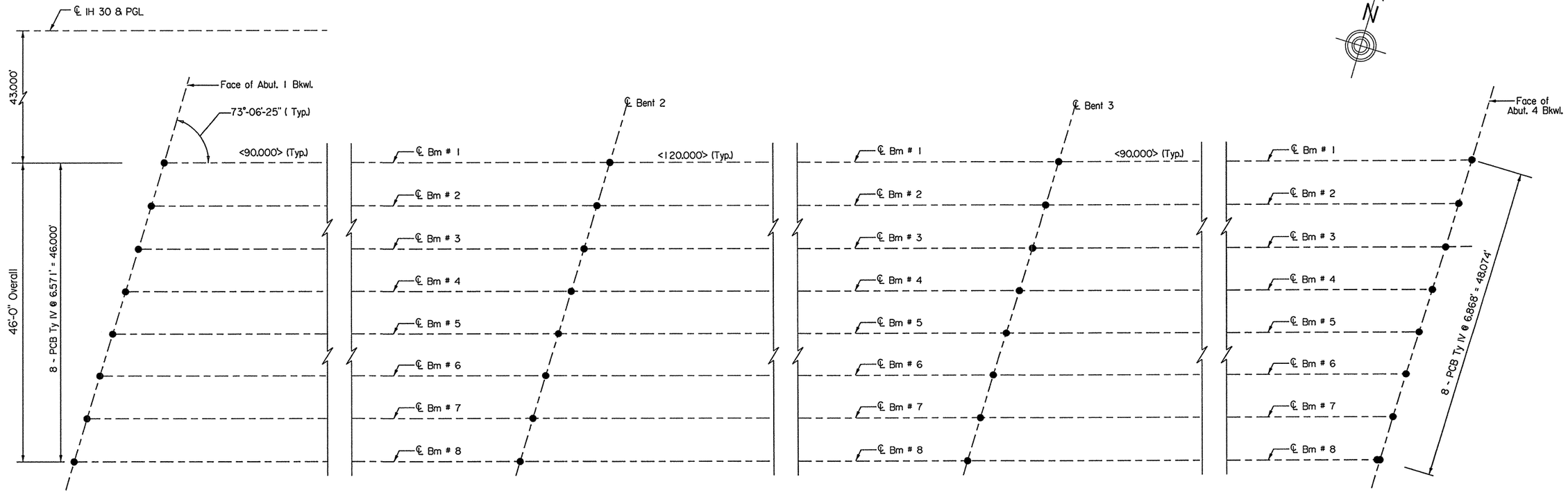
2/6/09

Sheet 8 of 45 Sheets

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IH 30
EB MAINLANES
OVER JOHN KING BLVD
BENT MISC. DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ADS	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
MBP	TEXAS	DALLAS	ROCKWALL	290
GRAPHICS	CONTROL	SECTION	JOB	
ADS	0009	12	073	
GRPH CHECK				
SNP				

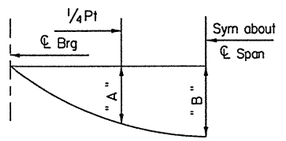


FRAMING PLAN
Scale: 1/16" : 1-0"

TABLE OF BEAM LENGTHS & DEAD LOAD DEFLECTIONS

Span	Beam		"A" Ft.	"B" Ft.	Length Ft.
1 & 3	1,8	EXT	0.043	0.060	89.659
	2-7	INT	0.044	0.062	89.659
2	1,8	EXT	0.136	0.192	119.667
	2-7	INT	0.162	0.227	119.667

All beam lengths are horizontal length end to end of beam.



Note: Deflections shown are calculated values due to concrete slab only. Field deflections may be less than the calculated values shown. Calculations are based on an Ec of 5,000 ksi.

GENERAL NOTES:
Dimensions shown thus <XXX.XXX> represent horizontal beam lengths Face of Abut. Bkwl. to Centerline of Bent or Centerline to Centerline of Bents.
All dimensions are in feet unless otherwise shown.

Sheet 9 of 45 Sheets

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IH 30

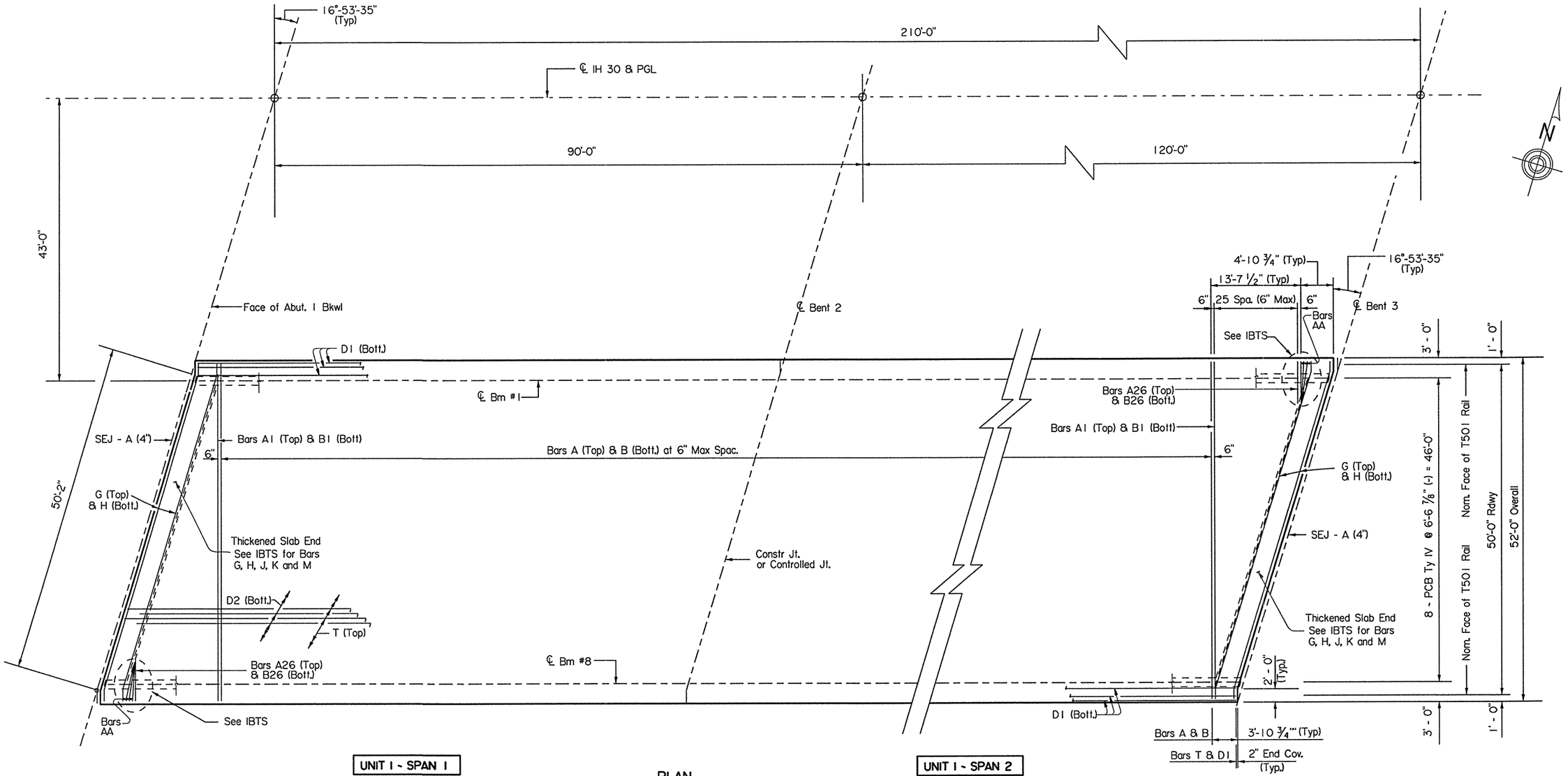
EB MAINLANES OVER JHON KING BLVD

FRAMING PLAN

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
GRAPHICS SNP	TEXAS	DALLAS	ROCKWALL	291
GRPH CHECK ADS	CONTROL	SECTION	JOB	
	0009	12	073	

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DISPLAYED



UNIT 1 - SPAN 1

UNIT 1 - SPAN 2

PLAN

Scale: 1/16" = 1'-0"

BAR TABLE	
BAR	SIZE
A	#5
AA	#5
B	#5
D	#5
G	#5
H	#5
J	#5
K	#5
M	#5
T	#4

General Notes:

Provide Class S Concrete, f'c = 4 ksi.

For beam, bearing pad, misc. slab and thickened slab end details not shown, see IBD, IBEB, IBMS, IBTS and IBNS.

For Sealed Expansion Joint details not shown, see SEJ-A.

For Sealed Expansion Joint Quantities not shown, see Summary of Estimated Quantities.

Place and finish not less than 30 feet of Bridge Deck concrete per hour.

For rail details not shown, see Traffic Rail Type T501

For framing details not shown, see Framing Plan.

Provide epoxy coated, Grade 60 reinforcing.

Where required, provide bar laps as follows:

#4 = 2'-1"

#5 = 2'-7"

See PCP or PMDF Standards for details and quantity adjustments if either of these options are used.

Provide a construction joint or controlled joint at the center line of interior Bent 2. Break the construction joint or controlled joint 2 feet from edge of slab & directed normal to the edge of slab.

For Trannsverse Section, see "SLAB SECTION DETAILS" sheet.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
	REINF CONC SLAB	SF	10,920
	PRESTR CONC BEAM (TY IV)	LF	1674.61
∓	CL S CONC (SLAB)	CY	277.2
◇∓	REINF STL	LB	70,980

∓ - For Contractor's information only.

◇ - Reinforcing Steel Weight is calculated using an approximate factor of 6.5 Lb/SF for slab.

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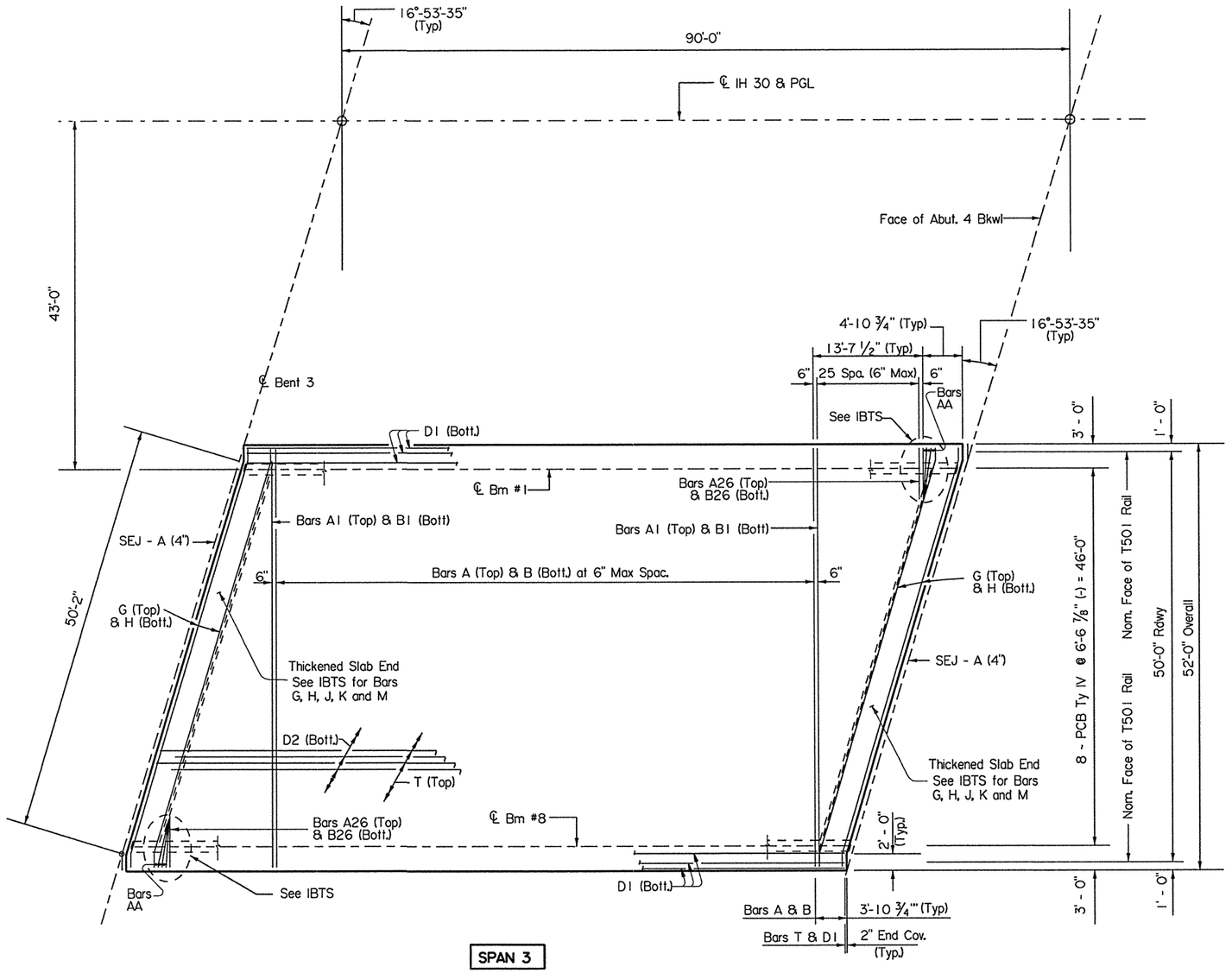
IH 30
EB MAINLANES
OVER JOHN KING BLVD
SLAB DETAILS - UNIT 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT	TEXAS	DALLAS	ROCKWALL	292
GRAPHICS	CONTROL	SECTION	JOB	
ADS	0009	12	073	
GRPH CHECK				
SNP				

DISPLAYED
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9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48
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57 58 59 60 61 62 63

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TIME: 12:34:38 PM
DATE: 2/6/2009



SPAN 3

PLAN
Scale: 1/16" = 1'-0"

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
	REINF CONC SLAB	SF	4,680
	PRESTR CONC BEAM (TY IV)	LF	717.27
#	CL S CONC (SLAB)	CY	119.8
◇#	REINF STL	LB	30,420

- For Contractor's information only.
◇ - Reinforcing Steel Weight is calculated using an approximate factor of 6.5 Lb/SF for slab.

General Notes:
Provide Class S Concrete, f'c = 4 ksi.
For beam, bearing pad, misc. slab and thickened slab end details not shown, see IBD, IBEB, IBMS, IBTS and IBNS.
For Sealed Expansion Joint details not shown, see SEJ-A.
For Sealed Expansion Joint Quantities not shown, see Summary of Estimated Quantities.
Place and finish not less than 30 feet of Bridge Deck concrete per hour.
For rail details not shown, see Traffic Rail Type T501
For framing details not shown, see Framing Plan.
Provide epoxy coated, Grade 60 reinforcing.
Where required, provide bar laps as follows:
#4 = 2'-1"
#5 = 2'-7"
See PCP or PMDF Standards for details and quantity adjustments if either of these options are used.
For Transverse Section, see "SLAB SECTION DETAILS" sheet.

BAR TABLE

BAR	SIZE
A	#5
AA	#5
B	#5
D	#5
G	#5
H	#5
J	#5
K	#5
M	#5
T	#4

DISPLAYED

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	

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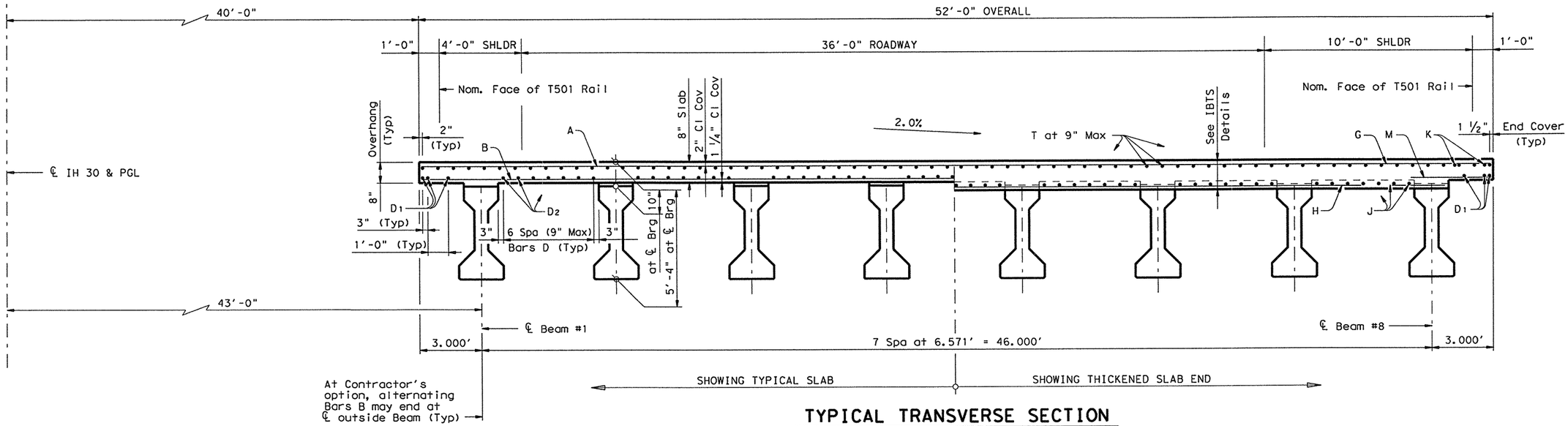
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IH 30
EB MAINLANES
OVER JOHN KING BLVD
SLAB DETAILS - SPAN 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT				
GRAPHICS	TEXAS	DALLAS	ROCKWALL	293
ADS	CONTROL	SECTION	JOB	
GRPH CHECK	0009	12	073	
SNP				



TYPICAL TRANSVERSE SECTION

Scale: 3/16" = 1'-0"

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IH 30

EB MAINLANES

OVER JOHN KING BLVD

SLAB SECTION DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT	TEXAS	DALLAS	ROCKWALL	294
GRAPHICS	CONTROL	SECTION	JOB	
ADS	0009	12	073	
GRPH CHECK				
SNP				

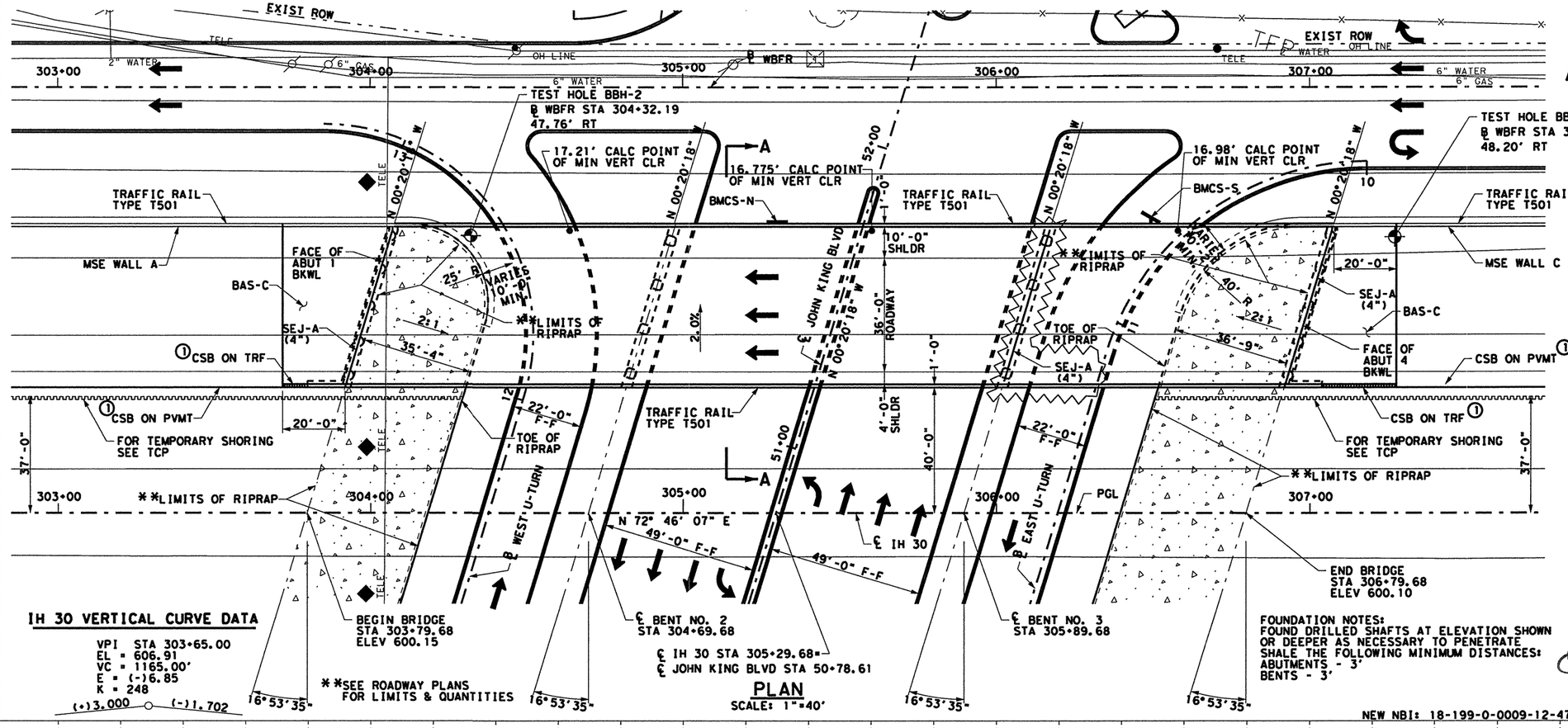
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1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	

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$USERNAME$
$TIME$
$DATE$

◆ RELOCATE TELE. LINE TO AVOID ANY CONFLICT.



**SEE ROADWAY PLANS FOR LIMITS & QUANTITIES

PLAN
SCALE: 1"=40'

IH 30 VERTICAL CURVE DATA
VPI STA 303+65.00
EL = 606.91
VC = 1165.00'
E = (-)6.85
K = 248
(+)3.000 (-)1.702

FOUNDATION NOTES:
FOUND DRILLED SHAFTS AT ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE THE FOLLOWING MINIMUM DISTANCES:
ABUTMENTS - 3'
BENTS - 3'

20 10 0 20 40
SCALE FEET

N

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63663
LICENSED PROFESSIONAL ENGINEER
10-15-09
P.E.
Signature of Registrant & Date

① - SEE ROADWAY PLANS FOR DETAILS AND QUANTITIES

DESIGN NOTES:

BRIDGE DESIGNED FOR HL 93 LOADING IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS, 4TH EDITION.

Design Speed = 70 MPH
ADT = 13800 (1997)
ADT = 42800 (2027)
FUNCTIONAL CLASS = INTERSTATE

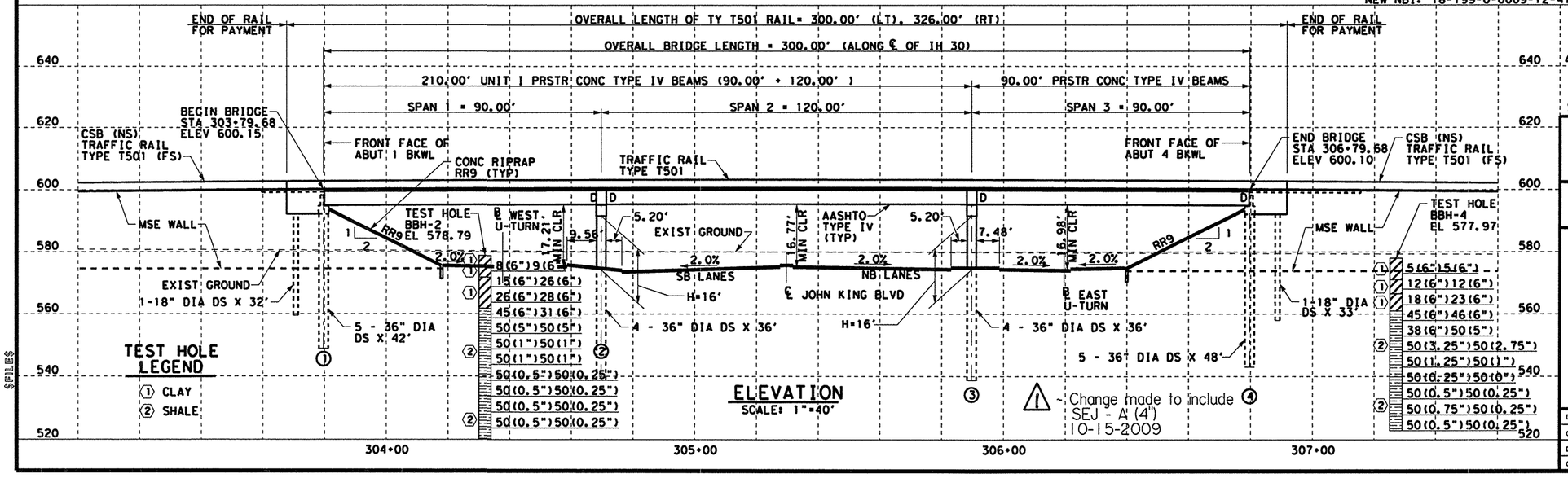
NOTE:

1. REFER TO RETAINING WALL PLAN AND ELEVATION SHEETS FOR LIMITS OF MSE WALLS.
2. SEE SHEET 2 OF 2 FOR SECTION A-A.
3. REFER TO THE CORE BORING SHEETS FOR BORING INFORMATION.
4. REFER TO THE WALL FORM LINER PLAN SHEETS FOR AESTHETIC GUIDELINES AND ADDITIONAL INFORMATION.

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10-15-09

NEW NBI: 18-199-0-0009-12-476



ELEVATION
SCALE: 1"=40'

TEST HOLE LEGEND
① CLAY
② SHALE

③ ⚠ - Change made to include ④ SEJ - A (4")
10-15-2009

⚠ - FIELD CHANGE # : _____

Sheet 13 of 45 Sheets

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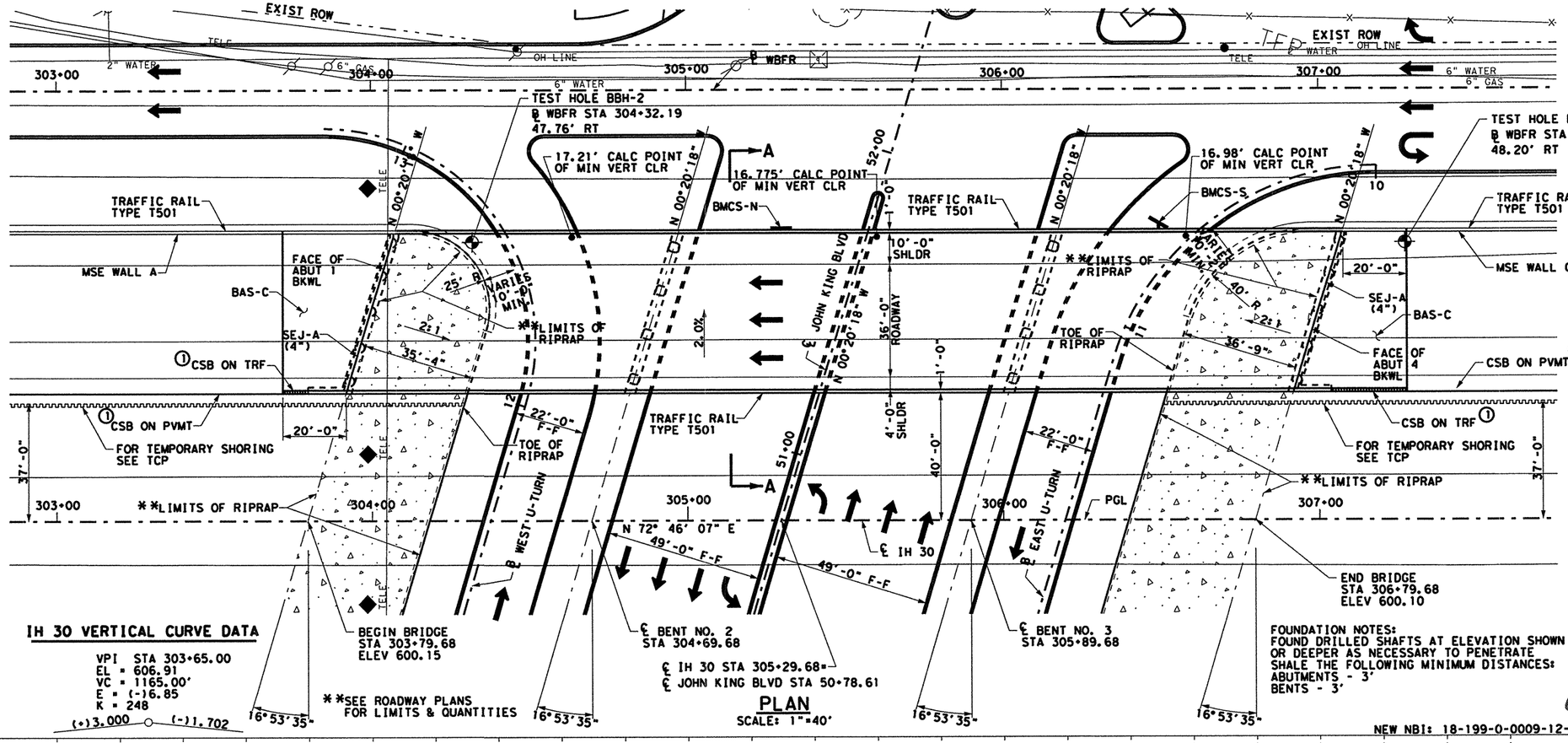
IH 30
WB MAINLANES
OVER JOHN KING BLVD
BRIDGE LAYOUT

Designed: DJP	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ACO	6	TEXAS	(SEE TITLE SHEET)			IH 30
Drawn: TFT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JLC	DAL	ROCKWALL	0009	12	073	29SA

$FILE$

$USERNAME$
$TIME$
$DATE$

◆ RELOCATE TELE. LINE TO AVOID ANY CONFLICT.



**SEE ROADWAY PLANS FOR LIMITS & QUANTITIES

PLAN
SCALE: 1"=40'

IH 30 VERTICAL CURVE DATA

VPI STA 303+65.00
EL = 606.91
VC = 1165.00'
E = (-)6.85
K = 248
(+)3.000 (-)1.702

① - SEE ROADWAY PLANS FOR DETAILS AND QUANTITIES

DESIGN NOTES:

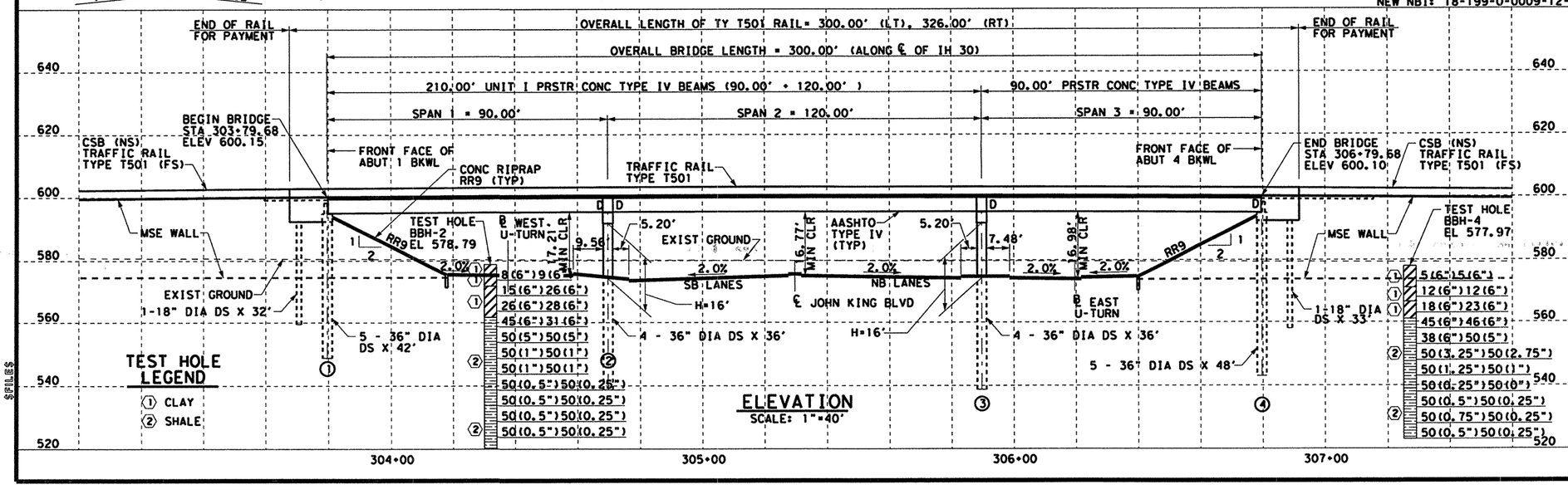
BRIDGE DESIGNED FOR HL 93 LOADING IN ACCORDANCE WITH AASHTO LRFD BRIDGE SPECIFICATIONS, 4TH EDITION.

Design Speed = 70 MPH
ADT = 13800 (1997)
ADT = 42800 (2027)
FUNCTIONAL CLASS = INTERSTATE

NOTE:

1. REFER TO RETAINING WALL PLAN AND ELEVATION SHEETS FOR LIMITS OF MSE WALLS.
2. SEE SHEET 2 OF 2 FOR SECTION A-A.
3. REFER TO THE CORE BORING SHEETS FOR BORING INFORMATION.
4. REFER TO THE WALL FORM LINER PLAN SHEETS FOR AESTHETIC GUIDELINES AND ADDITIONAL INFORMATION.

FOUNDATION NOTES:
FOUND DRILLED SHAFTS AT ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE SHALE THE FOLLOWING MINIMUM DISTANCES:
ABUTMENTS - 3'
BENTS - 3'



TEST HOLE BBH-2		TEST HOLE BBH-4	
8(6")	9(6")	5(6")	15(6")
15(6")	26(6")	12(6")	12(6")
26(6")	28(6")	18(6")	23(6")
45(6")	31(6")	45(6")	46(6")
50(5")	50(5")	38(6")	50(5")
50(1")	50(1")	50(3.25")	50(2.75")
50(1")	50(1")	50(1.25")	50(1")
50(0.5")	50(0.25")	50(0.25")	50(0")
50(0.5")	50(0.25")	50(0.5")	50(0.25")
50(0.5")	50(0.25")	50(0.75")	50(0.25")
50(0.5")	50(0.25")	50(0.5")	50(0.25")

TEST HOLE LEGEND
① CLAY
② SHALE

ELEVATION
SCALE: 1"=40'

NEW NBI: 18-199-0-0009-12-476

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IH 30
WB MAINLANES
OVER JOHN KING BLVD
BRIDGE LAYOUT

Designed: DJP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ACO	6	TEXAS	(SEE TITLE SHEET)			IH 30
Drawn: TFT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: JLC	DAL	ROCKWALL	0009	12	073	295

$FILE$

20 10 0 20 40
SCALE FEET

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P.E. 2-9-09
Signature of Registrant & Date

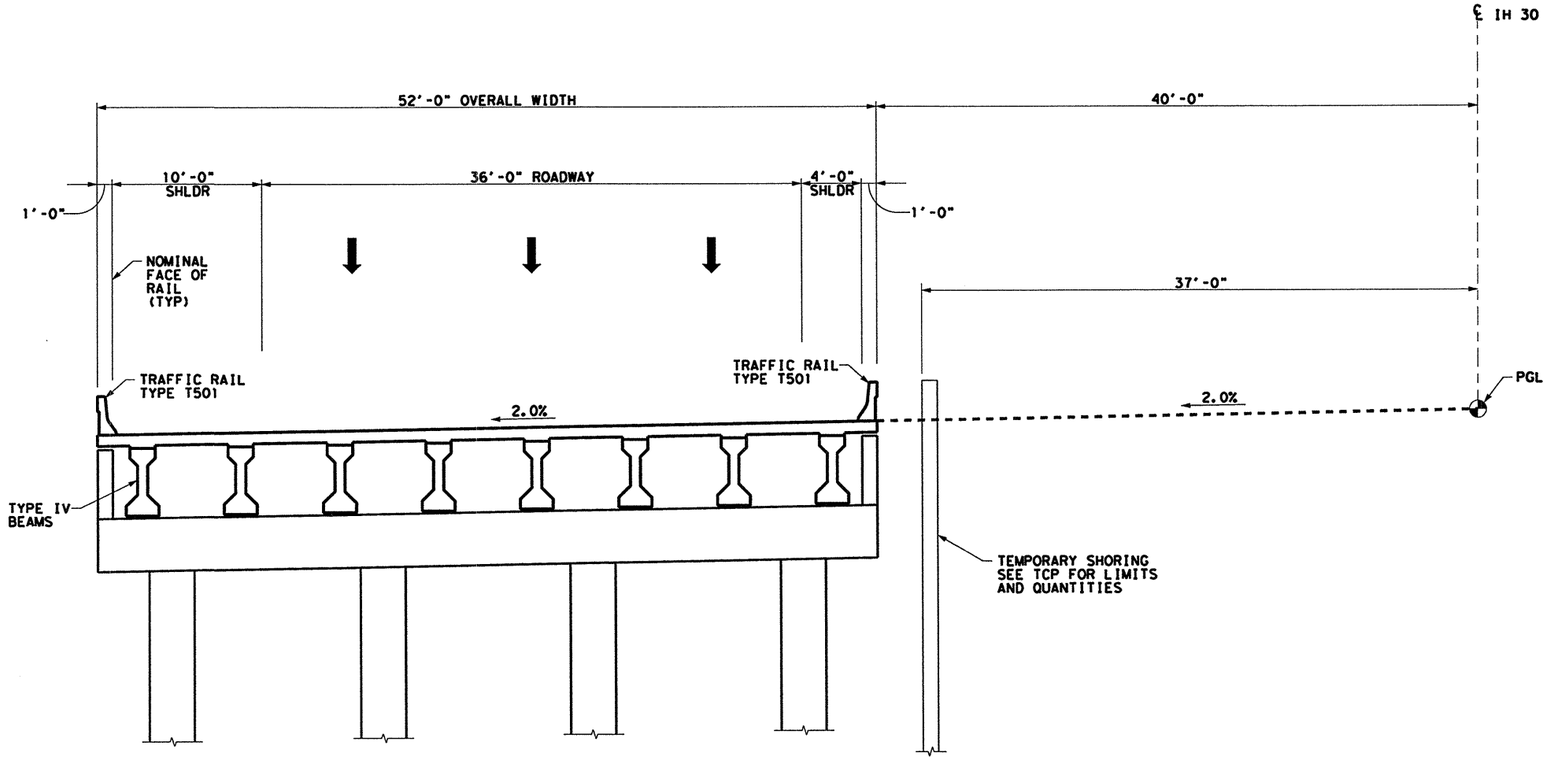
2-6-09
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$USERNAME$

$TIME$

$DATE$



TYPICAL SECTION A-A
SCALE: 1"=10'

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Sheet 14 of 45 sheets HL93 LOADING

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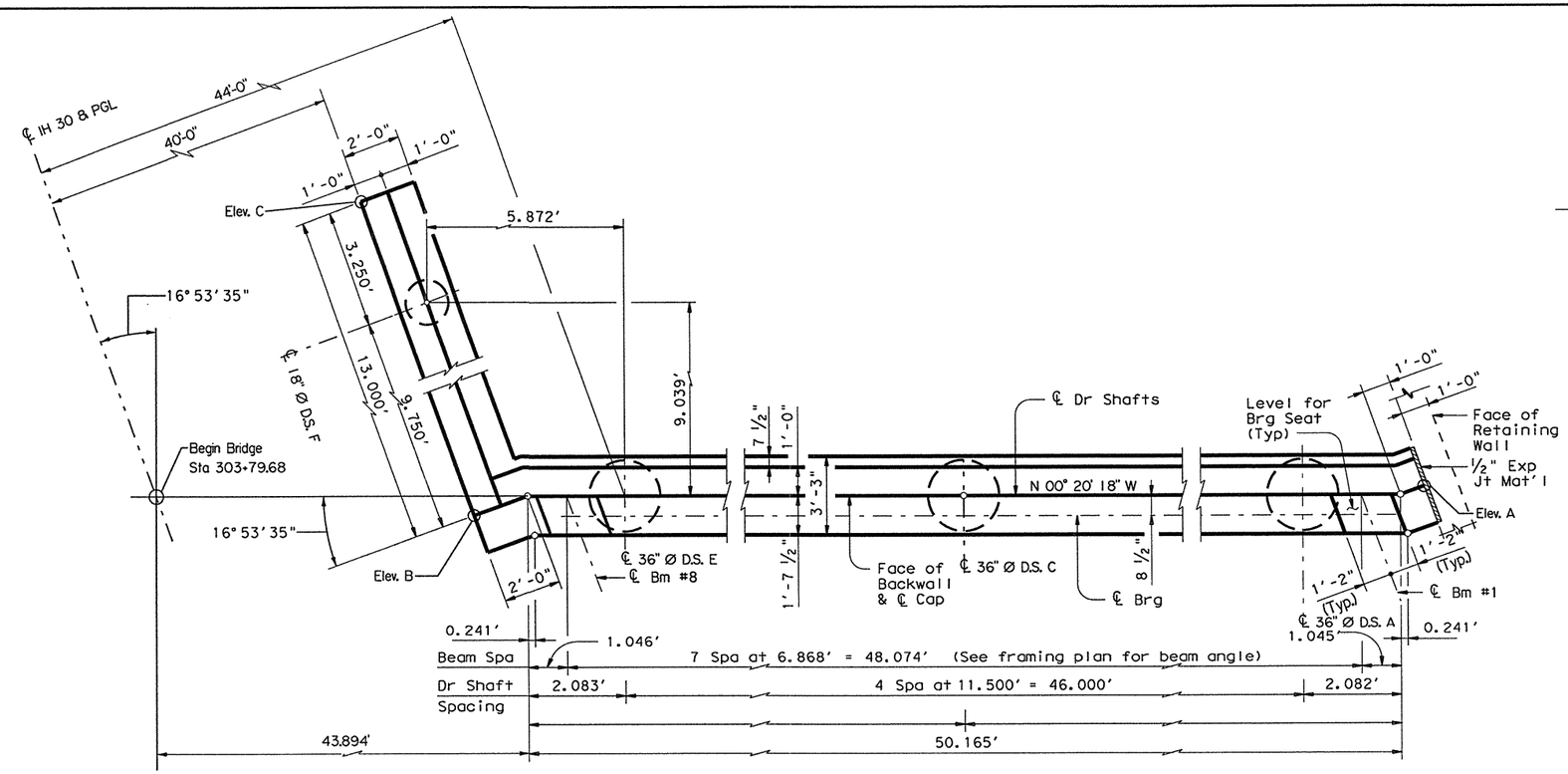
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IH 30
WB MAINLANES
OVER JOHN KING BLVD
TYPICAL SECTIONS

Designed: DJP	FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: ACO	6	TEXAS	(SEE TITLE SHEET)			IH 30
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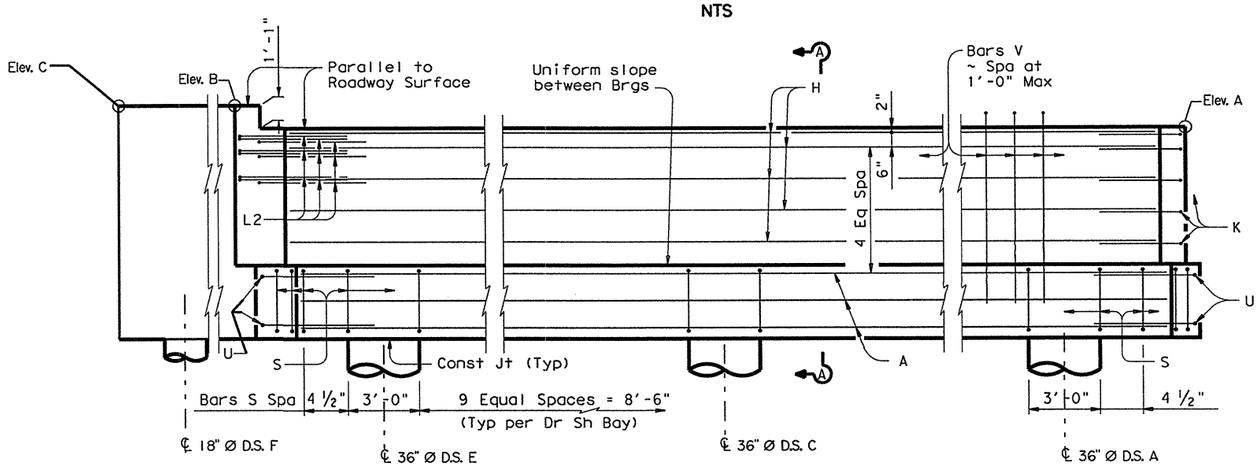
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PLAN

NTS



ELEVATION

NTS

BEARING SEAT ELEVATIONS

Bm #1	Bm #2	Bm #3	Bm #4	Bm #5	Bm #6	Bm #7	Bm #8
592.96	593.08	593.20	593.32	593.45	593.57	593.69	593.81

TOP OF DS ELEVATION

D.S. A	D.S. B	D.S. C	D.S. D	D.S. E	D.S. F
590.35	590.55	590.76	590.96	590.16	591.16

CONTROL ELEVATIONS

EL. A	EL. B	EL. C
597.40	599.42	599.35

TABLE OF ESTIMATED QUANTITIES

(Reinforcing quantitites shown for Contractor's information only)

Bar	No.	Size	Length	Weight
A	8	#11	50'- 2"	2132
H	10	#6	50'- 2"	754
K	5	#5	5'-11"	31
L1	9	#6	5'-9"	78
S	48	#4	10'- 8"	342
U_1	2	#6	9'- 3"	28
U_2	2	#6	11'- 3"	34
V	53	#5	13'-11"	769
wH_1	7	#6	14'- 3"	150
wH_2	12	#6	12'- 8"	228
wS	14	#4	7'- 9"	72
wV	14	#5	14'- 2"	207
■ Reinforcing Steel			Lb	4825
Class "C" Concrete			CY	30.1

■ ~ For contractor's Information only

General Notes:

Provide spiral steel with one extra turn at the top, bottom, and at splices.

Include the reinforcing extending from the shaft into the cap in the price bid per foot of DRILL SHAFT.

Finish Bearing Seats with a wood float.

Provide Grade 60 reinforcing for the Cap and walls.

Drilled Shaft reinforcing may be Grade 40.

For framing details not shown, see Framing Plan.

Calculated Drilled Shaft Foundation Load = 106 Tons/Drilled Shaft.

For Dr. Sh reinforcement see FD standard sheet.

For Details not shown See " ABUTMENT MISC DETAILS" Sheet.

Sheet 15 of 45 Sheets

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IH 30

WB MAINLANES OVER JOHN KING BLVD

ABUTMENT - 1 DETAILS

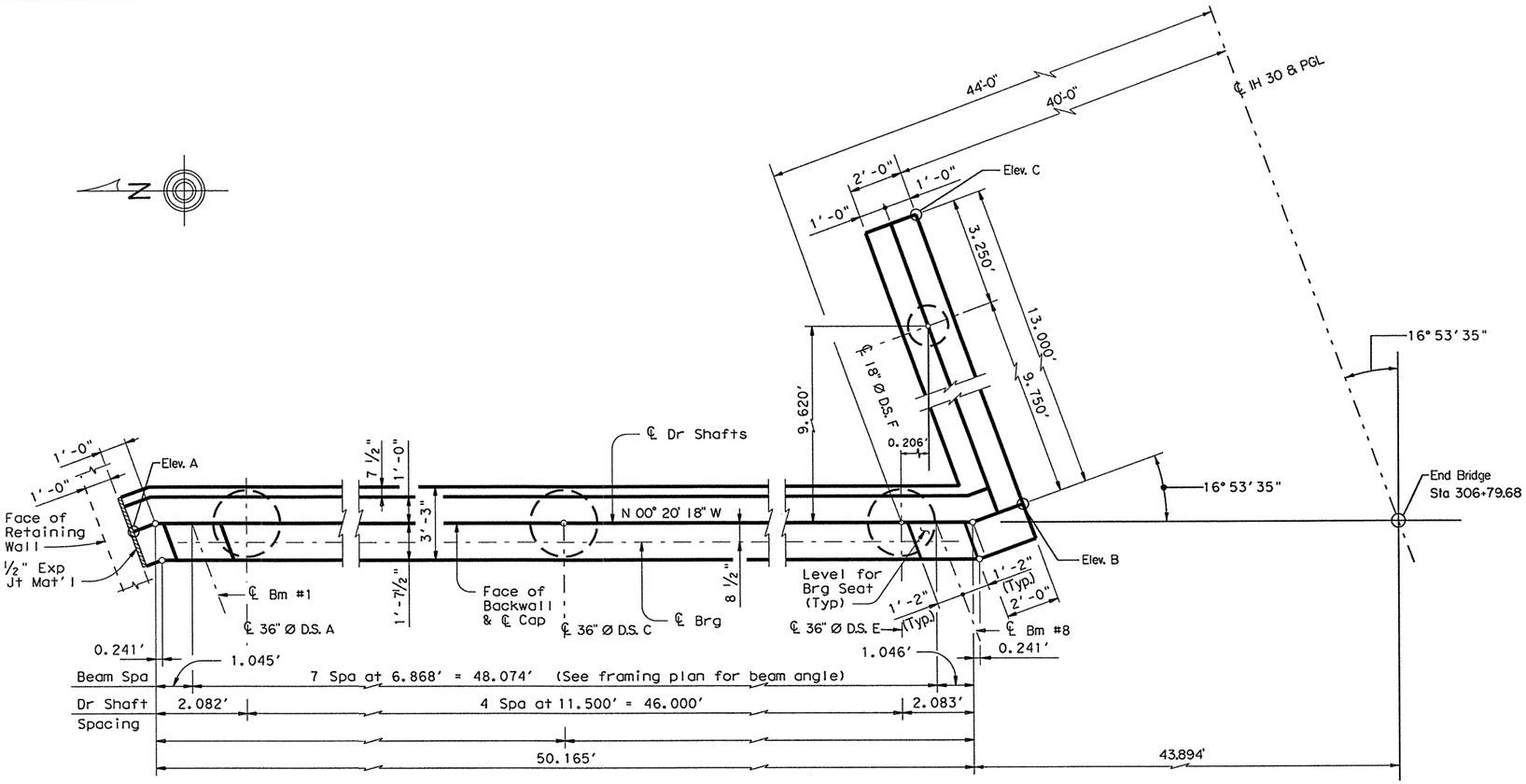
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SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
GRAPHICS SNP	TEXAS	DALLAS	ROCKWALL	297
GRPH CHECK	CONTROL	SECTION	JOB	
ADS	0009	12	073	

2-6-09

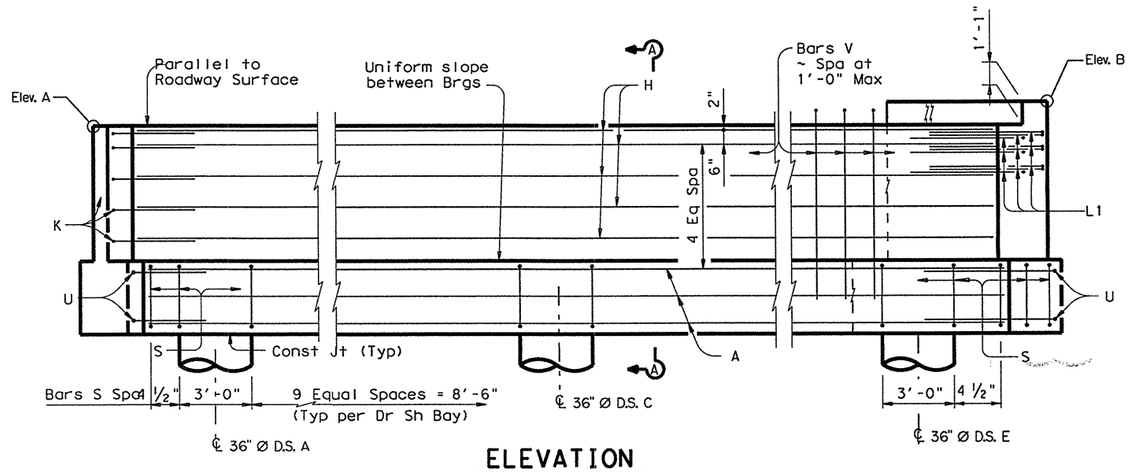
STATE OF TEXAS
SUNIL N. PATEL
85345
LICENSED
PROFESSIONAL ENGINEER

Sunil Patel

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PLAN
NTS



ELEVATION
NTS

BEARING SEAT ELEVATIONS

Bm #1	Bm #2	Bm #3	Bm #4	Bm #5	Bm #6	Bm #7	Bm #8
592.58	592.72	592.87	593.01	593.16	593.31	593.45	593.60

TOP OF DS ELEVATION

D.S. A	D.S. B	D.S. C	D.S. D	D.S. E	D.S. F
589.98	590.22	590.47	590.71	590.95	590.95

CONTROL ELEVATIONS

EL. A	EL. B	EL. C
597.02	599.23	599.14

TABLE OF ESTIMATED QUANTITIES
(Reinforcing quantitites shown for Contractor's information only)

Bar	No.	Size	Length	Weight
A	8	#11	50'- 2"	2132
H	10	#6	50'- 2"	754
K	5	#5	5'-11"	31
L1	9	#6	5'-9"	78
S	48	#4	10'- 8"	342
U_1	2	#6	9'- 3"	28
U_2	2	#6	11'- 3"	34
V	53	#5	13'-11"	769
wH_1	7	#6	14'- 3"	150
wH_2	12	#6	12'- 8"	228
wS	14	#4	7'- 9"	72
wV	14	#5	14'- 2"	207
Reinforcing Steel			Lb	4825
Class "C" Concrete			CY	30.1

■ ~ For contractor's Information only

General Notes:
Provide spiral steel with one extra turn at the top, bottom, and at splices.
Include the reinforcing extending from the shaft into the cap in the price bid per foot of DRILL SHAFT.
Finish Bearing Seats with a wood float.
Provide Grade 60 reinforcing for the Cap and walls.
Drilled Shaft reinforcing may be Grade 40.
For framing details not shown, see Framing Plan.
Calculated Drilled Shaft Foundation Load = 106 Tons/Drilled Shaft.
For Dr. Sh reinforcement see FD standard sheet.
For Details not shown See " ABUTMENT MISC DETAILS" Sheet.

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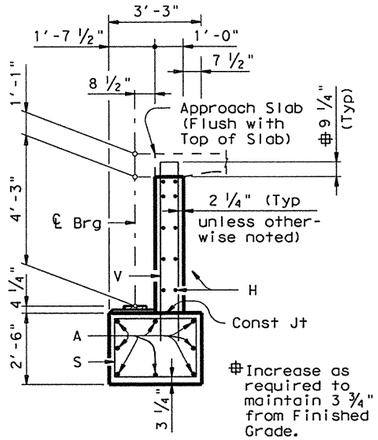
IH 30

WB MAINLANES OVER JOHN KING BLVD

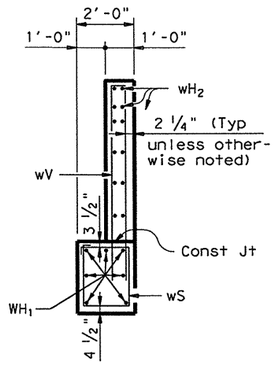
ABUTMENT - 4 DETAILS

2-609
STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

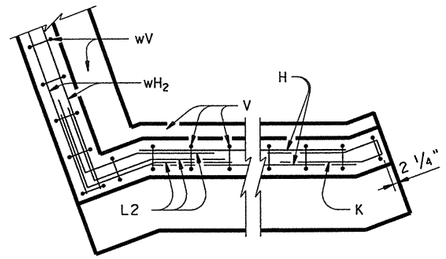
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SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
GRAPHICS SNP	TEXAS	DALLAS	ROCKWALL	298
GRPH CHECK	CONTROL	SECTION	JOB	
ADS	0009	12	073	



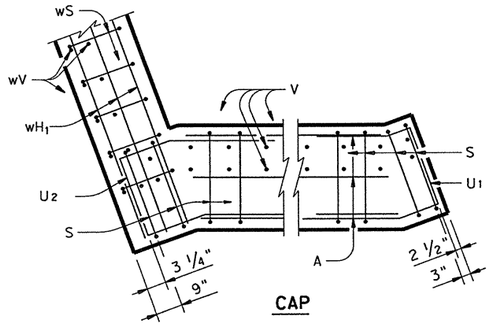
SECTION A-A



SECTION B-B

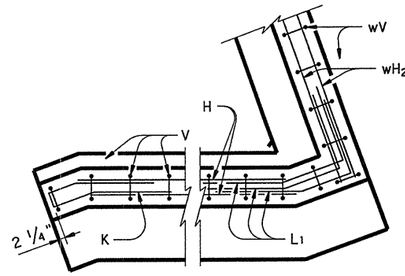


BACKWALL

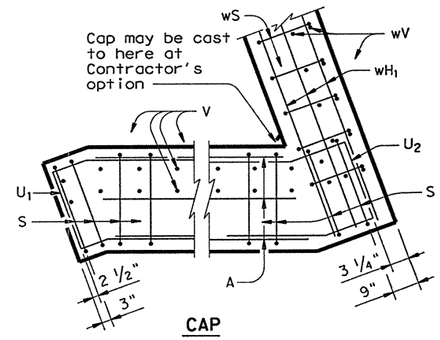


CAP

CORNER DETAILS



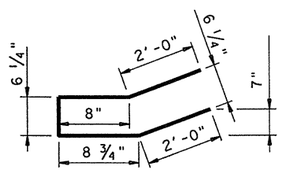
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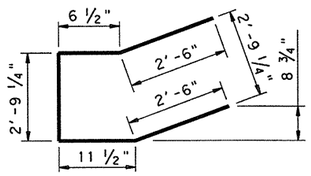
CAP

CORNER DETAILS

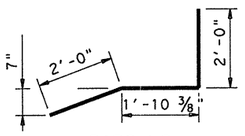
WINGWALL ELEVATION



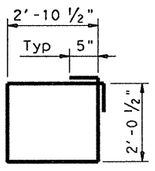
BARS K



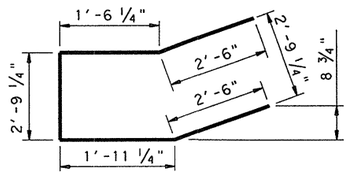
BARS U1



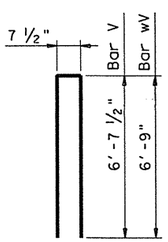
BARS L2



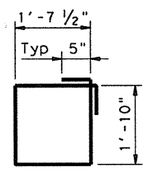
BARS S



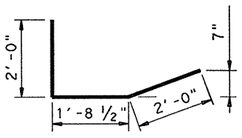
BARS U2



BARS V & wV



BARS wS



BARS L1

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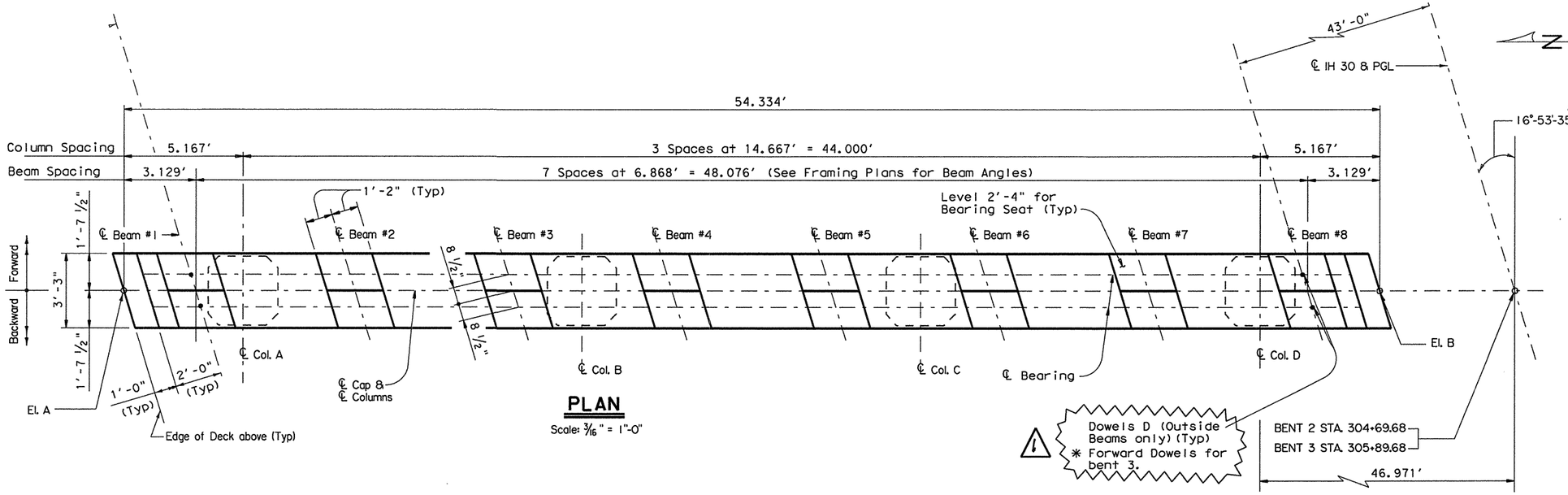
WB MAINLANES OVER JHON KING BLVD

ABUTMENT MISC. DETAILS

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
SNP	TEXAS	DALLAS	ROCKWALL	299
GRAPHICS	CONTROL	SECTION	JOB	
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PLAN
Scale: 3/16" = 1'-0"

TABLE OF ESTIMATED QUANTITIES (ONE BENT)

Bar	No.	Size	Length	Weight
A	8	#11	54'-0"	2,295
B	6	#11	54'-0"	1,721
D	4	1¼"D	1'-8"	28
H	8	#5	2'-11"	24
M	4	#5	14'-8"	61
S	89	#5	14'-0"	1,300
S1	2	#5	14'-4"	30
T	10	#5	54'-0"	563
◆ Reinforcing Steel			Lb	6,022
Class "C" Concrete (Cap)			CY	27.6

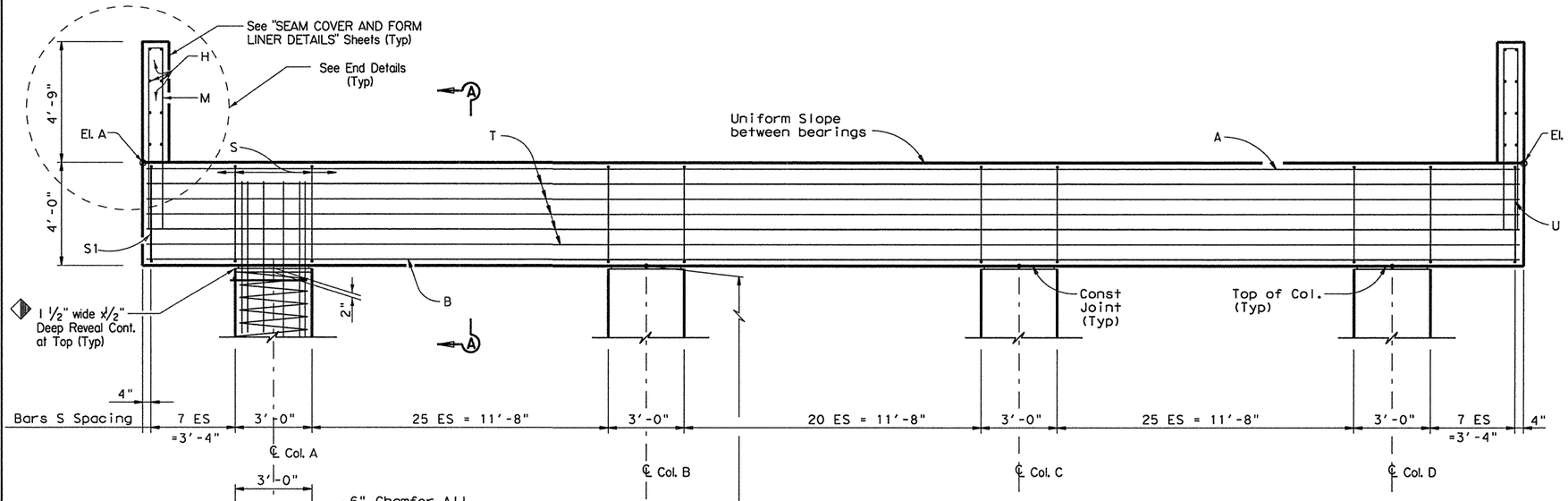
◆ ~ For Contractor's information only.
* ~ Deduct 14 lbs for bent 3.

ESTIMATED QUANTITIES

ITEM	UNIT	BENT 2	BENT 3
DRILL SHAFT (36")	LF	144	144
CL. C CONC (BENT)	CY	47.7	47.7
□ REINF STL	LB	9,070	9,056

□ ~ For Contractor's information only.

⚠ ~ FIELD CHANGE # : _____



ELEVATION
Scale: 3/16" = 1'-0"

◆ See "SEAM COVER AND FORM LINER DETAILS" Sheets (Typ)

⚠ ~ Change made to accomodate the SEJ - A (4") 10-15-2009

General Notes:
Include the reinforcing extending from the shaft into the Column in the price bid per foot of DRILL SHAFT.
Provide spiral steel with one extra turn at the top, bottom, and at splices.
For framing details not shown, see Framing Plan.
Provide Grade 60 reinforcing for the Cap.
Drilled Shaft reinforcing may be Grade 40.
Finish Bearing Seats with a wood float.
Calculated Drilled Shaft Foundation Load: Bent 2 = 302 Tons/Dr. Shaft.
Bent 3 = 302 Tons/Dr. Shaft.
For Bearing seat elevations, Control elevations, Column schedule and other Details not shown, see "BENT MISC. DETAILS" sheet.



10-15-09

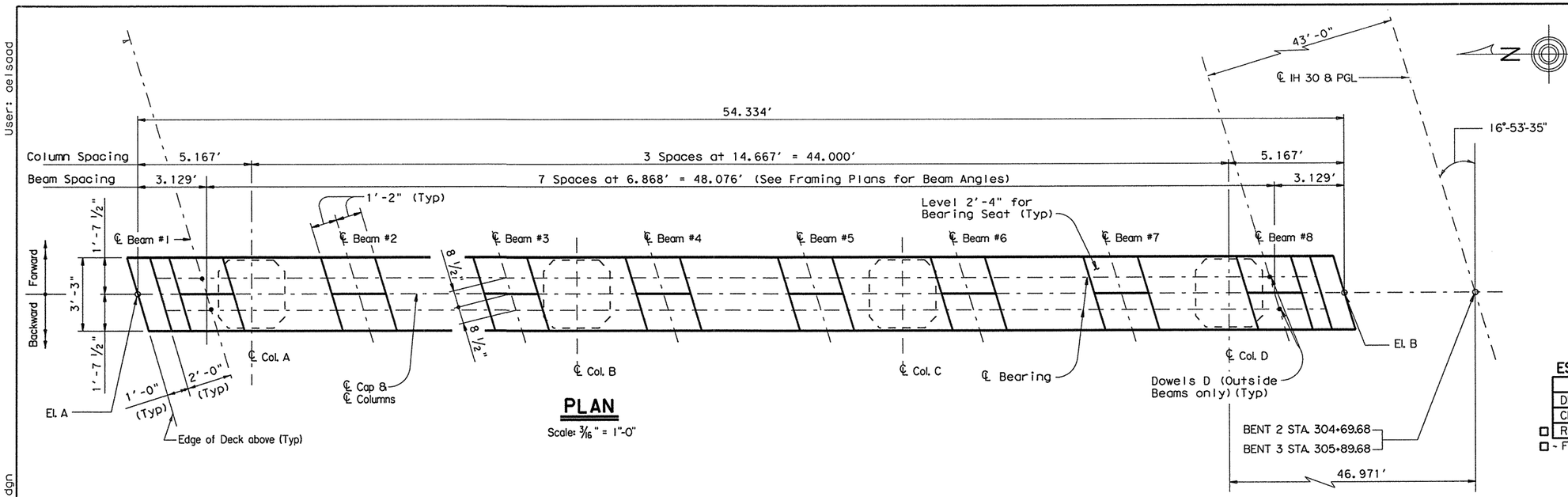
Sheet 18 of 45 Sheets

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IH 30
WB MAINLANES
OVER JOHN KING BLVD
BENT 2 & 3 DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ADS	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
MBP	TEXAS	DALLAS	ROCKWALL	300A
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GRPH CHECK				
SNP				

User: aelsaad



PLAN
Scale: 3/16" = 1"-0"

TABLE OF ESTIMATED QUANTITIES (ONE BENT)

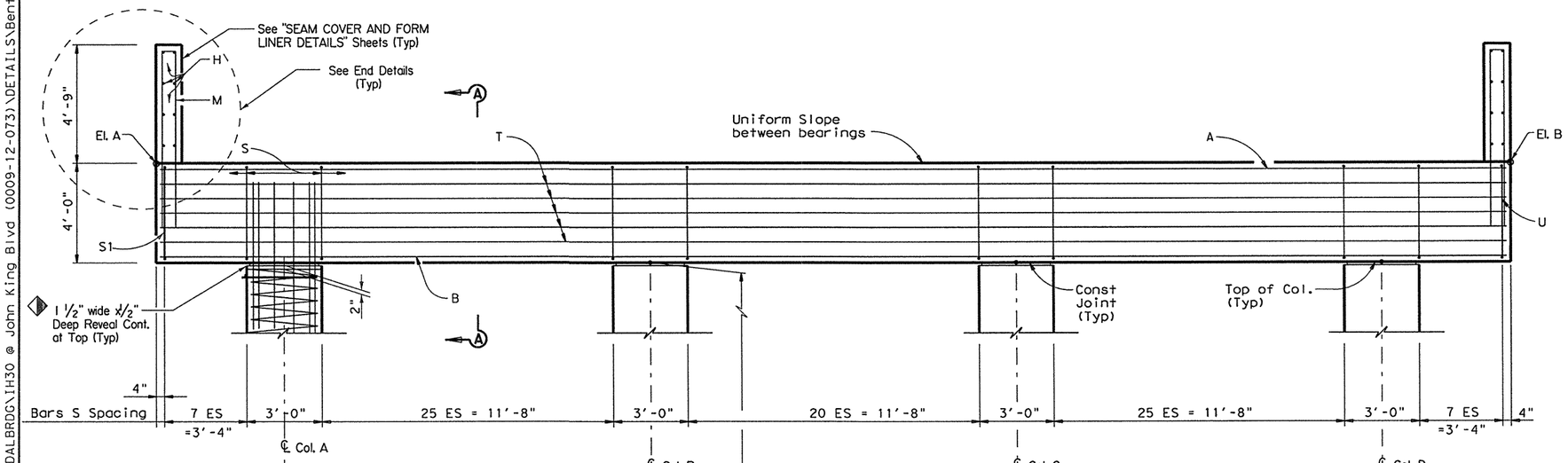
Bar	No.	Size	Length	Weight
A	8	#11	54'-0"	2,295
B	6	#11	54'-0"	1,721
D	4	1¼"D	1'-8"	28
H	8	#5	2'-11"	24
M	4	#5	14'-8"	61
S	89	#5	14'-0"	1,300
S1	2	#5	14'-4"	30
T	10	#5	54'-0"	563
◆ Reinforcing Steel			Lb	6,022
Class "C" Concrete (Cap)			CY	27.6

◆ - For Contractor's information only.

ESTIMATED QUANTITIES

ITEM	UNIT	BENT 2	BENT 3
DRILL SHAFT (36")	LF	144	144
CL C CONC (BENT)	CY	47.7	47.7
□ REINF STL	LB	9,070	9,070

□ - For Contractor's information only.



ELEVATION
Scale: 3/16" = 1"-0"

General Notes:

Include the reinforcing extending from the shaft into the Column in the price bid per foot of DRILL SHAFT.

Provide spiral steel with one extra turn at the top, bottom, and at splices.

For framing details not shown, see Framing Plan.

Provide Grade 60 reinforcing for the Cap.

Drilled Shaft reinforcing may be Grade 40.

Finish Bearing Seats with a wood float.

Calculated Drilled Shaft Foundation Load: Bent 2 = 302 Tons/Dr. Shaft.
Bent 3 = 302 Tons/Dr. Shaft.

For Bearing seat elevations, Control elevations, Column schedule and other Details not shown, see "BENT MISC. DETAILS" sheet.



2/6/09

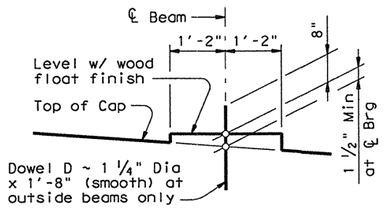
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IH 30
WB MAINLANES
OVER JOHN KING BLVD
BENT 2 & 3 DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ADS	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
MBP	TEXAS	DALLAS	ROCKWALL	300
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SNP				

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BEARING SEAT DETAIL

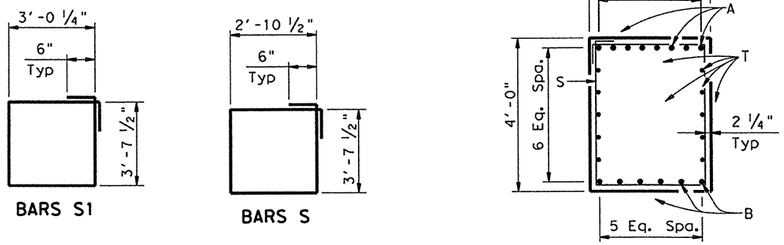
(Bearing surface shall be clean and free of all loose material before placing bearing pad.)

BEARING SEAT ELEVATIONS

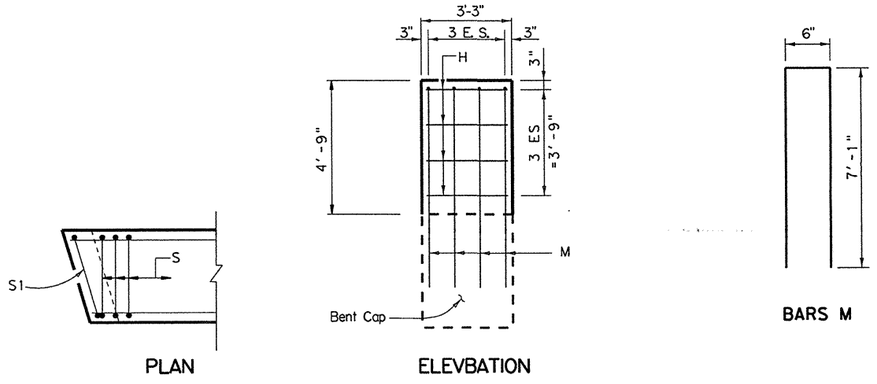
BENT	Bm #1	Bm #2	Bm #3	Bm #4	Bm #5	Bm #6	Bm #7	Bm #8
2	593.22	593.35	593.48	593.61	593.74	593.87	593.99	594.12
3	593.07	593.21	593.35	593.49	593.63	593.76	593.90	594.04

CONTROL ELEVATIONS

	Top of Cap			
Bent	El. A	El. B		
2	593.04	594.06		
3	592.88	593.97		
	Top of Col.			
Bent	Col. A	Col. B	Col. C	Col. D
2	589.14	589.41	589.69	589.96
3	588.98	589.27	589.57	589.87



SECTION A-A



END DETAILS

COLUMN SCHEDULE ~ ONE COLUMN

"H"	Bars V ~ 10-#9		Bars Z ~ #3 Spiral		Est. Quant.-4 Col. Reinf. Steel	Est. Quant.-4 Col. Class C Concrete
FT	Length	Weight	Length	Weight	LBS	CY
13	16'- 6"	561	215	81	2,568	16.4
14	17'- 6"	595	231	87	2,728	17.6
15	18'- 6"	629	247	93	2,888	18.9
16	19'- 6"	663	262	99	3,048	20.1
17	20'- 6"	697	278	105	3,208	21.4
18	21'- 6"	731	294	111	3,368	22.7
19	22'- 6"	765	310	117	3,528	23.9

Adjust spiral Z length by 8.0 Ft. and bars V length by 0.5 Ft. for each 0.5 Ft. variation in "H" value.
Adjust Estimated Quantity of Concrete for each column by 0.2 CY for each 0.5 Ft. variation in "H" value.
Adjust Estimated Quantity of Reinforcing Steel for each column by 20.0 Lb for each 0.5 Ft. variation in "H" value.

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ADNAN AHMAD EL-SAAD
87977
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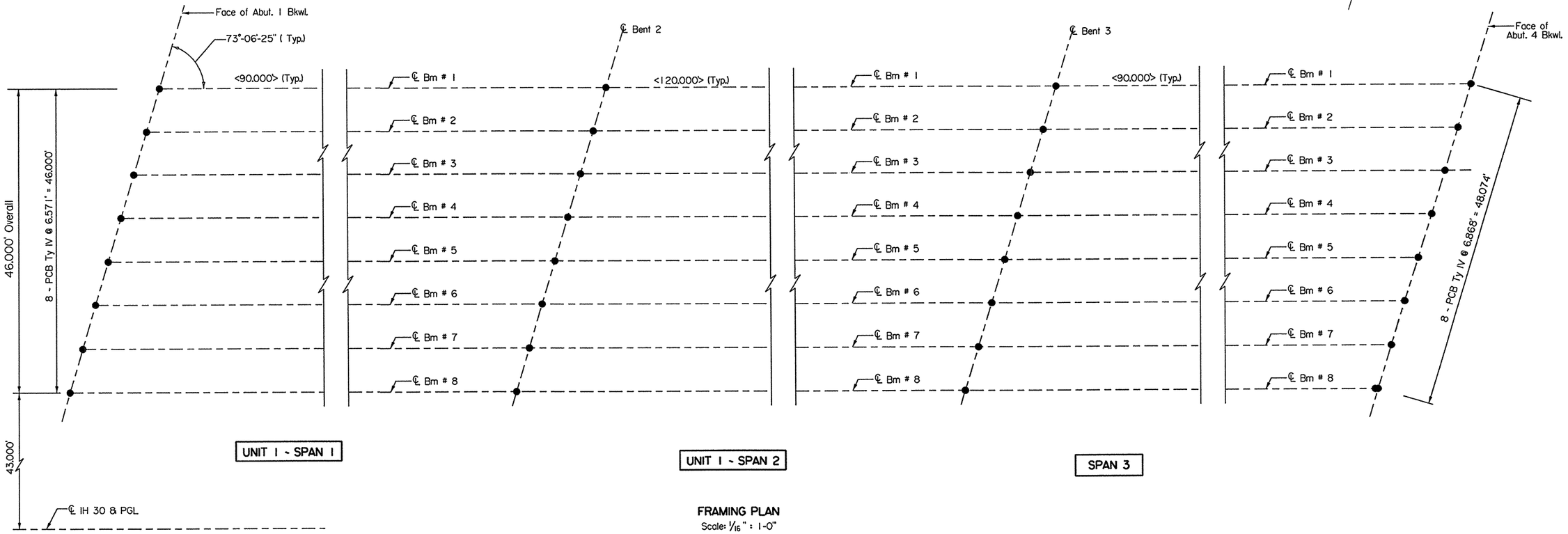
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WB MAINLANES
OVER JOHN KING BLVD
BENT MISC. DETAILS

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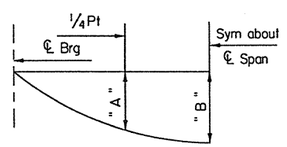


FRAMING PLAN
Scale: 1/16 " = 1-0"

TABLE OF BEAM LENGTHS & DEAD LOAD DEFLECTIONS

Span	Beam		"A" Ft.	"B" Ft.	Length Ft.
1 & 3	1,8	EXT	0.043	0.060	89.659
	2-7	INT	0.044	0.062	89.659
2	1,8	EXT	0.136	0.192	119.667
	2-7	INT	0.162	0.227	119.667

All beam lengths are horizontal length end to end of beam.



Note: Deflections shown are calculated values due to concrete slab only. Field deflections may be less than the calculated values shown. Calculations are based on an Ec of 5,000 ksi.

GENERAL NOTES:
Dimensions shown thus <XXX.XXX> represent horizontal beam lengths Face of Abut. Bkwl. to Centerline of Bent or Centerline to Centerline of Bents.
All dimensions are in feet unless otherwise shown.

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IH 30

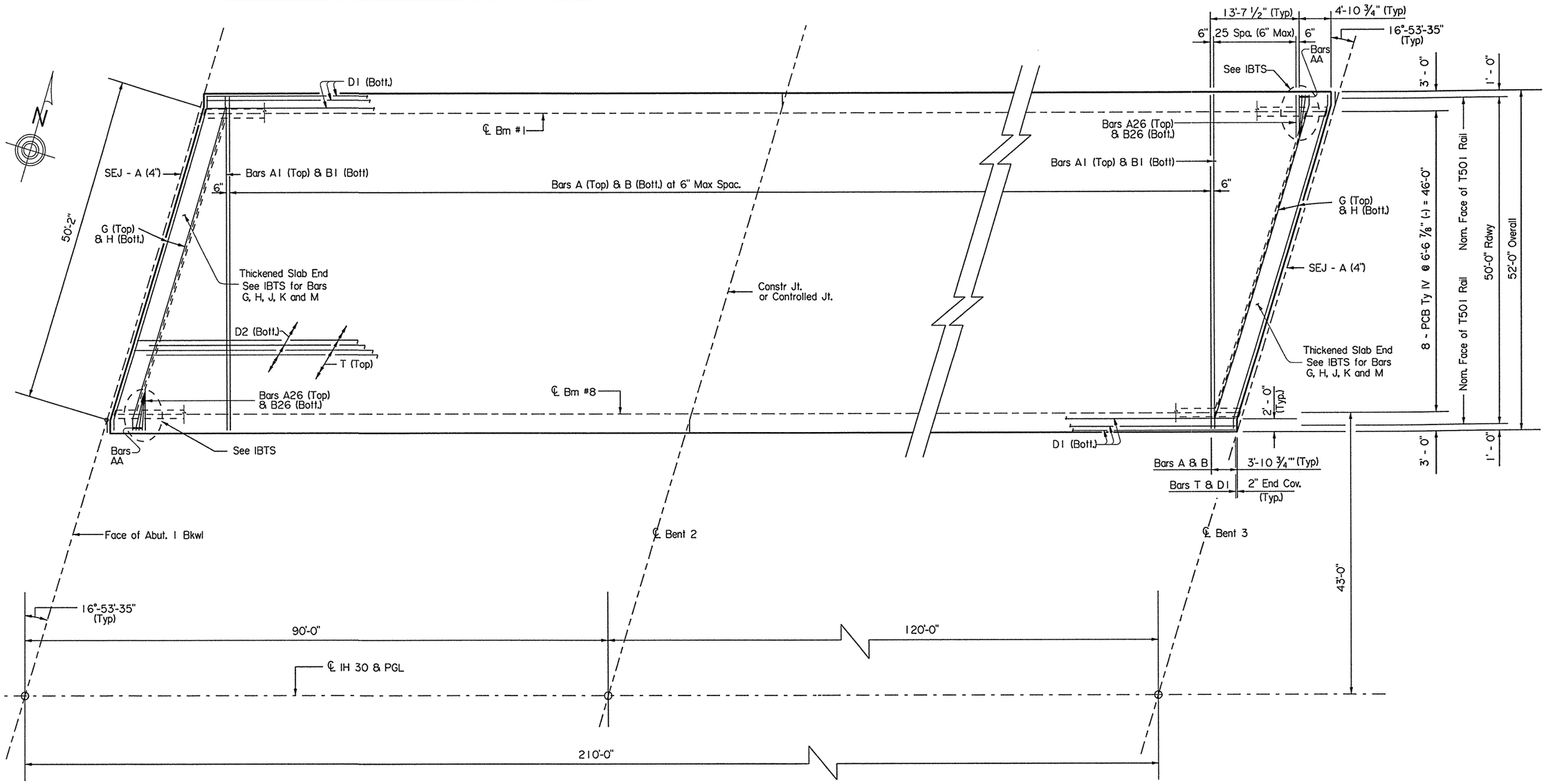
WB MAINLANES OVER JHON KING BLVD

FRAMING PLAN

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SNP	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
GRAPHICS SNP	TEXAS	DALLAS	ROCKWALL	302
GRPH CHECK	CONTROL	SECTION	JOB	
ADS	0009	12	073	

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TIME: 2:42:06 PM
DATE: 2/6/2009



UNIT 1 - SPAN 1 | **UNIT 1 - SPAN 2**

PLAN
Scale: 1/16" = 1'-0"

BAR TABLE	
BAR	SIZE
A	#5
AA	#5
B	#5
D	#5
G	#5
H	#5
J	#5
K	#5
M	#5
T	#4

General Notes:
Provide Class S Concrete, f'c = 4 ksi.
For beam, bearing pad, misc. slab and thickened slab end details not shown, see IBD, IBEB, IBMS, IBTS and IBNS.
For Sealed Expansion Joint details not shown, see SEJ-A.
For Sealed Expansion Joint Quantities not shown, see Summary of Estimated Quantities.
Place and finish not less than 30 feet of Bridge Deck concrete per hour.
For rail details not shown, see Traffic Rail Type T501
For framing details not shown, see Framing Plan.
Provide epoxy coated, Grade 60 reinforcing.
Where required, provide bar laps as follows:
#4 = 2'-1"
#5 = 2'-7"
See PCP or PMDF Standards for details and quantity adjustments if either of these options are used.

Provide a construction joint or controlled joint at the center line of interior Bent 2. Break the construction joint or controlled joint 2 feet from edge of slab & directed normal to the edge of slab.

For Trannsverse Section, see "SLAB SECTION DETAILS" sheet.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
	REINF CONC SLAB	SF	10,920
	PRESTR CONC BEAM (TY IV)	LF	1674.61
≠	CL S CONC (SLAB)	CY	277.2
◇≠	REINF STL	LB	70,980

≠ - For Contractor's information only.
◇ - Reinforcing Steel Weight is calculated using an approximate factor of 6.5 Lb/SF for slab.

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Aaahman
2/6/09

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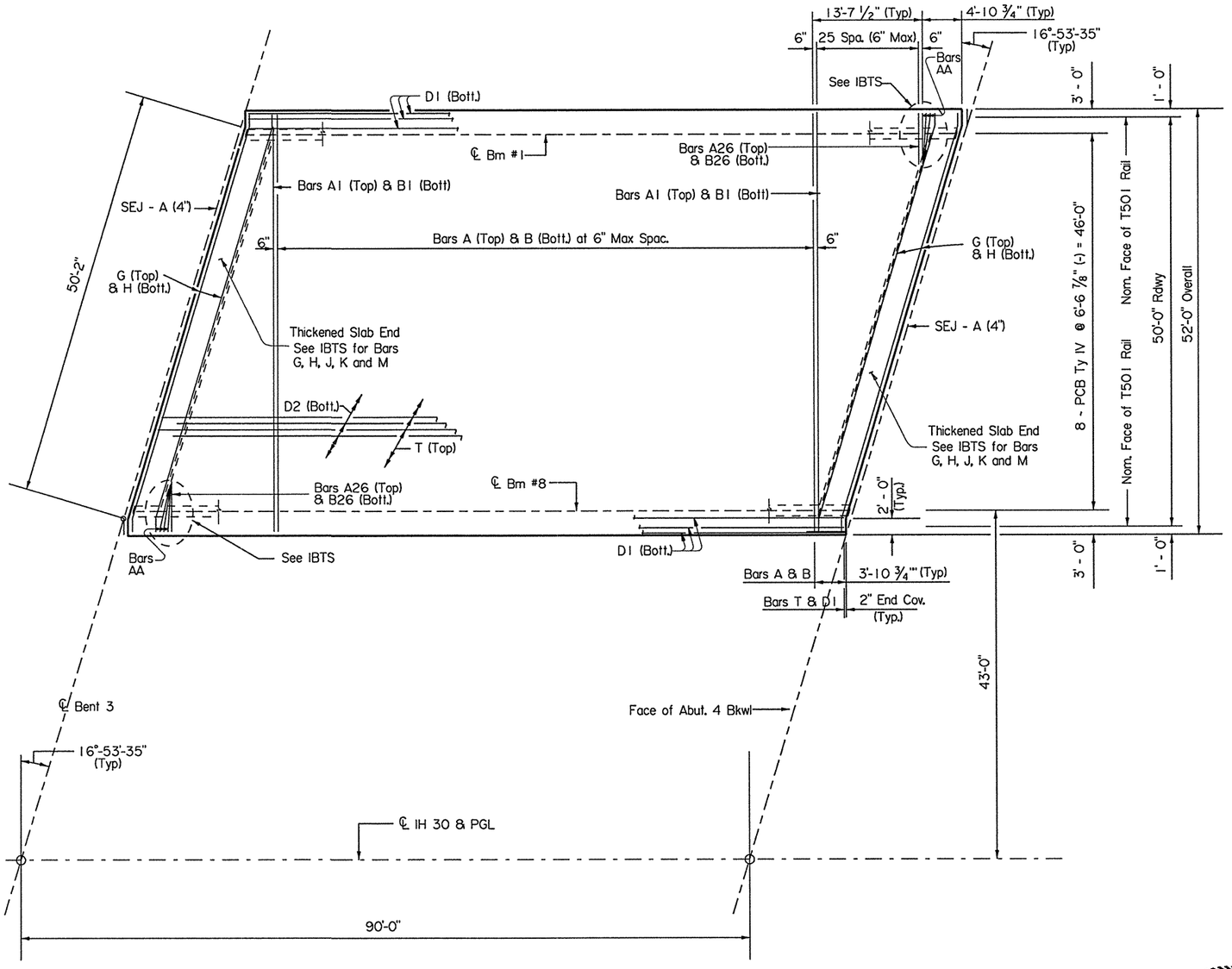
Sheet 21 of 45 Sheets

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IH 30
WB MAINLANES
OVER JOHN KING BLVD
SLAB DETAILS - UNIT 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT				
GRAPHICS	TEXAS	DALLAS	ROCKWALL	303
ADS	CONTROL	SECTION	JOB	
GRPH CHECK	0009	12	073	
SNP				

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ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
	REINF CONC SLAB	SF	4,680
	PRESTR CONC BEAM (TY IV)	LF	717.27
⧧	CL S CONC (SLAB)	CY	119.8
◇⧧	REINF STL	LB	30,420

⧧ - For Contractor's information only.
◇ - Reinforcing Steel Weight is calculated using an approximate factor of 6.5 Lb/SF for slab.

General Notes:
Provide Class S Concrete, f'c = 4 ksi.
For beam, bearing pad, misc. slab and thickened slab end details not shown, see IBD, IBEB, IBMS, IBTS and IBNS.
For Sealed Expansion Joint details not shown, see SEJ-A.
For Sealed Expansion Joint Quantities not shown, see Summary of Estimated Quantities.
Place and finish not less than 30 feet of Bridge Deck concrete per hour.
For rail details not shown, see Traffic Rail Type T501
For framing details not shown, see Framing Plan.
Provide epoxy coated, Grade 60 reinforcing.
Where required, provide bar laps as follows:
#4 = 2'-1"
#5 = 2'-7"
See PCP or PMDF Standards for details and quantity adjustments if either of these options are used.

For Trannsverse Section, see "SLAB SECTION DETAILS" sheet.

BAR TABLE	
BAR	SIZE
A	#5
AA	#5
B	#5
D	#5
G	#5
H	#5
J	#5
K	#5
M	#5
T	#4

SPAN 3

PLAN
Scale: 1/16 " = 1'-0"

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2/6/09

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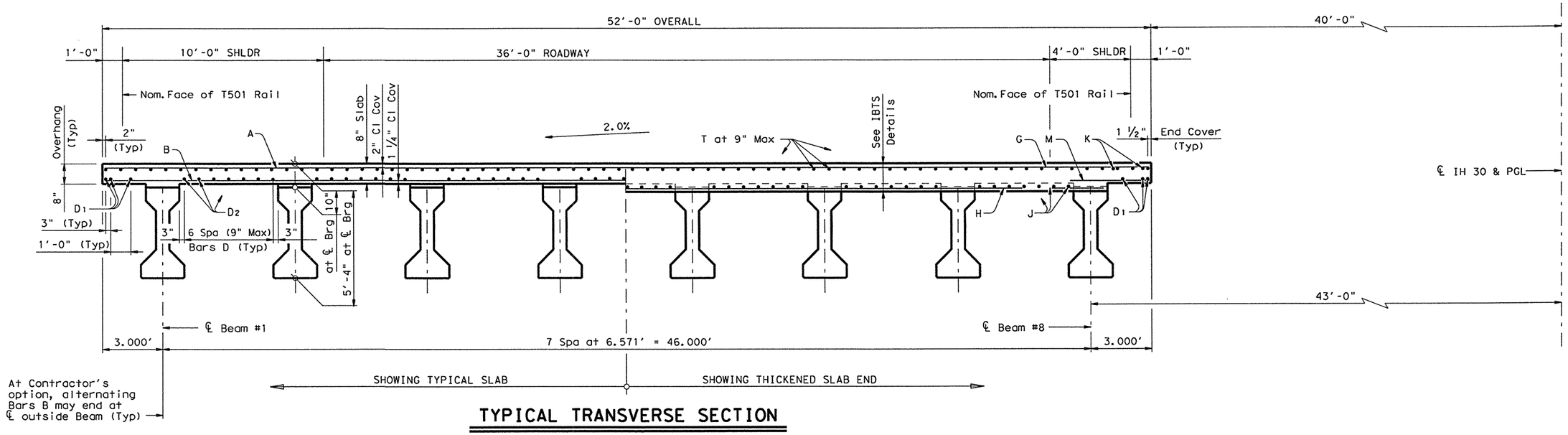
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Sheet 22 of 45 Sheets

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IH 30
WB MAINLANES
OVER JOHN KING BLVD
SLAB DETAILS - SPAN 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT	TEXAS	DALLAS	ROCKWALL	304
GRAPHICS ADS	CONTROL	SECTION	JOB	
GRPH CHECK SNP	0009	12	073	



TYPICAL TRANSVERSE SECTION

Scale: 3/16" = 1'-0"

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IH 30
WB MAINLANES
OVER JOHN KING BLVD
SLAB SECTION DETAILS

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TxDOT	6	(See Title Sheet)		IH 30
DESIGN CK	STATE	DISTRICT	COUNTY	SHEET NO.
TxDOT	TEXAS	DALLAS	ROCKWALL	305
GRAPHICS	CONTROL	SECTION	JOB	
ADS				
GRPH CHECK	0009	12	073	
SNP				

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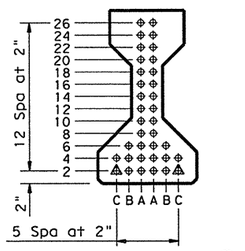
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DESIGNED BEAMS (DEPRESSED STRANDS)

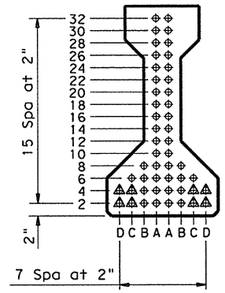
STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	NON-STD STRAND PATTERN	PRESTRESSING STRANDS TOTAL NO.	TOTAL SIZE (in)	TOTAL STRGTH fpu (ksi)	TOTAL "e" ℄ (in)	TOTAL "e" END (in)	DEPRESSED NO.	DEPRESSED TO (in)	CONCRETE RELEASE STRGTH f'ci (ksi)	CONCRETE MINIMUM 28 DAY COMP STRGTH f'c (ksi)
IH 30 EB / WB MAINLANES OVER JOHN KING BLVD	1 & 3	ALL	IV		28	½	270	21.32	16.18	6	30.0	4.000	5.000
	2	ALL	IV		64	½	270	18.00	9.69	14	52.0	6.482	6.482

OPTIONAL DESIGN

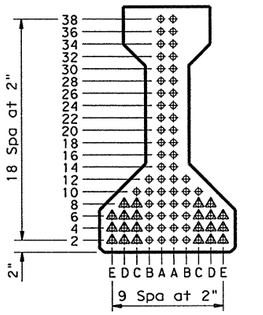
STRUCTURE	SPAN NO.	BEAM NO.	BEAM TYPE	NON-STD STRAND PATTERN	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	LIVE LOAD DISTRIB FACTOR ①
IH 30 EB / WB MAINLANES OVER JOHN KING BLVD	1 & 3	ALL	IV		2.399	-2.664	4636	0.588
	2	ALL	IV		4.309	-4.627	7564	0.545



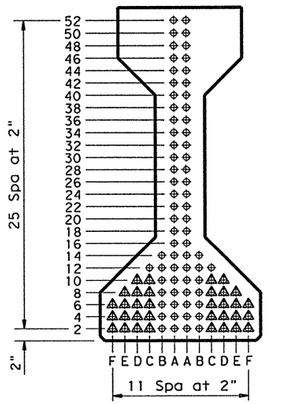
TYPE A BM ②



TYPE B BM ②



TYPE C BM ②



TYPE IV BM ②
(AASHTO TYPE IV BM)

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF BEAM

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.

All concrete shall be Class H. All reinforcing bars shall be Grade 60.

When shown on this sheet, the Fabricator has the option of furnishing either the designed depressed strand beam or an approved optional design. All optional design submittals shall be signed, sealed and dated by a registered Professional Engineer.

Optional designs for beams 120 feet or longer shall have a calculated residual camber equal to or greater than that of the designed beam.

Prestress losses for the designed beams have been calculated for a relative humidity of 65 percent. Optional designs shall likewise conform.

Certain beams with depressed strands are subject to cracking in the end of the beam. When such cracks occur, all subsequent beams of the same type and strand pattern shall have strands debonded in the following manner:

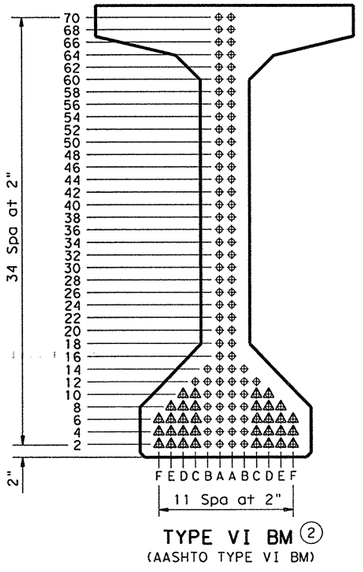
1. Alternate rows of depressed strands shall be debonded for two feet from each end of the beam.
2. One half of the straight strands, as nearly as possible, shall be debonded for four feet from each end of the beam.
3. The debonding pattern shall be symmetrical about the vertical axis of the beam for both depressed and straight strands.
4. Strands shall be debonded so that the centers of gravity of the depressed strands and the straight strands will remain within one inch of their original location.
5. Strands shall be encased in plastic tubing along entire debonded length, and ends of tubing shall be sealed with waterproof tape. Split plastic tubing may be used provided the seam of the tubing is sufficiently sealed with waterproof tape to prohibit grout infiltration. Wrapping of strands with tape to provide debonding will not be permitted.
6. Revised shop drawings will not be required.

For depressed strand designed beams, strands shall be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2", then row "4", then row "6", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position shall be depressed, maintaining the 2" spacing so that, at the beam ends, the upper two strands are in the position shown in the table.

Strands for the designed beam shall be low relaxation strands pretensioned to 75 percent of fpu each.

① Portion of full HL93

② Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.



TYPE VI BM ②
(AASHTO TYPE VI BM)

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HL93 LOADING

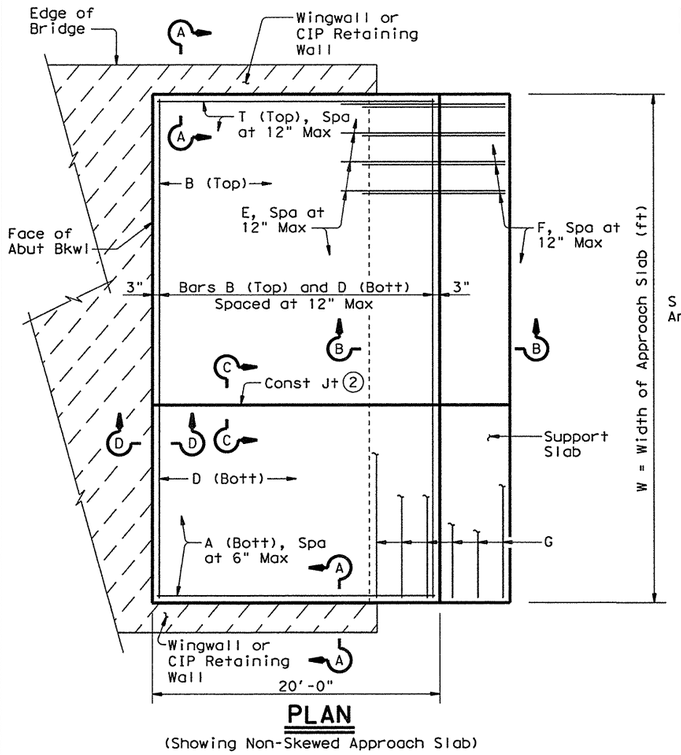
Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE I-BEAM DESIGNS (NON-STANDARD SPANS)

IBND

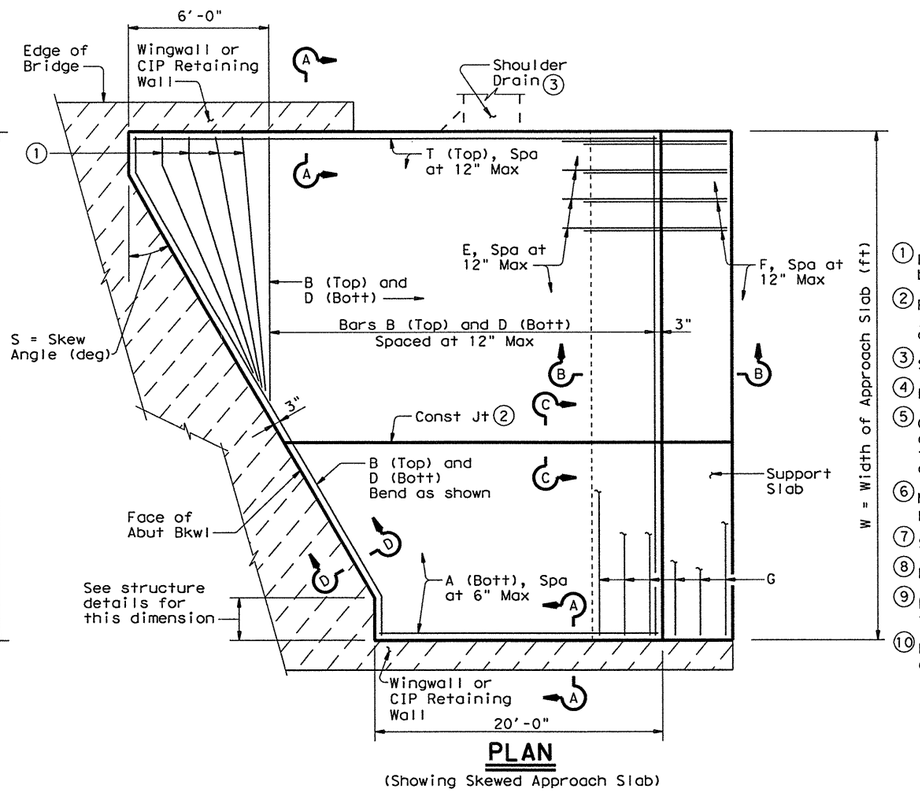
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©TxDOT January 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 01-06: Full-length debonding				306
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

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PLAN

(Showing Non-Skewed Approach Slab)



PLAN

(Showing Skewed Approach Slab)

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
E	#5
F	#5
G	#5
T	#5

APPROXIMATE QUANTITIES (4)

Reinf steel weight = 8.5 Lbs/SF of Approach Slab
= 18.4 Lbs/LF of Support Slab

Area of Appr Slab = $20W + 0.5W^2 \tan S$ (SF)
(Support Slab not included)

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only.

(5) On portion of support slab that supports the concrete pavement, adjust top surface elevation, if required, to accommodate concrete pavement thickness. Smooth trowel finish. Oil top of support slab with 60 grade oil and apply heavy coat of powdered graphite. Press down one layer of 30# roofing felt.

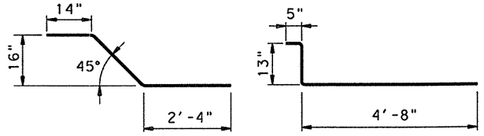
(6) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

(7) See details elsewhere in plans for required cross-slope.

(8) Place in accordance with Item 438.

(9) Backer rod shall be 25% larger than joint opening and shall be compatible with the sealant.

(10) Place ½" Preformed Bituminous Fiber Material between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.



BARS E (#5) BARS F (#5)

GENERAL NOTES:

Construct approach slab in accordance with Item 420.

Concrete shall be Class "S" with a minimum compressive strength of 4,000 psi.

All reinforcing steel shall be Grade 60.

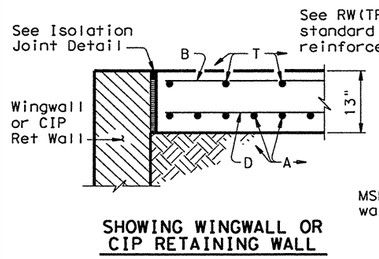
Construct the subgrade or subbase from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

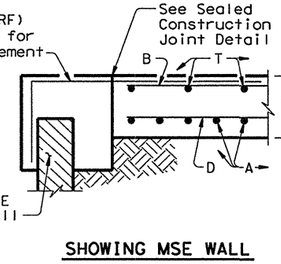
Cure for 4 days using water or membrane curing per Item 420.

Sealant, backer rod and preformed bituminous fiber material is subsidiary to approach slab concrete.

Provide a 1" bondbreaker (asphaltic concrete pavement or asphalt stabilized base) between the approach slab and cement stabilized backfill or cement treated base. Other bondbreakers may be used if approved by the Engineer.

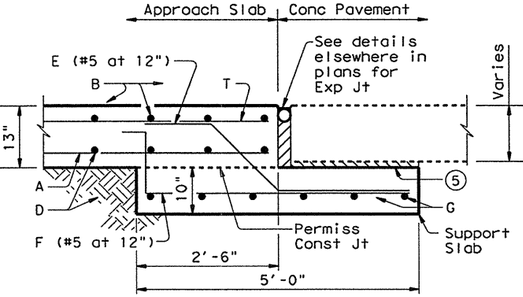


SHOWING WINGWALL OR CIP RETAINING WALL

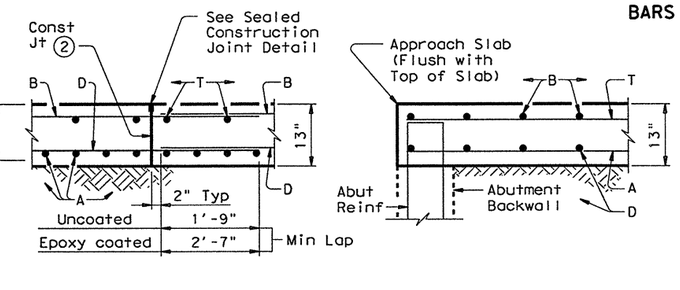


SHOWING MSE WALL

SECTION A-A

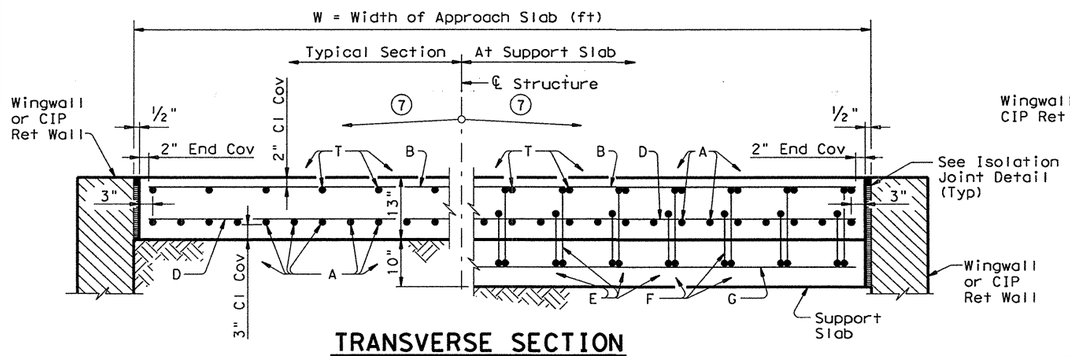


SECTION B-B

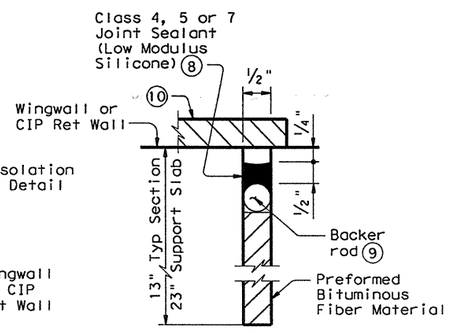


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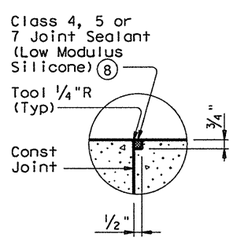
SECTION D-D



TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

Sheet 25 of 45 Sheet

Texas Department of Transportation
Bridge Division

BRIDGE APPROACH SLAB

CONCRETE PAVEMENT

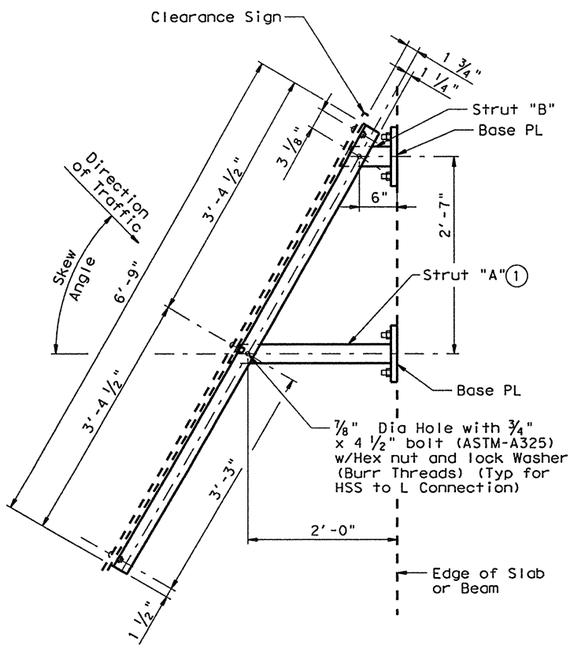
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©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
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	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

PATH:
LEVELS D
0
1

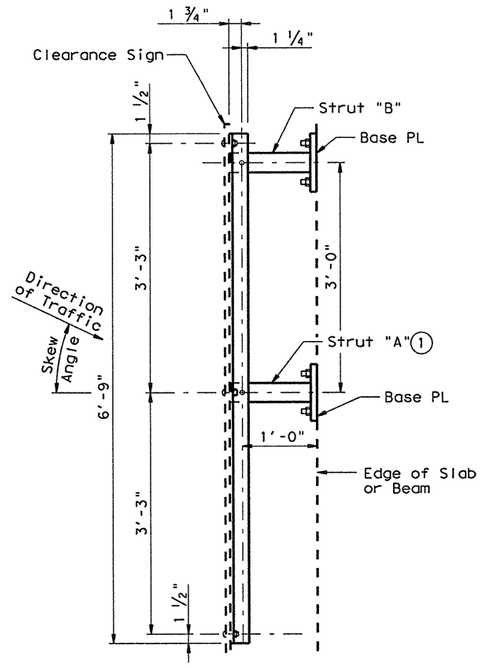
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ACC:
FED
LEVELS



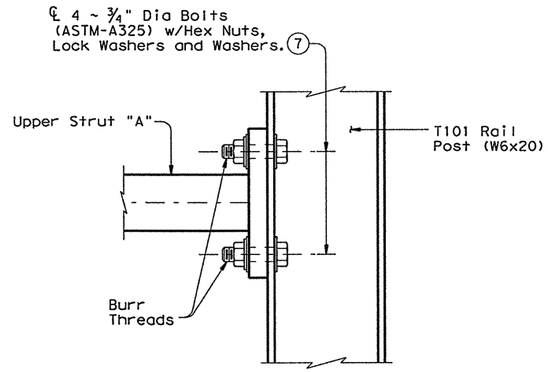
PLAN OF TYPE S MOUNT

(Used for Skews over 30°)

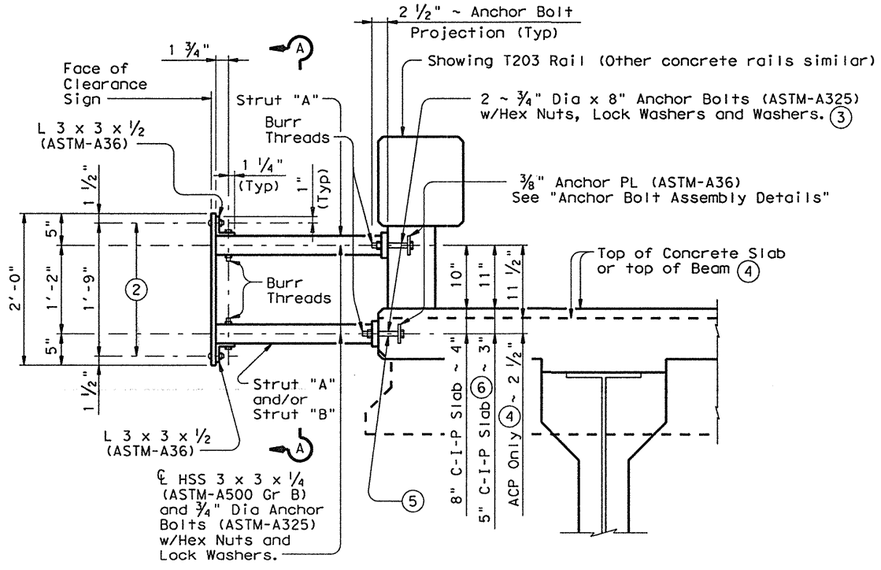


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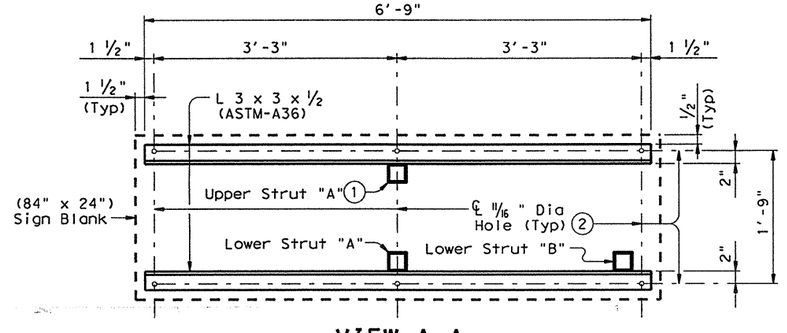
(Used for 0° to 30° Skews)



SHOWING ELEVATION VIEW OF CONNECTION AT T101 RAIL POST



SECTION



VIEW A-A

(1) Locate centerline of Strut A no closer than 12" from a vertical concrete edge.

(2) ℄ 5/8" Dia x 2" Hexagon Socket Button Head Cap Screws (ASTM A574) w/Hex Nuts. Attach hex nuts to L 3 x 3 x 1/2 by tack welding in two places. Threads shall have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

(3) Epoxy anchors utilizing 3/4" Dia A193 Grade B7 anchor rods (no expansion anchors) can be substituted for the anchor bolts detailed at all locations. Minimum pullout strength of epoxy anchors must exceed 7 kips, taking spacing and edge distances into consideration. Install according to the manufacturer's specifications. Min embedment allowed is 6". Galvanize anchor rods and lock washers and washers used with optional epoxy anchors.

(4) For Prestressed Concrete Box Beams and Dbl-T Beams topped with a 2 course surface treatment and ACP overlay.

(5) Anchor bolts to be cast in Box Beams and Dbl-T Beams topped with a 2 course surface treatment and ACP overlay. The Anchor Bolts w/Hex Nuts, Lock Washers and Anchor PL that is embeded in the beam will be provided by the beam fabricator.

(6) For Prestressed Concrete Box Beams, Slab Beams and Dbl-T Beams with a composite cast-in-place slab used as a topping.

(7) Field Drill 13/16 " Holes in back of T101 Rail Post.

GENERAL NOTES:

This standard provides details to mount a vertical clearance sign (84" x 24") to bridges. Rail Types T6, T77, PR1 and PR2 are not accommodated.

The vertical face of clearance sign will be plumb unless otherwise approved by the Engineer.

All steel components shall be galvanized after fabrication unless otherwise noted.

The Engineer will furnish the clearance to be shown on the sign.

See Bridge Layout for sign location and mounting type (Type N or S).

Cost of furnishing, installing, relocating or removing a Clearance Sign will be included in unit price bid for "Aluminum Signs (Type A)".

One Sign Blank (84" x 24") is 14 SF.

Average steel weight for one complete Type N Mount is 209 Lb.

Average steel weight for one complete Type S Mount is 222 Lb.

Sign mounts will be paid for at the unit price bid for "Structural Steel (Misc)".

Texas Department of Transportation
Bridge Division

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

SHEET 1 OF 2 **BMCS**

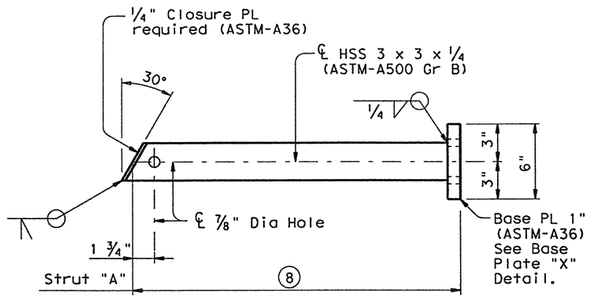
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©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT			SHEET	
REVISIONS 08-2007: Removed reference of W12-2P.					308	
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		0009	12	073	IH 30

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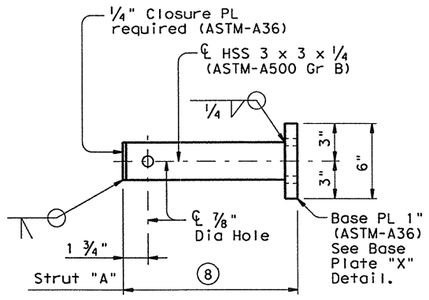
ACC:

LEVELS

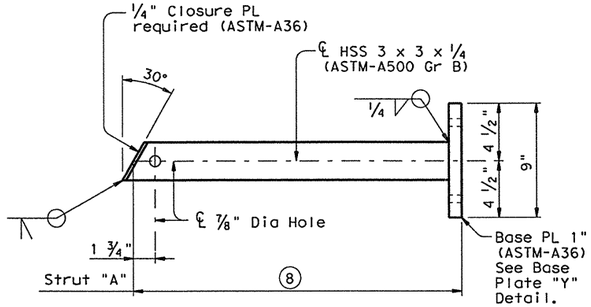
XED



FOR T101, T411 AND C411 RAIL TYPES



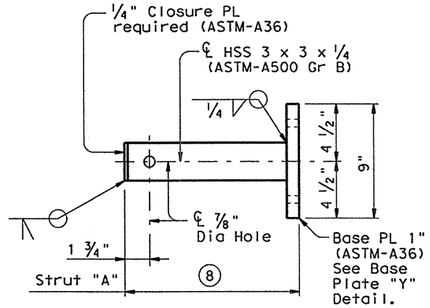
FOR T101, T411 AND C411 RAIL TYPES



FOR T203, C203, T221, C221, T401, T402, C402, T501, C501, T502, C502, T503, T504, HT AND SSTR RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

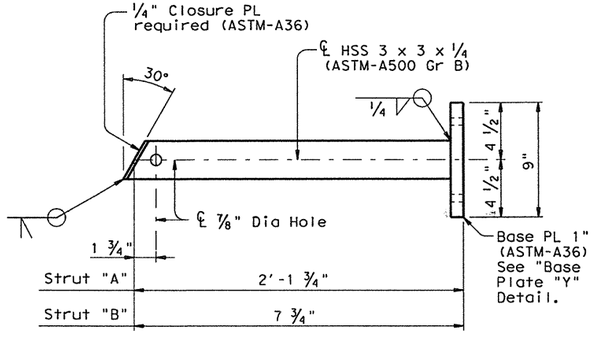
(Used for Skews over 30°)



FOR T203, C203, T221, C221, T401, T402, C402, T501, C501, T502, C502, T503, T504, HT AND SSTR RAIL TYPES

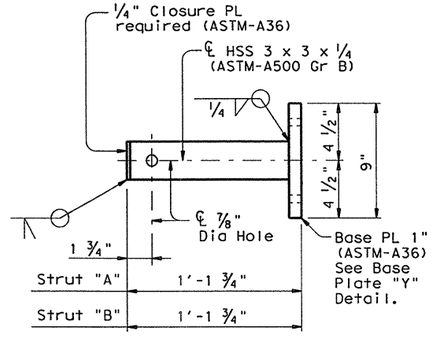
UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° Skews)



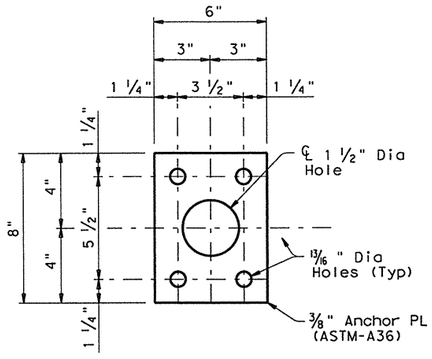
LOWER STRUT DETAILS FOR (TYPE S MOUNT)

(Used for Skews over 30°)

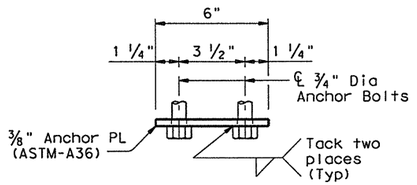


LOWER STRUT DETAILS FOR (TYPE N MOUNT)

(Used for 0° to 30° Skews)



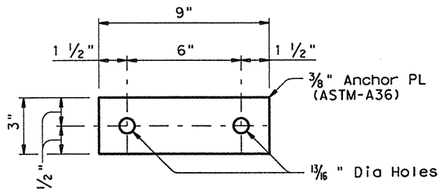
PLAN OF ANCHOR PLATE



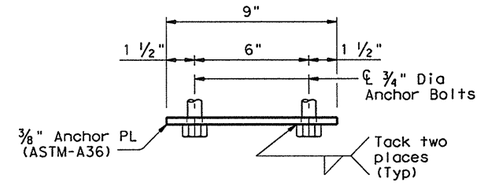
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(USED ON UPPER BASE PLATE "X" WITH T411 & C411 RAIL TYPES)



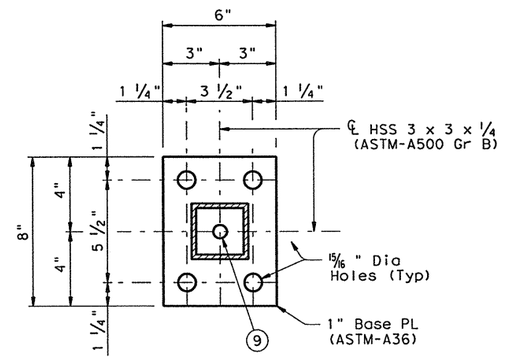
PLAN OF ANCHOR PLATE



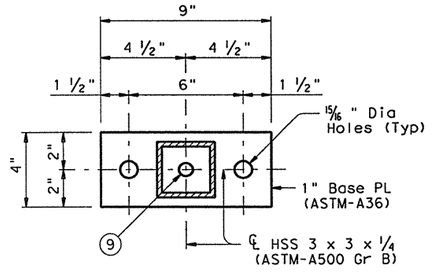
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(USED ON UPPER AND/OR LOWER BASE PLATE "Y")



BASE PLATE "X" DETAIL



BASE PLATE "Y" DETAIL

(3) Epoxy anchors utilizing A193 Grade B7 anchor rods (no expansion anchors) can be substituted for the anchor bolts detailed at all locations. Minimum pullout strength of epoxy anchors must exceed 7 kips, taking spacing and edge distances into consideration. Install according to the manufacturer's specifications. Min embedment allowed is 6". Galvanize anchor rods and lock washers and washers used with optional epoxy anchors.

(8) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(9) Hole required to drain zinc from base plate during galvanizing.

Texas Department of Transportation
Bridge Division

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

SHEET 2 OF 2 — BMCS

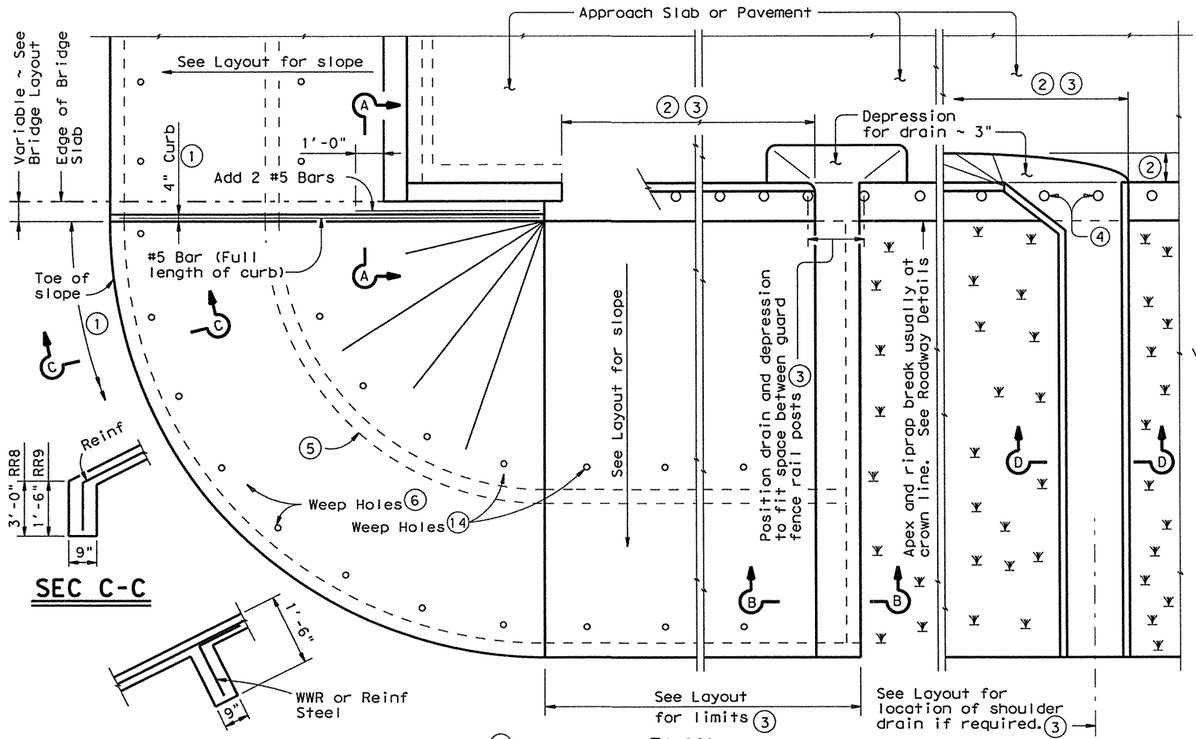
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©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT					SHEET
REVISIONS 08-2007: Removed reference of W12-2P.							309
	COUNTY		CONTROL	SECT	JOB	HIGHWAY	
	ROCKWALL		0009	12	073	IH 30	

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PATH:

LEVELS D

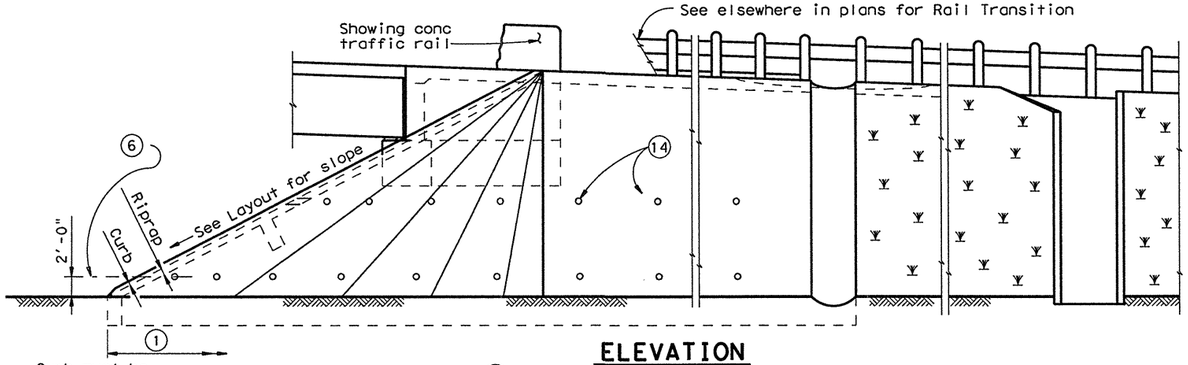
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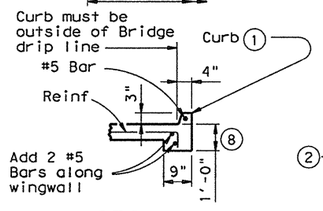
PLAN

SEC C-C

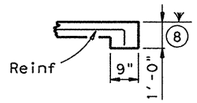
OPTIONAL INTERMEDIATE TOEWALL (5)



ELEVATION

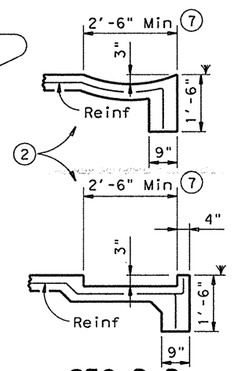


SEC A-A



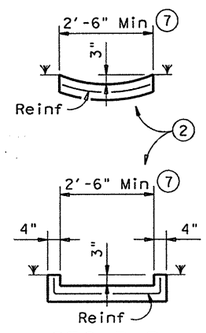
SEC B-B

(No Drain)



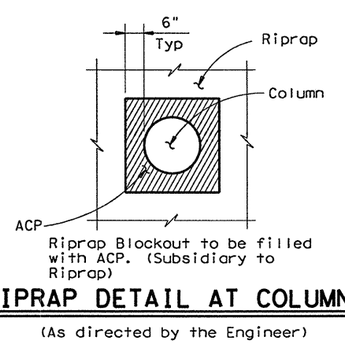
SEC B-B

(Shoulder Drain integral with riprap)



SEC D-D

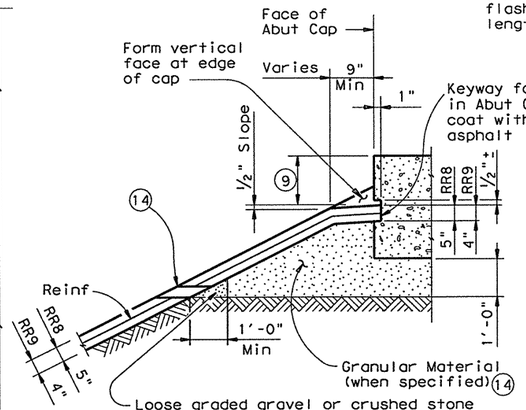
(Shoulder Drain)



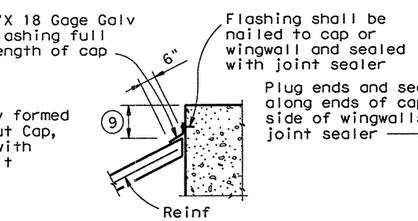
Riprap Blockout to be filled with ACP. (Subsidiary to Riprap)

RIPRAP DETAIL AT COLUMNS

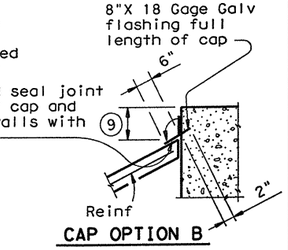
(As directed by the Engineer)



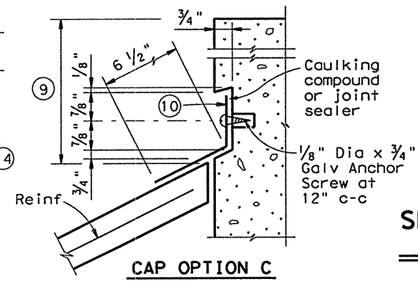
SHOWING KEYWAY OPTION



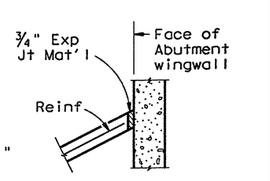
CAP OPTION A



CAP OPTION B

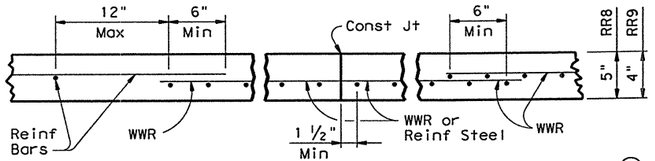


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



DETAILS OF WWR, REINF AND CONST JOINT (13)

(1) When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.

(2) Limits and configuration of drains and depressions shall be as shown elsewhere in plans or as directed by the Engineer.

(3) Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(4) See details elsewhere in plans for installation of guard fence posts through concrete riprap.

(5) The optional intermediate toewall shall be constructed when designated elsewhere in the plans or included in the specifications.

(6) Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.

(7) Wider or other drain configurations shall be used if shown elsewhere in plans or if directed by the Engineer.

(8) Wall extension may be reduced or modified if approved by the Engineer. Wall extension shall be increased to 1'-6" whenever the optional intermediate toewall is called for in the plans.

(9) Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

(10) 8" x 18 Gage Galv Sheet Metal

(11) The sealing option of the joint between the face of cap and riprap shall be as designated by the Engineer or as shown elsewhere on plans.

(12) Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.

(13) Reinforcing bars shall be #3 at 18" Spa c-c. Welded Wire Reinforcement (WWR) shall be 6X6-W2.9XW2.9. Combinations of WWR and reinforcing bars may be used if both are permitted. Lap splices shall be a minimum of 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.

(14) If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.

GENERAL NOTES:

Concrete shall be Class "B" with a minimum compressive strength of 2,000 psi unless noted elsewhere in plans.

All reinforcing steel shall be Grade 60.

Reinforcing other than that shown may be used by substituting reinforcement of equal or greater unit cross-sectional area. The maximum reinforcement spacing shall be 18 inches.

Construction joints or grooved joints extending the full slant slope height shall be at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose graded stone behind weep holes, flashing, or other sealing material shall not be paid for directly but shall be subsidiary to the bid item "Riprap".

Unless specified elsewhere in the plans to be only reinforcing bars, the riprap reinforcing may be composed of reinforcing bars, Welded Wire Reinforcement (WWR), or any suitable combination of both types.

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6X6-W2.9XW2.9 = 0.394 Lbs/SF

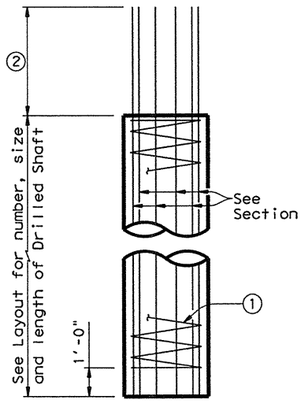
Texas Department of Transportation
Bridge Division

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

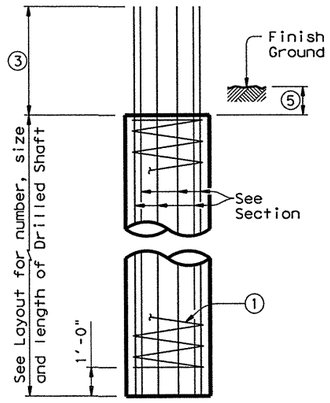
CRR

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©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 08-2007: Revised Note 6, removed "H" reference, added Note 14 & changed weep hole size & spacing.				310
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

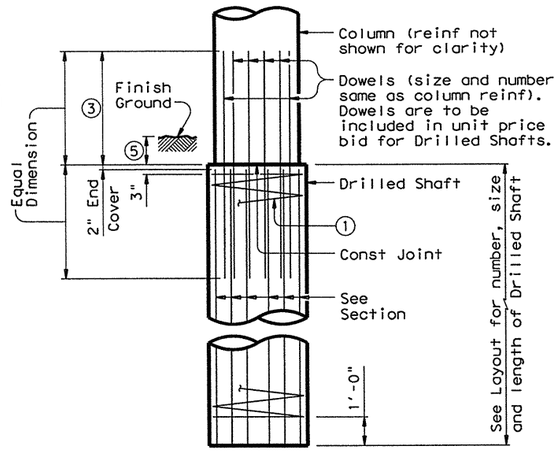
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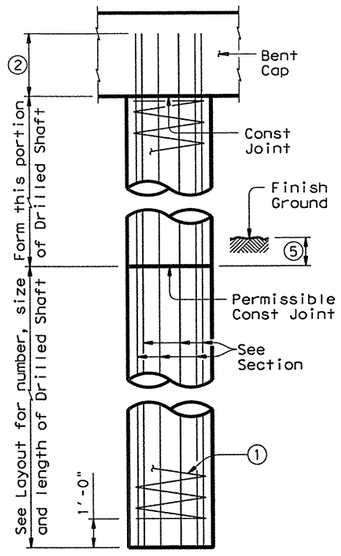
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



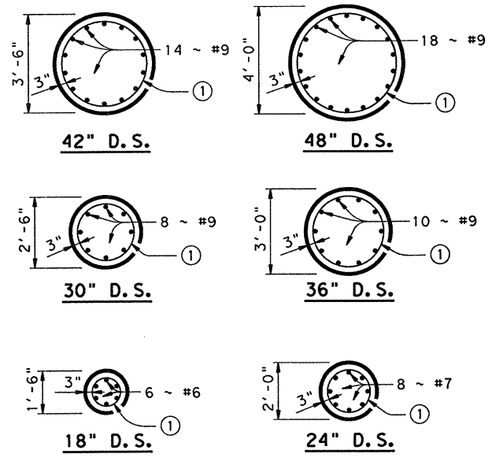
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL④



DRILLED SHAFT SECTIONS

DRILLED SHAFT DETAILS

① #3 Spiral at 6" pitch (One flat turn top & bottom)

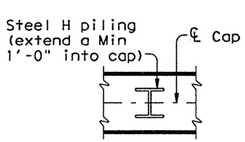
② Min extension into supported element:
#6 Bars = 1'-0"
#7 Bars = 1'-5"
#9 Bars = 2'-3"

③ Min lap with Column reinf:
#7 Bars = 2'-4"
#9 Bars = 3'-10"

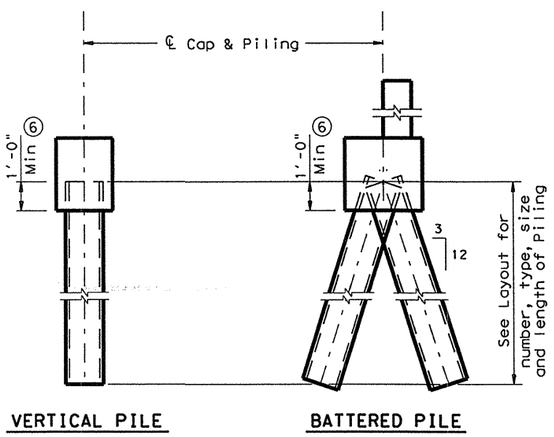
④ If approved by the Engineer, Drilled Shafts may extend to bottom of bent caps for "H" heights of 6 ft or less (as shown on Bridge Layout). This option can only be used when Drilled Shaft Dia equals Column Dia. The forming method shall be submitted for approval prior to construction. No adjustments in payment will be made if this option is used.

⑤ 6" Min at Grade Crossing, 1'-0" Min in Channel.

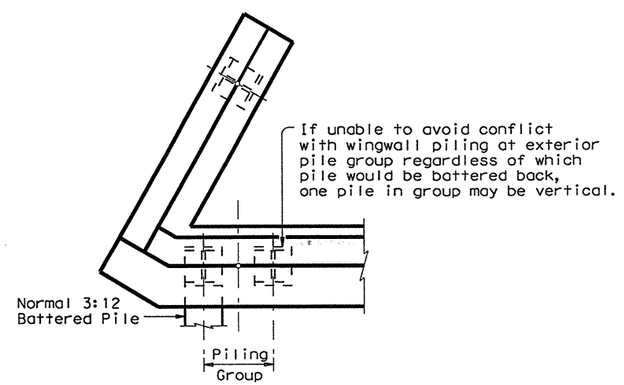
⑥ Or as shown on plans.



ORIENTATION OF STEEL H PILING



PILING DETAILS
(Concrete or Steel H)



DETAIL "A"
(Showing Plan View of a 30° Skewed Abutment)

Sheet 29 of 45 Sheet

Texas Department of Transportation
Bridge Division

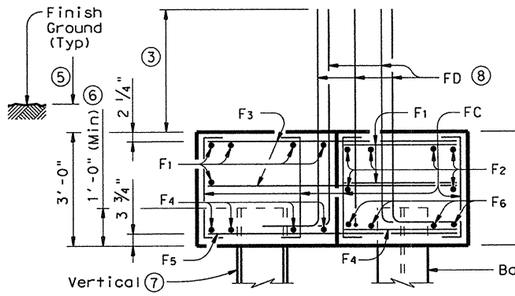
COMMON FOUNDATION DETAILS

SHEET 1 OF 2 **FD**

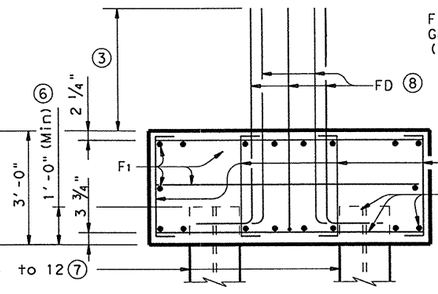
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©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				31
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	ROCKWALL	0009	12	073	IH 30

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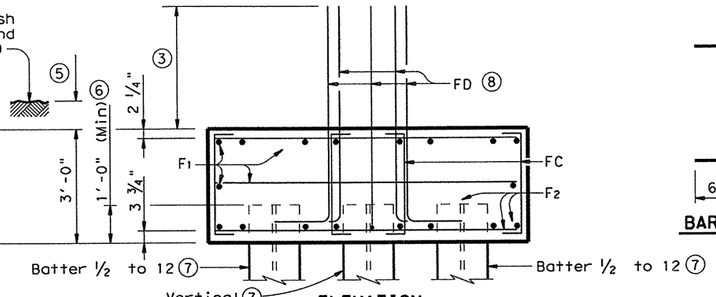
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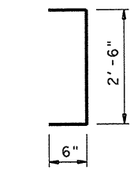
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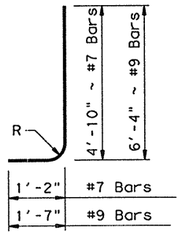
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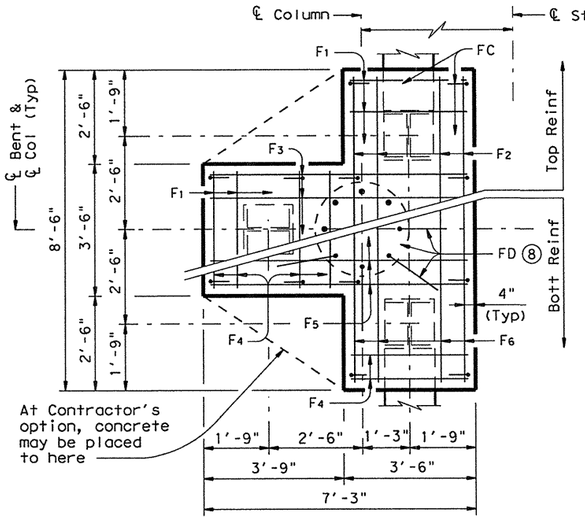


BARS FC

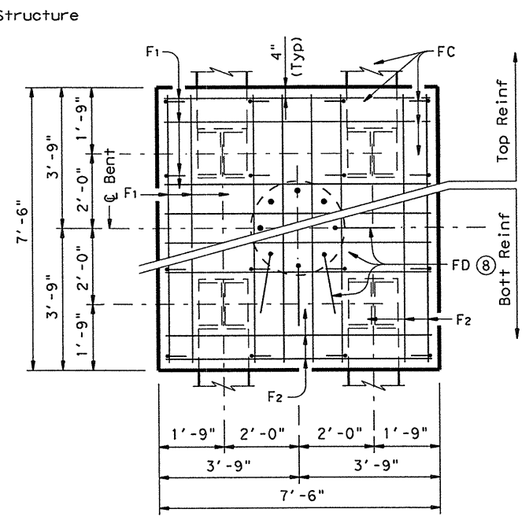


BARS FD ⑧

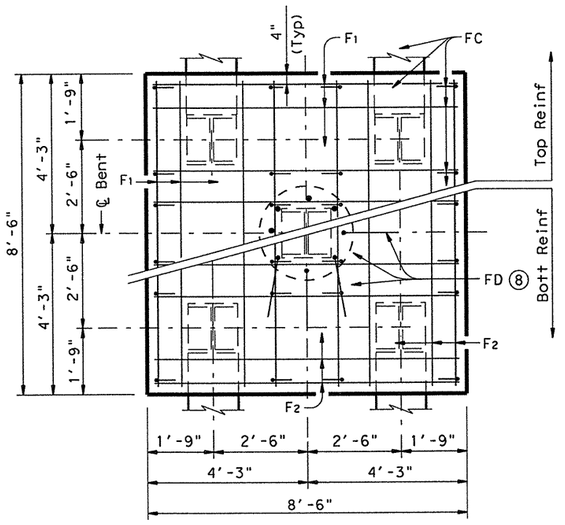
R = 3 1/4" ~ #7 Bars
and 5 1/4" ~ #9 Bars



PLAN



PLAN



PLAN

THREE PILE FOOTING

FOUR PILE FOOTING

FIVE PILE FOOTING

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS				
ONE 3 PILE FOOTING				
Bar	No.	Size	Length	Weight
F_1	11	#4	3'- 2"	23
F_2	6	#4	8'- 2"	33
F_3	6	#4	6'- 11"	28
F_4	8	#9	3'- 2"	86
F_5	4	#9	6'- 11"	94
F_6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD ⑨	8	#9	7'- 11"	215
Reinforcing Steel			Lb	618
Class "C" Concrete			CY	4.8
ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F_1	20	#4	7'- 2"	96
F_2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD ⑨	8	#9	7'- 11"	215
Reinforcing Steel			Lb	654
Class "C" Concrete			CY	6.3
ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F_1	20	#4	8'- 2"	109
F_2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD ⑨	8	#9	7'- 11"	215
Reinforcing Steel			Lb	824
Class "C" Concrete			CY	8.0

③ Min lap with Column reinf:
#7 Bars = 2'-4"
#9 Bars = 3'-10"

⑤ 6" Min at Grade Crossing, 1'-0" Min in Channel.

⑥ Or as shown on plans.

⑦ See Layout for Type, Size and length of Piling.

⑧ Number and size of FD bars must match Column reinforcing. FD bars shall be tied to the top of the bottom mat of reinforcing

⑨ For 24" Columns, use #7 FD bars (6'-0") in place of #9 bars and deduct 116 lbs. For 36" Columns, add 2 FD bars (54 lbs).

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

See Bridge Layout of each Structure for Foundation Type to be used.

Drilled shaft details shown are not to be used for retaining wall, noise wall, barrier or sign foundation without structural evaluation.

Footings shown on this standard are not applicable for columns larger than 36" Diameter.

Details shown on this standard to be used unless shown otherwise in the plans.

Maximum Pile Load for the footings shown shall be as follows : 72 Tons/Pile with 24" Dia Column
80 Tons/Pile with 30" Dia Column
100 Tons/Pile with 36" Dia Column

The footings shown on this Standard are not to be used in direct contact with salt water or exposed to salt water spray.

Drilled Shaft reinforcing may be Grade 40.

Piling under abutment wings to be driven to a minimum resistance of 10 Tons.

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Bridge Division

COMMON FOUNDATION DETAILS

SHEET 2 OF 2 **FD**

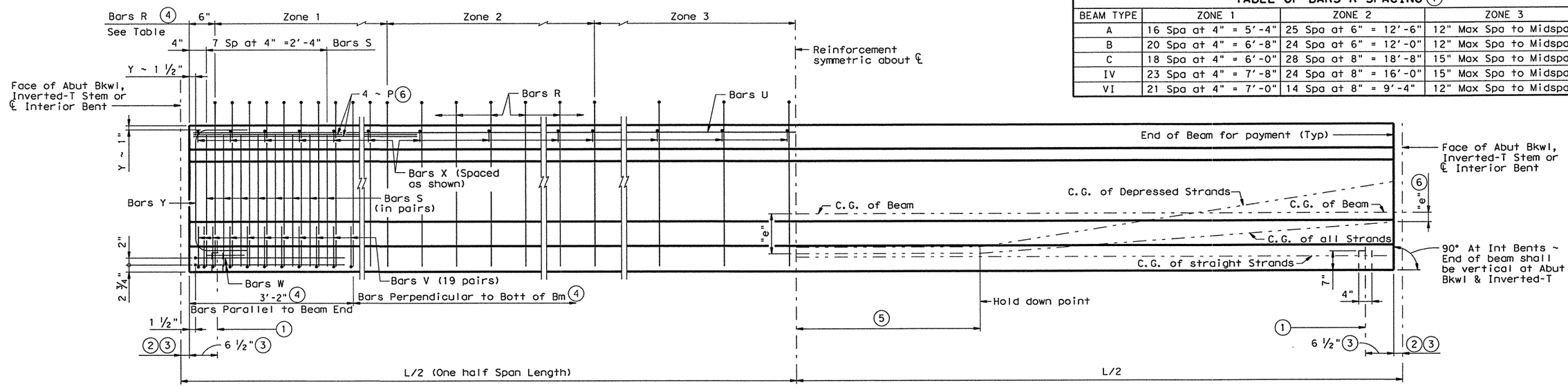
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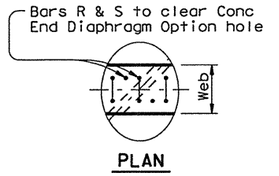
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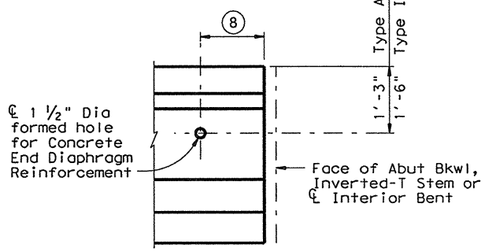
TABLE OF BARS R SPACING (7)			
BEAM TYPE	ZONE 1	ZONE 2	ZONE 3
A	16 Spa at 4" = 5'-4"	25 Spa at 6" = 12'-6"	12" Max Spa to Midspan
B	20 Spa at 4" = 6'-8"	24 Spa at 6" = 12'-0"	12" Max Spa to Midspan
C	18 Spa at 4" = 6'-0"	28 Spa at 8" = 18'-8"	15" Max Spa to Midspan
IV	23 Spa at 4" = 7'-8"	24 Spa at 8" = 16'-0"	15" Max Spa to Midspan
VI	21 Spa at 4" = 7'-0"	14 Spa at 8" = 9'-4"	12" Max Spa to Midspan



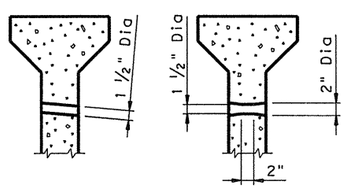
BEAM ELEVATION



PLAN



ELEVATION

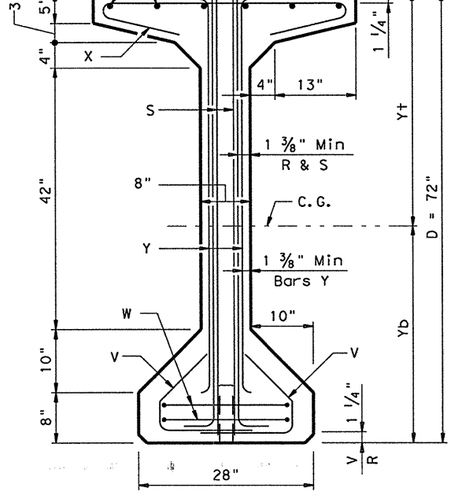


Form holes parallel to roadway slope if superelevation is greater than 0.03'/Ft for 1 ½" Dia holes or 0.06'/Ft for 2" Dia holes.

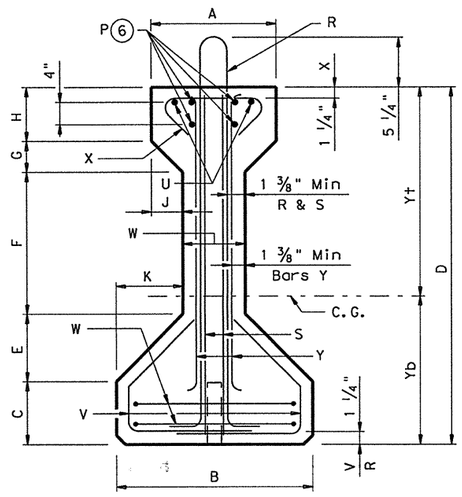
FORMED HOLE SECTIONS

CONCRETE END DIAPHRAGM OPTION HOLE

(Diaphragm holes for lifting purposes will not be permitted.)
Only required when span details require End Diaphragms.



TYPE VI BEAM



TYPES A, B, C & IV BEAMS

TABLE OF BEAM DIMENSIONS AND SECTION PROPERTIES																
BEAM TYPE	A in.	B in.	C in.	D in.	E in.	F in.	G in.	H in.	J in.	K in.	W in.	Yt in.	Yb in.	AREA in.²	I in.⁴	Weight plf
A	12	16	5	28	5	11	3	4	3	5	6	15.39	12.61	275.4	22,658	287
B	12	18	6	34	5 ¾	14	2 ¾	5 ½	2 ¾	5 ¾	6 ½	19.07	14.93	360.3	43,177	375
C	14	22	7	40	7 ½	16	3 ½	6	3 ½	7 ½	7	22.91	17.09	494.9	82,602	516
IV	20	26	8	54	9	23	6	8	6	9	8	29.25	24.75	788.4	260,403	821
VI	See section for beam dimensions											35.60	36.40	1,084.4	732,586	1,130

(1) ℄ 4" x 1 ½" Vertical Slotted Hole at Doweled Beam end [labeled (D) on Bridge Layout]. Required for Outside Beams only or as shown on substructure details. Anchorage holes may be tapered (4 ¾" x 1 ⅝") at base. If holes are formed with sheet metal, forms may be left in place.

(2) 3" ~ Inverted-T Stem, 2" ~ Abutment Bkwl and Interior Bents.

(3) Measured along ℄ Beam at Interior Bents; perpendicular to Abutment Bkwl or Inverted-T Stem.

(4) Spacing shown shall not be exceeded at either top or bottom of beam.

(5) 5'-0" Min or L/20 (- 0 ; + 2'-0") Max.

(6) Bars P (#6 x 10'-0") are only required for Type IV Beams when "e" at beam ends exceeds 14.0". At the fabricator's option, bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars U.

(7) Short beams may not include all of Zone 2 and none of Zone 3 reinforcing.

(8) [(1'-2 ½" ÷ Cos Skew Angle) - 2"] at Interior Bents.
[1'-0 ½" ÷ Cos Skew Angle] at Abutment Bents and Inverted-T Bents.
Measured along beam centerline. Skew Angle = 90° - Beam Angle.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.
All concrete shall be Class H.
Bottom corners of all beam flanges and outside corners of exterior beam ends shall be chamfered ¾" or rounded to a ¾" radius.
All reinforcing bars for beams shall be Grade 60.
An equal area of deformed Welded Wire Reinforcement (WWR) (ASTM A497) may be substituted for Bars R, V, S or X.
It is permissible for bars or strands to come in contact with materials used in forming anchor holes.

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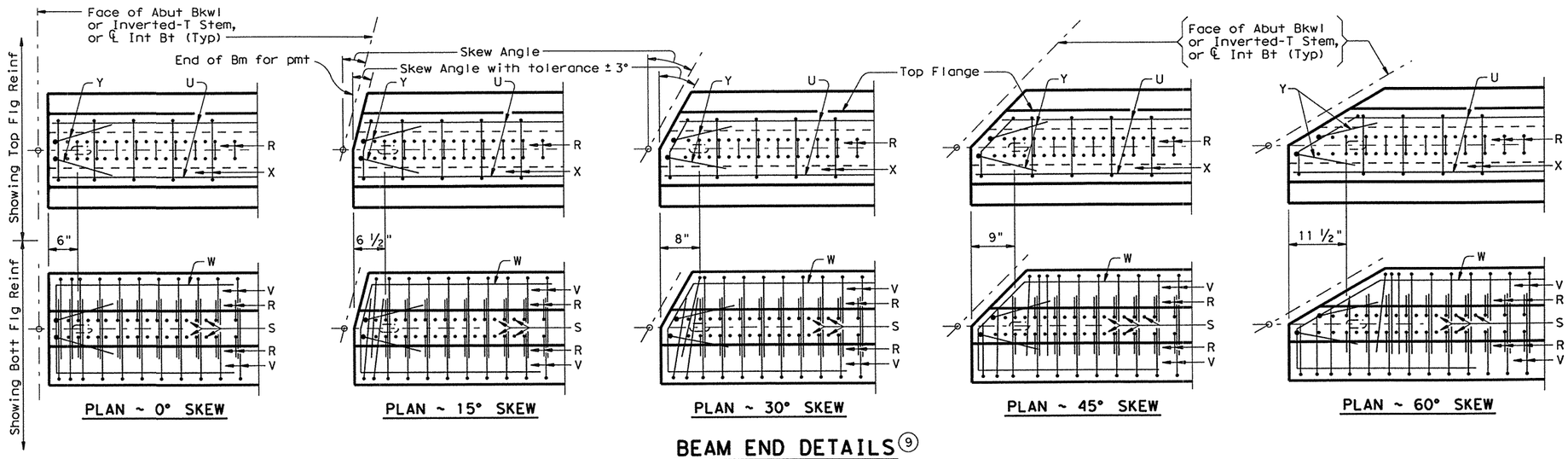
PRESTRESSED CONCRETE I-BEAM DETAILS

Sheet 1 of 2 IBD

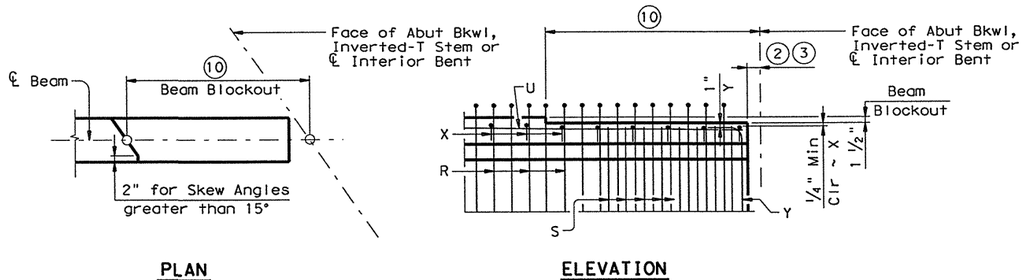
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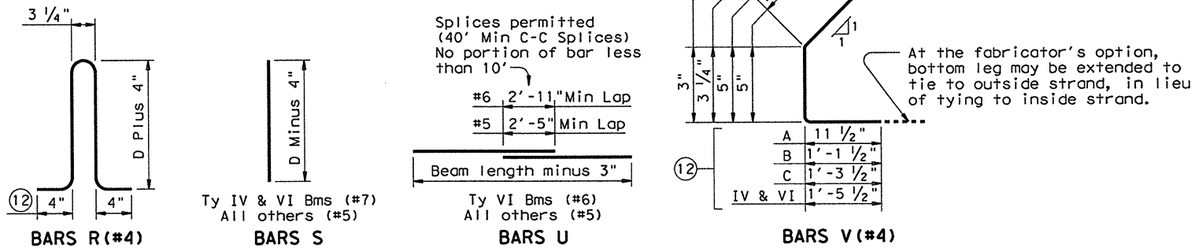


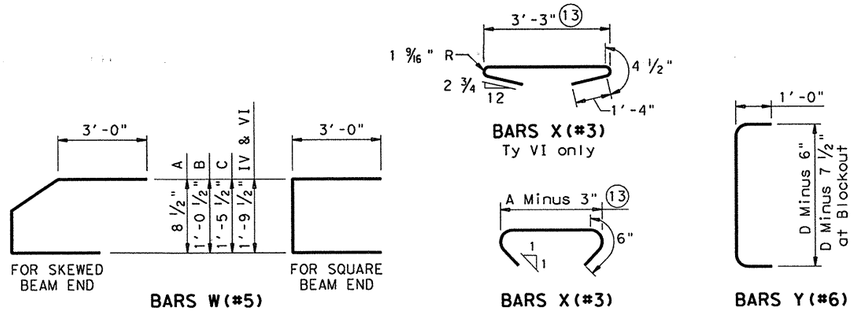
BEAM END DETAILS (9)



PLAN ELEVATION

BEAM BLOCKOUT DETAIL FOR THICKENED SLAB END (11)





(2) 3" ~ Inverted-T Stem, 2" ~ Abutment Bkwl and Interior Bents.

(3) Measured along ℄ Beam at Interior Bents; perpendicular to Abutment Bkwl or Inverted-T Stem.

(9) Reinforcing patterns shown are to be used as guides in determining the reinforcement for the actual beam type (Type C shown) and the skew angle used. In general, the distance between consecutive Bars R and/or S shall be 2". This spacing may be varied in order to avoid Dowel Holes or Concrete End Diaphragm Option holes. However, a minimum cross sectional area equivalent to that of Bars R & S in a square beam end shall be provided.

(10) 4'-0" ÷ Cos Skew Angle. Skew Angle = 90° - Beam Angle.

(11) Beam blockout required only when beam haunch at ℄ Brg is less than 2". Haunch = top of slab to top of beam dimension minus slab thickness.

(12) Bars may be cut or bent at skewed end as required.

(13) Increase for first bar at skewed end.

Sheet 32 of 45 Sheets HL93 LOADING

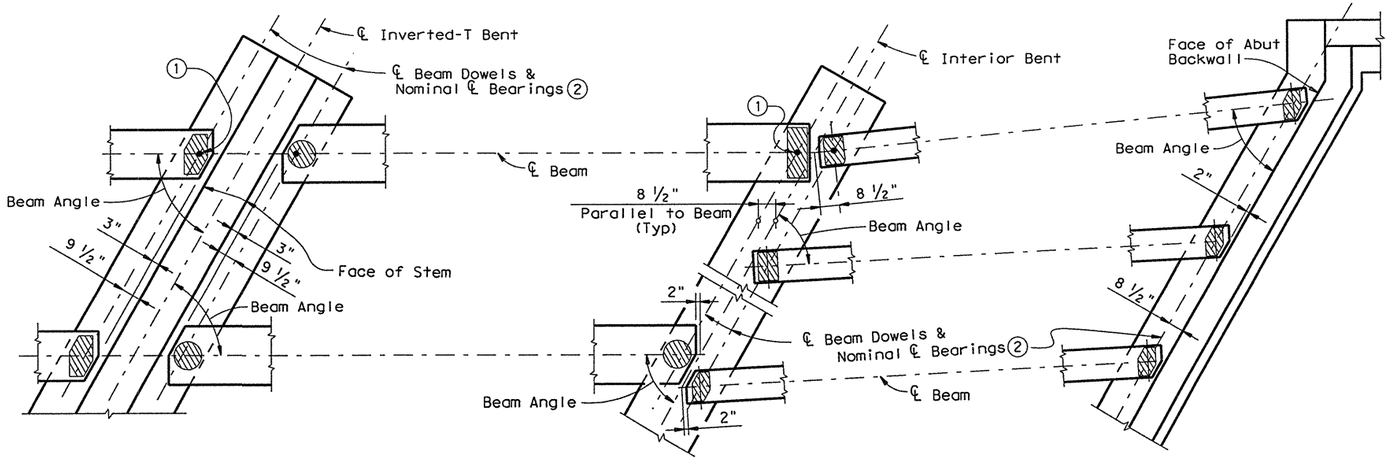
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PRESTRESSED CONCRETE I-BEAM DETAILS

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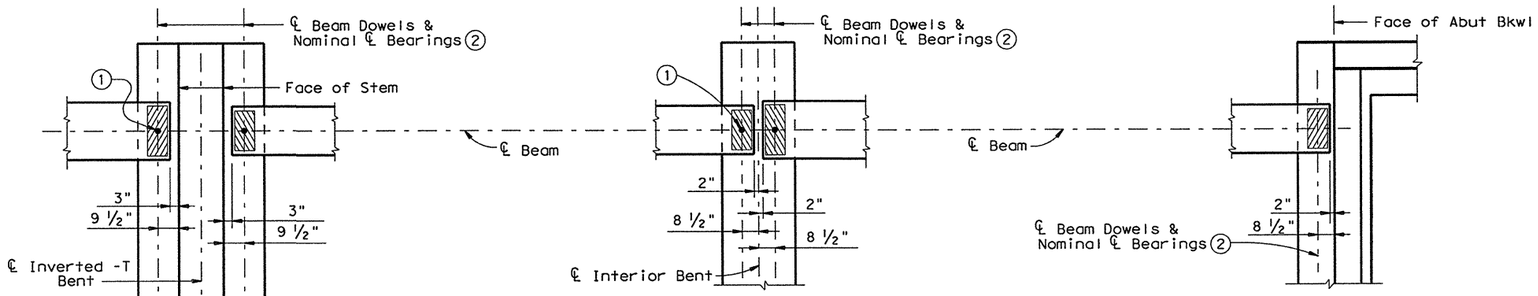
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AT INVERTED-T BENT WITH SKEW

AT CONVENTIONAL INTERIOR BENT WITH SKEW

AT ABUTMENT WITH SKEW (3)



AT INVERTED-T BENT

AT CONVENTIONAL INTERIOR BENT

AT ABUTMENT

BEAM END DETAILS

(1) Dowel at doweled beam end [labeled (D) on Bridge Layout]. Required for outside beams only or as shown on substructure details.

(2) For purposes of computing Bearing Seat Elevations, nominal centerline of bearing shall be defined as shown. The actual center of bearing pad may vary from this line.

(3) For Transition Bents with backwall, beams and elastomeric bearings shall receive the same treatment as shown for Abutments.

(4) When angle exceeds 0°, one or both beam ends shall be clipped to maintain the clearance between beam ends as shown in view.

(5) See Elastomeric Bearing Data Table for Bearing size. Corner clips in Table not applicable for this situation. Table reflects beam conflicts of this type on radial bents only.

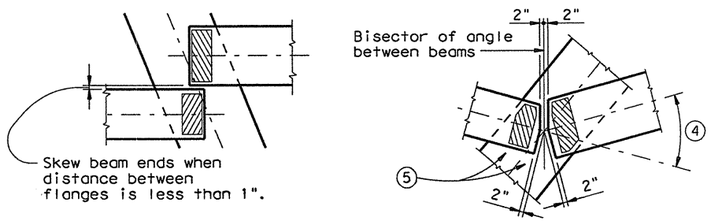
GENERAL NOTES:

These details accommodate skew angles up to 60°.

Shop drawings for approval are required.

A bearing layout which identifies location and orientation of all bearings shall be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer.

Cost of furnishing and installing elastomeric bearings shall be included in unit price bid for "Prestressed Concrete Beams".



BEAM CONFLICT DETAILS

Sheet 33 of 45 Sheets

HL93 LOADING

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ELASTOMERIC BEARING AND BEAM END DETAILS

PRESTR CONCRETE I-BEAMS

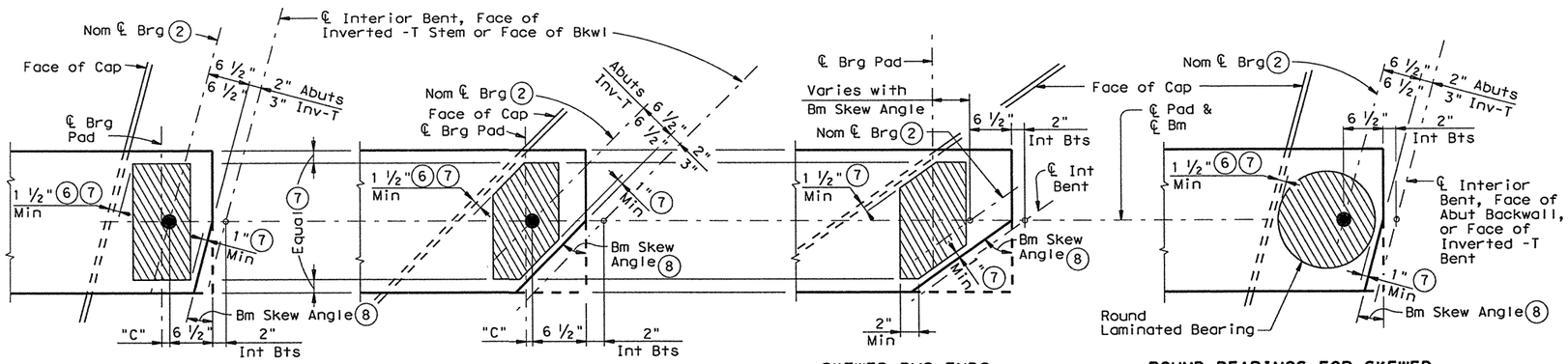
Sheet 1 of 2

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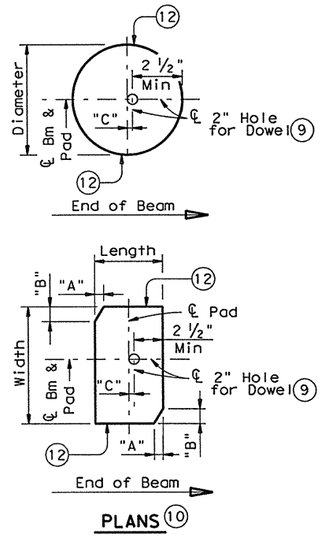
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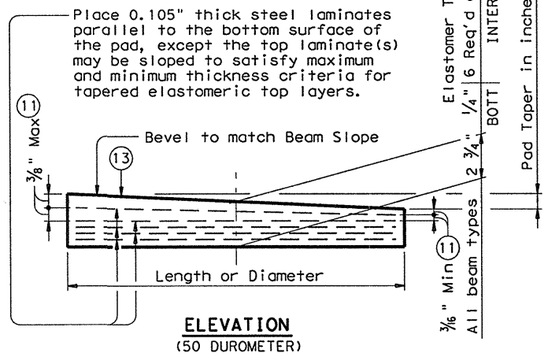


SKEWED BMS ENDS AT CONV INT BENTS

ROUND BEARINGS FOR SKEWED TYPE IV & VI BEAMS ONLY

ELASTOMERIC BEARING PLACEMENT DIAGRAMS





LAMINATED ELASTOMERIC BEARING DETAILS (14)

(2) For purposes of computing Bearing Seat Elevations, nominal centerline of bearing shall be defined as shown. The actual center of bearing pad may vary from this line.

(6) 3" for Inverted -T.

(7) Factors controlling laminated bearing placement if no dowel is present. Place ℄ Pad as near Nominal ℄ Brg as possible between limits shown.

(8) Complement of Beam Angle except at some conflicting beams.

(9) Provide 2" Dia Hole (always on beam end side of centerline pad) only at locations required. See substructure details for location. The Dowel offset "C" dimension may be 0" when the bridge is square.

(10) See Elastomeric Bearing Data Table for dimensions.

(11) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.

(12) Locate Permanent Mark here.

(13) BEARING TYPE shall be indicated on all pads. For tapered pads, BEARING TYPE shall be located on the high side. The Fabricator shall include the value of "N" (amount of taper in 1/8" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for 1/8" taper)
N=2, (for 1/4" taper)
(etc.)
Fabricated pad top surface slope shall not vary from plan beam slope by more than $\left(\frac{0.0625"}{\text{Length or Dia}}\right)$ IN/IN.

(14) The use of Polyisoprene (natural rubber), for the manufacture of bearing pads, is not permitted.

(15) Substructure dimensions must satisfy the minimums provided to accommodate the elastomeric bearings shown on this standard.

(16) Interpolate "C" values for angles not shown between 30° & 40°, 40° & 50°, 50° & 60°.

TABLE OF MINIMUM SUBSTRUCTURE DIMENSIONS (15)

Beam Type	Abutments: Face of Bkwl to Face of Cap	Int Bents: Overall Cap Width	Inv-T Bents: Corbel Width
A, B, & C	1'-4 ½"	2'-9"	1'-8"
IV	1'-7 ½"	3'-3"	1'-10"
VI	1'-10 ½"	3'-9"	2'-0"

ELASTOMERIC BEARING DATA TABLE

Bent Type	Beam Type	Brg Type (13)	Beam End Skew Angle Range	Pad Size Lgth x Wdth	Pad Clip Dimensions "A"	Pad Clip Dimensions "B"	"C" (9)
AT ABUTMENTS, INVERTED - T & TRANSITION BENTS WITH BACKWALLS	A	A-1-"N"	0° thru 15°	7" x 12"	—	—	—
	A	A-2-"N"	15° + thru 45°	7" x 12"	1 ¼"	1 ¼"	¾"
	A	A-3-"N"	45° + thru 60°	7" x 12"	1 ½"	2"	1"
	B	B-1-"N"	0° thru 15°	7" x 14"	—	—	—
	B	B-2-"N"	15° + thru 45°	7" x 14"	2 ¼"	2 ¼"	¾"
	B	B-3-"N"	45° + thru 60°	7" x 14"	3 ¾"	2 ¼"	1"
	C	C-1-"N"	0° thru 15°	7" x 16"	—	—	—
	C	C-2-"N"	15° + thru 45°	7" x 16"	3 ¼"	3 ¼"	¾"
	C	C-3-"N"	45° + thru 60°	8" x 16"	6"	4"	1"
	IV	IV-1-"N"	0° thru 15°	7" x 22"	—	—	1"
	IV	IV-2-"N"	15° + thru 29°	7" x 22"	2 ½"	4 ½"	1"
	IV	IV-3-"N"	30° (16)	15" Dia	—	—	2 ⅜"
	IV	IV-4-"N"	40° (16)	15" Dia	—	—	2 ⅜"
	IV	IV-5-"N"	50° (16)	15" Dia	—	—	3 ⅛"
	IV	IV-6-"N"	60° (16)	15" Dia	—	—	4"
	VI	VI-1-"N"	0° thru 15°	9" x 24"	—	—	2"
	VI	VI-2-"N"	15° + thru 29°	9" x 24"	3 ¼"	5 ½"	2"
	VI	VI-3-"N"	30° (16)	17" Dia	—	—	3 ¾"
	VI	VI-4-"N"	40° (16)	17" Dia	—	—	4"
	VI	VI-5-"N"	50° (16)	17" Dia	—	—	5 ½"
	VI	VI-6-"N"	60° (16)	17" Dia	—	—	6"
AT CONVENTIONAL INTERIOR BENTS, Sq Bm Ends	A	A-4-"N"	Not Applicable	7" x 12"	—	—	—
	B	B-4-"N"	Not Applicable	7" x 14"	—	—	—
	C	C-4-"N"	Not Applicable	7" x 16"	—	—	—
	IV	IV-7-"N"	Not Applicable	7" x 22"	—	—	—
	VI	VI-7-"N"	Not Applicable	9" x 24"	—	—	—
AT CONVENTIONAL INTERIOR BENTS, Skewed Bm Ends	A	A-5-"N"	0° thru 15°	7" x 12"	—	—	—
	A	A-6-"N"	15° + thru 60°	7" x 12"	1"	1"	—
	B	B-5-"N"	0° thru 15°	7" x 14"	—	—	—
	B	B-6-"N"	15° + thru 45°	7" x 14"	1 ¾"	1 ¾"	—
	B	B-7-"N"	45° + thru 60°	7" x 14"	2 ¾"	1 ¾"	—
	C	C-5-"N"	0° thru 15°	7" x 16"	—	—	½"
	C	C-6-"N"	15° + thru 45°	7" x 16"	2 ¾"	2 ¾"	—
	C	C-7-"N"	45° + thru 60°	7" x 16"	4 ½"	2 ¾"	—
	IV	IV-8-"N"	0° thru 15°	7" x 22"	—	—	1"
	IV	IV-9-"N"	15° + thru 29°	7" x 22"	1 ¼"	2"	—
	IV	IV-10-"N"	29° + thru 60°	15" Dia	—	—	—
	VI	VI-8-"N"	0° thru 15°	9" x 24"	1"	3 ¾"	1 ½"
	VI	VI-9-"N"	15° + thru 29°	9" x 24"	1"	2"	—
	VI	VI-10-"N"	29° + thru 60°	17" Dia	—	—	—

HL93 LOADING

Texas Department of Transportation
Bridge Division

ELASTOMERIC BEARING AND BEAM END DETAILS

PRESTR CONCRETE I-BEAMS

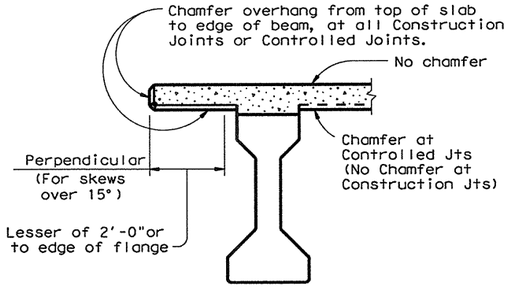
Sheet 2 of 2

IBEB

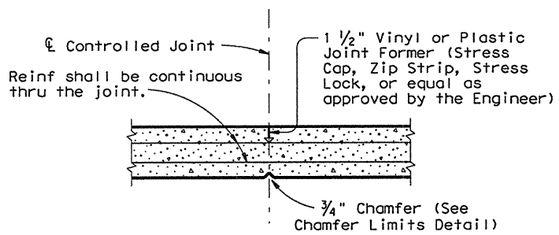
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REVISIONS	DAL			316
Rev. 4-05: Taper Tolerance and Shop Drawings	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

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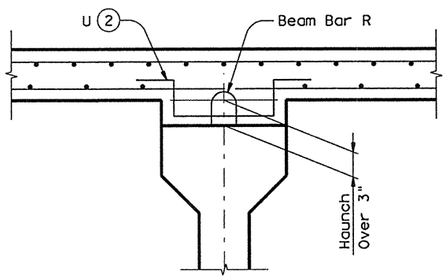


CHAMFER LIMITS DETAIL (1)

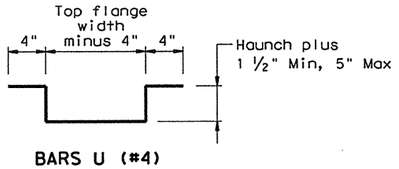


CONTROLLED JOINT DETAIL

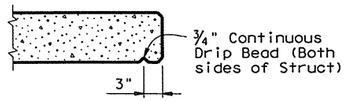
(Saw-cutting will not be allowed)



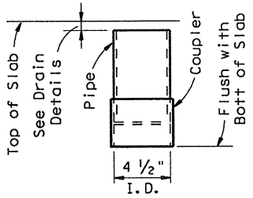
HAUNCH REINFORCING DETAIL



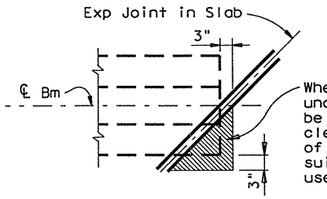
BARS U (#4)



DRIP BEAD DETAIL

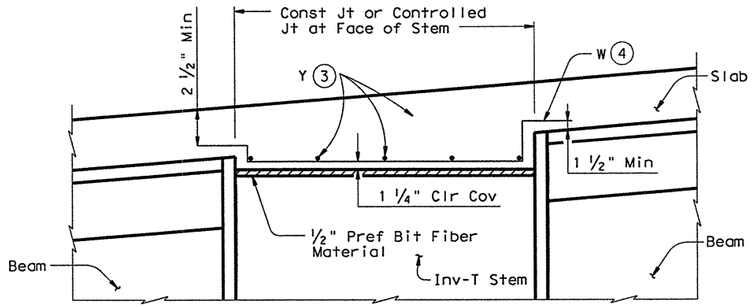


C-I-P DRAIN DETAIL (8)



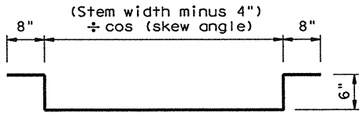
Where corners of Beam Flanges project under slab of adjacent span, care shall be taken to provide a minimum of ½" clearance between top of beam and bottom of adjacent slab. Polystyrene or other suitable compressible material may be used as a filler.

TREATMENT AT BEAM END FOR SKEWED SPANS

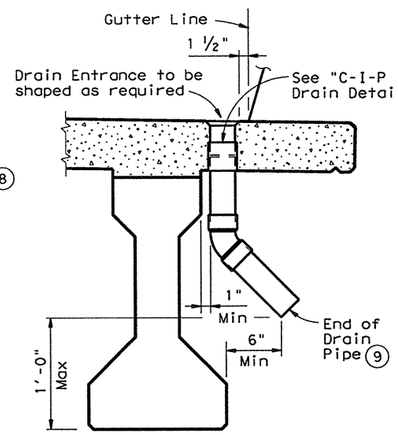


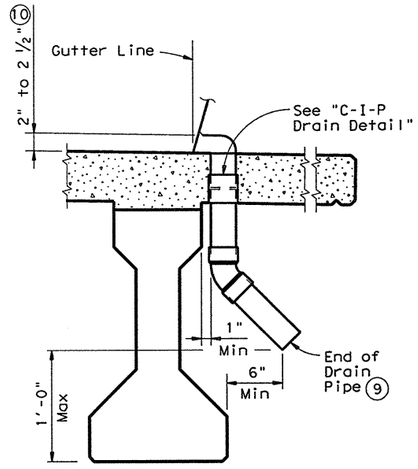
REINFORCEMENT OVER INV-T BENTS

Slab reinforcement not shown for clarity.

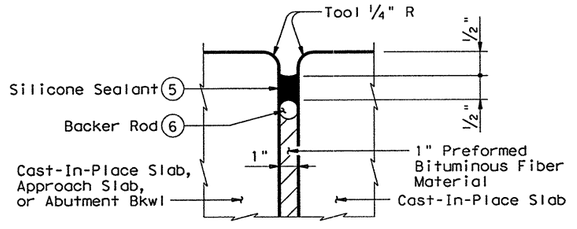


BARS W (#4)





DRAIN DETAILS (11)



TYPE A JOINT DETAIL (7)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications.

All items (reinforcing steel, drains, joint formers, etc.) shown on this sheet shall be considered subsidiary to other bid items.

(1) See Span details for type of joint and joint locations.

(2) Space Bars U with Beam Bars R in all areas where measured haunch exceeds 3".

(3) Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.

(4) Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.

(5) Class 7 silicone sealant that conforms to DMS-6310. Install when ambient temperature is between 55°F and 85°F and rising. Engineer to determine allowable hours for sealant application.

(6) 1 ¼" backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.

(7) The maximum distance between Type A expansion joints is 100'. See Bridge Layout for location of joints. Type A joints will not be paid for directly, but shall be considered subsidiary to Item 420, "Concrete Structures".

(8) Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.

(9) No water shall be discharged onto girders.

(10) Drain Entrance formed in Rail or Sidewalk.

(11) All drain pipe and fittings to be 4" diameter (Sch 40) PVC. See Item 481 "PVC Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location shall be as directed by the Engineer. No drains shall be permitted over roadways or railways, or within 10'-0" of Bent Caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside girder face. Variations of the above designs, as required for the type of rail used and its location on the structure, shall be installed with the approval and direction of the Engineer.

Texas Department of Transportation
Bridge Division

MISCELLANEOUS SLAB DETAILS PRESTR CONCRETE I-BEAMS

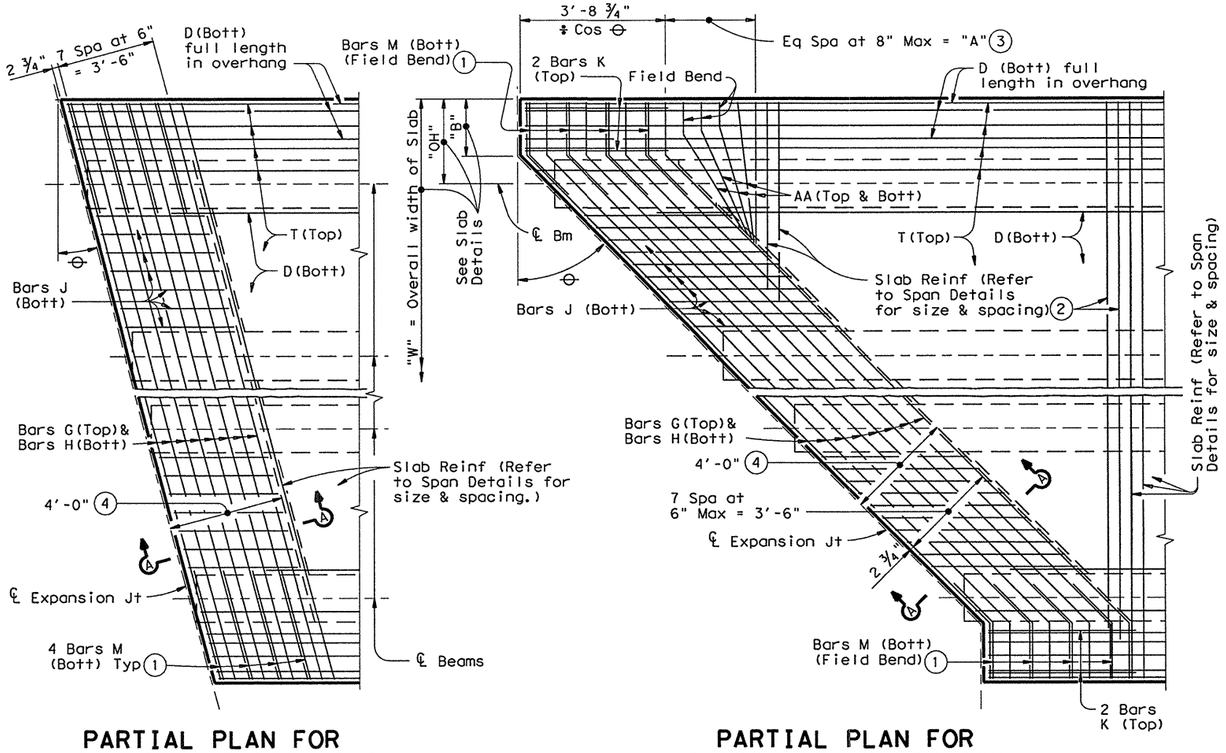
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	ROCKWALL		0009	12	073	IH 30

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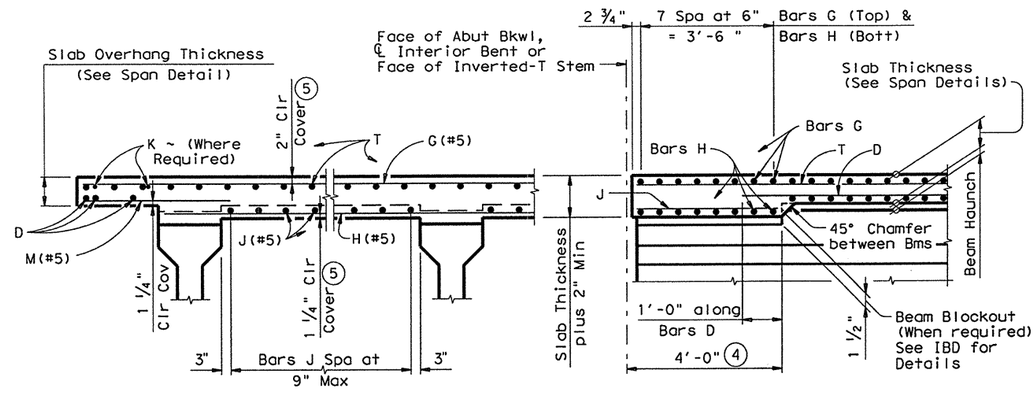
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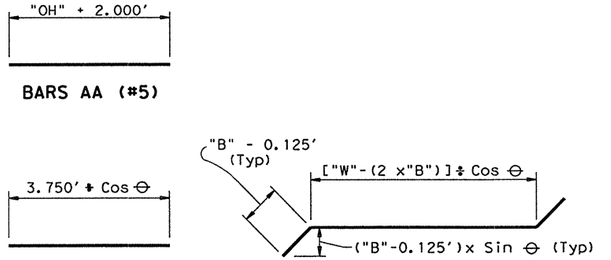
PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK

PARTIAL PLAN FOR SLABS WITH BREAKBACK



TYPICAL TRANSVERSE SECTION

SECTION A-A



(1) 1' Max Spacing measured along slab edge.

(2) End the top transverse reinforcement steel at inside Bar G. End the bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(3) "A"= ("OH" + 2.125' + $\frac{0.052'}{\text{Sin} \ominus}$ -"B") x Tan ⊖

(4) Thickened Slab End dimensioned perpendicular to Face of Bkwl, Centerline Interior Bent or Face of Inverted-T Stem.

(5) Clear Cover shall be as indicated unless otherwise shown on Span Details.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

These details are to be used in conjunction with the Span Details and Standard PCP (if prestressed concrete panels are used).

All reinforcing bars shall be Grade 60 steel.

Unless otherwise shown or noted hereon, all Span Details remain unchanged.

If slab reinforcing steel is shown on the Slab Details to be epoxy coated, then Bars AA, G, K, H, J and M shall be epoxy coated.

Bar laps, where required, shall be as follows:

Uncoated ~ #4 = 1'-5"
~ #5 = 1'-9"
Epoxy Coated ~ #4 = 2'-1"
~ #5 = 2'-7"

Sheet 36 of 45 Sheets

HL93 LOADING

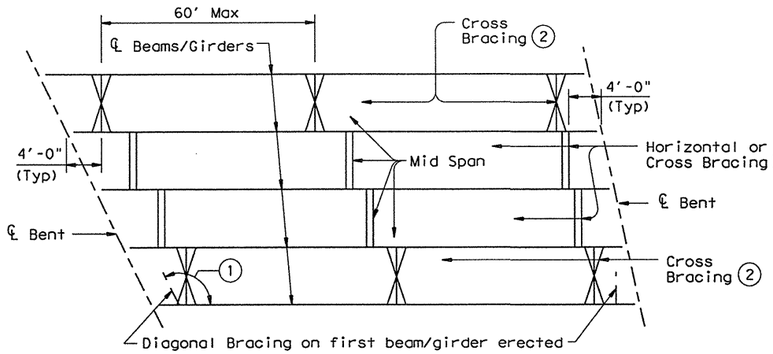
Texas Department of Transportation
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THICKENED SLAB END DETAILS
PRESTR CONC I-BEAM SPANS

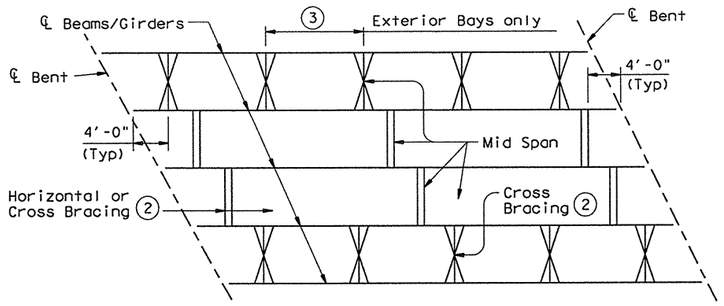
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	ROCKWALL	0009	12	073	IH 30

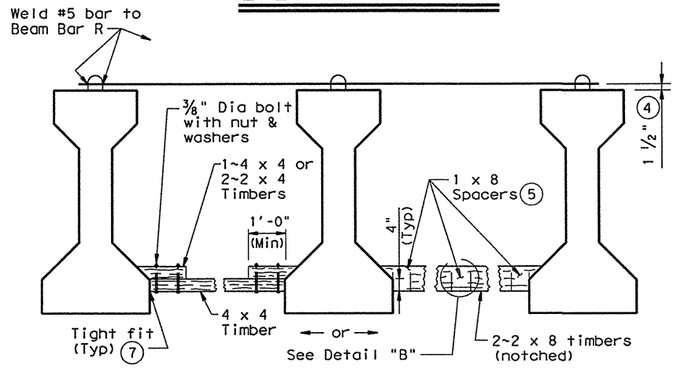
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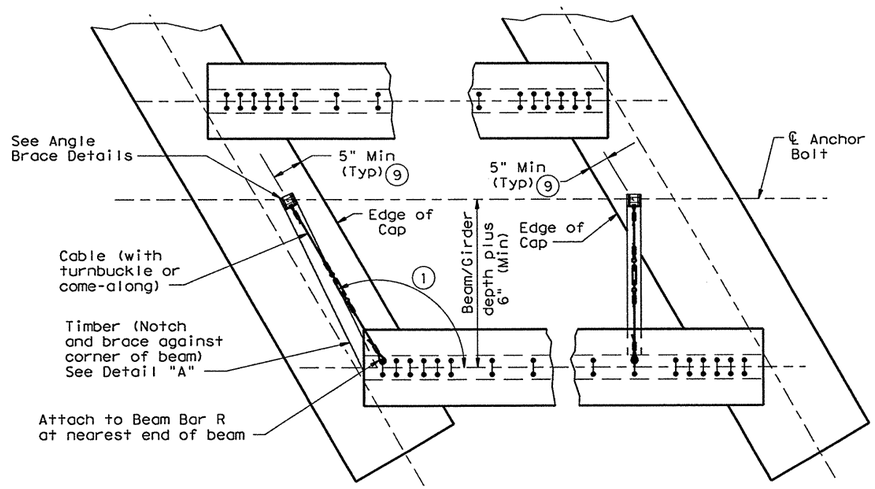
ERECTION BRACING



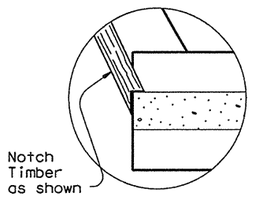
SLAB PLACEMENT BRACING



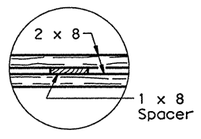
HORIZONTAL BRACING DETAILS (6)



PLAN

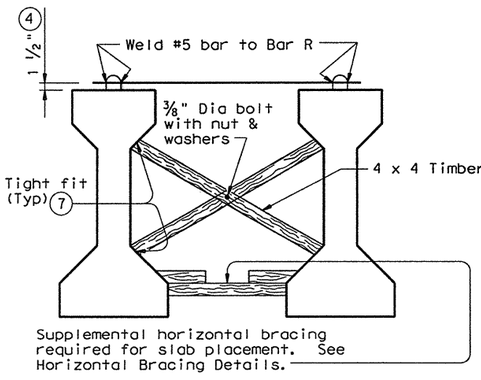


DETAIL "A"

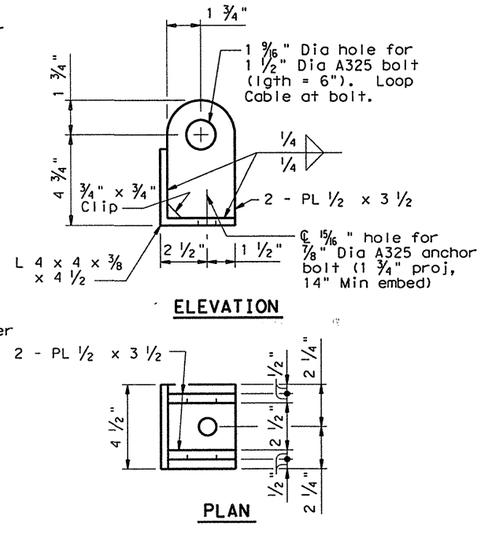


PLAN

DETAIL "B"



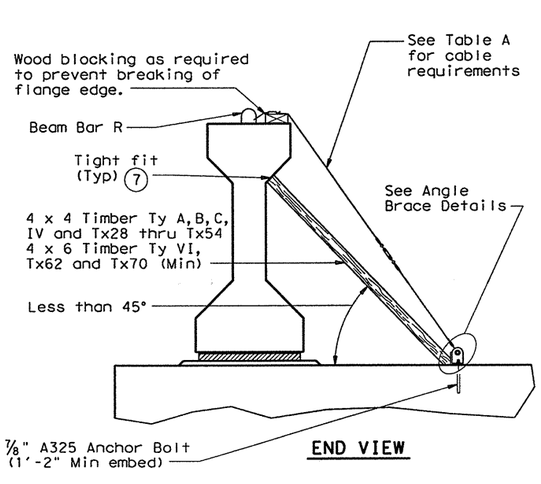
CROSS BRACING DETAIL (6)



ELEVATION

PLAN

ANGLE BRACE DETAILS



END VIEW

DIAGONAL BRACING DETAILS (6)

(To be used on both ends of the first beam/girder erected in the span.)

TABLE A	
Girder /Beam Type	Min Cable Breaking Strength (8)
A	10.5 K
B	12.5 K
C	15.9 K
IV	21.8 K
VI	26.8 K
Tx28	18.9 K
Tx34	21.6 K
Tx40	23.1 K
Tx46	24.5 K
Tx54	26.2 K
Tx62	27.9 K
Tx70	27.9 K

HAULING & ERECTION:
The Contractor's attention is directed to the possible lateral instability of prestressed concrete beams and girders over 130' long, especially during hauling and erection. The use of the following methods to improve stability is encouraged: Locate lifting devices at the maximum practical distance from beam ends; use external lateral stiffening devices during hauling and erection; lift with vertical lines using two machines; and take care in handling to minimize inertial and impact forces.

ERECTION BRACING:
Erection bracing details shown are considered the minimum for fulfilling the bracing requirements of Item 425.
Required erection bracing must be placed immediately after erection of each beam and remain in place until additional bracing as required for slab placement is in place. This standard is needed in all cases to meet requirements for Slab Placement Bracing.

SLAB PLACEMENT BRACING:
The details for slab placement bracing are considered minimum for fulfilling the requirements of Specification Item 420.
Required slab placement bracing must remain in place until slab concrete has attained a compressive strength of 3000 psi.

GENERAL NOTES:
Bracing details for closely spaced beams and girders (as on ramps or railroad structures) are not included. Details for spans longer than 150' are not provided. The Contractor must submit his proposed bracing details for such conditions to the Engineer for approval prior to erection.
Systems equal to or better than those shown may be used provided details of such systems are submitted to and approved by the Engineer prior to erection.
Use of these systems and/or details does not relieve the Contractor of the responsibility for the adequacy of the bracing and the safety of the structure.
Removal of bracing for short periods of time to align beams and girders is permissible.
All turn-buckles, come-alongs, anchors and other connections must be capable of developing the full strength of the cable shown.

(1) If angle shown exceeds 120 degrees, move diagonal brace to other side of beam/girder and place square to beam/girder. This may prevent exterior beam from being erected first.

(2) Cross bracing must be placed between the first two beams/girders erected, in exterior bays, and in every fourth bay. At the Contractor's option, remaining bays may have either cross-bracing or horizontal bracing.

(3) 15'-0" Max for Type A, B beams and Tx28 and Tx34 girders. 30'-0" Max for all others.

(4) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to Beam Bars R.

(5) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(6) Pressure treated landscape timbers can not be used.

(7) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(8) All hardware used with cable must be able to develop the minimum breaking strength specified. Use thimbles at all loops in cable. Install cable clamps with saddles bearing against the live end and U-bolts bearing aginst the dead end.

(9) It is acceptable to tie anchor bolts to cap reinforcement.

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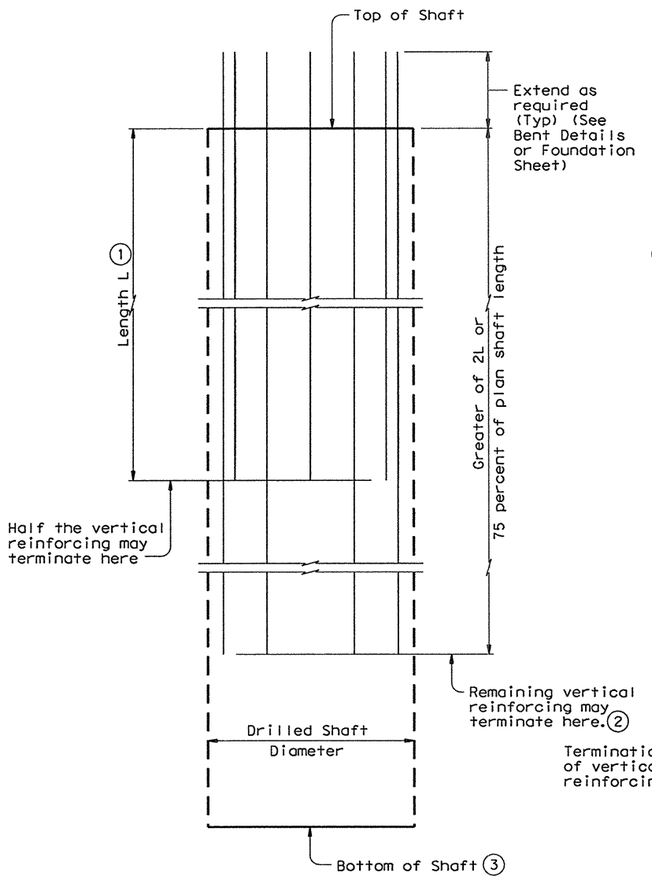
MINIMUM ERECTION AND BRACING REQUIREMENTS
PRESTRESSED CONCRETE I-BEAMS AND I-GIRDERS

MEBR(C)

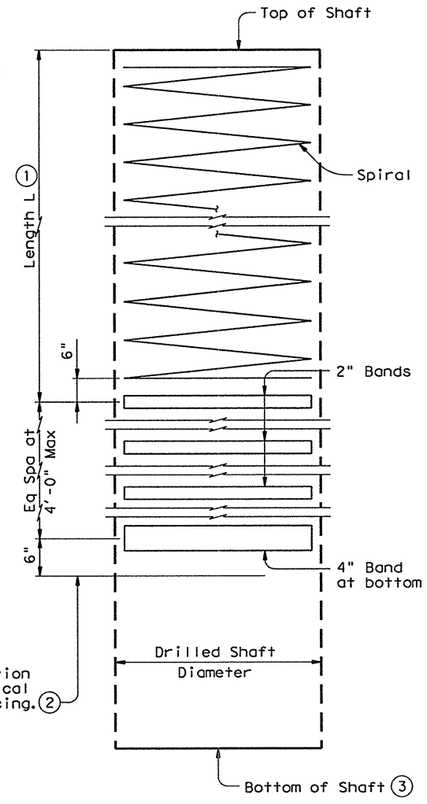
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REVISIONS 06-2007: Revised "Cross Bracing Detail", Hauling, Erection Note and added I-Girders.				39
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

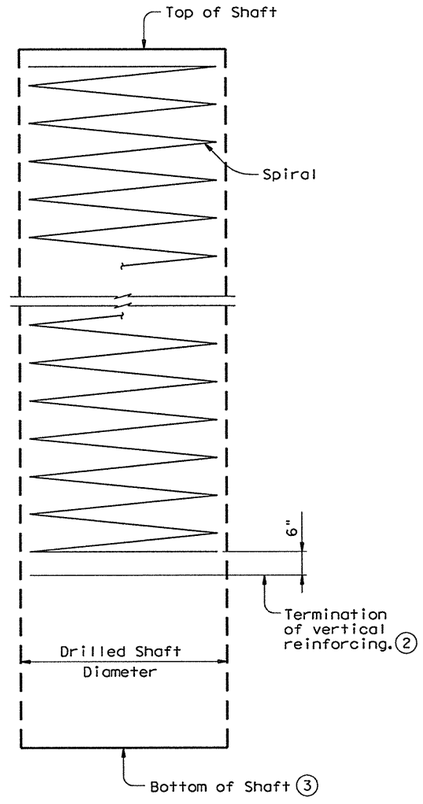
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VERTICAL REINFORCING OPTION
(Lateral reinforcing not shown for clarity)





LATERAL REINFORCING OPTIONS
(Vertical reinforcing not shown for clarity)

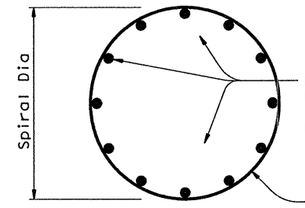
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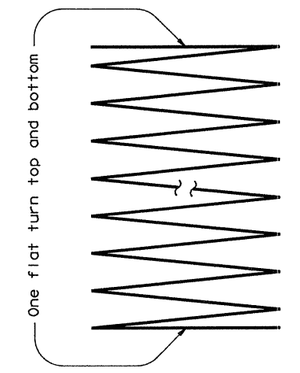
(1) See Table for length L.

(2) When steel does not extend the full shaft length, the Contractor must demonstrate adequacy of the temporary support procedures to the satisfaction of the Engineer.

(3) Vertical bars may be supported on bottom of drilled hole if material is firm enough to do so when concrete is placed

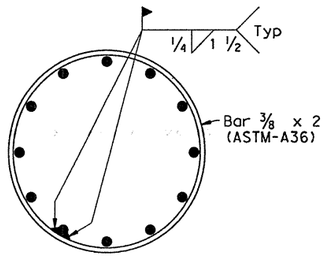
(4) Spiral to be at the pitch and diameter as shown elsewhere in the plans.



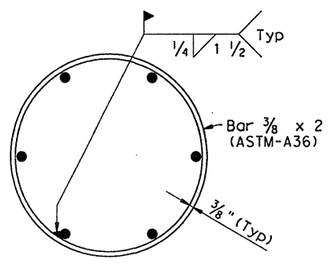


SPIRAL DETAIL (4)

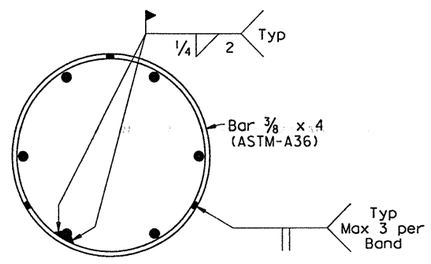
GENERAL NOTES:
All welded bands and reinforcing steel, including that projecting the required amount from the top of the shaft, shall not be paid for directly, but shall be subsidiary to the bid item, "Drilled Shafts".
Tack welding of spiral to main steel will not be allowed in the upper 15' of drilled shaft.



TOP



INTERIOR



BOTTOM

BAND DETAILS

LENGTH L		
Drilled Shaft Diameter (Inches)	Length L (Feet)	Note
18 & 24	24	The length L is measured from top of shaft, natural ground, or finished ground, whichever results in the longer length of full reinforcement.
30 & 36	30	
42 & larger	10 Shaft Diameters	

These details may only be used for bridge foundations not in or adjacent to waterways. They may only be used for multi-column bents and abutments, excluding abutments supported by drilled shaft retaining walls. Other applications must receive approval of the Engineer.

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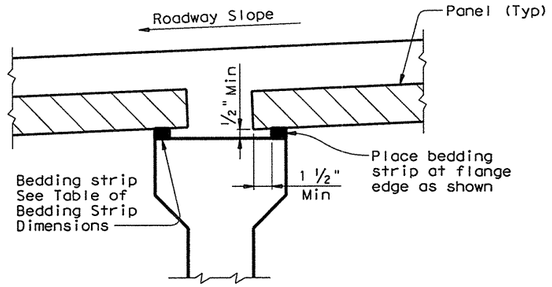
OPTIONAL DRILLED SHAFT REINFORCING

ODSR

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REVISIONS						320
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		0009	12	073	IH 30

PATH:
LEVELS D

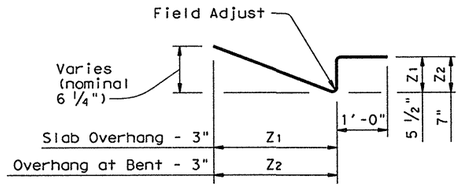
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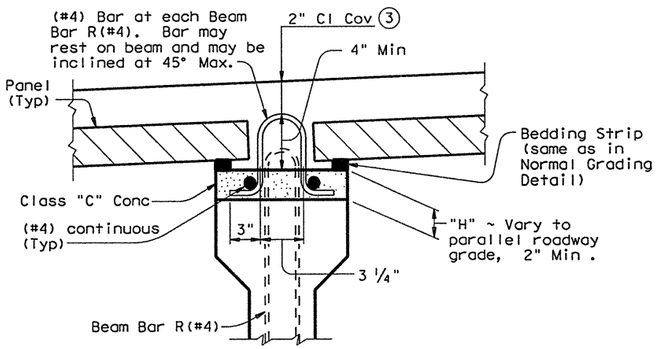
NORMAL GRADING DETAIL (1)

Showing Prestressed Concrete I-Beams.
(Other Beam Types Similar)

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (2)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2" (Max)	½"	4"

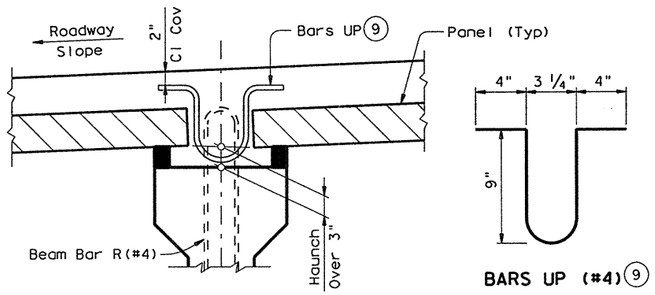


BARS Z (#4) (7)



SPECIAL GRADING DETAILS FOR CONCRETE BEAMS (4)

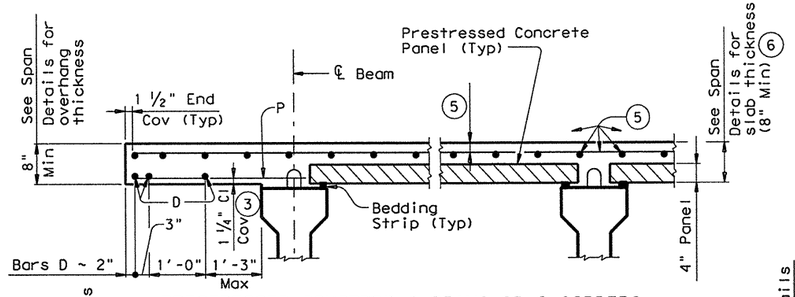
Showing Prestressed Concrete I-Beams.
(U-Beams and I-Girders Similar)



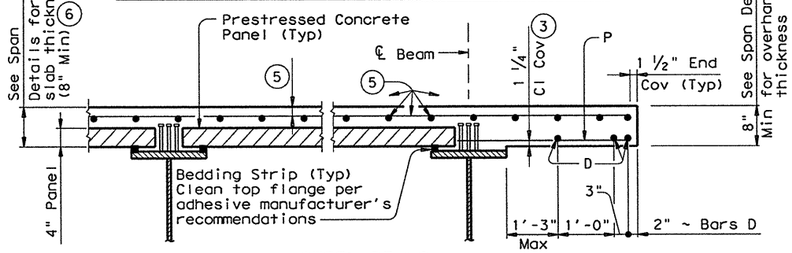
HAUNCH REINFORCING DETAIL

Showing Prestressed Concrete I-Beams.
(U-Beams and I-Girders Similar)

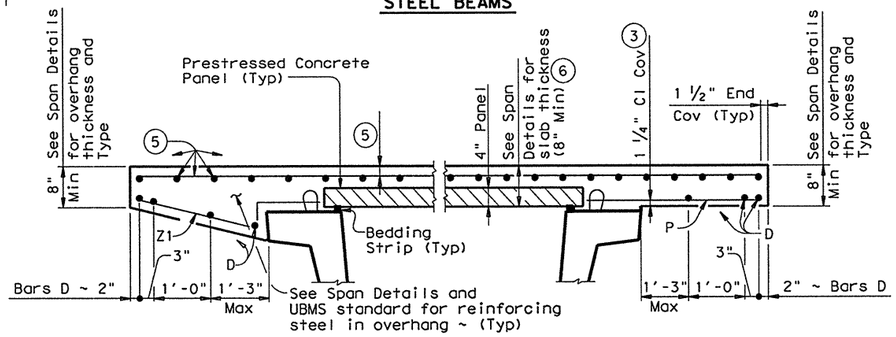
BARS UP (#4) (9)



PRESTRESSED CONCRETE I-BEAMS OR I-GIRDERS



STEEL BEAMS



SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

TYPICAL PART TRANSVERSE SECTIONS

(1) To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in ¼" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels must be ¼". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division.

(2) Height must not exceed twice the width.

(3) Clear cover shall be as indicated unless otherwise shown on Span Details.

(4) For use where the distance between top of beam and finished grade can not be achieved within tolerances on cast-in-place slab thickness and thickness of bedding strips. Control dimensions shown in Normal Grading Detail still apply.

(5) See Span Details for top slab reinforcement and clear cover. Longitudinal top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(6) The actual thickness constructed may exceed the slab thickness shown on the Span Details but, the extra thickness shall be no more than 2" for Prestressed Concrete I-Beams and 1" for Prestressed Concrete U-Beams and Steel Beams. Bearing Seat Elevations or finished grade may be adjusted.

(7) Bars Z1(#4) shall be field adjusted to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inv-T stems only.

(8) Max Spacing as listed unless otherwise shown.

(9) Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3".

TABLE OF REINFORCING STEEL (8)		
BAR	SIZE	Max Spa (in.)
A	#5	~
D	#5	9
E	#5	6
P	#4	18
UP	#4	~
Z	#4	18

CONSTRUCTION NOTES:

Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges.

If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction.

Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete mortar under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 ½" under the panels as the slab concrete is placed.

To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least ½". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required.

All reinforcing steel in the cast-in-place slab must be Grade 60. See Table of Reinforcing Steel for size and spacing of reinforcement. Orientation of reinforcement (normal or skewed) must match that shown on the Span Details.

If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the A, D, E, P, & Z bars must be epoxy coated.

For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

Bar Laps, where required, must be as follows:

Uncoated	~ #4	1'-5"
	~ #5	1'-9"
Epoxy Coated	~ #4	2'-1"
	~ #5	2'-7"

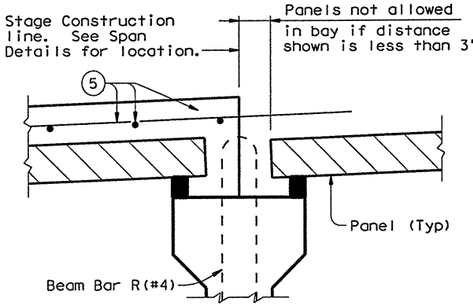
GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

These details are to be used in conjunction with the Span Details and applicable Standard sheets.

Any additional reinforcement or concrete required on this standard is to be considered subsidiary to the bid Item "Reinforced Concrete Slab".



STAGE CONSTRUCTION LIMITATIONS ON PANELS

Showing Prestressed Concrete I-Beams.
(Other Beam Types Similar)

Sheet 39 of 45 Sheets

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PRESTRESSED CONCRETE PANELS

OPTIONAL DECK DETAILS FOR BEAM SPANS

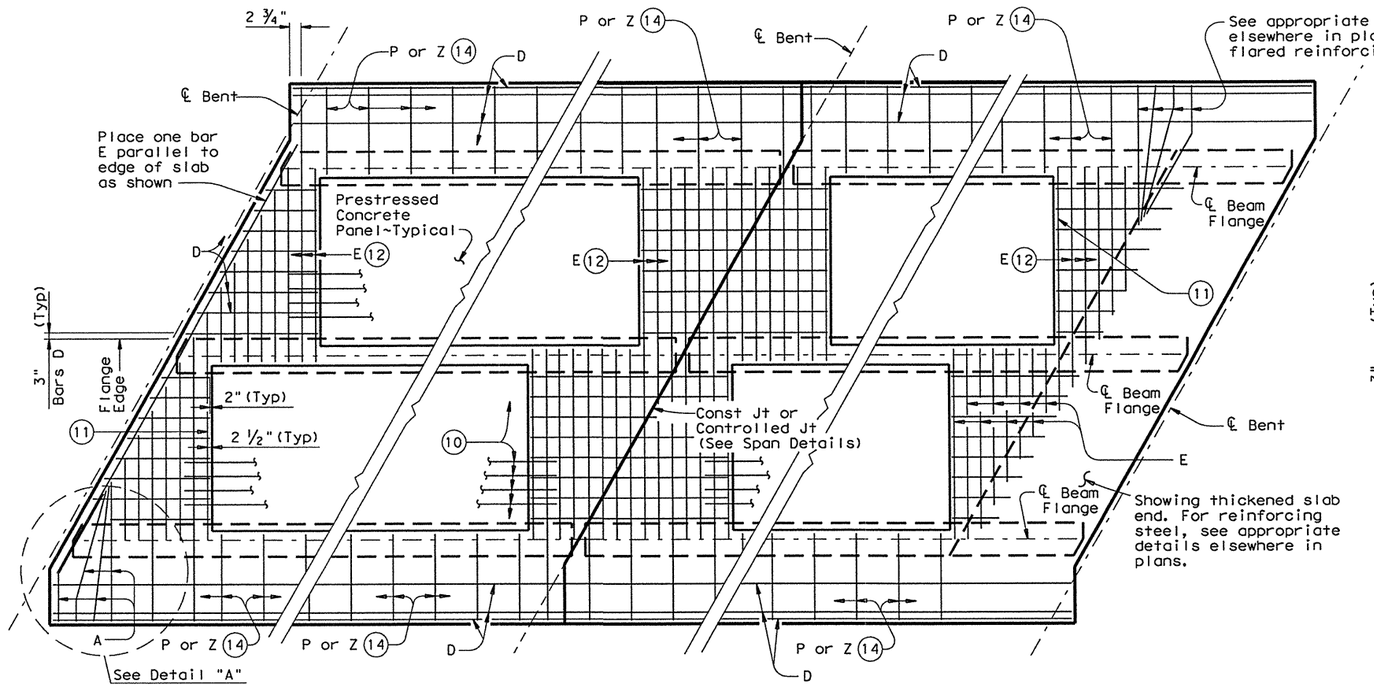
SHEET 1 OF 4

PCP

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REVISIONS 08-07: Added I-Girders and added note to WWR splice detail.				321
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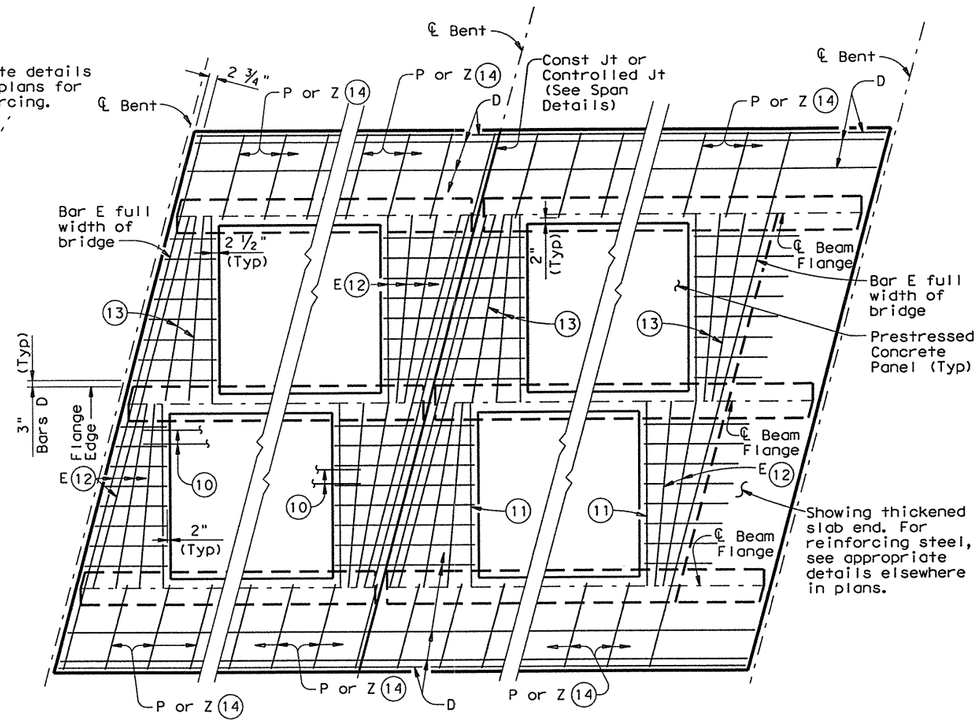
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE

AT INTERIOR BENTS

AT THICKENED END SLABS ON STEEL, CONC I-BEAMS, I-GIRDERS OR U-BEAMS

PLAN OF SLABS WITH NORMAL REINFORCEMENT

(Showing bottom reinforcing steel. See Span Details for top reinforcement steel.)



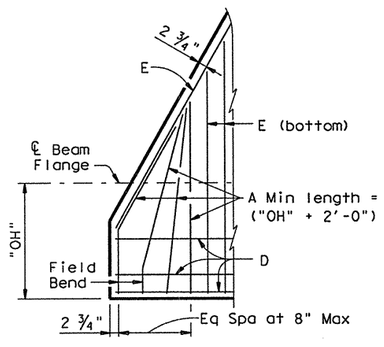
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE

AT INTERIOR BENTS

AT THICKENED END SLABS ON STEEL, CONC I-BEAMS, I-GIRDERS OR U-BEAMS

PLAN OF SLABS WITH SKEWED REINFORCEMENT

(Showing bottom reinforcing steel. See Span Details for top reinforcement steel.)



DETAIL "A"

APPROXIMATE QUANTITIES FOR ONE SQUARE FOOT OF SLAB (15)	
Slab Thickness (In.)	Class S Concrete CY
8	0.0123
8 ¼	0.0131
8 ½	0.0139

(For Contractor's information only)

(8) Max Spacing as listed unless otherwise shown.

(10) At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2", -0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max spacing and extend dowels 1'-0" past panel end.

(11) Maintain one Bar E(#5) parallel to panel ends (Typ).

(12) Bars E(#5) not continuous over beam flanges must overlap beam flange 6" Min.

(13) Add flared Bars E(#5) (Min Spa = 2", Max Spa = 10") as required at panel ends.

(14) Where possible, Bars E(#5) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.

(15) These approximate quantities are for a typical square foot of cast-in-place slab over the PCP. They do not include an allowance for slab overhangs, thickened ends at diaphragms, or the portion between panels over the beams.

TABLE OF REINFORCING STEEL (8)		
BAR	SIZE	Max Spa (in.)
A	#5	~
D	#5	9
E	#5	6
P	#4	18
UP	#4	~
Z	#4	18

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Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE PANELS

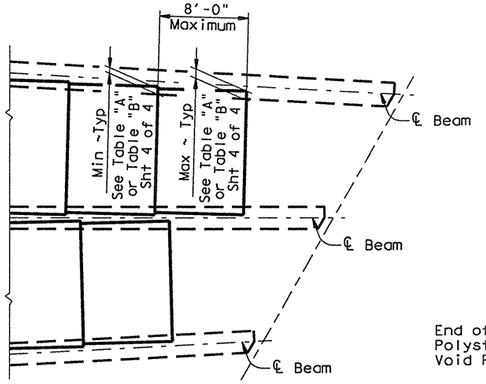
OPTIONAL DECK DETAILS FOR BEAM SPANS

SHEET 2 OF 4 **PCP**

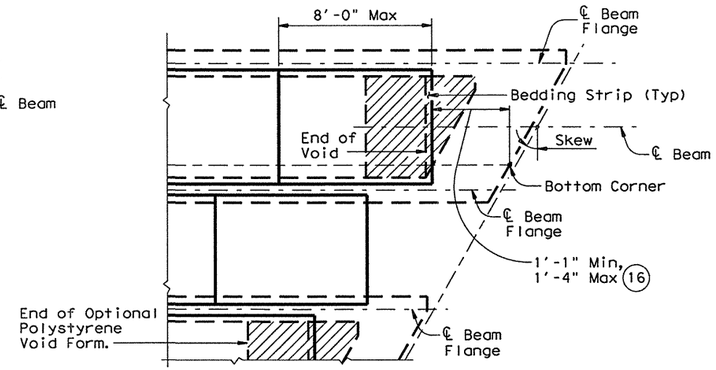
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REVISIONS				322
08-07: Added I-Girders and added note to WWR splice detail.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

ACC: FED LEVELS 1

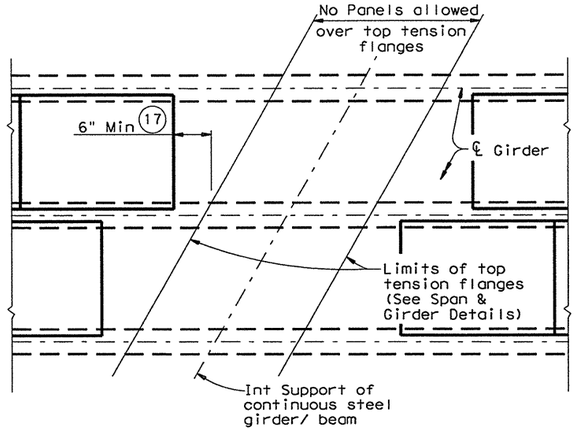
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AT ENDS OF FLARED I-BEAMS OR I-GIRDERS
(Showing thickened slab end condition)

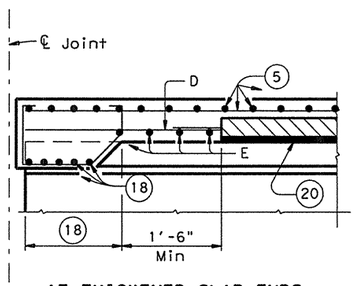


AT ENDS OF CONC U-BEAMS

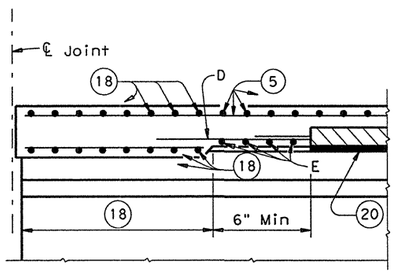


AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS

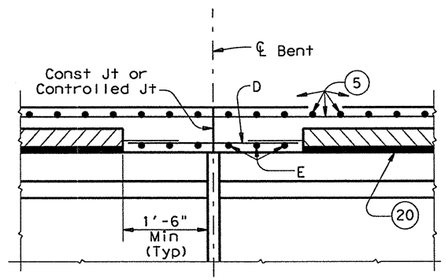
PART PLANS OF PANEL PLACEMENT



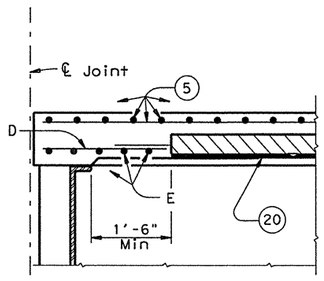
AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS



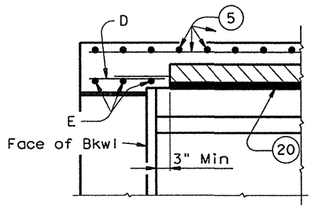
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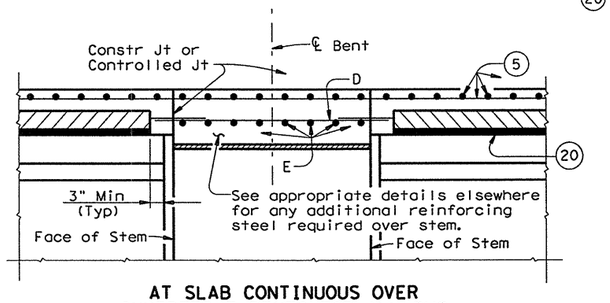
AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS

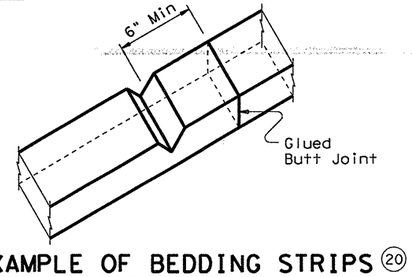


AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS

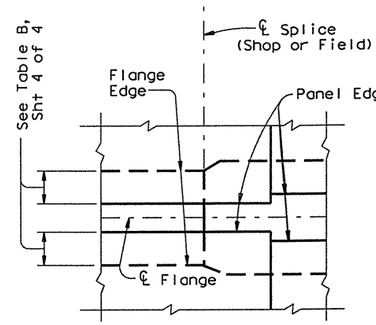


AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

ELEVATIONS AT BEAM ENDS

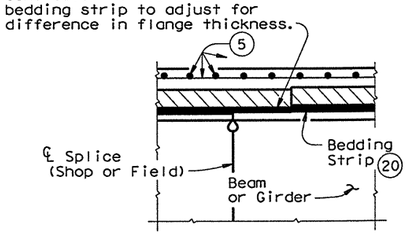


EXAMPLE OF BEDDING STRIPS (20) BUTTED TOGETHER WITH V-NOTCH

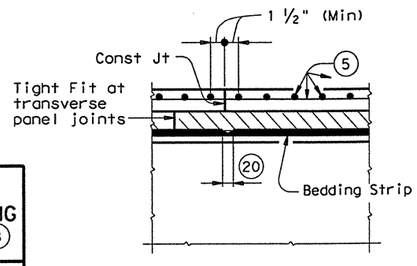


PLAN AT SPLICE
(Showing Steel Bms with flange width transition)

Contractor to field cut bedding strip to adjust for difference in flange thickness.



ELEVATION AT SPLICE (19)
(Showing Steel Bms with different flange thickness)



TRANSVERSE PANEL JOINTS AND SLAB CONST JOINTS

(5) See Span Details for top slab reinforcement and clear cover. Longitudinal top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

(8) Max Spacing as listed unless otherwise shown.

(16) For panel placement at ends of dapped end U-Beams, with Skews under 30°, use 2'-9" ± 1" or with Skews 30° thru 45°, use 3'-3" ± 1".

(17) Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.

(18) See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

(19) When flange thickness differs or flange cover plates are used the Contractor must compensate by using different thickness bedding strips to assure that the tops of Precast Panels are within ¼" of alignment. See Normal Grading Detail for additional notes.

(20) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

TABLE OF REINFORCING STEEL (8)

BAR	SIZE	Max Spa (in.)
A	#5	~
D	#5	9
E	#5	6
P	#4	18
UP	#4	~
Z	#4	18

Sheet 41 of 45 Sheets HL93 LOADING

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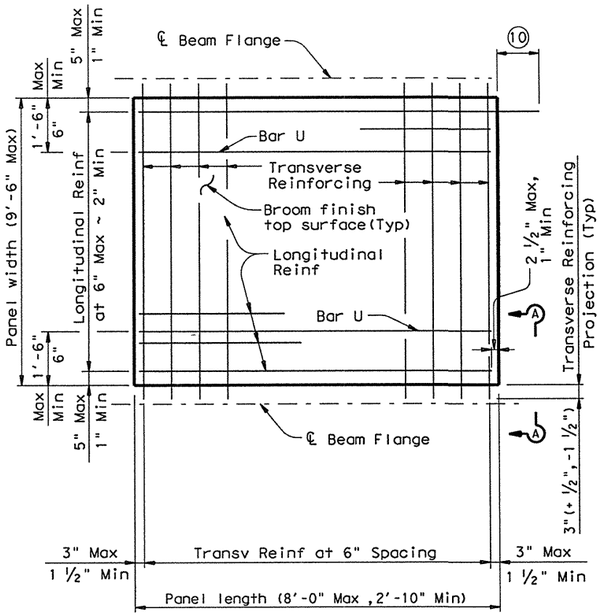
PRESTRESSED CONCRETE PANELS
OPTIONAL DECK DETAILS FOR BEAM SPANS

SHEET 3 OF 4 **PCP**

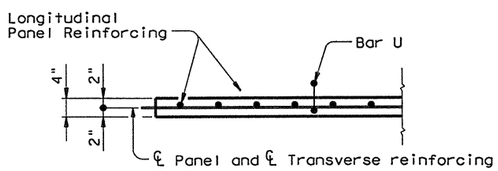
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ACC: FED LEVELS 1

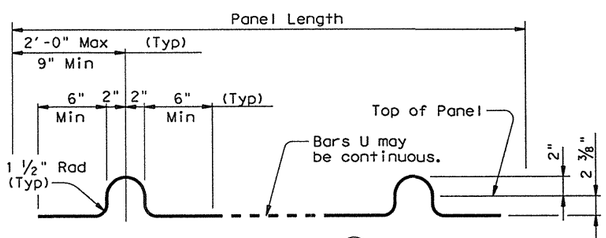
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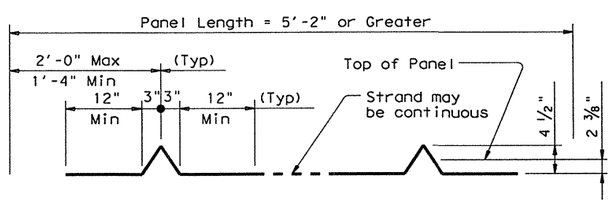
TYPICAL PANEL PLAN



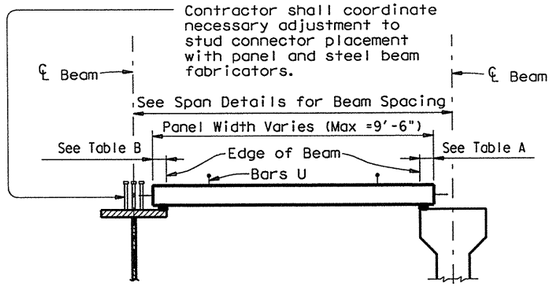
SECTION A-A



BARS U (#3) (21)

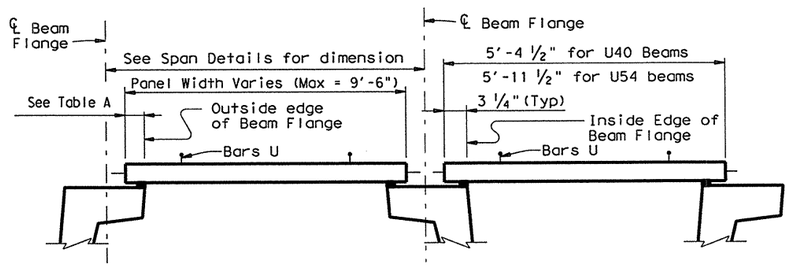


OPTIONAL STRAND FOR BARS U (22)



STEEL BEAMS

PRESTRESSED CONCRETE I-BEAMS OR I GIRDERS



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

(10) At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2",-0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.

(21) Four loops required per panel.

(22) Four loops required per panel. ⅜" or ½" strands may be used.

(23) Normal dimensions must be used on spans with parallel beams. Maximum and Minimum dimensions apply only to spans with flared beams.

(24) See Normal Grading Detail on Sht 1 of 4 for lap requirements and bedding strip dimensions. Some laps shown in tables cannot utilize all bedding strip widths.

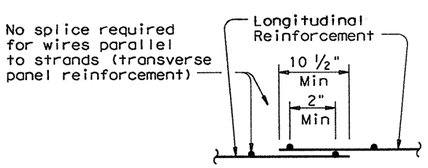
(25) One Splice allowed per panel.

TABLE A (23)(24)

Beam Type	Normal (In.)	Min (In.)	Max (In.)
A	3	2 ½	3 ½
B	3	2 ½	3 ½
C	4	3	4 ½
IV	6	4	7 ½
VI	6 ½	4 ½	8 ½
U40	5 ½	5 ½	7
U54	5 ½	5 ½	7
Tx28-70	6	4	7 ½

TABLE B (23)(24)

Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 ¾	2 ½	2 ¾
Over 12" to 15"	3 ¼	3	3 ¼
Over 15" to 18"	4	3	4 ¾
Over 18"	5	3 ½	6 ¼



WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (25)

FABRICATION NOTES:

All concrete for panels is to be Class H. Use Class H (HPC) concrete for panels if required elsewhere in plans. Release strength f'ci=4000 psi. Minimum 28 day strength f'c=5000 psi.

Remove laitance from top panel surface.

A minimum of 90 percent of the top surface area must have the required broom finish.

Shop drawings for the fabrication of panels will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

A panel layout which identifies location of each panel must be developed by the fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.

TRANSVERSE PANEL REINFORCEMENT:

For panel widths over 5', use ⅜" or ½" Dia (270k) prestressing strands with an initial tension of 16.1 kips per strand.

For panel widths over 3'-6" up to and including 5', use ⅜" or ½" Dia (270k) prestressing strands with an initial tension of 16.1 kip per strand. Optionally, #4 Grade 60 reinforcing bars may be used in lieu of prestressed strands.

For panel widths up to 3'-6", use #4 Grade 60 reinforcing bars (prestressed strands are not allowed).

Place transverse panel reinforcement at panel centroid and space at 6" Max.

LONGITUDINAL PANEL REINFORCEMENT:

Any of the following options may be used for longitudinal panel reinforcement:

1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
2. ⅜" Dia prestressing strands at 4 ½" Max Spacing (unstressed). No splices allowed.
3. ½" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
4. Deformed Welded Wire Reinforcement (WWR) (ASTM A497) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.

No combination of longitudinal reinforcement options in a panel is allowed.

Place longitudinal panel reinforcement above transverse panel reinforcement.

ACC:
RED
LEVELS

Sheet 42 of 45 Sheets HL93 LOADING

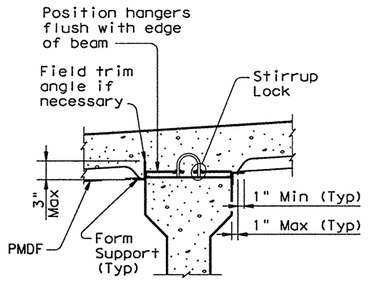
Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE PANELS
OPTIONAL DECK DETAILS FOR BEAM SPANS

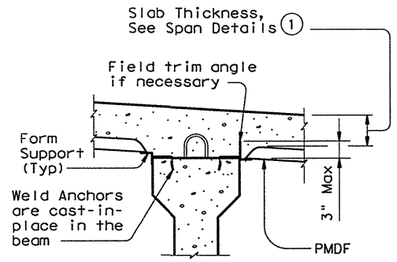
SHEET 4 OF 4 PCP

FILE: pcpstdet.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				324
08-07: Added I-Girders and added note to WWR splice detail.	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

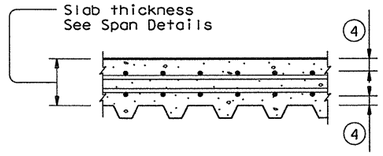
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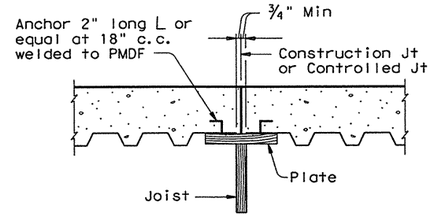
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS

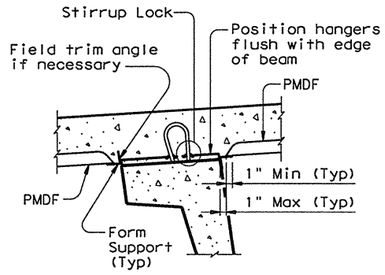


TYP LONGITUDINAL SLAB SECTION

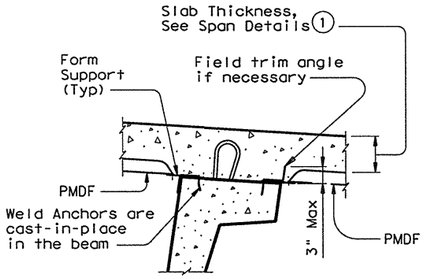


Note: In spans where PMD forms are used, timber forms must be used at construction joints.
Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

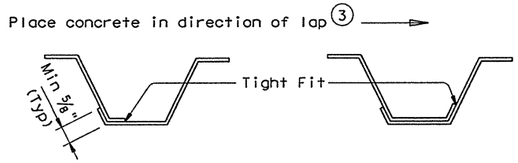
SECTION THRU CONSTRUCTION JOINT



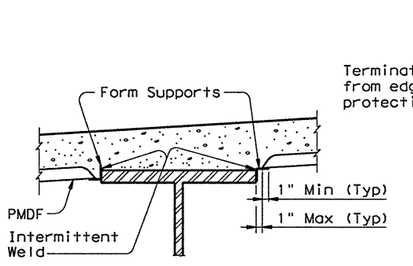
U-BEAMS WITH STIRRUP LOCKS



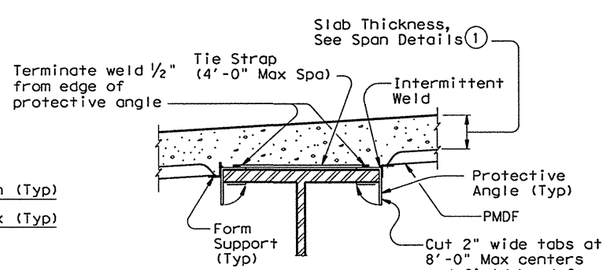
U-BEAMS WITH WELD ANCHORS



SIDE LAP DETAILS

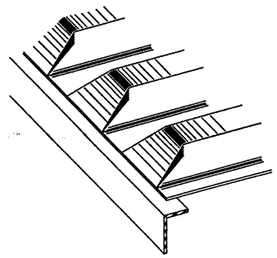


STEEL BEAMS AT COMPRESSION FLANGES

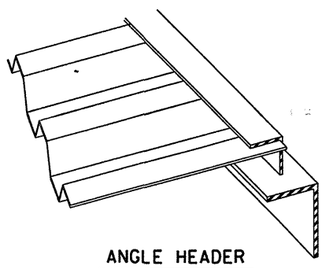


STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



PRECLOSED



ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars.

(2) Welding of form supports to tension flanges will not be permitted.
Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.

(3) The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.

(4) See Span details for cover requirements.

GENERAL NOTES:
Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, Structural Steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.
Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.
The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.
All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Reinforced Concrete Slab".

FOR PRESTR CONC U-BEAM BRIDGES:
Size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5.

DESIGN NOTES:
As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.
Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

CONSTRUCTION NOTES:
Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.
All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.
Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.
All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.
Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.
Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.
A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

Texas Department of Transportation
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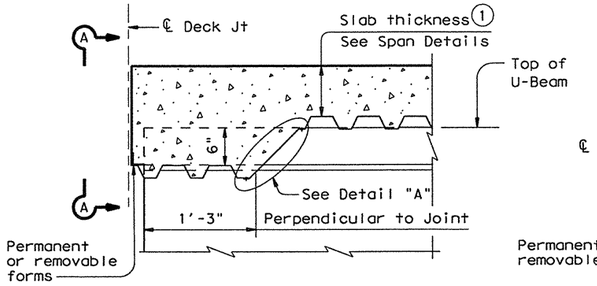
PERMANENT METAL DECK FORMS

SHEET 1 OF 2 — **PMDF**

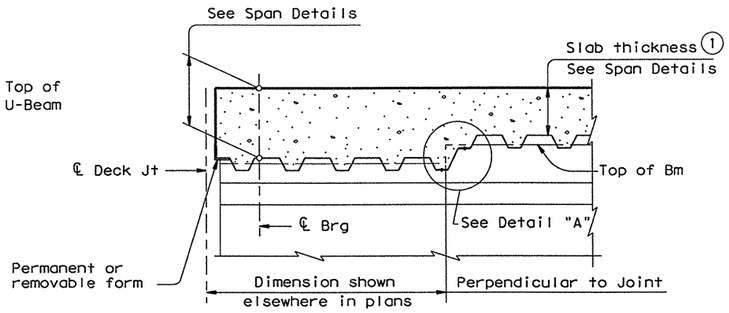
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©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS 08-2007: Added I-Girders.				325
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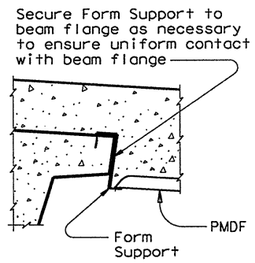


AT THICKENED SLAB END FOR U-BEAMS

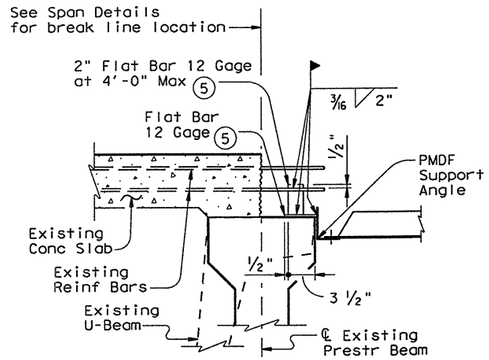


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

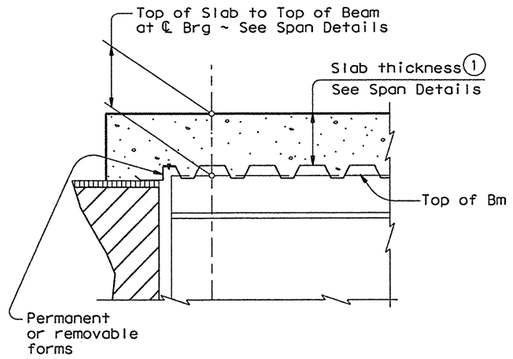
Showing I-Beam block-out.
No block-out for I-Girders or Steel Beams.



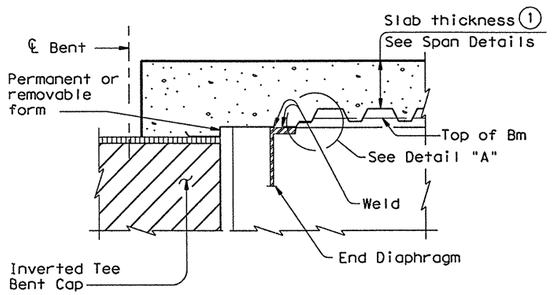
SECTION A-A



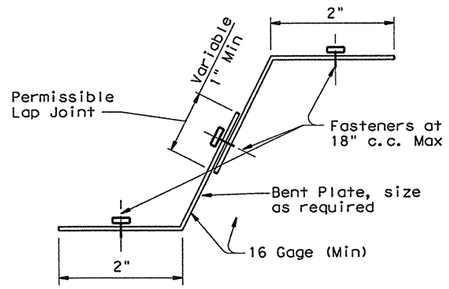
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



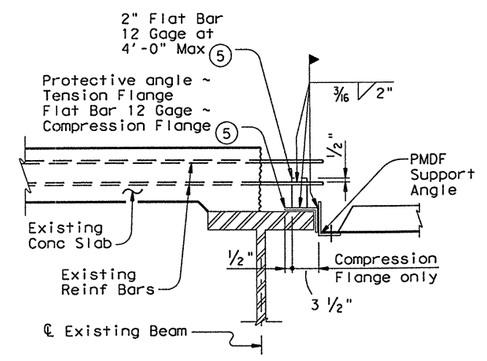
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

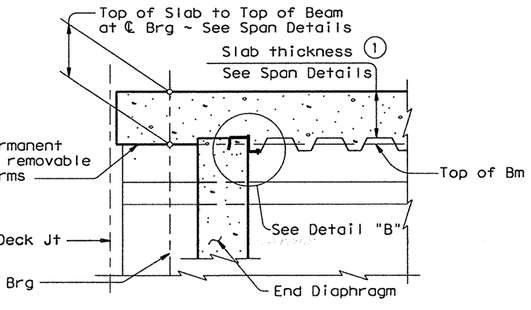


DETAIL "A"

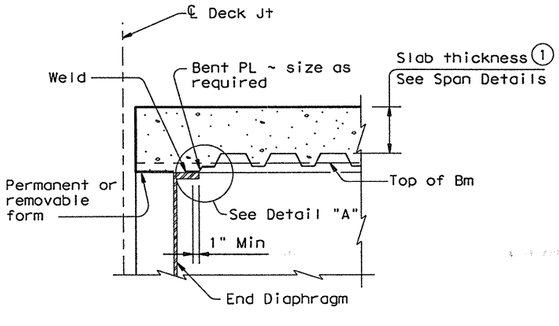


SHOWING STEEL BEAMS

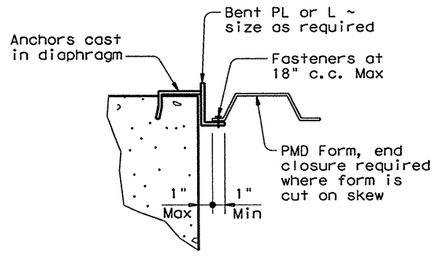
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 Gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

Sheet 44 of 45 Sheets

Texas Department of Transportation
Bridge Division

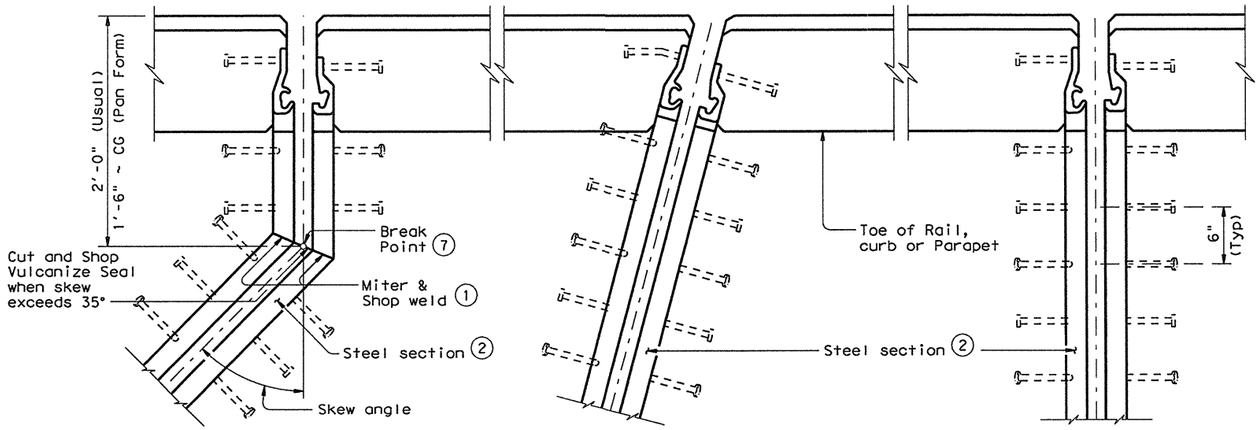
PERMANENT METAL DECK FORMS

SHEET 2 OF 2 **PMDF**

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REVISIONS 08-2007: Added I-Girders.						326
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		0009	12	073	IH 30

PATH:
LEVELS

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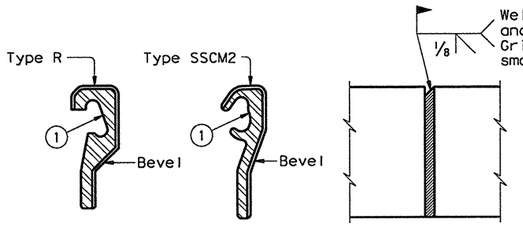
SHOWING SKEWS WITH SLAB BREAKBACKS

SHOWING SKEWS WITHOUT SLAB BREAKBACKS

SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

TABLE OF SEALED EXPANSION JOINT INFORMATION

MANUFACTURER	STEEL SECTION (2)	NEOPRENE STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening (3)	Seal Type	Joint Opening (3)
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowmon Acme	Type R	SE-400	1 ¾"	SE-500	2"



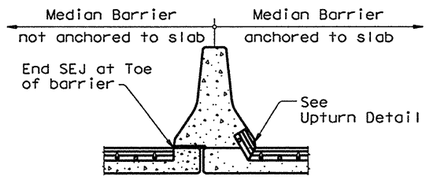
WELD LIMITS WELD LIMITS REAR VIEW

BEVEL AT FIELD SPLICE

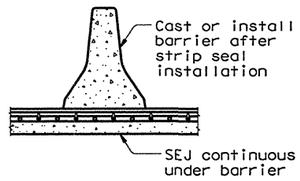
Weld preparation shall be done by shop

PLANS OF END CONDITIONS

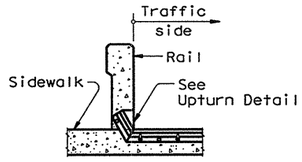
SHOWN WITH UPTURNS



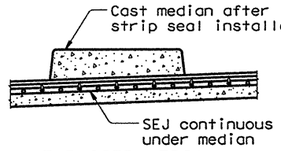
WITH OPEN DECK JT BELOW MEDIAN BARRIER



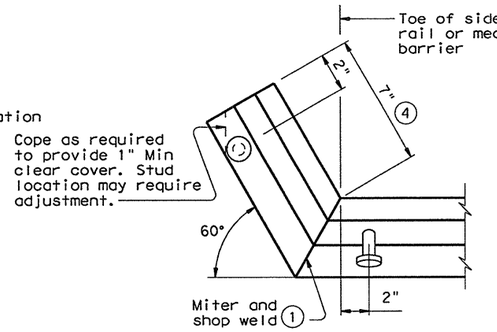
AT MEDIAN BARRIER



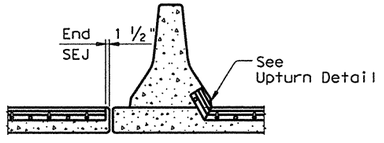
AT SIDEWALK BEHIND BRIDGE RAIL



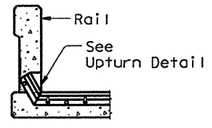
AT RAISED MEDIAN



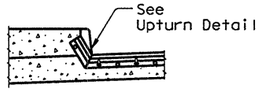
UPTURN DETAIL



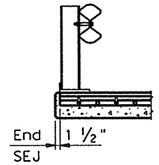
WITH OPEN DECK JT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

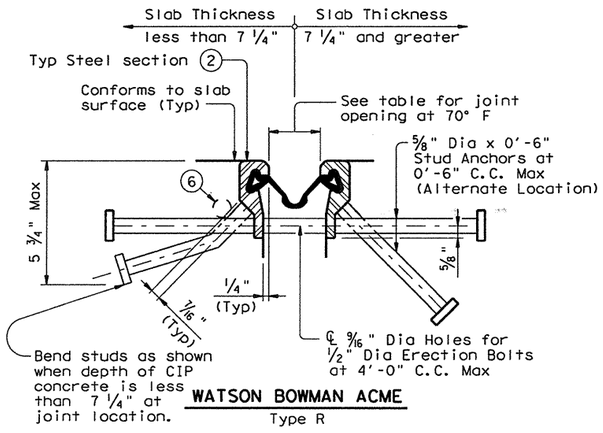


AT SIDEWALK

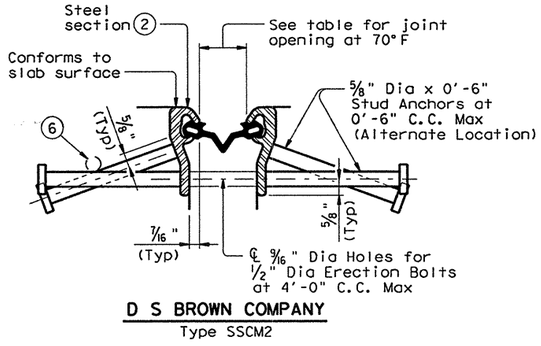


AT STEEL POST BRIDGE RAIL

TYPICAL SECTIONS (5)



WATSON BOWMAN ACME
Type R



D S BROWN COMPANY
Type SSCM2

SECTIONS THRU SEALED EXPANSION JOINT

FABRICATION NOTES:

Corresponding sections of Sealed Exp Jts shall be temporarily shop assembled, checked for fit, and match marked for shipment.

Erection holes shall be punched so as to line up when Sealed Exp Jts are in their final position.

Weld studs in accordance with AWS D1.1.

The neoprene seal shall be continuous and included in the price bid for Sealed Exp Jt.

Steel sections shall be shipped in convenient lengths of 24'-0" Max and 10'-0" Min unless otherwise necessary for stage construction or widenings. One shop splice will be permitted in each shipping length provided no piece is less than 2'-0" in length and sufficient studs are added to limit the stud to shop or field splice distance to 2" Min and 4" Max.

Shop and field splices shall be made by butt welding with areas in contact with seal to be ground smooth.

Paint portions of steel sections not in contact with concrete with the primer specified for System II paint.

Shop drawings for the fabrication of Sealed Expansion Joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

An SEJ Layout which identifies location of each steel section shall be developed. Permanently mark each steel section in accordance with the SEJ Layout.

CONSTRUCTION NOTES:

The Contractor shall arrange for securing the Sealed Exp Jt in position, and placing to the proper grade and alignment by welding braces to adjacent reinf steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Cost of temporary bracing is to be included in the price bid for Sealed Exp Jt.

After bracing and welding the steel section, remove the erection bolts and spacers and seal erection holes before placing concrete.

Seal cavity shall be cleaned and prepared for seal installation as per the manufacturer's suggested installation procedures.

GENERAL NOTES:

Sealed Exp Jts shall be provided in the size and at locations shown on plans.

Minimum slab and overhang thickness required for the use of SEJ-A is 6 ½".

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) Transverse bars in conflict with SEJ studs in either the bridge slab or approach slab shall be moved to rest at the junction of the studs.

(7) See Span details for location of break point.

Sheet 45 of 45 Sheets

Texas Department of Transportation
Bridge Division

SEALED EXPANSION JOINT TYPE A WITHOUT OVERLAY

SEJ-A

FILE: sejastel.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				327
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	0009	12	073	IH 30

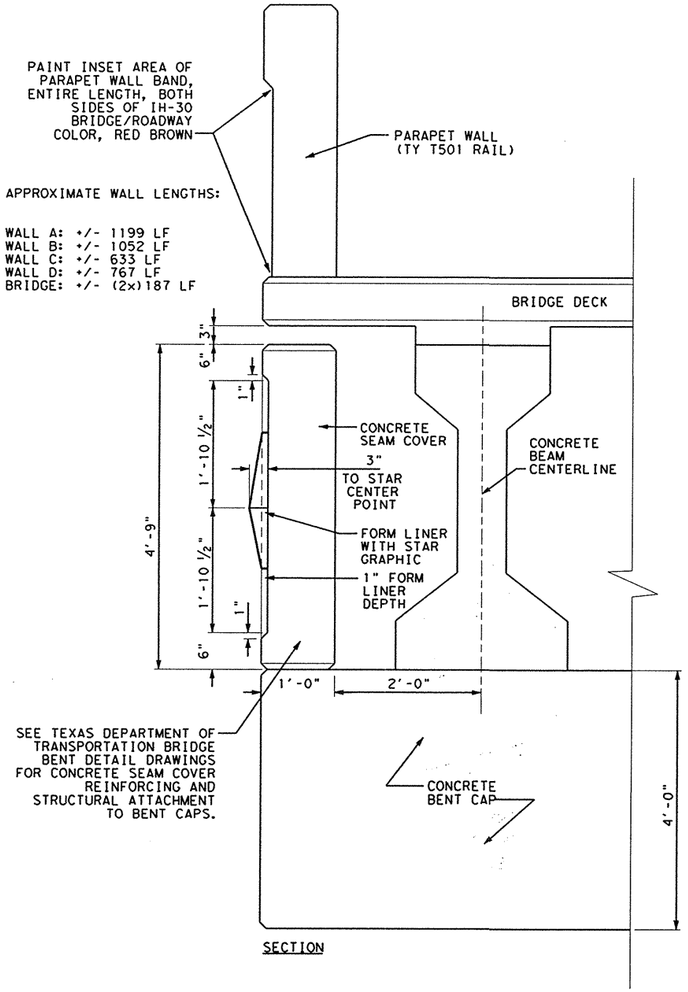
PATH:
LEVELS D 1

PAINT INSET AREA OF PARAPET WALL BAND, ENTIRE LENGTH, BOTH SIDES OF IH-30 BRIDGE/ROADWAY COLOR, RED BROWN

PARAPET WALL (TY T501 RAIL)

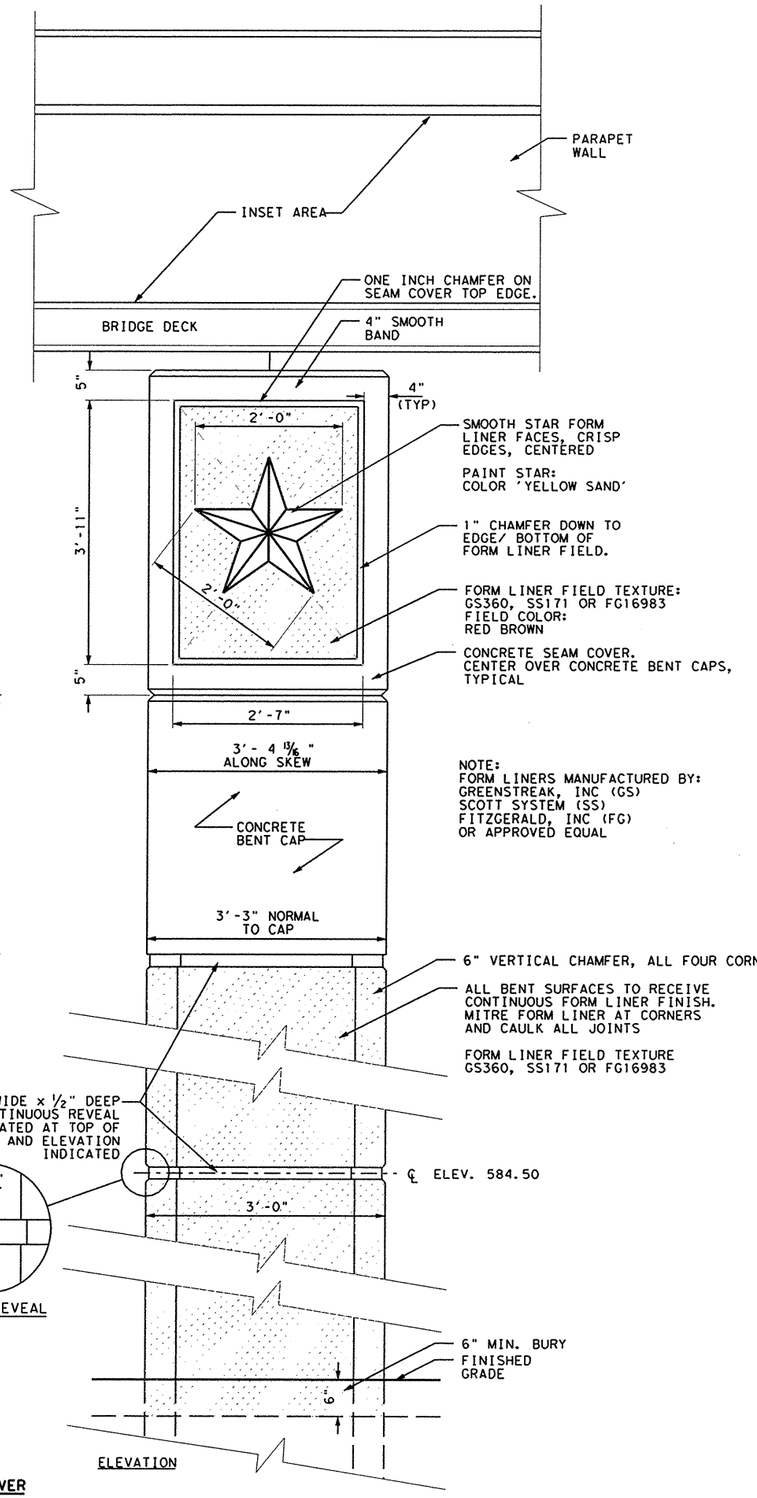
APPROXIMATE WALL LENGTHS:

WALL A: +/- 1199 LF
WALL B: +/- 1052 LF
WALL C: +/- 633 LF
WALL D: +/- 767 LF
BRIDGE: +/- (2x)187 LF



SEE TEXAS DEPARTMENT OF TRANSPORTATION BRIDGE BENT DETAIL DRAWINGS FOR CONCRETE SEAM COVER REINFORCING AND STRUCTURAL ATTACHMENT TO BENT CAPS.

SECTION



SMOOTH STAR FORM LINER FACES, CRISP EDGES, CENTERED

PAINT STAR: COLOR 'YELLOW SAND'

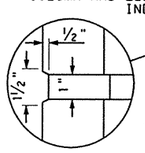
1" CHAMFER DOWN TO EDGE/ BOTTOM OF FORM LINER FIELD.

FORM LINER FIELD TEXTURE: GS360, SS171 OR FG16983 FIELD COLOR: RED BROWN

CONCRETE SEAM COVER. CENTER OVER CONCRETE BENT CAPS, TYPICAL

NOTE:
FORM LINERS MANUFACTURED BY:
GREENSTREAK, INC (GS)
SCOTT SYSTEM (SS)
FITZGERALD, INC (FG)
OR APPROVED EQUAL

ELEVATION



COLUMN REVEAL

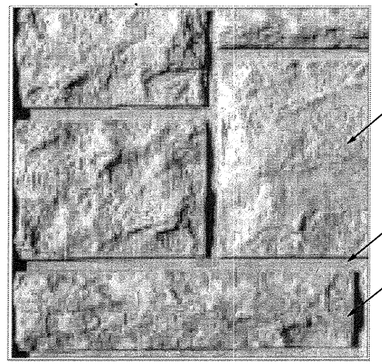
NOTE:

BENT MOCK-UP: THE CONTRACTOR SHALL REFER TO BUILT SH205 BENT AS EXAMPLE FOR CONSTRUCTION.

CONCRETE SEAM COVER
NOT TO SCALE

GENERAL NOTES

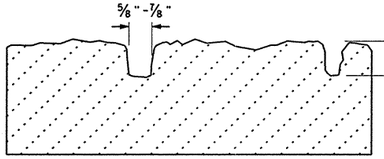
1. FOR FABRICATION AND FINISHING OF THE CONCRETE SEAM COVERS, SEE GENERAL NOTES ITEMS 420 AND 427.
2. SEE SHEET 1 OF 3 FOR ADDITIONAL NOTED REQUIREMENTS.
3. CONTRACTOR SHALL SUBMIT A SAMPLE OF EACH FORM LINER TO CITY OF ROCKWALL REPRESENTATIVE FOR APPROVAL PRIOR TO PUCHASING FORM LINERS. SEE GENERAL NOTES ITEM 427.
4. CONTRACTOR SHALL SUBMIT PAINT COLOR CHIPS FOR ALL WALL AND GRAPHIC IMAGE COLORS TO CITY OF ROCKWALL REPRESENTATIVE FOR APPROVAL PRIOR TO PURCHASING PAINT. SEE GENERAL NOTES ITEM 427.



SHARP CHISLED (ASHLAR) STONE TEXTURE GS460, SS167 OR FG16986

STONE JOINT PATTERN

FORM LINER STONE SIZES VARY



FORM LINER STONE TEXTURE DETAIL
NOT TO SCALE

REGISTERED LANDSCAPE ARCHITECT
CORY M. SCHULZ
2032
STATE OF TEXAS

2/9/09

Sheet 3 of 3 Sheets

Parsons Brinckerhoff Quade & Douglas, Inc.
2777 Stemmons Freeway
Suite 1333
Dallas, TX 75207

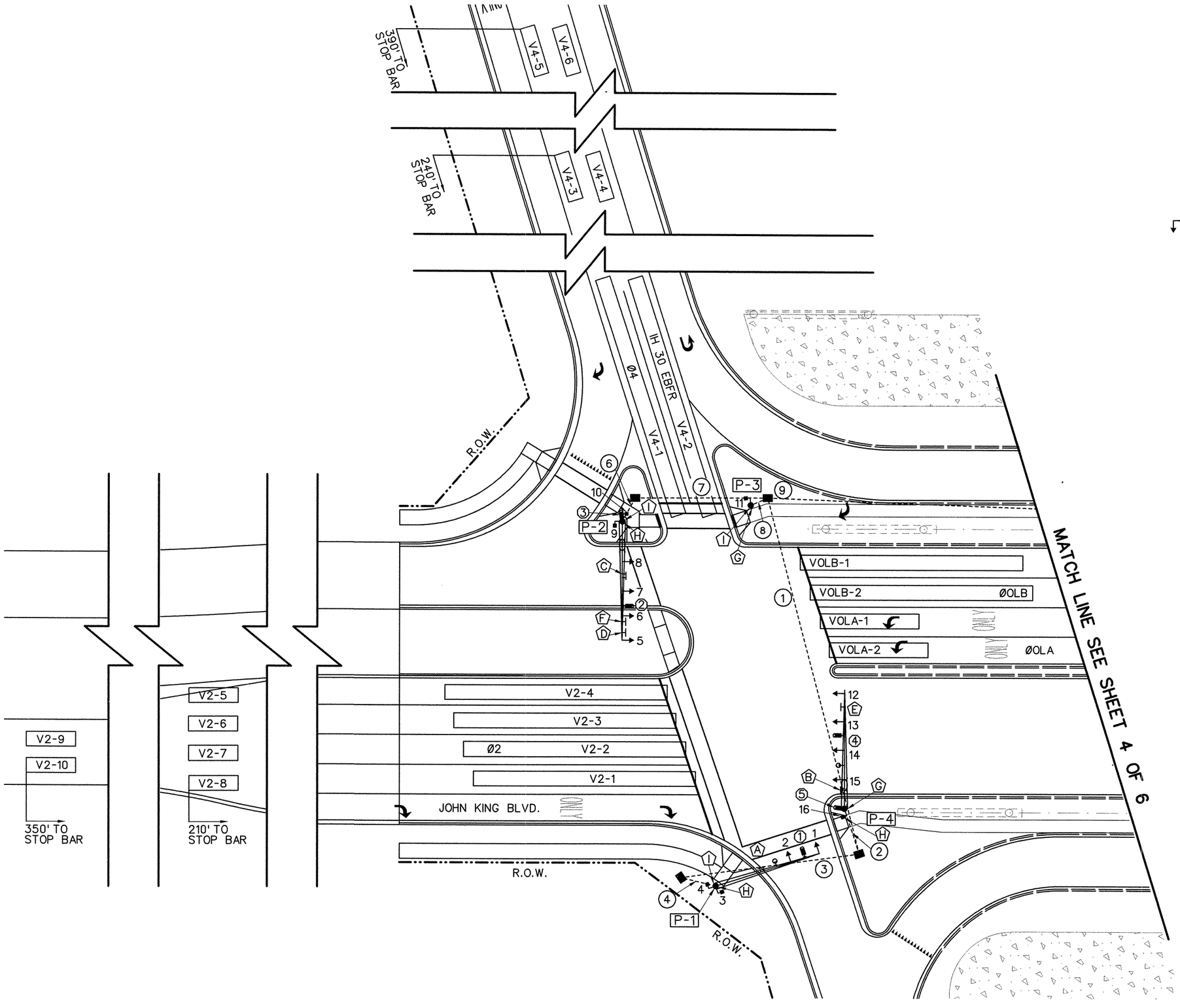
Texas Department of Transportation
© 2009

IH-30
OVER JOHN KING BLVD
BRIDGE FORM LINER PLANS

SEAM COVER AND FORM LINER DETAILS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TMT	6	(See Title Sheet)		IH 30
DESIGN CK.	STATE	DISTRICT	COUNTY	SHEET NO.
CMS	TEXAS	DALLAS	ROCKWALL	327A
GRAPHICS	CONTROL	SECTION	JOB	-
LEL				
GRAPHICS CK.	0009	12	073	
CMS				

$FILE$
$DATE$



N

20 10 0 20 40
SCALE FEET

SCALE: 1"=40'

LEGEND

- TYPICAL PROPOSED MAST ARM COMBINATION SIGNAL/WITH PEDESTRIAN SIGNAL, PUSH BUTTON, LUMINAIRE, AND SIGNAGE
- TRAFFIC SIGNAL CONTROLLER CABINET W/B.B.U.
- GROUND BOX (TY D) W/APRON
- PROPOSED CONDUIT
- (1) CONDUIT RUN NUMBER
- 1 SIGNAL HEAD NUMBER
- (1) VIVD CAMERA AND LABEL
- VIVDS DETECTION ZONE
- (A) SIGN LABEL
- (S) ELECTRICAL SERVICE POLE
- OPTICOM
- SSR YAGI ANTENNA

Reginald Fountain P.E. 5/18/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

TRAFFIC SIGNAL LAYOUT

JOHN KING BLVD. (SH 205 BYPASS) AT IH 30 EB FRONTAGE ROAD

Designed:	BCM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	BCM	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	BCM	DAL	ROCKWALL	0009	12	073		328

SHEET 1 OF 6

5/15/2009 10:52:07 AM rfountain pw:Active Projects:TxDOT43:TXDOT43-05/8.0@ Plans and Drawings/8.30 Cut Sheets/8.3... Signals/435TL01.050

CONDUIT AND CABLE CHART

RUN NO.	CONDUIT STATUS	ITEM 618 SIZE/TYPE CONDUIT (FT)				CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS			ITEM 684 SIG CAB (EA)		ITEM 6266 VIVDS CABLE (EA)	MODEL 138 (EA) OPTICOM CABLE	ITEM 6006 HELIAX CABLE	LENGTH OF RUN (FT)	RUN NO.
										TY-A						
		2" PVC TRENCHED	3" PVC TRENCHED	3" PVC BORED	4" PVC TRENCHED		NO. 6 XHHW WIRE	NO. 6 BARE WIRE	NO. 8 XHHW WIRE	12 CONDR. CABLE	20 CONDR. CABLE					
1	I			150		I		1	2	2		3	2		150	1
2	I		18			I		1	2	1		2	1		18	2
3	I			75		I		1		1		1	1		75	3
4	I		15			I		1		1		1	1		15	4
6	I		10			I		1	2		1	2			15	6
7	I			55		I		1	2		1	2			55	7
8	I		10			I		1		1					10	8
9	I				162	I		1	2	3	1	5	2		162	9
TOTAL			53	280	162		0	500	800	904	232	1526	732			

CONDITION STATUS: E=EXISTING; I=INSTALL; A=ABANDON; AC=AERIAL CABLE; R=RELOCATE; RRC=REMOVE/REINSTALL CABLE; REM=REMOVE; S=SALVAGE

ITEM 682 SIGNAL HEADS

SIGNAL HEAD NO.	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS				
			BACKPLATES		LOUVER	VEH. SIGNAL	PED. SIGNAL
			3 SEC (EA)	5 SEC (EA)		SEC (EA)	SEC (EA)
5, 6	H3LT	I	2	0		6	
1,2,7,8,12	H3	I	8			24	
13,14,15							
3, 4, 9,	152A	I					6
10, 11,16							
TOTAL (NEW)			10	0	0	30	6

STATUS: E=EXISTING; R=EX. TO BE REMOVED; I=INSTALL NEW

WIRE INSIDE POLE (FEET)

POLE NO.	ITEM 620 ELEC. CONDR.		ITEM 684 TYPE A		ITEM 6266 VIVDS CABLE	OPTICOM CABLE* MODEL 138
	NO. 6 XHHW	NO. 12 XHHW	5 CNDR NO. 14	7 CNDR NO. 14		
P-1			140		65	50
P-2		80	105	130	120	
P-3			10			
P-4		80	240		125	45
TOTAL		160	495	130	310	95

* - CITY SUPPLIED CABLE

152A/143C



SH 3, 4, 9, 10, 11, 16

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0624	GROUND BOX TY D (162922) W/APRON	EA	4

H3LT

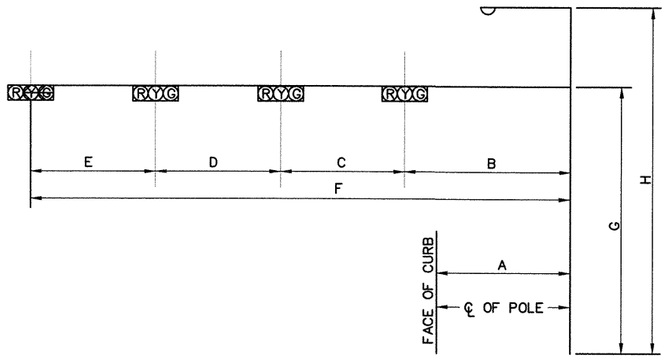


SH 5, 6

H3



SH 1, 2, 7, 8 12, 13, 14, 15



ITEM 0682 LED SIGNAL INDICATIONS

ITEM NO.	DESCRIPTION	UNIT	QTY.
0682	PED SIG SEC (12 IN) LED (2 IND)	EA.	6
0682	VEH SIG SEC (12 IN) LED (GRN ARW)	EA.	2
0683	VEH SIG SEC (12 IN) LED (YEL ARW)	EA.	2
0682	VEH SIG SEC (12 IN) LED (GRN)	EA.	8
0682	VEH SIG SEC (12 IN) LED (YEL)	EA.	8
0682	VEH SIG SEC (12 IN) LED (RED)	EA.	10

SIGNAL HEAD AND POLE PLACEMENT

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	NO. OF HEADS (EA)	LUM	FDN. TYPE
P-1	I	18.3	32.0	12.0			44.0	19		2		36-A
P-2	I	9.1	16.0	12.0	10.0	10.0	48.0	19	30	4	Y	36-A
P-3	I	9.5						10				24-A
P-4	I	4.3	12.0	12.0	12.0	12.0	48.0	19	30	4	Y	36-A

P= PERMANENT STEEL TRAFFIC SIGNAL POLE & MAST ARM
I=INSTALL; E = EXISTING; REM=REMOVE; REL=RELOCATE; S=SALVAGE

NOTE:

1. THE INFORMATION SHOWN ON THESE DRAWING CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS/HER OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AD MAY BE NECESSARY TO AVOID DAMAGE THERE TO.

Reginald Fountain P.E. 5/18/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

TRAFFIC SIGNAL LAYOUT

JOHN KING BLVD. (SH 205 BYPASS) AT IH 30 EB FRONTAGE ROAD

Designed:	RNR	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	JAV	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073		329

SHEET 2 OF 6

5/15/2009 10:53:15 AM rfountain n:\Active Projects\TXDOT\43-TXDOT43-07_SubSubs\435TRFDATA01.999

CABLE TERMINATION CHART

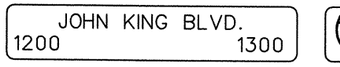
CNDR. NO.	CONDUCTOR COLOR	CABLE 1 12 CNDR. FROM P-1 TO CNTRL.	CABLE 2 20 CNDR. FROM P-2 TO CNTRL.	CABLE 3 12 CNDR. FROM P-3 TO CNTRL.	CABLE 4 12 CNDR. FROM P-4 TO CNTRL.	CNDR. NO.
1	BLACK	PB COM	PB COM	PB COM	PB COM	1
2	WHITE	SH COM	SH COM	SH COM	SH COM	2
3	RED	SH 1-2 RED	SH 5-8 RED	Φ6 PED CALL	SH 12-15 RED	3
4	GREEN	SH 1-2 GREEN	SH 7-8 GREEN	PED HD 11 W	SH 12-15 GREEN	4
5	ORANGE	SH 1-2 YELLOW	SH 7-8 YELLOW	PED HD 11 DW	SH 12-15 YELLOW	5
6	BLUE	SPARE	SPARE	SPARE	SPARE	6
7	WHITE/BLACK	Φ2 PED CALL	SH 5-6 GRN ARW	SPARE	Φ2 PED CALL	7
8	RED/BLACK	PED HD 3 W	SH 5-6 YEL ARW	SPARE	PED HD 16 W	8
9	GREEN/BLACK	PED HD 3 DW	SPARE	SPARE	PED HD 16 DW	9
10	ORANGE/BLACK	Φ8 PED CALL	SPARE	SPARE	SPARE	10
11	BLUE/BLACK	PED HD 4 W	Φ8 PED CALL	SPARE	SPARE	11
12	BLACK/WHITE	PED HD 4 DW	PED HD 9 W	SPARE	SPARE	12
13	RED/WHITE		PED HD 9 DW			13
14	GREEN/WHITE		Φ6 PED CALL			14
15	BLUE/WHITE		PED HD 10 W			15
16	BLACK/RED		PED HD 10 DW			16
17	WHITE/RED		SPARE			17
18	ORANGE/RED		SPARE			18
19	BLUE/RED		SPARE			19
20	RED/GREEN		SPARE			20

VIVDS DETECTION ZONE DETAILS

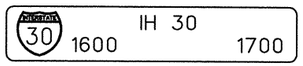
CAMERA	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	SETBACK DISTANCE	DIMENSIONS	DETECT UNIT	DELAY INHIBIT
1	P-1 MAST ARM	24'	STOP BAR	V4-1	N/A	6'X90'	Ø4-1	Ø4-R
				V4-2		6'X90'		
2	P-2 MAST ARM	24'	STOP BAR	VOLA-1	N/A	6'X40'	ØOLA-1	ØOLA-G
				VOLA-2		6'X40'		
				VOLB-1		6'X90'	ØOLB-1	ØOLA-R
				VOLB-2		6'X90'		
3	P-2 LUMINAIRE ARM	32'	SETBACK	V4-3	240'	6'X20'	Ø4-2	Ø4-G
				V4-4		6'X20'		
				V4-5	390'	6'X20'	Ø4-3	Ø4-G
				V4-6		6'X20'		
4	P-4 MAST ARM	24'	STOP BAR	V2-1	N/A	6'X90'	Ø2-1	Ø2-R
				V2-2		6'X90'		
				V2-3		6'X90'		
				V2-4		6'X90'		
5	P-4 LUMINAIRE ARM	32'	SETBACK	V2-5	210'	6'X20'	Ø2-2	Ø2-G
				V2-6		6'X20'		
				V2-7		6'X20'		
				V2-8		6'X20'		
				V2-9	350'	6'X20'	Ø2-3	Ø2-G
				V2-10		6'X20'		

ITEM 6266 VIVDS

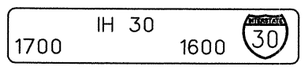
ITEM	QUANTITY
VIVDS PROCESSOR SYSTEM (INSTALL & TEST)	1
VIVDS CAMERA ASSEMBLY	5
VIVDS COMM. CABLE, LF	1836
VIVDS SET UP SYSTEM	1



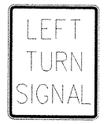
A



B



C



D



E



F



G



H



I

SIGNS SUMMARY

SIGN	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in X in)	REFLECTIVE SHEETING	GROUND MOUNT TYPE	
							TWT (1) UA (P)	TWT (1) UA (T)
A	STREET NAME	JOHN KING BLVD.	I			-	-	-
B	STREET NAME	IH 30	I			-	-	-
C	STREET NAME	IH 30	I			-	-	-
D	R10-10L	LEFT TURN SIGNAL	I		24" X 30"	C	-	-
E	R6-2R	ONE-WAY SIGN (RIGHT)	I		24" X 30"	C	-	-
F	R6-2L	ONE-WAY SIGN (LEFT)	I		24" X 30"	C	-	-
G	R9-3A	NO PEDESTRIANS	I		24" X 24"	C	-	-
H	R10-4BR	PUSH BUTTON FOR (WALK SYMBOL) RIGHT ARROW	I		9" X 12"	C	-	-
I	R10-4BL	PUSH BUTTON FOR (WALK SYMBOL) LEFT ARROW	I		9" X 12"	C	-	-

STATUS: E= EXISTING; R=REMOVE; REL=RELOCATE; REP=REPLACE; I=INSTALL; SAL=SALVAGE

Reginald Fountain, P.E
5/18/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

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IH 30 AT JOHN KING BLVD.

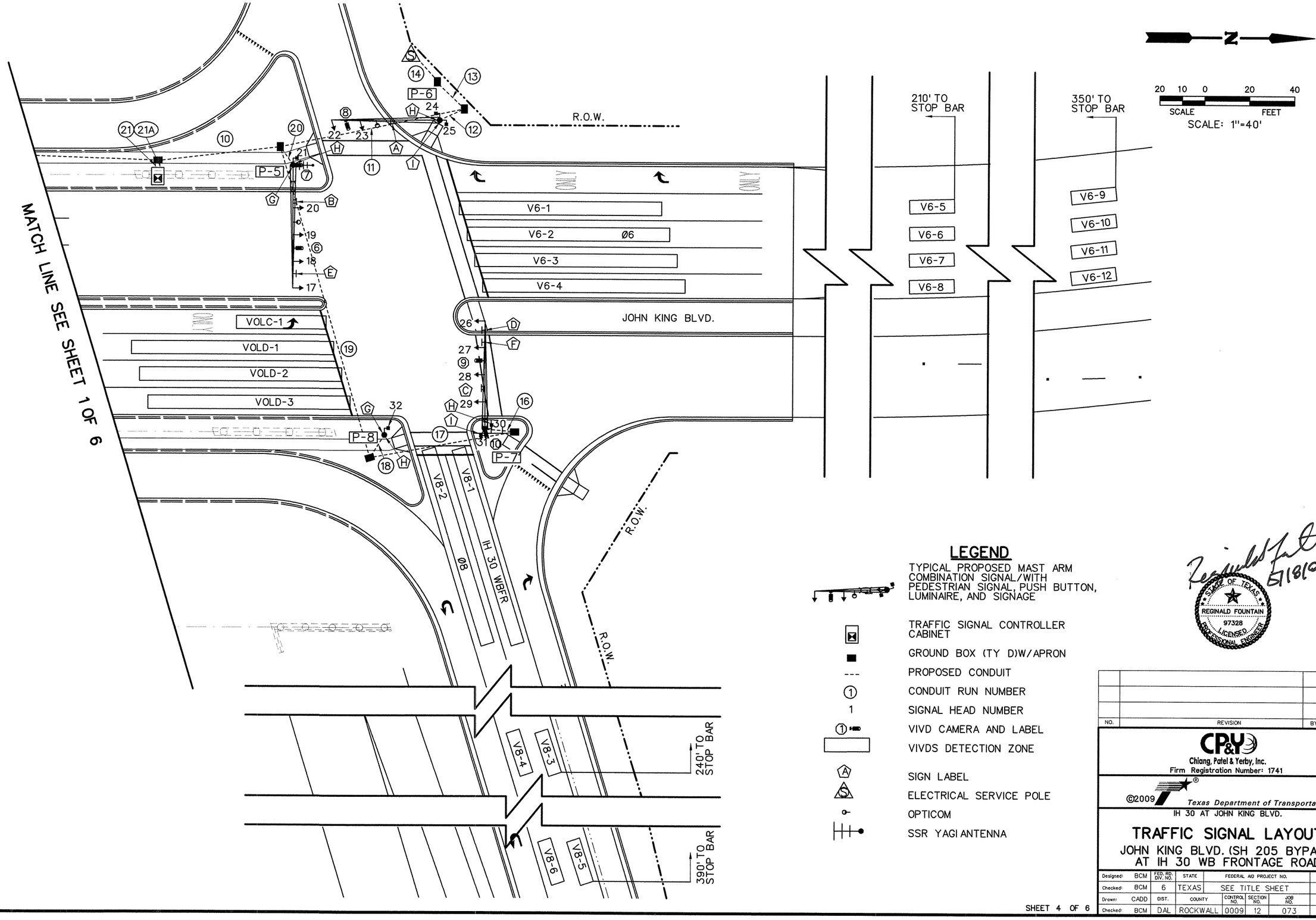
TRAFFIC SIGNAL LAYOUT

JOHN KING BLVD. (SH 205 BYPASS)
AT IH 30 EB FRONTAGE ROAD

Designed: BCM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: BCM	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: BCM	DAL	ROCKWALL	0009	12	073	330

SHEET 3 OF 6

5/18/2009 8:19:00 AM RFOUNTAIN
Documents & Settings/All Users/Documents/Active Projects/TXDOT/4x/TxDOT4x-j65-8.00 Plans and Documents/Sheets/8.30 Cut Sheets/8.30a Signals/4307TRFDATA02.dgn



LEGEND

- TYPICAL PROPOSED MAST ARM COMBINATION SIGNAL/WITH PEDESTRIAN SIGNAL, PUSH BUTTON, LUMINAIRE, AND SIGNAGE
- TRAFFIC SIGNAL CONTROLLER CABINET
- GROUND BOX (TY D)W/APRON
- PROPOSED CONDUIT
- CONDUIT RUN NUMBER
- SIGNAL HEAD NUMBER
- VIVD CAMERA AND LABEL
- VIVDS DETECTION ZONE
- SIGN LABEL
- ELECTRICAL SERVICE POLE
- OPTICOM
- SSR YAGI ANTENNA

Reginald Fountain, P.E. 5/18/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

TRAFFIC SIGNAL LAYOUT

JOHN KING BLVD. (SH 205 BYPASS) AT IH 30 WB FRONTAGE ROAD

Designed:	BCM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	BCM	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BCM	DAL	ROCKWALL	0009	12	073	331

SHEET 4 OF 6

5/15/2009 10:50:50 AM rfountain pw:/Active Projects/TXDOT43/TXDOT43-073-8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx Signals/4.35TL02.dgn

CONDUIT AND CABLE CHART

RUN NO.	CONDUIT STATUS	ITEM 618 SIZE/TYPE CONDUIT (FT) 2" PVC TRENCHED	3" PVC TRENCHED	3" PVC BORED	4" PVC TRENCHED	CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS NO. 6 XHHW WIRE	NO. 6 BARE WIRE	NO. 8 XHHW WIRE	ITEM 684 SIG CAB (EA) TY-A 12 CONDR. CABLE	20 CONDR. CABLE	ITEM 6266 VIVDS CABLE (EA)	* MODEL 138 (EA) OPTICOM CABLE	ITEM 6006 HELIAX CABLE	LENGTH OF RUN (FT)	RUN NO.
10	I				53	I	2	1	2	3	1	5	2	1	53	10
11	I			85		I	2	1	2	1		1	1		85	11
12	I		15			I		1		1		1	1		15	12
13	I		15			I	2	1	2						15	13
** 14	I	15				I	2	1	2						15	14
16	I		15			I		1	2		1	2			15	16
17	I			65		I		1	2		1	2			65	17
18	I		15			I		1		1					15	18
19	I			150		I		1	2	1	1	2			150	19
20	I		10			I		1	2	1		2	1	1	10	20
21	I				10	I		1		3	1	5	2		10	21
21A	I				10	I	2	1		3	1	5	2	1	10	21A
TOTAL		15	70	300	73		356	458	816	494	303	945	256	73		

CONDITION STATUS: E=EXISTING; I=INSTALL; A=ABANDON; AC=AERIAL CABLE; R=RELOCATE; RRC=REMOVE/REINSTALL CABLE; REM=REMOVE; S=SALVAGE

*-CITY SUPPLIED CABLE

** LOCATION OF ELECTRICAL SERVICE IS APPROXIMATE. LENGTH OF RUN 14 MAY VARY.

ITEM 682 SIGNAL HEADS

SIGNAL HEAD NO.	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS BACKPLATES 3 SEC (EA)	BACKPLATES 5 SEC (EA)	LOUVER	VEH. SIGNAL SEC (EA)	PED. SIGNAL SEC (EA)
17, 18, 19, 20	H3	I	9			27	
22, 23, 27, 28, 29							
26	H3LT	I	1			3	
21, 24, 25, 30, 31, 32	152A	I					6
TOTAL (NEW)			10	0	0	30	6

STATUS: E=EXISTING; R=EX. TO BE REMOVED; I=INSTALL NEW

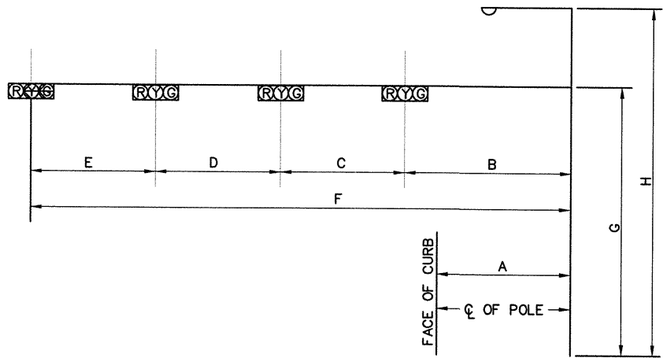
ITEM 0682 LED SIGNAL INDICATIONS

ITEM NO.	DESCRIPTION	UNIT	QTY.
0682	PED SIG SEC (12 IN) LED (2 IND)	EA.	6
0682	VEH SIG SEC (12 IN) LED (GRN ARW)	EA.	1
0682	VEH SIG SEC (12 IN) LED (GRN)	EA.	9
0682	VEH SIG SEC (12 IN) LED (YEL ARW)	EA.	1
0682	VEH SIG SEC (12 IN) LED (YEL)	EA.	9
0682	VEH SIG SEC (12 IN) LED (RED)	EA.	10

WIRE INSIDE POLE (FEET)

POLE NO.	ITEM 620 ELEC. CONDR. NO. 6 XHHW	NO. 12 XHHW	ITEM 684 TYPE A 5 CNDR NO. 14	7 CNDR NO. 14	ITEM 6266 VIVDS CABLE	OPTICOM CABLE* MODEL 138	ITEM 6006 HELIAX CABLE
P-5		80	240		125	45	50
P-6			120		70	50	
P-7		80	175	75	125		
P-8			10				
TOTAL		160	545	75	320	95	50

* - CITY SUPPLIED CABLE



H3LT



SH 26

H3



SH 17, 18, 19, 20, 22, 23, 27, 28, 29

152A/143C



SH 21, 24, 25, 30, 31, 32

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0624	GROUND BOX TY D (162922) W/APRON	EA	6

SIGNAL HEAD AND POLE PLACEMENT

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	NO. OF HEADS (EA)	LUM	FDN. TYPE
P-5	I	10.9	19	12	12	12	55	19	30	4	Y	48-A
P-6	I	21.3	35.5	12.5			48	19		2		36-A
P-7	I	4	12	12	12	12	48	19	30	4	Y	36-A
P-8	I	7.5						10		0		24-A

P= PERMANENT STEEL TRAFFIC SIGNAL POLE & MAST ARM
I=INSTALL; E = EXISTING; REM=REMOVE; REL=RELOCATE; S=SALVAGE

ITEM 628 ELECTRICAL SERVICE DATA

SERVICE IDENTIFIER	ELECTRICAL SERVICE DESCRIPTION	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN CKT. BRK POLE/AMP	TWO-POLE CONTACTOR AMPS	PANEL BD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	CIRCUIT DESC.	BRANCH CKT. / BRD. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
1	TYPE D 120/240 070 (NS) SS (E) SP (O)	1 1/4"	3/#4	N/A	2P/70	30	100	1 2	T.S. LIGHTING	1P/50 2P/15	40 9	7.0

NOTE:

1. THE INFORMATION SHOWN ON THESE DRAWING CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS/HER OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AD MAY BE NECESSARY TO AVOID DAMAGE THERE TO.

Reginald Fountain 5/18/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

TRAFFIC SIGNAL LAYOUT

JOHN KING BLVD. (SH 205 BYPASS) AT IH 30 WB FRONTAGE ROAD

Designed:	BCM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	BCM	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	BCM	DAL	ROCKWALL	0009	12	073		33Z

SHEET 5 OF 6

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CABLE TERMINATION CHART

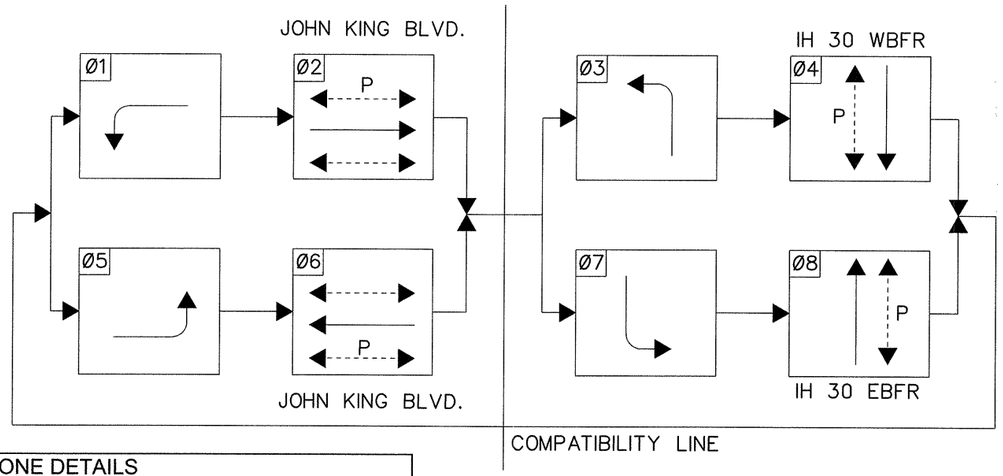
CNDR. NO.	CONDUCTOR COLOR	CABLE 1 12 CNDR. FROM P-5 TO CNTRL.	CABLE 2 12 CNDR. FROM P-6 TO CNTRL.	CABLE 3 20 CNDR. FROM P-7 TO CNTRL.	CABLE 4 12 CNDR. FROM P-8 TO CNTRL.	CNDR. NO.
1	BLACK	PB COM	PB COM	PB COM	PB COM	1
2	WHITE	SH COM	SH COM	SH COM	SH COM	2
3	RED	SH 17-20 RED	SH 22-23 RED	SH 26-29 RED	Φ2 PED CALL	3
4	GREEN	SH 17-20 GREEN	SH 22-23 GREEN	SH 27-29 GREEN	PED HD 32 W	4
5	ORANGE	SH 17-20 YELLOW	SH 22-23 YELLOW	SH 27-29 YELLOW	PED HD 32 DW	5
6	BLUE	SPARE	SPARE	SPARE	SPARE	6
7	WHITE/BLACK	Φ6 PED CALL	Φ6 PED CALL	SPARE	SPARE	7
8	RED/BLACK	PED HD 21 W	PED HD 24 W	SH 26 GRN ARW	SPARE	8
9	GREEN/BLACK	PED HD 21 DW	PED HD 24 DW	SH 26 YEL ARW	SPARE	9
10	ORANGE/BLACK	SPARE	Φ4 PED CALL	SPARE	SPARE	10
11	BLUE/BLACK	SPARE	PED HD 25 W	SPARE	SPARE	11
12	BLACK/WHITE	SPARE	PED HD 25 DW	SPARE	SPARE	12
13	RED/WHITE			SPARE		13
14	GREEN/WHITE			Φ4 PED CALL		14
15	BLUE/WHITE			PED HD 30 W		15
16	BLACK/RED			PED HD 30 DW		16
17	WHITE/RED			Φ2 PED CALL		17
18	ORANGE/RED			PED HD 31 W		18
19	BLUE/RED			PED HD 31 DW		19
20	RED/GREEN			SPARE		20

ITEM 6266 VIVDS

ITEM	QUANTITY
VIVDS PROCESSOR SYSTEM (INSTALL & TEST)	1
VIVDS CAMERA ASSEMBLY	5
VIVDS COMM. CABLE, LF	1265
VIVDS SET UP SYSTEM	1

ITEM 6006 SSR

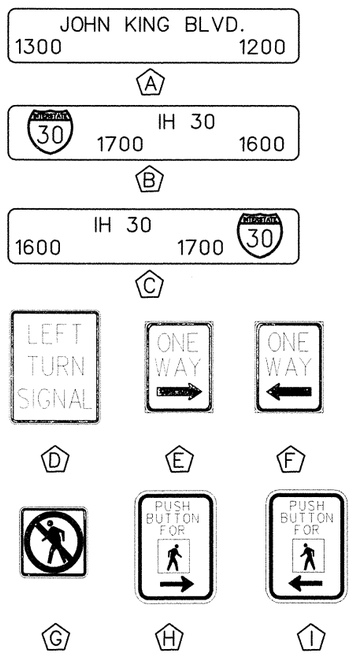
ITEM	QUANTITY
SPREAD SPECTRUM RADIO	1
RADIO ANTENNA	1
HELIAX CABLE, LF	123



OLA = Ø1 + Ø3
OLB = Ø1 + Ø2 + Ø3
OLC = Ø5 + Ø7
OLD = Ø5 + Ø6 + Ø7
MAINT. FLASH = ALL RED
EMERGENCY FLASH = ALL RED

VIVDS DETECTION ZONE DETAILS

CAMERA	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATION	ZONE	SETBACK DISTANCE	DIMENSIONS	DETECT UNIT	DELAY INHIBIT
6	P-5 MAST ARM	24'	STOP BAR	V6-1	N/A	6'X90'	Ø6-1	Ø6-R
				V6-2		6'X90'		
				V6-3		6'X90'		
				V6-4		6'X90'		
7	P-5 LUMINAIRE ARM	32'	SETBACK	V6-5	210'	6X20'	Ø6-2	Ø6-G
				V6-6		6X20'		
				V6-7		6X20'		
				V6-8		6X20'		
				V6-9	350'	6X20'		
				V6-10		6X20'		
				V6-11		6X20'		
				V6-12		6X20'		
8	P-6 MAST ARM	24'	STOP BAR	V8-1	N/A	6'X100'	Ø8-1	Ø8-R
				V8-2		6'X100'		
9	P-7 MAST ARM	24'	STOP BAR	VOLC-1	N/A	6'X40'	ØOLC-1	ØOLC-G
				VOLD-1		6'X90'		
				VOLD-2		6'X90'	ØOLD-1	ØOLD-R
				VOLD-3		6'X90'		
10	P-7 LUMINAIRE ARM	32'	SETBACK	V8-3	240'	6'X20'	Ø8-2	Ø8-G
				V8-4		6'X20'		
				V8-5	390'	6'X20'		
				V8-6		6'X20'		



SIGNS SUMMARY

SIGN	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in X in)	REFLECTIVE SHEETING	GROUND MOUNT TYPE	
							TWT (1) UA (P)	TWT (1) UA (T)
A	STREET NAME	JOHN KING BLVD.	I			-	-	-
B	STREET NAME	IH 30	I			-	-	-
C	STREET NAME	IH 30	I			-	-	-
D	R10-10L	LEFT TURN SIGNAL	I		24" X 30"	C	-	-
E	R6-2R	ONE-WAY SIGN RIGHT	I		24" X 30"	C	-	-
F	R6-2L	ONE-WAY SIGN LEFT	I		24" X 30"	C	-	-
G	R9-3A	NO PEDESTRIANS	I		24" X 24"	C	-	-
H	R10-4BR	PUSH BUTTON (WALK SYMBOL) RIGHT ARROW	I		9" X 12"	C	-	-
I	R10-4BL	PUSH BUTTON (WALK SYMBOL) LEFT ARROW	I		9" X 12"	C	-	-

STATUS: E= EXISTING; R=REMOVE; REL=RELOCATE; REP=REPLACE; I=INSTALL; SAL=SALVAGE

Reginald Fountain, P.E. 5/18/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

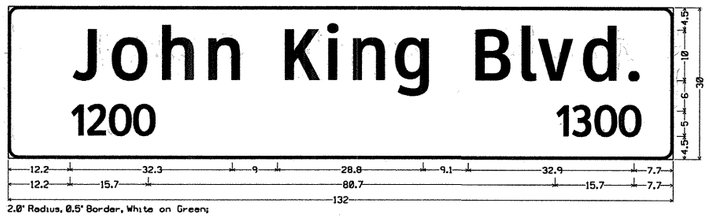
TRAFFIC SIGNAL LAYOUT

JOHN KING BLVD. (SH 205 BYPASS)
AT IH 30 WB FRONTAGE ROAD

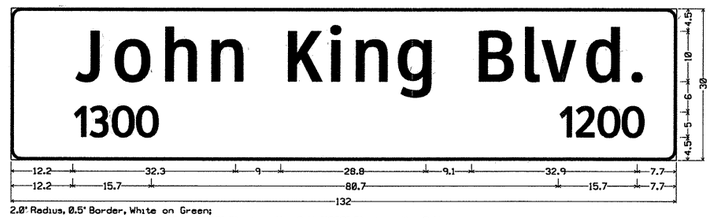
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Checked:	BCM	6	TEXAS	SEE TITLE SHEET			IH 30	
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.	
Checked:	BCM	DAL	ROCKWALL	0009	12	073	333	

SHEET 6 OF 6

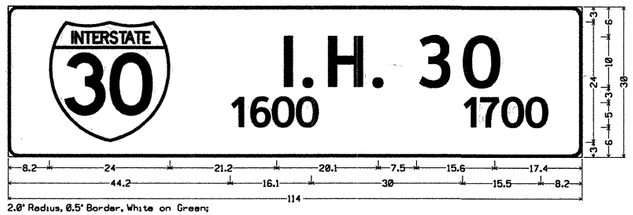
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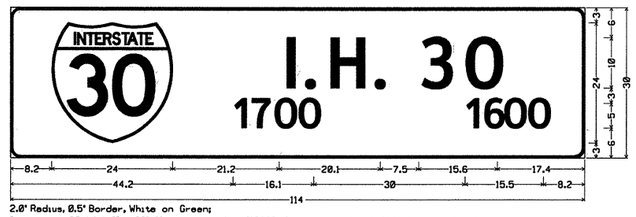
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(John King Blvd.) ClearviewHwy-3-W; (1300) ClearviewHwy-3-W; (1200) ClearviewHwy-3-W;



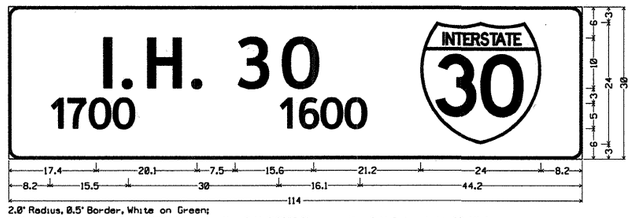
2.0" Radius, 0.5" Border, White on Green;
(John King Blvd.) ClearviewHwy-3-W; (1200) ClearviewHwy-3-W; (1300) ClearviewHwy-3-W;



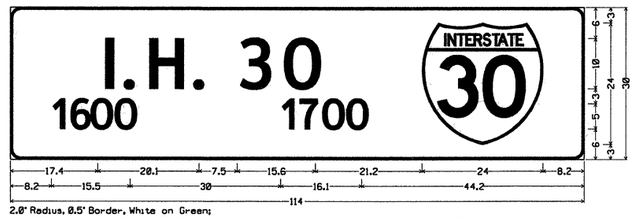
2.0" Radius, 0.5" Border, White on Green;
Interstate 30 M1-1; (I.H. 30) ClearviewHwy-3-W; (1600) ClearviewHwy-3-W; (1700) ClearviewHwy-3-W;



2.0" Radius, 0.5" Border, White on Green;
Interstate 30 M1-1; (I.H. 30) ClearviewHwy-3-W; (1600) ClearviewHwy-3-W; (1700) ClearviewHwy-3-W;



2.0" Radius, 0.5" Border, White on Green;
(I.H. 30) ClearviewHwy-3-W; (1700) ClearviewHwy-3-W; (1600) ClearviewHwy-3-W; Interstate 30 M1-1;



2.0" Radius, 0.5" Border, White on Green;
(I.H. 30) ClearviewHwy-3-W; (1600) ClearviewHwy-3-W; (1700) ClearviewHwy-3-W; Interstate 30 M1-1;

NOTE: AL LETTERING SHALL BE SERIES CV-3W

LEGEND

LETTERS-WHITE
BORDER-WHITE
BACKGROUND- GREEN REFLECTIVE

GENERAL NOTES:

ALPHABETS AND LATERAL SPACING BETWEEN LETTERS AND NUMERALS SHALL CONFORM WITH THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" LATEST EDITION AND ANY APPROVED CHANGES THERETO. LATERAL SPACING OF TEXT SHALL BE SUCH AS TO PROVIDE A BALANCED APPEARANCE.
SIGN BACKGROUNDS SHALL BE OF FLAT SURFACE REFLECTIVE SHEETING CONFORMING WITH THE SPECIFICATIONS (TYPE C).
THE SIGN BLANKS SHALL BE ONE PIECE SHEET ALUMINUM ALLOY 0.080 INCHES THICK CONFORMING WITH THE ITEM "ALUMINUM SIGNS (TYPE A)".

Reginald Fountain, P.E. 3/2/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

SIGN DETAILS

JOHN KING BLVD. (SH 205 BYPASS)

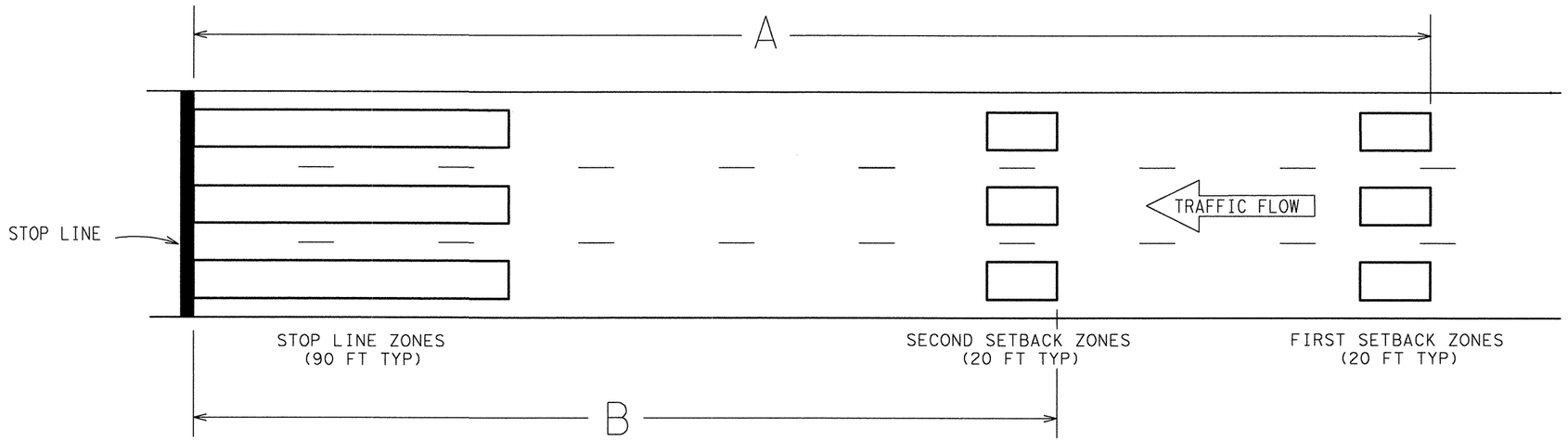
Designed:	BCM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	BCM	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	BCM	DAL	ROCKWALL	0009	12	073		333A

3/2/2009 3:43:41 PM RFOUNTAIN p:\Active Projects\TXD0643\TXD0643-05/8.00 Plans and Drawings\8.30 Cut Sheets\8.3.xx Signals\435SIGNDETAILS.999

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ACC:

| | | |



APPROACH SPEED LIMIT (MPH)	DISTANCE [2] BETWEEN CAMERA AND STOP LINE (FT)	DISTANCE [1] A (FT)	CAMERA HEIGHT (FT)									
			24	28	32	36	40	24	28	32	36	40
			DISTANCE B (FT)					EXTENSION ON 2ND DET. ZONE (SEC.)				
60	80	470	280	295	305	310	315	0.0	0.0	0.0	0.5	0.5
	150	470	270	285	295	300	310	0.0	0.0	0.0	0.0	0.5
55	80	430	255	265	275	280	285	0.0	0.0	0.0	0.5	0.5
	150	430	245	255	265	275	280	0.0	0.0	0.0	0.0	0.5
50	80	390	235	245	250	255	260	0.0	0.0	0.5	0.5	0.5
	150	390	220	230	240	245	250	0.0	0.0	0.0	0.0	0.5
45	80	350	210	215	220	225	230	0.0	0.0	0.5	0.5	0.5
	150	350	190	200	210	215	220	0.0	0.0	0.0	0.0	0.5

1. Distances shown are based on a 20' detection zone and a 1.0 second passage time setting.
2. Distance between the camera and the stop line, as measured parallel to the direction of travel.

DALLAS DISTRICT STANDARD

Texas Department of Transportation
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Dallas District

VIDEO DETECTION ZONE PLACEMENT

VDZ-04 (DAL)

©TxDOT September 2004	DN: THW	CK: CDB	DW: BES	CK: TRF-Aus.

REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		IH 30
	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	DALLAS	ROCKWALL	335
	CONTROL	SECTION	JOB	
	009	12	073	

NOTES FOR VIDEO DETECTION:

1. INSTALL VIDEO DETECTION PROCESSOR UNIT INSIDE CONTROLLER CABINET.

2. INSTALL VIDEO DETECTION CAMERA & BRACKET AS DETAILED OR AS DIRECTED BY THE VIDEO DETECTION SUPPLIER.

3. MOUNT CAMERAS AS FAR OVER THE ROADWAY AS POSSIBLE.

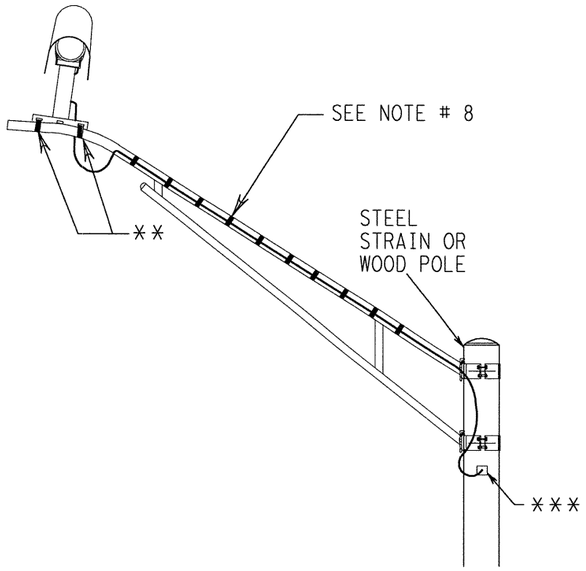
4. USE ¾ IN. STAINLESS STEEL BANDING MATERIAL TO INSTALL CAMERA MOUNTS.

5. AIM CAMERA SO THAT HORIZON IS NOT VISIBLE IN THE FIELD OF VIEW.

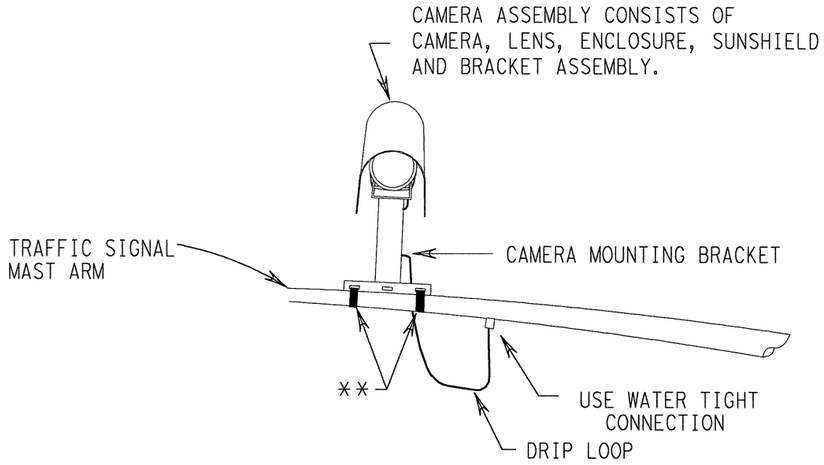
6. INSTALL CAMERA ENCLOSURE ASSEMBLY SO THAT IT CAN ROTATE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.

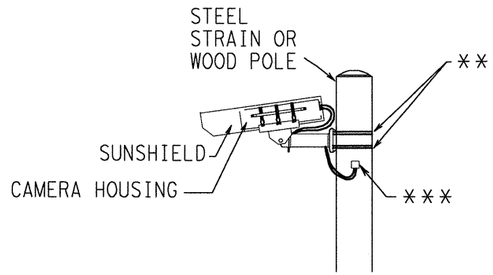
7. PROVIDE WATER TIGHT CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES.

8. FOR VIVDS COAX AND POWER CABLES ATTACHED TO LUMINAIRE ARM, PROVIDE UV STABILIZED TIE-WRAP (1/4 IN. MINIMUM WIDTH AT 8 IN. MAXIMUM SPACING) THAT IS APPROVED FOR OUTDOOR USE.

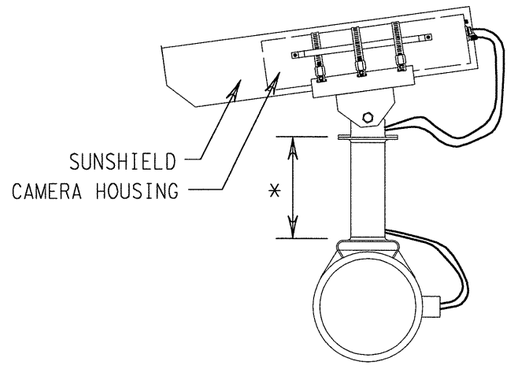


LUMINAIRE ARM MOUNT



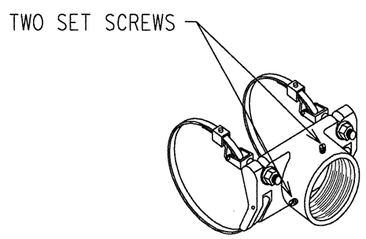


POLE MOUNT



SIDE VIEW

*	4 FT. PIPE EXTENSION WHEN MOUNTED ON TRAFFIC SIGNAL MAST ARM.
**	¾ IN. (MIN) STAINLESS STEEL BANDING 2 PLACES MIN.
***	ENTRY INTO STEEL POLE OR CONDUIT WEATHERHEAD ON WOOD POLE



BAND MOUNT BRACKET DETAIL

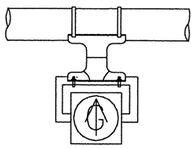
Texas Department of Transportation
Houston District

SIGNAL DETAILS/STANDARDS VIVDS CAMERA MOUNTING DETAILS

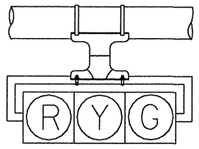
VC/MD

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2004	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 02/2004 03/16/2006	DAL	6	SEE TITLE SHEET	336
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	009	12	073	IH 30

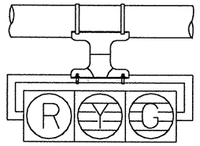
STD-M13



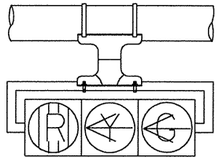
H1TA



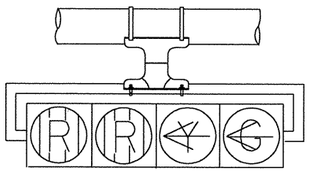
H3



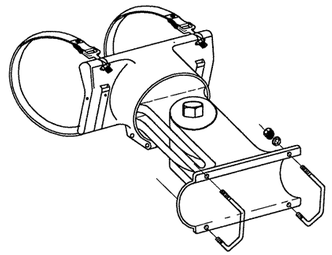
H3L



H3LLT

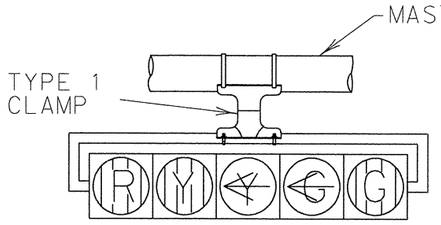


H4LLT

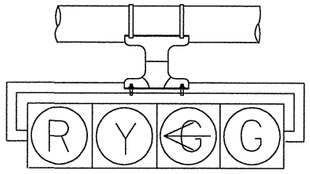


TYPE 2 CLAMP KIT

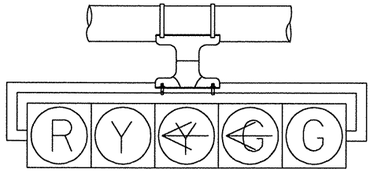
SHALL BE INSTALLED WHEN ROTATION ABOUT THE HORIZONTAL AND VERTICAL AXES ARE NEEDED.



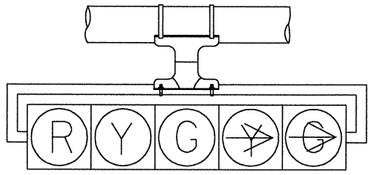
H5LLT



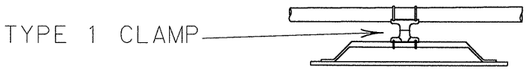
H4LT



H5LT

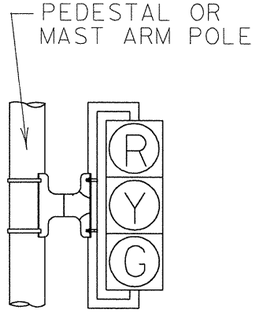


H5RT

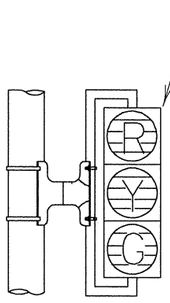


ONE (1) CLAMP SHALL BE USED ON SIGNS LESS THAN OR EQUAL TO 10'-0" IN LENGTH.

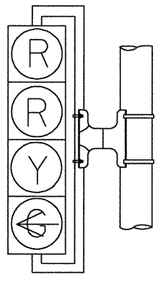
TWO (2) CLAMPS SHALL BE USED ON SIGNS GREATER THAN 10'-0" IN LENGTH.



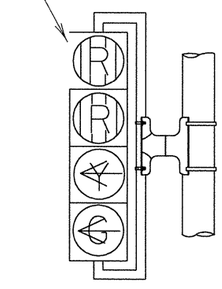
V3



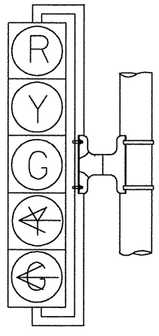
V3L



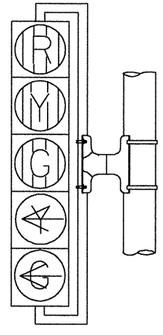
V4LT



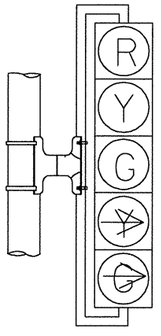
V4LLT



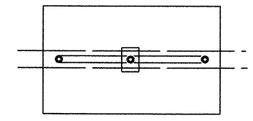
V5LT



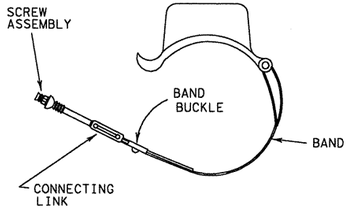
V5LLT



V5RT



SIGN OR DAMPENING DEVICE ATTACHMENT FOR MAST ARMS



TYPE 1 AND 2 CLAMPS

NOTES:

1. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMP AND APPROPRIATE TUBING.
2. ALL POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
3. ALL DAMPING DEVICES SHALL BE 18" TO 2' WIDE BY 4' IN LENGTH.

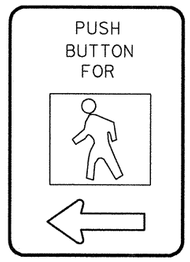
TRAFFIC SIGNAL HEAD IDENTIFICATION

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DALLAS DISTRICT STANDARD

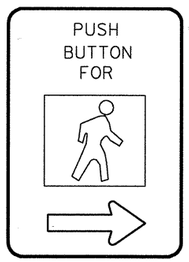
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			337
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
009	12	073	IH 30

SIGN R10-4bL
9" x 12"

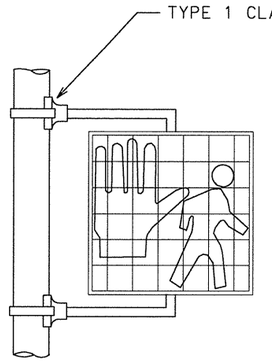


PEDESTRIAN PUSHBUTTON
SIGN DETAILS

SIGN R10-4bR
9" x 12"

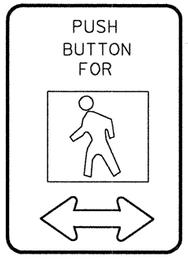


PEDESTRIAN PUSHBUTTON
SIGN DETAILS

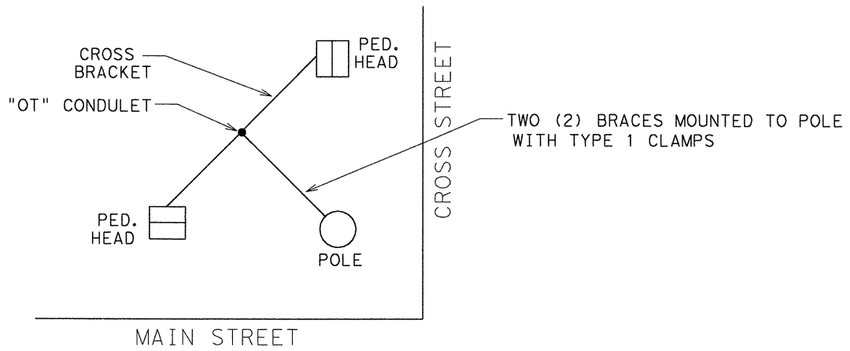


PEDESTRIAN SIGNAL HEAD MOUNTING
FOR ONE PEDESTRIAN SIGNAL HEAD
152A

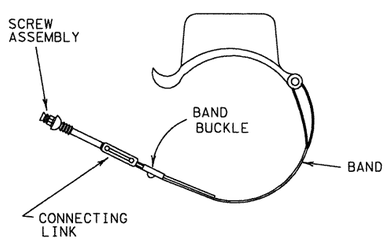
SIGN R10-4bRL
9" x 12"



PEDESTRIAN PUSHBUTTON
SIGN DETAILS



PEDESTRIAN SIGNAL HEAD MOUNTING
FOR TWO PEDESTRIAN SIGNAL HEADS
143C



TYPE 1 CLAMP

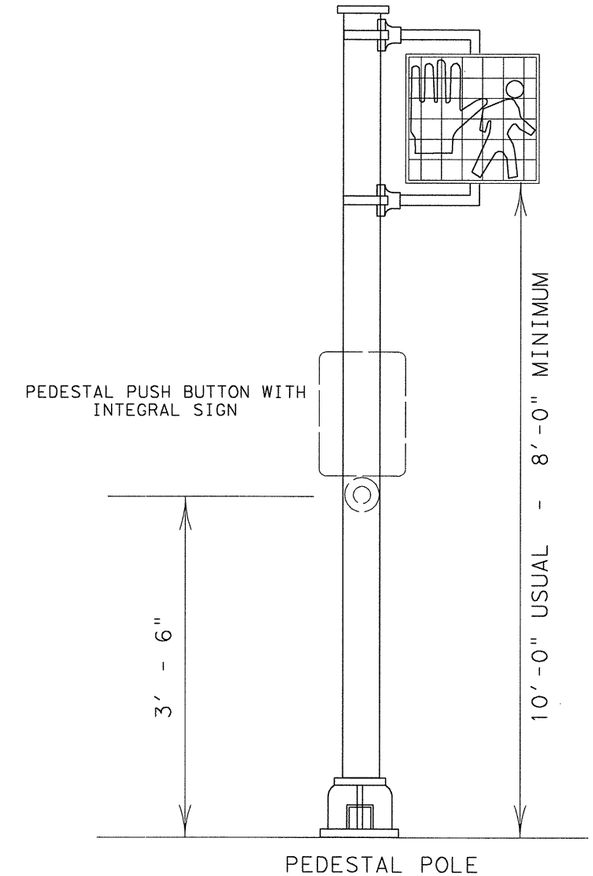
△1 NOTE: CLAM SHELL MOUNTING HARDWARE MAY BE USED INSTEAD OF MOUNTING HARDWARE SHOWN ABOVE, AS APPROVED BY THE ENGINEER.
ICC P/N 4805 OR McCAIN QUICKMOUNT OR APPROVED EQUAL.

NOTES:

1. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMPS AND APPROPRIATE TUBING.
2. ALL PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
3. ALL WIRING FOR PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
4. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE.

NOTE:

THE POLE ON THIS DRAWING IS SHOWN AS AN EXAMPLE ONLY. POLES OF SIMILAR DESIGN FOR ANY CROSS SECTION WHICH MEET THE SPECIFICATIONS AND REQUIREMENTS SHOWN ON THESE DRAWINGS AND ARE APPROVED BY THE ENGINEER WILL BE DEEMED ACCEPTABLE.



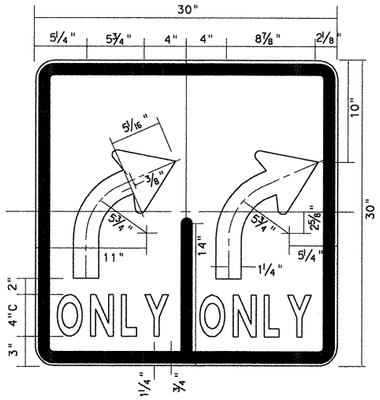
PEDESTAL POLE

△1 ALTERNATIVE MOUNTING METHOD
revised 12-92

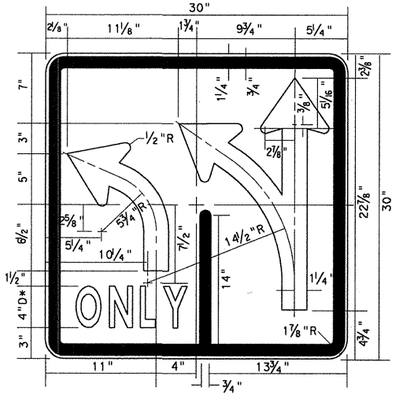
DALLAS DISTRICT STANDARD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			338
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
009	12	073	IH 30

PEDESTRIAN SIGNAL HEAD IDENTIFICATION

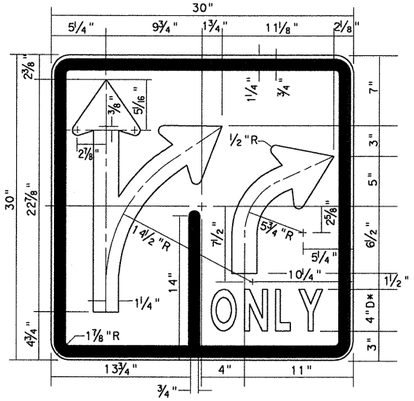


R3-8RR
30"x 30"

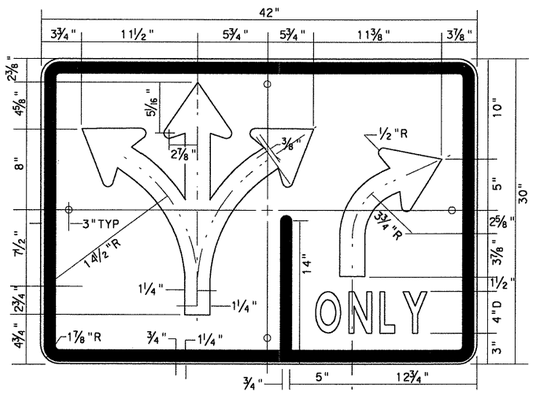


* SPACING REDUCED 50%

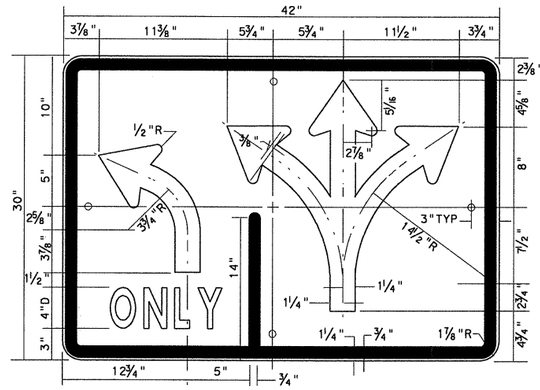
R3-8L
30"x 30"



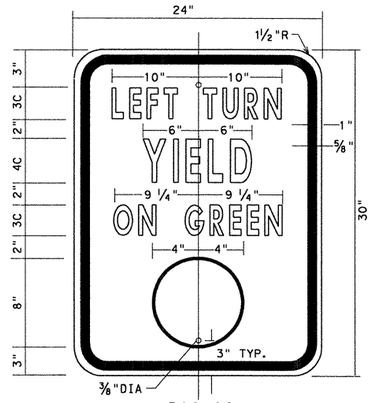
R3-8R
30"x 30"



R3-8R(SPL)
42"x 30"

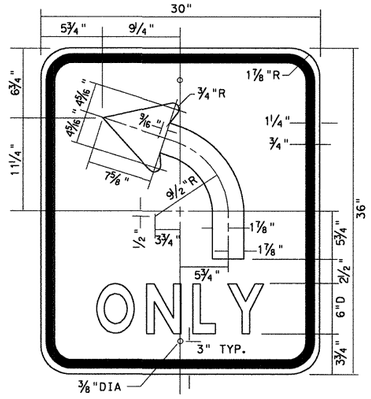


R3-8L(SPL)
42"x 30"

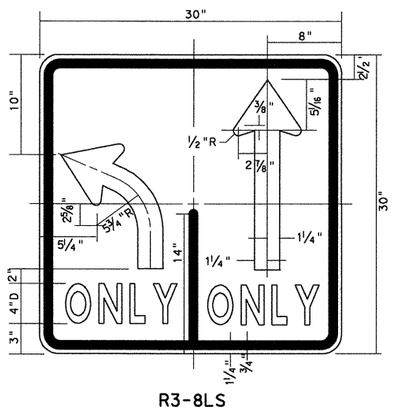


R10-12
24"x 30"

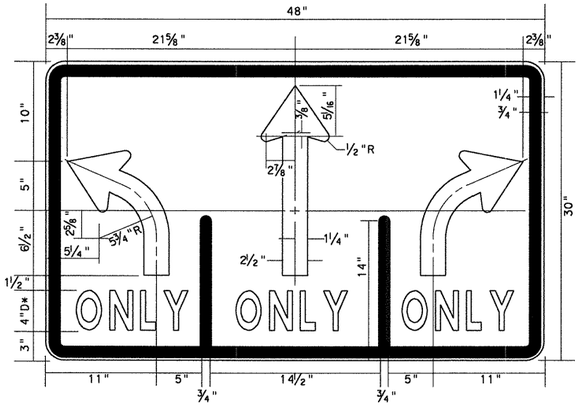
LEGEND BLACK (NON-REFLECTIVE)
BACKGROUND WHITE (REFLECTIVE)
CIRCULAR GREEN (REFLECTIVE)



R3-5L
R3-5R(RT. ARROW)
30"x 36"

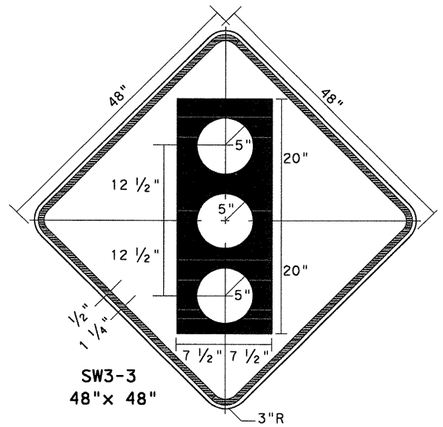


R3-8LS
30"x 30"



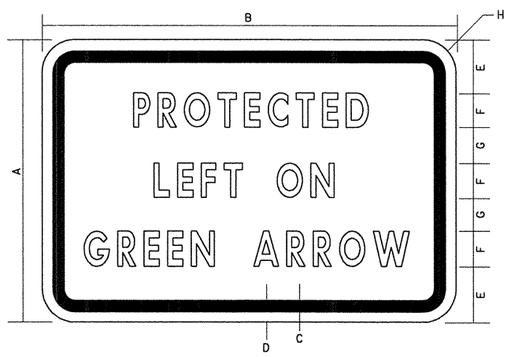
R3-8RSL
48"x 30"

*SPACING REDUCED 50%



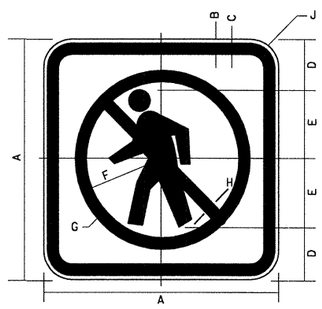
SW3-3
48"x 48"

SYMBOL & LEGEND- BLACK (NON-REFL.)
TOP CIRCLE - RED (REFL.)
BOTTOM CIRCLE - GREEN (REFL.)
BACKGROUND - YELLOW (REFL.)



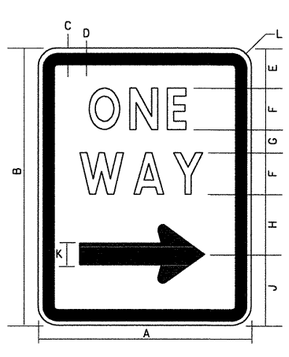
SIGN NO.	SIGN	DIMENSIONS (INCHES)							
		A	B	C	D	E	F	G	H
R10-9	STD.	12	18	3/8	3/4	2	2 C	1	1 1/2
SR10-9S	EXPWY.	18	30	3/8	3/4	3	3 C	1 1/2	1 1/2
SR10-9	FRWY.	24	36	5/8	1	4	4C*	2	1 1/2

* - REDUCE SPACING 40%

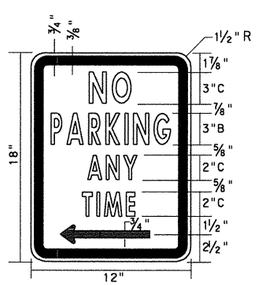


CIRCLE AND DIAGONAL - RED
SYMBOL & BORDER - BLACK
BACKGROUND - WHITE

SIGN NO.	SIGN	DIMENSIONS (INCHES)								
		A	B	C	D	E	F	G	H	J
R9-3a	STD.	18	1	5/8	3 1/2	5 1/2	6 3/8	7 7/8	1 1/2	1 1/2
ER9-3a	EXPWY.	24	1	5/8	4 1/2	7 1/2	8 1/2	10 1/2	2	1 1/2
FR9-3a	FRWY.	30	1 1/4	3/4	5 3/4	9 1/4	10 5/8	13 1/8	2 1/2	1 7/8



SIGN NO.	SIGN	DIMENSIONS (INCHES)										
		A	B	C	D	E	F	G	H	J	K	L
R6-2	STD.	18	24	1	5/8	2 1/2	5D	1 1/2	4 1/2	5 1/2	2 1/4	1 1/2
SR6-2	SPEC.	24	30	1	5/8	3	6D	1 7/8	6 1/16	7 1/16	3	1 1/2



R7-1L
R7-1R(RT ARROW)
R7-1LR(DBL ARROW)
12"x 18"

DEPARTMENT MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS 7100
ALUMINUM SIGN BLANKS	DMS 7110
FLAT SURFACE REFLECTIVE SHEETING	DMS 8300
VINYL NON-REFLECTIVE DECAL SHEETING	DMS 8320

SIGN SHEETING

COLOR	USAGE	MATERIAL TYPE
WHITE	BACKGROUND	TYPE C (HIGH SPECIFIC INTENSITY)
GREEN	LEGEND	TYPE C (HIGH SPECIFIC INTENSITY)
RED	LEGEND	TYPE C (HIGH SPECIFIC INTENSITY)
BLACK	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

GENERAL NOTES:

The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", latest edition, and any approved changes thereto. Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.

Colored legends shall be applied by screening process with transparent colored ink, transparent colored overlay film, colored sheeting or combination thereof. Black legends shall be applied by screening process, cut-out vinyl non-reflective decal sheeting or combination thereof. Check table for sheeting type if used.

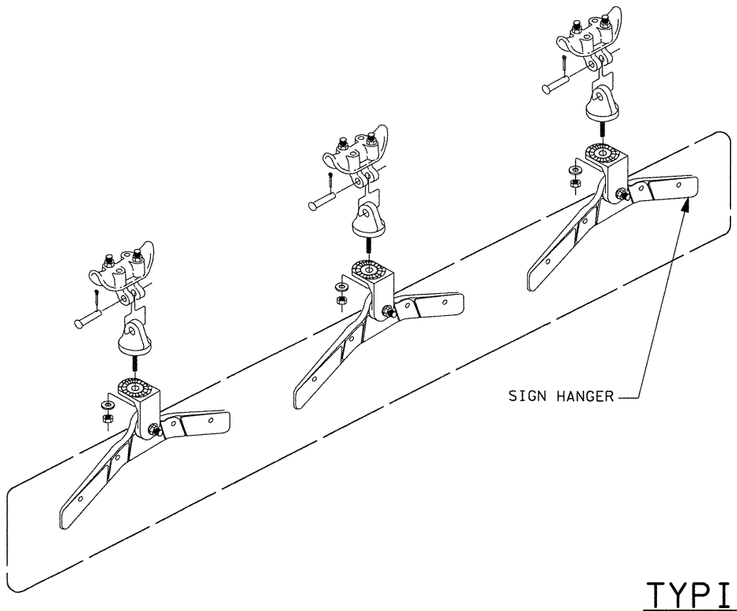
Sign blanks shall be any material that meets the DMS requirements for permanent sign substrates.

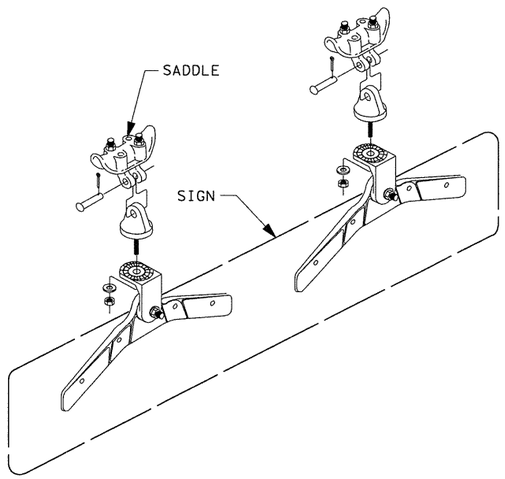
1 10/01 Revision
All ground and signal mounted signs to use High Specific Intensity sheeting

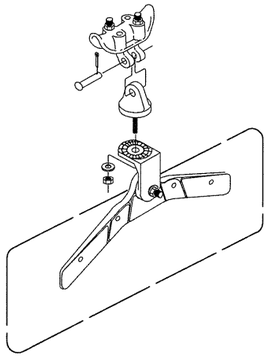
SIGNS (DAL)

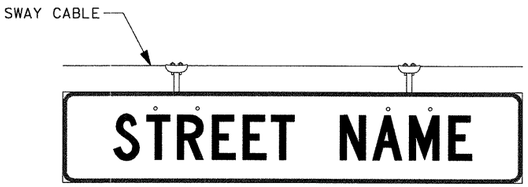
DALLAS DISTRICT STANDARD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			339
STATE	STATE DIST. NO.	COUNTY	
TEXAS	DAL	ROCKWALL	
CONT.	SECT.	JOB	HIGHWAY NO.
009	12	073	IH 30



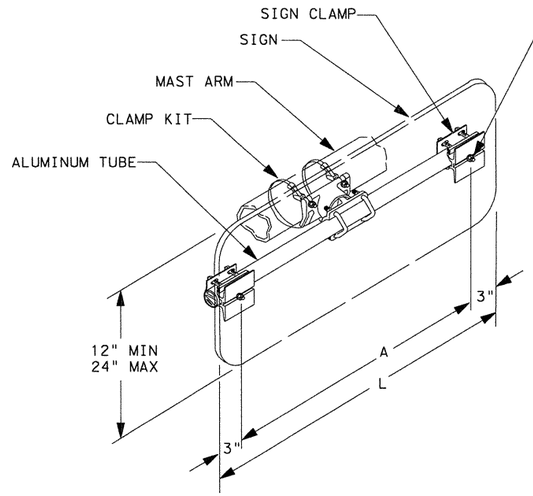


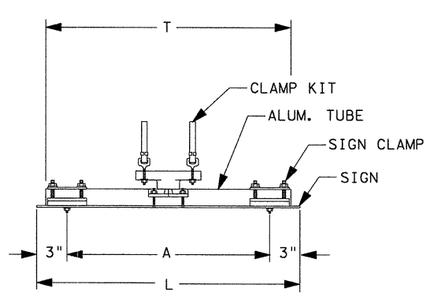


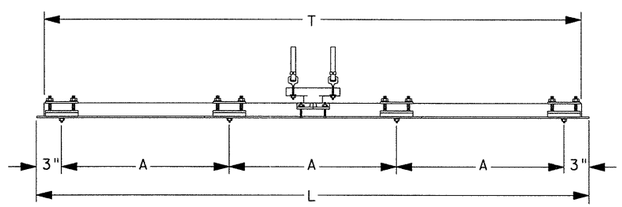


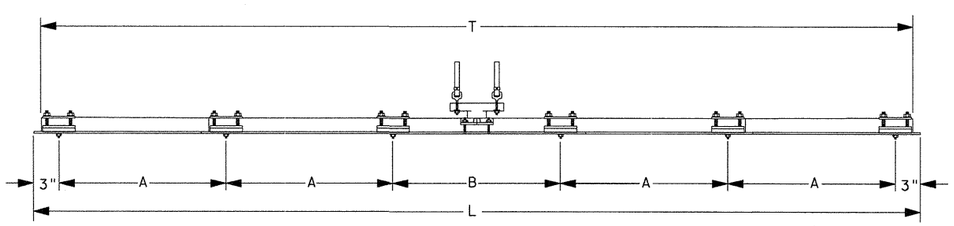
1. USE PELCO PARTS OR APPROVED EQUAL.
2. FURNISH HARDWARE FOR A COMPLETE INSTALLATION.
3. ATTACH THE 90* SPAN WIRE CLAMPS (SADDLES) TO TETHERS (SWAY CABLES).
4. FURNISH 1 ADJUSTABLE FREE SWINGING SIGN HANGER PER STREET NAME SIGN SMALLER THAN 3 FT. - 0 IN. SIGNS 3 FT - 0 IN. TO 6 FT.- 0 IN. REQUIRE 2 HANGERS. SIGNS LARGER THAN 6 FT. - 0 IN. REQUIRE 3 HANGERS.

TYPICAL SPAN WIRE SIGN HANGER DETAILS









SIGNS (1'-6" to 3'-0" Long)

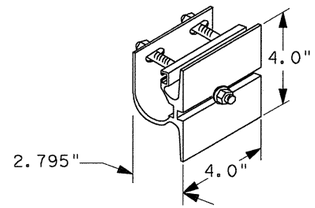
SIGN LENGTH (L)	TUBE LENGTH (T)	A
1'-6"	16"	12"
2'-0"	22"	18"
2'-6"	28"	24"
3'-0"	34"	30"

SIGNS (3'-6" to 8'-0" Long)

SIGN LENGTH (L)	TUBE LENGTH (T)	A
3'-6"	40"	12"
4'-0"	46"	14"
4'-6"	52"	16"
5'-0"	58"	18"
5'-6"	64"	20"
6'-0"	70"	22"
6'-6"	76"	24"
7'-0"	82"	26"
7'-6"	88"	28"
8'-0"	94"	30"

SIGNS (8'-6" to 10'-0" Long)

SIGN LENGTH (L)	TUBE LENGTH (T)	A	B
8'-6"	100"	19"	20"
9'-0"	106"	20"	22"
9'-6"	112"	21"	24"
10'-0"	118"	22"	26"



SIGN CLAMP DETAIL



GUSSETED TUBE CROSS SECTION

TYPICAL MAST ARM SIGN MOUNT DETAILS

FILE: Overhead-Sign-mount-det-sp04.dgn

Texas Department of Transportation
Houston District

SIGNAL DETAILS/STANDARDS
OVERHEAD STREET NAME SIGN MOUNTING DETAILS

OSNS/MD

	DN:	CK:	DW:	CK:	
©TxDOT 2004	DIST	FED REG	PROJECT NO.		SHEET
	DAL	6	SEE TITLE SHEET		340
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

STD-M12

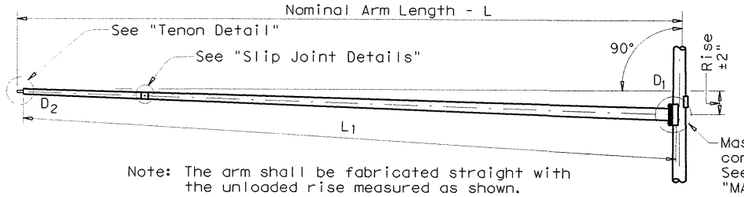
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

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



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

TRAFFIC SIGNAL ARM

(Fixed Mount)

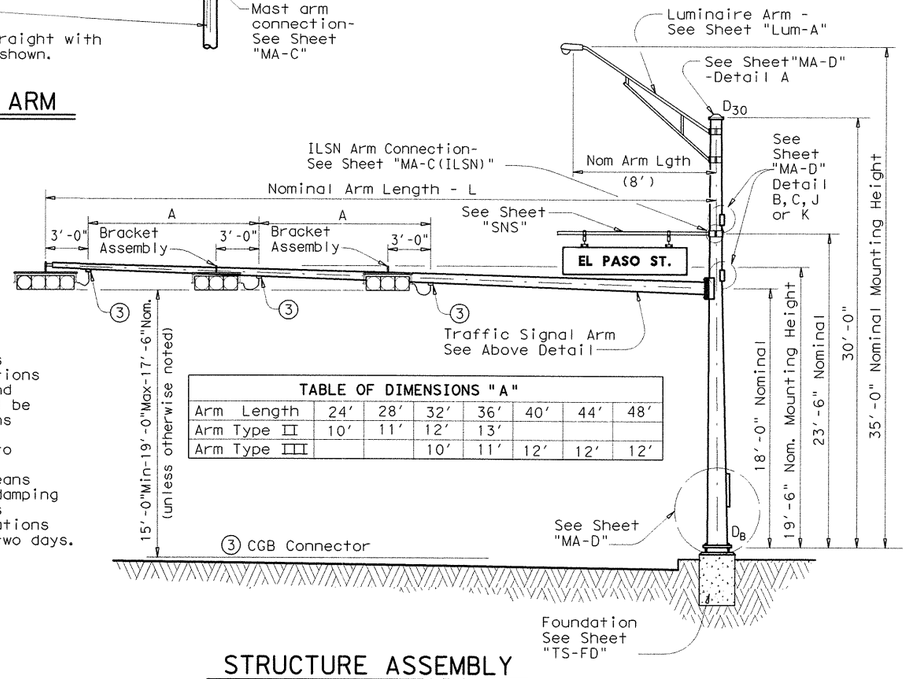


TABLE OF DIMENSIONS "A"							
Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

STRUCTURE ASSEMBLY

VIBRATION WARNING

Mast Arms of approximately 40' or longer are subject to possible harmonic vertical vibrations in light wind conditions due to unusual combinations of signal numbers, weights or positions, arm-wind orientation, and arm-pole stiffness. Arms shall be visually inspected in 5 to 20 mph wind conditions after signal head installation and, if vertical movements with a total excursion (max positive to max negative) of more than approximately 8" are observed at arm tip, damping devices or other means shall be fitted to the arm(s). The necessary damping device(s) or other remedial measures shall be as recommended by the fabricator. Excessive vibrations shall not be allowed to continue for more than two days.

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	1
48	48L-80	3	48S-80		48-80	1

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type IV Arm (4 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors ④		3 Bracket Assemblies and 4 CGB Connectors ④	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44			44II-80	1	44III-80	
48			48II-80	1	48III-80	3

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

④ Supply Option "A" unless otherwise noted

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3'-4"	
1 ¾"	3'-10"	5

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, 4 lock washers and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

11/99 Revision

⚠1 Changed to Facilitate new terminal strip enclosure

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

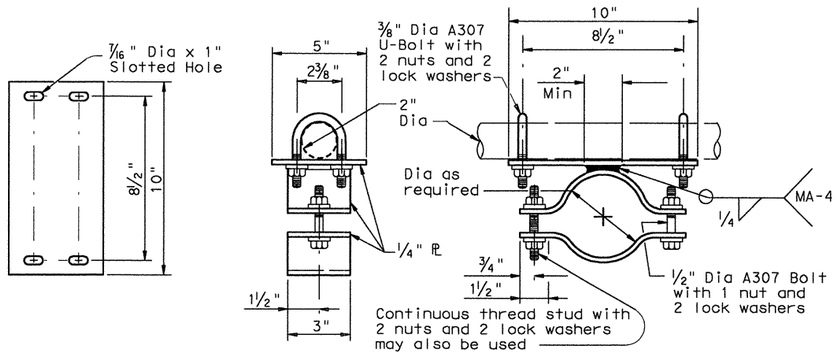
(80 MPH WIND ZONE)

SMA-80(1)-99

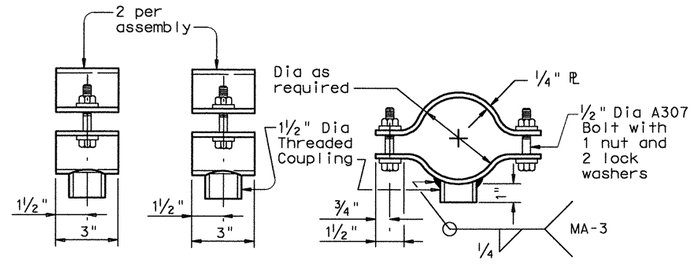
FILE: SMA-80.DGN	DN: MS	CK: JSY	DW: MMF	CK: JSY
©TxDOT August 1995	DIST	FED REG	FEDERAL AID PROJECT #	SHEET
REVISIONS 5-96 11-99	DAL	6	SEE TITLE SHEET	341
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH30

122A

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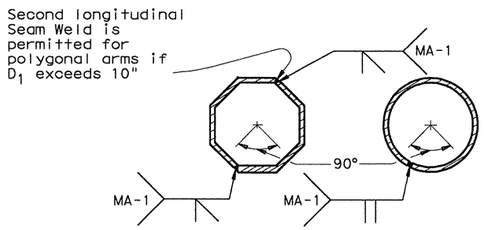
BRACKET ASSEMBLY DETAILS OPTION A



BRACKET ASSEMBLY DETAILS OPTION B

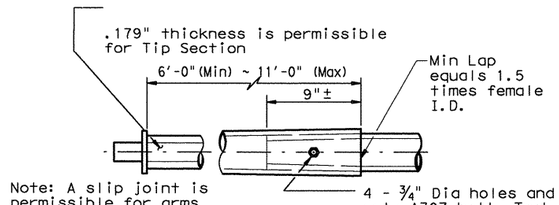
Stainless steel bands and cast bracket as in "Astro-Brac" with 1½" Dia Threaded Coupling.

BRACKET ASSEMBLY OPTION C



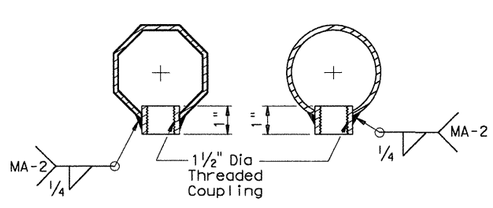
Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.

ARM WELD DETAIL

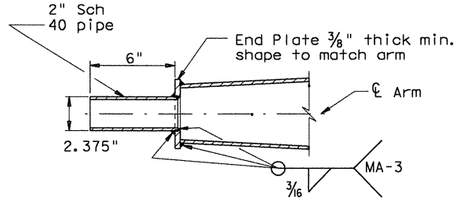


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL



COUPLING DETAILS



TENON DETAIL

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 75 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.5 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Miscellaneous welds which do not call for preapproved weld procedures are nevertheless subject to rejection for poor workmanship. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and the Specifications.

Unless otherwise noted, all parts shall be galvanized in accordance with the Specifications.

Special design require submission of shop drawings in accordance with the item "Steel Structures".

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-96

FILE: SMA-80.DGN	DN: MS	CK: JSY	DW: MMF	CK: JSY
©TxDOT August 1995	DIST	FED REG	FEDERAL AID PROJECT #	SHEET
REVISIONS 5-96	DAL	6	SEE TITLE SHEET	342
	COUNTY		CONTROL SECT JOB	HIGHWAY
	ROCKWALL		009 12 073	IH30

1228

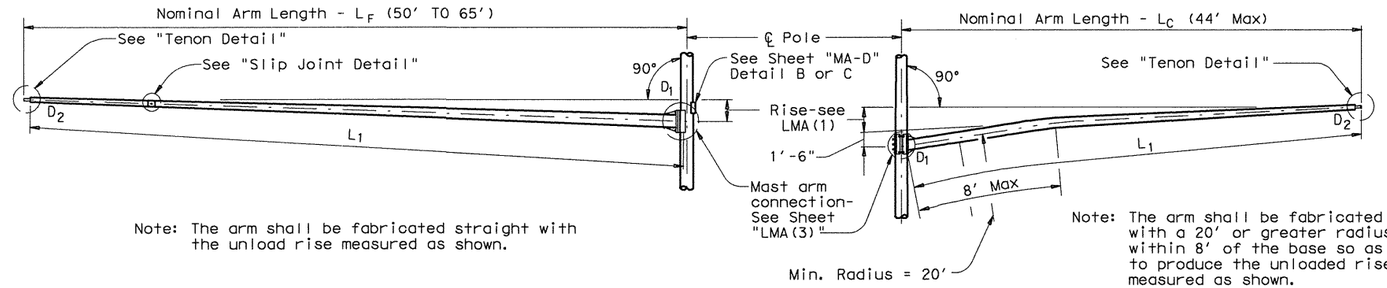
LEVELS DN: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66
ED: LV=1,2 for English 1,3 for Metric
ACC: d48npiq:/usr/d482517

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ACC:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63		

DISPLAYED



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

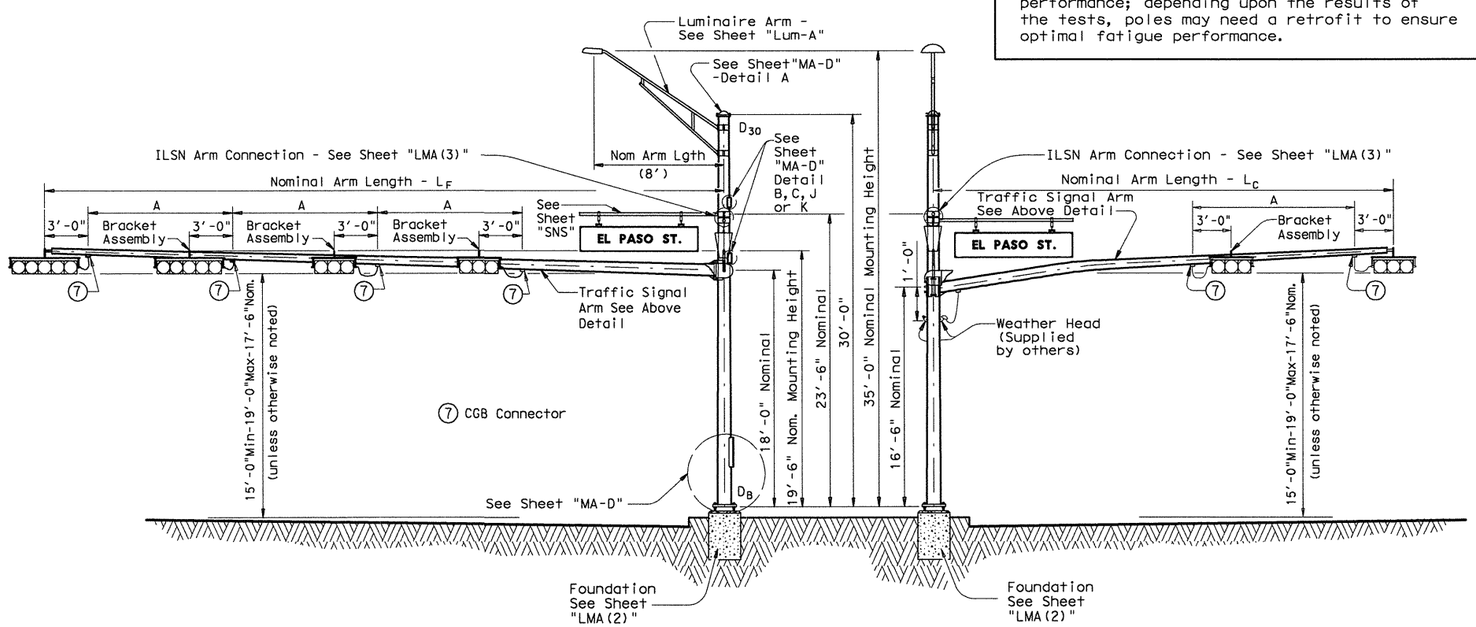
Note: The arm shall be fabricated with a 20′ or greater radius within 8′ of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM

(If required, See DMA-80 or DMA-100 Standard Sheets for Clamp-on Arm Details)

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.



ELEVATION
(Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp mount arm)

TABLE OF DIMENSIONS "A"										
Arm Length	24′	28′	32′	36′	40′	44′	50′	55′	60′	65′
Arm Type II	10′	11′	12′	13′						
Arm Type III			10′	11′	12′	12′				
Arm Type IV							12′	12′	12′	12′

VIBRATION WARNING

Mast Arms of approximately 40′-0" or longer are subject to possible harmonic vertical vibrations in light wind conditions due to unusual combinations of signal numbers, weights or positions, arm-wind orientation, and arm-pole stiffness.

Arms shall be visually inspected in 5 to 20 mph wind conditions after signal head installation and, if vertical movements with a total excursion (max positive to max negative) of more than approximately 8" are observed at arm tip, damping devices or other means shall be fitted to the arm(s).

The necessary damping device(s) or other remedial measures shall be as recommended by the fabricator. Excessive vibrations shall not be allowed to continue for more than two days.

If damping plate is used, the size shall be 16" x 66". The plate must be installed directly above traffic light located nearest the free end.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8′-0" luminaire arm, two 9′-0" internally lighted street name signs and two traffic signal arms with limited length combinations. The specified luminaire load applied at the end of luminaire arm equals 75 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.5 sq ft. The specified internally lighted street name sign applied 4′-6" from the centerline of the pole equals 85 lbs vertical dead load plus the horizontal wind load on an effective projected area of 11.5 sq ft. For 50 ft. to 65 ft. fixed-mount mast arm the specified signal load applied at the end of the traffic signal arm equals 310 lbs vertical dead load plus the horizontal wind load on an effective projected area of 52.0 sq ft. (actual area times drag coefficient). For clamp-on mast arm, the specified signal load applied at the end of the traffic signal arms equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft. (actual area times drag cofficient).

Except as noted in sheets 1 thru 3 of 3, also refer to Standard Sheet "MA-D" for pole details, "LUM-A for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Miscellaneous welds which do not call for preapproved weld procedures are nevertheless subject to rejection for poor workmanship. Material, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and the Specifications.

Unless otherwise noted, all parts shall be galvanized in accordance with the Specifications.

Special designs require submission of shop drawings in accordance with the item "Steel Structures".

STANDARD PLANS
Texas Department of Transportation
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TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 1 of 4

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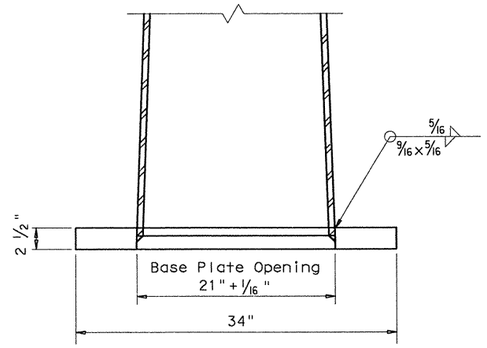
DN: JSY	CK: ARC	DW: TGG	CK: JSY

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-20-01	DAL	6	SEE TITLE SHEET	343

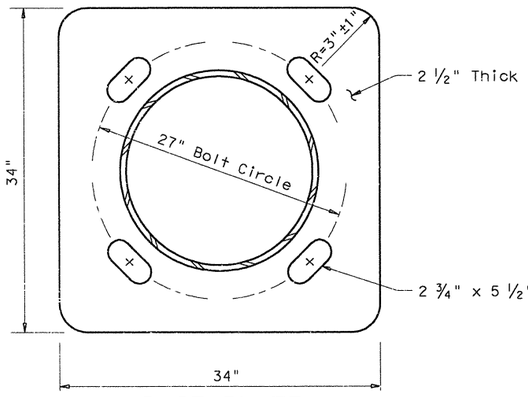
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH30

131A

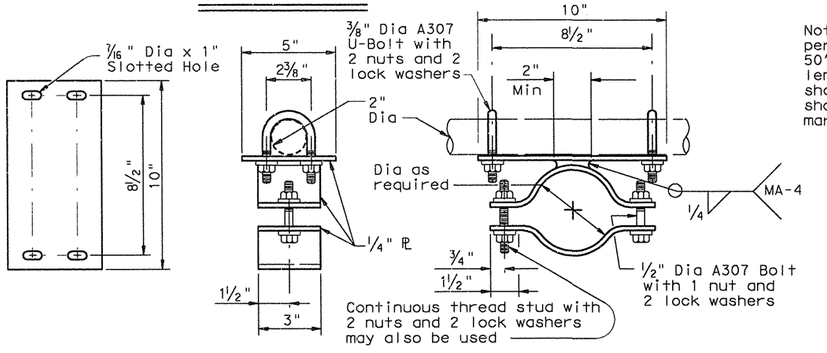
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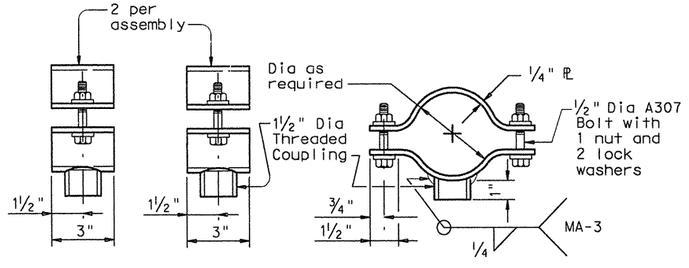
POLE CONNECTION TO BASE PLATE



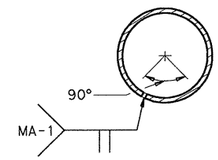
BASE PLATE



BRACKET ASSEMBLY DETAILS OPTION A

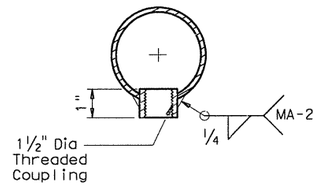


BRACKET ASSEMBLY DETAILS OPTION B



Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.

ARM WELD DETAIL



COUPLING DETAIL

Arm Length	ROUND POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.3	17.6	16.8	.3125	48-A

Arm Length	ROUND ARMS				
	L_1	D_1	D_2	① thk	Rise (±2")
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown is minimum, thicker materials may be used.

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in	Length ‡	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-3"	10"	3"	27"	16"	11"

‡ Min dimension given, longer bolts are acceptable.

① Anchor bolt design develops the foundation capacity given under Foundation Design Laods.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

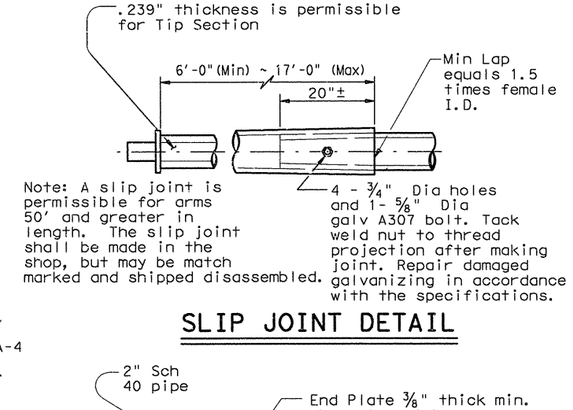
④ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑤ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION DESIGN TABLE

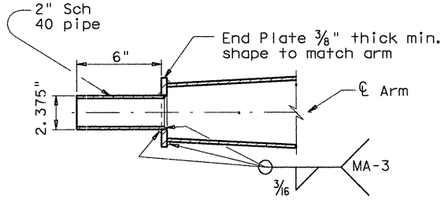
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft ③, ④, ⑤			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.



Note: A slip joint is permissible for arms 50' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

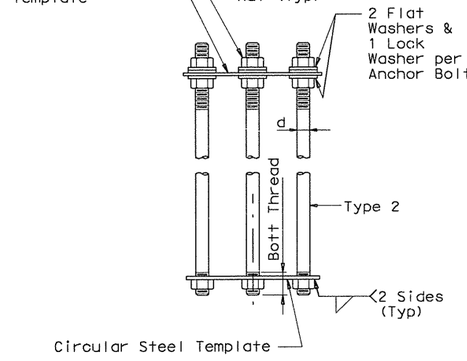
SLIP JOINT DETAIL



TENON DETAIL

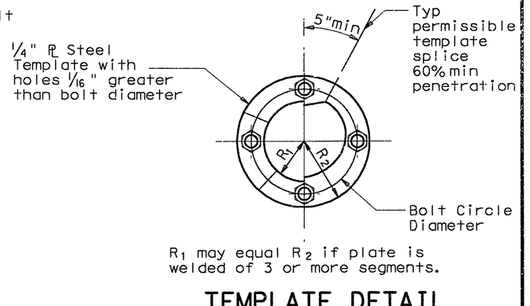
Stainless steel bands and cast bracket as in "Astro-Brac" with 1½" Dia Threaded Coupling.

BRACKET ASSEMBLY OPTION C



NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY



R_1 may equal R_2 if plate is welded of 3 or more segments.

TEMPLATE DETAIL

DISPLAYED: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65

ACC:

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

Sheet 2 of 4 — LMA(2)-01

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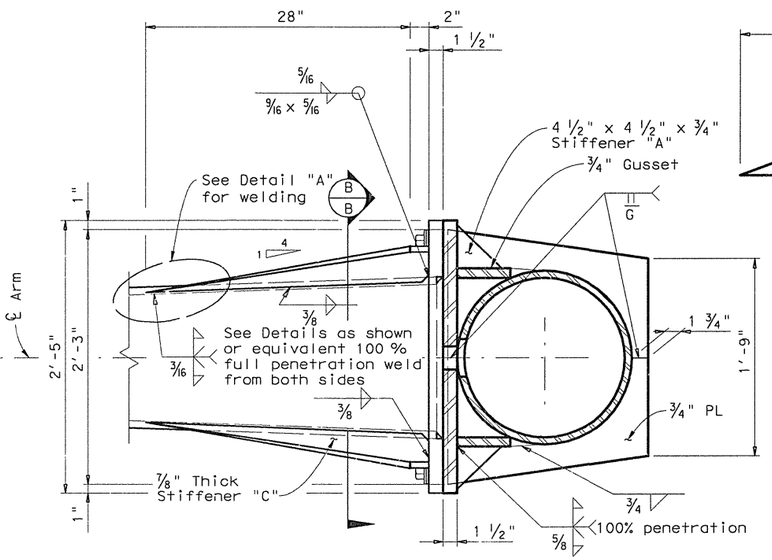
DN: JSY	CK: ARC	DW: TGG	CK: JSY

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-20-01	DAL	6	SEE TITLE SHEET	344

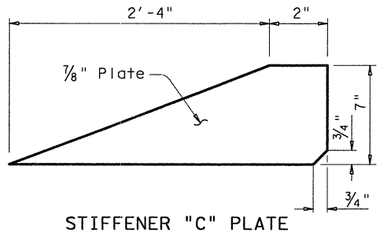
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH30

131B

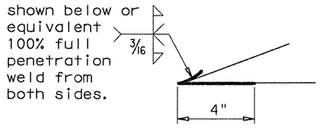
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SECTION A-A

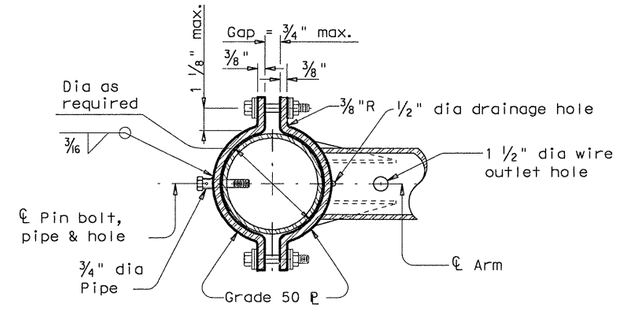


STIFFENER "C" PLATE

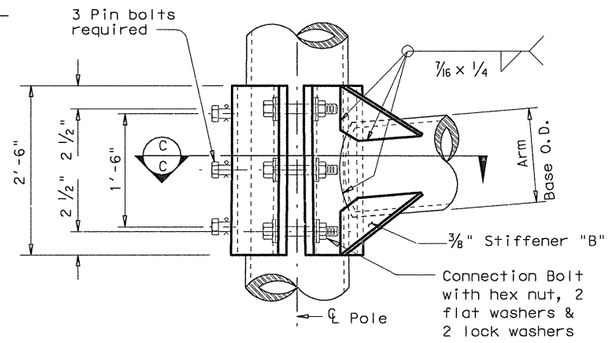


Only 4" length at tip of Stiffener "C" requires full penetration weld. Smooth weld radius to connect Stiffener . Others only require fillet weld.

DETAIL "A"



SECTION C-C

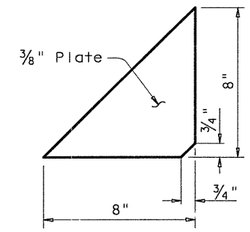


ELEVATION

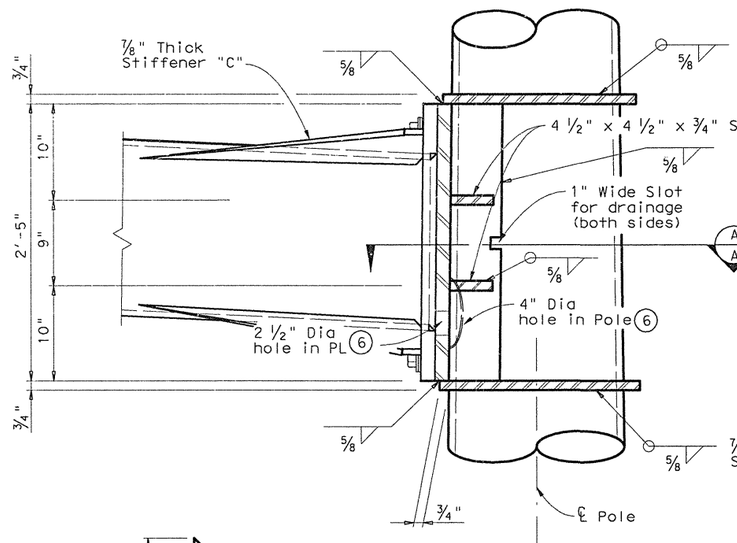
MATERIALS	
Round Shafts or Polygonal Shafts	ASTM A595 GR A, ASTM A570 GR 50, ASTM A607 GR 50, ASTM A572 GR 50 or A36M50
Plates (1)	ASTM A36 OR A572 GR 50 or A595(2) or A36M50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe	ASTM A53 GR A or B, or A501
Misc. Hardware	Galvanized steel or stainless steel or as noted

(1) Any of the materials listed for plates may be used where the drawings do not specify a particular Grade designation.

(2) If A595 material is used, it need not be cold worked to A595 requirments, but material must have 40 ksi minimum yield prior to fabrication.

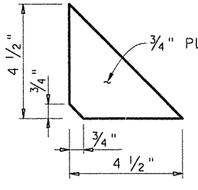


STIFFENER "B" PLATE

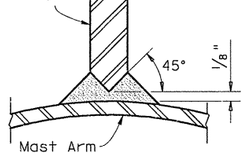


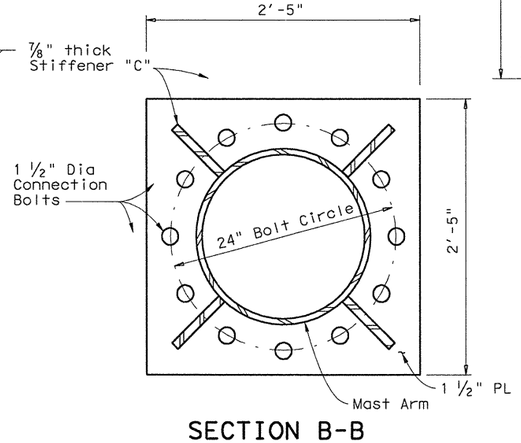
(6) Deburr holes and offset as shown for drainage

ELEVATION

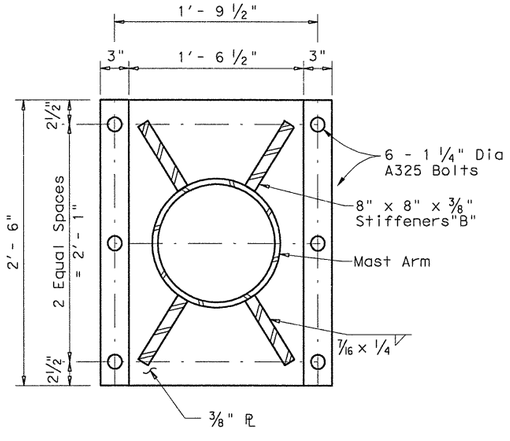


STIFFENER "A" PLATE





SECTION B-B



MAST ARM AND ILSN ARM TO POLE

CLAMP-ON DETAIL

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. THe slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1".

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

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

LETTERS DISPLAYED
ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

STANDARD PLANS
Texas Department of Transportation
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TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
LMA(3)-01

Sheet 3 of 4

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COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH30

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Shipping Parts List

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30' Poles with Luminaire: See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24' Poles with ILSN: See note above plus one small hand hole		19' Poles with no Luminaire and no ILSN: See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L		50S		50	
55	55L	1	55S		55	
60	60L		60S		60	
65	65L		65S		65	

Dual Mast Arm

Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
SH 205 BYPASS @ WBFR			
POLE P-5	10	1	22
Total Drill Shaft Length			22

Shipping Parts List

Traffic Signal Arms (Fixed Mount) (1 per pole)
Ship each arm with listed equipment attached

Nominal Arm Length	Type IV Arm (4 Signals) * 3 Bracket Assembly * and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	
55	55IV	1
60	60IV	
65	65IV	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	1

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) * 1 Bracket Assembly * and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) * 2 Bracket Assembly * and 4 CGB connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) * 1 Bracket Assembly * and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) * 2 Bracket Assembly * and 4 CGB connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2½"	5' - 3"	1

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, 4 lock washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD".
Templates may be removed for shipment.

Notes
* Supply Option "A" unless otherwise noted
** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Abbreviations
Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44' Max.)

Reginald Fontaine 3/2009
STATE OF TEXAS REGINALD FONTAINE 97328 LICENSED PROFESSIONAL ENGINEER

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

Sheet 4 of 4 LMA(4)-01

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REVISIONS 4-20-01	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET	SHEET: 346
	COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH30

131D

ACC:
S DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

The location of all conductors, conduits, junction boxes, ground boxes, and electrical services is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Materials shall be new and unused. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA) standards, and shall be Underwriters Laboratories (UL) Listed unless otherwise shown on the plans or specifications or approved by the Engineer in writing. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection. When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comparable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard. Where reference is made to NEMA listed devices, IEC listed devices shall not be considered to be an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing.

With the exception of high strength bolts, miscellaneous nuts, bolts and hardware may be stainless steel when plans specify galvanized, provided that bolts are 1/2 inch or less in diameter. The Contractor shall provide the following electrical test instruments as required by the Engineer to confirm compliance with the contract and the NEC. Those test instruments are voltmeter, amp probe, megger (1000 volt DC) and torque wrenches. All meters shall have been properly calibrated within one year. Calibration certification shall be provided to the Engineer upon request. Calibration certification tag shall also be applied to the meter. The Contractor shall operate meters during inspection as requested by the Engineer. Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, light poles, luminaires on bridge structures, and all metal enclosures shall be bonded to the system-grounding conductor. The ground rod in each ground box or junction box at the bridge ends, and in each ground box installed for underpass lighting will also be bonded to the system grounding conductor. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

SUBMITTALS:

The contractor shall submit for approval six (6) copies of catalog cut sheets for each of the following three (3) categories.
Category 1. Electrical services including photocell.
Catagory 2. Breakaway disconnects, heat shrink tubing, heat shrink filler tape, GelCaps and ground boxes which will include loading capacity certification.
Category 3. Highmast assembly kits, when applicable. See Item 614 "Highmast Illumination Assemblies". Submittals shall be legible and shall be marked to indicate which product on a cut sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, the Contractor shall furnish to the State such warranties and guarantees.
Any deviation from plans or specifications, including deviations due to plan error should be prominently displayed on the submittal. Any changes not prominently noted in submittal and incorporated into the work without proper authorization will constitute grounds for rejection of that portion of the work.

II. CONDUIT

A. MATERIALS

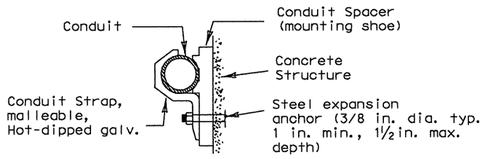
1. Conduit and fittings shall be UL Listed for the intended use shown on plan sheets.
2. Conduit shall be the type shown by descriptive code or shown elsewhere on the plans. Substitution of the various types of conduits will not be permitted. All flexible conduit in rigid metallic conduit (RMC) systems shall be Liquidtight Flexible Metal (LFMC) conduit. All flexible conduit in PVC systems shall be Liquidtight Flexible Non-metallic conduit (LFNC).
3. All exposed conduits shall be RMC, unless otherwise specifically shown on the plans. All metal conduit shall be properly grounded.
4. Couplings, connectors, conduit bodies, grounding bushings, and offset nipples for RMC shall be electro-zinc plated steel or hot dipped galvanized malleable iron, threaded or threadless compression type, rain-tight and shall be UL listed for the intended use.
5. Expansion joints for metal conduit shall be provided with an internal or external bonding jumper and shall be UL listed.
6. Unless otherwise shown on the plans, junction box minimum sizes shall be in accordance with the following table which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, the conductors shall be counted as if all are of the larger size. Situations not applicable to the table shall be sized in accordance with NEC 370-28.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

7. RMC system junction boxes equal to or smaller, in any dimension, than 12 x 12 x 6 (HxWxD), surface mounted and containing conductors #8 or larger, shall be hot dipped galvanized cast iron with minimum wall thickness of 3/16 inch, shall have external mounting lugs, and shall be UL listed Crouse-Hinds Type WAB, OZ/Gedney Type YS or approved equal. Unless otherwise shown elsewhere on the plans, RMC system junction boxes larger than the aforementioned boxes but equal to or smaller, in any dimension, than 18 x 18 x 6 (HxWxD) shall be 14-ga. stainless steel; RMC system junction boxes larger than 18 x 18 x 6 (HxWxD) shall be 12-ga. stainless steel. All metal junction boxes shall be equipped with a threaded hole or lug for grounding. Stainless steel boxes 12 x 12 x 6 and larger need not be UL Listed but shall meet the other requirements of the NEC and shall have ribs, stiffeners, or thicker metal and shall have external mounting feet. Junction boxes with an internal volume of more than 100 cu. in. may be supported by connection of two or more rigid metal conduits, where specifically shown on the plans or where approved by the Engineer.
8. Junction boxes containing only #10 or #12 AWG conductors shall be Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or similar approved cast iron box. Boxes shall be sized according to NEC Table 370-16(a).
9. IMC and EMT conduit shall not be used unless specifically required by the plan layout sheets. Junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed and approved for outdoor use, unless otherwise noted on the plans. Sheet metal junction boxes shall be sized in accordance with the NEC. Junction boxes for IMC conduit systems shall meet the requirements of boxes used with RMC systems.
10. Junction boxes in PVC conduit systems shall be PVC, intended for outdoor use, unless otherwise noted on the plans.
11. Elbows in PVC conduit systems one inch and larger shall be rigid metal, with the exception of traffic signal systems which may have PVC elbows instead of rigid. If any part of the rigid metal elbow is buried less than 18 inches underground the elbow and rigid metal extension shall be grounded. Grounding shall be accomplished by means of a grounding bushing installed on the extension. Unless specifically shown on the plans, rigid metal elbows containing, or entering ground boxes containing only communications conductors, loop detectors, or other low voltage power limited circuits need not be grounded unless a ground wire is present in the conduit or ground box. The rigid metal elbows located in concrete foundations may be extended with PVC conduit and need not be grounded provided that the end of the elbow nearest the end of the conduit run exiting the foundation is at least 2 inches below the concrete. RMC elbows will not be eliminated. RMC elbows will not be paid for directly, but will be subsidiary to various bid items.
12. High-Density Polyethylene (HDPE) conduit shall meet the requirements of Item 622, Duct Cable, except that the HDPE conduit, when bid under Item 618, Conduit, shall not contain factory installed conductors. Fittings for HDPE conduit shall be UL listed as an electrical conduit connector or shall be thermally fused using an electrically heated wound wire resistance welding method. HDPE conduit may be substituted for bored schedule 40 or schedule 80 PVC conduit. When such substitution is made, bored HDPE shall be schedule 40 of the size PVC being replaced. The HDPE conduit shall transition to PVC (or RMC elbow when required) at the bore pit. Size and schedule shall be as shown on the plans. Substituted conduit may not be extended to ground boxes or foundations; RMC elbows shall be installed at ground boxes and foundations. RMC elbows will not be eliminated.
13. All conduit support hardware including straps, nuts, bolts, screws, retaining anchors and washers shall be hot dipped galvanized or stainless steel. Strut type conduit straps shall be stainless steel or hot dipped galvanized. Strut type straps need not be made of malleable type material. Stamped-cadmium plated straps will not be allowed. Straps having only one mounting hole shall not be allowed for use on conduits 2 inches and larger with the exception of electrical service poles where stainless steel standoff straps will be allowed. Two piece conduit straps designed to be used with a mounting shoe shall be installed only with the correctly sized shoe.

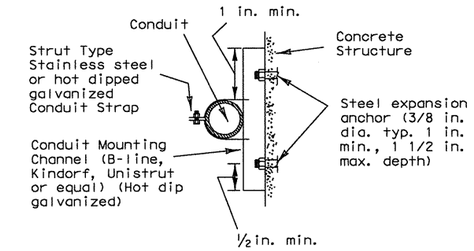
B. CONSTRUCTION METHODS

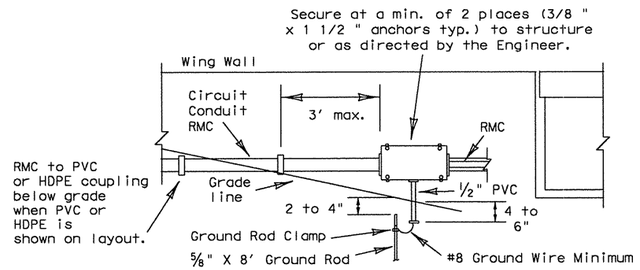
1. Conduit in structures shall have expansion fittings at structure expansion joints. All straight runs of RMC conduit exposed on structures such as bridges shall have expansion joints installed at maximum intervals of 150 feet. Expansion joints shall be installed so they allow for movement of the conduit. Installation of the joint in such a manner that will not allow for movement shall be repaired at no expense to the state. The method of determining the final setting length of the expansion joint shall be provided to the Engineer upon request.
2. Conduit supports shall be spaced at maximum intervals of 5 feet. Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit mounting options).
3. Conduit supports shall not be attached directly to prestressed concrete beams except as shown specifically in the plans and approved by the Engineer.
4. Unless otherwise shown on the plans, conduit placed beneath existing roadways, driveways, or sidewalks, or after the base or surfacing operation has begun, shall be accomplished by jacking or boring. The Contractor shall back fill and compact the bore pits to the bottom of the conduit prior to installing connecting conduit or duct cable to prevent bending of the connection.
5. Conduit trenched in the subgrade of new roadways shall be backfilled with excavated material, unless otherwise noted on the plans. Conduit trenched in the sub-base of new roadways shall be backfilled with cement-stabilized base.
6. Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction. The temporary cap may be constructed of duct tape, but in all cases shall be tightly fixed to the conduit and shall be durable. The contractor shall clean out the conduit and prove it clear in accordance with Standard Specifications Item 618.3 prior to installing any conductors.
7. Conduit entry into the top of enclosures such as safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes shall be made weatherproof using conduit sealing hubs, or threaded bosses.
8. A bonding jumper shall be installed from each grounding bushing to the nearest grounding rod, grounding lug, and/or equipment grounding conductor. All jumpers shall be the same size as equipment grounding conductor. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing. At electrical services, grounding electrode conductor shall be a solid Copper #6 AWG.
9. Metal junction boxes shall be bonded to the grounding conductor in accordance with the NEC.
10. Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 3 inches nor more than 6 inches from bottom of box (See ground box detail on sheet ED(3).
11. Conduit ends shall be sealed with heat shrink boots with waterproof sealant, urethane foam, or by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests. Duct tape shall not be used as a permanent conduit sealant. Silicone caulking shall not be used as a sealant.
12. All strut mounting material and hardware shall be hot-dip galvanized or shall be stainless steel. The cut ends of strut and non-galvanized rigid metal conduit threads shall be coated with a zinc rich paint (90% or more zinc content). Zinc rich paint may only be used to touch up galvanized material as allowed under item 445.6 galvanizing. The painting of non-galvanized material with a zinc rich paint shall not be considered as an approved alternative for galvanized materials.
13. All PVC conduit terminations shall be fitted with bushings or bell ends. All metal conduit terminations shall be fitted with a grounding type bushing.



CONDUIT MOUNTING OPTIONS

(Attachment to concrete surfaces)
(See para. II.B.2)

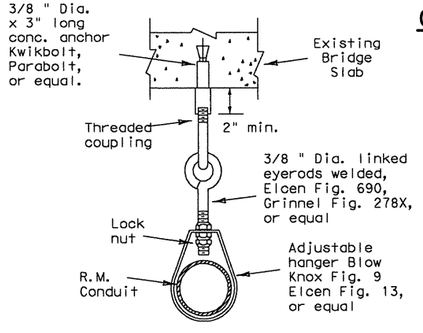




TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

NOTES

1.) Ground rod clamp to be UL listed for direct burial.
2.) For conduit placed in structure, use flush-mounted box.
3.) Bond junction box and metal conduits to equipment grounding conductor and grounding electrode conductor using listed connector.
4.) Seal all conduits entering the junction box from underground.
5.) Install bell end or bushing on 1/2 " PVC conduit both ends.
6.) Ground rod to be driven within 8 inches of 1/2 inch PVC conduit end.



CONDUIT HANGER DETAIL

(Attachment to horizontal surfaces)
Hangers need not be UL listed for electrical use
ie: plumber pipe hangers are acceptable

5/03 Revision

⚠ Revised notes.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-CONDUIT

ED(1)-03

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REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-98	DAL	6	SEE TITLE SHEET	347
12-00	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
3-03	ROCKWALL		009 / 12 / 073	IH30
5-03				

71A

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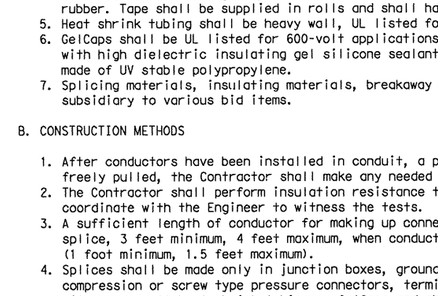
I. ELECTRICAL CONDUCTORS

A. MATERIALS

1. Insulated conductors shall be NEC Type XHHW. Insulated conductors shall be color coded in accordance with the NEC, articles 200, 250, and 310; i.e. Insulation of grounded conductors (neutrals) shall be white. Grounding conductors (ground wires) shall be bare or insulation shall be green. Insulation of ungrounded conductors (hots) shall be any color except green, white, or gray. Identification of conductors #6 American Wire Guage (AWG) and smaller shall be by continuous jacket color. Color coding of electrical conductors #4 AWG and larger shall be either by continuous color jacket or by colored tape. Colored tape marker shall consist of a half-lap of tape covering a 6-inch length of conductor.
2. Where two or more circuits are present in one conduit or enclosure, the conductors of each circuit shall be identified by a permanent non-metallic tag at each accessible location. The tag shall be fastened to the conductors by two plastic straps. Each tag shall indicate circuit number, letter, or other identification shown in the plans.
3. Grounding electrode conductor #6 AWG for bonding to ground rod at electrical service, shall be solid. Connection of conductor to ground rod shall be made using UL Listed connectors designed for such purposes.
4. Heat Shrink Tape filler shall be used to seal the ends of heat shrink tubing around two or more conductors that are insulated with heat shrink tubing. Tape material shall have a minimum dielectric strength of 225 volts per mil and shall be cross-linked butyl rubber. Tape shall be supplied in rolls and shall have a backing (release paper) to prevent the tape from sticking to itself.
5. Heat shrink tubing shall be heavy wall, UL listed for 600 volts or greater and shall have factory applied internal sealant.
6. GelCaps shall be UL listed for 600-volt applications. GelCap shall have see-through elastomer molded cover. Cover shall be filled with high dielectric insulating gel silicone sealant to provide waterseal. Cover shall be held in place by snap-lock, molded clamp made of UV stable polypropylene.
7. Splicing materials, insulating materials, breakaway disconnects, GelCaps and fuse holders will not be paid for directly but shall be subsidiary to various bid items.

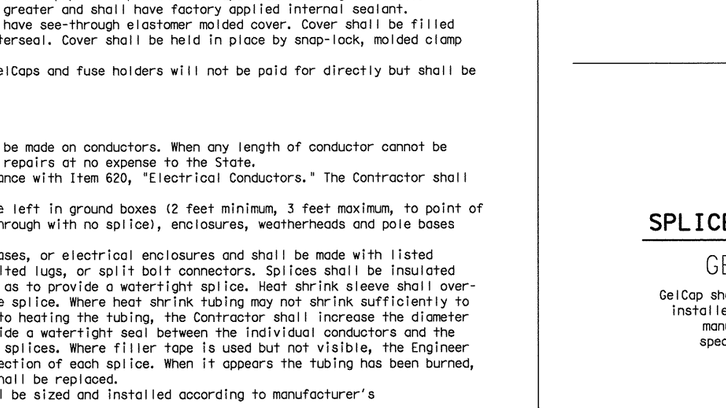
B. CONSTRUCTION METHODS

1. After conductors have been installed in conduit, a pull test shall be made on conductors. When any length of conductor cannot be freely pulled, the Contractor shall make any needed alterations or repairs at no expense to the State.
2. The Contractor shall perform insulation resistance tests in accordance with Item 620, "Electrical Conductors." The Contractor shall coordinate with the Engineer to witness the tests.
3. A sufficient length of conductor for making up connections shall be left in ground boxes (2 feet minimum, 3 feet maximum, to point of splice, 3 feet minimum, 4 feet maximum, when conductor is pulled through with no splice), enclosures, weatherheads and pole bases (1 foot minimum, 1.5 feet maximum).
4. Splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with listed compression or screw type pressure connectors, terminal blocks, bolted lugs, or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing or GelCaps and shall be made so as to provide a watertight splice. Heat shrink sleeve shall overlap conductor insulation a minimum of 2 inches on both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, the Contractor shall increase the diameter of the conductors insulation using heat shrink filler tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Tape shall be visible after completion of all splices. Where filler tape is used but not visible, the Engineer shall approve each individual splice by conducting a physical inspection of each splice. When it appears the tubing has been burned, or overheated the tubing shall be considered to be defective and shall be replaced.
5. GelCaps when used in place of heat shrink method of splicing, shall be sized and installed according to manufacturer's specifications. (Raychem GelCap and GelCap SL or equal.)
6. Wire nuts may be used for #8 AWG or smaller conductors in above-ground junction boxes, but not in pole bases or ground boxes. Wire nuts shall be positioned upright to prevent the accumulation of water. Wire nuts used at these locations shall have factory applied waterproof sealant.
7. Conductors in illumination poles shall be supported by a J-hook in the top of the pole.
8. All conductors bid under Item 620 "Electrical Conductors" shall have breakaway electrical disconnects installed anytime conductors pass through a break-away support device.
9. For terminating the conductors, insulation-jacketing material shall be removed in such a manner as to not nick any of the individual strands of the conductor. When individual conductor strands are removed, the conductor shall be considered to be damaged.
10. When a conductor or cable has been damaged, or fails to pass an insulation resistance test, the conductor shall be replaced.
11. Duct tape, black electrical tape, or wire nuts shall not be used in the repair of a damaged conductor.
12. For terminations, no more than one wire may be installed under a single pressure connector, unless the device is listed for more than one wire.
13. Conductors connected to break-away in line fuse holders must be installed in accordance with the specific manufacturer's installation instructions. Where threaded connections are made, they shall be properly torqued. Where crimp type connections are made, crimps shall be made using properly sized crimping pliers. Proper conductor terminations are critical to the safe operation of break-away devices.
14. Waterproofing boots shall be properly trimmed to fit snugly around the conductor so as to provide a water proof connection. No more than one wire may enter a single opening in any one boot. Water proofing boots must provide the correct number of openings. Where only one wire is to be connected to a boot, the boot may not be a two wire type.



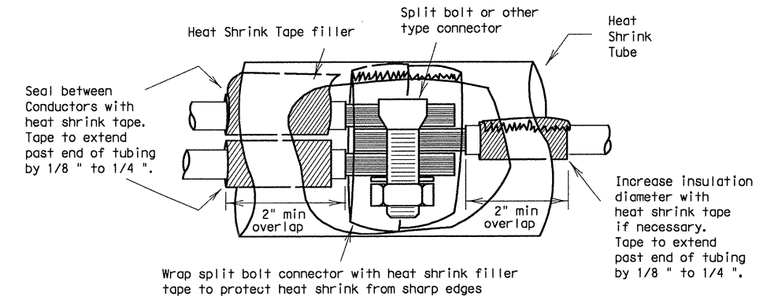
SPLICE OPTION 1

C-CLAMP



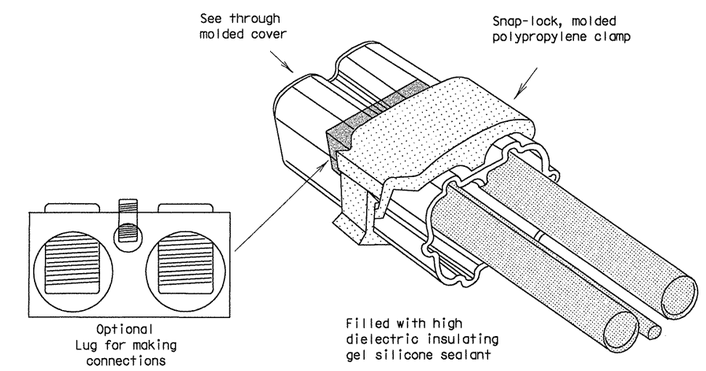
SPLICE OPTION 2

BOLTED WIRE LUGS



SPLICE OPTION 3

SPLIT BOLT



SPLICE OPTION 4

GELCAP

GelCap shall be sized and installed according to manufacturers specifications

15. All conduits that contain circuit wiring of 50 volts or more shall contain an equipment grounding conductor (EGC). Conduit for traffic signals shall have an EGC, with a minimum size of #8 AWG stranded. Unless otherwise shown on the plans, the EGC for all other conduits shall be the same AWG size as the largest current carrying conductor contained in that conduit. The EGC shall be paid for item 620-Electrical Conductors.

C. TEMPORARY WIRING

1. Temporary conductors and electrical equipment to provide power for utilization equipment, shall be installed in accordance with the NEC article 305. All temporary wiring materials and methods shall comply with the standard sheets. All power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade, supplied from a utility power source, shall be provided with a ground fault circuit interrupter.
2. Residual current protective devices (GFCI) may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Where wire nuts are approved for temporary wiring, they shall be of the self-sealing type.
4. All conductor splices must be contained within a listed enclosure, ground box or the splices will be more than ten feet above grade vertically and more than five feet horizontally from any metal structure. Where temporary conductors are installed in any area that is likely to be subjected to vehicle traffic, or mobile construction equipment, the vertical clearance to ground shall be at least 18 feet when measured at the lowest point. Where power conductors are to be supported by a span wire, the span wire shall be properly grounded.
5. Existing conduit containing service conductors uncovered during the construction process shall be repaired in a timely manner in accordance with the NEC. Existing non-metallic conduit exposed during construction shall not be left exposed above grade, or with less than eighteen inches of cover, without protective methods approved by the Engineer.

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LEVEL:	1	2	3	4	5	6	7	8
	1	9	17	25	33	41	49	57
	2	10	18	26	34	42	50	58
	3	11	19	27	35	43	51	59
	4	12	20	28	36	44	52	60
	5	13	21	29	37	45	53	61
	6	14	22	30	38	46	54	62
	7	15	23	31	39	47	55	63
	8	16	24	32	40	48	56	64

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-CONDUCTORS

ED(2)-03

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DN: KB	CK: JW	DW: DN	CK: GC	NEC NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
10-93	DAL	6	SEE TITLE SHEET	348
4-98				
12-00	COUNTY		CONTROL SECTION JOB	HIGHWAY
3-03	ROCKWALL		009 12 073	IH30

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II. GROUND RODS

A. MATERIALS

1. All ground rods installed at electrical services, including supplemental lightning protection ground rods specified by the plans in other locations such as pole bases, shall be copper clad and UL listed. Rods shall be a minimum diameter of 5/8 inch. The length shall be a minimum of 8 feet. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets.
2. Ground rod clamps shall be listed to be in direct contact with the soil. Where concrete encasement is required, the clamp shall be listed for concrete encasement.

B. CONSTRUCTION METHODS

1. Ground rods installed in locations such as pole bases, to provide supplemental lightning protection need not be totally in contact with the soil. Where called for in the plans, rods may be encased in soil or concrete or any combination of soil and concrete. When concrete encased, the connection of the conductor to the rod shall be readily accessible for inspection or repairs. When driven into the soil the upper end shall be between 2 to 4 inches below finished grade. Ground rods shall not be placed in the same drilled hole as a timber pole.
2. Ground rods shall be installed such that the end imprinted with the rod's part number is installed as being the upper end.
3. Non-conductive coatings such as concrete splatter shall be removed from the rod at the clamp location.
4. Routing of lightning protection ground rod wires shall be run as short and straight as possible. Where bends are required they shall have a minimum radius of four inches.
5. Unless specifically called for by the plans, conduits used for ground rod wires shall be non-metallic. Where metal conduits are specified, a grounding bushing and properly sized bonding jumper shall be provided and properly installed on each end.
6. Where rocky soil or a solid rock bottom is encountered when driving a ground rod and the horizontal trench placement method is the only viable solution, written authorization from the Engineer must be obtained.

III. GROUND BOX

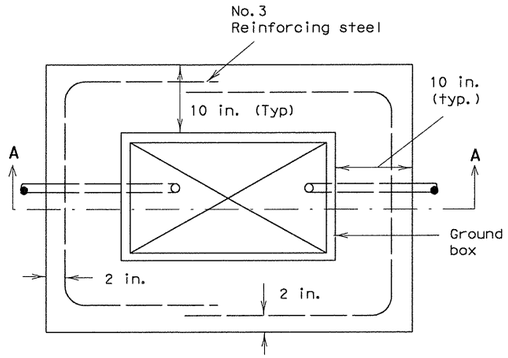
A. MATERIALS

1. Ground boxes 16x30x24 inches (WxLxD) or smaller shall be polymer concrete of the type required by the descriptive code shown elsewhere. Larger ground boxes shall be as shown elsewhere in the plans.
2. All ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Ground box Types A, B, C, D & E shall meet the following requirements:
   a. Ground boxes and covers be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Minimum inside dimensions shall be as follows (width x length x depth):
      Type A shall be 11.5 inches x 21 inches x 10 inches, (122311)
      Type B shall be 11.5 inches x 21 inches x 20 inches, (122322)
      Type C shall be 15.25 inches x 28.25 inches x 10 inches, (162911)
      Type D shall be 15.25 inches x 28.25 inches x 20 inches, (162922)
      Type E shall be 11.5 inches x 21 inches x 16 inches, (122317)
   c. Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
   d. Ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 10 inch area centered on the cover with less than 1/2 inch deflection. Ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   e. Covers shall be 2 inch (nominal) thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly imprinted with the following words in minimum 1 inch letters:
      Ground Boxes containing wiring for traffic signals shall be labeled, Danger High Voltage Traffic Signal.
      Ground boxes containing wiring for illumination systems shall be labeled, Danger High Voltage Illumination.
      Ground boxes containing wiring for traffic management systems shall be labeled, Danger High Voltage Traffic Management.
      Ground boxes containing wiring for sign illumination systems shall be labeled, Danger High Voltage Sign Illumination.
      Ground boxes containing wiring for traffic signals that also contain illumination, powered by the signal electrical service, shall be labeled, Danger High Voltage Traffic Signal.

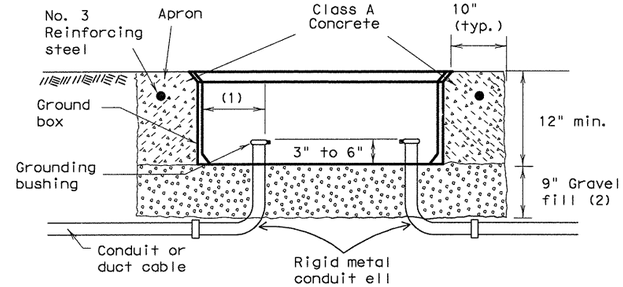
B. CONSTRUCTION METHODS

⚠

1. Ground boxes shall be set on a 9 inch (minimum) bed of aggregate from 3/4 " up to 2" in size. Aggregate shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. When required by Item descriptive code, construction of an apron encasing a ground box including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Conduit holes may be cut in the walls of type B & D boxes at least 18 inches beneath the cover.
4. If, within the limits of this project, the Contractor must utilize an existing ground box equipped with a metal cover, the Contractor shall bond the cover to the grounding conductor with a 3 foot long flexible stranded jumper the same size as the grounding conductor. Connection of bonding jumper to metal ground cover shall not be paid for directly but shall be subsidiary to various bid items. The box(es) must be clearly shown on the plans with plan notes fully describing the work required.
5. If there are other ground boxes with metal Covers within the project limits but not involved in the contract, the Engineer may direct the Contractor to ground the covers, designating and identifying the specific boxes in writing. This work will be paid for separately.
6. Termination to metal ground box covers shall be made using a tank ground type lug.



PLAN VIEW

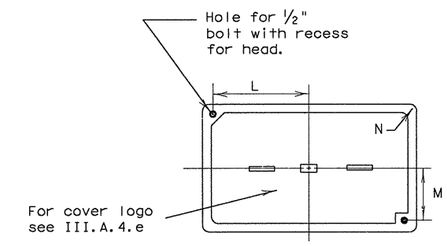


SECTION A - A

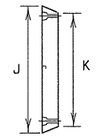
APRON FOR GROUND BOXES

(Where required)

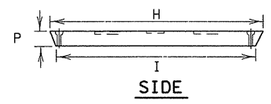
(1) Final position of end of conduit shall not exceed one-half the distance to the side of box opposite the conduit entry.
(2) Place gravel "under" the box. not "in" the box. Gravel should not encroach on the interior volume of the box.
(3) Install bushing on the upper end of all ells.
(4) Where a ground rod is present in the ground box, connect it to any and all equipment grounding conductors using a listed connector.
(5) Maintain sufficient space between all conduits so as to allow for proper installation of bushings.
(6) All conduits shall be installed in a neat and workmanlike manner.
(7) All conduits installed in the ground box shall be sealed after completion of conductor installation and any required pull tests. Silicone shall not be used as sealant.



PLAN VIEW



END



SIDE

GROUND BOX COVER

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

5/03 Revision

⚠ Revised notes.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- GROUND BOXES

ED(3)-03

©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: GC	REC NO.:
REVISIONS 4-98 12-00 3-03 5-03	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET		SHEET: 349
	COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH30

71C

DN: CK: DW: CK:
DATE: ACC: FILE:
LEVELS

DISCLAIMER
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ELECTRICAL SERVICES NOTES

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary for a complete and proper electrical service installation as specified in the plans to obtain electrical power shall be paid for, performed, furnished and installed by the Contractor. The Contractor shall contact the Utility for metering and shall comply with all Utility requirements.

Primary line extensions, connection charges, meter charges, and other charges by the Utility company to provide power to the location shown, when required, shall be paid for under force account work. The costs associated with these charges shall be approved by the Engineer prior to engaging the Utility company to do the work. The Contractor shall consult with the appropriate Utility to determine costs and requirements, and shall coordinate the Utility's work as approved by the Engineer. The Contractor shall be reimbursed only the amount billed by the Utility. No additional amount for supervision of the Utility's work will be paid.

Materials shall be new and unused, materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards and shall be Underwriters Laboratories (UL) Listed. Electrical Service conduits, conductors, disconnects, contactors, circuit breaker panel sizes, and branch circuit breakers, shall be as shown in the Electrical Service Data elsewhere in the plans. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection.

The Contractor shall submit for approval no less than six (6) copies of catalog cut sheets on electrical service materials. Submittals shall be legible and shall be marked to indicate which product on a cut-sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The Contractor shall provide locks keyed with Master #2195 for all lockable electrical enclosures. Keys and locks become property of the State. Unless otherwise approved by the Engineer, enclosures shall not be energized until locks are provided and all bolts are installed.

Circuit directories, where provided, shall be filled out. All breakers and components in shop built panels and enclosures shall be labeled with duo-colored plastic labels. Letters shall be a minimum 3/8 " in height.

Enclosures with external disconnects that de-energize all equipment inside the enclosure, need not have dead front trim, except that incoming line terminations shall be protected from incidental contact.

When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used. All wiring and components shall be rated for 75 degrees C. Minimum size for service entrance conductors shall be #6 XHHW.

I. Safety Switch. A safety switch, placed ahead of the meter, shall only be used when specified by the Utility and when shown on the Electrical Service Data. The switch shall be UL Listed, heavy duty type, 600 volt, unfused, with a UL type 3R enclosure and equipped with a solid neutral (s/n) assembly. The switch shall be padlockable in the "on" position.

II. Service Type. Electrical service types A, C, D, and T shall be as schematically detailed on ED(4) or ED(5). Other service types shall be as detailed elsewhere on the plans.

III. Branch Circuit Breakers. Circuit breakers shall be thermal magnetic and have a minimum interrupting capacity of 10,000 amps and a voltage rating compatible with their use. Circuit breakers shall be sized as shown in the electrical service data. Circuit breakers in panelboards and load centers shall be full size and designed exclusively for the panelboard or load center in use. Tandem and half-width breakers shall not be used. All circuit breakers shall be permanently and clearly marked identifying the circuit or device supplied. Circuit breakers shall be UL Listed to UL489.

IV. Circuit Breaker Panelboard. Panelboards shall be UL Listed. Panelboards shall have copper busses, a minimum of 6 one-pole spaces or as required in the electrical service data, and when required will be rated for service equipment. Enclosure shall meet or exceed UL type 3R classification. Panelboards shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be bolt-in type only.

V. Circuit Breaker Load Center. Load centers shall be UL Listed.
Load centers for type T services may have copper or aluminum busses, all other load centers will be copper bus only. Load center will have a minimum of 4 one-pole spaces, and shall be rated for service equipment. Enclosure shall meet UL type 3R classification. Load centers shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be plug-in type only. Load centers for type T services shall accomodate a maximum of 6 one-pole breakers.

VI. Separate or Auxiliary Enclosure. Separate enclosures for HOA, photocell and lighting contactors for types D & T Services shall be a UL Listed assembly with outer door. Interior shall have dead front trim. HOA switch operator shall extend through the dead front trim. Photocell shall be mounted inside the enclosure as described in paragraph XIII when required by descriptive code. Separate enclosures shall meet the construction requirements of paragraph VIII. E, except that separate enclosure shall not have external operating handle, need not have a data pocket and door may latch at only one point. All equipment may be located in one enclosure instead of two, when approved by the Engineer.

VII. Where a Type D or T service is provided, laminated "as built" drawings are required as shown on ED(5) VIII E; shall be delivered before completion of the work, to the Engineer in lieu of placement within these smaller enclosures. Conduit may not enter the back wall of a service enclosure penetrating the equipment mounting panel. Provide grounding bushings on all metal conduits, terminate bonding jumper to grounding bus. Grounding bushing is not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss such as a meter base.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X (XXX/XXX) XXX (XX) XX (X) XX (X)

Example: ELEC SERV TY A(240/480)100(NS)SS(E)GC(O)

Schematic Type

Service Voltage (V / V)

Disconnect Amp Rating
(000 indicates main lug only)

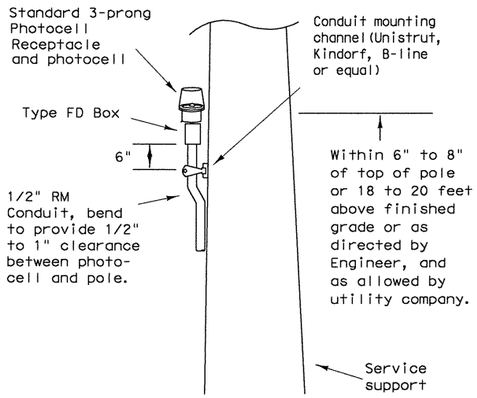
SS= Safety switch ahead of meter
NS= No switch ahead of meter and/or no meter required

Enclosure Type
GS= Galvanized steel (see ED(5)VIII,D)
SS= Stainless steel
AL= Aluminum

Photocell Mounting Location
T= Top of pole
E= Inside service/separate enclosure
L= Luminaire mounted
N= None

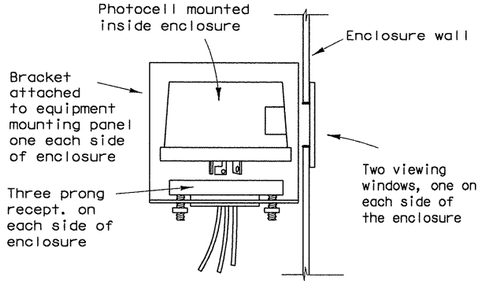
Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Switch gear to be placed on traffic signal pole
RT= Rectangular structural tubing
PS= Pedestal Service (see ED(5)VIII,G)

O= Overhead service
U= Underground service



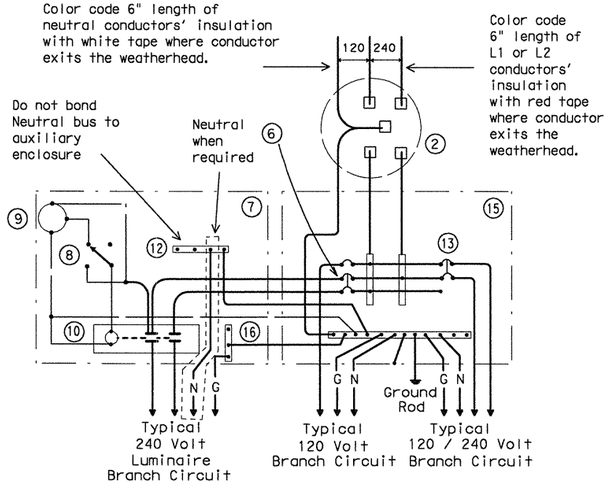
TOP MOUNTED PHOTOCELL

Conduit support spacing 3 feet from enclosure; 5 feet max.



ENCLOSURE MOUNTED PHOTOCELL

For photocell specifications see ED(5),XIII.



SCHEMATIC TYPE T

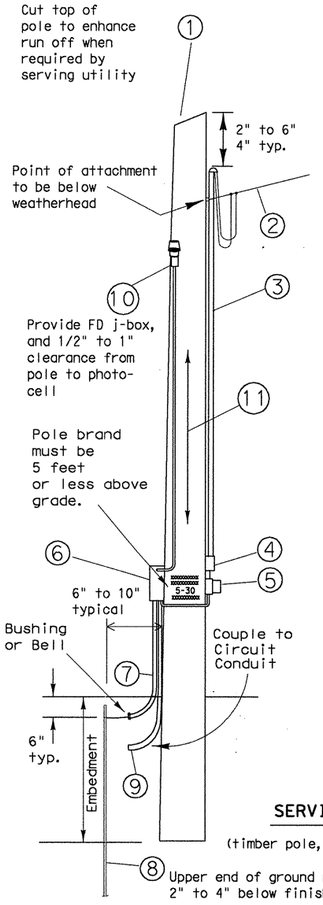
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data.

SCHEMATIC LEGEND

1 - omitted
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (Not Used)
5 - Omit
6 - Circuit Breaker, 15 Amp typical for control circuit wiring
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks (Not Used)
12 - Neutral Bus required when 120 v. lights are controlled by lighting contactor
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (Not Used)
15 - Load Center
16 - Ground Bus

——— Power Wiring
— — — Control Wiring
—N— Neutral Conductor (when required-to serve 120 v. loads only)
—G— Equipment grounding conductor-always required



1 - Class 5 pole, height as required
2 - Service drop from utility company (attached below weatherhead)
3 - Service conduit and service entrance conductors(RMC) (See Electrical Service Data)
4 - Safety switch (when required)
5 - Meter (when required)
6 - Service enclosure
7 - No. 6 bare grounding electrode conductor in 1/2 " PVC to ground rod - extend 1/2 " PVC 6" underground.
8 - 5/8 " x 8' Copper clad ground rod - drive ground rod completely underground unless otherwise approved by the Engineer.
9 - RM conduit - same size as branch circuit conduit.
10 - Photocell and conduit - if top mounted. (See Electrical Service Data)
11 - When required by the serving utility provide bare #6 awg copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor to a height of 8 ft above finish grade.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

(If applicable)
- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. Size shall be same as service entrance conduit.
- LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. No strap required for LFMC shorter then 12"
- Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting.
- A neutral conductor must be installed within the LFMC.
- Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.

SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

TIMBER POLE NOTES

1. Conduit and electrical conductors attached to the electrical service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
2. Pole top mounted photocell, install on north side of pole or in service enclosure as required. See Electrical Service Data.
3. Attach meter and service equipment with stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Gain pole as required to provide flat surfaces for each strut. Paint ends of galvanized channel with zinc rich paint. Gain depth 5/8" max. Gain height 1 7/8" max. Strut to be 1" max. deep, and 1 5/8" wide max. Secure each strut section to timber pole with two galvanized or SS lag bolts, 1/4" diameter min. by 1 1/2" length min. Place flat cut galvanized or SS washer on each lag bolt. Gain pole in a neat and workmanlike manner.
4. Embedment depth shall be as required in Item 627 Treated Timber Poles.
5. Poles trimmed for excess length shall be trimmed from the top end only.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE SCHEMATICS AND SUPPORT-TYPE TP (OVERHEAD)

ED(4)-03

© TxDOT April 1998

DN: KB	CK: JW	DW: DN	CK: GC	MEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-00 3-03	DAL	6	SEE TITLE SHEET	350

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH30

71D

LEVELS
1 2 3 4 5 6 7 8
17 18 19 20 21 22 23 24
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

ID
1 2 3 4 1 5 1 6

DATE:
ACC:
FILE:

DN:
CK:
DW:
CK:

SERVICE ENCLOSURE NOTES

VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.

A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor or enclosure mounted photo cell) and all auxilliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSED INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The service assembly enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".

B. Conduit entries into the top of enclosures shall have threaded hub. Conduit entries through the equipment mounting back plate will not be allowed.

C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using duo-colored plastic labels or self adhesive vinyl weather resistant labels, minimum of 1 inch high; applied in a neat and workmanlike manner. On the label will be the service number shown on the plans as well as identifying the load served specifically (i.e. lighting, landscaping, signals, traffic management or other wording as directed by the Engineer). Safety switches need not be OSHA labeled unless specifically required by the serving utility.

D. Type GS enclosures will only be allowed for service Types D and T without an enclosure mounted photocell and/or lighting contactor and the Type C panelboard. This spec will allow an "off the shelf" product meeting these specifications to be used. Type GS enclosures shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel unless shown differently on the plans. Steel enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, white or light green. Panelboard/loadcenter enclosures shall meet UL type 3R requirements, shall have a dead front trim, and an outer padlockable door preventing unauthorized persons from operating contained equipment. Galvanized steel is no longer allowed for Types A, C, or custom-built D or T enclosures. If GS is shown in the descriptive code for any of these, an AL shall be provided.

E. Type AL enclosures for service Types A and C shall meet UL type 3R requirements and shall also meet additional requirements of this paragraph. The enclosure shall have both a main disconnect remote operator handle and a door latch handle. Die-cast handles are not acceptable. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be padlockable in both the "on" or "off" positions. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Door closure clamps will not be allowed. Lock must be keyed to Master #2195. All the enclosures shall have either a continuous stainless steel piano hinge with stainless steel pin or enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 0.185 inch minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 70 lbs of loading. The door shall have an attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of a minimum 12 guage galvanized steel. Equipment mounting panels shall not be painted. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm or other approved means to hold the door open. Only the enclosure exterior will be primed and painted. Paint color shall be beige or gray and shall be powder coat paint as shown below. Condensation drainage shall be provided in the bottom of the enclosure before leaving the factory. The Contractor shall prepare and submit a schematic drawing unique to an individual service. The approved drawing shall be laminated and placed in the document pocket of the service at the time of shipment to the job site. All applicable wiring diagrams and plan sheet layouts for all equipment and branch breaker circuits supplied by that service shall also be laminated and placed in the document pocket prior to shipping. Type AL enclosures for Type D and T services with enclosure mounted photocell and/or lighting contactor shall have the loadcenter interior mounted in an enclosure with properly adopted dead front trim. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. (Do not put one enclosure inside another enclosure). Types D and T with enclosure mounted photocell and/or lighting contactor shall meet the additional requirements of this paragraph except that remote-operating handle will not be provided.

F. Type SS enclosures for Type A and C shall meet all the requirements above for their respective type AL. Type SS enclosures for D and T shall meet all the requirements above for their respective type AL. Stainless Steel shall not be painted.

G. PS enclosure shall be as detailed and specified on ED(8). Galvanized steel will not be allowed for any pedestal service. If GS is shown in the descriptive code an AL will be provided.

IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the 5A or 5B classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.

X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be an UL Listed thermal-magnetic circuit breaker controlled by flange-mounted remote operator in the service assembly enclosure when required. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backfed breakers will be allowed for use as a main disconnect.

XI. Control Circuit. Control circuit protection shall be 15 amp circuit breaker.

XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in an UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.

XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paned windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. Bracket and photocell's receptacle will be mounted inside enclosure next to each window. Except for window side, 2" of clearance is required on all sides of photocell for ease of replacement. The photocell's receptacle is held in place by two mounting screws on bracket and located next to each window of the enclosure. The 3-prong twist lock photocell shall be mounted in a position to receive light from the window closest to the photocell. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.

XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.

XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.

XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

SCHEMATIC LEGEND

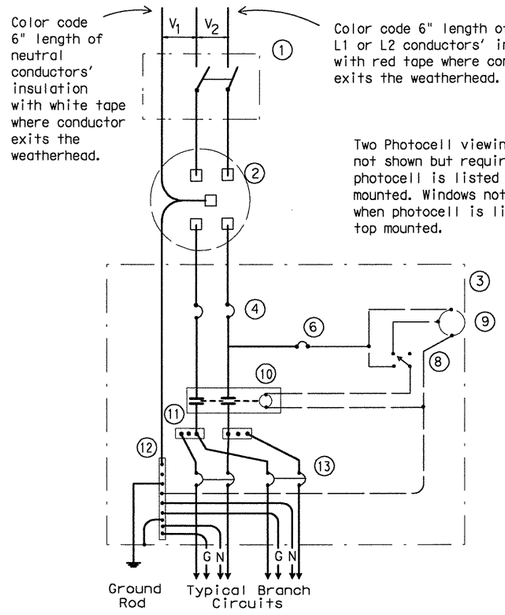
1 - Safety Switch (when required)
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (See Electrical Service Data)
5 - Omit
6 - Circuit Breaker, 15Amp
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks
12 - Neutral/Ground Bus
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (See Electrical Service Data)
(If Type C is shown as AL or SS on descriptive code, this is the service assembly enclosure only. Panelboard enclosure is GS unless otherwise noted.
15 - Load Center

———— Power Wiring
— — — — Control Wiring
——N—— Neutral Conductor (when required) serve 120 v. loads only)
——G—— Equipment grounding conductor-always required

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LEVELS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

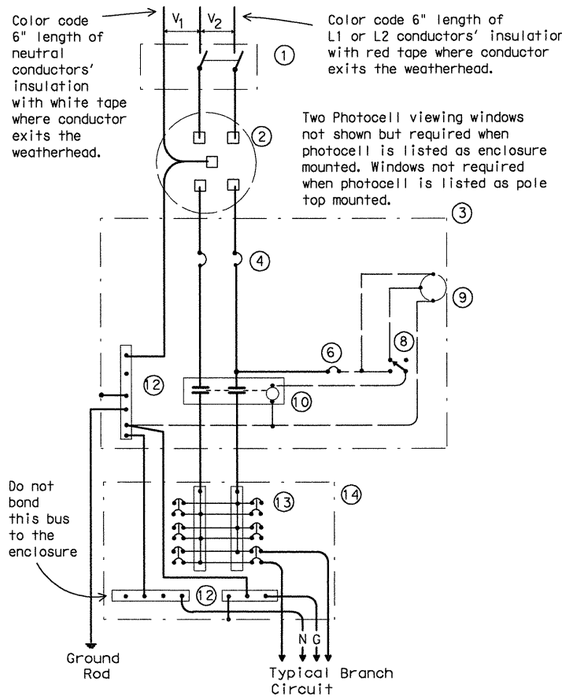
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SCHEMATIC TYPE A

THREE WIRE

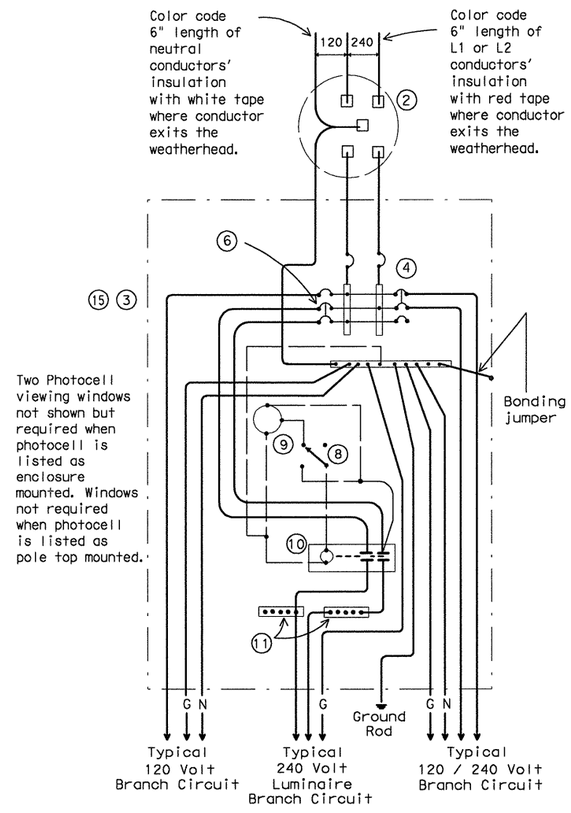
Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE C

THREE WIRE

Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE D

120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data. See Type D service notes.

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. There shall be a window on each side of enclosure to allow operation of photocell. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Engineer. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.

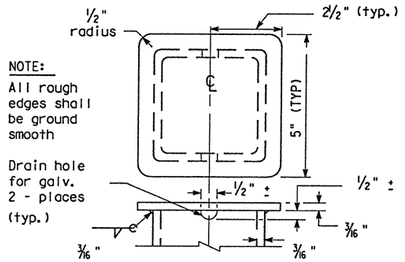
STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE ENCLOSURE & NOTES

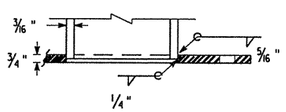
ED(5)-03

©TxDOT April 1998		DN: KB	CK: JW	DW: DN	CK: GC	REQ NO.:
REVISIONS 12-00 3-03	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
	DAL	6	SEE TITLE SHEET			351
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH30

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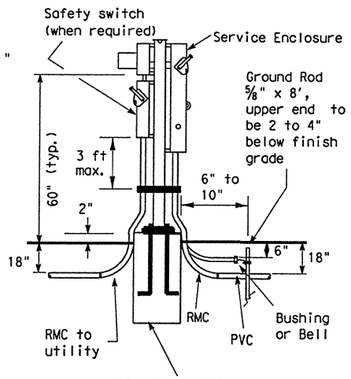


TOP OF POLE
TYPE SF & SP



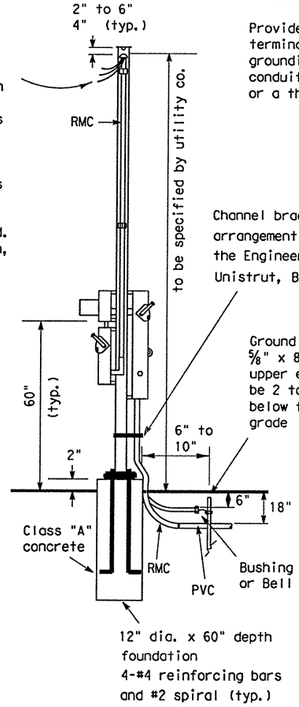
BOTTOM OF POLE
TYPE SF & SP

Color code 6" of grounded neutral conductors insulation with white tape where conductor exits the weatherhead. Color code 6" of L1 or L-2 Hot-ungrounded conductors insulation with red tape where conductor exits the weatherhead. Conductor free length, 12" min., 18" max.



12" dia. x 36" depth foundation
4-#4 reinforcing bars and #2 spiral (typ.)

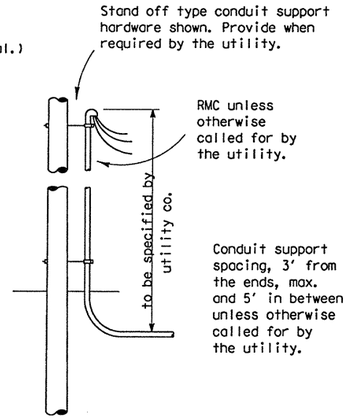
SERVICE SUPPORT
TYPE SP (U)
UNDERGROUND SERVICE
WITH SAFETY SWITCH



12" dia. x 60" depth foundation
4-#4 reinforcing bars and #2 spiral (typ.)

SERVICE SUPPORT
TYPE SP (O)
OVERHEAD SERVICE
WITH SAFETY SWITCH

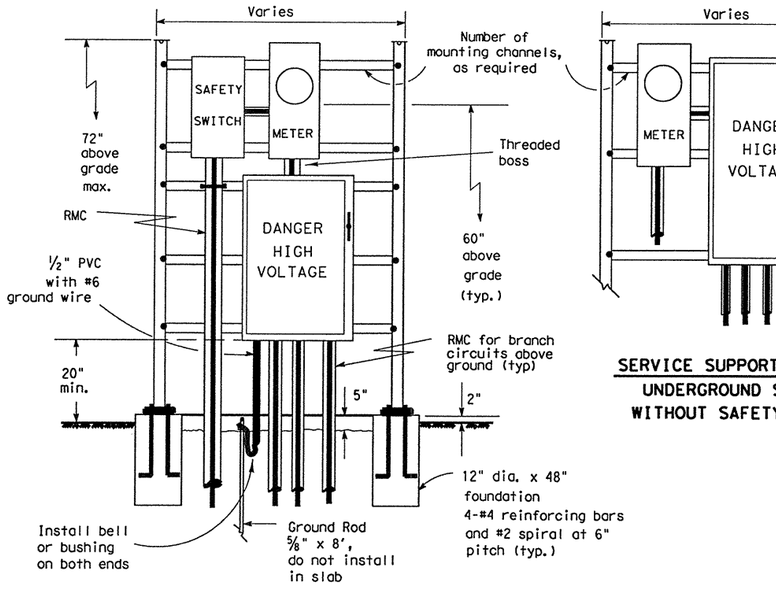
Provide grounding bushings on all metal conduits, terminate bonding jumpers(min. #6 AWG. Copper) to grounding bus. Grounding bushing not required when conduit end is fitted with a conduit sealing hub or a threaded type of boss such as a meter hub.



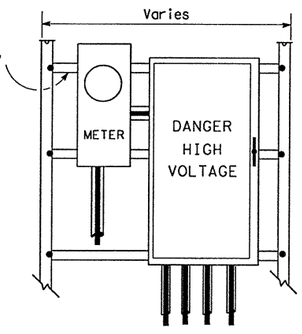
UNDERGROUND RISER
AT UTILITY POLE
(for underground service)

NOTES:

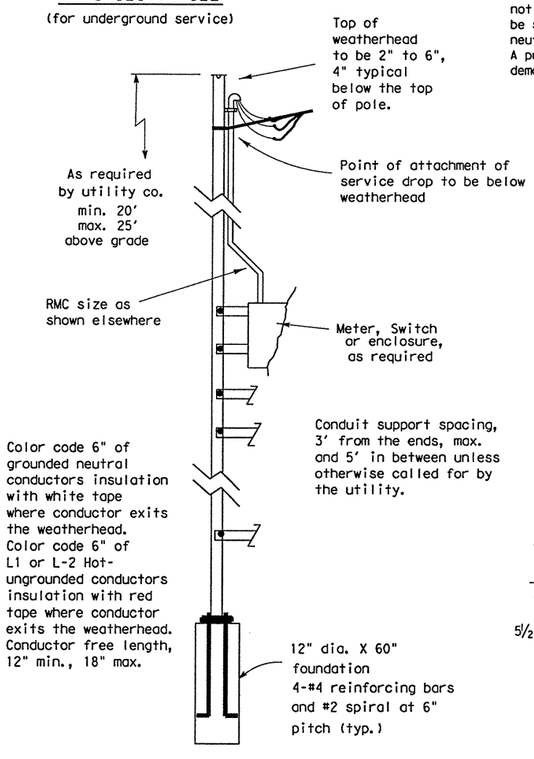
1. Support Type SP and SF: Fabricated from 4" x 4" x 3/16 " square structural tubing, ASTM A500 Grade A or G or equal. Base plate shall be 3/4 " plate, ASTM A36 or equal. All equipment and conduit shall be mounted on galvanized channel strut, 1 1/2 " x 1 5/8 " x 12 guage galvanized steel channel (Unistrut, Kindorf, B-line or equal) clamped with channel hardware, bolted or welded to vertical member as approved by the Engineer.
2. Paint field cut ends of all channels with zinc-rich paint.
3. All Steel Poles (SP and SF) shall be hot-dip galvanized after fabrication. Poles for overhead service shall be fitted with eyebolt or similar fitting, as approved by the utility company, for attachment of sevice drop to the pole.
4. All conduit and conductors attached to the electrical service and within 12 inches of the electrical service will not be paid for directly, but shall be subsidiary to the electrical service. All conduit and conductors from the utility company pole to the point 12 inches from the electrical service, including conduit and conductors required for the utility pole riser when furnished by the Contractor, will be paid for separately.
5. All mounting hardware and installation details of services shall be in accordance with utility company specifications.
6. Anchor bolts for underground service supports shall be 3/4" x 18" x 4" (dia. x length x hook length). Anchor bolts for overhead services shall be 3/4" x 56" x 4". Anchor bolts shall be provided with leveling nuts.
7. Conduit for grounding electrode conductor (ground rod wire) shall be 1/2" PVC. All other conduit on electrical services shall be rigid metal conduit. Service entrance conduit size shall be as shown elsewhere. Conduit for branch circuit entry to enclosure shall be the same size as that shown on the layout sheets for branch circuit conduit. Rigid metal conduit shall extend to the rigid metal elbow and then be coupled to the type conduit shown on the layout for that particular branch circuit. RMC shall have grounding bushings in enclosures.
8. If pole is painted, each separate painted piece shall have a bonding jumper attached to a tapped hole.
9. Sheet metal screws are not allowed for bonding. Provide 1/4-20 machine screws. Remove all non-conductive material at contact points. Terminate bonding jumper using listed device. Bonding jumper min. #6 AWG Copper. Make up all threaded bonding connections wrench tight.
10. Conduits entering enclosure from underground shall be sealed at both ends. Silicone sealant will not be allowed.
11. ⚠ Ground rod clamp to be UL listed for direct burial.
12. Service entrance conductors shall exit separately bushed non-metallic openings in weatherhead.
13. Free conductor at weatherhead to be 12 in. min., 18 in. max., or as required by utility. Color code grounded-neutral conductor with white tape covering 6 in. of conductor. Color code L1 or L2 Hot un-grounded conductor with red tape covering 6 in. of conductor. Service drop and service entrance conductors must not contact metal pole in such a manner as to result in abrasion of insulated conductors.
14. Conduit support spacing to be max. 3 ft. from ends, and max. 5 ft. in between.
15. Shop drawings are not required for service support structure unless specifically stated elsewhere or as directed by the Engineer.
16. Service enclosure to be labeled as specified on ED(5) VIII C.
17. Liquidtight flexible metal conduit (LFMC) may be used between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. LFMC shall be the same size as service entrance conduit. LFMC shall not exceed 3 ft. and shall be securely supported within one foot of each end. LFMC shorter then 12" need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in LFMC shall not exceed 180 degrees.
A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.



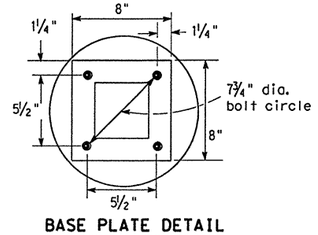
SERVICE SUPPORT TYPE SF (U)
UNDERGROUND SERVICE
WITH SAFETY SWITCH
(Typical Arrangement)



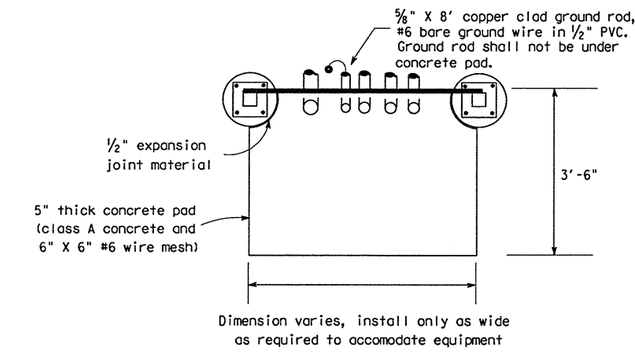
SERVICE SUPPORT TYPE SF (U)
UNDERGROUND SERVICE
WITHOUT SAFETY SWITCH



SERVICE SUPPORT TYPE SF (O)
OVERHEAD SERVICE



BASE PLATE DETAIL
TYPE SF & SP



SERVICE SUPPORT TY SF (O) & SF (U)
TOP VIEW

5/03 Revision
⚠ Revised notes.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-SERVICE SUPPORT TYPES SF & SP

ED(6)-03

©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: GC	MSG NO.:
REVISIONS 4-98, 12-00, 3-03, 5-03	STATE DISTRICT 6	FEDERAL REGION	FEDERAL AID PROJECT		SHEET 351A
	COUNTY Rockwall	CONTROL 0009	SECTION 13	JOB 073	HIGHWAY

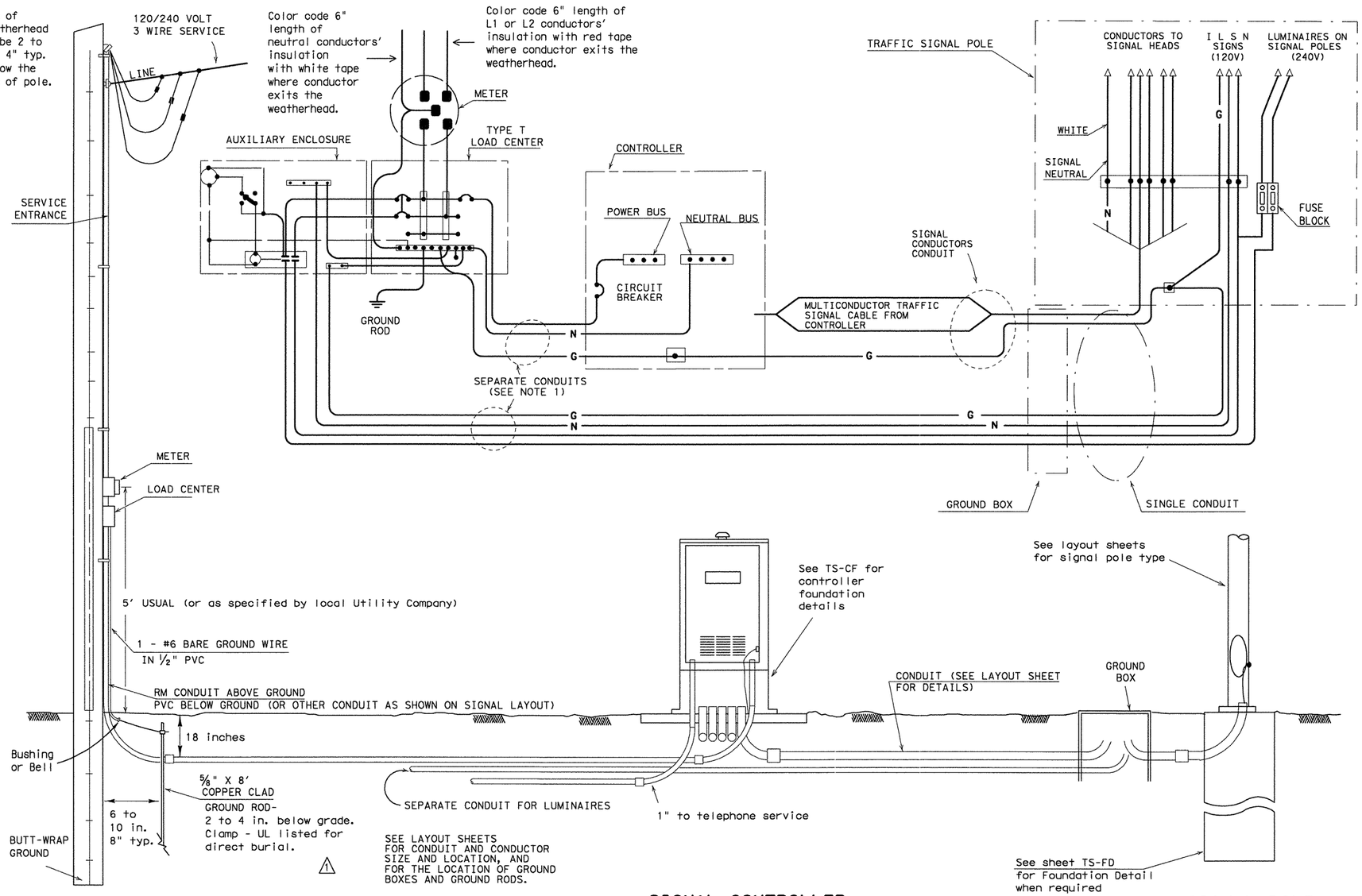
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NOTES:

1. Luminaire conductors shall not be looped through controller cabinet.
2. Electrical system to include an equipment grounding conductor noted here as "G". All exposed metal parts are to be bonded to grounding conductor.
3. Photocell, when required, shall be mounted at top of pole or in enclosure as shown on ED(4) and ED(5) and as required by descriptive code.
4. Roadway lighting fixtures, when required, shall be in accordance with the material and construction methods of the Item, "Roadway Illumination Assemblies" except for the test period for proper operation of the luminaires. Installed roadway lighting luminaires and internally lighted street name signs shall be tested for proper operation as a part of the associated traffic signal system.
5. Internally lighted street name signs (ILSN), when required, shall be in accordance with the Item "Internally Lighted Street Name Signs". Because of the electrical isolation of ILSN hinges, a #12 green grounding conductor shall be run to the ILSN fixture.
6. Install ground rod at alternate location when directed by the Engineer. Maintain a minimum of 8 ft in contact with the earth.
7. Liquidtight flexible metal conduit (LFMC), may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. LFMC shall be same size as service entrance conduit. LFMC shall not exceed 3 ft. and shall be securely supported within one foot of each end. No strap required for a LFMC shorter than 12". Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
8. Minimum embedment depth as per Item 627 Treated Timber Poles.
9. Pole to be set plumb.
10. Back fill thoroughly tamped in 6 in. lifts. Place 6 inches additional backfill above grade around pole base to allow for settling, as per Item 627.
11. Excess pole length shall be trimmed from the top at a slope to aid water run off.
12. Gain pole two places for each meter, service, separate or auxiliary enclosure. See ED(4) for details.
13. All illumination and power conductors to be pull tested and megged. Do not meg traffic signal cable.
14. Enclosures are to be locked, and ground box covers are to be bolted before power is applied to the circuit.
15. Conduits entering top of enclosures to be fitted with conduit sealing hub or threaded boss, such as meter hub. Off-set nipple, when required, shall not be zinc-die-pressure cast. All metal conduits not connected to conduit sealing hub, or threaded boss must have a grounding bushing. Terminate bonding jumper to ground bus. All conduits entering enclosures shall be sealed. Silicone shall not be allowed.



ELECTRICAL SERVICE

(TYPE T TIMBER POLE SHOWN AS EXAMPLE, SEE ELECTRICAL DETAILS, LAYOUT SHEETS, AND ELECTRICAL SERVICE DATA SHEET FOR SERVICE REQUIRED AND FOR DETAILS.)

SIGNAL CONTROLLER

SIGNAL POLE

Unless shown elsewhere in the plans, electrical service data for Types D and T shall be as follows.

ELECTRICAL SERVICE DATA

ELECTRICAL SERVICE DESCRIPTION(SEE ED(4))	SERVICE CONDUIT SIZE (RMC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS ***	PANELBD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/AMPS	KVA LOAD
TY D (120/240)070(NS)AL(E)**(*)	1 1/4 ⚠1	3/#4	N/A	2P/70	30	100	T.S. Lighting	1P/50 2P/15	<7.1
TY T (120/240)000(NS)GS(E)**(*)	1 1/4 ⚠1	3/#4	N/A	None	30	70	T.S. Lighting	1P/50 2P/15	<7.1

*** Eliminate photocell, contactor and seperate enclosure if lighting, or internally lighted signs are not required by plans
** See descriptive code in estimate for service support type.
* See descriptive code in estimate for overhead or underground service.

5/03 Revision
⚠1 Revised notes.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(7)-03

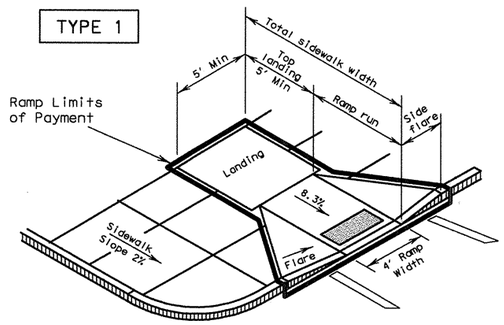
©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: GC	MEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-98	DAL	6	SEE TITLE SHEET	352
12-00	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
3-03	ROCKWALL		009	12	073	IH30
5-03						

LEVELS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
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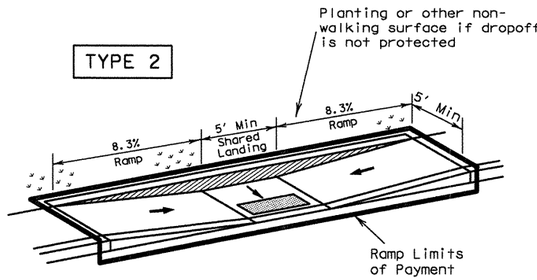
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TYPE 1



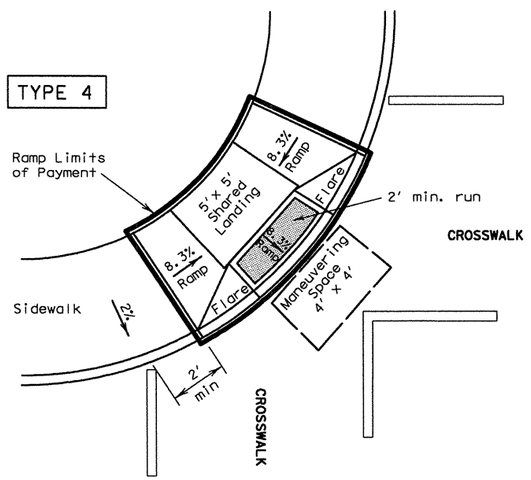
PERPENDICULAR CURB RAMP

TYPE 2



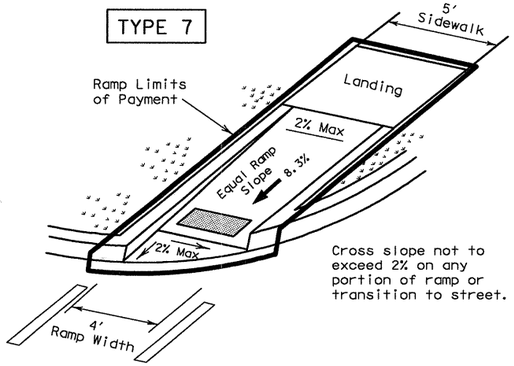
PARALLEL CURB RAMP
(Use only where water will not pond in the landing.)

TYPE 4



DIAGONAL COMBINATION CURB RAMP
Perpendicular to the Tangent of the Curb Radius and Contained in Crosswalk

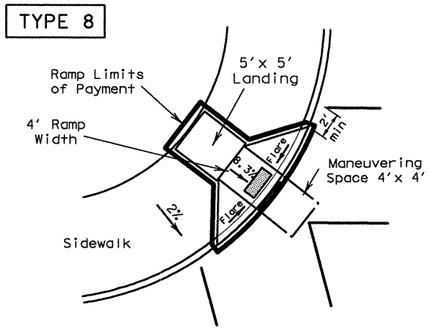
TYPE 7



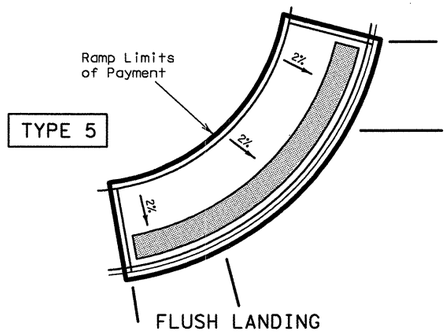
Cross slope not to exceed 2% on any portion of ramp or transition to street.

DIRECTIONAL RAMP WITHIN RADIUS
(Sidewalk set back from curb)

TYPE 8

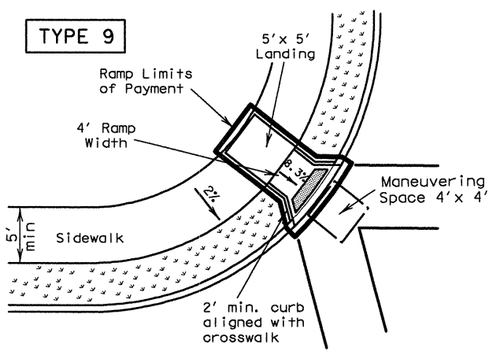


DIAGONAL CURB RAMP (FLARED SIDES)

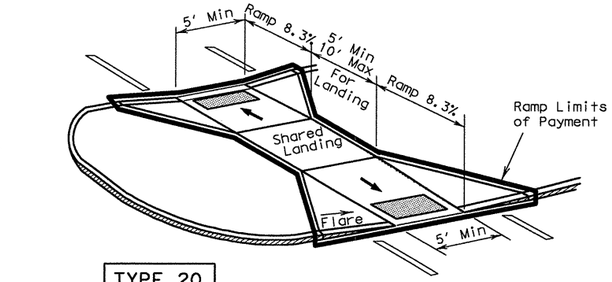


TYPE 5

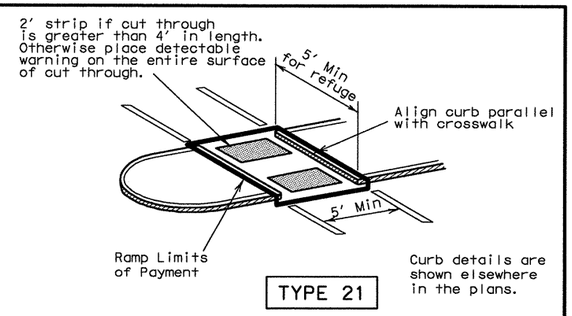
FLUSH LANDING



DIAGONAL CURB RAMP (RETURNED CURB)



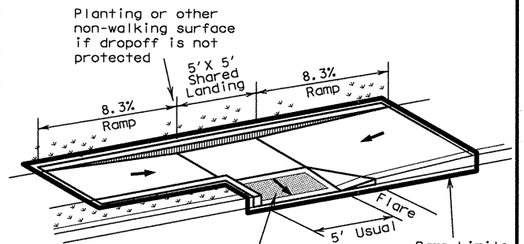
TYPE 20



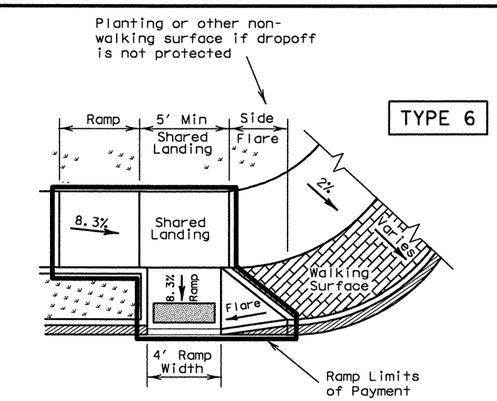
TYPE 21

Curb details are shown elsewhere in the plans.

CURB RAMPS AT MEDIAN ISLANDS



TYPE 3



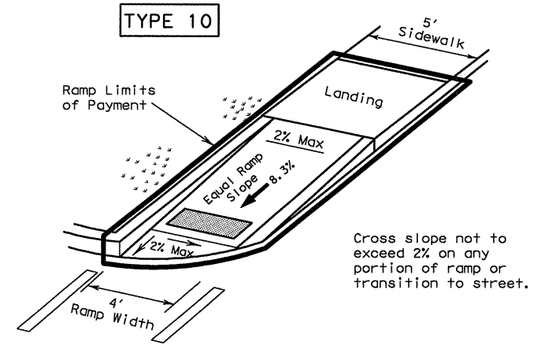
TYPE 6

COMBINATION CURB RAMPS

TYPE 22

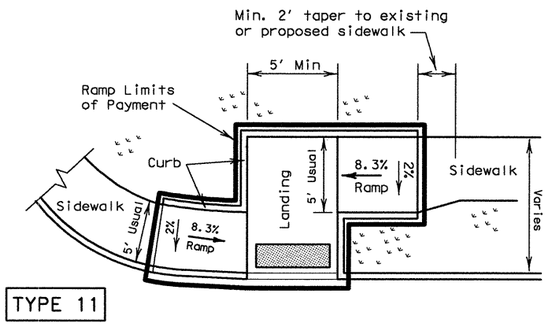
COMBINATION ISLAND RAMPS

TYPE 10



Cross slope not to exceed 2% on any portion of ramp or transition to street.

DIRECTIONAL RAMP WITHIN RADIUS
(Sidewalk adjacent to curb)



TYPE 11

OFFSET PARALLEL CURB RAMP

NOTES:
See General Notes on sheet 2 of 4 for more information.

" " Denotes planting or non-walking surface.

Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES
CURB RAMPS

PED-05

SHEET 1 OF 4

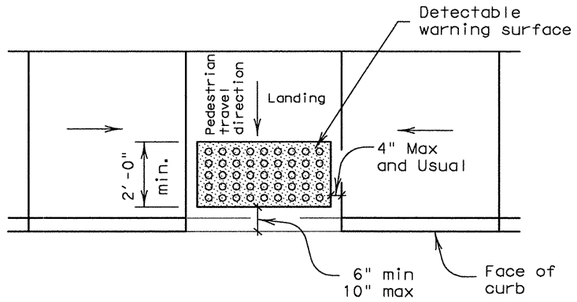
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© TxDOT March 2002	DIST	FEDERAL AID PROJECT			SHEET
REVISIONS	DAL	SEE TITLE SHEET			353
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

LEVELS DIS... cD

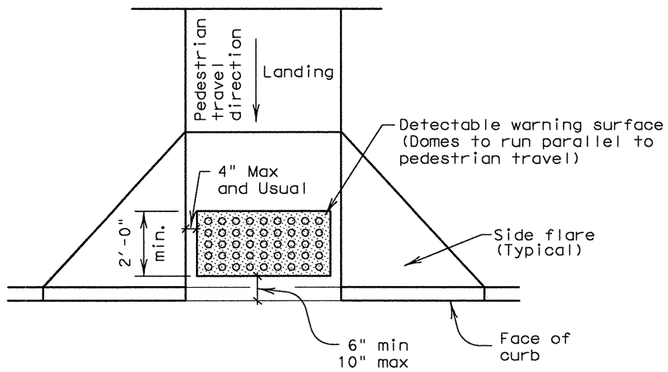
DETECTABLE WARNINGS

General Notes for Detectable Warnings

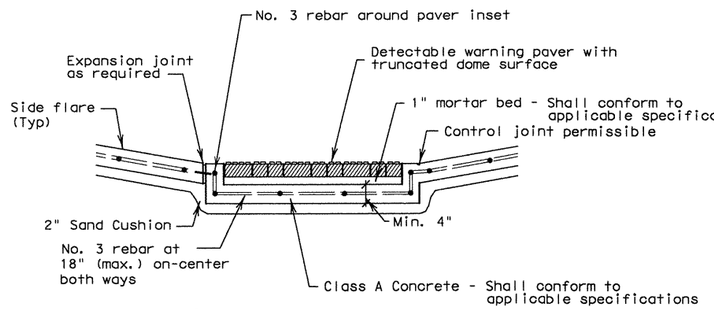
1. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 4.29 of the Texas Accessibility Standards (TAS). The surface must contrast visually with adjoining surfaces, including side flares. Furnish dark brown or dark red detectable warning surface adjacent to uncolored concrete, unless specified elsewhere in the plans.
2. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
3. Align truncated domes in the direction of pedestrian travel when entering the street.
4. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.
5. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
6. Detectable warning surfaces shall be located so that the edge nearest the curb line is a minimum of 6" and a maximum of 10" from the extension of the face of curb. Detectable warning surfaces may be curved along the corner radius.
7. TxDOT maintains a list of Qualified Detectable Warning Materials. Details are provided herein for the placement of landscape pavers. For other materials, refer to the manufacturer's product manual for proper installation.



Typical placement of detectable warning surface on landing at street edge.



Typical placement of detectable warning surface on sloping ramp run.

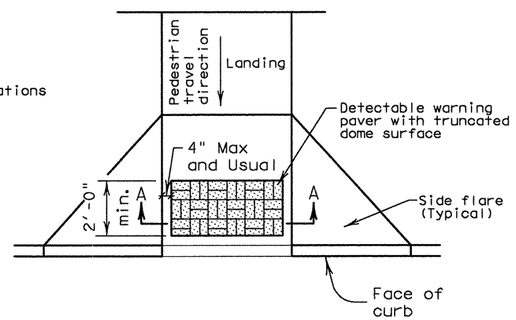


Section A-A

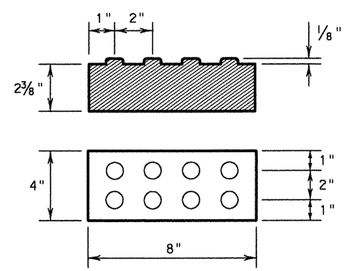
General Notes (Pavers)

Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.

Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.



Truncated Dome Pattern Curb Ramp



Detectable Warning Paver

DETECTABLE WARNING PAVER (OPTION)

Pedestrian Facilities General Notes

1. All slopes are maximum allowable. The least possible slope that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
2. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is encouraged. Where a 5' sidewalk can not be provided due to site constraints, a minimum 3' sidewalk with 5'x 5' passing areas at intervals not to exceed 200' is required.
3. Landings shall be 5'x 5' minimum with a maximum 2% slope in any direction.
4. Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
5. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
6. Curb ramps with returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planting or other non-walking surface or because the side approach is substantially obstructed. Otherwise, provide flared sides.
7. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC §68.102.
8. To serve as a pedestrian refuge area, the median should be a minimum of 5' wide. Medians should be designed to provide accessible passage over or through them.
9. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
10. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall be aligned with theoretical crosswalks, or as directed by the Engineer.
11. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.
12. Handrails are not required on curb ramps. Provide curb ramps wherever on accessible route crosses (penetrates) a curb.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Separate curb ramp and landings from adjacent sidewalk and any other elements with premold or board joint of ¾" unless otherwise directed by the Engineer.
15. Provide a smooth transition where the curb ramps connect to the street.
16. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
17. Flare slope shall not exceed 10% measured along curb line.

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LEVELS ON ... ED

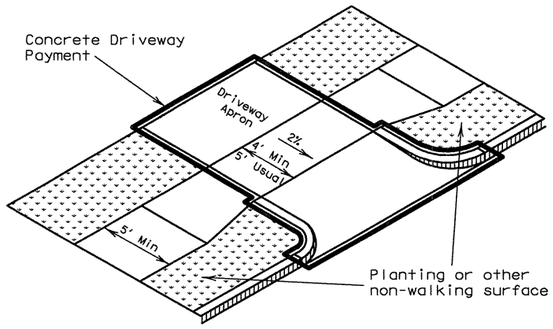
Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES

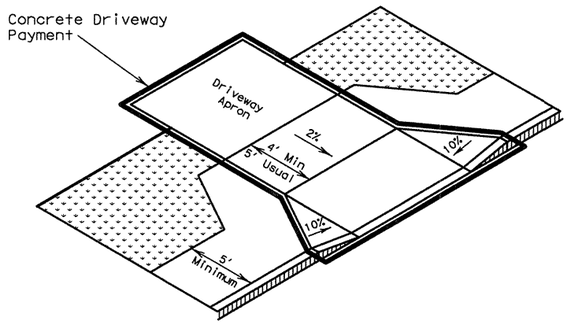
GENERAL NOTES AND DETECTABLE WARNINGS

PED-05

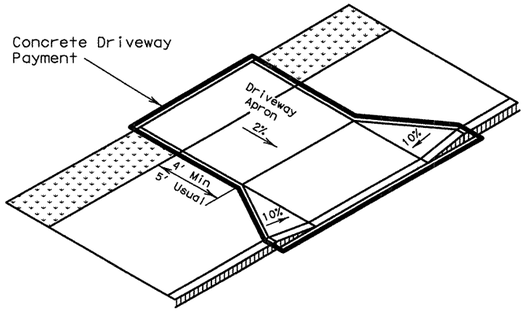
FILE: ped05.dgn	DN: EH	CK:	DW: BGD	CK:	
© TxDOT March 2002	DIST	FEDERAL AID PROJECT			SHEET
REVISIONS	DAL	SEE TITLE SHEET			354
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30



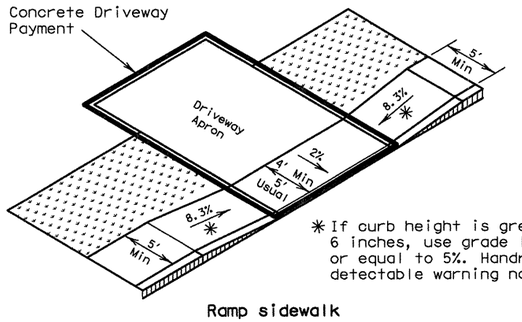
Setback sidewalk



Apron offset sidewalk



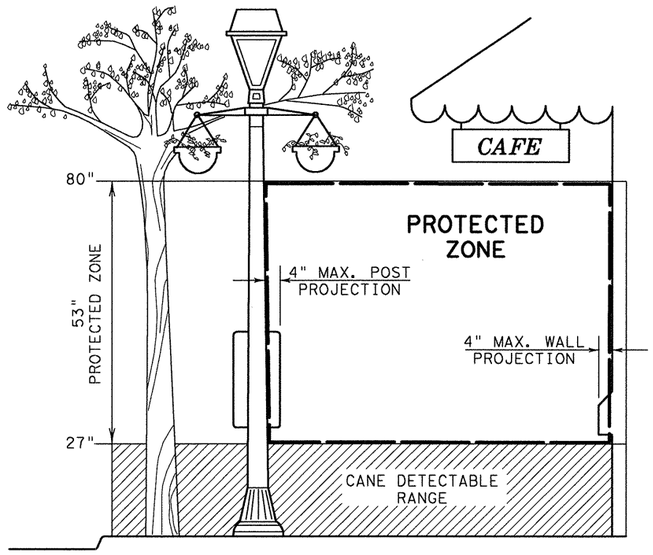
Wide sidewalk



* If curb height is greater than 6 inches, use grade less than or equal to 5%. Handrail and detectable warning not required.

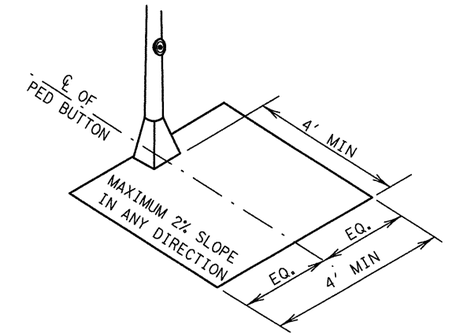
Ramp sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS

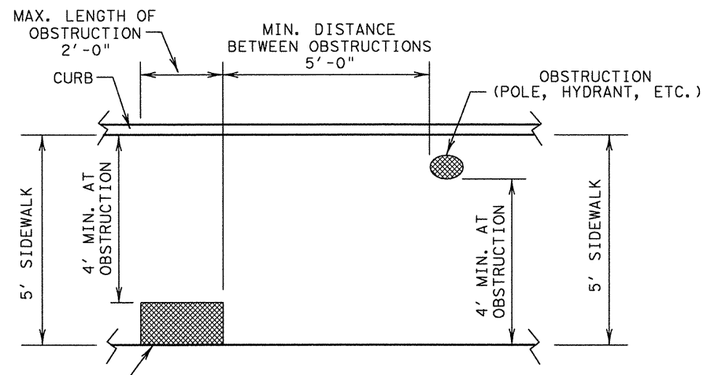


PROTECTED ZONE

In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



CLEAR GROUND SPACE CENTERED AT PEDESTRIAN PUSH BUTTON



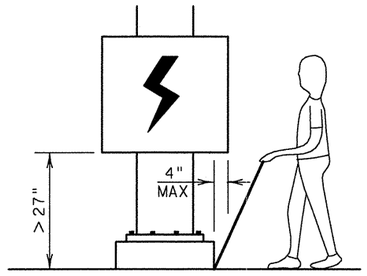
PLAN VIEW

PLACEMENT OF STREET FIXTURES

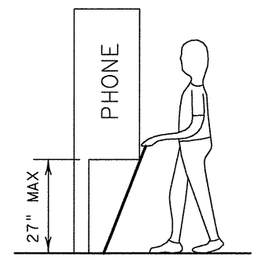
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)

General Notes

1. All slopes are maximum allowable. The least possible slope that will still drain properly should be used.
2. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the accessible route or clear ground space.
3. Usual sidewalk cross slope equals 1.5%. The maximum allowable sidewalk cross slope equals 2%.
4. Street grades and cross slopes shall be as shown elsewhere in the plans.
5. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.
6. Changes in level greater than ¼inch are not permitted.
7. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks, within the public right of way, may follow the grade of the parallel roadway. Where a continuous grade greater than 5% must be provided, handrails may be desirable on one or both sides of the sidewalk to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails must comply with TAS 4.8.5.
8. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
9. Driveways and turnouts shall be constructed and paid for in accordance with Item, "Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
10. Sidewalk details are shown elsewhere in the plans.



When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.



Protruding objects of a height ≤ 27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

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LEVELS DEFINED

1

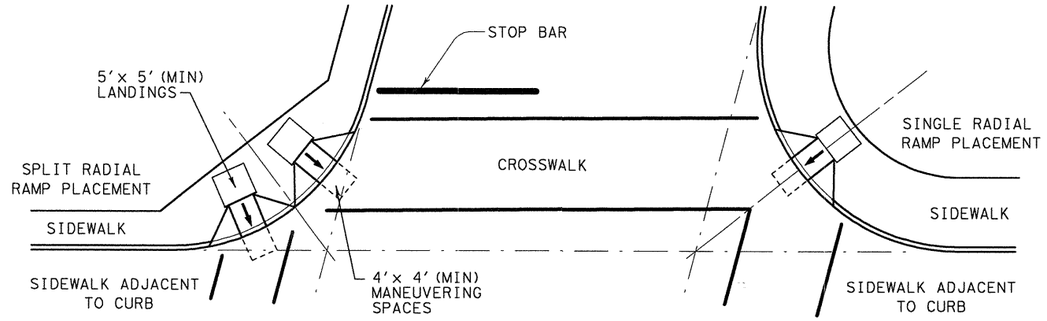
Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES
SIDEWALKS

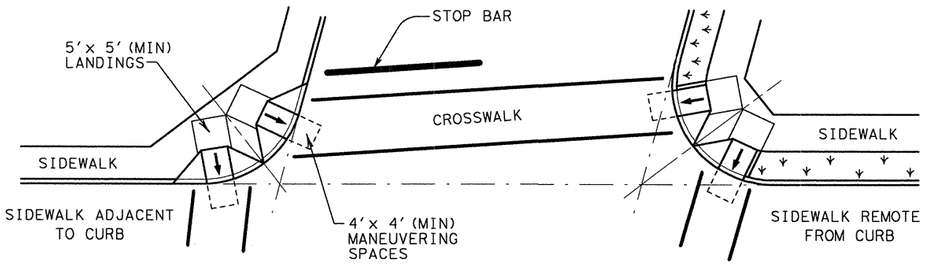
PED-05

FILE: ped05.dgn	DN: EH	CK:	DW: BGD	CK:	
©TxDOT March 2002	DIST	FEDERAL AID PROJECT			SHEET
REVISIONS	DAL	SEE TITLE SHEET			355
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

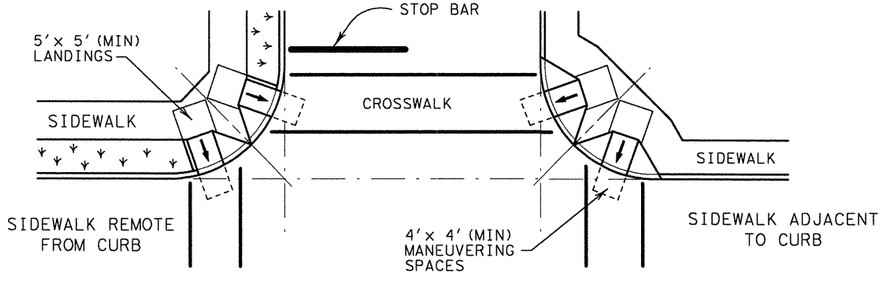
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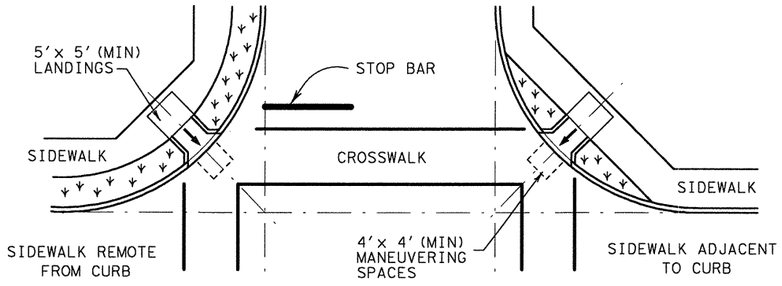
SKEWED INTERSECTION WITH "LARGE" RADIUS



SKEWED INTERSECTION WITH "SMALL" RADIUS



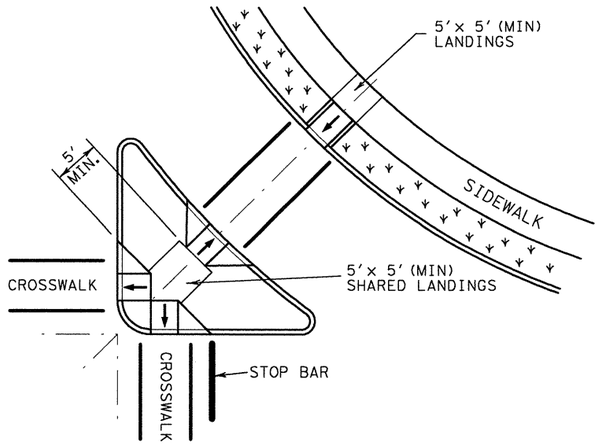
NORMAL INTERSECTION WITH "SMALL" RADIUS



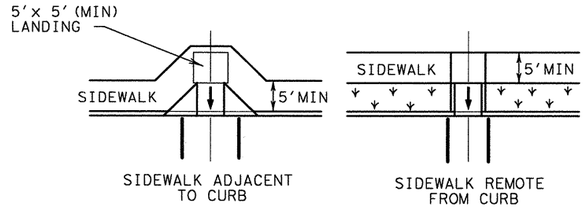
NORMAL INTERSECTION WITH "LARGE" RADIUS

General Notes

1. Street grades and cross slopes shall be as shown elsewhere in the plans.
2. Ramps are shown here without detectable warnings for simplicity. Detectable warnings are required at the locations shown on the PED Standard (Sheets 1 and 2 of 4) and in accordance with the details shown below.
3. Small channelization islands, which can not provide a minimum 5' x 5' landing at the top of ramps, shall be cut through level with the surface of the street.



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

TYPICAL CROSSING LAYOUTS

SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS

Texas Department of Transportation
Design Division (Roadway)

PEDESTRIAN FACILITIES

INTERSECTION LAYOUTS

PED-05

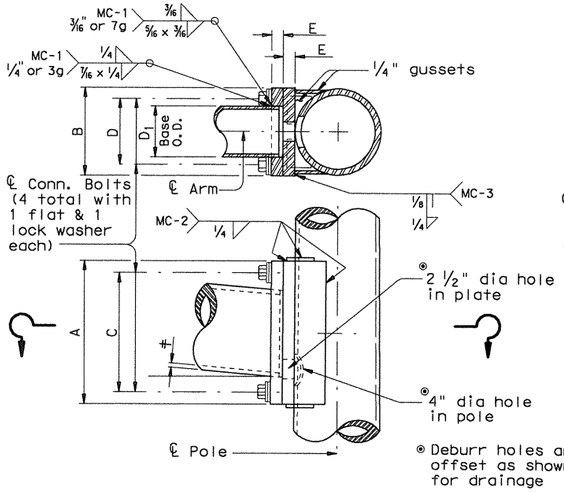
SHEET 4 OF 4

FILE: ped05.dgn	DN: EH	CK:	DW: BGD	CK:			
© TxDOT March 2002	DIST	FEDERAL AID PROJECT					SHEET
REVISIONS	DAL	SEE TITLE SHEET					356
	COUNTY			CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL			009	12	073	IH 30

LEVELS DIS. FED

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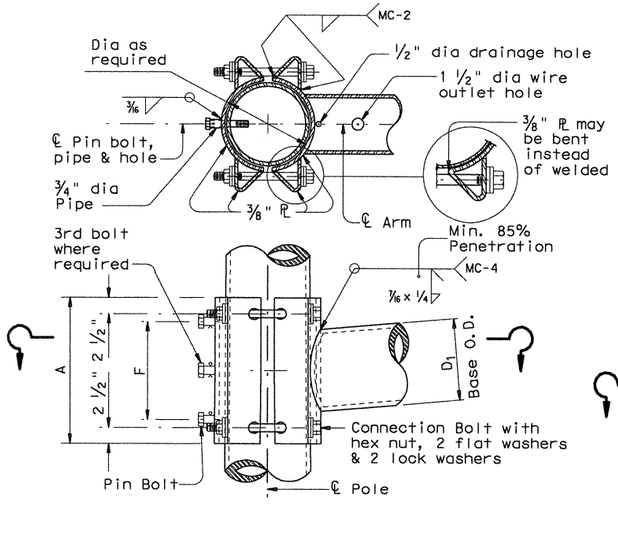
ARM SIZE D_1	ARM SIZE ∓	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1	1
7.5	.179	13	9	10	6	1	1
8.0	.179	14	10	11	7	1 1/4	1 1/4
9.0	.179	16	11	13	8	1 1/4	1 1/4
9.5	.179	17	12	14	9	1 1/4	1 1/4
9.5	.239	18	12	15	9	1 1/4	1 1/4
10.0	.239	18	12	15	9	1 1/4	1 1/4
10.5	.239	18	13	15	10	1 1/2	1 1/2
11.0	.239	18	13	15	10	1 1/2	1 1/2



FIXED MOUNT DETAIL 1

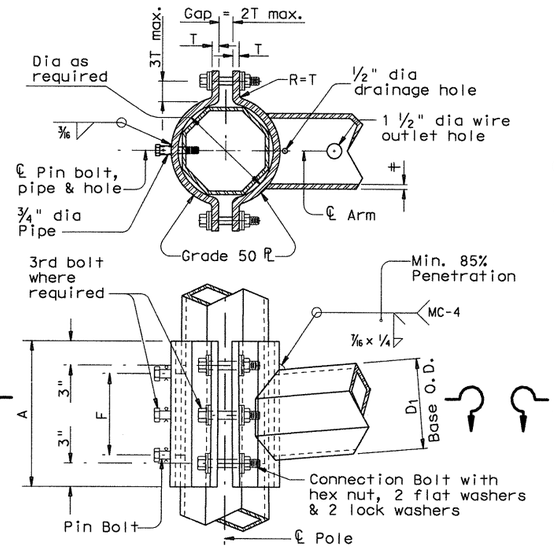
ARM SIZE D_1	ARM SIZE ∓	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	8	4	* 7/8	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8

*1" Dia connection bolts are permissible



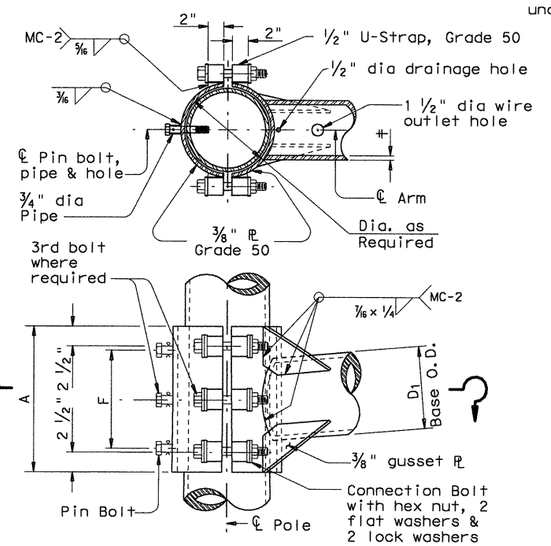
CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ∓	A	F	T	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	in.	ea.	in.	ea.	in.
7.0	.179	12	8	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

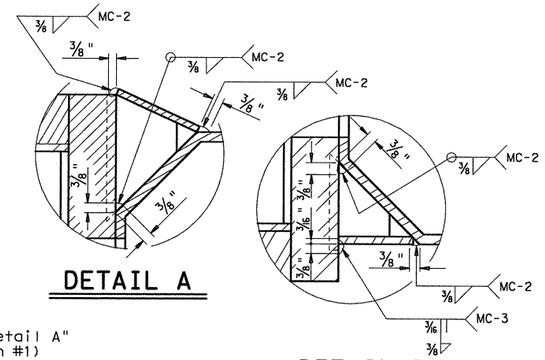


CLAMP-ON DETAIL 2

ARM SIZE D_1	ARM SIZE ∓	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	8	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8



CLAMP-ON DETAIL 3



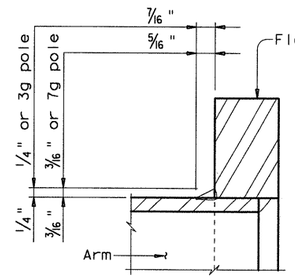
DETAIL A

DETAIL B

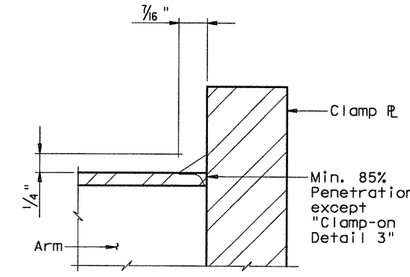
MATERIALS	
Round Shafts or Polygonal Shafts	ASTM A595 GR A, ASTM A570 GR 50, ASTM A607 GR 50, ASTM A572 GR 50 or A36M50
Plates (1)	ASTM A36 OR A572 GR 50 or A595(2) or A36M50
Connection Bolts	ASTM A325 except where noted
Pin Bolts	ASTM A325
Pipe	ASTM A53 GR A or B, or A501
Misc. Hardware	Galvanized steel or stainless steel or as noted

(1) Any of the materials listed for plates may be used where the drawings do not specify a particular Grade designation.

(2) If A595 material is used, it need not be cold worked to A595 requirments, but material must have 40 ksi minimum yield prior to fabrication.



FIXED MOUNT ARM



CLAMP-ON ARM

ARM BASE WELD DETAILS

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

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

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 7/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-96

FILE: MA-C.DGN	DN: MS	CK: JSY	DW: MMF	CK: JSY
©TxDOT August 1995	DIST	FED REG	FEDERAL AID PROJECT •	SHEET
REVISIONS 5-96	DAL	6	SEE TITLE SHEET	357
	COUNTY		CONTROL SECT JOB	HIGHWAY
	ROCKWALL		009 12 073	IH30

126A

LEVELS USED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
ACC: d48hp1q:/usr/d482517
LV=1,2 for English 1,3 for Metric

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MATERIALS	
Pole or Arm Simplex	ASTM A27 GR 65-35 or A148 GR 80-50 or A576 GR 1021 (4) or A36 (Arm only)
Arm Pipes	ASTM A53 GR A or B or A500 GR B or A501 or A595 (2) or A715 GR 50
Arm Plates (3)	ASTM A36 or A572 GR50 (1) or A595 GR A or A588
Misc.	ASTM designations as noted

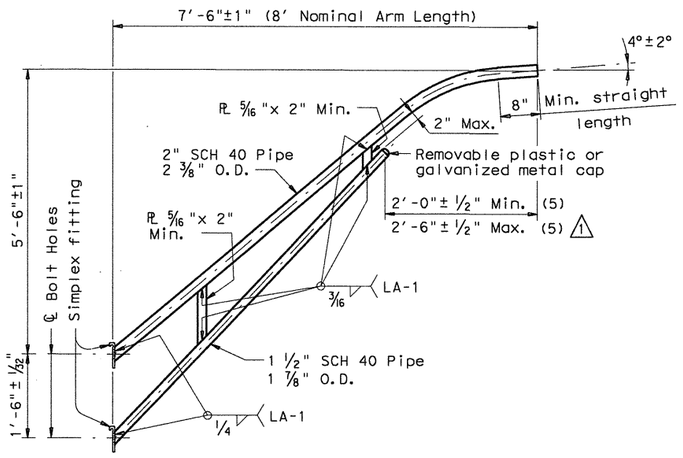
(1) ASTM A36M50 steel as described in Item 442 "Metal for Structures" may be used in lieu of A 572 GR 50.

(2) If A595 GR A material is used, arm need not be cold worked to A595 requiremants, but material must have 40 ksi minimum yield prior to fabrication.

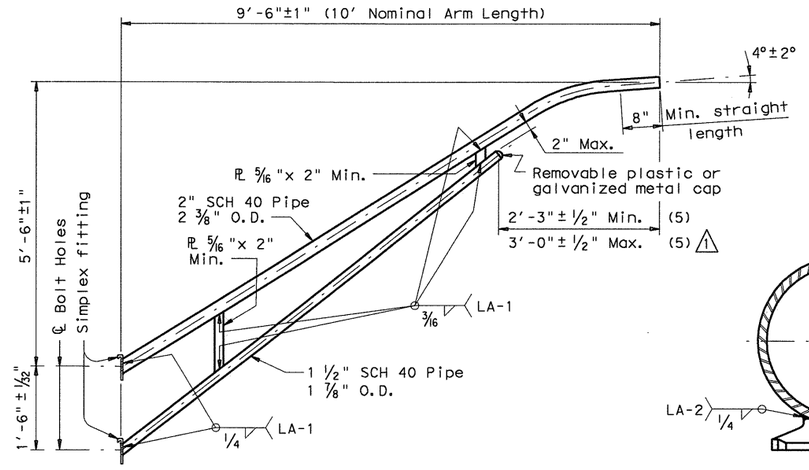
(3) Either of the materials listed for pates may be used where the drawings do not specify a particular ASTM designation.

(4) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

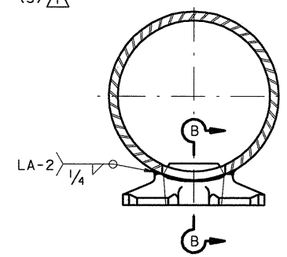
(5) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.



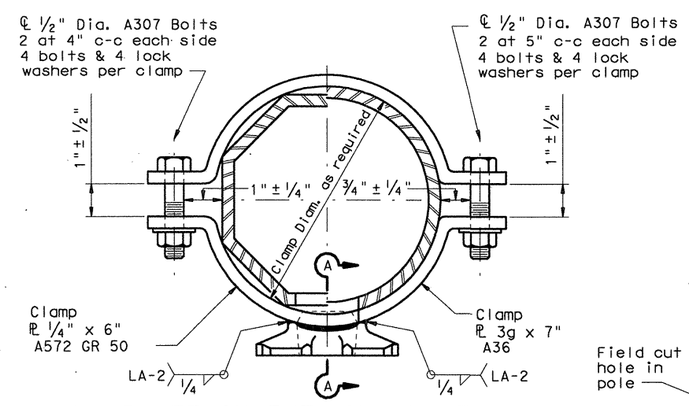
8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM

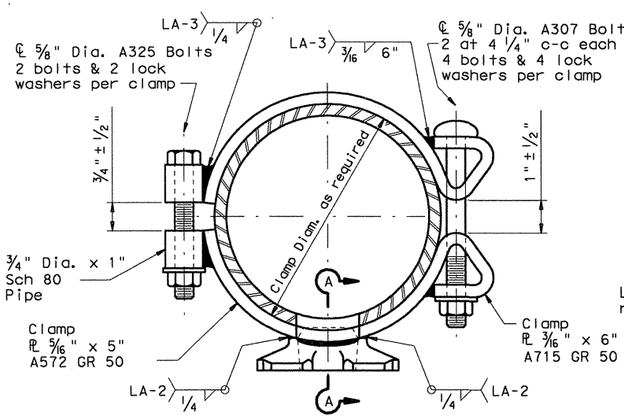


DIRECT ATTACHMENT DETAIL



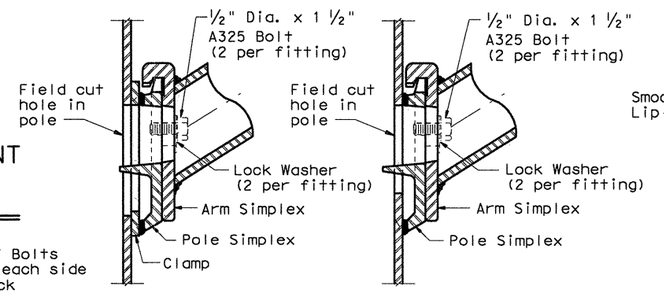
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



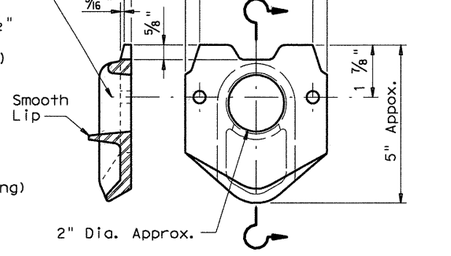
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

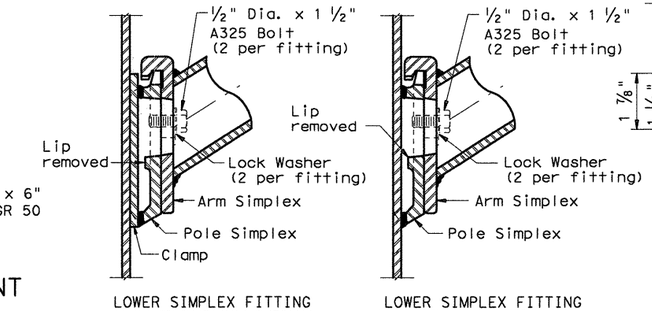


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

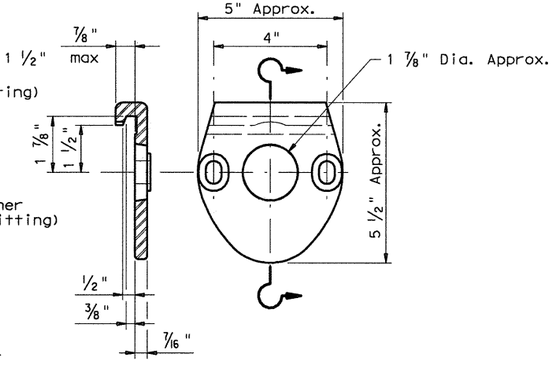


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 75 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.5 sq. ft.

Materials and fabrication shall be in accordance with the Specificatons and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with the Specifications.

Special designs require submission of shop drawings in accordance with the item "Steel Structures".

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

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.

1 - 99 - minor typo correction

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

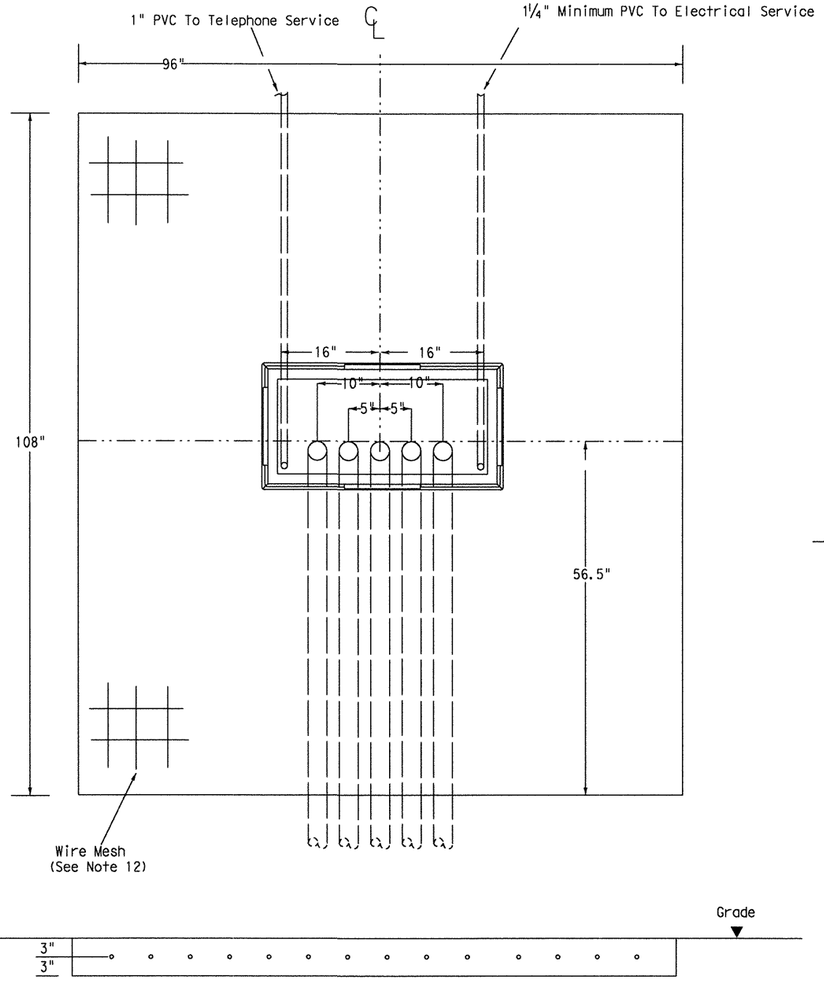
LUM-A-99

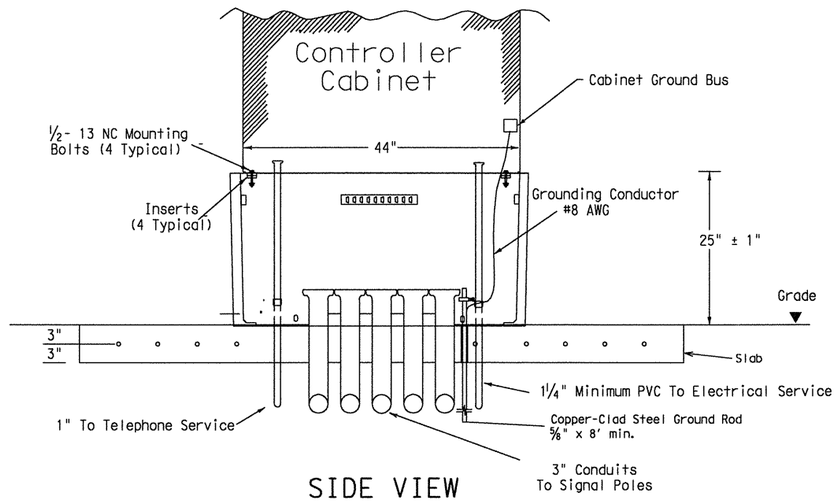
FILE: lum-a.dgn	DN: LEH	CK: JSY	DW: LTT	CK: TEB	STD:	
©TxDOT August 1995	DIST	FED REG	FEDERAL AID PROJECT •			SHEET
REVISIONS	DAL	6	SEE TITLE SHEET			358
5-96	COUNTY		CONTROL	SECT	JOB	HIGHWAY
1-99	ROCKWALL		009	12	073	IH30

LEVELS & FED ACC: (LV=1,2 for English; 1,3 for Metric)

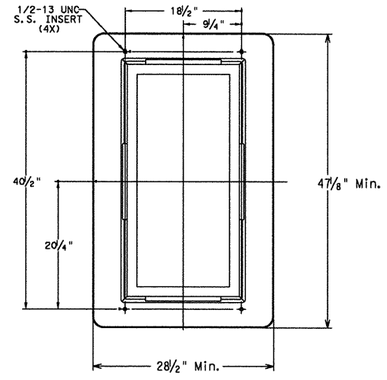
DISCLAIMER
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TOP VIEW
(Slab & Base)





SIDE VIEW
(Slab & Base)



CABINET BASE

TRAFFIC SIGNAL CONTROLLER BASE:

1. Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armorcast Part # A6001848X24, Quazite Model # PG3048Z709, or other as approved by TxDOT Traffic Operation Division.
2. The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.
3. The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.
4. Supply the cabinet base with four ½"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.
5. Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7 " from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x 5/16 x 5/16 inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using ½"-13 UNC stainless steel screws and inserts.
6. The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.
7. The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
8. Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

9. Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.
10. Bond a #8 AWG copper ground wire and an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.
11. Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.
12. Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.
13. Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

14. Stub up and run 3-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.
15. Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.
16. Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.
17. Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

18. Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.
19. The silicone caulk bead specified in Item 680.3.B must be RTV 133.

PAYMENT:

20. Bid TS-CF as subsidiary to Item 680.

DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 13 15 16
1 7 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
3 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
4 95 0 51 52 53 54 55 56 57 58 59 60 61 62 63

ACC:

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-04

©TxDOT October 2000

DN: - HW	CK: -	DW: - CJ	CK: - CAL

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-04	DAL	6	SEE TITLE SHEET	359

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH30

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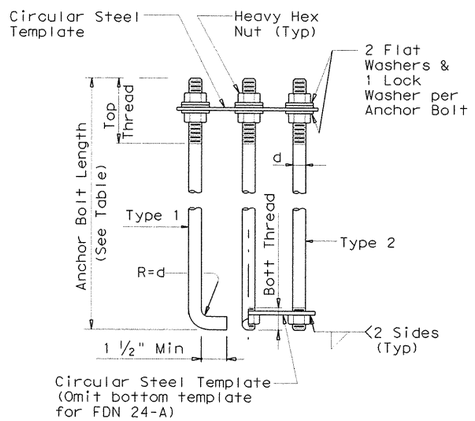
FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32' ⚠1	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	⚠1	36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

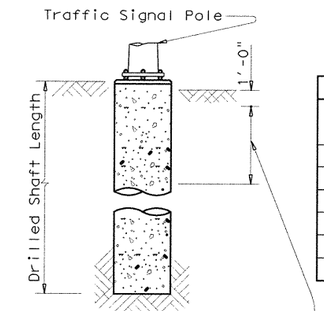
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



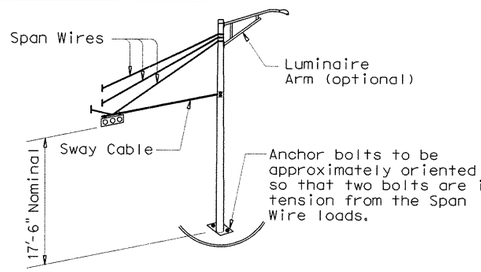
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

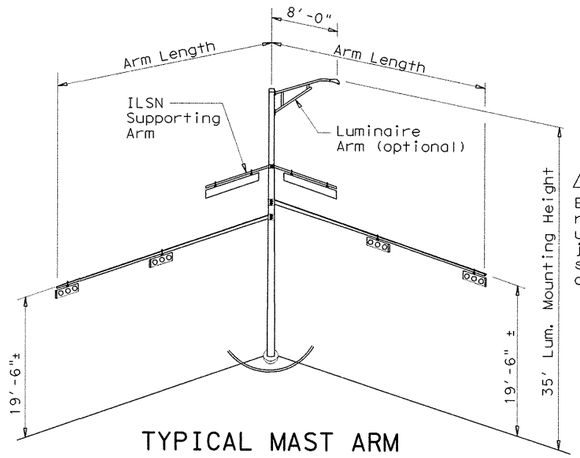
INSTALLATION PROCEDURE:
Threads of anchor bolts shall be coated with pipe joint compound prior to installation of upper nuts when erecting pole. After pole is plumbed and in permanent alignment, the exposed threads of painted bolts shall be cleaned and an additional coating of zinc-rich paint applied to seal the bolt thread-nut joint.



Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.



TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed seperately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

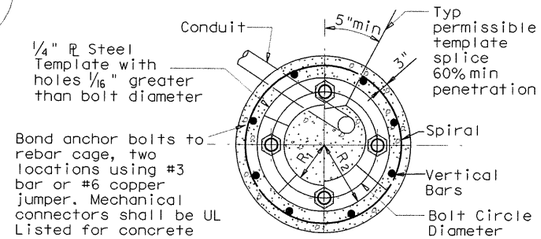
④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

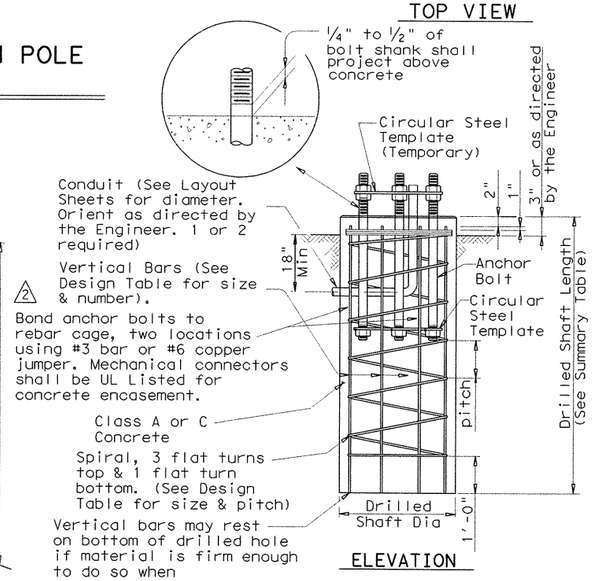
ANCHOR BOLT & TEMPLATE SIZES						
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTT THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	2"	17"	10"	7"
1 ¾"	3'-10"	7"	2 ¼"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	2 ½"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	3"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.



R1 may equal R2 if plate is welded of 3 or more segments.

TOP VIEW



ELEVATION

FOUNDATION DETAILS

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
SH 205 BYPASS @ EBFR								
POLE P-1	10	36-A	1			14.0		
POLE P-2	10	36-A	1			14.0		
POLE P-3	10	24-A	1	6.0				
POLE P-4	10	36-A	1			14.0		
SH 205 BYPASS @ WBFR								
POLE P-6	10	36-A	1			14.0		
POLE P-7	10	36-A	1			14.0		
POLE P-8	10	24-A	1	6.0				
TOTAL DRILLED SHAFT LENGTHS				12.0		70.0		

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440.

Concrete shall be Class A or C.

Threads for anchor bolts and nuts shall be rolled or cut threads of unified national coarse thread series except for A193B7 bolts which shall have 8 pitch thread series. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Anchor bolts larger than 1" in diameter shall conform to A36M55 in accordance with the Item, "Anchor Bolts" or ASTM A193B7 or A687. Galvanize or coat with zinc-rich paint a minimum of the upper 14 inches of all anchor bolts unless otherwise noted. Exposed nuts shall be galvanized or coated with zinc-rich paint. Washers shall be galvanized. Templates and embeded nuts need not be galvanized.

Reginald Fountain 5/18/99
STATE OF TEXAS REGINALD FOUNTAIN 97329 LICENSED PROFESSIONAL ENGINEER

11/99 Revision

⚠1 Changed to Facilitate new terminal strip enclosure

⚠2 Changed from ground rod to UFER ground

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

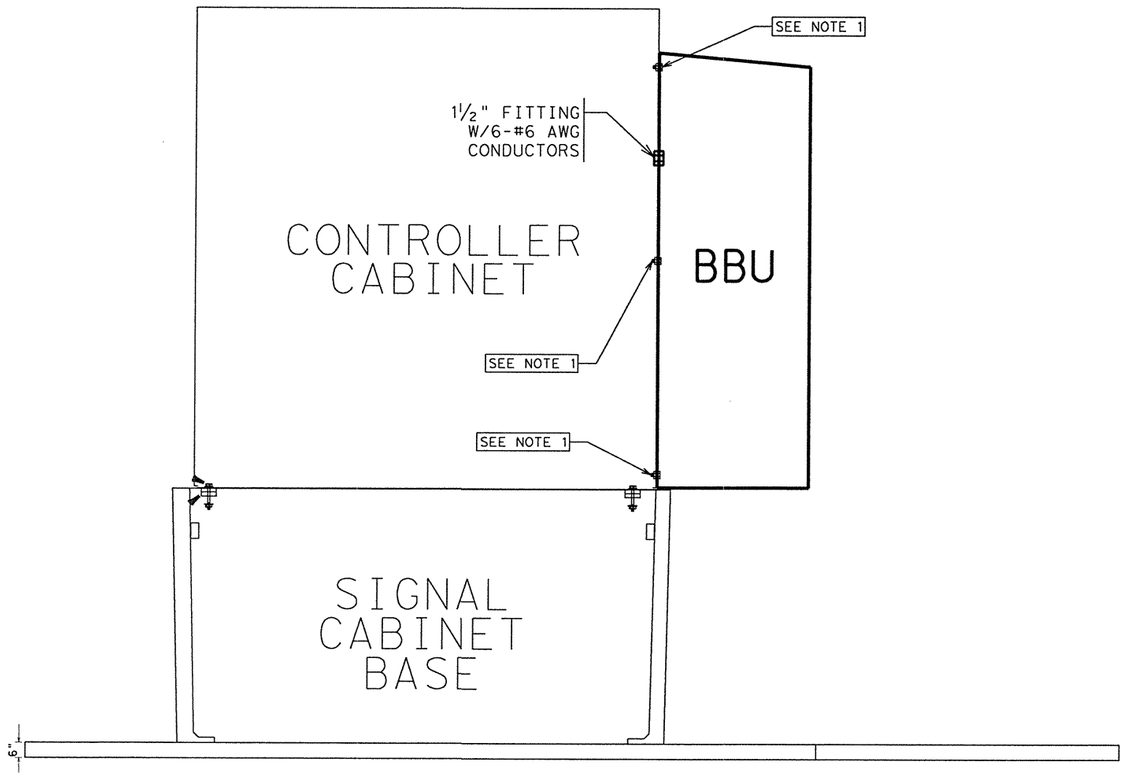
TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-99

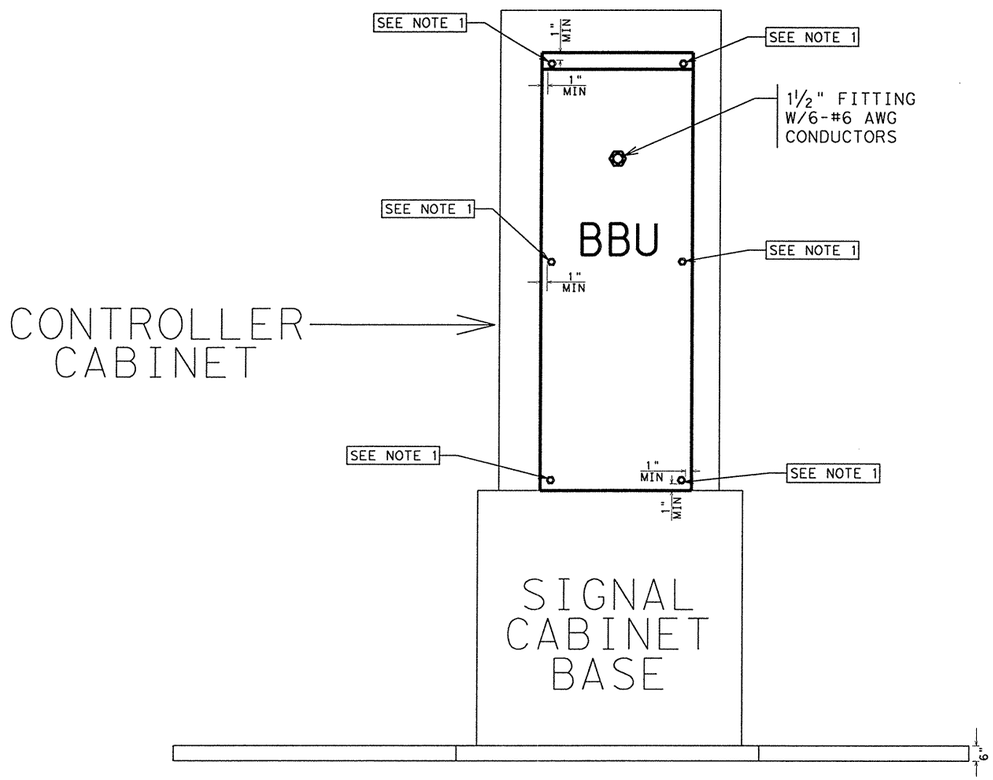
©TxDOT August 1995	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
REVISIONS 5-96 11-99	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET	SHEET: 360
	COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH30

NOTES:

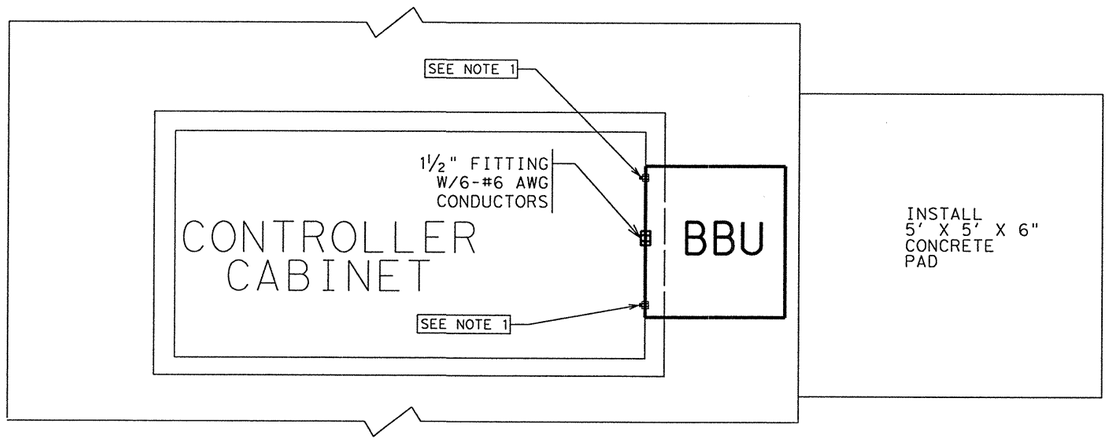
1. INSTALL 1½" FITTING WITH SIX #6 AWG CONDUCTORS AND 6 EA OF ½" X 1½" 13 UNC MOUNTING BOLTS BETWEEN THE TWO CABINETS.
2. CAULK BETWEEN THE CABINETS OF THE CONTROLLER AND BBU UNIT.
3. EXTEND THE CONCRETE CONTROLLER PAD (REFER TO TS-CF-04, 6" SLAB) UNDER THE BBU AS SHOWN BELOW.
4. THE ABOVE WORK PERFORMED AND MATERIALS FURNISHED WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO THE BBU ASSEMBLY.



ELEVATION VIEW



SIDE VIEW



PLAN VIEW

Texas Department of Transportation
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INSTALLATION OF BBU

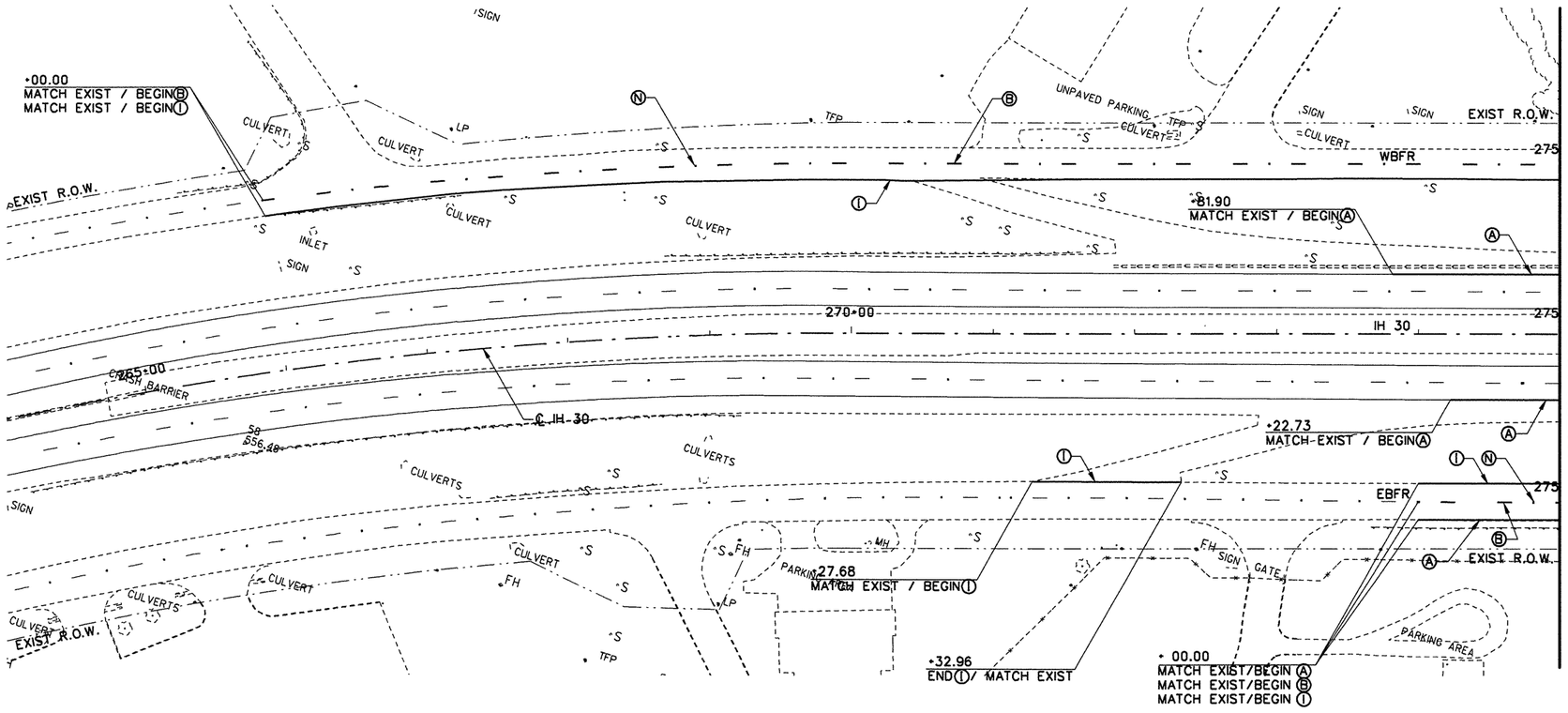
EXTERNAL BATTERY CABINET (SIDE MOUNT)

DALLAS DISTRICT STANDARD

N. T. S.

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS	ROCKWALL	360A
CONTROL	SECTION	JOB	
0009	12	073	



EXIT 70

F.M. 549

1 MILE

[1] STA. 254+60 RT.

N

50 25 0 50 100

SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I(W)(4")(SLD)
- (B) REFL PAV MRK TY I(W)(4")(BRK)
- (C) REFL PAV MRK TY I(W)(8")(SLD)
- (D) REFL PAV MRK TY I(W)(12")(SLD)
- (E) REFL PAV MRK TY I(W)(12")(LNDP)
- (F) REFL PAV MRK TY I(W)(24")(SLD)
- (G) REFL PAV MRK TY I(W)(ARROW)
- (H) REFL PAV MRK TY I(W)(WORD)
- (I) REFL PAV MRK TY I(Y)(4")(SLD)
- (J) REFL PAV MRK TY I(Y)(8")(SLD)
- (K) REFL PAV MRK TY I(Y)(12")(SLD)
- (L) REFL PAV MRK TY II(W)36"(YLD TRI)
- (M) EXIT NUMBER GORE MRKS AERIAL
- (N) RAIS PAV MRK CL B (REFL) TY II-C-R
- (O) RAIS PAV MRK CL B (REFL) TY II-A-A
- (P) RAIS PAV MRK CL B (REFL) TY I-A
- (##) PROPOSED SMALL SIGN
- [##] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. (N) AT 20' SPACING
B. (N)X2 AT 80' SPACING
C. (N)X2 AT 45' SPACING
D. (P) AT 20' SPACING
E. (N) AT 10' SPACING

JAIME AGUILAR
87606
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
PE
5/13/09

NO.	REVISION	BY	DATE

CP&Y
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IH 30 AT JOHN KING BLVD.

SIGNING AND STRIPING

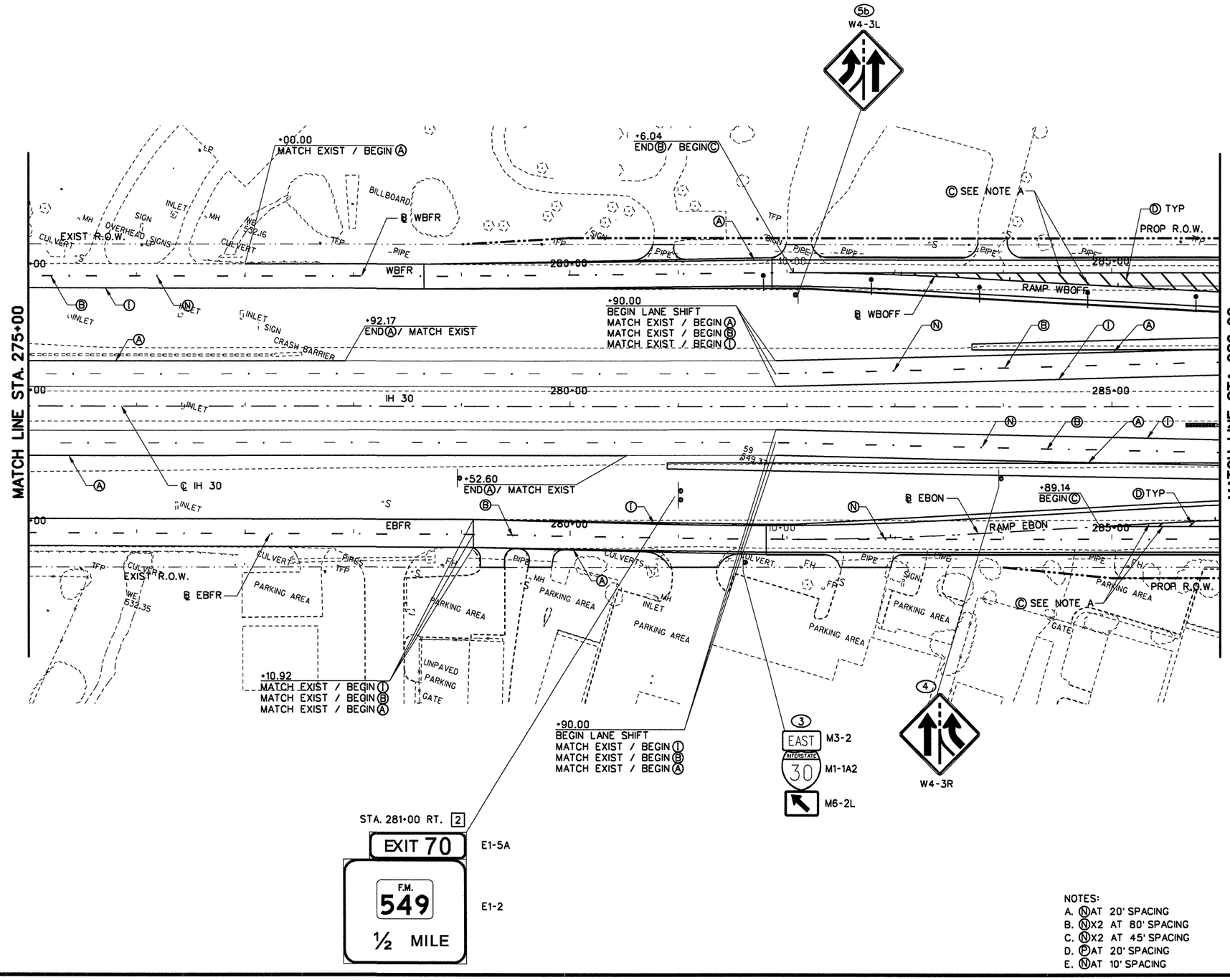
PAVEMENT MARKING LAYOUT

BEGIN TO STA. 275+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	361

SHEET 1 OF 9

5/18/2009 7:17:32 AM jaguilar $PWFILE$



50 25 0 50 100
SCALE FEET

LEGEND

- Ⓐ REFL PAV MRK TY I(W)(4")(SLD)
- Ⓑ REFL PAV MRK TY I(W)(4")(BRK)
- Ⓒ REFL PAV MRK TY I(W)(8")(SLD)
- Ⓓ REFL PAV MRK TY I(W)(12")(SLD)
- Ⓔ REFL PAV MRK TY I(W)(12")(LNDP)
- Ⓕ REFL PAV MRK TY I(W)(24")(SLD)
- Ⓖ REFL PAV MRK TY I(W)(ARROW)
- Ⓗ REFL PAV MRK TY I(W)(WORD)
- Ⓘ REFL PAV MRK TY I(Y)(4")(SLD)
- Ⓙ REFL PAV MRK TY I(Y)(8")(SLD)
- Ⓚ REFL PAV MRK TY I(Y)(12")(SLD)
- Ⓛ REFL PAV MRK TY I(W)36"(YLD TRI)
- Ⓜ EXIT NUMBER GORE MRKS AERIAL
- Ⓝ RAIS PAV MRK CL B (REFL) TY II-C-R
- Ⓞ RAIS PAV MRK CL B (REFL) TY II-A-A
- Ⓟ RAIS PAV MRK CL B (REFL) TY I-A
- (#) PROPOSED SMALL SIGN
- [#] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. ⓃAT 20' SPACING
B. ⓃX2 AT 80' SPACING
C. ⓃX2 AT 45' SPACING
D. ⓅAT 20' SPACING
E. ⓃAT 10' SPACING

STATE OF TEXAS
JAIME AGUILAR
87606
LICENSED
PROFESSIONAL ENGINEER
5/18/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING

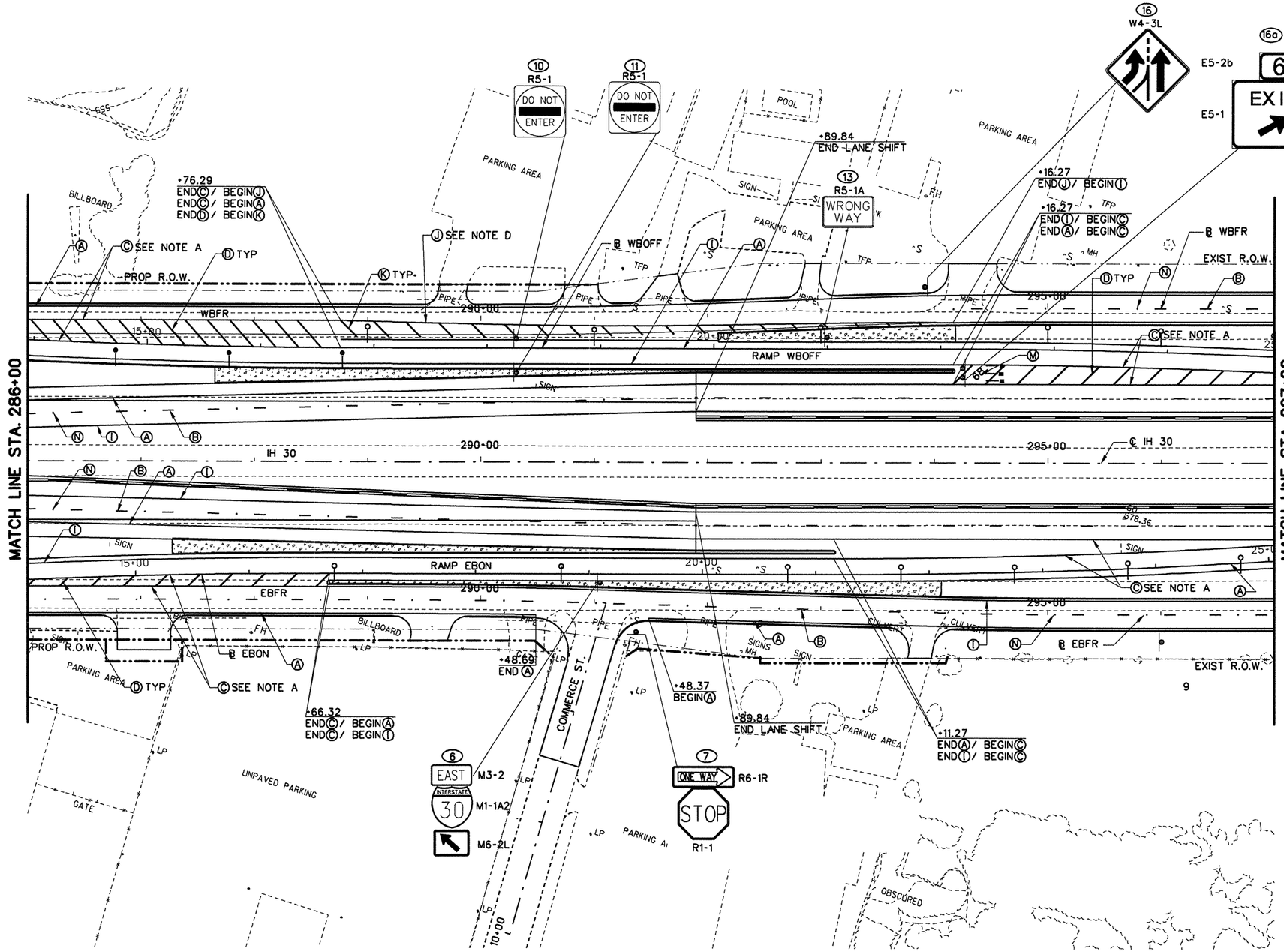
PAVEMENT MARKING LAYOUT

STA. 275+00 TO STA. 286+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	362

SHEET 2 OF 9

5/18/2009 7:18:18 AM jaguilar $PWFILE$



50 25 0 50 100
SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I(W)(4")(SLD)
- (B) REFL PAV MRK TY I(W)(4")(BRK)
- (C) REFL PAV MRK TY I(W)(8")(SLD)
- (D) REFL PAV MRK TY I(W)(12")(SLD)
- (E) REFL PAV MRK TY I(W)(12")(LNDP)
- (F) REFL PAV MRK TY I(W)(24")(SLD)
- (G) REFL PAV MRK TY I(W)(ARROW)
- (H) REFL PAV MRK TY I(W)(WORD)
- (I) REFL PAV MRK TY I(Y)(4")(SLD)
- (J) REFL PAV MRK TY I(Y)(8")(SLD)
- (K) REFL PAV MRK TY I(Y)(12")(SLD)
- (L) REFL PAV MRK TY I(W)36"(YLD TRI)
- (M) EXIT NUMBER GORE MRKS AERIAL
- (N) RAIS PAV MRK CL B (REFL) TY II-C-R
- (O) RAIS PAV MRK CL B (REFL) TY II-A-A
- (P) RAIS PAV MRK CL B (REFL) TY I-A
- (#) PROPOSED SMALL SIGN
- [#] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. (N) AT 20' SPACING
B. (N)X2 AT 80' SPACING
C. (N)X2 AT 45' SPACING
D. (P) AT 20' SPACING
E. (N) AT 10' SPACING

JAIME AGUILAR 87606 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
5/18/09

NO.	REVISION	BY	DATE

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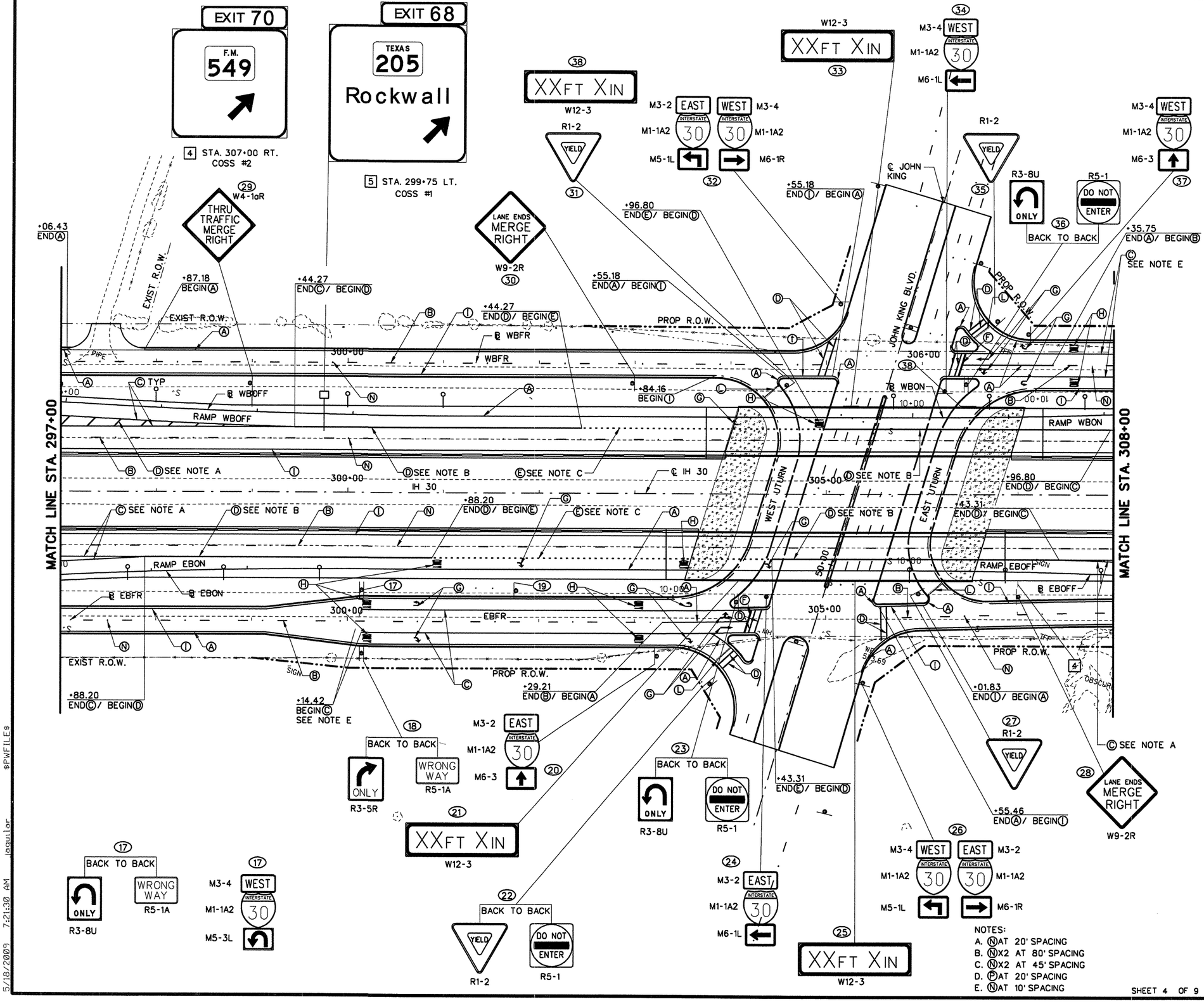
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IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING
PAVEMENT MARKING LAYOUT
STA. 286+00 TO STA. 297+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073		363

SHEET 3 OF 9

5/18/2009 7:20:10 AM jaguilar $PWFILE$



LEGEND

- Ⓐ REFL PAV MRK TY I(W)(4")(SLD)
- Ⓑ REFL PAV MRK TY I(W)(4")(BRK)
- Ⓒ REFL PAV MRK TY I(W)(8")(SLD)
- Ⓓ REFL PAV MRK TY I(W)(12")(SLD)
- Ⓔ REFL PAV MRK TY I(W)(12")(LNDP)
- Ⓕ REFL PAV MRK TY I(W)(24")(SLD)
- Ⓖ REFL PAV MRK TY I(W)(ARROW)
- Ⓗ REFL PAV MRK TY I(W)(WORD)
- Ⓘ REFL PAV MRK TY I(Y)(4")(SLD)
- Ⓙ REFL PAV MRK TY I(Y)(8")(SLD)
- Ⓚ REFL PAV MRK TY I(Y)(12")(SLD)
- Ⓛ REFL PAV MRK TY I(W)36"(YLD TRI)
- Ⓜ EXIT NUMBER GORE MRKS AERIAL
- Ⓝ RAIS PAV MRK CL B (REFL) TY II-C-R
- Ⓞ RAIS PAV MRK CL B (REFL) TY II-A-A
- Ⓟ RAIS PAV MRK CL B (REFL) TY I-A
- ## PROPOSED SMALL SIGN
- ### PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. Ⓝ AT 20' SPACING
B. ⓃX2 AT 80' SPACING
C. ⓃX2 AT 45' SPACING
D. Ⓟ AT 20' SPACING
E. Ⓝ AT 10' SPACING

NOTE:
SEE SHEET 9 OF 9 FOR JOHN KING BLVD. STRIPING.

JAIME AGUILAR, PE 5/18/09
STATE OF TEXAS
JAIME AGUILAR
87606
LICENSED PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

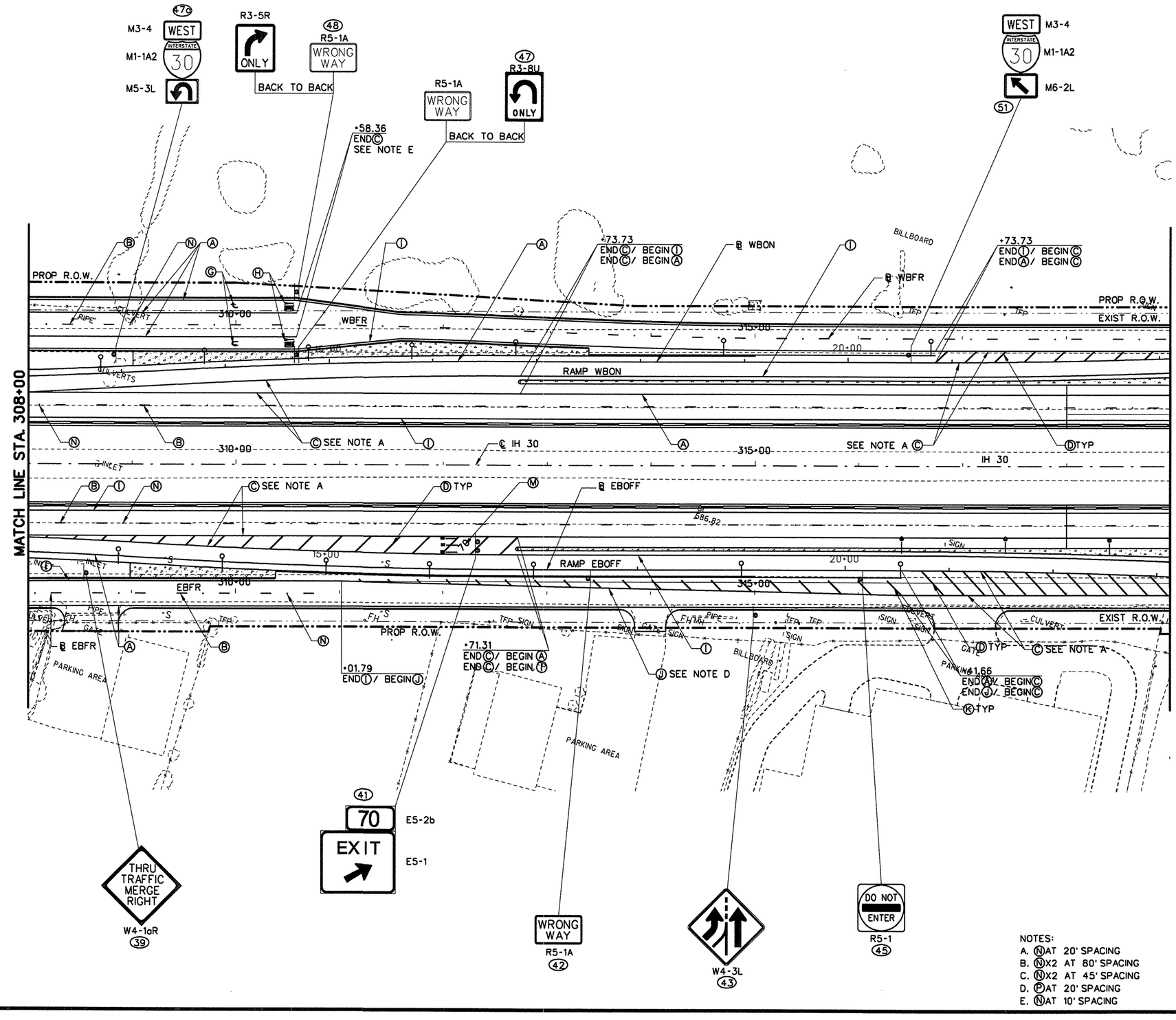
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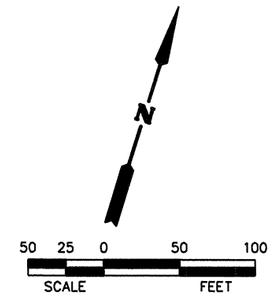
IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING
PAVEMENT MARKING LAYOUT
STA. 297+00 TO STA. 308+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	364

5/18/2009 7:21:30 AM jaguilar $PWFILE$



NOTES:
A. Ⓝ AT 20' SPACING
B. Ⓝ X2 AT 80' SPACING
C. Ⓝ X2 AT 45' SPACING
D. Ⓟ AT 20' SPACING
E. Ⓝ AT 10' SPACING



LEGEND

- Ⓐ REFL PAV MRK TY I(W)(4")(SLD)
- Ⓑ REFL PAV MRK TY I(W)(4")(BRK)
- Ⓒ REFL PAV MRK TY I(W)(8")(SLD)
- Ⓓ REFL PAV MRK TY I(W)(12")(SLD)
- Ⓔ REFL PAV MRK TY I(W)(12")(LNDP)
- Ⓕ REFL PAV MRK TY I(W)(24")(SLD)
- Ⓖ REFL PAV MRK TY I(W)(ARROW)
- Ⓗ REFL PAV MRK TY I(W)(WORD)
- Ⓘ REFL PAV MRK TY I(Y)(4")(SLD)
- Ⓙ REFL PAV MRK TY I(Y)(8")(SLD)
- Ⓚ REFL PAV MRK TY I(Y)(12")(SLD)
- Ⓛ REFL PAV MRK TY II(W)36"(YLD TRI)
- Ⓜ EXIT NUMBER GORE MRKS AERIAL
- Ⓝ RAIS PAV MRK CL B (REFL) TY II-C-R
- Ⓞ RAIS PAV MRK CL B (REFL) TY II-A-A
- Ⓟ RAIS PAV MRK CL B (REFL) TY I-A
- (##) PROPOSED SMALL SIGN
- [##] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

JAIME AGUILAR
87606
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
5/18/09

NO.	REVISION	BY	DATE

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IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING

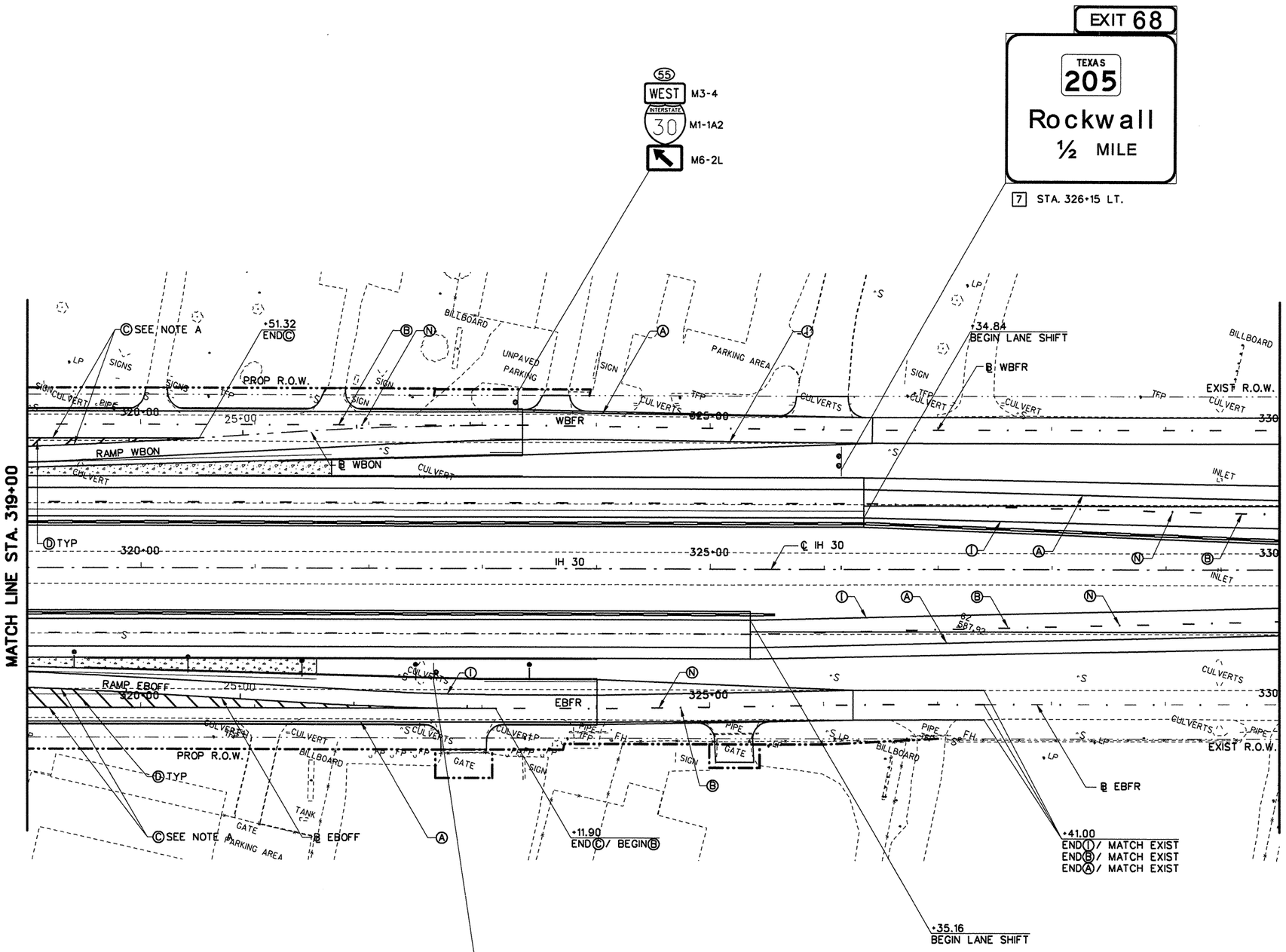
PAVEMENT MARKING LAYOUT

STA. 308+00 TO STA. 319+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073		365

SHEET 5 OF 9

5/18/2009 7:23:15 AM jaguilar $PWFILE$



N

50 25 0 50 100
SCALE FEET

LEGEND

- (A) REFL PAV MRK TY I(W)(4")(SLD)
- (B) REFL PAV MRK TY I(W)(4")(BRK)
- (C) REFL PAV MRK TY I(W)(8")(SLD)
- (D) REFL PAV MRK TY I(W)(12")(SLD)
- (E) REFL PAV MRK TY I(W)(12")(LNDP)
- (F) REFL PAV MRK TY I(W)(24")(SLD)
- (G) REFL PAV MRK TY I(W)(ARROW)
- (H) REFL PAV MRK TY I(W)(WORD)
- (I) REFL PAV MRK TY I(Y)(4")(SLD)
- (J) REFL PAV MRK TY I(Y)(8")(SLD)
- (K) REFL PAV MRK TY I(Y)(12")(SLD)
- (L) REFL PAV MRK TY I(W)36"(YLD TRI)
- (M) EXIT NUMBER GORE MRKS AERIAL
- (N) RAIS PAV MRK CL B (REFL) TY II-C-R
- (O) RAIS PAV MRK CL B (REFL) TY II-A-A
- (P) RAIS PAV MRK CL B (REFL) TY I-A
- (##) PROPOSED SMALL SIGN
- [##] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. (N) AT 20' SPACING
B. (N) X2 AT 80' SPACING
C. (N) X2 AT 45' SPACING
D. (P) AT 20' SPACING
E. (N) AT 10' SPACING

JAIME AGUILAR 87606 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
5/18/09

NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING

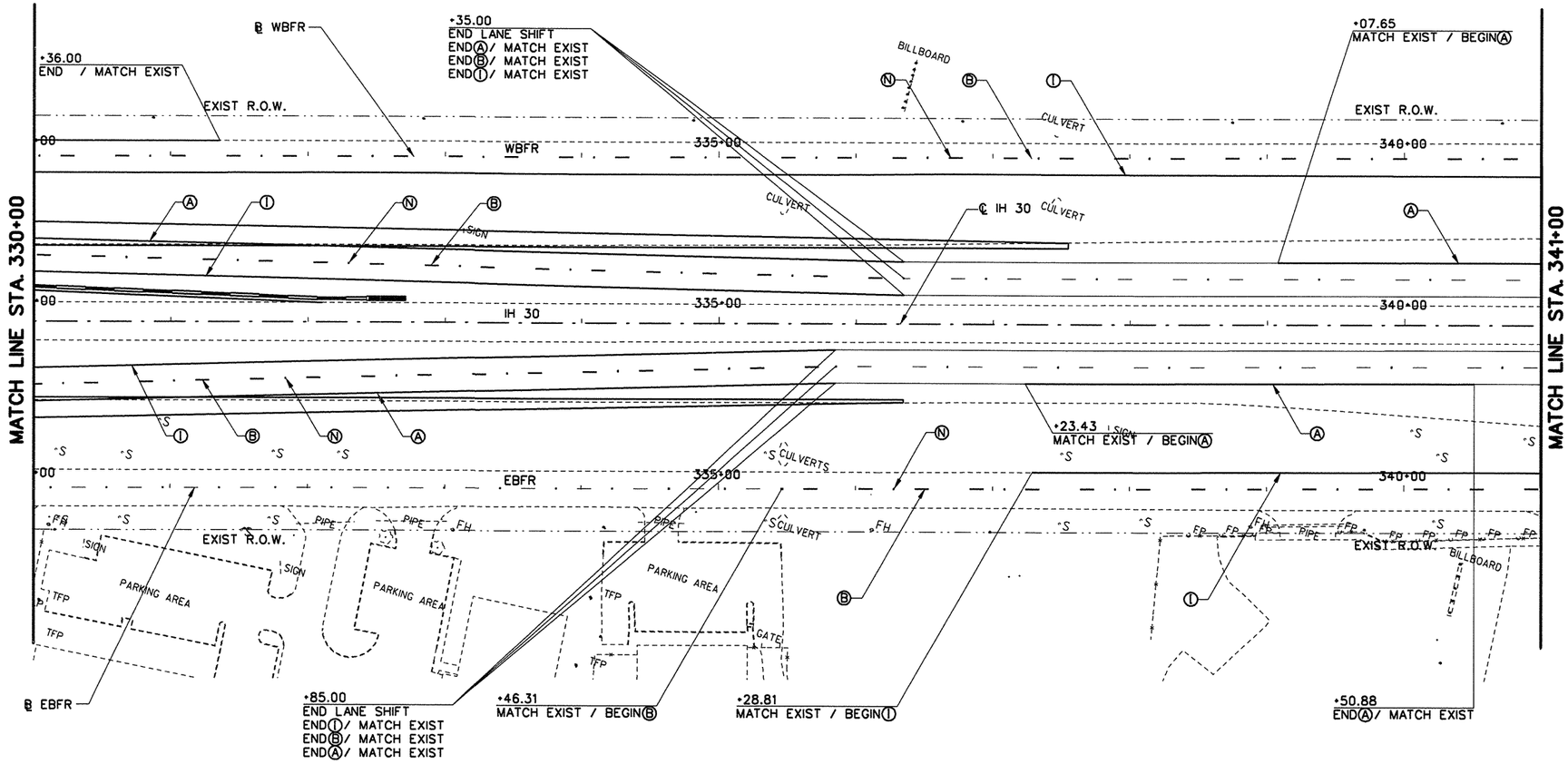
PAVEMENT MARKING LAYOUT

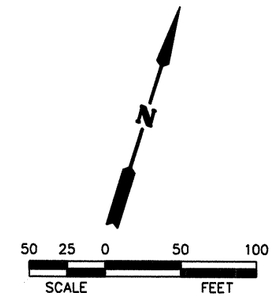
STA. 319+00 TO STA. 330+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	366

SHEET 6 OF 9

5/18/2009 7:24:39 AM jaguilar $PWFILE$

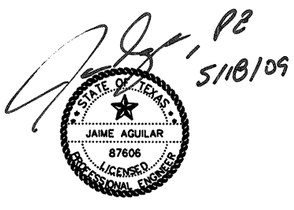




LEGEND

- Ⓐ REFL PAV MRK TY I(W)(4")(SLD)
- Ⓑ REFL PAV MRK TY I(W)(4")(BRK)
- Ⓒ REFL PAV MRK TY I(W)(8")(SLD)
- Ⓓ REFL PAV MRK TY I(W)(12")(SLD)
- Ⓔ REFL PAV MRK TY I(W)(12")(LNDP)
- Ⓕ REFL PAV MRK TY I(W)(24")(SLD)
- Ⓖ REFL PAV MRK TY I(W)(ARROW)
- Ⓗ REFL PAV MRK TY I(W)(WORD)
- Ⓘ REFL PAV MRK TY I(Y)(4")(SLD)
- Ⓙ REFL PAV MRK TY I(Y)(8")(SLD)
- Ⓚ REFL PAV MRK TY I(Y)(12")(SLD)
- Ⓛ REFL PAV MRK TY I(W)36"(YLD TRI)
- Ⓜ EXIT NUMBER GORE MRKS AERIAL
- Ⓝ RAIS PAV MRK CL B (REFL) TY II-C-R
- Ⓞ RAIS PAV MRK CL B (REFL) TY II-A-A
- Ⓟ RAIS PAV MRK CL B (REFL) TY I-A
- (##) PROPOSED SMALL SIGN
- [##] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. ⓃAT 20' SPACING
B. ⓃX2 AT 80' SPACING
C. ⓃX2 AT 45' SPACING
D. ⓅAT 20' SPACING
E. ⓃAT 10' SPACING



NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

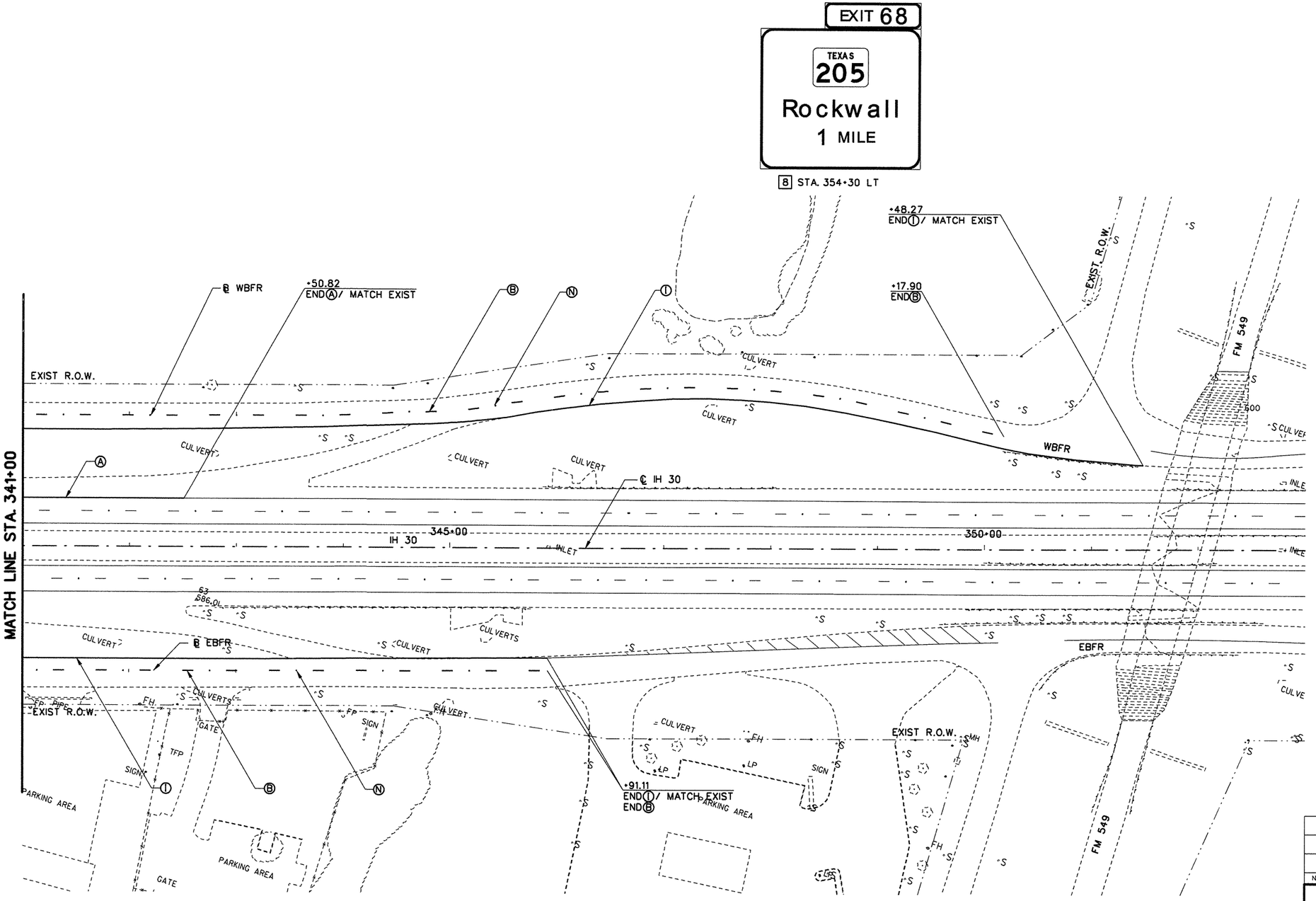
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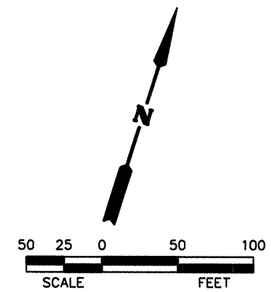
IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING
PAVEMENT MARKING LAYOUT
STA. 330+00 TO STA. 341+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	367

SHEET 7 OF 9

5/18/2009 7:25:37 AM jaguilar $PWFILES$





LEGEND

- Ⓐ REFL PAV MRK TY I(W)(4")(SLD)
- Ⓑ REFL PAV MRK TY I(W)(4")(BRK)
- Ⓒ REFL PAV MRK TY I(W)(8")(SLD)
- Ⓓ REFL PAV MRK TY I(W)(12")(SLD)
- Ⓔ REFL PAV MRK TY I(W)(12")(LNDP)
- Ⓕ REFL PAV MRK TY I(W)(24")(SLD)
- Ⓖ REFL PAV MRK TY I(W)(ARROW)
- Ⓗ REFL PAV MRK TY I(W)(WORD)
- Ⓘ REFL PAV MRK TY I(Y)(4")(SLD)
- Ⓙ REFL PAV MRK TY I(Y)(8")(SLD)
- Ⓚ REFL PAV MRK TY I(Y)(12")(SLD)
- Ⓛ REFL PAV MRK TY I(W)36"(YLD TRI)
- Ⓜ EXIT NUMBER GORE MRKS AERIAL
- Ⓝ RAIS PAV MRK CL B (REFL) TY II-C-R
- Ⓞ RAIS PAV MRK CL B (REFL) TY II-A-A
- Ⓟ RAIS PAV MRK CL B (REFL) TY I-A
- (#) PROPOSED SMALL SIGN
- [#] PROPOSED LARGE SIGN
- DELINEATOR SINGLE YELLOW
- DELINEATOR SINGLE WHITE
- OBJECT MARKER TY 2

NOTES:
A. ⓃAT 20' SPACING
B. ⓃX2 AT 80' SPACING
C. ⓃX2 AT 45' SPACING
D. ⓅAT 20' SPACING
E. ⓃAT 10' SPACING

SHEET 8 OF 9

STATE OF TEXAS
JAIME AGUILAR
87606
LICENSED
PROFESSIONAL ENGINEER
5/18/09

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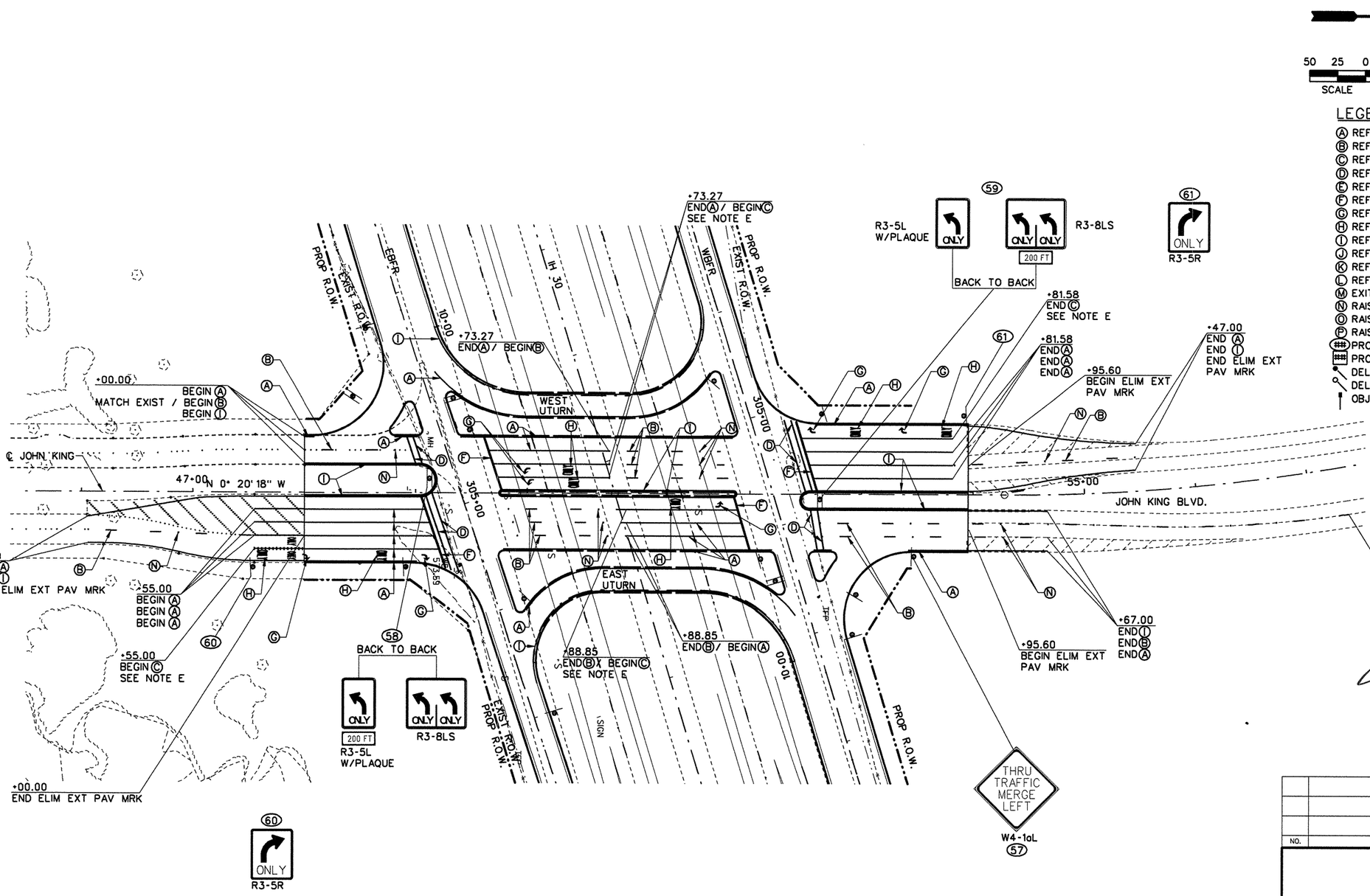
IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING

PAVEMENT MARKING LAYOUT

STA. 330+00 TO END PROJECT

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073		368

5/18/2009 7:26:23 AM jaguilar $PWFILE$



NOTES:
A. (N) AT 20' SPACING
B. (N)x2 AT 80' SPACING
C. (N)x2 AT 45' SPACING
D. (P) AT 20' SPACING
E. (N) AT 10' SPACING

JAIME AGUILAR 87606 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS
PE 5/18/09

NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING

PAVEMENT MARKING LAYOUT

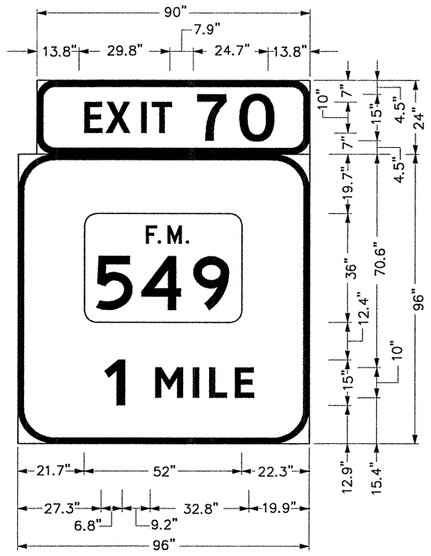
JOHN KING BLVD

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Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	369

SHEET 9 OF 9

5/18/2009 7:27:18 AM jaguilar $PWFILE$

LARGE GUIDE SIGN #1



6.0" Radius, 2.0" Border, White on Green:

EXIT 70 ClearviewHwy-4-W:

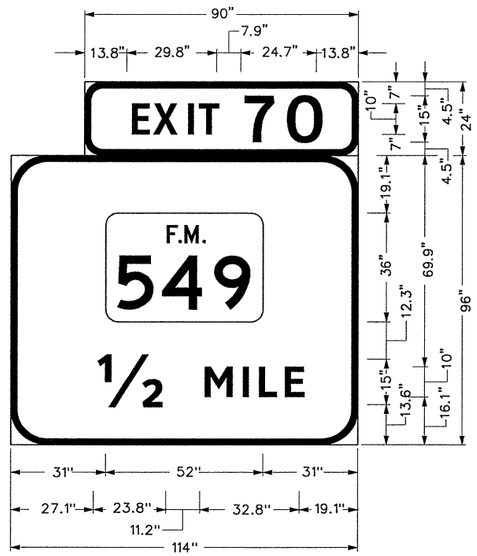
Rockwall Exit:

12.0" Radius, 2.0" Border, White on Green:

State Highway 549 M1-6F3B:

ClearviewHwy-5-W 1 MILE ClearviewHwy-5-W-R:

LARGE GUIDE SIGN #2



6.0" Radius, 2.0" Border, White on Green:

EXIT 70 ClearviewHwy-4-W:

Rockwall Exit:

12.0" Radius, 2.0" Border, White on Green:

State Highway 549 M1-6F3B:

ClearviewHwy-5-W 1/2MILE ClearviewHwy-5-W-R:

Reginald Fountain 3/2/09

STATE OF TEXAS
REGINALD FOUNTAIN
97328
LICENSED
PROFESSIONAL ENGINEER

NO.	REVISION	BY	DATE

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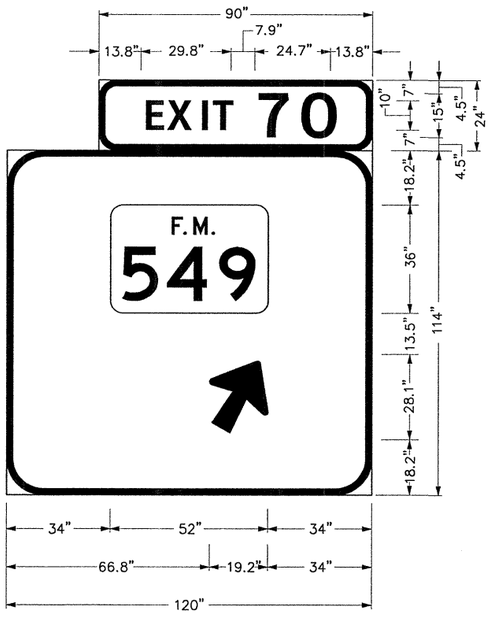
SIGNING AND STRIPING

GUIDE SIGN DETAILS

Designed:	RTF	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JAA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	JAA	DAL	ROCKWALL	0009	12	073	340

3/2/2009 9:30:06 AM raonzales p:/Active Projects/TXD0643/TXD0643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx Signing and Striping/435TSD01.999

LARGE GUIDE SIGN #4



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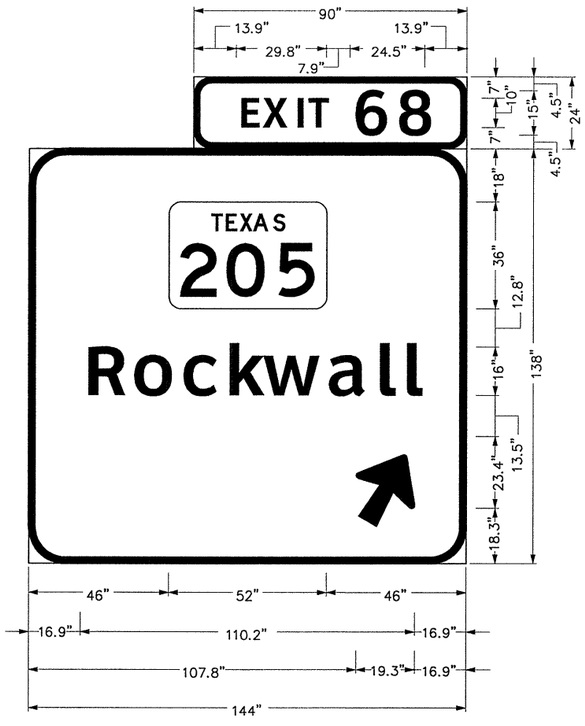
EXIT 70 ClearviewHwy-4-W;

12.0" Radius, 2.0" Border, White on Green;

State Highway 549 M1-6F3B;

Arrow B-3 - 25.0" 60°;

LARGE GUIDE SIGN #5



6.0" Radius, 2.0" Border, White on Green;

EXIT 68 ClearviewHwy-4-W;

Rockwall Exit;

12.0" Radius, 2.0" Border, White on Green;

State Highway 205 M1-6T3B;

Rockwall ClearviewHwy-5-W-R;

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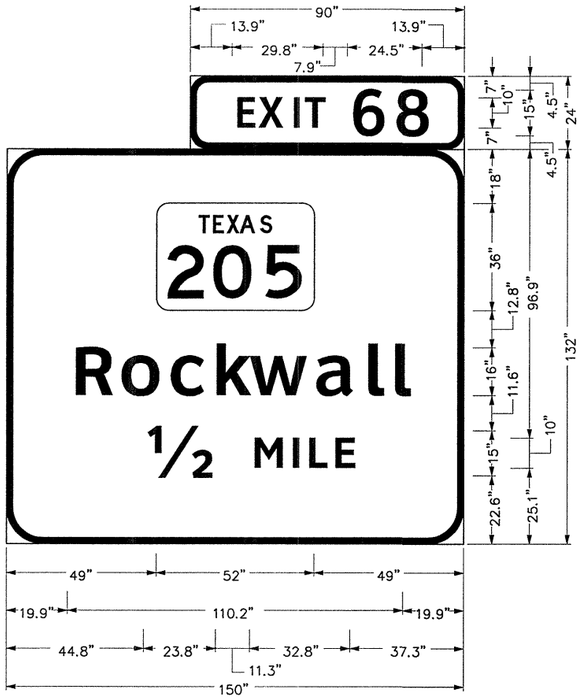
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IH 30 AT JOHN KING BLVD.
SIGNING AND STRIPING
GUIDE SIGN DETAILS

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LARGE GUIDE SIGN #7



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EXIT 68 ClearviewHwy-4-W;

Rockwall Exit;

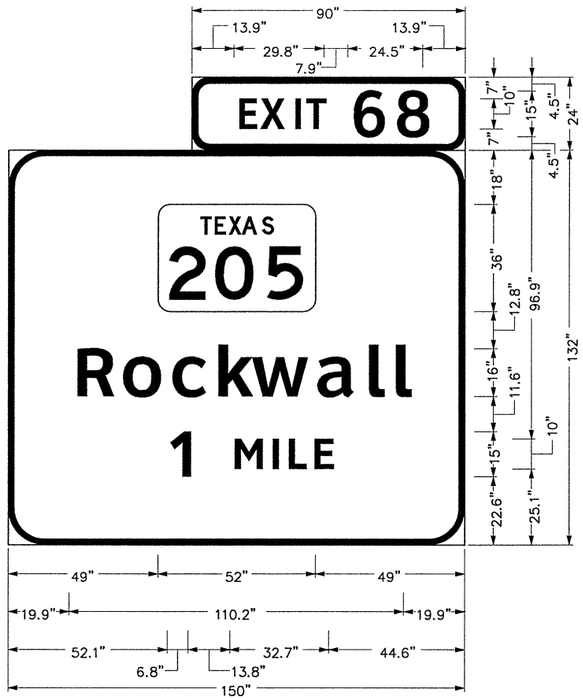
12.0" Radius, 2.0" Border, White on Green;

State Highway 205 M1-6T3B;

Rockwall ClearviewHwy-5-W-R;

1/2 MILE ClearviewHwy-5-W-R;

LARGE GUIDE SIGN #8



6.0" Radius, 2.0" Border, White on Green;

EXIT 68 ClearviewHwy-4-W;

Rockwall Exit;

12.0" Radius, 2.0" Border, White on Green;

State Highway 205 M1-6T3B;

Rockwall ClearviewHwy-5-W-R;

1 MILE ClearviewHwy-5-W-R;

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SIGNING AND STRIPING
GUIDE SIGN DETAILS

Designed: RTF	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: JAA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
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SHEET 3 OF 3

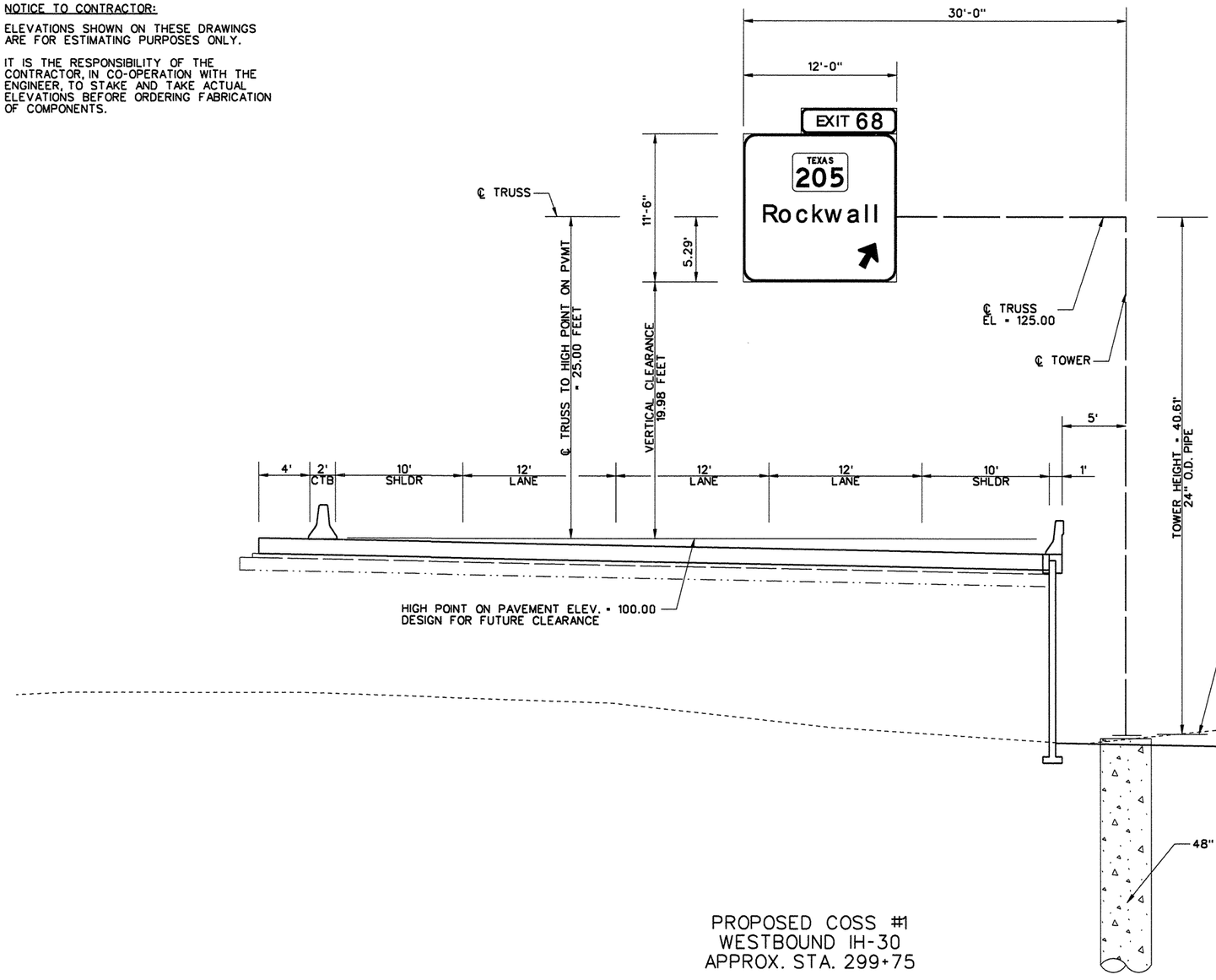
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2/6/2009 10:14:31 AM jaguilar

NOTICE TO CONTRACTOR:

ELEVATIONS SHOWN ON THESE DRAWINGS ARE FOR ESTIMATING PURPOSES ONLY.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR, IN CO-OPERATION WITH THE ENGINEER, TO STAKE AND TAKE ACTUAL ELEVATIONS BEFORE ORDERING FABRICATION OF COMPONENTS.



PROPOSED COSS #1
WESTBOUND IH-30
APPROX. STA. 299+75

DESIGN DATA

SPAN LENGTH	30	FT
DESIGN HEIGHT	OVER 30	FT
TOWER HEIGHT	40.61	FT
DESIGN SIGN AREA	300.00	SF
ACTUAL SIGN AREA	153.0	SF
PENETROMETER VALUE	ASSUME 15	
DESIGN LOADS TORSION	250.41	K-FT
MOMENT	763.41	K-FT

STRUCTURE DATA

STRUCTURE CODE	HCOSS-Z1
TRUSS SIZE	4.5' X 4.5'
TOWER SIZE	24" O.D. PIPE

SUMMARY OF DRILLED SHAFT

25 LF OF 48" DIA. DRILLED SHAFT
2 3/4" Ø ANCHOR BOLTS 31.5" BOLT CIRLCE DIA.

BOTTOM OF BASE PLATE ELEV.	84.39'
TOP DRILLED SHAFT ELEV.	84.14'
GROUND ELEV.	83.64' (APPROX.)
BOTTOM DRILLED SHAFT ELEV.	59.14'

Reginald Fountain, P.E. 2/6/09

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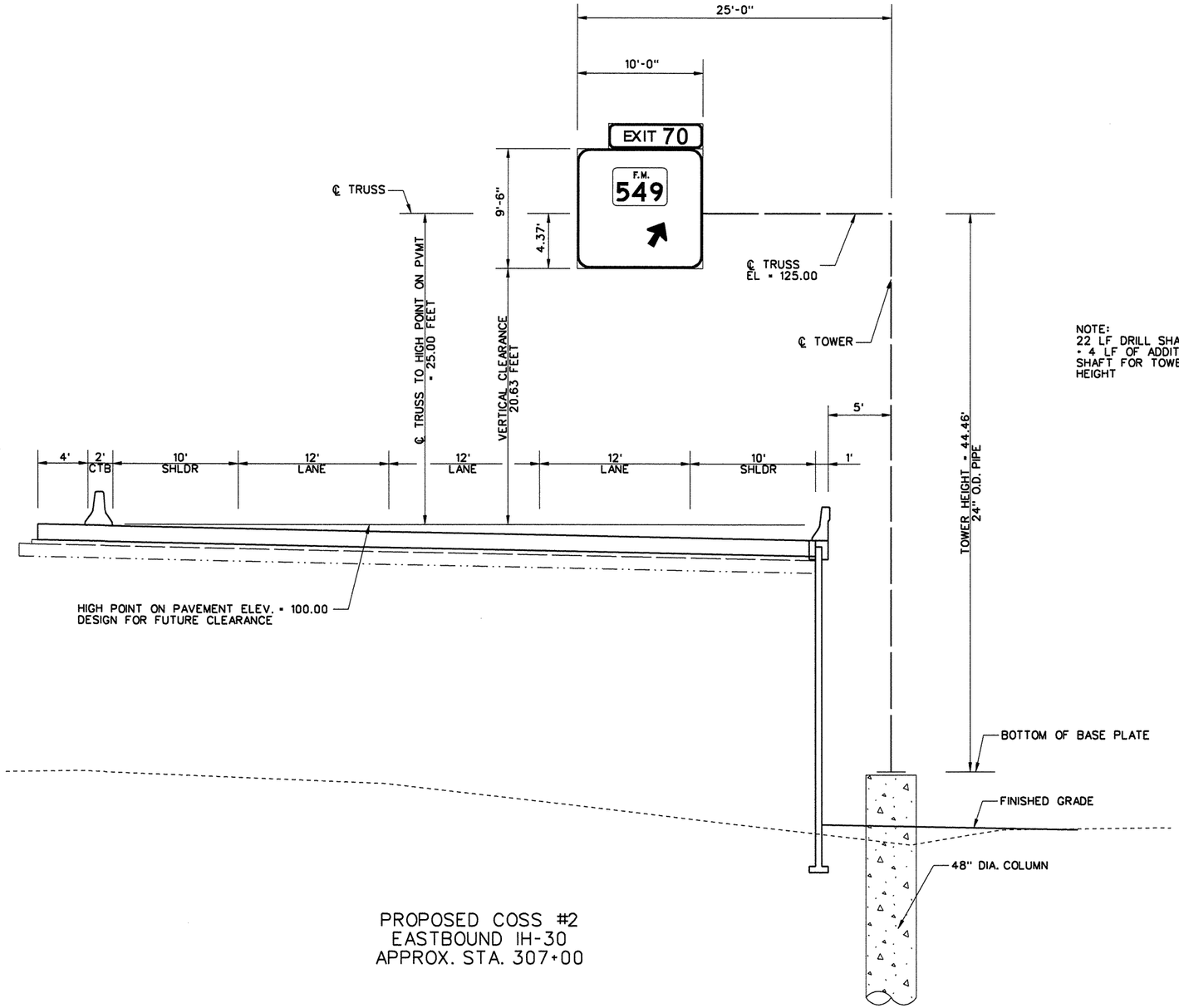
OVERHEAD SIGN STRUCTURE DETAILS

Designed: RTF	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: JAA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: JAA	DAL	ROCKWALL	0009	12	073		373

NOTICE TO CONTRACTOR:

ELEVATIONS SHOWN ON THESE DRAWINGS ARE FOR ESTIMATING PURPOSES ONLY.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR, IN CO-OPERATION WITH THE ENGINEER, TO STAKE AND TAKE ACTUAL ELEVATIONS BEFORE ORDERING FABRICATION OF COMPONENTS.



PROPOSED COSS #2
EASTBOUND IH-30
APPROX. STA. 307+00

DESIGN DATA

SPAN LENGTH	25	FT
DESIGN HEIGHT	OVER 30	FT
TOWER HEIGHT	44.46	FT
DESIGN SIGN AREA	250.0	SF
ACTUAL SIGN AREA	110.0	SF
PENETROMETER VALUE	ASSUME 15	
DESIGN LOADS TORSION	173.89	K-FT
MOMENT	690.71	K-FT

STRUCTURE DATA

STRUCTURE CODE	HCOSS-Z1
TRUSS SIZE	4.5' X 4.5'
TOWER SIZE	24" O.D. PIPE

NOTE:
22 LF DRILL SHAFT
+ 4 LF OF ADDITIONAL SHAFT FOR TOWER HEIGHT

SUMMARY OF DRILLED SHAFT

26 LF OF 48" DIA. DRILLED SHAFT
2 1/2" Ø ANCHOR BOLTS 30.5" BOLT CIRLCE DIA.

BOTTOM OF BASE PLATE ELEV.	80.54'
TOP DRILLED SHAFT ELEV.	80.29'
GROUND ELEV.	76.25' APPROX.
BOTTOM DRILLED SHAFT ELEV.	54.29'

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OVERHEAD SIGN STRUCTURE DETAILS

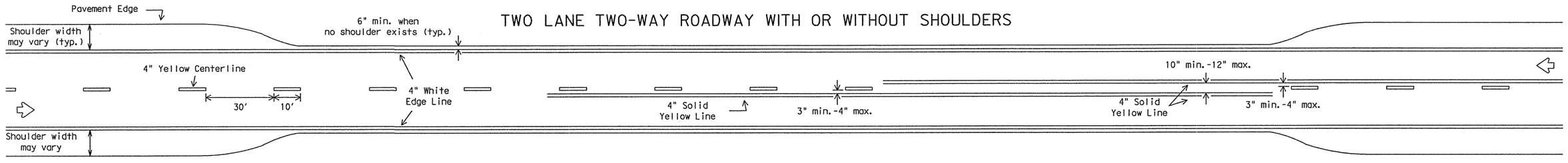
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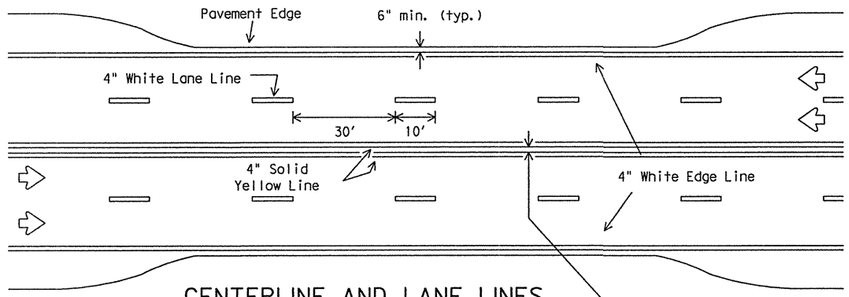
SHEET 2 OF 2

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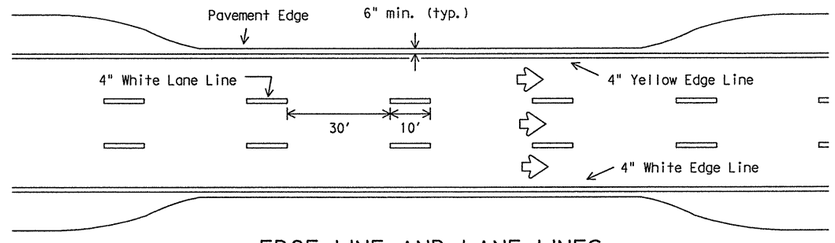
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TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

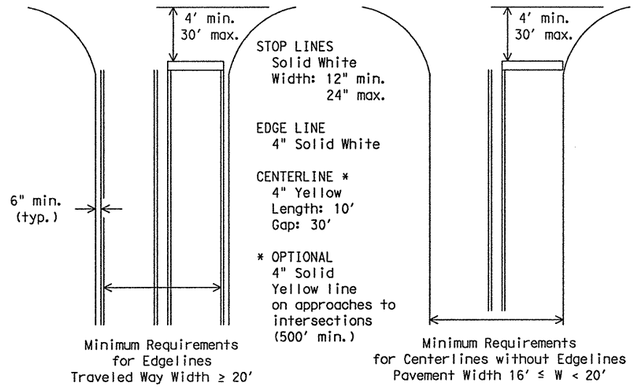




CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



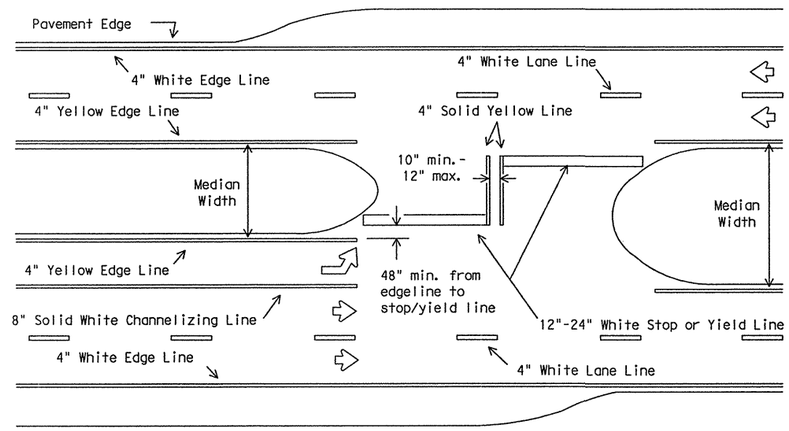
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

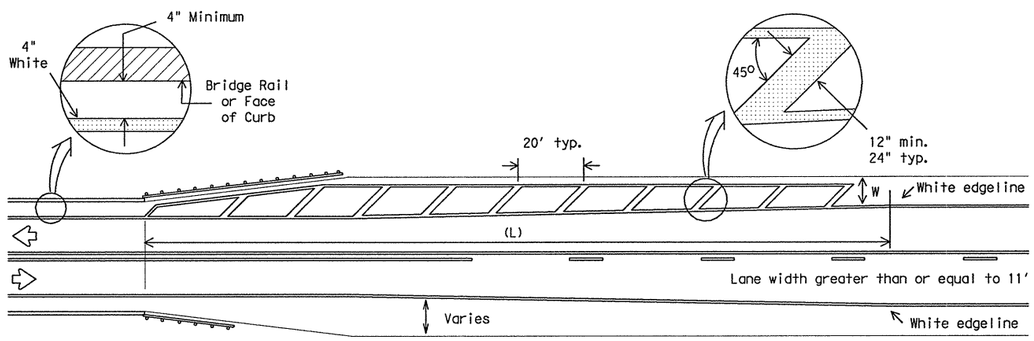
Based on Traveled Way and Pavement Widths for Undivided Highways

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT



NOTES:

1. No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
2. For crosshatching length (L) see Table 1.
3. The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
4. The crosshatching should be required if the shoulder width in advance of the bridge is 4 foot or wider and any reduction in shoulder width across the bridge occurs.
5. For guard fence details, refer elsewhere in the plans.

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed *	Formula
30, 35, 40	$L = \frac{WS^2}{60}$
45, 50, 55, 60, 65, 70	L=WS

* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.

L=Length of Crosshatching (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

EXAMPLES:

An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the cross-hatching should be:

$L = 8 \times 70 = 560$ ft.

A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the cross-hatching should be:

$L = 4(40)^2 / 60 = 106.67$ ft. rounded to 110 ft.

GENERAL NOTES:

Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should typically be placed a minimum of 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

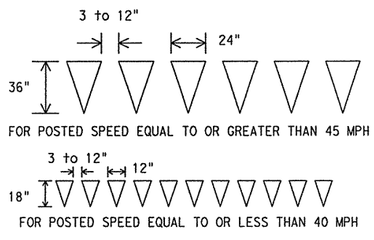
The traveled way includes only that portion of the roadway used for vehicular travel and not the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to inside of edgeline of a two lane roadway.

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

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130

YIELD LINES

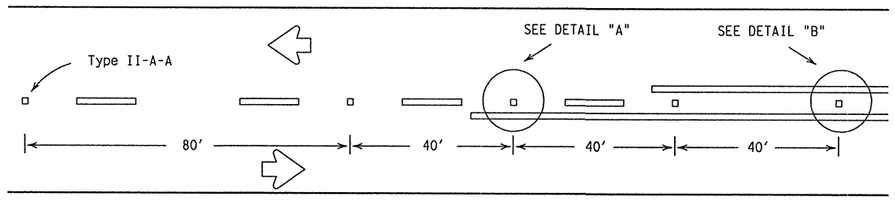


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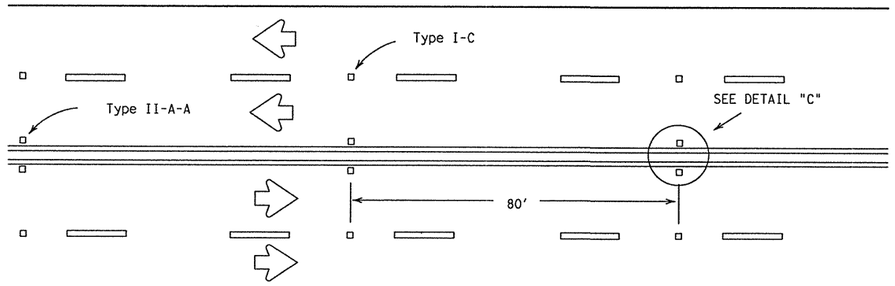
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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

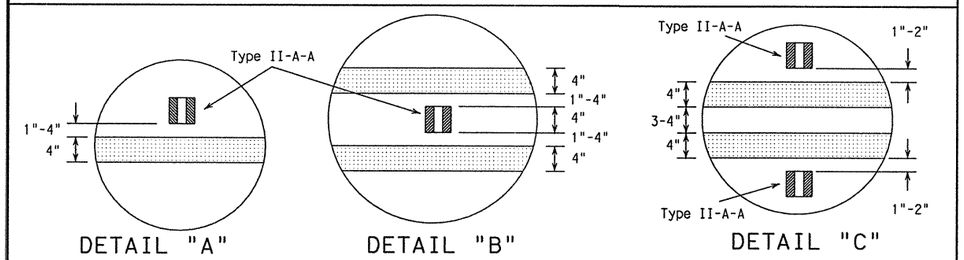


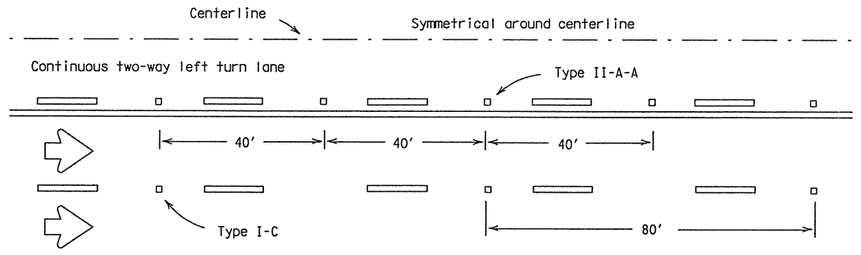
CENTERLINE FOR ALL TWO LANE ROADWAYS



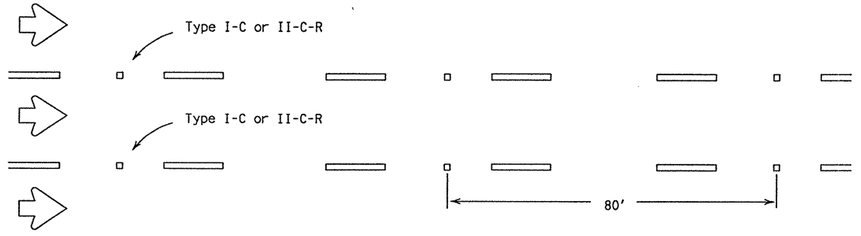
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

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





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

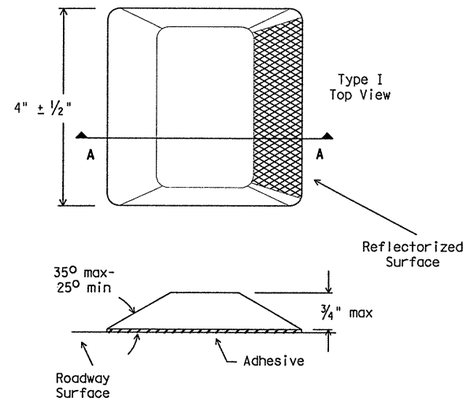


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

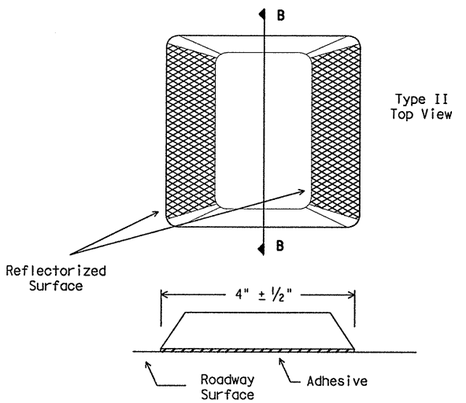
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

RAISED PAVEMENT MARKERS

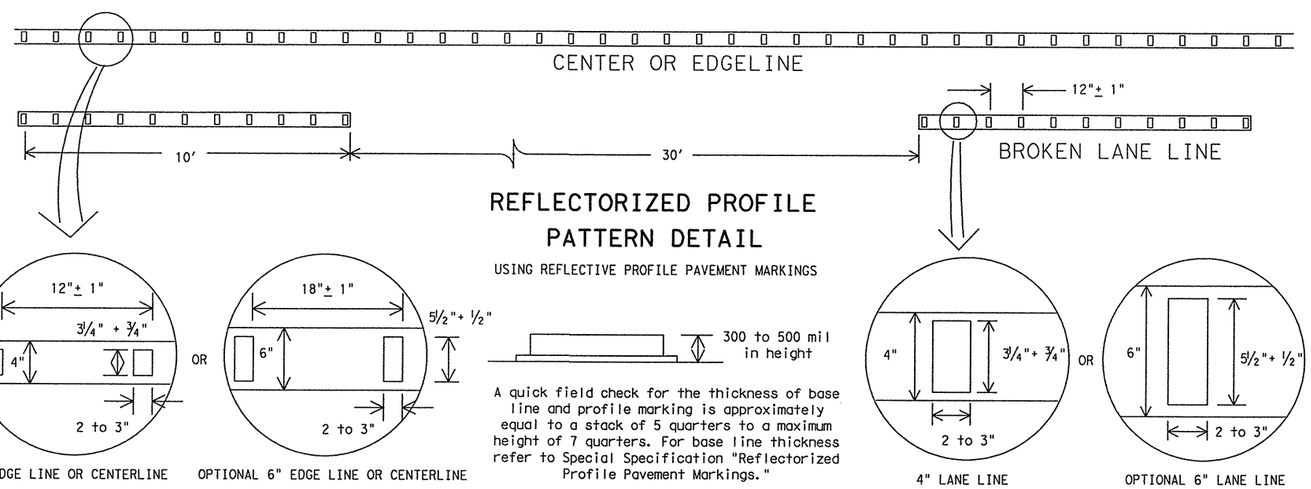
(REFLECTORIZED)



SECTION A



SECTION B



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters. For base line thickness refer to Special Specification "Reflectorized Profile Pavement Markings."

GENERAL NOTES:

All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.

On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

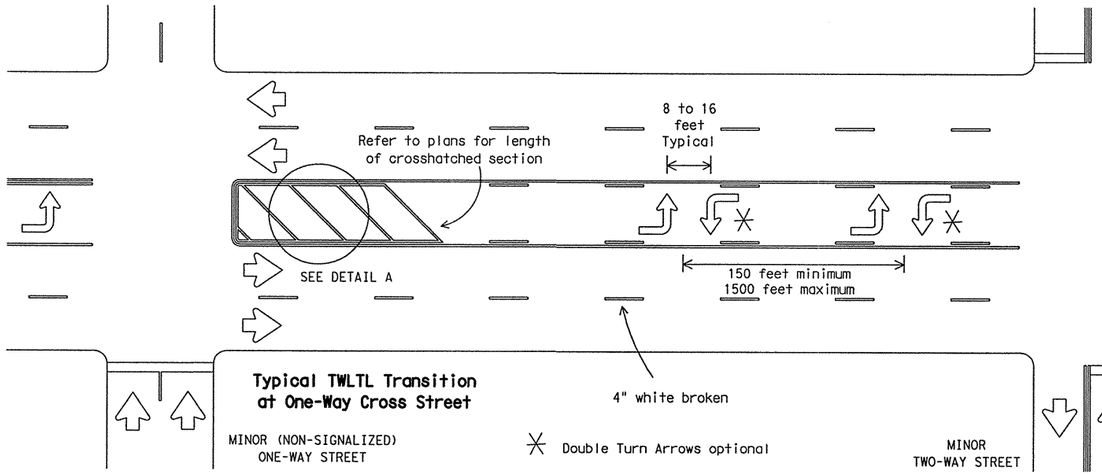
SPECIFICATION REFERENCE TABLE

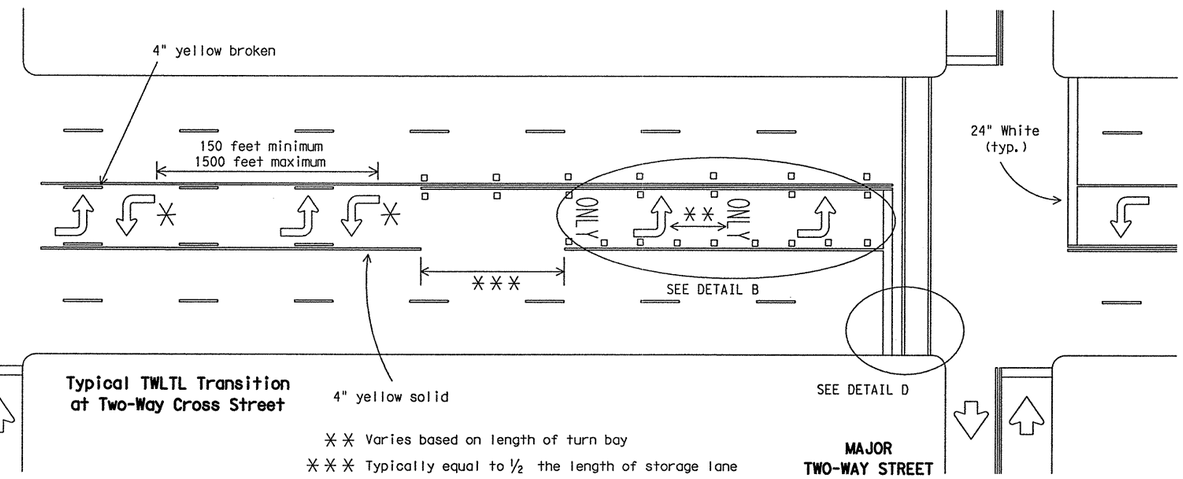
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130

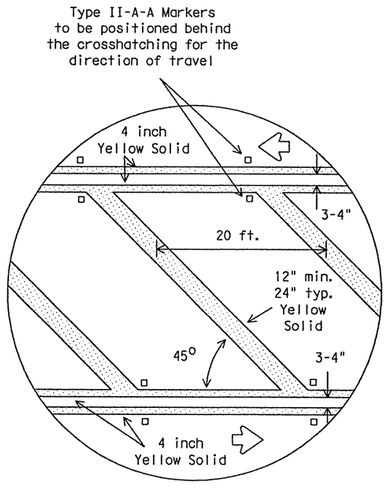
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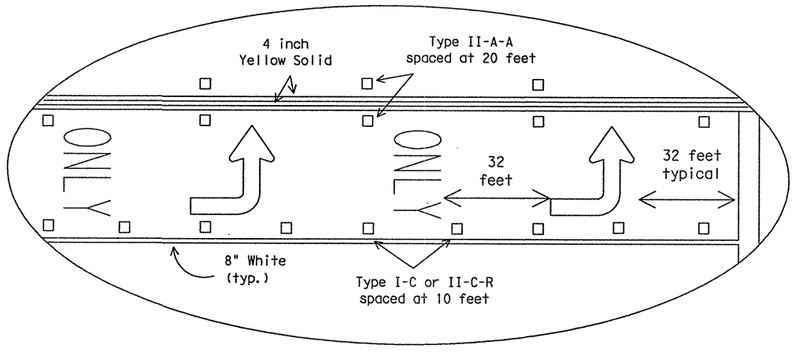
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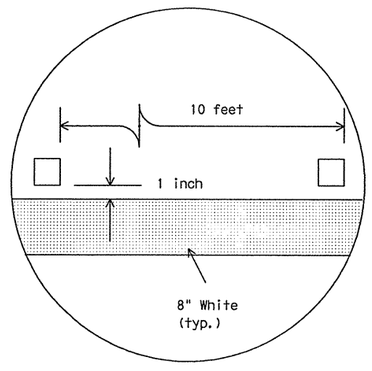




DETAIL A

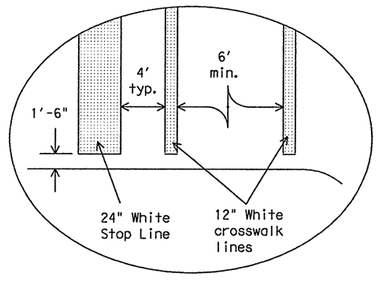


DETAIL B



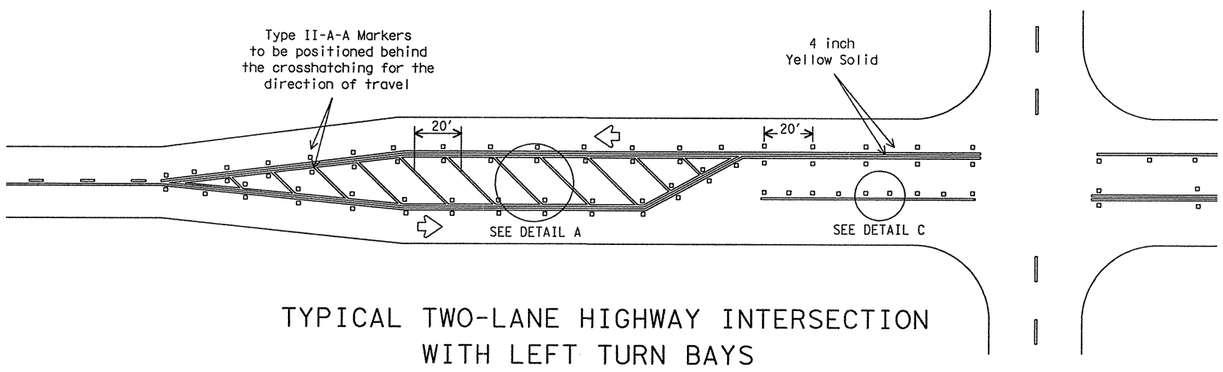
DETAIL C

Raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes.
Raised pavement marker Type II-C-R with divided highways and raised medians.

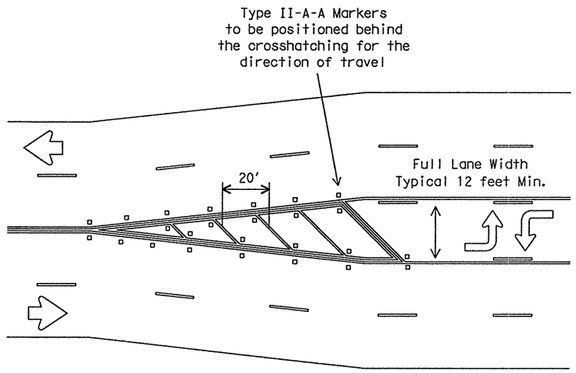


DETAIL D

Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

Refer elsewhere in plans for additional RPM placement and details.

Details for words and arrows as shown on other sheets.

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

For a left turn bay, two sets of words and arrows shall be used if the length of the bay is equal to or greater than 180 feet. The bottom of the first ONLY shall be placed at the beginning of the turn bay lane line as shown above.

Other crosswalk paterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

PAVEMENT MARKINGS FOR TWO-WAY LEFT TURN LANES DIVIDED HIGHWAYS AND RURAL LEFT TURN BAYS

PM(4)-03

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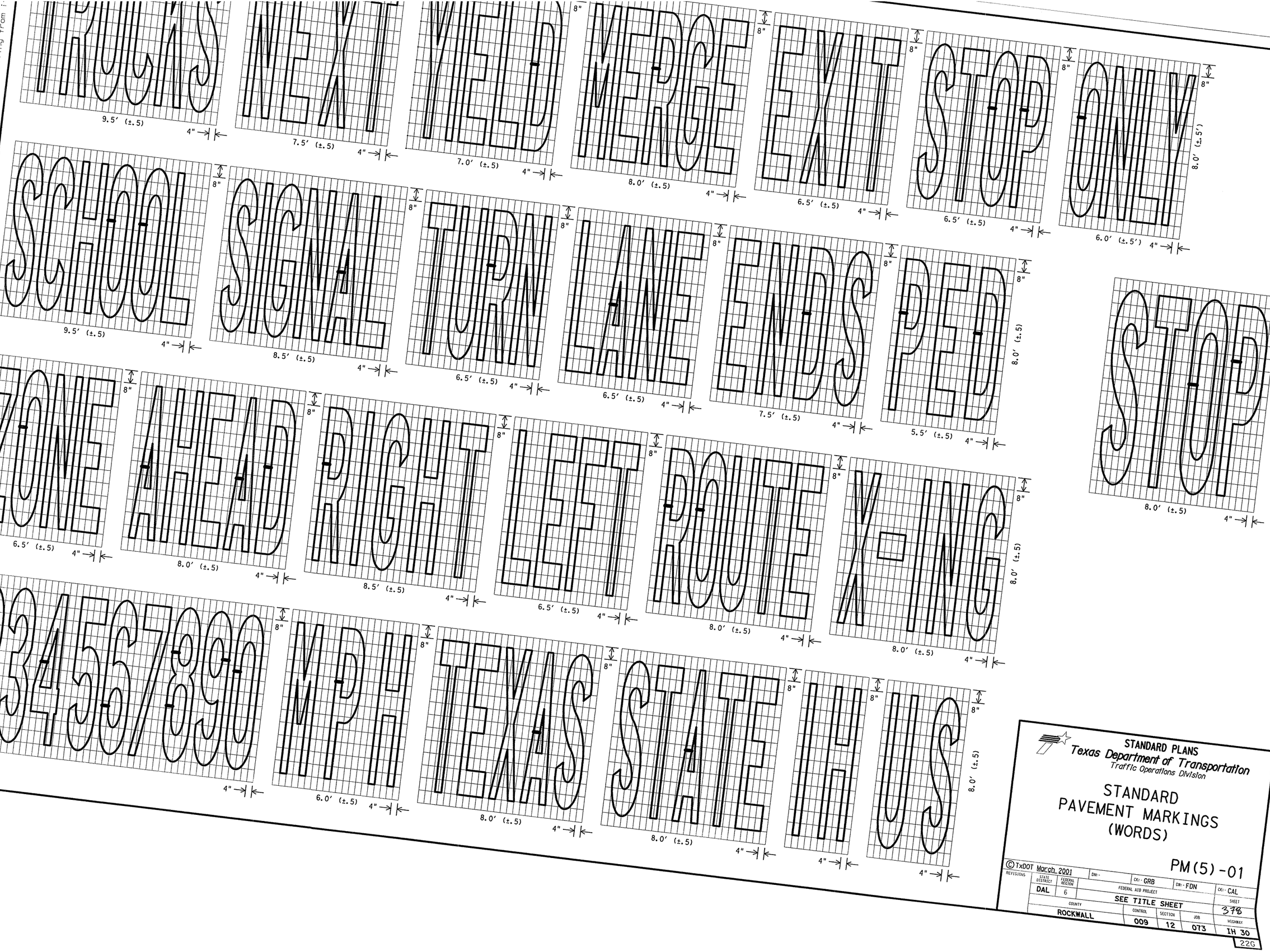
DN: BAS	CK: GRB	DN: FDN	CK: CAL	MEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
5-00	DAL	6	SEE TITLE SHEET	377
8-00	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
3-03	ROCKWALL		009 / 12 / 073	IH 30

22D

ACC: S DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	ACC:
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63		

S DISPLAYED

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

STANDARD PAVEMENT MARKINGS (WORDS)

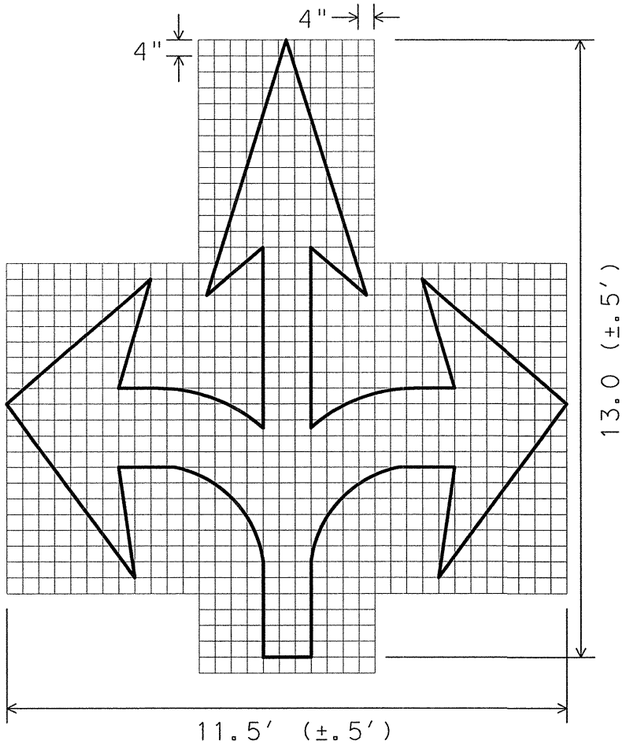
PM(5)-01

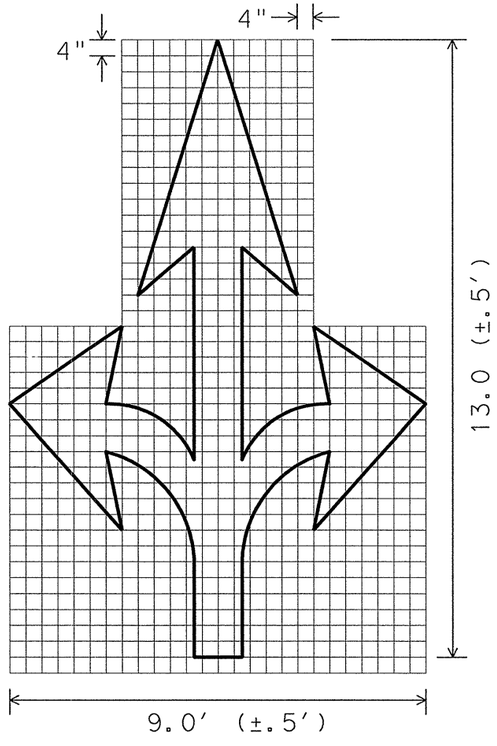
© TxDOT March 2001

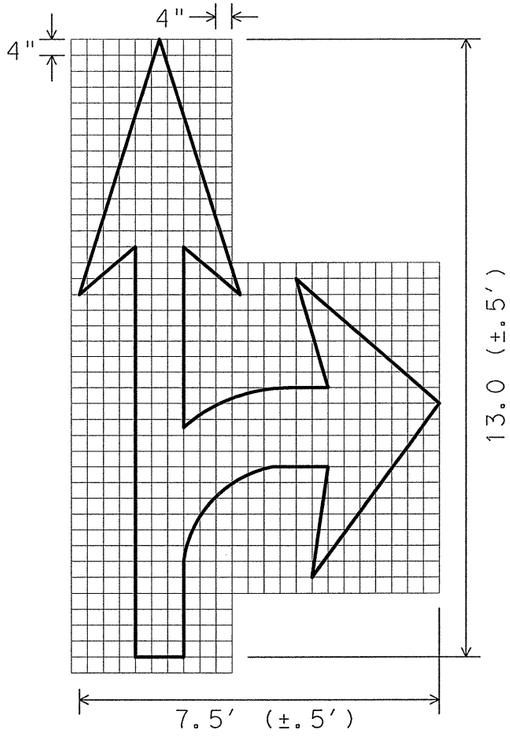
REVISIONS			DN: -	CK: GRB	DW: FDN	CK: CAL
STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT				SHEET
DAL	6	SEE TITLE SHEET				378
COUNTY		CONTROL	SECTION	JOB		HIGHWAY
ROCKWALL		009	12	073		IH 30

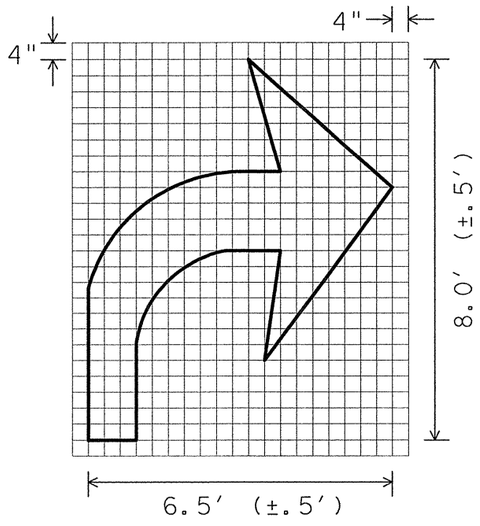
22G

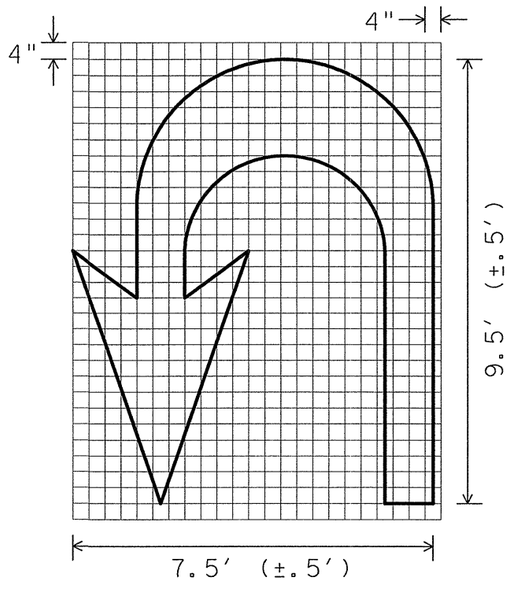
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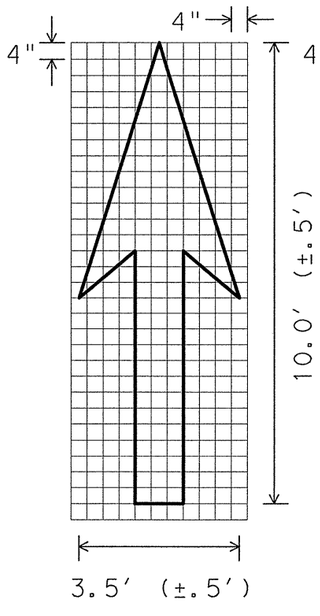


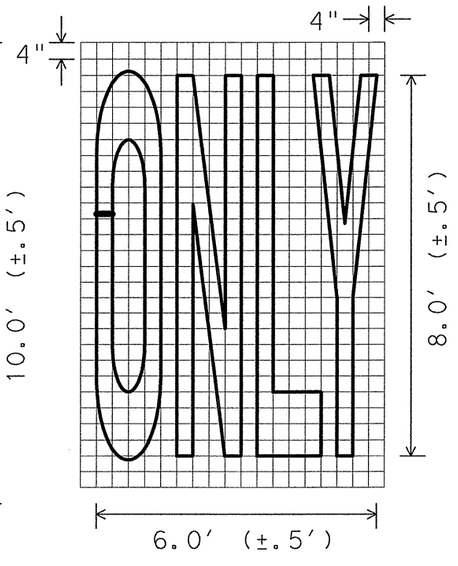












GENERAL NOTES;

1. Minimum 8 foot white markings should be used, unless otherwise noted. If message consists of more than one word, it should be placed with first word nearest the driver.
2. These details are standard size for normal installation; sizes may be reduced approximately one-third for low speed urban conditions; larger sizes may be needed for freeways, above average speed conditions or other critical locations.
3. The longitudinal space between markings should be at least four times the height of the markings, on low speed roads, but should not exceed ten times the height under any condition.
4. Markings considered appropriate for use when warranted include the following:
   A. Regulatory
      STOP
      RIGHT (LEFT) TURN ONLY
      25 MPH
      SYMBOL ARROWS
   B. Warning
      STOP AHEAD
      SIGNAL AHEAD
      SCHOOL
      SCHOOL X-ING
      PED X-ING
      R X R (see RCPM standard)
   C. Guide
      US XXX
      ROUTE XXX
      STATE XXX
      Other words or symbols may be necessary under certain conditions
5. Uncontrolled use of pavement markings can result in driver confusion. Word and symbol markings should be no more than three lines.
6. The word "STOP" shall not be used on the pavement unless accompanied by a Stop line and Stop sign. The word "STOP" shall not be placed on the pavement in advance to a stop line, unless every vehicle is required to stop at all times.
7. Pavement markings should generally be no more than one lane in width, with School messages being the exception. For details of School and School crossing pavement markings, refer to Part VII of the "Texas Manual on Uniform Traffic Control Devices".
8. Spacing between letters should be approximately 4 inches. The width of letters may vary depending on the width of the travel lanes.
9. Lane-Use arrow markings may be used to convey either guidance or mandatory messages. Arrows used to convey a mandatory movement must be accompanied by standard signs and the pavement marking word "ONLY".
10. Pavement markings are to be located as specified elsewhere in the plans.

SPACING BETWEEN LINES OF PAVEMENT MARKINGS	
MPH	SPACING
≤ 45	MINIMUM 4 TIMES THE LETTER HEIGHT
> 45	MINIMUM - 4 TIMES THE LETTER HEIGHT MAXIMUM - 10 TIMES THE LETTER HEIGHT

# DISPLAYED	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACC:	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

STANDARD PAVEMENT MARKINGS (ARROWS)

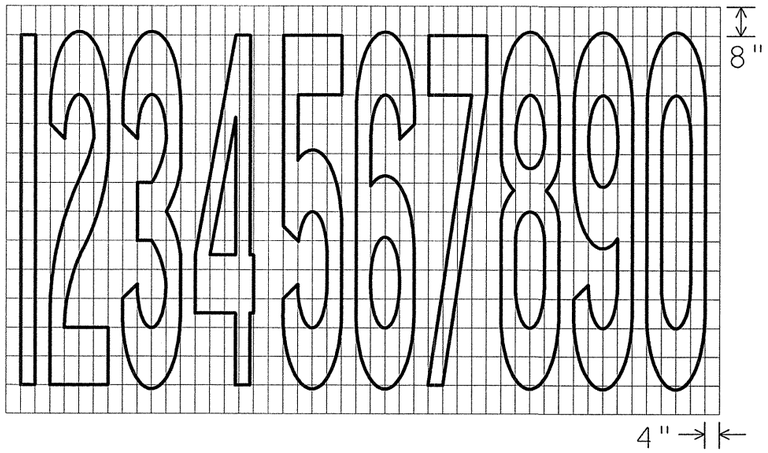
PM(6)-01

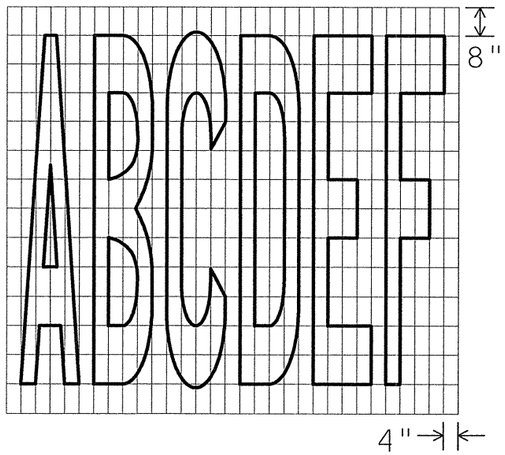
© TxDOT March 2001

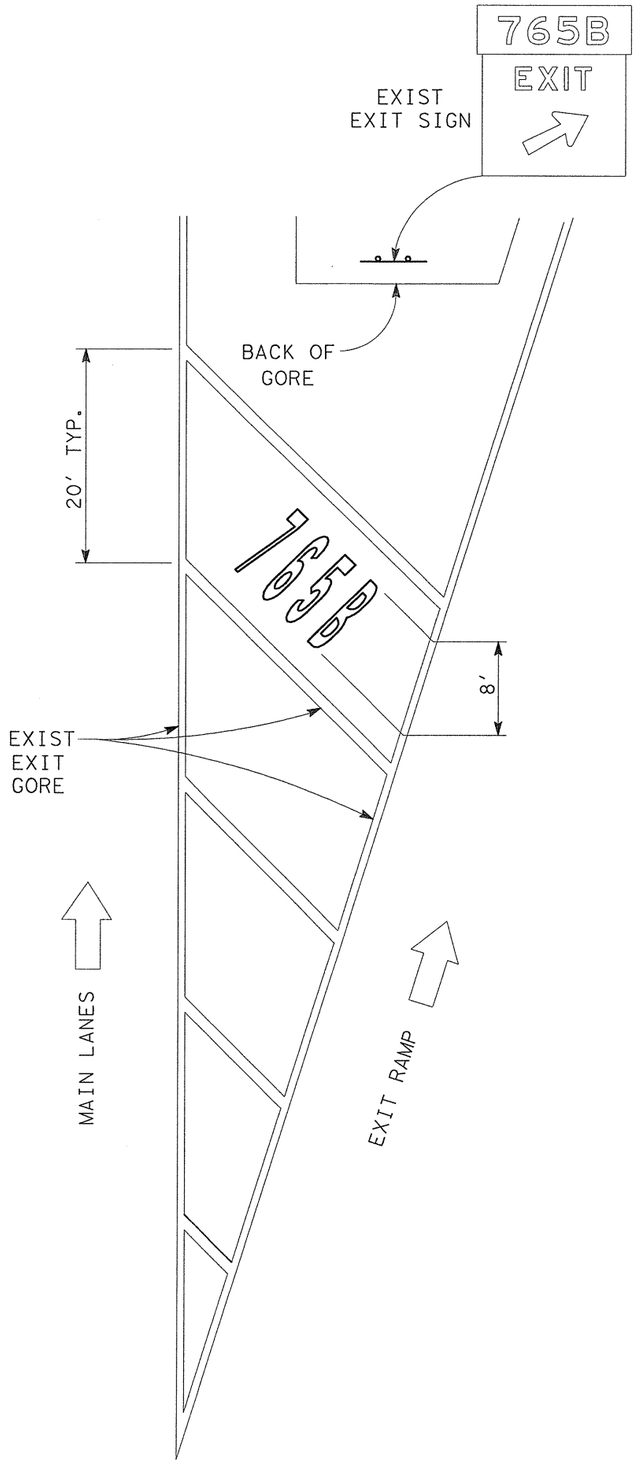
DN:	CK: GRB	DW: FDN	CK: CAL

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT				SHEET
	DAL	6	SEE TITLE SHEET				379
	COUNTY		CONTROL	SECTION	JOB		HIGHWAY
	ROCKWALL		009	12	073		IH 30

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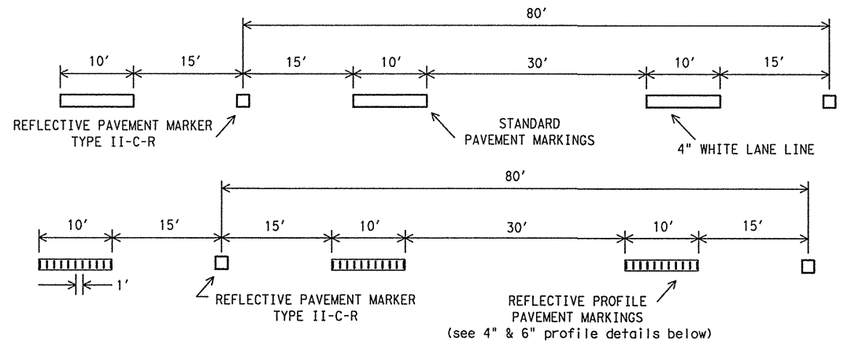
GENERAL NOTES;

1. Minimum 8 foot white markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.

| S DISPLAYED | | |

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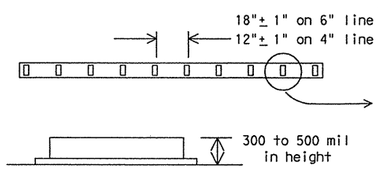
TRAFFIC LANE LINES PAVEMENT MARKING DETAILS



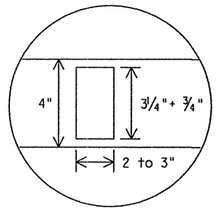
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

EDGELINE PAVEMENT MARKINGS

EDGELINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS.
IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.

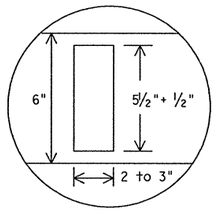


REFLECTIVE PROFILE PAVEMENT MARKINGS



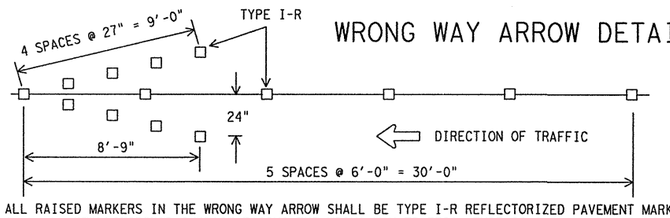
STANDARD 4" PROFILE DETAIL

OR



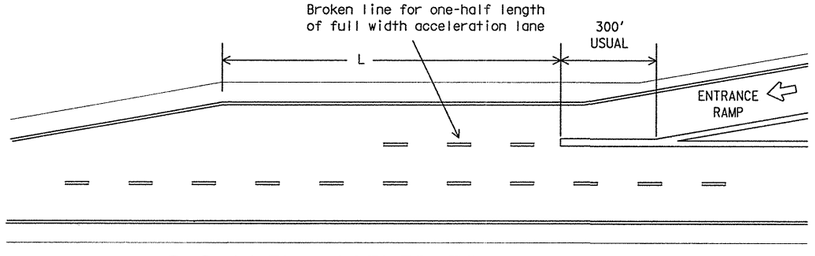
OPTIONAL 6" PROFILE DETAIL

WRONG WAY ARROW DETAIL

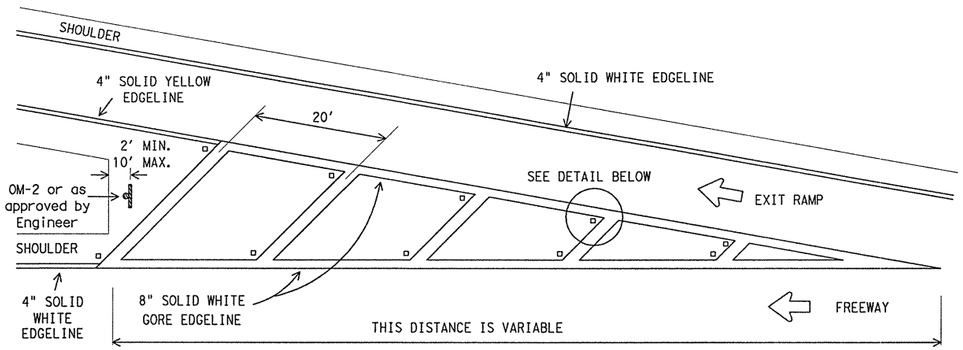


ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

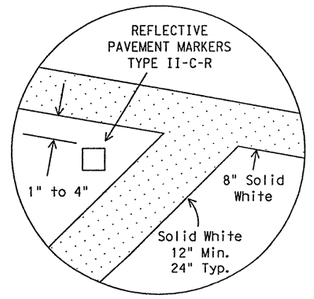
REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS.
LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.



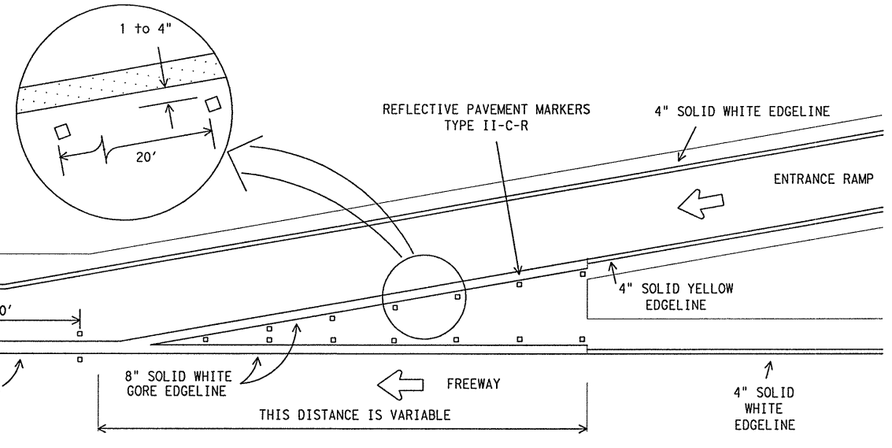
PARALLEL ACCELERATION LANE



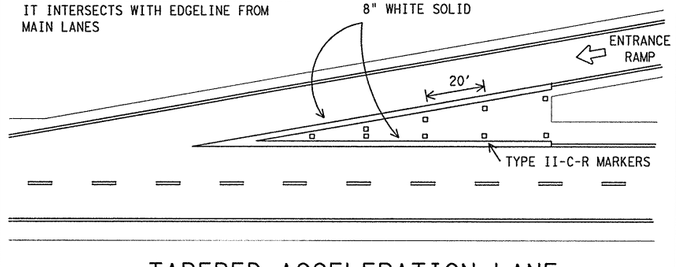
THE SHAPE OF THE GORE MARKING WILL VARY DEPENDING ON THE RAMP DESIGN AND WILL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. OM-2 OR SURFACE MOUNT OBJECT MARKER MOUNTING HEIGHT IS 36 INCHES.



TYPICAL EXIT RAMP GORE MARKING



TYPICAL ENTRANCE RAMP GORE MARKING



TAPERED ACCELERATION LANE

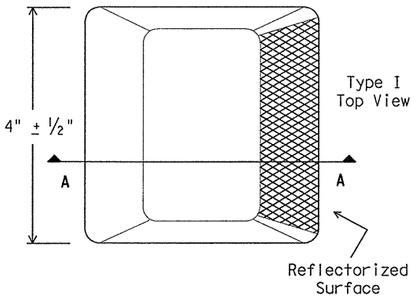
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

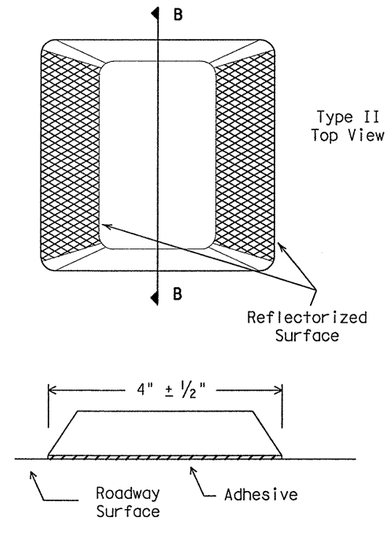
SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130

RAISED PAVEMENT MARKERS

(REFLECTORIZED)



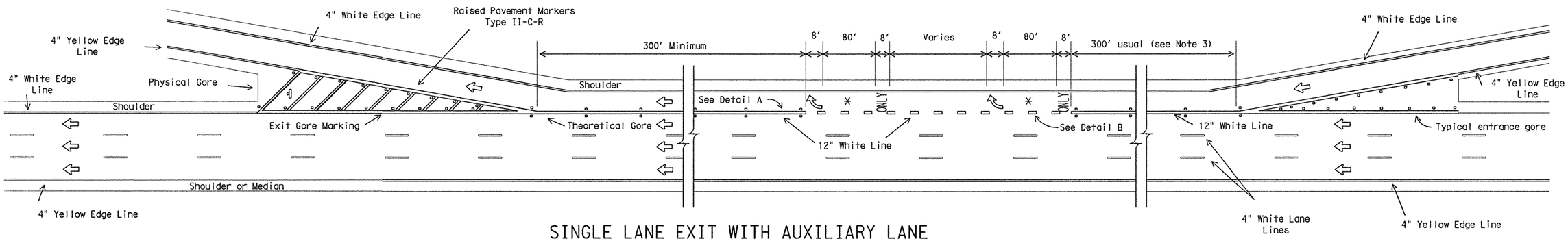


SECTION B

S DISPLAYED ACC:

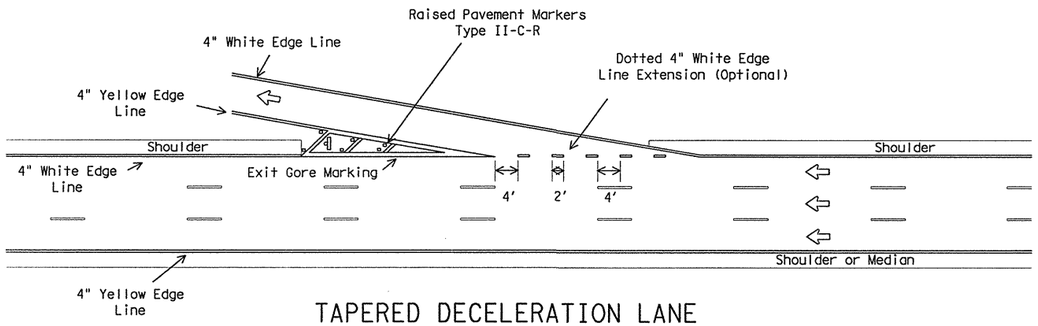
| | | |

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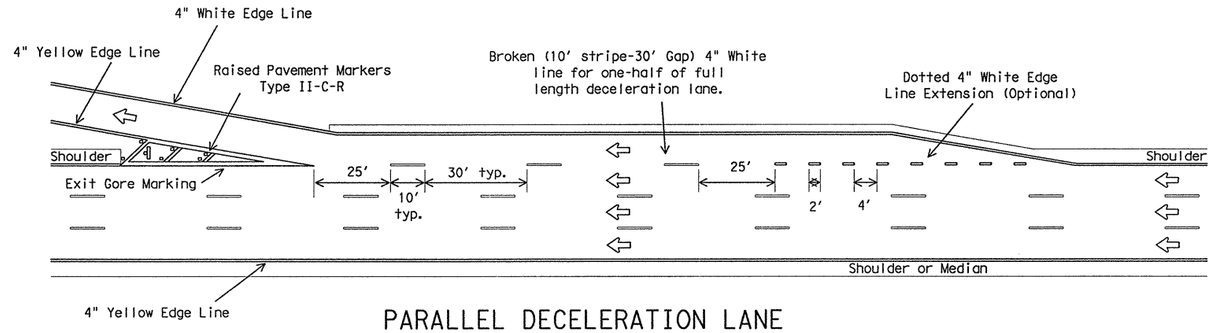


SINGLE LANE EXIT WITH AUXILIARY LANE

(See Note 5)



TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

LEGEND

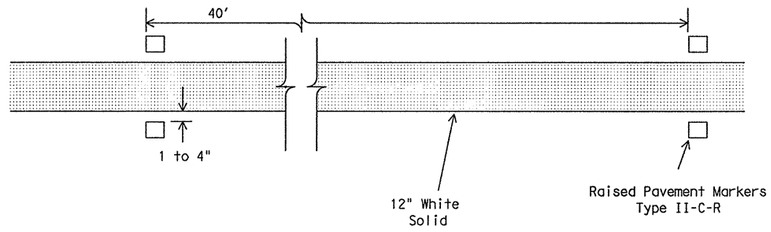
- OM-2, or approved surface mount object marker installed 2 to 10 feet from Physical Gore. Mounting height is approximately 36 inches.
- Denotes direction of traffic.
- Pavement marking arrows (white).
- Arrow markings are optional, however "ONLY" is required if arrow is used.

GENERAL NOTES:

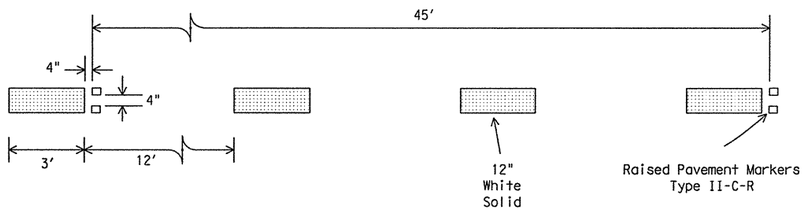
1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Lane drop markings are to be used to separate lanes that are required to go in different directions.
4. A lane drop (EXIT ONLY) condition is typically when the nearest entrance ramp is greater than 2000 feet upstream of the exit ramp, measured from theoretical gore of entrance ramp to theoretical gore of exit ramp.
5. All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130



DETAIL A



DETAIL B

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-00A

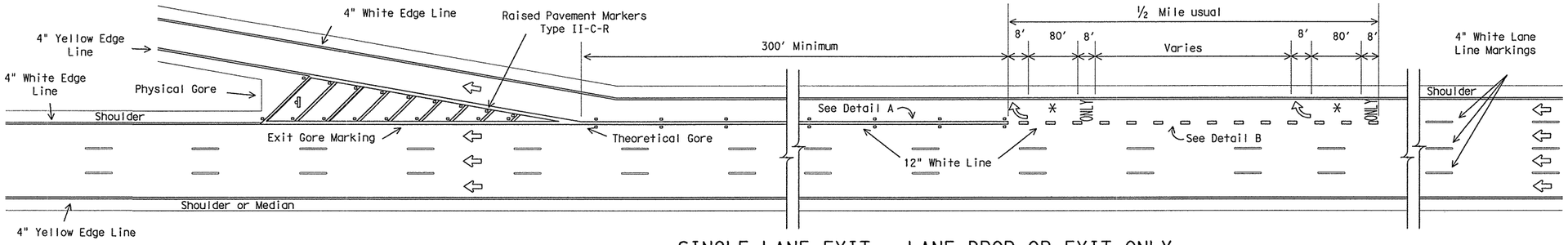
©TxDOT February 1977	DW:- BAS	CK:- GRB	DW:- FDN	CK:- CAL

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-92	DAL	6	SEE TITLE SHEET	382
8-95				
5-00	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
8-00	ROCKWALL		009 / 12 / 073	IH 30

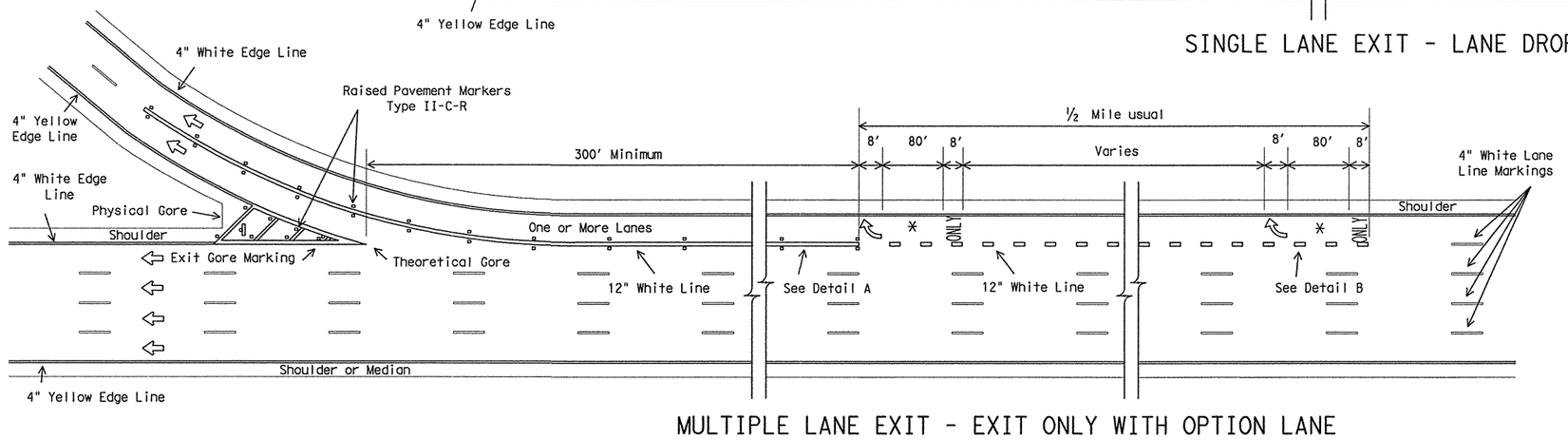
23B

FILES DISPLAYED	ACC:
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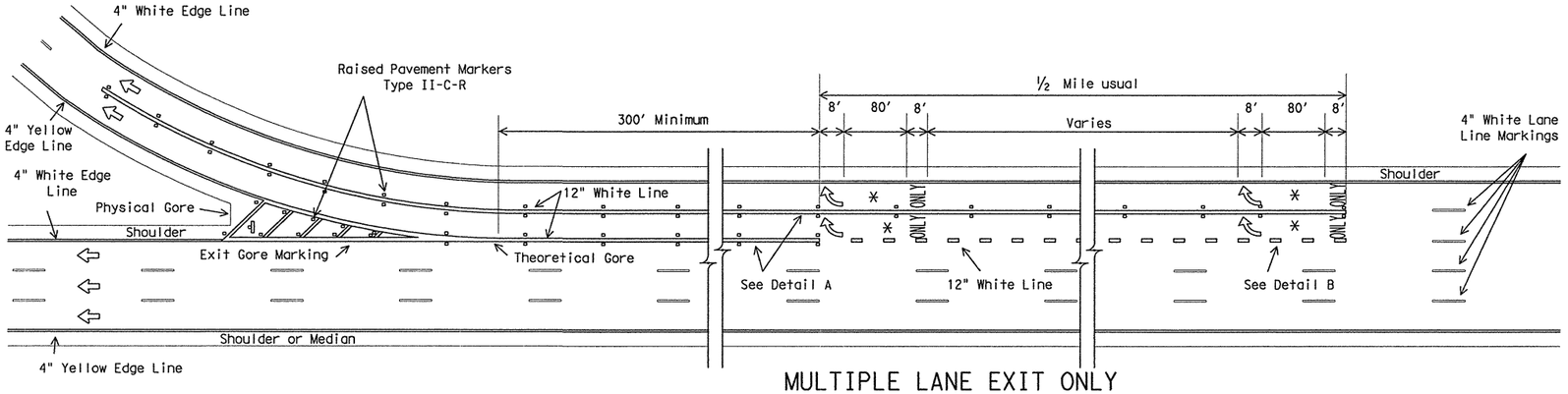
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SINGLE LANE EXIT - LANE DROP OR EXIT ONLY



MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE



MULTIPLE LANE EXIT ONLY

LEGEND

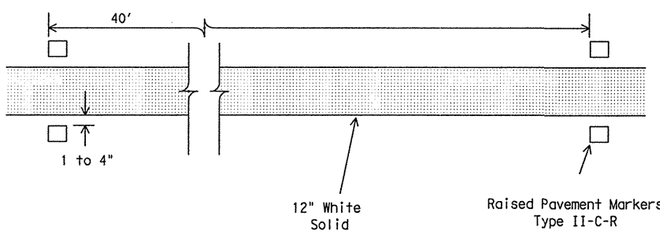
- OM-2, or approved surface mount object marker installed 2 to 10 feet from Physical Gore. Mounting height is approximately 36 inches.
- Denotes direction of traffic.
- Pavement marking arrows (white).
- Arrow markings are optional, however "ONLY" is required if arrow is used.

GENERAL NOTES:

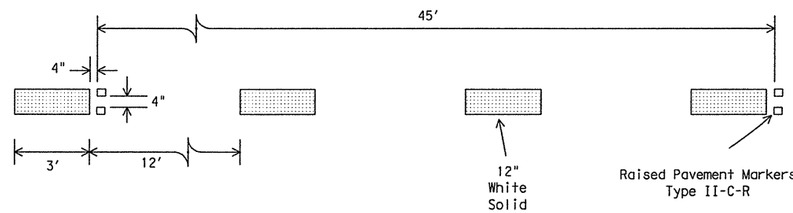
1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Lane drop markings are to be used to separate lanes that are required to go in different directions.
4. A lane drop (EXIT ONLY) condition is typically when the nearest entrance ramp is greater than 2000 feet upstream of the exit ramp, measured from theoretical gore of entrance ramp to theoretical gore of exit ramp.
5. All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130



DETAIL A



DETAIL B

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) EXIT RAMPS

FPM(3)-00A

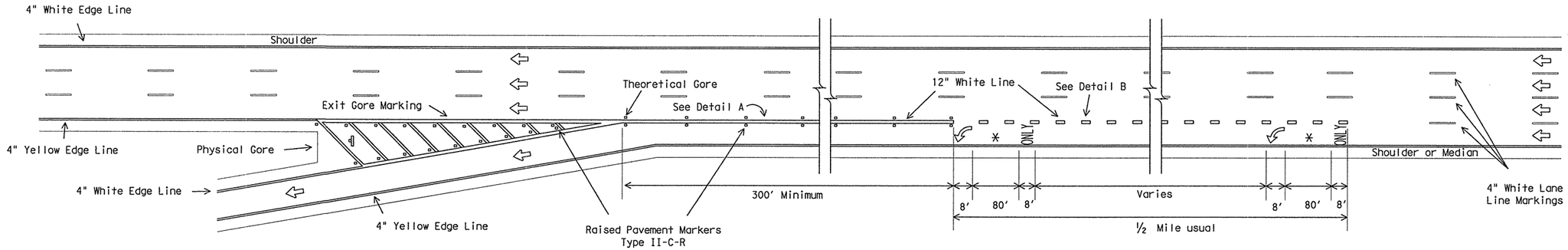
©TxDOT April 1992	DN: BAS	CK: GRB	DW: FDN	CK: CAL

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
5-00	DAL	6	SEE TITLE SHEET	383
8-00	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
	ROCKWALL		009 / 12 / 073	IH 30

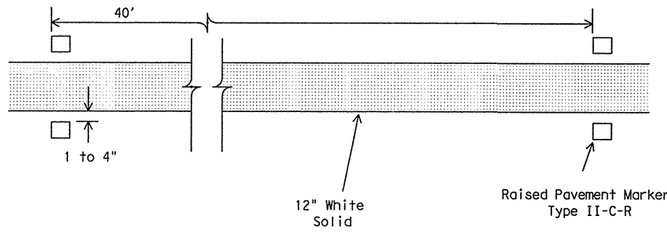
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ACC: DISPLAYED
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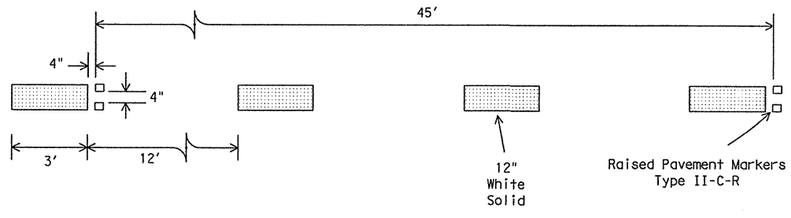
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SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)



DETAIL A



DETAIL B

LEGEND

- OM-2, or approved surface mount object marker installed 2 to 10 feet from Physical Gore. Mounting height is approximately 36 inches.
- Denotes direction of traffic.
- Pavement marking arrows (white).
- Arrow markings are optional, however "ONLY" is required if arrow is used.

GENERAL NOTES:

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Lane drop markings are to be used to separate lanes that are required to go in different directions.
4. A lane drop (EXIT ONLY) condition is typically when the nearest entrance ramp is greater than 2000 feet upstream of the exit ramp, measured from theoretical gore of entrance ramp to theoretical gore of exit ramp.
5. All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

SPECIFICATION REFERENCE TABLE

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECT.)	DMS-4200
EPOXY	DMS-6100
BITUMINOUS ADHESIVE FOR PAVE. MKS.	DMS-6130

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) DETAILS

FPM(4)-00A

© TxDOT April 1992	DN: BAS	CK: GRB	DW: FDN	CK: CAL

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
5-00 8-00	DAL	6	SEE TITLE SHEET	384

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH 30

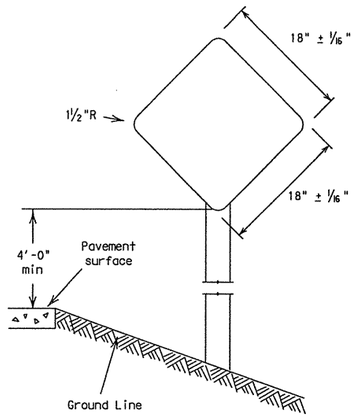
23D

ACC:
S DISPLAYED
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17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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OBJECT MARKERS

TYPES 1 and 4

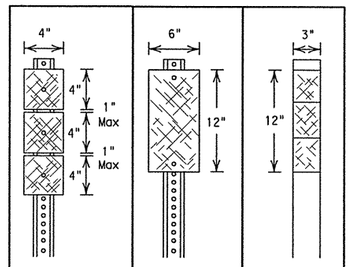


TYPE 1
18" x 18"
Yellow Type E Sheeting

TYPE 4
18" x 18"
Red Type D Sheeting

Use Sign blank 0.080" thick sheet aluminum conforming to ASTM B-209 Alloy 6061-T6. Use reflective sheeting in accordance with DMS 8300.

TYPE 2



Number of Reflectors	X	Y	Z
Post	WC	WC	FLX/RCR

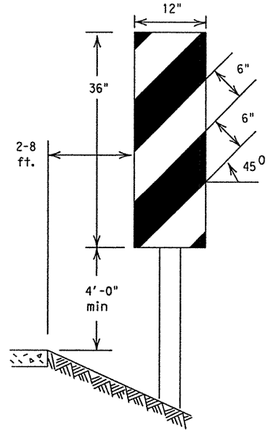
ALL TYPE 2 OBJECT MARKERS ARE YELLOW

WC-wing channel post (1.12 lbs/ft) per ASTM A 1011 SS Gr 50

FLX/RCR-flexible post (driveable and surface mount) or recycled rubber

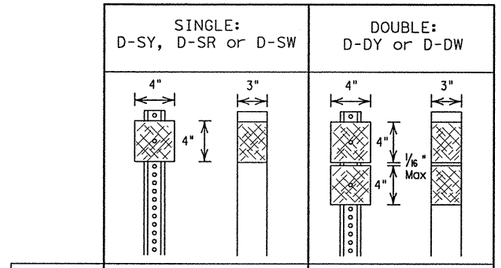
Typically used on bridge rail approach ends, some bridge abutments and at bridge rail exits on two-lane, two-way roadways

TYPE 3



Use Sign blank .080" thick sheet aluminum conforming to ASTM B-209 Alloy 6061-T6. Use reflective sheeting in accordance with DMS 8300, Type E. Use at bridges with no approach rails.

DELINEATORS



Number of Reflectors	S		D	
Post	WC	FLX/RCR	WC	FLX/RCR

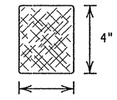
Length of post may vary to meet field conditions.

REFLECTOR UNITS: W-white, R-red or Y-yellow

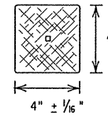
WC-wing channel post (1.12 lbs/ft) per ASTM A 1011 SS Gr 50

FLX/RCR-flexible post (driveable and surface mount) or recycled rubber.

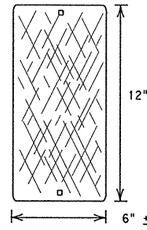
REFLECTOR UNIT SIZES



Size 1



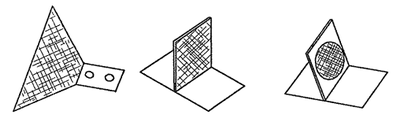
Size 2
For use on Winged Channel posts only. Use approved metal, plastic or fiberglass backplate with 17/64" square mounting hole.



Size 3
For use on Winged Channel posts only. Use approved metal, plastic or fiberglass backplate with 17/64" square mounting hole.

REFLECTIVE SHEETING
Yellow - DMS 8300, Type E White - DMS 8300, Type D
Red- - DMS 8300, Type D

TYPE C BARRIER REFLECTORS



REFLECTIVE SHEETING
Yellow - DMS 8300, Type E
White - DMS 8300, Type D

Mounting holes - 17/64 "

A Type A or B reflector unit (per DMS 8600) attached to a bracket to facilitate the mounting of the reflector on concrete traffic barrier, railing, metal beam guard fence (MBGF) or other locations shown on the plans. A list of approved Type C reflectors can be found at:

ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/typcdeln.pdf

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X(XXX)XXX(XX)

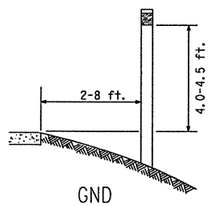
Number of Reflectors
S = Single
D = Double
Color of Reflectors
W = White
Y = Yellow
Reflector Unit Size
1 or 2
Type of Post
WC = Wing Channel Post
FLX = Flexible Post
RCR = Recycled Rubber
TYC = Type C Barrier Reflector
Type of Installations
GND = Ground Mount
CTB = Concrete Barrier Mount (Type C only)
GF1, GF2, GF3 = Guard Fence Attachment
SRF = Surface Mount
SLF = Self Righting
Direction
IF REQUIRED
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXX)XXX(XX)

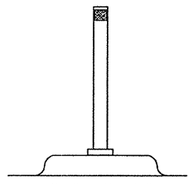
Type of Object Marker
1, 2, 3, or 4
Number of Reflectors
X = 3 each Size 2 reflector units (Type 2 only)
Y = 1 Size 3 reflector unit (Type 2 only)
Z = 3 each Size 1 reflector units (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
Type of Post
WC = Wing Channel Post
FLX = Flexible Post
RCR = Recycled Rubber
TWT = Thin Walled Tubing
Type of Mount
GND = Ground Mount
WP = Wedge Anchor Plastic System
SRF = Surface Mount
SLF = Self Righting
WS = Wedge Anchor Steel System
Direction
IF REQUIRED
BI = Bi-Directional

# DISPLAYED	ACC:
1 2 3 4	
5 6 7 8	
9 10 11 12	
13 14 15 16	
17 18 19 20	
21 22 23 24	
25 26 27 28	
29 30 31 32	
33 34 35 36	
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41 42 43 44	
45 46 47 48	
49 50 51 52	
53 54 55 56	
57 58 59 60	
61 62 63 64	

TYPES OF INSTALLATIONS

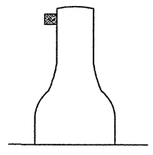


GND



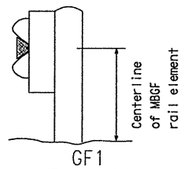
Surface Mount & Self Righting Surface Mount

SLF & SRF

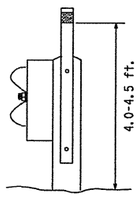


Concrete Barrier

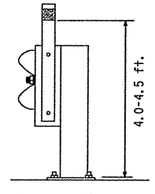
CTB
(Type C only)



GF1
(Type C only)



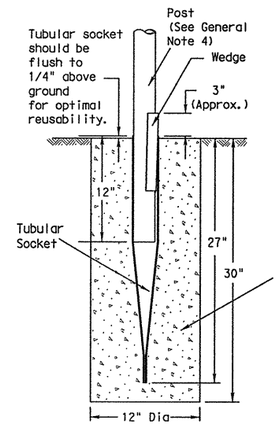
GF2



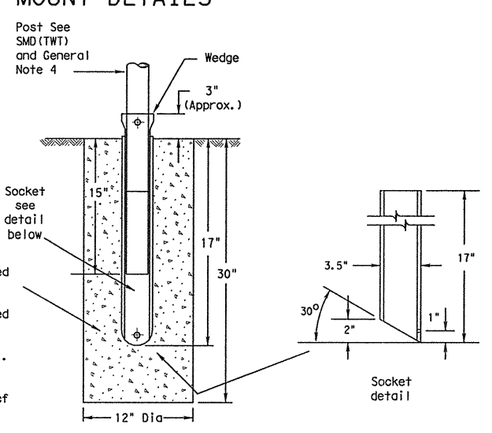
MBGF at low fill culvert

GF3

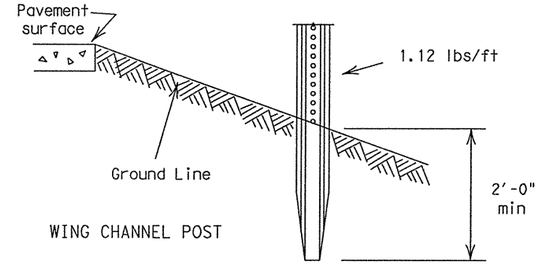
GROUND MOUNT DETAILS



WEDGE ANCHOR STEEL SYSTEM



WEDGE ANCHOR PLASTIC SYSTEM



WING CHANNEL POST

NOTE: Wing Channel post option is to be used for Type 2 Object Markers and delineators only

GENERAL NOTES

1. Place delineators on a section of roadway the same distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When object markers are more than 8 ft from the edge of the pavement, it may not be possible to maintain a height of 4.0-4.5 ft. If this is the case, place the object markers as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (DRIVEABLE & SURFACE MOUNT TYPES)	DMS-4400
FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

DELINEATOR & OBJECT MARKER INSTALLATION AND MATERIAL DESCRIPTION D & OM(1)-04

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DN: DAS	CK: GRB	DW: FDN	CK: CAL

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
	DAL	6	SEE TITLE SHEET	385

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH 30

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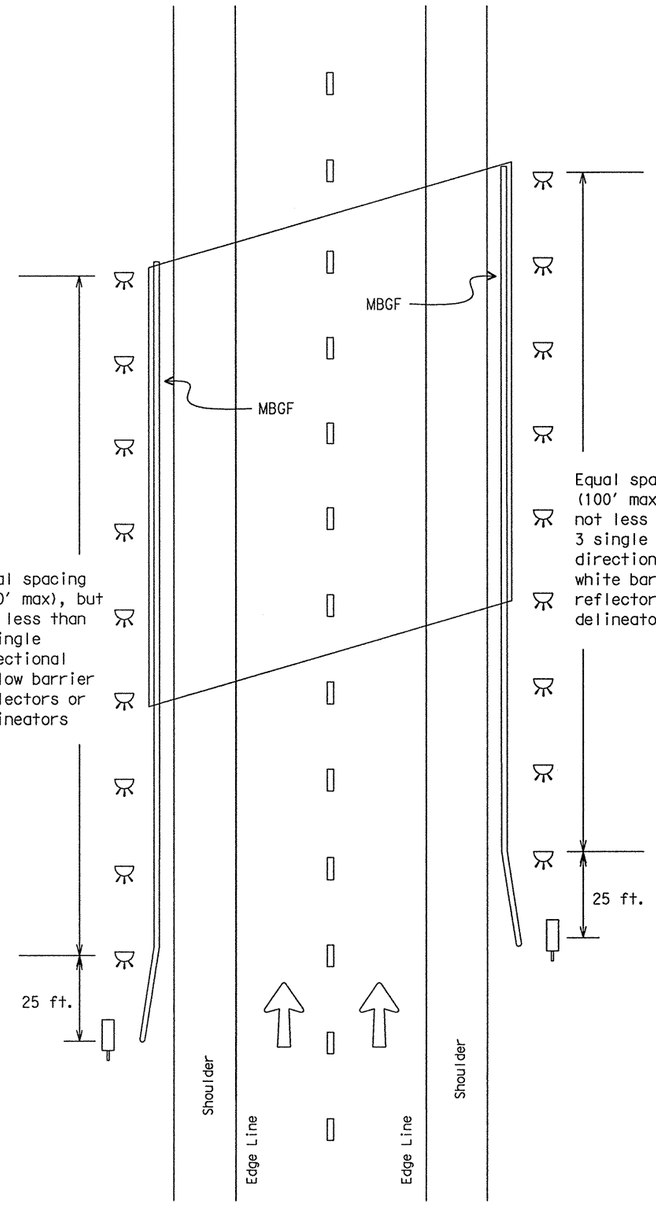
ACC: ----------

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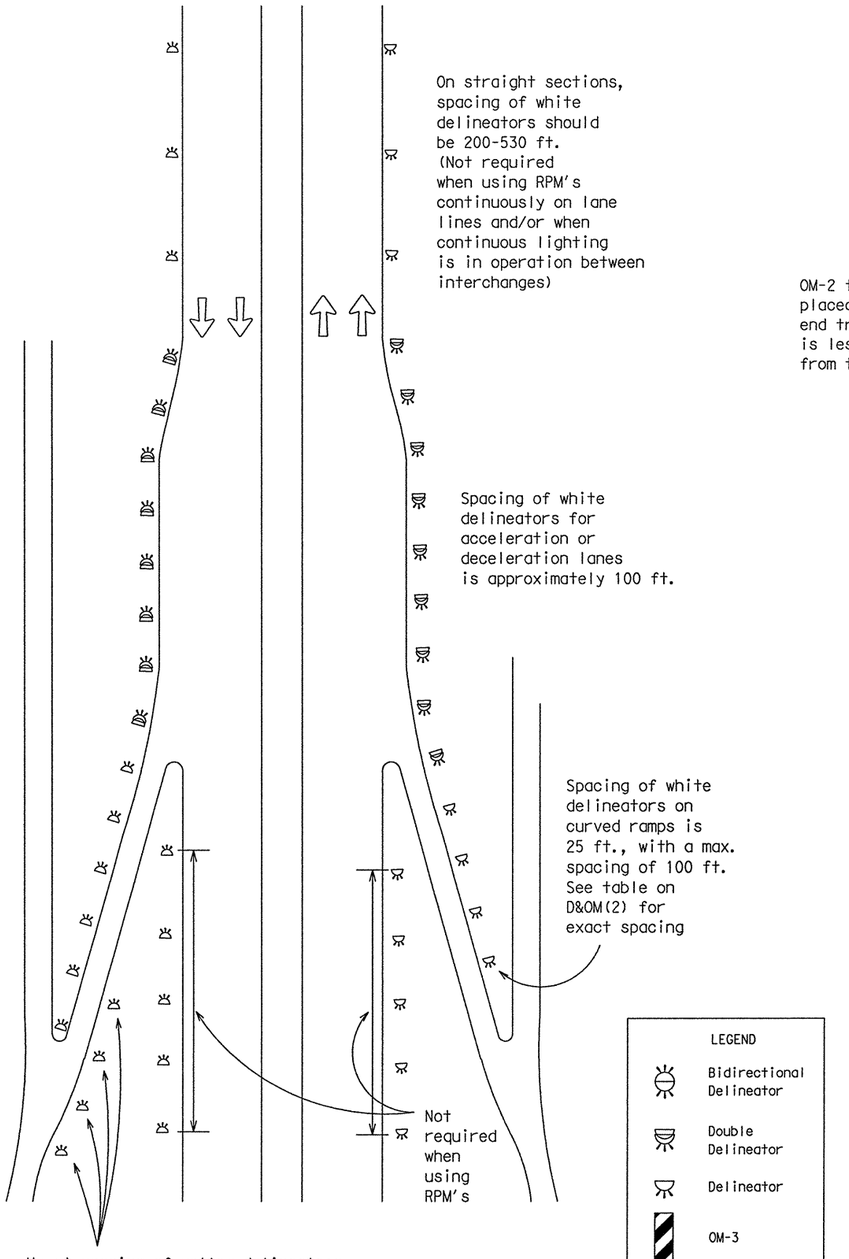
| | | |

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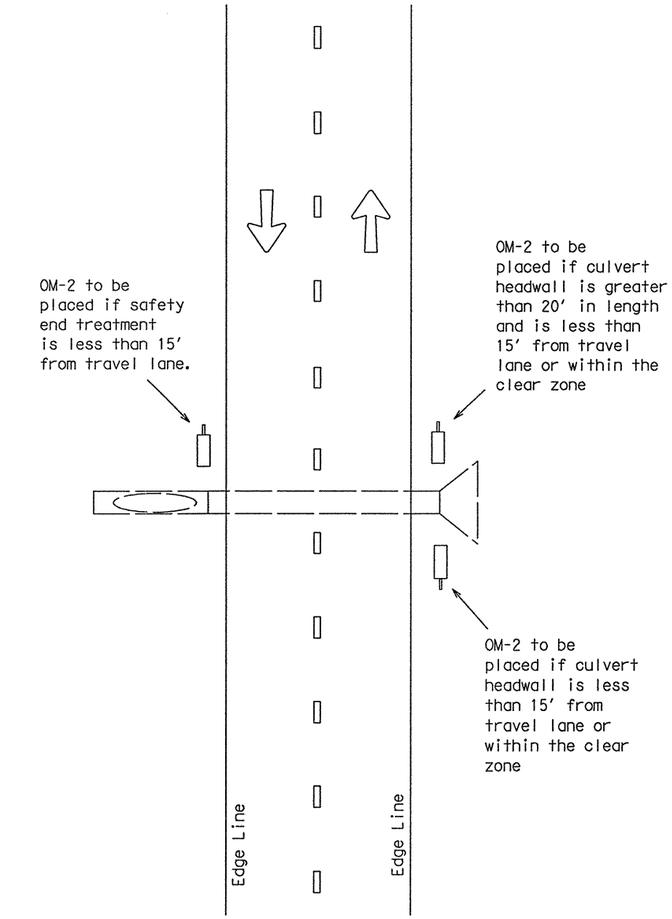
Divided Roadway with Metal Beam Guard Fence



Freeway Delineation including Ramps



For Culverts without MBGF



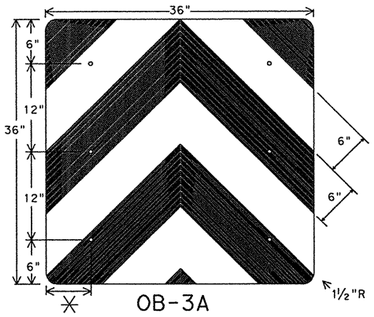
LEGEND

- Bidirectional Delineator
- Double Delineator
- Delineator
- OM-3
- OM-2

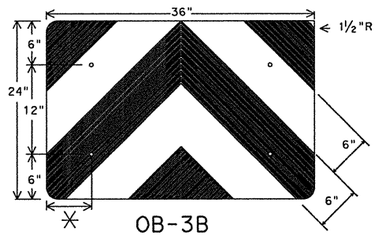
5 DISPLAYED

| | | |

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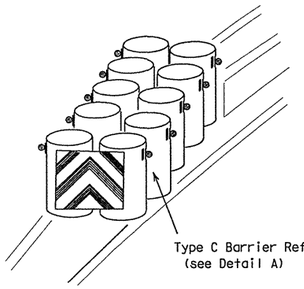


OB-3A



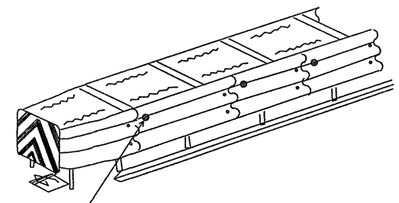
OB-3B

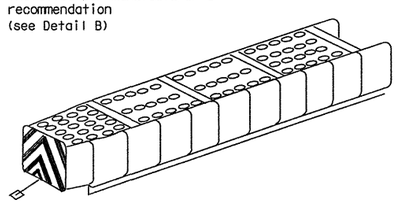
✳ adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer.

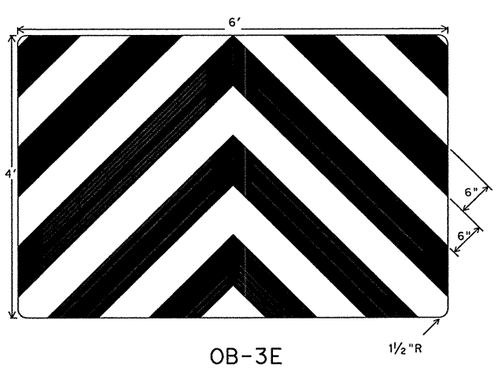


Object Marker blank to be 0.08" thick sheet aluminum conforming to ASTM B-209 Alloy 6061-T6 aluminum as per Specification DMS 7110.

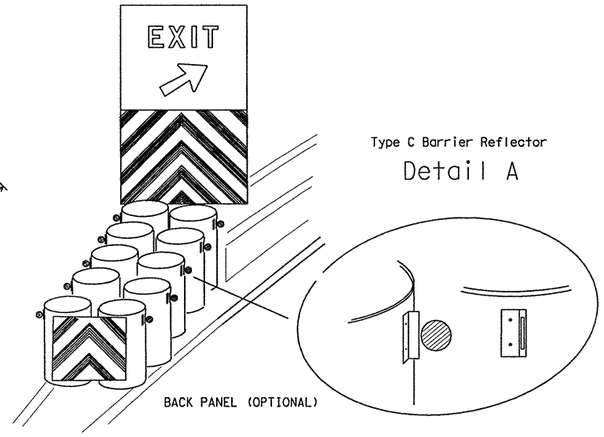
Mounting should be flush with top of VIA. Minimum size 36" x 24".





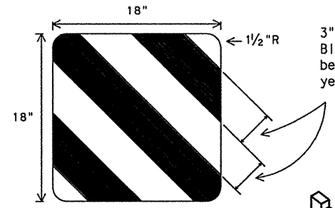


OB-3E



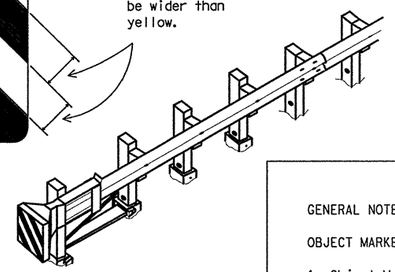
GENERAL NOTES:

1. Back panel will be mounted independent of the attenuator. The minimum mounting height is flush with the top of the attenuator.
2. Attenuator may have additional yellow reflective and black striping, and/or reflectors placed on sides. CHEVRONS (W1-8) may be erected to delineate roadway curvature beyond the attenuator. These additional devices will be installed if required elsewhere in the plans.
3. Mount Back Panel per details on SMD Standards, or as detailed elsewhere in the plans.



OB-3F

3" minimum to 4" maximum. Black stripes may be wider than yellow.



TYPICAL GUARDRAIL END TREATMENT

GENERAL NOTES:

OBJECT MARKERS

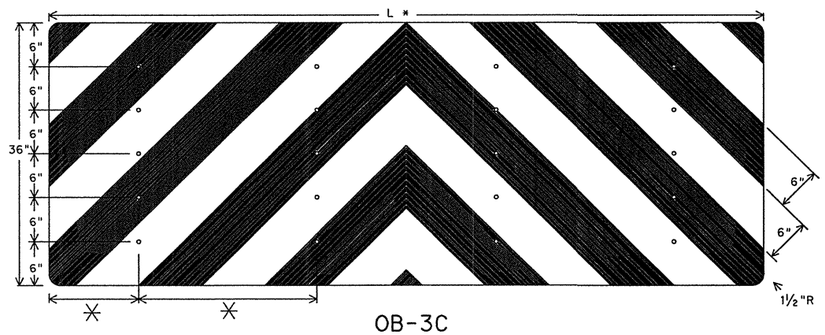
1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300, Type C. Background shall be yellow reflective and Chevron shall be black.
2. OB-3F is intended for use only with guardrail terminal ends. OM-BF may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears.
3. Size may be reduced to fit smaller devices, however, the minimum size shall be:
   (a) 24 x 24 inch for attenuators, and
   (b) 18 x 18 inches for guardrail end treatments.
4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
5. When traffic passes only on one side of attenuator, only the OM-3 marker should be installed. OM-3 should be installed per the requirements of D & OM Standards with a minimum mounting height of 18 inches.

TYPE C REFLECTORS

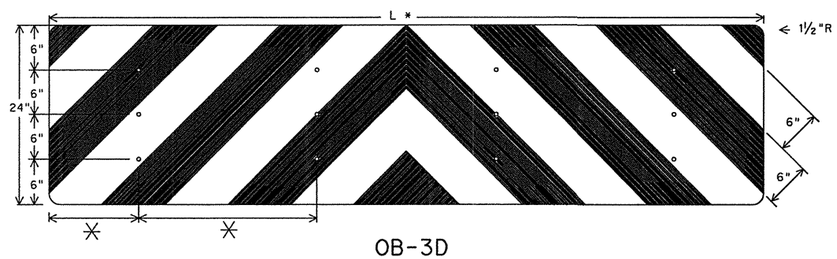
1. Type C delineators shall consist of a Type A or Type B reflector unit (per DMS 8600) attached to a bracket to facilitate delineator mounting on attenuators, guardrails and concrete traffic barriers.
2. Type C reflectors may also be used to delineate side of attenuator, guardrail and concrete traffic barrier.
3. Type C reflectors shall meet the requirements of DMS 8600.

A list of approved Type C Delineators can be found at:

ftp//ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/typecdeln.pdf



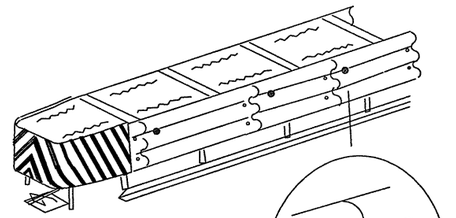
OB-3C

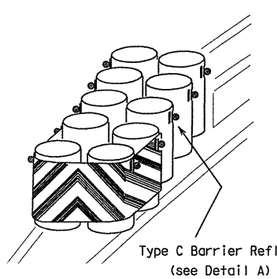


OB-3D

✳ spacing adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

Mounting should be flush with top of attenuator. Minimum size 96" x 24".





Type C Barrier Reflector
(see Detail A)

5 DISPLAYED	ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	----------
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	----------
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48	----------
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63	----------

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

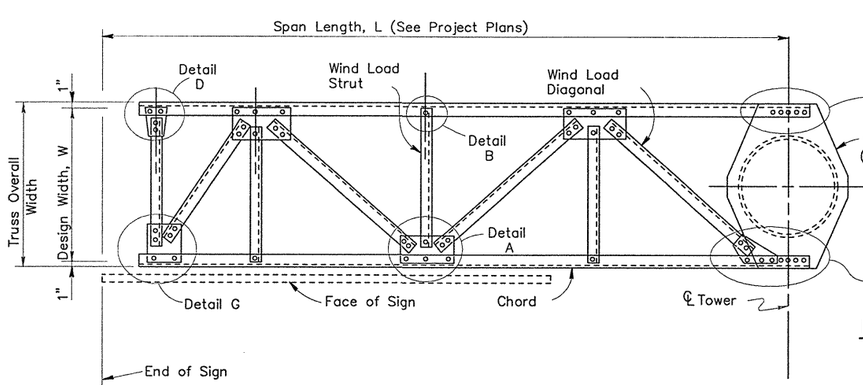
DELINEATORS & OBJECT MARKERS FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-04

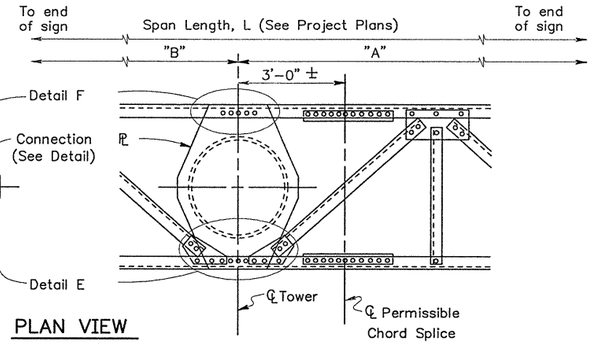
© TxDOT December 1989	DN: LR	CK: -	DW: DN	CK: -	NEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-92	DAL	6	SEE TITLE SHEET	388
8-95				
4-98	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
8-04	ROCKWALL		009 / 12 / 073	IH 30

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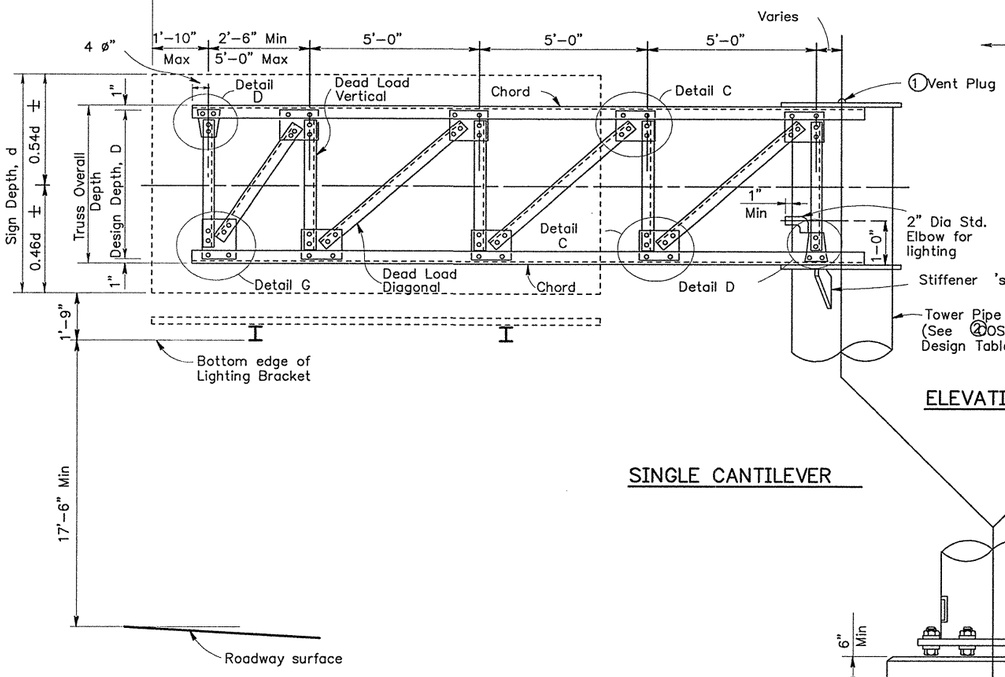


PLAN VIEW

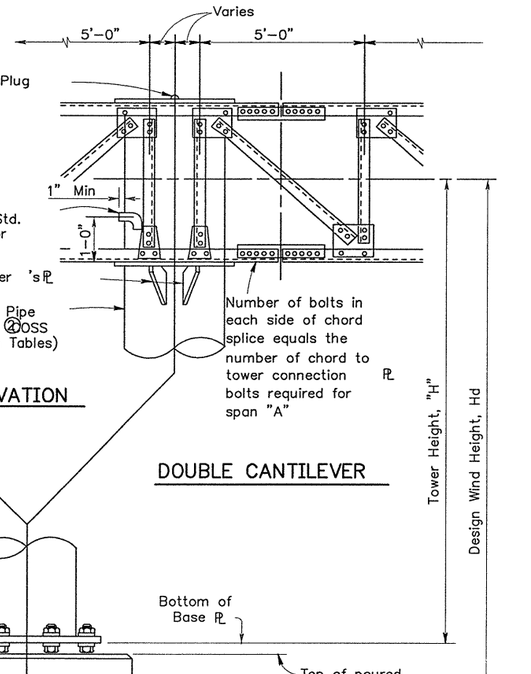


GENERAL NOTES:

Design conforms to 1975 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto. Connection details are typical only. Actual size of member and number of bolts will vary. The details on this sheet are intended as a guide only. See "Cantilever Overhead Sign Supports" or "High Level Cantilever Overhead Sign Supports" sheets for number of bolts and size of members.
Gusset plates to be same thickness as thickest web member in connection.



SINGLE CANTILEVER



DOUBLE CANTILEVER

ELEVATION

See standard drawing, COSSF for Hand Hole, Base ℄ Anchor Bolt and Foundation Details.

① Note: Cap shall be solid steel sheet ∗" nominal thickness. Drill,tap and plug galvanizing vent. Weld plate to pipe with ∗" weld all around.

② For COSS design tables see standard drawing, "Cantilever Overhead Sign Supports" or "High Level Cantilever Overhead Sign Supports".

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

CANTILEVER OVERHEAD SIGN SUPPORT DETAILS

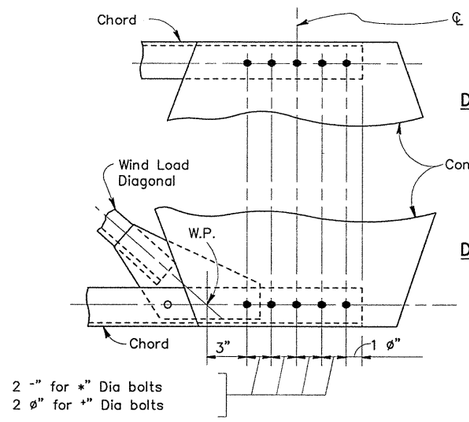
COSSD

FILE: cossd.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
©TxDOT November 2007	DISTRICT	FEDERAL AID PROJECT					SHEET
REVISIONS	DAL	SEE TITLE SHEET					369
	COUNTY			CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL			009	12	073	IH 30

66A

PATH:
LEVELS DISP 1 2 12

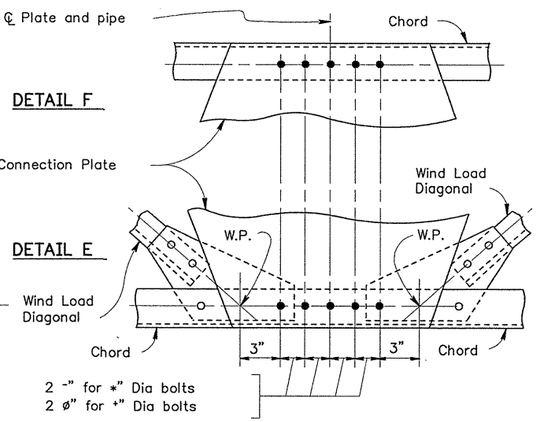
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DETAIL F

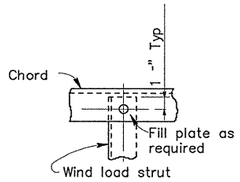
DETAIL E

SINGLE CANTILEVER

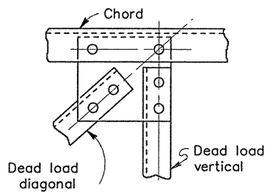


DOUBLE CANTILEVER

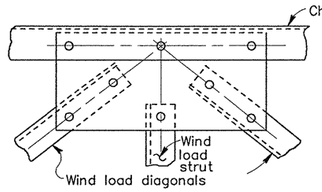
CONNECTION DETAILS



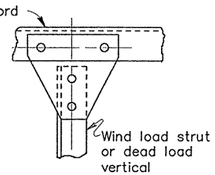
DETAIL B



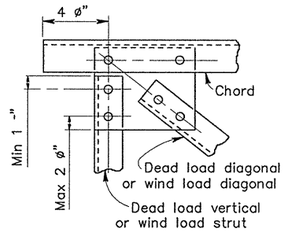
DETAIL C



DETAIL A

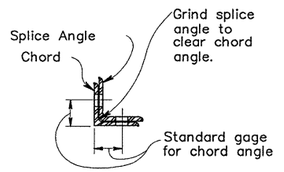


DETAIL D

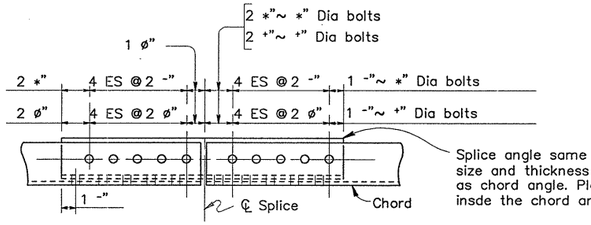


DETAIL G

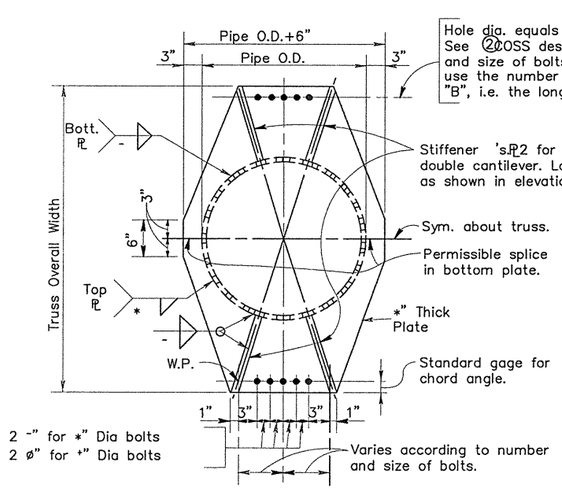
TOTAL NO. OF BOLTS IN DIAG'S. IN JOINT	NUMBER OF BOLTS REQD. IN GUSSET ℄ TO CHORD CONNECTION
0	2
2	2
3	3
4	3
5	4
6	4
8	5
10	6



SECTION ON ℄ SPLICE

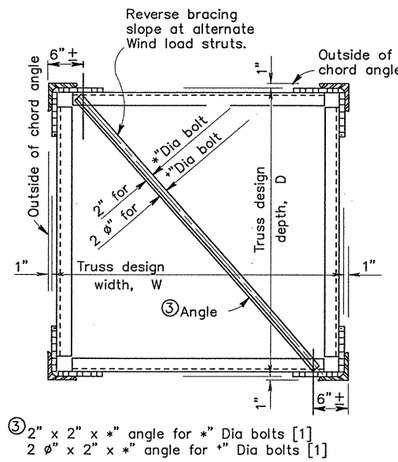


SINGLE SHEAR CHORD SPLICE



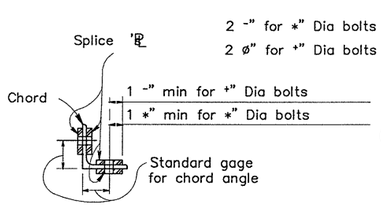
CONNECTION PLATE DETAIL

STIFFENER ℄ DETAIL

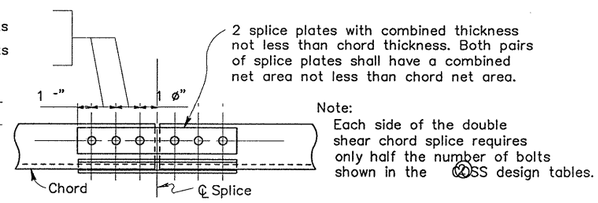


TRUSS SECTION

(DIAGONALS NOT SHOWN)

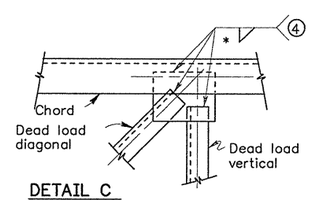


SECTION ON ℄ SPLICE



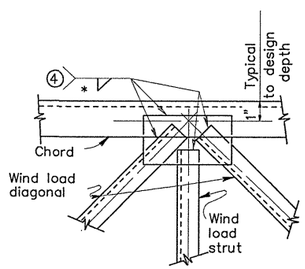
DOUBLE SHEAR CHORD SPLICE

SPLICE DETAILS



DETAIL C

(Gusset plates in other details to be similar)



DETAIL A

ALTERNATE WELDED CONNECTION DETAILS

④MINIMUM LENGTH OF *" FILLET WELD REQUIRED		
NUMBER OF BOLTS	TO REPLACE *" DIA BOLTS	TO REPLACE +" DIA BOLTS
1	2"	3"
2	4"	6"
3	6"	9"
4	8"	11 ø"
5	10"	14 ø"
6	12"	17 ø"
7	14"	20"

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division

CANTILEVER OVERHEAD SIGN SUPPORT DETAILS

COSSD

FILE: cossd.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	SEE TITLE SHEET		390
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	009	12	073	IH 30

668

PATH:
LEVELS DISP
1 2
1 2

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Washers shall conform to ASTM F436.

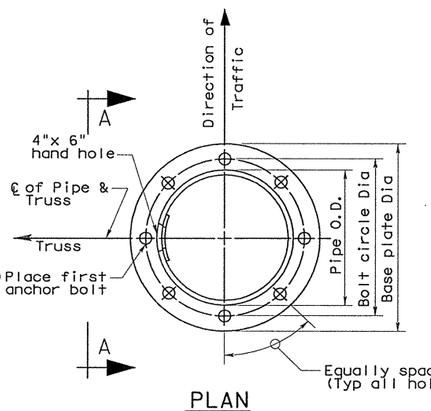
ANCHOR BOLT DIA. d	WASHER DIMENSIONS: OUTSIDE DIAMETER	HOLE DIAMETER	THICKNESS: MIN.	THICKNESS: MAX.	HOLE IN BASE PLATE
1 ½" or less	2d	d + ⅛"	0.136"	0.177"	d + ¼"
1 ¾"	2d - ⅛"	d + ⅛"	0.178"	0.280"	d + 5/16"
2"	2d - ¼"	d + ⅛"	0.178"	0.280"	d + 5/16"
Over 2"	2d - ½"	d + ⅛"	0.240"	0.340"	d + 5/16"

ANCHOR BOLT SIZE: DIA	BOLT ① LENGTH	THREAD ① LENGTH	PROJECTION LENGTH	GALVAN. ① LENGTH
1 ¼"	2'-11"	5"	5 ¼"	11 ¼"
1 ⅜"	3'-1"	5 ½"	5 ¾"	11 ¾"
1 ½"	3'-4"	6"	6 ¼"	1'-0 ¼"
1 ¾"	3'-10"	7"	7 ¼"	1'-1 ¼"
2"	4'-3"	8"	8 ¼"	1'-2 ¼"
2 ¼"	4'-9"	9"	9 ¼"	1'-3 ¼"
2 ½"	5'-2"	10"	10 ¼"	1'-4 ¼"
2 ¾"	5'-8"	11"	11 ¼"	1'-5 ¼"
3"	6'-1"	1'-0"	1'-0 ¼"	1'-6 ¼"

① Anchor Bolt Fabrication Tolerances:
Bolt Length ~ ±½"
Thread Length ~ ±½"
Galvanized Length ~ -¼"

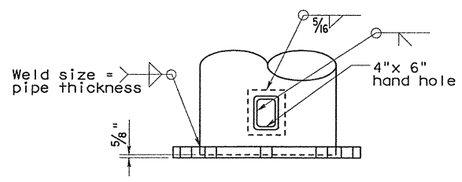
ANCHOR BOLT SIZE	PIPE OUTSIDE DIAMETER 16": BOLT CIRCLE DIA	16": DRILLED SHAFT SIZE	16": DRILLED SHAFT REINF	20": BOLT CIRCLE DIA	20": DRILLED SHAFT SIZE	20": DRILLED SHAFT REINF	24": BOLT CIRCLE DIA	24": DRILLED SHAFT SIZE	24": DRILLED SHAFT REINF	30": BOLT CIRCLE DIA	30": DRILLED SHAFT SIZE	30": DRILLED SHAFT REINF
1 ¼"Dia x 2'-11"	20 ½"	36" Dia	14-#8 (A)	24 ½"	36" Dia	14-#8 (A)						
1 ⅜"Dia x 3'-1"	20 ¾"	36" Dia	12-#9 (A)	24 ¾"	36" Dia	12-#9 (A)						
1 ½"Dia x 3'-4"	21"	36" Dia	12-#9 (A)	25"	42" Dia	14-#9 (A)	29"	42" Dia	14-#9 (C)			
1 ¾"Dia x 3'-10"	21 ½"	36" Dia	10-#10(A)	25 ⅜"	42" Dia	12-#10(B)	29 ⅜"	42" Dia	12-#10(C)	35 ⅜"	48" Dia	16-#10(C)
2"Dia x 4'-3"	22"	36" Dia	12-#10(A)	25 ¾"	42" Dia	12-#10(B)	29 ¾"	48" Dia	16-#10(C)	35 ¾"	54" Dia	18-#10(C)
2 ¼"Dia x 4'-9"	22 ½"	36" Dia	10-#11(A)	26"	42" Dia	10-#11(B)	30"	48" Dia	14-#11(C)	36"	54" Dia	14-#11(D)
2 ½"Dia x 5'-2"				26 ½"	42" Dia	12-#11(B)	30 ½"	48" Dia	16-#11(C)	36 ½"	54" Dia	16-#11(D)
2 ¾"Dia x 5'-8"							31 ½"	48" Dia	18-#11(D)	37"	54" Dia	20-#11(D)
3"Dia x 6'-1"										37 ½"	54" Dia	24-#11(D)

A = #3 Plain spiral at 6" pitch (Grade 40)
B = #4 Plain spiral at 6" pitch (Grade 40)
C = #4 Plain spiral at 6" pitch (Grade 60)
D = #4 Plain spiral at 3 ½" pitch (Grade 60)



PLAN

② See "Cantilever Overhead Sign Support" or "High Lever Cantilever Overhead Sign Support" sheets for number and size.

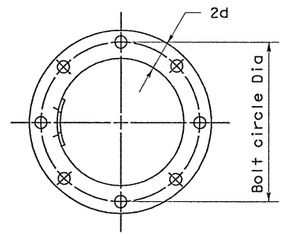


Cut 5" x 7" hole in pipe. Center 4" x 6" hand hole in ⅜" x 8" x 10" back up plate. Provide attachable cover made from section cut from pipe.

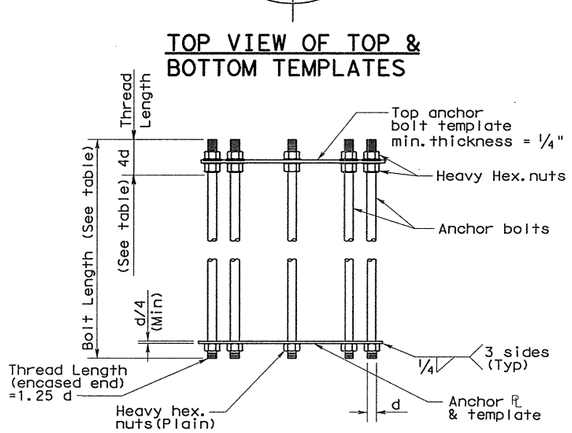
VIEW A-A

③ BASE PLATE & HANDHOLE DETAILS

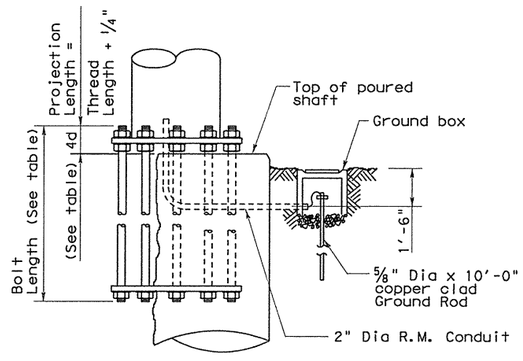
③ See "Cantilever Overhead Sign Support" or "High Level Cantilever Overhead Sign Support" sheets for Diameter and thickness of base plate.



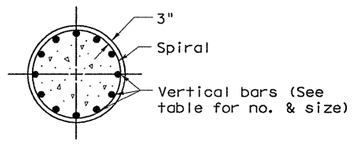
TOP VIEW OF TOP & BOTTOM TEMPLATES



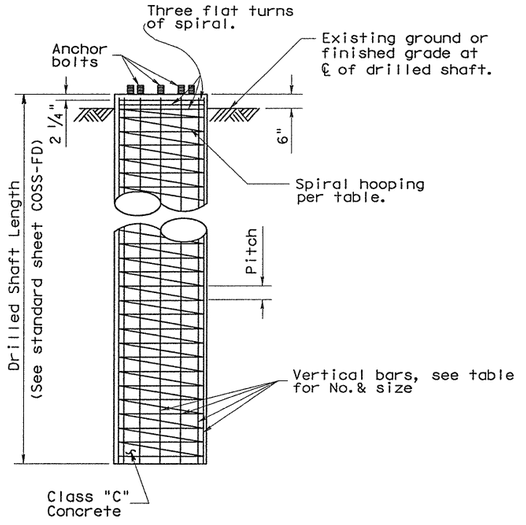
ANCHOR BOLT ASSEMBLY
(PRIOR TO INSTALLATION)



BEARING SEAT ELEVATION



SECTION



FOUNDATION DETAIL

GENERAL NOTES:

Concrete shall be Class "C".
Reinforcing shall conform to Item 440, "Reinforcing Steel".
Anchor bolts and nuts for anchor bolts shall be "Alloy Steel" per Item 449, "Anchor Bolts".
Anchor bolts shall be rigidly held in position during concrete placement using steel templates at the top and bottom. The top templates shall be removed after the concrete has set.
Lubricate and tighten anchor bolts when erecting the structure per Item 449, "Anchor Bolts". After the structure has been aligned in its final position and the anchor bolts have been properly tightened, tack weld anchor bolt nuts to washer, and tack weld washers to base plate. Galvanizing in tack welded areas shall be repaired in accordance with Item 445, "Galvanizing".
All vertical reinforcing shall be carried to the bottom of the Drilled Shaft.

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Traffic Operations Division

CANTILEVER OVERHEAD SIGN SUPPORT FOUNDATION

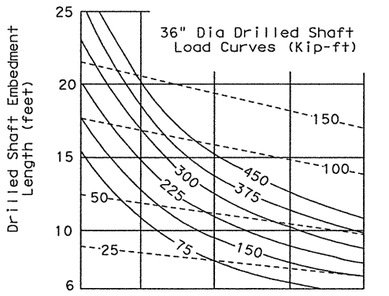
COSSF

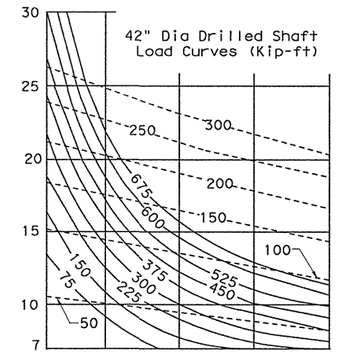
FILE: cossf.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	SEE TITLE SHEET		391
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	009	12	073	IH 30

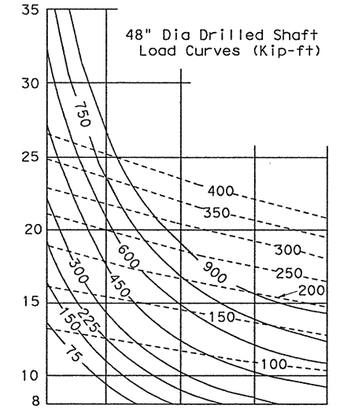
67

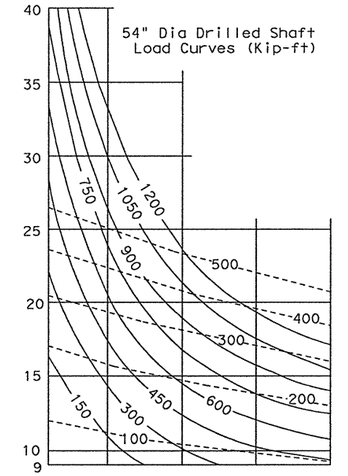
PATH:
cD
LEVELS DI

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① ∅ = Angle of internal friction of soil (degrees)

② N = Texas cone penetrometer value (blows per ft)

④ C(psi) = Cohesive shear strength of soil (psi)

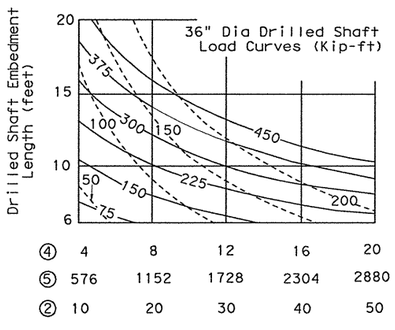
⑤ C(psf) = Cohesive shear strength of soil (psf)

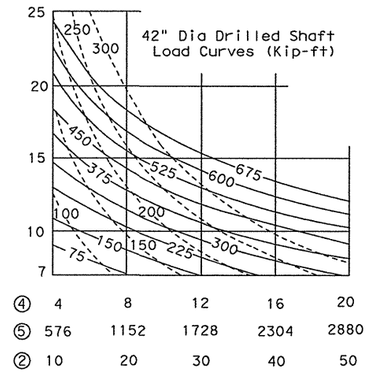
③ SUBMERGED SAND SOIL (COHESIONLESS)

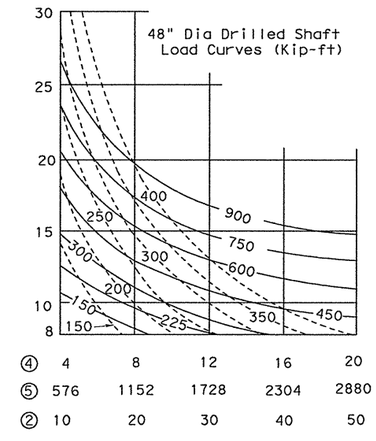
Moment ————

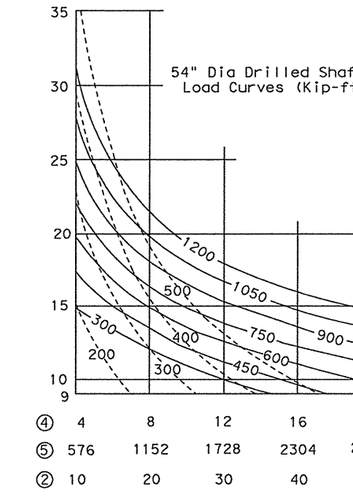
Torsion ----------

③ Note:
For unsubmerged sands and clayey sands the charts for clay soil will give a conservative foundation design.





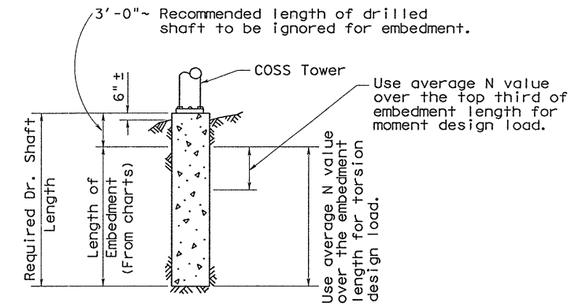




CLAY SOIL (COHESIVE)

Moment ————

Torsion ----------



PROCEDURE:

1. Determine design moment and torsion, and the required drilled shaft diameter as outlined in the selection example sheet COSS-SE.
2. Make an initial estimate of the required embedment length.
3. From soil exploration data determine type of soil and average N value or soil property along the upper third of the drilled shaft.
4. Enter chart (for the correct shaft diameter and soil type) from the bottom at the average N value or soil property determined in step 3.
5. Proceed vertically into chart and locate intersection with design moment. Interpolate between moment curves (solid lines) as needed.
6. From intersection point turn 90° to left and read embedment length along vertical scale.
7. If embedment length differs significantly from estimated value return to step 3 with the embedment length determined in step 6.
8. From soil exploration data determine average N value or soil property over the entire length of the embedment.
9. Enter chart (for correct shaft diameter and soil type) from the bottom at the average N value or soil property determined in step 8.
10. Proceed vertically into chart and locate intersection with design torsion. Interpolate between torsion curves (dashed lines) as needed.
11. From intersection point turn 90° to left and read embedment length along vertical scale.
12. Compute the required length of drilled shaft by adding 3'-0" to longer embedment length required for moment or torsion.

GENERAL NOTES:

These charts are for use with Cantilever Overhead Sign Supports with one shaft per tower.

Solid curves are base moment in Kip-ft.

Dash curves are base torsion in Kip-ft.

Minimum embedment of drilled shaft is two diameters.

Add 3'-0" to the required embedment length to determine the required length of drilled shaft.

Texas Department of Transportation
Traffic Operations Division

FOUNDATION EMBEDMENT SELECTION CHARTS

COSS-FD

FILE: coss-fd.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
©TxDOT November 2007	DISTRICT	FEDERAL AID PROJECT				SHEET
REVISIONS	DAL	SEE TITLE SHEET				392
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

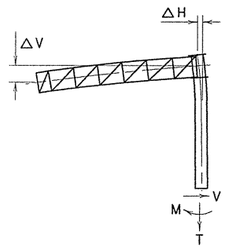
LEVELS DI. 1:2 PATH: .D 12

ZONE 1 100 MPH WIND

TOWER HEIGHT	10' SPAN												15' SPAN												20' SPAN												25' SPAN												TOWER HEIGHT
	TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				
(ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	(ft)
25'	16	0.375	0.240	1 ½	8	21"	25 x1	0.2	6.46	27.82	153.70	16	0.531	0.384	1 ¾	8	21 ½"	26 x2¼	0.5	9.30	62.60	225.51	20	0.438	0.411	2	8	25 ¾"	30½x2	0.8	12.34	111.29	300.38	24	0.469	0.356	2	8	29 ¾"	34½x2	0.9	15.37	173.89	375.94	25'
26'	↑	0.375	0.250	↓	↑	↓	25 x1	↑	6.49	↑	160.15	↑	0.531	0.415	1 ¾	↑	21 ½"	26 x2¼	↑	9.33	↑	234.80	↑	0.438	0.444	↑	↑	↑	30½x2	↑	12.37	↑	312.67	↑	0.469	0.385	2	↑	29 ¾"	34½x2	↑	15.41	↑	391.21	26'
27'		0.406	0.260				25 x1		6.52		166.65		0.531	0.448	1 ¾		21 ½"	26 x2¼		9.36		244.12		0.469	0.449				30½x2¼		12.41		325.01		0.500	0.391	2		29 ¾"	34½x2¼		15.46		406.54	27'
28'		0.438	0.260	↓		↓	25 x1		6.55		173.18		0.656	0.400	2		22"	27 x2⅜		9.39		253.47		0.500	0.455				↓		12.44		337.38		↓	0.421	2 ¼		30"	35 x2¼		15.50		421.92	28'
29'		0.469	0.260	1 ½		21"	25 x1		6.58		179.73		0.656	0.429	↑		↑	27 x2⅜		9.42		262.85		0.500	0.488						12.48		349.80			0.451	↑		↑	↑		15.54		437.35	29'
30'			0.270	1 ¾		21 ½"	26 x1		6.61		186.32		0.687	0.441				27 x2½		9.45		272.26		0.531	0.495	↓		↓	30½x2¼		12.52		362.25		0.500	0.483						15.59		452.82	30'
31'		↓	0.290	↑		↑	26 x 2		6.64		192.94		↑	0.471				↑		9.48		281.70		0.562	0.501	2		25 ¾"	30½x2⅜		12.55		374.75		0.531	0.488					0.9	15.63		468.35	31'
32'		0.469	0.310				26 x 2		6.67		199.59		↓	0.502				↓		9.50		291.17		0.562	0.534	2 ¼		26"	31 x2⅜		12.59		387.28		↑	0.520					1.0	15.68		483.93	32'
33'		0.500	0.320				26x2		6.70		206.26		0.687	0.534						9.53		300.68		0.562	0.568	↑		↑	31 x2⅜		12.63		399.85			0.553	↑		↑	35 x2¼	↑	15.72		499.55	33'
34'		0.500	0.330				↑		6.73		212.97		0.750	0.525	2		22"	27 x2½		9.56		310.21		0.594	0.573				31 x2⅜		12.66		412.46		↓	0.587	2 ¼		30"	35 x2⅜		15.76		515.23	34'
35'		0.500	0.350				↓		6.75		219.70		↑	0.557	2 ¼		22 ½"	28 x2⅝		9.59		319.77		0.594	0.607				31 x2½		12.70		425.11		0.531	0.622	2 ½		30 ½"	36 x2⅜		15.81		530.95	35'
36'		0.531	0.350				26x2		6.78		226.47		↓	0.589	↑		↑	28 x2⅝		9.62		329.37		0.594	0.643				31 x2⅝		12.74		437.80		0.562	0.624	↑		↑	36 x2½	↓	15.85		546.71	36'
37'		0.531	0.370				26x2¼		6.81		233.26			0.622				28 x2		9.65		338.99		0.625	0.648				31 x2⅝		12.77		450.53		0.562	0.659				36 x2½	1.0	15.89		562.53	37'
38'		0.531	0.390				↑		6.84		240.08		0.750	0.656				28 x2		9.65		347.49		0.625	0.684				31 x2⅝		12.81		463.29		0.562	0.695				36 x2½	1.1	15.94		578.39	38'
39'		0.656	0.350	↓		↓	↓		6.87		246.94		0.843	0.626				28 x2		9.71		358.32		0.656	0.689	↓		↓	31 x2		12.84		476.09		0.594	0.696				36 x2⅝		15.98		594.30	39'
40'		0.656	0.360	1 ¾		21 ½"	26x2¼		6.90		253.82		0.843	0.658				28 x2		9.74		368.03		0.656	0.725	2 ¼		26"	31 x2		12.88		488.93		0.594	0.732				36 x2⅝		16.03		610.25	40'
42'		0.656	0.400	2		22"	27x2⅜		6.96		267.67		0.843	0.726				28 x 3		9.80		387.55		0.719	0.736	2 ½		26 ½"	31½x2		12.95		514.72		0.625	0.770				36 x2		16.11		642.29	42'
44'	↓	0.687	0.420	2		22"	27x2⅜	↓	7.02	↓	281.64	↓	1.031	0.675	↓	↓	↓	28 x 3	↓	9.85	↓	407.18	↓	0.750	0.779	2 ½	↓	26 ½"	31½x2	↓	13.03	↓	540.66	↓	0.656	0.808	↓	↓	↓	36 x2	↓	16.20	↓	674.52	44'
45'	16	0.687	0.440	2	8	22"	27x2⅜	0.2	7.05	27.82	288.67	16	1.218	0.619	2 ¼	8	22 ½"	28 x 3	0.5	9.88	62.60	417.04	20	0.750	0.814	2 ½	8	26 ½"	31½x2	0.8	13.06	111.29	553.68	24	0.688	0.809	2 ½	8	30 ½"	36 x2	1.1	16.24	173.89	690.71	45'

ZONE 1 100 MPH WIND

TOWER HEIGHT	30' SPAN												35' SPAN												40' SPAN												TOWER HEIGHT
	TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS				
(ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)												(ft)
25'	24	0.531	0.475	2 ¼	8	30"	35 x2¼	1.4	18.21	250.41	449.85	30	0.406	0.442	2 ¼	8	36"	41 x 2	1.6	21.34	340.83	529.13	30	0.500	0.502	2 ½	8	36 ½"	42 x2¼	2.1	24.18	445.17	606.83														25'
26'	↑	0.531	0.514	↑	↑	↑	35 x2¼	↑	18.25	↑	467.86	↑	0.406	0.478	↑	↑	↑	41 x 2	1.7	21.40	↑	550.13	↑	0.500	0.543	↑	↑	↑	42 x2¼	2.2	24.23	↑	630.43														26'
27'		0.562	0.526				35 x2⅜		18.29		485.93		0.438	0.479				41 x2		21.45		571.21		0.500	0.586				42 x2⅜	2.3	24.29		654.13														27'
28'		0.562	0.566	↓		↓	35 x2⅜	1.4	18.34		504.07			0.515	↓		↓	41 x2		21.50		592.37		0.531	0.595				42 x2⅜		24.34		677.92														28'
29'		0.562	0.607	2 ¼		30"	35 x2⅜	1.5	18.38		522.25		↓	0.552	2 ¼		36"	41 x2		21.56		613.61		0.531	0.638				42 x2⅜	↓	24.40		701.81														29'
30'		0.594	0.617	2 ½		30 ½"	36 x2½	1.5	18.43		540.50		0.438	0.591	2 ½		36 ½"	42 x2¼	↓	21.61		634.92		0.531	0.683	↓		↓	42 x2½	2.3	24.45		725.77														30'
31'		0.594	0.659	↑		↑	36 x2½	1.5	18.47		558.79		0.469	0.591	↑		↑	42 x2¼	1.7	21.67		656.31		0.562	0.691	2 ½		36 ½"	42 x2½	2.4	24.51		749.82														31'
32'		0.594	0.702				36 x2⅝	1.6	18.51		577.14		0.469	0.630				42 x2¼	1.8	21.72		677.76		0.562	0.737	2 ¾		37"	43 x2½		24.56		773.96														32'
33'		0.625	0.712				36 x2⅝	↑	18.56		595.54		0.469	0.670				42 x2⅜	↑	21.78		699.28		0.562	0.783	↑		↑	43 x2⅝		24.61		798.17														33'
34'		0.625	0.756				36 x2⅝		18.60		614.00		0.500	0.669				42 x2⅜		21.83		720.87		0.594	0.789				43 x2⅝	↓	24.67		822.45														34'
35'		0.656	0.766				36 x2		18.64		632.50		0.500	0.709				42 x2½		21.89		742.53		0.594	0.836				43 x2⅝	2.4	24.72		846.81														35'
36'		0.656	0.811				36 x2		18.69		651.05		0.500	0.750	↓		↓	42 x2½		21.94		764.25		0.594	0.885				43 x2	2.5	24.78		871.25														36'
37'		0.688	0.820				36 x2		18.73		669.66		0.531	0.749	2 ½		36 ½"	42 x2½		22.00		786.04		0.625	0.891				43 x2	↑	24.83		895.75														37'
38'		0.688	0.865	↓		↓	36 x2		18.78		688.31		0.531	0.790	2 ¾		37"	43 x2⅝		22.05		807.89		0.625	0.940				43 x2		24.89		920.33														38'
39'		0.719	0.875	2 ½		30 ½"	36 x2		18.82		707.01		0.562	0.788	↑		↑	43 x2⅝		22.10		829.80		0.656	0.946				43 x2	↓	24.94		944.97														39'
40'		0.719	0.920	2 ¾		31 ½"	38 x2		18.86		725.76		0.562	0.829				43 x2		22.16		851.78		0.656	0.995	2 ¾		37"	43 x2	2.5	25.00		969.68														40'
42'		0.750	0.977	↑		↑	38 x 3		18.95		763.41		0.594	0.868				43 x2	↓	22.27		895.92		0.688	1.150	3		37 ½"	44 x 3	2.7	25.11		1019.30														42'
44'	↓	0.937	0.877	↓	↓	↓	38 x 3	↓	19.04	↓	801.24	↓	0.625	0.905	↓	↓	↓	43 x2	1.8	22.38	↓	940.31	↓	0.719	1.106	3	↓	37 ½"	44 x 3	2.6	25.22	↓	1069.19														44'
45'	24	0.937	0.918	2 ¾	8	31 ½"	38 x3	1.6	19.08	250.41	820.23	30	0.625	0.947	2 ¾	8	37"	43 x2	1.9	22.43	340.83	962.59	30	0.719	1.157	3	8	37 ½"	44 x 3	2.6	25.27	445.17	1094.23														45'



ELEVATION

(SHOWING DESIGN LOADS AND DEAD LOAD DEFLECTIONS)

TRUSS DETAILS

SPAN	10', 15', & 20'	25'	30'	35'	40'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5
CHORD-①, Unless Otherwise Shown	L 3 x 3 x 3/16 ② [3]	L 3 x 3 x ¼ ② [4]	L3 ½x3 ½x 5/16 [8]	L3 ½x3 ½x 5/16 [9]	L3 ½x3 ½x ⅜ [8]
DEAD LOAD DIAGONAL-②	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD DIAGONAL-②	L 3 x 3 x 3/16 [3]	L 3 x 3 x 3/16 [3]	L 3 x2 ½x ¼ [3]	L 3 x2 ½x ¼ [4]	L 3 x 3 x ¼ [3]
DEAD LOAD VERTICAL-②	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD STRUT-②	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L2 ½x2 ½x 3/16 [1]
TRUSS DEAD LOAD	42 lb/ft	47 lb/ft	59 lb/ft	60 lb/ft	70 lb/ft
SIZE H. S. BOLTS IN CONNECTION	⅝" DIA	⅝" DIA	⅝" DIA	⅝" DIA	¾" DIA
NO. & SIZE OF H. S. BOLTS IN CHORD ANGLE TO TOWER CONNECTION PLATE	3 ~ ⅝" DIA ea	5 ~ ⅝" DIA or 3 ~ ¾" DIA ea	8 ~ ⅝" DIA or 6 ~ ¾" DIA ea	9 ~ ⅝" DIA or 7 ~ ¾" DIA ea	8 ~ ¾" DIA ea

① "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

② "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

GENERAL NOTES :

Steel for tower pipe shall conform to ASTM A53 Grade B or to ASTM A501. Tower pipe wall thickness shown is the minimum allowable. Fabricator may use the wall thickness shown or pipe of the same diameter with greater wall thickness.

All connection bolts shall conform to Item 447, "Structural Bolting". All structural steel, connection bolts, nuts and washers shall be galvanized in accordance with the Specifications.

Compensate for truss deflection at free end by offsetting upper and lower bolt holes at truss-to-tower connection.

For truss details see standard drawing COSSD.

For base and foundation details see standard drawing COSSF.

For cantilever truss lengths falling between those shown use sizes called for in the next longer span.

Truss and towers for cantilever sign supports are designed for the equivalent area of a 10'-0" deep sign panel over 100% of the span length. Design includes 3 pounds per foot squared for sign panel and 20 pounds per foot for lights and 50 pounds per foot for walkways all placed as specified for the design sign panel.

Details called for hereon are applicable for Design Wind Heights of 30' to 50' inclusive.

Number of High Strength bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.

Deflections shown include the design loads for Truss, Sign Panel, Lights and Walkways.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

PATH:

LEVELS DI... 12

Texas Department of Transportation
Traffic Operations Division

HIGH LEVEL CANTILEVER OVERHEAD SIGN SUPPORTS

HCOSS-Z1

FILE: hcoss-z1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	SEE TITLE SHEET		393
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	009	12	073	IH 30

62

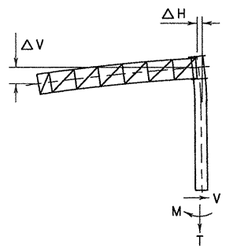
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ZONE 1 100 MPH WIND

TOWER HEIGHT	10' SPAN													15' SPAN														20' SPAN													25' SPAN													TOWER HEIGHT
	TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS			TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS			TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS			TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS							
(ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)							(ft)
25'	16	0.375	0.240	1 1/2	8	21"	25 x1 3/4	0.2	6.46	27.82	153.70	16	0.531	0.384	1 3/4	8	21 1/2"	26 x2 1/4	0.5	9.30	62.60	225.51	20	0.438	0.411	2	8	25 3/4"	30 1/2x2 1/8	0.8	12.34	111.29	300.38	24	0.469	0.356	2	8	29 3/4"	34 1/2x2 1/8	0.9	15.37	173.89	375.94							25'
26'		0.375	0.250				25 x1 3/4		6.49		160.15		0.531	0.415	1 3/4		21 1/2"	26 x2 1/4		9.33		234.80		0.438	0.444				30 1/2x2 1/8		12.37		312.67		0.469	0.385	2		29 3/4"	34 1/2x2 1/8		15.41		391.21							26'
27'		0.406	0.260				25 x1 3/4		6.52		166.65		0.531	0.448	1 3/4		21 1/2"	26 x2 1/4		9.36		244.12		0.469	0.449				30 1/2x2 1/4		12.41		325.01		0.500	0.391	2		29 3/4"	34 1/2x2 1/4		15.46		406.54							27'
28'		0.438	0.260				25 x1 7/8		6.55		173.18		0.656	0.400	2		22"	27 x2 3/8		9.39		253.47		0.500	0.455						12.44		337.38			0.421	2 1/4		30"	35 x2 1/4		15.50		421.92							28'
29'		0.469	0.260	1 1/2		21"	25 x1 7/8		6.58		179.73		0.656	0.429				27 x2 3/8		9.42		262.85		0.500	0.488						12.48		349.80			0.451						15.54		437.35							29'
30'			0.270	1 3/4		21 1/2"	26 x1 7/8		6.61		186.32		0.687	0.441				27 x2 1/2		9.45		272.26		0.531	0.495				30 1/2x2 1/4		12.52		362.25		0.500	0.483						15.59		452.82							30'
31'			0.290				26 x 2		6.64		192.94			0.471						9.48		281.70		0.562	0.501	2		25 3/4"	30 1/2x2 3/8		12.55		374.75		0.531	0.488					0.9	15.63		468.35							31'
32'		0.469	0.310				26 x 2		6.67		199.59			0.502						9.50		291.17		0.562	0.534	2 1/4		26"	31 x2 3/8		12.59		387.28			0.520					1.0	15.68		483.93							32'
33'		0.500	0.320				26 x2 1/8		6.70		206.26		0.687	0.534						9.53		300.68		0.562	0.568				31 x2 3/8		12.63		399.85			0.553				35 x2 1/4		15.72		499.55							33'
34'		0.500	0.330						6.73		212.97		0.750	0.525	2		22"	27 x2 1/2		9.56		310.21		0.594	0.573				31 x2 3/8		12.66		412.46			0.587	2 1/4		30"	35 x2 3/8		15.76		515.23							34'
35'		0.500	0.350						6.75		219.70			0.557	2 1/4		22 1/2"	28 x2 5/8		9.59		319.77		0.594	0.607				31 x2 1/2		12.70		425.11		0.531	0.622	2 1/2		30 1/2"	36 x2 3/8		15.81		530.95							35'
36'		0.531	0.350				26 x2 1/8		6.78		226.47			0.589				28 x2 5/8		9.62		329.37		0.594	0.643				31 x2 5/8		12.74		437.80		0.562	0.624				36 x2 1/2		15.85		546.71							36'
37'		0.531	0.370				26 x2 1/4		6.81		233.26			0.622				28 x2 3/4		9.65		338.99		0.625	0.648				31 x2 5/8		12.77		450.53		0.562	0.659				36 x2 1/2	1.0	15.89		562.53							37'
38'		0.531	0.390						6.84		240.08		0.750	0.656				28 x2 3/4		9.65		347.49		0.625	0.684				31 x2 5/8		12.81		463.29		0.562	0.695				36 x2 1/2	1.1	15.94		578.39							38'
39'		0.656	0.350						6.87		246.94		0.843	0.626				28 x2 7/8		9.71		358.32		0.656	0.689				31 x2 3/4		12.84		476.09		0.594	0.696				36 x2 5/8		15.98		594.30							39'
40'		0.656	0.360	1 3/4		21 1/2"	26 x2 1/4		6.90		253.82		0.843	0.658				28 x2 7/8		9.74		368.03		0.656	0.725	2 1/4		26"	31 x2 3/4		12.88		488.93		0.594	0.732				36 x2 5/8		16.03		610.25							40'
42'		0.656	0.400	2		22"	27 x2 3/8		6.96		267.67		0.843	0.726				28 x 3		9.80		387.55		0.719	0.736	2 1/2		26 1/2"	31 1/2x2 3/4		12.95		514.72		0.625	0.770				36 x2 3/4		16.11		642.29							42'
44'		0.687	0.420	2		22"	27 x2 3/8		7.02		281.64		1.031	0.675				28 x 3		9.85		407.18		0.750	0.779	2 1/2		26 1/2"	31 1/2x2 7/8		13.03		540.66		0.656	0.808				36 x2 3/4		16.20		674.52							44'
45'	16	0.687	0.440	2	8	22"	27 x2 3/8	0.2	7.05	27.82	288.67	16	1.218	0.619	2 1/4	8	22 1/2"	28 x 3	0.5	9.88	62.60	417.04	20	0.750	0.814	2 1/2	8	26 1/2"	31 1/2x2 7/8	0.8	13.06	111.29	553.68	24	0.688	0.809	2 1/2	8	30 1/2"	36 x2 3/4	1.1	16.24	173.89	690.71							45'

ZONE 1 100 MPH WIND

TOWER HEIGHT	30' SPAN													35' SPAN														40' SPAN													TOWER HEIGHT
	TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS			TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS			TOWER PIPE			ANCHOR BOLTS			BASE PLATE	TRUSS	DESIGN LOADS																			
(ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)	O.D. (in)	WALL THICK (in)	DEFL ΔH (in)	SIZE DIA (in)	NO.	BOLT CIR DIA	SIZE (in)	DEFL ΔV (in)	SHEAR V (Kips)	TORSION T (K-ft)	MOMENT M (K-ft)																			(ft)
25'	24	0.531	0.475	2 1/4	8	30"	35 x2 1/4	1.4	18.21	250.41	449.85	30	0.406	0.442	2 1/4	8	36"	41 x 2	1.6	21.34	340.83	529.13	30	0.500	0.502	2 1/2	8	36 1/2"	42 x2 1/4	2.1	24.18	445.17	606.83																			25'
26'		0.531	0.514				35 x2 1/4		18.25		467.86		0.406	0.478				41 x 2	1.7	21.40		550.13		0.500	0.543				42 x2 1/4	2.2	24.23		630.43																							26'
27'		0.562	0.526				35 x2 3/8		18.29		485.93		0.438	0.479				41 x2 1/8		21.45		571.21		0.500	0.586				42 x2 3/8	2.3	24.29		654.13																							27'
28'		0.562	0.566				35 x2 3/8	1.4	18.34		504.07			0.515				41 x2 1/8		21.50		592.37		0.531	0.595				42 x2 3/8		24.34		677.92																							28'
29'		0.562	0.607	2 1/4		30"	35 x2 3/8	1.5	18.38		522.25			0.552	2 1/4		36"	41 x2 1/8		21.56		613.61		0.531	0.638				42 x2 3/8		24.40		701.81																							29'
30'		0.594	0.617	2 1/2		30 1/2"	36 x2 1/2	1.5	18.43		540.50		0.438	0.591	2 1/2		36 1/2"	42 x2 1/4		21.61		634.92		0.531	0.683				42 x2 1/2	2.3	24.45		725.77																							30'
31'		0.594	0.659				36 x2 1/2	1.5	18.47		558.79		0.469	0.591				42 x2 1/4	1.7	21.67		656.31		0.562	0.691	2 1/2		36 1/2"	42 x2 1/2	2.4	24.51		749.82																							31'
32'		0.594	0.702				36 x2 5/8	1.6	18.51		577.14		0.469	0.630				42 x2 1/4	1.8	21.72		677.76		0.562	0.737	2 3/4		37"	43 x2 1/2		24.56		773.96																							32'
33'		0.625	0.712				36 x2 5/8		18.56		595.54		0.469	0.670				42 x2 3/8		21.78		699.28		0.562	0.783				43 x2 5/8		24.61		798.17																							33'
34'		0.625	0.756				36 x2 5/8		18.60		614.00		0.500	0.669				42 x2 3/8		21.83		720.87		0.594	0.789				43 x2 5/8		24.67		822.45																							34'
35'		0.656	0.766				36 x2 3/4		18.64		632.50		0.500	0.709				42 x2 1/2		21.89		742.53		0.594	0.836				43 x2 5/8	2.4	24.72		846.81																							35'
36'		0.656	0.811				36 x2 3/4		18.69		651.05		0.500	0.750				42 x2 1/2		21.94		764.25		0.594	0.885				43 x2 3/4	2.5	24.78		871.25																							36'
37'		0.688	0.820				36 x2 3/4		18.73		669.66		0.531	0.749	2 1/2		36 1/2"	42 x2 1/2		22.00		786.04		0.625	0.891				43 x2 3/4		24.83		895.75																							37'
38'		0.688	0.865				36 x2 3/4		18.78		688.31		0.531	0.790	2 3/4		37"	43 x2 5/8		22.05		807.89		0.625	0.940				43 x2 3/4		24.89		920.33																							38'
39'		0.719	0.875	2 1/2		30 1/2"	36 x2 7/8		18.82		707.01		0.562	0.788				43 x2 5/8		22.10		829.80		0.656	0.946				43 x2 3/4		24.94		944.97																							39'
40'		0.719	0.920	2 3/4		31 1/2"	38 x2 7/8		18.86		725.76		0.562	0.829				43 x2 3/4		22.16		851.78		0.656	0.995	2 3/4		37"	43 x2 7/8	2.5	25.00		969.68																							40'
42'		0.750	0.977				38 x 3		18.95		763.41		0.594	0.868				43 x2 3/4		22.27		895.92		0.688	1.150	3		37 1/2"	44 x 3	2.7	25.11		1019.30																							42'
44'		0.937	0.877				38 x 3		19.04		801.24		0.625	0.905				43 x2 3/4	1.8	22.38		940.31		0.719	1.106	3		37 1/2"	44 x 3	2.6	25.22		1069.19																							44'
45'	24	0.937	0.918	2 3/4	8	31 1/2"	38 x3 1/8	1.6	19.08	250.41	820.23	30	0.625	0.947	2 3/4	8	37"	43 x2 3/4	1.9	22.43	340.83	962.59	30	0.719	1.157	3	8	37 1/2"	44 x 3	2.6	25.27	445.17	1094.23																			45'



ELEVATION

(SHOWING DESIGN LOADS AND DEAD LOAD DEFLECTIONS)

TRUSS DETAILS

SPAN	10', 15', & 20'	25'	30'	35'	40'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5
CHORD-①, Unless Otherwise Shown	L 3 x 3 x 3/16 ② [3]	L 3 x 3 x 1/4 ② [4]	L 3 1/2x3 1/2x 5/16 [8]	L 3 1/2x3 1/2x 5/16 [9]	L 3 1/2x3 1/2x 3/8 [8]
DEAD LOAD DIAGONAL-②	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD DIAGONAL-②	L 3 x 3 x 3/16 [3]	L 3 x 3 x 3/16 [3]	L 3 x2 1/2x 1/4 [3]	L 3 x2 1/2x 1/4 [4]	L 3 x 3 x 1/4 [3]
DEAD LOAD VERTICAL-②	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD STRUT-②	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 1/2x2 1/2x 3/16 [1]
TRUSS DEAD LOAD	42 lb/ft	47 lb/ft	59 lb/ft	60 lb/ft	70 lb/ft
SIZE H. S. BOLTS IN CONNECTION	5/8" DIA	5/8" DIA	5/8" DIA	5/8" DIA	3/4" DIA
NO. & SIZE OF H. S. BOLTS IN CHORD ANGLE TO TOWER CONNECTION PLATE	3 ~ 5/8" DIA ea	5 ~ 5/8" DIA or 3 ~ 3/4" DIA ea	8 ~ 5/8" DIA or 6 ~ 3/4" DIA ea	9 ~ 5/8" DIA or 7 ~ 3/4" DIA ea	8 ~ 3/4" DIA ea

① "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

② "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

GENERAL NOTES :

Design conforms to AASHTO 1994 Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto.

Steel for tower pipe shall conform to ASTM A53 Grade B or to ASTM A501. Tower pipe wall thickness shown is the minimum allowable. Fabricator may use the wall thickness shown or pipe of the same diameter with greater wall thickness.

All connection bolts shall conform to Item 447, "Structural Bolting". All structural steel, connection bolts, nuts and washers shall be galvanized in accordance with the Specifications.

Compensate for truss deflection at free end by offsetting upper and lower bolt holes at truss-to-tower connection.

For truss details see standard drawing COSSD.

For base and foundation details see standard drawing COSSF.

For cantilever truss lengths falling between those shown use sizes called for in the next longer span.

Truss and towers for cantilever sign supports are designed for the equivalent area of a 10'-0" deep sign panel over 100% of the span length. Design includes 3 pounds per foot squared for sign panel and 20 pounds per foot for lights and 50 pounds per foot for walkways all placed as specified for the design sign panel.

Details called for hereon are applicable for Design Wind Heights of 30' to 50' inclusive.

Number of High Strength bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.

Deflections shown include the design loads for Truss, Sign Panel, Lights and Walkways.

Texas Department of Transportation
Traffic Operations Division

HIGH LEVEL CANTILEVER OVERHEAD SIGN SUPPORTS

HCOSS-Z1-10

393A

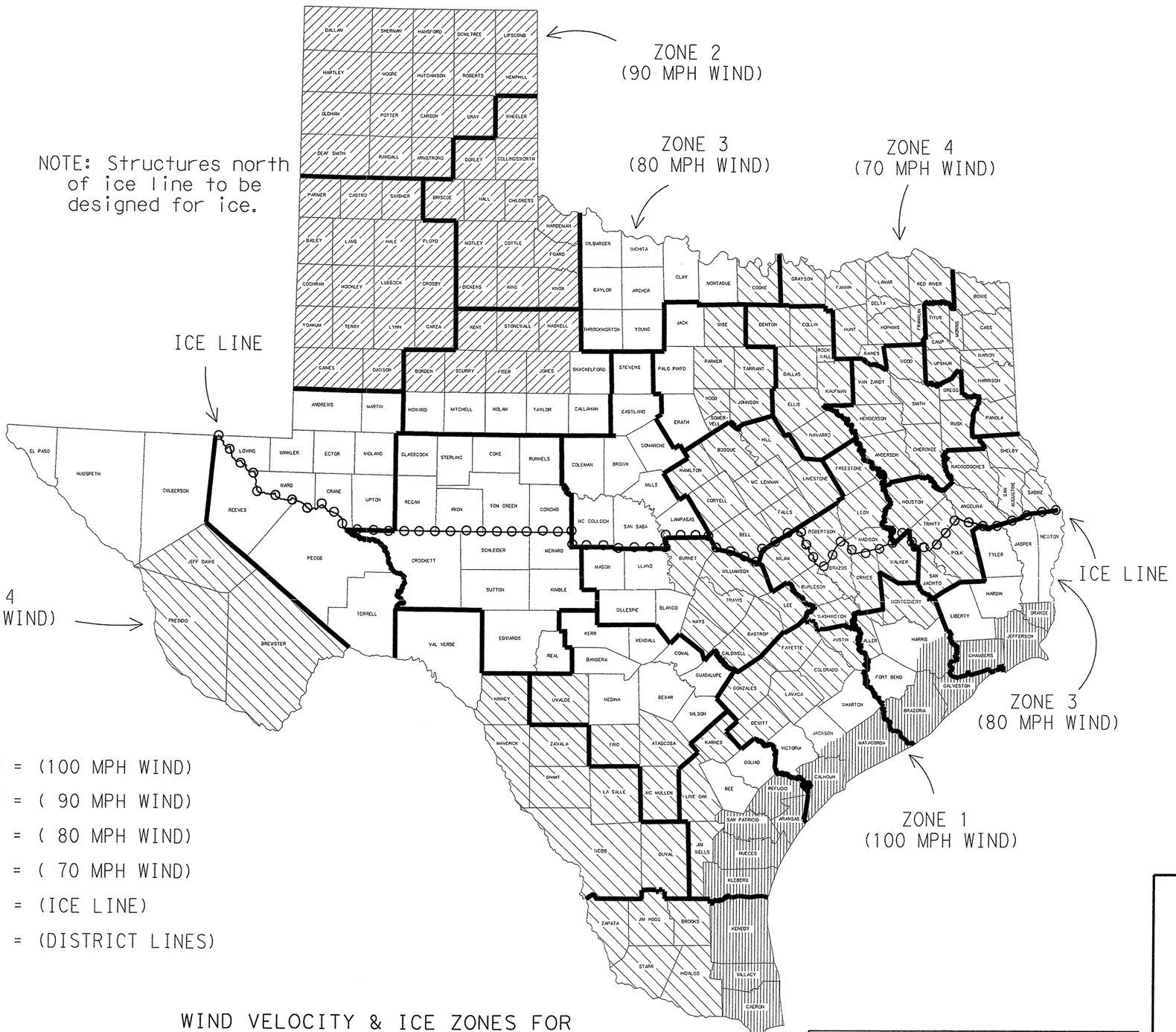
© TxDOT November 2007

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
4-10	0009	12	073	FM 740
	DIST	COUNTY		SHEET NO.
	18	ROCKWALL		393A

DATE:
FILE:

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LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
Zone line is just North of SH 616.

WIND VELOCITY & ICE ZONES FOR OVERHEAD SIGN SUPPORTS

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E.'s WITH OVERHEAD SIGN SUPPORTS

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

WIND VELOCITY AND ICE ZONES

WV & IZ-96

©TxDOT April 1996

DN: -	CK: -	DW: DN	CK: MT	REC NO.:
REVISIONS				

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
DAL	6	SEE TITLE SHEET	394

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH 30

30

LEVEL 1 2 3 4 5 6 7
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
XYED 1 1 2 1 3 1 4 1 5 1 6
DATE:
ACC: d58hplc/usr/d580504
FILE:
DN: LR
CK: CW
DW: DN
CK: MT

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

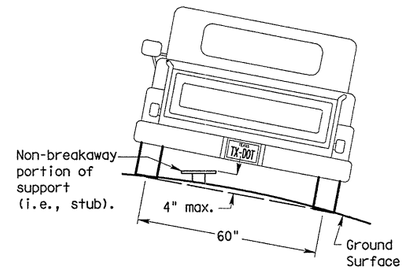
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

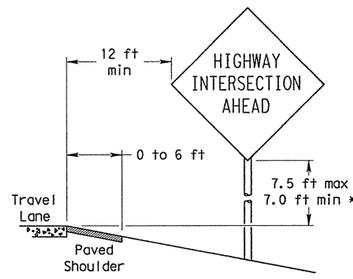
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

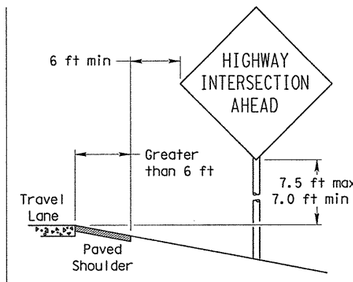
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

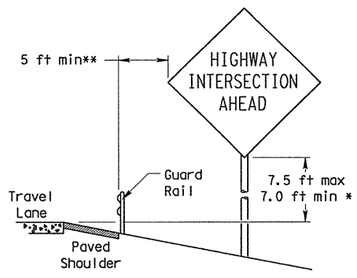
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



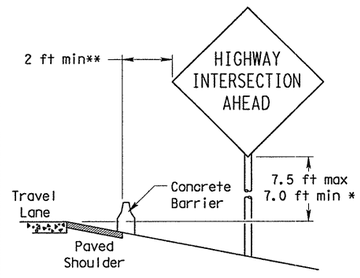
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER



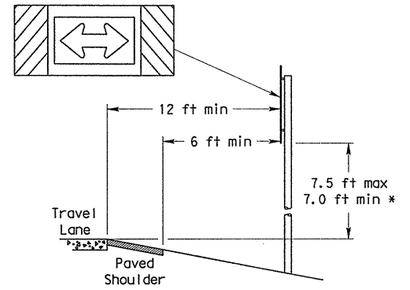
BEHIND GUARDRAIL



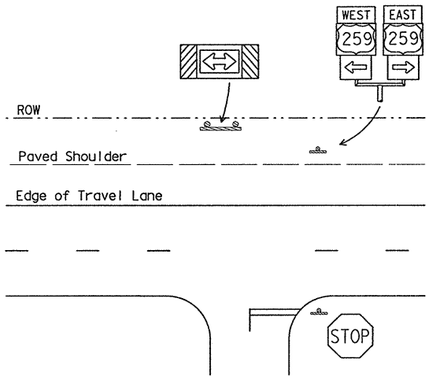
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

T-INTERSECTION



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



* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

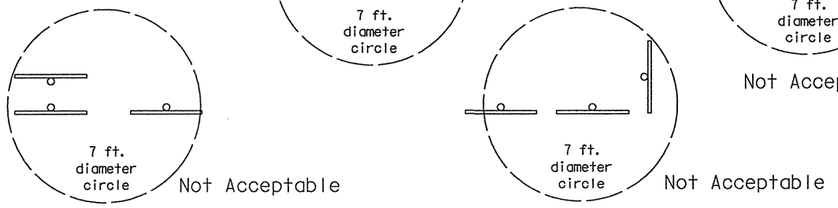
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

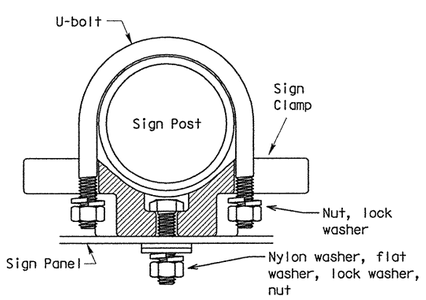
The website address is:
http://www.txdot.gov/publications/traffic.htm

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

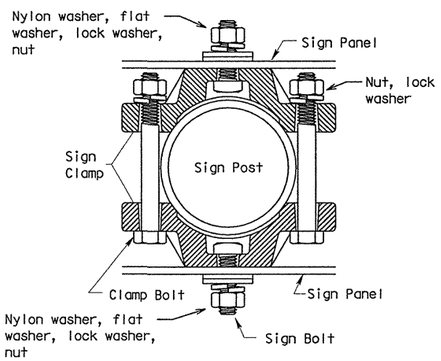


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

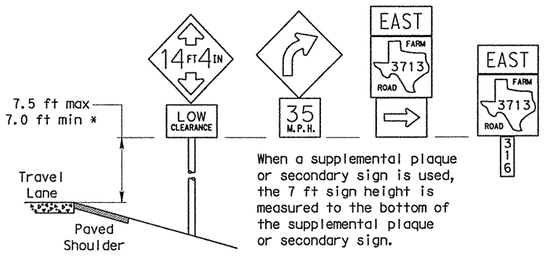
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



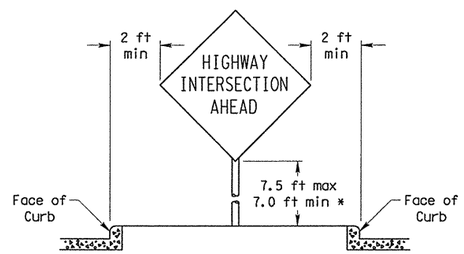
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



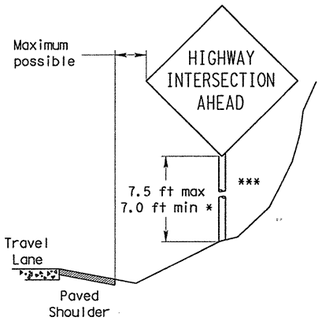
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

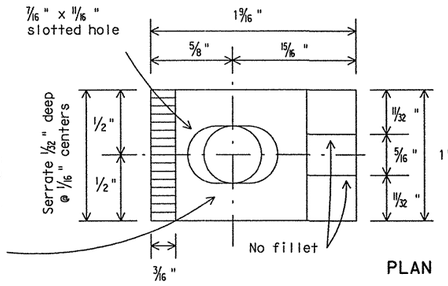
©TxDOT July 2002			DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS 9-08	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
	DAL	6	SEE TITLE SHEET			395
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

26A

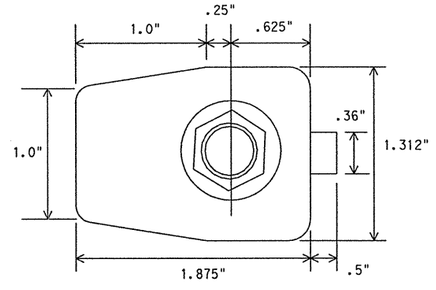
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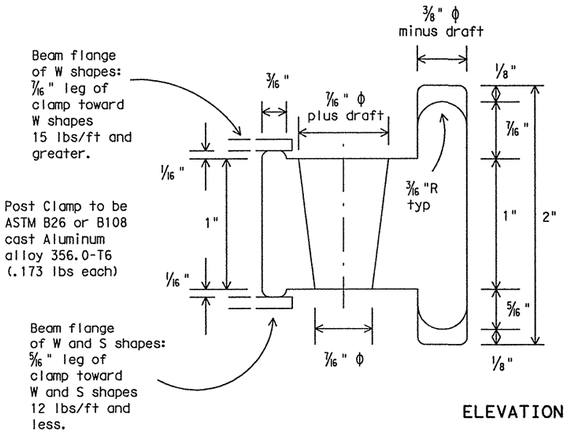
NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.



PLAN

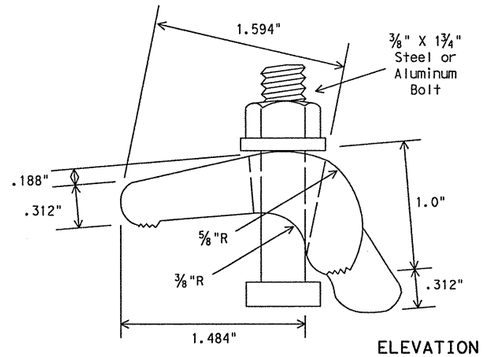


PLAN



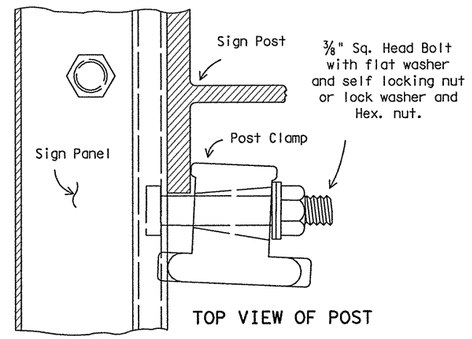
ELEVATION

POST CLAMP DETAIL

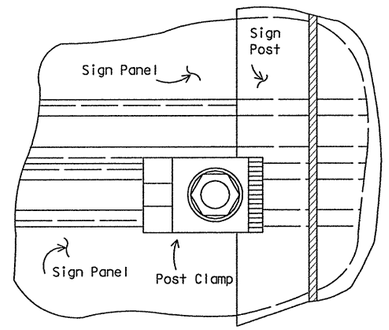


ELEVATION

ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



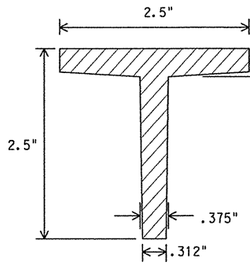
TOP VIEW OF CLAMP

DEPARTMENTAL MATERIAL SPECIFICATIONS

SIGN HARDWARE	DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
4. For fiberglass substrate connection details, see manufacturer's recommendations.

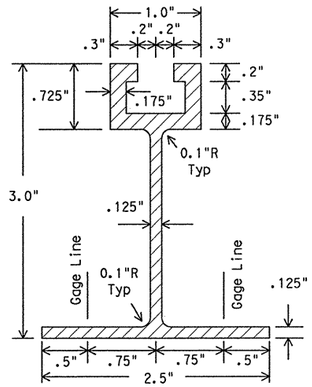


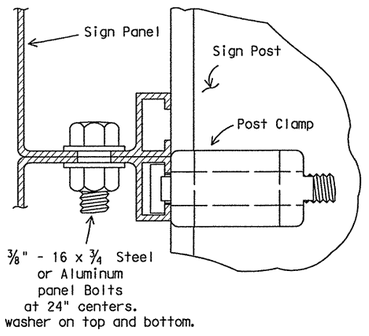
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

WINDBEAM CROSS SECTION

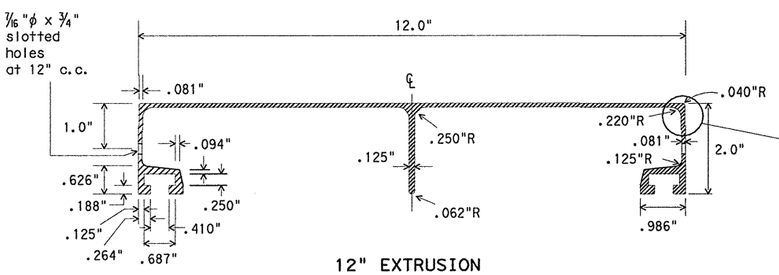
Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative



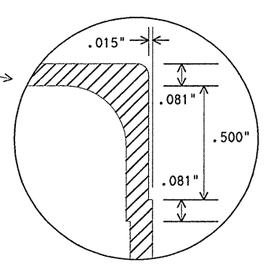


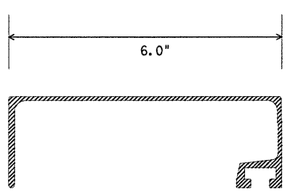
SIDE VIEW OF PANELS

CONNECTION DETAILS

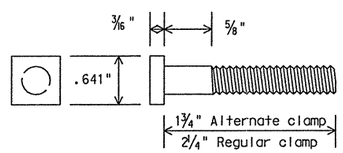


12" EXTRUSION





6" EXTRUSION



POST CLAMP BOLT DETAIL

ALUMINUM SIGN PANEL EXTRUSION DETAILS

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- EXTRUDED ALUMINUM SIGN PANELS & HARDWARE

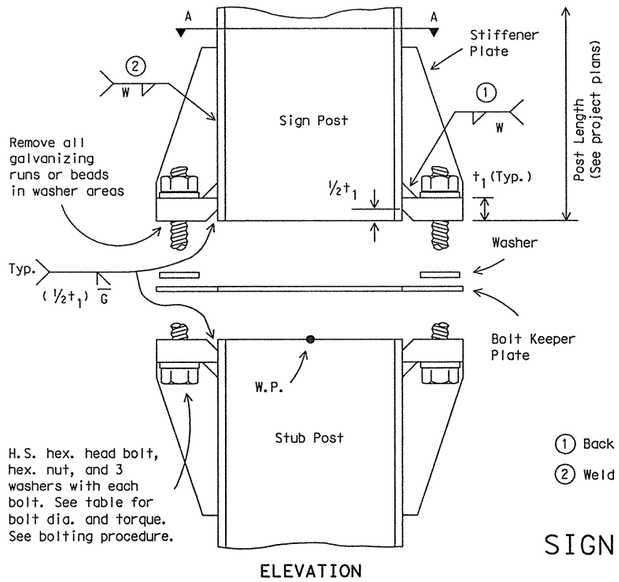
SMD(2-1)-08

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REVISIONS 9-08	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
	DAL	6	SEE TITLE SHEET			396
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

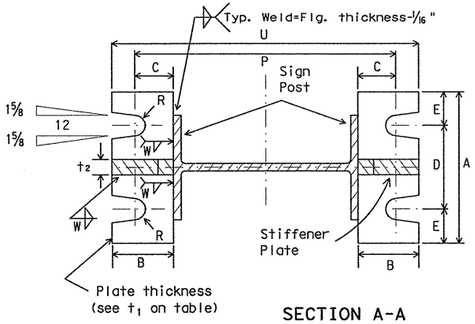
27A

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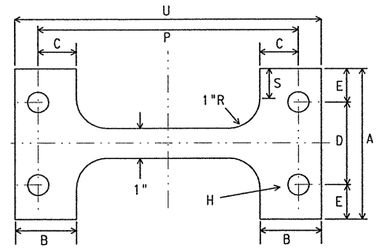
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ELEVATION

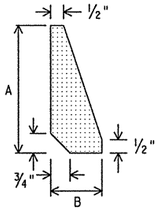


SECTION A-A



H= Bolt dia. + ⅛"

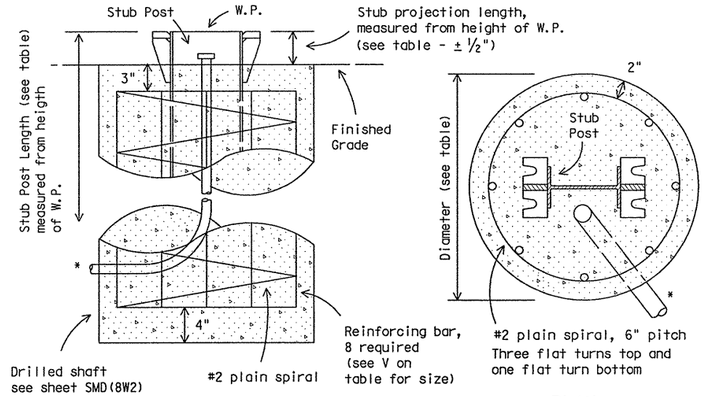
BOLT KEEPER PLATE
30 Ga galv. sheet steel



STIFFENER PLATE DETAIL

Steel Plate (thickness = t_2)

(See table for dimensions)

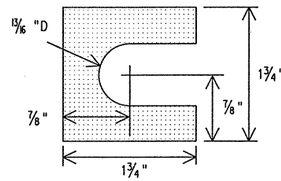


ELEVATION

PLAN

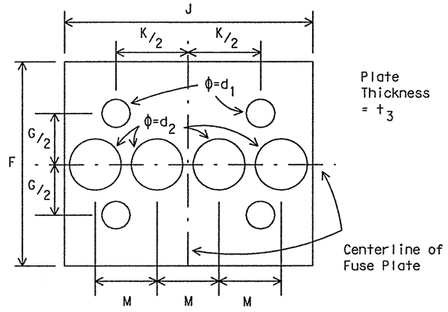
FOUNDATION DETAIL

*Note: For signs with electrical apparatus, see ED(10) for conduit required in founation.



SHIM DETAIL

Furnish two .012"+ thick and two .032"+ thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM B36.



PERFORATED FUSE PLATE DETAIL

Use H.S. hex head bolts, hex head nut and bevel or flat washer (where req'd) under nut. All holes shall be drilled, sub-punched and reamed. All plate cuts shall preferably be saw cuts. However, flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be permitted. Steel fuse plates shall conform to the requirements of ASTM A36. ASTM A572 Grade 50 or ASTM A588 may be substituted for A36 at the option of the fabricator. Mill test reports shall be submitted for Fuse Plates. Steel used shall have an ultimate tensile strength not to exceed 80 KSI. For alternative Fuse Plate contact Traffic Operations Division.

SIGN POST AND STUB POST

(For W Shapes)

① Back up weld to be made before installing stiffener plate

② Weld W may be continued across clips to seal joint

BOLTING PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

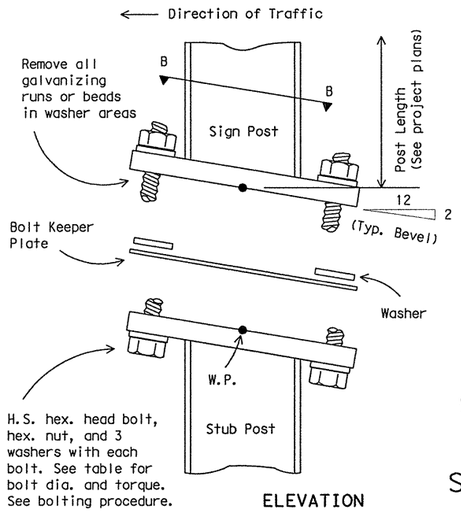
1. Assemble sign post, BOLT KEEPER PLATE and stub post with bolts and three flat washers per bolt as shown.
2. Shim as required to plumb post.
3. Tighten all bolts the maximum possible with a 12 to 15 inch wrench to clean bolt threads and to bed washers and shims.
4. Loosen each bolt in sequence and retighten bolts in a systematic order to the prescribed torque. Do not overtighten.
5. To prevent nut loosening, burr threads of bolt at junction with nut using a center punch.

Dimensions / Post Size	Base Connection Data Table: Bolt Size & Torque	A	B	C	D	E	t_1	t_2	W	R
W6x9	⅝"ϕ x 2¾" 440-450 inch pounds 36-38 foot pounds	5"	2"	1¼"	2¾"	1⅛"	¾"	½"	¼"	"
W6x12										
W6x15										
W8x18										
W8x21	¾"ϕ x 3½" 740-750 inch pounds 62-63 foot pounds	6"	2¼"	1⅜"	3½"	1¼"	1"	¾"	5/16"	13/32"
W10x22										
W10x26										
W12x26										
S3x5.7	½"ϕ x 2½" 440-450 inch pounds 36-38 foot pounds	See Detail Below								
S4x7.7										

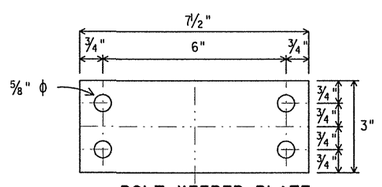
Perforated Fuse Plate Data Table											
F	G	J	K	M	d_1	d_2	t_3	Bolt Dia.	Wt. (ea.) (lbs.)	Bolt length
4¼"	2"	4"	2¼"	1"	"	¾"	¼"	½"	1.01	1½"
5"	2½"	6"	3½"	1½"	"	1¼"	⅜"	⅝"	2.51	2¼"
5"	2½"	5¼"	2¾"	1¼"	"	1 1/16"	⅜"	⅝"	2.26	2¼"
5½"	2½"	5¼"	2¾"	1¼"	13/16"	1"	½"	¾"	3.35	2¼"
6"	3"	5¾"	2¾"	1⅜"	13/16"	1⅛"	½"	¾"	4.03	2¼"
6"	3"	6½"	3½"	1⅝"	13/16"	1 5/16"	½"	¾"	4.47	2¼"
3¾"	1½"	2⅝"	1½"	⅝"	"	⅜"	¼"	½"	0.60	1½"

Bolt Keeper Data			Foundation Data			
P	S	U	Stub length	Stub projection	Dr. Shaft diameter	Bar V Size
8⅜"	1"	9⅞"	2'-0"	3"	24"	#5
8½"		10"	2'-0"	3"		#5
8½"		10"	2'-6"	3"		#6
10⅝"		12⅛"	2'-6"	3"		#7
11"	1½"	12¾"	3'-0"	2½"		#8
12⅞"		14⅝"	3'-0"	2½"		#9
13⅜"		14⅞"	3'-0"	2½"		#10
15"		16¾"	3'-0"	2½"		#11
See Detail Below			3'-3½"	3½"	12"	Non-reinforced ③

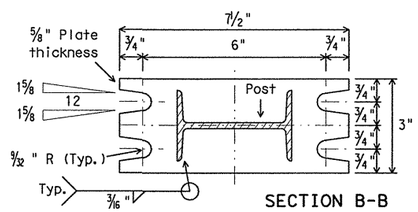
③ Foundation design shall be Type G Mount, see SMD (TY G).



ELEVATION



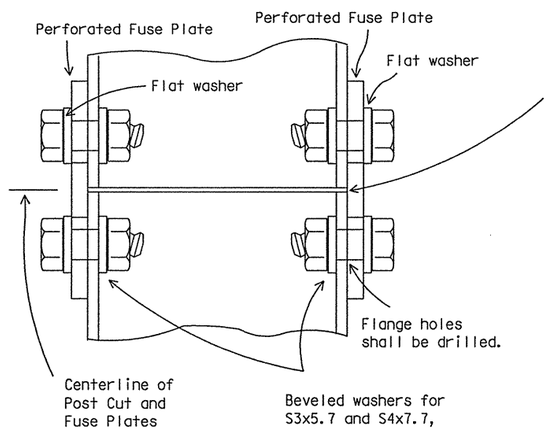
BOLT KEEPER PLATE
30 Ga galv. sheet steel



SECTION B-B

SIGN POST AND STUB POST

(For S4x7.7 and S3x5.7)



DETAIL "A"

Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing."

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

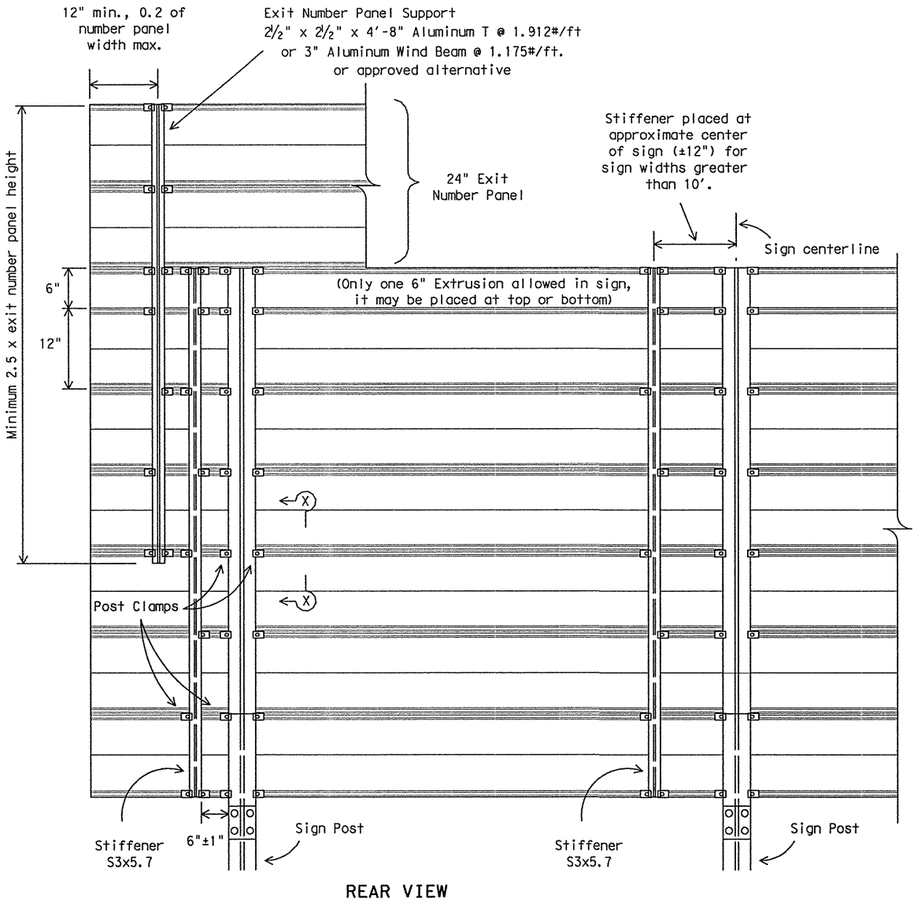
SIGN MOUNTING DETAILS- LARGE ROADSIDE SIGNS FOUNDATION & STUB

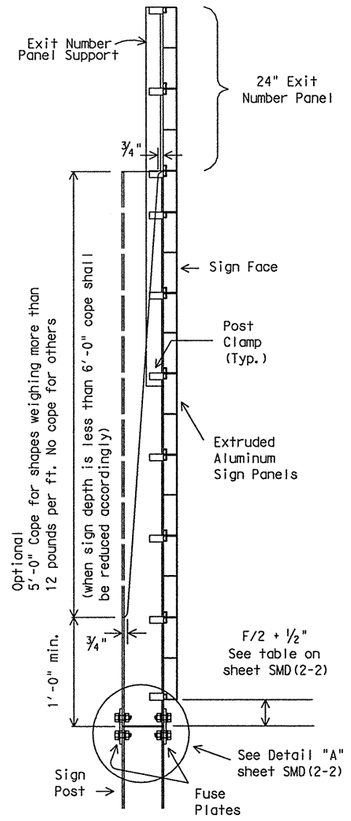
SMD(2-2)-08

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REVISIONS 4-98 9-08	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET	SHEET: 347
COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH 30

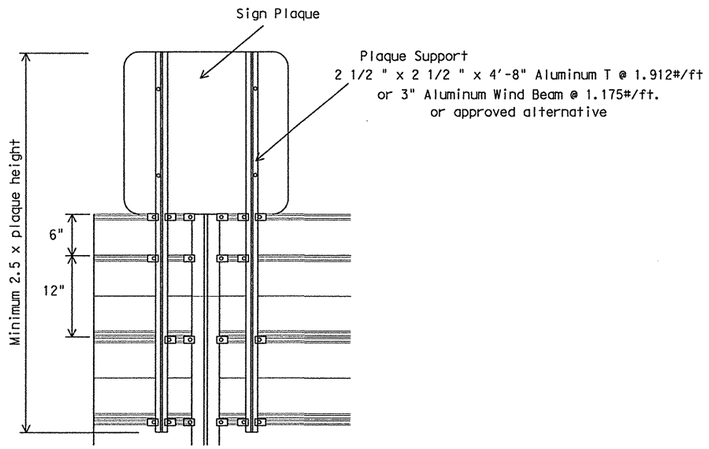
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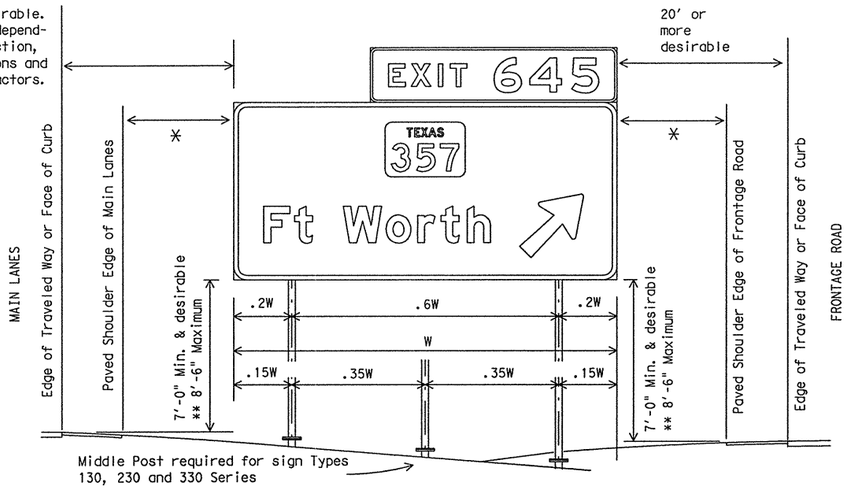


ALUMINUM PARENT SIGN & EXIT NUMBER PANEL MOUNTING DETAILS



SIGN PLAQUE MOUNTING DETAIL TO ALUMINUM PARENT SIGN

30' or more desirable. May be reduced depending on cross section, viewing conditions and other related factors.



TYPICAL SIGN INSTALLATION AND LOCATION

LATERAL CLEARANCE NOTES:

Lateral clearances of signs mounted on median side of main lanes are the same as shown above where space will permit.

Where a sign is to be located behind guardrail, an allowable minimum clearance of five feet may be used, measured from the face of the guardrail to the near edge of sign.

⁎ - 6' minimum and desirable may be used only in areas of limited lateral clearance and when approved by the Engineer.

POST SPACING NOTES:

Post spacing on a two post sign may vary a maximum of plus or minus 10% of total sign width to fit field conditions.

Post spacing on a three post sign may vary a maximum of plus or minus 5% of total sign width to fit field conditions.

SIGN HEIGHT NOTES:

** The 8' 6" maximum may be exceeded when placing signs on extreme slopes. In these conditions, a 7' minimum from natural ground to bottom of sign must be maintained.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN HARDWARE	DMS-7120

GENERAL NOTES:

1. Exit number panel shall be mounted to the right hand side of the parent sign for right exits and to the left hand side for left exits. The number panel shall be mounted with two uprights so its right edge is even with the right edge of the parent sign or vice-versa for left hand exits.
2. Exit number panel support shall be symmetrical about number panel centerline.
3. Exit number panel support shall be ASTM A36 structural steel galvanized after fabrication, or ASTM B221 aluminum alloy 6061-T6 or approved alternative.
4. All bolts, nuts and washers shall be galvanized per ASTM Designation: B695 Class 50, or A153 Class C or D.
5. Posts, parent sign panels, and exit number panels shall comply with notes on sheets SMD(2-1) and SMD(2-2).
6. Signs (such as exit number panels) attached above a parent sign shall be made of the same type material as the parent sign. General Service and Routing signs may be fabricated from flat sheet aluminum.
7. Exit number panel support and other connection hardware required to fasten exit number panel to parent sign shall be subsidiary to "Aluminum Signs" or "Fiberglass Signs."
8. For fiberglass sign installation details, see manufacturer's recommendations.

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Traffic Operations Division

SIGN MOUNTING DETAILS-LARGE ROADSIDE SIGNS

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REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
9-08	DAL	6	SEE TITLE SHEET	398

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH 30

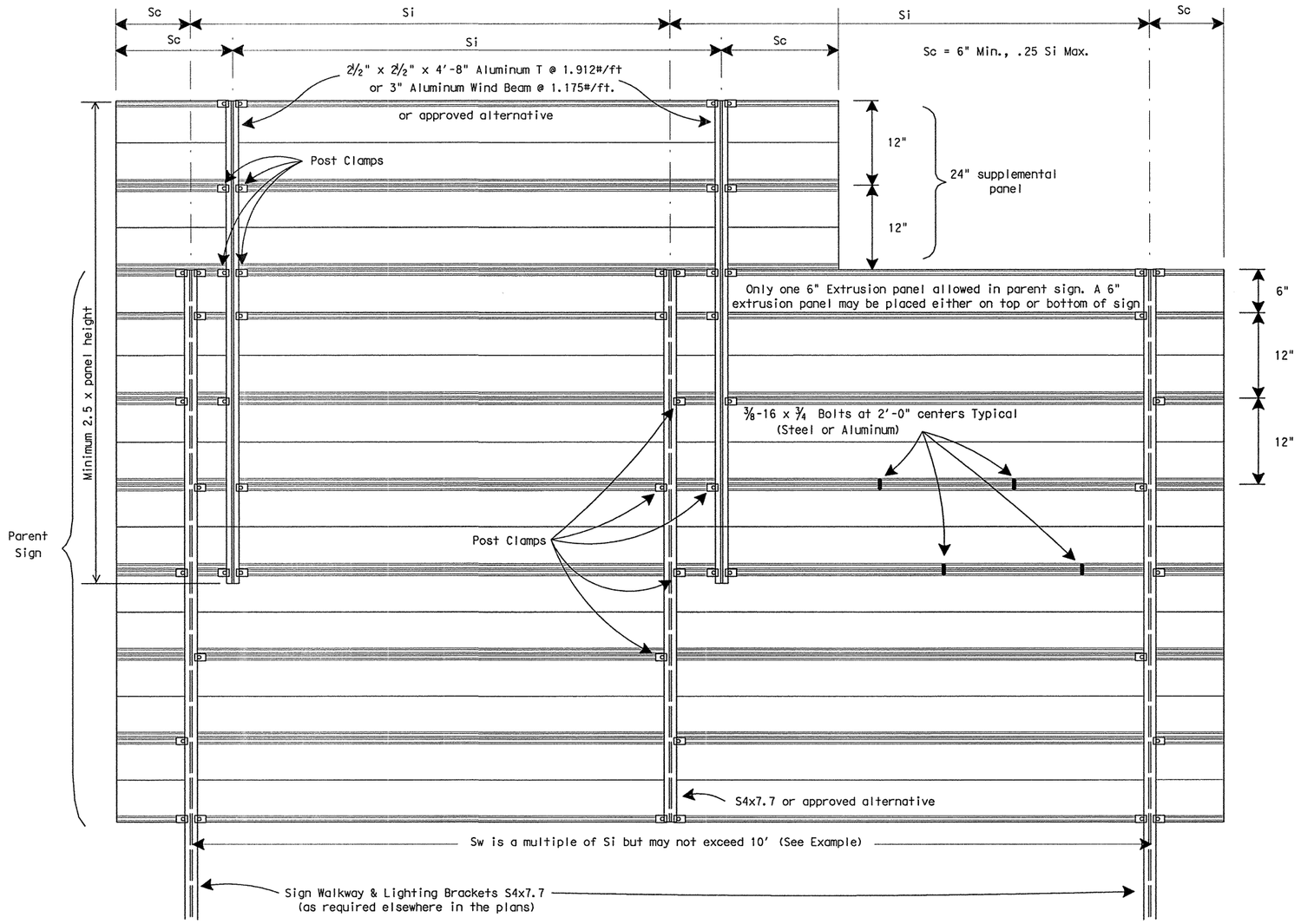
27C

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49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96

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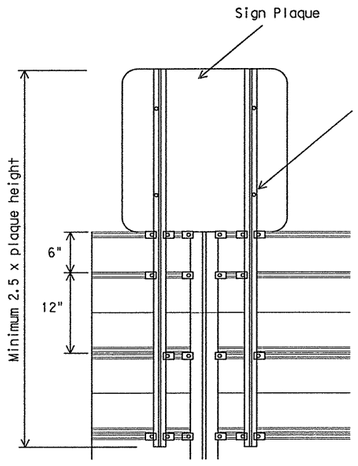


REAR VIEW

EXAMPLES (FOR DETERMINING Si and Sw)

NO.	ZONE	"d"	EXIT PANEL	WALKWAY	Si	Sw	COMMENT
1	1	15.0	YES	YES	4.5	9.0	Sw=2x(Si)
2	2	14.0	YES	NO	7.5	7.5	Sw = Si
3	1	15.0	NO	NO	8.5	8.5	Sw = Si
4	3	14.0	NO	YES	10.0	10.0	Sw = Si

Values shown for Si are maximum values. Si may be varied for different sign lengths and Truss mounting conditions. Sw should not exceed two times Si(Max.) or 10 feet.



SIGN PLAQUE MOUNTING DETAIL

MAXIMUM SIGN SUPPORT SPACING "Si" (FEET)

"d" Deepest Sign in Group (Ft.)	EXTRUDED ALUMINUM SIGN PANELS															
	WITH EXIT NUMBER PANELS								WITHOUT EXIT NUMBER PANELS							
	WITH WALKWAYS				WITHOUT WALKWAYS				WITH WALKWAYS				WITHOUT WALKWAYS			
	WIND ZONE				WIND ZONE				WIND ZONE				WIND ZONE			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
15	4.5	7	8	10	5	7	8	10	7	8	9	10	8.5	10	10	10
14	6	7.5	9.5	10	6	7.5	9.5	10	8	9	10	10	10	10	10	10
13	7.5	9	10	10	7.5	9	10	10	9	10	10	10	10	10	10	10
12	8.5	10	10	10	8.5	10	10	10	10	10	10	10	10	10	10	10
11 or less	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

For fiberglass sign installations, see manufacturer's recommendations.

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- OVERHEAD SIGNS EXTRUDED ALUMINUM

SMD(2-4)-08

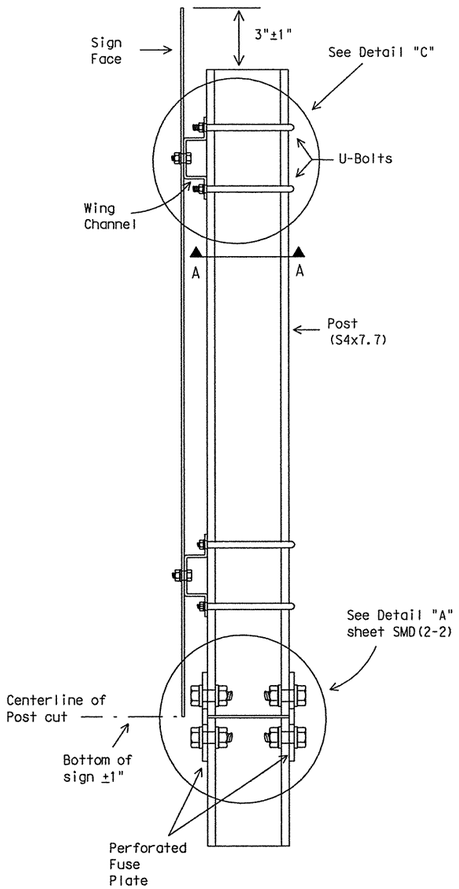
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REVISIONS 9-08	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET	SHEET: 399
COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH 30

27D

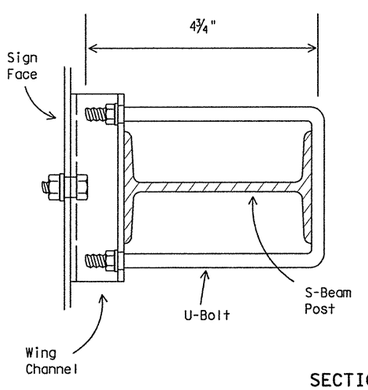
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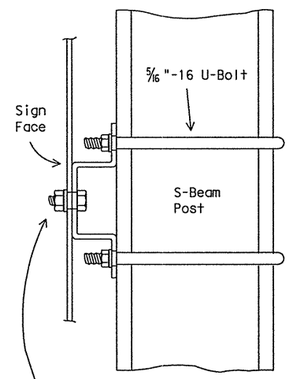
WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT



SIDE VIEW

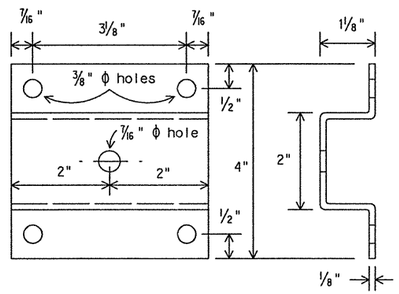


SECTION A-A



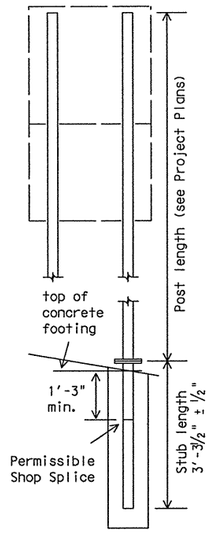
Galvanized steel or aluminum self-locking hex. head nut. 3/8 " - 16 x 3/4 " hex. head bolt for sheet metal. 3/8 " - 16 x 1 1/4 " hex. head bolt for plywood. 3/8 " galvanized medium washer.

DETAIL "C"

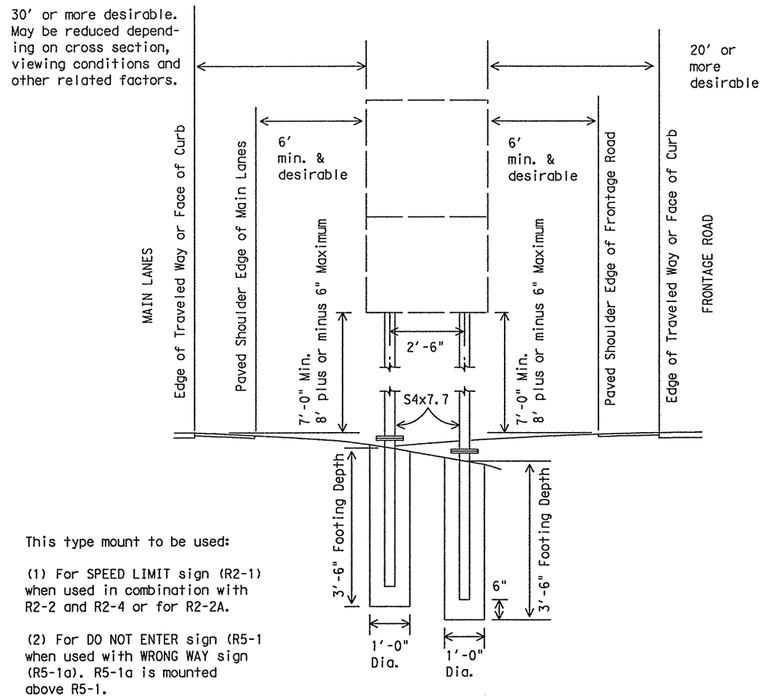


WING CHANNEL

Wing channel, 4" width x 1⅛" depth x ⅛" thickness, shall be aluminum (ASTM B221 6061-T6 or B308 6061-T6), galvanized steel (ASTM A36) or stainless steel (ASTM A167 type 304, No. 2B finish).



The weight of one S4x7.7 post is equal to 112.2 lbs. plus 7.7 lbs./ft x (post length in feet minus 10 ft). The weight of 112.2 lbs. includes 10 feet of post length, post foundation stub, related connection plates, friction fuse plate, and all high strength bolts, nuts and washers.



This type mount to be used:

(1) For SPEED LIMIT sign (R2-1) when used in combination with R2-2 and R2-4 or for R2-2A.

(2) For DO NOT ENTER sign (R5-1 when used with WRONG WAY sign (R5-1a). R5-1a is mounted above R5-1.

DEPARTMENTAL MATERIAL SPECIFICATIONS
SIGN HARDWARE DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures."
4. Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing." (Cut surface will not be treated until plate is installed and all bolts fully tightened.)

DN: CK: DW: CK:
DATE: ACC: FILE:
YED 12 58
LEV 1 2 3

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS, TYPE G SUPPORT

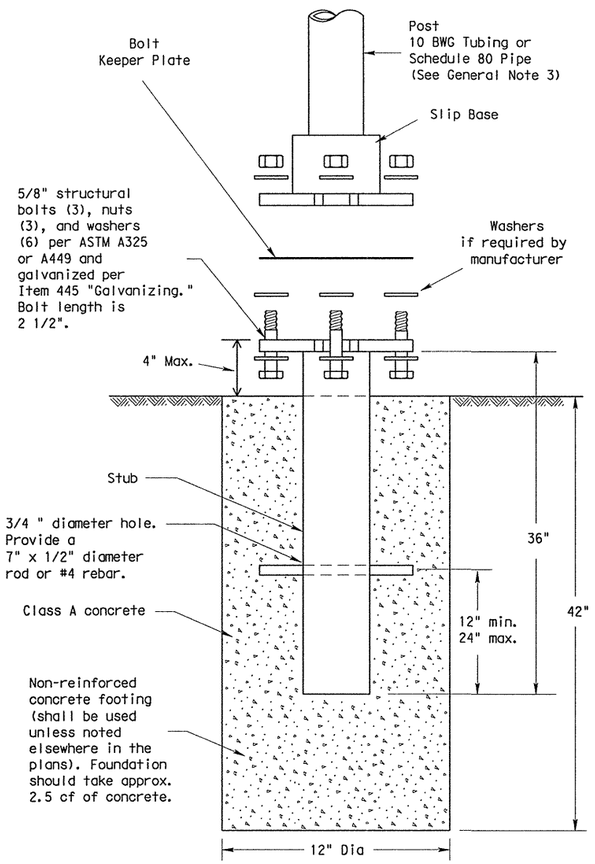
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9-08	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
	ROCKWALL		009 / 12 / 073	IH 30

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

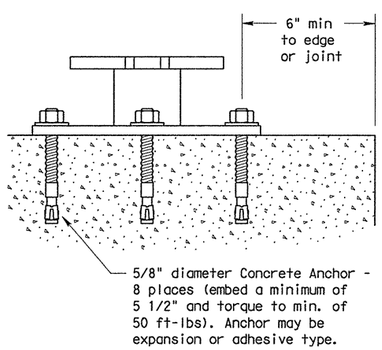
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR

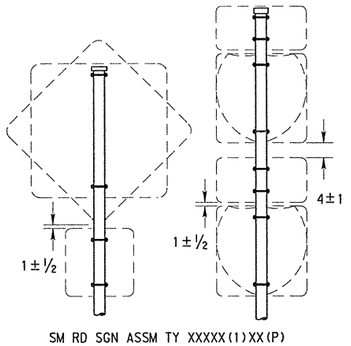


SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

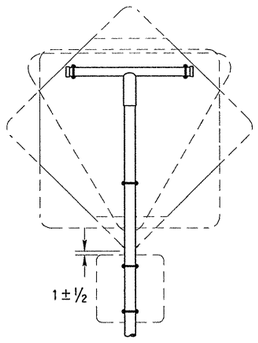
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

| LS DISPLAYED | | |

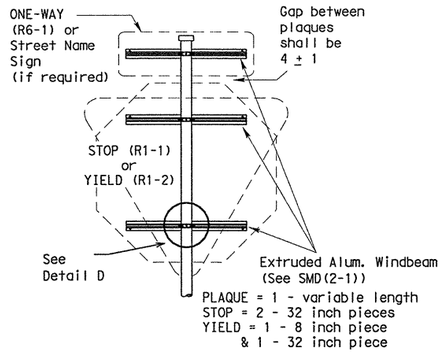
DISCLAIMER
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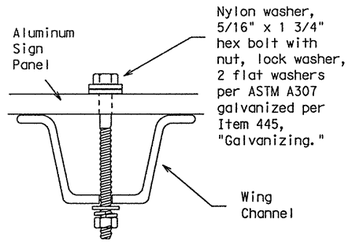
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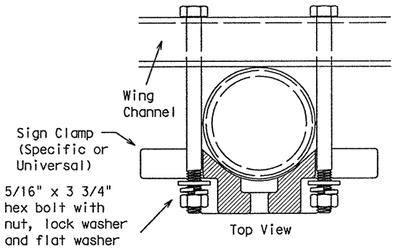
SM RD SGN ASSM TY XXXXX(1)XX(T)



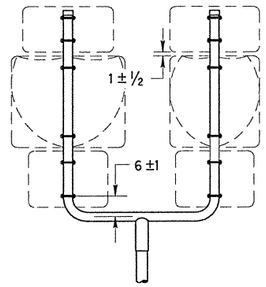
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



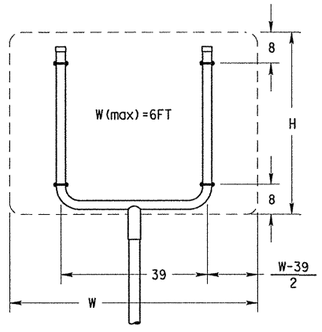
Detail A



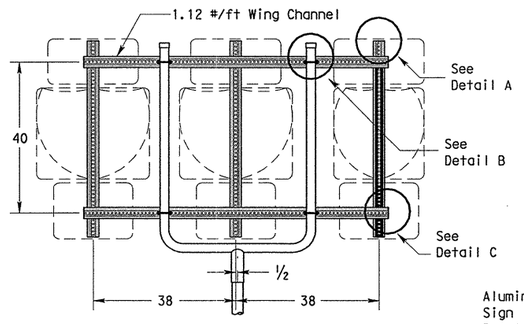
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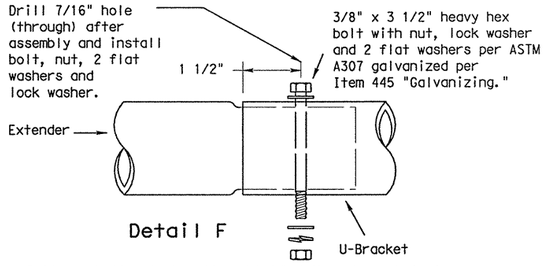
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

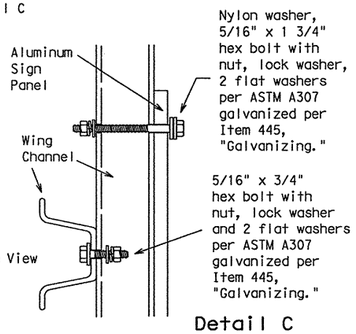


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(See Note 11)

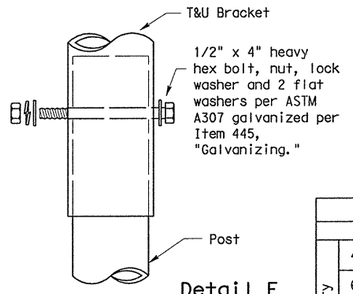


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



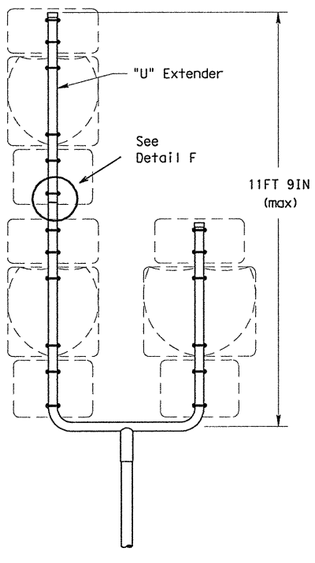
Detail E

GENERAL NOTES:

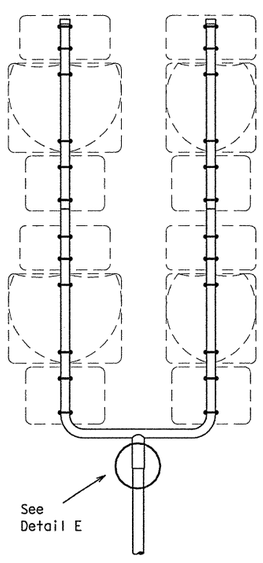
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

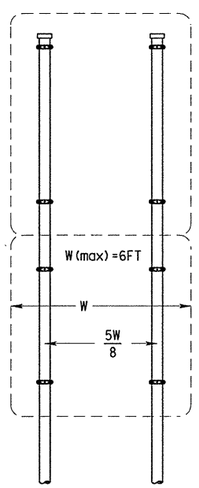
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



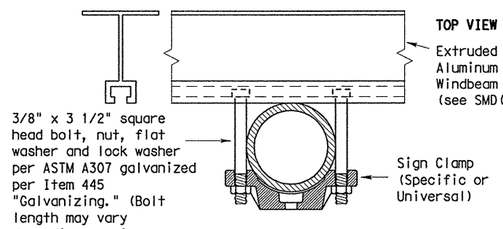
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



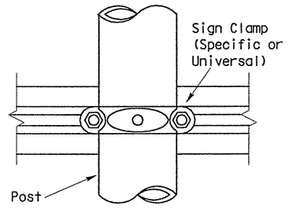
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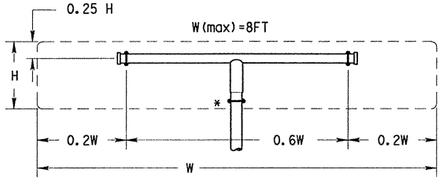
SM RD SGN ASSYM TY XXXXX(2)XX(P)



Detail D



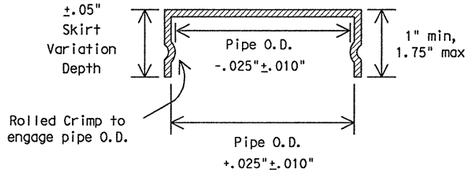
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

LS DISPLAYED
1 2 3 4
7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
ACC:

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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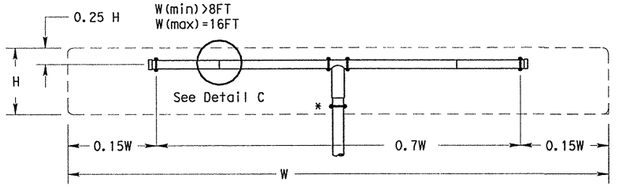
DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
9-08	DAL	6	SEE TITLE SHEET	402

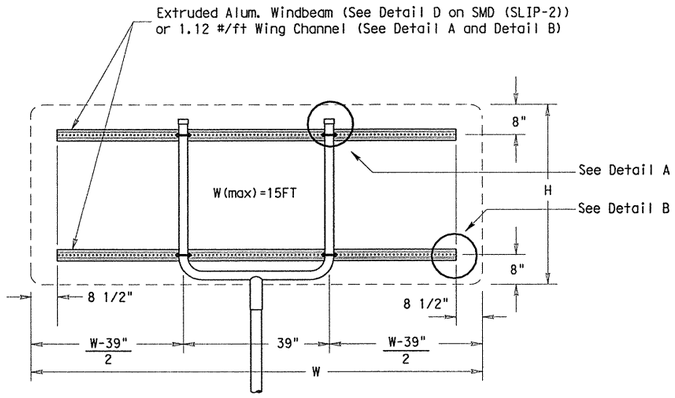
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	009	12	073	IH 30

26C

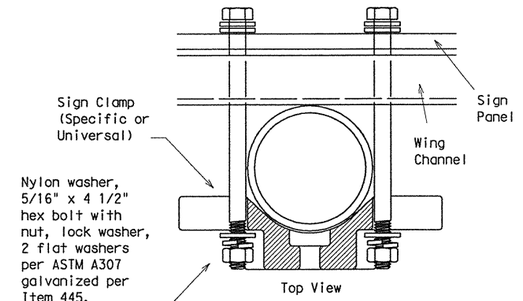
DISCLAIMER
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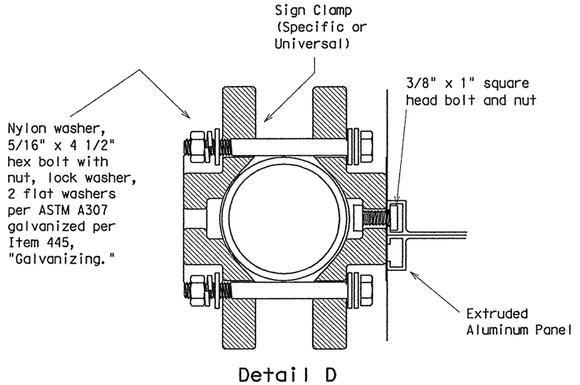
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



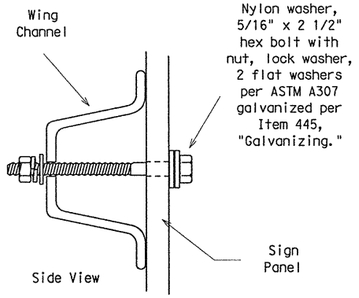
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



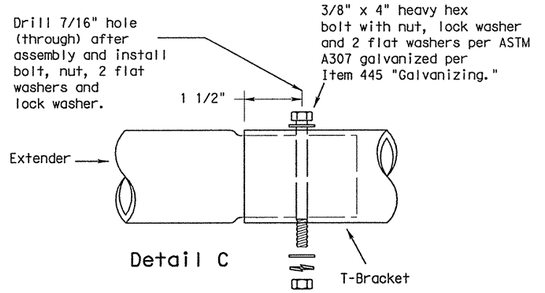
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

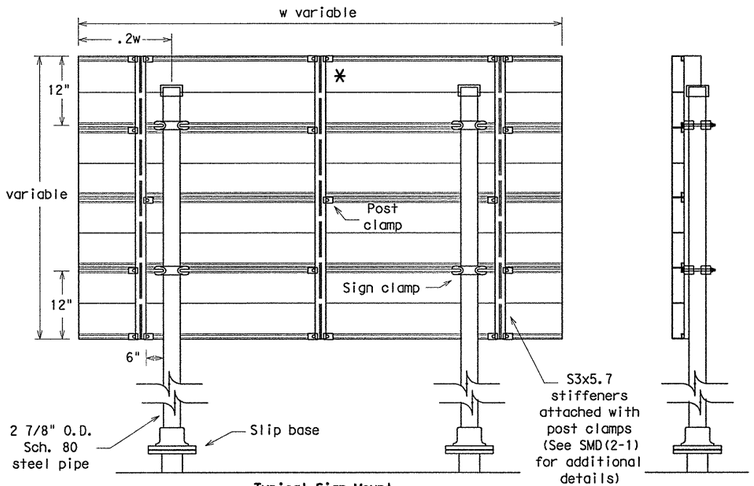


Detail B



Detail C

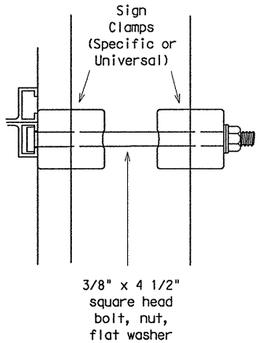
Splices shall only be allowed behind the sign substrate.



Typical Sign Mount

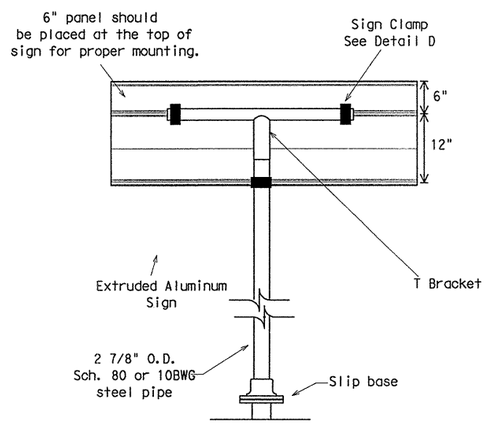
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

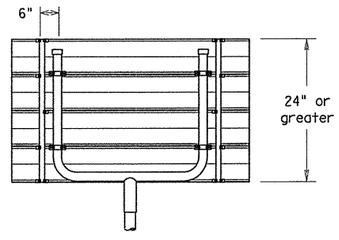


See Detail E
for clamp installation

Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

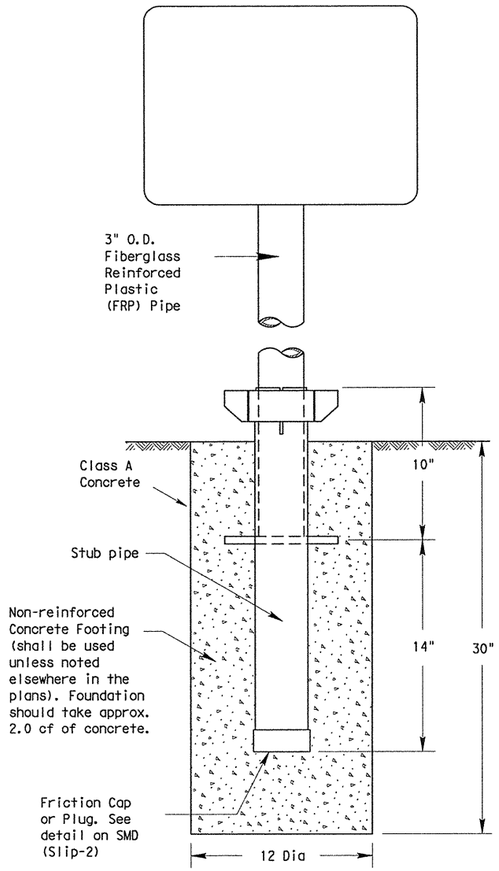
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

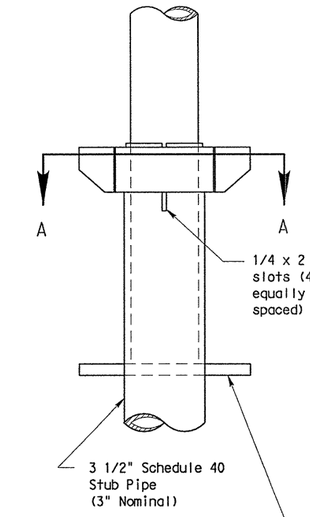
ACC:

| IS DISPLAYED | | |

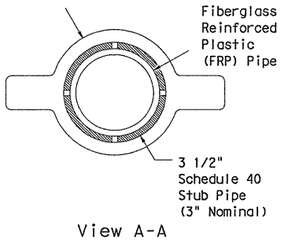
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Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



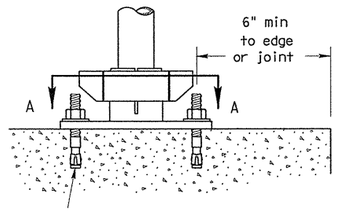


1/2 x 7 1/2" Steel Rod
Acts as a "stop" for the sign post and prevents stub from turning in the foundation.



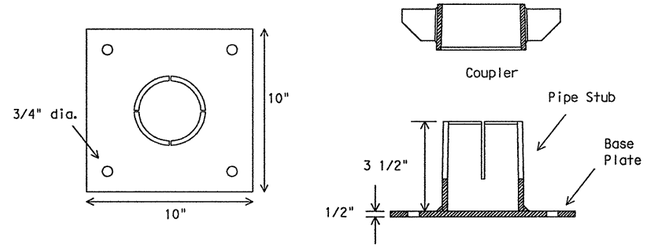
View A-A

SM RD SGN ASSM TY FRP(X)UA(P)



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is:
   http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

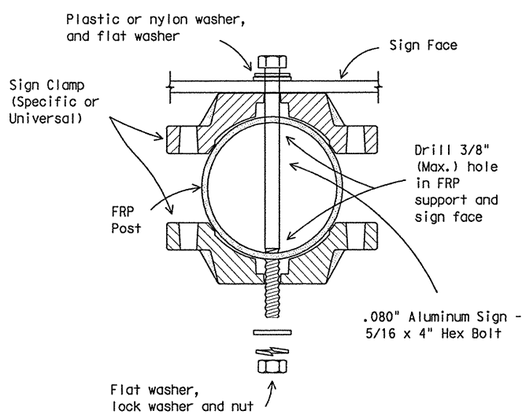
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

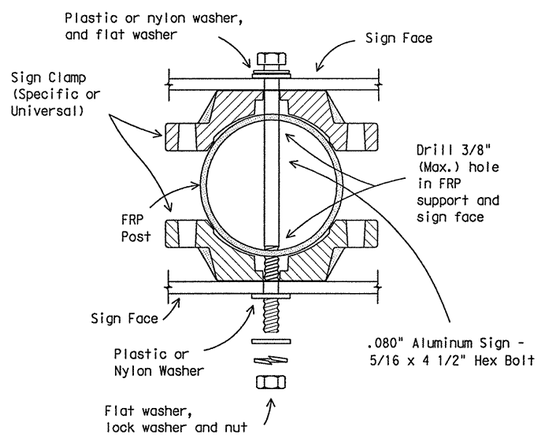
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



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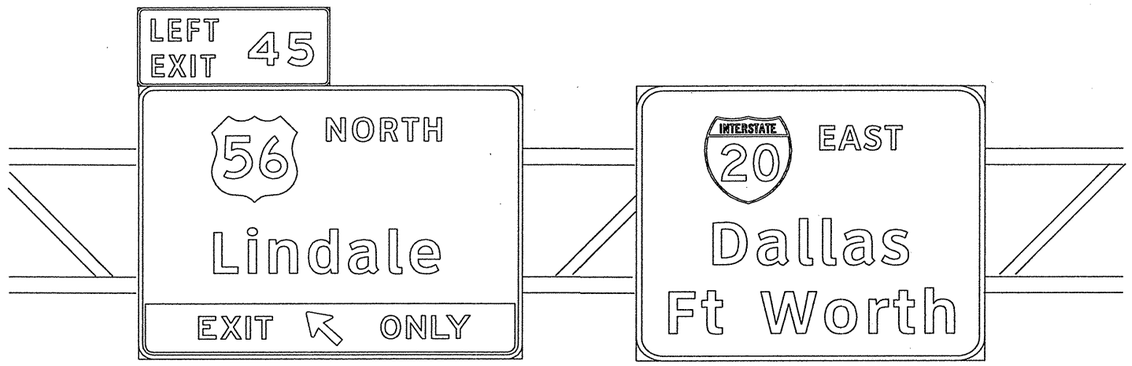
ACC:

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REQUIREMENTS FOR OVERHEAD GUIDE SIGNS

TYPICAL EXAMPLES



DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300
FIBERGLASS SIGN SUBSTRATE	DMS-8305

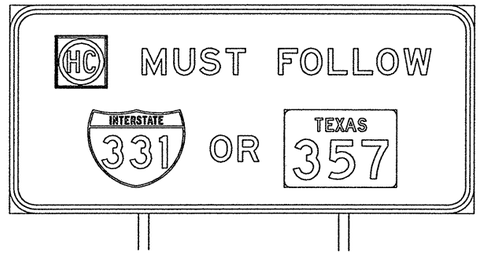
OVERHEAD GUIDE SIGNS AND EXIT NUMBER PANELS

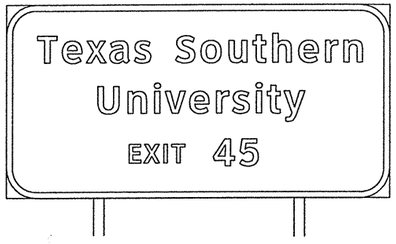
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE D SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

REQUIREMENTS FOR LARGE GROUND-MOUNTED GUIDE SIGNS

TYPICAL EXAMPLES







DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300
FIBERGLASS SIGN SUBSTRATE	DMS-8305

LARGE GROUND-MOUNTED SIGNS AND EXIT NUMBER PANELS

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign summary sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Black legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
   White legend shall use the Clearview Alphabet.
   The following Clearview fonts shall be used to replace the existing white FHWA lettering, when not specified in the SHSD or in the plans.
   - B CV-1W
   - C CV-2W
   - D CV-3W
   - E CV-4W
   - Emod CV-5WR
   - F CV-6W
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders for overhead guide signs shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. White legend and borders for large ground mounted guide signs shall be cut-out white sheeting applied to colored background sheeting.
7. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius need not be trimmed or rounded if fabricated from an extruded material.
8. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or DMS-8305. Exit Number Panels attached above the parent sign shall be made with the same substrate and sheeting as the parent sign.
9. Mounting details of attachments to parent sign face are shown on Standard Plan Sheet TSR(5). Mounting details of exit number panels above parent sign are shown in the "SMD series" Standard Plan Sheets.
10. Background sheeting shall be applied to the substrate per sheeting manufacturer's recommendations. Sheeting will not be allowed to bridge the horizontal gap between panels.
11. Cut all legend, symbols, borders, and direct applied sign attachments at panel joints.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/publications/traffic.htm

LEVELS DISPLAYED ACC:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL SIGN REQUIREMENTS

TSR(1)-08

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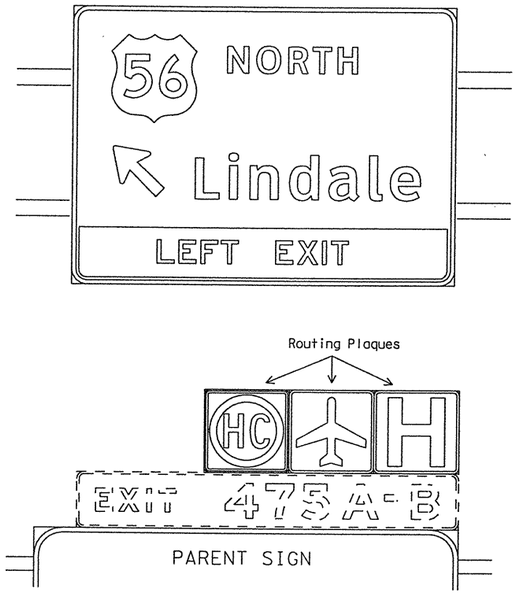
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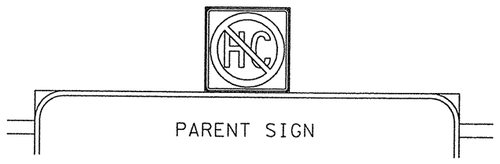
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12-03	DAL	6		405A
9-08	COUNTY		CONTROL / SECTION / JOB	HIGHWAY
	ROCKWALL		0009 / 12 / 073	IH 30

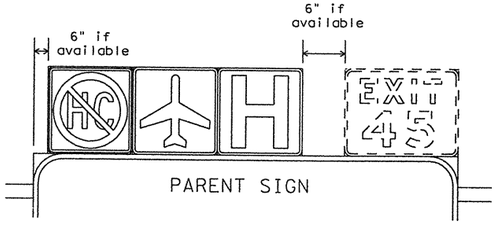
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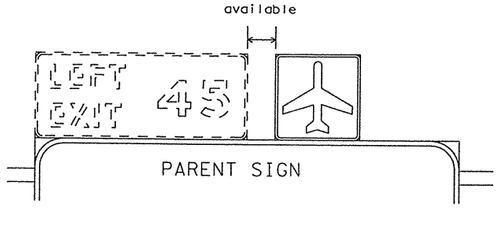
REQUIREMENTS FOR ATTACHMENTS TO GUIDE SIGNS

TYPICAL EXAMPLES









DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE D SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

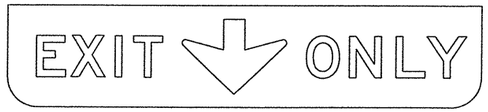
GENERAL NOTES:

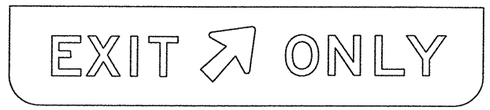
1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Route Marker legends (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to white background sheeting, or combination thereof.
7. Route markers and other attachments within the parent sign face shall be direct applied unless otherwise specified in the plans. Attachments not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
8. General Service Plaques shall be 0.080 inch thick and Routing Plaques shall be 0.100 inch thick.
9. The priority for Routing Plaques shall be (left to right) Hazardous Cargo, Airport then Hospital. See examples for mounting location.
10. Mounting details of attachments to parent signs face are shown on Standard Plan Sheet TSR(5). Mounting details of sign plaque attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets.
11. Plaques shall be horizontally centered at the top of the parent sign. If an exit number panel exists, the plaque shall be centered between the edge of the parent sign and the edge of the exit number panel. The plaque may be placed above the exit number panel when there is insufficient space.

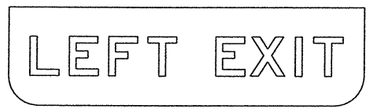


REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

TYPICAL EXAMPLES







DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

OVERHEAD EXIT PANELS

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	YELLOW	TYPE E SHEETING
LEGEND	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
2. Exit Panel legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets E Series.
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
5. Exit Only and Left Exit panels within the parent sign face shall be direct applied unless otherwise specified in the plans. Panels not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
6. Mounting details of Exit Only and Left Exit panel attachments to parent signs face are shown on Standard Plan Sheet TSR(5).

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

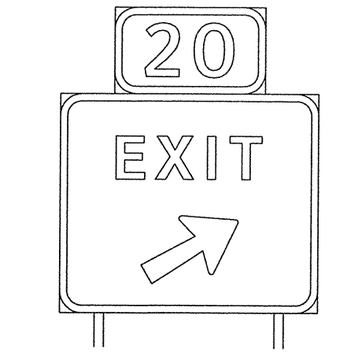
http://www.txdot.gov/publications/traffic.htm

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REQUIREMENTS FOR E SERIES STANDARD GUIDE SIGNS

TYPICAL EXAMPLES





DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300
FIBERGLASS SIGN SUBSTRATE	DMS-8305

GROUND-MOUNTED SIGNS

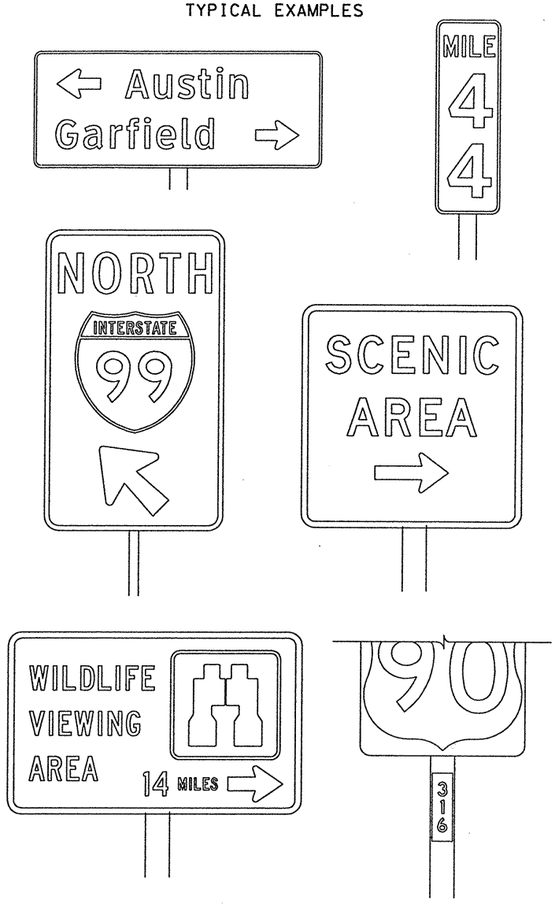
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
2. White legend shall use the Clearview Alphabet.
   The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.
   - B CV-1W
   - C CV-2W
   - D CV-3W
   - E CV-4W
   - Emod CV-5WR
   - F CV-6W
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. White legend, symbols and borders shall be cut-out white sheeting applied to colored background sheeting.
5. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius need not be trimmed or rounded if fabricated from an extruded material.
6. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110, or DMS-8305. Exit Number Panels attached above the parent sign shall be made with the same substrate and sheeting as the parent sign.
7. Mounting details of attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.
8. Cut all legend, symbols, and borders at panel joints.

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

TYPICAL EXAMPLES



DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110

Square Ft.	Min. Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

SIGN FACE MATERIALS	DMS-8300
FIBERGLASS SIGN SUBSTRATE	DMS-8305

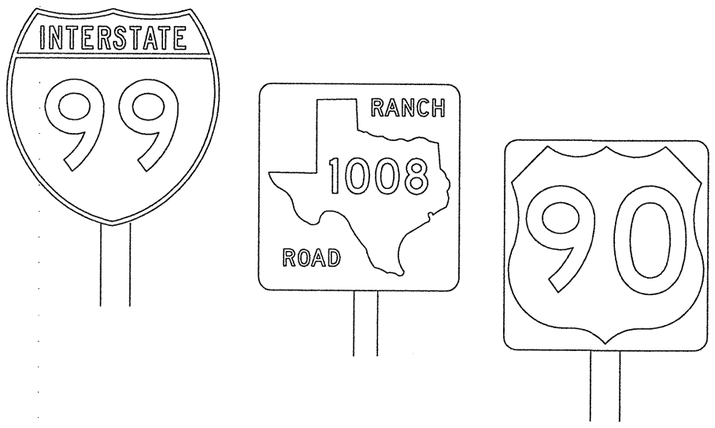
GROUND-MOUNTED SIGNS

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. White legend shall use the Clearview Alphabet.
   The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.
   - B CV-1W
   - C CV-2W
   - D CV-3W
   - E CV-4W
   - Emod CV-5WR
   - F CV-6W
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. White legend, symbols and borders shall be cut-out white sheeting applied to colored background sheeting.
5. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
6. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or DMS 8305.
7. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE MARKERS



DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE C SHEETING
LEGEND & BORDERS	WHITE	TYPE C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Route Marker legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to white background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Independent mounted Route Marker sign blanks, for 24 inch markers shall be 0.080 inch thick, and for 36 inch markers shall be 0.100 inch thick one piece sheet aluminum signs(Type A).
7. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/publications/traffic.htm

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL SIGN REQUIREMENTS

TSR(3)-08

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REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-03	DAL	6		405C
9-08				

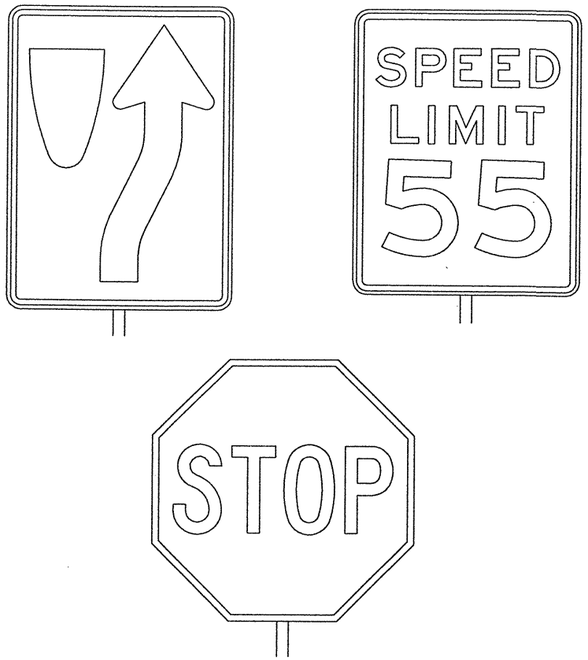
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	0009	12	073	IH 30

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REQUIREMENTS FOR REGULATORY SIGNS

TYPICAL EXAMPLES



DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS DMS-7110

Square Ft.	Min. Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

SIGN FACE MATERIALS DMS-8300

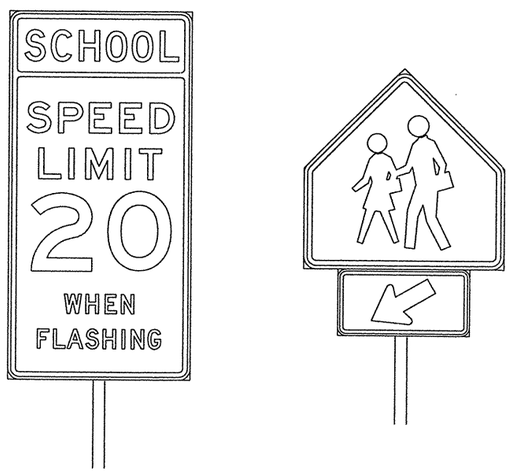
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE C SHEETING
LEGEND & BORDERS	WHITE	TYPE C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Regulatory sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to white background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES



DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS DMS-7110

Square Ft.	Min. Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

SIGN FACE MATERIALS DMS-8300

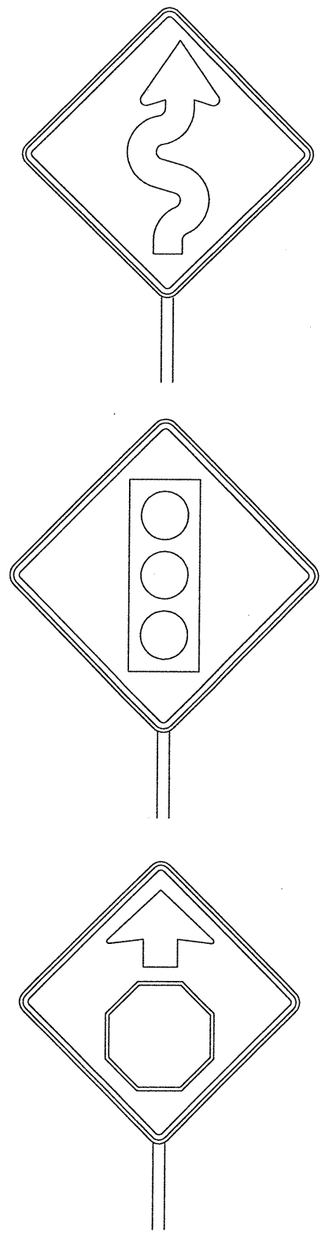
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE C SHEETING
BACKGROUND	FLOR. YEL. GRN.	TYPE E SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. School sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110.
6. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

REQUIREMENTS FOR WARNING SIGNS

TYPICAL EXAMPLES



DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS DMS-7110

Square Ft.	Min. Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

SIGN FACE MATERIALS DMS-8300

USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	YELLOW	TYPE E SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE D SHEETING

GENERAL NOTES:

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Warning sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
5. Colored legend and symbols shall be applied by screening process with transparent colored ink, transparent colored overlay film, or colored sheeting to white sheeting, or combination thereof. The colored legend or symbol is then applied to the yellow background sheeting.
6. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110.
7. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/publications/traffic.htm

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL SIGN REQUIREMENTS

TSR(4)-08

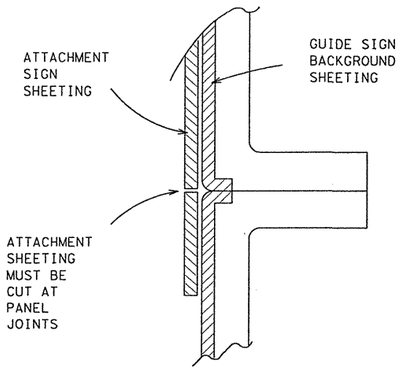
© TxDOT October 2003	DN: - TxDOT	CK: - TxDOT	DW: - TxDOT	CK: - TxDOT
REVISIONS 12-03 9-08	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT	SHEET: 405D
COUNTY: ROCKWALL	CONTROL: 0009	SECTION: 12	JOB: 073	HIGHWAY: IH 30

ACC:
ILS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 21 31 41 51 61 71 81 91 02 12 22 32 42 52 62 72 82 92 03 13 23 33 43 53 63 73 83 93 04 14 24 34 44 54 64 74 84 94 05 15 25 35 45 55 65 75 85 95 06 16 26 36

DISCLAIMER
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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

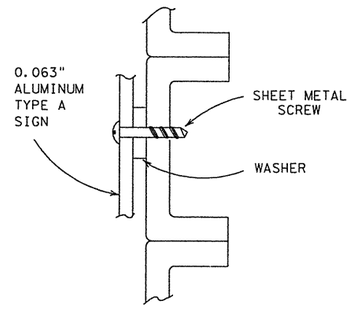
DIRECT APPLIED ATTACHMENT



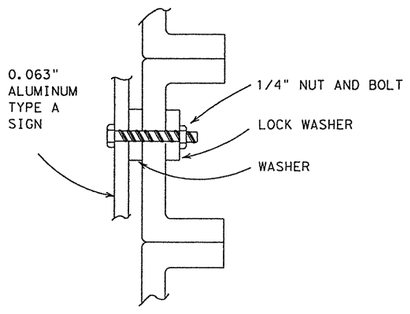
Sheeting for legend, symbols, and borders must be cut at panel joints.

Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

SCREW ATTACHMENT

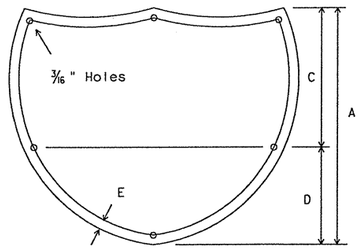


NUT/BOLT ATTACHMENT



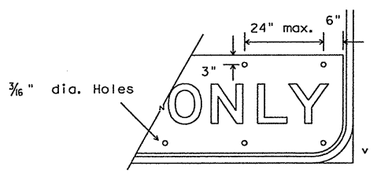
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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

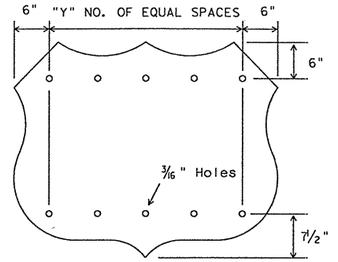


INTERSTATE ROUTE MARKERS

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

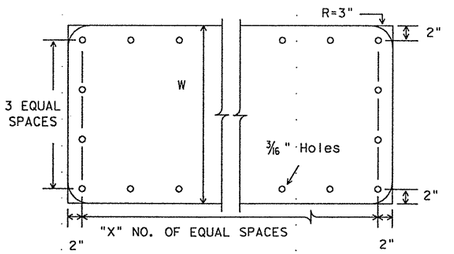


EXIT ONLY PANEL



U.S. ROUTE MARKERS

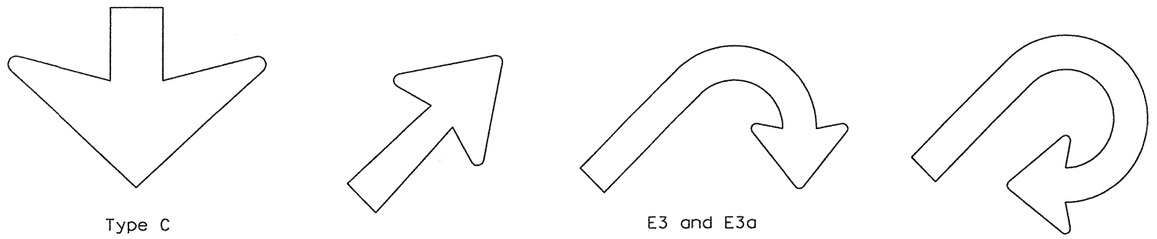
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

ARROW DETAILS
for Large Ground-Mounted and Overhead Guide Signs



Type C "Down" arrow

E3 and E3a

E4 and E4a

TYPE	LETTER SIZE
A-1	10.67" U/L and 10" Caps
A-2	13.33" U/L and 12" Caps
A-3	16" U/L
B-1	10.67" U/L and 10" Caps
B-2	13.33" U/L and 12" Caps
B-3	16" U/L

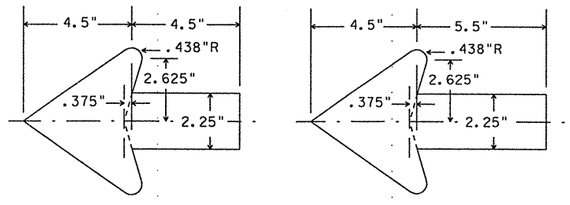
CODE	USED ON SIGN NO.
E-3 & E-4	E5-3 and E5-4
E-3a & E-4a	E5-3a and E5-4a

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/publications/traffic.htm

ARROW DETAILS
for Destination Signs



Standard arrow to be used with 6 inch letters.

Standard arrow to be used with 8 inch letters.

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

TYPICAL SIGN REQUIREMENTS

TSR(5)-08

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DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-03	DAL	6		405E
9-08				

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
ROCKWALL	0009	12	073	IH 30

ACC:

| LS DISPLAYED | | | |

Notes To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.
3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed.

Revised: February 16, 2009
Prepared by NikkiLoya of Civil Associates, Inc., on 02/27/09

During the planning phase of project development the following environmental permits, issues and commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities, as additional environmental clearances may be required.

I. Clean Water Act, Section 402 Texas Pollutant Discharge Elimination System
(Addresses MS4 requirements for project)

☐ No Action Required ☒ Required Action

Action No.	Waters of the US/Station • R/L of Centerline	Commitment
1. Project disturbs more than 5 acres surface area: TxDOT must file NOI and coordinate with TCEQ for CGP.	Unnamed tributary to Buffalo Creek	Comply with TPDES CGP. Contractor must implement and maintain a SW3P. See SW3P Plan Sheet, BMPs, and detail.
2. TxDOT must file NOT.		Contractor must stabilize project site as stated in SW3P.

II. Clean Water Act, Section 401 and 404 Compliance

Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet area is prohibited unless specified in the USACE permit and approved by the Engineer.

When temporary fill is implemented, only stated District standards will be used unless written authorization for an alternative is obtained from the Engineer. No equipment is allowed in any stream channel below the Ordinary High Water Mark except on temporary stream crossings or drill pads.

☐ No Permit Required ☒ 404 Permit and 401 Certification Required

Permit	Required Action	Waters of the US	Applicable Plan Sheet Number
NWP 14	Comply With Conditions of the Permit. (USACE coordination is not required).	Unnamed tributary to Buffalo Creek	

Best Management Practices for applicable 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

- ☒ Temporary Vegetation
- ☒ Mulch
- ☐ Interceptor Swale
- ☒ Erosion Control Compost
- ☐ Compost Filter Berms and Socks
- ☒ Blankets, Matting
- ☐ Sod
- ☐ Diversion Dike
- ☒ Mulch Filter Berms and Socks
- ☐ Compost Blankets

Category II (Sedimentation Control)

- ☐ Sand Bag Berm
- ☐ Silt Fence
- ☐ Triangular Filter Dike
- ☒ Stone Outlet Sediment Traps
- ☒ Erosion Control Compost
- ☐ Compost Filter Berms and Socks
- ☒ Rock Berm
- ☐ Straw Bale Dike
- ☐ Brush Berms
- ☐ Sediment Basins
- ☒ Mulch Filter Berms and Socks
- ☐ Compost Blankets

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

- ☐ Retention/Irrigation
- ☐ Extended Detention Basin
- ☐ Vegetative Filter Strips
- ☐ Grassy Swales
- ☒ Erosion Control Compost
- ☐ Compost Filter Berms and Socks
- ☐ Constructed Wetlands
- ☐ Wet Basins
- ☒ Vegetation-Lined Ditches
- ☐ Sand Filter Systems
- ☐ Inlet Sediment Traps
- ☐ Sedimentation Chambers

III. Cultural Resources

Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.	Station • R/L of Centerline	Commitment

IV. Vegetation Resources

☒ No Action Required ☐ Required Action

Action No.	Station • R/L of Centerline	Commitment

V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds Treaty Act (MBTA)

☐ No Action Required ☒ Required Action

Species Potentially within Project Area w/ Description	Habitat Description

Special Notes

1. *The work may not remove active nests from bridges or other structures during the nesting season of the birds with associated nests.*
2. *Prior to construction activities, bridge would be surveyed for active nests to ensure preservation of such species as barn swallow, cliff swallow, and rough-winged swallow.*
3. *The contractor would remove all old migratory bird nests between September 1 through the end of February from any structure where work will be done. In addition, the contractor would be prepared to prevent migratory birds from building nests between March 1 and August 31.*

Action

1. *If the listed species is observed in the immediate area, do not disturb the species or habitat and contact the engineer and District Environmental Coordinator at 214-320-6157 immediately.*

VI. Hazardous Materials or Contamination Issues

Comply with the Hazardous Communication Act for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of the potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project which may include, but are not limited to, the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labeling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells/odors
- Underground storage tanks
- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on-site

****

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action required.
If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a Texas Department of State Health Services (DSHS) licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled abatement activities and/or demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

☐ No Action Required ☒ Required Action

Action No.	Station • R/L of Centerline	Commitment

Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

Measures to control fugitive dust would be considered and incorporated into the final design and construction specifications. Dust control measures could include sprinkling and watering, wheel washers, gravel pads, vegetative cover and mulch, wind fencing, or spray-on soil treatments.

List of Abbreviations

BMP: Best Management Practice
CGP: Construction General Permit
FEMA: Federal Emergency Management Agency
FHWA: Federal Highway Administration
MOA: Memorandum of Agreement
MOU: Memorandum of Understanding
MS4: Municipal Separate Stormwater Sewer System
NOI: Notice of Intent
NOT: Notice of Termination
NWP: Nationwide Permit
PCN: Pre-Construction Notification
SW3P: Storm Water Pollution Prevention Plan
TCEQ: Texas Commission on Environmental Quality
TPDES: Texas Pollutant Discharge Elimination System
TPWD: Texas Parks and Wildlife Department
TxDOT: Texas Department of Transportation
T&E: Threatened and Endangered Species
USFWS: U.S. Fish and Wildlife Service
USACE: U.S. Army Corp of Engineers
MBTA: Migratory Bird Treaty Act

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Texas Department of Transportation
Dallas District (DAL)

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	NH ( )		IH-30
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	ROCKWALL	
CONTROL	SECTION	JOB	SHEET NO.
0009	12	073	406

A. GENERAL SITE DATA

1. **PROJECT LIMITS:** *IH 30 AT SH 205 BYPASS*

Project Coordiates: *7,022,702.448 N : 2.600,609.845 E BEGIN PROJECT*
7,024,447.051 N : 2.606,234.858 E END PROJECT

2. **PROJECT SITE MAPS:**

- *Project Location Map: The Title Sheet*
- *Drainage Patterns: Drainage Area Maps*
- *Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: Typical Sections*
- *Location of Erosion and Sediment Controls: SW3P Site Maps*
- *Surface Waters and Discharge Locations: Drainage and Culvert Layouts*
- *Project Specific Locations: To be specified by the Project Field Office during construction and located in the Project SW3P File. Reference Item #10 below.*

3. **PROJECT DESCRIPTION:**

For construction of the widening of a freeway consisting of widening, grading, structures, and surfacing.

4. **MAJOR SOIL DISTURBING ACTIVITIES:**

Soil disturbing activities include preparing of right-of-way, grading, excavation, embankment, structures, erosion and sediment controls, topsoil and seeding.

5. **EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:**

6. **TOTAL PROJECT AREA:** 45 Acres

7. **TOTAL AREA TO BE DISTURBED:** 45 Acres (100%)

8. **WEIGHTED RUNOFF COEFFICIENT**

BEFORE CONSTRUCTION: 0.60
AFTER CONSTRUCTION: 0.71

9. **NAME OF RECEIVING WATERS:**

Buffalo Creek flows into East Fork above S. Mesquite Creek which in turn feeds the East Fork Trinity River.

10. **PROJECT SW3P FILE**

For projects disturbing one acre or more, TxDOT will maintain a SW3P file at the project field office which contains the following: Index Sheet, TCEQ N.O.I., TCEQ Signature Authority, TCEQ Fee Payment Form, TPDES Storm Water Program or Construction Site Notice, TPDES Permit Coverage Notice, SW3P Inspector Qualification Statements, Inspection and Maintenance Reports, Required Location Maps, Stored Materials List specifying associated control measures, and the Appendix, which contains the TPDES Construction General Permit Language and the Contractor's PSL Permits.

B. EROSION AND SEDIMENT CONTROLS

1. **SOIL STABILIZATION PRACTICES:** (Select T = Temporary or P = Permanent, as applicable)

- T TEMPORARY SEEDING
- T MULCHING (Hay or Straw)
- ___ BUFFER ZONES
- T PLANTING
- P SEEDING
- P SODDING
- T PRESERVATION OF NATURAL RESOURCES
- ___ FLEXIBLE CHANNEL LINER
- ___ RIGID CHANNEL LINER
- ___ SOIL RETENTION BLANKET
- P COMPOST MANUFACTURED TOPSOIL
- T/P OTHER:

2. **STRUCTURAL PRACTICES:** (Select T = Temporary or P = Permanent, as applicable)

- ___ SILT FENCES
- T EROSION CONTROL COMPOST LOGS
- T EROSION CONTROL COMPOST BERMS (Low Velocity)
- T ROCK FILTER DAMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- P PIPE SLOPE DRAINS
- P PAVED FLUMES
- T ROCK BEDDING AT CONSTRUCTION EXIT
- T TIMBER MATTING AT CONSTRUCTION EXIT
- P CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- ___ STORM INLET SEDIMENT TRAP
- P STONE OUTLET STRUCTURES
- P CURBS AND GUTTERS
- P STORM SEWERS
- P VELOCITY CONTROL DEVICES
- OTHER:

3. **STORM WATER MANAGEMENT:**

1. *Storm water drainage will be provided by ditches, inlets, and storm water systems which carry drainage within the R.O.W. to the lows within the roadway and project site which drains to natural facilities.*

2. *Other permanent erosion controls include hydraulic design to limit structure outlet velocities and grading design generally consisting of 4 : 1 or flatter slopes with permanent vegetative cover.*

4. **STORM WATER MANAGEMENT ACTIVITIES:** (Sequence of Construction)

1. *Prepare ROW and install Phase 1 sediment control items as shown in SW3P plans. Construct culvert "A", mainlane pavement, drainage, walls, and John King Blvd. bridge,*

2. *Place all phase 2 sediment control item as shown in SW3P plans and construct frontage road, drainage and remainder of ramp pavement.*

3. *When all construction activity is complete and the site is stabilized and approved by the engineer, remove all temporary structural controls and reseed any areas disturbed by their removal.*

5. **NON-STORM WATER DISCHARGES:**

Filter non-storm water discharges, or hold in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water; and water used for dust control, pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. **MAINTENANCE:**

Maintain all erosion and sediment controls in good working order. Perform any necessary repairs at the earliest date possible but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. Stabilize disturbed areas on which construction activities have ceased, temporarily or permanently, within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways have priority followed by devices protecting storm sewer inlets.

2. **INSPECTION:**

A TxDOT Inspector will perform a regularly scheduled SW3P inspection every 7 calendar days. An Inspection and Maintenance Report, signed by the TxDOT Inspector and the Contractor, will be filed for each inspection. Revise and/or repair each BMP control device in accordance with the current Inspection and Maintenance Report and Item #1 above.

3. **WASTE MATERIALS:**

On a regular basis, or as may be directed, collect all waste materials, trash and debris from the construction site and deposit into a metal dumpster having a secure cover and which meets all state and local city solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at a local approved landfill site. Do not bury construction waste on the construction project site.

4. **HAZARDOUS WASTE & SPILL REPORTING:**

As a minimum, any products in the following categories are considered to be hazardous: Paints, Acids, Solvents, Fuels, Asphalt Products, Chemical Additives for Soil Stabilization, and Concrete Curing Compounds or Additvives. When storing hazardous material on the project site, or at a Project Specific Location, take all practicable precaution to prevent and/or contain any spillage of these materials. In the event of a spill, contact the spill coordinator immediately.

5. **SANITARY WASTE:**

Use a licensed sanitary waste management contractor to collect all sanitary waste from portable units as may be required by local regulation, or as directed.

6. **OFFSITE VEHICLE TRACKING:**

On a regular basis, or as may be directed, dampen haul roads for dust control and stabilize construction entrances/exits. Provide for a motorized broom or vacuum type sweeper to be avilable on a weekly basis, or as may be directed, to remove sediment from paved roadways abutting or transversing the project site.

7. **MANAGEMENT PRACTICES:**

1. *Construct disposal areas, stockpiles and haul roads in a manner that will minimize and control the amount of sediment that may enter receiving waters. Do not locate disposal areas in any wetland, waterbody or streambed.*

2. *Locate construction staging areas and vehicle maintenance areas in a manner to minimize the runoff of pollutants.*

3. *When working in or near a wetland, install and maintain operating soil erosion and sediment controls at all times during construction and isolate the work from the wetland.*

4. *Clear all waterways as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.*



Signature of Registrant & Date P.E. 2/9/09

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

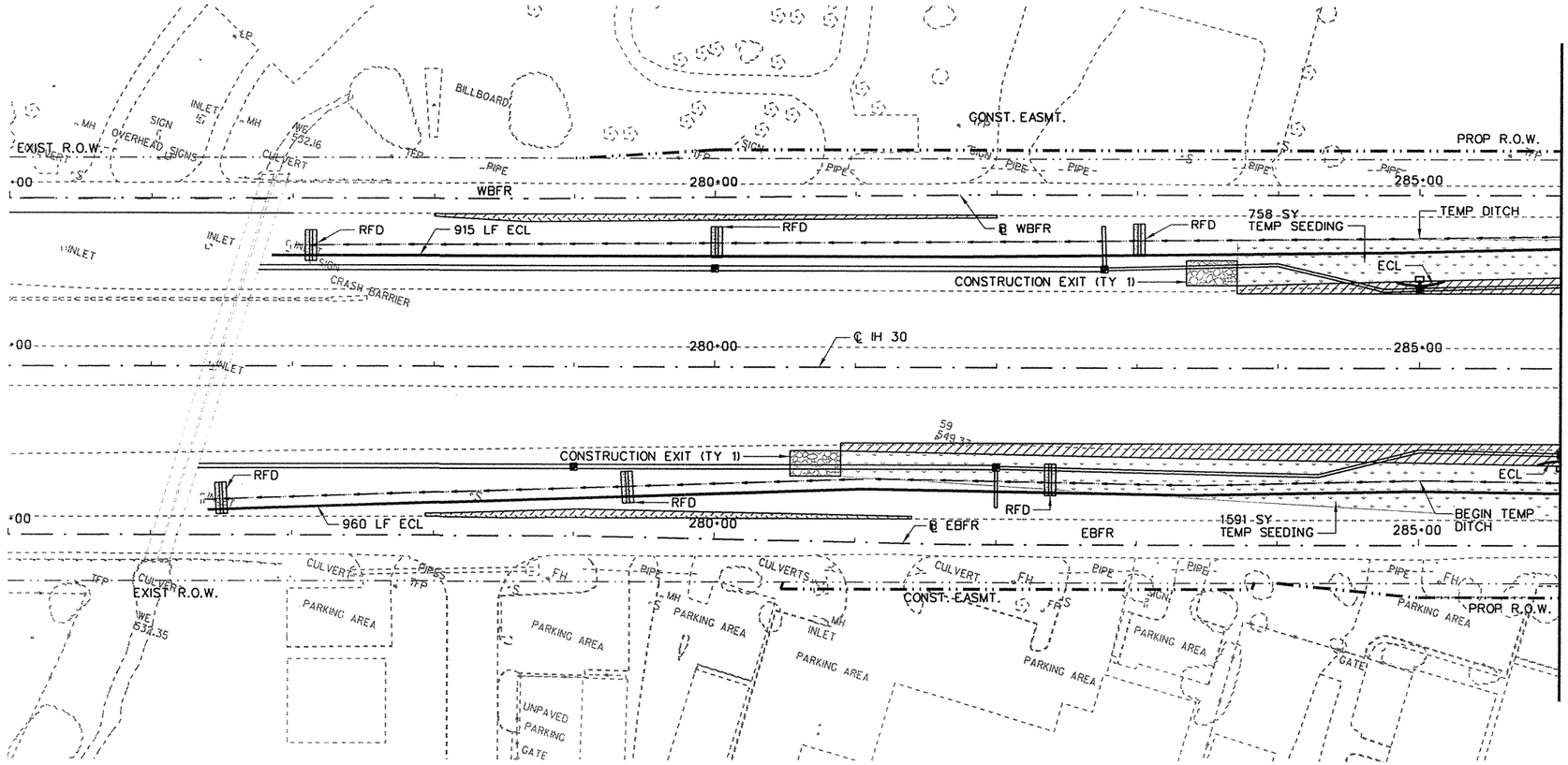
Texas Department of Transportation
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DALLAS DISTRICT ENVIRONMENTAL

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

TEMPLATE REVISION DATE: 02-08-05

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRB	6	SEE TITLE SHEET		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
GRB	TEXAS	DALLAS	ROCKWALL	407
CHECK	CONTROL	SECTION	JOB	
RRH	009	12	073	
CHECK				
RRH				



LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

50 25 0 50 100
SCALE FEET

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. ALL INLETS AND JUNCTION BOXES WITHIN THE PROJECT LIMITS OR AFFECTED BY CONSTRUCTION DEBRIS SHALL BE PROTECTED AT ALL TIMES.
4. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE, AND REMOVAL SHALL BE IN ACCORDANCE WITH TxDOT STANDARDS FOR EROSION CONTROL.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

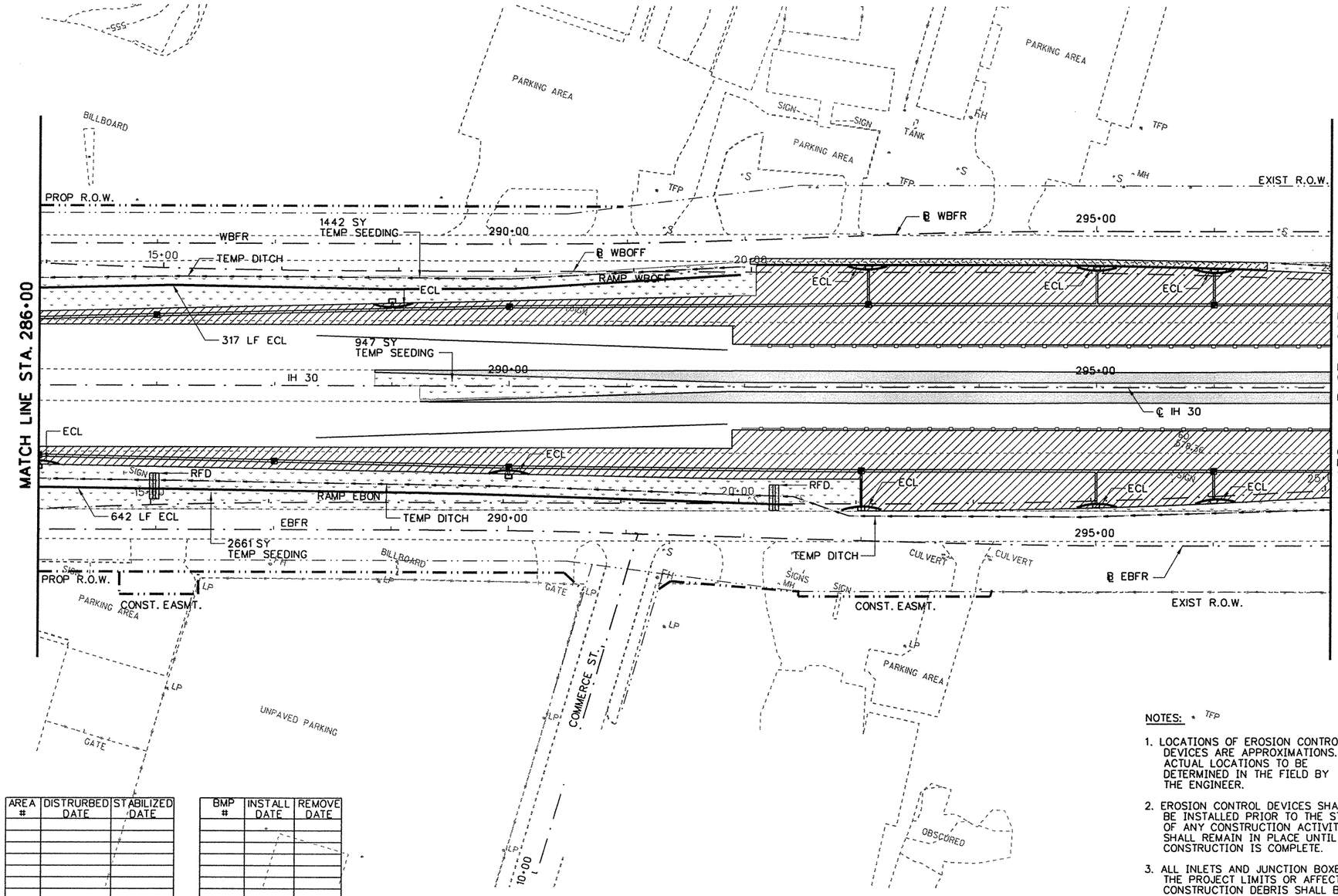
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 1
STA. 275+00 TO STA. 286+00

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	408

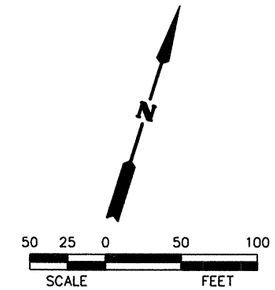
SHEET 1 OF 6

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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE



LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

NOTES: * TFP

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
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STATE OF TEXAS
ROBIN R. HANDEL
86931
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PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

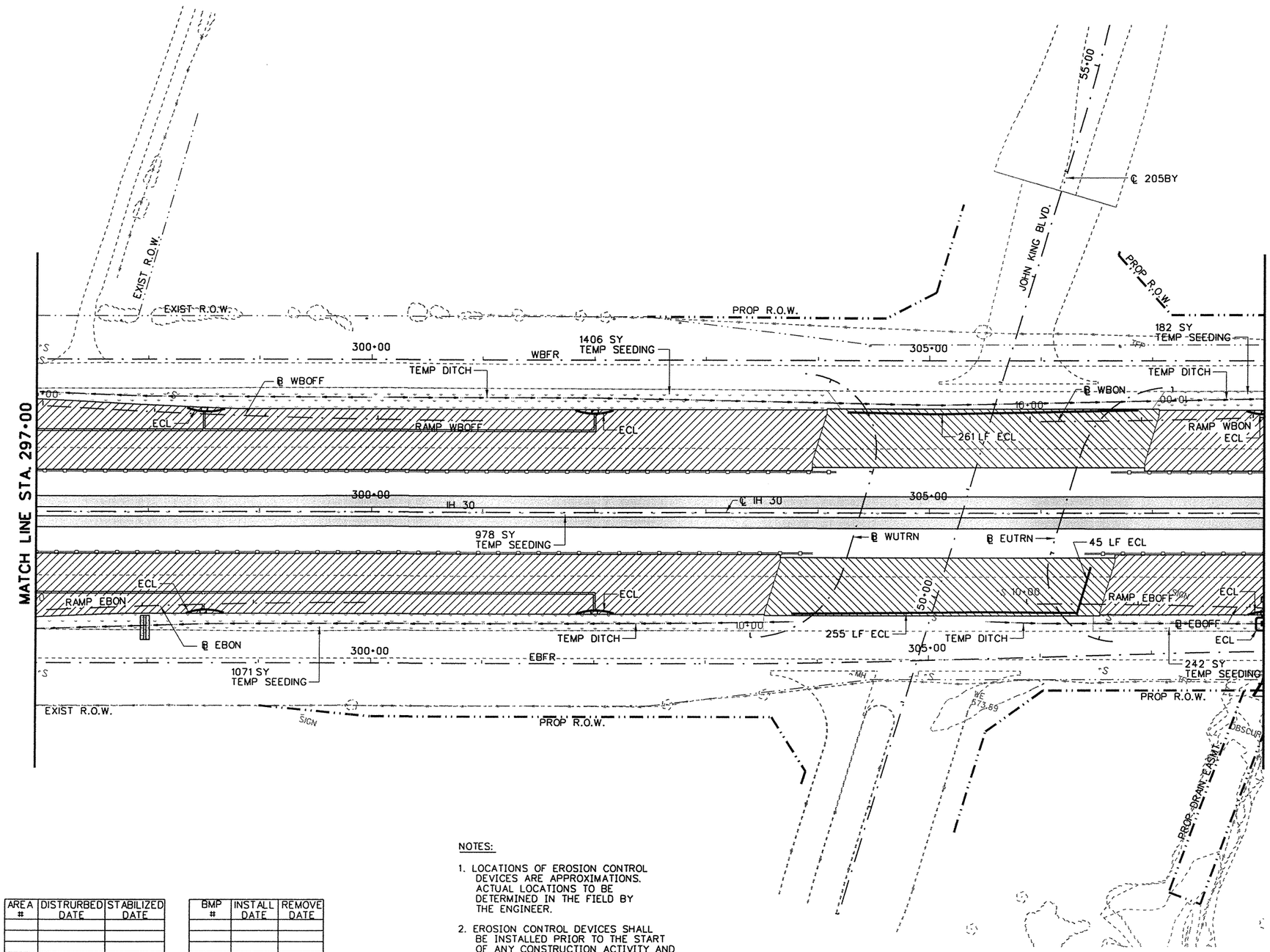
CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

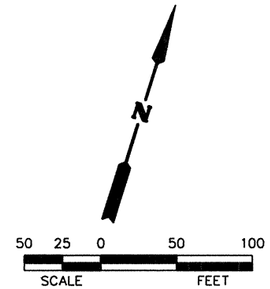
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 1
STA. 286+00 TO STA. 297+00

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	409

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER
2/1/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

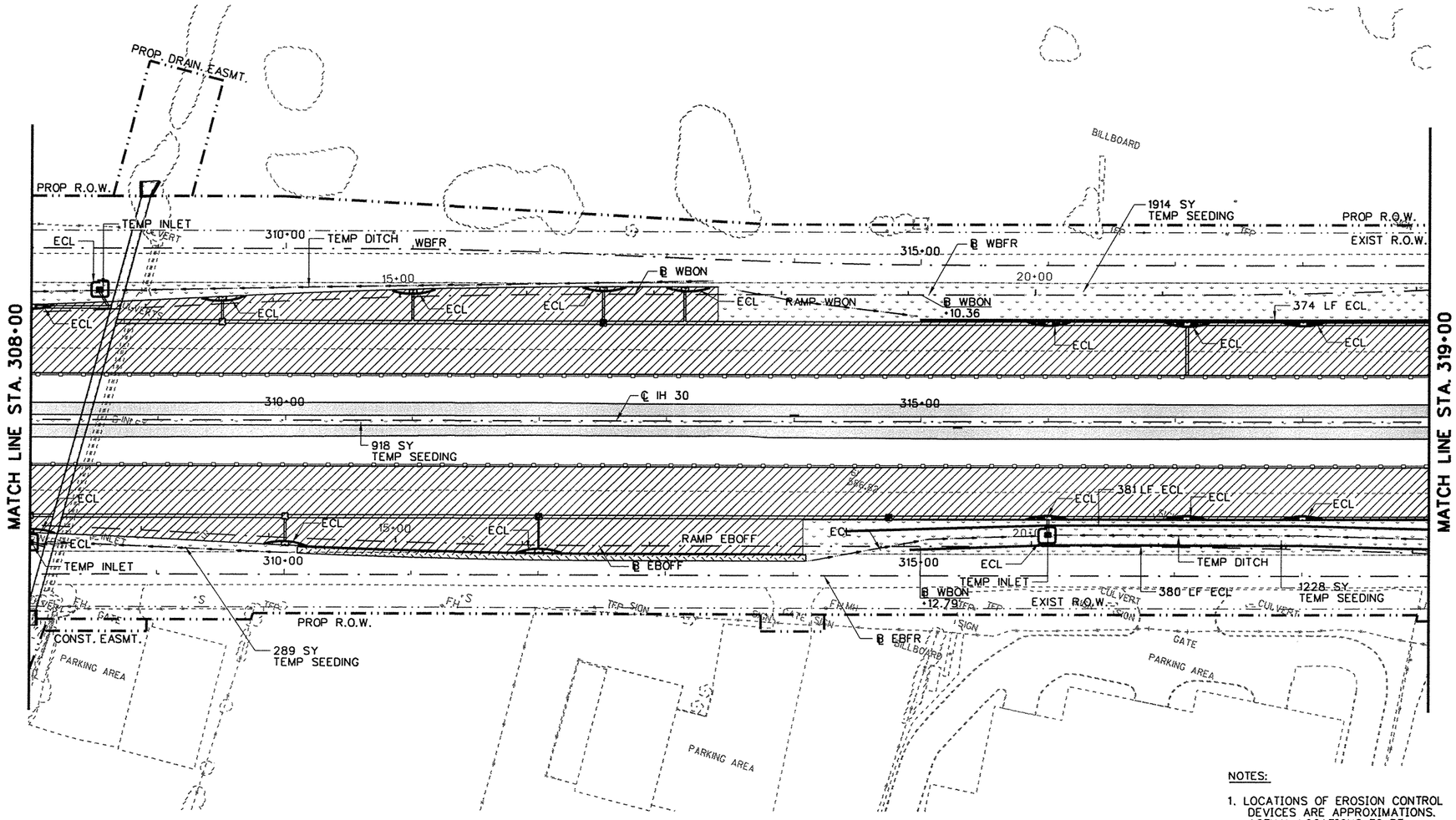
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 1
STA. 297+00 TO STA. 308+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4/0

SHEET 3 OF 6

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SCALE FEET

N

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

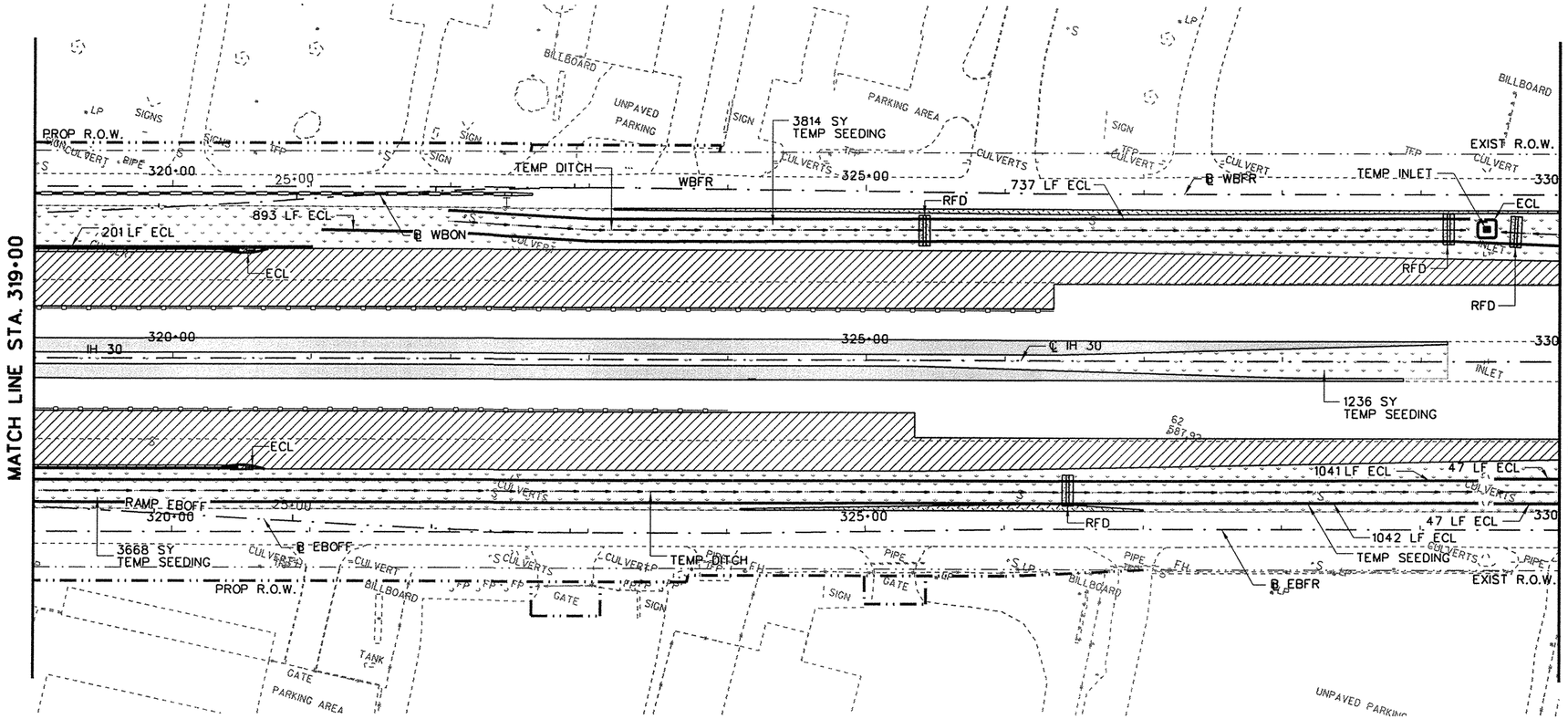
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 1
STA. 308+00 TO STA. 319+00

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	4/11

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N

50 25 0 50 100

SCALE FEET

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

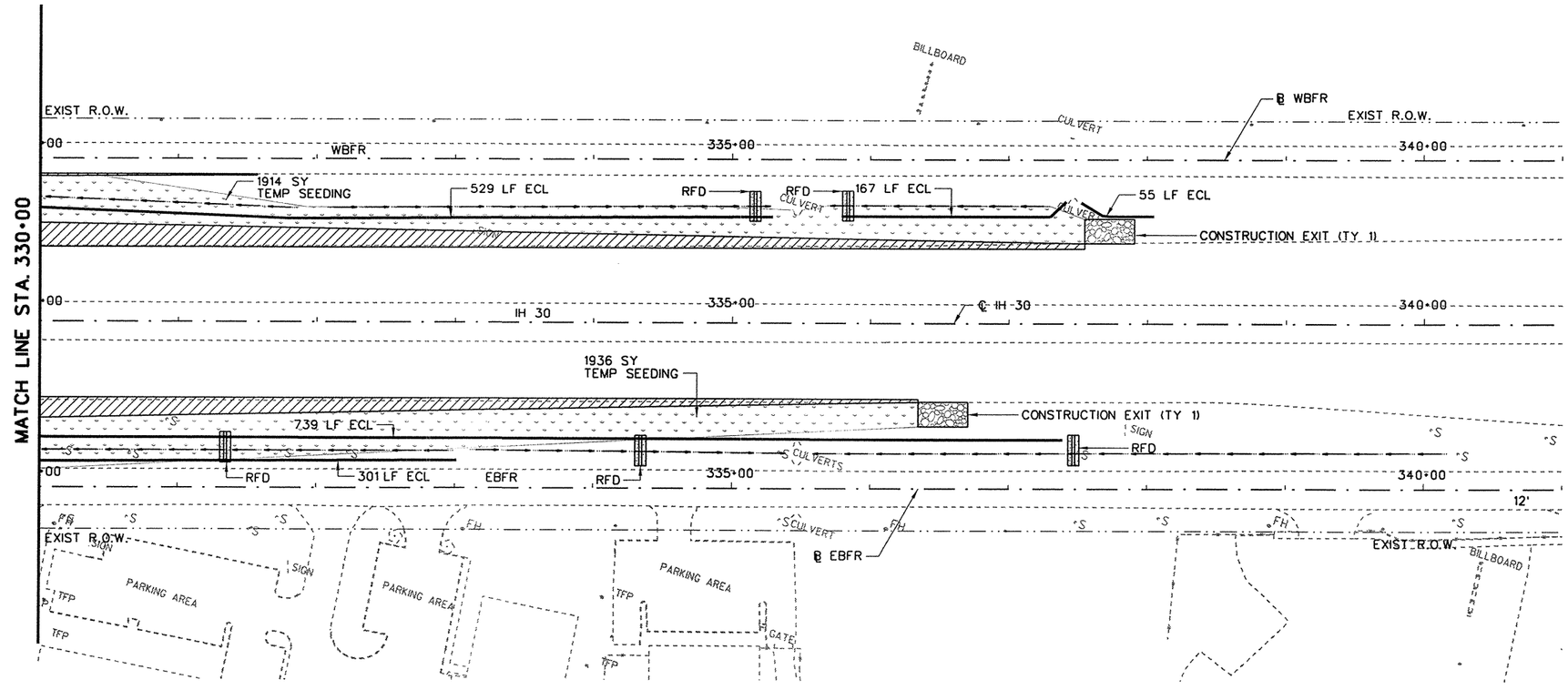
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

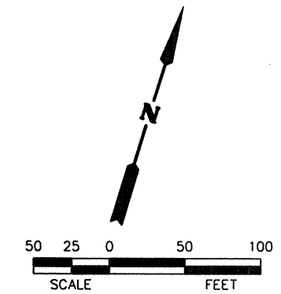
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 1
STA. 319+00 TO STA. 330+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4/12

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LEGEND

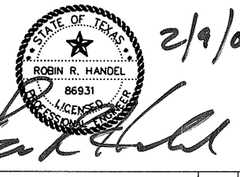
- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

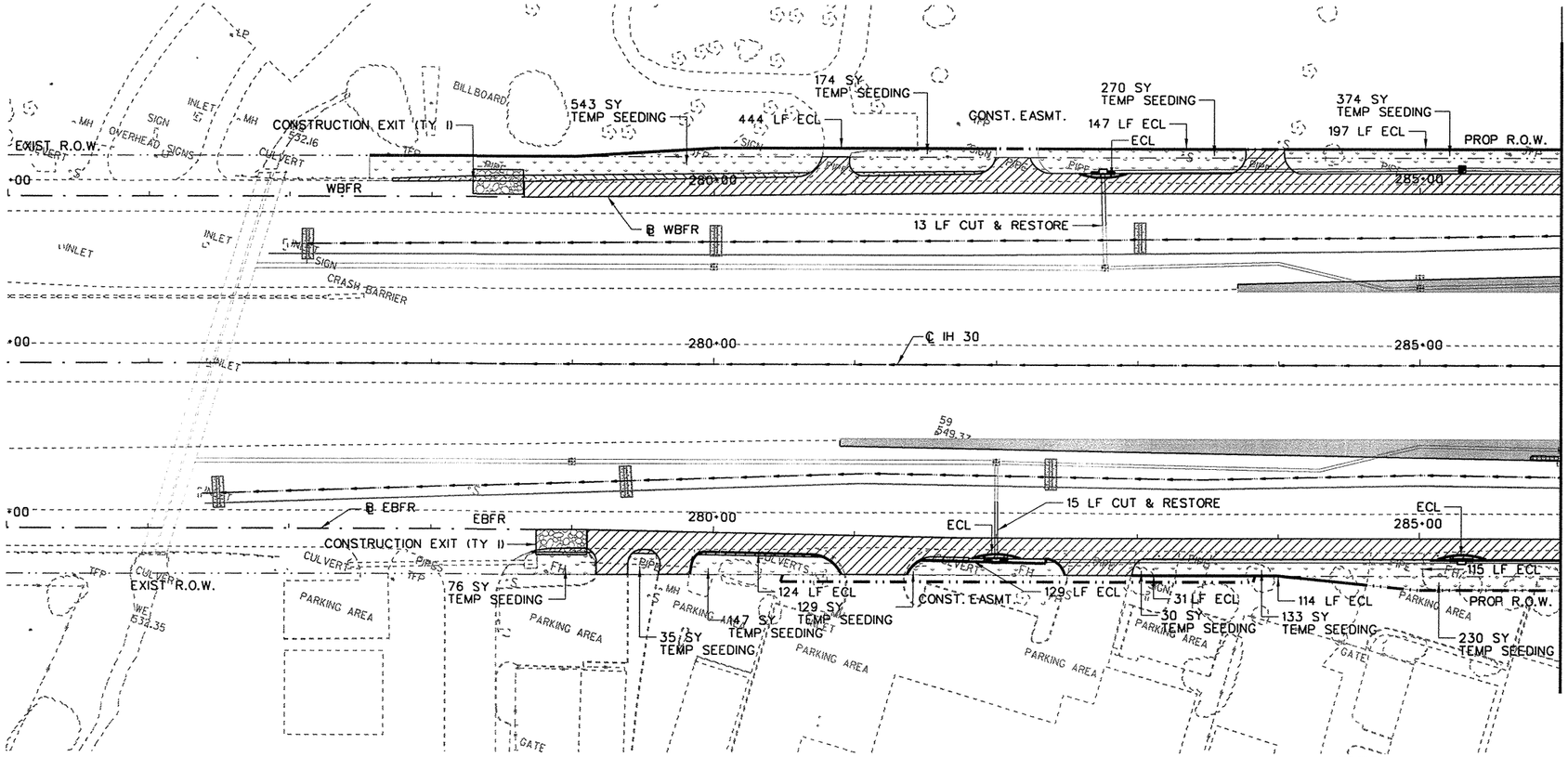
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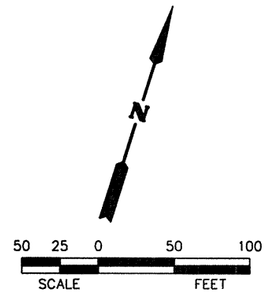
IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 1
STA. 330+00 TO STA. 341+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4/13

SHEET 6 OF 6

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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2/9/09

NO.	REVISION	BY	DATE

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Firm Registration Number: 1741

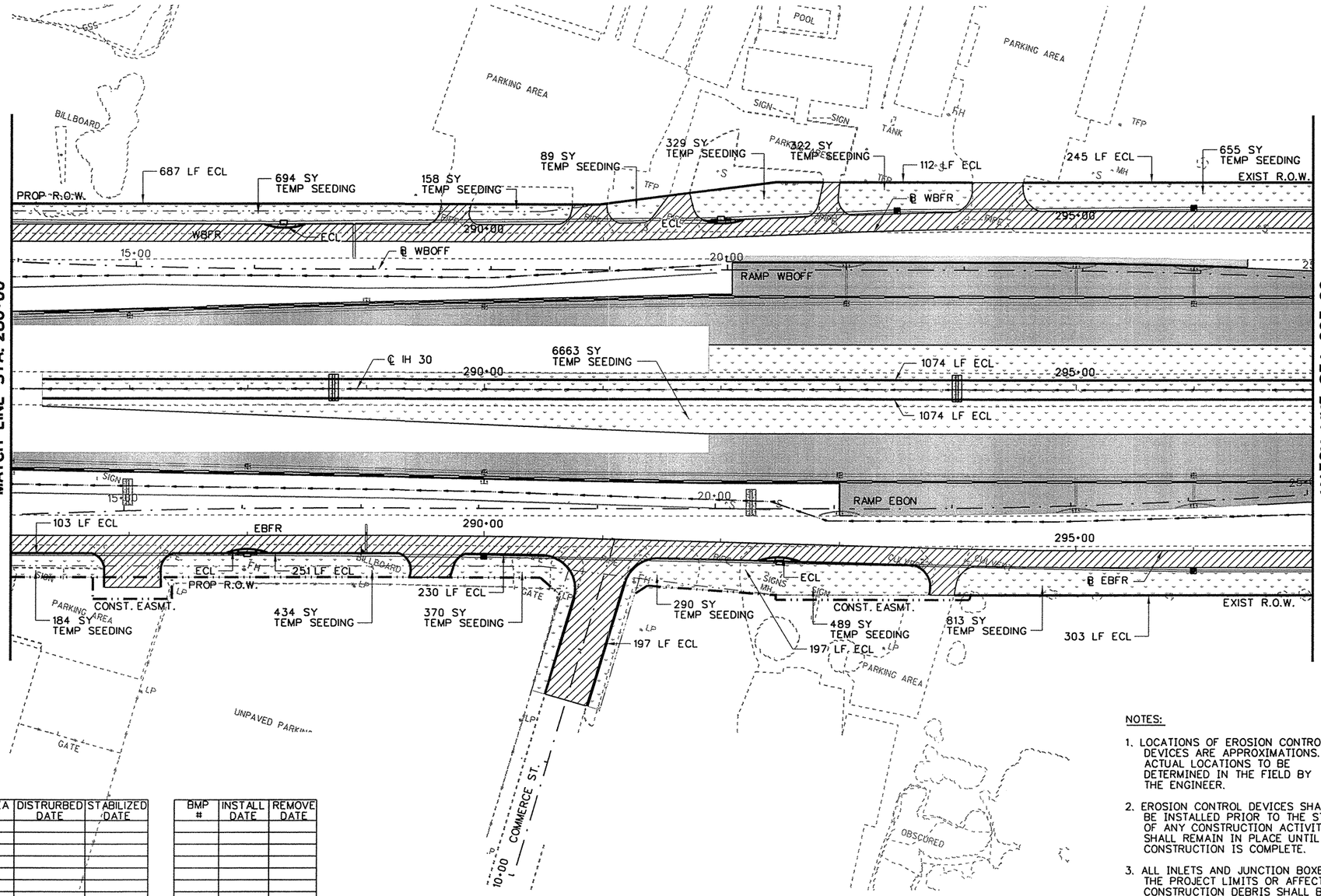
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IH 30 AT JOHN KING BLVD.
SW3P

SITE PLAN - PHASE 2 - STEP 1
BIGIN PROJECT TO STA. 286+00

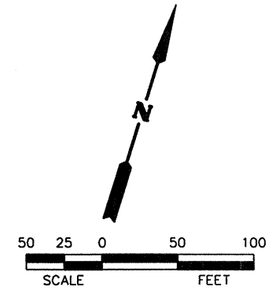
Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073		414

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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE



LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
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LICENSED PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
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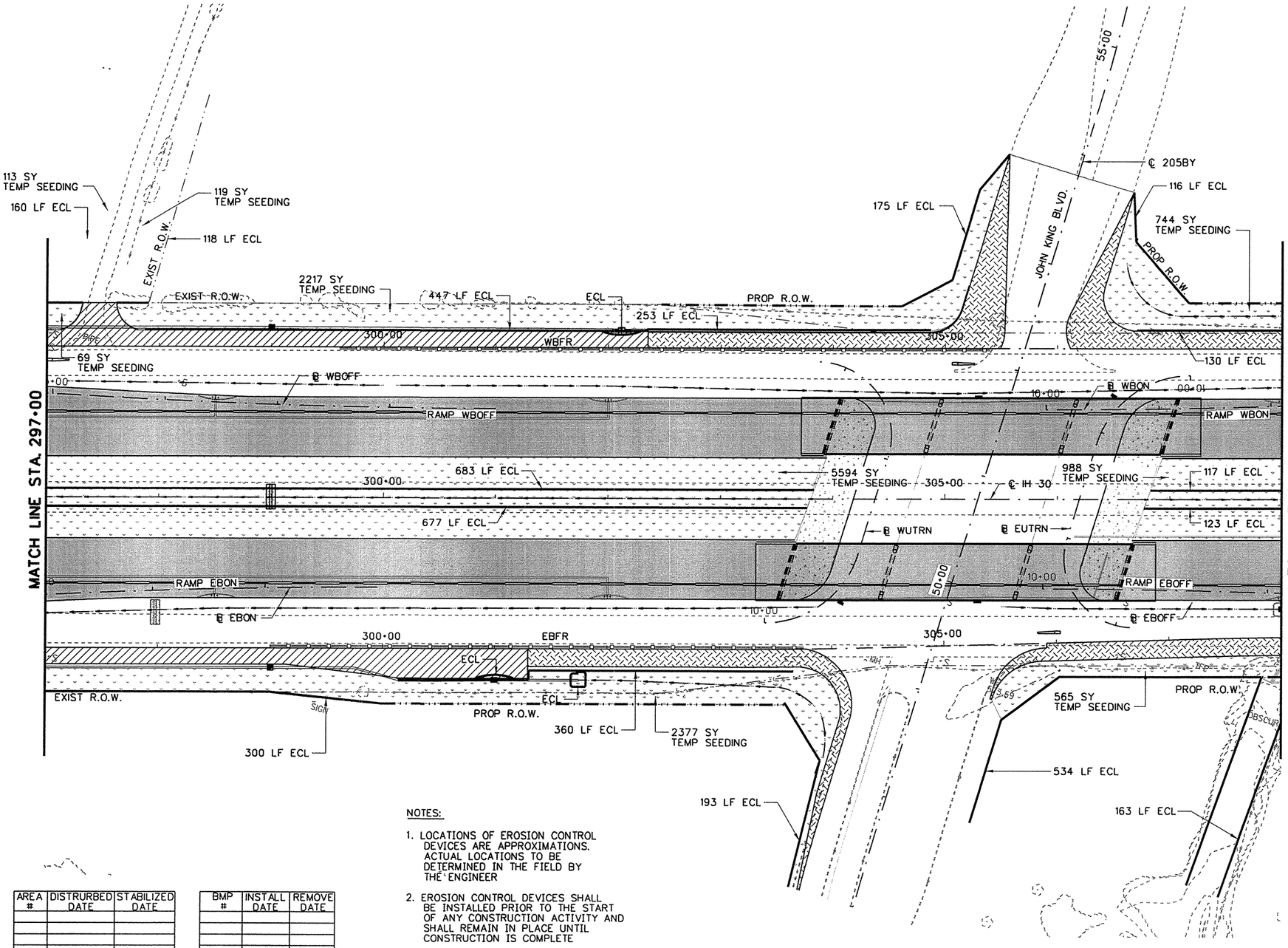
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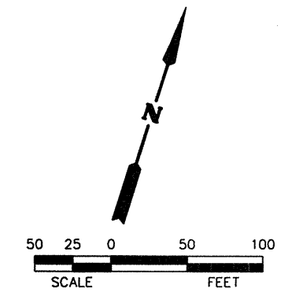
IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 1
STA. 286+00 TO STA. 297+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4/5

SHEET 2 OF 6

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
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Firm Registration Number: 1741

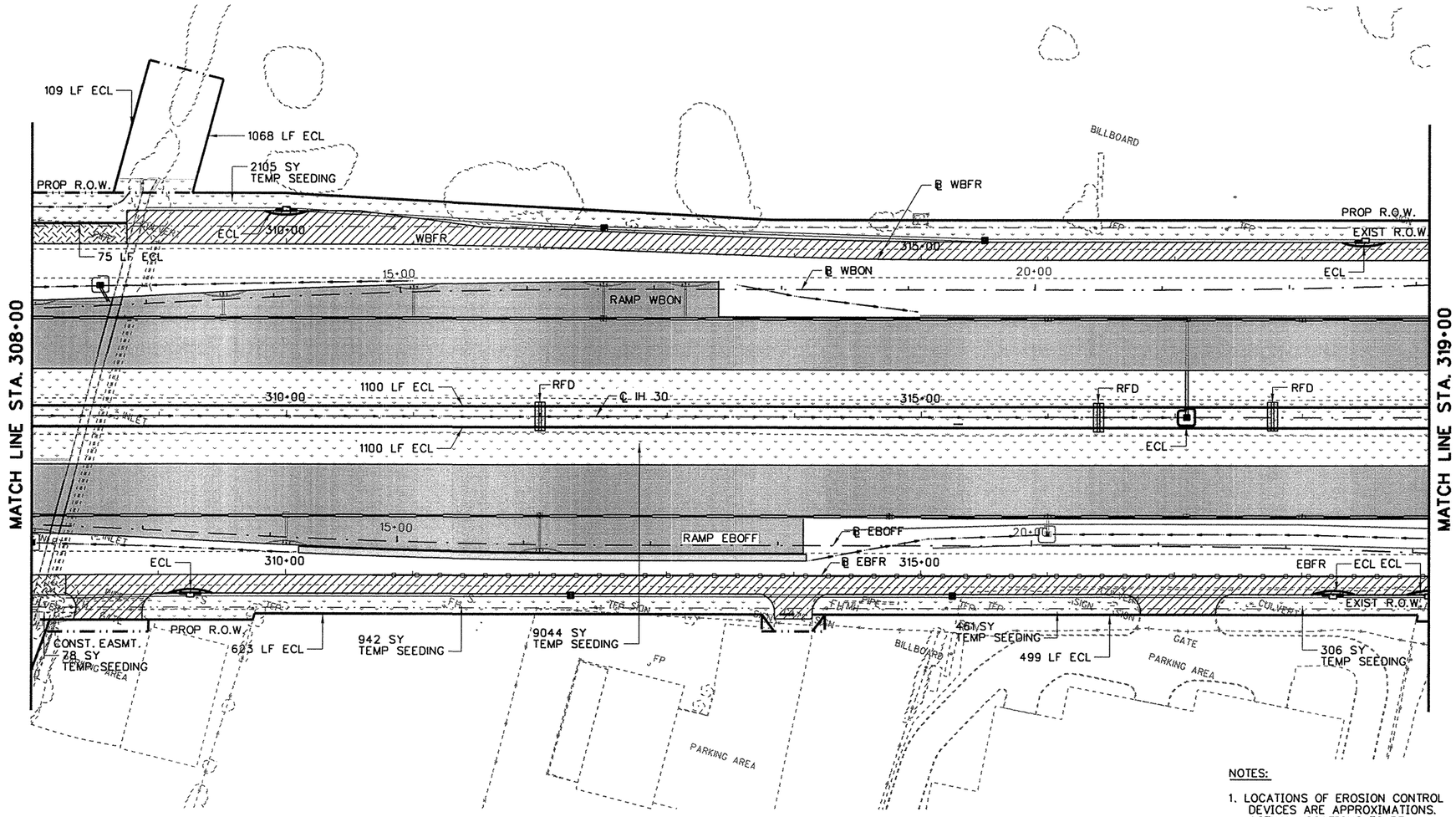
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 1
STA. 297+00 TO STA. 308+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4116

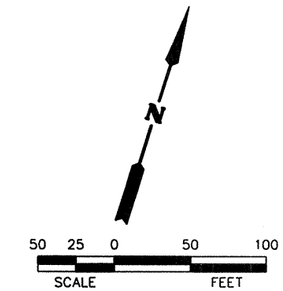
SHEET 3 OF 6

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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE



LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

NOTES:

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. ALL INLETS AND JUNCTION BOXES WITHIN THE PROJECT LIMITS OR AFFECTED BY CONSTRUCTION DEBRIS SHALL BE PROTECTED AT ALL TIMES.
4. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE, AND REMOVAL SHALL BE IN ACCORDANCE WITH TxDOT STANDARDS FOR EROSION CONTROL.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

SW3P

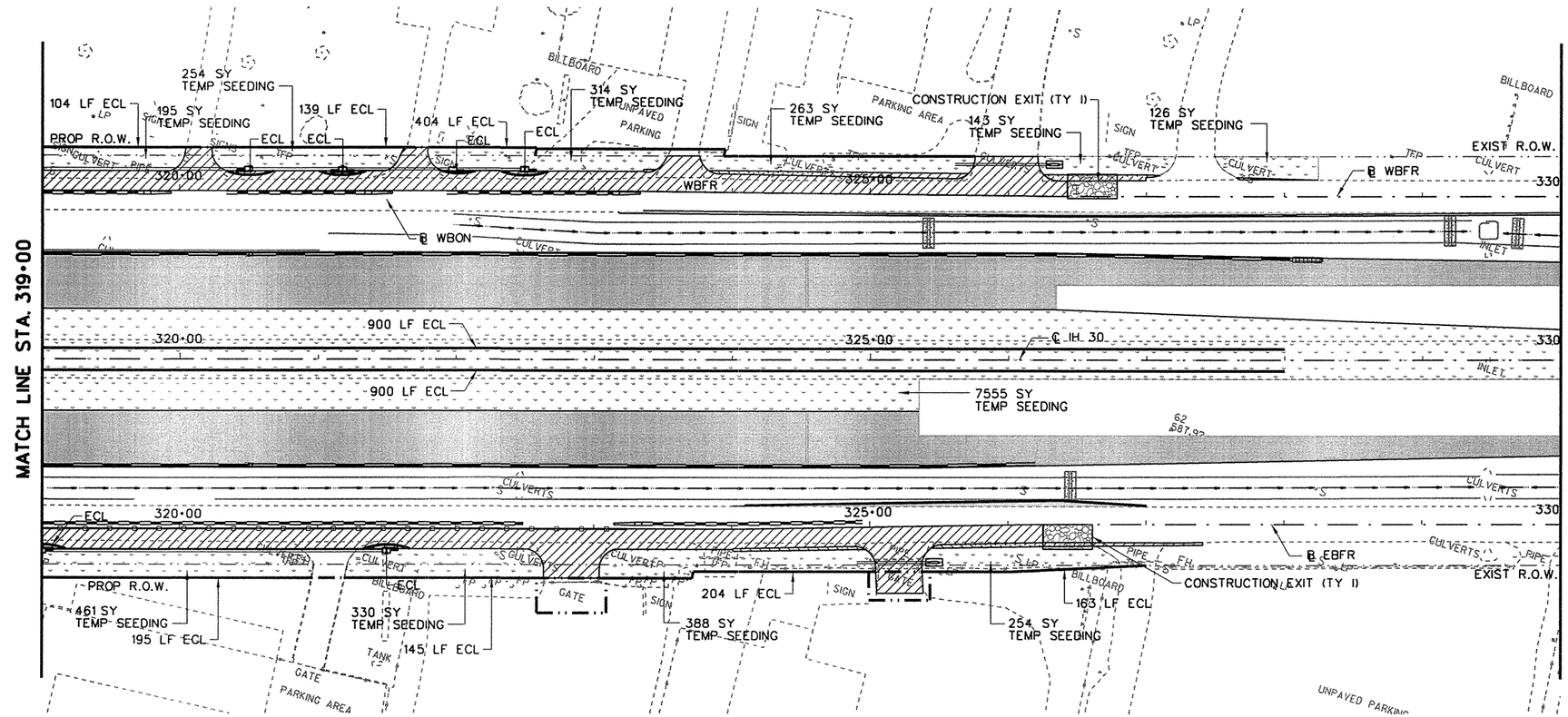
SITE PLAN - PHASE 2 - STEP 1

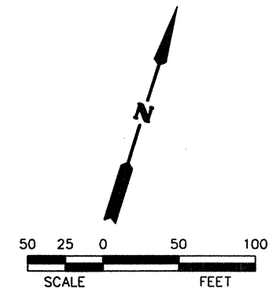
STA. 308+00 TO STA. 319+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	417

SHEET 4 OF 6

2/6/2009 8:38:43 PM D:\Active Projects\TX0263\TX0263_25\SW3P\Plans and Drawings\8.30 C.A. Sheets\8.3xx SW3P CEL 2 1433 to 2441.dgn





LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
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3. ALL INLETS AND JUNCTION BOXES WITHIN THE PROJECT LIMITS OR AFFECTED BY CONSTRUCTION DEBRIS SHALL BE PROTECTED AT ALL TIMES.
4. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE, AND REMOVAL SHALL BE IN ACCORDANCE WITH TxDOT STANDARDS FOR EROSION CONTROL.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

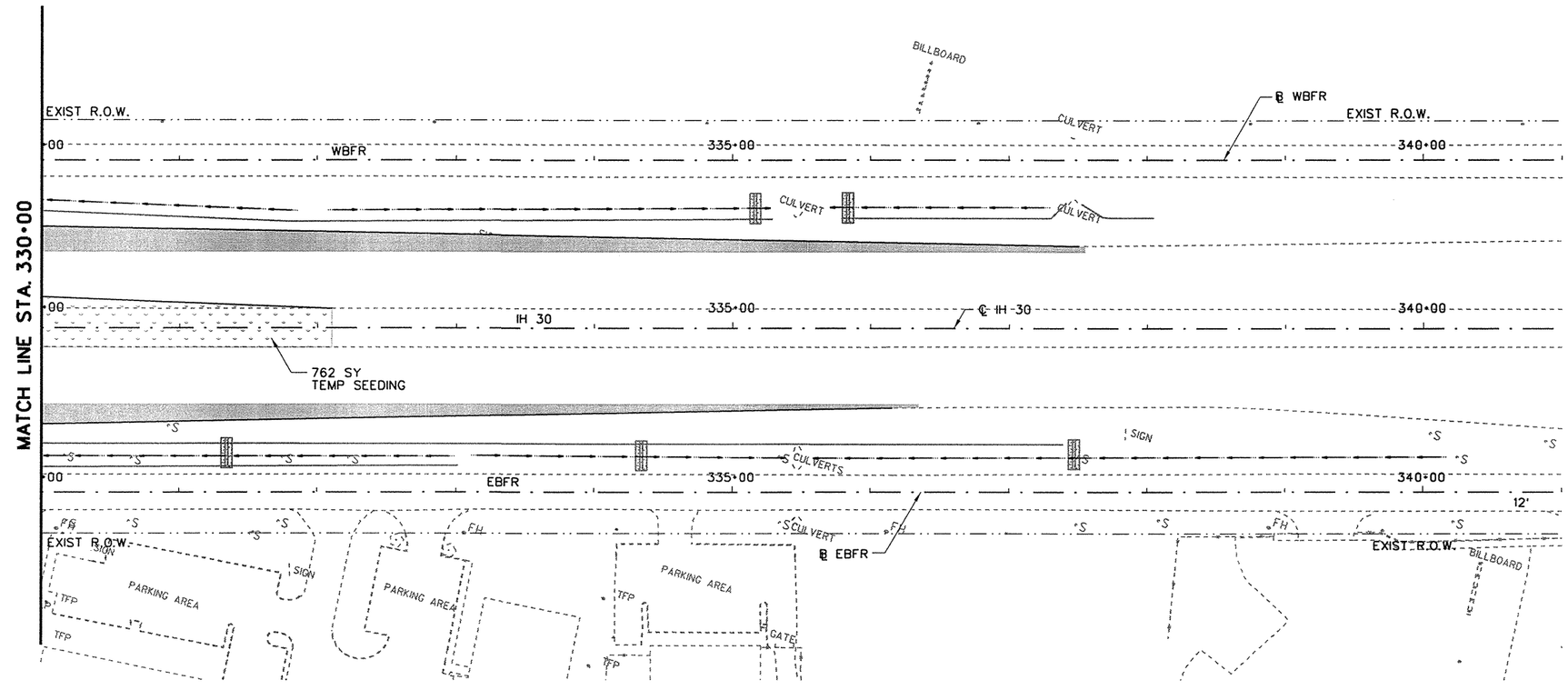
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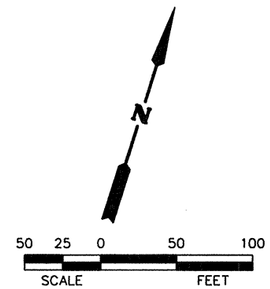
IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 1
STA. 319+00 TO STA. 330+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4/8

SHEET 5 OF 6

2/6/2009 3:35:25 PM C:\PLANSK pw:/Active Projects/TX106643/TX106643_05/8.00 Plans and Drawings/8.39 Cut Sheets/8.3.xx SW3P/TEL 2-1/435 TEL 2105.dgn





LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
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4. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE, AND REMOVAL SHALL BE IN ACCORDANCE WITH TxDOT STANDARDS FOR EROSION CONTROL.

STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

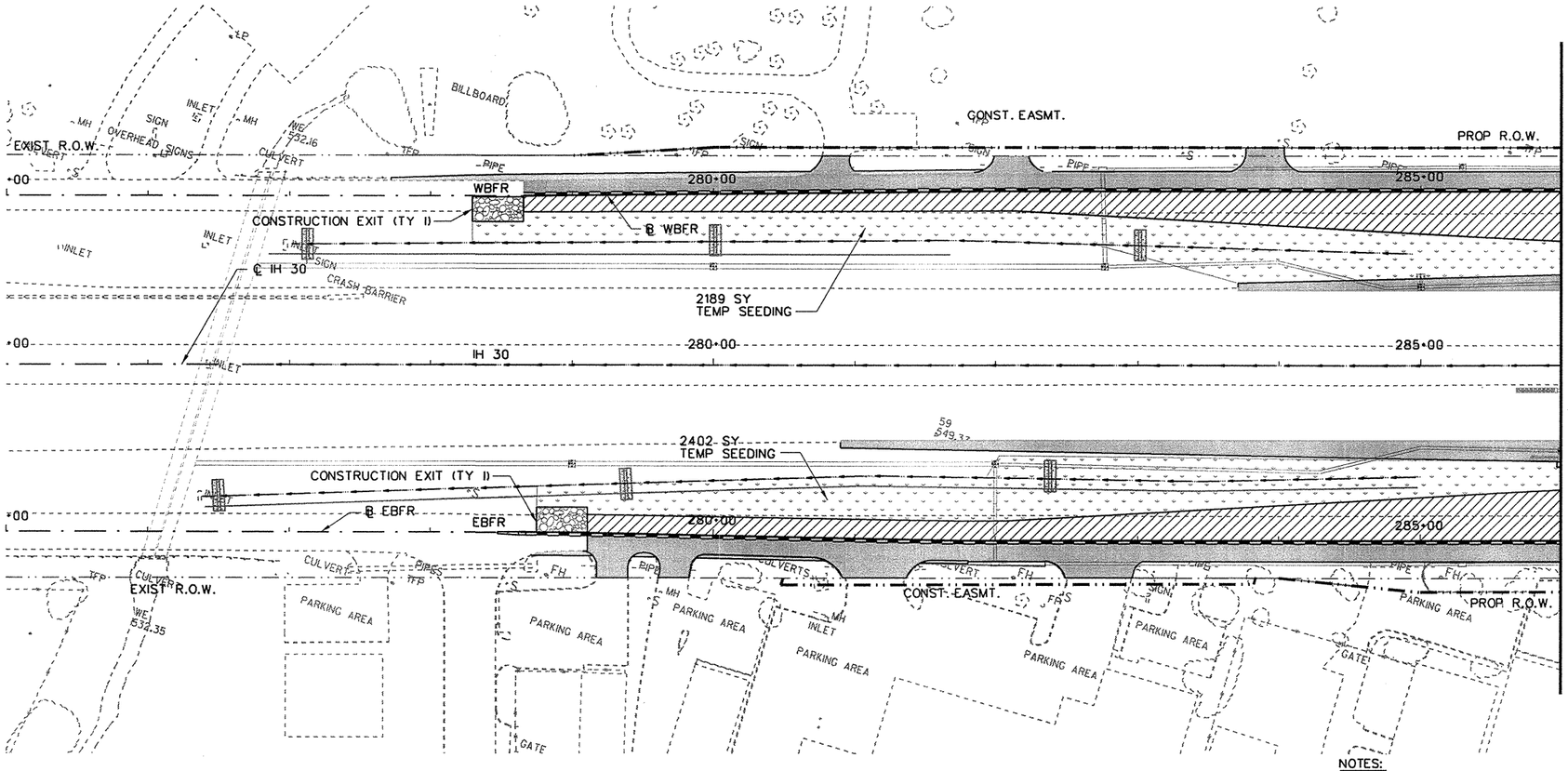
CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

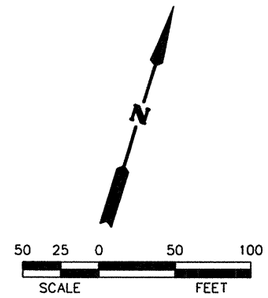
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 1
STA. 330+00 TO STA. 341+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	4/9

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LEGEND

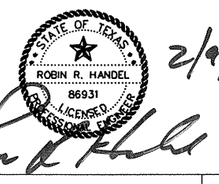
- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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NO.	REVISION	BY	DATE

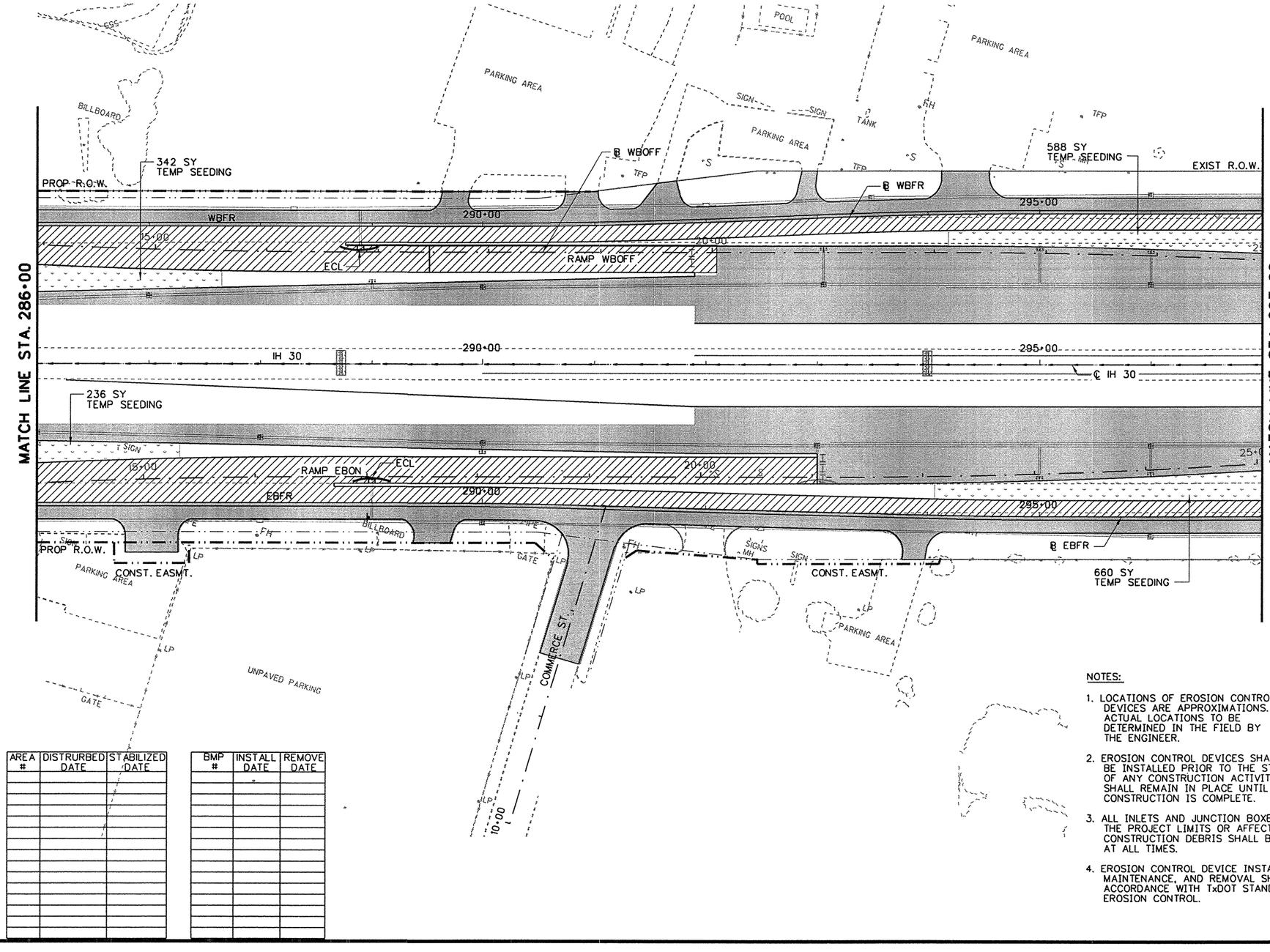
CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 2
BEGIN PROJECT TO STA. 286+00

Designed:	GBG	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	420

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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

50 25 0 50 100
SCALE FEET

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

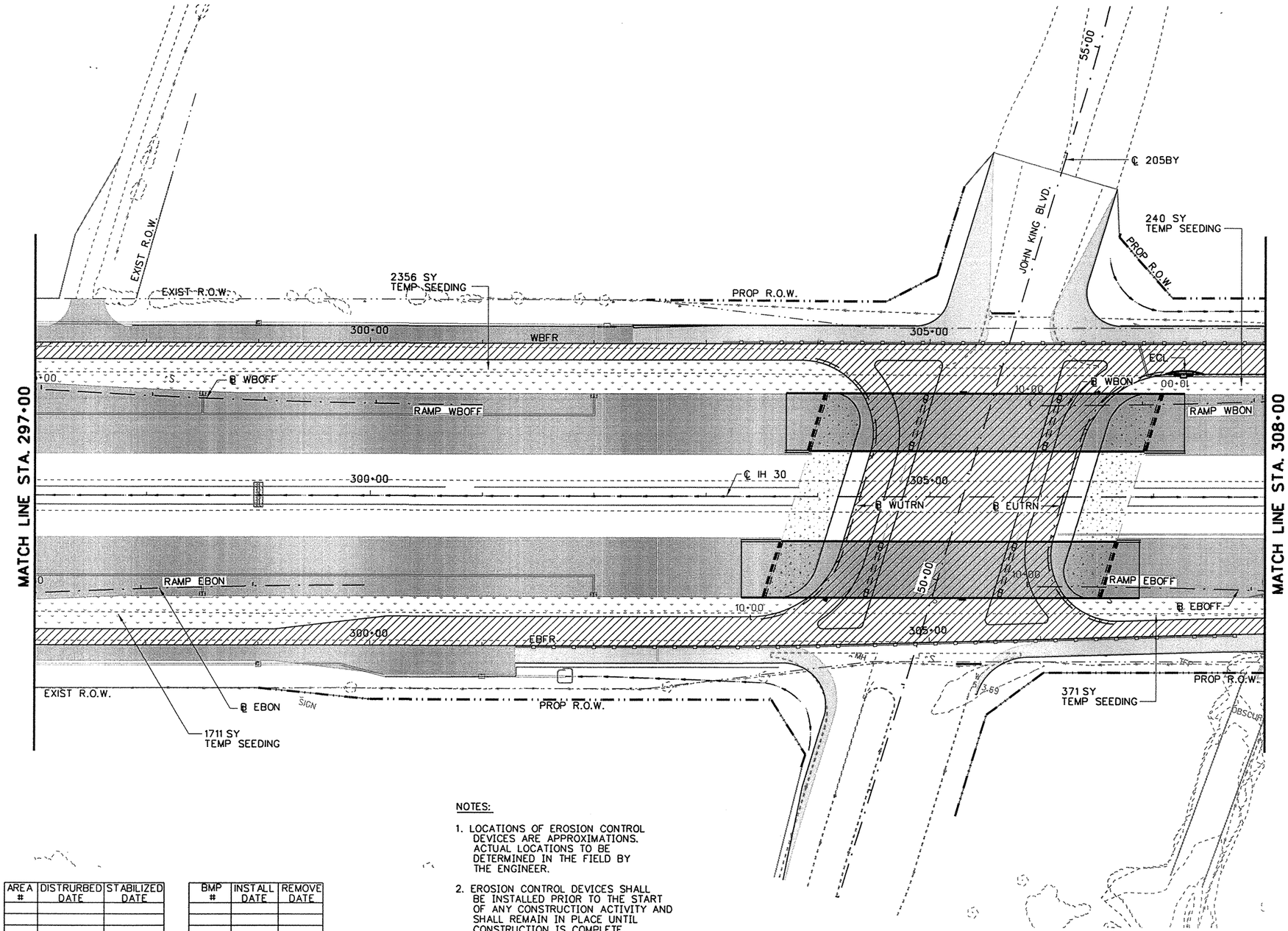
CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 2
STA. 286+00 TO STA. 297+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	421

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50 25 0 50 100
SCALE FEET

N

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

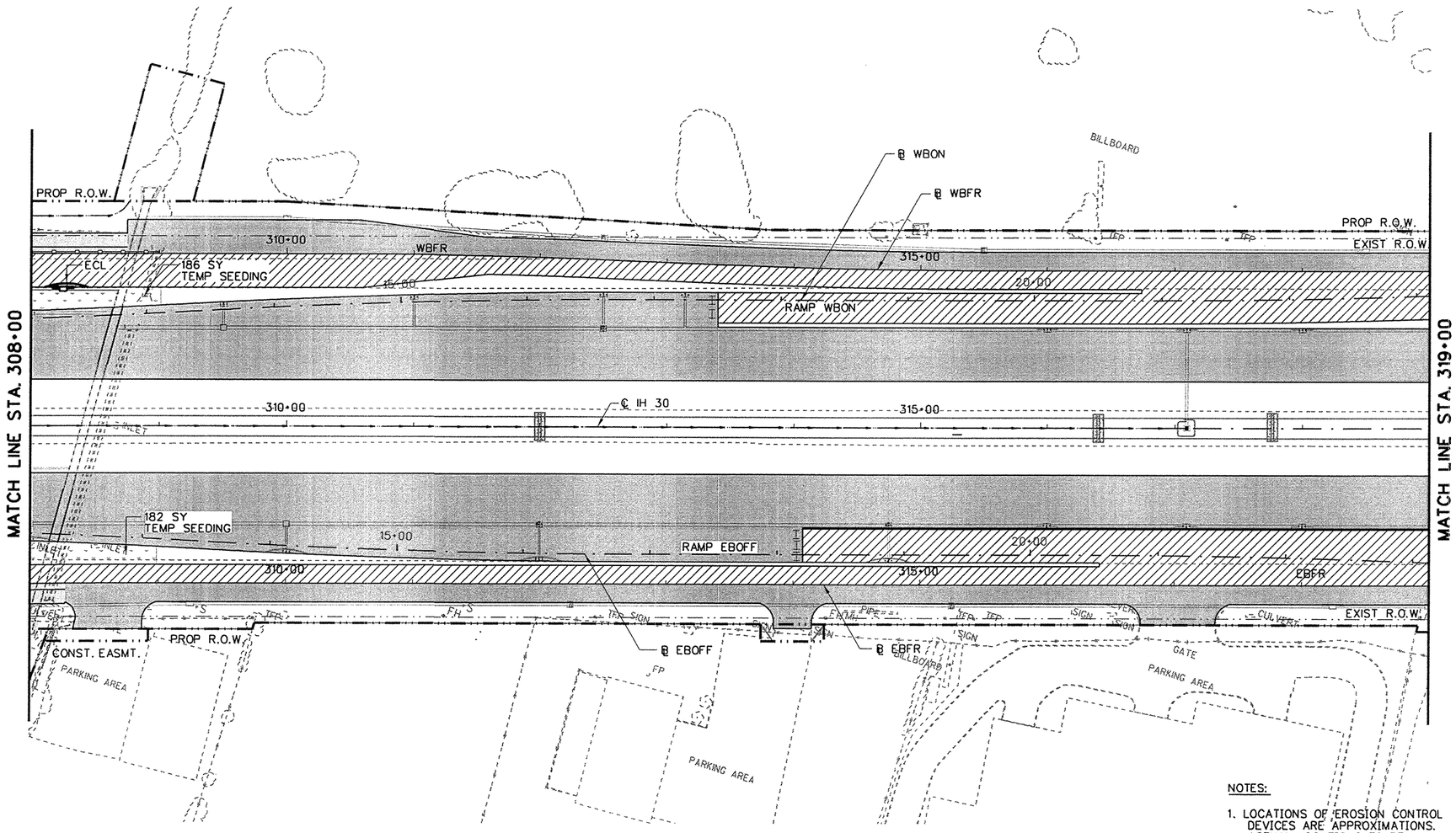
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 2
STA. 297+00 TO STA. 308+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	422

SHEET 3 OF 6

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N

50 25 0 50 100

SCALE FEET

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED RESIDENT ENGINEER

2/9/09

NO.	REVISION	BY	DATE

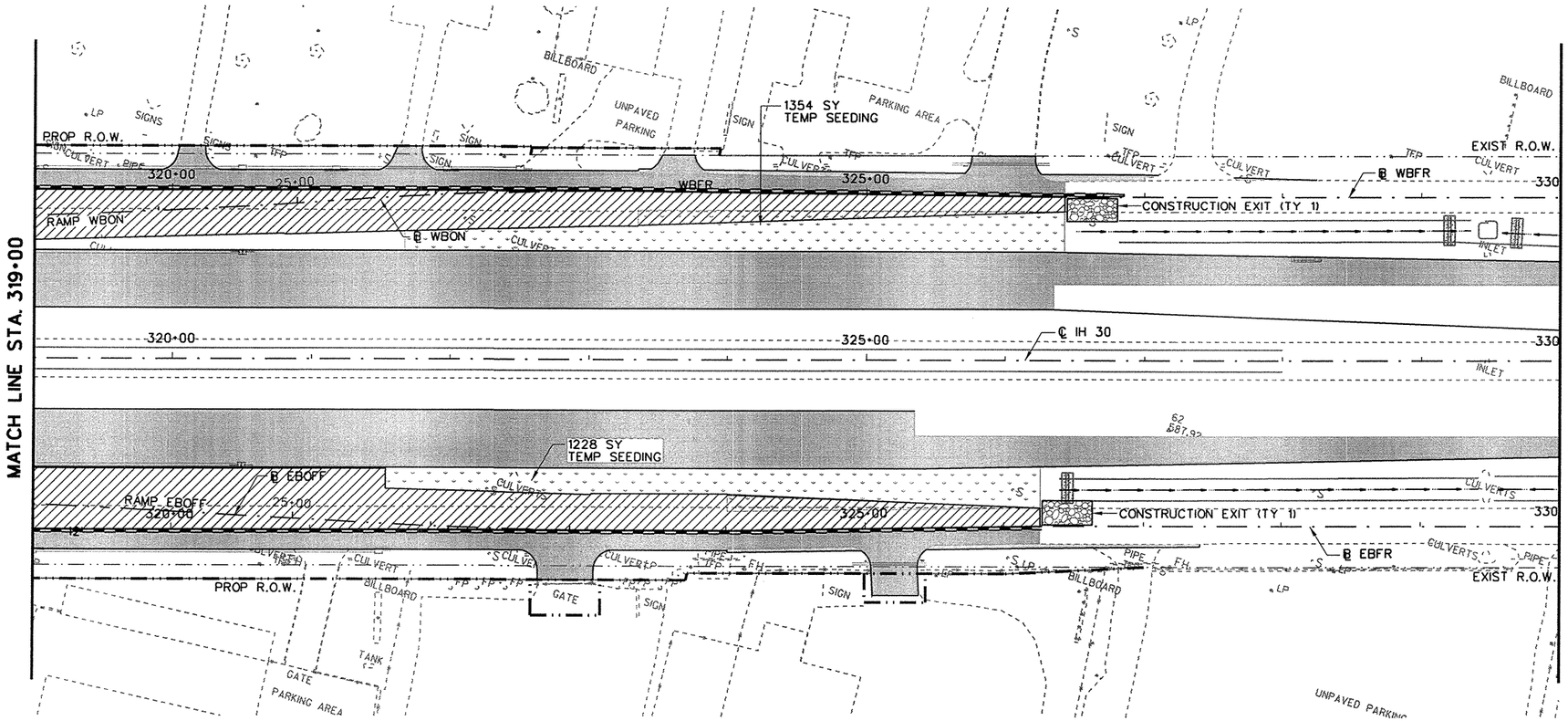
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Firm Registration Number: 1741

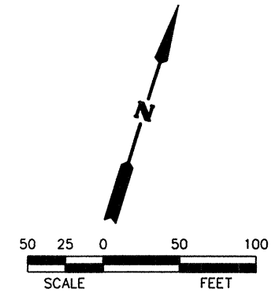
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 2
STA. 308+00 TO STA. 319+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	423

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER

2/9/09

NO.	REVISION	BY	DATE

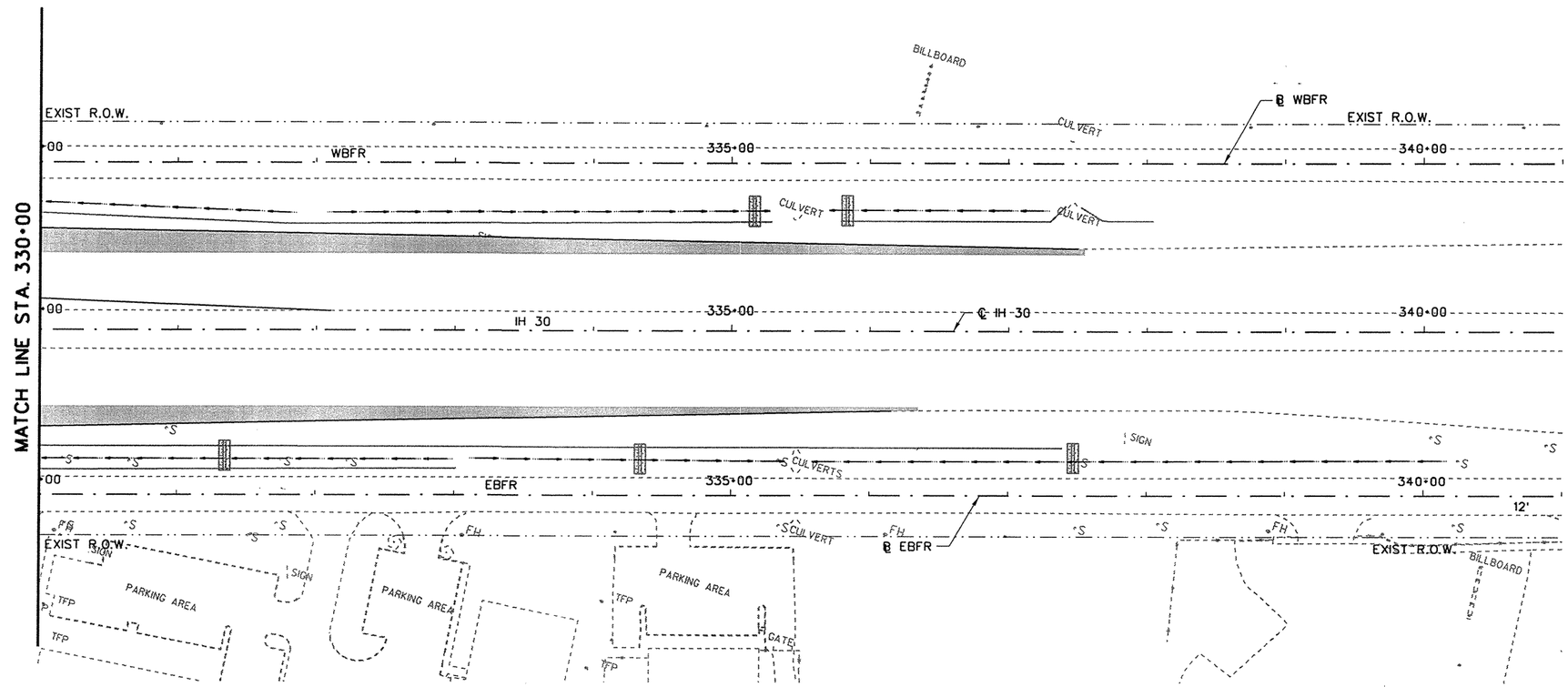
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

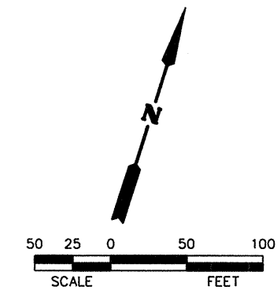
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 2
STA. 319+00 TO STA. 330+00

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET				IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073		424

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

NOTES:

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STATE OF TEXAS
ROBIN R. HANDEL
86931
LICENSED
PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

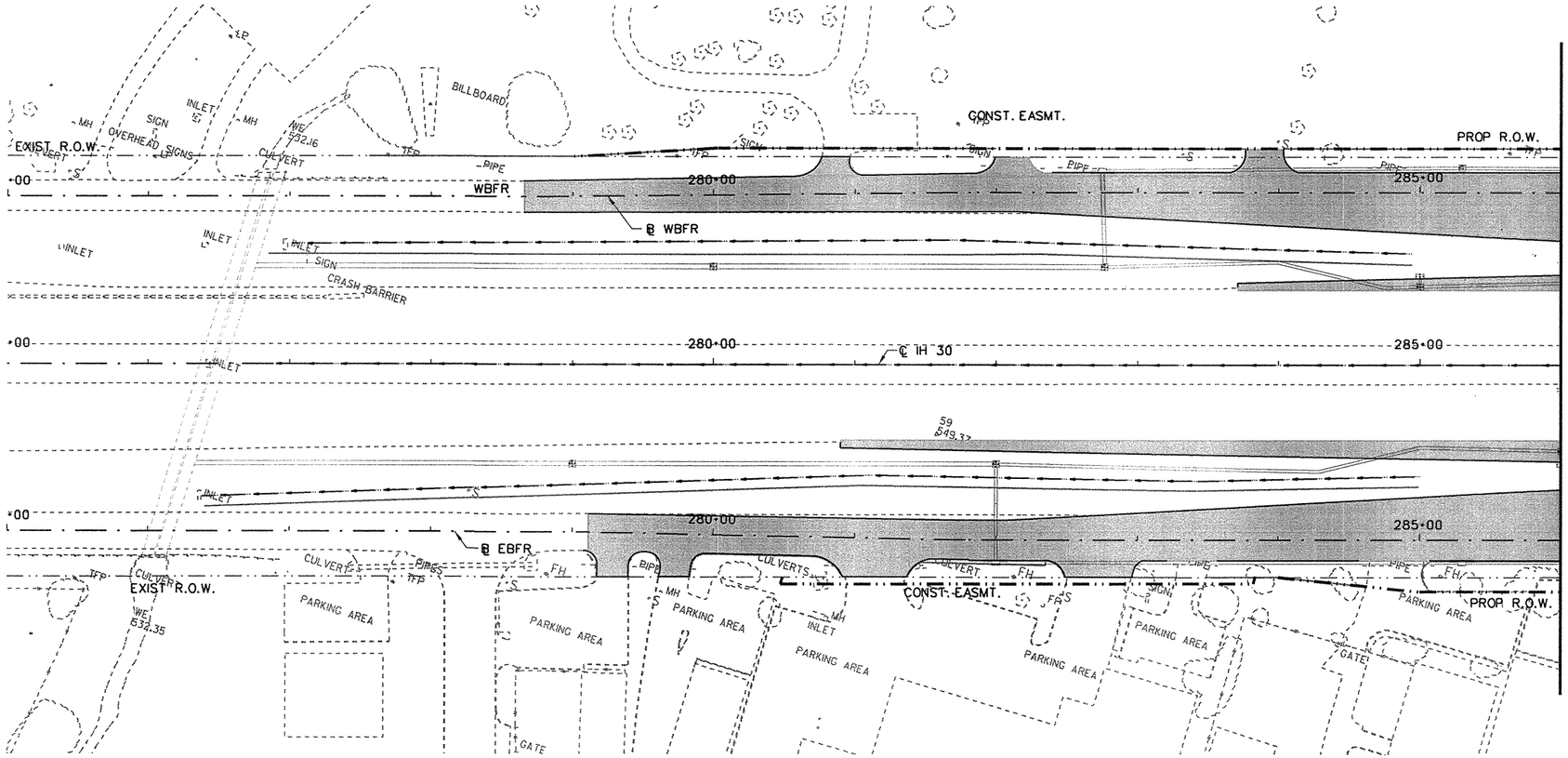
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Chiang, Patel & Yerby, Inc.
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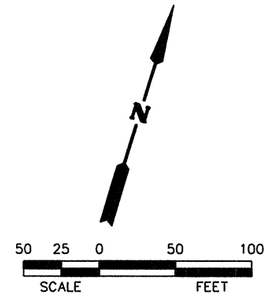
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 2
STA. 330+00 TO END PROJECT

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	425

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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2/9/09

NO.	REVISION	BY	DATE

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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

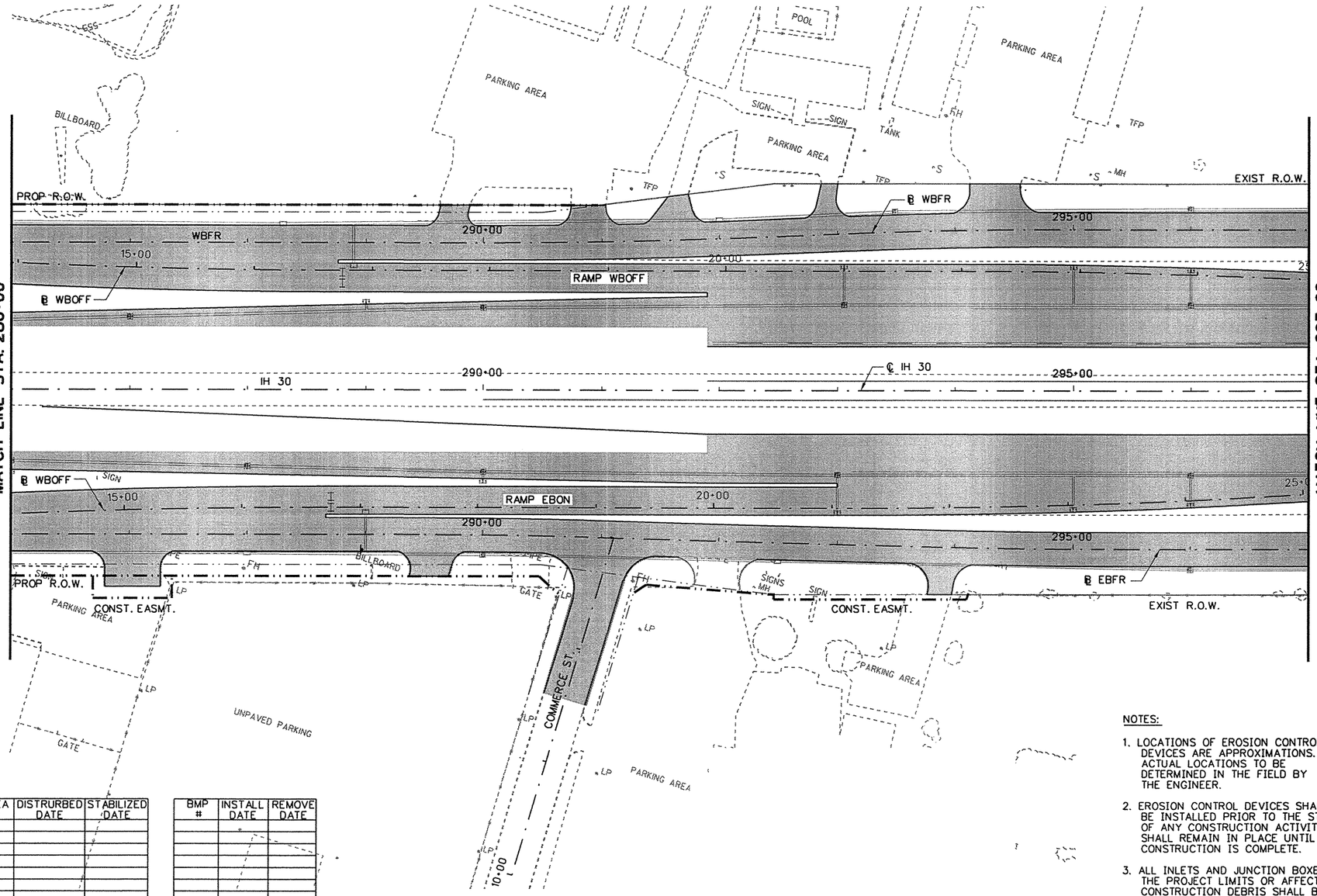
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 3
BEGIN PROJECT TO STA. 286+00

Designed: AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn: CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked: RRH	DAL	ROCKWALL	0009	12	073	4/26

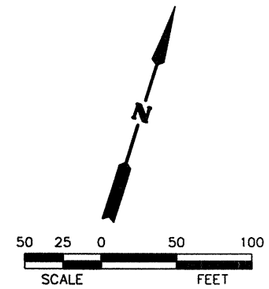
SHEET 1 OF 6

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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE



LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

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STATE OF TEXAS
ROBIN R. HANDEL
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PROFESSIONAL ENGINEER
2/9/09

NO.	REVISION	BY	DATE

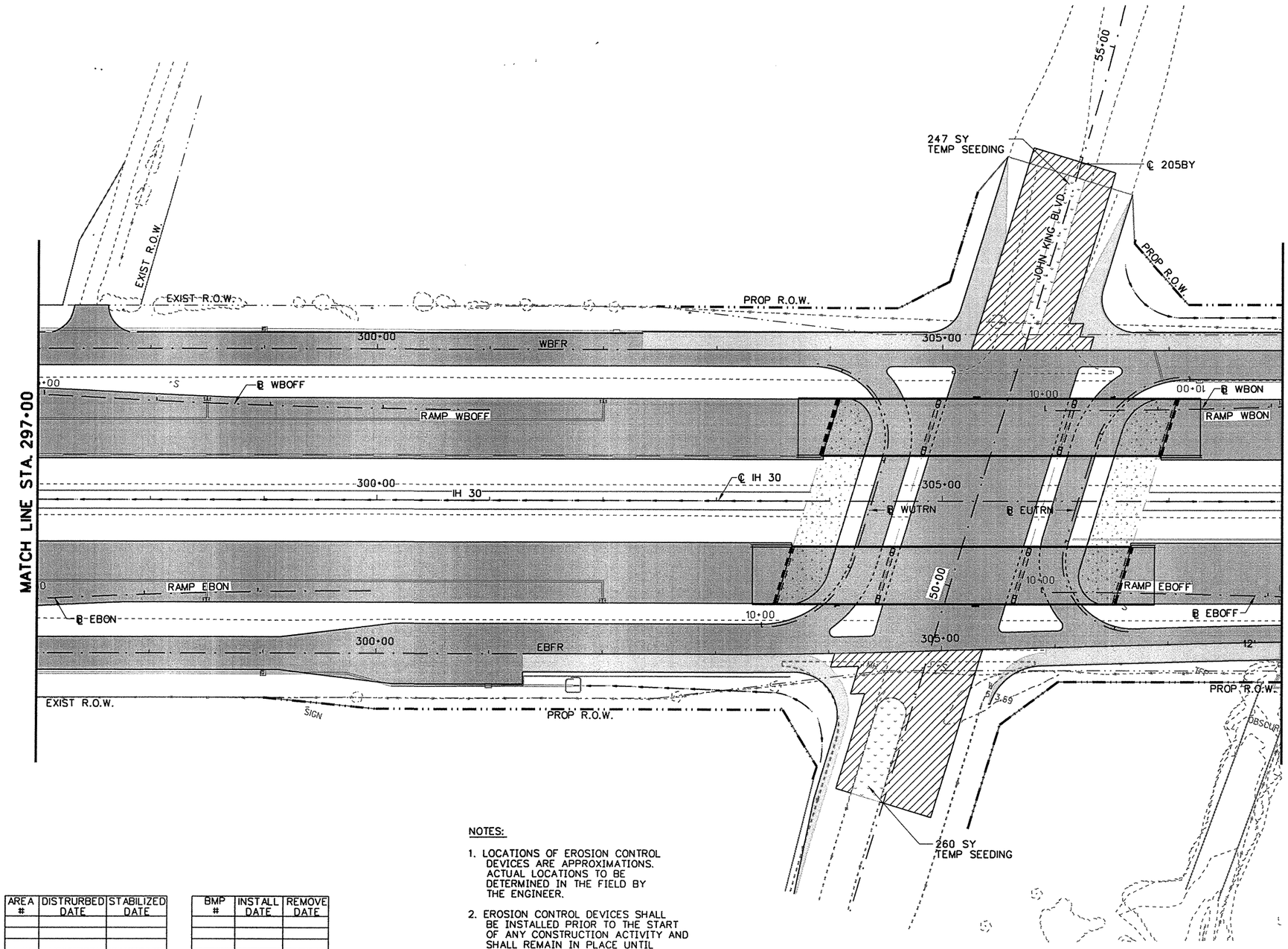
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 3
STA. 286+00 TO STA. 297+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	427

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N

50 25 0 50 100

SCALE FEET

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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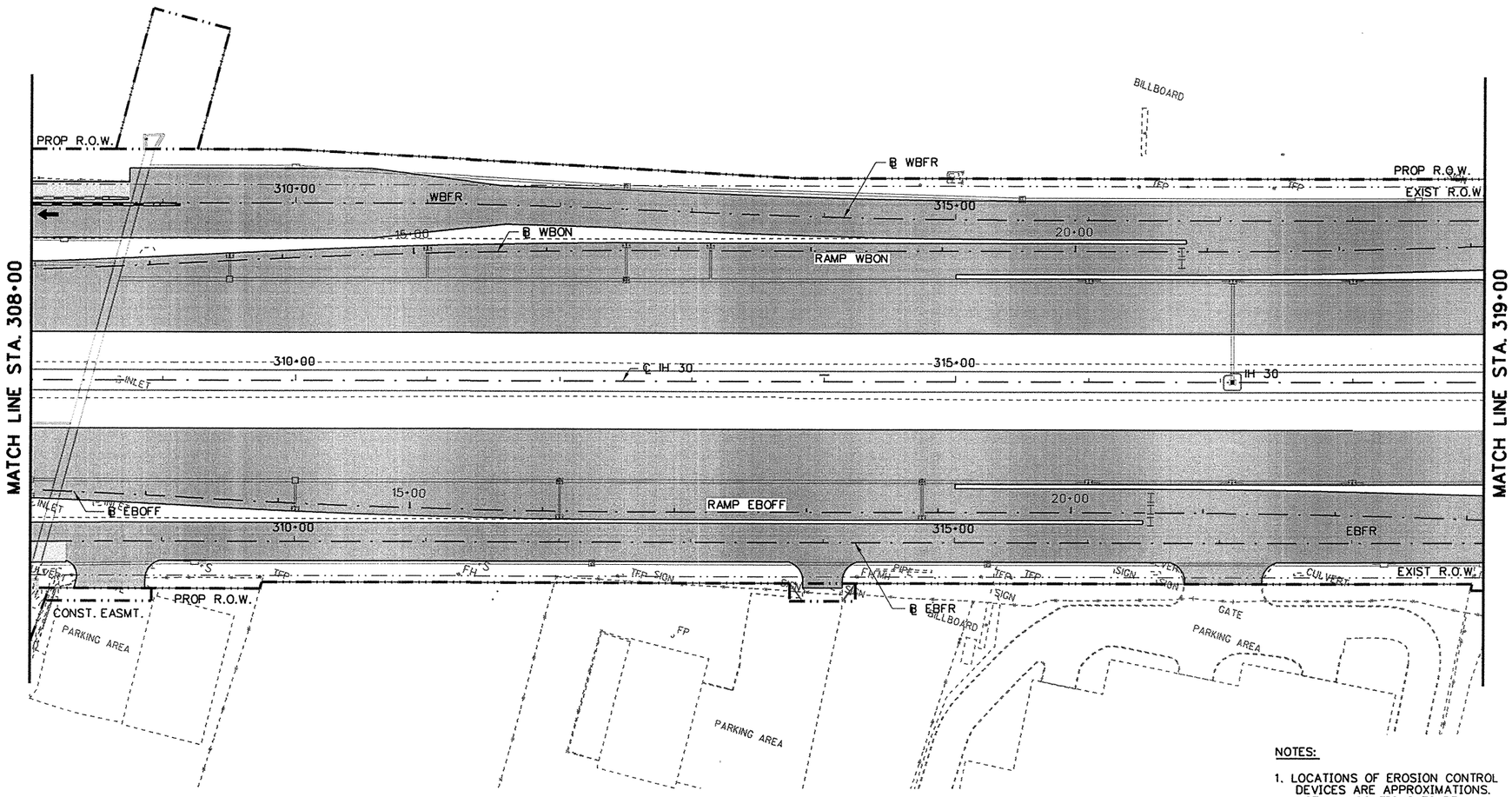
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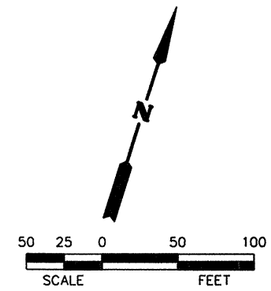
IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 3
STA. 297+00 TO STA. 308+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	428

SHEET 3 OF 6

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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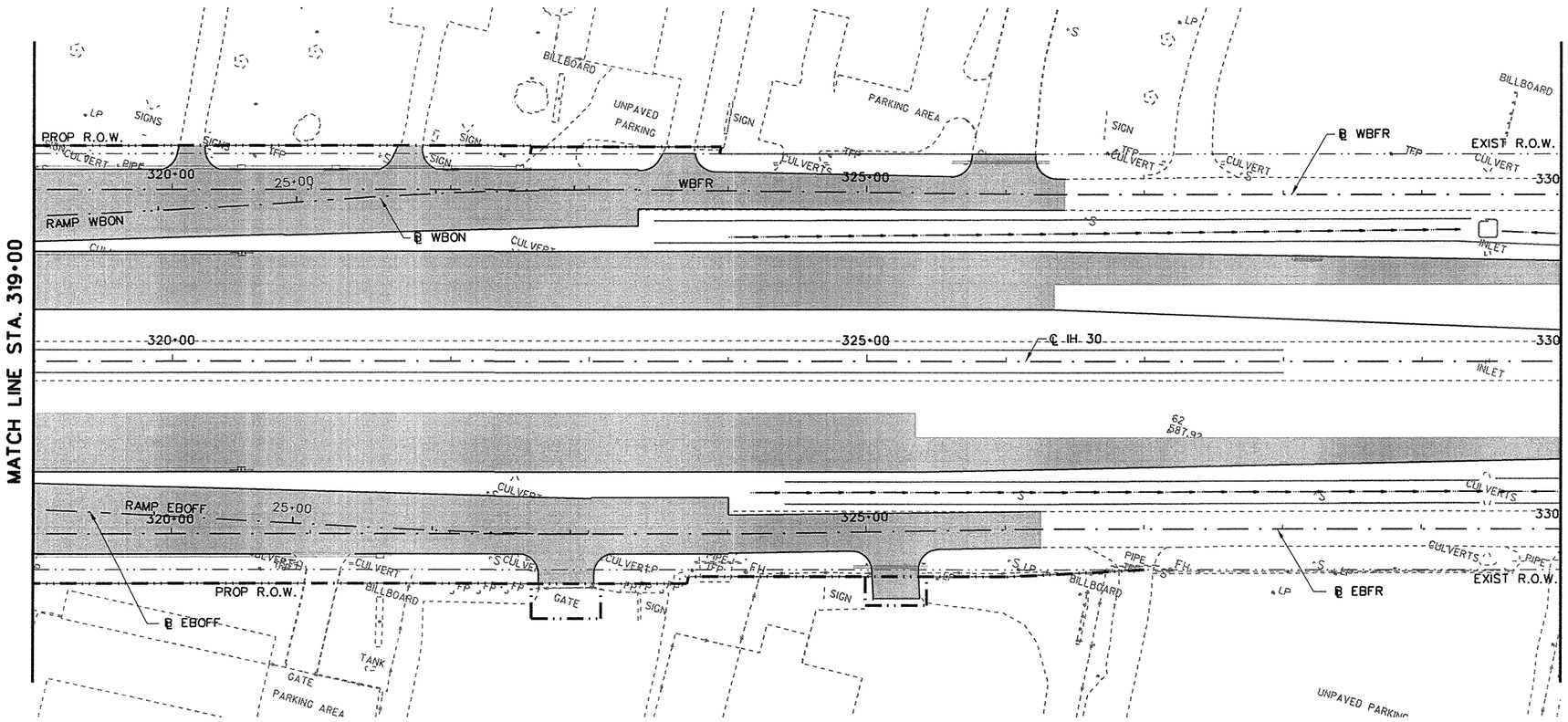
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 3
STA. 308+00 TO STA. 319+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	429

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SCALE FEET

LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
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- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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2/9/09

NO.	REVISION	BY	DATE

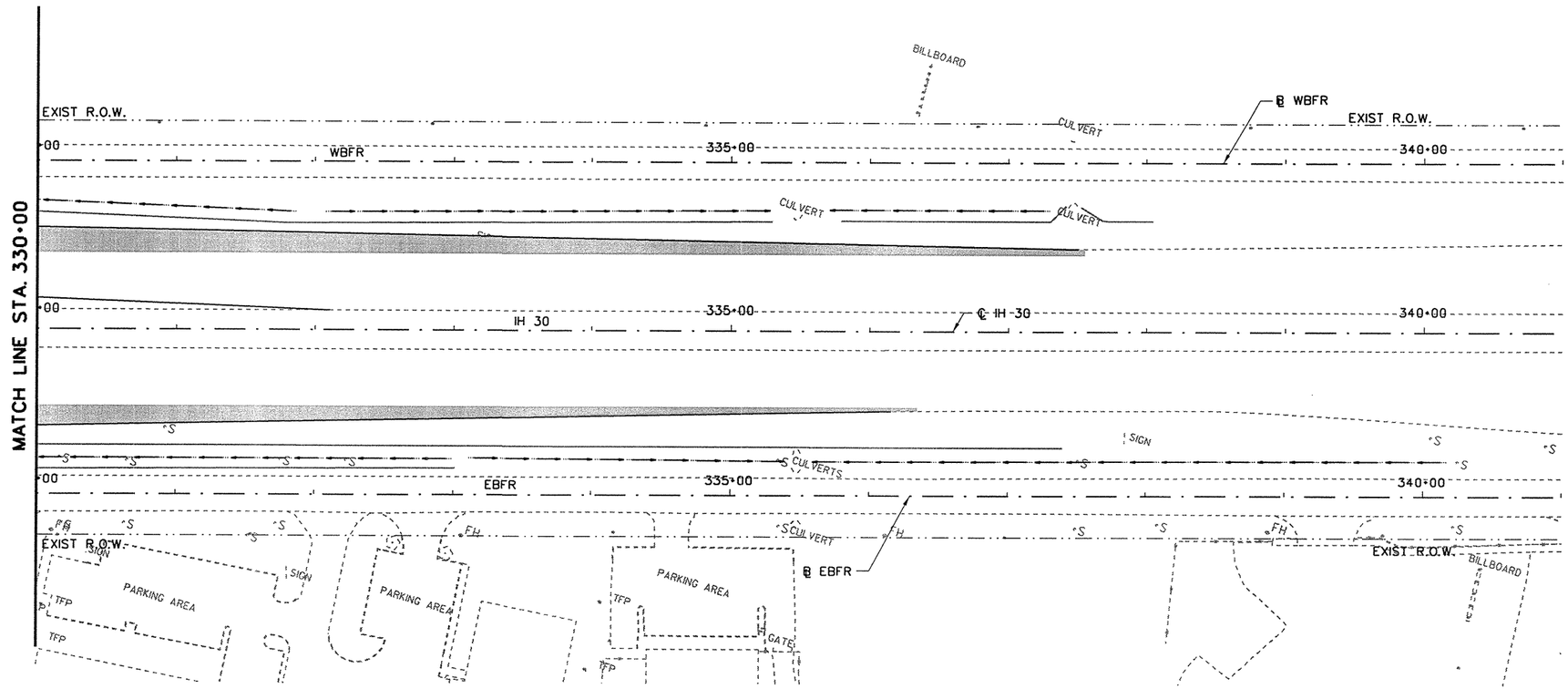
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

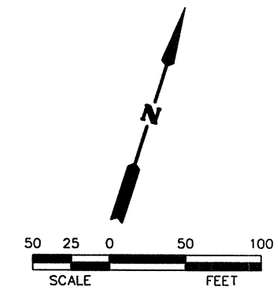
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 3
STA. 319+00 TO STA. 330+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	930

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
- ECL FOR CURB INLET (35 LF TYP)
- TYPE 1 CONSTRUCTION EXIT (167 SY EA)
- SEEDING/VEGETATION
- SOIL RETENTION BLANKET
- TEMPORARY PAVEMENT
- PROPOSED CONSTRUCTION
- RCP DRAINAGE THIS STEP
- DRAINAGE PREVIOUS STEP

AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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NO.	REVISION	BY	DATE

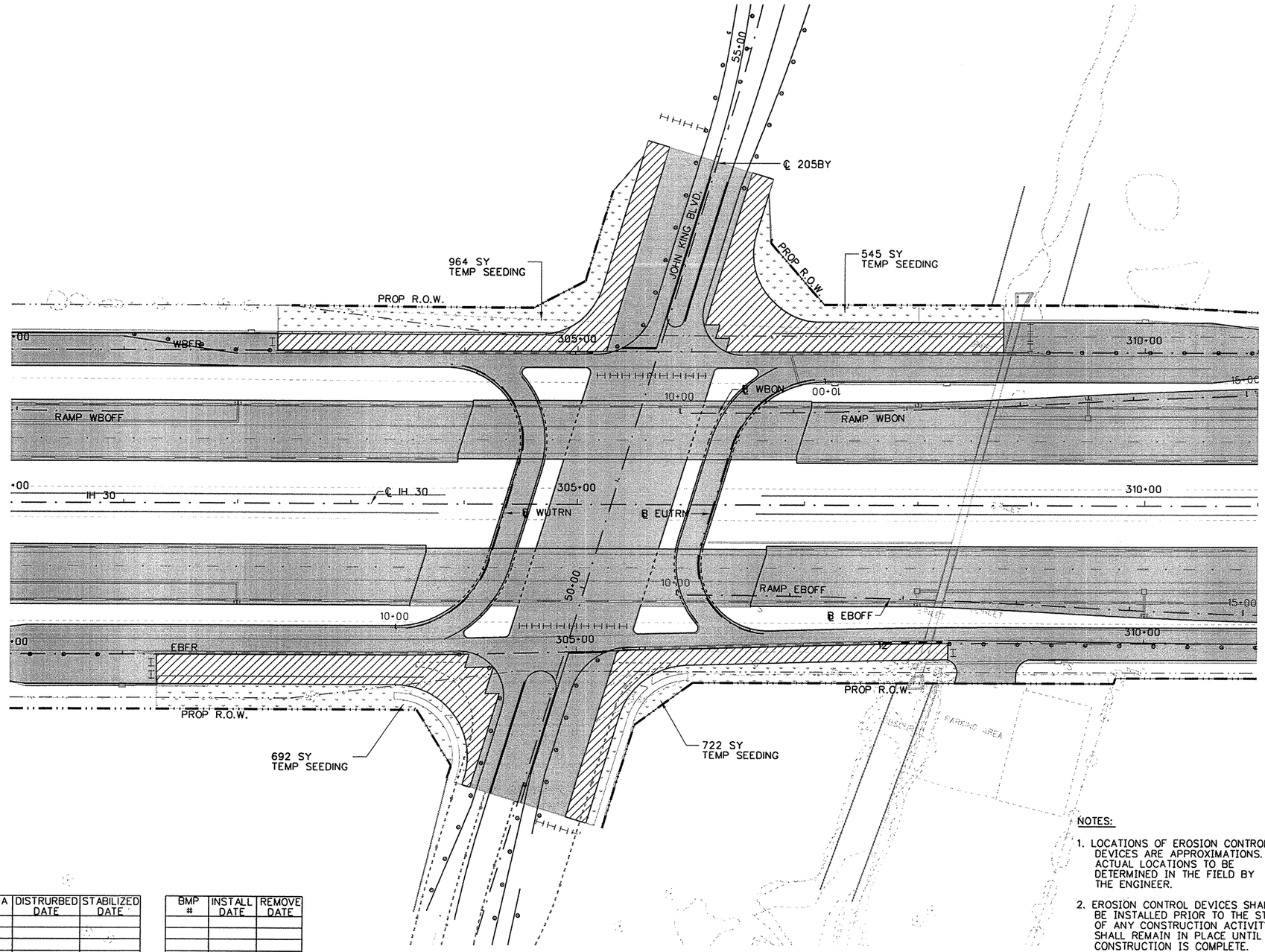
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Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

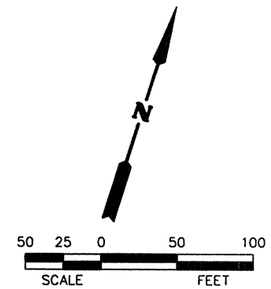
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 3
STA. 330+00 TO END PROJECT

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	431

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LEGEND

- EROSION CONTROL LOGS (ECL)
- EROSION CONTROL LOGS PREVIOUS STEP
- TYPE 2 ROCK FILTER DAM (22 LF TYP) (RFD)
- DITCH INLET PROTECTION (50 LF ECL)
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AREA #	DISTRURBED DATE	STABILIZED DATE

BMP #	INSTALL DATE	REMOVE DATE

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SHEET 1 OF 1

STATE OF TEXAS
ROBIN R. HANDEL
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NO.	REVISION	BY	DATE

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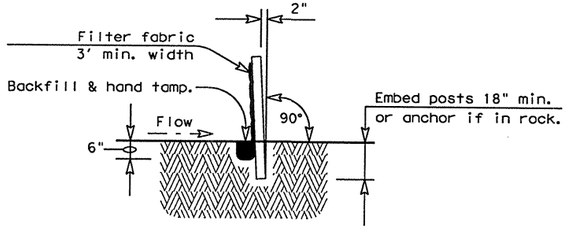
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IH 30 AT JOHN KING BLVD.
SW3P
SITE PLAN - PHASE 2 - STEP 4
STA. 297+00 TO STA. 308+00

Designed:	AWD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AJA	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	RRH	DAL	ROCKWALL	0009	12	073	432

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SECTION A-A

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

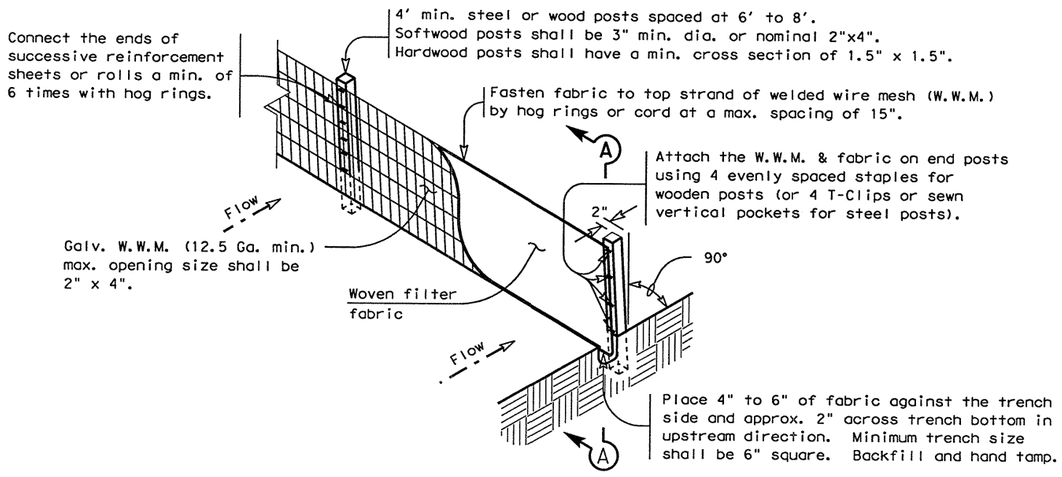
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

PLAN SHEET LEGEND

Sediment Control Fence —— SCF ——

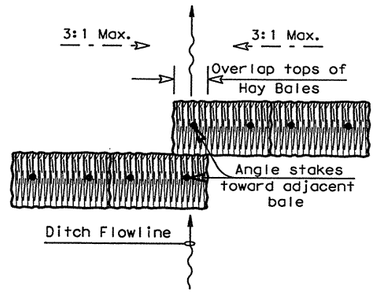
GENERAL NOTES

1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

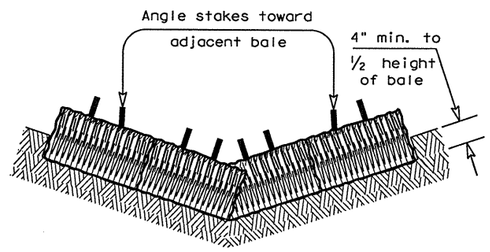


TEMPORARY SEDIMENT CONTROL FENCE

SCF



PLAN VIEW



PROFILE VIEW

PLANS SHEET LEGEND

Baled Hay —— BH ——

BALED HAY USAGE GUIDELINES

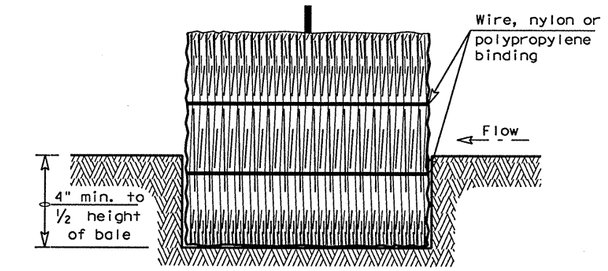
A Baled Hay installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT^2 of cross sectional area. Baled hay may be used at the following locations:

1. Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
2. Where the installation will be required for less than 3 months.
3. Where the contributing drainage area is less than ½ acre.

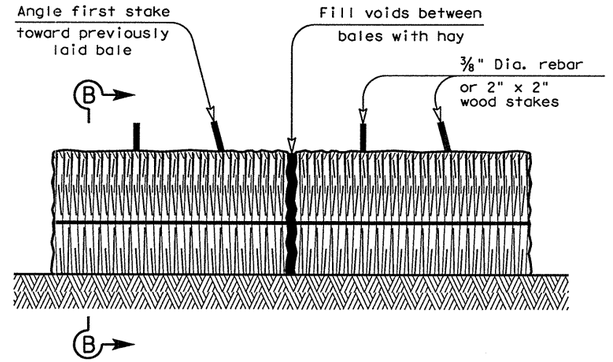
For Baled Hay installations in small ditches, the additional following considerations apply:

1. The ditch sideslopes should be graded as flat as possible to maximize the drainage flowrate thru the hay.
2. The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay.

Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.



SECTION B-B



BALED HAY FOR EROSION CONTROL

BH

GENERAL NOTES

1. Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.
2. Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetative matter.
3. Hay bales shall be embedded in the soil a minimum of 4" and where possible ½ the height of the bale.
4. Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
5. Hay bales shall be securely anchored in place with ⅜" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

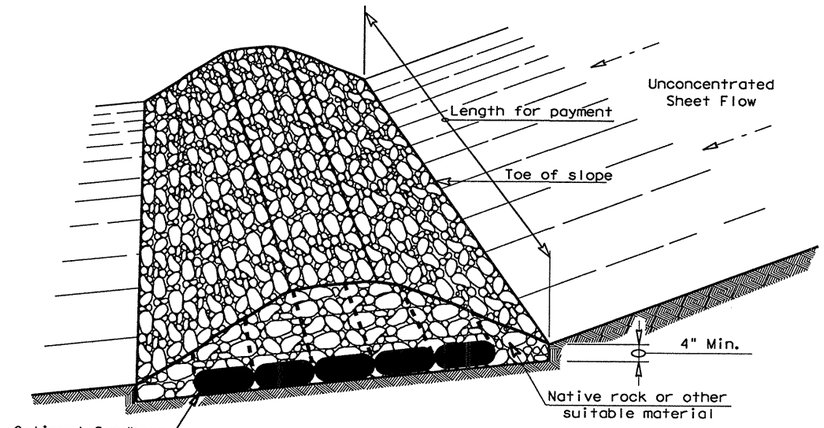
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & BALED HAY

EC(1)-93

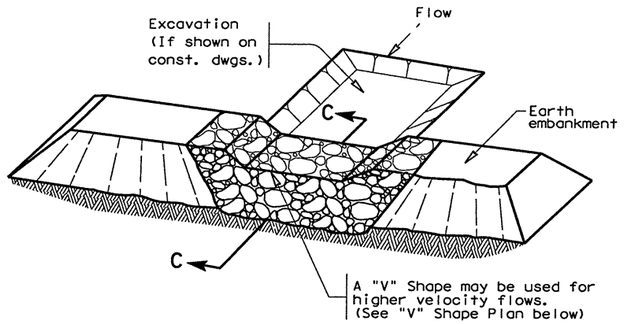
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© TxDOT JUNE 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				433
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall				



FILTER DAM AT TOE OF SLOPE

RFD1

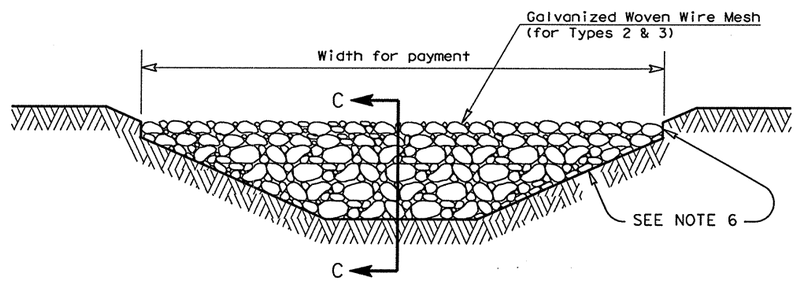
TYPE 1



FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2

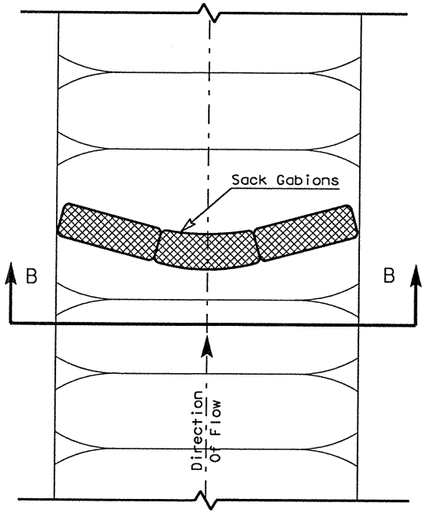
TYPE 1 OR TYPE 2



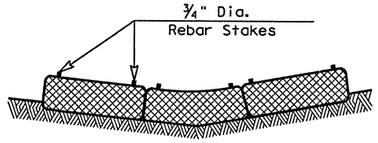
FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

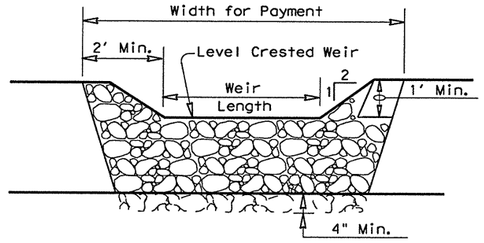
TYPE 1 OR TYPE 2



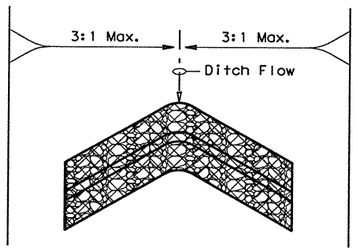
PLAN VIEW



SECTION B-B

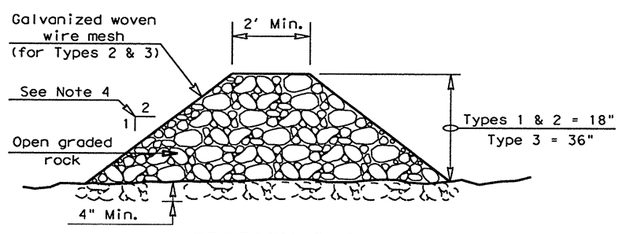


PROFILE



"V" SHAPE

(Plan View)



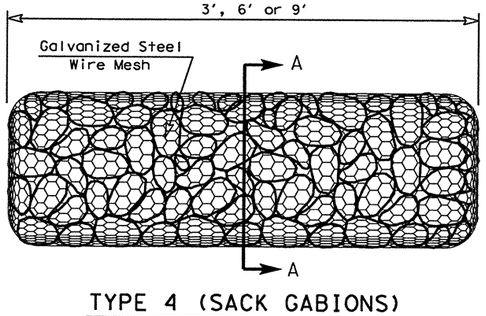
SECTION C-C

PLANS SHEET LEGEND

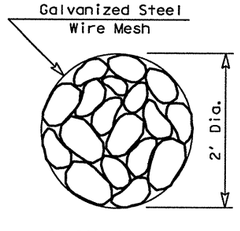
Type 1 Rock Filter Dam — RFD1

Type 2 Rock Filter Dam — RFD2

Type 3 Rock Filter Dam — RFD3



TYPE 4 (SACK GABIONS)



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

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

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

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

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

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

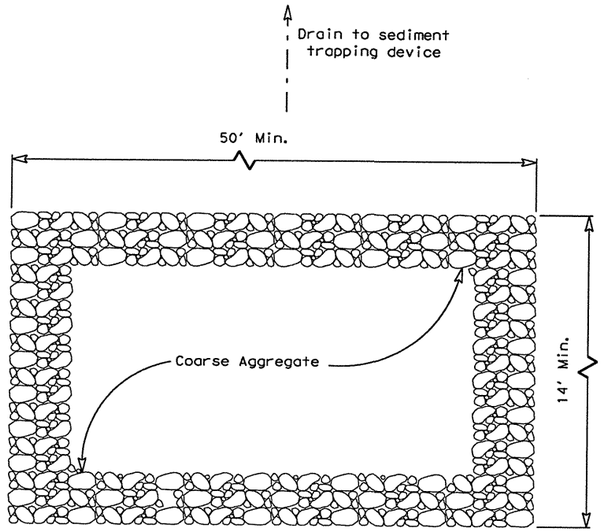
GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. In stream use the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes.
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

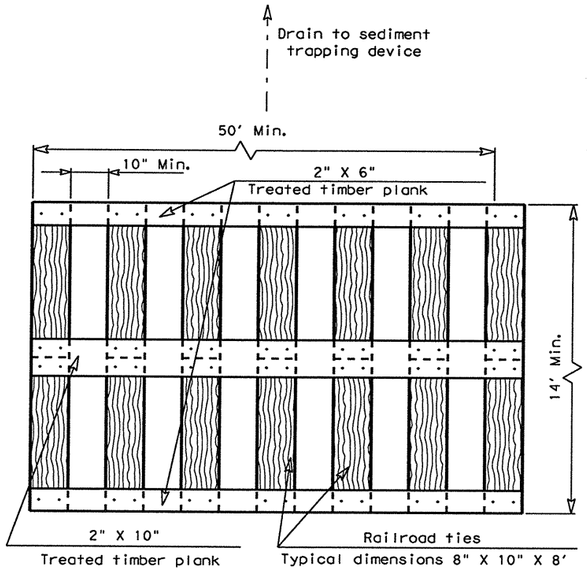
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LEVEL LAYED

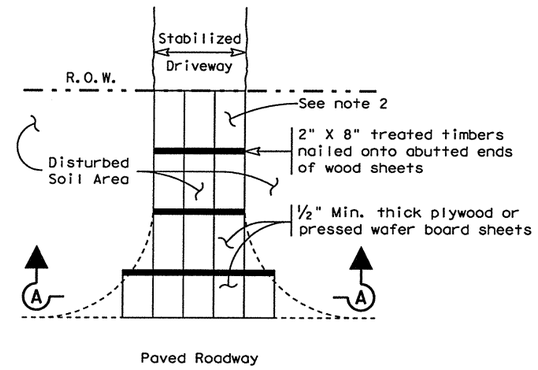
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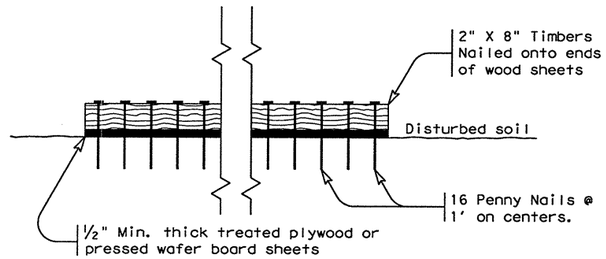
PLAN



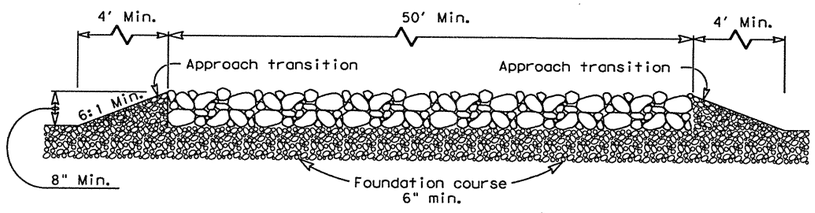
PLAN



PLAN



SECTION A-A

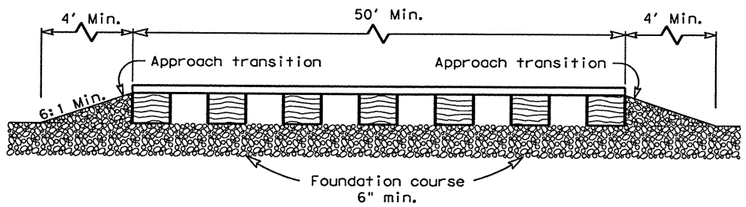


PROFILE

CONSTRUCTION EXIT (TYPE 1)

GENERAL NOTES

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



PROFILE

CONSTRUCTION EXIT (TYPE 2)

GENERAL NOTES

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

GENERAL NOTES

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

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Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-93

FILE: EC393.DGN	DN: HEJ	CK: HEJ	DW: BGD	CK:
© TxDOT JUNE 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				435
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	Rockwall	0008	12	003	

LEVEL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

ASSIGNED

SEEDING FOR EROSION CONTROL

RECOMMENDED PLANTING SEASON	PERMANENT RURAL SEED MIX ITEM 164 DRILL SEEDING (PERM) (RURAL) (CLAY)	PERMANENT URBAN SEED MIX ITEM 164 DRILL SEEDING (PERM) (URBAN) (CLAY)	TEMPORARY DRILL SEED MIX ITEM 164 DRILL SEED (TEMP) (WARM OR COOL)
WARM SEASON Mar. 15th, April, May, June, July, August, Sept. 15th	Pure Live Seed Rate Green Sprangletop (Leptochloa dubia) - 0.3 lbs/AC Bermudagrass (Cynodon dactylon) - 1.2 lbs/AC Sideoats Grama (El Reno) (Bouteloua curtipendula) - 2.7 lbs/AC Little Bluestem (Native) (Schizachyrium scoparium) - 2.0 lbs/AC Buffalograss (Texoka) (Buchloe dactyloides) - 1.6 lbs/AC Illinois Bundleflower (Desmanthus illinoensis) - 1.0 lbs/AC	Pure Live Seed Rate Green Sprangletop (Leptochloa dubia) - 0.3 lbs/AC Sideoats Grama (El Reno) (Bouteloua curtipendula) - 3.6 lbs/AC Buffalograss (Texoka) (Buchloe dactyloides) - 1.6 lbs/AC Bermudagrass (Cynodon dactylon) - 2.4 lbs/AC	Pure Live Seed Rate Foxtail Millet (Setaria italica) - 34 lbs/AC
COOL SEASON Sept 16th, Oct, Nov, Dec, Jan, Feb, Mar 14th			Pure Live Seed Rate Tall Fescue (Festuca arundinaceae) - 4.5 lbs/AC Western Wheatgrass (Agropyron smithii) - 5.6 lbs/AC Red Winter Wheat (Triticum aestivum) - 34 lbs/AC

SEEDING NOTES:

1. Refer to Item 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Apply seed upon completion of each construction stage (dependent on planting date requirements) without compensation for additional move-ins.
3. All seed will meet labelling, delivery, analysis, and testing requirements as described in Item 164.2(A).
4. Hydroseeding machines will not be allowed.
5. Fertilizer will be applied under Item 166 prior to seeding to help drill fertilizer into soil.
6. Refer to Item 166 Fertilizer this sheet for specifications.
7. All areas to be seeded will be cultivated to a depth as described in Item 164.3.
8. Seed will be drilled to a depth as described in Item164.3(D).
9. Vegetative watering will be paid for under Item 168 as shown on this sheet.
10. **BROADCAST SEEDING METHOD OF APPROPRIATE PERMANENT OR TEMPORARY SEED MIX MAY ONLY BE USED WHERE SITE CONDITIONS PREVENT DRILL SEEDING.**

FERTILIZER ITEM 166 FERTILIZER AC

FERTILIZER RATE
Unless otherwise stated in the plans, perform one soil analysis on each project before fertilization and submit results to the Engineer with recommended fertilizer rates based on soil analysis. Soil analysis maybe waived if both compost and sod are used on entire project.

FERTILIZER NOTES:

1. Refer to Item 166 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Fertilizer will be applied before seeding and sodding.
3. Fertilizer will be delivered in bags unless otherwise specified or approved prior to delivery. Bags will be clearly labeled showing contents. When non-bagged, loose fertilizer is approved, documentation will be required for each load of material delivered verifying authenticity of material.
4. Fertilizer will be granular and essentially dust free.
5. Do not exceed 60 lbs of Nitrogen per acre without consulting with the Engineer.

VEGETATIVE WATERING FOR SEED AND SOD ITEM 168 VEGETATIVE WATERING MG

WATERING SCHEDULE			
MONTH	RATE	TIME SCHEDULE	TOTAL WATER
March, April, May, October	7000 gallons/acre per working day	Vegetative watering for seed shall begin on the day after rainfall described below and continue for 20 consecutive working days; vegetative watering for sod shall begin on the day the sod is placed and continue for a minimum of 15 consecutive working days.	140,000 gallons/acre (20 working days)
June, July, August, September	12,000 gallons/acre per working day		240,000 gallons/acre (20 working days)
November, December, January, February	1000 gallons/acre per working day	Vegetative watering for seed and/or sod shall begin on the day after placement for 15 consecutive working days	15,000 gallons/acre (15 working days)
Rate and frequency may be adjusted, with the approval of the Engineer, to meet site conditions (especially with sod). For informational purposes only: 1,000 gallons equals 1 MG			

VEGETATIVE WATERING NOTES:

1. Refer to Item 168 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. **After drill seeding, postpone watering operations until the site receives at least 1/2" of natural rainfall in a single day. Use Vegetative Watering to keep the seed bed moist during germination; not to provide the initial watering.**
3. All watering equipment will have a metering device.
4. Water will be evenly distributed over entire area(s) designated for seeding and/or sodding.
5. If 1/4 inch or more of rainfall occurs on site on any given working day, no vegetative watering will be needed on that working day (Note: 1/4 inch rain equals 7000 gallons of water per acre).
6. **Should the Contractor fail to apply the specified amount of water within the time allowed any seed or sod in poor condition will be replaced, fertilized, and watered at the Contractor's expense.**

SODDING FOR EROSION CONTROL ITEM 162 BLOCK SOD (BERMUDA) SY

BLOCK OR ROLL SOD	
COMMON NAME	BOTANICAL NAME
Common Bermuda Grass	Cynodon dactylon

SODDING NOTES:

1. Refer to Item 162 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2004 for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. All sod (blocks or rolls) will be placed within 24 hours of delivery to the site.
3. Sod will be placed only after soil preparation is complete and fertilizer has been applied to soil.
4. Sod blocks will be placed firmly against adjacent sod blocks.
5. Sod will be placed with joints alternating on each row to prevent all joints from lining up.
6. Vegetative watering will be paid for under Item 168 as shown on this sheet. Sod will be watered immediately following placement.

COMPOST APPLICATION ITEM 161 COMPOST MANF. TOPSOIL (BOS) (4") SY

APPLICATION RATE
A one inch uniform layer of compost will be placed on grade. The compost will then be incorporated into the existing soil (by till or disk) to a 3 to 4 inch depth.

COMPOST NOTES:

1. Refer to Item 161 - Compost for specifications, dimensions, volumes, and measurements that have been modified or not shown.
2. Erosion Control Compost (ECC) will be used to control erosion on slopes. ECC will be used in lieu of Soil Retention Blankets and other slope applications on slopes 3:1 and flatter. The ECC will be uniformly placed on the slope in a minimum one inch layer.
3. Filter berms will be placed in locations where concentration of flow may cause erosion - reference current Special Specification for Compost/Mulch Filter Berm.

ROADSIDE MOWING ITEM 730 PROJECT MAINTENANCE AC

Mowing will be included during project construction. Provide six mowing cycles per year during the project.

Once seed is established, mowing will be used to promote the warm season grasses by mowing the cool season and/or temporary grasses.

REQUIRED ITEMS:

- COMPOST MANUFACTURED TOPSOIL
- FERTILIZER TO BE USED WITH ALL SEEDING AND MOST SODDING.
- VEGETATIVE WATERING TO BE USED WITH ALL SEEDING AND SODDING.
- ONLY BROADCAST SEED IN AREAS THAT CANNOT DRILLED OR SODDED.

SEQUENCE OF WORK:

PREPARE SOIL WITH COMPOST
APPLY FERTILIZER
PLACE SEED AND/OR SOD
APPLY WATER FOR SEED AND SOD AREAS
MOW TO PROMOTE WARM SEASON GRASSES

TEMPLATED REVISED: 10-23-02

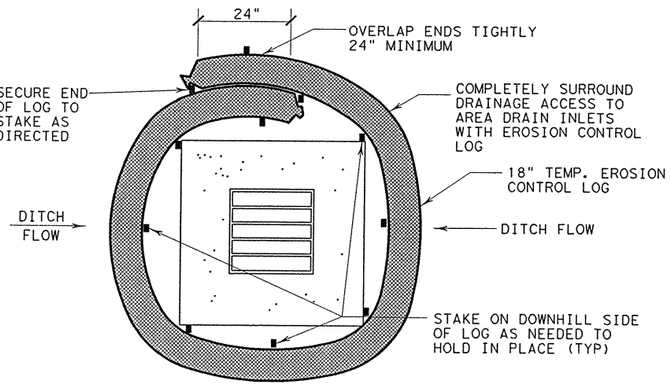
Texas Department of Transportation
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VEGETATION ESTABLISHMENT SHEET

(DALLAS DISTRICT)

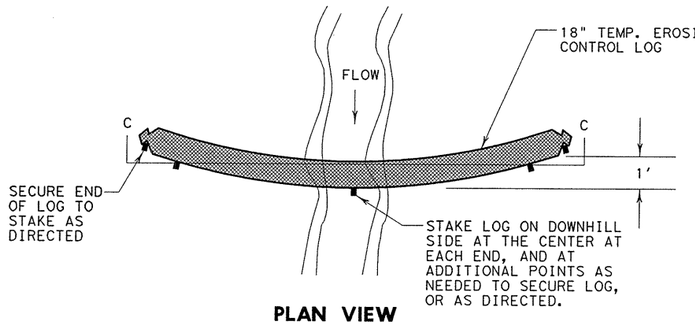
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XXX	6	(See Title Sheet)		
GRAPHICS XXX	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK XXX	TEXAS	DALLAS	Rockwall	436
REV 08/11/2008	CONTROL 0009	SECTION 12	JOB 073	

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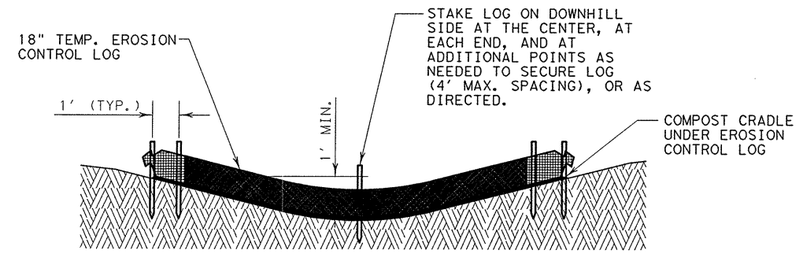


LOGS PLACED AT AREA DRAIN INLETS

NTS



PLAN VIEW



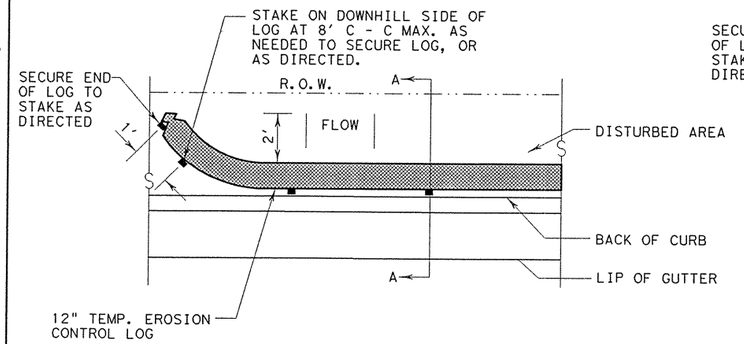
SECTION C-C

EROSION CONTROL LOG CHECK DAM

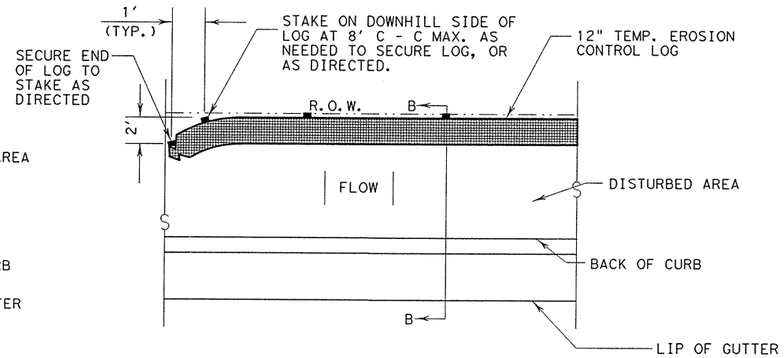
NTS

GENERAL NOTES:

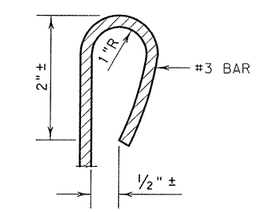
1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 60' FOR 18" DIAMETER OR 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED.
5. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.



PLAN VIEW

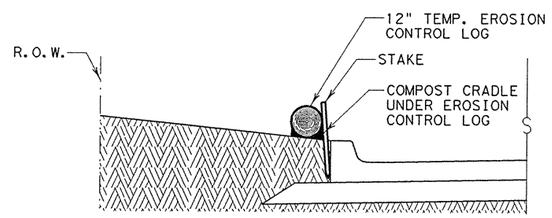


PLAN VIEW

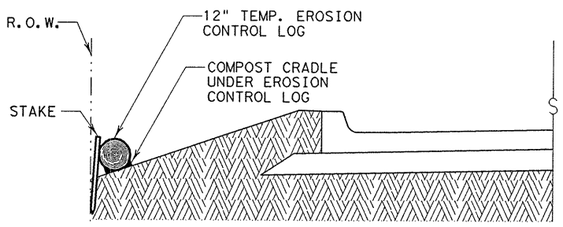


REBAR STAKE DETAIL

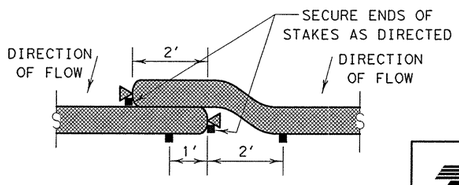
NTS



SECTION A-A



SECTION B-B



LAP DETAIL

NTS

LOG PLACED AT BACK OF CURB

NTS

LOG PLACED AT EDGE OF RIGHT-OF-WAY

NTS

Texas Department of Transportation
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DALLAS DISTRICT

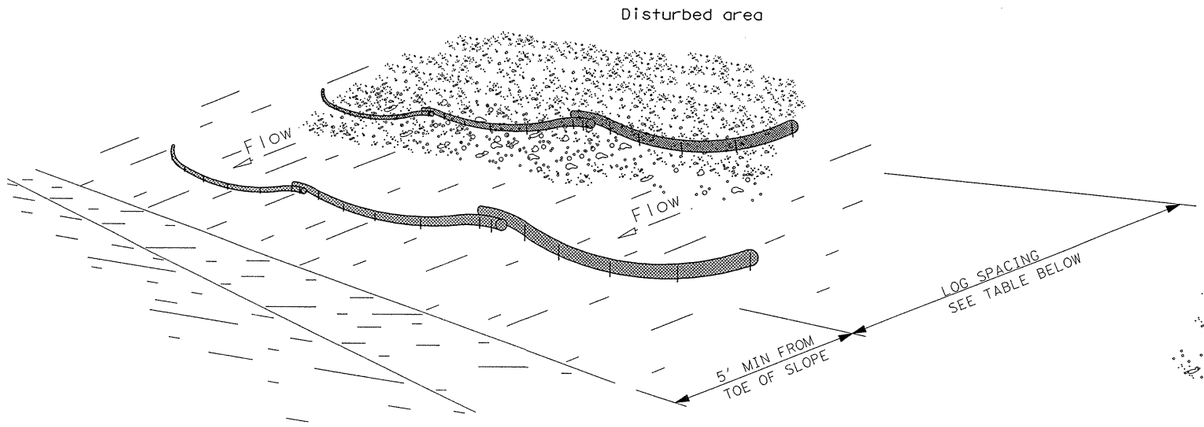
EROSION CONTROL LOGS

SCALE: NOT TO SCALE

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GRAPHICS	6	(See Title Sheet)		IH 20
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CHECK	CONTROL	SECTION	JOB	
	0009	12	073	

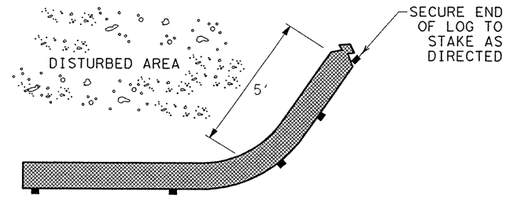
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LEVELS ED
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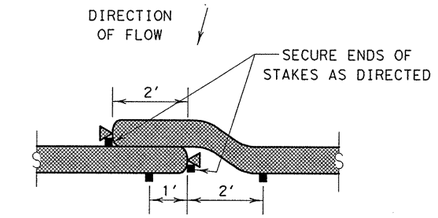
LOGS PLACED ON EXPOSED SLOPES

NTS



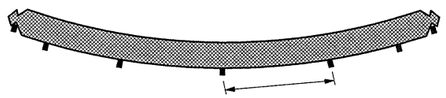
END SECTION RAP DETAIL

NTS



LAP DETAIL

NTS

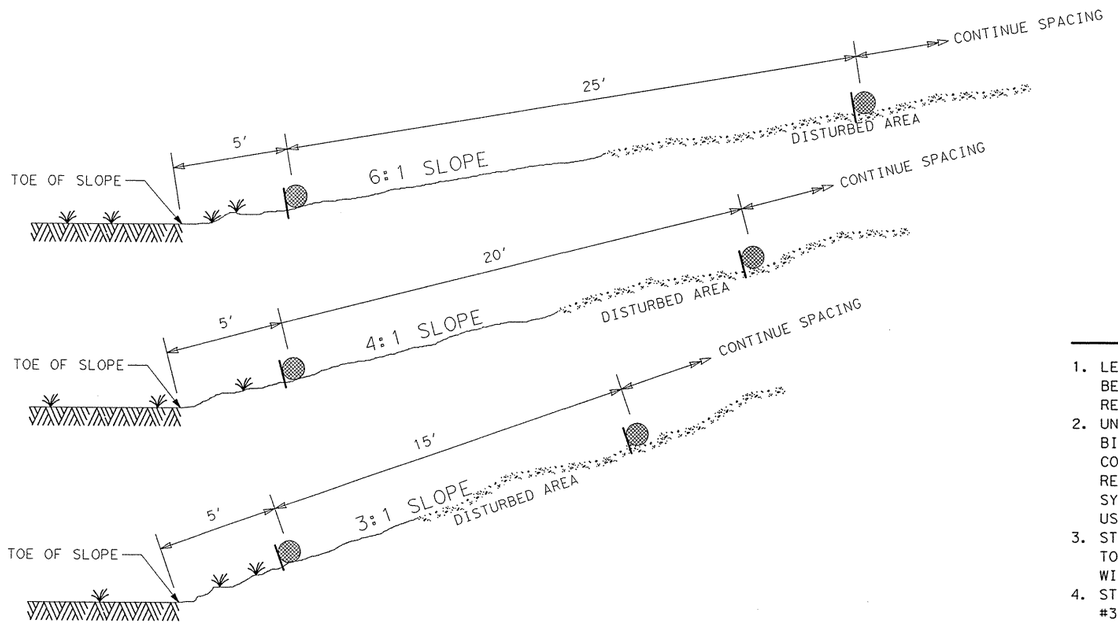


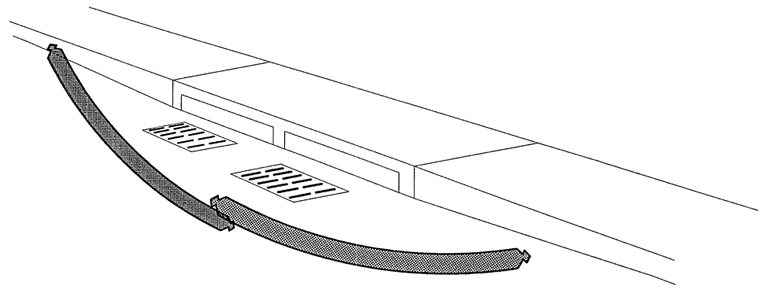
STAKE ON DOWNHILL SIDE OF LOG AT 8' C - C MAX. AS NEEDED TO SECURE LOG, OR AS DIRECTED.

STAKE DETAIL

NTS

SLOPE	LOG DIAMETER	SPACING BETWEEN LOGS
3:1	6"	15'
4:1	6"	20'
6:1	6"	25'





COMPLETED INLETS DETAIL

WITH NO TRAFFIC NTS

GENERAL NOTES:

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED.
5. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.

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DALLAS DISTRICT

EROSION CONTROL LOGS

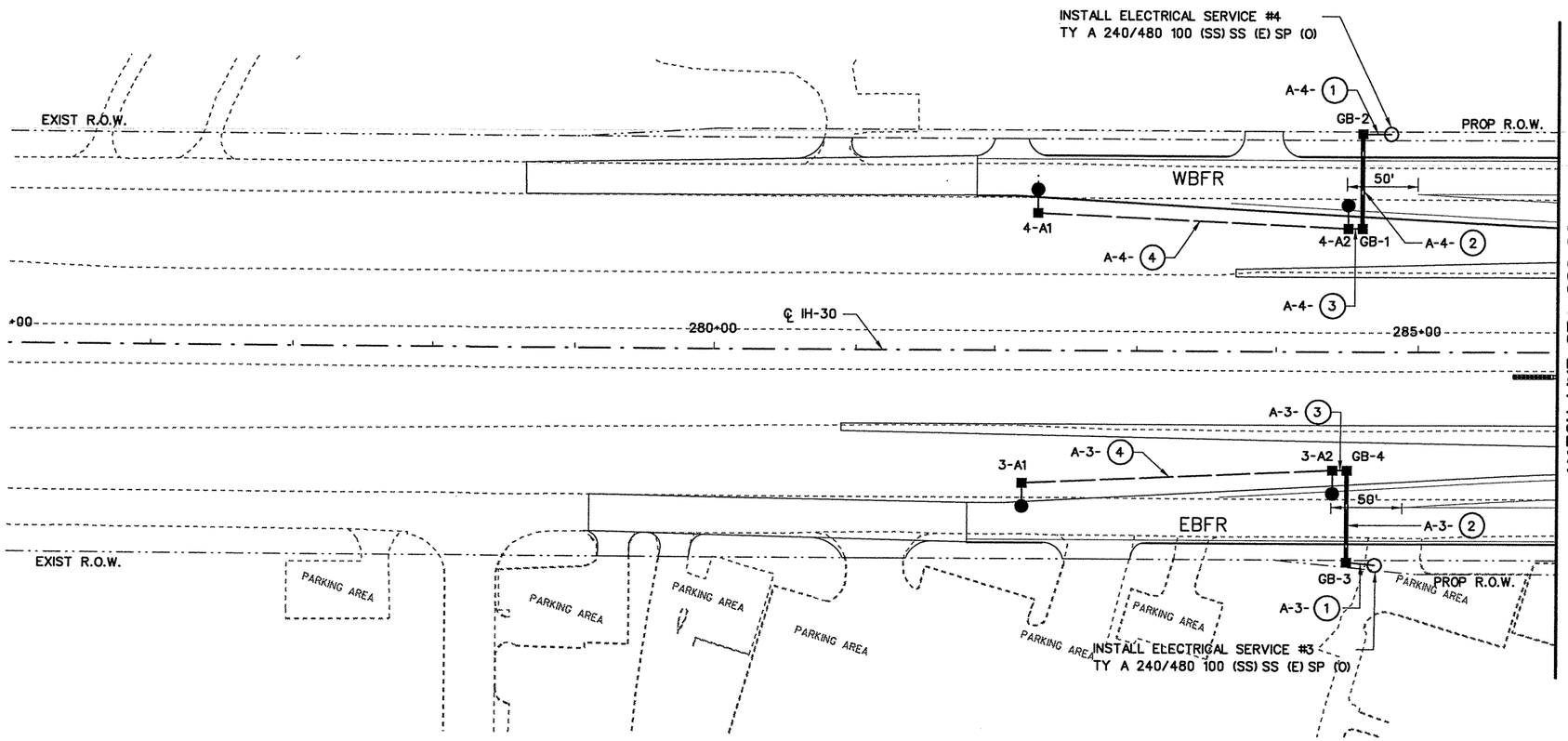
SCALE: NOT TO SCALE SHEET 2

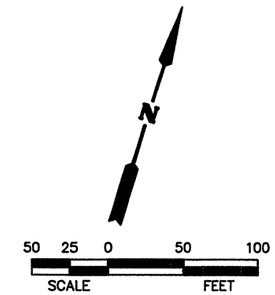
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GRAPHICS	6	(See Title Sheet)		XXXXX
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DALLAS	Rockwall	438
CHECK	CONTROL	SECTION	JOB	
	0004	12	023	

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CONDUIT AND CONDUCTOR RUNS (THIS SHEET ONLY)						
CIRCUIT	SERVICE	RUN NO.	GROUND SIZE & LENGTH (FEET)	CONDUCTOR SIZE & LENGTH (FEET)	CONDUIT SIZE & LENGTH (FEET)	
			#8 BARE	#8 XHHW	2" PVC (SCH. 80)	2" PVC (SCH. 80) BORED
A	3	1	20	40	20	
A	3	2	70	140		70
A	3	3	10	20	10	
A	3	4	220	440	220	
A	4	1	20	40	20	
A	4	2	70	140		70
A	4	3	10	20	10	
A	4	4	220	440	220	
TOTAL			640	1280	500	140

ROADWAY ILLUMINATION ASSEMBLY SUMMARY					
NUMBER	STATION	LOCATION	WATT	TYPE	STAND. TYPE
3-A1	282+20.00	CL IH30 EBFR 95.76' RT	250	HPS	(TY SA 40T-8) (0.25 KW) S
3-A2	284+40.00	CL IH30 EBFR 85.73' RT	250	HPS	(TY SA 40T-8) (0.25 KW) S
4-A1	282+30.00	CL IH30 WBFR 97.58' LT	250	HPS	(TY SA 40T-8) (0.25 KW) S
4-A2	284+50.00	CL IH30 WBFR 87.50' LT	250	HPS	(TY SA 40T-8) (0.25 KW) S





LEGEND

- RDWY ILLUM ASSEM (TY SA 40T-8) (0.25KW)S
- RDWY ILLUM ASSEM U/P(TY SPL-CO)(.15KW)S(TY I)
- CONDUIT AND CONDUCTOR (PVC)
- CONDUIT AND CONDUCTOR (BORED)
- CONDUIT (RIGID METAL)
- GROUND BOX (TY A) (122311) W/APRON
- JUNCTION BOX
- ELECTRICAL SERVICE POLE
- RDWY ILLUM ASSEM (TY SA 40B-8)(0.25 KW) S

X-X-(X)
- CONDUIT RUN NUMBER
- SERVICE NUMBER
- CIRCUIT

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNITS	SHEET TOTAL
0610-2025	INS RD AM (TY SA) 40T-8 (.25 KW) S	EA	4
0618-2034	CONDT (PVC) (SCHD 80) (2")	LF	500
0618-2035	CONDT (PVC) (SCHD 80) (2") (BORE)	LF	140
0620-2011	ELEC CONDR (NO. 8) BARE	LF	640
0620-2012	ELEC CONDR (NO. 8) INSULATED	LF	1280
0624-2008	GROUND BOX TY A (122311) W/APRON	EA	4
0416 2029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	24
0628 2040	ELC SRV TY A 240/480 100 (SS) SS (E) SP (O)	EA	2

NOTES:

ALL INDICATED LENGTHS IN THE CONDUIT AND CONDUCTOR RUNS SCHEDULE ARE HORIZONTAL ONLY. ALLOW FOR SPLICING AND VERTICAL REQUIREMENTS.

STATE OF TEXAS
TIMOTHY E. CAMPBELL
81011
LICENSED
PROFESSIONAL ENGINEER
5/20/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

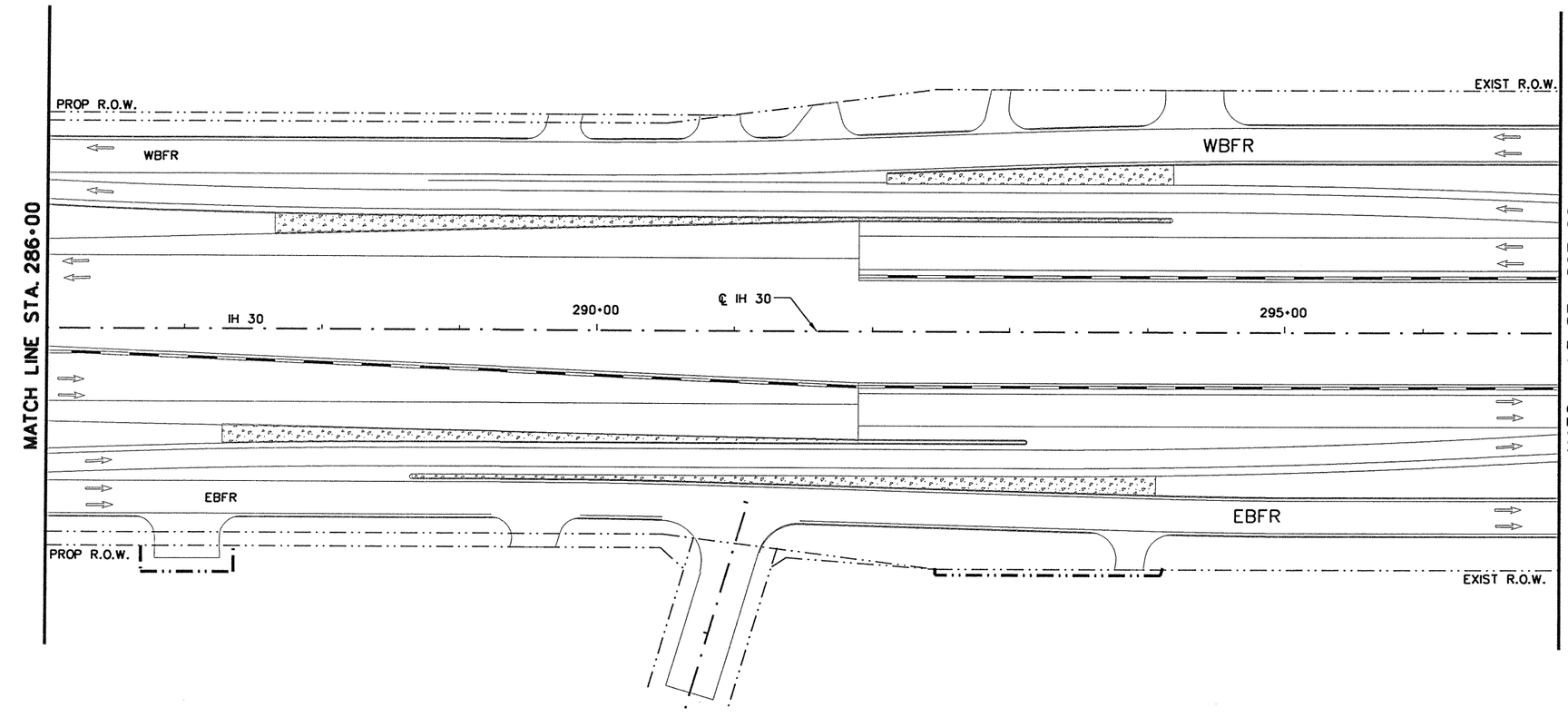
ILLUMINATION LAYOUT

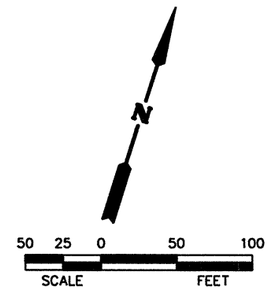
BEGIN PROJECT TO STA. 286+00

Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AL	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	TEC	DAL	ROCKWALL	0009	12	073	439

SHEET 1 OF 5

4/23/2009 9:23:29 AM eadams p:\Active Projects\TXD0643\TXD0643-05\8.00 Plans and Drawings\8.30 Cut Sheets\8.3.xx Illumination\435TLN02.100





LEGEND

- RDWY ILLUM ASSEM (TY SA 40T-8) (0.25KW)S
- RDWY ILLUM ASSEM U/P(TY SPL-CO)(.15KW)S(TY I)
- CONDUIT AND CONDUCTOR (PVC)
- CONDUIT AND CONDUCTOR (BORED)
- CONDUIT (RIGID METAL)
- GROUND BOX (TY A) (122311) W/APRON
- JUNCTION BOX
- ELECTRICAL SERVICE POLE
- RDWY ILLUM ASSEM (TY SA 40B-8)(0.25 KW) S

X-X-(X)
- CONDUIT RUN NUMBER
- SERVICE NUMBER
- CIRCUIT

STATE OF TEXAS
TIMOTHY E. CAMPBELL
81011
LICENSED
PROFESSIONAL ENGINEER
3/3/09
Timothy E Campbell

NOTES:

ALL INDICATED LENGTHS IN THE CONDUIT AND CONDUCTOR RUNS SCHEDULE ARE HORIZONTAL ONLY. ALLOW FOR SPLICING AND VERTICAL REQUIREMENTS.

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

ILLUMINATION LAYOUT

STA. 286+00 TO STA. 297+00

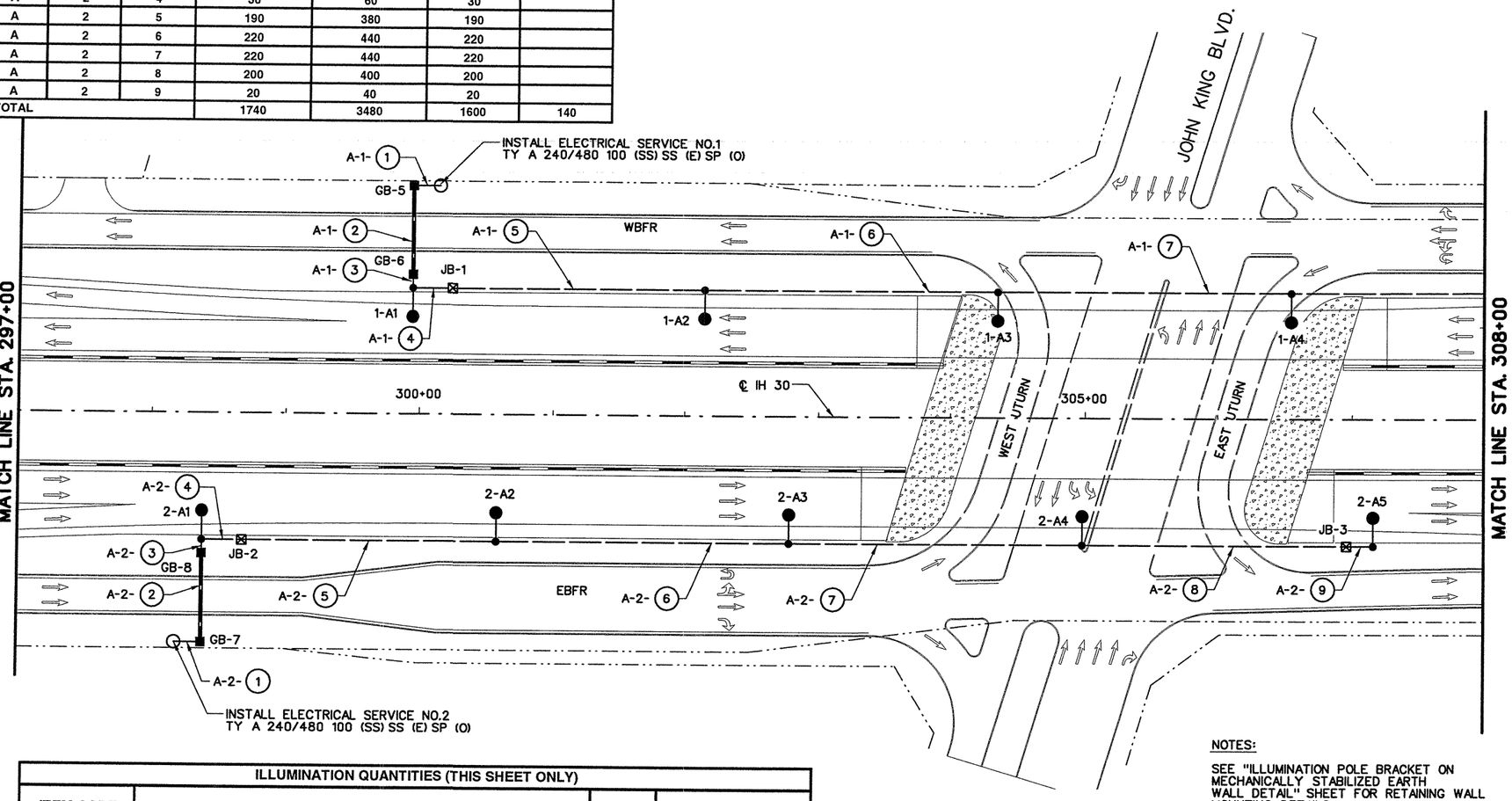
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Checked:	TEC	DAL	ROCKWALL	0009	12	073	440

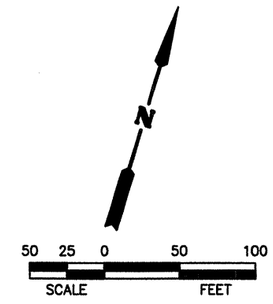
SHEET 2 OF 5

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CONDUIT AND CONDUCTOR RUNS (THIS SHEET ONLY)						
CIRCUIT	SERVICE	RUN NO.	GROUND & CONDUCTOR SIZE & LENGTH (FEET)		CONDUIT SIZE & LENGTH (FEET)	
			#8 BARE	#8 INSUL	2" PVC (SCH. 80)	2" PVC (SCH. 80) BORED
A	1	1	20	40	20	
A	1	2	70	140		70
A	1	3	10	20	10	
A	1	4	30	60	30	
A	1	5	190	380	190	
A	1	6	220	440	220	
A	1	7	220	440	220	
A	2	1	20	40	20	
A	2	2	70	140		70
A	2	3	10	20	10	
A	2	4	30	60	30	
A	2	5	190	380	190	
A	2	6	220	440	220	
A	2	7	220	440	220	
A	2	8	200	400	200	
A	2	9	20	40	20	
TOTAL			1740	3480	1600	140

ROADWAY ILLUMINATION ASSEMBLY SUMMARY					
NUMBER	STATION	LOCATION	WATT	TYPE	STANDARD TYPE
1-A1	299+94.27	CL IH30 WBFR 92.81' LT	250	HPS	(TY SA 40B-8) (0.25 KW) S
1-A2	302+14.27	CL IH30 WBFR 92.81' LT	250	HPS	(TY SA 40B-8) (0.25 KW) S
1-A3	304+34.27	CL IH30 WBFR 92.81' LT	250	HPS	(TY SA 40B-8) (0.25 KW) S
1-A4	306+54.27	CL IH30 WBFR 92.81' LT	250	HPS	(TY SA 40B-8) (0.25 KW) S
2-A1	298+38.20	CL IH30 EBFR 92.81' RT	250	HPS	(TY SA 40B-8) (0.25 KW) S
2-A2	300+58.20	CL IH30 EBFR 92.81' RT	250	HPS	(TY SA 40B-8) (0.25 KW) S
2-A3	302+78.20	CL IH30 EBFR 92.81' RT	250	HPS	(TY SA 40B-8) (0.25 KW) S
2-A4	304+98.20	CL IH30 EBFR 92.81' RT	250	HPS	(TY SA 40B-8) (0.25 KW) S
2-A5	307+18.20	CL IH30 EBFR 92.81' RT	250	HPS	(TY SA 40B-8) (0.25 KW) S





LEGEND

- RDWY ILLUM ASSEM (TY SA 40T-8) (0.25KW)S
- RDWY ILLUM ASSEM U/P(TY SPL-CO)(.15KW)S(TY I)
- CONDUIT AND CONDUCTOR (PVC)
- CONDUIT AND CONDUCTOR (BORED)
- CONDUIT (RIGID METAL)
- GROUND BOX (TY A) (122311) W/APRON
- JUNCTION BOX
- ELECTRICAL SERVICE POLE
- RDWY ILLUM ASSEM (TY SA 40B-8)(0.25 KW) S

X-X-(X)
- CONDUIT RUN NUMBER
- SERVICE NUMBER
- CIRCUIT

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNITS	SHEET TOTAL
0610-2020	INS RD IL AM (TY SA) 40B-8 (.25 KW)S	EA	9
0618-2034	CONDT (PVC) (SCHD 80) (2")	LF	1600
0618-2035	CONDT (PVC) (SCHD 80) (2") (BORE)	LF	140
0620-2011	ELEC CONDR (NO. 8) BARE	LF	1740
0620-2012	ELEC CONDR (NO. 8) INSULATED	LF	3480
0624-2008	GROUND BOX TY A (122311) W/APRON	EA	4
0628-2040	ELC SRV TY A 240/480 100 (SS) SS (E) SP (O)	EA	2

NOTES:

SEE "ILLUMINATION POLE BRACKET ON MECHANICALLY STABILIZED EARTH WALL DETAIL" SHEET FOR RETAINING WALL MOUNTING DETAILS.

SEE ILLUMINATION SUMMARY SHEET FOR SERVICE POLE SUMMARY.

ALL INDICATED LENGTHS IN THE CONDUIT AND CONDUCTOR RUNS SCHEDULE ARE HORIZONTAL ONLY. ALLOW FOR SPLICING AND VERTICAL REQUIREMENTS.

ALLOW FOR HORIZONTAL RUNS BETWEEN THE JUNCTION AND GROUND BOXES

CONDUIT FOR LUMINARIES MOUNTED ON THE RETAINING WALL OR BRIDGE SHALL BE PLACED IN THE FACE OF THE T501 RAIL.

STATE OF TEXAS
TIMOTHY E. CAMPBELL
81011
LICENSED
PROFESSIONAL ENGINEER

Timothy E. Campbell 5/20/09

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

ILLUMINATION LAYOUT

STA. 297+00 TO STA. 308+00

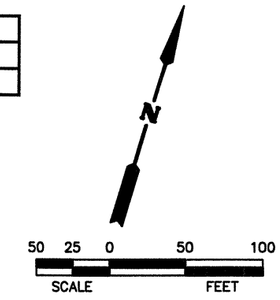
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Checked:	AL	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	TEC	DAL	ROCKWALL	0009	12	073	441

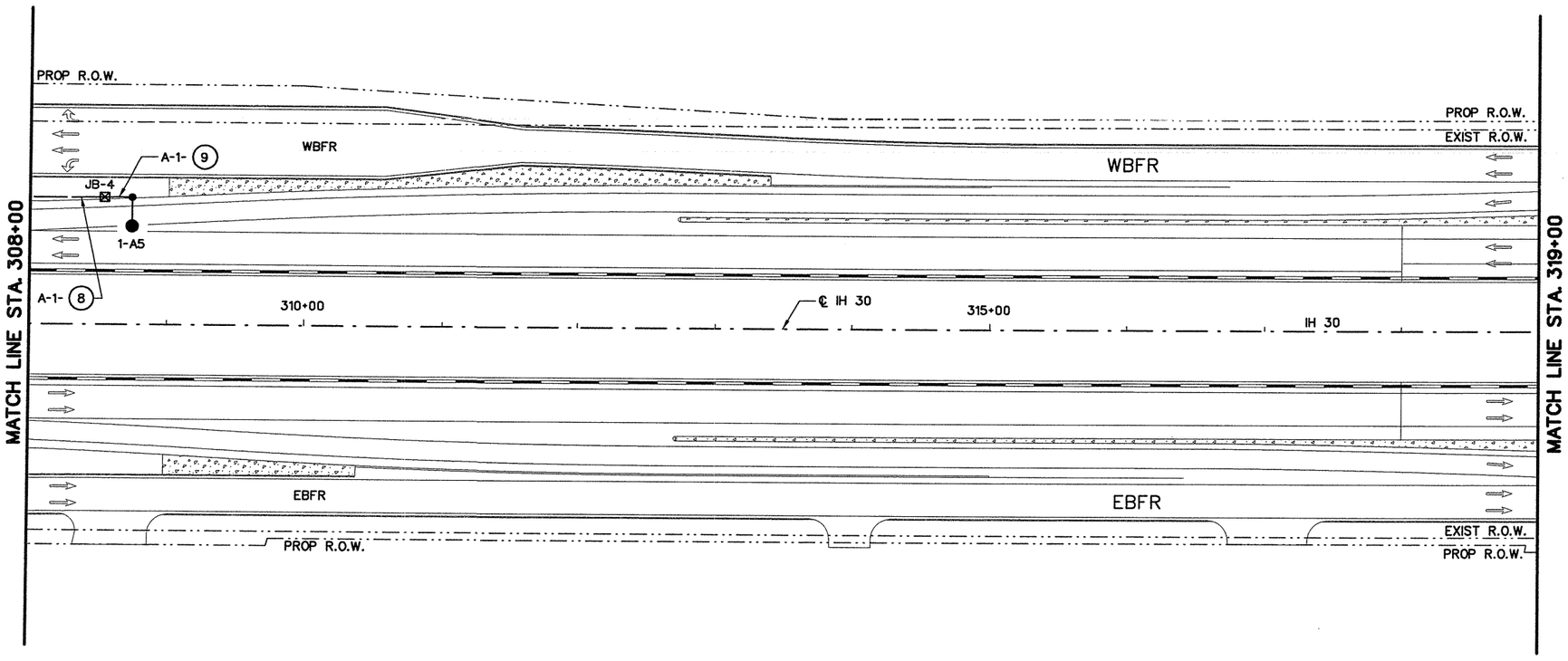
SHEET 3 OF 5

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CONDUIT AND CONDUCTOR RUNS (THIS SHEET ONLY)						
CIRCUIT	SERVICE	RUN NO.	GROUND & CONDUCTOR SIZE & LENGTH (FEET)		CONDUIT SIZE & LENGTH (FEET)	
			#8 BARE	#8 INSUL	2" PVC (SCH. 80)	2" PVC (SCH. 80) BORED
ITEM NO.			0620	0620	0618	0618
A	1	8	200	400	200	
A	1	9	20	40	20	
TOTAL			220	440	220	

ROADWAY ILLUMINATION ASSEMBLY SUMMARY					
NUMBER	STATION	LOCATION	WATT	TYPE	TYPE
1-A5	308+74.27	CL IH30 WBFR 92.88' LT	250	HPS	(TY SA 40B-8) (0.25 KW) S





LEGEND

- RDWY ILLUM ASSEM (TY SA 40T-8) (0.25KW)S
- RDWY ILLUM ASSEM U/P(TY SPL-CO)(.15KW)S(TY I)
- CONDUIT AND CONDUCTOR (PVC)
- CONDUIT AND CONDUCTOR (BORED)
- CONDUIT (RIGID METAL)
- GROUND BOX (TY A) (122311) W/APRON
- JUNCTION BOX
- ELECTRICAL SERVICE POLE
- RDWY ILLUM ASSEM (TY SA 40B-8)(0.25 KW) S

X-X-(X)
- CONDUIT RUN NUMBER
- SERVICE NUMBER
- CIRCUIT

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNITS	SHEET TOTAL
0610-2020	INS RD IL AM (TY SA) 40B-8 (.25 KW) S	EA	1
0618-2034	CONDT (PVC) (SCHD 80) (2")	LF	220
0618-2035	CONDT (PVC) (SCHD 80) (2") (BORE)	LF	
0620-2011	ELEC CONDR (NO. 8) BARE	LF	220
0620-2012	ELEC CONDR (NO. 8) INSULATED	LF	440
0624-2008	GROUND BOX TY A (122311) W/APRON	EA	

NOTES:

SEE "ILLUMINATION POLE BRACKET ON MECHANICALLY STABILIZED EARTH WALL DETAIL" SHEET FOR RETAINING WALL MOUNTING DETAILS.

SEE ILLUMINATION SUMMARY SHEET FOR SERVICE POLE SUMMARY.

ALL INDICATED LENGTHS IN THE CONDUIT AND CONDUCTOR RUNS SCHEDULE ARE HORIZONTAL ONLY. ALLOW FOR SPLICING AND VERTICAL REQUIREMENTS.

ALLOW FOR HORIZONTAL RUNS BETWEEN THE JUNCTION AND GROUND BOXES

CONDUIT FOR LUMINARIES MOUNTED ON THE RETAINING WALL OR BRIDGE SHALL BE PLACED IN THE FACE OF THE T501 RAIL.



5/20/09

Timothy E Campbell

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

ILLUMINATION LAYOUT

STA. 308+00 TO STA. 319+00

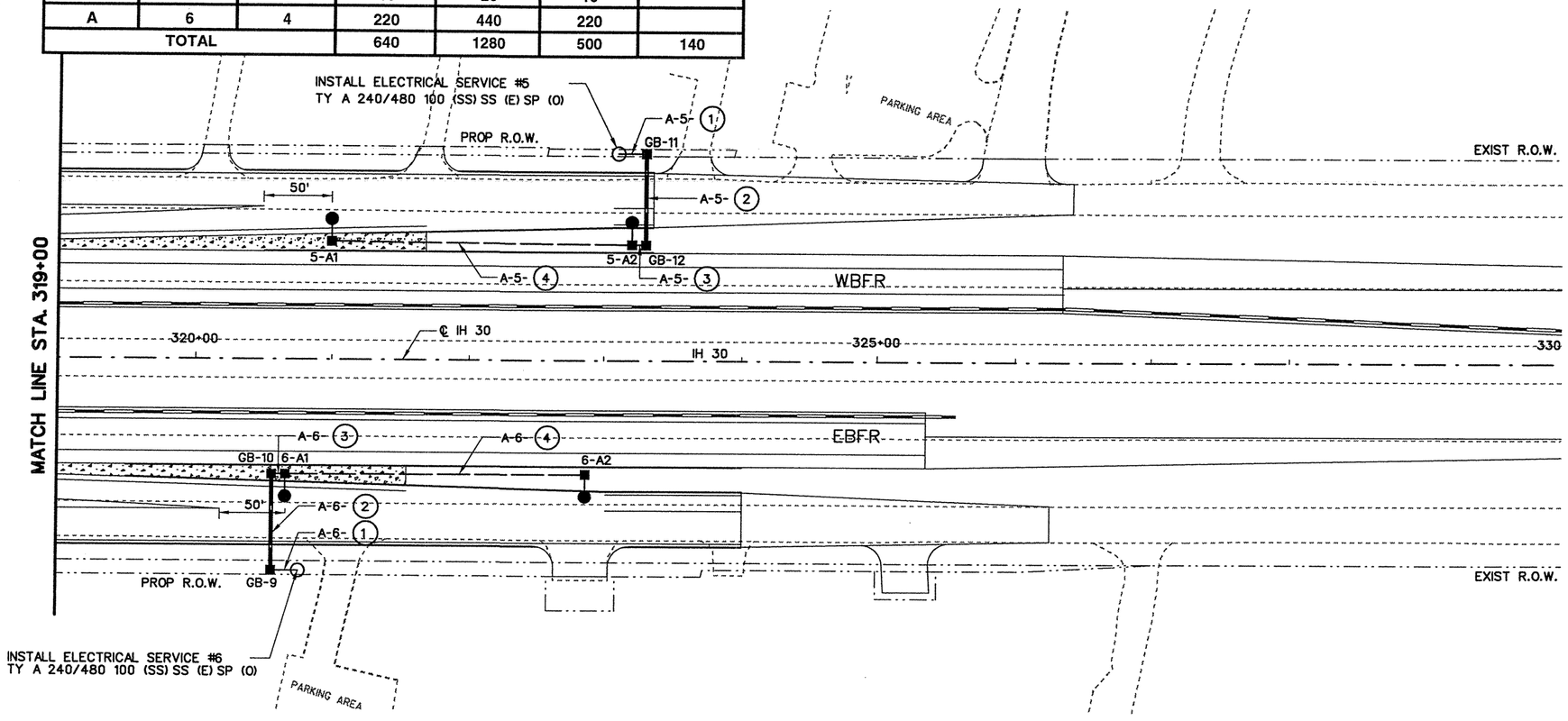
Designed:	JAV	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	AL	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	CADD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	TEC	DAL	ROCKWALL	0009	12	073	4A2

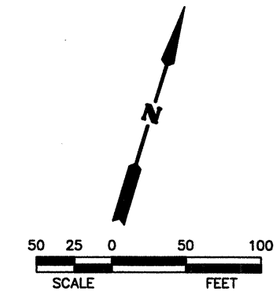
SHEET 4 OF 5

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CONDUIT AND CONDUCTOR RUNS (THIS SHEET ONLY)						
CIRCUIT	SERVICE	RUN NO.	GROUND & CONDUCTOR SIZE & LENGTH (FEET)		CONDUIT SIZE & LENGTH (FEET)	
			#8 BARE	#8 INSUL	2" PVC (SCH. 80)	2" PVC (SCH. 80) BORED
A	5	1	20	40	20	
A	5	2	70	140		70
A	5	3	10	20	10	
A	5	4	220	440	220	
A	6	1	20	40	20	
A	6	2	70	140		70
A	6	3	10	20	10	
A	6	4	220	440	220	
TOTAL			640	1280	500	140

ROADWAY ILLUMINATION ASSEMBLY SUMMARY					
NUMBER	STATION	LOCATION	WATT	TYPE	STANDARD TYPE
5-A1	321+00.00	CL IH30 WBFR 86.50' LT	250	HPS	(TY SA 40T-8) (0.25 KW) S
5-A2	323+20.00	CL IH30 WBFR 85.00' LT	250	HPS	(TY SA 40T-8) (0.25 KW) S
6-A1	320+67.00	CL IH30 EBFR 85.00' RT	250	HPS	(TY SA 40T-8) (0.25 KW) S
6-A2	322+87.00	CL IH30 EBFR 85.00' RT	250	HPS	(TY SA 40T-8) (0.25 KW) S





LEGEND

- RDWY ILLUM ASSEM (TY SA 40T-8) (0.25KW)S
- RDWY ILLUM ASSEM U/P(TY SPL-CO)(.15KW)S(TY I)
- CONDUIT AND CONDUCTOR (PVC)
- CONDUIT AND CONDUCTOR (BORED)
- CONDUIT (RIGID METAL)
- GROUND BOX (TY A) (122311) W/APRON
- JUNCTION BOX
- ELECTRICAL SERVICE POLE
- RDWY ILLUM ASSEM (TY SA 40B-8)(0.25 KW) S

X-X- (X)
- CONDUIT RUN NUMBER
- SERVICE NUMBER
- CIRCUIT

ILLUMINATION QUANTITIES (THIS SHEET ONLY)			
ITEM-CODE	DESCRIPTION	UNITS	SHEET TOTAL
0610-2025	INS RD IL AM (TY SA 40T-8) (0.25 KW) S	EA	4
0618-2034	CONDT (PVC) (SCHD 80) (2")	LF	500
0618-2035	CONDT (PVC) (SCHD 80) (2") (BORE)	LF	140
0620-2011	ELEC CONDR (NO. 8) BARE	LF	640
0620-2012	ELEC CONDR (NO. 8) INSULATED	LF	1280
0624-2008	GROUND BOX TY A (122311) W/APRON	EA	4
0416 2029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	24
0628-2040	ELC SRV TY A 240/480 100 (SS) SS (E) SP (O)	EA	2

NOTES:

ALL INDICATED LENGTHS IN THE CONDUIT AND CONDUCTOR RUNS SCHEDULE ARE HORIZONTAL ONLY. ALLOW FOR SPLICING AND VERTICAL REQUIREMENTS.



5/20/09

Timothy E. Campbell

NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

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IH 30 AT JOHN KING BLVD.

ILLUMINATION LAYOUT

STA. 319+00 TO END PROJECT

Designed: JAV	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO. SEE TITLE SHEET			HIGHWAY NO. IH 30
Checked: AL						
Drawn: CADD	DIST. DAL	COUNTY ROCKWALL	CONTROL NO. 0009	SECTION NO. 12	JOB NO. 073	SHEET NO. 4443
Checked: TEC						

SHEET 5 OF 5

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I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

The location of all conductors, conduits, junction boxes, ground boxes, and electrical services is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Materials shall be new and unused. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA) standards, and shall be Underwriters Laboratories (UL) Listed unless otherwise shown on the plans or specifications or approved by the Engineer in writing. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection. When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comparable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard. Where reference is made to NEMA listed devices, IEC listed devices shall not be considered to be an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing.

With the exception of high strength bolts, miscellaneous nuts, bolts and hardware may be stainless steel when plans specify galvanized, provided that bolts are 1/2 inch or less in diameter. The Contractor shall provide the following electrical test instruments as required by the Engineer to confirm compliance with the contract and the NEC. Those test instruments are voltmeter, amp probe, megger (1000 volt DC) and torque wrenches. All meters shall have been properly calibrated within one year. Calibration certification shall be provided to the Engineer upon request. Calibration certification tag shall also be applied to the meter. The Contractor shall operate meters during inspection as requested by the Engineer. Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, light poles, luminaires on bridge structures, and all metal enclosures shall be bonded to the system-grounding conductor. The ground rod in each ground box or junction box at the bridge ends, and in each ground box installed for underpass lighting will also be bonded to the system grounding conductor. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

SUBMITTALS:

The contractor shall submit for approval six (6) copies of catalog cut sheets for each of the following three (3) categories.
Category 1. Electrical services including photocell.
Catagory 2. Breakaway disconnects, heat shrink tubing, heat shrink filler tape, GelCaps and ground boxes which will include loading capacity certification.
Category 3. Highmast assembly kits, when applicable. See Item 614 "Highmast Illumination Assemblies". Submittals shall be legible and shall be marked to indicate which product on a cut sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, the Contractor shall furnish to the State such warranties and guarantees.
Any deviation from plans or specifications, including deviations due to plan error should be prominently displayed on the submittal.
Any changes not prominently noted in submittal and incorporated into the work without proper authorization will constitute grounds for rejection of that portion of the work.

II. CONDUIT

A. MATERIALS

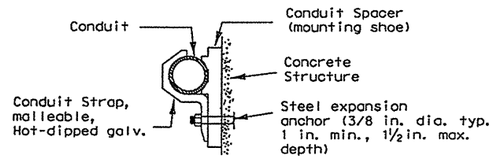
1. Conduit and fittings shall be UL Listed for the intended use shown on plan sheets.
2. Conduit shall be the type shown by descriptive code or shown elsewhere on the plans. Substitution of the various types of conduits will not be permitted. All flexible conduit in rigid metallic conduit (RMC) systems shall be Liquidtight Flexible Metal (LFMC) conduit. All flexible conduit in PVC systems shall be Liquidtight Flexible Non-metallic conduit (LFNC).
3. All exposed conduits shall be RMC, unless otherwise specifically shown on the plans. All metal conduit shall be properly grounded.
4. Couplings, connectors, conduit bodies, grounding bushings, and offset nipples for RMC shall be electro-zinc plated steel or hot dipped galvanized malleable iron, threaded or threadless compression type, rain-tight and shall be UL listed for the intended use.
5. Expansion joints for metal conduit shall be provided with an internal or external bonding jumper and shall be UL listed.
6. Unless otherwise shown on the plans, junction box minimum sizes shall be in accordance with the following table which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, the conductors shall be counted as if all are of the larger size. Situations not applicable to the table shall be sized in accordance with NEC 370-28.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

7. RMC system junction boxes equal to or smaller, in any dimension, than 12 x 12 x 6 (HxWxD), surface mounted and containing conductors #8 or larger, shall be hot dipped galvanized cast iron with minimum wall thickness of 3/16 inch, shall have external mounting lugs, and shall be UL listed Crouse-Hinds Type WAB, OZ/Gedney Type YS or approved equal. Unless otherwise shown elsewhere on the plans, RMC system junction boxes larger than the aforementioned boxes but equal to or smaller, in any dimension, than 18 x 18 x 6 (HxWxD) shall be 14-ga. stainless steel; RMC system junction boxes larger than 18 x 18 x 6 (HxWxD) shall be 12-ga. stainless steel. All metal junction boxes shall be equipped with a threaded hole or lug for grounding. Stainless steel boxes 12 x 12 x 6 and larger need not be UL Listed but shall meet the other requirements of the NEC and shall have ribs, stiffeners, or thicker metal and shall have external mounting feet. Junction boxes with an internal volume of more than 100 cu. in. may be supported by connection of two or more rigid metal conduits, where specifically shown on the plans or where approved by the Engineer.
8. Junction boxes containing only #10 or #12 AWG conductors shall be Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or similar approved cast iron box. Boxes shall be sized according to NEC Table 370-16(a).
9. IMC and EMT conduit shall not be used unless specifically required by the plan layout sheets. Junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed and approved for outdoor use, unless otherwise noted on the plans. Sheet metal junction boxes shall be sized in accordance with the NEC. Junction boxes for IMC conduit systems shall meet the requirements of boxes used with RMC systems.
10. Junction boxes in PVC conduit systems shall be PVC, intended for outdoor use, unless otherwise noted on the plans.
11. Elbows in PVC conduit systems one inch and larger shall be rigid metal, with the exception of traffic signal systems which may have PVC elbows instead of rigid. If any part of the rigid metal elbow is buried less than 18 inches underground the elbow and rigid metal extension shall be grounded. Grounding shall be accomplished by means of a grounding bushing installed on the extension. Unless specifically shown on the plans, rigid metal elbows containing, or entering ground boxes containing only communications conductors, loop detectors, or other low voltage power limited circuits need not be grounded unless a ground wire is present in the conduit or ground box. The rigid metal elbows located in concrete foundations may be extended with PVC conduit and need not be grounded provided that the end of the elbow nearest the end of the conduit run exiting the foundation is at least 2 inches below the concrete. RMC elbows will not be eliminated. RMC elbows will not be paid for directly, but will be subsidiary to various bid items.
12. High-Density Polyethylene (HDPE) conduit shall meet the requirements of Item 622, Duct Cable, except that the HDPE conduit, when bid under Item 618, Conduit, shall not contain factory installed conductors. Fittings for HDPE conduit shall be UL listed as an electrical conduit connector or shall be thermally fused using an electrically heated wound wire resistance welding method. HDPE conduit may be substituted for bored schedule 40 or schedule 80 PVC conduit. When such substitution is made, bored HDPE shall be schedule 40 of the size PVC being replaced. The HDPE conduit shall transition to PVC (or RMC elbow when required) at the bore pit. Size and schedule shall be as shown on the plans. Substituted conduit may not be extended to ground boxes or foundations; RMC elbows shall be installed at ground boxes and foundations. RMC elbows will not be eliminated.
13. All conduit support hardware including straps, nuts, bolts, screws, retaining anchors and washers shall be hot dipped galvanized or stainless steel. Strut type conduit straps shall be stainless steel or hot dipped galvanized. Strut type straps need not be made of malleable type material. Stamped-cadmium plated straps will not be allowed. Straps having only one mounting hole shall not be allowed for use on conduits 2 inches and larger with the exception of electrical service poles where stainless steel standoff straps will be allowed. Two piece conduit straps designed to be used with a mounting shoe shall be installed only with the correctly sized shoe.

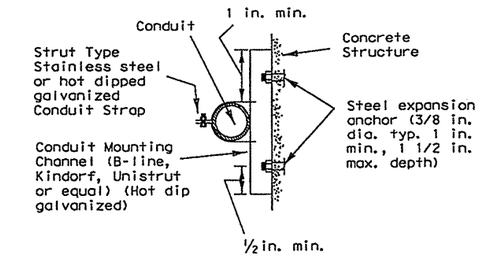
B. CONSTRUCTION METHODS

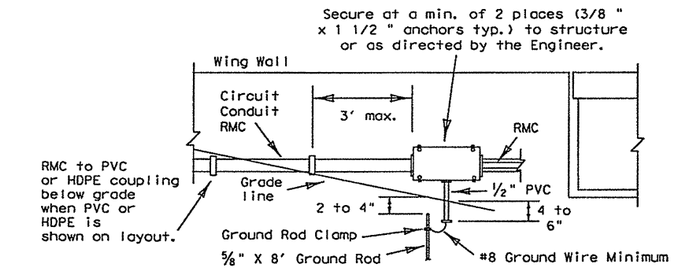
1. Conduit in structures shall have expansion fittings at structure expansion joints. All straight runs of RMC conduit exposed on structures such as bridges shall have expansion joints installed at maximum intervals of 150 feet. Expansion joints shall be installed so they allow for movement of the conduit. Installation of the joint in such a manner that will not allow for movement shall be repaired at no expense to the state. The method of determining the final setting length of the expansion joint shall be provided to the Engineer upon request.
2. Conduit supports shall be spaced at maximum intervals of 5 feet. Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit mounting options).
3. Conduit supports shall not be attached directly to prestressed concrete beams except as shown specifically in the plans and approved by the Engineer.
4. Unless otherwise shown on the plans, conduit placed beneath existing roadways, driveways, or sidewalks, or after the base or surfacing operation has begun, shall be accomplished by jacking or boring. The Contractor shall back fill and compact the bore pits to the bottom of the conduit prior to installing connecting conduit or duct cable to prevent bending of the connection.
5. Conduit trenched in the subgrade of new roadways shall be backfilled with excavated material, unless otherwise noted on the plans. Conduit trenched in the sub-base of new roadways shall be backfilled with cement-stabilized base.
6. Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction. The temporary cap may be constructed of duct tape, but in all cases shall be tightly fixed to the conduit and shall be durable. The contractor shall clean out the conduit and prove it clear in accordance with Standard Specifications Item 618.3 prior to installing any conductors.
7. Conduit entry into the top of enclosures such as safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes shall be made weatherproof using conduit sealing hubs, or threaded bosses.
8. A bonding jumper shall be installed from each grounding bushing to the nearest grounding rod, grounding lug, and/or equipment grounding conductor. All jumpers shall be the same size as equipment grounding conductor. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing. At electrical services, grounding electrode conductor shall be a solid Copper #6 AWG.
9. Metal junction boxes shall be bonded to the grounding conductor in accordance with the NEC.
10. Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 3 inches nor more than 6 inches from bottom of box (See ground box detail on sheet ED(3).
11. Conduit ends shall be sealed with heat shrink boots with waterproof sealant, urethane foam, or by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests. Duct tape shall not be used as a permanent conduit sealant. Silicone caulking shall not be used as a sealant.
12. All strut mounting material and hardware shall be hot-dip galvanized or shall be stainless steel. The cut ends of strut and non-galvanized rigid metal conduit threads shall be coated with a zinc rich paint (90% or more zinc content). Zinc rich paint may only be used to touch up galvanized material as allowed under item 445.6 galvanizing. The painting of non-galvanized material with a zinc rich paint shall not be considered as an approved alternative for galvanized materials.
13. All PVC conduit terminations shall be fitted with bushings or bell ends. All metal conduit terminations shall be fitted with a grounding type bushing.



CONDUIT MOUNTING OPTIONS

(Attachment to concrete surfaces)
(See para. II.B.2)

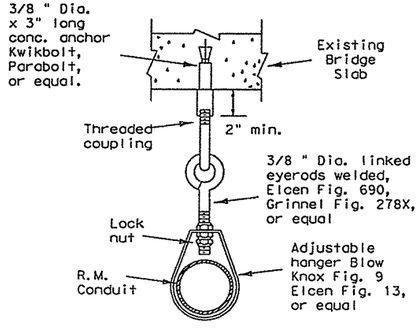




TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

NOTES

1.) Ground rod clamp to be UL listed for direct burial.
2.) For conduit placed in structure, use flush-mounted box.
3.) Bond junction box and metal conduits to equipment grounding conductor and grounding electrode conductor using listed connector.
4.) Seal all conduits entering the junction box from underground.
5.) Install bell end or bushing on 1/2 " PVC conduit both ends.
6.) Ground rod to be driven within 8 inches of 1/2 inch PVC conduit end.



CONDUIT HANGER DETAIL

(Attachment to horizontal surfaces)
Hangers need not be UL listed for electrical use
ie: plumber pipe hangers are acceptable

5/03 Revision
⚠1 Revised notes.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-CONDUIT

ED(1)-03

©TxDOT January 1992	DN:- KB	CK:- JW	DW:- DN	CK:- GC	REG NO.:
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT		SHEET
4-98					
12-00	DAL	6	SEE TITLE SHEET		444
3-03	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
5-03	ROCKWALL		009	12	073	IH 30

DN: CK: DW: CK:

SPLAYED LEGS

| | | | | |

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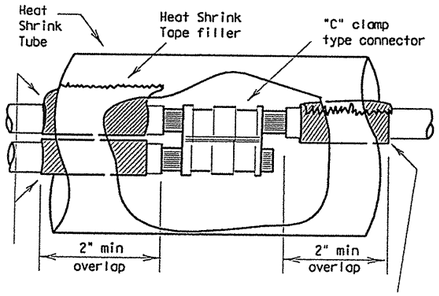
I. ELECTRICAL CONDUCTORS

A. MATERIALS

1. Insulated conductors shall be NEC Type XHHW. Insulated conductors shall be color coded in accordance with the NEC, articles 200, 250, and 310; i.e. Insulation of grounded conductors (neutrals) shall be white. Grounding conductors (ground wires) shall be bare or insulation shall be green. Insulation of ungrounded conductors (hots) shall be any color except green, white, or gray. Identification of conductors #6 American Wire Guage (AWG) and smaller shall be by continuous jacket color. Color coding of electrical conductors #4 AWG and larger shall be either by continuous color jacket or by colored tape. Colored tape marker shall consist of a half-lap of tape covering a 6-inch length of conductor.
2. Where two or more circuits are present in one conduit or enclosure, the conductors of each circuit shall be identified by a permanent non-metallic tag at each accessible location. The tag shall be fastened to the conductors by two plastic straps. Each tag shall indicate circuit number, letter, or other identification shown in the plans.
3. Grounding electrode conductor #6 AWG for bonding to ground rod at electrical service, shall be solid. Connection of conductor to ground rod shall be made using UL Listed connectors designed for such purposes.
4. Heat Shrink Tape filler shall be used to seal the ends of heat shrink tubing around two or more conductors that are insulated with heat shrink tubing. Tape material shall have a minimum dielectric strength of 225 volts per mil and shall be cross-linked butyl rubber. Tape shall be supplied in rolls and shall have a backing (release paper) to prevent the tape from sticking to itself.
5. Heat shrink tubing shall be heavy wall, UL listed for 600 volts or greater and shall have factory applied internal sealant.
6. GelCaps shall be UL listed for 600-volt applications. GelCap shall have see-through elastomer molded cover. Cover shall be filled with high dielectric insulating gel silicone sealant to provide waterseal. Cover shall be held in place by snap-lock, molded clamp made of UV stable polypropylene.
7. Splicing materials, insulating materials, breakaway disconnects, GelCaps and fuse holders will not be paid for directly but shall be subsidiary to various bid items.

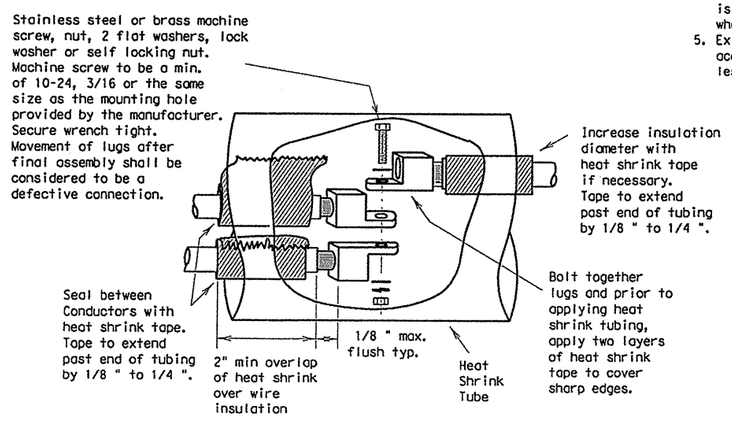
B. CONSTRUCTION METHODS

1. After conductors have been installed in conduit, a pull test shall be made on conductors. When any length of conductor cannot be freely pulled, the Contractor shall make any needed alterations or repairs at no expense to the State.
2. The Contractor shall perform insulation resistance tests in accordance with Item 620, "Electrical Conductors." The Contractor shall coordinate with the Engineer to witness the tests.
3. A sufficient length of conductor for making up connections shall be left in ground boxes (2 feet minimum, 3 feet maximum, to point of splice, 3 feet minimum, 4 feet maximum, when conductor is pulled through with no splice), enclosures, weatherheads and pole bases (1 foot minimum, 1.5 feet maximum).
4. Splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with listed compression or screw type pressure connectors, terminal blocks, bolted lugs, or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing or GelCaps and shall be made so as to provide a watertight splice. Heat shrink sleeve shall overlap conductor insulation a minimum of 2 inches on both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, the Contractor shall increase the diameter of the conductors insulation using heat shrink filler tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Tape shall be visible after completion of all splices. Where filler tape is used but not visible, the Engineer shall approve each individual splice by conducting a physical inspection of each splice. When it appears the tubing has been burned, or overheated the tubing shall be considered to be defective and shall be replaced.
5. GelCaps when used in place of heat shrink method of splicing, shall be sized and installed according to manufacturer's specifications. (Raychem GelCap and GelCap SL or equal.)
6. Wire nuts may be used for #8 AWG or smaller conductors in above-ground junction boxes, but not in pole bases or ground boxes. Wire nuts shall be positioned upright to prevent the accumulation of water. Wire nuts used at these locations shall have factory applied waterproof sealant.
7. Conductors in illumination poles shall be supported by a J-hook in the top of the pole.
8. All conductors bid under Item 620 "Electrical Conductors" shall have breakaway electrical disconnects installed anytime conductors pass through a break-away support device.
9. For terminating the conductors, insulation-jacketing material shall be removed in such a manner as to not nick any of the individual strands of the conductor. When individual conductor strands are removed, the conductor shall be considered to be damaged.
10. When a conductor or cable has been damaged, or fails to pass an insulation resistance test, the conductor shall be replaced.
11. Duct tape, black electrical tape, or wire nuts shall not be used in the repair of a damaged conductor.
12. For terminations, no more than one wire may be installed under a single pressure connector, unless the device is listed for more than one wire.
13. Conductors connected to break-away in line fuse holders must be installed in accordance with the specific manufacturer's installation instructions. Where threaded connections are made, they shall be properly torqued. Where crimp type connections are made, crimps shall be made using properly sized crimping pliers. Proper conductor terminations are critical to the safe operation of break-away devices.
14. Waterproofing boots shall be properly trimmed to fit snugly around the conductor so as to provide a water proof connection. No more than one wire may enter a single opening in any one boot. Water proofing boots must provide the correct number of openings. Where only one wire is to be connected to a boot, the boot may not be a two wire type.



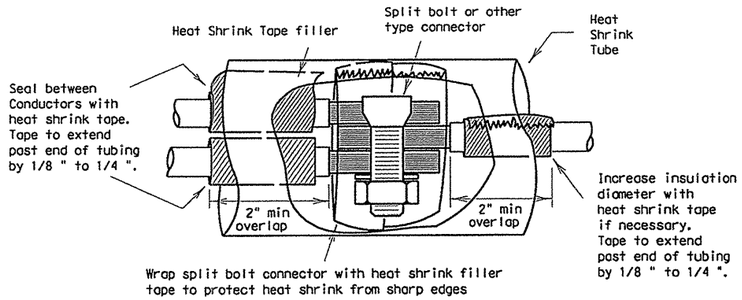
SPLICE OPTION 1

C-CLAMP



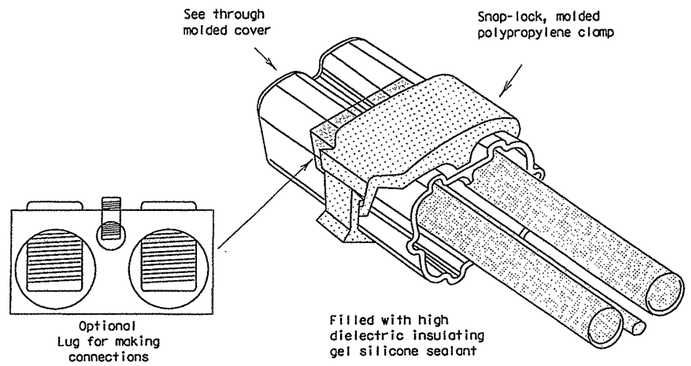
SPLICE OPTION 2

BOLTED WIRE LUGS



SPLICE OPTION 3

SPLIT BOLT



SPLICE OPTION 4

GELCAP

GelCap shall be sized and installed according to manufacturers specifications

15. All conduits that contain circuit wiring of 50 volts or more shall contain an equipment grounding conductor (EGC). Conduit for traffic signals shall have an EGC, with a minimum size of #8 AWG stranded. Unless otherwise shown on the plans, the EGC for all other conduits shall be the same AWG size as the largest current carrying conductor contained in that conduit. The EGC shall be paid for in item 620-Electrical Conductors.

C. TEMPORARY WIRING

1. Temporary conductors and electrical equipment to provide power for utilization equipment, shall be installed in accordance with the NEC article 305. All temporary wiring materials and methods shall comply with the standard sheets. All power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade, supplied from a utility power source, shall be provided with a ground fault circuit interrupter.
2. Residual current protective devices (GFCI) may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Where wire nuts are approved for temporary wiring, they shall be of the self-sealing type.
4. All conductor splices must be contained within a listed enclosure, ground box or the splices will be more than ten feet above grade vertically and more than five feet horizontally from any metal structure. Where temporary conductors are installed in any area that is likely to be subjected to vehicle traffic, or mobile construction equipment, the vertical clearance to ground shall be at least 18 feet when measured at the lowest point. Where power conductors are to be supported by a span wire, the span wire shall be properly grounded.
5. Existing conduit containing service conductors uncovered during the construction process shall be repaired in a timely manner in accordance with the NEC. Existing non-metallic conduit exposed during construction shall not be left exposed above grade, or with less than eighteen inches of cover, without protective methods approved by the Engineer.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-CONDUCTORS

ED(2)-03

©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: GC	REQ No.:
REVISIONS 10-93 4-98 12-00 3-03	STATE DISTRICT: DAL 6	FEDERAL ROUTE	FEDERAL AID PROJECT / SEE TITLE SHEET		SHEET 445
	COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH 30

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FILE: DATE: DN: CK: DW: CK:
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II. GROUND RODS

A. MATERIALS

1. All ground rods installed at electrical services, including supplemental lightning protection ground rods specified by the plans in other locations such as pole bases, shall be copper clad and UL listed. Rods shall be a minimum diameter of 5/8 inch. The length shall be a minimum of 8 feet. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets.
2. Ground rod clamps shall be listed to be in direct contact with the soil. Where concrete encasement is required, the clamp shall be listed for concrete encasement.

B. CONSTRUCTION METHODS

1. Ground rods installed in locations such as pole bases, to provide supplemental lightning protection need not be totally in contact with the soil. Where called for in the plans, rods may be encased in soil or concrete or any combination of soil and concrete. When concrete encased, the connection of the conductor to the rod shall be readily accessible for inspection or repairs. When driven into the soil the upper end shall be between 2 to 4 inches below finished grade. Ground rods shall not be placed in the same drilled hole as a timber pole.
2. Ground rods shall be installed such that the end imprinted with the rod's part number is installed as being the upper end.
3. Non-conductive coatings such as concrete splatter shall be removed from the rod at the clamp location.
4. Routing of lightning protection ground rod wires shall be run as short and straight as possible. Where bends are required they shall have a minimum radius of four inches.
5. Unless specifically called for by the plans, conduits used for ground rod wires shall be non-metallic. Where metal conduits are specified, a grounding bushing and properly sized bonding jumper shall be provided and properly installed on each end.
6. Where rocky soil or a solid rock bottom is encountered when driving a ground rod and the horizontal trench placement method is the only viable solution, written authorization from the Engineer must be obtained.

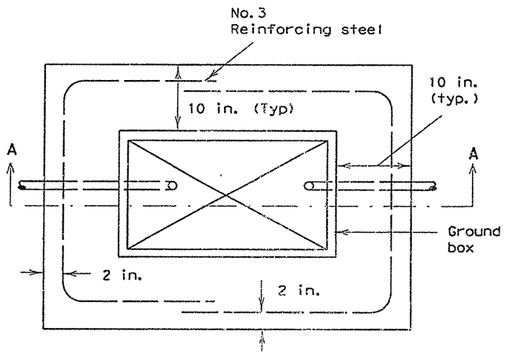
III. GROUND BOX

A. MATERIALS

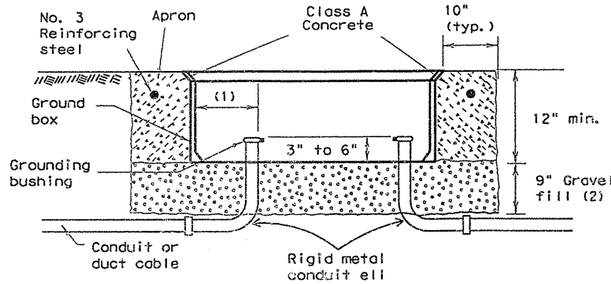
1. Ground boxes 16x30x24 inches (WxLxD) or smaller shall be polymer concrete of the type required by the descriptive code shown elsewhere. Larger ground boxes shall be as shown elsewhere in the plans.
2. All ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Ground box Types A, B, C, D & E shall meet the following requirements:
   a. Ground boxes and covers be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Minimum inside dimensions shall be as follows (width x length x depth):
      Type A shall be 11.5 inches x 21 inches x 10 inches, (122311)
      Type B shall be 11.5 inches x 21 inches x 20 inches, (122322)
      Type C shall be 15.25 inches x 28.25 inches x 10 inches, (162911)
      Type D shall be 15.25 inches x 28.25 inches x 20 inches, (162922)
      Type E shall be 11.5 inches x 21 inches x 16 inches, (122317)
   c. Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
   d. Ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 10 inch area centered on the cover with less than 1/2 inch deflection. Ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   e. Covers shall be 2 inch (nominal) thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly imprinted with the following words in minimum 1 inch letters:
      Ground Boxes containing wiring for traffic signals shall be labeled, Danger High Voltage Traffic Signal.
      Ground boxes containing wiring for illumination systems shall be labeled, Danger High Voltage Illumination.
      Ground boxes containing wiring for traffic management systems shall be labeled, Danger High Voltage Traffic Management.
      Ground boxes containing wiring for sign illumination systems shall be labeled, Danger High Voltage Sign Illumination.
      Ground boxes containing wiring for traffic signals that also contain illumination, powered by the signal electrical service, shall be labeled, Danger High Voltage Traffic Signal.

B. CONSTRUCTION METHODS

1. Ground boxes shall be set on a 9 inch (minimum) bed of aggregate from 3/4 " up to 2" in size. Aggregate shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. When required by item descriptive code, construction of an apron encasing a ground box including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Conduit holes may be cut in the walls of type B & D boxes at least 18 inches beneath the cover.
4. If, within the limits of this project, the Contractor must utilize an existing ground box equipped with a metal cover, the Contractor shall bond the cover to the grounding conductor with a 3 foot long flexible stranded jumper the same size as the grounding conductor. Connection of bonding jumper to metal ground cover shall not be paid for directly but shall be subsidiary to various bid items. The box(es) must be clearly shown on the plans with plan notes fully describing the work required.
5. If there are other ground boxes with metal Covers within the project limits but not involved in the contract, the Engineer may direct the Contractor to ground the covers, designating and identifying the specific boxes in writing. This work will be paid for separately.
6. Termination to metal ground box covers shall be made using a tank ground type lug.



PLAN VIEW

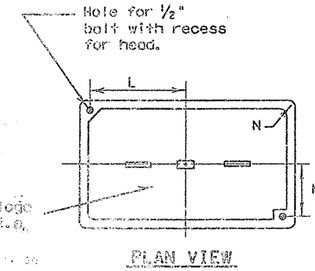


SECTION A - A

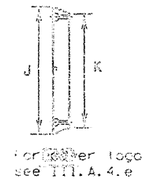
APRON FOR GROUND BOXES

(Where required)

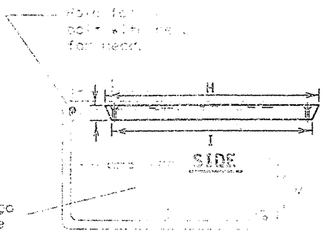
(1) Final position of end of conduit shall not exceed one-half the distance to the side of box opposite the conduit entry.
(2) Place gravel "under" the box, not "in" the box. Gravel should not encroach on the interior volume of the box.
(3) Install bushing on the upper end of all ells.
(4) Where a ground rod is present in the ground box, connect it to any and all equipment grounding conductors using a listed connector.
(5) Maintain sufficient space between all conduits so as to allow for proper installation of bushings.
(6) All conduits shall be installed in a neat and workmanlike manner.
(7) All conduits installed in the ground box shall be sealed after completion of conductor installation and any required pull tests. Silicone shall not be used as sealant.



PLAN VIEW



PLAN VIEW



GROUND BOX COVER

GROUND BO

GROUND BOX COVER DIMENSIONS									GROUND BOX
BOX SIZE	DIMENSIONS (INCHES)								DIMENSIONS
	H	I	J	K	L	M	N	P	
A, B & E	23 ½	23	13 ⅜	13 ½	9 ⅛	5 ½	4.1 ⅜	2	23 ¼	23	13
C & D	30 ½	30 ½	17 ½	17 ½	13 ½	6 ½	4.6 ⅜	2	30 ½	30 ¼	17

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-
GROUND BOXES

ED(3)-03

5/03 Revision

⚠ Revised notes.

©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: EC	REF. NO.'S
REVISIONS 4-98, 12-00, 3-03, 5-03	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET		SHEET: 446
COUNTY: ROCKWALL		CONTROL: 609	SECTION: 12	JOB: 013	HIGHWAY: IH 30

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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ELECTRICAL SERVICES NOTES

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary for a complete and proper electrical service installation as specified in the plans to obtain electrical power shall be paid for, performed, furnished and installed by the Contractor. The Contractor shall contact the Utility for metering and shall comply with all Utility requirements.

Primary line extensions, connection charges, meter charges, and other charges by the Utility company to provide power to the location shown, when required, shall be paid for under force account work. The costs associated with these charges shall be approved by the Engineer prior to engaging the Utility company to do the work. The Contractor shall consult with the appropriate Utility to determine costs and requirements, and shall coordinate the Utility's work as approved by the Engineer. The Contractor shall be reimbursed only the amount billed by the Utility. No additional amount for supervision of the Utility's work will be paid.

Materials shall be new and unused, materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards and shall be Underwriters Laboratories (UL) Listed. Electrical Service conduits, conductors, disconnects, contactors, circuit breaker panel sizes, and branch circuit breakers, shall be as shown in the Electrical Service Data elsewhere in the plans. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection.

The Contractor shall submit for approval no less than six (6) copies of catalog cut sheets on electrical service materials. Submittals shall be legible and shall be marked to indicate which product on a cut-sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The Contractor shall provide locks keyed with Master #2195 for all lockable electrical enclosures. Keys and locks become property of the State. Unless otherwise approved by the Engineer, enclosures shall not be energized until locks are provided and all bolts are installed.

Circuit directories, where provided, shall be filled out. All breakers and components in shop built panels and enclosures shall be labeled with duo-colored plastic labels. Letters shall be a minimum 3/8 " in height.

Enclosures with external disconnects that de-energize all equipment inside the enclosure, need not have dead front trim, except that incoming line terminations shall be protected from incidental contact.

When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used. All wiring and components shall be rated for 75 degrees C. Minimum size for service entrance conductors shall be #6 XHHW.

I. Safety Switch. A safety switch, placed ahead of the meter, shall only be used when specified by the Utility and when shown on the Electrical Service Data. The switch shall be UL Listed, heavy duty type, 600 volt, unfused, with a UL type 3R enclosure and equipped with a solid neutral (s/n) assembly. The switch shall be padlockable in the "on" position.

II. Service Type. Electrical service types A, C, D, and T shall be as schematically detailed on ED(4) or ED(5). Other service types shall be as detailed elsewhere on the plans.

III. Branch Circuit Breakers. Circuit breakers shall be thermal magnetic and have a minimum interrupting capacity of 10,000 amps and a voltage rating compatible with their use. Circuit breakers shall be sized as shown in the electrical service data. Circuit breakers in panelboards and load centers shall be full size and designed exclusively for the panelboard or load center in use. Tandem and half-width breakers shall not be used. All circuit breakers shall be permanently and clearly marked identifying the circuit or device supplied. Circuit breakers shall be UL Listed to UL489.

IV. Circuit Breaker Panelboard. Panelboards shall be UL Listed. Panelboards shall have copper busses, a minimum of 6 one-pole spaces or as required in the electrical service data, and when required will be rated for service equipment. Enclosure shall meet or exceed UL type 3R classification. Panelboards shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be bolt-in type only.

V. Circuit Breaker Load Center. Load centers shall be UL Listed.
Load centers for type T services may have copper or aluminum busses, all other load centers will be copper bus only. Load center will have a minimum of 4 one-pole spaces, and shall be rated for service equipment. Enclosure shall meet UL type 3R classification. Load centers shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be plug-in type only. Load centers for type T services shall accomodate a maximum of 6 one-pole breakers.

VI. Separate or Auxiliary Enclosure. Separate enclosures for HOA, photocell and lighting contactors for types D & T Services shall be a UL Listed assembly with outer door. Interior shall have dead front trim. HOA switch operator shall extend through the dead front trim. Photocell shall be mounted inside the enclosure as described in paragraph XIII when required by descriptive code. Separate enclosures shall meet the construction requirements of paragraph VIII. E, except that separate enclosure shall not have external operating handle, need not have a data pocket and door may latch at only one point. All equipment may be located in one enclosure instead of two, when approved by the Engineer.

VII. Where a Type D or T service is provided, laminated "as built" drawings are required as shown on ED(5) VIII E; shall be delivered before completion of the work, to the Engineer in lieu of placement within these smaller enclosures. Conduit may not enter the back wall of a service enclosure penetrating the equipment mounting panel. Provide grounding bushings on all metal conduits, terminate bonding jumper to grounding bus. Grounding bushing is not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss such as a meter base.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X (XXX/XXX) XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage (V / V)[1]

Disconnect Amp Rating
(000 indicates main lug only)

SS= Safety switch ahead of meter
NS= No switch ahead of meter and/or no meter required

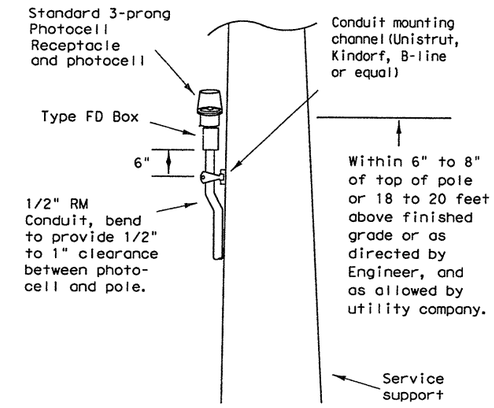
Enclosure Type
GS= Galvanized steel (see ED(5)VIII,D)
SS= Stainless steel
AL= Aluminum

Photocell Mounting Location
T= Top of pole
E= Inside service/separate enclosure
L= Luminaire mounted
N= None

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Switch gear to be placed on traffic signal pole
RT= Rectangular structural tubing
PS= Pedestal Service (see ED(5)VIII,G)

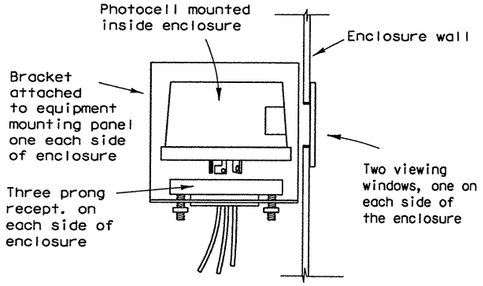
O= Overhead service
U= Underground service

Example: ELEC SERV TY A(240/480)100(NS)SS(E)GC(O)



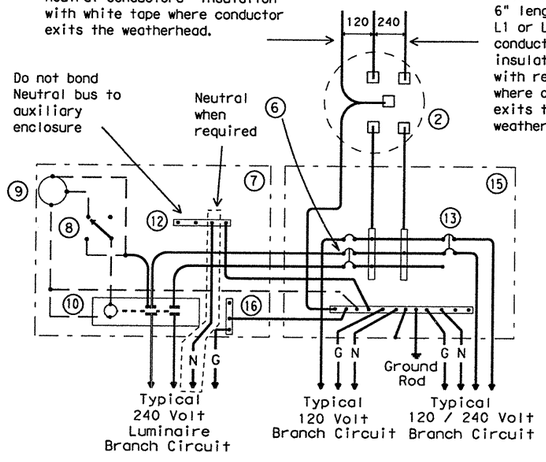
TOP MOUNTED PHOTOCELL

Conduit support spacing 3 feet from enclosure; 5 feet max.



ENCLOSURE MOUNTED PHOTOCELL

For photocell specifications see ED(5),XIII.



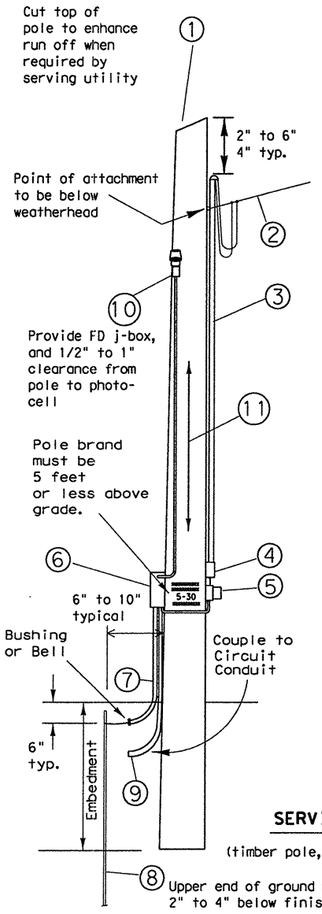
SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data.

SCHEMATIC LEGEND

1 - omitted
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (Not Used)
5 - Omit
6 - Circuit Breaker, 15 Amp typical for control circuit wiring
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks (Not Used)
12 - Neutral Bus required when 120 v. lights are controlled by lighting contactor
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (Not Used)
15 - Load Center
16 - Ground Bus

——— Power Wiring
– – – – Control Wiring
—N— Neutral Conductor (when required-to serve 120 v. loads only)
—G— Equipment grounding conductor-always required



1 - Class 5 pole, height as required
2 - Service drop from utility company (attached below weatherhead)
3 - Service conduit and service entrance conductors (RMC) (See Electrical Service Data)
4 - Safety switch (when required)
5 - Meter (when required)
6 - Service enclosure
7 - No. 6 bare grounding electrode conductor in 1/2 " PVC to ground rod - extend 1/2 " PVC 6" underground.
8 - 5/8 " x 8' Copper clad ground rod - drive ground rod completely underground unless otherwise approved by the Engineer.
9 - RM conduit - same size as branch circuit conduit.
10 - Photocell and conduit - if top mounted. (See Electrical Service Data)
11 - When required by the serving utility provide bare #6 awg copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor to a height of 8 ft above finish grade.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

(If applicable)

- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. Size shall be same as service entrance conduit.
- LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. No strap required for LFMC shorter then 12"
- Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting.
- A neutral conductor must be installed within the LFMC.
- Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.

SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

8 Upper end of ground rod to be 2" to 4" below finished grade

TIMBER POLE NOTES

1. Conduit and electrical conductors attached to the electrical service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
2. Pole top mounted photocell, install on north side of pole or in service enclosure as required. See Electrical Service Data.
3. Attach meter and service equipment with stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Gain pole as required to provide flat surfaces for each strut. Paint ends of galvanized channel with zinc rich paint. Gain depth 5/8" max. Gain height 1 7/8" max. Strut to be 1" max. deep, and 1 5/8" wide max. Secure each strut section to timber pole with two galvanized or SS lag bolts, 1/4" diameter min. by 1 1/2" length min. Place flat cut galvanized or SS washer on each lag bolt. Gain pole in a neat and workmanlike manner.
4. Embedment depth shall be as required in Item 627 Treated Timber Poles.
5. Poles trimmed for excess length shall be trimmed from the top end only.

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STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE SCHEMATICS AND SUPPORT-TYPE TP (OVERHEAD)

ED(4)-03

©TxDOT April 1998

DN: KB	CK: JW	DW: DN	CK: GC	MEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-00		6		447
3-03	COUNTY		CONTROL SECTION JOB	HIGHWAY
	Rockwall		0004 12 073	

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SERVICE ENCLOSURE NOTES

VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.

A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor or enclosure mounted photo cell) and all auxilliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSED INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The service assembly enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".

B. Conduit entries into the top of enclosures shall have threaded hub. Conduit entries through the equipment mounting back plate will not be allowed.

C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using duo-colored plastic labels or self adhesive vinyl weather resistant labels, minimum of 1 inch high; applied in a neat and workmanlike manner. On the label will be the service number shown on the plans as well as identifying the load served specifically (i.e. lighting, landscaping, signals, traffic management or other wording as directed by the Engineer). Safety switches need not be OSHA labeled unless specifically required by the serving utility.

D. Type GS enclosures will only be allowed for service Types D and T without an enclosure mounted photocell and/or lighting contactor and the Type C panelboard. This spec will allow an "off the shelf" product meeting these specifications to be used. Type GS enclosures shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel unless shown differently on the plans. Steel enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, white or light green. Panelboard/loadcenter enclosures shall meet UL type 3R requirements, shall have a dead front trim, and an outer padlockable door preventing unauthorized persons from operating contained equipment. Galvanized steel is no longer allowed for Types A, C, or custom-built D or T enclosures. If GS is shown in the descriptive code for any of these, an AL shall be provided.

E. Type AL enclosures for service Types A and C shall meet UL type 3R requirements and shall also meet additional requirements of this paragraph. The enclosure shall have both a main disconnect remote operator handle and a door latch handle. Die-cast handles are not acceptable. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be padlockable in both the "on" or "off" positions. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Door closure clamps will not be allowed. Lock must be keyed to Master #2195. All the enclosures shall have either a continuous stainless steel piano hinge with stainless steel pin or enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 0.185 inch minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 70 lbs of loading. The door shall have an attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of a minimum 12 guage galvanized steel. Equipment mounting panels shall not be painted. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm or other approved means to hold the door open. Only the enclosure exterior will be primed and painted. Paint color shall be beige or gray and shall be powder coat paint as shown below. Condensation drainage shall be provided in the bottom of the enclosure before leaving the factory. The Contractor shall prepare and submit a schematic drawing unique to an individual service. The approved drawing shall be laminated and placed in the document pocket of the service at the time of shipment to the job site. All applicable wiring diagrams and plan sheet layouts for all equipment and branch breaker circuits supplied by that service shall also be laminated and placed in the document pocket prior to shipping. Type AL enclosures for Type D and T services with enclosure mounted photocell and/or lighting contactor shall have the loadcenter interior mounted in an enclosure with properly adopted dead front trim. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. (Do not put one enclosure inside another enclosure). Types D and T with enclosure mounted photocell and/or lighting contactor shall meet the additional requirements of this paragraph except that remote-operating handle will not be provided.

F. Type SS enclosures for Type A and C shall meet all the requirements above for their respective type AL. Type SS enclosures for D and T shall meet all the requirements above for their respective type AL. Stainless Steel shall not be painted.

G. PS enclosure shall be as detailed and specified on ED(8). Galvanized steel will not be allowed for any pedestal service. If GS is shown in the descriptive code an AL will be provided.

IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the 5A or 5B classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.

X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be an UL Listed thermal-magnetic circuit breaker controlled by flange-mounted remote operator in the service assembly enclosure when required. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backfed breakers will be allowed for use as a main disconnect.

XI. Control Circuit. Control circuit protection shall be 15 amp circuit breaker.

XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in an UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.

XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paned windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. Bracket and photocell's receptacle will be mounted inside enclosure next to each window. Except for window side, 2" of clearance is required on all sides of photocell for ease of replacement. The photocell's receptacle is held in place by two mounting screws on bracket and located next to each window of the enclosure. The 3-prong twist lock photocell shall be mounted in a position to receive light from the window closest to the photocell. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.

XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.

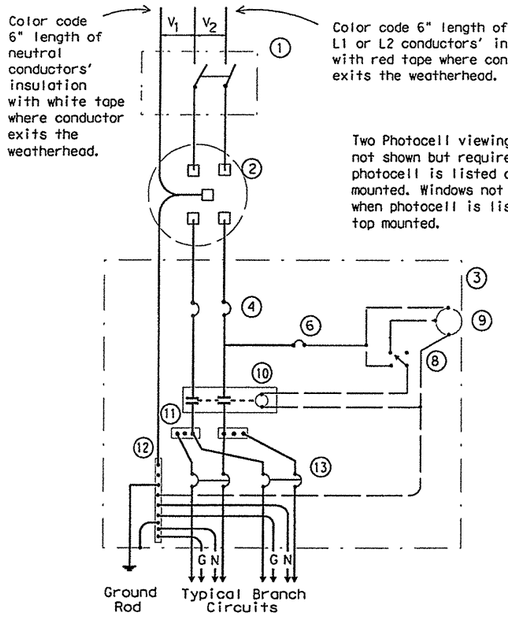
XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.

XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

SCHEMATIC LEGEND

1 - Safety Switch (when required)
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (See Electrical Service Data)
5 - Omit
6 - Circuit Breaker, 15Amp
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks
12 - Neutral/Ground Bus
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (See Electrical Service Data) (If Type C is shown as AL or SS on descriptive code, this is the service assembly enclosure only. Panelboard enclosure is GS unless otherwise noted.
15 - Load Center

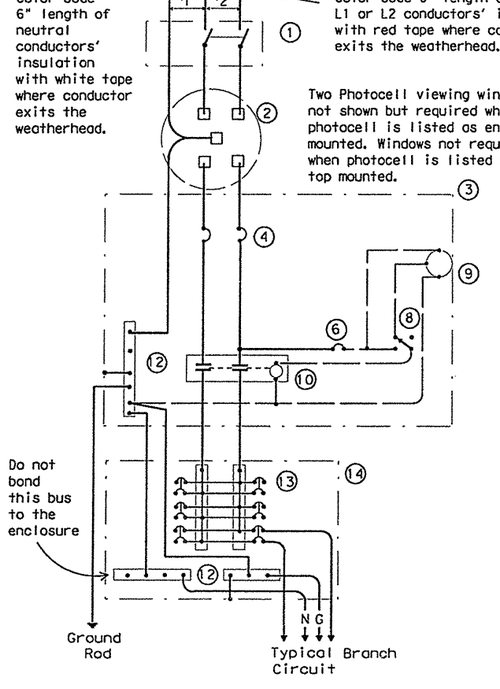
——— Power Wiring
— — — Control Wiring
——N—— Neutral Conductor (when required) serve 120 v. loads only)
——G—— Equipment grounding conductor-always required



SCHEMATIC TYPE A

THREE WIRE

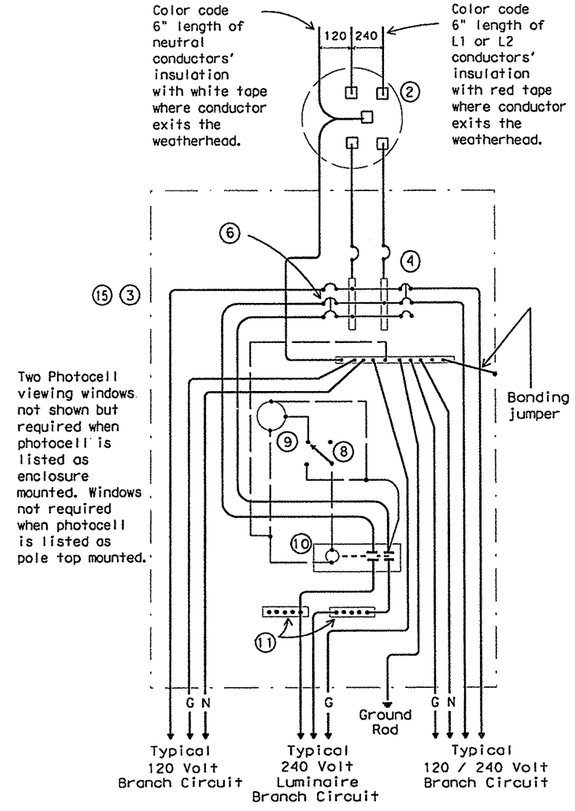
Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE C

THREE WIRE

Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.



SCHEMATIC TYPE D

120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data. See Type D service notes.

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. There shall be a window on each side of enclosure to allow operation of photocell. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Engineer. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE ENCLOSURE & NOTES

ED(5)-03

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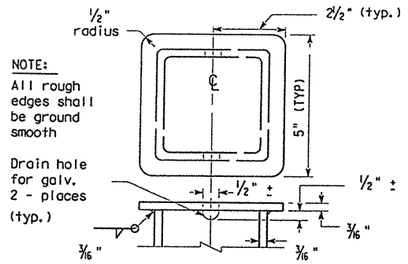
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REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
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3-03	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

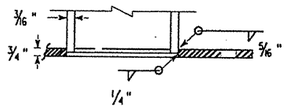
71E

PLOTTED: DATE: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
ACC:
FILE:
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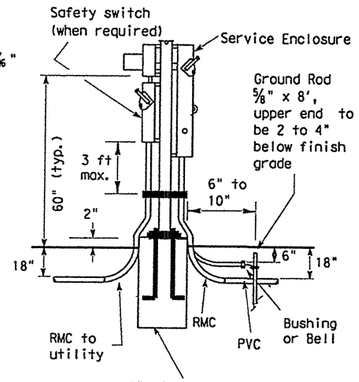


TOP OF POLE
TYPE SF & SP

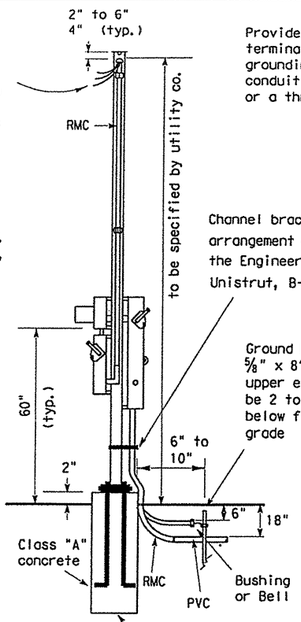


BOTTOM OF POLE
TYPE SF & SP

Color code 6" of grounded neutral conductors insulation with white tape where conductor exits the weatherhead. Color code 6" of L1 or L-2 Hot-ungrounded conductors insulation with red tape where conductor exits the weatherhead. Conductor free length, 12" min., 18" max.



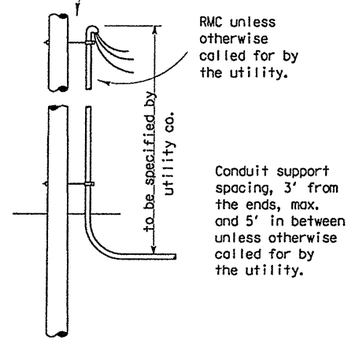
SERVICE SUPPORT
TYPE SP (U)
UNDERGROUND SERVICE
WITH SAFETY SWITCH



SERVICE SUPPORT
TYPE SP (O)
OVERHEAD SERVICE
WITH SAFETY SWITCH

Provide grounding bushings on all metal conduits, terminate bonding jumpers(min. #6 AWG. Copper) to grounding bus. Grounding bushing not required when conduit end is fitted with a conduit sealing hub or a threaded type of boss such as a meter hub.

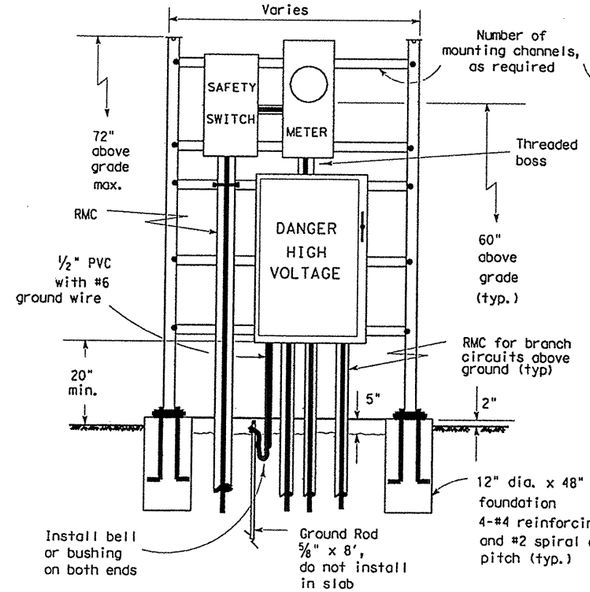
Stand off type conduit support hardware shown. Provide when required by the utility.



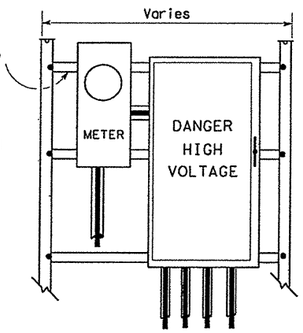
UNDERGROUND RISER
AT UTILITY POLE
(for underground service)

NOTES:

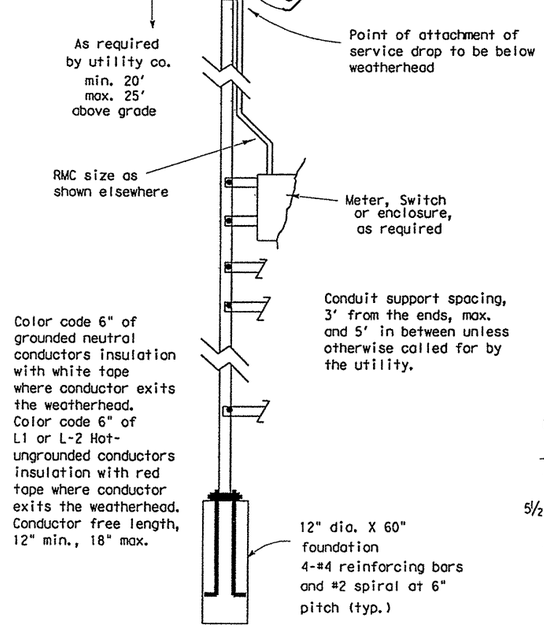
1. Support Type SP and SF: Fabricated from 4" x 4" x 3/16 " square structural tubing, ASTM A500 Grade A or G or equal. Base plate shall be 3/4 " plate, ASTM A36 or equal. All equipment and conduit shall be mounted on galvanized channel strut, 1 1/2 " x 1 5/8 " x 12 guage galvanized steel channel (Unistrut, Kindorf, B-line or equal) clamped with channel hardware, bolted or welded to vertical member as approved by the Engineer.
2. Paint field cut ends of all channels with zinc-rich paint.
3. All Steel Poles (SP and SF) shall be hot-dip galvanized after fabrication. Poles for overhead service shall be fitted with eyebolt or similar fitting, as approved by the utility company, for attachment of sevice drop to the pole.
4. All conduit and conductors attached to the electrical service and within 12 inches of the electrical service will not be paid for directly, but shall be subsidiary to the electrical service. All conduit and conductors from the utility company pole to the point 12 inches from the electrical service, including conduit and conductors required for the utility pole riser when furnished by the Contractor, will be paid for separately.
5. All mounting hardware and installation details of services shall be in accordance with utility company specifications.
6. Anchor bolts for underground service supports shall be 3/4" x 18" x 4" (dia. x length x hook length). Anchor bolts for overhead services shall be 3/4" x 56" x 4". Anchor bolts shall be provided with leveling nuts.
7. Conduit for grounding electrode conductor (ground rod wire) shall be 1/2" PVC. All other conduit on electrical services shall be rigid metal conduit. Service entrance conduit size shall be as shown elsewhere. Conduit for branch circuit entry to enclosure shall be the same size as that shown on the layout sheets for branch circuit conduit. Rigid metal conduit shall extend to the rigid metal elbow and then be coupled to the type conduit shown on the layout for that particular branch circuit. RMC shall have grounding bushings in enclosures.
8. If pole is painted, each separate painted piece shall have a bonding jumper attached to a tapped hole.
9. Sheet metal screws are not allowed for bonding. Provide 1/4-20 machine screws. Remove all non-conductive material at contact points. Terminate bonding jumper using listed device. Bonding jumper min. #6 AWG Copper. Make up all threaded bonding connections wrench tight.
10. Conduits entering enclosure from underground shall be sealed at both ends. Silicone sealant will not be allowed.
11. Ground rod clamp to be UL listed for direct burial.
12. Service entrance conductors shall exit separately bushed non-metallic openings in weatherhead.
13. Free conductor at weatherhead to be 12 in. min., 18 in. max., or as required by utility. Color code grounded-neutral conductor with white tape covering 6 in. of conductor. Color code L1 or L2 Hot un-grounded conductor with red tape covering 6 in. of conductor. Service drop and service entrance conductors must not contact metal pole in such a manner as to result in abrasion of insulated conductors.
14. Conduit support spacing to be max. 3 ft. from ends, and max. 5 ft. in between.
15. Shop drawings are not required for service support structure unless specifically stated elsewhere or as directed by the Engineer.
16. Service enclosure to be labeled as specified on ED(5) VIII C.
17. Liquidtight flexible metal conduit (LFMC) may be used between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. LFMC shall be the same size as service entrance conduit. LFMC shall not exceed 3 ft. and shall be securely supported within one foot of each end. LFMC shorter then 12" need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in LFMC shall not exceed 180 degrees.
A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.



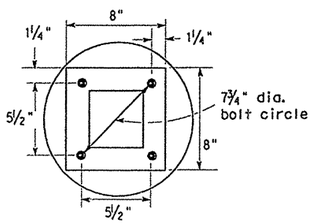
SERVICE SUPPORT TYPE SF (U)
UNDERGROUND SERVICE
WITH SAFETY SWITCH
(Typical Arrangement)



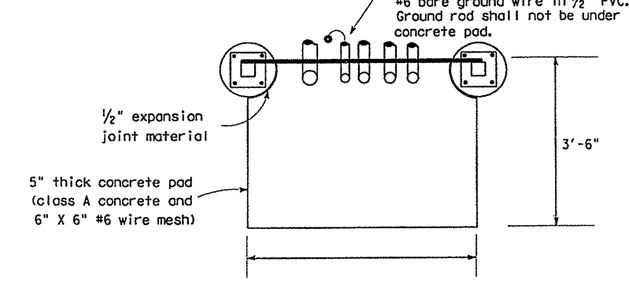
SERVICE SUPPORT TYPE SF (U)
UNDERGROUND SERVICE
WITHOUT SAFETY SWITCH



SERVICE SUPPORT TYPE SF (O)
OVERHEAD SERVICE



BASE PLATE DETAIL
TYPE SF & SP



SERVICE SUPPORT TY SF (O) & SF (U)
TOP VIEW

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-SERVICE SUPPORT TYPES SF & SP

ED(6)-03

5/03 Revision
⚠ Revised notes.

©TxDOT January 1992	DN:- KB	CK:- JW	DW:- DN	CK:- GC	MCG NO.:
REVISIONS 4-98, 12-00, 3-03, 5-03	STATE DISTRICT: DAL	FEDERAL REGION: 6	FEDERAL AID PROJECT: SEE TITLE SHEET		SHEET: 449
COUNTY: ROCKWALL	CONTROL: 009	SECTION: 12	JOB: 073	HIGHWAY: IH 30	

DN:LR CK:CW DW:DN CK:MT
DATE:
FILE: d58hplc/usr/d580504
ACC:
PLAYED

71F

ROADWAY ILLUMINATION LIGHT FIXTURES

Fixture Housing:

A. Provide *UL listed fixture suitable for use in wet locations. Ensure optical compartment meets IEC Standard 60529-IP 65. Place a permanent label inside fixture indicating fixture meets *UL, IP 65 optical, and shows date of manufacture. Meet ANSI 136.15 wattage label requirements.
B. Construct fixture housing, lens frame, and door from 96% copper-free, die cast aluminum. Provide fixture mounting to a 2-in. pipe arm. Equip fixture with a 4-bolt clamp capable of adjustments plus or minus 5 degrees from level. Meet ANSI 136.31 3.0 G vibration requirements.
C. Attach a level bubble to the fixture housing. Ensure the level bubble is sensitive to 1 degree changes in position at any point within 5 degrees of the level position. Ensure the level bubble is clearly visible from the ground up to a 50 ft. mounting height. Ensure level bubble corresponds to level position of fixture.
D. Do not exceed 1.6 sq. ft. effective projected area. Do not exceed 60 lb. maximum weight.
E. Equip fixture with a 3-prong photocell receptacle with shorting cap installed.
F. Paint inside and outside of fixture light gray, when installing on galvanized poles. For all other fixtures, paint to match the color of the pole as directed by the Department.
G. Use a thermoset powder coat system. Ensure paint exceeds 1000-hr. salt-spray test in accordance with ASTM B117. Ensure a nominal thickness of 2.5 mil and no pigment loss upon 50 double-rubs using Methyl Ethyl Ketone (MEK) solvent in accordance with ASTM D5402, "Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs."
H. Fabricate brackets, nuts, bolts, washers, ballast tray, and parts from stainless-steel, or aluminum of adequate thickness as approved by the Department except that:
   1. The 4 bolts/studs, 4 flat washers, 4 lock washers, and clamp that attach the luminaire to the arm may be galvanized in accordance with ASTM A123, A153 or B633. Provide means to ensure clamp is in the open position when installing.
   2. Glass lens retainer spring clips may be fabricated from galvanized steel in accordance with ASTM A153.
   3. Provide nylon throat or other approved locking means for all stainless steel nuts.
I. Provide optical assemblies which meet the following:
   1. Polished aluminum reflectors with Alzak or equal coating.
   2. Do not paint reflectors, except that, when approved by the Engineer, some surfaces may be painted with 92% reflective white paint.
   3. Reflectors may be one piece or segmented as follows.
      a. One piece reflectors:
         1. Seal photometric compartment by the use of a seamless or vulcanized seam, closed-cell silicone gasket, or other method approved by the Department.
         2. Provide a non-adjustable lamp socket mounting method so the lamp center is consistent with the reflector.
      b. Segmented reflectors:
         1. Attach segments at both ends (or opposite sides if segments are square) of the segment to a rigid aluminum base plate and side wall support assembly. Seal glass lens to lens frame with a one piece seamless silicone gasket.
   4. Equip the optical assembly with a lamp support in addition to the lamp socket to ensure the outer envelope is positioned as intended.
J. Provide 5/32 in. thick (min.) clear heat tempered or borosilicate glass.

Electrical Components:

K. Meet the following ballast requirements and pass tests in accordance with Test Method Tex-1130-T, "Ballasts of Lighting Assemblies."
   1. Mount electrical components on a removable stainless steel or aluminum tray of adequate thickness.
   2. Provide a fixture wiring diagram on or near the ballast.
   3. Use a copper wound magnetic regulating three isolated coil ballast.
   4. Provide ballast factor between 0.95 and 1.0.
   5. When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of plus 10 percent and minus 10 percent, do not exceed the following:
      a. 220 Watts for 150 watt nominal lamp rating
      b. 440 Watts for 250 watt nominal lamp rating
      c. 552 Watts for 400 watt nominal lamp rating
   6. During fluctuation of the test voltage of plus 10 percent and minus 10 percent, ensure the lamp wattage fluctuation does not exceed a total of 20 percent and ballast maintains lamp wattage within the following limits.
      a. 110 Watts minimum and 180 Watts maximum for 150 Watt nominal lamp rating
      b. 175 Watts minimum and 370 Watts maximum for 250 Watt nominal lamp rating
      c. 280 Watts minimum and 475 Watts maximum for 400 Watt nominal lamp rating
   7. Ensure the ballast power factor, when tested at circuit voltage indicated on the plans, is not less than 90%.
   8. Permanently and clearly mark ballast or fixture to indicate following:
      a. Lamp type
      b. Catalog number
      c. Voltage rating
      d. Connection diagram
      e. Manufacturer
      f. *UL listing
L. Meet the following electronic starting aid requirements and pass tests in accordance with Test Method Tex-1140-T, "Electronic Starting Aids of High Pressure Sodium Vapor Lighting Assemblies."
   1. Provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum.
   2. Ensure the pulse width is a minimum of 0.8 microseconds at 2250 volts.
   3. Ensure the pulse occurs when the open circuit voltage is equal to or greater than 90 percent of peak open circuit voltage.
   4. Ensure pulse repetition rate is a minimum of one per cycle.
   5. Provide a pulse current of 0.18 amperes (min.).
   6. Discontinue to pulse when, either,
      a. the lamp starts, or
      b. after a minimum of 3 minutes and a maximum of 10 minutes if the lamp fails to start.
M. Do not place fuses inside pole mounted luminaires. For wall mount or underpass mounted luminaires, provide internal 10 amp time-delay fuses.
N. Provide a two position terminal block for connecting supply wires which meet the following requirements:
   1. Insulate using nylon, porcelain, or phenolic material. Ensure phenolic terminal block is of adequate construction as approved by the Department.
   2. Fabricate terminals from nickel, tin plated brass, or aluminum.
O. Equip fixture with MOV surge protection in accordance with IEEE recommendations.
   1. Connect MOV from line to neutral or from line to line.
   2. Install MOV on the terminal block.

Lamp & Socket:

P. Provide *UL listed mogul base lamp sockets rated for 600 V, 1500 W that can withstand a 5000 V pulse. Meet *UL 496 requirements. Use porcelain-insulated lamp sockets with nickel plated copper alloy screw shells. Equip socket shell with a spring tensioned contact. Use nickel-plated copper alloy or stainless steel for the spring and contact.
Q. Supply and secure lamps inside the fixture that meet the following:
   1. Use pre-qualified high pressure sodium (HPS) lamps from TxDOT's material producers list of the wattages shown on the plans. No alternatives allowed.
   2. Average rated lamp life 30,000 hours.
   3. Fully extinguish at end of usable lamp life and remain extinguished without cycling.
   4. Do not provide lamps that burn at reduced output at end of life.
   5. Meet the Federal Toxic Characteristic Leachate Procedure (TCLP) limits.

Performance:

R. Meet the following photometric requirements using published photometric data and photometric data obtained by testing sampled fixtures.
   1. 150 Watt mast arm (underpass) mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 110.0 ft. by 30.0 ft., when mounted in a level position as indicated on the properly mounted fixture level bubble 20.0 ft. above the midpoint of either long side of the surface area. Do not exceed 50:1 maximum to minimum horizontal illuminance uniformity ratio within the rectangular area.
   2. 250-watt mast arm mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectangular area measuring 190.0 ft. by 45.0 ft., when mounted properly in a level position as indicated on the level bubble 40.0 ft. above the midpoint either long side of the surface area. Ensure light intensities along a line parallel to and 20.0 ft. in from the long side of this rectangular area do not decrease by more than 0.50 foot-candles in any 5.0 ft. interval along the line from 10.0 ft. to 90.0 ft. on both sides of the luminaire and provide a minimum intensity of 0.30 foot-candles at any point along the line. Do not exceed 20:1 maximum-to-minimum horizontal illuminance uniformity ratio within the rectangular area.
   3. 400-watt mast arm mounted luminaire. Meet IESNA Cutoff requirements. Provide a minimum intensity of 0.20 foot-candle in a rectanglular area measuring 220.0 ft. by 60.0 ft. when mounted properly in a level position as indicated on the level bubble 50.0 ft. above the midpoint of either long side of the surface area. Ensure light intensities along a line parallel to and 30.0 ft. in from the long side of this rectangular area do not decrease by more than 0.75 foot-candle in any 10.0 ft. interval along the line from 10.0 ft. to 90.0 ft. on both sides of the luminaire and provide a minimum intensity of 0.30 foot-candle at any point along the line. Do not exceed 20:1 maximum-to-minimum horizontal illuminance uniformity ratio within the rectangular area.
S. Ensure photometric data is consistent from fixture to fixture. Match published photometric data (or approved photometric reports submitted during the prequalification process as the typical photometric output instead of published data) as follows:
   1. Point of maximum candela within 5 degrees horizontally and vertically.
   2. Maximum candela within 20% of published maximum candela.
   3. Fixture efficiency within 10% of published efficiency.

* When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comperable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard.

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Sheet 1 of 2

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM LIGHT FIXTURES)
RID(LUM1)-07

FILE: rid-07dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
©TxDOT January 2007	DIST	FEDERAL AID PROJECT					SHEET
REVISIONS	DAL	SEE TITLE SHEET					450
	COUNTY		CONTROL	SECT	JOB		HIGHWAY
	ROCKWALL		009	12	073		IH 30

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Prequalification:

T. Use only pre-qualified fixtures. No alternates will be considered.
   1. Only materials with approved product codes or designations from prequalified producers are accepted on bids. The Construction Division (CST) of the Texas Department of Transportation (TxDOT) maintains the material producers list of approved producer product codes or designations. Use the following website to view this list:
      http://www.dot.state.tx.us/business/producer_list.htm
      Use of prequalified material does not relieve the contractor of the responsibility to provide materials that meet the specifications. All materials, including those shown on the prequalified material list, may be inspected and tested at any time and may be rejected if not in compliance with the specifications.
   2. Notify the Department in writing as to which fixture from the prequalified list of approved fixtures will be supplied on each project.
   3. To have a fixture listed as pre-qualified:
      a. Submit a sample of each type of luminaire and all pertinent data, including published photometric data and recently tested photometric data (IES format, both "averaged" and both sides of "un-averaged" data) to:
         TXDOT- TRF 118 East Riverside Dr. Austin, TX 78704
      b. Demonstrate a commitment to quality.
      c. Submit the following documentation:
         1. QA/QC program documentation with the following minimum requirements;
            a. Written statement of the companies QA/QC policy.
            b. QA/QC person employed that has special QA/QC training and has QA/QC as their primary job responsibility.
            c. A written procedure specifically for handling orders for fixtures built to TxDOT specifications.
            d. A written procedure for keeping track of fixtures built, certified, and tested for TxDOT orders.
            e. A check list of features for TxDOT fixtures with QA/QC person signature.
         2. Fixture UL certification
         3. IP 65 certification
         4. 3G certification
         5. Aluminum casting and paint analysis
         6. Socket, MOV, and shutoff ignitor data
         7. Stainless steel and aluminum bracket data
         8. Ballast electrical data
         9. Photometric data
         10. Lamp data
      d. Prequalification samples, if approved, will not be returned to the manufacturer but will be retained by the the Department for comparison testing. Once a fixture has been approved, do not change any material or manufacturing method without prior approval of the Department. Unapproved changes will result in rejection of the fixture.
      e. In addition, luminaires will be tested for compliance with this specification. Luminaires that inconsistently pass testing or that are inconsistent with published photometric information will be removed from the pre-qualified list at the discretion of the Department.

Sampling:

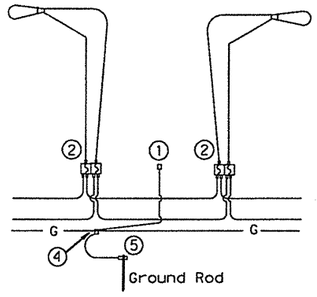
U. Sample in accordance with Test Method Tex-1110-T, "Sampling Lighting Assemblies."

Manufacturer Warranty:

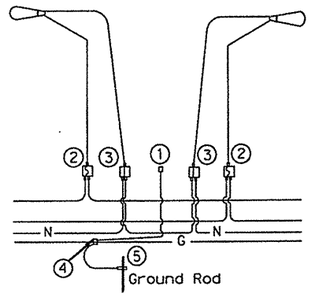
V. Replace failed fixtures, when non-operable due to defects in materials or workmanship within five years of installation with a fixture that passes all testing, delivered to the project location. Lamps and photocells are subject to the warranties of their respective manufacturers.

Testing:

W. Conduct electrical testing required in the Ballast section. Provide photometric testing of fixtures. Test fixtures at the following rates.
   1. Manufactuer Testing. Before fixtures are shipped from the manufacturer, test fixtures as follows. From each lot or manufacturing run, select one completed fixture of each 25, with a minimum of 2 and a maximum of 5. Test photometrics at an independent test lab inspected and approved by TxDOT. Electrical testing may be performed at manufacturer's facility.
      a. Provide IES photometric report in two formats:
         1. Standard averaged format for asymmetric fixtures.
         2. Un-averaged format showing both sides. Un-averaged data may be supplied in two files or as approved by the Department.
      b. Provide electrical and photometric test data directly to TRF-TE electronically for evaluation prior to shipping fixtures to the project. Do not ship fixtures until test data for each lot is approved by TRF-TE.
      c. Provide the following information on test reports:
         1. TxDOT's Control-Section-Job number, maintenance contract number, or purchase order number the fixtures are assigned to,
         2. a unique fixture test number per fixture,
         3. date of manufacture, and
         4. quantities supplied and lot number per fixture type.
      d. Write the unique lab report number on the top of the fixture housing with permanent marker. Ensure the test lab retains the results for 5 years. Provide the Department access to documentation.
      e. Retain records of manufacturing lots, test reports, lot quantities, and other pertinent details. Submit records to the Department upon request.
      f. Submit to TRF-TE a daily shipment report for shipments to each job.
      g. Make available to TxDOT inspectors upon request, all manufacturing facilities involved in the production of fixtures for use on Department projects, inventories of fixtures produced to Department specifications, and records of fixture testing and tracking.
   2. Departmental Test Reporting. Departmental test reports will be issued in accordance with Tex 1110-T.



FOR THREE-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR FOR 120/240 VOLT SERVICE.



FOUR-WIRE CIRCUIT-CENTER GROUNDED
LUMINAIRES SERVED AT 240V (240/480 VOLT SERVICE)

NOTES:

① Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors.
②③ Use pre-qualified Breakaway Connectors for both T-Base and Shoe-Base installations.
④ Split Bolt or other connector.
⑤ Use Ground Rod Clamp listed for its intended purpose (i.e. concrete, direct burial...)

LEVELS DISPLAYED 1 2 62 ACC: 04 JAN 2007

Texas Department of Transportation
Traffic Operations Division

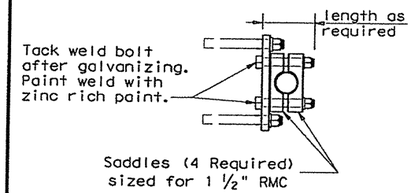
ROADWAY ILLUMINATION DETAILS

(RDWY ILLUM LIGHT FIXTURES)

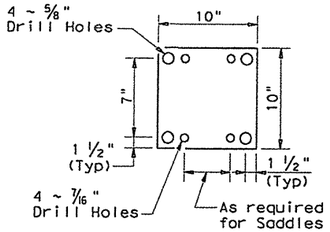
RID(LUM2)-07

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REVISIONS	DAL	SEE TITLE SHEET				451
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL		009	12	073	IH 30

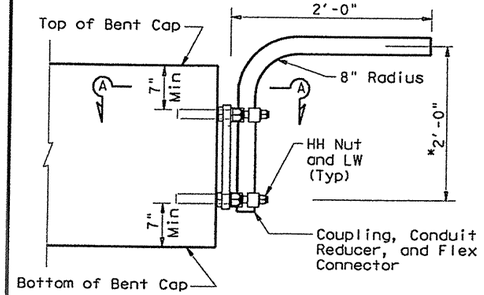
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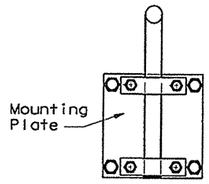
SECTION A-A



MOUNTING PLATE
Make from ⅜" Plate Galvanized after fabrication



PROFILE VIEW
Or as Required
(See Note A. 4)



END VIEW

UNDERPASS LIGHTING ARM TYPE 1

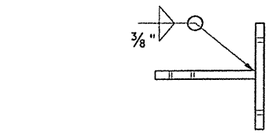
NOTES:

A. ALL 150 watt H.P.S. LUMINAIRES
1. Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
2. Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductor," unless otherwise shown on the plans. See lighting layout sheets.
3. Install a ground rod and attach to the equipment grounding conductor in all ground boxes containing conduit that extends above grade 6 in. or more. Install grounding bushings and properly bond RMC in these boxes.
4. Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and layout sheet. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDER PASS LIGHTING ARM TYPE 2)
5. Use ASTM A-153 galvanized bolts, nuts and washers.
6. Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
7. Install a Heavy Duty, 480 volt or 600 volt, 30 amp fused disconnect switch or breaker with a NEMA 3R enclosure, in circuits to switch underpass luminaires, as shown on plans or a min. of 1 per bridge circuit. Mount disconnect or breaker 10 ft. (min) above grade on columns or bent caps as approved by the Department. Modify switch to allow padlocking in the "ON" and "OFF" positions, and install 20 amp time-delay fuses or inverse-time circuit breakers. Furnishing and installing disconnect switches or circuit breakers for underpass lighting fixtures will not be paid for directly but is subsidiary to the various bid items of the contract.

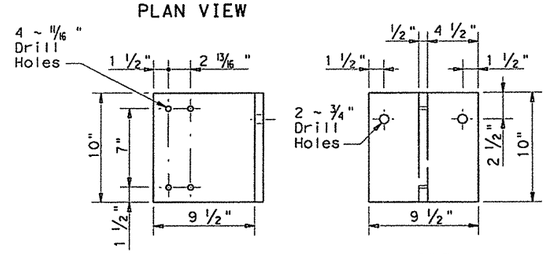
B. TYPE 1
1. Provide 1½in. rigid metal conduit (1.90" O.D., 0.145" wall) Type 1 arm shaft.
2. Use ⅜in. bolt or stud expansion anchors for Type 1 mounting. Ensure a 3000 lb. (min.) pull-out for each anchor. Provide 4 in. (min) embedment. Use lock washers.
3. Attach conduit to plate with 4 saddles, four-3/8 in. diameter (min.) bolts, hex head nut and lock washer.

C. TYPE 2
1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.154" wall) Type 2 arm shaft. Reduce conduit length for Type C concrete beams. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
2. Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
3. Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See location of underpass lighting mounting bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

NOTE: Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.



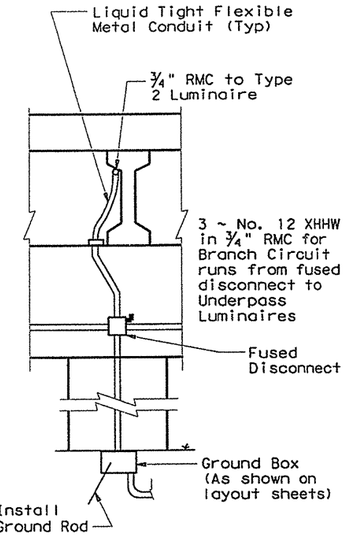
PLAN VIEW



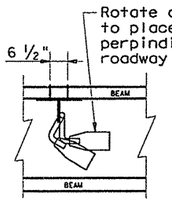
FRONT SIDE

BRACKET DETAIL

Make from ½" plate (ASTM A-36) Galvanize after fabrication, ASTM A-123

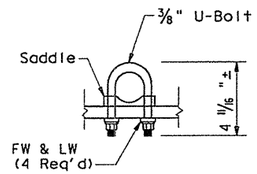


U/P (SPL-CO) (.15 KW)S(TYPE 2)

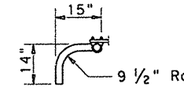


FIXTURE ORIENTATION

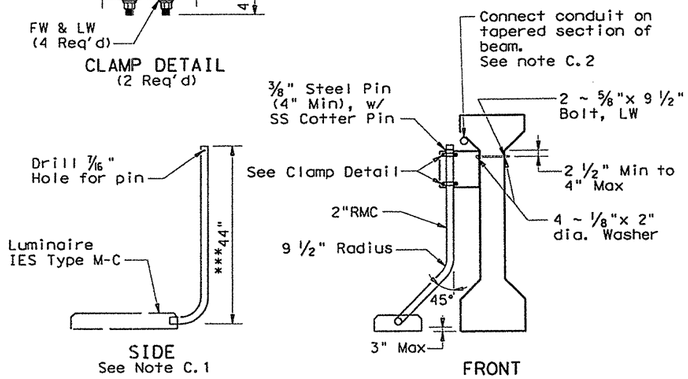
Plan View



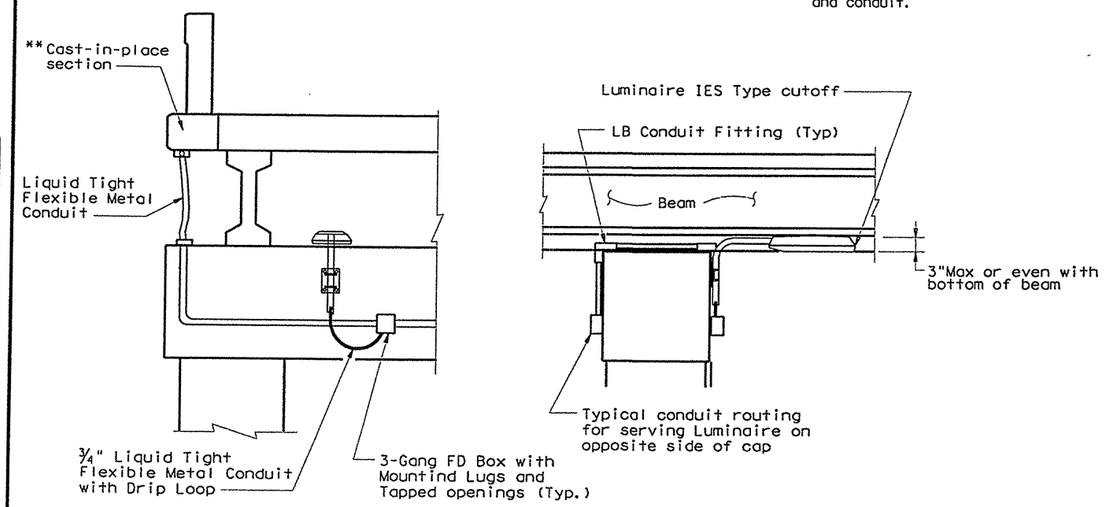
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

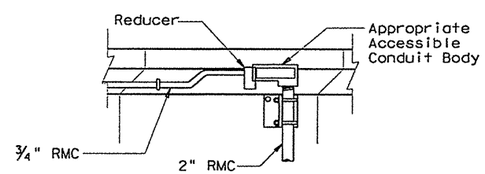


UNDERPASS LIGHTING ARM TYPE 2

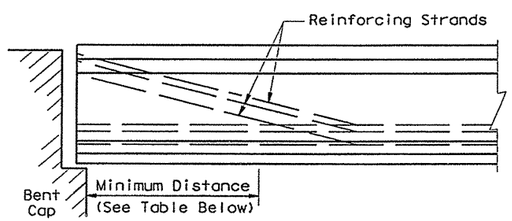


U/P (SPL-CO) (.15 KW)S(TYPE 1)

If bridge has pre-cast panels under deck, run circuit under deck edge.



CONDUIT CONNECTION PROFILE



LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE	
SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50'- 70'	15'-0"
70'- 90'	20'-0"
> 90'	25'-0"

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Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

(UNDERPASS LIGHT FIXTURES)

RID(UP)-07

FILE: rid-07.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	DAL	SEE TITLE SHEET		452
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	009	12	073	IH 30

72D

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SHIPPING PARTS LIST ~ POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base Designation Pole	A1	A2	Luminaire	Quantity	T-Base Designation Pole	A1	A2	Luminaire	Quantity	CSB/SSCB Mounted Designation Pole	A1	A2	Luminaire	Quantity
20	(Type SA 20 S - 4)			(.15kW) S		(Type SA 20 T - 4)			(.15kW) S						
	(Type SA 20 S - 4 - 4)			(.15kW) S		(Type SA 20 T - 4 - 4)			(.15kW) S						
30	(Type SA 30 S - 4)			(.25kW) S		(Type SA 30 T - 4)			(.25kW) S		(Type SP 28 S - 4)			(.25kW) S	
	(Type SA 30 S - 4 - 4)			(.25kW) S		(Type SA 30 T - 4 - 4)			(.25kW) S		(Type SP 28 S - 4 - 4)			(.25kW) S	
	(Type SA 30 S - 8)			(.25kW) S		(Type SA 30 T - 8)			(.25kW) S		(Type SP 28 S - 8)			(.25kW) S	
	(Type SA 30 S - 8 - 8)			(.25kW) S		(Type SA 30 T - 8 - 8)			(.25kW) S		(Type SP 28 S - 8 - 8)			(.25kW) S	
40	(Type SA 40 S - 4)			(.25kW) S		(Type SA 40 T - 4)			(.25kW) S		(Type SP 38 S - 4)			(.25kW) S	
	(Type SA 40 S - 4 - 4)			(.25kW) S		(Type SA 40 T - 4 - 4)			(.25kW) S		(Type SP 38 S - 4 - 4)			(.25kW) S	
	(Type SA 40 S - 8)			(.25kW) S		(Type SA 40 T - 8)			(.25kW) S		(Type SP 38 S - 8)			(.25kW) S	
	(Type SA 40 S - 8 - 8)			(.25kW) S		(Type SA 40 T - 8 - 8)			(.25kW) S		(Type SP 38 S - 8 - 8)			(.25kW) S	
	(Type SA 40 S - 10)			(.25kW) S		(Type SA 40 T - 10)			(.25kW) S		(Type SP 38 S - 10)			(.25kW) S	
	(Type SA 40 S - 10 - 10)			(.25kW) S		(Type SA 40 T - 10 - 10)			(.25kW) S		(Type SP 38 S - 10 - 10)			(.25kW) S	
	(Type SA 40 S - 12)			(.25kW) S		(Type SA 40 T - 12)			(.25kW) S		(Type SP 38 S - 12)			(.25kW) S	
	(Type SA 40 S - 12 - 12)			(.25kW) S		(Type SA 40 T - 12 - 12)			(.25kW) S		(Type SP 38 S - 12 - 12)			(.25kW) S	
50	(Type SA 50 S - 4)			(.4kW) S		(Type SA 50 T - 4)			(.4kW) S		(Type SP 48 S - 4)			(.4kW) S	
	(Type SA 50 S - 4 - 4)			(.4kW) S		(Type SA 50 T - 4 - 4)			(.4kW) S		(Type SP 48 S - 4 - 4)			(.4kW) S	
	(Type SA 50 S - 8)			(.4kW) S		(Type SA 50 T - 8)			(.4kW) S		(Type SP 48 S - 8)			(.4kW) S	
	(Type SA 50 S - 8 - 8)			(.4kW) S		(Type SA 50 T - 8 - 8)			(.4kW) S		(Type SP 48 S - 8 - 8)			(.4kW) S	
	(Type SA 50 S - 10)			(.4kW) S		(Type SA 50 T - 10)			(.4kW) S		(Type SP 48 S - 10)			(.4kW) S	
	(Type SA 50 S - 10 - 10)			(.4kW) S		(Type SA 50 T - 10 - 10)			(.4kW) S		(Type SP 48 S - 10 - 10)			(.4kW) S	
	(Type SA 50 S - 12)			(.4kW) S		(Type SA 50 T - 12)			(.4kW) S		(Type SP 48 S - 12)			(.4kW) S	
	(Type SA 50 S - 12 - 12)			(.4kW) S		(Type SA 50 T - 12 - 12)			(.4kW) S		(Type SP 48 S - 12 - 12)			(.4kW) S	

OTHER Designation Pole	A1	A2	Luminaire	Quantity

GENERAL NOTES:

All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, Contractor shall furnish to the Department such warranties or guarantees.

The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Erection and/or removal of poles and luminaires located near overhead electrical lines shall be accomplished using established industry and utility safety practices and in accordance with laws governing such work. The Contractor shall consult with the appropriate utility company prior to beginning such work.

A. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.

B. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.
1. Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer registered in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
2. Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the 2001 Edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." All poles shall be designed for 110 mph 3-second gust wind speeds. An additional 1.14 gust factor shall be applied to the wind loads. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
3. Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
4. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

C. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.
1. Meet all of the requirements stated above for optional steel pole designs and the following:
a. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
b. Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
c. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
d. Pole components shall be constructed using the following material:
Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

D. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

EXPLANATION OF ROADWAY ILLUMINAION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (.4KW) S

- SA: Pole and mast arm may be steel or aluminum.
- ST: Pole and mast arm must be steel.
- AL: Pole and mast arm must be aluminum.
- SP: Squashed (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (5), or SSCB (4).

Two numerical digits denote mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Shoe Base Bridge Mount)

First number denotes length of mast arm in feet.

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

Next three figures indicate luminaire rating (1 kW= 1000 watts, .4 kW= 400 watts, etc.) Fixtures for U/P (SPL-CO) (.15KW)S(TYPE 1) and (TYPE 2) as shown on RID(UP) shall be "cobra head" style fixtures that meet the specifications shown on RID(LUM) sheets 1 and 2. Fixtures bid under the descriptive code RDWY ILL ASSEM U/P TYPE IF shall meet the specifications shown on RID(IF). All other fixtures bid under Item 610 shall meet specifications shown elsewhere in the plans.

Last letter indicates the type of lamp (M- Metal Halide, S- High Pressure Sodium, L- Low Pressure Sodium).

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ROADWAY ILLUMINATION POLES

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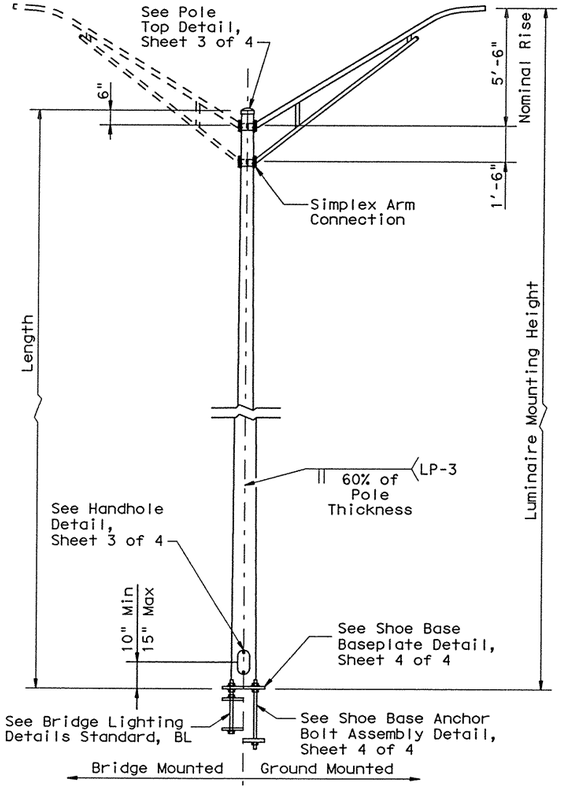
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REVISIONS

STATE DISTRICT	FEDERAL AID PROJECT	SHEET
		452A

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
Rockwall	0009	12	073	

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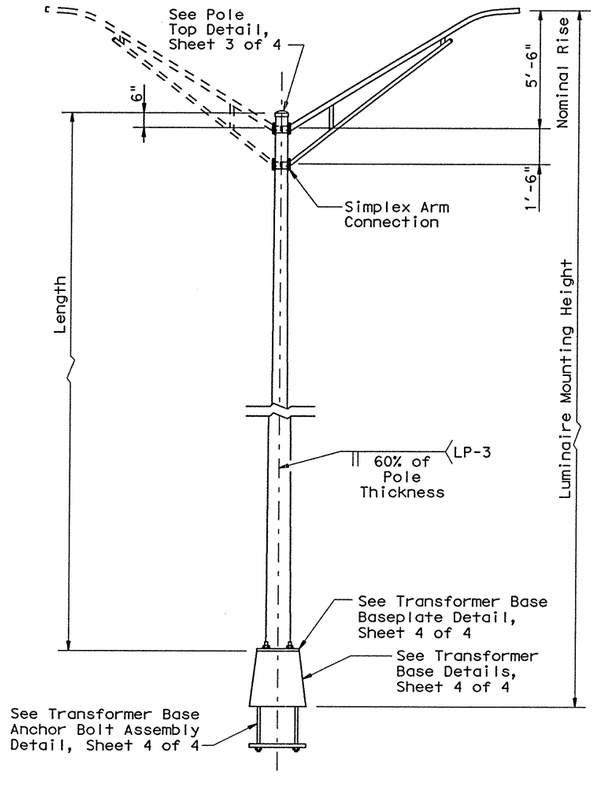
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3

Designs conform to 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications. Design 3-Second Gust Wind Speed equal 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is less than 25' above natural ground level.

Design structures to support two 12' luminaire mast arms and luminaires. Design mast arms for a 60-pound luminaire having an effective projected area of 1.6 square feet.

Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.41	43.50	0.1196	30.3

For mounting heights between values shown in the tables, use base diameter and thickness values for the larger pole.

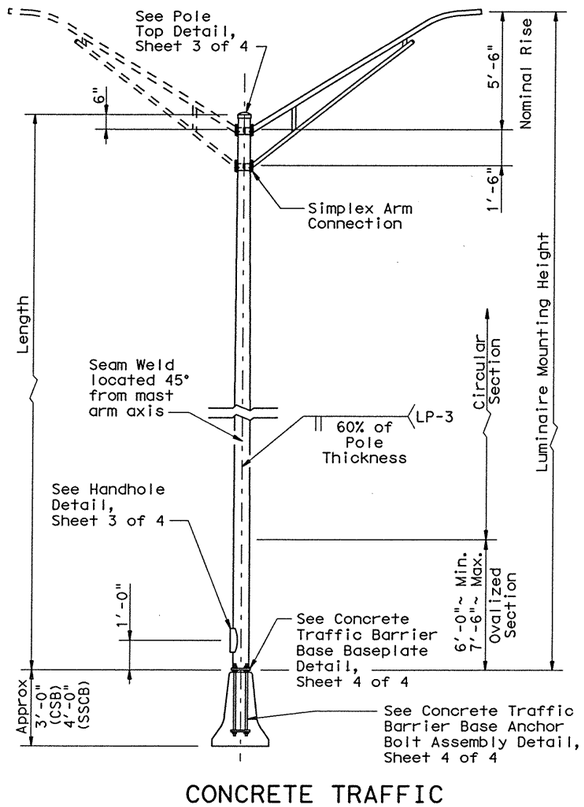
Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."

Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with the ANSI/AWS Structural Welding Code D1.1.

Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.

Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.

Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (ft)	Base ② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. Except for poles mounted on a concrete traffic barrier, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier.

The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."

MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	A325 ①	92
Anchor Bolts (T-Base, Shoe)	F1554 Gr 55	55
Anchor Bolts (CSB/SSCB)	A325, A193-B7, or A321	105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

① Lubricate in the field if necessary in lieu of the requirements in ASTM A325.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ A1011 SS Gr 50 may be used in lieu of HSLAS, provided the material meets the elongation requirements for HSLAS

POLE ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

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Traffic Operations Division

ROADWAY ILLUMINATION POLES

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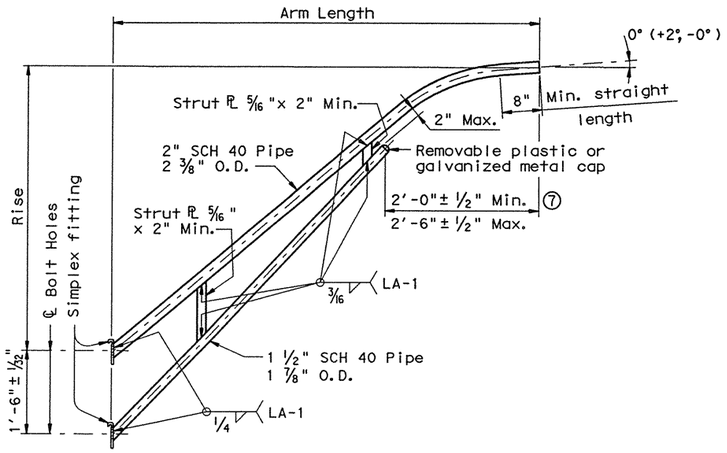
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			452B

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
Rockwall	0909	12	073	

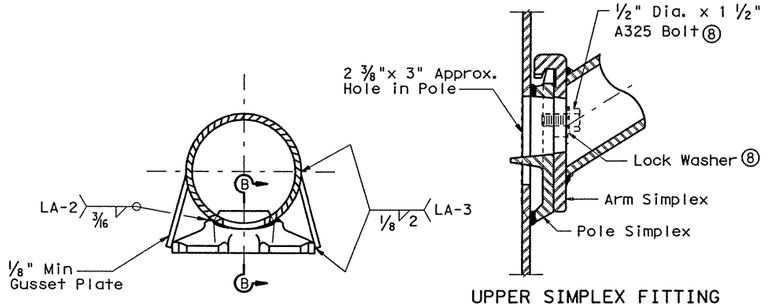
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LUMINAIRE ARM

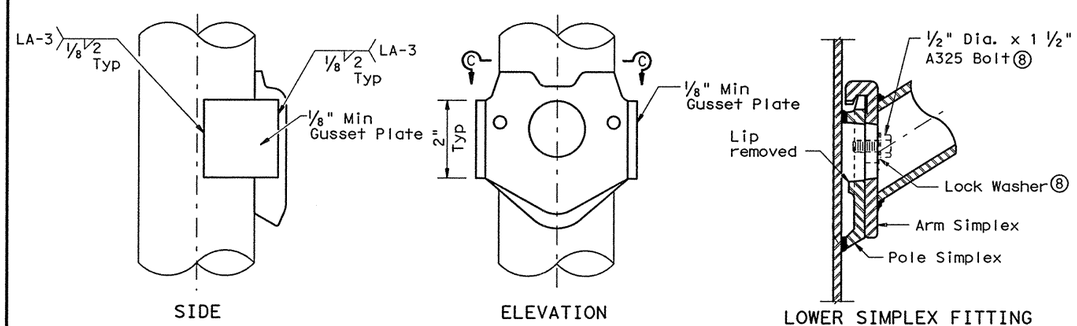
LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6" ⑩
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

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



SECTION C-C

UPPER SIMPLEX FITTING
(Gusset not shown for clarity)



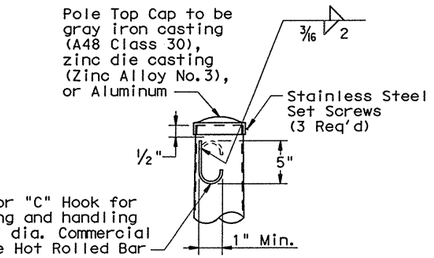
SIDE

ELEVATION

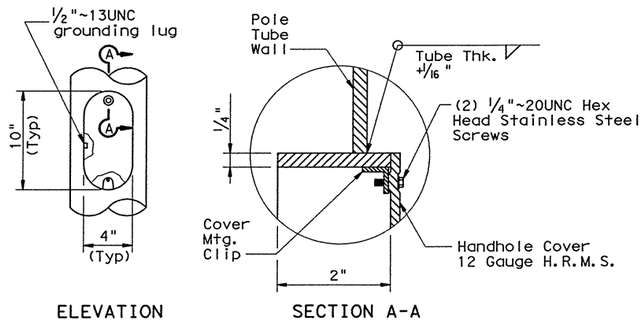
LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SIMPLEX ATTACHMENT DETAIL

SECTION B-B



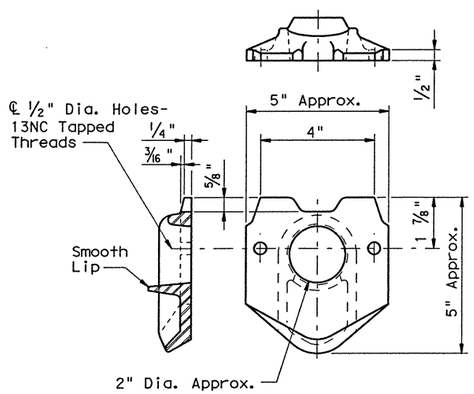
POLE TOP



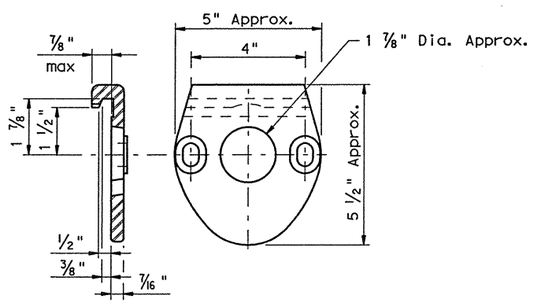
ELEVATION

SECTION A-A

HANDHOLE



POLE SIMPLEX DETAIL ⑨



ARM SIMPLEX DETAIL ⑨

ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±3"
Arm Rise	+1 3/4" in 10 ft
Arm Diameter	+3/16"
Overall length or width	+1/4"
Thickness	+1/4", -1/16"
Deviation from flat	1/8" in 12"
Spacing between holes	+3/32"
Bolt hole size	±1/16"
Strut location in truss arms	±1 1/2"

④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

⑤ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.

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

⑧ Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.

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

⑩ Luminaire mounting heights are based on assumed 5'-6" luminaire arm rise.

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION POLES

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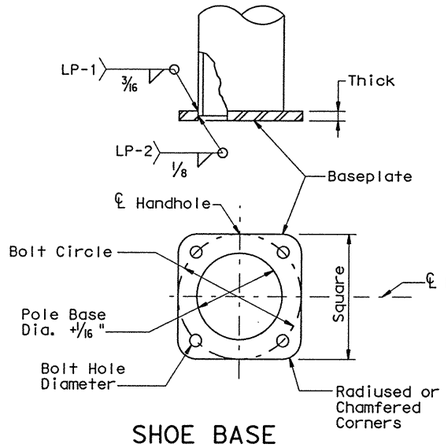
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	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	Rockwall	0009	12	673	

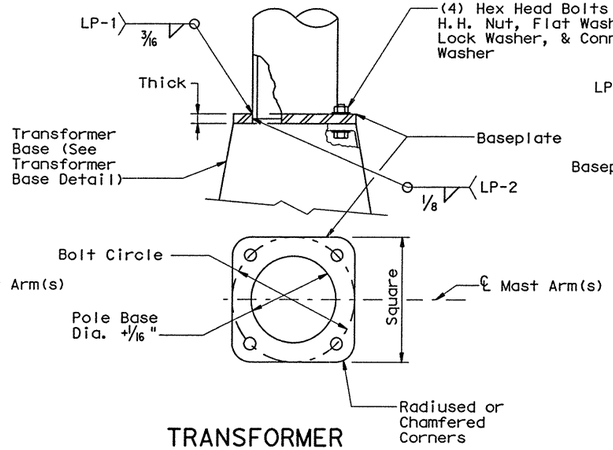
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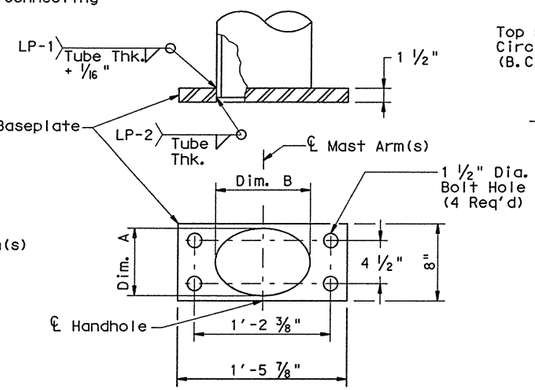
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20′- 30′	13"	13"	1 1/4"	1 1/4"
40′	15"	15"	1 1/4"	1 1/2"
50′	15"	15"	1 1/2"	1 1/2"



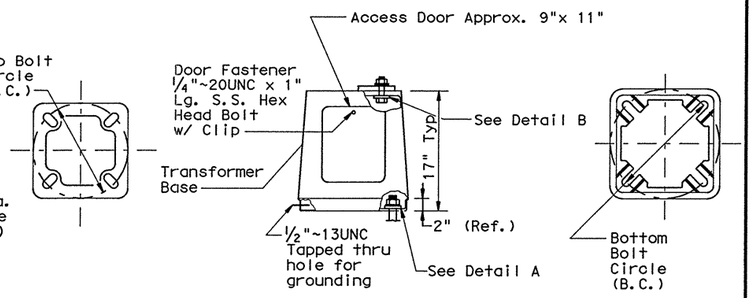
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFOMER BASE TYPE
20′- 30′	13"	13"	1 1/4"	1"	1 1/4"	A
40′	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50′	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



CONCRETE TRAFFIC BARRIER BASE BASEPLATE

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



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

TRANSFORMER BASE DETAILS

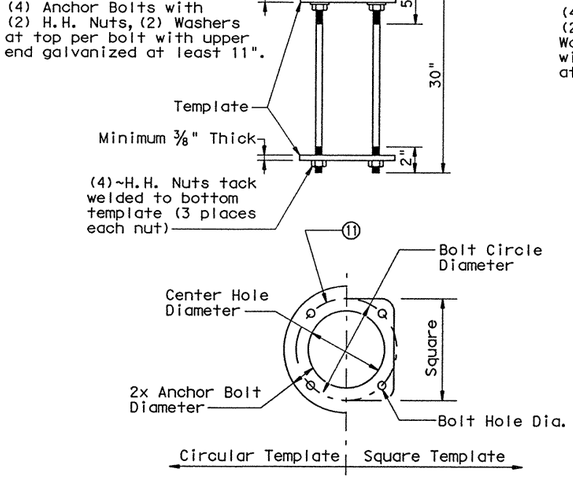
For mounting heights between those shown in the table, use the values in the table for the larger mounting height.

All breakaway bases shall meet the breakaway requirements of the Latest Edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.

Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four hex head bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.

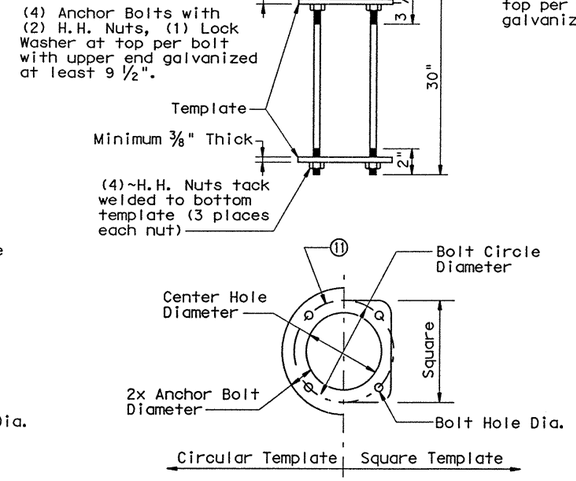
Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.

Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.



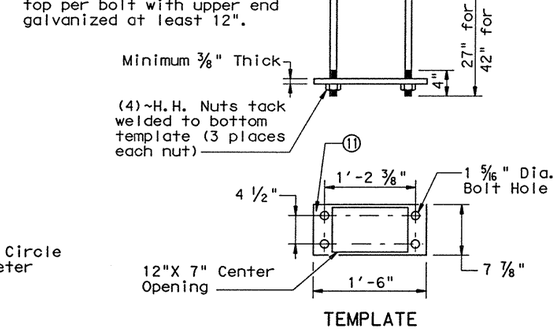
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE					
MOUNTING HEIGHTS	A.B. Dia.	BOLT CIRCLE DIAMETER	SQUARE	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′- 30′	1"	13"	13"	11"	1 1/16"
40′- 50′	1 1/4"	15"	14 1/2"	12 1/2"	1 5/16"



TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE					
MOUNTING HEIGHTS	A.B. Dia.	BOLT CIRCLE DIAMETER	SQUARE	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′- 30′	1"	14"	14"	12"	1 1/16"
40′- 50′	1 1/4"	17 1/4"	16 3/4"	14 3/4"	1 5/16"



CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

⑪ Anchor Bolt Templates need not be galvanized.

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

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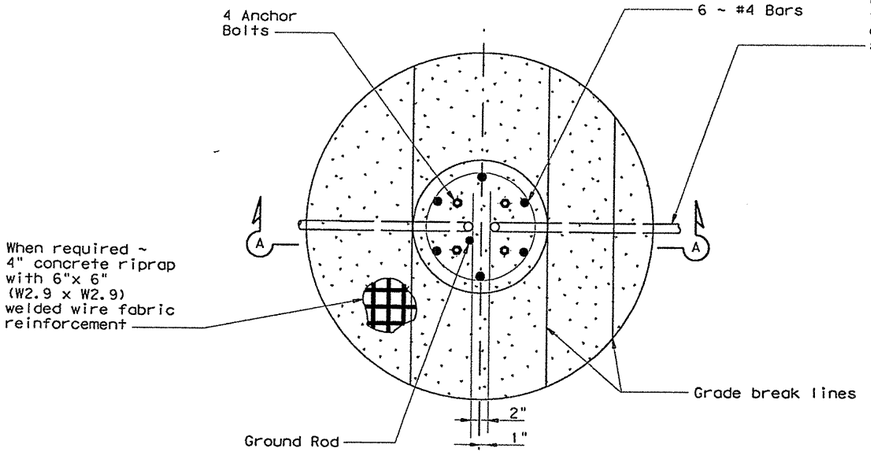
ROADWAY ILLUMINATION POLES

RIP(4)-07

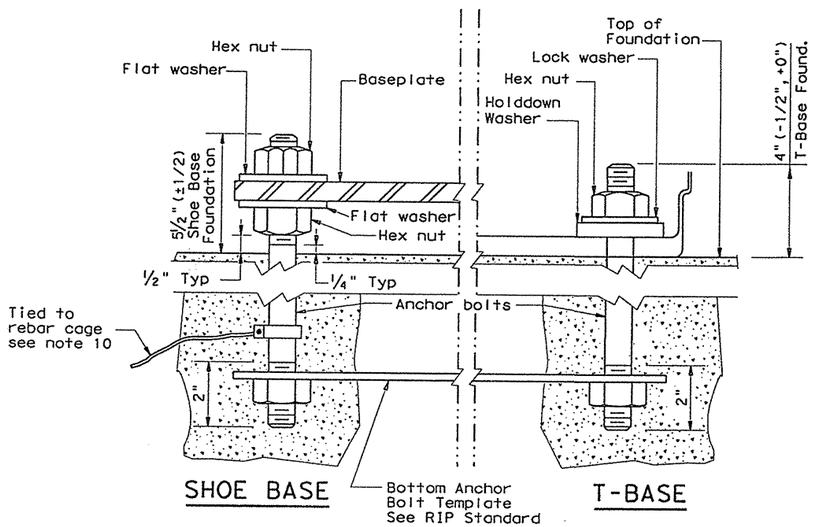
©TxDOT Jan 2007	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	STATE DISTRICT	FEDERAL AID PROJECT		SHEET
				452D
	COUNTY	CONTROL	SECTION	JOB
	Rockwall	0009	12	073

730

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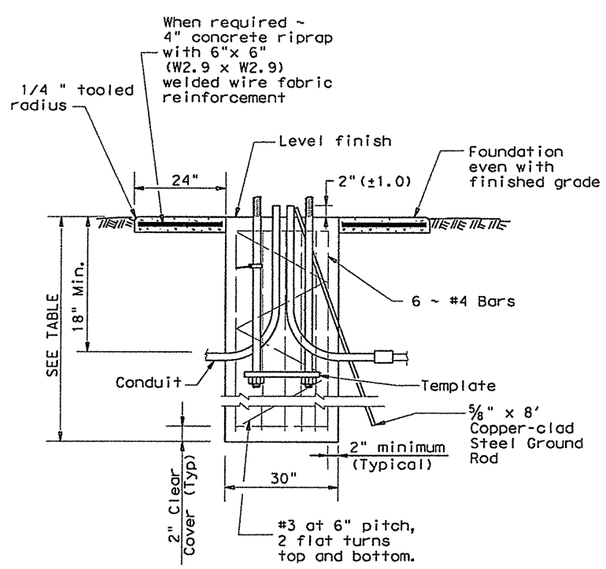


FOUNDATION DETAIL



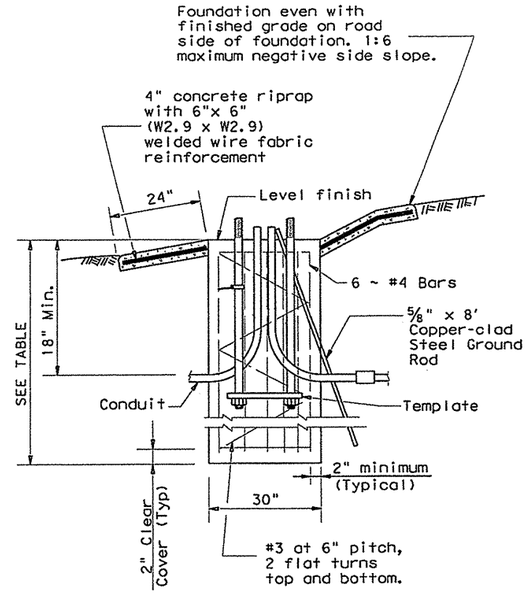
ANCHOR BOLT DETAIL

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less, see design guidelines for further information.
7. Use 8 hold down washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete.
11. Use rip rap on T-base foundations that are located on a sloped grades.



SECTION A-A

SHOWING CONSTANT GRADE



SECTION A-A

SHOWING SLOPED GRADE

PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)		
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

ANCHOR BOLTS			
POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in.x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

RECOMMENDED FOUNDATION LENGTHS (See note 1)			
MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6'	6'	6'
>20 ft. to 30 ft.	8'	6'	6'
>30 ft. to 40 ft.	8'	8'	6'
>40 ft. to 50 ft.	10'	8'	6'

BREAKAWAY POLE PLACEMENT (See note 6)	
Roadway Functional Classification	** Pole offset (distance to transformer base, tolerance + 6in.-0in.)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

ACC: 04 JAN 2007
LEVELS DISPLAYED 1 2 62

Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

(RDWY ILLUM FOUNDATIONS)

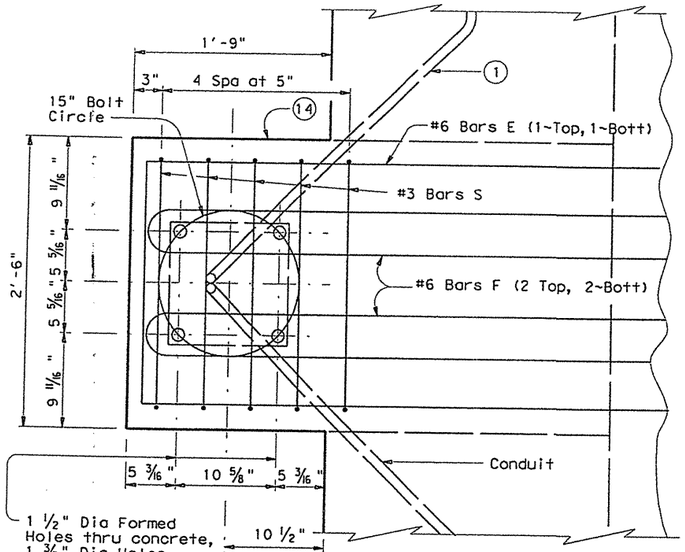
RID(FND)-07

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©TxDOT January 2007	DIST	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	SEE TITLE SHEET		453
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	ROCKWALL	009	12	073	IH 30

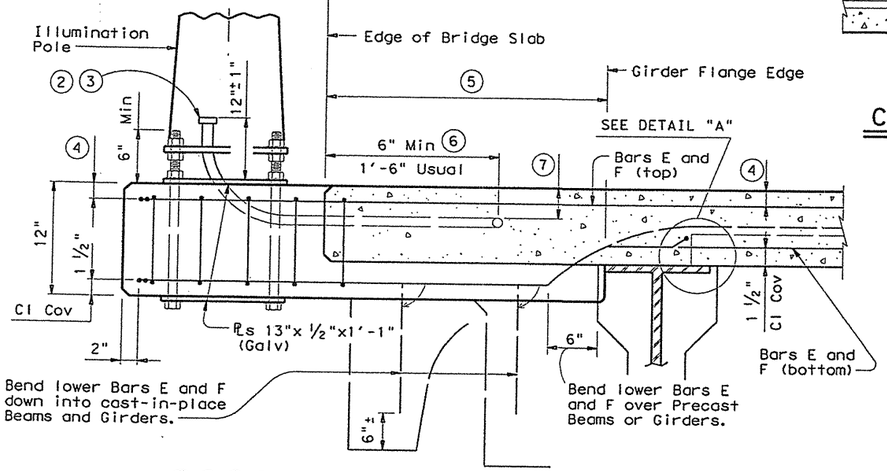
72C

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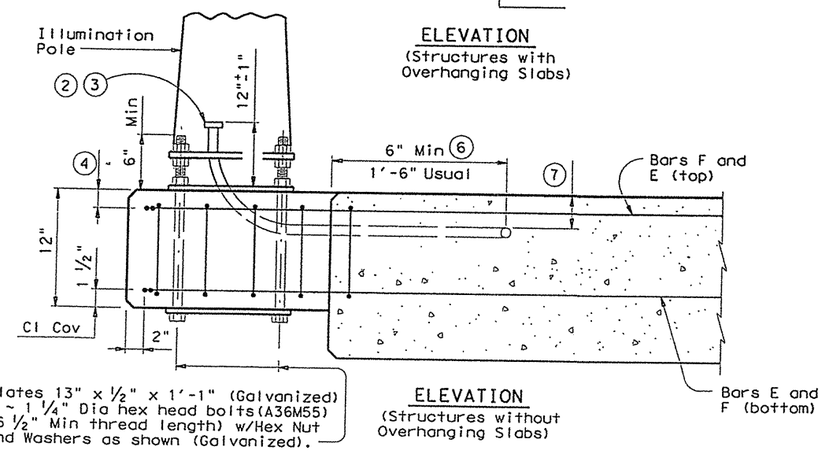
DISPLAYED ACC:



PLAN

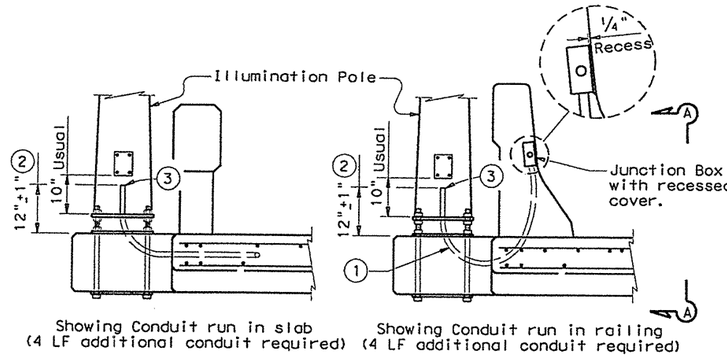


ELEVATION
(Structures with Overhanging Slabs)



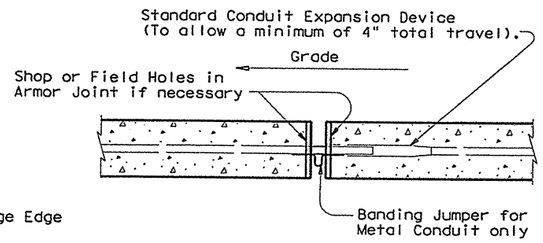
ELEVATION
(Structures without Overhanging Slabs)

ILLUMINATION POLE BRACKET AND CONDUIT LOCATION

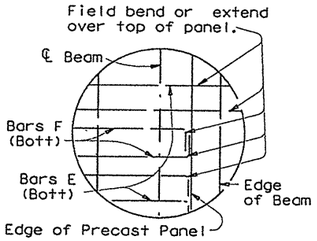


CONDUIT PLACEMENT OPTIONS

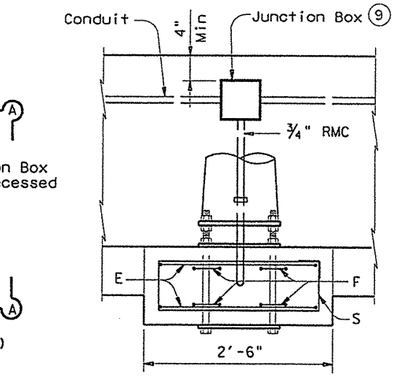
(Treatment shall be as shown elsewhere on the plans or as directed by the Engineer)



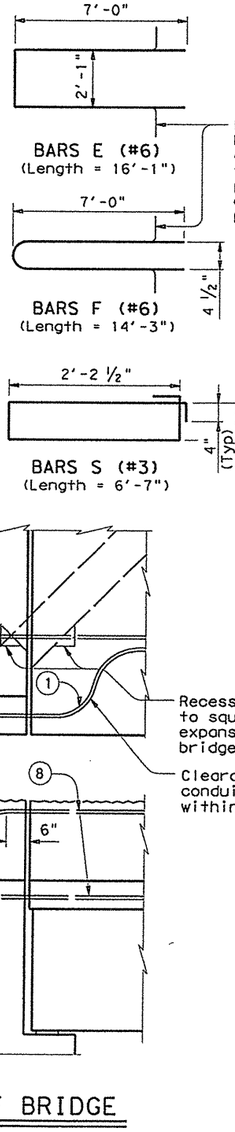
CONDUIT EXPANSION JOINT

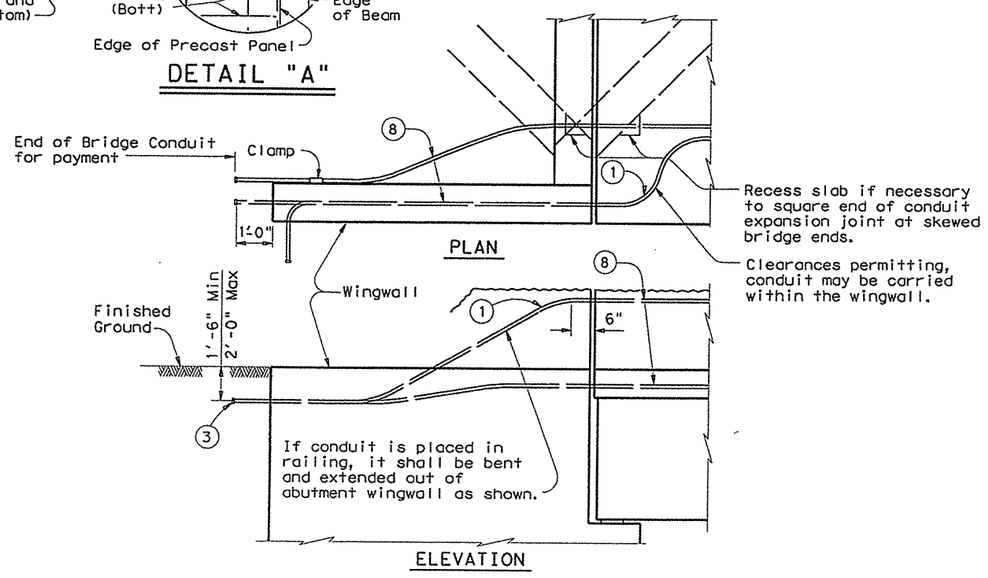


DETAIL "A"



SECTION A-A





TREATMENT AT END OF BRIDGE

ESTIMATED QUANTITIES~ONE BRACKET			
ITEM		UNIT	QUANT
CONCRETE	(10)(11)	CY	0.2
REINFORCING STEEL	(11)	LB	146
STRUCTURAL STEEL	(12)(11)	LB	104
CONDUIT	(13)	LF	4

(1) Conduit bends in accordance with NEC (4 1/2" Min radius for 3/4" Dia conduit and 5 3/4" Min radius for 1" conduit).

(2) If lighting is to be placed on future contract, extend conduit only 6" and provide water tight cap.

(3) All conduit ends shall have all burrs reamed and bell ends or bushings installed.

(4) 2" clear top cover. Place beneath top slab reinforcing only if necessary to provide this cover.

(5) If slab edge to girder flange edge exceed 3'-11", lengthen Bars E and F proportionally to ensure Bars E and F extend 1'-6" Min beyond girder flange edge.

(6) Clear rail anchors, drains, etc 1 1/2" Min.

(7) 1 1/2" Min cover but always beneath top layer slab reinforcing.

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

(9) Junction boxes shall be 8 x 8 x 4 inches heavy duty, flush mounted, galvanized, cast iron or cast steel, externally flanged, and be Crouse-Hinds Type WGB, O-Z Gedney Type YR, or equal, if approved by the Engineer. Bond junction box to grounding conductor.

(10) Variation due to slab thickness is insignificant.

(11) For Contractor's information only.

(12) Anchor Bolts, Nuts, Washers, and 2 plates.

(13) Additional to main run (Size and type as shown elsewhere on the plans).

(14) Minimum clear distance between bracket and deck drain is 3'.

GENERAL NOTES:

Designed for up to 50 Ft light pole with one 12 Ft arm, 55 Lb luminaire with 1.4 sq ft EPA at maximum design wind speed of 90 mph (117 mph gusts). A special design is required if luminaire mounting height exceeds 100 ft above average surrounding terrain.

Concrete for Illumination Pole Brackets shall be of the same type and placed monolithically with the bridge slab. The bracket quantity is considered subsidiary to the Item "Reinforced Concrete Slab".

The anchor bolts and lower plates are subsidiary to the Item "Roadway Illumination Assemblies".

The type and size of conduit and the number and location of brackets shall be as shown elsewhere on the plans. Brackets found to conflict with other components of the bridge may be relocated as necessary.

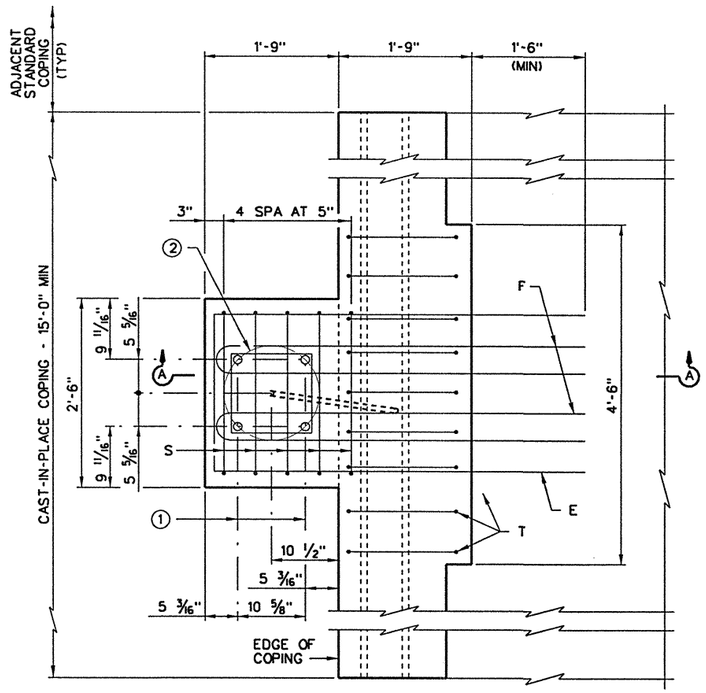
All reinforcing steel shall be Grade 60.

Texas Department of Transportation
Bridge Division

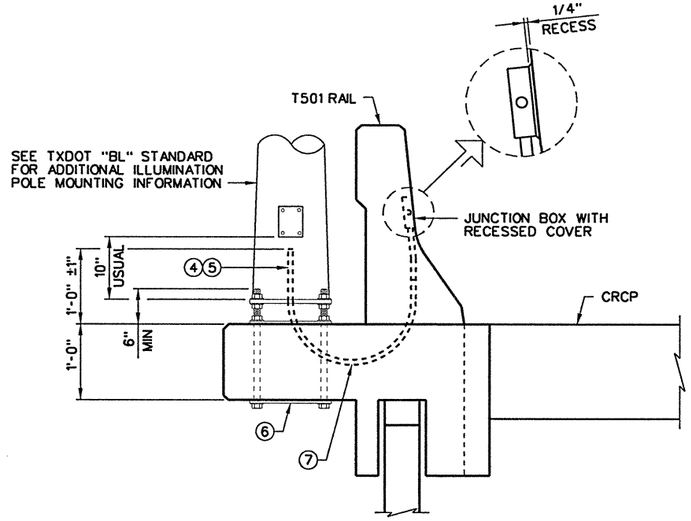
BRIDGE LIGHTING DETAILS

BL

FILE: blside01.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	DAL	SEE TITLE SHEET		455
	COUNTY	CONTROL	SECT	JOB	HIGHWA
	ROCKWALL	009	12	073	IH 30

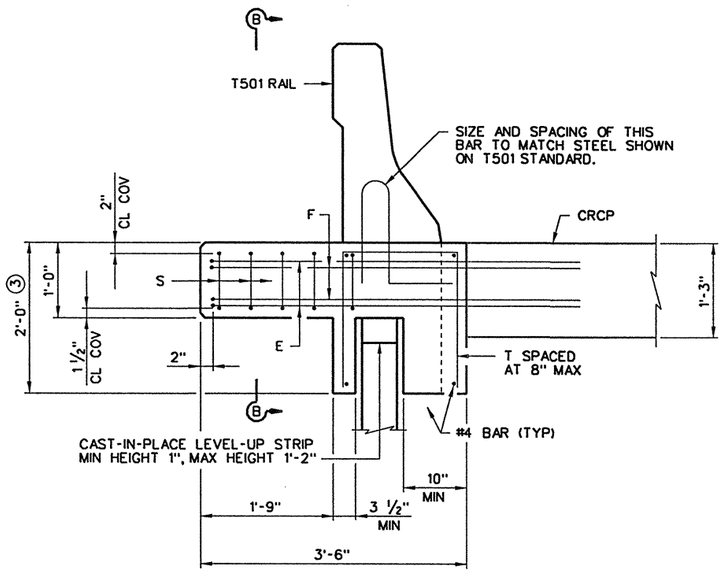


PLAN

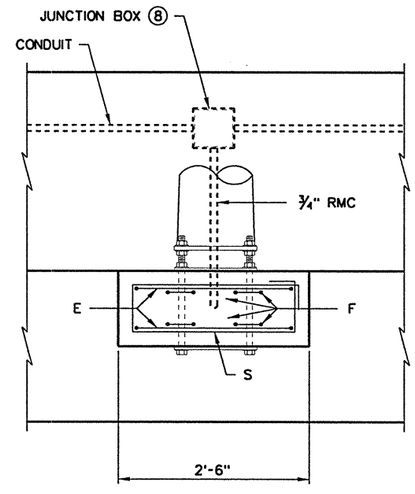


CONDUIT PLACEMENT

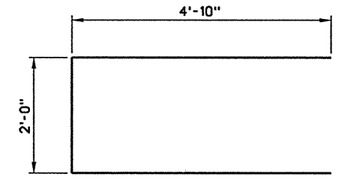
(TREATMENT TO BE SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER)



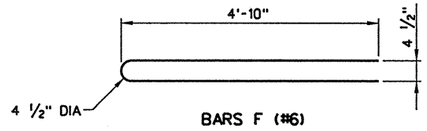
SECTION A-A



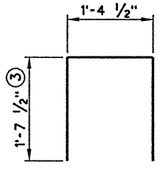
SECTION B-B



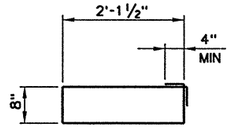
BARS E (#6)



BARS F (#6)



BARS T (#6)

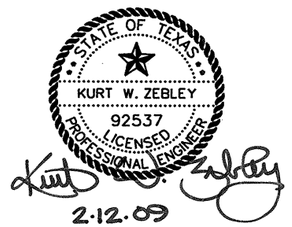


BARS S (#3)

1. 1 1/2" DIA FORMED HOLES THRU CONCRETE, 1 3/8" DIA HOLES THRU PLATES.
2. 15" BOLT CIRCLE.
3. DIMENSIONS MAY BE ADJUSTED TO MATCH ADJACENT COPING.
4. IF LIGHTING IS TO BE PLACED ON FUTURE CONTRACT, EXTEND CONDUIT ONLY 6" AND PROVIDE WATER TIGHT CAP.
5. ALL CONDUIT ENDS SHALL HAVE ALL BURRS REAMED AND BELL ENDS OR BUSHINGS INSTALLED.
6. PLATES 13" x 1/2" x 1'-1" (GALVANIZED), 4 - 1 1/4" DIA HEX HEAD BOLTS (A36M55) (6 1/2" MIN THREAD LENGTH) WITH HEX NUT AND WASHERS AS SHOWN (GALVANIZED).
7. CONDUIT BENDS IN ACCORDANCE WITH NEC (4 1/2" MIN RADIUS FOR 3/4" DIA CONDUIT AND 5 3/4" MIN RADIUS FOR 1" CONDUIT).
8. JUNCTION BOXES TO BE 8 x 8 x 4 INCHES HEAVY DUTY, FLUSH MOUNTED, GALVANIZED, CAST IRON OR CAST STEEL, EXTERNALLY FLANGED, AND BE CROUSE-HINDS TYPE WGB, O-Z GEDNEY TYPE YR, OR EQUAL, IF APPROVED BY THE ENGINEER. BOND JUNCTION BOX TO GROUNDING CONDUCTOR. JUNCTION BOXES ARE SUBSIDIARY TO THE ITEM 'CONDUIT'.

GENERAL NOTES:

1. DESIGNED FOR UP TO 50 FT LIGHT POLE WITH ONE 12 FT ARM, 55 LB LUMINAIRE WITH 1.4 SQ FT EPA AT MAXIMUM DESIGN WIND SPEED OF 90 MPH (117 MPH GUSTS).
2. CONCRETE FOR ILLUMINATION POLE BRACKET AND CAST-IN-PLACE COPING TO BE CLASS "C". THE BRACKET QUANTITY IS CONSIDERED SUBSIDIARY TO THE ITEM "RETAINING WALL".
3. ALL REINFORCING STEEL TO BE GRADE 60.
4. THE ANCHOR BOLTS AND LOWER PLATES ARE SUBSIDIARY TO THE ITEM "ROADWAY ILLUMINATION ASSEMBLIES".
5. THE TYPE AND SIZE OF CONDUIT AND THE NUMBER AND LOCATION OF BRACKETS TO BE AS SHOWN ELSEWHERE IN THE PLAN SET. BRACKETS FOUND TO CONFLICT WITH OTHER COMPONENTS ON THE RETAINING WALL MAY BE RELOCATED AS NECESSARY.
6. THESE DETAILS TO BE USED IN ACCORDANCE WITH THE MSE WALL RW(TRF) STANDARD SHEET TO DEVELOP SPECIFIC DETAILS FOR SUBMISSION WITH THE SHOP DRAWINGS. THE STEEL REINFORCEMENT SHOWN IS SPECIFICALLY FOR THE AREA OF THE ILLUMINATION POLE BRACKET.
7. SEE BL STANDARD FOR ADDITIONAL ILLUMINATION POLE MOUNTING INFORMATION.



NO.	REVISION	BY	DATE

CP&Y
Chiang, Patel & Yerby, Inc.
Firm Registration Number: 1741

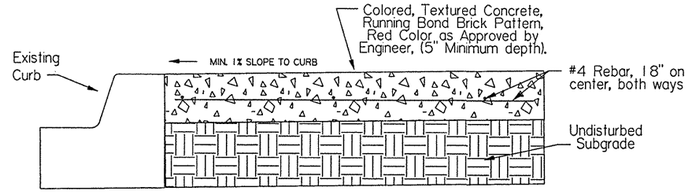
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IH 30 AT JOHN KING BLVD.

ILLUMINATION POLE BRACKET ON MSE WALL DETAIL

Designed:	KWZ	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked:	JPW	6	TEXAS	SEE TITLE SHEET			IH 30
Drawn:	GWS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KWZ	DAL	ROCKWALL	0009	12	073	45

2/12/2009 7:29:57 AM kzebley pw:/Active Projects/TX00643/TX00643-05/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.xx Illumination/Pole Support/435TM001.dgn



1 COLORED, TEXTURED CONCRETE DETAIL
AT CONCRETE CURBS N.T.S.

0 10 20 30 40 50 100

Colored, Textured Concrete
(Item 528-2006)
Approx. 1312.67 SY
used in lieu of plain riprap

REGISTERED LANDSCAPE ARCHITECT
PATRICK J. HAIGH
1498
STATE OF TEXAS

Patrick Haigh RLA 26FEB2009
Signature of Registrant & Date

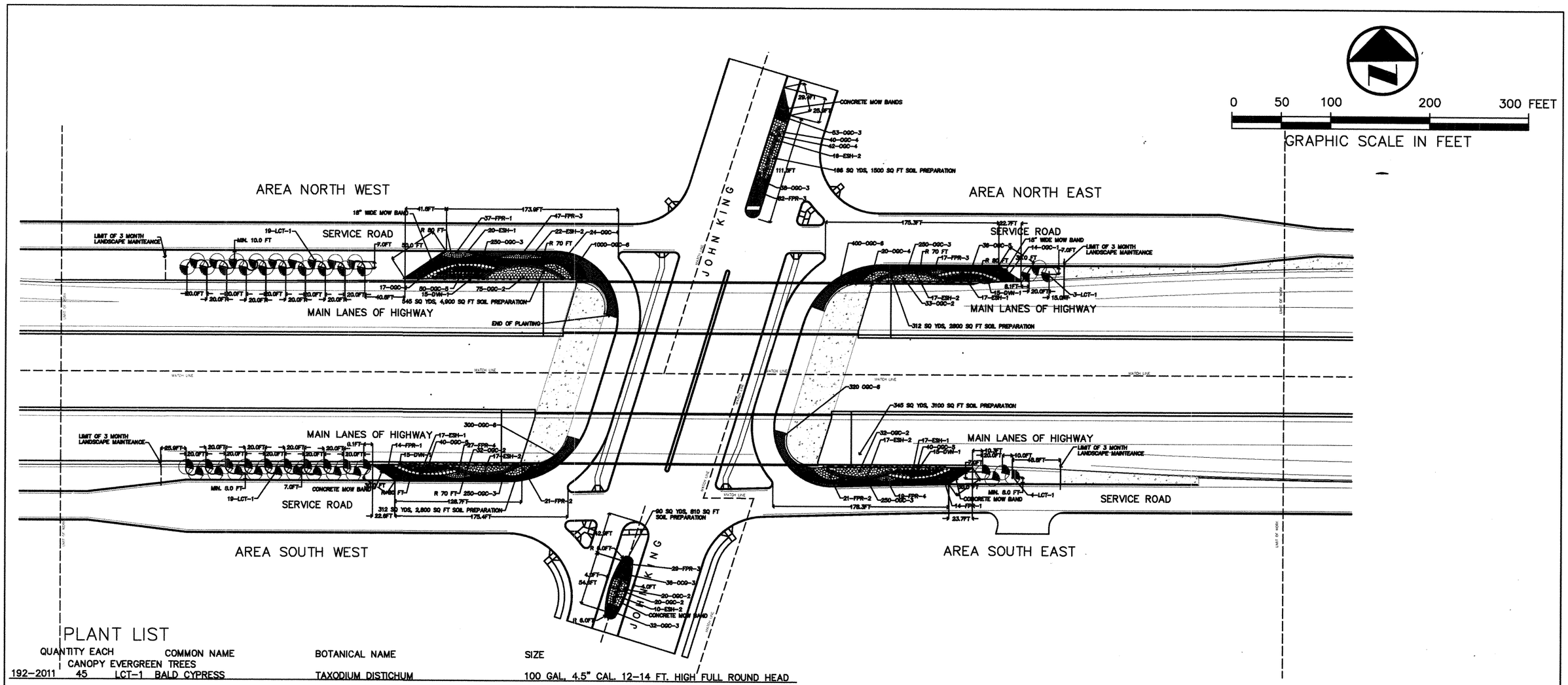
Texas Department of Transportation
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AMENITY PAVING SHEET

SCALE: 1" = 50'-0"

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
XXX	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
XXX	TEXAS	DALLAS	ROCKWALL	457
CHECK	CONTROL	SECTION	JOB	
XXX	0009	12	073	
CHECK				
XXX				

TEMPLATED REVISED: 10-23-02



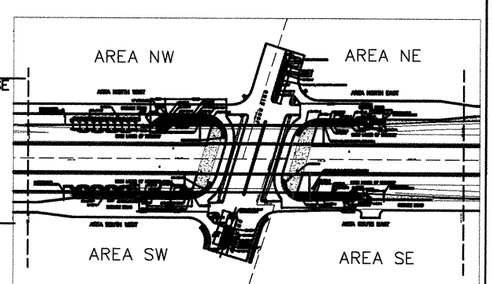
PLANT LIST

	QUANTITY EACH		COMMON NAME	BOTANICAL NAME	SIZE
			CANOPY EVERGREEN TREES		
192-2011	45	LCT-1	BALD CYPRESS	TAXODIUM DISTICHUM	100 GAL, 4.5" CAL. 12-14 FT. HIGH FULL ROUND HEAD
			SHRUBS, EVERGREEN HEDGES		
192-2023	71	ESH-1	ABELIA VAR. EDWARD GOUCHER	ABELIA GRANDIFLORA "EDWARD GOUCHER"	5 GAL., FULL ROUND HEAD 24" HIGH, NO SUBSTITUTES
192-2072	99	ESH-2	CHERRY RED KNOCK OUT ROSE	ROSA KNOCK OUT CHERRY RED	5 GAL. 24" HIGH, 3 CANES MIN.
192-2002			GROUND COVERS		
	31	OGC-1	TEXAS RED YUCCA	HESPERALOE PARVIFLORA	5 GALLON, SPACING 36" ON CENTER
	212	OGC-2	ORIENTAL FOUNTAIN GRASS	PENNISETUM ORIENTALE	5 GALLON, SPACING 36" ON CENTER
	1159	OGC-3	HAMELN GRASS	PENNISETUM ALOPECUROIDES "HAMELN"	3 GALLON, SPACING 18" ON CENTER
	126	OGC-4	MORNING LIGHT	MISCANTHUS SINENSIS "MORNING LIGHT"	3 GALLON, SPACING 12" ON CENTER
	166	OGC-5	BURGANDY GIANT	PENNISETUM "BURGANDY GIANT"	3 GALLON, SPACING 18" ON CENTER
	1720	OGC-6	WEEPING LOVE GRASS	ERAGOSTIS CURVULA	1 GALLON, SPACING 12" ON CENTER
192-2002			PERRIENIALS		
	65	FPR-1	CHERRY SAGE	SALVIA GREGGII, CHERRY RED	3 GALLON, SPACING 24" ON CENTER
	42	FPR-2	SIERRA SAN ANTONIO SAGE	SALVIA GREGGII, YELLOW/RED COLORS	3 GALLON, SPACING 24" ON CENTER
	175	FPR-3	LANTANA, PURPLE, TRAILING	LANTANA MONTEVIDENSIS, PURPUREA	1 GALLON, SPACING 24" ON CENTER
	46	FPR-4	LANTANA, WHITE, TRAILING	LANTANA MONTEVIDENSIS, WHITE	1 GALLON, SPACING 24" ON CENTER
192-2003			VINES		
	60	DVN-1	BOSTON IVY	PATHENOSIS QUINQUIFOLIA	3 GALLON, ON STAKE, AT WALL BASE
	GRASS	BGS-1	BERMUDA GRASS	BERMUDA SPECIES, COMMON	HYDROMULCH

BED PREPARATION
1770 SQ YDS SOIL PREPARTION, SOIL AMENDMENTS AND FERTILZER AND EXCAVATION
1770 SQ YDS 3" MULCH OVER FINISHED PLANTING BEDS, SEE SPECIFICATIONS, APPLIE TACKIFIER FOR HOLDING INPLACE, 2 COATS

MAINTENANCE PERIOD IN BASE BID 3, MONTHS

1. LANDSCAPE CONTRACTOR TO MAINTAIN THE SITE LIMITS OF WORK ARE FOR A PERIOD OF 3 MONTHS FROM DATE OF FINAL ACCEPTANCE.
2. FINAL ACCEPTANCE LETTER SHALL BE ISSUED BY ARCHITECT WITH ACCEPTANCE DATE FOR PERIOD TO BEGIN.
3. INCLUDE COST IN BASE BID AS SUB CONTRACTING THIS WORK OUT, PROVIDE SUB CONTRACTORS NAME AND INSURANCE CERTIFICATION WITH BID.



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT
THOMAS H. PRITCHETT
2115
STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Signature of Registrant & Date — 3/04/2009

T. H. Pritchett / Associates
LANDSCAPE ARCHITECTS - 1218 CAMINO LAGO, IRVING, TEXAS 75039
PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

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LANDSCAPE PLANTING PLAN

AMENITY LANDSCAPE PLANS

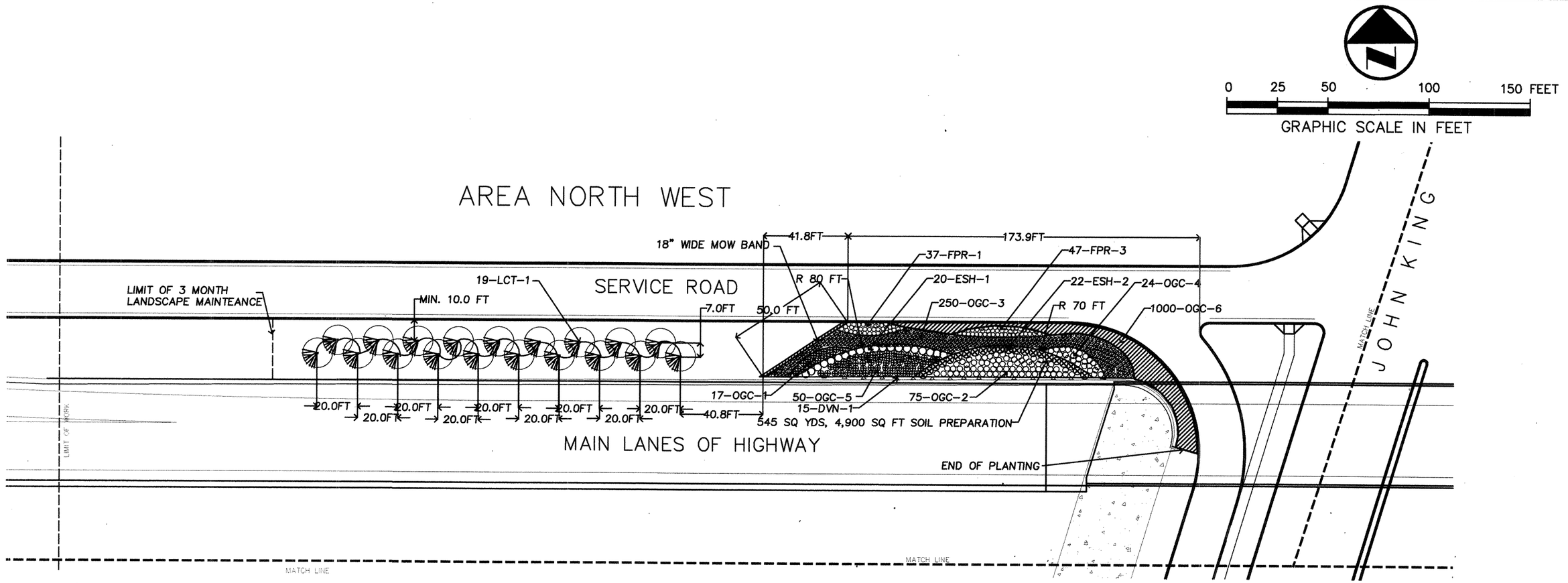
OVERALL AMENITY AREAS
L100

SCALE: 1:100 AT 11" X 17" SHEET 1 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS THP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK THP	TEXAS	DALLAS	ROCKWALL	458
CHECK THP	CONTROL	SECTION	JOB	
	0009	12	073	

TEMPLATED REVISED: 10-23-02

USER ID



PLANT LIST NORTH WEST

QUANTITY EACH		COMMON NAME
	CANOPY EVERGREEN TREES	
192-2011	19	LCT-1 BALD CYPRESS
	SHRUBS, EVERGREEN HEDGES	
192-2023	20	ESH-1 ABELIA VAR. EDWARD GOUCHER
192-2072	22	ESH-2 CHERRY RED KNOCK OUT ROSE
192-2002	GROUND COVERS	
	17	OGC-1 TEXAS RED YUCCA
	75	OGC-2 ORIENTAL FOUNTAIN GRASS
	250	OGC-3 HAMELN GRASS
	24	OGC-4 MORNING LIGHT
	50	OGC-5 BURGANDY GIANT
	1000	OGC-6 WEEPING LOVE GRASS
192-2002	PERRIENIALS	
	37	FPR-1 CHERRY SAGE
	0	FPR-2 SIERRA SAN ANTONIO SAGE
	47	FPR-3 LANTANA, PURPLE, TRAILING
	0	FPR-4 LANTANA, WHITE, TRAILING
192-2003	VINES	
	15	DVN-1 BOSTON IVY
	GRASS	BGS-1 BERMUDA GRASS
	BED PREPARATION	
545 SQ YDS		SOIL PREPARTION
545 SQ YDS		3" MULCH OVER FINISHED PLANTING BEDS

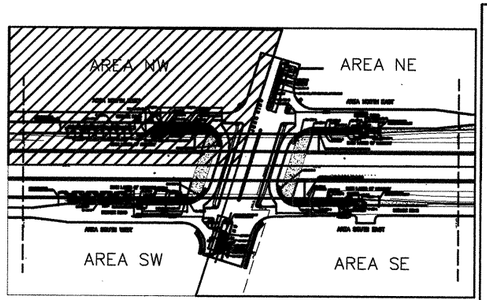
LEGEND

LANDSCAPE PLANT KEY:

1-ESH-1 — QUANTITY; PLANT LIST KEY, SEE PLANT

CONCRETE MOW BANDS:

18" WIDE, 5 INCH THICK CONCRETE PAVING SLOPE WITH GRADE, SEE DETAILS WITH EXPANSION JOINTS AT EACH END AND 8 FEET O.C.



LOCATION KEY MAP

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Thomas H. Pritchett, R.L.A. 3/04/2009

Signature of Registrant & Date

T. H. Pritchett / Associates
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LANDSCAPE PLANTING PLAN

AMENITY LANDSCAPE PLANS

AREA NORTH WEST

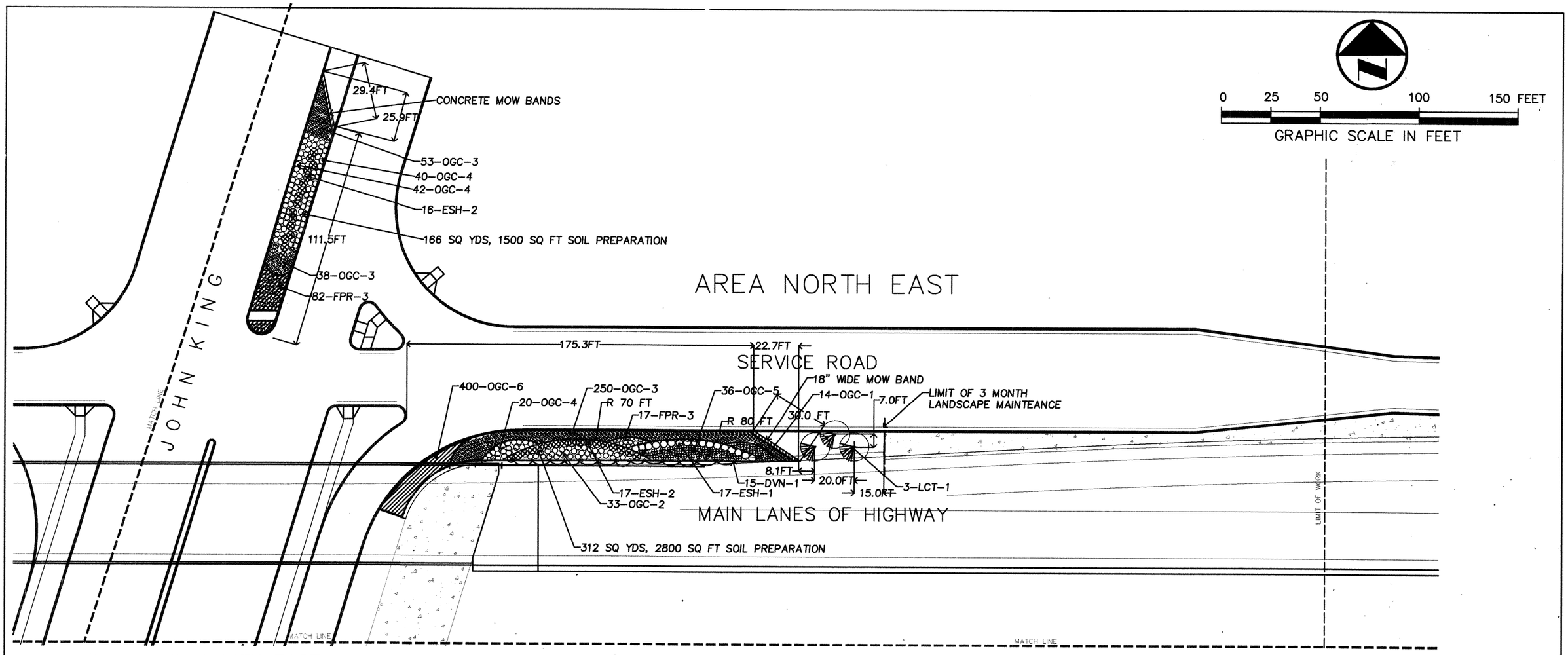
L101

SCALE: 1:50 AT 11" X 17"

SHEET 2 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS THP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK THP	TEXAS	DALLAS	ROCKWALL	459
CHECK THP	CONTROL	SECTION	JOB	
	0009	12	073	

TEMPLATED REVISED: 10-23-02



PLANT LIST NORTH EAST

	QUANTITY EACH		COMMON NAME
		CANOPY EVERGREEN TREES	
192–2011	3	LCT–1	BALD CYPRESS
		SHRUBS, EVERGREEN HEDGES	
192–2023	17	ESH–1	ABELIA VAR. EDWARD GOUCHER
192–2072	33	ESH–2	CHERRY RED KNOCK OUT ROSE
192–2002	GROUND COVERS		
	14	OGC–1	TEXAS RED YUCCA
	33	OGC–2	ORIENTAL FOUNTAIN GRASS
	341	OGC–3	HAMELN GRASS
	102	OGC–4	MORNING LIGHT
	36	OGC–5	BURGANDY GIANT
	400	OGC–6	WEEPING LOVE GRASS
192–2002	PERRIENIALS		
	0	FPR–1	CHERRY SAGE
	0	FPR–2	SIERRA SAN ANTONIO SAGE
	99	FPR–3	LANTANA, PURPLE, TRAILING
	0	FPR–4	LANTANA, WHITE, TRAILING
192–2003	VINES		
	15	DVN–1	BOSTON IVY
	GRASS	BGS–1	BERMUDA GRASS

BED PREPARATION
478 SQ YDS SOIL PREPARTION
478 SQ YDS 3" MULCH OVER FINISHED PLANTING BEDS

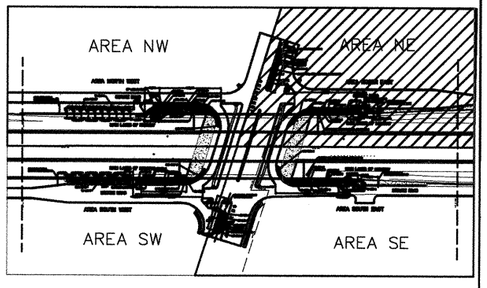
LEGEND

LANDSCAPE PLANT KEY:

1–ESH–1 QUANTITY
PLANT LIST KEY, SEE PLANT

CONCRETE MOW BANDS:

18" WIDE, 5 INCH THICK CONCRETE PAVING
SLOPE WITH GRADE, SEE DETAILS WITH
EXPANSION JOINTS AT EACH END AND 8 FEET O.C.



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT
THOMAS H. PRITCHETT
2115
STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Thomas H. Pritchett, RLA 3/04/2009
Signature of Registrant & Date

T. H. Pritchett / Associates
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LANDSCAPE PLANTING PLAN

AMENITY LANDSCAPE PLANS

AREA NORTH EAST

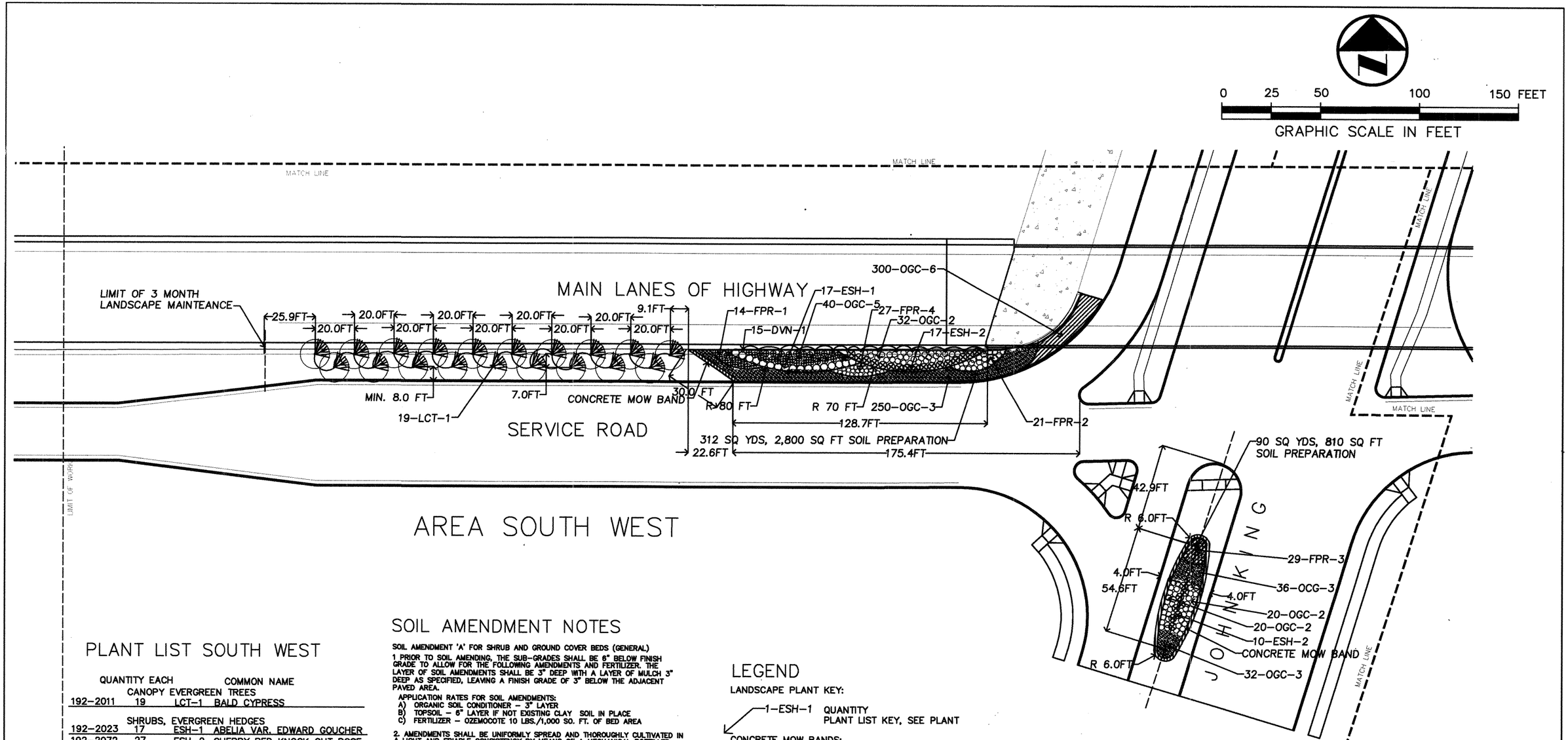
L102

SCALE: 1:50 AT 11" X 17" SHEET 3 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	460
CHECK	CONTROL	SECTION	JOB	
THP	0009	12	073	
CHECK				
THP				

USER ID

TEMPLATED REVISED: 10-23-02



AREA SOUTH WEST

PLANT LIST SOUTH WEST

	QUANTITY EACH	COMMON NAME	
		CANOPY EVERGREEN TREES	
192-2011	19	LCT-1	BALD CYPRESS
		SHRUBS, EVERGREEN HEDGES	
192-2023	17	ESH-1	ABELIA VAR. EDWARD GOUCHER
192-2072	27	ESH-2	CHERRY RED KNOCK OUT ROSE
192-2002	GROUND COVERS		
	0	OGC-1	TEXAS RED YUCCA
	72	OGC-2	ORIENTAL FOUNTAIN GRASS
	318	OGC-3	HAMELN GRASS
	0	OGC-4	MORNING LIGHT
	40	OGC-5	BURGANDY GIANT
	0	OGC-6	WEEPING LOVE GRASS
192-2002	PERRIENIALS		
	14	FPR-1	CHERRY SAGE
	21	FPR-2	SIERRA SAN ANTONIO SAGE
	29	FPR-3	LANTANA, PURPLE, TRAILING
	27	FPR-4	LANTANA, WHITE, TRAILING
192-2003	VINES		
	15	DVN-1	BOSTON IVY
	GRASS	BGS-1	BERMUDA GRASS

BED PREPARATION
402 SQ YDS SOIL PREPARTION
402 SQ YDS 3" MULCH OVER FINISHED PLANTING BEDS

SOIL AMENDMENT NOTES

SOIL AMENDMENT 'A' FOR SHRUB AND GROUND COVER BEDS (GENERAL)

1 PRIOR TO SOIL AMENDING, THE SUB-GRADES SHALL BE 6" BELOW FINISH GRADE TO ALLOW FOR THE FOLLOWING AMENDMENTS AND FERTILIZER. THE LAYER OF SOIL AMENDMENTS SHALL BE 3" DEEP WITH A LAYER OF MULCH 3" DEEP AS SPECIFIED, LEAVING A FINISH GRADE OF 3" BELOW THE ADJACENT PAVED AREA.

APPLICATION RATES FOR SOIL AMENDMENTS:
A) ORGANIC SOIL CONDITIONER – 3" LAYER
B) TOPSOIL – 6" LAYER IF NOT EXISTING CLAY SOIL IN PLACE
C) FERTILIZER – OZEMOCOTE 10 LBS./1,000 SQ. FT. OF BED AREA

2. AMENDMENTS SHALL BE UNIFORMLY SPREAD AND THOROUGHLY CULTIVATED IN A LIGHT AND FRIABLE CONSISTENCY BY MEANS OF A MECHANICAL ROTTILLER INTO THE TOP 6" OF SUB-GRADE WHICH WILL MAKE A BED OF APPROXIMATELY 6-9" TOTAL DEPTH OF AMENDED SOIL.

SOIL AMENDMENT 'C' PREPARED BACK FILL FOR TREES AND LARGE SHRUBS (3 GALLON AND LARGER) REMOVE BURLAP FROM TOP OF ROOT BALLS

1. BACK FILL MIX: PRIOR TO BACK FILL. PROVIDE TREE STAKING PER TREE
A) TOPSOIL – 3 PARTS FROM SITE STOCK PILES OR HOLE
B) COMPOST – 2 PART
C) 3" MULCH OVER 4" HIGH TREE WATER RING AND TOP OF BALL

SOIL AMENDMENT 'E' SOIL PREPARATION FOR LAWN AND GRASS AREAS

1. PRE-PLANT WEED CONTROL: ROUND-UP TO BE APPLIED UNIFORMLY TO TREAT FOR WEEDS.

2. SOIL AMENDMENTS FOR LAWN AND GRASS AREAS:
A) FOR HYDRO-SEEDING PREPARATION AND SOLID SOIL OPERATIONS.
B) PRIOR TO SOIL AMENDING, THE SUB-GRADES SHALL BE 2" BELOW FINISH GRADE TO ALLOW FOR THE FOLLOWING AMENDMENTS AND FERTILIZER. THE LAYER OF SOIL AMENDMENTS SHALL BE 1" DEEP LEAVING A FINISH GRADE 1" BELOW THE ADJACENT PAVED AREA. EXCAVATION AND/OR FILL MAY BE REQUIRED TO ACHIEVE THESE GRADES.

APPLICATION RATES FOR SOIL AMENDMENTS
A) TOP SOIL – 1/2" LAYER ON BASE OF CUT SOD
B) FERTILIZER – 10 LBS./1,000 SQ. FT. OF LAWN AREA
C) AMENDMENTS SHALL BE UNIFORMLY SPREAD AND THOROUGHLY CULTIVATED TO LIGHT AND FRIABLE CONSISTENT, BY MEANS OF A MECHANICAL ROTOTILLER INTO THE TOP 3" OF SUB-GRADE, WHICH WILL MAKE A BED OF APPROXIMATELY 4" DEPTH OF AMENDED SOIL.

MAINTENANCE NOTES

1. IT SHALL BE UNLAWFUL FOR THE OWNER OR OCCUPANT OF PROPERTY ON WHICH A LANDSCAPE PLAN HAS BEEN APPROVED, PURSUANT TO THIS CHAPTER, TO FAIL TO PLANT OR MAINTAIN IN LIVING CONDITION, THE PLANTS AND TREES SHOWN ON THIS PLAN.
2. REPLACEMENT OF PLANT MATERIALS IS REQUIRED IF DEAD OR IN POOR HEALTH.

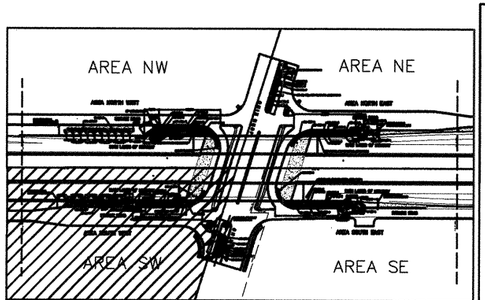
LEGEND

LANDSCAPE PLANT KEY:

1-ESH-1 QUANTITY
PLANT LIST KEY, SEE PLANT

CONCRETE MOW BANDS:

18" WIDE, 5 INCH THICK CONCRETE PAVING
SLOPE WITH GRADE, SEE DETAILS WITH
EXPANSION JOINTS AT EACH END AND 8 FEET O.C.



LOCATION KEY MAP

T. H. Pritchett / Associates
LANDSCAPE ARCHITECTS - 1218 CAMINO LAGO, IRVING, TEXAS 75039
PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

REGISTERED LANDSCAPE ARCHITECT * THOMAS H. PRITCHETT * 2115 * STATE OF TEXAS *

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Thomas H. Pritchett, R.L.A. 3/04/2009
Signature of Registrant & Date

Texas Department of Transportation
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LANDSCAPE PLANTING PLAN

AMENITY LANDSCAPE PLANS

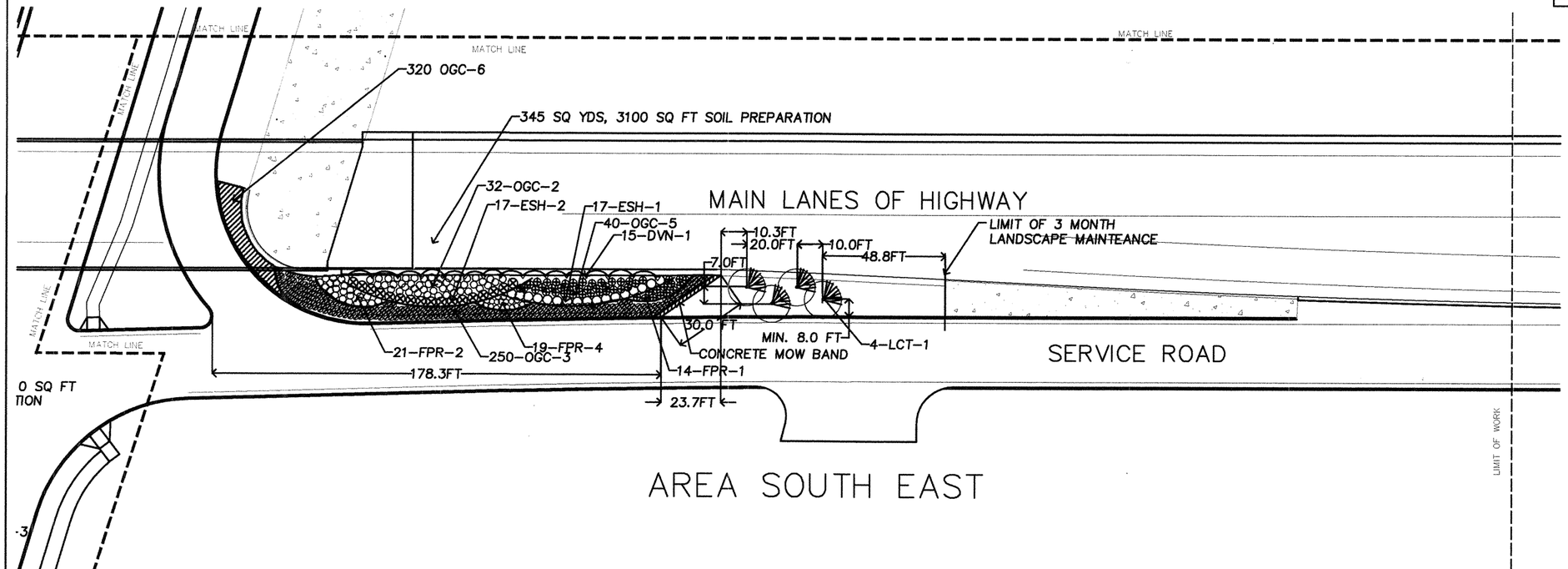
AREA SOUTH WEST

L103

SCALE: 1:50 AT 11" X 17" SHEET 4 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	461
CHECK	CONTROL	SECTION	JOB	
THP	0009	12	073	

TEMPLATED REVISED: 10-23-02



0 25 50 100 150 FEET

GRAPHIC SCALE IN FEET

LANDSCAPE NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR BEING FAMILIAR WITH ALL UNDERGROUND UTILITIES, PIPES, AND STRUCTURES. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO DAMAGE OF SOIL UTILITIES.
2. CONTRACTOR SHALL NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS, AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AT (972(484-7373. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH GENERAL CONTRACTOR AND SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH PLANTING OPERATIONS.
4. IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR IS TO CONTACT LANDSCAPE ARCHITECT FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE LANDSCAPE ARCHITECT WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE THE MATERIALS.
5. ALL PLANT MATERIAL SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
6. FINAL LOCATION OF ALL PLANT MATERIAL SHALL BE SUBJECT THE APPROVAL OF THE LANDSCAPE ARCHITECT AND OWNER.
7. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT 48 HOURS PRIOR TO COMMENCEMENT OF LANDSCAPE WORK TO COORDINATE PROJECT INSPECTION SCHEDULES.
8. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL SHRUB AND GROUND COVER AREA IN A WEED-FREE, DEBRIS-FREE, AND BERMUDA-FREE CONDITION. ALL EXISTING GRASSES SHALL BE DUG OUT BY THE ROOTS AND REMOVED FROM THE SITE.
9. ALL PLANTING AREA SHALL SLOPE AWAY FROM BUILDINGS TOWARDS THE WALKS AT A MINIMUM 2% SLOPE.
10. FINISH GRADE SHALL BE 1" BELOW FINISH PAVING SURFACE IN ADJACENT LAWN AREA AND 2" IN SHRUB AREAS. SOME SOIL EXCAVATION MAY BE REQUIRED TO ACCOMPLISH FINISH GRADE. (SEE SOIL PREPARATION SPECIFICATIONS.)
11. CROWN OF AL PLANT ROOT SYSTEMS SHALL BE SLIGHTLY HIGHER AFTER SETTLING ADJACENT SOIL.
12. SEE DETAILS AND SPECIFICATIONS FOR STAKING AND GUYING METHODS, PLAT PIT DIMENSIONS AND BACK FILL REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE TREE'S STABILITY FOR THE DURATION OF THE WARRANTY PERIOD.
13. SHRUBS, GROUND COVERS, AND SEASONAL COLOR SHALL BE TRIANGULARLY SPACED AT SPAN SHOWN ON PLANT LIST AND SHALL RECEIVE A 2" LAYER OF LAYER OF MULCH.
14. ALL GROUND COVERS TO BE HELD BACK 12" FROM EDGE OF SHRUB PLANTING AREAS AND 6" FROM EDGE OF PAVING. ALL PLANTING BEDS TO BE DIVIDED FROM SOD WITH STEEL EDGING, TYPICAL.
15. SEASONAL COLOR WILL BE SELECTED BT THE LANDSCAPE ARCHITECT PRIOR TO THE INSTALLATION TIME.
16. ALL TREES SHALL BE LOCATED A MINIMUM OF 4 FEET FROM WALLS, HEADERS, WALKS, AND OTHER TREES WITHIN THE PROJECT. IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR IS TO CONTACT ARCHITECT FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE ARCHITECT WILL RESULT IN CONTRACTOR LIABILITY TO REDUCE THE MATERIALS.
17. SLOPE AREA SHALL NOT HAVE PLANTING INSTALLED UNTIL ALL GULLIES TO RUTS HAVE FILLED IN WITH ADJACENT SOIL AND COMPACTED.
18. LANDSCAPE CONTRACTOR TO RECEIVE SITE GRADED +/- .10 OF 1' OF FINISHED GRADE.
19. IT IS THE CONTRACTORS RESPONSIBILITY TO FURNISH PLANT MATERIALS FREE OF PEST OR PLANT DISEASE. IT IS THE CONTRACTORS OBLIGATION TO WARRANTY ALL PLANT MATERIAL FOR 365 DAYS FROM FINAL COMPLETION DATE.

PLANT LIST SOUTH EAST

	QUANTITY EACH		COMMON NAME
		CANOPY EVERGREEN TREES	
192-2011	4	LCT-1	BALD CYPRESS
		SHRUBS, EVERGREEN HEDGES	
192-2023	17	ESH-1	ABELIA VAR. EDWARD GOUCHER
192-2072	17	ESH-2	CHERRY RED KNOCK OUT ROSE
192-2002	GROUND COVERS		
	0	OGC-1	TEXAS RED YUCCA
	32	OGC-2	ORIENTAL FOUNTAIN GRASS
	250	OGC-3	HAMELN GRASS
	0	OGC-4	MORNING LIGHT
	40	OGC-5	BURGANDY GIANT
	320	OGC-6	WEEPING LOVE GRASS
192-2002	PERRIENIALS		
	14	FPR-1	CHERRY SAGE
	21	FPR-2	SIERRA SAN ANTONIO SAGE
	0	FPR-3	LANTANA, PURPLE, TRAILING
	19	FPR-4	LANTANA, WHITE, TRAILING
192-2003	VINES		
	15	DVN-1	BOSTON IVY
	GRASS	BGS-1	BERMUDA GRASS

BED PREPARATION
345 SQ YDS SOIL PREPARTION
345 SQ YDS 3" MULCH OVER FINISHED PLANTING BEDS

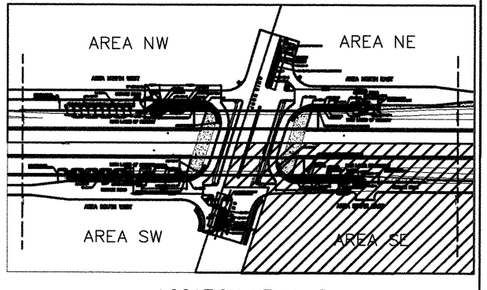
LEGEND

LANDSCAPE PLANT KEY:

1-ESH-1 QUANTITY
PLANT LIST KEY, SEE PLANT

CONCRETE MOW BANDS:

18" WIDE, 5 INCH THICK CONCRETE PAVING
SLOPE WITH GRADE, SEE DETAILS WITH
EXPANSION JOINTS AT EACH END AND 8 FEET O.C.



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT
THOMAS H. PRITCHETT
2115
STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Thomas H. Pritchett, RLA 3/04/2009
Signature of Registrant & Date

T. H. Pritchett / Associates
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LANDSCAPE PLANTING PLAN

AMENITY LANDSCAPE PLANS

AREA SOUTH EAST

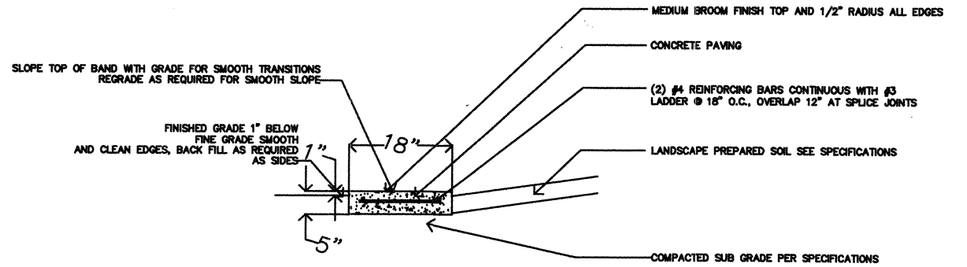
L104

SCALE: 1:50 AT 11" X 17" SHEET 5 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	
CHECK	CONTROL	SECTION	JOB	462
THP	0009	12	073	
CHECK				
THP				

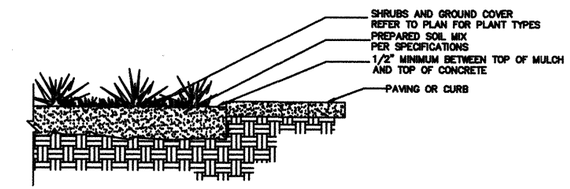
TEMPLATED REVISED: 10-23-02

USER ID



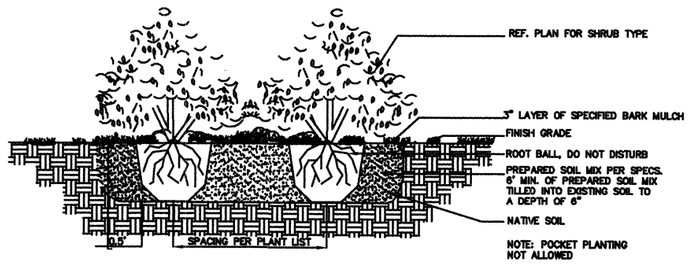
01 L105 CONCRETE BANDS IN LANDSCAPE

NOT TO SCALE



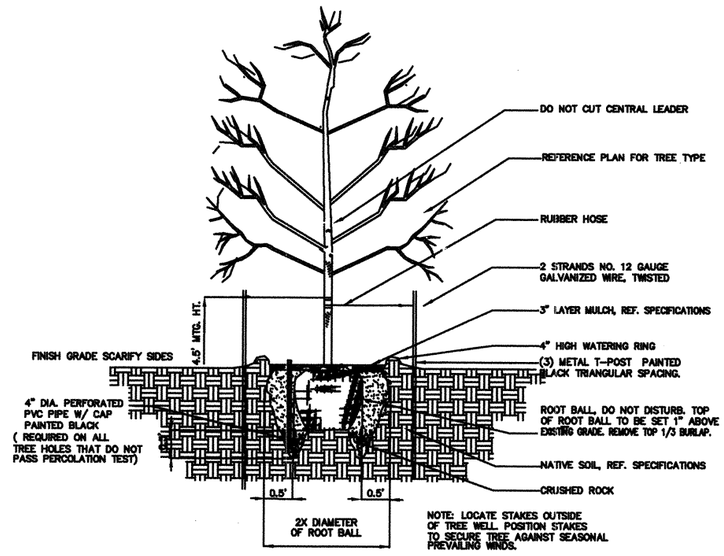
02 L105 SIDEWALK/MULCH DETAIL

NOT TO SCALE



03 L105 SHRUB/GROUNDCOVER DETAIL

NOT TO SCALE



04 L105 TREE PLANTING DETAIL

NOT TO SCALE

T. H. Pritchett / Associates
LANDSCAPE ARCHITECTS - 1218 CAMINO LAGO, IRVING, TEXAS 75039
PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

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THOMAS H. PRITCHETT
2115
STATE OF TEXAS

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Thomas H. Pritchett, RLA 3/04/2009

Signature of Registrant & Date

LANDSCAPE PLANTING DETAILS

AMENITY LANDSCAPE PLANS

DETAILS

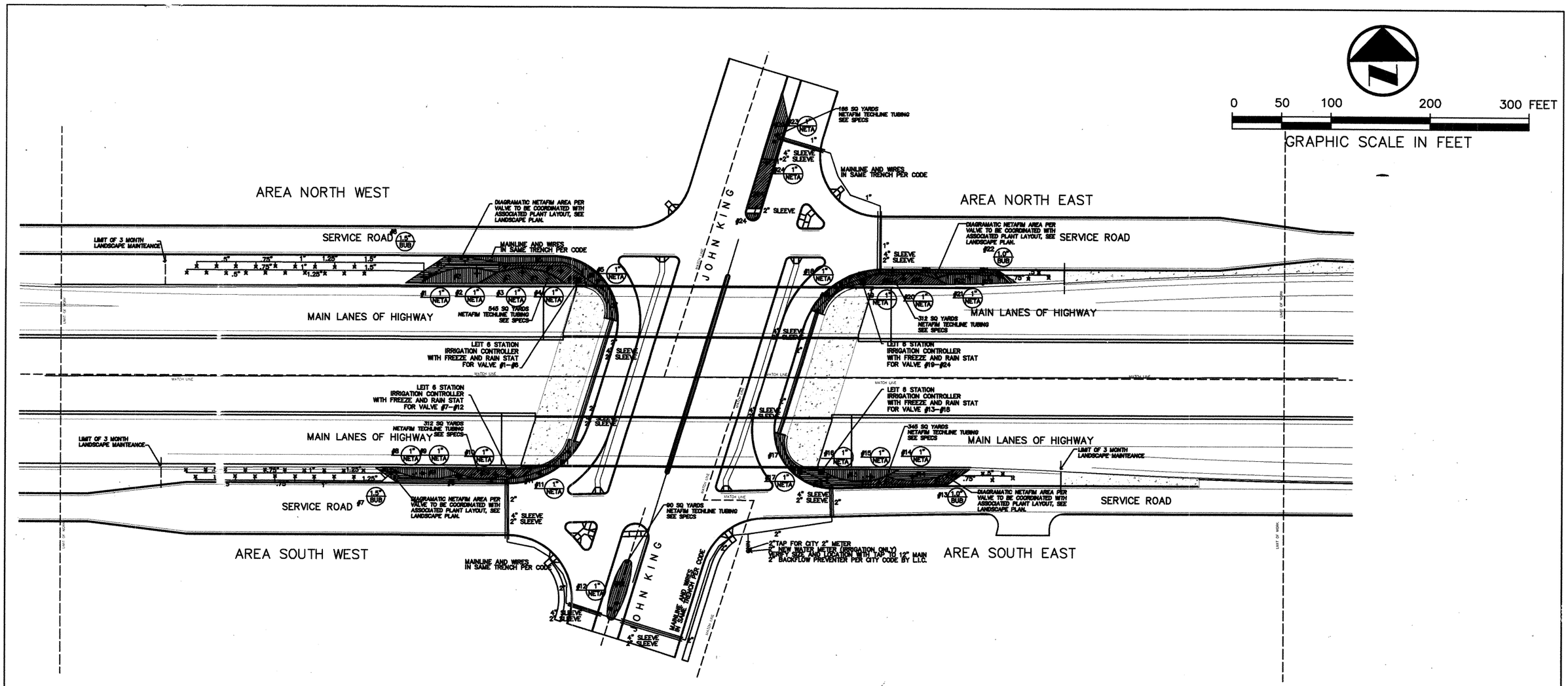
L105

SCALE: 1:50 AT 11" X 17"

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS THP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK THP	TEXAS	DALLAS	ROCKWALL	463
CHECK THP	CONTROL 0009	SECTION 12	JOB 073	

TEMPLATED REVISED: 10-23-02

USER ID



AMENITY IRRIGATION ITEMS

SPEC ITEM	TXDOT SPECIFICATION	QTY	UNIT
170 2001	IRRIGATION SYSTEM	1.00	LS

QUANTITIES ARE PROVIDED FOR CONTRACTORS INFORMATION ONLY, ADJUST QUANTITIES AS NECESSARY TO INSTALL FULLY FUNCTIONING IRRIGATION SYSTEM WITH 100% COVERAGE.

BID ITEMS

4 CONTROLLER AND MOUNTING POST, PER PLANS

4 RAINSTAT

4 FREEZE STAT

1 2" DOUBLE CHECK, IN CONCRETE BOX, PER PLANS

14 QUICK COUPLERS 3/4", WITH KEYS AND QUICK COUPLER IN BOX. PER PLANS

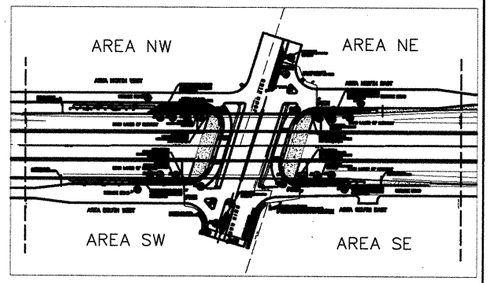
24 1" VALVES IN VALVE BOXES AS SHOWN, PER PLANS

1,660 LF MAIN LINE 2" P.V.C. PIPE, PER PLANS

592 LF 4" P.V.C. SLEEVES, SCH 80 FOR MAIN LINES MEASURED BOC–BOC, ADDED 5 FEET ON EACH SIDE

592 LF 2" P.V.C. SLEEVES, SCH 80 FOR CONTROL WIRES MEASURED BOC–BOC w/ 5 FEET ON EACH SIDE

1,770 SQ YDS NETAFIM TECHLINE WATERING PIPES, INSTALLED PER PLANS, PIN EVERY 2 FEET AND ALL ENDS, CORNER AND SPLICES



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT THOMAS H. PRITCHETT 2115 STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Thomas H. Pritchett, RLA 3/04/2009

Signature of Registrant & Date

T. H. Pritchett / Associates
LANDSCAPE ARCHITECTS - 1218 CAMINO LAGO, IRVING, TEXAS 75039
PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

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IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

OVERALL AMENITY AREAS

I 100

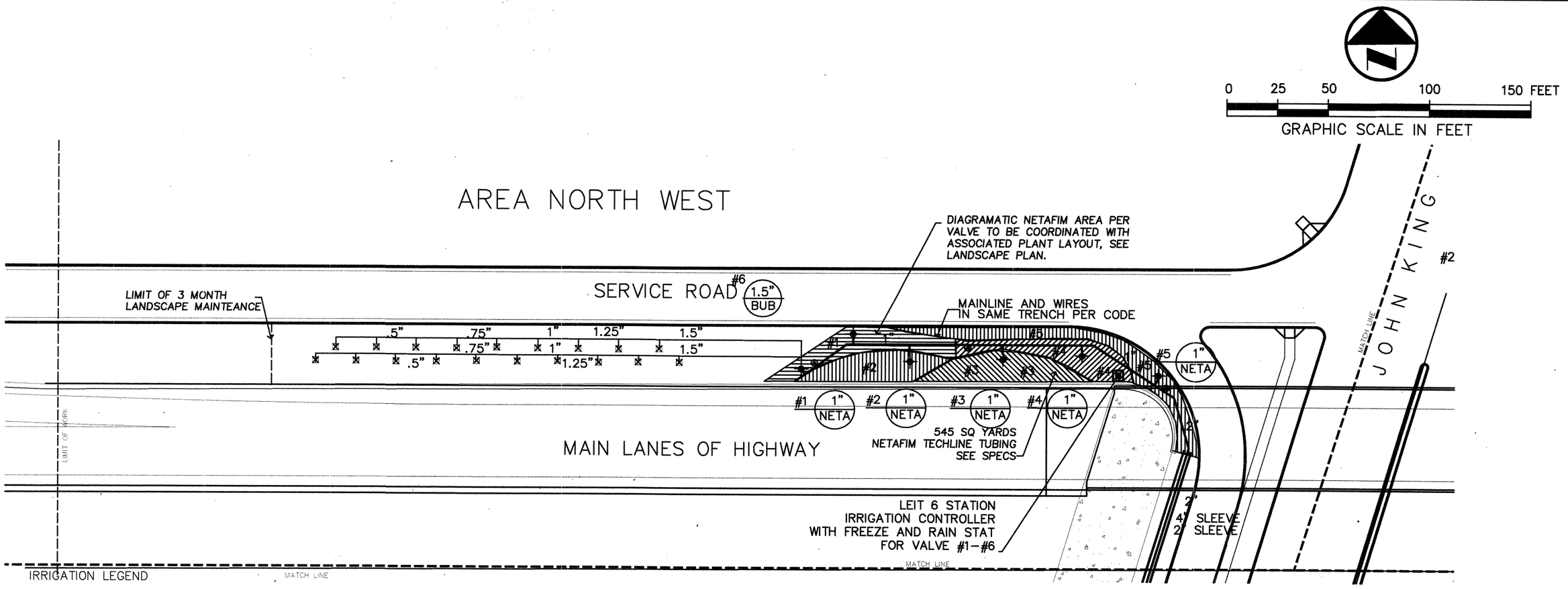
SCALE: 1:100 AT 11" X 17" SHEET 1 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	
CHECK	CONTROL	SECTION	JOB	464
THP	0009	12	073	

TEMPLATED REVISED: 10-23-02

USER ID

USER ID

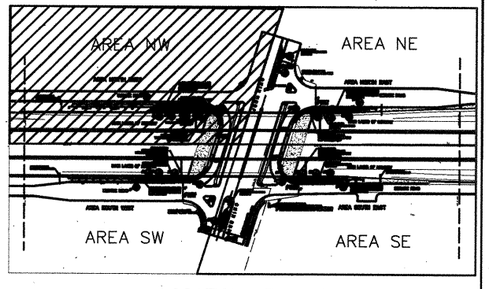


IRRIGATION LEGEND

- ADJUSTABLE BUBBLER (2 PER TREE, TYP.)
- HUNTER SRC PLUS ELECTRIC VALVE
- .75" QUICK COUPLER WITH BOX AND .75" KEY
- CONTROLLER, LEIT 6 STATION, BATTERY POWERED
- WATER METER, 2" SIZE AS INDICATED WITH D.C.A., 2" SIZE AS INDICATED
- PVC SCHEDULE 40 SLEEVING
- PVC CLASS 200 MAINLINE
- PVC CLASS 200 LATERAL LINE
- 1.5" BUB — VALVE SIZE / GPM
- #1 — NETAFIM TECHLINE # TLDL6–1210 (18" LATERAL SPACING, 12" EMITTER SPACING) PVC LATERAL PIPING SIZED AS REQUIRED INSTALL ALL EQUIPMENT ACCORDING TO MANUFACTURERS SPECIFICATIONS
- #11 1" NETA — NETAFIM DISC FILTER #DF100–080 NETAFIM PRESSURE REGULATOR #PRV15025 INSTALL ALL EQUIPMENT ACCORDING TO MANUFACTURERS SPECIFICATIONS

BUBBLER PIPING CHART

NUMBER OF BUBBLERS	SIZE OF PIPE
1 – 5	.5"
6 – 10	.75"
11 – 20	1"
21 – 30	1.25"
31 – 40	1.5"



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT THOMAS H. PRITCHETT 2115 STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Signature of Registrant & Date — R.L.A. 3/04/2009

T. H. Pritchett / Associates
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PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

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IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

AREA NORTH WEST

L101

SCALE: 1:50 AT 11" X 17" SHEET 2 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS THP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK THP	TEXAS	DALLAS	ROCKWALL	465
CHECK THP	CONTROL 0009	SECTION 12	JOB 073	

TEMPLATED REVISED: 10-23-02

USER ID

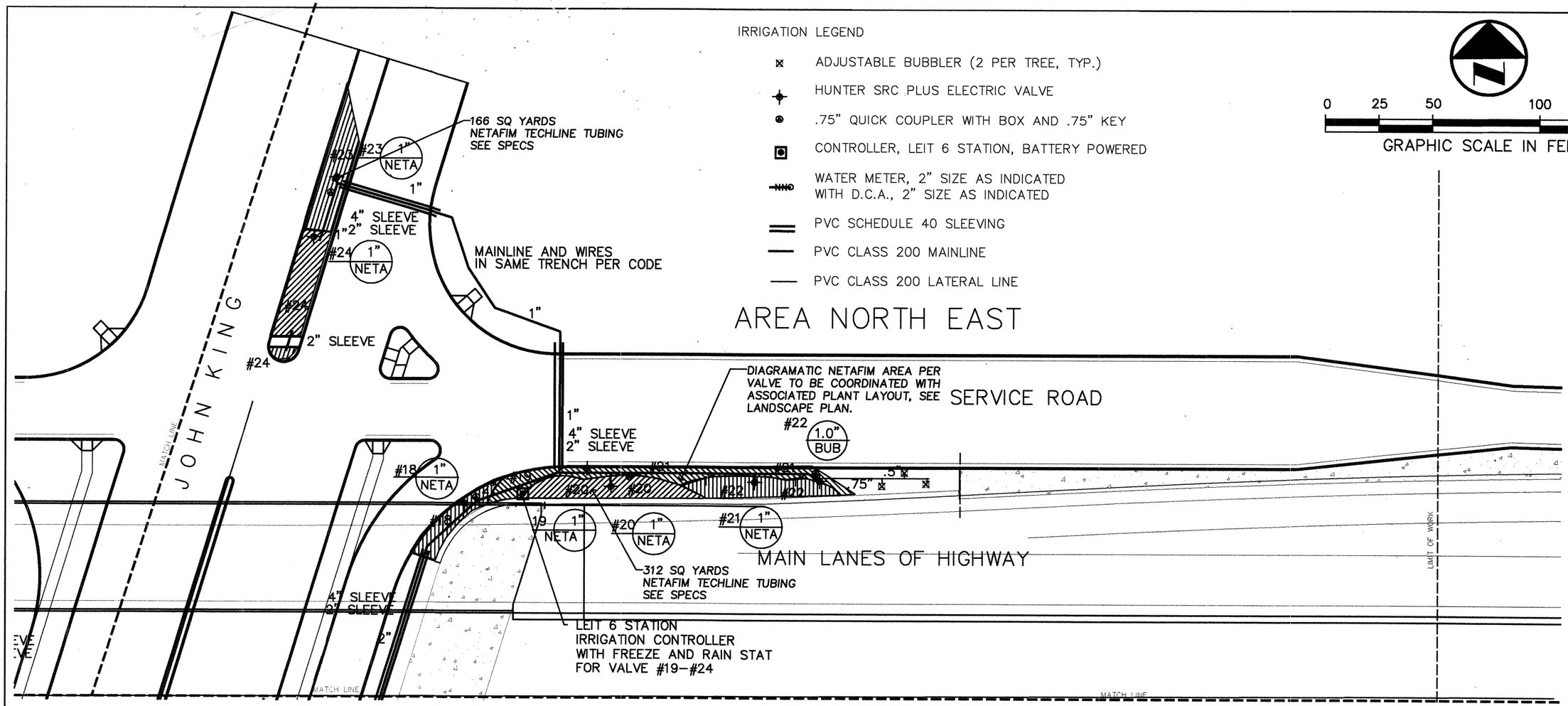
IRRIGATION LEGEND

- ADJUSTABLE BUBBLER (2 PER TREE, TYP.)
- HUNTER SRC PLUS ELECTRIC VALVE
- .75" QUICK COUPLER WITH BOX AND .75" KEY
- CONTROLLER, LEIT 6 STATION, BATTERY POWERED
- WATER METER, 2" SIZE AS INDICATED WITH D.C.A., 2" SIZE AS INDICATED
- PVC SCHEDULE 40 SLEEVING
- PVC CLASS 200 MAINLINE
- PVC CLASS 200 LATERAL LINE

0 25 50 100 150 FEET

GRAPHIC SCALE IN FEET

AREA NORTH EAST



IRRIGATION LEGEND

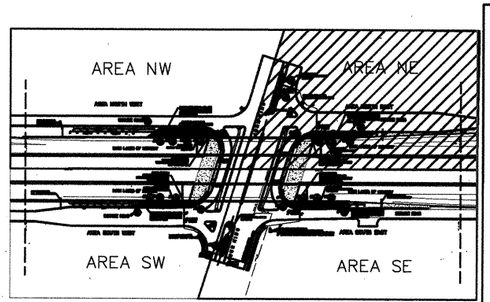
1.5" BUB — VALVE SIZE / GPM

#11 — NETAFIM TECHLINE # TLDL6–1210
(18" LATERAL SPACING, 12" EMITTER SPACING)
PVC LATERAL PIPING SIZED AS REQUIRED
INSTALL ALL EQUIPMENT ACCORDING TO MANUFACTURERS SPECIFICATIONS

#11 1" NETA — NETAFIM DISC FILTER #DF100–080
NETAFIM PRESSURE REGULATOR #PRV15025
INSTALL ALL EQUIPMENT ACCORDING TO MANUFACTURERS SPECIFICATIONS

BUBBLER PIPING CHART

NUMBER OF BUBBLERS	SIZE OF PIPE
1 – 5	.5"
6 – 10	.75"
11 – 20	1"
21 – 30	1.25"
31 – 40	1.5"



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT THOMAS H. PRITCHETT 2115 STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Signature of Registrant & Date — R.L.A. 3/04/2009

T. H. Pritchett / Associates
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IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

AREA NORTH EAST

1102

SCALE: 1:50 AT 11" X 17" SHEET 3 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	466
CHECK	CONTROL	SECTION	JOB	
THP	0009	12	073	
CHECK				
THP				

TEMPLATED REVISED: 10-23-02

USER ID

0 25 50 100 150 FEET

GRAPHIC SCALE IN FEET

MATCH LINE

LEIT 6 STATION IRRIGATION CONTROLLER WITH FREEZE AND RAIN STAT FOR VALVE #7–#12

312 SQ YARDS NETAFIM TECHLINE TUBING SEE SPECS

MAIN LANES OF HIGHWAY

LIMIT OF 3 MONTH LANDSCAPE MAINTEANCE

#8 1" NETA #9 1" NETA #10 1" NETA #11 1" NETA

.5" .75" 1" 1.25" 1.25" .5" .75" 1"

#7 1.5" BUB

SERVICE ROAD #7

DIAGRAMATIC NETAFIM AREA PER VALVE TO BE COORDINATED WITH ASSOCIATED PLANT LAYOUT, SEE LANDSCAPE PLAN.

2" 4" SLEEVE 2" SLEEVE

90 SQ YARDS NETAFIM TECHLINE TUBING SEE SPECS

MAINLINE AND WIRES IN SAME TRENCH PER CODE

#12 1" NETA

JOHN KING

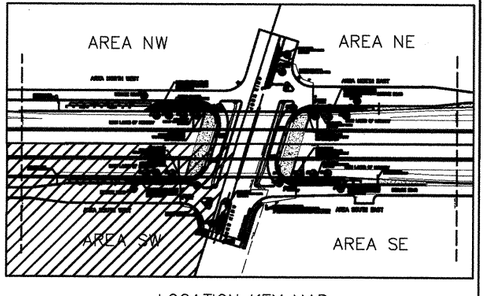
LIMIT OF WORK

AREA SOUTH WEST

IRRIGATION LEGEND

- ADJUSTABLE BUBBLER (2 PER TREE, TYP.)
- HUNTER SRC PLUS ELECTRIC VALVE
- .75" QUICK COUPLER WITH BOX AND .75" KEY
- CONTROLLER, LEIT 6 STATION, BATTERY POWERED
- WATER METER, 2" SIZE AS INDICATED WITH D.C.A., 2" SIZE AS INDICATED
- PVC SCHEDULE 40 SLEEVING
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NUMBER OF BUBBLERS	SIZE OF PIPE
1 – 5	.5"
6 – 10	.75"
11 – 20	1"
21 – 30	1.25"
31 – 40	1.5"



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT THOMAS H. PRITCHETT 2115 STATE OF TEXAS

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Thomas H. Pritchett, RLA 3/04/2009

Signature of Registrant & Date

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IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

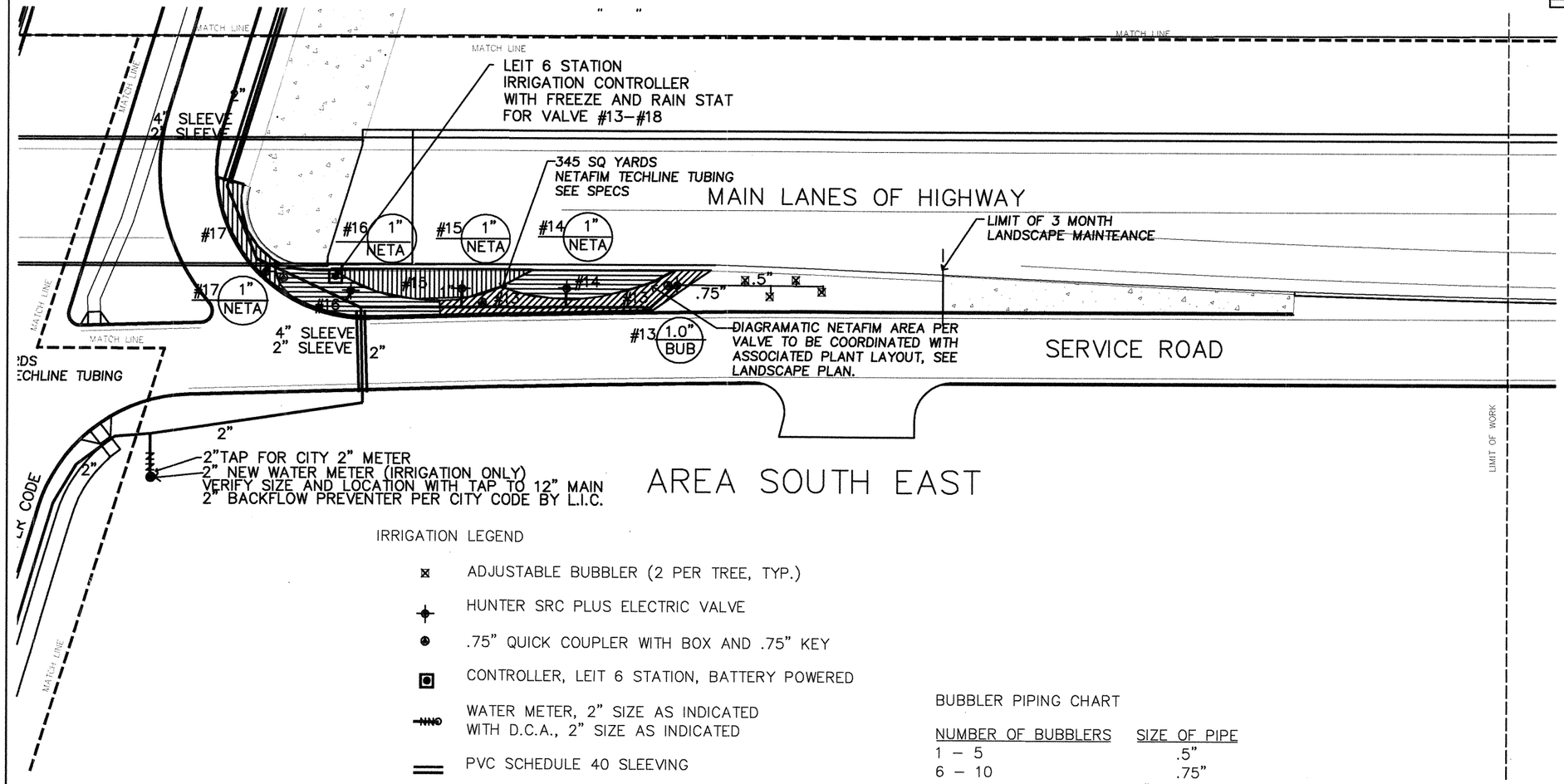
AREA SOUTH WEST

L103

SCALE: 1:50 AT 11" X 17" SHEET 4 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS THP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK THP	TEXAS	DALLAS	ROCKWALL	467
CHECK THP	CONTROL	SECTION	JOB	
	0009	12	073	

TEMPLATED REVISED: 10-23-02

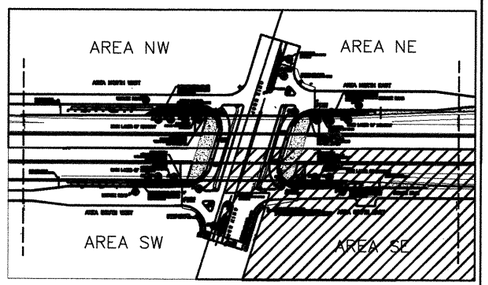


IRRIGATION LEGEND

- ⊠ ADJUSTABLE BUBBLER (2 PER TREE, TYP.)
- HUNTER SRC PLUS ELECTRIC VALVE
- .75" QUICK COUPLER WITH BOX AND .75" KEY
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  WITH D.C.A., 2" SIZE AS INDICATED
- PVC SCHEDULE 40 SLEEVING
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  (18" LATERAL SPACING, 12" EMITTER SPACING)
  PVC LATERAL PIPING SIZED AS REQUIRED
  INSTALL ALL EQUIPMENT ACCORDING TO
  MANUFACTURERS SPECIFICATIONS
- #11 1" NETA — NETAFIM DISC FILTER #DF100–080
  NETAFIM PRESSURE REGULATOR #PRV15025
  INSTALL ALL EQUIPMENT ACCORDING TO
  MANUFACTURERS SPECIFICATIONS

BUBBLER PIPING CHART

NUMBER OF BUBBLERS	SIZE OF PIPE
1 – 5	.5"
6 – 10	.75"
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21 – 30	1.25"
31 – 40	1.5"



LOCATION KEY MAP

REGISTERED LANDSCAPE ARCHITECT
THOMAS H. PRITCHETT
2115
STATE OF TEXAS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY T. H. PRITCHETT, R.L.A. NO. 2115

Thomas H. Pritchett, RLA 3/04/2009
Signature of Registrant & Date

T. H. Pritchett / Associates
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PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

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IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

AREA SOUTH EAST

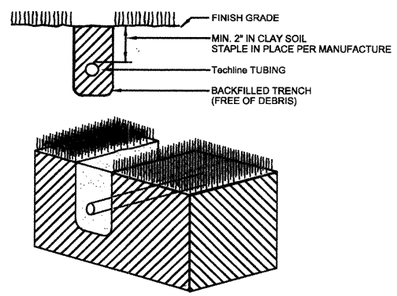
I104

SCALE: 1:50 AT 11" X 17" SHEET 5 OF 5

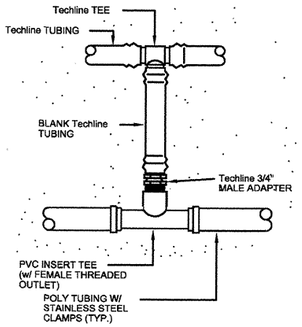
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THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	468
CHECK	CONTROL	SECTION	JOB	
THP	0009	12	073	
CHECK				
THP				

TEMPLATED REVISED: 10-23-02

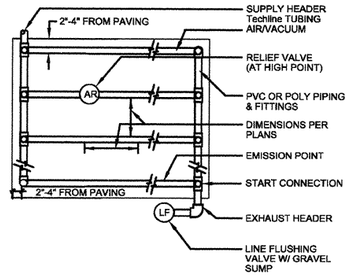
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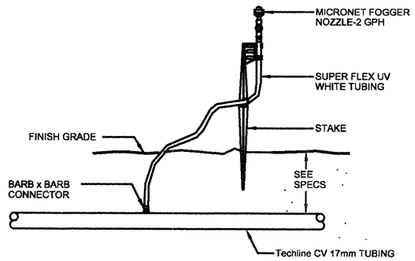
1 Techline TRENCHING
NO SCALE



2 Techline START CONNECTION
POLY TUBING TO TEE
SECTION - NO SCALE

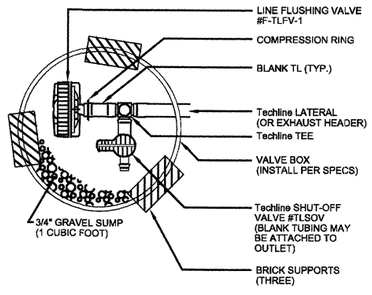


3 Techline TUBING & ACCESSORIES
SAMPLE LAYOUT
SECTION - NO SCALE

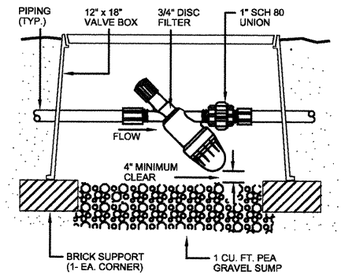


NOTE: LOCATE INDICATOR STAKE AT
THE FARTHEST AND/OR HIGHEST POINT
ON THE ZONE. LOCATE IN A VISIBLE AREA FROM THE ROAD..

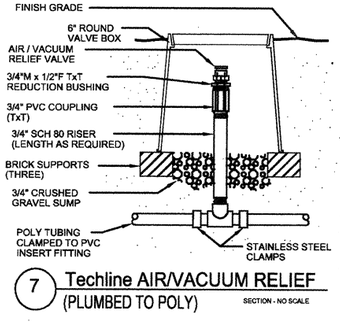
4 Techline CV OPERATION
PRESSURE INDICATOR STAKE
NO SCALE



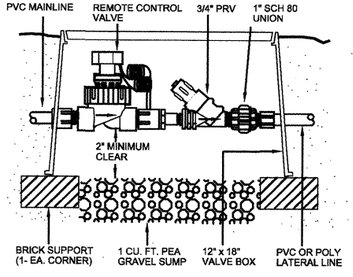
5 Techline LINE FLUSHING VALVE
W/ SHUT-OFF VALVE
SECTION - NO SCALE



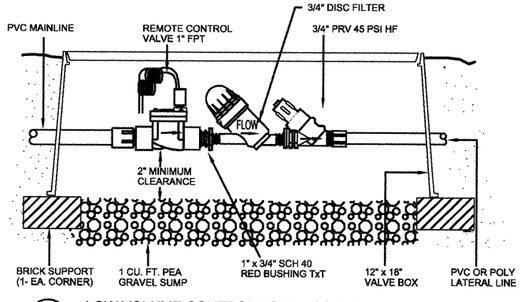
6 3/4" DISC FILTER
SECTION - NO SCALE



7 Techline AIR/VACUUM RELIEF
(PLUMBED TO POLY)
SECTION - NO SCALE



8 REMOTE CONTROL VALVE W/
3/4" PRV
SECTION - NO SCALE



9 LOW VOLUME CONTROL ZONE ASSEMBLY
P/N LVCZ10075-HF
3.5 - 17.6 GPM
SECTION - NO SCALE

THE SEAL APPEARING ON THIS
DOCUMENT WAS AUTHORIZED BY
T. H. PRITCHETT, R.L.A.
NO. 2115

Thomas H. Pritchett, RLA 3/04/2009
Signature of Registrant & Date

T. H. Pritchett / Associates
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PHONE 972-869-3535 CELL 214-697-2580 EMAIL Tom@LandDesignPlan.com

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IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

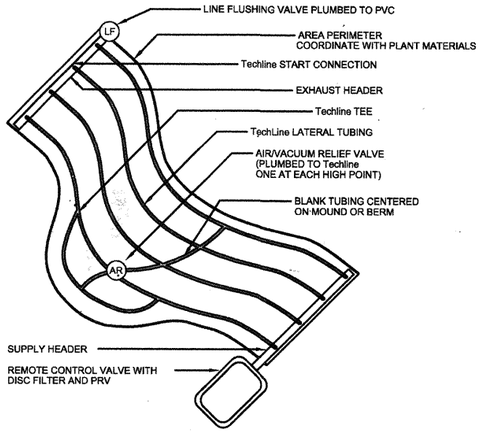
DETAILS 1 OF 2

. I 105

SCALE: 1:50 AT 11" X 17"

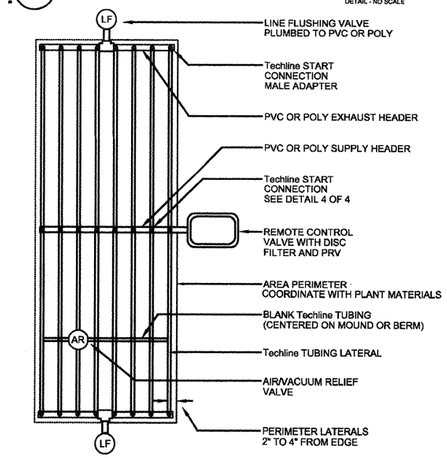
DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
THP	TEXAS	DALLAS	ROCKWALL	469
CHECK	CONTROL	SECTION	JOB	
THP	0009	12	073	

TEMPLATED REVISED: 10-23-02



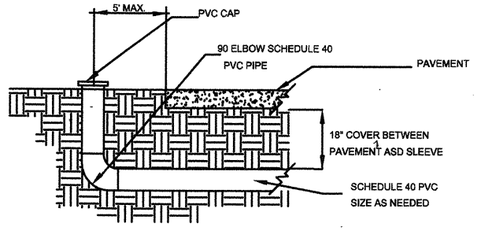
10 IRREGULAR AREAS: ODD CURVES

DETAIL - NO SCALE



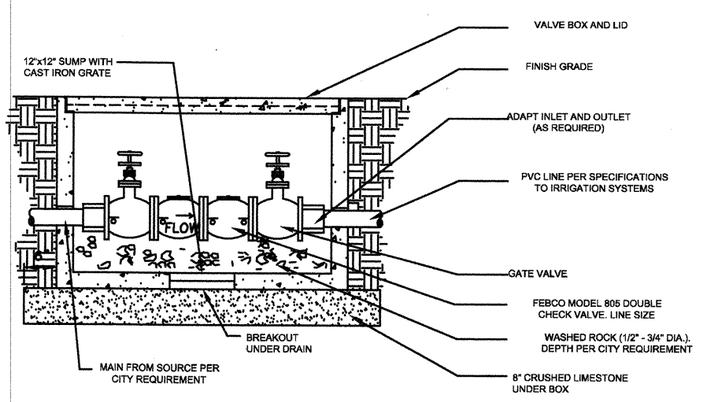
11 Techline CENTER FEED LAYOUT

DETAIL - NO SCALE



12 SLEEVE DETAILS

DETAIL - NO SCALE



13 BACK FLOW PREVENTER

DETAIL - NO SCALE

TEMPLATED REVISED: 10-23-02

T. H. Pritchett / Associates
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2115
STATE OF TEXAS

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Thomas H. Pritchett, R.L.A. 3/04/2009
Signature of Registrant & Date

IRRIGATION SYSTEM PLAN

AMENITY IRRIGATION PLANS

DETAILS 2 OF 2

I 106

SCALE: 1:50 AT 11" X 17"

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
THP	6	(See Title Sheet)		IH 30
GRAPHICS THP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK THP	TEXAS	DALLAS	ROCKWALL	470
CHECK THP	CONTROL	SECTION	JOB	
	0009	12	073	