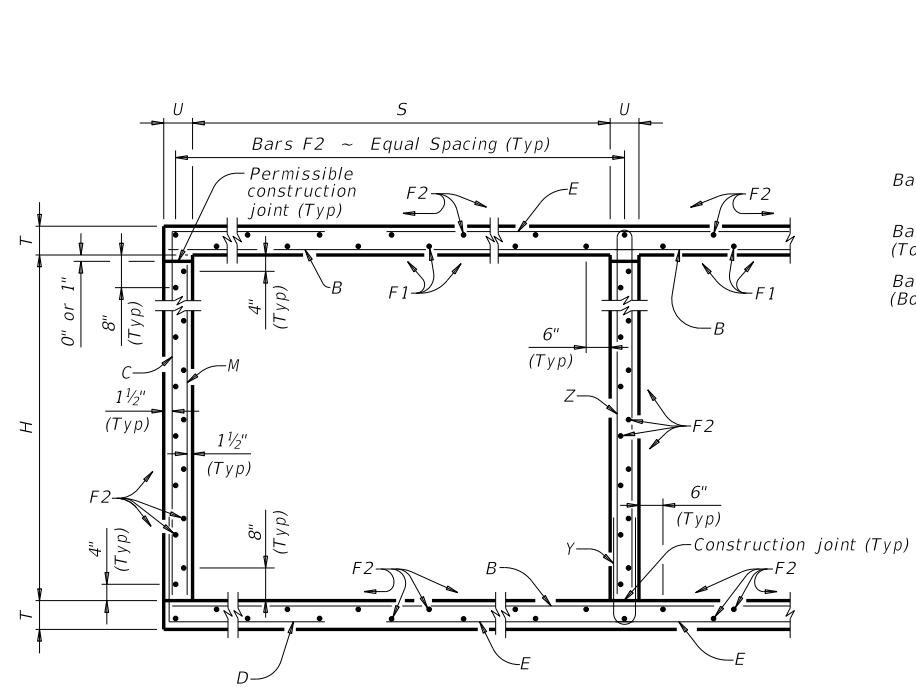
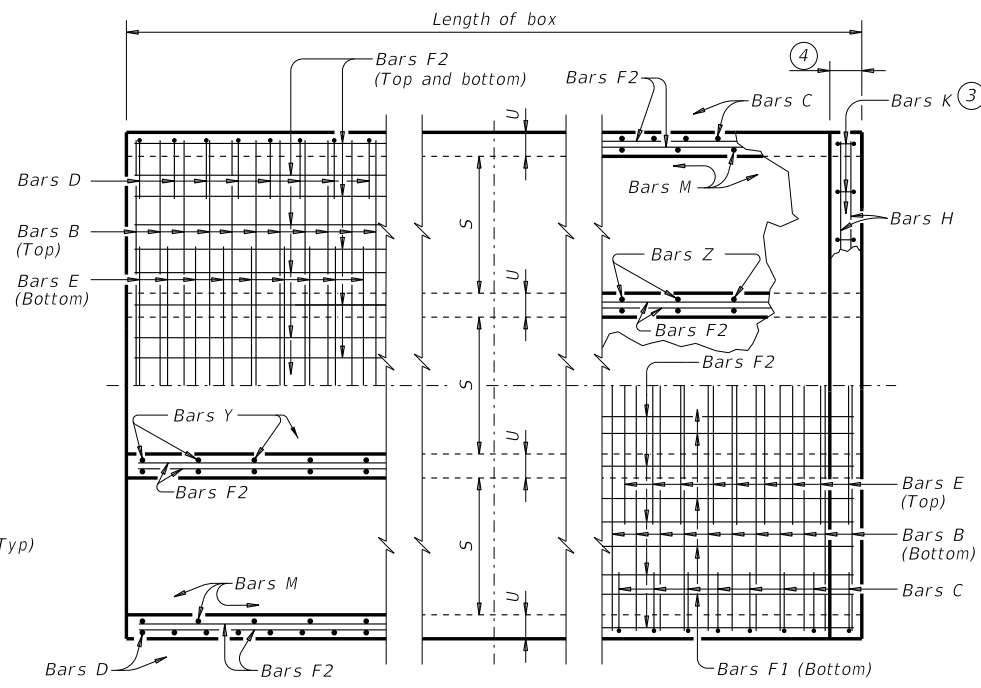


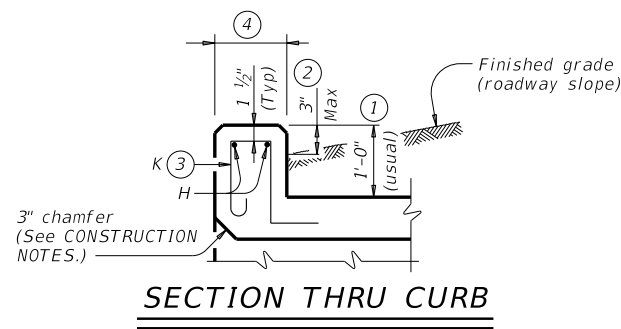
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TYPICAL SECTION

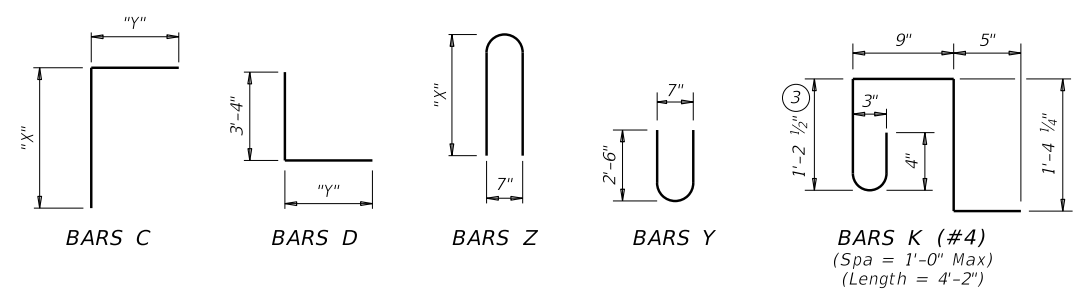


PART PLANS



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
4'-0"	4'-10 1/2"	5'-7 1/2"
5'-0"	5'-10 1/2"	5'-7 1/2"
6'-0"	6'-10 1/2"	5'-7 1/2"
7'-0"	7'-10 1/2"	5'-7 1/2"
8'-0"	8'-10 1/2"	5'-7 1/2"
9'-0"	9'-10 1/2"	5'-7 1/2"



- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 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.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:
 Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb.
 Provide bar laps, where required, as follows:
 • Uncoated or galvanized ~ #4 = 1'-8" Min
 • Uncoated or galvanized ~ #5 = 2'-1" Min
 • Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
 See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions are out-to-out of bar.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE

9'-0" SPAN
2' TO 23' FILL
MC-9-23

FILE: CD-MC923-20.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY	SHEET NO.	

DATE:
FILE:

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DATE: FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																																QUANTITIES																
					Bars B				Bars C & D				Bars E				Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total												
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars C		Bars D		No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Bars Y		Bars Z		Length	Wt	No.	Wt	Conc (CY)	Ref (Lb)	Conc (CY)	Ref (Lb)	Conc (CY)	Ref (Lb)
													Length	Wt	Length	Wt																								Length	Wt	Length	Wt										
2	9'-0"	4'-0"	12"	10"	162	#6	6"	20'-3"	4,927	108	#6	9"	10'-6"	1,703	9'-0"	1,460	162	#6	6"	9'-1"	2,210	14	18"	39'-9"	372	62	18"	39'-9"	1,646	108	9"	4'-0"	289	54	9"	5'-5"	195	10'-1"	364	20'-3"	54	44	122	1.889	329.2	1.5	176	77.1	13,342				
3	9'-0"	4'-0"	12"	10"	162	#6	6"	30'-1"	7,320	108	#6	9"	10'-6"	1,703	9'-0"	1,460	162	#6	6"	18'-1"	4,400	21	18"	39'-9"	558	89	18"	39'-9"	2,363	108	9"	4'-0"	289	108	9"	5'-5"	391	10'-1"	727	30'-1"	80	64	178	2.741	480.3	2.2	258	111.9	19,469				
4	9'-0"	4'-0"	12"	10"	162	#6	6"	39'-11"	9,713	108	#6	9"	10'-6"	1,703	9'-0"	1,460	162	#6	6"	27'-1"	6,590	28	18"	39'-9"	743	116	18"	39'-9"	3,080	108	9"	4'-0"	289	162	9"	5'-5"	586	10'-1"	1,091	39'-11"	107	82	228	3.593	631.4	3.0	335	146.7	25,590				
5	9'-0"	4'-0"	12"	10"	162	#6	6"	49'-9"	12,105	108	#6	9"	10'-6"	1,703	9'-0"	1,460	162	#6	6"	36'-1"	8,780	35	18"	39'-9"	929	143	18"	39'-9"	3,797	108	9"	4'-0"	289	216	9"	5'-5"	782	10'-1"	1,455	49'-9"	133	102	284	4.444	782.5	3.7	417	181.5	31,717				
6	9'-0"	4'-0"	12"	10"	162	#6	6"	59'-7"	14,498	108	#6	9"	10'-6"	1,703	9'-0"	1,460	162	#6	6"	45'-1"	10,970	42	18"	39'-9"	1,115	170	18"	39'-9"	4,514	108	9"	4'-0"	289	270	9"	5'-5"	977	10'-1"	1,819	59'-7"	159	122	340	5.296	933.6	4.4	499	216.3	37,844				
2	9'-0"	5'-0"	12"	10"	162	#6	6"	20'-3"	4,927	108	#6	9"	11'-6"	1,865	9'-0"	1,460	162	#6	6"	9'-1"	2,210	14	18"	39'-9"	372	68	18"	39'-9"	1,806	108	9"	5'-0"	361	54	9"	5'-5"	195	12'-1"	436	20'-3"	54	44	122	1.981	340.8	1.5	176	80.8	13,808				
3	9'-0"	5'-0"	12"	10"	162	#6	6"	30'-1"	7,320	108	#6	9"	11'-6"	1,865	9'-0"	1,460	162	#6	6"	18'-1"	4,400	21	18"	39'-9"	558	97	18"	39'-9"	2,576	108	9"	5'-0"	361	108	9"	5'-5"	391	12'-1"	872	30'-1"	80	64	178	2.864	495.1	2.2	258	116.8	20,061				
4	9'-0"	5'-0"	12"	10"	162	#6	6"	39'-11"	9,713	108	#6	9"	11'-6"	1,865	9'-0"	1,460	162	#6	6"	27'-1"	6,590	28	18"	39'-9"	743	126	18"	39'-9"	3,346	108	9"	5'-0"	361	162	9"	5'-5"	586	12'-1"	1,308	39'-11"	107	82	228	3.747	649.3	3.0	335	152.8	26,307				
5	9'-0"	5'-0"	12"	10"	162	#6	6"	49'-9"	12,105	108	#6	9"	11'-6"	1,865	9'-0"	1,460	162	#6	6"	36'-1"	8,780	35	18"	39'-9"	929	155	18"	39'-9"	4,116	108	9"	5'-0"	361	216	9"	5'-5"	782	12'-1"	1,743	49'-9"	133	102	284	4.630	803.5	3.7	417	188.9	32,558				
6	9'-0"	5'-0"	12"	10"	162	#6	6"	59'-7"	14,498	108	#6	9"	11'-6"	1,865	9'-0"	1,460	162	#6	6"	45'-1"	10,970	42	18"	39'-9"	1,115	184	18"	39'-9"	4,886	108	9"	5'-0"	361	270	9"	5'-5"	977	12'-1"	2,179	59'-7"	159	122	340	5.512	957.8	4.4	499	224.9	38,810				
2	9'-0"	6'-0"	12"	10"	162	#6	6"	20'-3"	4,927	108	#6	9"	12'-6"	2,028	9'-0"	1,460	162	#6	6"	9'-1"	2,210	14	18"	39'-9"	372	74	18"	39'-9"	1,965	108	9"	6'-0"	433	54	9"	5'-5"	195	14'-1"	508	20'-3"	54	44	122	2.074	352.5	1.5	176	84.5	14,274				
3	9'-0"	6'-0"	12"	10"	162	#6	6"	30'-1"	7,320	108	#6	9"	12'-6"	2,028	9'-0"	1,460	162	#6	6"	18'-1"	4,400	21	18"	39'-9"	558	105	18"	39'-9"	2,788	108	9"	6'-0"	433	108	9"	5'-5"	391	14'-1"	1,016	30'-1"	80	64	178	2.988	509.9	2.2	258	121.8	20,652				
4	9'-0"	6'-0"	12"	10"	162	#6	6"	39'-11"	9,713	108	#6	9"	12'-6"	2,028	9'-0"	1,460	162	#6	6"	27'-1"	6,590	28	18"	39'-9"	743	136	18"	39'-9"	3,611	108	9"	6'-0"	433	162	9"	5'-5"	586	14'-1"	1,524	39'-11"	107	82	228	3.901	667.2	3.0	335	159.0	27,023				
5	9'-0"	6'-0"	12"	10"	162	#6	6"	49'-9"	12,105	108	#6	9"	12'-6"	2,028	9'-0"	1,460	162	#6	6"	36'-1"	8,780	35	18"	39'-9"	929	167	18"	39'-9"	4,434	108	9"	6'-0"	433	216	9"	5'-5"	782	14'-1"	2,032	49'-9"	133	102	284	4.815	824.6	3.7	417	196.3	33,400				
6	9'-0"	6'-0"	12"	10"	162	#6	6"	59'-7"	14,498	108	#6	9"	12'-6"	2,028	9'-0"	1,460	162	#6	6"	45'-1"	10,970	42	18"	39'-9"	1,115	198	18"	39'-9"	5,257	108	9"	6'-0"	433	270	9"	5'-5"	977	14'-1"	2,540	59'-7"	159	122	340	5.728	982.0	4.4	499	233.5	39,777				
2	9'-0"	7'-0"	12"	10"	162	#6	6"	20'-3"	4,927	108	#6	9"	13'-6"	2,190	9'-0"	1,460	162	#6	6"	9'-1"	2,210	14	18"	39'-9"	372	74	18"	39'-9"	1,965	108	9"	7'-0"	505	54	9"	5'-5"	195	16'-1"	580	20'-3"	54	44	122	2.167	360.1	1.5	176	88.2	14,580				
3	9'-0"	7'-0"	12"	10"	162	#6	6"	30'-1"	7,320	108	#6	9"	13'-6"	2,190	9'-0"	1,460	162	#6	6"	18'-1"	4,400	21	18"	39'-9"	558	105	18"	39'-9"	2,788	108	9"	7'-0"	505	108	9"	5'-5"	391	16'-1"	1,160	30'-1"	80	64	178	3.111	519.3	2.2	258	126.7	21,030				
4	9'-0"	7'-0"	12"	10"	162	#6	6"	39'-11"	9,713	108	#6	9"	13'-6"	2,190	9'-0"	1,460	162	#6	6"	27'-1"	6,590	28	18"	39'-9"	743	136	18"	39'-9"	3,611	108	9"	7'-0"	505	162	9"	5'-5"	586	16'-1"	1,740	39'-11"	107	82	228	4.056	678.5	3.0	335	165.2	27,473				
5	9'-0"	7'-0"	12"	10"	162	#6	6"	49'-9"	12,105	108	#6	9"	13'-6"	2,190	9'-0"	1,460	162	#6	6"	36'-1"	8,780	35	18"	39'-9"	929	167	18"	39'-9"	4,434	108	9"	7'-0"	505	216	9"	5'-5"	782	16'-1"	2,321	49'-9"	133	102	284	5.000	837.7	3.7	417	203.7	33,923				
6	9'-0"	7'-0"	12"	10"	162	#6	6"	59'-7"	14,498	108	#6	9"	13'-6"	2,190	9'-0"	1,460	162	#6	6"	45'-1"	10,970	42	18"	39'-9"	1,115	198	18"	39'-9"	5,257	108	9"	7'-0"	505	270	9"	5'-5"	977	16'-1"	2,901	59'-7"	159	122	340	5.944	996.8	4.4	499	242.2	40,372				
2	9'-0"	8'-0"	12"	10"	162	#6	6"	20'-3"	4,927	108	#6	9"	14'-6"	2,352	9'-0"	1,460	162	#6	6"	9'-1"	2,210	14	18"	39'-9"	372	80	18"	39'-9"	2,124	108	9"	8'-0"	577	54	9"	5'-5"	195	18'-1"	652	20'-3"	54	44	122	2.259	371.7	1.5	176	91.9	15,045				
3	9'-0"	8'-0"	12"	10"	162	#6	6"	30'-1"	7,320	108	#6	9"	14'-6"	2,352	9'-0"	1,460	162	#6	6"	18'-1"	4,400	21	18"	39'-9"	558	113	18"	39'-9"	3,000	108	9"	8'-0"	577	108	9"	5'-5"	391	18'-1"	1,305	30'-1"	80	64	178	3.235	534.1	2.2	258	131.6	21,621				
4	9'-0"	8'-0"	12"	10"	162	#6	6"	39'-11"	9,713	108	#6	9"	14'-6"	2,352	9'-0"	1,460	162	#6	6"	27'-1"	6,590	28	18"	39'-9"	743	146	18"	39'-9"	3,877	108	9"	8'-0"	577	162	9"	5'-5"	586	18'-1"	1,957	39'-11"	107	82	228	4.210	696.4	3.0	335	171.4	28,190				
5	9'-0"	8'-0"	12"	10"	162	#6	6"	49'-9"	12,105	108	#6	9"	14'-6"	2,352	9'-0"	1,460	162	#6	6"	36'-1"	8,780	35	18"	39'-9"	929	179	18"	39'-9"	4,753	108	9"	8'-0"	577	216	9"	5'-5"	782	18'-1"	2,609	49'-9"	133	102	284	5.185	858.7	3.7	417	211.1	34,764				
6	9'-0"	8'-0"	12"	10"	162	#6	6"	59'-7"	14,498	108	#6	9"	14'-6"	2,352	9'-0"	1,460	162	#6	6"	45'-1"	10,970	42	18"	39'-9"	1,115	212	18"	39'-9"	5,629	108	9"	8'-0"	577	270	9"	5'-5"	977	18'-1"	3,262	59'-7"	159	122	340	6.160	1,021.0	4.4	499	250.8	41,339				
2	9'-0"	9'-0"	12"	10"	162	#6	6"	20'-3"	4,927	108	#6	9"	15'-6"	2,514	9'-0"	1,460	162	#6	6"	9'-1"	2,210	14	18"	39'-9"	372	86	18"	39'-9"	2,284	108	9"	9'-0"	649	54	9"	5'-5"	195	20'-1"	724	20'-3"	54	44	122	2.352	383.4	1.5	176	95.6	15,511				
3	9'-0"	9'-0"	12"	10"	162	#6	6"	30'-1"	7,320	108	#6	9"	15'-6"	2,514	9'-0"	1,460	162	#6	6"	18'-1"	4,400	21	18"	39'-9"	558	121	18"	39'-9"	3,213	108	9"	9'-0"	649	108	9"	5'-5"	391	20'-1"	1,449	30'-1"	80	64	178	3.358	548.9	2.2	258	136.6	22,212				
4	9'-0"	9'-0"	12"	10"	162	#6	6"	39'-11"	9,713	108	#6	9"	15'-6"	2,514	9'-0"	1,460	162	#6	6"	27'-1"	6,590	28	18"	39'-9"	743	156	18"	39'-9"	4,142																								