DESCRIPTION OF SHEETS
BOX BRIDGE & BOX CULVERT DRAWINGS

DESCRIPTION OF SHEETS	WORKING NUMBER	SHEET NUMBER
BASIC CULVERT DRAWING - DRAWINGS INDEX	1-1	7001
BASIC CULVERT DRAWING - DRAWINGS INDEX	1-2	7002
BASIC CULVERT DRAWING - DRAWINGS INDEX	1-3	7003
BASIC CULVERT DRAWING - PLAN ASSEMBLY PROCEDURE	1-4	7004
BASIC CULVERT DRAWING - COLLAR LOCATIONS - NORMAL AND SKEWED CULVERTS GROUP I DIAGRAMS	IBJL-1	7005
BASIC CULVERT DRAWING - COLLAR LOCATIONS - NORMAL AND SKEWED CULVERTS GROUP II DIAGRAMS	IBJL-1	7006
BASIC CULVERT DRAWING - COLLAR LOCATIONS - NORMAL AND SKEWED CULVERTS GROUP III DIAGRAMS	IBJL-1	7007
COLLAR DETAILS FOR BOX STRUCTURES	ICJ-1	7008
SKEWED COLLAR DETAILS FOR BOX STRUCTURES	ICJS-1	7009
CULVERT DRAWING - EXTENSION DETAILS - FOR LENGTHENING EXISTING BOX CULVERTS	ICX-1	7010
BARREL DETAILS - SINGLE CELL - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IBS-6	7011
BARREL DETAILS - SINGLE CELL - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IBS-6	7012
BARREL DETAILS - SINGLE CELL - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IBS-6	7013
BARREL DETAILS - SINGLE CELL - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IBS-8	7014
BARREL DETAILS - SINGLE CELL - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IBS-8	7015
BARREL DETAILS - SINGLE CELL - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IBS-8	7016
BARREL DETAILS - SINGLE CELL - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IBS-10	7017
BARREL DETAILS - SINGLE CELL - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IBS-10	7018
BARREL DETAILS - SINGLE CELL - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IBS-10	7019
BARREL DETAILS - SINGLE CELL - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IBS-12	7020
BARREL DETAILS - SINGLE CELL - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IBS-12	7021
BARREL DETAILS - SINGLE CELL - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IBS-12	7022
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-2W	7023
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W	7024
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W	7025
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W	7026
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W	7027
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W	7028
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W	7029
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W	7030
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W	7031
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-3W	7032
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W	7033
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W	7034
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W	7035
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W	7036
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W	7037
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W	7038
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W	7039
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W	7040
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-2W-15	7041
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W-15	7042
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W-15	7043
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-15	7044
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-15	7045
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-15	7046
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-15	7047
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-15	7048
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-15	7049
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-15	7050
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-15	7051
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-3W-15	7052
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-15	7053
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-15	7054
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-15	7055
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-15	7056
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-15	7057
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-15	7058
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-15	7059
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-15	7060
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-15	7061
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-15	7062
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-15	7063
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-2W-30	7064
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W-30	7065
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W-30	7066
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-30	7067
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-30	7068
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-30	7069
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-30	7070
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-30	7071
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-30	7072
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-30	7073
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-30	7074

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BOX BRIDGE & BOX CULVERT

DRAWINGS INDEX

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER 1-1

SHEET NUMBER 7001

DESCRIPTION OF SHEETS BOX BRIDGE & BOX CULVERT DRAWINGS	WORKING NUMBER	SHEET NUMBER
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-3W-30	7075
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-30	7076
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-30	7077
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-30	7078
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-30	7079
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-30	7080
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-30	7081
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-30	7082
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-30	7083
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-30	7084
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-30	7085
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-30	7086
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-30	7087
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-2W-45	7088
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W-45	7089
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-2W-45	7090
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-45	7091
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-45	7092
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-2W-45	7093
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-45	7094
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-45	7095
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-2W-45	7096
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-45	7097
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-45	7098
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-2W-45	7099
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-3W-45	7100
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 6 - 24 FT.	IWS-3W-45	7101
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-45	7102
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-45	7103
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 6 - 20 FT.	IWS-6-3W-45	7104
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-45	7105
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-45	7106
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 8 - 20 FT.	IWS-8-3W-45	7107
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-45	7108
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-45	7109
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 10 - 22 FT.	IWS-10-3W-45	7110
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-45	7111
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-45	7112
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-45	7113
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - SINGLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 12 - 24 FT.	IWS-12-3W-45	7114
BARREL DETAILS - DOUBLE CELL - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IBD-6	7115
BARREL DETAILS - DOUBLE CELL - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IBD-6	7116
BARREL DETAILS - DOUBLE CELL - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IBD-6	7117
BARREL DETAILS - DOUBLE CELL - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IBD-8	7118
BARREL DETAILS - DOUBLE CELL - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IBD-8	7119
BARREL DETAILS - DOUBLE CELL - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IBD-8	7120
BARREL DETAILS - DOUBLE CELL - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IBD-10	7121
BARREL DETAILS - DOUBLE CELL - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IBD-10	7122
BARREL DETAILS - DOUBLE CELL - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IBD-10	7123
BARREL DETAILS - DOUBLE CELL - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IBD-12	7124
BARREL DETAILS - DOUBLE CELL - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IBD-12	7125
BARREL DETAILS - DOUBLE CELL - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IBD-12	7126
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-2W	7127
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W	7128
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W	7129
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W	7130
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W	7131
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W	7132
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W	7133
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W	7134
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W	7135
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W	7136
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W	7137
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W	7138
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W	7139
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W	7140
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W	7141
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W	7142
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W	7143
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W	7144
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 0° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W	7145
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-2W-15	7146
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W-15	7147
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W-15	7148
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-15	7149
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-15	7150
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-15	7151

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BOX BRIDGE & BOX CULVERT

DRAWINGS INDEX

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER 1-2

SHEET NUMBER 7002

DESCRIPTION OF SHEETS BOX BRIDGE & BOX CULVERT DRAWINGS	WORKING NUMBER	SHEET NUMBER
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-15	7152
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-15	7153
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-15	7154
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-15	7155
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-15	7156
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-15	7157
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W-15	7158
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W-15	7159
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-15	7160
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-15	7161
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-15	7162
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-15	7163
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-15	7164
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-15	7165
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-15	7166
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-15	7167
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-15	7168
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-15	7169
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-15	7170
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 15° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-15	7171
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-2W-30	7172
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-2W-30	7173
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W-30	7174
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W-30	7175
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-30	7176
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-30	7177
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-30	7178
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-30	7179
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-30	7180
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-30	7181
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-30	7182
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-30	7183
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-30	7184
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W-30	7185
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W-30	7186
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-30	7187
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-30	7188
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-30	7189
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-30	7190
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-30	7191
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-30	7192
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-30	7193
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-30	7194
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-30	7195
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-30	7196
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-30	7197
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-30	7198
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 30° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-30	7199
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-2W-45	7200
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-2W-45	7201
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W-45	7202
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-2W-45	7203
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-45	7204
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-45	7205
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-2W-45	7206
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-45	7207
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-45	7208
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-2W-45	7209
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-45	7210
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-45	7211
WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-2W-45	7212
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W-45	7213
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHTS 6 - 12 FT. - SPANS 12 - 40 FT.	IWD-3W-45	7214
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-45	7215
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-45	7216
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 6 FT. - SPANS 12 - 32 FT.	IWD-6-3W-45	7217
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-45	7218
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-45	7219
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 8 FT. - SPANS 16 - 32 FT.	IWD-8-3W-45	7220
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-45	7221
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-45	7222
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-45	7223
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 10 FT. - SPANS 20 - 36 FT.	IWD-10-3W-45	7224
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-45	7225
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-45	7226
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-45	7227
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING - DOUBLE CELL - 45° SKEW DETAILS - HEIGHT 12 FT. - SPANS 24 - 40 FT.	IWD-12-3W-45	7228

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BOX BRIDGE & BOX CULVERT

DRAWINGS INDEX

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER 1-3

SHEET NUMBER 7003

TABLE 1

		BOX SKEW	SIDE SLOPE	BOX HEIGHT	SHEET NUMBERS		
SINGLE CELL BOX CULVERT DETAILS	SINGLE CELL BARREL DETAILS	ALL SKEWS	ALL SIDE SLOPES	6	7011	thru	7013
				8	7014	thru	7016
				10	7017	thru	7019
				12	7020	thru	7022
	SINGLE CELL WINGWALL DETAILS	0°	2:1	LAYOUT	7023		
				6	7024	thru	7025
				8	7026	thru	7027
				10	7028	thru	7029
				12	7030	thru	7031
			3:1	LAYOUT	7032		
				6	7033	thru	7034
				8	7035	thru	7036
				10	7037	thru	7038
				12	7039	thru	7040
		15°	2:1	LAYOUT	7041		
				6	7042	thru	7043
				8	7044	thru	7045
				10	7046	thru	7048
				12	7049	thru	7051
			3:1	LAYOUT	7052		
				6	7053	thru	7054
				8	7055	thru	7057
				10	7058	thru	7060
				12	7061	thru	7063
		30°	2:1	LAYOUT	7064		
				6	7065	thru	7066
				8	7067	thru	7068
				10	7069	thru	7071
				12	7072	thru	7074
			3:1	LAYOUT	7075		
				6	7076	thru	7077
				8	7078	thru	7080
				10	7081	thru	7083
				12	7084	thru	7087
		45°	2:1	LAYOUT	7088		
				6	7089	thru	7090
				8	7091	thru	7093
				10	7094	thru	7096
				12	7097	thru	7099
			3:1	LAYOUT	7100	thru	7101
				6	7102	thru	7104
				8	7105	thru	7107
				10	7108	thru	7110
				12	7111	thru	7114

TABLE 2

		BOX SKEW	SIDE SLOPE	BOX HEIGHT	SHEET NUMBERS		
DOUBLE CELL BOX CULVERT DETAILS	DOUBLE CELL BARREL DETAILS	ALL SKEWS	ALL SIDE SLOPES	6	7115	thru	7117
				8	7118	thru	7120
				10	7121	thru	7123
				12	7124	thru	7126
	DOUBLE CELL WINGWALL DETAILS	0°	2:1	LAYOUT	7127		
				6	7128	thru	7129
				8	7130	thru	7131
				10	7132	thru	7133
				12	7134	thru	7135
			3:1	LAYOUT	7136		
				6	7137	thru	7138
				8	7139	thru	7140
				10	7141	thru	7142
				12	7143	thru	7145
		15°	2:1	LAYOUT	7146		
				6	7147	thru	7148
				8	7149	thru	7151
				10	7152	thru	7154
				12	7155	thru	7157
			3:1	LAYOUT	7158	thru	7159
				6	7160	thru	7162
				8	7163	thru	7165
				10	7166	thru	7168
				12	7169	thru	7171
		30°	2:1	LAYOUT	7172	thru	7173
				6	7174	thru	7175
				8	7176	thru	7178
				10	7179	thru	7181
				12	7182	thru	7184
			3:1	LAYOUT	7185	thru	7186
				6	7187	thru	7189
				8	7190	thru	7192
				10	7193	thru	7195
				12	7196	thru	7199
		45°	2:1	LAYOUT	7200	thru	7201
				6	7202	thru	7203
				8	7204	thru	7206
				10	7207	thru	7209
				12	7210	thru	7212
			3:1	LAYOUT	7213	thru	7214
				6	7215	thru	7217
				8	7218	thru	7220
				10	7221	thru	7224
				12	7225	thru	7228

INSTRUCTIONS TO ASSEMBLE BOX CULVERT STANDARD PLAN SET:

Step 1) Pull sheet for collar locations.
GROUP I .....Sheet no. 7005
GROUP II .....Sheet no. 7006
GROUP III .....Sheet no. 7007

✳Step 2) Pull sheet for collar details.
Non-skewed collar .....Sheet no. 7008
Skewed collar .....Sheet no. 7009

Step 3) Pull sheet for box culvert extension details.
If extending existing box culvert .....Sheet no. 7010
If not extending existing box culvert .....N/A

Step 4) Pull sheets for box culvert barrel details.
Single cell box culvert .....Use TABLE 1 to find sheet numbers
Double cell box culvert .....Use TABLE 2 to find sheet numbers

Step 5) Pull sheet(s) for box culvert wingwall layout details.
Single cell box culvert .....Use TABLE 1 to find sheet numbers
Double cell box culvert .....Use TABLE 2 to find sheet numbers

Step 6) Pull sheets for box culvert wingwall quantity details.
Single cell box culvert .....Use TABLE 1 to find sheet numbers
Double cell box culvert .....Use TABLE 2 to find sheet numbers

✳**NOTE:** Skewed collar details shall not be used unless directed by the Director of Structures, State Bridge Engineer.

EXAMPLE BOX CULVERT STANDARD PLAN SET

Follow steps 1 thru 6 above to assemble the plan set for a new double cell 8'x10' box culvert with a 15° skew, 3:1 side slopes, and a GROUP II roadway designation.

Step 1) collar location details.....Sheet no. 7006

Step 2) collar details.....Sheet no. 7008

Step 3) box extension details.....N/A

Step 4) barrel details.....Sheet nos. 7021, 7022 & 7023

Step 5) wingwall layout details.....Sheet no. 7158 & 7159

Step 6) wingwall quantity details.....Sheet nos. 7166, 7167 & 7168

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
REVISIONS	BOX BRIDGE & BOX CULVERT	
	PLAN ASSEMBLY PROCEDURE	
		WORKING NUMBER 1-4
DATE	DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E. DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015	SHEET NUMBER 7004
	DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

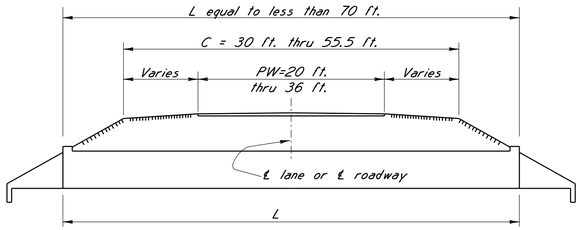


Diagram "A" - drawn for L = 60 ft. & PW = 24 ft.

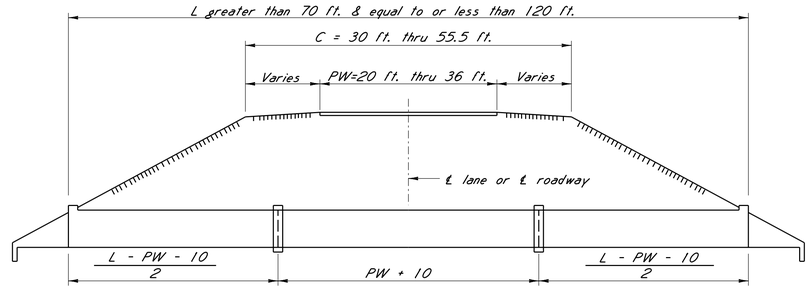


Diagram "B" - drawn for L = 90 ft. & PW = 24 ft.

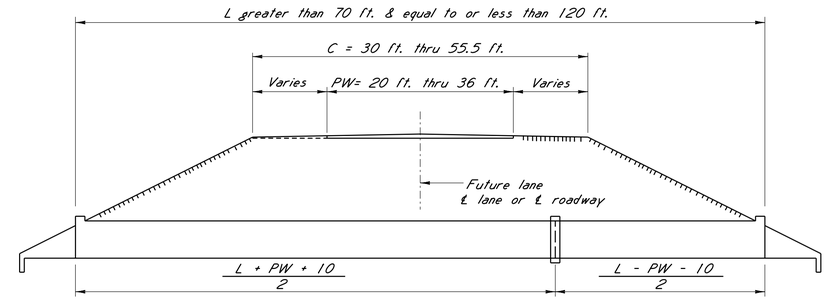


Diagram "C" - Drawn for L = 90 ft. & PW = 24 ft.

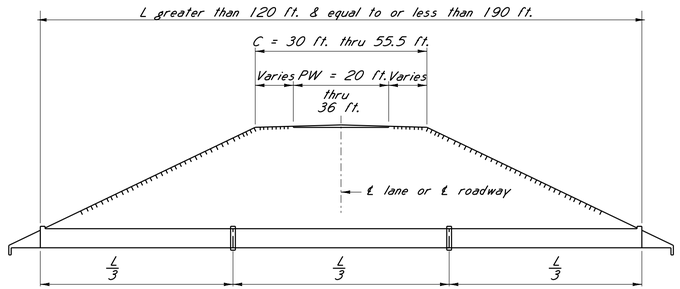


Diagram "D" - drawn for L = 150 ft. & PW = 24 ft.

NOTE: These collar locations are for culverts constructed normal to ℄ roadway and shall be adjusted for skew per details in group IV.

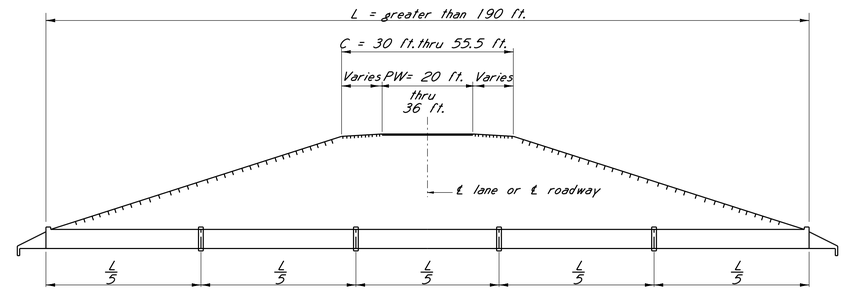


Diagram "E" - drawn for L = 200 ft. & PW = 24 ft.

SIDE ELEVATION OF CULVERTS CONSTRUCTED NORMAL TO ℄ ROADWAY

Showing collar locations

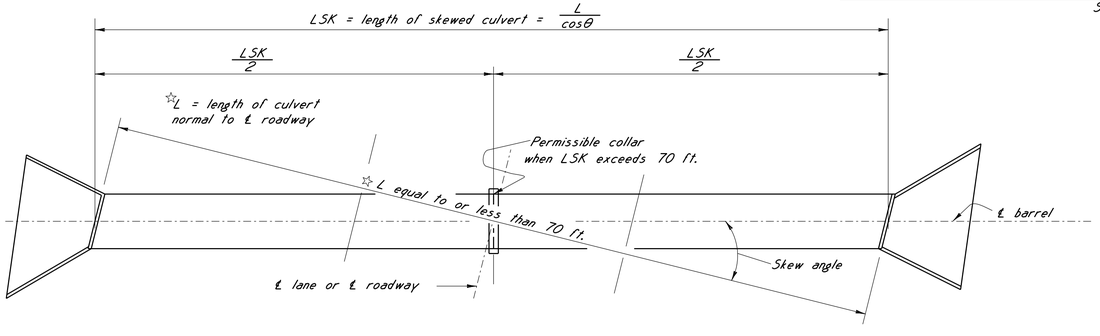


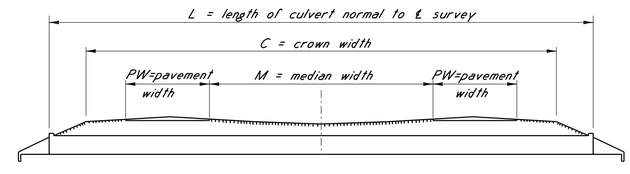
DIAGRAM "A"

PLAN OF SKEWED CULVERT

Typical for diagram "A" group I and skewed 15° right forward
(No collars required)
Note : LSK = 1.03528(L) for 15° skew.

GENERAL NOTES:

This drawing shows collar locations for box culverts constructed normal to ℄ of roadway and general details necessary to locate collars for culverts on 15, 30 and 45° skews.
The diagrams on this sheet show collar locations for culverts under variable amounts of cover, crown width and side slopes.
Collars shall be placed only at locations shown unless otherwise stated.
Collars shall not be located closer than 5 ft. outside pavement for cover of 8 ft. or less except in cases where median is less than 10 ft. where cover exceeds 8 ft., collars may be located without regard to pavement edge.
Collar locations per group IV, if required, shall have reinforcement continuous thru collar and shall be placed only at locations indicated.
General requirements of basic culvert drawings shall apply except as specifically modified hereon.



SIDE ELEVATION OF CULVERTS CONSTRUCTED NORMAL TO ℄ SURVEY

Showing variable for diagrams in group I.

✱ NOTE: Group I : 2 or 3 - 10 ft. thru 12 ft. traffic lanes
or 2 - 12 ft. (present) & 1 - 12 ft. (future) traffic lanes

GROUP IV DIAGRAMS
TYPICAL DIAGRAMS FOR SKEWED CULVERTS

Application of diagrams:
The following diagrams show the general application of joint location diagrams in groups I, II & III to skewed culverts.
Location of barrel joints for skewed culverts is determined as follows:
1. With LSK (length of skewed culvert along ℄ barrel) given and number of joints and length of barrel sections required, multiply LSK by the cosine of the skew angle O to obtain L (length of culvert normal to ℄ roadway).
2. Enter group I, II or III (determined by roadway cross section) with L to determine the number of joints and length of each barrel section for a culvert constructed normal to ℄ roadway.
3. Divide each length of section by the cosine of the skew angle O to determine the length of each barrel section along ℄ barrel.
4. Place the barrel joints (type per basic dwg.) at these locations. if the length of any section exceeds 70 ft. and a construction joint is desired (to reduce yardage of pour) place a construction joint in center of section.

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
REVISIONS	BASIC CULVERT DRAWING COLLAR LOCATIONS NORMAL AND SKEWED CULVERTS GROUP I DIAGRAMS✱	SHT. 1 OF 3
		WORKING NUMBER IBJL-1
DATE	DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC. DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	SHEET NUMBER 7005

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

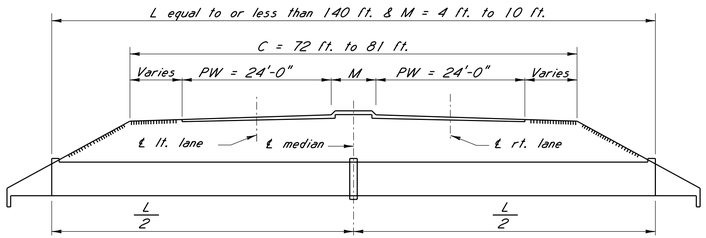


Diagram "A" - drawn for L = 100 ft. & M = 6 ft.

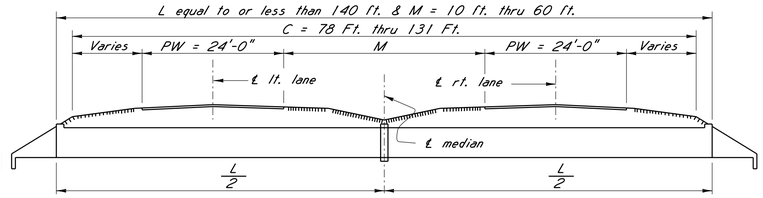


Diagram "B" - drawn for L = 110 ft. & M = 35 ft.

NOTE: These collar locations are for culverts constructed normal to ℄ roadway and shall be adjusted for skew per details in group IV.

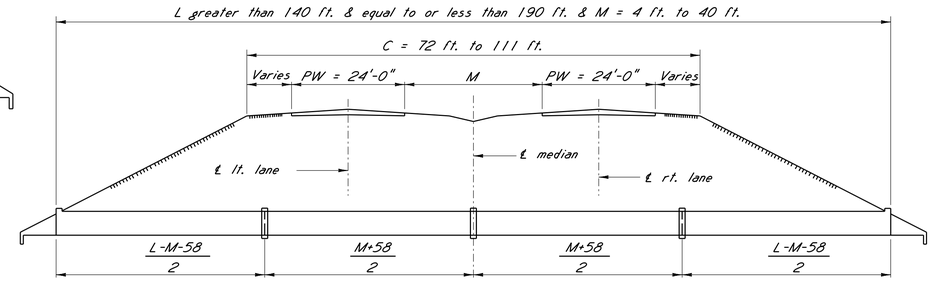


Diagram "C" - drawn for L = 165 ft. & M = 22 ft.

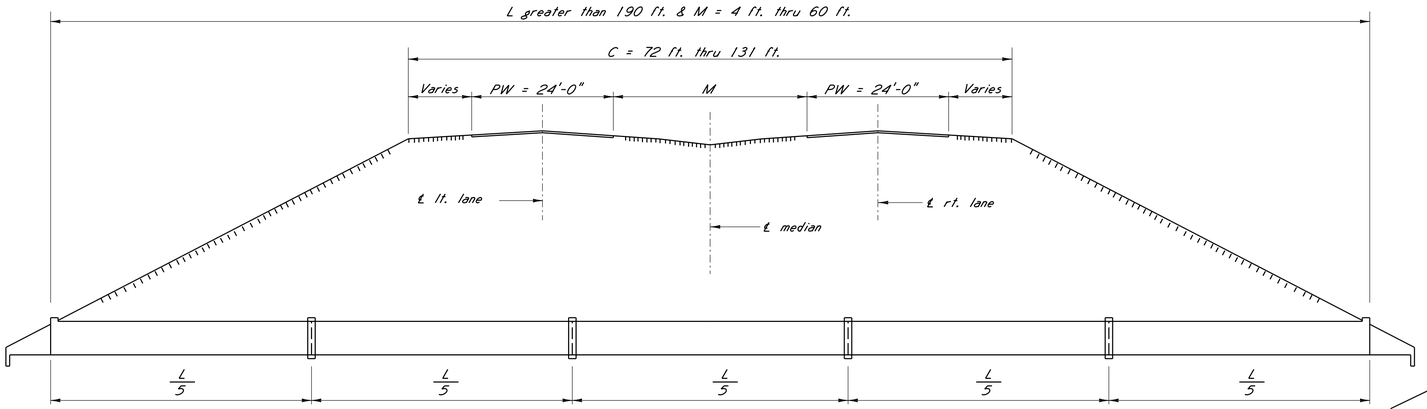


Diagram "E" - drawn for L = 220 ft. & M = 32 ft.

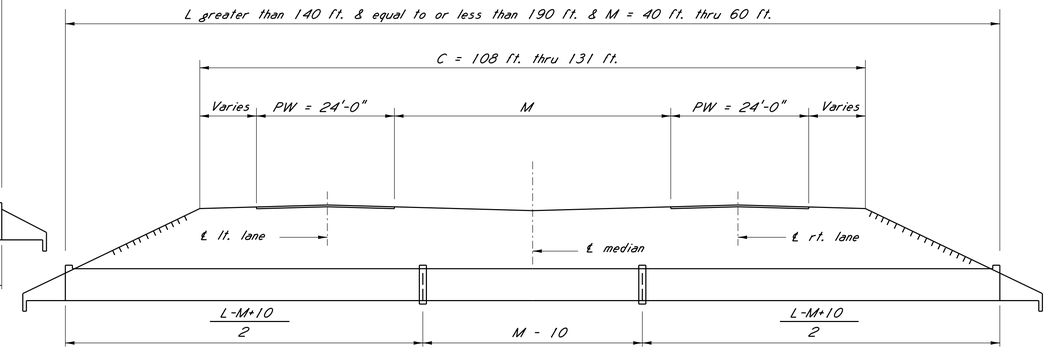


Diagram "D" - drawn for L = 165 ft. & M = 50 ft.

SIDE ELEVATION OF CULVERTS CONSTRUCTED NORMAL TO ℄ ROADWAY

Showing collar locations

NOTE: For GROUP IV DIAGRAM application notes, see sheet no. 7001.

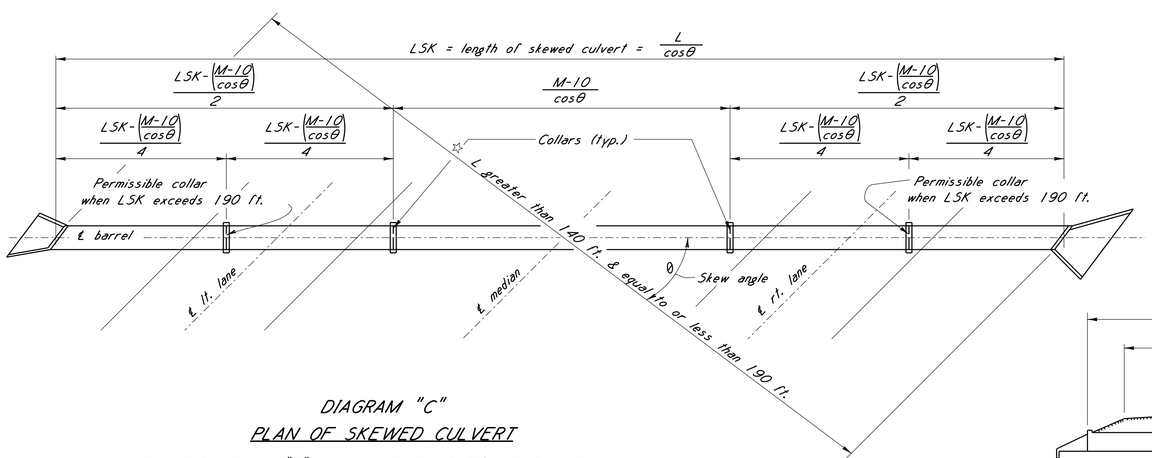


DIAGRAM "C"

PLAN OF SKEWED CULVERT

Typical for diagram "D" group II and skewed 45° right forward (Two collars required)

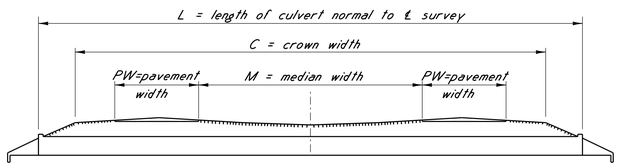
Note : LSK = 1.41421(L) for 45° skew.

☆L = length of culvert normal to ℄ roadway

GENERAL NOTES:

This drawing shows collar locations for box culverts constructed normal to ℄ of roadway and general details necessary to locate collars for culverts on 15, 30 and 45° skews.
The diagrams on this sheet show collar locations for culverts under variable amounts of cover, crown width and side slopes.
Collars shall be placed only at locations shown unless otherwise stated.
Collars shall not be located closer than 5 ft. outside pavement for cover of 8 ft. or less except in cases where median is less than 10 ft. where cover exceeds 8 ft., collars may be located without regard to pavement edge.
Collar locations per group IV, if required, shall have reinforcement continuous thru collar and shall be placed only at locations indicated.
General requirements of basic culvert drawings shall apply except as specifically modified hereon.

*NOTE: Group II : 4 - 12 ft. traffic lanes
4 ft. thru 60 ft. medians.



SIDE ELEVATION OF CULVERTS CONSTRUCTED NORMAL TO ℄ SURVEY

Showing variable for diagrams in group II.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC CULVERT DRAWING

COLLAR LOCATIONS

NORMAL AND SKEWED CULVERTS

GROUP II DIAGRAMS*

SHT. 2 OF 3

WORKING NUMBER	IBJL-1
SHEET NUMBER	7006

REVISIONS | BY

DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

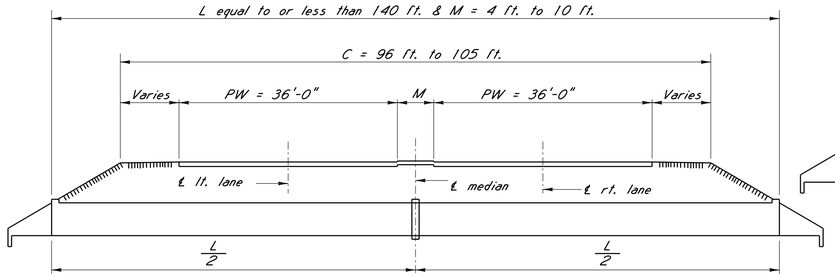


Diagram "A" - drawn for L = 124 ft. & M = 6 ft.

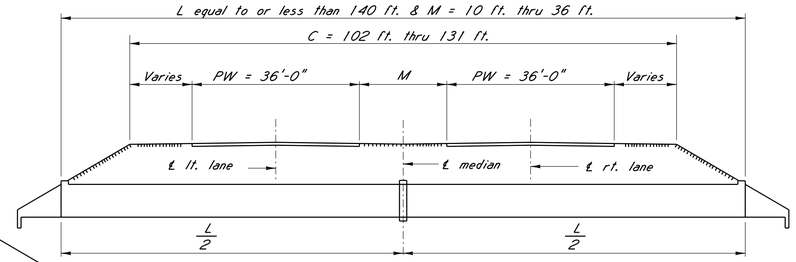


Diagram "B" - drawn for L = 134 ft. & M = 23 ft.

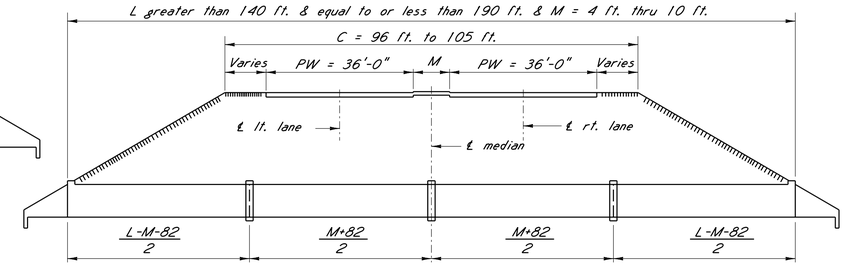


Diagram "C" - drawn for L = 165 ft. & M = 6 ft.

NOTE: These collar locations are for culverts constructed normal to ℄ roadway and shall be adjusted for skew per details in group IV.

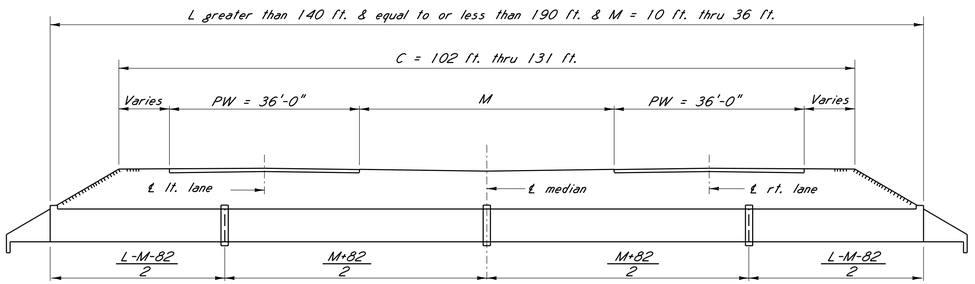


Diagram "D" - drawn for L = 165 ft. & M = 23 ft.

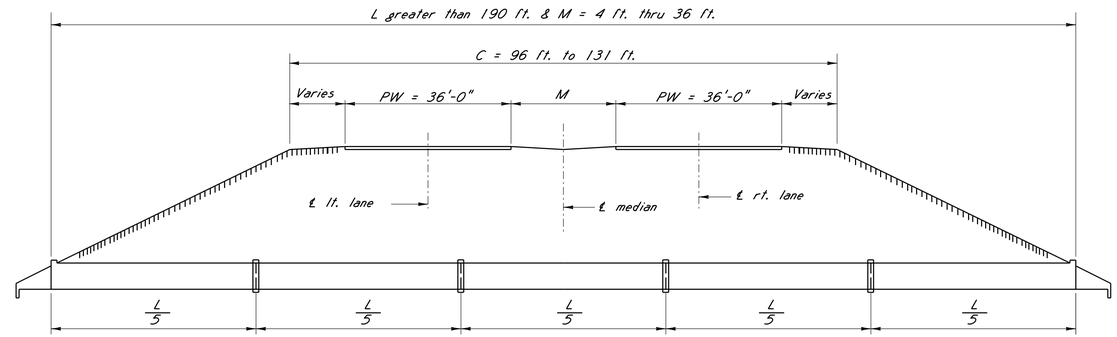


Diagram "E" - drawn for L = 220 ft. & M = 20 ft.

SIDE ELEVATION OF CULVERTS CONSTRUCTED NORMAL TO ℄ ROADWAY

Showing collar locations

GENERAL NOTES:

This drawing shows collar locations for box culverts constructed normal to ℄ of roadway and general details necessary to locate collars for culverts on 15, 30 and 45° skews.
The diagrams on this sheet show collar locations for culverts under variable amounts of cover, crown width and side slopes.
Collars shall be placed only at locations shown unless otherwise stated.
Collars shall not be located closer than 5 ft. outside pavement for cover of 8 ft. or less except in cases where median is less than 10 ft. where cover exceeds 8 ft., collars may be located without regard to pavement edge.
Collar locations per group IV, if required, shall have reinforcement continuous thru collar and shall be placed only at locations indicated.
General requirements of basic culvert drawings shall apply except as specifically modified hereon.

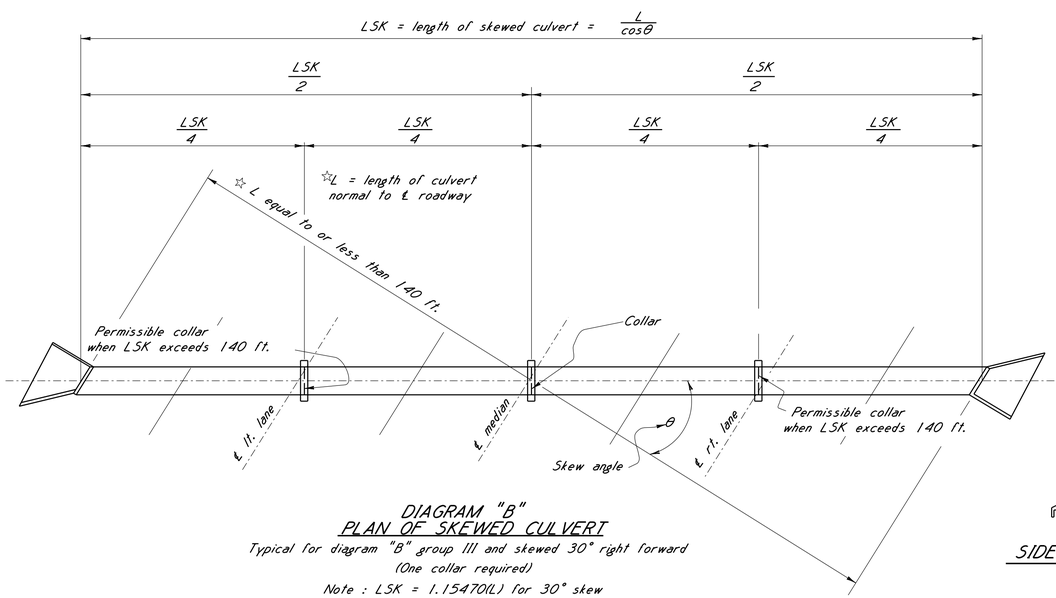
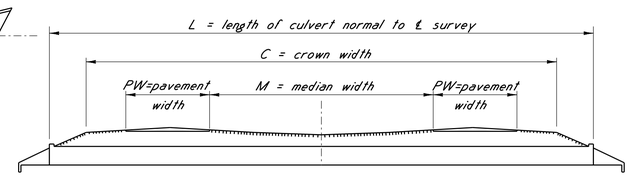


DIAGRAM "B"
PLAN OF SKEWED CULVERT

Typical for diagram "B" group III and skewed 30° right forward
(One collar required)
Note : LSK = 1.15470(L) for 30° skew

NOTE: For GROUP IV DIAGRAM application notes, see sheet no. 7001.

*NOTE: Group III : 6 - 12 ft. traffic lanes - 4 ft. thru 36 ft. medians or 4 - 12 ft. (present) & 2 - 12 ft. (future) traffic lanes with 28 ft. thru 60 ft. medians.



SIDE ELEVATION OF CULVERTS CONSTRUCTED NORMAL TO ℄ SURVEY

Showing variable for diagrams in group III.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS	BY

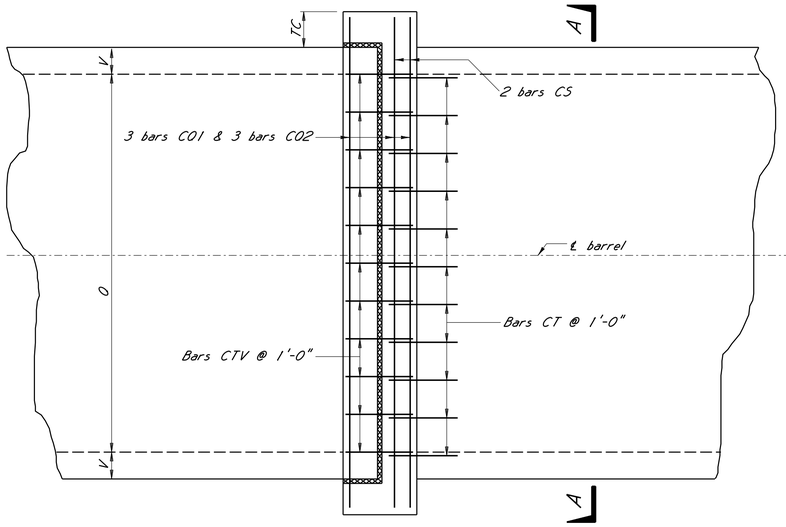
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
BASIC CULVERT DRAWING
COLLAR LOCATIONS
NORMAL AND SKEWED CULVERTS
GROUP III DIAGRAMS*

SHT. 3 OF 3

WORKING NUMBER IBJL-1

DATE
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

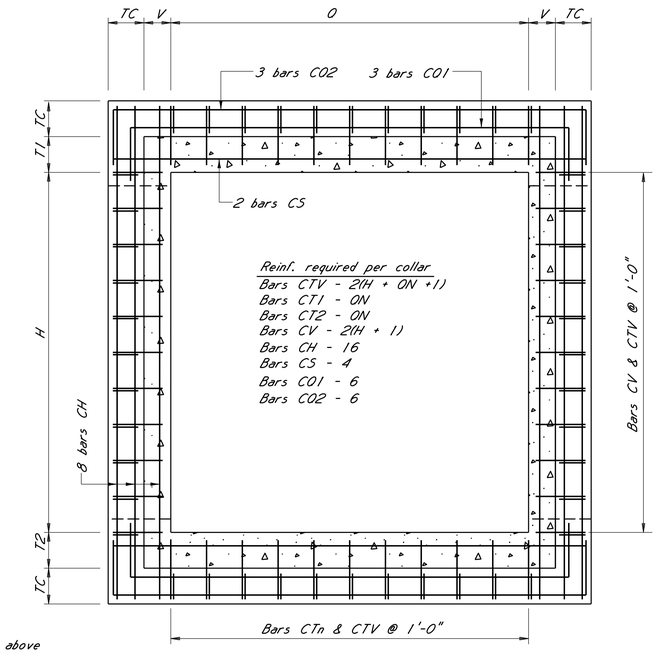
SHEET NUMBER 7007



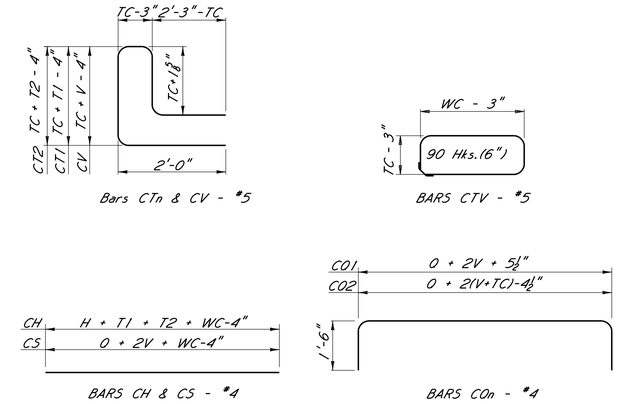
PLAN OF COLLAR

NOTE: For H = 6 Ft.
TC = 9"
WC = 1'-6"

NOTE: For H = 8 Ft. & above
TC = 1'-0"
WC = 2'-0"



SECTION A-A

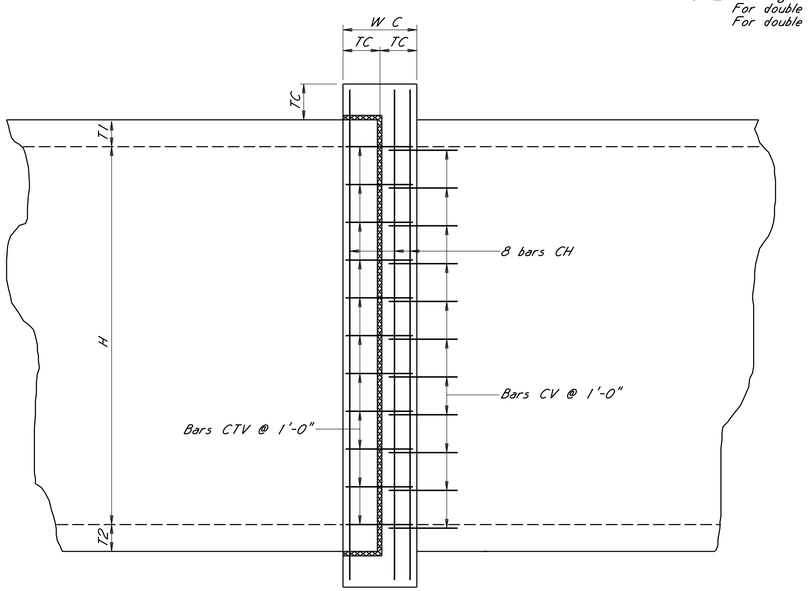


BAR BENDING DETAILS

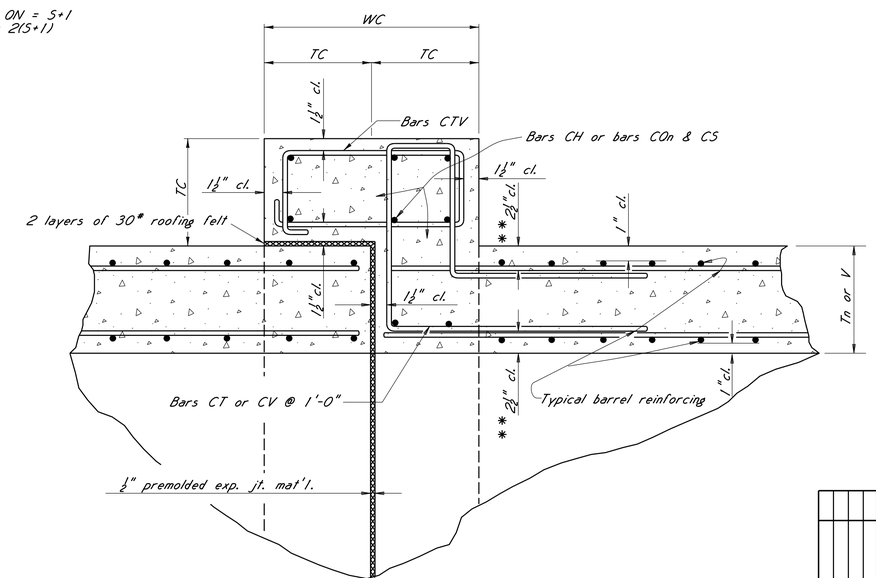
Dimensions are out to out

NOTE: See headwall details for collar quantities.

NOTE: For single cell box: O = S (clear span), ON = S+1
For double cell box: O = 2(S)+V2, ON = 2(S+1)
For double cell box: V = V1



ELEVATION OF COLLAR



** NOTE: 2½" cl. based on 1" cl. for typ. barrel reinf.
this cl. shall be adjusted for cl. other than 1".

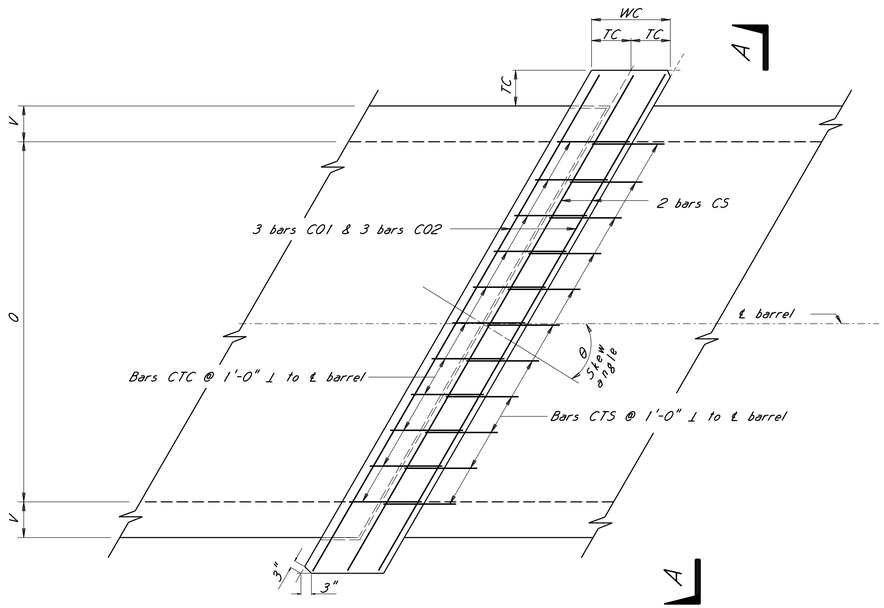
TYPICAL SECTION OF COLLAR

GENERAL NOTES:

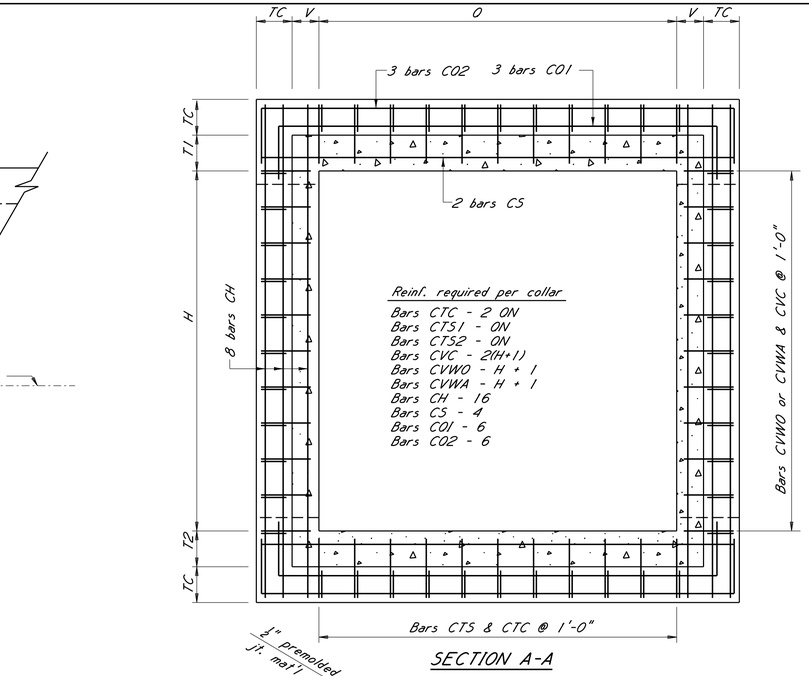
This drawing is detailed for a single cell box structure, and double-cell box structures shall be treated similarly as shown.

REVISIONS	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION COLLAR DETAILS FOR BOX STRUCTURES (SINGLE & DOUBLE)
DATE	DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC. DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	WORKING NUMBER ICJ-1 SHEET NUMBER 7008

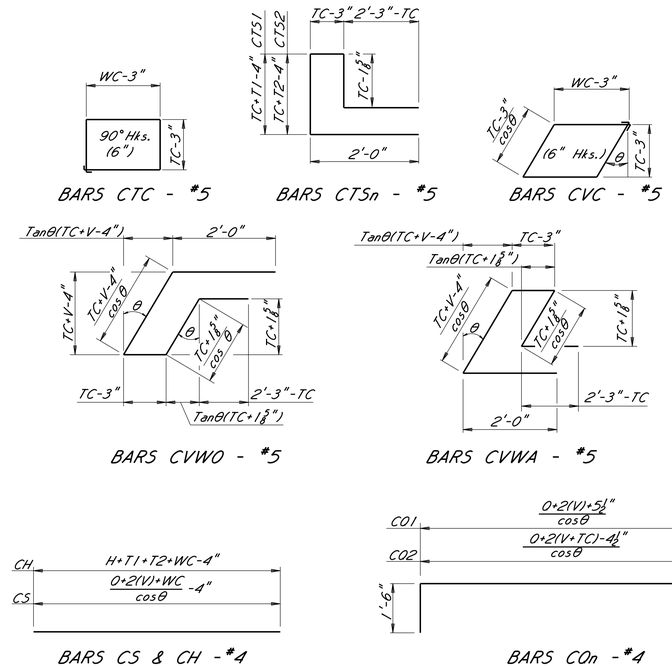
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI



PLAN OF COLLAR

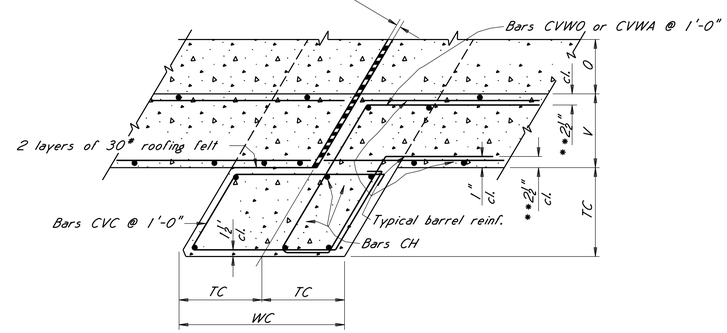


SECTION A-A

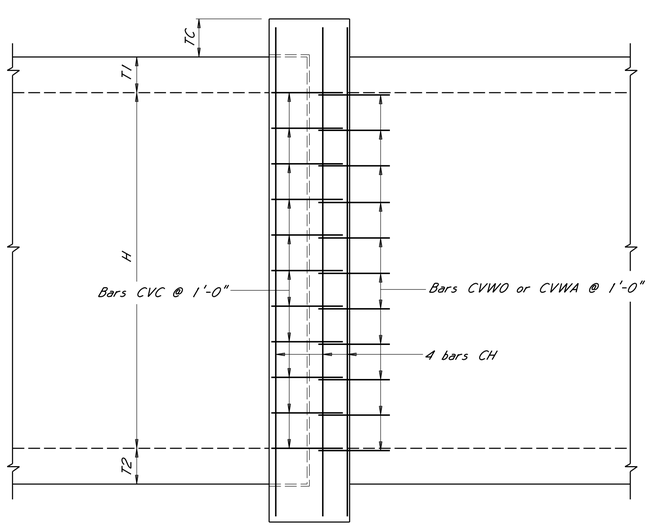


BAR BENDING DETAILS

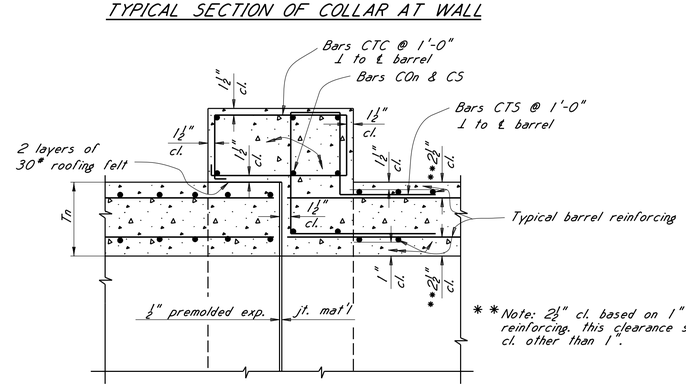
Dimensions are out to out.



TYPICAL SECTION OF COLLAR AT WALL



ELEVATION OF COLLAR



TYPICAL SECTION OF COLLAR - TOP & BOTTOM

** Note: 2½" cl. based on 1" cl. for typical barrel reinforcing. this clearance shall be adjusted for cl. other than 1".

NOTE: For H = 6 Ft.
TC = 9"
WC = 1'-6"

NOTE: For H = 8 Ft. & above
TC = 1'-0"
WC = 2'-0"

NOTE: For single cell box: O = S (clear span), ON = S+1
For double cell box: O = 2(S)+V2, ON = 2(S+1)
For double cell box: V = V1
θ = Skew angle

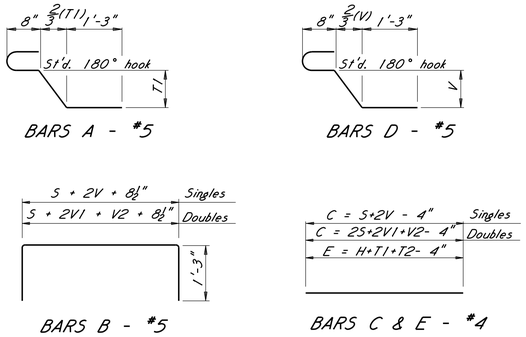
NOTE: See headwall details for collar quantities.

GENERAL NOTES:

This drawing is detailed for a single cell box structure, and double-cell box structures shall be treated similarly as shown.
Skewed collar details shall not be used unless directed by the Director of Structures, State Bridge Engineer.

REVISIONS	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION SKEWED COLLAR DETAILS FOR BOX STRUCTURES (SINGLE & DOUBLE)
DATE	DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC. DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	WORKING NUMBER ICJS-1 SHEET NUMBER 7009

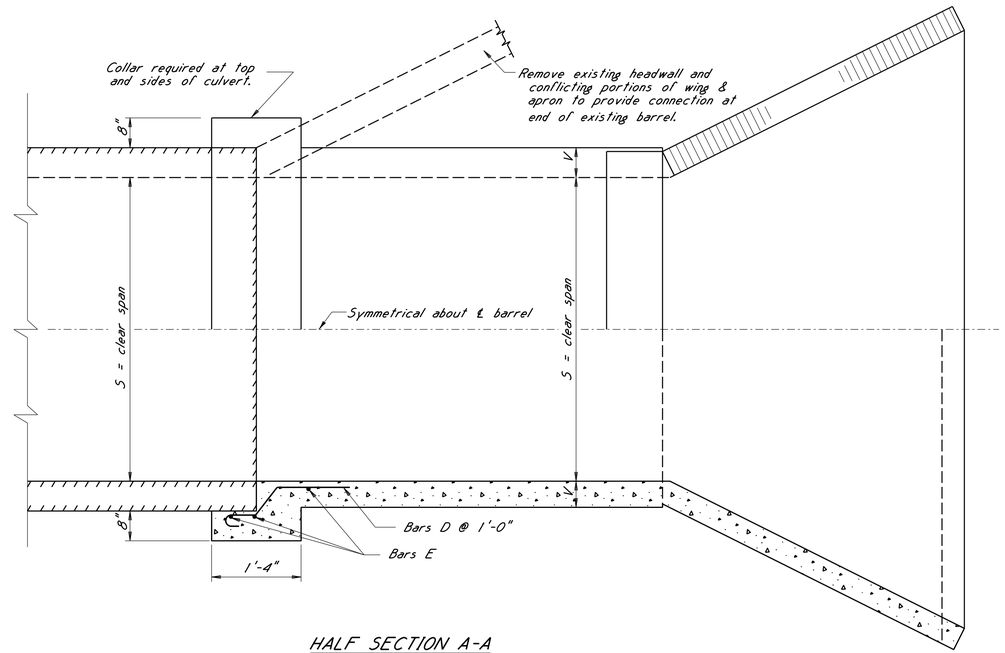
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI



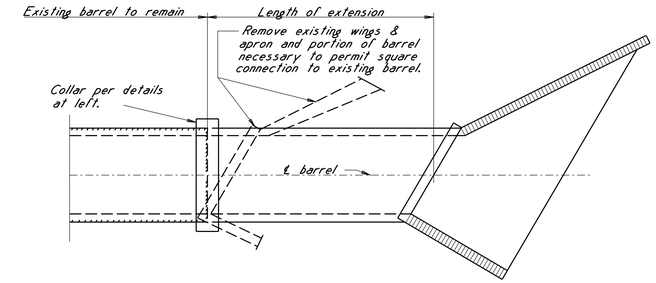
BAR BENDING DETAILS

Dimensions are out to out.

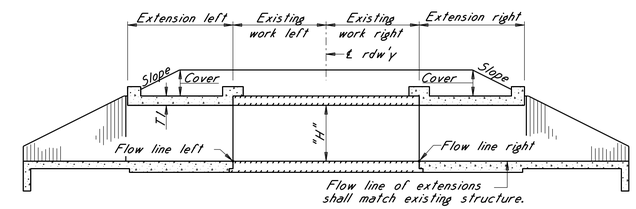
HALF TOP PLAN



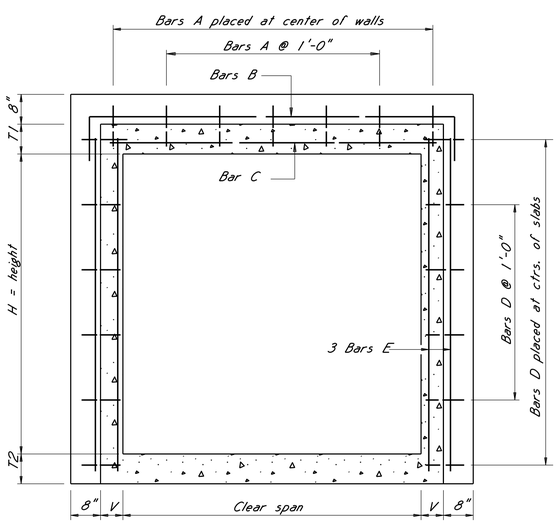
HALF SECTION A-A



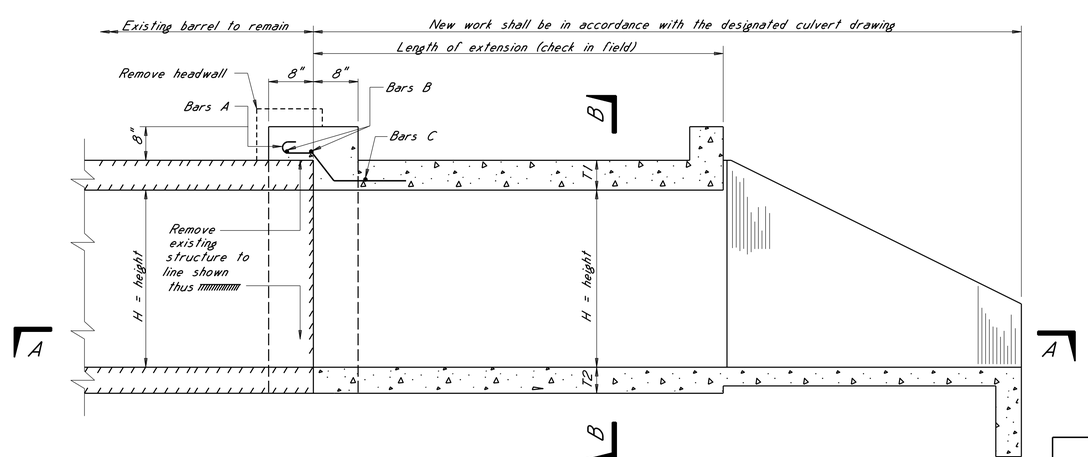
TYPICAL SKEW INSTALLATION



TYPICAL LONGITUDINAL SECTION



SECTION B-B



LONGITUDINAL SECTION

GENERAL NOTES:

This drawing is supplementary to basic culvert drawings of the IB5 and IBD series and all typical details and general notes shown thereon shall apply.

The length of extensions for each end of the culvert shall be checked in the field by the project engineer before the reinforcing steel is ordered.

Bar list of reinforcing steel shall be submitted to the Project Engineer prior to fabrication. placing plan shall be furnished when extensions are skewed.

When the length of the extension is less than 10 feet, the vertical construction joints at the junction of the barrel and wings shown on the basic culvert drawings for culvert heights of 8 feet and greater shall be omitted.

This drawing is detailed for a single cell culvert and double cell structure shall be treated similarly.

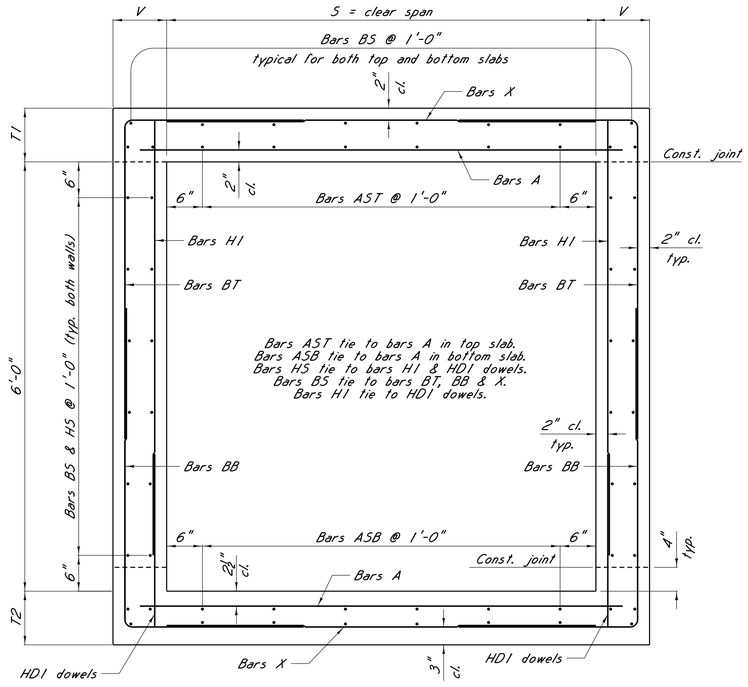
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
CULVERT DRAWING
EXTENSION DETAILS
FOR LENGTHENING
EXISTING BOX CULVERTS

REVISIONS	BY

WORKING NUMBER ICX-1

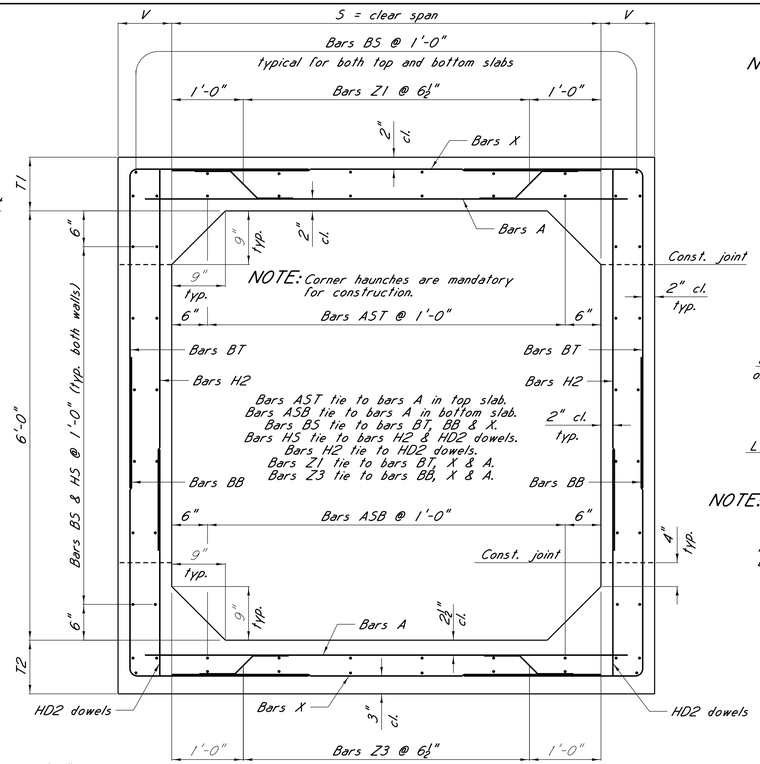
SHEET NUMBER 7010

DATE
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



CROSS SECTION "A"

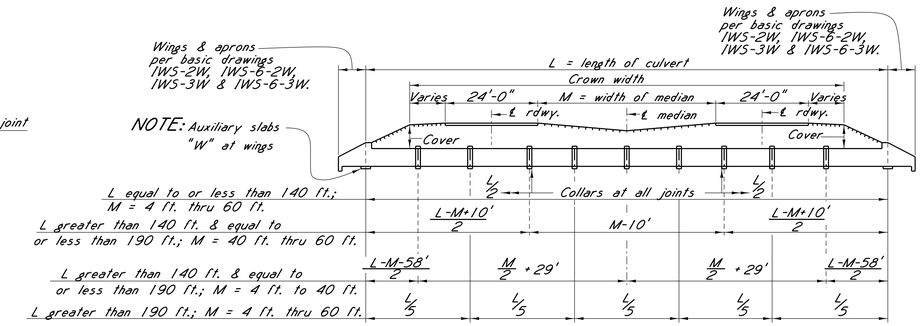
NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.



CROSS SECTION "B"

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

NOTE: See basic drawing IBJL-1 for additional collar locations.

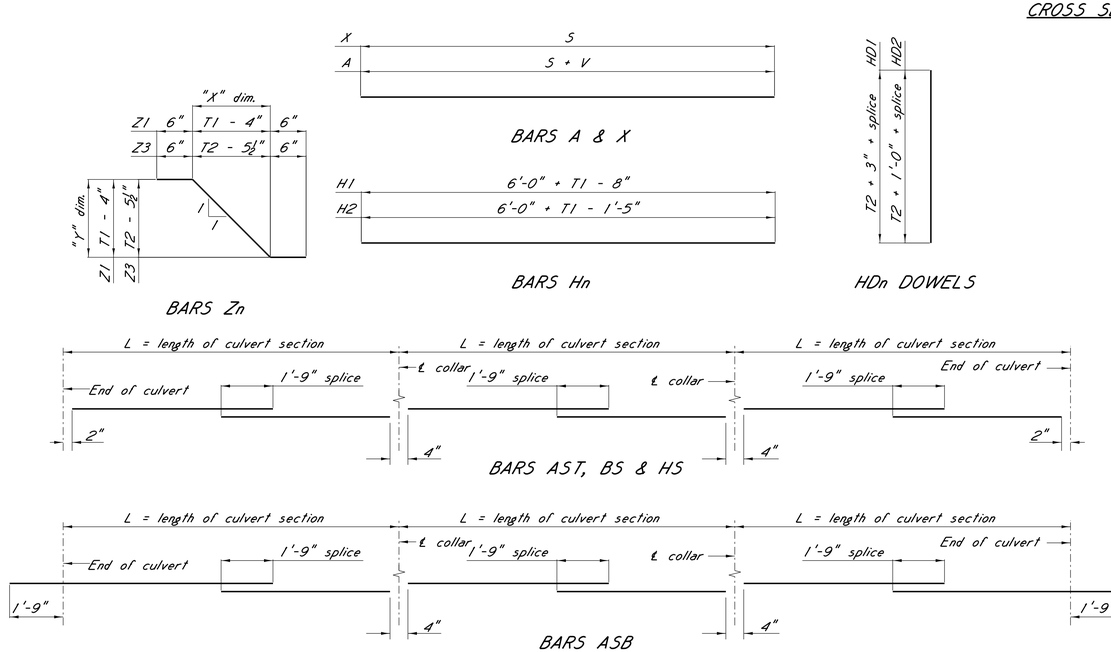


SIDE ELEVATION OF CULVERT

Showing collar locations.
Drawn for L = 150 ft. and M = 60 ft.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWS-2W, IWS-6-2W, IWS-3W & IWS-6-3W.



BAR BENDING DETAILS

Dimensions are out to out

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7012 & 7013.

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBS-6.
No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.
All concrete shall be class "B".
Expansion joint material shall be bituminous fiber type unless unless otherwise noted.
All exposed edges shall be chamfered ¾".
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.
Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.
Finish concrete per section 804.03.19.6.2 of the specifications.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.
Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.

SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. HL-93
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 6 FT.

SPANS 6 - 20 FT.

SHT. 1 OF 3

WORKING NUMBER IBS-6

SHEET NUMBER 7011

REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																		EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "Hn"		"HDn" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"				BARS "Z1"			BARS "Z2"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
						SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	(WALLS)	NO.	(SLABS)	SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
36	6x6	5'-0"	9"	9"	9"	*6	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	10	*4	10	*4	12	*4	12		16										0.7500	127.443
		10'-0"	9"	9"	9"	*6	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	10	*4	10	*4	12	*4	12		16										0.7500	127.443
		15'-0"	9"	9"	9"	*6	6"	*4	6"	*4	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	10	*4	10	*4	12	*4	12		16										0.7500	145.207
		20'-0"	9"	10"	9"	*6	6"	*4	6"	*4	6"	*4	6"	*4	6"	*4	6"	*4	10	*4	10	*4	12	*4	12		16										0.7731	157.009
		25'-0"	9"	10"	9"	*6	6"	*4	6"	*4	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	10	*4	10	*4	12	*4	12		16										0.8148	145.541
		30'-0"	9"	10"	9"	*7	6"	*4	6"	*4	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	10	*4	10	*4	12	*4	12		16										0.8148	160.175
48	8x6	5'-0"	9"	10"	9"	*7	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	12	*4	12	*4	12	*4	12		20										0.8904	160.368
		10'-0"	9"	10"	9"	*7	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	8"	*4	12	*4	12	*4	12	*4	12		20										0.8904	160.368
		15'-0"	9"	10½"	9"	*7	6"	*4	6"	*4	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	12	*4	12	*4	12	*4	12		20										0.9051	187.382
		20'-0"	10"	1'-0"	9"	*7	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	12	*4	12	*4	12	*4	12		20										0.9784	213.764
		25'-0"	10"	11½"	9"	*7	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	12	*4	12	*4	12	*4	12		20										1.0054	213.535
		30'-0"	11"	1'-0½"	9"	*8	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	12	*4	12	*4	12	*4	12		20										1.0640	236.363
60	10x6	5'-0"	9"	11½"	9"	*6	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	14	*4	14	*4	12	*4	12		24										1.0610	216.810
		10'-0"	9"	11½"	9"	*7	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	14	*4	14	*4	12	*4	12		24										1.0610	240.116
		15'-0"	10"	1'-0"	9"	*7	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	14	*4	14	*4	12	*4	12		24										1.1142	240.804
		20'-0"	1'-0"	1'-1½"	9"	*8	6"	*5	6"	*5	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	14	*4	14	*4	12	*4	12		24										1.2384	269.329
		25'-0"	1'-0"	1'-2"	10"	*8	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	14	*4	14	*4	12	*4	12		24										1.3483	306.068
		30'-0"	1'-1½"	1'-3"	11"	*8	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	14	*4	14	*4	12	*4	12		24										1.4900	309.490
72	12x6	5'-0"	9½"	11½"	9"	*7	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	16	*4	16	*4	12	*4	12		28										1.2083	301.239
		10'-0"	10½"	1'-1"	9"	*8	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	16	*4	16	*4	12	*4	12		28										1.3125	334.695
		15'-0"	11½"	1'-1½"	9½"	*8	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	16	*4	16	*4	12	*4	12		28										1.3999	336.559
		20'-0"	1'-1½"	1'-3½"	10½"	*8	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	16	*4	16	*4	12	*4	12		28										1.6196	340.898
		25'-0"	1'-2"	1'-4"	1'-0"	*8	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	16	*5	16	*5	12	*5	12		28										1.7824	427.914
		30'-0"	1'-1½"	1'-3½"	1'-0½"	*9	6"	*8	6"	*8	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	16	*5	16	*5	12	*5	12		28	*4	1'-0"	10				*4	1'-0"	10	1.7652	567.064
84	14x6	5'-0"	10"	1'-1"	9½"	*7	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	18	*4	18	*4	12	*4	12		32										1.4581	330.344
		10'-0"	11½"	1'-2"	10"	*8	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	18	*4	18	*4	12	*4	12		32										1.6034	420.390
		15'-0"	1'-1"	1'-2½"	10½"	*9	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	18	*4	18	*4	12	*4	12		32										1.7257	466.537
		20'-0"	1'-3½"	1'-5½"	1'-0"	*9	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	18	*4	18	*4	12	*4	12		32										2.0741	474.640
		25'-0"	1'-1½"	1'-4"	1'-1½"	*9	6"	*8	6"	*8	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	18	*5	18	*5	12	*5	12		32	*4	1'-0"	12				*4	1'-0"	12	2.0212	617.580
		30'-0"	1'-3"	1'-5"	1'-3"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	18	*5	18	*5	12	*5	12		34	*4	1'-0"	12				*4	1'-0"	12	2.2269	785.868
96	16x6	5'-0"	11½"	1'-2½"	1'-0½"	*7	6"	*6	6"	*6	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	20	*4	20	*4	12	*4	12		36										1.9141	364.268
		10'-0"	1'-0½"	1'-3"	1'-0½"	*8	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	20	*4	20	*4	12	*4	12		36										1.9978	459.655
		15'-0"	1'-3½"	1'-5½"	1'-0½"	*9	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	20	*4	20	*4	12	*4	12		36										2.3048	513.776
		20'-0"	1'-2"	1'-3½"	1'-2"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	20	*4	20	*4	12	*4	12		38	*4	1'-0"	10				*4	1'-0"	10	2.2294	780.734
		25'-0"	1'-3½"	1'-5½"	1'-3½"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	20	*5	20	*5	12	*5	12		38	*4	1'-0"	10				*4	1'-0"	10	2.5085	831.647
		30'-0"	1'-5½"	1'-6½"	1'-5½"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	20	*5	20	*5	12	*5	12		38	*4	1'-0"	12				*4	1'-0"	12	2.7917	851.990
108	18x6	5'-0"	1'-0"	1'-2"	11½"	*8	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	22	*4	22	*4	12	*4	12		40										2.0242	488.261
		10'-0"	1'-3"	1'-5"	1'-1½"	*9	6"	*8	6"	*8	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	22	*4	22	*4	12	*4	12		40										2.5000	626.434
		15'-0"	1'-3"	1'-4½"	1'-3"	*9	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	22	*4	22	*4	12	*4	12		42	*4	1'-0"	12				*4	1'-0"	12	2.5903	770.216
		20'-0"	1'-4"	1'-5½"	1'-4"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	22	*4	22	*4	12	*4	12		42	*4	1'-0"	12				*4	1'-0"	12	2.7711	847.827
		25'-0"	1'-6"	1'-6"	1'-6"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	22	*5	22	*5	12	*5	12		42	*4	1'-0"	14				*4	1'-0"	14	3.0417	908.797
		30'-0"	1'-9"	1'-9"	1'-9"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	22	*5	22	*5	12	*5	12		44	*4	1'-0"	14				*4	1'-0"	14	3.6065	936.066
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	*8	6"	*7	6"	*7	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	24	*4	24	*4	12	*4	12		44										2.4655	526.066
		10'-0"	1'-3"	1'-5"	1'-1½"	*9	6"	*8	6"	*8	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	24	*4	24	*4	12	*4	12		44										2.6975	664.322
		15'-0"	1'-4"	1'-4½"	1'-4"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*4	24	*4	24	*4	12	*4	12		46	*4	1'-0"	14				*4	1'-0"	14	2.9079	897.043
		20'-0"	1'-8"	1'-8"	1'-8"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	24	*5	24	*5	12	*5	12		48	*4	1'-0"	14				*4	1'-0"	14	3.6631	975.784
		25'-0"	1'-9½"	1'-9½"	1'-9½"	*10	6"	*9	6"	*9	6"	*4	6"	*4	1'-0"	*4	1'-0"	*5	24	*5	24	*5	12	*5	12		48	*5	1'-0"	14				*5	1'-0"	14	3.9678	1019.603

NOTE: If Z1, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 6 FT.

SPANS 6 - 20 FT.

SHT. 2 OF 3

WORKING NUMBER IBS-6

SHEET NUMBER 7012

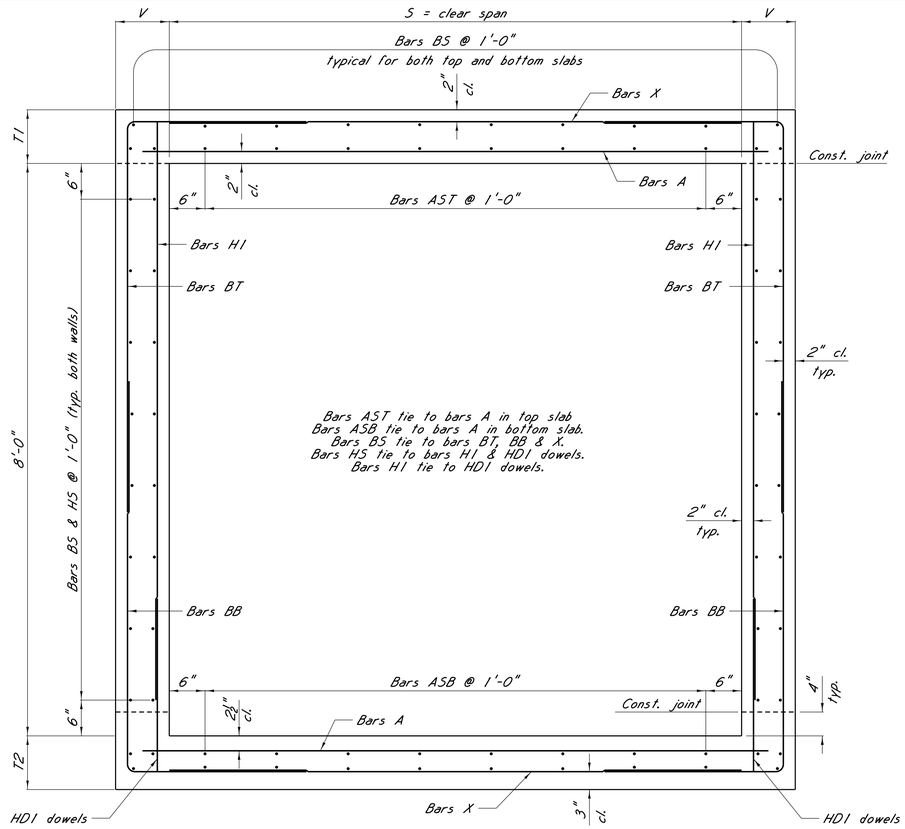
DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																																	
		Cover	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H1"		BARS "H2"		"HD1" DOWELS		"HD2" DOWELS		BARS "Z1"				BARS "Z2"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
36	6x6	5'-0"	#6	6'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-5½"	6'-11½"	#4	6'-0"	#4	6'-1"			#4	2'-5"														
		10'-0"	#6	6'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-5½"	6'-11½"	#4	6'-0"	#4	6'-1"			#4	2'-5"														
		15'-0"	#6	6'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-5½"	6'-11½"	#4	6'-0"	#4	6'-1"			#4	2'-5"														
		20'-0"	#6	6'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6½"	7'-0½"	#4	6'-0"	#4	6'-1"			#4	2'-6"														
		25'-0"	#6	6'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6½"	7'-0½"	#4	6'-0"			#4	5'-4"			#4	3'-3"												
		30'-0"	#7	6'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6½"	7'-0½"	#4	6'-0"			#4	5'-4"			#4	3'-3"												
48	8x6	5'-0"	#7	8'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6½"	7'-0½"	#4	8'-0"	#4	6'-1"			#4	2'-6"														
		10'-0"	#7	8'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6½"	7'-0½"	#4	8'-0"	#4	6'-1"			#4	2'-6"														
		15'-0"	#7	8'-9"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-7"	7'-1"	#4	8'-0"	#4	6'-1"			#4	2'-6½"														
		20'-0"	#7	8'-9"	#5	2'-10"	4'-8½"	7'-6½"	#5	2'-10"	4'-10½"	7'-8½"	#4	8'-0"	#4	6'-2"			#4	2'-8"														
		25'-0"	#7	8'-9"	#5	2'-10"	4'-8½"	7'-6½"	#5	2'-10"	4'-10"	7'-8"	#4	8'-0"			#4	5'-5"			#4	3'-4½"												
		30'-0"	#8	8'-9"	#5	2'-10"	4'-9½"	7'-7½"	#5	2'-10"	4'-11"	7'-9"	#4	8'-0"			#4	5'-6"			#4	3'-5½"												
60	10x6	5'-0"	#6	10'-9"	#5	2'-10"	4'-7½"	7'-5½"	#5	2'-10"	4'-10"	7'-8"	#4	10'-0"	#4	6'-1"			#4	2'-7½"														
		10'-0"	#7	10'-9"	#5	2'-10"	4'-7½"	7'-5½"	#5	2'-10"	4'-10"	7'-8"	#4	10'-0"	#4	6'-1"			#4	2'-7½"														
		15'-0"	#7	10'-9"	#5	2'-10"	4'-8½"	7'-6½"	#5	2'-10"	4'-10½"	7'-8½"	#4	10'-0"	#4	6'-2"			#4	2'-8"														
		20'-0"	#8	10'-9"	#5	2'-10"	4'-10½"	7'-8½"	#5	2'-10"	5'-0"	7'-10"	#4	10'-0"	#4	6'-4"			#4	2'-9½"														
		25'-0"	#8	10'-10"	#6	3'-3"	5'-0½"	8'-3½"	#6	3'-3"	5'-2½"	8'-5½"	#4	10'-0"			#4	5'-7"			#4	3'-7"												
		30'-0"	#8	10'-11"	#6	3'-4"	5'-2"	8'-6"	#6	3'-4"	5'-3½"	8'-7½"	#4	10'-0"			#4	5'-8½"			#4	3'-8"												
72	12x6	5'-0"	#7	12'-9"	#6	3'-2"	4'-10"	8'-0"	#6	3'-2"	5'-0"	8'-2"	#4	12'-0"	#4	6'-1½"			#4	2'-7½"														
		10'-0"	#8	12'-9"	#6	3'-2"	4'-11"	8'-1"	#6	3'-2"	5'-1½"	8'-3½"	#4	12'-0"	#4	6'-2½"			#4	2'-9"														
		15'-0"	#8	12'-9½"	#6	3'-2½"	5'-0"	8'-2½"	#6	3'-2½"	5'-2"	8'-4½"	#4	12'-0"	#4	6'-3½"			#4	2'-9½"														
		20'-0"	#8	12'-10½"	#6	3'-3½"	5'-2"	8'-5½"	#6	3'-3½"	5'-4"	8'-7½"	#4	12'-0"	#4	6'-5½"			#4	2'-11½"														
		25'-0"	#8	13'-0"	#7	4'-0"	5'-6"	9'-6"	#7	4'-0"	5'-8"	9'-8"	#4	12'-0"			#4	5'-9"			#4	3'-9"												
		30'-0"	#9	13'-0½"	#8	4'-9½"	5'-10"	10'-7½"	#8	4'-9½"	6'-0"	10'-9½"	#4	12'-0"			#4	5'-8½"			#4	3'-8½"	#4	9½"	9½"	2'-1 7/16"					#4	10"	10"	2'-2⅛"
84	14x6	5'-0"	#7	14'-9½"	#6	3'-2½"	4'-10½"	8'-1"	#6	3'-2½"	5'-1½"	8'-4"	#4	14'-0"	#4	6'-2"			#4	2'-9"														
		10'-0"	#8	14'-10"	#7	3'-10"	5'-3½"	9'-1½"	#7	3'-10"	5'-6"	9'-4"	#4	14'-0"	#4	6'-3½"			#4	2'-10"														
		15'-0"	#9	14'-10½"	#7	3'-10½"	5'-5"	9'-3½"	#7	3'-10½"	5'-6½"	9'-5"	#4	14'-0"	#4	6'-5"			#4	2'-10½"														
		20'-0"	#9	15'-0"	#7	4'-0"	5'-7½"	9'-7½"	#7	4'-0"	5'-9½"	9'-9½"	#4	14'-0"	#4	6'-7½"			#4	3'-1½"														
		25'-0"	#9	15'-1½"	#8	4'-10½"	5'-10"	10'-8½"	#8	4'-10½"	6'-0½"	10'-11"	#4	14'-0"			#4	5'-8½"			#4	3'-9"	#4	9½"	9½"	2'-1 7/16"					#4	10½"	10½"	2'-2⅞"
		30'-0"	#10	15'-3"	#9	5'-11"	6'-5"	12'-4"	#9	5'-11"	6'-7"	12'-6"	#4	14'-0"			#4	5'-10"			#4	3'-10"	#4	11"	11"	2'-3 9/16"					#4	11½"	11½"	2'-4¼"
96	16x6	5'-0"	#7	17'-0½"	#6	3'-5½"	5'-0"	8'-5½"	#6	3'-5½"	5'-3"	8'-8½"	#4	16'-0"	#4	6'-3½"			#4	2'-10½"														
		10'-0"	#8	17'-0½"	#7	4'-0½"	5'-4½"	9'-5"	#7	4'-0½"	5'-7"	9'-7½"	#4	16'-0"	#4	6'-4½"			#4	2'-11"														
		15'-0"	#9	17'-0½"	#7	4'-0½"	5'-7½"	9'-8"	#7	4'-0½"	5'-9½"	9'-10"	#4	16'-0"	#4	6'-7½"			#4	3'-1½"														
		20'-0"	#10	17'-2"	#9	5'-10"	6'-4"	12'-2"	#9	5'-10"	6'-5½"	12'-3½"	#4	16'-0"			#4	5'-9"			#4	3'-8½"	#4	10"	10"	2'-2⅛"					#4	10"	10"	2'-2⅛"
		25'-0"	#10	17'-3½"	#9	5'-11½"	6'-5½"	12'-5"	#9	5'-11½"	6'-7½"	12'-7"	#4	16'-0"			#4	5'-10½"			#4	3'-10½"	#4	11½"	11½"	2'-4¼"					#4	1'-0"	1'-0"	2'-5"
		30'-0"	#10	17'-5½"	#9	6'-1½"	6'-7½"	12'-9"	#9	6'-1½"	6'-8½"	12'-10"	#4	16'-0"			#4	6'-0½"			#4	3'-11½"	#4	1'-1½"	1'-1½"	2'-7 1/16"					#4	1'-1"	1'-1"	2'-6⅜"
108	18x6	5'-0"	#8	18'-11½"	#7	3'-11½"	5'-4"	9'-3½"	#7	3'-11½"	5'-6"	9'-5½"	#4	18'-0"	#4	6'-4"			#4	2'-10"														
		10'-0"	#9	19'-1½"	#8	4'-10½"	5'-11½"	10'-10"	#8	4'-10½"	6'-1½"	11'-0"	#4	18'-0"	#4	6'-7"			#4	3'-1"														
		15'-0"	#9	19'-3"	#9	5'-11"	6'-5"	12'-4"	#9	5'-11"	6'-6½"	12'-5½"	#4	18'-0"			#4	5'-10"			#4	3'-9½"	#4	11"	11"	2'-3 9/16"					#4	11"	11"	2'-3 9/16"
		20'-0"	#10	19'-4"	#9	6'-0"	6'-6"	12'-6"	#9	6'-0"	6'-7½"	12'-7½"	#4	18'-0"			#4	5'-11"			#4	3'-10½"	#4	1'-0"	1'-0"	2'-5"					#4	1'-0"	1'-0"	2'-5"
		25'-0"	#10	19'-6"	#9	6'-2"	6'-8"	12'-10"	#9	6'-2"	6'-8"	12'-10"	#4	18'-0"			#4	6'-1"			#4	3'-11"	#4	1'-2"	1'-2"	2'-7 13/16"					#4	1'-0½"	1'-0½"	2'-5 11/16"
		30'-0"	#10	19'-9"	#9	6'-5"	6'-11"	13'-4"	#9	6'-5"	6'-11"	13'-4"	#4	18'-0"			#4	6'-4"			#4	4'-2"	#4	1'-5"	1'-5"	3'-0 1/16"					#4	1'-3½"	1'-3½"	2'-9 15/16"
120	20x6	5'-0"	#8	21'-1"	#7	4'-1"	5'-5"	9'-6"	#7	4'-1"	5'-8"	9'-9"	#4	20'-0"	#4	6'-5"			#4	3'-0"														
		10'-0"	#9	21'-1½"	#8	4'-10½"	5'-11½"	10'-10"	#8	4'-10½"	6'-1½"	11'-0"	#4	20'-0"	#4	6'-7"			#4	3'-1"														
		15'-0"	#10	21'-4"	#9	6'-0"	6'-6"	12'-6"	#9	6'-0"	6'-6½"	12'-6½"	#4	20'-0"			#4	5'-11"			#4	3'-9½"	#4	1'-0"	1'-0"	2'-5"					#4	11"	11"	2'-3⅜"
		20'-0"	#10	21'-8"	#9	6'-4"	6'-10"	13'-2"	#9	6'-4"	6'-10"	13'-2"	#4	20'-0"			#4	6'-3"			#4	4'-1"	#4	1'-4"	1'-4"	2'-10⅝"					#4	1'-2½"	1'-2½"	2'-8½"
		25'-0"	#10	21'-9½"	#9	6'-5½"	6'-11½"	13'-5"	#9	6'-5½"	6'-11½"	13'-5"	#4	20'-0"			#4	6'-4½"			#4	4'-2½"	#5	1'-5½"	1'-5½"	3'-0⅜"					#5	1'-4"	1'-4"	2'-10⅝"

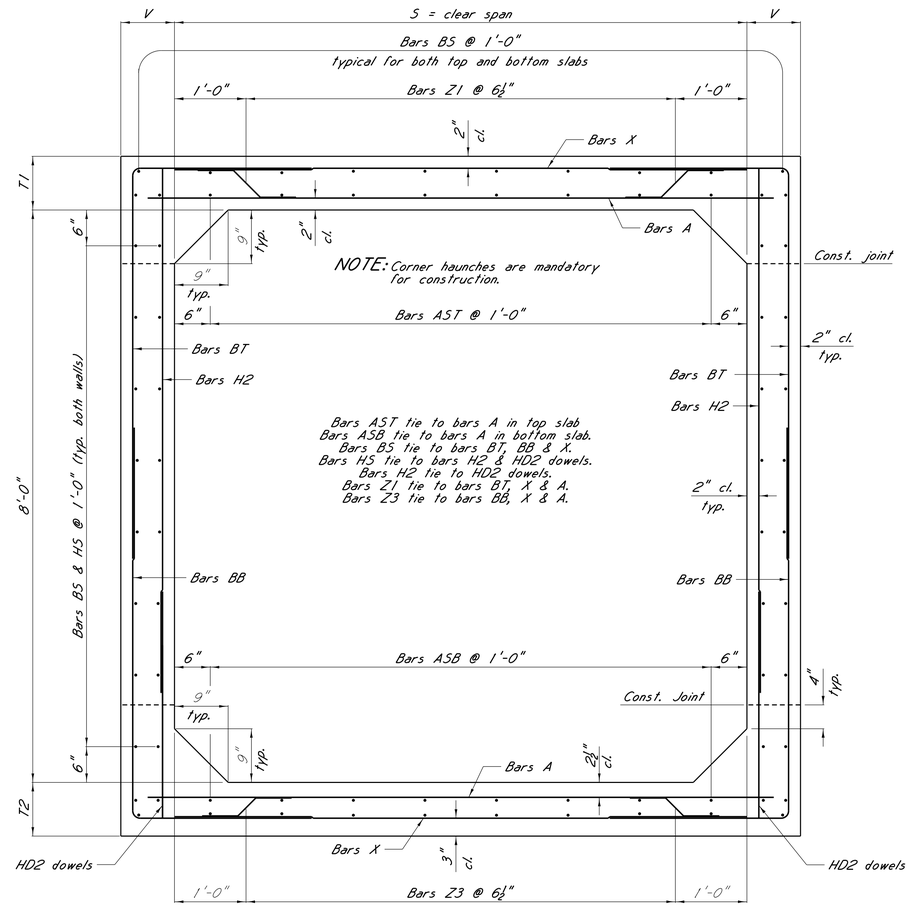
NOTE: If Z1, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
REVISIONS	BARREL DETAILS FOR SINGLE CELL BOX CULVERT	
	HEIGHT 6 FT.	SHT. 3 OF 3
	SPANS 6 - 20 FT.	WORKING NUMBER IBS-6
DATE	DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC. DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	SHEET NUMBER 7013



CROSS SECTION "A"

NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.



CROSS SECTION "B"

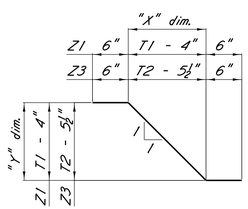
NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWS-2W, IWS-8-2W, IWS-3W & IWS-8-3W.

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7015 & 7016.

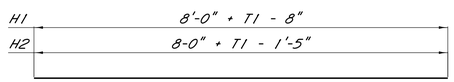
NOTE: For joint locations and joint details see sheet no. 7015.

GENERAL NOTES:

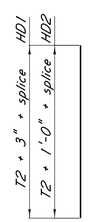
Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
Barrel details, on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBS-8.
No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.
All concrete shall be class "B".
Expansion joint material shall be bituminous fiber type unless unless otherwise noted.
All exposed edges shall be chamfered ¾".
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.
Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.
Finish concrete per section 804.03.19.6.2 of the specifications.
Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.
Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.
Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.



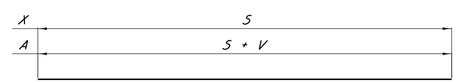
BARS Zn



BARS Hn

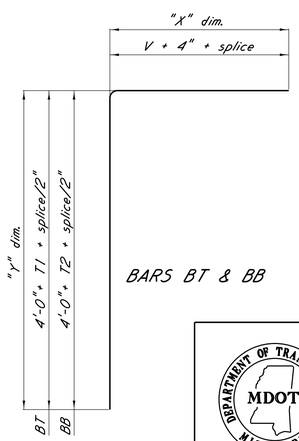


HDn DOWELS

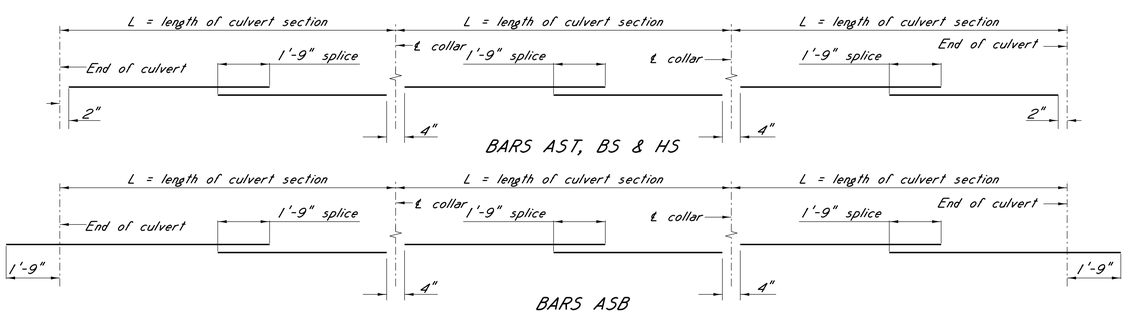


BARS A & X

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"



BARS BT & BB



BAR BENDING DETAILS

Dimensions are out to out

SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. HL-93
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 8 FT.

SPANS 8 - 20 FT.

SHT. 1 OF 3

WORKING NUMBER IBS-8

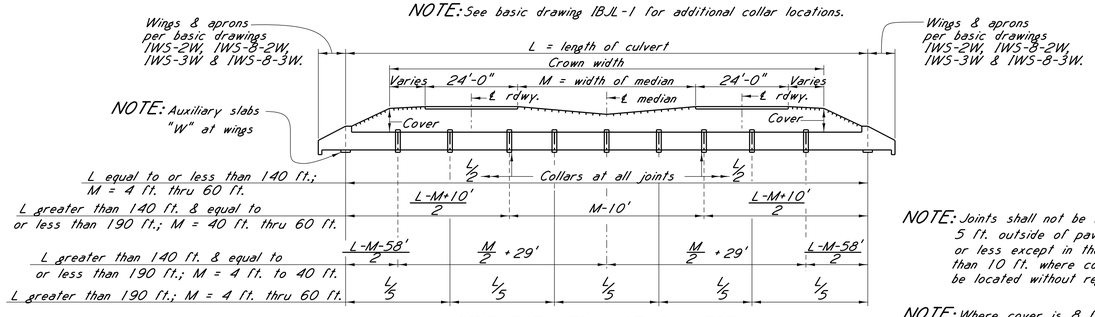
SHEET NUMBER 7014

REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																	EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "Hn"		"HDn" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"				BARS "Z1"			BARS "Z2"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
						SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO. (WALLS)	NO. (SLABS)	SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
64	8x8	5'-0"	9"	9"	9"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	12	#4	12	#4	16	#4	16	20										0.9722	195.299
		10'-0"	9"	9"	9"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	12	#4	12	#4	16	#4	16	20										0.9722	195.299
		15'-0"	9"	10½"	9"	#6	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	12	#4	12	#4	16	#4	16	20										1.0162	224.202
		20'-0"	10"	1'-0"	9½"	#6	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	12	#4	12	#4	16	#4	16	20										1.1199	226.226
		25'-0"	10"	1'-0"	9½"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	12	#4	12	#4	16	#4	16	20										1.1615	245.286
		30'-0"	11"	1'-0½"	10½"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	12	#4	12	#4	16	#4	16	20										1.2674	247.518
80	10x8	5'-0"	10"	10"	9"	#7	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	14	#4	14	#4	16	#4	16	24										1.1543	242.200
		10'-0"	10"	11"	9"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	14	#4	14	#4	16	#4	16	24										1.1898	271.067
		15'-0"	10½"	1'-0"	9½"	#7	6"	#5	6"	#5	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	14	#4	14	#4	16	#4	16	24										1.2735	258.082
		20'-0"	1'-0"	1'-2"	10"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	14	#4	14	#4	16	#4	16	24										1.4300	275.296
		25'-0"	1'-0"	1'-2½"	10"	#8	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	14	#4	14	#4	16	#4	16	24										1.4897	326.406
		30'-0"	1'-0"	1'-2½"	10"	#8	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	14	#4	14	#4	16	#4	16	24										1.4897	326.406
96	12x8	5'-0"	10"	11½"	9"	#7	6"	#5	6"	#5	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	16	#4	16	28										1.3403	283.975
		10'-0"	10½"	1'-1½"	10"	#7	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	16	#4	16	28										1.5062	324.790
		15'-0"	11½"	1'-1½"	10"	#8	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	16	#4	16	28										1.5484	357.536
		20'-0"	1'-1½"	1'-3½"	10½"	#8	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	16	#4	16	28										1.7492	360.930
		25'-0"	1'-2"	1'-4"	11½"	#9	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	16	#4	16	28										1.8981	401.272
		30'-0"	1'-2"	1'-4"	11½"	#9	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	16	#4	16	28										1.8981	401.272
112	14x8	5'-0"	11"	1'-1"	10"	#7	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	16	#4	16	32										1.6543	351.830
		10'-0"	11½"	1'-2"	10"	#8	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	16	#4	16	32										1.7269	389.890
		15'-0"	1'-1"	1'-3"	10½"	#9	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	16	#4	16	32										1.8796	435.801
		20'-0"	1'-3½"	1'-5½"	11½"	#9	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	16	#4	16	32										2.1890	440.996
		25'-0"	1'-2"	1'-4"	1'-1"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	16	#4	16	32	#4	1'-0"	10				#4	1'-0"	10	2.1806	660.554
		30'-0"	1'-4"	1'-6"	1'-2"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	16	#4	16	34	#4	1'-0"	10				#4	1'-0"	10	2.4470	672.259
128	16x8	5'-0"	11"	1'-2"	10"	#8	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	16	#4	16	36										1.8570	476.410
		10'-0"	1'-1"	1'-4½"	11½"	#8	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	16	#4	16	36										2.1992	483.356
		15'-0"	1'-3½"	1'-5½"	1'-0"	#9	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	16	#4	16	36										2.4259	536.896
		20'-0"	1'-1½"	1'-4½"	1'-1½"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	16	#4	16	36	#4	1'-0"	10				#4	1'-0"	10	2.3981	707.273
		25'-0"	1'-3½"	1'-6½"	1'-2"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	16	#4	16	38	#4	1'-0"	10				#4	1'-0"	10	2.6569	825.094
		30'-0"	1'-5½"	1'-6½"	1'-5½"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	16	#4	16	38	#5	1'-0"	16				#5	1'-0"	16	3.0077	893.383
144	18x8	5'-0"	1'-0"	1'-3"	11"	#8	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	16	#4	16	40										2.1960	512.296
		10'-0"	1'-2"	1'-5"	1'-0"	#9	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	16	#4	16	40										2.5062	573.199
		15'-0"	1'-3"	1'-5"	1'-2"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	16	#4	16	42	#4	1'-0"	12				#4	1'-0"	12	2.7413	765.120
		20'-0"	1'-3"	1'-6"	1'-3"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	16	#4	16	42	#4	1'-0"	12				#4	1'-0"	12	2.8704	878.247
		25'-0"	1'-6"	1'-7½"	1'-6"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	16	#4	16	42	#4	1'-0"	12				#4	1'-0"	12	3.3611	899.202
		30'-0"	1'-8"	1'-10"	1'-8"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	22	#5	22	#5	16	#5	16	44	#5	1'-0"	12				#5	1'-0"	12	3.7948	989.028
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	#8	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	24	#4	24	#4	16	#4	16	44										2.9681	554.398
		10'-0"	1'-4"	1'-6"	1'-2"	#9	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	24	#4	24	#4	16	#4	16	46										3.0350	619.793
		15'-0"	1'-3½"	1'-6"	1'-3½"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	24	#4	24	#4	16	#4	16	46	#4	1'-0"	14				#4	1'-0"	14	3.1421	932.755
		20'-0"	1'-6"	1'-9"	1'-6"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	16	#5	16	46	#4	1'-0"	14				#4	1'-0"	14	3.6991	1002.165
		25'-0"	1'-9"	1'-9½"	1'-9"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	16	#5	16	48	#5	1'-0"	14				#5	1'-0"	14	4.1613	1054.486
		30'-0"	1'-11½"	2'-0"	1'-11½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	16	#5	16	48	#5	1'-0"	22				#5	1'-0"	22	4.7085	1221.333

NOTE: See basic drawing IBJL-1 for additional collar locations.



SIDE ELEVATION OF CULVERT

Showing collar locations

Drawn for L = 150 ft. and M = 60 ft.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

NOTE: If Zn, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 8 FT.

SPANS 8 - 20 FT.

SHT. 2 OF 3

WORKING NUMBER IBS-8

SHEET NUMBER 7015

REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																																	
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H1"		BARS "H2"		"HD1" DOWELS		"HD2" DOWELS		BARS "Z1"				BARS "Z2"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
64	8x8	5'-0"	#6	8'-9"	#4	2'-6"	5'-5½"	7'-11½"	#4	2'-6"	5'-5½"	7'-11½"	#4	8'-0"	#4	8'-1"			#4	2'-5"														
		10'-0"	#6	8'-9"	#4	2'-6"	5'-5½"	7'-11½"	#4	2'-6"	5'-5½"	7'-11½"	#4	8'-0"	#4	8'-1"			#4	2'-5"														
		15'-0"	#6	8'-9"	#5	2'-10"	5'-7½"	8'-5½"	#5	2'-10"	5'-9"	8'-7"	#4	8'-0"	#4	8'-1"			#4	2'-6½"														
		20'-0"	#6	8'-9½"	#5	2'-10½"	5'-8½"	8'-7"	#5	2'-10½"	5'-10½"	8'-9"	#4	8'-0"	#4	8'-2"			#4	2'-8"														
		25'-0"	#7	8'-9½"	#5	2'-10½"	5'-8½"	8'-7"	#5	2'-10½"	5'-10½"	8'-9"	#4	8'-0"			#4	7'-5"			#4	3'-5"												
		30'-0"	#7	8'-10½"	#5	2'-11½"	5'-9½"	8'-9"	#5	2'-11½"	5'-11"	8'-10½"	#4	8'-0"			#4	7'-6"			#4	3'-5½"												
80	10x8	5'-0"	#7	10'-9"	#4	2'-6"	5'-6½"	8'-0½"	#4	2'-6"	5'-6½"	8'-0½"	#4	10'-0"	#4	8'-2"			#4	2'-6"														
		10'-0"	#7	10'-9"	#5	2'-10"	5'-8½"	8'-6½"	#5	2'-10"	5'-9½"	8'-7½"	#4	10'-0"	#4	8'-2"			#4	2'-7"														
		15'-0"	#7	10'-9½"	#5	2'-10½"	5'-9"	8'-7½"	#5	2'-10½"	5'-10½"	8'-9"	#4	10'-0"	#4	8'-2½"			#4	2'-8"														
		20'-0"	#7	10'-10"	#5	2'-11"	5'-10½"	8'-9½"	#5	2'-11"	6'-0½"	8'-11½"	#4	10'-0"	#4	8'-4"			#4	2'-10"														
		25'-0"	#8	10'-10"	#6	3'-3"	6'-0½"	9'-3½"	#6	3'-3"	6'-3"	9'-6"	#4	10'-0"	#4		#4	7'-7"			#4	3'-7½"												
		30'-0"	#8	10'-10"	#6	3'-3"	6'-0½"	9'-3½"	#6	3'-3"	6'-3"	9'-6"	#4	10'-0"	#4		#4	7'-7"			#4	3'-7½"												
96	12x8	5'-0"	#7	12'-9"	#5	2'-10"	5'-8½"	8'-6½"	#5	2'-10"	5'-10"	8'-8"	#4	12'-0"	#4	8'-2"			#4	2'-7½"														
		10'-0"	#7	12'-10"	#6	3'-3"	5'-11"	9'-2"	#6	3'-3"	6'-2"	9'-5"	#4	12'-0"	#4	8'-2½"			#4	2'-9½"														
		15'-0"	#8	12'-10"	#6	3'-3"	6'-0"	9'-3"	#6	3'-3"	6'-2"	9'-5"	#4	12'-0"	#4	8'-3½"			#4	2'-9½"														
		20'-0"	#8	12'-10½"	#6	3'-3½"	6'-2"	9'-5½"	#6	3'-3½"	6'-4"	9'-7½"	#4	12'-0"	#4	8'-5½"			#4	2'-11½"														
		25'-0"	#9	12'-11½"	#6	3'-4½"	6'-2½"	9'-7"	#6	3'-4½"	6'-4½"	9'-9"	#4	12'-0"			#4	7'-9"			#4	3'-9"												
		30'-0"	#9	12'-11½"	#6	3'-4½"	6'-2½"	9'-7"	#6	3'-4½"	6'-4½"	9'-9"	#4	12'-0"			#4	7'-9"			#4	3'-9"												
112	14x8	5'-0"	#7	14'-10"	#6	3'-3"	5'-11½"	9'-2½"	#6	3'-3"	6'-1½"	9'-4½"	#4	14'-0"	#4	8'-3"			#4	2'-9"														
		10'-0"	#8	14'-10"	#6	3'-3"	6'-0"	9'-3"	#6	3'-3"	6'-2½"	9'-5½"	#4	14'-0"	#4	8'-3½"			#4	2'-10"														
		15'-0"	#9	14'-10½"	#6	3'-3½"	6'-1½"	9'-5"	#6	3'-3½"	6'-3½"	9'-7"	#4	14'-0"	#4	8'-5"			#4	2'-11"														
		20'-0"	#9	14'-11½"	#6	3'-4½"	6'-4"	9'-8½"	#6	3'-4½"	6'-6"	9'-10½"	#4	14'-0"	#4	8'-7½"			#4	3'-1½"														
		25'-0"	#10	15'-1"	#8	4'-10"	6'-10½"	11'-8½"	#8	4'-10"	7'-0½"	11'-10½"	#4	14'-0"			#4	7'-9"			#4	3'-9"	#4	10"	10"	2'-2⅛"					#4	10½"	10½"	2'-2⅞"
		30'-0"	#10	15'-2"	#8	4'-11"	7'-0½"	11'-11½"	#8	4'-11"	7'-2½"	12'-1½"	#4	14'-0"			#4	7'-11"			#4	3'-11"	#4	1'-0"	1'-0"	2'-5"					#4	1'-0½"	1'-0½"	2'-5 11/16"
128	16x8	5'-0"	#8	16'-10"	#7	3'-10"	6'-3"	10'-1"	#7	3'-10"	6'-6"	10'-4"	#4	16'-0"	#4	8'-3"			#4	2'-10"														
		10'-0"	#8	16'-11½"	#7	3'-11½"	6'-5"	10'-4½"	#7	3'-11½"	6'-8½"	10'-8"	#4	16'-0"	#4	8'-5"			#4	3'-0½"														
		15'-0"	#9	17'-0"	#7	4'-0"	6'-7½"	10'-7½"	#7	4'-0"	6'-9½"	10'-9½"	#4	16'-0"	#4	8'-7½"			#4	3'-1½"														
		20'-0"	#10	17'-1½"	#8	4'-10½"	6'-10"	11'-8½"	#8	4'-10½"	7'-1"	11'-11½"	#4	16'-0"			#4	7'-8½"			#4	3'-9½"	#4	9½"	9½"	2'-1 7/16"					#4	11"	11"	2'-3 9/16"
		25'-0"	#10	17'-2"	#9	5'-10"	7'-5½"	13'-3½"	#9	5'-10"	7'-8½"	13'-6½"	#4	16'-0"			#4	7'-10½"			#4	3'-11½"	#4	11½"	11½"	2'-4¼"					#4	1'-1"	1'-1"	2'-6 3/8"
		30'-0"	#10	17'-5½"	#9	6'-1½"	7'-7½"	13'-9"	#9	6'-1½"	7'-8½"	13'-10"	#4	16'-0"			#4	8'-0½"			#4	3'-11½"	#5	1'-1½"	1'-1½"	2'-7 1/16"					#5	1'-1"	1'-1"	2'-6 3/8"
144	18x8	5'-0"	#8	18'-11"	#7	3'-11"	6'-4"	10'-3"	#7	3'-11"	6'-7"	10'-6"	#4	18'-0"	#4	8'-4"			#4	2'-11"														
		10'-0"	#9	19'-0"	#7	4'-0"	6'-6"	10'-6"	#7	4'-0"	6'-9"	10'-9"	#4	18'-0"	#4	8'-6"			#4	3'-1"														
		15'-0"	#10	19'-2"	#8	4'-11"	6'-11½"	11'-10½"	#8	4'-11"	7'-1½"	12'-0½"	#4	18'-0"			#4	7'-10"			#4	3'-10"	#4	11"	11"	2'-3 9/16"					#4	11½"	11½"	2'-4¼"
		20'-0"	#10	19'-3"	#9	5'-11"	7'-5"	13'-4"	#9	5'-11"	7'-8"	13'-7"	#4	18'-0"			#4	7'-10"			#4	3'-11"	#4	11"	11"	2'-3 9/16"					#4	1'-0½"	1'-0½"	2'-5 11/16"
		25'-0"	#10	19'-6"	#9	6'-2"	7'-8"	13'-10"	#9	6'-2"	7'-9½"	13'-11½"	#4	18'-0"			#4	8'-1"			#4	4'-0½"	#4	1'-2"	1'-2"	2'-7 13/16"					#4	1'-2"	1'-2"	2'-7 13/16"
		30'-0"	#10	19'-8"	#9	6'-4"	7'-10"	14'-2"	#9	6'-4"	8'-0"	14'-4"	#4	18'-0"			#4	8'-3"			#4	4'-3"	#5	1'-4"	1'-4"	2'-10 5/8"					#5	1'-4½"	1'-4½"	2'-11 5/16"
160	20x8	5'-0"	#8	21'-1"	#7	4'-1"	6'-8"	10'-9"	#7	4'-1"	6'-10"	10'-11"	#4	20'-0"	#4	8'-8"			#4	3'-2"														
		10'-0"	#9	21'-2"	#7	4'-2"	6'-8"	10'-10"	#7	4'-2"	6'-10"	11'-0"	#4	20'-0"	#4	8'-8"			#4	3'-2"														
		15'-0"	#10	21'-3½"	#9	5'-11½"	7'-5½"	13'-5"	#9	5'-11½"	7'-8"	13'-7½"	#4	20'-0"			#4	7'-10½"			#4	3'-11"	#4	11½"	11½"	2'-4¼"					#4	1'-0½"	1'-0½"	2'-5 11/16"
		20'-0"	#10	21'-6"	#9	6'-2"	7'-8"	13'-10"	#9	6'-2"	7'-11"	14'-1"	#4	20'-0"			#4	8'-1"			#4	4'-2"	#4	1'-2"	1'-2"	2'-7 13/16"					#4	1'-3½"	1'-3½"	2'-9 15/16"
		25'-0"	#10	21'-9"	#9	6'-5"	7'-11"	14'-4"	#9	6'-5"	7'-11½"	14'-4½"	#4	20'-0"			#4	8'-4"			#4	4'-2½"	#5	1'-5"	1'-5"	3'-0⅛"					#5	1'-4"	1'-4"	2'-10 5/8"
		30'-0"	#11	21'-11½"	#9	6'-7½"	8'-1½"	14'-9"	#9	6'-7½"	8'-2"	14'-9½"	#4	20'-0"			#4	8'-6½"			#4	4'-5"	#5	1'-7½"	1'-7½"	3'-3 9/16"					#5	1'-6½"	1'-6½"	3'-2 3/16"

NOTE: If Z1, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR
SINGLE CELL BOX CULVERT

HEIGHT 8 FT.

SPANS 8 - 20 FT.

SHT. 3 OF 3

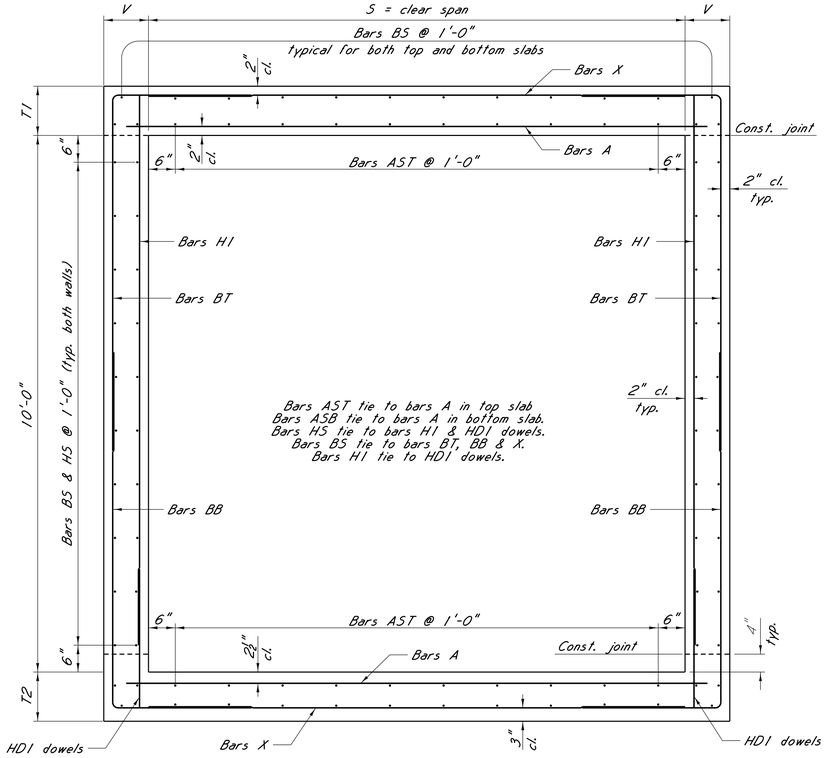
WORKING NUMBER IBS-8

SHEET NUMBER 7016

REVISIONS | BY | DATE

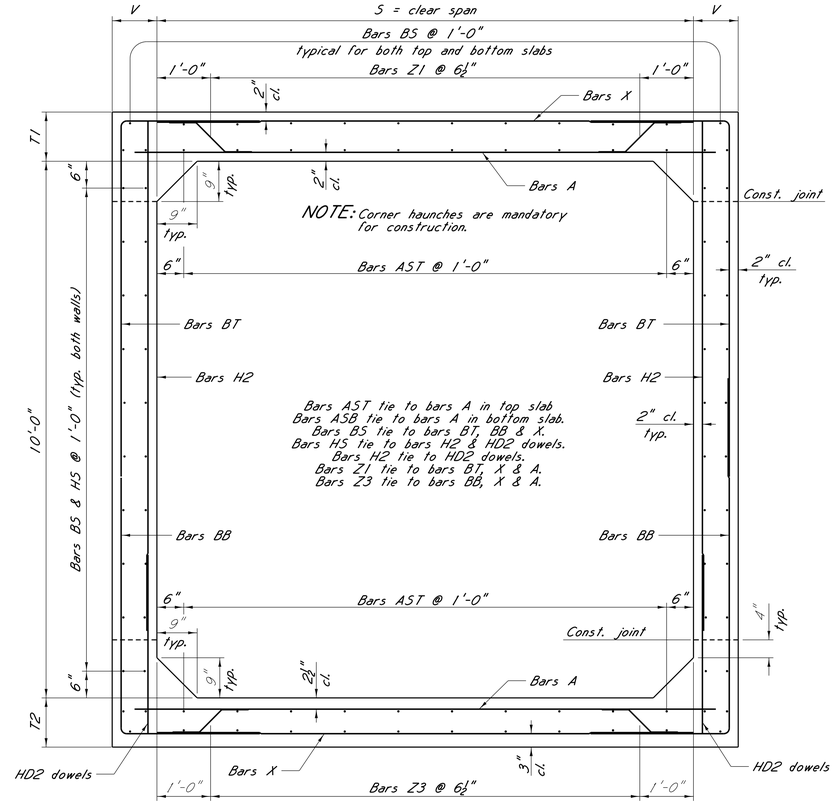
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



CROSS SECTION "A"

NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.



CROSS SECTION "B"

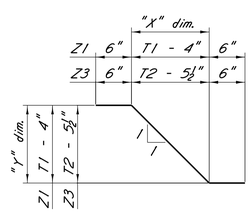
NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings No. IWS-2W, IWS-10-2W, IWS-3W & IWS-10-3W.

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7018 & 7019.

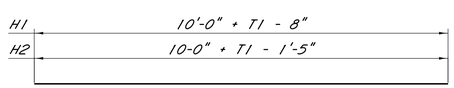
NOTE: For joint locations and joint details see sheet no. 7018.

GENERAL NOTES:

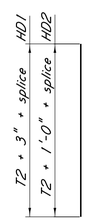
Specifications: Mississippi Standard Specifications for Road and Bridge Construction, 2004.
Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBS-10.
No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.
All concrete shall be class "B".
Expansion joint material shall be bituminous fiber type unless unless otherwise noted.
All exposed edges shall be chamfered ¾".
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.
Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.
Finish concrete per section 804.03.19.6.2 of the specifications.
Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.
Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.
Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.



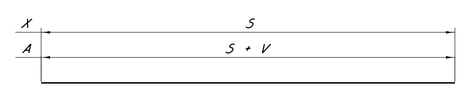
BARS Zn



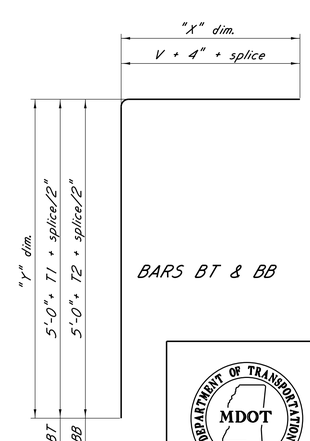
BARS Hn



HDn DOWELS

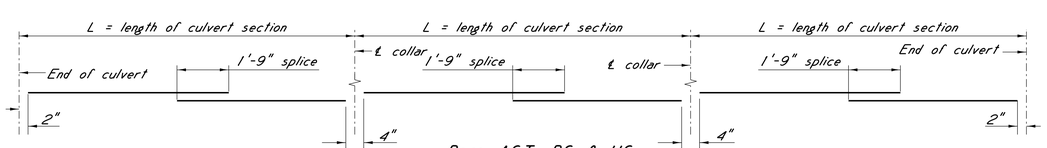


BARS A & X

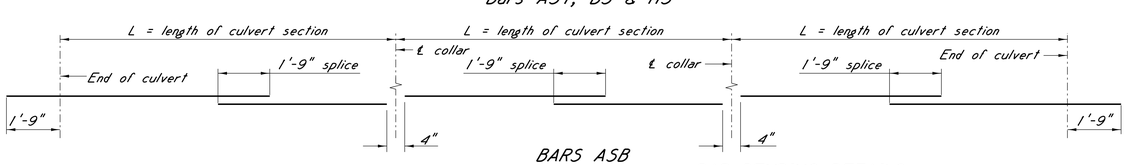


BARS BT & BB

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"



Bars AST, BS & HS



BARS ASB

BAR BENDING DETAILS

Dimensions are out to out

SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. . . . . HL-93.
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 10 FT.

SPANS 10 - 22 FT.

REVISIONS | BY

SHT. 1 OF 3

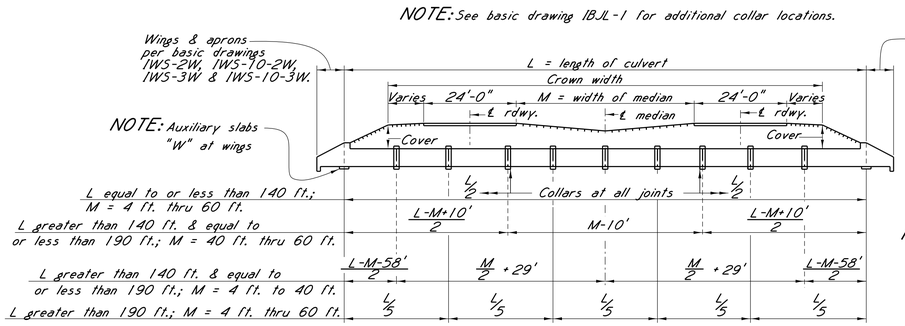
WORKING NUMBER IBS-10

SHEET NUMBER 7017

DATE
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																		EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "Hn"		"HDn" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"				BARS "Z1"			BARS "Z2"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
						SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	(WALLS)	NO. (SLABS)	SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
100	10x10	5'-0"	11"	11"	10"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	14	#4	14	#4	20	#4	20		24										1.4095	236.763
		10'-0"	11"	1'-0"	10"	#6	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	14	#4	14	#4	20	#4	20		24										1.4455	269.130
		15'-0"	10"	1'-0"	10½"	#7	6½"	#5	6½"	#5	6½"	#4	6½"	#4	6½"	#4	6½"	#4	14	#4	14	#4	20	#4	20		24										1.4460	274.944
		20'-0"	1'-0"	1'-2"	1'-0½"	#7	6½"	#5	6½"	#5	6½"	#4	6½"	#4	6½"	#4	6½"	#4	14	#4	14	#4	20	#4	20		24										1.7413	279.591
		25'-0"	1'-0½"	1'-2"	1'-0½"	#8	6½"	#5	6½"	#5	6½"	#4	6½"	#4	6½"	#4	6½"	#4	14	#4	14	#4	20	#4	20		24										1.8016	305.376
		30'-0"	1'-2"	1'-3½"	1'-2"	#8	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	14	#4	14	#4	20	#4	20		26										2.0288	331.128
120	12x10	5'-0"	1'-0"	1'-0"	10"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	20	#4	20		28										1.6296	320.227
		10'-0"	1'-0"	1'-1½"	10"	#7	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	20	#4	20		28										1.6929	363.275
		15'-0"	11½"	1'-1½"	10½"	#8	6½"	#6	6½"	#6	6½"	#4	6½"	#4	6½"	#4	6½"	#4	16	#4	16	#4	20	#4	20		28										1.7091	370.671
		20'-0"	1'-1½"	1'-4"	1'-0½"	#8	6½"	#6	6½"	#6	6½"	#4	6½"	#4	6½"	#4	6½"	#4	16	#4	16	#4	20	#4	20		28										2.0539	377.167
		25'-0"	1'-2"	1'-4½"	1'-1"	#8	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	20	#4	20		28										2.1777	386.608
		30'-0"	1'-1½"	1'-4½"	1'-2½"	#9	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	16	#4	16	#4	20	#4	20		28	#4	1'-0"	10				#4	1'-0"	10	2.2716	518.849
140	14x10	5'-0"	1'-0"	1'-3"	10"	#7	6½"	#6	6½"	#6	6½"	#4	6½"	#4	6½"	#4	6½"	#4	18	#4	18	#4	20	#4	20		32										1.9228	366.842
		10'-0"	1'-0"	1'-3"	10"	#8	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	18	#4	18	#4	20	#4	20		32										1.9228	428.542
		15'-0"	1'-1"	1'-3"	11"	#9	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	20	#4	20		32										2.0473	456.900
		20'-0"	1'-3½"	1'-6"	1'-1"	#9	6"	#6	6"	#6	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	20	#4	20		32										2.4740	464.536
		25'-0"	1'-4½"	1'-6½"	1'-1"	#9	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	20	#4	20		32										2.5905	527.457
		30'-0"	1'-4"	1'-6½"	1'-3"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	18	#4	18	#4	20	#4	20		32	#4	1'-0"	10				#4	1'-0"	10	2.7245	704.408
160	16x10	5'-0"	1'-0"	1'-4"	11"	#7	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	20	#4	20		36										2.2202	420.846
		10'-0"	1'-1"	1'-4½"	11"	#8	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	20	#4	20		36										2.3027	524.578
		15'-0"	1'-3½"	1'-6"	1'-0½"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	20	#4	20		36										2.6413	581.334
		20'-0"	1'-4"	1'-6"	1'-1"	#10	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	20	#4	20		36										2.7505	626.258
		25'-0"	1'-3½"	1'-7"	1'-2"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	20	#4	20	#4	20	#4	20		38	#4	1'-0"	10				#4	1'-0"	10	2.8580	747.641
		30'-0"	1'-6"	1'-9"	1'-3½"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	20	#5	20	#5	20	#5	20		38	#4	1'-0"	10				#4	1'-0"	10	3.2353	804.761
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	#8	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	22	#4	22	#4	20	#4	20		40										2.4691	557.522
		10'-0"	1'-2"	1'-5"	1'-0"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	22	#4	22	#4	20	#4	20		40										2.6543	615.714
		15'-0"	1'-4"	1'-6"	1'-1½"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	20	#4	20		40										3.0000	756.268
		20'-0"	1'-3½"	1'-6"	1'-2½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	22	#4	22	#4	20	#4	20		42	#4	1'-0"	12				#4	1'-0"	12	3.0477	990.309
		25'-0"	1'-5"	1'-8½"	1'-3½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	22	#5	22	#5	20	#5	20		42	#5	1'-0"	12				#5	1'-0"	12	3.3808	1074.203
		30'-0"	1'-6½"	1'-10½"	1'-5½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	22	#5	22	#5	20	#5	20		42	#5	1'-0"	20				#5	1'-0"	20	3.7688	1139.461
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	#8	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	24	#4	24	#4	20	#4	20		44										2.9815	594.090
		10'-0"	1'-2"	1'-5½"	1'-1"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	24	#4	24	#4	20	#4	20		44										2.9992	797.270
		15'-0"	1'-3½"	1'-6"	1'-3"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	24	#4	24	#4	20	#4	20		46	#4	1'-0"	14				#4	1'-0"	14	3.2940	1051.971
		20'-0"	1'-5½"	1'-9"	1'-5½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	20	#5	20		46	#4	1'-0"	14				#4	1'-0"	14	3.8450	1124.049
		25'-0"	1'-7"	1'-10"	1'-7"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	20	#5	20		46	#5	1'-0"	14				#5	1'-0"	14	4.1461	1165.962
		30'-0"	1'-10"	2'-0"	1'-10"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	20	#5	20		48	#5	1'-0"	22				#5	1'-0"	22	4.7598	1247.569
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	#9	6"	#7	6"	#7	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	26	#4	26	#4	20	#4	20		50										3.3426	681.256
		10'-0"	1'-3½"	1'-6"	1'-3½"	#10	6"	#8	6"	#8	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	26	#4	26	#4	20	#4	20		50										3.5403	853.756
		15'-0"	1'-4½"	1'-7½"	1'-4½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	26	#4	26	#4	20	#4	20		50	#4	1'-0"	16				#4	1'-0"	16	3.8102	1123.930
		20'-0"	1'-6½"	1'-10½"	1'-6½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	26	#5	26	#5	20	#5	20		52	#4	1'-0"	16				#4	1'-0"	16	4.6803	1212.947

NOTE: See basic drawing IBJL-1 for additional collar locations.



NOTE: Auxiliary slabs "W" at wings

SIDE ELEVATION OF CULVERT

Showing collar locations

Drawn for L = 150 ft. and M = 60 ft.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

NOTE: If Zn, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 10 FT.

SPANS 10 - 22 FT.

SHT. 2 OF 3

WORKING NUMBER IBS-10

SHEET NUMBER 7018

REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.

DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

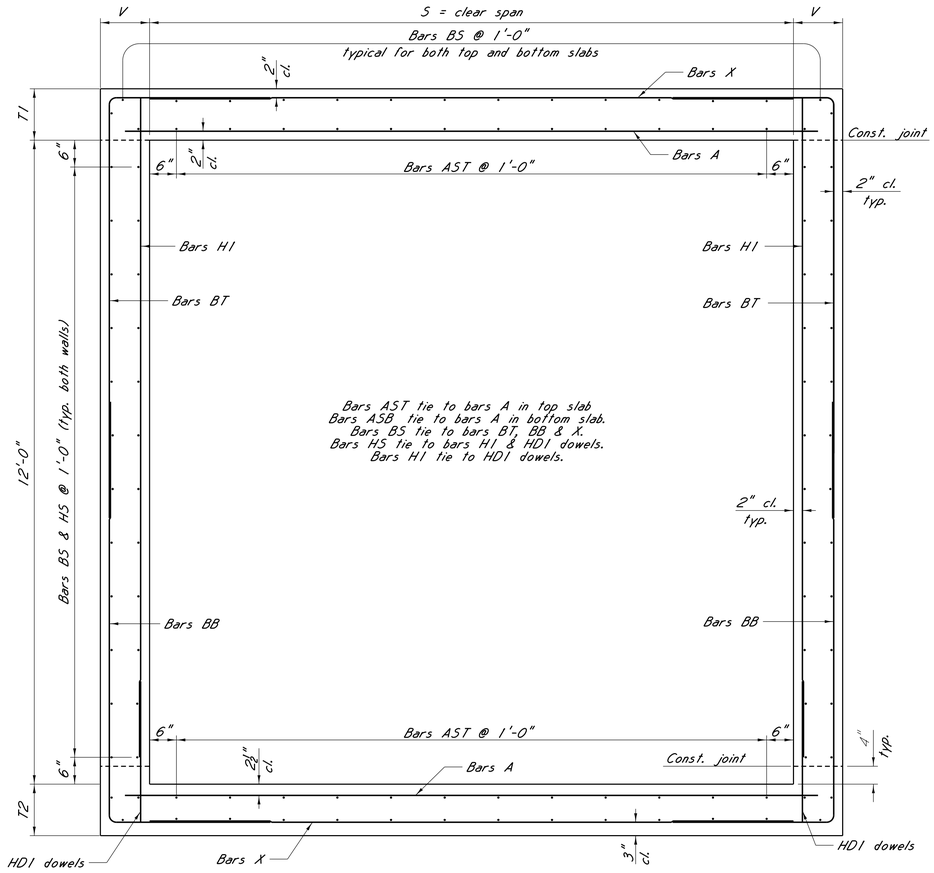
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																																
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H1"		BARS "H2"		"HD1" DOWELS		"HD2" DOWELS		BARS "Z1"				BARS "Z2"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
100	10x10	5'-0"	#6	10'-10"	#4	2'-7"	6'-7½"	9'-2½"	#4	2'-7"	6'-7½"	9'-2½"	#4	10'-0"	#4	10'-3"			#4	2'-7"														
		10'-0"	#6	10'-10"	#5	2'-11"	6'-9½"	9'-8½"	#5	2'-11"	6'-10½"	9'-9½"	#4	10'-0"	#4	10'-3"			#4	2'-8"														
		15'-0"	#7	10'-10½"	#5	2'-11½"	6'-8½"	9'-8"	#5	2'-11½"	6'-10½"	9'-10"	#4	10'-0"	#4	10'-2"			#4	2'-8"														
		20'-0"	#7	11'-0½"	#5	3'-1½"	6'-10½"	10'-0"	#5	3'-1½"	7'-0½"	10'-2"	#4	10'-0"	#4	10'-4"			#4	2'-10"														
		25'-0"	#8	11'-0½"	#5	3'-1½"	6'-11"	10'-0½"	#5	3'-1½"	7'-0½"	10'-2"	#4	10'-0"			#4	9'-7½"			#4	3'-7"												
		30'-0"	#8	11'-2"	#5	3'-3"	7'-0½"	10'-3½"	#5	3'-3"	7'-2"	10'-5"	#4	10'-0"			#4	9'-9"			#4	3'-8½"												
120	12x10	5'-0"	#7	12'-10"	#5	2'-11"	6'-10½"	9'-9½"	#5	2'-11"	6'-10½"	9'-9½"	#4	12'-0"	#4	10'-4"			#4	2'-8"														
		10'-0"	#7	12'-10"	#6	3'-3"	7'-0½"	10'-3½"	#6	3'-3"	7'-2"	10'-5"	#4	12'-0"	#4	10'-4"			#4	2'-9½"														
		15'-0"	#8	12'-10½"	#6	3'-3½"	7'-0"	10'-3½"	#6	3'-3½"	7'-2"	10'-5½"	#4	12'-0"	#4	10'-3½"			#4	2'-9½"														
		20'-0"	#8	13'-0½"	#6	3'-5½"	7'-2"	10'-7½"	#6	3'-5½"	7'-4½"	10'-10"	#4	12'-0"	#4	10'-5½"			#4	3'-0"														
		25'-0"	#8	13'-1"	#6	3'-6"	7'-2½"	10'-8½"	#6	3'-6"	7'-5"	10'-11"	#4	12'-0"			#4	9'-9"			#4	3'-9½"												
		30'-0"	#9	13'-2½"	#7	4'-2½"	7'-5½"	11'-8"	#7	4'-2½"	7'-8½"	11'-11"	#4	12'-0"			#4	9'-8½"			#4	3'-9½"	#4	9½"	9½"	2'-1 7/16"					#4	11"	11"	2'-3 9/16"
140	14x10	5'-0"	#7	14'-10"	#6	3'-3"	7'-0½"	10'-3½"	#6	3'-3"	7'-3½"	10'-6½"	#4	14'-0"	#4	10'-4"			#4	2'-11"														
		10'-0"	#8	14'-10"	#6	3'-3"	7'-0½"	10'-3½"	#6	3'-3"	7'-3½"	10'-6½"	#4	14'-0"	#4	10'-4"			#4	2'-11"														
		15'-0"	#9	14'-11"	#6	3'-4"	7'-1½"	10'-5½"	#6	3'-4"	7'-3½"	10'-7½"	#4	14'-0"	#4	10'-5"			#4	2'-11"														
		20'-0"	#9	15'-1"	#6	3'-6"	7'-4"	10'-10"	#6	3'-6"	7'-6½"	11'-0½"	#4	14'-0"	#4	10'-7½"			#4	3'-2"														
		25'-0"	#9	15'-1"	#7	4'-1"	7'-8½"	11'-9½"	#7	4'-1"	7'-10½"	11'-11½"	#4	14'-0"			#4	9'-11½"			#4	3'-11½"												
		30'-0"	#10	15'-3"	#8	5'-0"	8'-0½"	13'-0½"	#8	5'-0"	8'-3"	13'-3"	#4	14'-0"			#4	9'-11"			#4	3'-11½"	#4	1'-0"	1'-0"	2'-5"					#4	1'-1"	1'-1"	2'-6 3/8"
160	16x10	5'-0"	#7	16'-11"	#6	3'-4"	7'-0½"	10'-4½"	#6	3'-4"	7'-4½"	10'-8½"	#4	16'-0"	#4	10'-4"			#4	3'-0"														
		10'-0"	#8	16'-11"	#7	3'-11"	7'-5"	11'-4"	#7	3'-11"	7'-8½"	11'-7½"	#4	16'-0"	#4	10'-5"			#4	3'-0½"														
		15'-0"	#9	17'-0½"	#7	4'-0½"	7'-7½"	11'-8"	#7	4'-0½"	7'-10"	11'-10½"	#4	16'-0"	#4	10'-7½"			#4	3'-2"														
		20'-0"	#10	17'-1"	#7	4'-1"	7'-8"	11'-9"	#7	4'-1"	7'-10"	11'-11"	#4	16'-0"			#4	9'-11"			#4	3'-11"												
		25'-0"	#10	17'-2"	#8	4'-11"	8'-0"	12'-11"	#8	4'-11"	8'-3½"	13'-2½"	#4	16'-0"			#4	9'-10½"			#4	4'-0"	#4	1 1/4"	1 1/4"	2'-4 1/4"					#4	1'-1½"	1'-1½"	2'-7 1/16"
		30'-0"	#10	17'-3½"	#8	5'-0½"	8'-2½"	13'-3"	#8	5'-0½"	8'-5½"	13'-6"	#4	16'-0"			#4	10'-1"			#4	4'-2"	#4	1'-2"	1'-2"	2'-7 13/16"					#4	1'-3½"	1'-3½"	2'-9 15/16"
180	18x10	5'-0"	#8	19'-0"	#7	4'-0"	7'-4"	11'-4"	#7	4'-0"	7'-8"	11'-8"	#4	18'-0"	#4	10'-4"			#4	3'-0"														
		10'-0"	#9	19'-0"	#7	4'-0"	7'-6"	11'-6"	#7	4'-0"	7'-9"	11'-9"	#4	18'-0"	#4	10'-6"			#4	3'-1"														
		15'-0"	#10	19'-1½"	#8	4'-10½"	8'-0½"	12'-11"	#8	4'-10½"	8'-2½"	13'-1"	#4	18'-0"			#4	9'-11"			#4	3'-11"												
		20'-0"	#11	19'-2½"	#9	5'-10½"	8'-5½"	14'-4"	#9	5'-10½"	8'-8"	14'-6½"	#4	18'-0"			#4	9'-10½"			#4	3'-11"	#4	1 1/4"	1 1/4"	2'-4 1/4"					#4	1'-0½"	1'-0½"	2'-5 5/16"
		25'-0"	#11	19'-3½"	#9	5'-11½"	8'-7"	14'-6½"	#9	5'-11½"	8'-10½"	14'-10"	#4	18'-0"			#4	10'-0"			#4	4'-1½"	#5	1'-1"	1'-1"	2'-6 3/8"					#5	1'-3"	1'-3"	2'-9 3/16"
		30'-0"	#11	19'-5½"	#9	6'-1½"	8'-8½"	14'-10"	#9	6'-1½"	9'-0½"	15'-2"	#4	18'-0"			#4	10'-1½"			#4	4'-3½"	#5	1'-2½"	1'-2½"	2'-8½"					#5	1'-5"	1'-5"	3'-0 1/16"
200	20x10	5'-0"	#8	21'-0"	#7	4'-0"	7'-7"	11'-7"	#7	4'-0"	7'-10"	11'-10"	#4	20'-0"	#4	10'-7"			#4	3'-2"														
		10'-0"	#10	21'-1"	#8	4'-10"	7'-10½"	12'-8½"	#8	4'-10"	8'-2"	13'-0"	#4	20'-0"			#4	9'-9"			#4	3'-10½"												
		15'-0"	#11	21'-3"	#9	5'-11"	8'-5½"	14'-4½"	#9	5'-11"	8'-8"	14'-7"	#4	20'-0"			#4	9'-10½"			#4	3'-11"	#4	1 1/4"	1 1/4"	2'-4 1/4"					#4	1'-0½"	1'-0½"	2'-5 5/16"
		20'-0"	#11	21'-5½"	#9	6'-1½"	8'-7½"	14'-9"	#9	6'-1 ½"	8'-11"	15'-0½"	#4	20'-0"			#4	10'-0½"			#4	4'-2"	#4	1'-1½"	1'-1½"	2'-7 1/16"					#4	1'-3½"	1'-3½"	2'-9 15/16"
		25'-0"	#11	21'-7"	#9	6'-3"	8'-9"	15'-0"	#9	6'-3"	9'-0"	15'-3"	#4	20'-0"			#4	10'-2"			#4	4'-3"	#5	1'-3"	1'-3"	2'-9 3/8"					#5	1'-4½"	1'-4½"	2'-11 5/8"
		30'-0"	#11	21'-10"	#9	6'-6"	9'-0"	15'-6"	#9	6'-6"	9'-2"	15'-8"	#4	20'-0"			#4	10'-5"			#4	4'-5"	#5	1'-6"	1'-6"	3'-1 7/16"					#5	1'-6½"	1'-6½"	3'-2 3/8"
220	22x10	5'-0"	#9	23'-2"	#7	4'-2"	7'-7"	11'-9"	#7	4'-2"	7'-10"	12'-0"	#4	22'-0"	#4	10'-7"			#4	3'-2"														
		10'-0"	#10	23'-3½"	#8	5'-0½"	8'-0"	13'-0½"	#8	5'-0½"	8'-2½"	13'-3"	#4	22'-0"			#4	9'-10½"			#4	3'-11"												
		15'-0"	#11	23'-4½"	#9	6'-0½"	8'-6½"	14'-7"	#9	6'-0½"	8'-9½"	14'-10"	#4	22'-0"			#4	9'-11½"			#4	4'-0½"	#4	1'-0½"	1'-0½"	2'-5 11/16"					#4	1'-2"	1'-2"	2'-7 13/16"
		20'-0"	#11	23'-8½"	#9	6'-4½"	8'-10½"	15'-3"	#9	6'-4½"	9'-0½"	15'-5"	#4	22'-0"			#4	10'-3½"			#4	4'-3½"	#4	1'-4½"	1'-4½"	2'-11 5/8"					#4	1'-5"	1'-5"	3'-0 1/16"

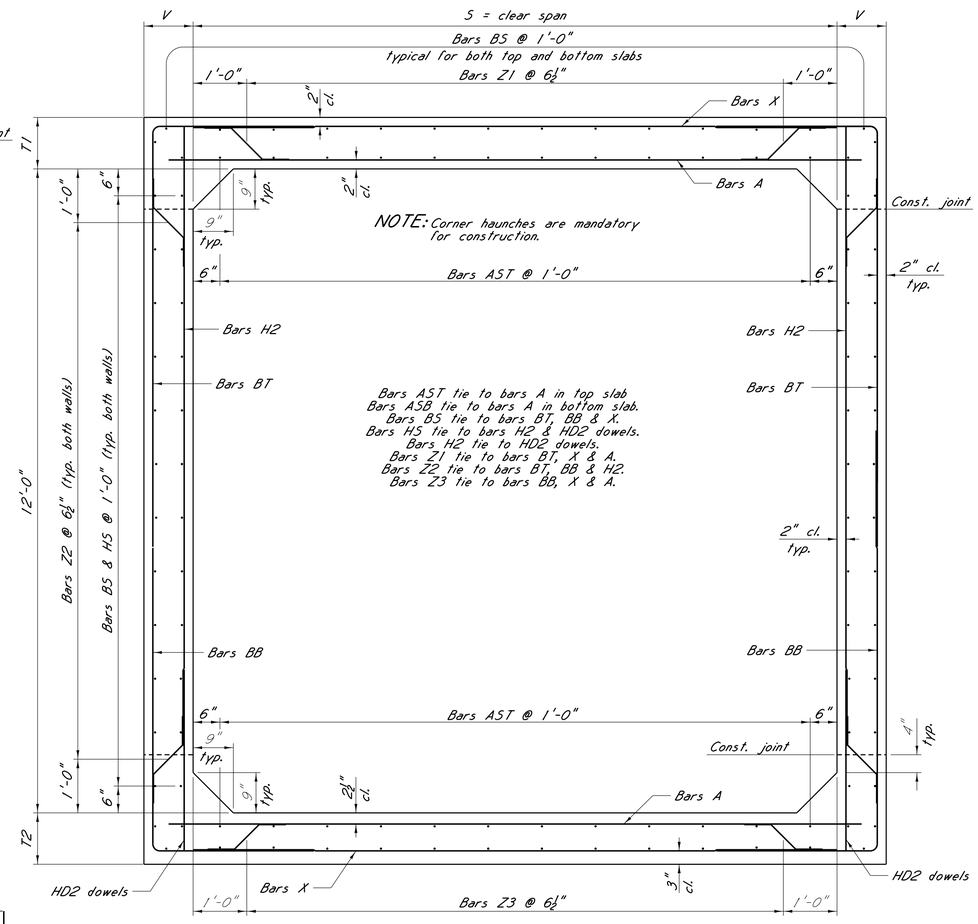
NOTE: If Z1, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
REVISIONS	BARREL DETAILS FOR SINGLE CELL BOX CULVERT	
	HEIGHT 10 FT.	SHT. 3 OF 3
	SPANS 10 - 22 FT.	WORKING NUMBER IBS-10
DATE	DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC. DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015	SHEET NUMBER 7019
	DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI



CROSS SECTION "A"



CROSS SECTION "B"

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7021 & 7022.

NOTE: For joint locations and joint details see sheet no. 7021.

NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWS-2W, IWS-12-2W, IWS-3W & IWS-12-3W.

GENERAL NOTES:

Specifications: Mississippi Standard Specifications for Road and Bridge Construction, 2004.

Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBS-12.

No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.

All concrete shall be class "B".

Expansion joint material shall be bituminous fiber type unless unless otherwise noted.

All exposed edges shall be chamfered ¾".

Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).

Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.

Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.

Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.

All bars shall be accurately spaced and securely wired at each intersection before placing concrete.

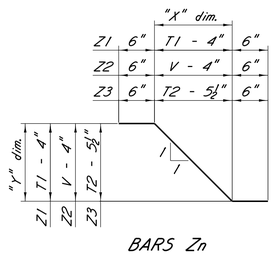
All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.

Finish concrete per section 804.03.19.6.2 of the specifications.

Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.

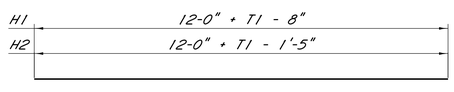
Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.

Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.

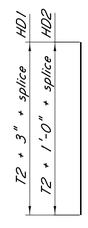


BARS Zn

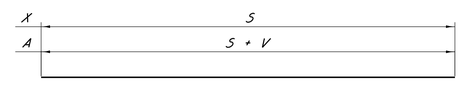
NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.



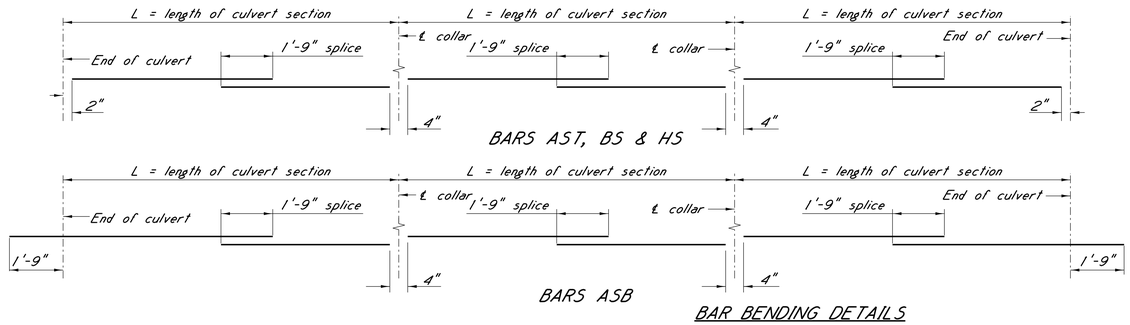
BARS Hn



HDN DOWELS



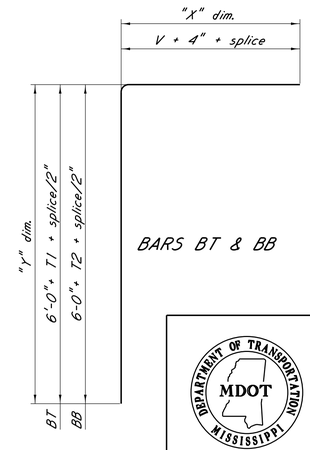
BARS A & X



BAR BENDING DETAILS

Dimensions are out to out

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"



BARS BT & BB

SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. . . . . HL-93.
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 12 FT.

SPANS 12 - 24 FT.

SHT. 1 OF 3

WORKING NUMBER IBS-12

SHEET NUMBER 7020

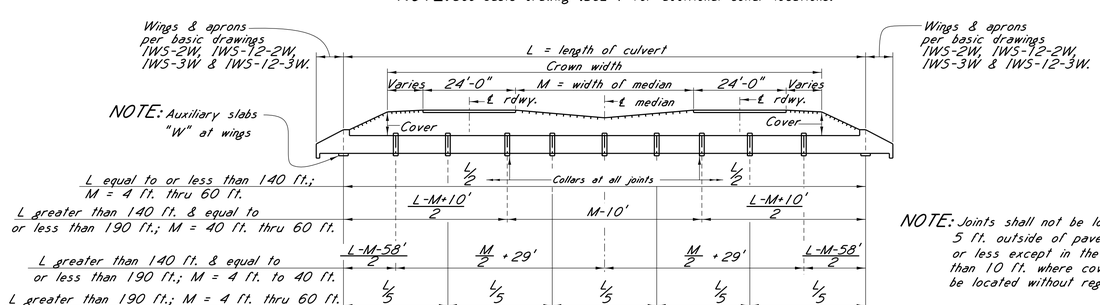
REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																		EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "Hn"		"HDn" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"				BARS "Z1"			BARS "Z2"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
						SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	(WALLS)	NO. (SLABS)	SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
144	12x12	5'-0"	11½"	11½"	11"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	24	#4	24	28											1.7968	340.065
		10'-0"	11½"	1'-1"	1'-0"	#7	6"	#5	6"	#5	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	24	#4	24	28											1.9475	342.297
		15'-0"	11½"	1'-2"	1'-1"	#7	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	24	#4	24	28											2.0779	391.027
		20'-0"	1'-2"	1'-4"	1'-3"	#8	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	24	#4	24	30											2.4537	432.161
		25'-0"	1'-3"	1'-4½"	1'-3"	#8	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	24	#4	24	30											2.5625	433.246
		30'-0"	1'-2"	1'-4½"	1'-0"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	16	#4	16	#4	24	#4	24	28		#4	1'-0"	8	#4	1'-0"	24	#4	1'-0"	8	2.2485	583.699
168	14x12	5'-0"	1'-0"	1'-2"	11"	#7	6½"	#6	6½"	#6	6½"	#4	6½"	#4	6½"	#4	6½"	#4	18	#4	18	#4	24	#4	24	32											2.0854	389.096
		10'-0"	1'-0½"	1'-2½"	1'-0"	#8	6½"	#6	6½"	#6	6½"	#4	6½"	#4	6½"	#4	6½"	#4	18	#4	18	#4	24	#4	24	32											2.2222	425.987
		15'-0"	1'-1"	1'-3½"	1'-1"	#8	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	18	#4	18	#4	24	#4	24	32											2.3850	458.005
		20'-0"	1'-3½"	1'-6"	1'-3"	#8	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	18	#4	18	#4	24	#4	24	34											2.8171	466.741
		25'-0"	1'-3½"	1'-5½"	1'-3½"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	18	#4	18	#4	24	#4	24	34		#4	1'-0"	10				#4	1'-0"	10	2.8789	610.718
		30'-0"	1'-4½"	1'-6½"	1'-4½"	#10	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	18	#4	18	#4	24	#4	24	34		#4	1'-0"	10	#4	1'-0"	16	#4	1'-0"	10	3.0733	698.564
192	16x12	5'-0"	1'-0"	1'-2"	11"	#8	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	24	#4	24	36											2.2459	484.462
		10'-0"	1'-1"	1'-3½"	1'-0"	#9	6½"	#7	6½"	#7	6½"	#4	6½"	#4	6½"	#4	6½"	#4	20	#4	20	#4	24	#4	24	36											2.4722	562.624
		15'-0"	1'-3½"	1'-6"	1'-2½"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	24	#4	24	38											2.9783	614.702
		20'-0"	1'-2½"	1'-5½"	1'-2½"	#10	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	24	#4	24	38		#4	1'-0"	10				#4	1'-0"	10	2.9347	706.576
		25'-0"	1'-4"	1'-7"	1'-4"	#10	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#4	20	#4	20	#4	24	#4	24	38		#4	1'-0"	10				#4	1'-0"	10	3.2433	805.605
		30'-0"	1'-5½"	1'-8½"	1'-3"	#11	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#5	20	#5	20	#5	24	#5	24	38		#5	1'-0"	16	#5	1'-0"	24	#5	1'-0"	16	3.3225	1036.143
216	18x12	5'-0"	1'-1"	1'-4"	11"	#8	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	22	#4	22	#4	24	#4	24	40											2.5900	583.214
		10'-0"	1'-2"	1'-5"	1'-0"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	22	#4	22	#4	24	#4	24	40											2.8025	642.754
		15'-0"	1'-4"	1'-6½"	1'-2"	#10	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#4	22	#4	22	#4	24	#4	24	42											3.2438	810.297
		20'-0"	1'-4"	1'-6½"	1'-2½"	#10	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#4	22	#4	22	#4	24	#4	24	42		#4	1'-0"	12				#4	1'-0"	12	3.2897	851.553
		25'-0"	1'-5½"	1'-9½"	1'-5"	#10	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	22	#5	22	#5	24	#5	24	42		#4	1'-0"	12				#4	1'-0"	12	3.8086	1019.467
		30'-0"	1'-8"	1'-10½"	1'-6½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	22	#5	22	#5	24	#5	24	42		#5	1'-0"	12				#5	1'-0"	12	4.1776	1138.131
240	20x12	5'-0"	1'-1"	1'-3½"	1'-0"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	24	#4	24	#4	24	#4	24	44											2.8241	678.382
		10'-0"	1'-2"	1'-5½"	1'-1"	#10	6½"	#8	6½"	#8	6½"	#4	6½"	#4	6½"	#4	6½"	#4	24	#4	24	#4	24	#4	24	44											3.1597	789.521
		15'-0"	1'-5½"	1'-7½"	1'-2½"	#10	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#4	24	#4	24	#4	24	#4	24	46											3.6757	859.798
		20'-0"	1'-6"	1'-10"	1'-4½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	6"	#4	6"	#5	24	#5	24	#5	24	#5	24	46		#4	1'-0"	14				#4	1'-0"	14	4.0725	1183.569
		25'-0"	1'-7"	1'-11½"	1'-5½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	24	#5	24	#5	24	#5	24	46		#5	1'-0"	14				#5	1'-0"	14	4.3440	1202.570
264	22x12	5'-0"	1'-2"	1'-4½"	1'-2"	#9	6"	#7	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	26	#4	26	#4	24	#4	24	50											3.3277	724.406
		10'-0"	1'-3½"	1'-6"	1'-1"	#10	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#4	26	#4	26	#4	24	#4	24	48											3.5033	894.858
		15'-0"	1'-5"	1'-7½"	1'-4"	#11	6"	#9	6"	#9	6"	#4	6"	#4	6"	#4	6"	#4	26	#4	26	#4	24	#4	24	50		#4	1'-0"	16				#4	1'-0"	16	4.0057	1179.811
		20'-0"	1'-8½"	1'-11"	1'-6"	#11	6"	#9	6"	#9	6"	#4	6"	#4	6"	#4	6"	#5	26	#5	26	#5	24	#5	24	50		#4	1'-0"	16				#4	1'-0"	16	4.7315	1262.446
		25'-0"	1'-11"	2'-0"	1'-9½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	1'-0"	#4	1'-0"	#5	26	#5	26	#5	24	#5	24	52		#5	1'-0"	16				#5	1'-0"	16	5.3454	1303.734
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	#10	6"	#8	6"	#8	6"	#4	6"	#4	6"	#4	6"	#4	28	#4	28	#4	24	#4	24	52											3.5082	937.188
		10'-0"	1'-4½"	1'-7½"	1'-3"	#11	6½"	#9	6½"	#9	6½"	#4	6½"	#4	6½"	#4	6½"	#4	28	#4	28	#4	24	#4	24	54											4.0972	1090.798
		15'-0"	1'-7"	1'-9"	1'-5"	#11	6"	#9	6"	#9	6"	#4	6"	#4	6"	#4	6"	#5	28	#5	28	#5	24	#5	24	54		#4	1'-0"	16				#4	1'-0"	16	4.6137	1305.446
		20'-0"	1'-10½"	2'-0"	1'-10½"	#11	6"	#9	6"	#9	6"	#4	6"	#4	6"	#4	6"	#5	28	#5	28	#5	24	#5	24	56		#5	1'-0"	16				#5	1'-0"	16	5.6910	1384.903

NOTE: See basic drawing IBJL-1 for additional collar locations.



SIDE ELEVATION OF CULVERT

Showing collar locations

Drawn for L = 150 ft. and M = 60 ft.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. Beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

NOTE: If Zn, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR SINGLE CELL BOX CULVERT

HEIGHT 12 FT.

SPANS 12 - 24 FT.

SHT. 2 OF 3

WORKING NUMBER IBS-12

SHEET NUMBER 7021

REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.

DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																																	
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H1"		BARS "H2"		"HD1" DOWELS		"HD2" DOWELS		BARS "Z1"				BARS "Z2"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
144	12x12	5'-0"	#7	12'-11"	#5	3'-0"	7'-10"	10'-10"	#5	3'-0"	7'-10"	10'-10"	#4	12'-0"	#4	12'-3½"			#4	2'-7½"														
		10'-0"	#7	13'-0"	#5	3'-1"	7'-10"	10'-11"	#5	3'-1"	7'-11½"	11'-0½"	#4	12'-0"	#4	12'-3½"			#4	2'-9"														
		15'-0"	#7	13'-1"	#6	3'-6"	8'-0"	11'-6"	#6	3'-6"	8'-2½"	11'-8½"	#4	12'-0"	#4	12'-3½"			#4	2'-10"														
		20'-0"	#8	13'-3"	#6	3'-8"	8'-2½"	11'-10½"	#6	3'-8"	8'-4½"	12'-0½"	#4	12'-0"	#4	12'-6"			#4	3'-0"														
		25'-0"	#8	13'-3"	#6	3'-8"	8'-3½"	11'-11½"	#6	3'-8"	8'-5"	12'-1"	#4	12'-0"			#4	11'-10"			#4	3'-9½"												
		30'-0"	#9	13'-0"	#7	4'-0"	8'-6"	12'-6"	#7	4'-0"	8'-8½"	12'-8½"	#4	12'-0"			#4	11'-9"			#4	3'-9½"	#4	10"	10"	2'-2⅛"	#4	8"	8"	1'-11 5/16"	#4	11"	11"	2'-3 3/16"
168	14x12	5'-0"	#7	14'-11"	#6	3'-4"	8'-0½"	11'-4½"	#6	3'-4"	8'-2½"	11'-6½"	#4	14'-0"	#4	12'-4"			#4	2'-10"														
		10'-0"	#8	15'-0"	#6	3'-5"	8'-1"	11'-6"	#6	3'-5"	8'-3"	11'-8"	#4	14'-0"	#4	12'-4½"			#4	2'-10½"														
		15'-0"	#8	15'-1"	#6	3'-6"	8'-1½"	11'-7½"	#6	3'-6"	8'-4"	11'-10"	#4	14'-0"	#4	12'-5"			#4	2'-11½"														
		20'-0"	#8	15'-3"	#6	3'-8"	8'-4"	12'-0"	#6	3'-8"	8'-6½"	12'-2½"	#4	14'-0"	#4	12'-7½"			#4	3'-2"														
		25'-0"	#9	15'-3½"	#7	4'-3½"	8'-7½"	12'-11"	#7	4'-3½"	8'-9½"	13'-1"	#4	14'-0"			#4	11'-10½"			#4	3'-10½"	#4	11½"	11½"	2'-4⅛"					#4	1'-0"	1'-0"	2'-5"
		30'-0"	#10	15'-4½"	#7	4'-4½"	8'-8½"	13'-1"	#7	4'-4½"	8'-10½"	13'-3"	#4	14'-0"			#4	11'-11½"			#4	3'-11½"	#4	1'-0½"	1'-0½"	2'-5 11/16"	#4	1'-0½"	1'-0½"	2'-5 11/16"	#4	1'-1"	1'-1"	2'-6⅜"
192	16x12	5'-0"	#8	16'-11"	#6	3'-4"	8'-0½"	11'-4½"	#6	3'-4"	8'-2½"	11'-6½"	#4	16'-0"	#4	12'-4"			#4	2'-10"														
		10'-0"	#9	17'-0"	#7	4'-0"	8'-5"	12'-5"	#7	4'-0"	8'-7½"	12'-7½"	#4	16'-0"	#4	12'-5"			#4	2'-11½"														
		15'-0"	#9	17'-2½"	#7	4'-2½"	8'-7½"	12'-10"	#7	4'-2½"	8'-10"	13'-0½"	#4	16'-0"	#4	12'-7½"			#4	3'-2"														
		20'-0"	#10	17'-2½"	#7	4'-2½"	8'-6½"	12'-9"	#7	4'-2½"	8'-9½"	13'-0"	#4	16'-0"			#4	11'-9½"			#4	3'-10½"	#4	10½"	10½"	2'-2⅞"					#4	1'-0"	1'-0"	2'-5"
		25'-0"	#10	17'-4"	#8	5'-1"	9'-0½"	14'-1½"	#8	5'-1"	9'-3½"	14'-4½"	#4	16'-0"			#4	11'-11"			#4	4'-0"	#4	1'-0"	1'-0"	2'-5"					#4	1'-1½"	1'-1½"	2'-7⅛"
		30'-0"	#11	17'-3"	#8	5'-0"	9'-2"	14'-2"	#8	5'-0"	9'-5"	14'-5"	#4	16'-0"			#4	12'-0½"			#4	4'-1½"	#5	1'-1½"	1'-1½"	2'-7⅛"	#5	11"	11"	2'-3 9/16"	#5	1'-3"	1'-3"	2'-9 9/16"
216	18x12	5'-0"	#8	18'-11"	#7	3'-11"	8'-5"	12'-4"	#7	3'-11"	8'-8"	12'-7"	#4	18'-0"	#4	12'-5"			#4	3'-0"														
		10'-0"	#9	19'-0"	#7	4'-0"	8'-6"	12'-6"	#7	4'-0"	8'-9"	12'-9"	#4	18'-0"	#4	12'-6"			#4	3'-1"														
		15'-0"	#10	19'-2"	#8	4'-11"	9'-0½"	13'-11½"	#8	4'-11"	9'-3"	14'-2"	#4	18'-0"			#4	11'-11"			#4	3'-11½"												
		20'-0"	#10	19'-2½"	#8	4'-11½"	9'-0½"	14'-0"	#8	4'-11½"	9'-3"	14'-2½"	#4	18'-0"			#4	11'-11"			#4	3'-11½"	#4	1'-0"	1'-0"	2'-5"					#4	1'-1"	1'-1"	2'-6⅜"
		25'-0"	#10	19'-5"	#9	6'-1"	9'-7½"	15'-8½"	#9	6'-1"	9'-11½"	16'-0½"	#4	18'-0"			#4	12'-0½"			#4	4'-2½"	#4	1'-1½"	1'-1½"	2'-7⅛"					#4	1'-4"	1'-4"	2'-10⅝"
		30'-0"	#11	19'-6½"	#9	6'-2½"	9'-10"	16'-0½"	#9	6'-2½"	10'-0½"	16'-3"	#4	18'-0"			#4	12'-3"			#4	4'-3½"	#5	1'-4"	1'-4"	2'-10⅝"					#5	1'-5"	1'-5"	3'-0⅛"
240	20x12	5'-0"	#9	21'-0"	#7	4'-0"	8'-5"	12'-5"	#7	4'-0"	8'-7½"	12'-7½"	#4	20'-0"	#4	12'-5"			#4	2'-11½"														
		10'-0"	#10	21'-1"	#8	4'-10"	8'-10½"	13'-8½"	#8	4'-10"	9'-2"	14'-0"	#4	20'-0"			#4	11'-9"			#4	3'-10½"												
		15'-0"	#10	21'-2½"	#8	4'-11½"	9'-2"	14'-1½"	#8	4'-11½"	9'-4"	14'-3½"	#4	20'-0"			#4	12'-0½"			#4	4'-0½"												
		20'-0"	#11	21'-4½"	#9	6'-0½"	9'-8"	15'-8½"	#9	6'-0½"	10'-0"	16'-0½"	#4	20'-0"			#4	12'-1"			#4	4'-3"	#4	1'-2"	1'-2"	2'-7 13/16"					#4	1'-4½"	1'-4½"	2'-11 5/16"
		25'-0"	#11	21'-5½"	#9	6'-1½"	9'-9"	15'-10½"	#9	6'-1½"	10'-1½"	16'-3"	#4	20'-0"			#4	12'-2"			#4	4'-4½"	#5	1'-3"	1'-3"	2'-9 3/16"					#5	1'-6"	1'-6"	3'-1 7/16"
264	22x12	5'-0"	#9	23'-2"	#7	4'-2"	8'-6"	12'-8"	#7	4'-2"	8'-8½"	12'-10½"	#4	22'-0"	#4	12'-6"			#4	3'-0½"														
		10'-0"	#10	23'-1"	#8	4'-10"	9'-0"	13'-10"	#8	4'-10"	9'-2½"	14'-0½"	#4	22'-0"			#4	11'-10½"			#4	3'-11"												
		15'-0"	#11	23'-4"	#9	6'-0"	9'-7"	15'-7"	#9	6'-0"	9'-9½"	15'-9½"	#4	22'-0"			#4	12'-0"			#4	4'-0½"	#4	1'-1"	1'-1"	2'-6⅜"					#4	1'-2"	1'-2"	2'-7 13/16"
		20'-0"	#11	23'-6"	#9	6'-2"	9'-10½"	16'-0 ½"	#9	6'-2"	10'-1"	16'-3"	#4	22'-0"			#4	12'-3½"			#4	4'-4"	#4	1'-4½"	1'-4½"	2'-11 5/16"					#4	1'-5½"	1'-5½"	3'-0 3/16"
		25'-0"	#11	23'-9½"	#9	6'-5½"	10'-1"	16'-6½"	#9	6'-5½"	10'-2"	16'-7½"	#4	22'-0"			#4	12'-6"			#4	4'-5"	#5	1'-7"	1'-7"	3'-2⅞"					#5	1'-6½"	1'-6½"	3'-2 3/16"
288	24x12	5'-0"	#10	25'-1"	#8	4'-10"	8'-10½"	13'-8½"	#8	4'-10"	9'-1½"	13'-11½"	#4	24'-0"			#4	11'-9"			#4	3'-10"												
		10'-0"	#11	25'-3"	#9	5'-11"	9'-6½"	15'-5½"	#9	5'-11"	9'-9½"	15'-8½"	#4	24'-0"			#4	11'-11½"			#4	4'-0½"												
		15'-0"	#11	25'-5"	#9	6'-1"	9'-9"	15'-10"	#9	6'-1"	9'-11"	16'-0"	#4	24'-0"			#4	12'-2"			#4	4'-2"	#4	1'-3"	1'-3"	2'-9 9/16"					#4	1'-3½"	1'-3½"	2'-9 9/16"
		20'-0"	#11	25'-10½"	#9	6'-6½"	10'-0½"	16'-7"	#9	6'-6½"	10'-2"	16'-8½"	#4	24'-0"			#4	12'-5½"			#4	4'-5"	#5	1'-6½"	1'-6½"	3'-2 3/16"					#5	1'-6½"	1'-6½"	3'-2 3/16"

NOTE: If Zn, H2 and HD2 reinforcement are required, see CROSS SECTION "B".

REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BARREL DETAILS FOR
SINGLE CELL BOX CULVERT

HEIGHT 12 FT.

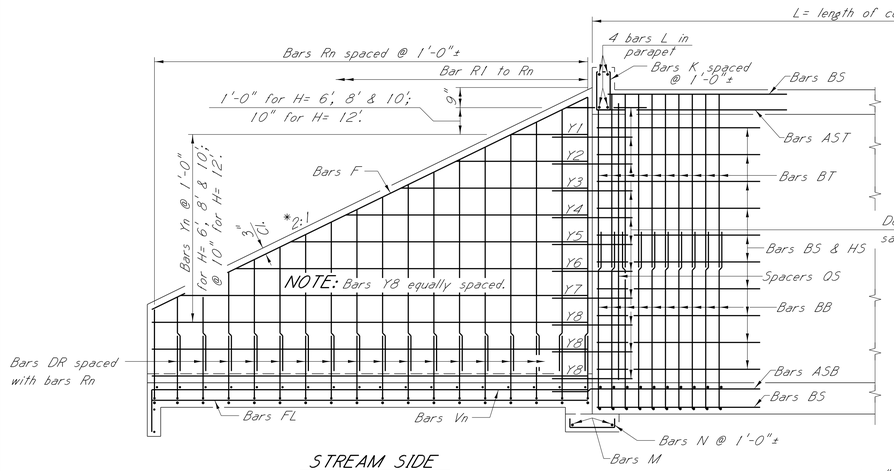
SPANS 12 - 24 FT.

SHT. 3 OF 3

WORKING NUMBER IBS-12

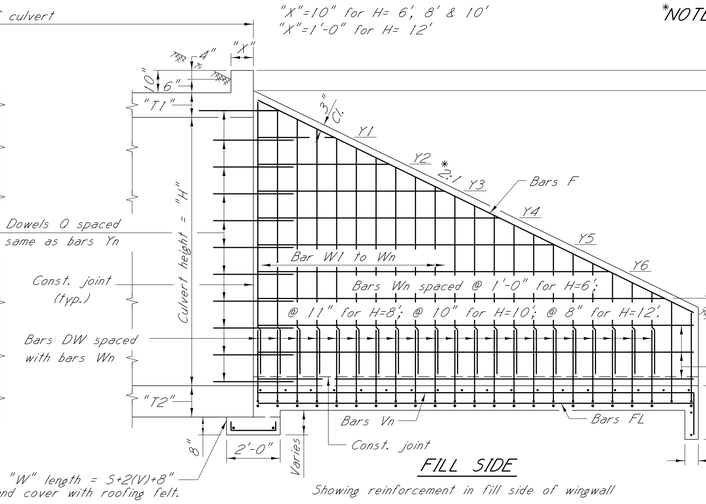
SHEET NUMBER 7022

DATE
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



STREAM SIDE

Showing reinforcement in stream side of wingwall

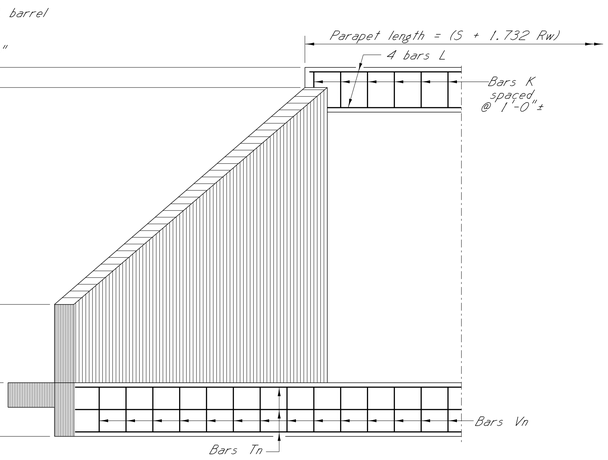


FILL SIDE

Showing reinforcement in fill side of wingwall

LONGITUDINAL SECTION

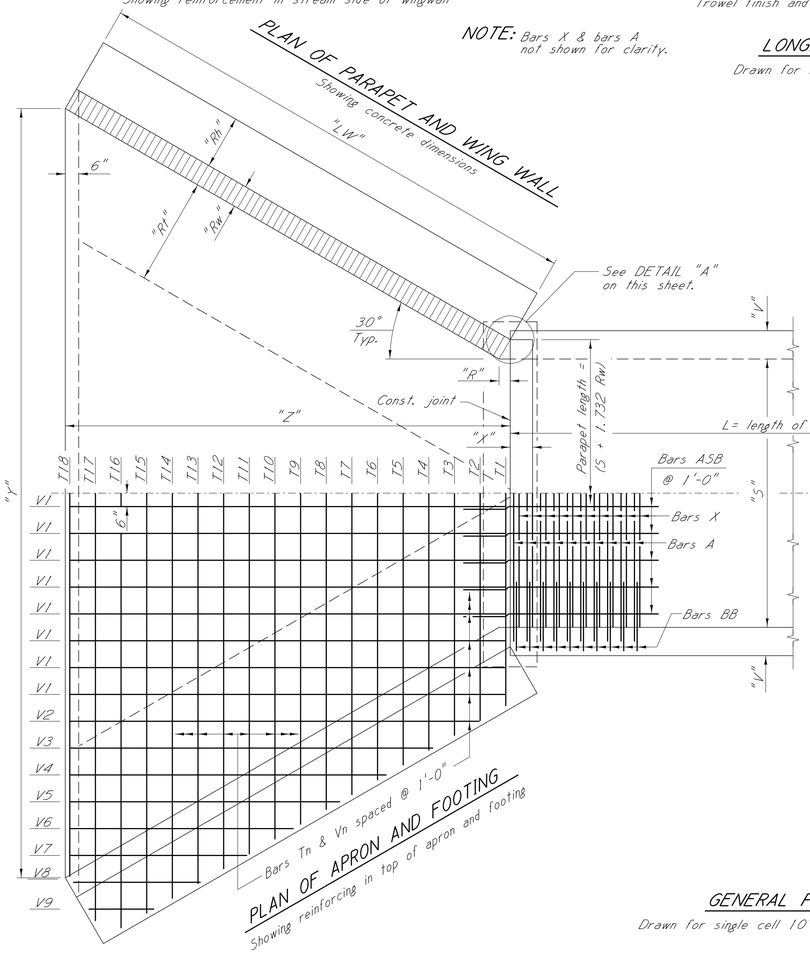
Drawn for single cell 10' x 10' culvert



HALF END ELEVATION

Showing reinforcement in parapet & toe wall

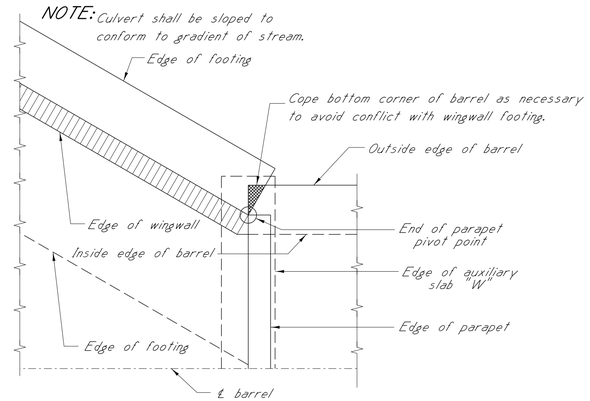
NOTE: Bars X & bars A not shown for clarity.



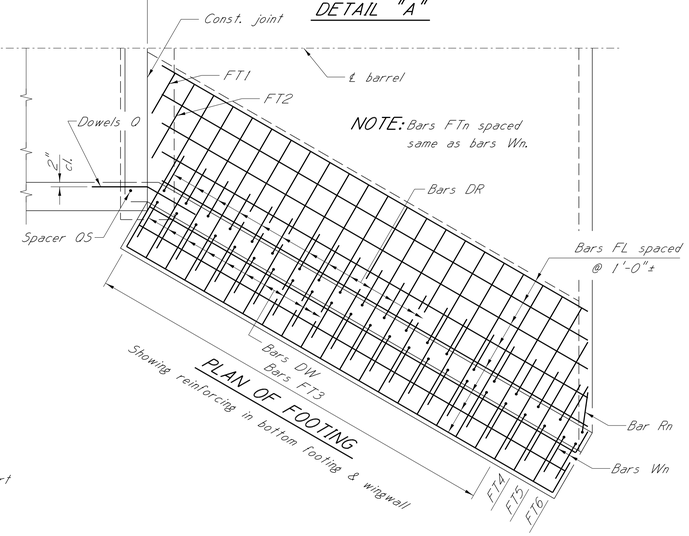
GENERAL PLAN

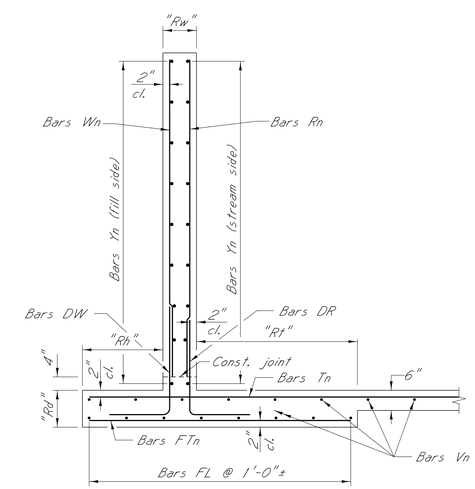
Drawn for single cell 10' x 10' culvert

NOTE: Culvert shall be sloped to conform to gradient of stream.



DETAIL "A"





CROSS SECTION WINGWALL

NOTE: For bar bending details and quantities, see drawings IWS-6-2W, IWS-8-2W, IWS-10-2W & IWS-12-2W.

SPECIAL PROVISIONS REQUIRED:
Concrete Bridges And Structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 6-24 FT.

SHT. 1 OF 1

WORKING NUMBER IWS-2W

SHEET NUMBER 7023

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rf"	"Y" CLEAR SPAN							
									6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-6"	12'-8 1/2"	4 1/2"	11'-4 9/16"	11"	9"	2'-0"	3'-0"	18'-8 1/2"	20'-8 1/2"	22'-8 1/2"	24'-8 1/2"	26'-8 1/2"	28'-8 1/2"	30'-8 1/2"	32'-8 1/2"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	9.7076	1329.674	0.4033	24.493	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	9.7076	1329.674	0.4033	24.493	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	9.7076	1329.674	0.4033	24.493	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	9.7332	1329.674	0.4033	24.493	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	9.7332	1329.674	0.4033	24.493	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	9.7332	1329.674	0.4033	24.493	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	10.2866	1434.634	0.5021	30.283	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	10.2866	1434.634	0.5021	30.283	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	10.3025	1434.634	0.5021	30.283	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	10.4097	1439.851	0.5021	30.283	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	10.3938	1439.851	0.5021	30.283	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	10.4851	1445.068	0.5021	30.283	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	10.8967	1482.340	0.6008	37.631	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	10.8967	1482.340	0.6008	37.631	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	10.9752	1487.780	0.6008	37.631	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	11.1513	1498.659	0.6008	37.631	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	11.1723	1498.659	0.6091	37.853	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	11.3033	1506.819	0.6173	38.076	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	11.4889	1532.878	0.6996	43.420	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	11.6146	1538.540	0.6996	43.420	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	11.6971	1544.202	0.7037	43.531	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	11.9084	1555.527	0.7119	43.754	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	11.9666	1558.358	0.7243	44.088	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	11.9156	1555.527	0.7284	44.199	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	12.1572	1583.638	0.8025	49.321	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	12.2983	1592.465	0.8066	49.432	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	12.4144	1601.293	0.8107	49.543	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	12.7250	1616.005	0.8230	49.877	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	12.5335	1604.235	0.8354	50.211	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	12.6851	1613.063	0.8477	50.545	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	12.9116	1640.728	0.9259	57.337	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	13.0007	1646.836	0.9259	57.337	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	13.3272	1665.159	0.9259	57.337	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	13.1256	1655.997	0.9383	57.671	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	13.3451	1665.159	0.9506	58.005	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	13.5418	1677.374	0.9671	58.450	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	13.4873	1692.156	1.0165	62.903	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	13.8695	1711.147	1.0329	63.349	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	13.8441	1711.147	1.0453	63.683	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	13.9777	1717.478	1.0535	63.905	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	14.1461	1730.138	1.0700	64.351	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	14.5726	1749.129	1.0947	65.019	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	14.2722	1747.084	1.1276	69.027	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	14.4659	1760.190	1.1317	69.138	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	14.5025	1766.743	1.1523	69.695	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	15.0425	1792.955	1.1852	70.585	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	15.2704	1802.784	1.1975	70.919	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-2W

SHEET NUMBER 7024

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

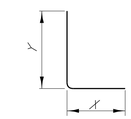
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB "W"

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			S+5'-8 ½"
T2	#4	1	1	1	1	1	1	1	1			S+6'-9 ½"
T3	#4	1	1	1	1	1	1	1	1			S+7'-10"
T4	#4	1	1	1	1	1	1	1	1			S+8'-11"
T5	#4	1	1	1	1	1	1	1	1			S+9'-11 ½"
T6	#4	1	1	1	1	1	1	1	1			S+11'-0 ½"
T7	#4	1	1	1	1	1	1	1	1			S+12'-1"
T8	#4	1	1	1	1	1	1	1	1			S+13'-2"
T9	#4	1	1	1	1	1	1	1	1			S+14'-3"
T10	#4	1	1	1	1	1	1	1	1			S+15'-3 ½"
T11	#4	1	1	1	1	1	1	1	1			S+16'-4 ½"
T12	#4	1	1	1	1	1	1	1	1			S+15'-9 ½"
T13	#4	3	3	3	3	3	3	3	3			S+12'-7 ½"
V1	#4	12	14	16	18	20	22	24	26	11'-0 ½"	1'-8"	12'-8 ½"
V2	#4	2	2	2	2	2	2	2	2	9'-11 ½"	1'-8"	11'-7 ½"
V3	#4	2	2	2	2	2	2	2	2	8'-2 ½"	1'-8"	9'-10 ½"
V4	#4	2	2	2	2	2	2	2	2	6'-6"	1'-8"	8'-2"
V5	#4	2	2	2	2	2	2	2	2	4'-7 ½"	1'-8"	6'-3 ½"
V6	#4	2	2	2	2	2	2	2	2	2'-4"		2'-4"
FT1	#5	2	2	2	2	2	2	2	2			1'-10 ½"
FT2	#5	24	24	24	24	24	24	24	24			5'-5"
FT3	#5	2	2	2	2	2	2	2	2			4'-2"
FT4	#5	2	2	2	2	2	2	2	2			2'-6 ½"
FL	#4	14	14	14	14	14	14	14	14			12'-4 ½"
W1	#5	2	2	2	2	2	2	2	2		W+4'-10"	W+4'-10"
W2	#5	2	2	2	2	2	2	2	2		W+4'-5"	W+4'-5"
W3	#5	2	2	2	2	2	2	2	2		W+4'-0"	W+4'-0"
W4	#5	2	2	2	2	2	2	2	2		W+3'-7"	W+3'-7"
W5	#5	2	2	2	2	2	2	2	2		W+3'-2"	W+3'-2"
W6	#5	2	2	2	2	2	2	2	2		W+2'-9"	W+2'-9"
W7	#5	2	2	2	2	2	2	2	2		W+2'-4"	W+2'-4"
W8	#5	2	2	2	2	2	2	2	2		W+1'-11 ½"	W+1'-11 ½"
W9	#5	2	2	2	2	2	2	2	2		W+1'-6 ½"	W+1'-6 ½"
W10	#5	2	2	2	2	2	2	2	2	1'-6"	W+2'-1"	W+3'-7"
W11	#5	2	2	2	2	2	2	2	2	1'-6"	W+1'-8 ½"	W+3'-2 ½"
W12	#5	2	2	2	2	2	2	2	2	1'-6"	W+1'-3 ½"	W+2'-9 ½"
W13	#5	2	2	2	2	2	2	2	2	1'-6"	W+0'-10 ½"	W+2'-4½"
W14	#5	2	2	2	2	2	2	2	2	1'-6"	W+0'-5 ½"	W+1'-11½"
R1	#4	2	2	2	2	2	2	2	2		W+4'-10"	W+4'-10"
R2	#4	2	2	2	2	2	2	2	2		W+4'-5"	W+4'-5"
R3	#4	2	2	2	2	2	2	2	2		W+4'-0"	W+4'-0"
R4	#4	2	2	2	2	2	2	2	2		W+3'-7"	W+3'-7"
R5	#4	2	2	2	2	2	2	2	2		W+3'-2"	W+3'-2"
R6	#4	2	2	2	2	2	2	2	2		W+2'-9"	W+2'-9"
R7	#4	2	2	2	2	2	2	2	2		W+2'-4"	W+2'-4"
R8	#4	2	2	2	2	2	2	2	2		W+1'-11 ½"	W+1'-11 ½"
R9	#4	2	2	2	2	2	2	2	2		W+1'-6 ½"	W+1'-6 ½"
R10	#4	2	2	2	2	2	2	2	2		W+1'-1 ½"	W+1'-1 ½"
R11	#4	2	2	2	2	2	2	2	2	1'-6"	W+1'-8 ½"	W+3'-2 ½"
R12	#4	2	2	2	2	2	2	2	2	1'-6"	W+1'-3 ½"	W+2'-3 ½"
R13	#4	2	2	2	2	2	2	2	2	1'-6"	W+0'-10 ½"	W+2'-4 ½"
R14	#4	2	2	2	2	2	2	2	2	1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4	4	4	4			3'-3"
Y2	#4	4	4	4	4	4	4	4	4			5'-6 ½"
Y3	#4	4	4	4	4	4	4	4	4			7'-10 ½"
Y4	#4	4	4	4	4	4	4	4	4			10'-2"
Y5	#4	8	12	12	12	12	12	12	12			12'-4 ½"
F	#4	4	4	4	4	4	4	4	4			13'-6"
N	#4	9	11	14	16	18	21	23	25	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			S+2V+4"
K	#4	8	10	12	14	16	18	20	22	0'-6"	T1+0'-6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			S+11 ½"
O	#7	14	16	16	16	16	16	16	16	2'-11 ½"	2'-11 ½"	S'-11"
OS	#4	2	2	2	2	2	2	2	2			T1+6'-0"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB "W"

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
DR	#4	20	20	20	20	20	20	20	20	1'-6"	2'-5"	3'-11"
DW	#5	18	18	18	18	18	18	18	18	1'-6"	2'-9"	4'-3"



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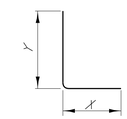

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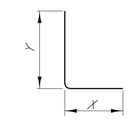

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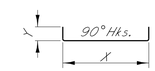

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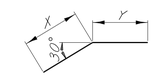

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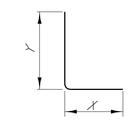

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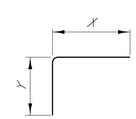

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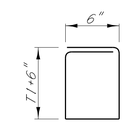


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-6-2W

SHEET NUMBER 7025

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rt"	"Y" CLEAR SPAN 8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-1"	16'-4 1/4"	4 1/2"	14'-6 7/16"	11"	9"	2'-0"	3'-0"	24'-4 1/4"	26'-4 1/4"	28'-4 1/4"	30'-4 1/4"	32'-4 1/4"	34'-4 1/4"	36'-4 1/4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	14.6349	2016.135	0.5021	31.841	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	14.6349	2016.135	0.5021	31.841	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	14.6825	2016.135	0.5021	31.841	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	14.8069	2022.667	0.5062	31.953	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	14.8069	2022.667	0.5062	31.953	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	14.9005	2029.198	0.5144	32.175	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	15.4132	2078.834	0.6008	36.072	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	15.4511	2078.834	0.6008	36.072	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	15.5276	2082.211	0.6049	36.183	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	15.7199	2092.343	0.6091	36.295	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	15.7392	2092.343	0.6091	36.295	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	15.7392	2092.343	0.6091	36.295	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	16.1495	2135.002	0.6996	43.420	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	16.2776	2138.490	0.7078	43.643	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	16.3541	2145.467	0.7078	43.643	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	16.5982	2159.421	0.7119	43.754	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	16.6629	2162.909	0.7202	43.977	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	16.6629	2162.909	0.7202	43.977	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	16.9821	2198.369	0.8066	49.432	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	17.0713	2201.969	0.8066	49.432	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	17.2384	2212.768	0.8107	49.543	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	17.5629	2230.767	0.8189	49.766	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	17.3763	2219.968	0.8313	50.100	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	17.6422	2234.367	0.8395	50.323	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	17.7279	2254.759	0.9053	56.780	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	18.0299	2269.604	0.9177	57.114	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	18.2918	2288.159	0.9218	57.225	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	18.0774	2273.315	0.9342	57.559	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	18.3537	2288.159	0.9383	57.671	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	18.5330	2303.004	0.9671	58.450	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	18.5655	2318.795	1.0123	62.792	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	18.8513	2334.084	1.0206	63.015	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	18.9382	2341.729	1.0370	63.460	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	19.0114	2341.729	1.0453	63.683	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	19.3687	2364.664	1.0700	64.351	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	19.7240	2379.953	1.0864	64.796	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	19.7945	2473.928	1.1276	70.585	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	19.8007	2473.928	1.1358	70.808	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	19.7726	2469.995	1.1481	71.142	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	20.2127	2489.663	1.1687	71.699	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	20.5181	2513.266	1.1934	72.367	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	20.9535	2532.935	1.2140	72.923	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-8-2W

SHEET NUMBER 7026

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

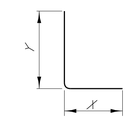
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			S+5'-8 1/2"
T2	#4	1	1	1	1	1	1	1			S+6'-10"
T3	#4	1	1	1	1	1	1	1			S+7'-11"
T4	#4	1	1	1	1	1	1	1			S+9'-0"
T5	#4	1	1	1	1	1	1	1			S+10'-1"
T6	#4	1	1	1	1	1	1	1			S+11'-2 1/2"
T7	#4	1	1	1	1	1	1	1			S+12'-3 1/2"
T8	#4	1	1	1	1	1	1	1			S+13'-4 1/2"
T9	#4	1	1	1	1	1	1	1			S+14'-5 1/2"
T10	#4	1	1	1	1	1	1	1			S+15'-7"
T11	#4	1	1	1	1	1	1	1			S+16'-8"
T12	#4	1	1	1	1	1	1	1			S+17'-9"
T13	#4	1	1	1	1	1	1	1			S+18'-10"
T14	#4	1	1	1	1	1	1	1			S+19'-11 1/2"
T15	#4	1	1	1	1	1	1	1			S+19'-6 1/2"
T16	#4	3	3	3	3	3	3	3			S+16'-3"
V1	#4	14	16	18	20	22	24	26	14'-2 1/2"	1'-8"	15'-10 1/2"
V2	#4	2	2	2	2	2	2	2	13'-1"	1'-8"	14'-9"
V3	#4	2	2	2	2	2	2	2	11'-4 1/2"	1'-8"	13'-0 1/2"
V4	#4	2	2	2	2	2	2	2	9'-7 1/2"	1'-8"	11'-3 1/2"
V5	#4	2	2	2	2	2	2	2	7'-11"	1'-8"	9'-7"
V6	#4	2	2	2	2	2	2	2	6'-2"	1'-8"	7'-10"
V7	#4	2	2	2	2	2	2	2	4'-2 1/2"	1'-8"	4'-2 1/2"
FT1	#5	2	2	2	2	2	2	2			2'-0"
FT2	#5	34	34	34	34	34	34	34			5'-5"
FT3	#5	2	2	2	2	2	2	2			4'-1"
FT4	#5	2	2	2	2	2	2	2			2'-6 1/2"
FL	#4	14	14	14	14	14	14	14			16'-0 1/2"
W1	#5	2	2	2	2	2	2	2		W+6'-5"	W+6'-5"
W2	#5	2	2	2	2	2	2	2		W+6'-0"	W+6'-0"
W3	#5	2	2	2	2	2	2	2		W+5'-7 1/2"	W+5'-7 1/2"
W4	#5	2	2	2	2	2	2	2		W+5'-3"	W+5'-3"
W5	#5	2	2	2	2	2	2	2		W+4'-10 1/2"	W+4'-10 1/2"
W6	#5	2	2	2	2	2	2	2		W+4'-5 1/2"	W+4'-5 1/2"
W7	#5	2	2	2	2	2	2	2		W+4'-1"	W+4'-1"
W8	#5	2	2	2	2	2	2	2		W+3'-8 1/2"	W+3'-8 1/2"
W9	#5	2	2	2	2	2	2	2		W+3'-4"	W+3'-4"
W10	#5	2	2	2	2	2	2	2		W+2'-11"	W+2'-11"
W11	#5	2	2	2	2	2	2	2		W+2'-6 1/2"	W+2'-6 1/2"
W12	#5	2	2	2	2	2	2	2		W+2'-2"	W+2'-2"
W13	#5	2	2	2	2	2	2	2		W+1'-9 1/2"	W+1'-9 1/2"
W14	#5	2	2	2	2	2	2	2		W+1'-4 1/2"	W+1'-4 1/2"
W15	#5	2	2	2	2	2	2	2		W+1'-0"	W+1'-0"
W16	#5	2	2	2	2	2	2	2	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
W17	#5	2	2	2	2	2	2	2	1'-6"	W+1'-2 1/2"	W+2'-8 1/2"
W18	#5	2	2	2	2	2	2	2	1'-6"	W+0'-10"	W+2'-4"
W19	#5	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
R1	#4	2	2	2	2	2	2	2		W+6'-5"	W+6'-5"
R2	#4	2	2	2	2	2	2	2		W+6'-0"	W+6'-0"
R3	#4	2	2	2	2	2	2	2		W+5'-7"	W+5'-7"
R4	#4	2	2	2	2	2	2	2		W+5'-2"	W+5'-2"
R5	#4	2	2	2	2	2	2	2		W+4'-9 1/2"	W+4'-9 1/2"
R6	#4	2	2	2	2	2	2	2		W+4'-4 1/2"	W+4'-4 1/2"
R7	#4	2	2	2	2	2	2	2		W+3'-11 1/2"	W+3'-11 1/2"
R8	#4	2	2	2	2	2	2	2		W+3'-6 1/2"	W+3'-6 1/2"
R9	#4	2	2	2	2	2	2	2		W+3'-1 1/2"	W+3'-1 1/2"
R10	#4	2	2	2	2	2	2	2		W+2'-9"	W+2'-9"
R11	#4	2	2	2	2	2	2	2		W+2'-4"	W+2'-4"
R12	#4	2	2	2	2	2	2	2		W+1'-11"	W+1'-11"
R13	#4	2	2	2	2	2	2	2		W+1'-6"	W+1'-6"
R14	#4	2	2	2	2	2	2	2		W+1'-1"	W+1'-1"
R15	#4	2	2	2	2	2	2	2		W+0'-8 1/2"	W+0'-8 1/2"
R16	#4	2	2	2	2	2	2	2	1'-6"	W+1'-3 1/2"	W+2'-9 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
R17	#4	2	2	2	2	2	2	2	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
R18	#4	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
Y1	#4	4	4	4	4	4	4	4			3'-3"
Y2	#4	4	4	4	4	4	4	4			5'-6 1/2"
Y3	#4	4	4	4	4	4	4	4			7'-10 1/2"
Y4	#4	4	4	4	4	4	4	4			10'-2"
Y5	#4	4	4	4	4	4	4	4			12'-6"
Y6	#4	4	4	4	4	4	4	4			14'-9 1/2"
Y7	#4	12	12	12	12	12	12	16			16'-0 1/2"
F	#4	4	4	4	4	4	4	4			17'-5 1/2"
N	#4	12	13	16	18	21	23	26	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			S+2V+4"
K	#4	10	12	14	16	18	20	22	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			S+11 1/2"
O	#7	20	20	20	20	20	20	22	2'-11 1/2"	2'-11 1/2"	5'-11"
OS	#4	2	2	2	2	2	2	2			T1+8'-0"
DW	#5	30	30	30	30	30	30	30	1'-6"	2'-9"	4'-1"
DR	#4	30	30	30	30	30	30	30	1'-6"	2'-5"	3'-11"



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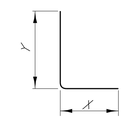

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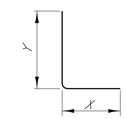

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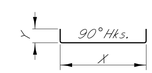

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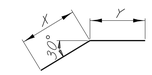

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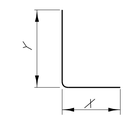

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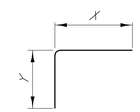

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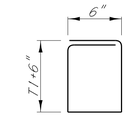


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-8-2W

SHEET NUMBER 7027

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rt"	"Y" CLEAR SPAN						
									10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-1"	18'-8"	5"	16'-7"	11"	10"	2'-0"	4'-0"	28'-8"	30'-8"	32'-8"	34'-8"	36'-8"	38'-8"	40'-8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	21.0189	2730.542	0.6091	37.853	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	21.0573	2730.542	0.6091	37.853	3.7901	889.456
		15'-0"	10"	1'-0"	10 ½"	2'-10"	20.9607	2722.870	0.6132	37.965	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 ½"	3'-0"	21.2367	2738.215	0.6296	38.410	3.8889	904.230
		25'-0"	1'-0 ½"	1'-2"	1'-0 ½"	3'-0 ½"	21.2852	2742.051	0.6296	38.410	3.8951	905.154
		30'-0"	1'-2"	1'-3 ½"	1'-2"	3'-2"	21.4967	2753.559	0.6420	38.744	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	21.9125	2800.227	0.7078	43.643	4.0988	966.089
		10'-0"	1'-0"	1'-1 ½"	10"	3'-0"	21.9794	2800.227	0.7078	43.643	4.1173	969.120
		15'-0"	11 ½"	1'-1 ½"	10 ½"	2'-11 ½"	21.9318	2796.280	0.7119	43.754	4.1235	969.957
		20'-0"	1'-1 ½"	1'-4"	1'-0 ½"	3'-1 ½"	22.2456	2812.069	0.7284	44.199	4.2284	986.436
		25'-0"	1'-2"	1'-4 ½"	1'-1"	3'-2"	22.3196	2816.017	0.7325	44.311	4.2531	990.303
		30'-0"	1'-1 ½"	1'-4 ½"	1'-2 ½"	3'-1 ½"	22.2782	2812.069	0.7449	44.645	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	22.8230	2862.240	0.8066	49.432	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	22.8230	2862.240	0.8066	49.432	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	22.9228	2870.357	0.8148	49.655	4.4691	1053.347
		20'-0"	1'-3 ½"	1'-6"	1'-1"	3'-3 ½"	23.3305	2890.651	0.8313	50.100	4.5864	1072.803
		25'-0"	1'-4 ½"	1'-6 ½"	1'-1"	3'-4 ½"	23.4540	2898.769	0.8313	50.100	4.6049	1076.095
		30'-0"	1'-4"	1'-6 ½"	1'-3"	3'-4"	23.4187	2894.710	0.8477	50.545	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	23.6602	2924.253	0.9136	55.444	4.7654	1128.828
		10'-0"	1'-1"	1'-4 ½"	11"	3'-1"	23.7860	2932.593	0.9136	55.444	4.7840	1132.381
		15'-0"	1'-3 ½"	1'-6"	1'-0 ½"	3'-3 ½"	24.1229	2953.443	0.9259	55.778	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	24.1742	2957.613	0.9300	55.889	4.8889	1150.425
		25'-0"	1'-3 ½"	1'-7"	1'-2"	3'-3 ½"	24.1918	2953.443	0.9383	56.112	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 ½"	3'-6"	24.5680	2974.294	0.9506	56.446	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	24.4469	2986.265	1.0206	63.015	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	24.7054	3003.391	1.0206	63.015	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 ½"	3'-4"	24.9724	3020.517	1.0329	63.349	5.1975	1228.796
		20'-0"	1'-3 ½"	1'-6"	1'-2 ½"	3'-3 ½"	24.9301	3016.235	1.0412	63.571	5.2160	1231.219
		25'-0"	1'-5"	1'-8 ½"	1'-3 ½"	3'-5"	25.2510	3029.079	1.0494	63.794	5.2901	1245.080
		30'-0"	1'-6 ½"	1'-10 ½"	1'-5 ½"	3'-6 ½"	25.5547	3041.924	1.0658	64.239	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	25.6621	3074.634	1.1193	68.804	5.4444	1297.065
		10'-0"	1'-2"	1'-5 ½"	1'-1"	3'-2"	25.5350	3065.849	1.1276	69.027	5.4506	1296.684
		15'-0"	1'-3 ½"	1'-6"	1'-3"	3'-3 ½"	25.7285	3079.027	1.1440	69.472	5.5247	1309.503
		20'-0"	1'-5 ½"	1'-9"	1'-5 ½"	3'-5 ½"	26.1671	3096.598	1.1646	70.029	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	26.4063	3109.776	1.1770	70.363	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	26.8987	3136.133	1.2016	71.031	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	26.4690	3137.315	1.2346	75.039	5.7901	1380.802
		10'-0"	1'-3 ½"	1'-6"	1'-3 ½"	3'-3 ½"	26.5270	3141.819	1.2469	75.373	5.8333	1387.788
		15'-0"	1'-4 ½"	1'-7 ½"	1'-4 ½"	3'-4 ½"	26.7522	3150.827	1.2551	75.595	5.8889	1398.705
		20'-0"	1'-8 ½"	1'-10 ½"	1'-8 ½"	3'-8 ½"	27.4335	3186.860	1.2881	76.486	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered ¾".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-10-2W

SHEET NUMBER 7028

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

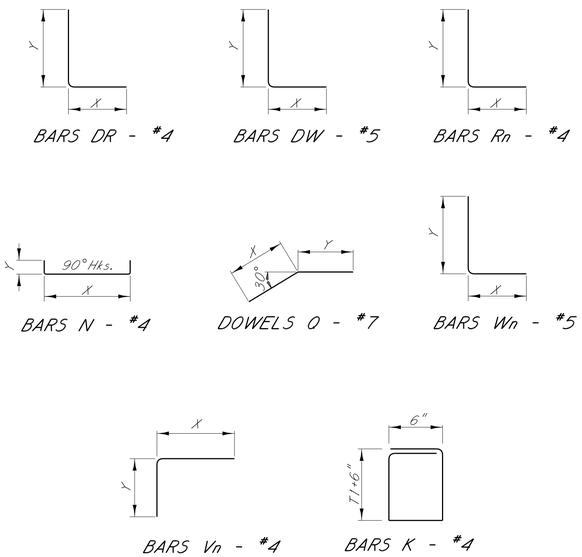
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			S+5'-10 ½"
T2	#4	1	1	1	1	1	1	1			S+6'-11 ½"
T3	#4	1	1	1	1	1	1	1			S+8'-1"
T4	#4	1	1	1	1	1	1	1			S+9'-2"
T5	#4	1	1	1	1	1	1	1			S+10'-3 ½"
T6	#4	1	1	1	1	1	1	1			S+11'-4 ½"
T7	#4	1	1	1	1	1	1	1			S+12'-6"
T8	#4	1	1	1	1	1	1	1			S+13'-7"
T9	#4	1	1	1	1	1	1	1			S+14'-8 ½"
T10	#4	1	1	1	1	1	1	1			S+15'-9 ½"
T11	#4	1	1	1	1	1	1	1			S+16'-11"
T12	#4	1	1	1	1	1	1	1			S+18'-0"
T13	#4	1	1	1	1	1	1	1			S+19'-1 ½"
T14	#4	1	1	1	1	1	1	1			S+20'-2 ½"
T15	#4	1	1	1	1	1	1	1			S+21'-4"
T16	#4	1	1	1	1	1	1	1			S+22'-5"
T17	#4	1	1	1	1	1	1	1			S+21'-10 ½"
T18	#4	3	3	3	3	3	3	3			S+18'-7"
V1	#4	16	18	20	22	24	26	28	16'-3"	1'-8"	17'-11"
V2	#4	2	2	2	2	2	2	2	15'-3"	1'-8"	16'-11"
V3	#4	2	2	2	2	2	2	2	13'-6 ½"	1'-8"	15'-2 ½"
V4	#4	2	2	2	2	2	2	2	11'-9 ½"	1'-8"	13'-5 ½"
V5	#4	2	2	2	2	2	2	2	10'-1"	1'-8"	11'-9"
V6	#4	2	2	2	2	2	2	2	8'-4"	1'-8"	10'-0"
V7	#4	2	2	2	2	2	2	2	6'-9 ½"	1'-8"	8'-3 ½"
V8	#4	2	2	2	2	2	2	2	4'-9"	1'-8"	6'-5"
V9	#4	2	2	2	2	2	2	2	2'-5 ½"		2'-5 ½"
FT1	#5	2	2	2	2	2	2	2			1'-9"
FT2	#5	2	2	2	2	2	2	2			3'-2"
FT3	#5	40	40	40	40	40	40	40			6'-6"
FT4	#5	2	2	2	2	2	2	2			5'-6"
FT5	#5	2	2	2	2	2	2	2			4'-1"
FT6	#5	2	2	2	2	2	2	2			2'-7 ½"
FL	#4	16	16	16	16	16	16	16			18'-4"
W1	#5	2	2	2	2	2	2	2		W+7'-5"	W+7'-5"
W2	#5	2	2	2	2	2	2	2		W+7'-0 ½"	W+7'-0 ½"
W3	#5	2	2	2	2	2	2	2		W+6'-8"	W+6'-8"
W4	#5	2	2	2	2	2	2	2		W+6'-4"	W+6'-4"
W5	#5	2	2	2	2	2	2	2		W+5'-11 ½"	W+5'-11 ½"
W6	#5	2	2	2	2	2	2	2		W+5'-7"	W+5'-7"
W7	#5	2	2	2	2	2	2	2		W+5'-3"	W+5'-3"
W8	#5	2	2	2	2	2	2	2		W+4'-10 ½"	W+4'-10 ½"
W9	#5	2	2	2	2	2	2	2		W+4'-6"	W+4'-6"
W10	#5	2	2	2	2	2	2	2		W+4'-2"	W+4'-2"
W11	#5	2	2	2	2	2	2	2		W+3'-9 ½"	W+3'-9 ½"
W12	#5	2	2	2	2	2	2	2		W+3'-5"	W+3'-5"
W13	#5	2	2	2	2	2	2	2		W+3'-1"	W+3'-1"
W14	#5	2	2	2	2	2	2	2		W+2'-8 ½"	W+2'-8 ½"
W15	#5	2	2	2	2	2	2	2		W+2'-4"	W+2'-4"
W16	#5	2	2	2	2	2	2	2		W+2'-0"	W+2'-0"
W17	#5	2	2	2	2	2	2	2		W+1'-7 ½"	W+1'-7 ½"
W18	#5	2	2	2	2	2	2	2		W+1'-3"	W+1'-3"
W19	#5	2	2	2	2	2	2	2		W+0'-11"	W+0'-11"
W20	#5	2	2	2	2	2	2	2		W+0'-6 ½"	W+0'-6 ½"
W21	#5	2	2	2	2	2	2	2		W+0'-2 ½"	W+0'-2 ½"
W22	#5	2	2	2	2	2	2	2	1'-6"	W+0'-11"	W+2'-4"
W23	#5	2	2	2	2	2	2	2	1'-6"	W+0'-5 ½"	W+1'-11 ½"
R1	#4	2	2	2	2	2	2	2		W+7'-5"	W+7'-5"
R2	#4	2	2	2	2	2	2	2		W+7'-0"	W+7'-0"
R3	#4	2	2	2	2	2	2	2		W+6'-7"	W+6'-7"
R4	#4	2	2	2	2	2	2	2		W+6'-2"	W+6'-2"
R5	#4	2	2	2	2	2	2	2		W+5'-9"	W+5'-9"
R6	#4	2	2	2	2	2	2	2		W+5'-4"	W+5'-4"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
R7	#4	2	2	2	2	2	2	2		W+4'-11"	W+4'-11"
R8	#4	2	2	2	2	2	2	2		W+4'-6"	W+4'-6"
R9	#4	2	2	2	2	2	2	2		W+4'-1"	W+4'-1"
R10	#4	2	2	2	2	2	2	2		W+3'-7 ½"	W+3'-7 ½"
R11	#4	2	2	2	2	2	2	2		W+3'-2 ½"	W+3'-2 ½"
R12	#4	2	2	2	2	2	2	2		W+2'-9 ½"	W+2'-9 ½"
R13	#4	2	2	2	2	2	2	2		W+2'-4 ½"	W+2'-4 ½"
R14	#4	2	2	2	2	2	2	2		W+1'-11 ½"	W+1'-11 ½"
R15	#4	2	2	2	2	2	2	2		W+1'-6 ½"	W+1'-6 ½"
R16	#4	2	2	2	2	2	2	2		W+1'-1 ½"	W+1'-1 ½"
R17	#4	2	2	2	2	2	2	2		W+0'-8 ½"	W+0'-8 ½"
R18	#4	2	2	2	2	2	2	2		W+0'-3 ½"	W+0'-3 ½"
R19	#4	2	2	2	2	2	2	2		W+0'-1 ½"	W+0'-1 ½"
R20	#4	2	2	2	2	2	2	2	1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4	4	4			3'-3"
Y2	#4	4	4	4	4	4	4	4			5'-6 ½"
Y3	#4	4	4	4	4	4	4	4			7'-10 ½"
Y4	#4	4	4	4	4	4	4	4			10'-2"
Y5	#4	4	4	4	4	4	4	4			12'-6"
Y6	#4	4	4	4	4	4	4	4			14'-9 ½"
Y7	#4	4	4	4	4	4	4	4			17'-1"
Y8	#4	16	16	16	16	16	16	16			18'-4"
F	#4	4	4	4	4	4	4	4			19'-11 ½"
N	#4	14	16	18	20	23	25	27	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			S+2V-4"
K	#4	12	14	16	18	20	22	24	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			S+1'-1 ½"
O	#7	24	24	24	24	24	24	24	3'-0"	3'-0"	6'-0"
OS	#4	2	2	2	2	2	2	2			T1+10'-0"
DW	#5	42	42	42	42	42	42	42	1'-6"	2'-9"	4'-3"
DR	#4	38	38	38	38	38	38	38	1'-6"	2'-5"	3'-11"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-10-2W

SHEET NUMBER 7029

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rt"	"Y" CLEAR SPAN						
									12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-4"	21'-6 3/4"	5 1/2"	19'-1 9/16"	11"	11"	2'-0"	5'-0"	33'-6 3/4"	35'-6 3/4"	37'-6 3/4"	39'-6 3/4"	41'-6 3/4"	43'-6 3/4"	45'-6 3/4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	29.4114	3932.813	0.7160	43.865	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	29.4806	3932.813	0.7243	44.088	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	29.5287	3932.813	0.7325	44.311	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	29.9382	3958.009	0.7490	44.756	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	30.0854	3968.088	0.7490	44.756	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	29.9489	3958.009	0.7243	44.088	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	30.4689	4088.249	0.8148	51.213	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	30.5586	4093.400	0.8230	51.436	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	30.6757	4098.550	0.8313	51.659	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	31.1272	4124.303	0.8477	52.104	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	31.1029	4124.303	0.8519	52.215	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	31.2879	4134.604	0.8601	52.438	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	31.3442	4156.998	0.9136	55.444	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	31.5568	4167.521	0.9218	55.667	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	32.0241	4193.831	0.9424	56.223	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	31.8708	4183.307	0.9424	56.223	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	32.1566	4199.093	0.9547	56.557	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	32.4250	4214.879	0.9465	56.335	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	32.4699	4236.492	1.0123	62.792	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	32.6610	4247.239	1.0206	63.015	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	33.0156	4268.732	1.0370	63.460	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	33.0188	4268.732	1.0412	63.571	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	33.4268	4284.852	1.0617	64.128	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	33.8209	4311.718	1.0741	64.462	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	33.3258	4305.463	1.1193	68.804	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	33.5950	4316.433	1.1276	69.027	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	34.1791	4354.825	1.1399	69.361	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	34.4420	4360.310	1.1564	69.806	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	34.6890	4371.278	1.1646	70.029	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	34.4188	4385.626	1.2346	75.039	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	34.7153	4402.414	1.2263	74.816	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	35.0381	4419.202	1.2510	75.484	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	35.7729	4458.373	1.2675	75.929	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	36.2137	4486.353	1.2963	76.709	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	35.3469	4454.820	1.3251	82.164	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	35.8781	4483.356	1.3416	82.609	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	36.3326	4511.892	1.3580	83.055	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	37.1052	4551.843	1.4033	84.279	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-12-2W

SHEET NUMBER 7030

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

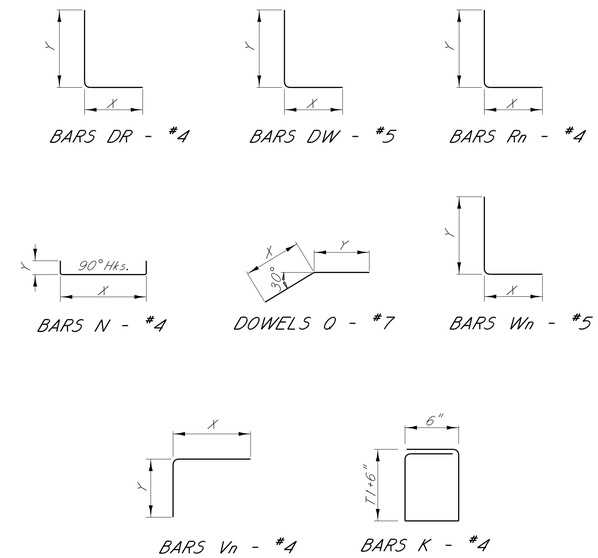
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			S+6'-0"
T2	#4	1	1	1	1	1	1	1			S+7'-2"
T3	#4	1	1	1	1	1	1	1			S+8'-3 1/2"
T4	#4	1	1	1	1	1	1	1			S+9'-5 1/2"
T5	#4	1	1	1	1	1	1	1			S+10'-7"
T6	#4	1	1	1	1	1	1	1			S+11'-8 1/2"
T7	#4	1	1	1	1	1	1	1			S+12'-10 1/2"
T8	#4	1	1	1	1	1	1	1			S+14'-0"
T9	#4	1	1	1	1	1	1	1			S+15'-2"
T10	#4	1	1	1	1	1	1	1			S+16'-3 1/2"
T11	#4	1	1	1	1	1	1	1			S+17'-5 1/2"
T12	#4	1	1	1	1	1	1	1			S+18'-7"
T13	#4	1	1	1	1	1	1	1			S+19'-8 1/2"
T14	#4	1	1	1	1	1	1	1			S+21'-10 1/2"
T15	#4	1	1	1	1	1	1	1			S+22'-0"
T16	#4	1	1	1	1	1	1	1			S+23'-2"
T17	#4	1	1	1	1	1	1	1			S+24'-3 1/2"
T18	#4	1	1	1	1	1	1	1			S+25'-5"
T19	#4	1	1	1	1	1	1	1			S+24'-11"
T20	#4	3	3	3	3	3	3	3			S+21'-5 1/2"
V1	#4	18	20	22	24	26	28	30	18'-9 1/2"	1'-8"	20'-5 1/2"
V2	#4	2	2	2	2	2	2	2	17'-11 1/2"	1'-8"	19'-7 1/2"
V3	#4	2	2	2	2	2	2	2	16'-2 1/2"	1'-8"	17'-10 1/2"
V4	#4	2	2	2	2	2	2	2	14'-6"	1'-8"	16'-2"
V5	#4	2	2	2	2	2	2	2	12'-9"	1'-8"	14'-5"
V6	#4	2	2	2	2	2	2	2	11'-0"	1'-8"	12'-8"
V7	#4	2	2	2	2	2	2	2	9'-3 1/2"	1'-8"	10'-11 1/2"
V8	#4	2	2	2	2	2	2	2	7'-6 1/2"	1'-8"	9'-2 1/2"
V9	#4	2	2	2	2	2	2	2	5'-10"	1'-8"	7'-6"
V10	#4	2	2	2	2	2	2	2	3'-8"		3'-8"
FT1	#5	2	2	2	2	2	2	2			2'-3"
FT2	#5	2	2	2	2	2	2	2			3'-5"
FT3	#5	2	2	2	2	2	2	2			4'-6 1/2"
FT4	#5	56	56	56	56	56	56	56			7'-7"
FT5	#5	2	2	2	2	2	2	2			7'-3 1/2"
FT6	#5	2	2	2	2	2	2	2			6'-2"
FT7	#5	2	2	2	2	2	2	2			5'-0"
FT8	#5	2	2	2	2	2	2	2			3'-10 1/2"
FT9	#5	2	2	2	2	2	2	2			2'-8 1/2"
FL	#4	18	18	18	18	18	18	18			21'-3"
W1	#5	2	2	2	2	2	2	2		W+8'-8"	W+8'-8"
W2	#5	2	2	2	2	2	2	2		W+8'-4 1/2"	W+8'-4 1/2"
W3	#5	2	2	2	2	2	2	2		W+8'-1"	W+8'-1"
W4	#5	2	2	2	2	2	2	2		W+7'-9 1/2"	W+7'-9 1/2"
W5	#5	2	2	2	2	2	2	2		W+7'-6"	W+7'-6"
W6	#5	2	2	2	2	2	2	2		W+7'-2 1/2"	W+7'-2 1/2"
W7	#5	2	2	2	2	2	2	2		W+6'-11"	W+6'-11"
W8	#5	2	2	2	2	2	2	2		W+6'-7 1/2"	W+6'-7 1/2"
W9	#5	2	2	2	2	2	2	2		W+6'-4 1/2"	W+6'-4 1/2"
W10	#5	2	2	2	2	2	2	2		W+6'-1"	W+6'-1"
W11	#5	2	2	2	2	2	2	2		W+5'-9 1/2"	W+5'-9 1/2"
W12	#5	2	2	2	2	2	2	2		W+5'-6"	W+5'-6"
W13	#5	2	2	2	2	2	2	2		W+5'-2 1/2"	W+5'-2 1/2"
W14	#5	2	2	2	2	2	2	2		W+4'-11"	W+4'-11"
W15	#5	2	2	2	2	2	2	2		W+4'-7 1/2"	W+4'-7 1/2"
W16	#5	2	2	2	2	2	2	2		W+4'-4"	W+4'-4"
W17	#5	2	2	2	2	2	2	2		W+4'-0 1/2"	W+4'-0 1/2"
W18	#5	2	2	2	2	2	2	2		W+3'-9 1/2"	W+3'-9 1/2"
W19	#5	2	2	2	2	2	2	2		W+3'-6"	W+3'-6"
W20	#5	2	2	2	2	2	2	2		W+3'-2 1/2"	W+3'-2 1/2"
W21	#5	2	2	2	2	2	2	2		W+2'-11"	W+2'-11"
W22	#5	2	2	2	2	2	2	2		W+2'-7 1/2"	W+2'-7 1/2"
W23	#5	2	2	2	2	2	2	2		W+2'-4"	W+2'-4"
W24	#5	2	2	2	2	2	2	2		W+2'-0 1/2"	W+2'-0 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
W25	#5	2	2	2	2	2	2	2		W+1'-9"	W+1'-9"
W26	#5	2	2	2	2	2	2	2		W+1'-5 1/2"	W+1'-5 1/2"
W27	#5	2	2	2	2	2	2	2		W+1'-2 1/2"	W+1'-2 1/2"
W28	#5	2	2	2	2	2	2	2		W+0'-11"	W+0'-11"
W29	#5	2	2	2	2	2	2	2		W+0'-7 1/2"	W+0'-7 1/2"
W30	#5	2	2	2	2	2	2	2		W+0'-4"	W+0'-4"
W31	#5	2	2	2	2	2	2	2		W+0'-0 1/2"	W+0'-0 1/2"
W32	#5	2	2	2	2	2	2	2		W-0'-3"	W-0'-3"
W33	#5	2	2	2	2	2	2	2		W-0'-6 1/2"	W-0'-6 1/2"
R1	#4	2	2	2	2	2	2	2		W+8'-8"	W+8'-8"
R2	#4	2	2	2	2	2	2	2		W+8'-3"	W+8'-3"
R3	#4	2	2	2	2	2	2	2		W+7'-10"	W+7'-10"
R4	#4	2	2	2	2	2	2	2		W+7'-5"	W+7'-5"
R5	#4	2	2	2	2	2	2	2		W+7'-0"	W+7'-0"
R6	#4	2	2	2	2	2	2	2		W+6'-7"	W+6'-7"
R7	#4	2	2	2	2	2	2	2		W+6'-2"	W+6'-2"
R8	#4	2	2	2	2	2	2	2		W+5'-9"	W+5'-9"
R9	#4	2	2	2	2	2	2	2		W+5'-4"	W+5'-4"
R10	#4	2	2	2	2	2	2	2		W+4'-11"	W+4'-11"
R11	#4	2	2	2	2	2	2	2		W+4'-5 1/2"	W+4'-5 1/2"
R12	#4	2	2	2	2	2	2	2		W+4'-0 1/2"	W+4'-0 1/2"
R13	#4	2	2	2	2	2	2	2		W+3'-7 1/2"	W+3'-7 1/2"
R14	#4	2	2	2	2	2	2	2		W+3'-2 1/2"	W+3'-2 1/2"
R15	#4	2	2	2	2	2	2	2		W+2'-9 1/2"	W+2'-9 1/2"
R16	#4	2	2	2	2	2	2	2		W+2'-4 1/2"	W+2'-4 1/2"
R17	#4	2	2	2	2	2	2	2		W+1'-11 1/2"	W+1'-11 1/2"
R18	#4	2	2	2	2	2	2	2		W+1'-6 1/2"	W+1'-6 1/2"
R19	#4	2	2	2	2	2	2	2		W+1'-1 1/2"	W+1'-1 1/2"
R20	#4	2	2	2	2	2	2	2		W+0'-8 1/2"	W+0'-8 1/2"
R21	#4	2	2	2	2	2	2	2		W+0'-3 1/2"	W+0'-3 1/2"
R22	#4	2	2	2	2	2	2	2		W-0'-1 1/2"	W-0'-1 1/2"
R23	#4	2	2	2	2	2	2	2		W-0'-6 1/2"	W-0'-6 1/2"
Y1	#4	4	4	4	4	4	4	4			2'-10 1/2"
Y2	#4	4	4	4	4	4	4	4			4'-9 1/2"
Y3	#4	4	4	4	4	4	4	4			6'-8 1/2"
Y4	#4	4	4	4	4	4	4	4			8'-7 1/2"
Y5	#4	4	4	4	4	4	4	4			10'-7"
Y6	#4	4	4	4	4	4	4	4			12'-6"
Y7	#4	4	4	4	4	4	4	4			14'-5"
Y8	#4	4	4	4	4	4	4	4			16'-4"
Y9	#4	4	4	4	4	4	4	4			18'-3"
Y10	#4	4	4	4	4	4	4	4			20'-2 1/2"
Y11	#4	20	24	24	24	24	24	24			21'-3"
F	#4	4	4	4	4	4	4	4			23'-1 1/2"
N	#4	16	19	20	23	25	27	30	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			S+2V-4"
K	#4	15	17	19	21	23	25	27	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			S+1'-3"
O	#7	32	34	34	34	34	34	34	3'-0 1/2"	3'-0 1/2"	6'-1"
DW1	#5	66	66	66	66	66	66	66	1'-6"	2'-9"	4'-3"
DR1	#4	46	46	46	46	46	46	46	1'-6"	2'-5"	3'-11"
OS	#4	2	2	2	2	2	2	2			12"+T1



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-12-2W

SHEET NUMBER 7031

REVISIONS | BY | DATE

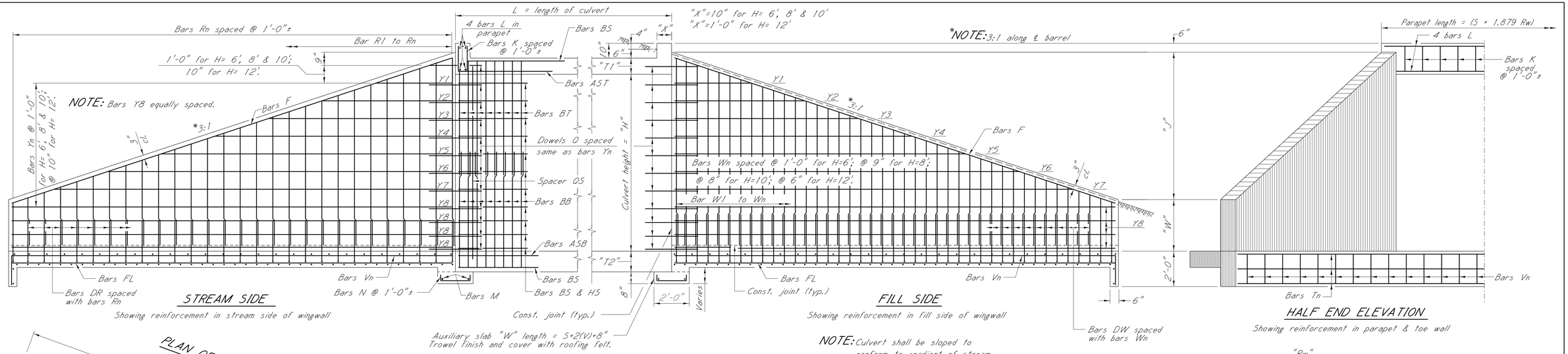
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.

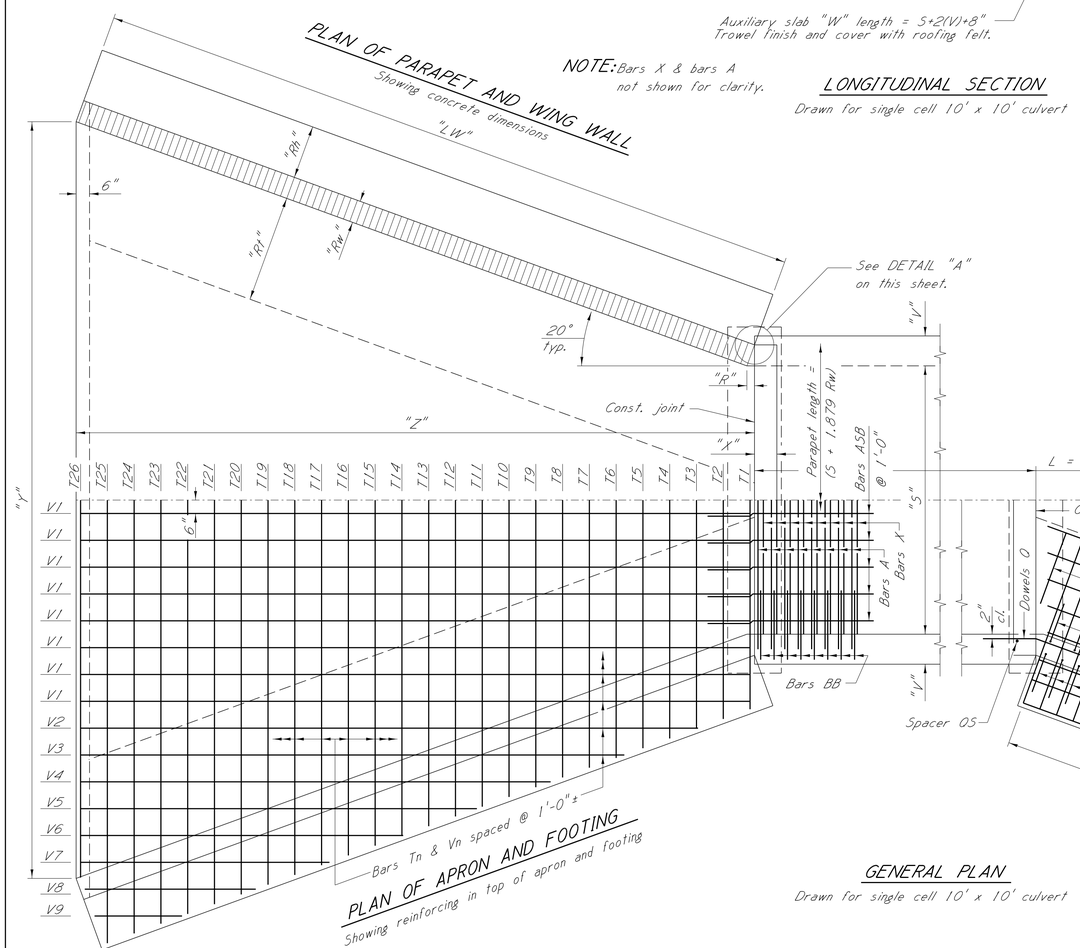
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

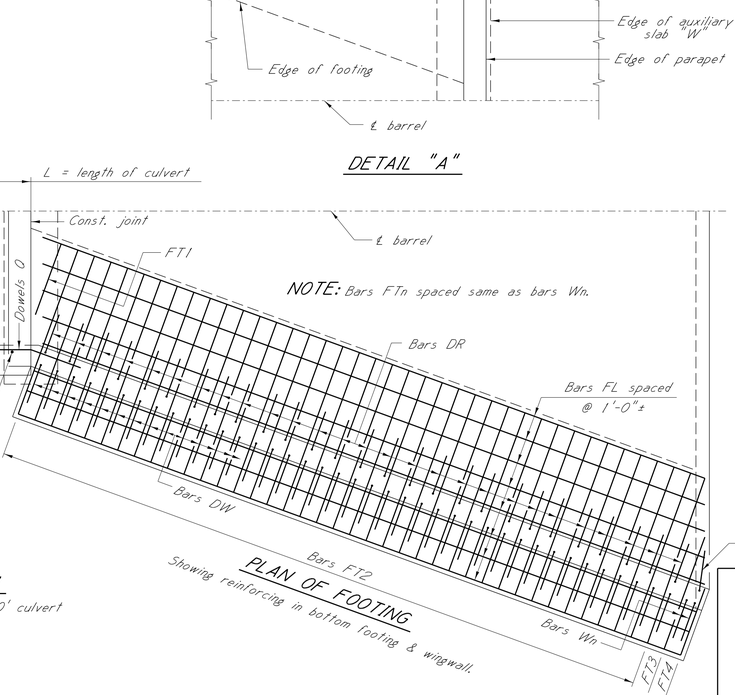
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI





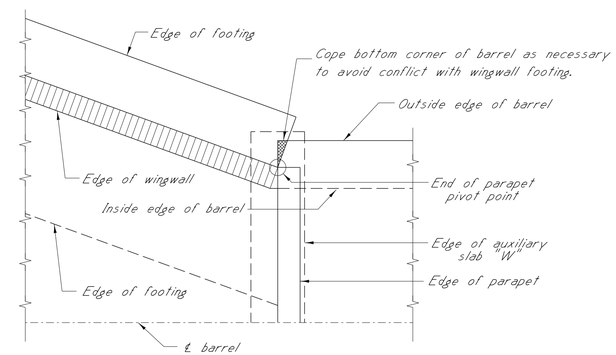


GENERAL PLAN

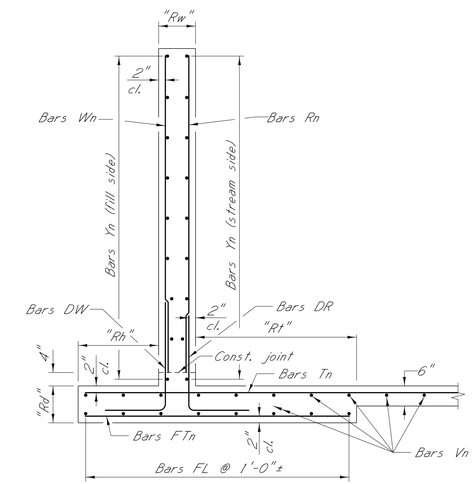
Drawn for single cell 10' x 10' culvert

LONGITUDINAL SECTION

Drawn for single cell 10' x 10' culvert



DETAIL "A"



CROSS SECTION WINGWALL

NOTE: For bar bending details and quantities, see drawings IWS-6-3W, IWS-8-3W, IWS-10-3W & IWS-12-3W.

SPECIAL PROVISIONS REQUIRED:
Concrete Bridges And Structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 6-24 FT.

SHT. 1 OF 1

WORKING NUMBER IWS-3W

SHEET NUMBER 7032

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rf"	"Y" CLEAR SPAN							
									6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-9"	18'-4 5/16"	3 1/16"	17'-6 1/8"	11"	9"	2'-0"	3'-0"	18'-6 11/16"	20'-6 11/16"	22'-6 11/16"	24'-6 11/16"	26'-6 11/16"	28'-6 11/16"	30'-6 11/16"	32'-6 11/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	14.0726	1879.943	0.4033	24.493	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	14.0726	1879.943	0.4033	24.493	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	14.0726	1879.943	0.4033	24.493	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	14.0980	1879.943	0.4033	24.493	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	14.0980	1879.943	0.4033	24.493	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	14.0980	1879.943	0.4033	24.493	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	14.8784	1943.848	0.5021	30.283	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	14.8784	1943.848	0.5021	30.283	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	14.8942	1943.848	0.5021	30.283	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	15.0271	1950.776	0.5021	30.283	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	15.0113	1950.776	0.5021	30.283	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	15.1284	1957.704	0.5021	30.283	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	15.7152	2007.753	0.6008	37.631	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	15.7152	2007.753	0.6008	37.631	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	15.8196	2014.904	0.6008	37.631	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	16.0472	2029.205	0.6008	37.631	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	16.0679	2029.205	0.6091	37.853	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	16.2372	2039.931	0.6173	38.076	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	16.5473	2075.345	0.6996	43.420	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	16.6987	2082.719	0.6996	43.420	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	16.8070	2090.092	0.7037	43.531	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	17.0693	2104.839	0.7119	43.754	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	17.1394	2108.525	0.7243	44.088	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	17.0753	2104.839	0.7284	44.199	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	17.4552	2143.160	0.8025	49.321	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	17.6349	2154.554	0.8066	49.432	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	17.7896	2165.948	0.8107	49.543	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	18.1629	2184.938	0.8230	49.877	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	17.9192	2169.746	0.8354	50.211	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	18.1074	2181.140	0.8477	50.545	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	18.4739	2219.016	0.9259	57.337	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	18.5887	2226.835	0.9259	57.337	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	18.9917	2250.291	0.9259	57.337	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	18.7512	2238.563	0.9383	57.671	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	19.0063	2250.291	0.9506	58.005	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	19.2506	2265.928	0.9671	58.450	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	19.2902	2359.212	1.0165	62.903	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	19.7473	2383.336	1.0329	63.349	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	19.7209	2383.336	1.0453	63.683	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	19.8781	2391.377	1.0535	63.905	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	20.0947	2407.460	1.0700	64.351	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	20.5861	2431.584	1.0947	65.019	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	20.3262	2432.049	1.1276	69.027	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	20.5707	2448.577	1.1317	69.138	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	20.6311	2456.841	1.1523	69.695	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	21.2620	2489.897	1.1852	70.585	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	21.5210	2502.293	1.1975	70.919	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications for Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-3W

SHEET NUMBER 7033

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

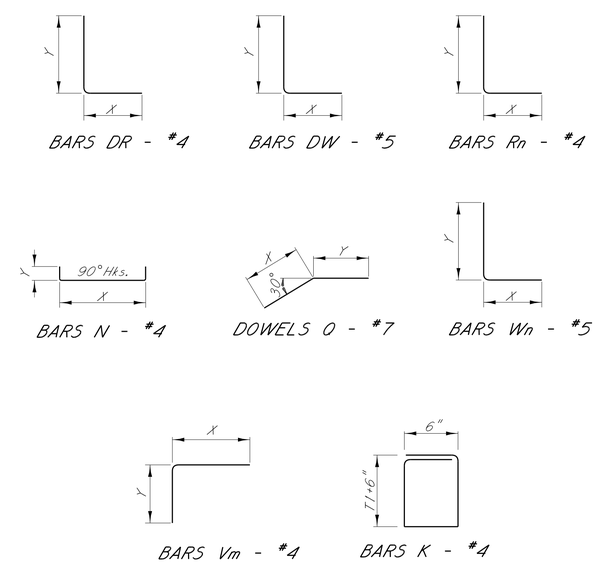
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			S+5'-5"
T2	#4	1	1	1	1	1	1	1	1			S+6'-1 1/2"
T3	#4	1	1	1	1	1	1	1	1			S+6'-10"
T4	#4	1	1	1	1	1	1	1	1			S+7'-6"
T5	#4	1	1	1	1	1	1	1	1			S+8'-2 1/2"
T6	#4	1	1	1	1	1	1	1	1			S+8'-11"
T7	#4	1	1	1	1	1	1	1	1			S+9'-7"
T8	#4	1	1	1	1	1	1	1	1			S+10'-3 1/2"
T9	#4	1	1	1	1	1	1	1	1			S+11'-0"
T10	#4	1	1	1	1	1	1	1	1			S+11'-8"
T11	#4	1	1	1	1	1	1	1	1			S+12'-4 1/2"
T12	#4	1	1	1	1	1	1	1	1			S+13'-1"
T13	#4	1	1	1	1	1	1	1	1			S+13'-9"
T14	#4	1	1	1	1	1	1	1	1			S+14'-5 1/2"
T15	#4	1	1	1	1	1	1	1	1			S+15'-2"
T16	#4	1	1	1	1	1	1	1	1			S+15'-10"
T17	#4	1	1	1	1	1	1	1	1			S+16'-6 1/2"
T18	#4	1	1	1	1	1	1	1	1			S+17'-3"
T19	#4	3	3	3	3	3	3	3	3			S+12'-6"
V1	#4	12	14	16	18	20	22	24	26	17'-2"	1'-8"	18'-10"
V2	#4	2	2	2	2	2	2	2	2	15'-0 1/2"	1'-8"	16'-8 1/2"
V3	#4	2	2	2	2	2	2	2	2	12'-3 1/2"	1'-8"	13'-11 1/2"
V4	#4	2	2	2	2	2	2	2	2	9'-6 1/2"	1'-8"	11'-2 1/2"
V5	#4	2	2	2	2	2	2	2	2	6'-8 1/2"	1'-8"	8'-4 1/2"
V6	#4	2	2	2	2	2	2	2	2	3'-7"		3'-7"
FT1	#5	38	38	38	38	38	38	38	38			5'-5"
FT2	#5	2	2	2	2	2	2	2	2			2'-6 1/2"
FL	#4	14	14	14	14	14	14	14	14			18'-0 1/2"
W1	#5	2	2	2	2	2	2	2	2		W+5'-1"	W+5'-1"
W2	#5	2	2	2	2	2	2	2	2		W+4'-9 1/2"	W+4'-9 1/2"
W3	#5	2	2	2	2	2	2	2	2		W+4'-6"	W+4'-6"
W4	#5	2	2	2	2	2	2	2	2		W+4'-2 1/2"	W+4'-2 1/2"
W5	#5	2	2	2	2	2	2	2	2		W+3'-11"	W+3'-11"
W6	#5	2	2	2	2	2	2	2	2		W+3'-7 1/2"	W+3'-7 1/2"
W7	#5	2	2	2	2	2	2	2	2		W+3'-4"	W+3'-4"
W8	#5	2	2	2	2	2	2	2	2		W+3'-0 1/2"	W+3'-0 1/2"
W9	#5	2	2	2	2	2	2	2	2		W+2'-8 1/2"	W+2'-8 1/2"
W10	#5	2	2	2	2	2	2	2	2		W+2'-5"	W+2'-5"
W11	#5	2	2	2	2	2	2	2	2		W+2'-1 1/2"	W+2'-1 1/2"
W12	#5	2	2	2	2	2	2	2	2		W+1'-10"	W+1'-10"
W13	#5	2	2	2	2	2	2	2	2		W+1'-6 1/2"	W+1'-6 1/2"
W14	#5	2	2	2	2	2	2	2	2	1'-6"	W+2'-3"	W+3'-9"
W15	#5	2	2	2	2	2	2	2	2	1'-6"	W+1'-11"	W+3'-5"
W16	#5	2	2	2	2	2	2	2	2	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
W17	#5	2	2	2	2	2	2	2	2	1'-6"	W+1'-4"	W+2'-10"
W18	#5	2	2	2	2	2	2	2	2	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
W19	#5	2	2	2	2	2	2	2	2	1'-6"	W+0'-9"	W+2'-3"
W20	#5	2	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
R1	#4	2	2	2	2	2	2	2	2		W+5'-1"	W+5'-1"
R2	#4	2	2	2	2	2	2	2	2		W+4'-9 1/2"	W+4'-9 1/2"
R3	#4	2	2	2	2	2	2	2	2		W+4'-6"	W+4'-6"
R4	#4	2	2	2	2	2	2	2	2		W+4'-2 1/2"	W+4'-2 1/2"
R5	#4	2	2	2	2	2	2	2	2		W+3'-11"	W+3'-11"
R6	#4	2	2	2	2	2	2	2	2		W+3'-7 1/2"	W+3'-7 1/2"
R7	#4	2	2	2	2	2	2	2	2		W+3'-4"	W+3'-4"
R8	#4	2	2	2	2	2	2	2	2		W+3'-0 1/2"	W+3'-0 1/2"
R9	#4	2	2	2	2	2	2	2	2		W+2'-8 1/2"	W+2'-8 1/2"
R10	#4	2	2	2	2	2	2	2	2		W+2'-5"	W+2'-5"
R11	#4	2	2	2	2	2	2	2	2		W+2'-1 1/2"	W+2'-1 1/2"
R12	#4	2	2	2	2	2	2	2	2		W+1'-10"	W+1'-10"
R13	#4	2	2	2	2	2	2	2	2		W+1'-6 1/2"	W+1'-6 1/2"
R14	#4	2	2	2	2	2	2	2	2		W+1'-3"	W+1'-3"
R15	#4	2	2	2	2	2	2	2	2	1'-6"	W+1'-11"	W+3'-5"
R16	#4	2	2	2	2	2	2	2	2	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
R17	#4	2	2	2	2	2	2	2	2	1'-6"	W+1'-4"	W+2'-10"
R18	#4	2	2	2	2	2	2	2	2	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
R19	#4	2	2	2	2	2	2	2	2	1'-6"	W+0'-9"	W+2'-3"
R20	#4	2	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
Y1	#4	4	4	4	4	4	4	4	4			4'-7"
Y2	#4	4	4	4	4	4	4	4	4			7'-9 1/2"
Y3	#4	4	4	4	4	4	4	4	4			10'-11 1/2"
Y4	#4	4	4	4	4	4	4	4	4			14'-2"
Y5	#4	4	4	4	4	4	4	4	4			17'-4 1/2"
Y6	#4	8	8	8	8	8	8	12	12			18'-0 1/2"
F	#4	4	4	4	4	4	4	4	4			18'-10 1/2"
N	#4	9	11	14	16	18	21	23	25	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			S+2V+4"
K	#4	8	10	12	14	16	18	20	22	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			S+1'-1"
O	#7	16	16	16	16	16	16	18	18	2'-10 1/2"	2'-10 1/2"	5'-9"
OS	#4	2	2	2	2	2	2	2	2			6'-0"+T1
DW	#5	26	26	26	26	26	26	26	26	1'-6"	2'-9"	4'-3"
DR	#4	28	28	28	28	28	28	28	28	1'-6"	2'-5"	3'-11"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-6-3W

SHEET NUMBER 7034

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rt"	"Y" CLEAR SPAN 8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-4"	23'-4 15/16"	3 1/16"	22'-3 1/16"	11"	9"	2'-0"	3'-0"	24'-0 3/16"	26'-0 3/16"	28'-0 3/16"	30'-0 3/16"	32'-0 3/16"	34'-0 3/16"	36'-0 3/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	21.0795	2879.618	0.5021	31.841	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	21.0795	2879.618	0.5021	31.841	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	21.1268	2879.618	0.5021	31.841	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	21.2834	2889.188	0.5062	31.953	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	21.2834	2889.188	0.5062	31.953	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	21.4092	2898.759	0.5144	32.175	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	22.1760	2965.006	0.6008	36.072	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	22.2137	2965.006	0.6008	36.072	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	22.3062	2969.903	0.6049	36.183	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	22.5466	2984.593	0.6091	36.295	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	22.5657	2984.593	0.6091	36.295	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	22.5657	2984.593	0.6091	36.295	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	23.1978	3040.824	0.6996	43.420	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	23.3416	3045.832	0.7078	43.643	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	23.4505	3055.848	0.7078	43.643	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	23.7588	3075.880	0.7119	43.754	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	23.8390	3080.888	0.7202	43.977	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	23.8390	3080.888	0.7202	43.977	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	24.3483	3126.881	0.8066	49.432	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	24.4534	3132.000	0.8066	49.432	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	24.6688	3147.358	0.8107	49.543	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	25.0729	3172.955	0.8189	49.766	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	24.8372	3157.597	0.8313	50.100	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	25.1656	3178.074	0.8395	50.323	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	25.3797	3202.922	0.9053	56.780	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	25.7450	3223.844	0.9177	57.114	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	26.0774	3249.998	0.9218	57.225	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	25.8072	3229.075	0.9342	57.559	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	26.1463	3249.998	0.9383	57.671	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	26.3853	3270.920	0.9671	58.450	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	26.5349	3374.831	1.0123	62.792	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	26.8841	3396.199	1.0206	63.015	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	27.0017	3406.883	1.0370	63.460	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	27.0728	3406.883	1.0453	63.683	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	27.5205	3438.935	1.0700	64.351	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	27.9309	3460.303	1.0864	64.796	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	27.1766	3494.721	1.1276	70.585	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	28.1817	3494.721	1.1358	70.808	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	28.1354	3489.268	1.1481	71.142	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	28.6479	3516.534	1.1687	71.699	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	29.0414	3549.254	1.1934	72.367	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	29.5413	3576.521	1.2140	72.923	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-8-3W

SHEET NUMBER 7035

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

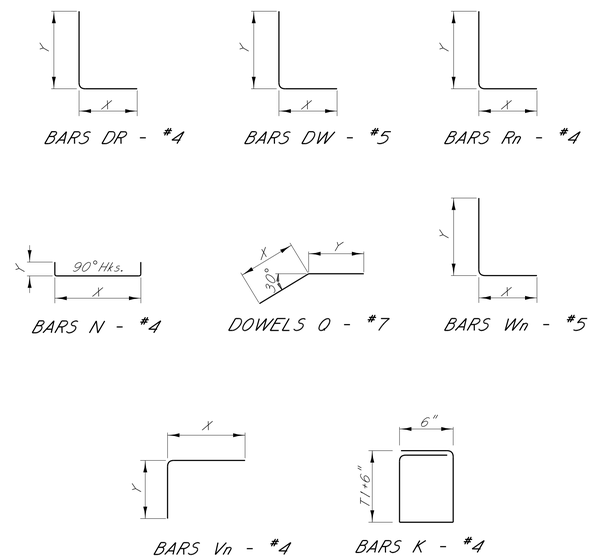
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			S+5'-5"
T2	#4	1	1	1	1	1	1	1			S+6'-2"
T3	#4	1	1	1	1	1	1	1			S+6'-10 1/2"
T4	#4	1	1	1	1	1	1	1			S+7'-7 1/2"
T5	#4	1	1	1	1	1	1	1			S+8'-4"
T6	#4	1	1	1	1	1	1	1			S+9'-0 1/2"
T7	#4	1	1	1	1	1	1	1			S+9'-9 1/2"
T8	#4	1	1	1	1	1	1	1			S+10'-6"
T9	#4	1	1	1	1	1	1	1			S+11'-3"
T10	#4	1	1	1	1	1	1	1			S+11'-11 1/2"
T11	#4	1	1	1	1	1	1	1			S+12'-8"
T12	#4	1	1	1	1	1	1	1			S+13'-5"
T13	#4	1	1	1	1	1	1	1			S+14'-1 1/2"
T14	#4	1	1	1	1	1	1	1			S+14'-10 1/2"
T15	#4	1	1	1	1	1	1	1			S+15'-7"
T16	#4	1	1	1	1	1	1	1			S+16'-4"
T17	#4	1	1	1	1	1	1	1			S+17'-0 1/2"
T18	#4	1	1	1	1	1	1	1			S+17'-9"
T19	#4	1	1	1	1	1	1	1			S+18'-6"
T20	#4	1	1	1	1	1	1	1			S+19'-2 1/2"
T21	#4	1	1	1	1	1	1	1			S+19'-11 1/2"
T22	#4	1	1	1	1	1	1	1			S+20'-8"
T23	#4	3	3	3	3	3	3	3			S+15'-11 1/2"
V1	#4	14	16	18	20	22	24	26	21'-11"	1'-8"	23'-7"
V2	#4	2	2	2	2	2	2	2	19'-9"	1'-8"	21'-5"
V3	#4	2	2	2	2	2	2	2	17'-0 1/2"	1'-8"	18'-8 1/2"
V4	#4	2	2	2	2	2	2	2	14'-3 1/2"	1'-8"	15'-11 1/2"
V5	#4	2	2	2	2	2	2	2	11'-6 1/2"	1'-8"	13'-2 1/2"
V6	#4	2	2	2	2	2	2	2	8'-9 1/2"	1'-8"	10'-5 1/2"
V7	#4	2	2	2	2	2	2	2	5'-10"		5'-10"
V8	#4	2	2	2	2	2	2	2	2'-9"		2'-9"
FT1	#5	2	2	2	2	2	2	2			1'-6"
FT2	#5	60	60	60	60	60	60	60			5'-5"
FT3	#5	2	2	2	2	2	2	2			4'-7"
FT4	#5	2	2	2	2	2	2	2			2'-6 1/2"
FL	#4	14	14	14	14	14	14	14			23'-1"
W1	#5	2	2	2	2	2	2	2		W+6'-8"	W+6'-8"
W2	#5	2	2	2	2	2	2	2		W+6'-5 1/2"	W+6'-5 1/2"
W3	#5	2	2	2	2	2	2	2		W+6'-2 1/2"	W+6'-2 1/2"
W4	#5	2	2	2	2	2	2	2		W+6'-0"	W+6'-0"
W5	#5	2	2	2	2	2	2	2		W+5'-9"	W+5'-9"
W6	#5	2	2	2	2	2	2	2		W+5'-6"	W+5'-6"
W7	#5	2	2	2	2	2	2	2		W+5'-3 1/2"	W+5'-3 1/2"
W8	#5	2	2	2	2	2	2	2		W+5'-0 1/2"	W+5'-0 1/2"
W9	#5	2	2	2	2	2	2	2		W+4'-10"	W+4'-10"
W10	#5	2	2	2	2	2	2	2		W+4'-7"	W+4'-7"
W11	#5	2	2	2	2	2	2	2		W+4'-4"	W+4'-4"
W12	#5	2	2	2	2	2	2	2		W+4'-1 1/2"	W+4'-1 1/2"
W13	#5	2	2	2	2	2	2	2		W+3'-10 1/2"	W+3'-10 1/2"
W14	#5	2	2	2	2	2	2	2		W+3'-8"	W+3'-8"
W15	#5	2	2	2	2	2	2	2		W+3'-5"	W+3'-5"
W16	#5	2	2	2	2	2	2	2		W+3'-2 1/2"	W+3'-2 1/2"
W17	#5	2	2	2	2	2	2	2		W+2'-11 1/2"	W+2'-11 1/2"
W18	#5	2	2	2	2	2	2	2		W+2'-8 1/2"	W+2'-8 1/2"
W19	#5	2	2	2	2	2	2	2		W+2'-6"	W+2'-6"
W20	#5	2	2	2	2	2	2	2		W+2'-3"	W+2'-3"
W21	#5	2	2	2	2	2	2	2		W+2'-0 1/2"	W+2'-0 1/2"
W22	#5	2	2	2	2	2	2	2		W+1'-9 1/2"	W+1'-9 1/2"
W23	#5	2	2	2	2	2	2	2		W+1'-6 1/2"	W+1'-6 1/2"
W24	#5	2	2	2	2	2	2	2		W+1'-4"	W+1'-4"
W25	#5	2	2	2	2	2	2	2		W+1'-1"	W+1'-1"
W26	#5	2	2	2	2	2	2	2	1'-6"	W+1'-10"	W+3'-4"
W27	#5	2	2	2	2	2	2	2	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
W28	#5	2	2	2	2	2	2	2	1'-6"	W+1'-4 1/2"	W+2'-10 1/2"
W29	#5	2	2	2	2	2	2	2	1'-6"	W+1'-2"	W+2'-8"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
W30	#5	2	2	2	2	2	2	2	1'-6"	W+0'-11"	W+2'-5"
W31	#5	2	2	2	2	2	2	2	1'-6"	W+0'-8"	W+2'-2"
W32	#5	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
R1	#4	2	2	2	2	2	2	2		W+6'-8"	W+6'-8"
R2	#4	2	2	2	2	2	2	2		W+6'-4 1/2"	W+6'-4 1/2"
R3	#4	2	2	2	2	2	2	2		W+6'-1"	W+6'-1"
R4	#4	2	2	2	2	2	2	2		W+5'-9 1/2"	W+5'-9 1/2"
R5	#4	2	2	2	2	2	2	2		W+5'-6"	W+5'-6"
R6	#4	2	2	2	2	2	2	2		W+5'-2"	W+5'-2"
R7	#4	2	2	2	2	2	2	2		W+4'-10 1/2"	W+4'-10 1/2"
R8	#4	2	2	2	2	2	2	2		W+4'-7"	W+4'-7"
R9	#4	2	2	2	2	2	2	2		W+4'-3 1/2"	W+4'-3 1/2"
R10	#4	2	2	2	2	2	2	2		W+3'-11 1/2"	W+3'-11 1/2"
R11	#4	2	2	2	2	2	2	2		W+3'-8"	W+3'-8"
R12	#4	2	2	2	2	2	2	2		W+3'-4 1/2"	W+3'-4 1/2"
R13	#4	2	2	2	2	2	2	2		W+3'-1"	W+3'-1"
R14	#4	2	2	2	2	2	2	2		W+2'-9"	W+2'-9"
R15	#4	2	2	2	2	2	2	2		W+2'-5 1/2"	W+2'-5 1/2"
R16	#4	2	2	2	2	2	2	2		W+2'-2"	W+2'-2"
R17	#4	2	2	2	2	2	2	2		W+1'-10 1/2"	W+1'-10 1/2"
R18	#4	2	2	2	2	2	2	2		W+1'-7"	W+1'-7"
R19	#4	2	2	2	2	2	2	2		W+1'-3"	W+1'-3"
R20	#4	2	2	2	2	2	2	2		W+0'-11 1/2"	W+0'-11 1/2"
R21	#4	2	2	2	2	2	2	2	1'-6"	W+1'-8"	W+3'-2"
R22	#4	2	2	2	2	2	2	2	1'-6"	W+1'-4"	W+2'-10"
R23	#4	2	2	2	2	2	2	2	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
R24	#4	2	2	2	2	2	2	2	1'-6"	W+0'-9"	W+2'-3"
R25	#4	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
Y1	#4	4	4	4	4	4	4	4			4'-7"
Y2	#4	4	4	4	4	4	4	4			7'-9 1/2"
Y3	#4	4	4	4	4	4	4	4			10'-11 1/2"
Y4	#4	4	4	4	4	4	4	4			14'-2"
Y5	#4	4	4	4	4	4	4	4			17'-4"
Y6	#4	4	4	4	4	4	4	4			20'-6 1/2"
Y7	#4	12	12	12	12	12	16	16			23'-1"
F	#4	4	4	4	4	4	4	4			24'-2"
N	#4	12	13	16	18	21	23	26	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			S+2V-4"
K	#4	10	12	14	16	18	20	22	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			S+1'-1"
O	#7	20	20	20	20	20	22	22	2'-10 1/2"	2'-10 1/2"	5'-9"
OS	#4	2	2	2	2	2	2	2			8'-0"+T1
DW1	#5	50	50	50	50	50	50	50	1'-6"	2'-9"	4'-3"
DR1	#4	40	40	40	40	40	40	40	1'-6"	2'-5"	3'-11"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-8-3W

SHEET NUMBER 7036

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

REVISIONS BY DATE

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rt"	"Y" CLEAR SPAN						
									10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-4"	26'-7 1/4"	3 7/16"	25'-3 7/16"	11"	10"	2'-0"	4'-0"	28'-2 3/8"	30'-2 3/8"	32'-2 3/8"	34'-2 3/8"	36'-2 3/8"	38'-2 3/8"	40'-2 3/8"

NOTE: Total headwall quantitities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	30.1294	4013.961	0.6091	37.853	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	30.1676	4013.961	0.6091	37.853	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	30.0304	4002.158	0.6132	37.965	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	30.3864	4025.765	0.6296	38.410	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	30.4552	4031.666	0.6296	38.410	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	30.7259	4049.371	0.6420	38.744	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	31.3857	4110.100	0.7078	43.643	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	31.4523	4110.100	0.7078	43.643	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	31.3843	4104.087	0.7119	43.754	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	31.7776	4128.138	0.7284	44.199	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	31.8712	4134.151	0.7325	44.311	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	31.8083	4128.138	0.7449	44.645	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	32.6179	4194.435	0.8066	49.432	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	32.6179	4194.435	0.8066	49.432	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	32.7579	4206.683	0.8148	49.655	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	33.2645	4237.304	0.8313	50.100	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	33.4283	4249.553	0.8313	50.100	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	33.3704	4243.429	0.8477	50.545	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	33.7768	4278.770	0.9136	55.444	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	33.9430	4291.241	0.9136	55.444	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	34.3797	4322.419	0.9259	55.778	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	34.4509	4328.654	0.9300	55.889	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	34.4464	4322.419	0.9383	56.112	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	34.9202	4353.597	0.9506	56.446	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	34.8852	4363.105	1.0206	63.015	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	35.2244	4388.492	1.0206	63.015	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	35.5708	4413.880	1.0329	63.349	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	35.5071	4407.533	1.0412	63.571	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	35.8854	4426.574	1.0494	63.794	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	36.2434	4445.614	1.0658	64.239	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	36.5437	4579.946	1.1193	68.804	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	36.3754	4567.030	1.1276	69.027	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	36.6273	4586.405	1.1440	69.472	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	37.1395	4612.238	1.1646	70.029	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	37.4343	4631.612	1.1770	70.363	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	38.0344	4670.362	1.2016	71.031	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	37.6709	4664.949	1.2346	75.039	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	37.7475	4671.519	1.2469	75.373	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	38.0102	4684.658	1.2551	75.595	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	38.8394	4737.215	1.2881	76.486	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-10-3W

SHEET NUMBER 7037

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

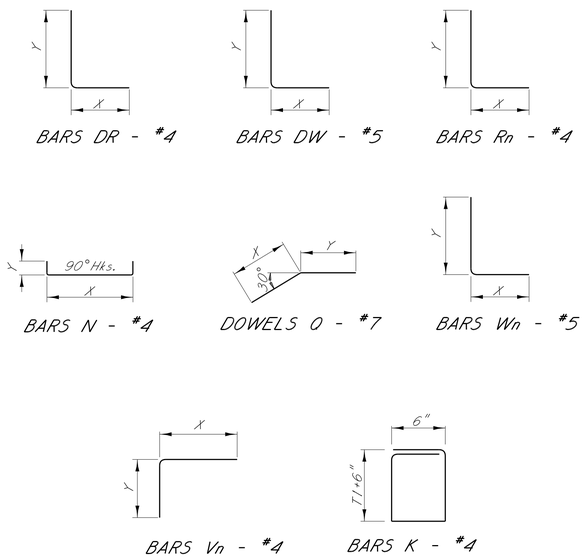
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			S+5'-7 1/2"
T2	#4	1	1	1	1	1	1	1			S+6'-4"
T3	#4	1	1	1	1	1	1	1			S+7'-0 1/2"
T4	#4	1	1	1	1	1	1	1			S+7'-9 1/2"
T5	#4	1	1	1	1	1	1	1			S+8'-6"
T6	#4	1	1	1	1	1	1	1			S+9'-2 1/2"
T7	#4	1	1	1	1	1	1	1			S+9'-11 1/2"
T8	#4	1	1	1	1	1	1	1			S+10'-8"
T9	#4	1	1	1	1	1	1	1			S+11'-5"
T10	#4	1	1	1	1	1	1	1			S+12'-1 1/2"
T11	#4	1	1	1	1	1	1	1			S+12'-10 1/2"
T12	#4	1	1	1	1	1	1	1			S+13'-7"
T13	#4	1	1	1	1	1	1	1			S+14'-3 1/2"
T14	#4	1	1	1	1	1	1	1			S+15'-0 1/2"
T15	#4	1	1	1	1	1	1	1			S+15'-9"
T16	#4	1	1	1	1	1	1	1			S+16'-6"
T17	#4	1	1	1	1	1	1	1			S+17'-2 1/2"
T18	#4	1	1	1	1	1	1	1			S+17'-11 1/2"
T19	#4	1	1	1	1	1	1	1			S+18'-8"
T20	#4	1	1	1	1	1	1	1			S+19'-4 1/2"
T21	#4	1	1	1	1	1	1	1			S+20'-1 1/2"
T22	#4	1	1	1	1	1	1	1			S+20'-10"
T23	#4	1	1	1	1	1	1	1			S+21'-7"
T24	#4	1	1	1	1	1	1	1			S+22'-3 1/2"
T25	#4	1	1	1	1	1	1	1			S+23'-0 1/2"
T26	#4	3	3	3	3	3	3	3			S+18'-1 1/2"
V1	#4	16	18	20	22	24	26	28	24'-11 1/2"	1'-8"	26'-7 1/2"
V2	#4	2	2	2	2	2	2	2	23'-0"	1'-8"	24'-8"
V3	#4	2	2	2	2	2	2	2	20'-3"	1'-8"	22'-11"
V4	#4	2	2	2	2	2	2	2	17'-6"	1'-8"	19'-2"
V5	#4	2	2	2	2	2	2	2	14'-9 1/2"	1'-8"	16'-5 1/2"
V6	#4	2	2	2	2	2	2	2	12'-0 1/2"	1'-8"	13'-8 1/2"
V7	#4	2	2	2	2	2	2	2	9'-3 1/2"	1'-8"	10'-11 1/2"
V8	#4	2	2	2	2	2	2	2	6'-4 1/2"	1'-8"	8'-0 1/2"
V9	#4	2	2	2	2	2	2	2	3-3"		3'-3"
FT1	#5	2	2	2	2	2	2	2			2'-10"
FT2	#5	78	78	78	78	78	78	78			6'-6"
FT3	#5	2	2	2	2	2	2	2			4'-5 1/2"
FT4	#5	2	2	2	2	2	2	2			2'-7 1/2"
FL	#4	16	16	16	16	16	16	16			26'-3 1/2"
W1	#5	2	2	2	2	2	2	2		W+7'-8"	W+7'-8"
W2	#5	2	2	2	2	2	2	2		W+7'-6"	W+7'-6"
W3	#5	2	2	2	2	2	2	2		W+7'-3 1/2"	W+7'-3 1/2"
W4	#5	2	2	2	2	2	2	2		W+7'-1"	W+7'-1"
W5	#5	2	2	2	2	2	2	2		W+6'-10 1/2"	W+6'-10 1/2"
W6	#5	2	2	2	2	2	2	2		W+6'-8"	W+6'-8"
W7	#5	2	2	2	2	2	2	2		W+6'-5 1/2"	W+6'-5 1/2"
W8	#5	2	2	2	2	2	2	2		W+6'-3"	W+6'-3"
W9	#5	2	2	2	2	2	2	2		W+6'-0 1/2"	W+6'-0 1/2"
W10	#5	2	2	2	2	2	2	2		W+5'-10"	W+5'-10"
W11	#5	2	2	2	2	2	2	2		W+5'-7 1/2"	W+5'-7 1/2"
W12	#5	2	2	2	2	2	2	2		W+5'-5"	W+5'-5"
W13	#5	2	2	2	2	2	2	2		W+5'-2 1/2"	W+5'-2 1/2"
W14	#5	2	2	2	2	2	2	2		W+5'-0"	W+5'-0"
W15	#5	2	2	2	2	2	2	2		W+4'-9 1/2"	W+4'-9 1/2"
W16	#5	2	2	2	2	2	2	2		W+4'-7"	W+4'-7"
W17	#5	2	2	2	2	2	2	2		W+4'-4 1/2"	W+4'-4 1/2"
W18	#5	2	2	2	2	2	2	2		W+4'-2 1/2"	W+4'-2 1/2"
W19	#5	2	2	2	2	2	2	2		W+4'-0"	W+4'-0"
W20	#5	2	2	2	2	2	2	2		W+3'-9 1/2"	W+3'-9 1/2"
W21	#5	2	2	2	2	2	2	2		W+3'-7"	W+3'-7"
W22	#5	2	2	2	2	2	2	2		W+3'-3 1/2"	W+3'-3 1/2"
W23	#5	2	2	2	2	2	2	2		W+3'-2"	W+3'-2"
W24	#5	2	2	2	2	2	2	2		W+2'-11 1/2"	W+2'-11 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
W25	#5	2	2	2	2	2	2	2		W+2'-9"	W+2'-9"
W26	#5	2	2	2	2	2	2	2		W+2'-6 1/2"	W+2'-6 1/2"
W27	#5	2	2	2	2	2	2	2		W+2'-4"	W+2'-4"
W28	#5	2	2	2	2	2	2	2		W+2'-1 1/2"	W+2'-1 1/2"
W29	#5	2	2	2	2	2	2	2		W+1'-11"	W+1'-11"
W30	#5	2	2	2	2	2	2	2		W+1'-8 1/2"	W+1'-8 1/2"
W31	#5	2	2	2	2	2	2	2		W+1'-6"	W+1'-6"
W32	#5	2	2	2	2	2	2	2		W+1'-3 1/2"	W+1'-3 1/2"
W33	#5	2	2	2	2	2	2	2		W+1'-1"	W+1'-1"
W34	#5	2	2	2	2	2	2	2		W+0'-11"	W+0'-11"
W35	#5	2	2	2	2	2	2	2		W+0'-8 1/2"	W+0'-8 1/2"
W36	#5	2	2	2	2	2	2	2		W+0'-6"	W+0'-6"
W37	#5	2	2	2	2	2	2	2		W+0'-3 1/2"	W+0'-3 1/2"
W38	#5	2	2	2	2	2	2	2		W+0'-1"	W+0'-1"
W39	#5	2	2	2	2	2	2	2	1'-6"	W-0'-10 1/2"	W+2'-4 1/2"
W40	#5	2	2	2	2	2	2	2	1'-6"	W-0'-8"	W+2'-2"
W41	#5	2	2	2	2	2	2	2	1'-6"	W-0'-5 1/2"	W+1'-11 1/2"
R1	#4	2	2	2	2	2	2	2		W+7'-8"	W+7'-8"
R2	#4	2	2	2	2	2	2	2		W+7'-4 1/2"	W+7'-4 1/2"
R3	#4	2	2	2	2	2	2	2		W+7'-1"	W+7'-1"
R4	#4	2	2	2	2	2	2	2		W+6'-9 1/2"	W+6'-9 1/2"
R5	#4	2	2	2	2	2	2	2		W+6'-5 1/2"	W+6'-5 1/2"
R6	#4	2	2	2	2	2	2	2		W+6'-2"	W+6'-2"
R7	#4	2	2	2	2	2	2	2		W+5'-10 1/2"	W+5'-10 1/2"
R8	#4	2	2	2	2	2	2	2		W+5'-6 1/2"	W+5'-6 1/2"
R9	#4	2	2	2	2	2	2	2		W+5'-3"	W+5'-3"
R10	#4	2	2	2	2	2	2	2		W+4'-11 1/2"	W+4'-11 1/2"
R11	#4	2	2	2	2	2	2	2		W+4'-7 1/2"	W+4'-7 1/2"
R12	#4	2	2	2	2	2	2	2		W+4'-4"	W+4'-4"
R13	#4	2	2	2	2	2	2	2		W+4'-0 1/2"	W+4'-0 1/2"
R14	#4	2	2	2	2	2	2	2		W+3'-8 1/2"	W+3'-8 1/2"
R15	#4	2	2	2	2	2	2	2		W+3'-5"	W+3'-5"
R16	#4	2	2	2	2	2	2	2		W+3'-1 1/2"	W+3'-1 1/2"
R17	#4	2	2	2	2	2	2	2		W+2'-9 1/2"	W+2'-9 1/2"
R18	#4	2	2	2	2	2	2	2		W+2'-6"	W+2'-6"
R19	#4	2	2	2	2	2	2	2		W+2'-2 1/2"	W+2'-2 1/2"
R20	#4	2	2	2	2	2	2	2		W+1'-10 1/2"	W+1'-10 1/2"
R21	#4	2	2	2	2	2	2	2		W+1'-7"	W+1'-7"
R22	#4	2	2	2	2	2	2	2		W+1'-3 1/2"	W+1'-3 1/2"
R23	#4	2	2	2	2	2	2	2		W+1'-0"	W+1'-0"
R24	#4	2	2	2	2	2	2	2		W+0'-8"	W+0'-8"
R25	#4	2	2	2	2	2	2	2		W+0'-4 1/2"	W+0'-4 1/2"
R26	#4	2	2	2	2	2	2	2		W+0'-1"	W+0'-1"
R27	#4	2	2	2	2	2	2	2		W-0'-3"	W-0'-3"
R28	#4	2	2	2	2	2	2	2	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
Y1	#4	4	4	4	4	4	4	4			4'-7"
Y2	#4	4	4	4	4	4	4	4			7'-9 1/2"
Y3	#4	4	4	4	4	4	4	4			10'-11 1/2"
Y4	#4	4	4	4	4	4	4	4			14'-2"
Y5	#4	4	4	4	4	4	4	4			17'-4"
Y6	#4	4	4	4	4	4	4	4			20'-6 1/2"
Y7	#4	4	4	4	4	4	4	4			23'-9"
Y8	#4	16	16	16	16	16	20	20			26'-3 1/2"
F	#4	4	4	4	4	4	4	4			27'-6 1/2"
N	#4	14	16	18	20	23	25	27	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			5+2V+4"
K	#4	13	15	17	19	21	23	25	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			5+1'-3"
O	#7	24	24	24	24	24	26	26	2'-10 1/2"	2'-10 1/2"	5'-9"
OS	#4	2	2	2	2	2	2	2			10''-0"+T1
DW1	#5	76	76	76	76	76	76	76	1'-6"	2'-9"	4'-3"
DR1	#4	54	54	54	54	54	54	54	1'-6"	2'-5"	3'-11"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-10-3W

SHEET NUMBER 7038

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rh"	"Rt"	"Y" CLEAR SPAN						
									12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-7"	30'-7 1/8"	3 3/4"	29'-0 3/4"	11"	11"	2'-0"	5'-0"	32'-11 1/8"	34'-11 1/8"	36'-11 1/8"	38'-11 1/8"	40'-11 1/8"	42'-11 1/8"	44'-11 1/8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	41.9850	6102.697	0.7160	43.865	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	42.0536	6102.697	0.7243	44.088	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	42.1011	6102.697	0.7325	44.311	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	42.6353	6143.001	0.7490	44.756	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	42.8330	6159.123	0.7490	44.756	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	42.6479	6143.001	0.7243	44.088	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	43.4273	6206.115	0.8148	51.213	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	43.5420	6214.287	0.8230	51.436	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	43.6836	6222.459	0.8313	51.659	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	44.2591	6263.320	0.8477	52.104	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	44.2346	6263.320	0.8519	52.215	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	44.4683	6279.664	0.8601	52.438	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	44.6704	6301.472	0.9136	55.444	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	44.9330	6318.039	0.9218	55.667	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	45.5243	6359.456	0.9424	56.223	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	45.3206	6342.889	0.9424	56.223	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	45.6796	6367.740	0.9547	56.557	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	46.0245	6392.590	0.9465	56.335	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	46.2143	6413.619	1.0123	62.792	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	46.4554	6430.408	1.0206	63.015	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	46.9092	6463.988	1.0370	63.460	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	46.9119	6463.988	1.0412	63.571	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	47.3896	6489.172	1.0617	64.128	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	47.9060	6531.146	1.0741	64.462	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	47.4376	6509.198	1.1193	68.804	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	47.7562	6526.211	1.1276	69.027	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	48.5155	6585.754	1.1399	69.361	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	48.7985	6594.260	1.1564	69.806	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	49.0923	6611.272	1.1646	70.029	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	48.9475	6622.013	1.2346	75.039	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	49.3203	6647.865	1.2263	74.816	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	49.7148	6673.718	1.2510	75.484	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	50.6196	6734.040	1.2675	75.929	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	51.1748	6777.128	1.2963	76.709	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	50.2439	6717.815	1.3251	82.164	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	50.8986	6761.459	1.3416	82.609	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	51.4755	6805.104	1.3580	83.055	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	52.4049	6866.205	1.4033	84.279	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-12-3W

SHEET NUMBER 7039

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			S+5'-9"
T2	#4	1	1	1	1	1	1	1			S+6'-5 1/2"
T3	#4	1	1	1	1	1	1	1			S+7'-2"
T4	#4	1	1	1	1	1	1	1			S+7'-11"
T5	#4	1	1	1	1	1	1	1			S+8'-7 1/2"
T6	#4	1	1	1	1	1	1	1			S+9'-4"
T7	#4	1	1	1	1	1	1	1			S+10'-1"
T8	#4	1	1	1	1	1	1	1			S+10'-9 1/2"
T9	#4	1	1	1	1	1	1	1			S+11'-6"
T10	#4	1	1	1	1	1	1	1			S+12'-3"
T11	#4	1	1	1	1	1	1	1			S+12'-11 1/2"
T12	#4	1	1	1	1	1	1	1			S+13'-8"
T13	#4	1	1	1	1	1	1	1			S+14'-5"
T14	#4	1	1	1	1	1	1	1			S+15'-1 1/2"
T15	#4	1	1	1	1	1	1	1			S+15'-10"
T16	#4	1	1	1	1	1	1	1			S+16'-7"
T17	#4	1	1	1	1	1	1	1			S+17'-3 1/2"
T18	#4	1	1	1	1	1	1	1			S+18'-0"
T19	#4	1	1	1	1	1	1	1			S+18'-8 1/2"
T20	#4	1	1	1	1	1	1	1			S+19'-5 1/2"
T21	#4	1	1	1	1	1	1	1			S+20'-2"
T22	#4	1	1	1	1	1	1	1			S+20'-10 1/2"
T23	#4	1	1	1	1	1	1	1			S+21'-7 1/2"
T24	#4	1	1	1	1	1	1	1			S+22'-4"
T25	#4	1	1	1	1	1	1	1			S+23'-0 1/2"
T26	#4	1	1	1	1	1	1	1			S+23'-9 1/2"
T27	#4	1	1	1	1	1	1	1			S+24'-6"
T28	#4	1	1	1	1	1	1	1			S+25'-2 1/2"
T29	#4	1	1	1	1	1	1	1			S+25'-11 1/2"
T30	#4	3	3	3	3	3	3	3			S+20'-10 1/2"
V1	#4	18	20	22	24	26	28	30	28'-8 1/2"	1'-8"	30'-4 1/2"
V2	#4	2	2	2	2	2	2	2	27'-0"	1'-8"	28'-8"
V3	#4	2	2	2	2	2	2	2	24'-3"	1'-8"	25'-11"
V4	#4	2	2	2	2	2	2	2	21'-6"	1'-8"	23'-2"
V5	#4	2	2	2	2	2	2	2	18'-9"	1'-8"	20'-5"
V6	#4	2	2	2	2	2	2	2	16'-0"	1'-8"	17'-8"
V7	#4	2	2	2	2	2	2	2	13'-3"	1'-8"	14'-11"
V8	#4	2	2	2	2	2	2	2	10'-6 1/2"	1'-8"	12'-2 1/2"
V9	#4	2	2	2	2	2	2	2	7'-9"	1'-8"	9'-5"
V10	#4	2	2	2	2	2	2	2	4'-7 1/2"		4'-7 1/2"
FT1	#5	2	2	2	2	2	2	2			1'-7 1/2"
FT2	#5	2	2	2	2	2	2	2			3'-0"
FT3	#5	2	2	2	2	2	2	2			4'-4 1/2"
FT4	#5	116	116	116	116	116	116	116			7'-7"
FT5	#5	2	2	2	2	2	2	2			6'-9 1/2"
FT6	#5	2	2	2	2	2	2	2			5'-5 1/2"
FT7	#5	2	2	2	2	2	2	2			4'-1"
FT8	#5	2	2	2	2	2	2	2			2'-8 1/2"
FL	#4	18	18	18	18	18	18	18			30'-3"
W1	#5	2	2	2	2	2	2	2		W+8'-11"	W+8'-11"
W2	#5	2	2	2	2	2	2	2		W+8'-9 1/2"	W+8'-9 1/2"
W3	#5	2	2	2	2	2	2	2		W+8'-7 1/2"	W+8'-7 1/2"
W4	#5	2	2	2	2	2	2	2		W+8'-5 1/2"	W+8'-5 1/2"
W5	#5	2	2	2	2	2	2	2		W+8'-4"	W+8'-4"
W6	#5	2	2	2	2	2	2	2		W+8'-2"	W+8'-2"
W7	#5	2	2	2	2	2	2	2		W+8'-0"	W+8'-0"
W8	#5	2	2	2	2	2	2	2		W+7'-10"	W+7'-10"
W9	#5	2	2	2	2	2	2	2		W+7'-8 1/2"	W+7'-8 1/2"
W10	#5	2	2	2	2	2	2	2		W+7'-6 1/2"	W+7'-6 1/2"
W11	#5	2	2	2	2	2	2	2		W+7'-4 1/2"	W+7'-4 1/2"
W12	#5	2	2	2	2	2	2	2		W+7'-2 1/2"	W+7'-2 1/2"
W13	#5	2	2	2	2	2	2	2		W+7'-1"	W+7'-1"
W14	#5	2	2	2	2	2	2	2		W+6'-11"	W+6'-11"
W15	#5	2	2	2	2	2	2	2		W+6'-9"	W+6'-9"
W16	#5	2	2	2	2	2	2	2		W+6'-7 1/2"	W+6'-7 1/2"

HEIGHT = 12 FT.

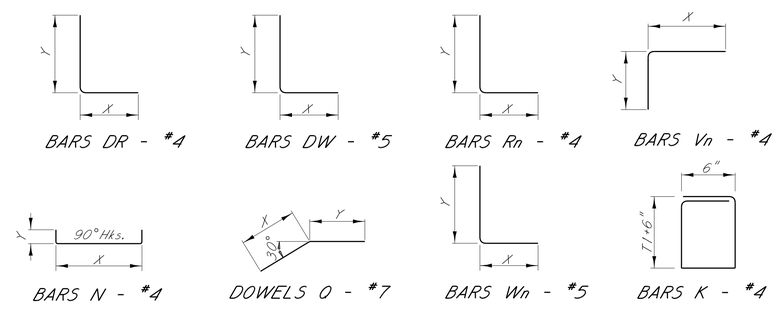
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
W17	#5	2	2	2	2	2	2	2		W+6'-5 1/2"	W+6'-5 1/2"
W18	#5	2	2	2	2	2	2	2		W+6'-3 1/2"	W+6'-3 1/2"
W19	#5	2	2	2	2	2	2	2		W+6'-1 1/2"	W+6'-1 1/2"
W20	#5	2	2	2	2	2	2	2		W+6'-0"	W+6'-0"
W21	#5	2	2	2	2	2	2	2		W+5'-10"	W+5'-10"
W22	#5	2	2	2	2	2	2	2		W+5'-8"	W+5'-8"
W23	#5	2	2	2	2	2	2	2		W+5'-6"	W+5'-6"
W24	#5	2	2	2	2	2	2	2		W+5'-4 1/2"	W+5'-4 1/2"
W25	#5	2	2	2	2	2	2	2		W+5'-2 1/2"	W+5'-2 1/2"
W26	#5	2	2	2	2	2	2	2		W+5'-0 1/2"	W+5'-0 1/2"
W27	#5	2	2	2	2	2	2	2		W+4'-10 1/2"	W+4'-10 1/2"
W28	#5	2	2	2	2	2	2	2		W+4'-9"	W+4'-9"
W29	#5	2	2	2	2	2	2	2		W+4'-7"	W+4'-7"
W30	#5	2	2	2	2	2	2	2		W+4'-5"	W+4'-5"
W31	#5	2	2	2	2	2	2	2		W+4'-3 1/2"	W+4'-3 1/2"
W32	#5	2	2	2	2	2	2	2		W+4'-1 1/2"	W+4'-1 1/2"
W33	#5	2	2	2	2	2	2	2		W+3'-11 1/2"	W+3'-11 1/2"
W34	#5	2	2	2	2	2	2	2		W+3'-9 1/2"	W+3'-9 1/2"
W35	#5	2	2	2	2	2	2	2		W+3'-8"	W+3'-8"
W36	#5	2	2	2	2	2	2	2		W+3'-6"	W+3'-6"
W37	#5	2	2	2	2	2	2	2		W+3'-4"	W+3'-4"
W38	#5	2	2	2	2	2	2	2		W+3'-2"	W+3'-2"
W39	#5	2	2	2	2	2	2	2		W+3'-0 1/2"	W+3'-0 1/2"
W40	#5	2	2	2	2	2	2	2		W+2'-10 1/2"	W+2'-10 1/2"
W41	#5	2	2	2	2	2	2	2		W+2'-8 1/2"	W+2'-8 1/2"
W42	#5	2	2	2	2	2	2	2		W+2'-7"	W+2'-7"
W43	#5	2	2	2	2	2	2	2		W+2'-5"	W+2'-5"
W44	#5	2	2	2	2	2	2	2		W+2'-3"	W+2'-3"
W45	#5	2	2	2	2	2	2	2		W+2'-1"	W+2'-1"
W46	#5	2	2	2	2	2	2	2		W+1'-11 1/2"	W+1'-11 1/2"
W47	#5	2	2	2	2	2	2	2		W+1'-9 1/2"	W+1'-9 1/2"
W48	#5	2	2	2	2	2	2	2		W+1'-7 1/2"	W+1'-7 1/2"
W49	#5	2	2	2	2	2	2	2		W+1'-5 1/2"	W+1'-5 1/2"
W50	#5	2	2	2	2	2	2	2		W+1'-4"	W+1'-4"
W51	#5	2	2	2	2	2	2	2		W+1'-2"	W+1'-2"
W52	#5	2	2	2	2	2	2	2		W+1'-0"	W+1'-0"
W53	#5	2	2	2	2	2	2	2		W+0'-10 1/2"	W+0'-10 1/2"
W54	#5	2	2	2	2	2	2	2		W+0'-8 1/2"	W+0'-8 1/2"
W55	#5	2	2	2	2	2	2	2		W+0'-6 1/2"	W+0'-6 1/2"
W56	#5	2	2	2	2	2	2	2		W+0'-4 1/2"	W+0'-4 1/2"
W57	#5	2	2	2	2	2	2	2		W+0'-3"	W+0'-3"
W58	#5	2	2	2	2	2	2	2		W+0'-1"	W+0'-1"
W59	#5	2	2	2	2	2	2	2		W-0'-1"	W-0'-1"
W60	#5	2	2	2	2	2	2	2		W-0'-3"	W-0'-3"
W61	#5	2	2	2	2	2	2	2		W-0'-4 1/2"	W-0'-4 1/2"
W62	#5	2	2	2	2	2	2	2		W-0'-6 1/2"	W-0'-6 1/2"
R1	#4	2	2	2	2	2	2	2		W+8'-11"	W+8'-11"
R2	#4	2	2	2	2	2	2	2		W+8'-7 1/2"	W+8'-7 1/2"
R3	#4	2	2	2	2	2	2	2		W+8'-4"	W+8'-4"
R4	#4	2	2	2	2	2	2	2		W+8'-0"	W+8'-0"
R5	#4	2	2	2	2	2	2	2		W+7'-8 1/2"	W+7'-8 1/2"
R6	#4	2	2	2	2	2	2	2		W+7'-5"	W+7'-5"
R7	#4	2	2	2	2	2	2	2		W+7'-1"	W+7'-1"
R8	#4	2	2	2	2	2	2	2		W+6'-9 1/2"	W+6'-9 1/2"
R9	#4	2	2	2	2	2	2	2		W+6'-6"	W+6'-6"
R10	#4	2	2	2	2	2	2	2		W+6'-2"	W+6'-2"
R11	#4	2	2	2	2	2	2	2		W+5'-10 1/2"	W+5'-10 1/2"
R12	#4	2	2	2	2	2	2	2		W+5'-7"	W+5'-7"
R13	#4	2	2	2	2	2	2	2		W+5'-3"	W+5'-3"
R14	#4	2	2	2	2	2	2	2		W+4'-11 1/2"	W+4'-11 1/2"
R15	#4	2	2	2	2	2	2	2		W+4'-8"	W+4'-8"
R16	#4	2	2	2	2	2	2	2		W+4'-4"	W+4'-4"
R17	#4	2	2	2	2	2	2	2		W+4'-0 1/2"	W+4'-0 1/2"
R18	#4	2	2	2	2	2	2	2		W+3'-9"	W+3'-9"
R19	#4	2	2	2	2	2	2	2		W+3'-5"	W+3'-5"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
R20	#4	2	2	2	2	2	2	2		W+3'-1 1/2"	W+3'-1 1/2"
R21	#4	2	2	2	2	2	2	2		W+2'-10"	W+2'-10"
R22	#4	2	2	2	2	2	2	2		W+2'-6"	W+2'-6"
R23	#4	2	2	2	2	2	2	2		W+2'-2 1/2"	W+2'-2 1/2"
R24	#4	2	2	2	2	2	2	2		W+1'-11"	W+1'-11"
R25	#4	2	2	2	2	2	2	2		W+1'-7"	W+1'-7"
R26	#4	2	2	2	2	2	2	2		W+1'-3 1/2"	W+1'-3 1/2"
R27	#4	2	2	2	2	2	2	2		W+1'-0"	W+1'-0"
R28	#4	2	2	2	2	2	2	2		W+0'-8"	W+0'-8"
R29	#4	2	2	2	2	2	2	2		W+0'-4 1/2"	W+0'-4 1/2"
R30	#4	2	2	2	2	2	2	2		W+0'-1"	W+0'-1"
R31	#4	2	2	2	2	2	2	2		W-0'-3"	W-0'-3"
R32	#4	2	2	2	2	2	2	2		W-0'-6 1/2"	W-0'-6 1/2"
Y1	#4	4	4	4	4	4	4	4			4'-0 1/2"
Y2	#4	4	4	4	4	4	4	4			6'-8 1/2"
Y3	#4	4	4	4	4	4	4	4			9'-4 1/2"
Y4	#4	4	4	4	4	4	4	4			12'-0 1/2"
Y5	#4	4	4	4	4	4	4	4			14'-8 1/2"
Y6	#4	4	4	4	4	4	4	4			17'-4"
Y7	#4	4	4	4	4	4	4	4			20'-0"
Y8	#4	4	4	4	4	4	4	4			22'-8"
Y9	#4	4	4	4	4	4	4	4			25'-4"
Y10	#4	4	4	4	4	4	4	4			28'-0"
Y11	#4	24	24	24	24	24	24	24			30'-3"
F	#4	4	4	4	4	4	4	4			31'-8 1/2"
N	#4	16	19	20	23	25	27	30	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			S+2V+0'-4"
K	#4	15	17	19	21	23	25	27	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			10'+1'-6"
O	#7	34	34	34	34	34	34	34	2'-11"	2'-11"	5'-10"
OS	#4	2	2	2	2	2	2	2			12''-0"+T1
DW	#5	124	124	124	124	124	124	124	1'-6"	2'-9"	4'-3"
DR	#4	64	64	64	64	64	64	64	1'-6"	2'-5"	3'-11"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

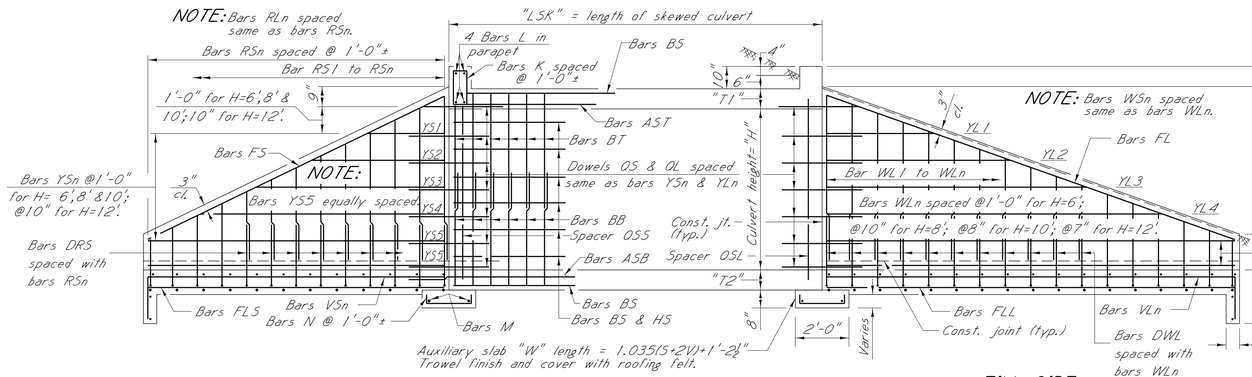
SHT. 2 OF 2

WORKING NUMBER IWS-12-3W

SHEET NUMBER 7040

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



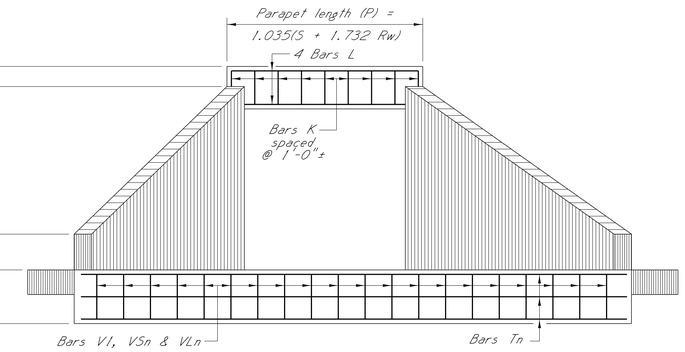
STREAM SIDE

Showing reinforcement in stream side of "LW1" wingwall

FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall

NOTE: Culvert shall be sloped to conform to gradient of stream.



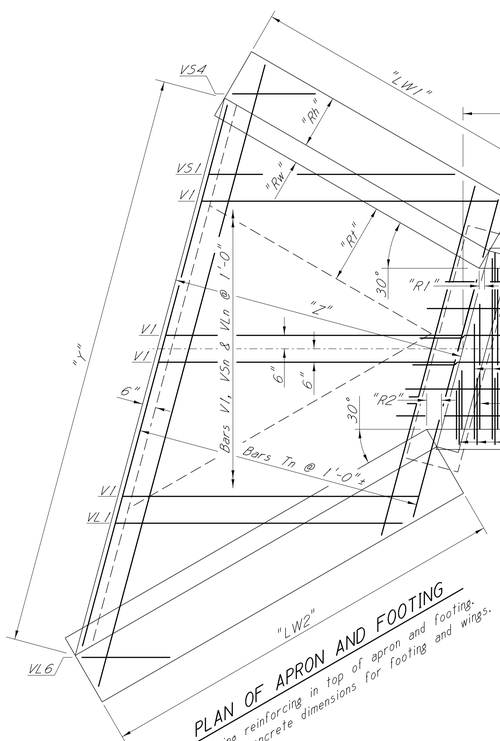
END ELEVATION

Showing reinforcing in pararpet & toe wall

NOTE: Bars X & bars A not shown for clarity.

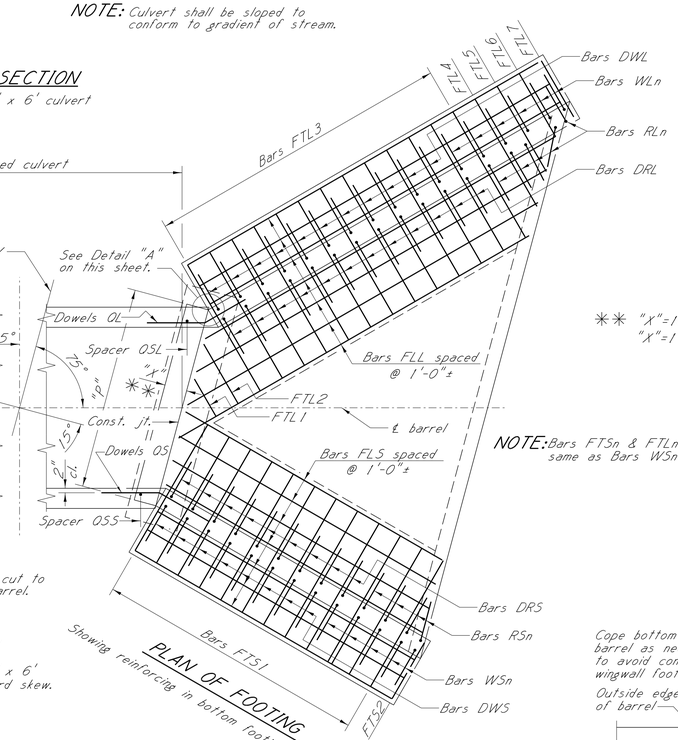
LONGITUDINAL SECTION

Drawn for single cell 6' x 6' culvert



PLAN OF APRON AND FOOTING

Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.



** "X"=10" For H= 6', 8' & 10'
"X"=1'-0" For H= 12'

NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.

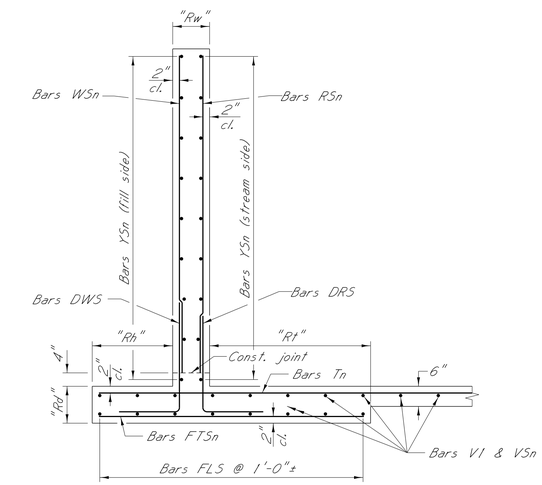
NOTE: Bars A & X shall be cut to fit skew at end of barrel.

GENERAL PLAN

Drawn for single cell 6' x 6' culvert on 15° right forward skew.

PLAN OF FOOTING

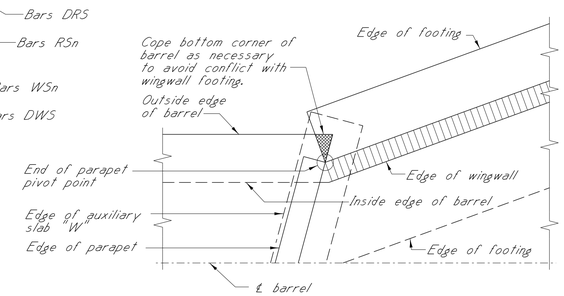
Showing reinforcing in bottom footing & wingwall.



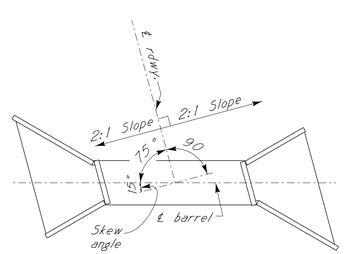
CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

NOTE: For bar bending details and quantities, see drawings IWS-6-2W-15, IWS-8-2W-15, IWS-10-2W-15 & IWS-12-2W-15.



DETAIL "A"



PLAN OF 15° LEFT FORWARD SKEW

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 6-24 FT.

SHT. 1 OF 1

WORKING NUMBER IWS-2W-15

SHEET NUMBER 7041

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																			
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN							
											6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-6"	11'-4 5/8"	15'-6 3/4"	0'-2 7/16"	0'-6 9/16"	11'-0"	0'-11"	0'-9"	3'-0"	2'-0"	21'-6 1/16"	23'-6 7/8"	25'-7 3/4"	27'-8 9/16"	29'-9 7/16"	31'-10 1/4"	33'-11 1/8"	36'-0"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	10.1172	1390.975	0.4428	27.110	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	10.1172	1390.975	0.4428	27.110	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	10.1172	1390.975	0.4428	27.110	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	10.1459	1390.975	0.4428	27.110	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	10.1459	1390.975	0.4428	27.110	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	10.1459	1390.975	0.4428	27.110	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	10.7048	1498.488	0.5451	33.010	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	10.7048	1498.488	0.5451	33.010	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	10.7223	1498.488	0.5451	33.010	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	10.8380	1504.101	0.5451	33.010	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	10.8204	1504.101	0.5451	33.010	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	10.9186	1509.715	0.5451	33.010	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	11.3250	1545.832	0.6473	40.470	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	11.3250	1545.832	0.6473	40.470	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	11.4089	1551.668	0.6473	40.470	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	11.5972	1563.341	0.6473	40.470	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	11.6203	1563.341	0.6558	40.692	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	11.7605	1572.095	0.6644	40.915	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	11.9243	1595.900	0.7496	46.315	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	12.0591	1601.959	0.7496	46.315	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	12.1471	1608.018	0.7538	46.426	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	12.3734	1620.135	0.7624	46.704	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	12.4357	1623.165	0.7751	47.038	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	12.3810	1620.135	0.7794	47.150	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	12.6056	1646.497	0.8561	52.327	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	12.7561	1655.919	0.8603	52.438	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	12.8797	1665.341	0.8646	52.549	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	13.2119	1681.045	0.8774	52.883	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	13.0072	1668.482	0.8902	53.273	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	13.1682	1677.904	0.9029	53.607	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	13.3778	1703.709	0.9839	60.454	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	13.4727	1710.213	0.9839	60.454	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	13.8207	1729.725	0.9839	60.454	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	13.6051	1719.969	0.9967	60.788	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	13.8386	1729.725	1.0095	61.178	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	14.0459	1742.734	1.0265	61.623	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	13.9587	1754.778	1.0776	67.691	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	14.3656	1774.959	1.0947	68.136	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	14.3378	1774.959	1.1074	68.470	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	14.4793	1781.686	1.1160	68.693	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	14.6562	1795.139	1.1330	69.194	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	15.1032	1815.320	1.1586	69.862	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	14.7628	1809.657	1.1927	73.925	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	14.9684	1823.556	1.1969	74.037	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	15.0059	1830.505	1.2182	74.593	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	15.5738	1858.303	1.2523	75.540	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	15.8114	1868.728	1.2651	75.874	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

BY | REVISIONS | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-2W-15

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7042

HEIGHT = 6 FT.

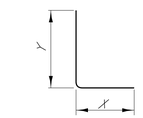
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			1.035S+6'-0 ½"
T2	#4	1	1	1	1	1	1	1	1			1.035S+7'-3 ½"
T3	#4	1	1	1	1	1	1	1	1			1.035S+8'-6"
T4	#4	1	1	1	1	1	1	1	1			1.035S+9'-9"
T5	#4	1	1	1	1	1	1	1	1			1.035S+10'-11 ½"
T6	#4	1	1	1	1	1	1	1	1			1.035S+12'-2 ½"
T7	#4	1	1	1	1	1	1	1	1			1.035S+13'-5"
T8	#4	1	1	1	1	1	1	1	1			1.035S+14'-8"
T9	#4	1	1	1	1	1	1	1	1			1.035S+15'-10 ½"
T10	#4	1	1	1	1	1	1	1	1			1.035S+17'-1 ½"
T11	#4	1	1	1	1	1	1	1	1			1.035S+17'-9 ½"
T12	#4	3	3	3	3	3	3	3	3			1.035S+14'-8"
V1	#4	12	14	16	18	20	22	24	26	11'-0 ½"	1'-8"	12'-8 ½"
VL1	#4	1	1	1	1	1	1	1	1	10'-8 ½"	1'-8"	12'-4 ½"
VL2	#4	1	1	1	1	1	1	1	1	9'-3"	1'-8"	10'-11"
VL3	#4	1	1	1	1	1	1	1	1	7'-9 ½"	1'-8"	9'-5 ½"
VL4	#4	1	1	1	1	1	1	1	1	6'-4"	1'-8"	8'-0"
VL5	#4	1	1	1	1	1	1	1	1	4'-10"	1'-8"	6'-6"
VL6	#4	1	1	1	1	1	1	1	1	3'-3 ½"		3'-3 ½"
VS1	#4	1	1	1	1	1	1	1	1	9'-2"	1'-8"	10'-10"
VS2	#4	1	1	1	1	1	1	1	1	7'-2"	1'-8"	8'-10"
VS3	#4	1	1	1	1	1	1	1	1	5'-2"	1'-8"	6'-10"
VS4	#4	1	1	1	1	1	1	1	1	3'-1 ½"		3'-1 ½"
FTL1	#5	1	1	1	1	1	1	1	1			1'-7 ½"
FTL2	#5	1	1	1	1	1	1	1	1			2'-7"
FTL3	#5	13	13	13	13	13	13	13	13			5'-5"
FTL4	#5	1	1	1	1	1	1	1	1			4'-7 ½"
FTL5	#5	1	1	1	1	1	1	1	1			3'-8"
FTL6	#5	1	1	1	1	1	1	1	1			2'-8 ½"
FTL7	#5	1	1	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7	7	7			15'-1"
FTS1	#5	12	12	12	12	12	12	12	12			5'-5"
FTS2	#5	1	1	1	1	1	1	1	1			2'-5"
FLS	#4	7	7	7	7	7	7	7	7			11'-0 ½"
WS1	#5	1	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
WS2	#5	1	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
WS3	#5	1	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WS4	#5	1	1	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"
WS5	#5	1	1	1	1	1	1	1	1		W+3'-0 ½"	W+3'-0 ½"
WS6	#5	1	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WS7	#5	1	1	1	1	1	1	1	1		W+2'-1 ½"	W+2'-1 ½"
WS8	#5	1	1	1	1	1	1	1	1		W+1'-8 ½"	W+1'-8 ½"
WS9	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-3"	W+3'-9"
WS10	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
WS11	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS12	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WS13	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	8	8	8	8	8	8	8	8	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL2	#5	1	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WL3	#5	1	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL4	#5	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL5	#5	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL6	#5	1	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL7	#5	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL8	#5	1	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WL9	#5	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL10	#5	1	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL11	#5	1	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
WL12	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-1 ½"	W+3'-7 ½"
WL13	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
WL14	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-5 ½"	W+2'-11 ½"
WL15	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 ½"	W+2'-7 ½"

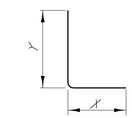
HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WL16	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"
WL17	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	11	11	11	11	11	11	11	11	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
RS2	#4	1	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
RS3	#4	1	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS4	#4	1	1	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"
RS5	#4	1	1	1	1	1	1	1	1		W+3'-0 ½"	W+3'-0 ½"
RS6	#4	1	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RS7	#4	1	1	1	1	1	1	1	1		W+2'-1 ½"	W+2'-1 ½"
RS8	#4	1	1	1	1	1	1	1	1		W+1'-8 ½"	W+1'-8 ½"
RS9	#4	1	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RS10	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
RS11	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RS12	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
RS13	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	9	9	9	9	9	9	9	9	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL2	#4	1	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
RL3	#4	1	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
RL4	#4	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RL5	#4	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
RL6	#4	1	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL7	#4	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL8	#4	1	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
RL9	#4	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RL10	#4	1	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RL11	#4	1	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
RL12	#4	1	1	1	1	1	1	1	1		W+1'-1 ½"	W+1'-1 ½"
RL13	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
RL14	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-5 ½"	W+2'-11 ½"
RL15	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 ½"	W+2'-7 ½"
RL16	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"
RL17	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	12	12	12	12	12	12	12	12	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2	2			2'-10 ½"
YS2	#4	2	2	2	2	2	2	2	2			4'-11 ½"
YS3	#4	2	2	2	2	2	2	2	2			7'-0 ½"
YS4	#4	2	2	2	2	2	2	2	2			9'-1"
YS5	#4	4	6	6	6	6	6	6	6			11'-0 ½"
YL1	#4	2	2	2	2	2	2	2	2			4'-0 ½"
YL2	#4	2	2	2	2	2	2	2	2			6'-10 ½"
YL3	#4	2	2	2	2	2	2	2	2			9'-8 ½"
YL4	#4	2	2	2	2	2	2	2	2			12'-6"
YL5	#4	4	6	6	6	6	6	6	6			15'-2 ½"
FS	#4	2	2	2	2	2	2	2	2			12'-3 ½"
FL	#4	2	2	2	2	2	2	2	2			16'-2"
N	#4	10	12	15	17	19	22	25	27	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			1.035(S+2V)+10 ½"
K	#4	9	11	13	15	17	19	21	23	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			1.0355+1'-0"
OS	#7	7	8	8	8	8	8	8	8	3'-1"	3'-1"	6'-2"
OL	#7	7	8	8	8	8	8	8	8	3'-1"	3'-1"	6'-2"
OSS	#4	1	1	1	1	1	1	1	1			6'-0"+T1
OSL	#4	1	1	1	1	1	1	1	1			6'-0"+T1



BARS DRS/DRL - #4



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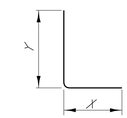
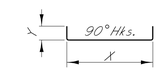
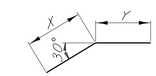


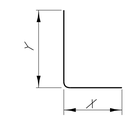
BARS RSn/RLn - #4



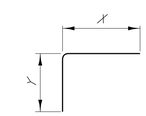
BARS N - #4



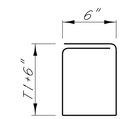
DOWELS OS/OL - #7



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER
WS-6-2W-15

SHEET NUMBER
7043

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-1"	14'-8"	20'-0 1/2"	0'-2 7/16"	0'-6 9/16"	14'-2"	0'-11"	0'-9"	3'-0"	2'-0"	27'-7 1/16"	29'-7 15/16"	31'-8 3/4"	33'-9 5/8"	35'-10 7/16"	37'-11 5/16"	40'-0 1/8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	15.3196	2159.554	0.5451	33.010	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	15.3196	2159.554	0.5451	30.010	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	15.3722	2159.554	0.5451	30.010	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	15.5062	2166.774	0.5493	33.122	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	15.5062	2166.774	0.5493	33.122	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	15.6062	2173.994	0.5579	33.344	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	16.1153	2222.831	0.6473	38.911	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	16.1567	2222.831	0.6473	38.911	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	16.2390	2226.552	0.6516	39.022	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	16.4455	2237.716	0.6558	39.134	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	16.4666	2237.716	0.6558	39.134	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	16.4666	2237.716	0.6558	39.134	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	16.8665	2278.776	0.7496	46.315	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	17.0047	2282.608	0.7581	46.537	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	17.0857	2290.274	0.7581	46.537	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	17.3469	2305.604	0.7624	46.704	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	17.4161	2309.437	0.7709	46.927	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	17.4161	2309.437	0.7709	46.927	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	17.7196	2342.609	0.8603	52.438	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	17.8151	2346.553	0.8603	52.438	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	17.9934	2358.385	0.8646	52.549	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	18.3400	2378.105	0.8731	52.772	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	18.1405	2366.273	0.8859	53.162	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	18.4240	2382.049	0.8944	53.384	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	18.4797	2398.860	0.9626	59.897	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	18.8021	2415.081	0.9754	60.231	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	19.0702	2435.358	0.9796	60.343	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	18.8522	2419.136	0.9924	60.677	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	19.1465	2435.358	0.9967	60.788	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	19.3341	2451.579	1.0265	61.623	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	19.3369	2463.528	1.0734	66.021	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	19.6413	2480.194	1.0819	66.243	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	19.7330	2488.528	1.0989	66.689	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	19.8108	2488.528	1.1074	66.911	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	20.1874	2513.528	1.1330	67.635	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	20.5607	2530.194	1.1500	68.080	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	20.6097	2624.692	1.1927	73.925	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	20.6160	2624.692	1.2012	74.148	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	20.5853	2620.414	1.2140	74.482	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	21.0499	2641.804	1.2353	75.039	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	21.3678	2667.472	1.2608	75.762	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	21.8199	2688.862	1.2821	76.319	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-8-2W-15

SHEET NUMBER 7044

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.035S+6'-0 ½"
T2	#4	1	1	1	1	1	1	1			1.035S+7'-3 ½"
T3	#4	1	1	1	1	1	1	1			1.035S+8'-6 ½"
T4	#4	1	1	1	1	1	1	1			1.035S+9'-9 ½"
T5	#4	1	1	1	1	1	1	1			1.035S+11'-0 ½"
T6	#4	1	1	1	1	1	1	1			1.035S+12'-3 ½"
T7	#4	1	1	1	1	1	1	1			1.035S+13'-6 ½"
T8	#4	1	1	1	1	1	1	1			1.035S+14'-9 ½"
T9	#4	1	1	1	1	1	1	1			1.035S+16'-0 ½"
T10	#4	1	1	1	1	1	1	1			1.035S+17'-4"
T11	#4	1	1	1	1	1	1	1			1.035S+18'-7"
T12	#4	1	1	1	1	1	1	1			1.035S+19'-10"
T13	#4	1	1	1	1	1	1	1			1.035S+21'-1"
T14	#4	1	1	1	1	1	1	1			1.035S+21'-9 ½"
T15	#4	3	3	3	3	3	3	3			1.035S+18'-8"
V1	#4	14	16	18	20	22	24	26	14'-4"	1'-8"	16'-0"
VL1	#4	1	1	1	1	1	1	1	14'-0"	1'-8"	15'-8"
VL2	#4	1	1	1	1	1	1	1	12'-6 ½"	1'-8"	14'-2 ½"
VL3	#4	1	1	1	1	1	1	1	11'-0 ½"	1'-8"	12'-8 ½"
VL4	#4	1	1	1	1	1	1	1	9'-7"	1'-8"	11'-3"
VL5	#4	1	1	1	1	1	1	1	8'-1 ½"	1'-8"	9'-9 ½"
VL6	#4	1	1	1	1	1	1	1	6'-8"	1'-8"	8'-4"
VL7	#4	1	1	1	1	1	1	1	5'-2 ½"	1'-8"	6'-10 ½"
VL8	#4	1	1	1	1	1	1	1	3'-9"		3'-9"
VL9	#4	1	1	1	1	1	1	1	1'-6 ½"		1'-6 ½"
VS1	#4	1	1	1	1	1	1	1	12'-5 ½"	1'-8"	14'-1 ½"
VS2	#4	1	1	1	1	1	1	1	10'-5 ½"	1'-8"	12'-1 ½"
VS3	#4	1	1	1	1	1	1	1	8'-5 ½"	1'-8"	10'-1 ½"
VS4	#4	1	1	1	1	1	1	1	6'-5 ½"	1'-8"	8'-1 ½"
VS5	#4	1	1	1	1	1	1	1	4'-5 ½"	1'-8"	6'-1 ½"
VS6	#4	1	1	1	1	1	1	1	2'-3 ½"		2'-3 ½"
FTL1	#5	1	1	1	1	1	1	1			1'-0 ½"
FTL2	#5	1	1	1	1	1	1	1			1'-10 ½"
FTL3	#5	1	1	1	1	1	1	1			2'-8 ½"
FTL4	#5	20	20	20	20	20	20	20			5'-5"
FTL5	#5	1	1	1	1	1	1	1			5'-0 ½"
FTL6	#5	1	1	1	1	1	1	1			4'-2 ½"
FTL7	#5	1	1	1	1	1	1	1			3'-5"
FTL8	#5	1	1	1	1	1	1	1			2'-7"
FTL9	#5	1	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7	7			19'-7"
FTS1	#5	17	17	17	17	17	17	17			5'-5"
FTS2	#5	1	1	1	1	1	1	1			4'-9 ½"
FTS3	#5	1	1	1	1	1	1	1			2'-5"
FLS	#4	7	7	7	7	7	7	7			14'-4"
WS1	#5	1	1	1	1	1	1	1		W+6'-4 ½"	W+6'-4 ½"
WS2	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WS3	#5	1	1	1	1	1	1	1		W+5'-7 ½"	W+5'-7 ½"
WS4	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WS5	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WS6	#5	1	1	1	1	1	1	1		W+4'-5 ½"	W+4'-5 ½"
WS7	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WS8	#5	1	1	1	1	1	1	1		W+3'-8 ½"	W+3'-8 ½"
WS9	#5	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
WS10	#5	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
WS11	#5	1	1	1	1	1	1	1		W+2'-6 ½"	W+2'-6 ½"
WS12	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WS13	#5	1	1	1	1	1	1	1		W+1'-9 ½"	W+1'-9 ½"
WS14	#5	1	1	1	1	1	1	1		W+1'-4 ½"	W+1'-4 ½"
WS15	#5	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
WS16	#5	1	1	1	1	1	1	1	1'-6"	W+1'-7 ½"	W+3'-1 ½"
WS17	#5	1	1	1	1	1	1	1	1'-6"	W+1'-2 ½"	W+2'-8 ½"
WS18	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10"	W+2'-4"
WS19	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"

HEIGHT = 8 FT.

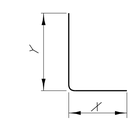
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
DWS	#5	15	15	15	15	15	15	15	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL2	#5	1	1	1	1	1	1	1		W+6'-1 ½"	W+6'-1 ½"
WL3	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WL4	#5	1	1	1	1	1	1	1		W+5'-6 ½"	W+5'-6 ½"
WL5	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL6	#5	1	1	1	1	1	1	1		W+4'-11 ½"	W+4'-11 ½"
WL7	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL8	#5	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
WL9	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL10	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL11	#5	1	1	1	1	1	1	1		W+3'-6 ½"	W+3'-6 ½"
WL12	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL13	#5	1	1	1	1	1	1	1		W+2'-11 ½"	W+2'-11 ½"
WL14	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL15	#5	1	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
WL16	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL17	#5	1	1	1	1	1	1	1		W+1'-9 ½"	W+1'-9 ½"
WL18	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL19	#5	1	1	1	1	1	1	1		W+1'-2 ½"	W+1'-2 ½"
WL20	#5	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WL21	#5	1	1	1	1	1	1	1	1'-6"	W+1'-7 ½"	W+3'-1 ½"
WL22	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL23	#5	1	1	1	1	1	1	1	1'-6"	W+1'-0 ½"	W+2'-6 ½"
WL24	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL25	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	19	19	19	19	19	19	19	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+6'-4 ½"	W+6'-4 ½"
RS2	#4	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
RS3	#4	1	1	1	1	1	1	1		W+5'-5 ½"	W+5'-5 ½"
RS4	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RS5	#4	1	1	1	1	1	1	1		W+4'-6 ½"	W+4'-6 ½"
RS6	#4	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RS7	#4	1	1	1	1	1	1	1		W+3'-7 ½"	W+3'-7 ½"
RS8	#4	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RS9	#4	1	1	1	1	1	1	1		W+2'-8 ½"	W+2'-8 ½"
RS10	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RS11	#4	1	1	1	1	1	1	1		W+1'-9 ½"	W+1'-9 ½"
RS12	#4	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RS13	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RS14	#4	1	1	1	1	1	1	1	1'-6"	W+1'-4 ½"	W+2'-10 ½"
RS15	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
RS16	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	13	13	13	13	13	13	13	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
RL2	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RL3	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RL4	#4	1	1	1	1	1	1	1		W+5'-4 ½"	W+5'-4 ½"
RL5	#4	1	1	1	1	1	1	1		W+5'-0 ½"	W+5'-0 ½"
RL6	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL7	#4	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RL8	#4	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
RL9	#4	1	1	1	1	1	1	1		W+3'-7 ½"	W+3'-7 ½"
RL10	#4	1	1	1	1	1	1	1		W+3'-3 ½"	W+3'-3 ½"
RL11	#4	1	1	1	1	1	1	1		W+2'-11 ½"	W+2'-11 ½"
RL12	#4	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RL13	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RL14	#4	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RL15	#4	1	1	1	1	1	1	1		W+1'-6 ½"	W+1'-6 ½"
RL16	#4	1	1	1	1	1	1	1		W+1'-2 ½"	W+1'-2 ½"
RL17	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL18	#4	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL19	#4	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
RL20	#4	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RL21	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	17	17	17	17	17	17	17	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-10 ½"
YS2	#4	2	2	2	2	2	2	2			4'-11 ½"
YS3	#4	2	2	2	2	2	2	2			7'-0 ½"
YS4	#4	2	2	2	2	2	2	2			9'-1"
YS5	#4	2	2	2	2	2	2	2			11'-2"
YS6	#4	2	2	2	2	2	2	2			13'-3"
YS7	#4	6	6	6	6	6	6	8			14'-4"
YL1	#4	2	2	2	2	2	2	2			4'-0 ½"
YL2	#4	2	2	2	2	2	2	2			6'-10 ½"
YL3	#4	2	2	2	2	2	2	2			9'-8 ½"
YL4	#4	2	2	2	2	2	2	2			12'-6"
YL5	#4	2	2	2	2	2	2	2			15'-4"
YL6	#4	2	2	2	2	2	2	2			18'-2"
YL7	#4	6	6	6	6	6	6	8			19'-8 ½"
FS	#4	2	2	2	2	2	2	2			15'-11"
FL	#4	2	2	2	2	2	2	2			20'-11"
N	#4	12	14	17	19	22	24	27	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.035(S+2V)+10 ½"
K	#4	11	13	15	17	19	21	23	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.035S+1'-0"
OS	#7	10	10	10	10	10	10	11	3'-1"	3'-1"	6'-2"
OL	#5	10	10	10	10	10	10	11	3'-1"	3'-1"	6'-2"
OSS	#4	1	1	1	1	1	1	1			8'-0"+T1
OSL	#4	1	1	1	1	1	1	1			8'-0"+T1



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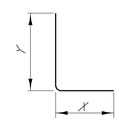

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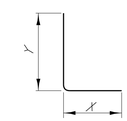

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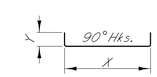

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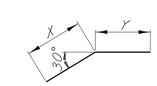
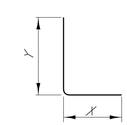


DOWELS OS/OL - #7



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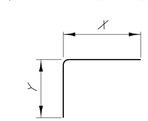
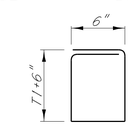


BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-8-2W-15

SHEET NUMBER 7045

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"Y" CLEAR SPAN						
											10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-1"	16'-8 13/16"	22'-10 3/8"	0'-2 11/16"	0'-7 5/16"	16'-2"	0'-11"	0'-10"	4'-0"	2'-0"	32'-4 1/8"	34'-5"	36'-5 13/16"	38'-6 11/16"	40'-7 9/16"	42'-8 3/8"	44'-9 1/4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	22.0125	3074.951	0.6558	40.692	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	22.0545	3074.951	0.6558	40.692	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	21.9521	3065.752	0.6601	40.804	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	22.2474	3084.149	0.6771	41.249	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	22.2987	3088.749	0.6771	41.249	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	22.5248	3102.547	0.6899	41.583	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	22.9263	3146.079	0.7581	46.537	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	22.9989	3146.079	0.7581	46.537	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	22.9485	3141.368	0.7624	46.704	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	23.2841	3160.210	0.7794	47.150	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	23.3631	3164.921	0.7837	47.261	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	23.3190	3160.210	0.7964	47.595	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	23.8596	3208.119	0.8603	52.438	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	23.8596	3208.119	0.8603	52.438	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	23.9656	3217.763	0.8689	52.661	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	24.4008	3241.873	0.8859	53.162	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	24.5322	3251.517	0.8859	53.162	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	24.4942	3246.695	0.9029	53.607	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	24.7129	3269.993	0.9711	60.120	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	24.8467	3279.859	0.9711	60.120	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	25.2052	3304.526	0.9839	60.454	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	25.2596	3309.459	0.9882	60.565	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	25.2788	3304.526	0.9967	60.788	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	25.6785	3329.192	1.0095	61.178	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	25.5116	3331.866	1.0819	66.243	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	25.7863	3352.045	1.0819	66.243	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	26.0700	3372.223	1.0947	66.577	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	26.0248	3367.178	1.1032	66.800	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	26.3661	3382.312	1.1117	67.023	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	26.6869	3397.446	1.1287	67.524	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	26.7656	3424.814	1.1841	73.647	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	26.6305	3414.503	1.1977	73.925	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	26.8354	3429.970	1.2097	74.371	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	27.2994	3450.594	1.2310	74.927	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	27.5509	3466.062	1.2438	75.261	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	28.0655	3496.998	1.2693	75.985	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	27.5850	3487.356	1.3034	79.993	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	27.6490	3492.623	1.3162	80.383	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	27.8844	3503.158	1.3247	80.605	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	28.6004	3545.296	1.3588	81.490	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-10-2W-15

SHEET NUMBER 7046

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.035S+6'-2 1/2"
T2	#4	1	1	1	1	1	1	1			1.035S+7'-5 1/2"
T3	#4	1	1	1	1	1	1	1			1.035S+8'-8 1/2"
T4	#4	1	1	1	1	1	1	1			1.035S+10'-0"
T5	#4	1	1	1	1	1	1	1			1.035S+11'-3"
T6	#4	1	1	1	1	1	1	1			1.035S+12'-6"
T7	#4	1	1	1	1	1	1	1			1.035S+13'-9"
T8	#4	1	1	1	1	1	1	1			1.035S+15'-0"
T9	#4	1	1	1	1	1	1	1			1.035S+16'-3"
T10	#4	1	1	1	1	1	1	1			1.035S+17'-6"
T11	#4	1	1	1	1	1	1	1			1.035S+18'-9"
T12	#4	1	1	1	1	1	1	1			1.035S+20'-0"
T13	#4	1	1	1	1	1	1	1			1.035S+21'-3 1/2"
T14	#4	1	1	1	1	1	1	1			1.035S+22'-6 1/2"
T15	#4	1	1	1	1	1	1	1			1.035S+23'-9 1/2"
T16	#4	1	1	1	1	1	1	1			1.035S+24'-6 1/2"
T17	#4	3	3	3	3	3	3	3			1.035S+21'-4 1/2"
V1	#4	16	18	20	22	24	26	28	16'-4 1/2"	1'-8"	18'-0 1/2"
VL1	#4	1	1	1	1	1	1	1	16'-2"	1'-8"	17'-10"
VL2	#4	1	1	1	1	1	1	1	14'-8 1/2"	1'-8"	16'-4 1/2"
VL3	#4	1	1	1	1	1	1	1	13'-3"	1'-8"	14'-11"
VL4	#4	1	1	1	1	1	1	1	11'-9 1/2"	1'-8"	13'-7"
VL5	#4	1	1	1	1	1	1	1	10'-3 1/2"	1'-8"	11'-11 1/2"
VL6	#4	1	1	1	1	1	1	1	8'-10"	1'-8"	10'-6"
VL7	#4	1	1	1	1	1	1	1	7'-4 1/2"	1'-8"	9'-0 1/2"
VL8	#4	1	1	1	1	1	1	1	5'-11"	1'-8"	7'-7"
VL9	#4	1	1	1	1	1	1	1	4'-5 1/2"	1'-8"	6'-1 1/2"
VL10	#4	1	1	1	1	1	1	1	2'-8"		2'-8"
VS1	#4	1	1	1	1	1	1	1	14'-8"	1'-8"	16'-4"
VS2	#4	1	1	1	1	1	1	1	12'-8"	1'-8"	14'-4"
VS3	#4	1	1	1	1	1	1	1	10'-8"	1'-8"	12'-4"
VS4	#4	1	1	1	1	1	1	1	8'-8"	1'-8"	10'-4"
VS5	#4	1	1	1	1	1	1	1	6'-8"	1'-8"	8'-4"
VS6	#4	1	1	1	1	1	1	1	4'-8"	1'-8"	6'-4"
VS7	#4	1	1	1	1	1	1	1	2'-6 1/2"		2'-6 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-3 1/2"
FTL2	#5	1	1	1	1	1	1	1			1'-11 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-7 1/2"
FTL4	#5	1	1	1	1	1	1	1			3'-3 1/2"
FTL5	#5	1	1	1	1	1	1	1			3'-11"
FTL6	#5	27	27	27	27	27	27	27			6'-6"
FTL7	#5	1	1	1	1	1	1	1			6'-5"
FTL8	#5	1	1	1	1	1	1	1			5'-9"
FTL9	#5	1	1	1	1	1	1	1			5'-1"
FTL10	#5	1	1	1	1	1	1	1			4'-5"
FTL11	#5	1	1	1	1	1	1	1			3'-9"
FTL12	#5	1	1	1	1	1	1	1			3'-1"
FTL13	#5	2	2	2	2	2	2	2			2'-6"
FLL	#4	8	8	8	8	8	8	8			22'-4 1/2"
FTS1	#5	1	1	1	1	1	1	1			2'-2 1/2"
FTS2	#5	24	24	24	24	24	24	24			6'-6"
FTS3	#5	1	1	1	1	1	1	1			4'-3"
FTS4	#5	1	1	1	1	1	1	1			2'-6"
FLS	#4	8	8	8	8	8	8	8			16'-4 1/2"
WS1	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
WS2	#5	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
WS3	#5	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
WS4	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WS5	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WS6	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WS7	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WS8	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WS9	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WS10	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WS11	#5	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
WS12	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WS13	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WS14	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WS15	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WS16	#5	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
WS17	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS18	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WS19	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WS20	#5	1	1	1	1	1	1	1		W+1'-4 1/2"	W+1'-4 1/2"
WS21	#5	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
WS22	#5	1	1	1	1	1	1	1		W+0'-9"	W+0'-9"
WS23	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WS24	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WS25	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WS26	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	24	24	24	24	24	24	24	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
WL2	#5	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
WL3	#5	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
WL4	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL5	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL6	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL7	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL8	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL9	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WL10	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WL11	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WL12	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL13	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WL14	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL15	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL16	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL17	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL18	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WL19	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WL20	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL21	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL22	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WL23	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL24	#5	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
WL25	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL26	#5	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
WL27	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL28	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WL29	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WL30	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WL31	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL32	#5	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
WL33	#5	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
WL34	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WL35	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	33	33	33	33	33	33	33	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
RS2	#4	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
RS3	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RS4	#4	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
RS5	#4	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
RS6	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RS7	#4	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RS8	#4	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
RS9	#4	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RS10	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RS11	#4	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
RS12	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RS13	#4	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
RS14	#4	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RS15	#4	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
RS16	#4	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
RS17	#4	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
RS18	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DR5	#4	17	17	17	17	17	17	17	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
RL2	#4	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
RL3	#4	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
RL4	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RL5	#4	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
RL6	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RL7	#4	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
RL8	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RL9	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL10	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RL11	#4	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
RL12	#4	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
RL13	#4	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
RL14	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RL15	#4	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RL16	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RL17	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RL18	#4	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
RL19	#4	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL20	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL21	#4	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
RL22	#4	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
RL23	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RL24	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	23	23	23	23	23	23	23	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-10 1/2"
YS2	#4	2	2	2	2	2	2	2			4'-11 1/2"
YS3	#4	2	2	2	2	2	2	2			7'-0 1/2"
YS4	#4	2	2	2	2	2	2	2			9'-1"
YS5	#4	2	2	2	2	2	2	2			11'-2"
YS6	#4	2	2	2	2	2	2	2			13'-3"
YS7	#4	2	2	2	2	2	2	2			15'-3 1/2"
YS8	#4	8	8	8	8	8	8	8			16'-5"
YL1	#4	2	2	2	2	2	2	2			4'-0 1/2"
YL2	#4	2	2	2	2	2	2	2			6'-10 1/2"
YL3	#4	2	2	2	2	2	2	2			9'-8 1/2"
YL4	#4	2	2	2	2	2	2	2			12'-6"
YL5	#4	2	2	2	2	2	2	2			15'-4"
YL6	#4	2	2	2	2	2	2	2			18'-2"
YL7	#4	2	2	2	2	2	2	2			21'-0"
YL8	#4	8	8	8	8	8	8	8			22'-6 1/2"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 3

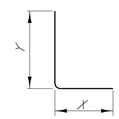
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

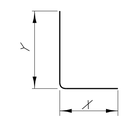
WORKING NUMBER IWS-10-2W-15

SHEET NUMBER 7047

HEIGHT = 10 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		10'	12'	14'	16'	18'	20'	22'			
FS	#4	2	2	2	2	2	2	2			18'-2 ½"
FL	#4	2	2	2	2	2	2	2			23'-11"
N	#4	15	17	19	22	24	27	29	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.035(S+2V)+10 ½"
K	#4	13	15	17	19	21	23	25	0'-6"	T1+0'-6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.035S+1'-2"
OS	#7	12	12	12	12	12	12	12	3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	12	12	12	12	12	12	12	3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1	1	1			10'-0"+T1
OSL	#4	1	1	1	1	1	1	1			10'-0"+T1



BARS DRS/DRL - #4



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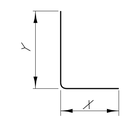
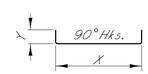
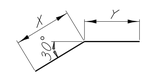


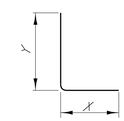
BARS RSn/RLn - #4



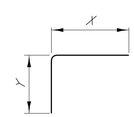
BARS N - #4



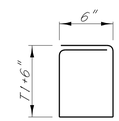
DOWELS OS/OL - #7



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 3 OF 3

WORKING NUMBER
IWS-10-2W-15

SHEET NUMBER
7048

DATE | REVISIONS | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"Y" CLEAR SPAN						
											12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-4"	19'-3 7/8"	26'-4 13/16"	0'-2 15/16"	0'-8 1/16"	18'-8"	0'-11"	0'-11"	5'-0"	2'-0"	37'-8 13/16"	39'-9 11/16"	41'-10 1/2"	43'-11 3/8"	46'-0 3/16"	48'-1 1/16"	50'-1 7/8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	30.8130	4348.023	0.7666	46.816	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	30.8880	4348.023	0.7751	47.038	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	30.9402	4348.023	0.7837	47.261	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	31.3762	4376.540	0.8007	47.706	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	31.5329	4387.946	0.8007	47.706	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	31.3883	4376.540	0.7751	47.038	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	31.8932	4510.329	0.8689	54.219	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	31.9889	4516.144	0.8774	54.442	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	32.1140	4521.958	0.8859	54.720	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	32.5947	4551.032	0.9029	55.166	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	32.5683	4551.032	0.9072	55.277	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	32.7649	4562.661	0.9157	55.500	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	32.7815	4580.636	0.9711	60.120	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	33.0082	4592.488	0.9796	60.343	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	33.5055	4622.118	1.0009	60.899	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	33.3427	4610.266	1.0009	60.899	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	33.6462	4628.044	1.0137	61.289	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	33.9322	4645.822	1.0052	61.066	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	33.9365	4663.045	1.0734	66.021	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	34.1399	4675.120	1.0819	66.243	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	34.5168	4699.269	1.0989	66.689	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	34.5201	4699.269	1.1032	66.800	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	34.9530	4717.381	1.1245	67.357	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	35.3693	4747.568	1.1373	67.746	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	34.8039	4733.408	1.1841	72.088	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	35.0904	4745.705	1.1927	72.367	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	35.7103	4788.746	1.2054	72.701	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	35.9891	4794.895	1.2225	73.146	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	36.2503	4807.192	1.2310	73.369	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	35.9232	4816.402	1.3034	79.993	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	36.2380	4835.182	1.2949	79.770	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	36.5800	4853.962	1.3205	80.494	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	37.3576	4897.782	1.3375	80.939	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	37.8179	4929.082	1.3673	81.774	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	36.8672	4887.182	1.3972	85.671	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	37.4304	4919.039	1.4142	86.116	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	37.9111	4950.896	1.4312	86.617	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	38.7192	4995.495	1.4781	87.842	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-12-2W-15

SHEET NUMBER 7049

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.035S+6'-4"
T2	#4	1	1	1	1	1	1	1			1.035S+7'-7"
T3	#4	1	1	1	1	1	1	1			1.035S+8'-9 1/2"
T4	#4	1	1	1	1	1	1	1			1.035S+10'-0 1/2"
T5	#4	1	1	1	1	1	1	1			1.035S+11'-3"
T6	#4	1	1	1	1	1	1	1			1.035S+12'-5 1/2"
T7	#4	1	1	1	1	1	1	1			1.035S+13'-8 1/2"
T8	#4	1	1	1	1	1	1	1			1.035S+14'-11"
T9	#4	1	1	1	1	1	1	1			1.035S+16'-1 1/2"
T10	#4	1	1	1	1	1	1	1			1.035S+17'-4 1/2"
T11	#4	1	1	1	1	1	1	1			1.035S+18'-7"
T12	#4	1	1	1	1	1	1	1			1.035S+19'-9 1/2"
T13	#4	1	1	1	1	1	1	1			1.035S+21'-0 1/2"
T14	#4	1	1	1	1	1	1	1			1.035S+22'-3"
T15	#4	1	1	1	1	1	1	1			1.035S+23'-6"
T16	#4	1	1	1	1	1	1	1			1.035S+24'-8 1/2"
T17	#4	1	1	1	1	1	1	1			1.035S+25'-11"
T18	#4	1	1	1	1	1	1	1			1.035S+27'-2"
T19	#4	1	1	1	1	1	1	1			1.035S+27'-9 1/2"
T20	#4	3	3	3	3	3	3	3			1.035S+24'-8 1/2"
V1	#4	19	21	23	25	27	29	31	19'-0"	1'-8"	20'-8"
VL1	#4	1	1	1	1	1	1	1	17'-4 1/2"	1'-8"	19'-0 1/2"
VL2	#4	1	1	1	1	1	1	1	15'-11"	1'-8"	17'-7"
VL3	#4	1	1	1	1	1	1	1	14'-5 1/2"	1'-8"	16'-1 1/2"
VL4	#4	1	1	1	1	1	1	1	13'-0"	1'-8"	14'-8"
VL5	#4	1	1	1	1	1	1	1	11'-6 1/2"	1'-8"	13'-2 1/2"
VL6	#4	1	1	1	1	1	1	1	10'-1"	1'-8"	11'-9"
VL7	#4	1	1	1	1	1	1	1	8'-7 1/2"	1'-8"	10'-3 1/2"
VL8	#4	1	1	1	1	1	1	1	7'-1 1/2"	1'-8"	8'-9 1/2"
VL9	#4	1	1	1	1	1	1	1	5'-8"	1'-8"	7'-4"
VL10	#4	1	1	1	1	1	1	1	4'-2 1/2"	1'-8"	5'-10 1/2"
VL11	#4	1	1	1	1	1	1	1	2'-3 1/2"		2'-3 1/2"
VS1	#4	1	1	1	1	1	1	1	17'-5"	1'-8"	19'-1"
VS2	#4	1	1	1	1	1	1	1	15'-5"	1'-8"	17'-1"
VS3	#4	1	1	1	1	1	1	1	13'-5"	1'-8"	15'-1"
VS4	#4	1	1	1	1	1	1	1	11'-5"	1'-8"	13'-1"
VS5	#4	1	1	1	1	1	1	1	9'-5"	1'-8"	11'-1"
VS6	#4	1	1	1	1	1	1	1	7'-5"	1'-8"	9'-1"
VS7	#4	1	1	1	1	1	1	1	5'-5"	1'-8"	7'-1"
VS8	#4	1	1	1	1	1	1	1	3'-4 1/2"		3'-4 1/2"
VS9	#4	1	1	1	1	1	1	1	1'-1"		1'-1"
FTL1	#5	1	1	1	1	1	1	1			1'-0 1/2"
FTL2	#5	1	1	1	1	1	1	1			1'-7 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-2 1/2"
FTL4	#5	1	1	1	1	1	1	1			2'-9 1/2"
FTL5	#5	1	1	1	1	1	1	1			3'-4 1/2"
FTL6	#5	1	1	1	1	1	1	1			3'-11 1/2"
FTL7	#5	1	1	1	1	1	1	1			4'-6 1/2"
FTL8	#5	1	1	1	1	1	1	1			5'-1"
FTL9	#5	36	36	36	36	36	36	36			7'-7"
FTL10	#5	1	1	1	1	1	1	1			6'-11 1/2"
FTL11	#5	1	1	1	1	1	1	1			6'-5"
FTL12	#5	1	1	1	1	1	1	1			5'-10"
FTL13	#5	1	1	1	1	1	1	1			5'-3"
FTL14	#5	1	1	1	1	1	1	1			4'-8"
FTL15	#5	1	1	1	1	1	1	1			4'-1"
FTL16	#5	1	1	1	1	1	1	1			3'-6"
FTL17	#5	1	1	1	1	1	1	1			2'-11"
FTL18	#5	2	2	2	2	2	2	2			2'-7"
FLL	#4	9	9	9	9	9	9	9			25'-11"
FTS1	#5	1	1	1	1	1	1	1			1'-5"
FTS2	#5	1	1	1	1	1	1	1			3'-7"
FTS3	#5	31	31	31	31	31	31	31			7'-7"
FTS4	#5	1	1	1	1	1	1	1			6'-1 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
FTS5	#5	1	1	1	1	1	1	1		3'-11 1/2"	3'-11 1/2"
FTS6	#5	1	1	1	1	1	1	1		2'-7"	2'-7"
FLS	#4	9	9	9	9	9	9	9		19'-0"	19'-0"
WS1	#5	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
WS2	#5	1	1	1	1	1	1	1		W+8'-4 1/2"	W+8'-4 1/2"
WS3	#5	1	1	1	1	1	1	1		W+8'-1"	W+8'-1"
WS4	#5	1	1	1	1	1	1	1		W+7'-9 1/2"	W+7'-9 1/2"
WS5	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WS6	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WS7	#5	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
WS8	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WS9	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WS10	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WS11	#5	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
WS12	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WS13	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WS14	#5	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
WS15	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WS16	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WS17	#5	1	1	1	1	1	1	1		4'-2 1/2"	W+4'-2 1/2"
WS18	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WS19	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS20	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WS21	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WS22	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WS23	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WS24	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WS25	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WS26	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WS27	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WS28	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WS29	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WS30	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WS31	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WS32	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WS33	#5	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
WS34	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	34	34	34	34	34	34	34	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WL2	#5	1	1	1	1	1	1	1		W+8'-5 1/2"	W+8'-5 1/2"
WL3	#5	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
WL4	#5	1	1	1	1	1	1	1		W+8'-0 1/2"	W+8'-0 1/2"
WL5	#5	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
WL6	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WL7	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL8	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WL9	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL10	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WL11	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL12	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL13	#5	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
WL14	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL15	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL16	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WL17	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL18	#5	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
WL19	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL20	#5	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
WL21	#5	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL22	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL23	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL24	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL25	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL26	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL27	#5	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
WL28	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL29	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL30	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL31	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL32	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WL33	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WL34	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL35	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL36	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL37	#5	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
WL38	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WL39	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WL40	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WL41	#5	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
WL42	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WL43	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WL44	#5	1	1	1	1	1	1	1		W-0'-1 1/2"	W-0'-1 1/2"
WL45	#5	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
WL46	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	46	46	46	46	46	46	46	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RS2	#4	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
RS3	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RS4	#4	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
RS5	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RS6	#4	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
RS7	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RS8	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RS9	#4	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RS10	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RS11	#4	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS12	#4	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS13	#4	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RS14	#4	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
RS15	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RS16	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS17	#4	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
RS18	#4	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
RS19	#4	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
RS20	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 3

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

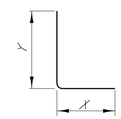
WORKING NUMBER IWS-12-2W-15

SHEET NUMBER 7050

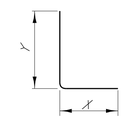
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

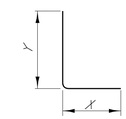
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
DRS	#4	20	20	20	20	20	20	20	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
RL2	#4	1	1	1	1	1	1	1		W+8'-4"	W+8'-4"
RL3	#4	1	1	1	1	1	1	1		W+8'-0"	W+8'-0"
RL4	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RL5	#4	1	1	1	1	1	1	1		W+7'-3 ½"	W+7'-3 ½"
RL6	#4	1	1	1	1	1	1	1		W+6'-11 ½"	W+6'-11 ½"
RL7	#4	1	1	1	1	1	1	1		W+6'-7 ½"	W+6'-7 ½"
RL8	#4	1	1	1	1	1	1	1		W+6'-3 ½"	W+6'-3 ½"
RL9	#4	1	1	1	1	1	1	1		W+5'-11 ½"	W+5'-11 ½"
RL10	#4	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
RL11	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RL12	#4	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
RL13	#4	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL14	#4	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL15	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RL16	#4	1	1	1	1	1	1	1		W+3'-6 ½"	W+3'-6 ½"
RL17	#4	1	1	1	1	1	1	1		W+3'-2 ½"	W+3'-2 ½"
RL18	#4	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
RL19	#4	1	1	1	1	1	1	1		W+2'-6 ½"	W+2'-6 ½"
RL20	#4	1	1	1	1	1	1	1		W+2'-2 ½"	W+2'-2 ½"
RL21	#4	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RL22	#4	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
RL23	#4	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
RL24	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL25	#4	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
RL26	#4	1	1	1	1	1	1	1		W+0'-1 ½"	W+0'-1 ½"
RL27	#4	1	1	1	1	1	1	1		W-0'-2 ½"	W-0'-2 ½"
RL28	#4	1	1	1	1	1	1	1		W-0'-6 ½"	W-0'-6 ½"
DRL	#4	28	28	28	28	28	28	28	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-6 ½"
YS2	#4	2	2	2	2	2	2	2			4'-3"
YS3	#4	2	2	2	2	2	2	2			6'-0"
YS4	#4	2	2	2	2	2	2	2			7'-8 ½"
YS5	#4	2	2	2	2	2	2	2			9'-5 ½"
YS6	#4	2	2	2	2	2	2	2			11'-2"
YS7	#4	2	2	2	2	2	2	2			12'-10 ½"
YS8	#4	2	2	2	2	2	2	2			14'-7 ½"
YS9	#4	2	2	2	2	2	2	2			16'-4"
YS10	#4	2	2	2	2	2	2	2			18'-1"
YS11	#4	10	12	12	12	12	12	12			19'-0"
YL1	#4	2	2	2	2	2	2	2			3'-6 ½"
YL2	#4	2	2	2	2	2	2	2			5'-11"
YL3	#4	2	2	2	2	2	2	2			8'-3 ½"
YL4	#4	2	2	2	2	2	2	2			10'-7 ½"
YL5	#4	2	2	2	2	2	2	2			13'-0"
YL6	#4	2	2	2	2	2	2	2			15'-4"
YL7	#4	2	2	2	2	2	2	2			17'-8 ½"
YL8	#4	2	2	2	2	2	2	2			20'-0 ½"
YL9	#4	2	2	2	2	2	2	2			22'-5"
YL10	#4	2	2	2	2	2	2	2			24'-9 ½"
YL11	#4	10	12	12	12	12	12	12			26'-1"
FS	#4	2	2	2	2	2	2	2			21'-1"
FL	#4	2	2	2	2	2	2	2			27'-8"
N	#4	17	20	22	24	26	29	31	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.035(S+2V)+10 ½"
K	#4	15	17	19	21	23	25	27	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			1.035S+1'-4"
OS	#7	16	16	16	16	16	16	16	3'-2 ½"	3'-2 ½"	6'-5"
OL	#7	16	16	16	16	16	16	16	3'-2 ½"	3'-2 ½"	6'-5"
OSS	#4	1	1	1	1	1	1	1			12'-0"+T1
OSL	#4	1	1	1	1	1	1	1			12'-0"+T1



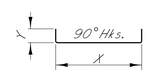
BARS DRS/DRL - #4



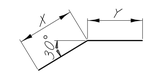
BARS DWS/DWL - #5



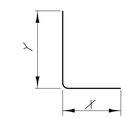
BARS RSn/RLn - #4



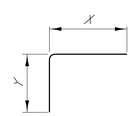
BARS N - #4



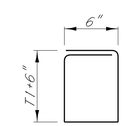
DOWELS OS/OL - #7



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 3 OF 3

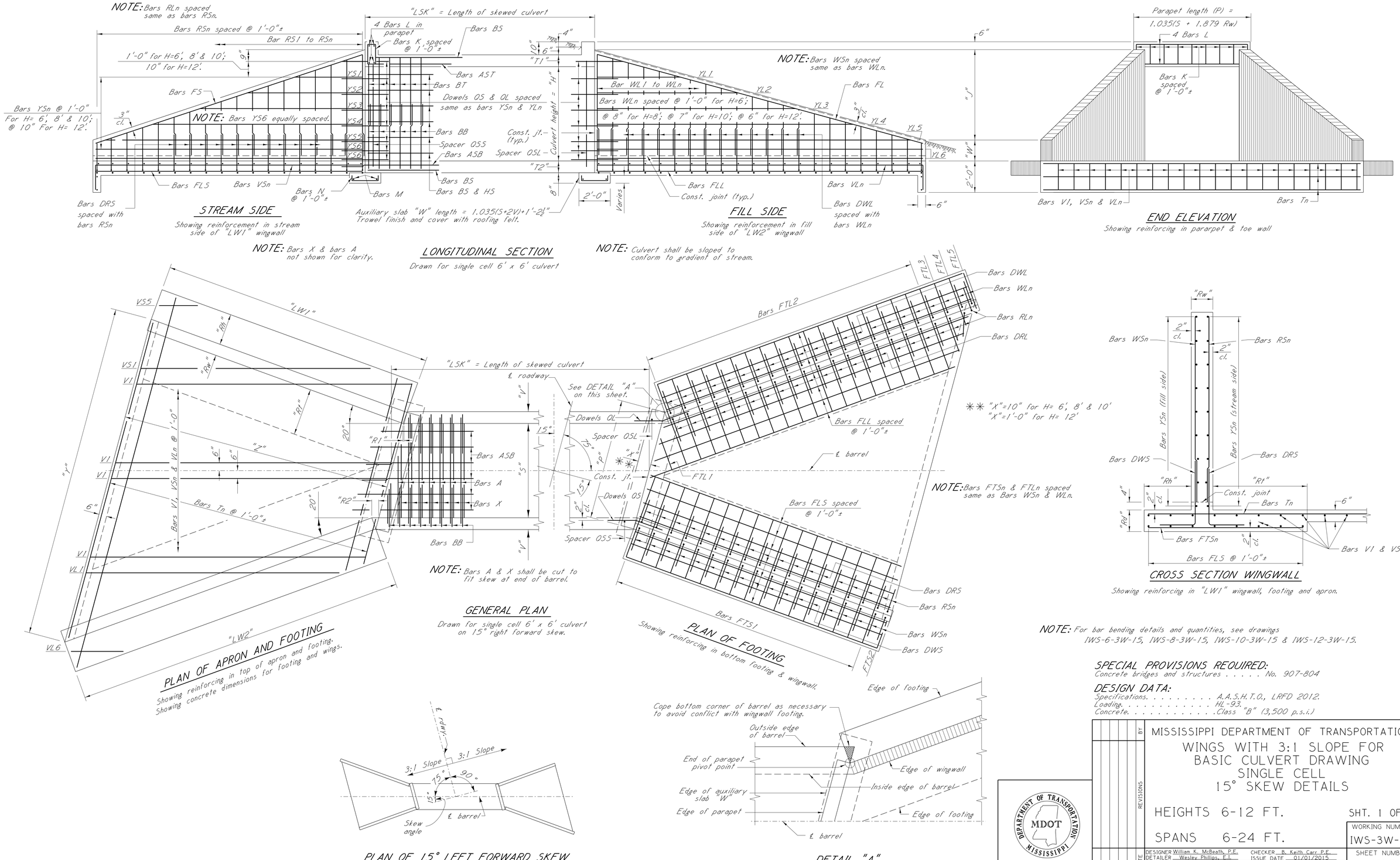
WORKING NUMBER IWS-12-2W-15

SHEET NUMBER 7051

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.


NOTE: Bars RLn spaced same as bars RSn.
Bars RSn spaced @ 1'-0"±
Bar RS1 to RSn
1'-0" for H=6', 8' & 10'; 10" for H=12'.
Bars YSn @ 1'-0" For H= 6', 8' & 10'; @ 10" For H= 12'.
NOTE: Bars YS6 equally spaced.
Bars FS
Bars FLS
Bars VSn
Bars N @ 1'-0"±
Bars M
Bars DRS spaced with bars RSn
STREAM SIDE
Showing reinforcement in stream side of "LW1" wingwall
"LSK" = Length of skewed culvert
4 Bars L in parapet
Bars K spaced @ 1'-0"±
Bars BS
Bars AST
Bars BT
Dowels OS & OL spaced same as bars YSn & YLn
Bars BB
Spacer OSS
Bars ASB
Bars BS & HS
Const. jt. (typ.)
Spacer OSL
Culvert height = "H"
Auxiliary slab "W" length = 1.035(S+2V)+1'-2½"
Trowel finish and cover with roofing felt.
NOTE: Bars WSn spaced same as bars WLn.
Bar WL1 to WLn
Bars WLn spaced @ 1'-0" for H=6'; @ 8" for H=8'; @ 7" for H=10'; @ 6" for H=12'.
Bars FL
Bars FLL
Const. joint (typ.)
Bars VLn
Bars DWL spaced with bars WLn
FILL SIDE
Showing reinforcement in fill side of "LW2" wingwall
Parapet length (P) = 1.035(S + 1.879 Rw)
4 Bars L
Bars K spaced @ 1'-0"±
Bars VI, VSn & VLn
Bars Tn
END ELEVATION
Showing reinforcing in pararpet & toe wall
NOTE: Bars X & bars A not shown for clarity.
LONGITUDINAL SECTION
Drawn for single cell 6' x 6' culvert
NOTE: Culvert shall be sloped to conform to gradient of stream.
"LW1"
"LW2"
Bars VI, VSn & VLn @ 1'-0"
Bars Tn @ 1'-0"±
PLAN OF APRON AND FOOTING
Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.
"LSK" = Length of skewed culvert
℄ roadway
See DETAIL "A" on this sheet.
Dowels OL
Spacer OSL
Bars ASB
Bars A
Bars X
Bars BB
Const. jt.
Dowels OS
Spacer OSS
NOTE: Bars A & X shall be cut to fit skew at end of barrel.
GENERAL PLAN
Drawn for single cell 6' x 6' culvert on 15° right forward skew.
Bars FTL2
Bars FLL spaced @ 1'-0"±
℄ barrel
FTL1
Bars FLS spaced @ 1'-0"±
Bars FTS1
Bars DWL
Bars WLn
Bars RLn
Bars DRL
Bars DRS
Bars RSn
Bars WSn
Bars DWS
PLAN OF FOOTING
Showing reinforcing in bottom footing & wingwall.
** "X"=10" for H= 6', 8' & 10'
"X"=1'-0" for H= 12'
NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.
Bars WSn
Bars RSn
Bars YSn (fill side)
Bars YSn (stream side)
Bars DWS
Bars DRS
Const. joint
Bars Tn
Bars FTSn
Bars FLS @ 1'-0"±
Bars VI & VSn
CROSS SECTION WINGWALL
Showing reinforcing in "LW1" wingwall, footing and apron.
NOTE: For bar bending details and quantities, see drawings IWS-6-3W-15, IWS-8-3W-15, IWS-10-3W-15 & IWS-12-3W-15.
SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804
DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)
3:1 Slope
15°
90°
Skew angle
PLAN OF 15° LEFT FORWARD SKEW
Cope bottom corner of barrel as necessary to avoid conflict with wingwall footing.
Outside edge of barrel
End of parapet pivot point
Edge of auxiliary slab "W"
Edge of parapet
Edge of footing
Edge of wingwall
Inside edge of barrel
DETAIL "A"
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI
REVISIONS
BY
DATE
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS
HEIGHTS 6-12 FT.
SPANS 6-24 FT.
SHT. 1 OF 1
WORKING NUMBER IWS-3W-15
SHEET NUMBER 7052
DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rl"	"Rh"	"Y" CLEAR SPAN							
											6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-6"	17'-3 13/16"	21'-0 11/16"	0'-0 13/16"	0'-5 3/8"	17'-3"	0'-11"	0'-9"	3'-0"	2'-0"	21'-3 1/8"	23'-3 15/16"	25'-4 13/16"	27'-5 5/8"	29'-6 1/2"	31'-7 5/16"	33'-8 3/16"	35'-9"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	14.6451	1920.634	0.4428	27.110	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	14.6451	1920.634	0.4428	27.110	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	14.6451	1920.634	0.4428	27.110	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	14.6733	1920.634	0.4428	27.110	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	14.6733	1920.634	0.4428	27.110	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	14.6733	1920.634	0.4428	27.110	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	15.4712	1984.846	0.5451	33.010	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	15.4712	1984.846	0.5451	33.010	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	15.4885	1984.846	0.5451	33.010	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	15.6297	1991.885	0.5451	33.010	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	15.6124	1991.885	0.5451	33.010	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	15.7364	1998.925	0.5451	33.010	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	16.3304	2048.946	0.6473	40.470	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	16.3304	2048.946	0.6473	40.470	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	16.4403	2056.208	0.6473	40.470	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	16.6805	2070.732	0.6473	40.470	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	16.7030	2070.732	0.6558	40.692	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	16.8815	2081.625	0.6644	40.915	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	17.1824	2116.789	0.7496	46.315	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	17.3429	2124.273	0.7496	46.315	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	17.4568	2131.758	0.7538	46.426	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	17.7340	2146.727	0.7624	46.704	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	17.8082	2150.470	0.7751	47.038	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	17.7404	2146.727	0.7794	47.150	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	18.1158	2184.965	0.8561	52.327	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	18.3050	2196.526	0.8603	52.438	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	18.4675	2208.087	0.8646	52.549	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	18.8622	2227.355	0.8774	52.883	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	18.6052	2211.941	0.8902	53.273	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	18.8031	2223.502	0.9029	53.607	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	19.1649	2261.294	0.9839	60.454	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	19.2856	2269.224	0.9839	60.454	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	19.7102	2293.014	0.9839	60.454	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	19.4560	2281.119	0.9967	60.788	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	19.7250	2293.014	1.0095	61.178	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	19.9807	2308.874	1.0265	61.623	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	19.9994	2404.822	1.0776	67.691	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	20.4812	2429.280	1.0947	68.136	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	20.4526	2429.280	1.1074	68.470	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	20.6180	2437.433	1.1160	68.693	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	20.8440	2453.738	1.1330	69.194	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	21.3577	2478.196	1.1586	69.862	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	21.0669	2478.077	1.1927	73.925	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	21.3237	2494.828	1.1969	74.037	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	21.3856	2503.203	1.2182	74.593	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	22.0462	2536.705	1.2523	75.540	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	22.3163	2549.268	1.2651	75.874	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications "For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-3W-15

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7053

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			1.035S+5'-8"
T2	#4	1	1	1	1	1	1	1	1			1.035S+6'-5 1/2"
T3	#4	1	1	1	1	1	1	1	1			1.035S+7'-3"
T4	#4	1	1	1	1	1	1	1	1			1.035S+8'-0 1/2"
T5	#4	1	1	1	1	1	1	1	1			1.035S+8'-9 1/2"
T6	#4	1	1	1	1	1	1	1	1			1.035S+9'-7"
T7	#4	1	1	1	1	1	1	1	1			1.035S+10'-4 1/2"
T8	#4	1	1	1	1	1	1	1	1			1.035S+11'-2"
T9	#4	1	1	1	1	1	1	1	1			1.035S+11'-11 1/2"
T10	#4	1	1	1	1	1	1	1	1			1.035S+12'-8 1/2"
T11	#4	1	1	1	1	1	1	1	1			1.035S+13'-6"
T12	#4	1	1	1	1	1	1	1	1			1.035S+14'-3 1/2"
T13	#4	1	1	1	1	1	1	1	1			1.035S+15'-1"
T14	#4	1	1	1	1	1	1	1	1			1.035S+15'-10 1/2"
T15	#4	1	1	1	1	1	1	1	1			1.035S+16'-8"
T16	#4	1	1	1	1	1	1	1	1			1.035S+17'-5"
T17	#4	1	1	1	1	1	1	1	1			1.035S+18'-2 1/2"
T18	#4	3	3	3	3	3	3	3	3			1.035S+14'-6 1/2"
V1	#4	12	14	16	18	20	22	24	26	17'-6"	1'-8"	19'-2"
VL1	#4	1	1	1	1	1	1	1	1	16'-1 1/2"	1'-8"	17'-9 1/2"
VL2	#4	1	1	1	1	1	1	1	1	13'-7 1/2"	1'-8"	15'-3 1/2"
VL3	#4	1	1	1	1	1	1	1	1	11'-2"	1'-8"	12'-10"
VL4	#4	1	1	1	1	1	1	1	1	8'-8"	1'-8"	10'-4"
VL5	#4	1	1	1	1	1	1	1	1	6'-2 1/2"	1'-8"	7'-10 1/2"
VL6	#4	1	1	1	1	1	1	1	1	3'-4"		3'-4"
VS1	#4	1	1	1	1	1	1	1	1	14'-7 1/2"	1'-8"	16'-3 1/2"
VS2	#4	1	1	1	1	1	1	1	1	11'-7"	1'-8"	13'-3"
VS3	#4	1	1	1	1	1	1	1	1	8'-7"	1'-8"	10'-3"
VS4	#4	1	1	1	1	1	1	1	1	5'-7"		5'-7"
VS5	#4	1	1	1	1	1	1	1	1	2'-5 1/2"		2'-5 1/2"
FTL1	#5	1	1	1	1	1	1	1	1			2'-1 1/2"
FTL2	#5	19	19	19	19	19	19	19	19			5'-5"
FTL3	#5	1	1	1	1	1	1	1	1			4'-7"
FTL4	#5	1	1	1	1	1	1	1	1			3'-2 1/2"
FTL5	#5	1	1	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7	7	7			20'-8"
FTS1	#5	17	17	17	17	17	17	17	17			5'-5"
FTS2	#5	1	1	1	1	1	1	1	1			1'-10"
FLS	#5	7	7	7	7	7	7	7	7			17'-0"
WS1	#5	1	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS2	#5	1	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WS3	#5	1	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WS4	#5	1	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WS5	#5	1	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WS6	#5	1	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WS7	#5	1	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WS8	#5	1	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WS9	#5	1	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
WS10	#5	1	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WS11	#5	1	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WS12	#5	1	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WS13	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-1 1/2"	W+3'-7 1/2"
WS14	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WS15	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
WS16	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS17	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WS18	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	12	12	12	12	12	12	12	12	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL2	#5	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL3	#5	1	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL4	#5	1	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WL5	#5	1	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WL6	#5	1	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"

HEIGHT = 6 FT.

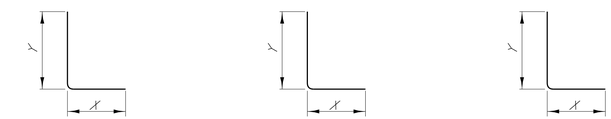
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WL7	#5	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL8	#5	1	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WL9	#5	1	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL10	#5	1	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL11	#5	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL12	#5	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL13	#5	1	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WL14	#5	1	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL15	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-4"	W+3'-10"
WL16	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
WL17	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WL18	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL19	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-3"	W+2'-9"
WL20	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-0"	W+2'-6"
WL21	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WL22	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	14	14	14	14	14	14	14	14	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RS2	#4	1	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
RS3	#4	1	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RS4	#4	1	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RS5	#4	1	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
RS6	#4	1	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RS7	#4	1	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
RS8	#4	1	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
RS9	#4	1	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RS10	#4	1	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RS11	#4	1	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
RS12	#4	1	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
RS13	#4	1	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
RS14	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
RS15	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RS16	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RS17	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RS18	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	13	13	13	13	13	13	13	13	1'-6"	W+2'-5"	W+3'-11"
RL1	#4	1	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
RL2	#4	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL3	#4	1	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL4	#4	1	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RL5	#4	1	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RL6	#4	1	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RL7	#4	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
RL8	#4	1	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL9	#4	1	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL10	#4	1	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
RL11	#4	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RL12	#4	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RL13	#4	1	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RL14	#4	1	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
RL15	#4	1	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RL16	#4	1	1	1	1	1	1	1	1	1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
RL17	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
RL18	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL19	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-3"	W+2'-9"
RL20	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-0"	W+2'-6"
RL21	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
RL22	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	15	15	15	15	15	15	15	15	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2	2			4'-3 1/2"
YS2	#4	2	2	2	2	2	2	2	2			7'-4"
YS3	#4	2	2	2	2	2	2	2	2			10'-4"
YS4	#4	2	2	2	2	2	2	2	2			13'-4"

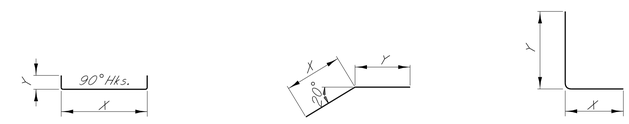
HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

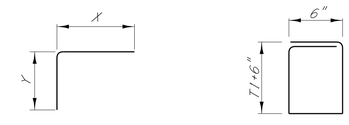
BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
YS5	#4	2	2	2	2	2	2	2	2			16'-4 1/2"
YS6	#4	4	4	4	4	4	4	6	6			17'-0"
YL1	#4	2	2	2	2	2	2	2	2			5'-3 1/2"
YL2	#4	2	2	2	2	2	2	2	2			8'-11 1/2"
YL3	#4	2	2	2	2	2	2	2	2			12'-7 1/2"
YL4	#4	2	2	2	2	2	2	2	2			16'-3 1/2"
YL5	#4	2	2	2	2	2	2	2	2			19'-11 1/2"
YL6	#4	4	4	4	4	4	4	6	6			20'-8 1/2"
FS	#4	2	2	2	2	2	2	2	2			17'-10 1/2"
FL	#4	2	2	2	2	2	2	2	2			21'-6"
N	#4	10	12	15	17	19	22	25	27	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			1.035(S+2V)+10 1/2"
K	#4	9	11	13	15	17	19	21	23	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			1.035S+1'-1 1/2"
OS	#7	8	8	8	8	8	8	9	9	3'-0"	3'-0"	6'-0"
OL	#7	8	8	8	8	8	8	9	9	3'-0"	3'-0"	6'-0"
OSS	#4	1	1	1	1	1	1	1	1			6'-0"+T1
OSL	#4	1	1	1	1	1	1	1	1			6'-0"+T1



BARS DRS/DRL - #4 BARS DWS/DWL - #5 BARS RSn/RLn - #4



BARS N - #4 DOWELS OS/OL - #7 BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4 BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-6-3W-15

SHEET NUMBER 7054

REVISIONS BY

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-4"	22'-1"	26'-10 5/16"	0'-0 13/16"	0'-5 3/8"	22'-0"	0'-11"	0'-9"	3'-0"	2'-3"	27'-0 3/8"	29'-1 11/16"	31'-2 9/16"	33'-3 3/8"	35'-4 1/4"	37'-5 1/16"	39'-5 15/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	22.3930	3158.196	0.5451	33.010	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	22.3930	3158.196	0.5451	33.010	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	22.4448	3158.196	0.5451	33.010	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	22.6109	3168.890	0.5493	33.122	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	22.6109	3168.890	0.5493	33.122	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	22.7432	3179.583	0.5579	33.344	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	23.5213	3246.600	0.6473	38.911	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	23.5622	3246.600	0.6473	38.911	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	23.6605	3252.059	0.6516	39.022	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	23.9149	3268.433	0.6558	39.134	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	23.9357	3268.433	0.6558	39.134	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	23.9357	3268.433	0.6558	39.134	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	24.5722	3324.506	0.7496	46.315	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	24.7255	3330.075	0.7581	46.537	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	24.8394	3341.214	0.7581	46.537	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	25.1647	3363.493	0.7624	46.704	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	25.2494	3369.062	0.7709	46.927	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	25.2494	3369.062	0.7709	46.927	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	25.7575	3413.773	0.8603	52.438	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	25.8689	3419.454	0.8603	52.438	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	26.0954	3436.497	0.8646	52.549	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	26.5216	3464.901	0.8731	52.772	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	26.2730	3447.858	0.8859	53.162	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	26.6191	3470.582	0.8944	53.384	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	26.8174	3491.856	0.9626	59.897	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	27.2029	3515.014	0.9754	60.231	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	27.5517	3543.975	0.9796	60.343	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	27.2679	3520.807	0.9924	60.677	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	27.6251	3543.975	0.9967	60.788	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	27.8735	3567.144	1.0265	61.623	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	28.0067	3670.687	1.0734	66.021	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	28.3745	3694.302	1.0819	66.243	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	28.4972	3706.109	1.0989	66.689	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	28.5727	3706.109	1.1074	66.911	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	29.0410	3741.530	1.1330	67.635	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	29.4706	3765.144	1.1500	68.080	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	29.7069	3797.185	1.1927	73.925	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	29.7122	3797.185	1.2012	74.148	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	29.6634	3791.170	1.2140	74.482	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	30.2011	3821.245	1.2353	75.039	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	30.6096	3857.334	1.2608	75.762	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	31.1293	3887.408	1.2821	76.319	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts reqardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-8-3W-15

SHEET NUMBER 7055

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.035S+6'-2 1/2"
T2	#4	1	1	1	1	1	1	1			1.035S+7'-0"
T3	#4	1	1	1	1	1	1	1			1.035S+7'-9"
T4	#4	1	1	1	1	1	1	1			1.035S+8'-6 1/2"
T5	#4	1	1	1	1	1	1	1			1.035S+9'-4"
T6	#4	1	1	1	1	1	1	1			1.035S+10'-1"
T7	#4	1	1	1	1	1	1	1			1.035S+10'-10 1/2"
T8	#4	1	1	1	1	1	1	1			1.035S+11'-8"
T9	#4	1	1	1	1	1	1	1			1.035S+12'-5"
T10	#4	1	1	1	1	1	1	1			1.035S+13'-2 1/2"
T11	#4	1	1	1	1	1	1	1			1.035S+13'-11 1/2"
T12	#4	1	1	1	1	1	1	1			1.035S+14'-9"
T13	#4	1	1	1	1	1	1	1			1.035S+15'-6 1/2"
T14	#4	1	1	1	1	1	1	1			1.035S+16'-3 1/2"
T15	#4	1	1	1	1	1	1	1			1.035S+17'-1"
T16	#4	1	1	1	1	1	1	1			1.035S+17'-10"
T17	#4	1	1	1	1	1	1	1			1.035S+18'-7 1/2"
T18	#4	1	1	1	1	1	1	1			1.035S+19'-5"
T19	#4	1	1	1	1	1	1	1			1.035S+20'-2"
T20	#4	1	1	1	1	1	1	1			1.035S+20'-11 1/2"
T21	#4	1	1	1	1	1	1	1			1.035S+21'-9"
T22	#4	1	1	1	1	1	1	1			1.035S+22'-1 1/2"
T23	#4	3	3	3	3	3	3	3			1.035S+18'-3 1/2"
V1	#4	14	16	18	20	22	24	26	22'-5"	1'-8"	24'-1"
VL1	#4	1	1	1	1	1	1	1	21'-9"	1'-8"	23'-5"
VL2	#4	1	1	1	1	1	1	1	19'-3 1/2"	1'-8"	20'-11 1/2"
VL3	#4	1	1	1	1	1	1	1	16'-9 1/2"	1'-8"	18'-5 1/2"
VL4	#4	1	1	1	1	1	1	1	14'-4"	1'-8"	16'-0"
VL5	#4	1	1	1	1	1	1	1	11'-10"	1'-8"	13'-6"
VL6	#4	1	1	1	1	1	1	1	9'-4 1/2"	1'-8"	11'-0 1/2"
VL7	#4	1	1	1	1	1	1	1	6'-10 1/2"	1'-8"	8'-6 1/2"
VL8	#4	1	1	1	1	1	1	1	4'-0"		4'-0"
VS1	#4	1	1	1	1	1	1	1	20'-3"	1'-8"	21'-11"
VS2	#4	1	1	1	1	1	1	1	17'-3"	1'-8"	18'-11"
VS3	#4	1	1	1	1	1	1	1	14'-3"	1'-8"	15'-11"
VS4	#4	1	1	1	1	1	1	1	11'-2 1/2"	1'-8"	12'-10 1/2"
VS5	#4	1	1	1	1	1	1	1	8'-2 1/2"	1'-8"	9'-10 1/2"
VS6	#4	1	1	1	1	1	1	1	5'-2"		5'-2"
VS7	#4	1	1	1	1	1	1	1	2'-0 1/2"		2'-0 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-7 1/2"
FTL2	#5	1	1	1	1	1	1	1			2'-7"
FTL3	#5	37	37	37	37	37	37	37			5'-8"
FTL4	#5	1	1	1	1	1	1	1			4'-10 1/2"
FTL5	#5	1	1	1	1	1	1	1			3'-11"
FTL6	#5	1	1	1	1	1	1	1			2'-11 1/2"
FTL7	#5	1	1	1	1	1	1	1			2'-8"
FLL	#4	7	7	7	7	7	7	7			26'-5 1/2"
FTS1	#5	33	33	33	33	33	33	33			5'-8"
FTS2	#5	1	1	1	1	1	1	1			2'-1"
FLS	#4	7	7	7	7	7	7	7			21'-9"
WS1	#5	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
WS2	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WS3	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WS4	#5	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
WS5	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WS6	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WS7	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WS8	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WS9	#5	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WS10	#5	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WS11	#5	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WS12	#5	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WS13	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS14	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WS15	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WS16	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS17	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WS18	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WS19	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WS20	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WS21	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WS22	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WS23	#5	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WS24	#5	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WS25	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WS26	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WS27	#5	1	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
WS28	#5	1	1	1	1	1	1	1	1'-6"	W+1'-9"	W+3'-3"
WS29	#5	1	1	1	1	1	1	1	1'-6"	W+1'-6 1/2"	W+3'-0 1/2"
WS30	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS31	#5	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS32	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WS33	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WS34	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	26	26	26	26	26	26	26	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL3	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WL4	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WL5	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL6	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL7	#5	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
WL8	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL9	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL10	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WL11	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL12	#5	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WL13	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL14	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL15	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL16	#5	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
WL17	#5	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL18	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL19	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WL20	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL21	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL22	#5	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL23	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WL24	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL25	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WL26	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL27	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL28	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL29	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL30	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WL31	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WL32	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WL33	#5	1	1	1	1	1	1	1	1'-6"	W+1'-10 1/2"	W+3'-4 1/2"
WL34	#5	1	1	1	1	1	1	1	1'-6"	W+1'-8 1/2"	W+3'-2 1/2"
WL35	#5	1	1	1	1	1	1	1	1'-6"	W+1'-6 1/2"	W+3'-0 1/2"
WL36	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL37	#5	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WL38	#5	1	1	1	1	1	1	1	1'-6"	W+1'-0"	W+2'-6"
WL39	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WL40	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WL41	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	32	32	32	32	32	32	32	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
RS2	#4	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
RS3	#4	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RS4	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RS5	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RS6	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RS7	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RS8	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS9	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS10	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RS11	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS12	#4	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RS13	#4	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
RS14	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS15	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RS16	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RS17	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS18	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RS19	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RS20	#4	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
RS21	#4	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RS22	#4	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RS23	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	19	19	19	19	19	19	19	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1			W+6'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
RL3	#4	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
RL4	#4	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RL5	#4	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
RL6	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RL7	#4	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RL8	#4	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL9	#4	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
RL10	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RL11	#4	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
RL12	#4	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RL13	#4	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RL14	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL15	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL16	#4	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
RL17	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RL18	#4	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL19	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RL20	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL21	#4	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RL22	#4	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL23	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RL24	#4	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL25	#4	1	1	1	1	1	1	1	1'-6"	W+1'-3"	W+2'-9"
RL26	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL27	#4	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
RL28	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	23	23	23	23	23	23	23	1'-6"	2'-5"	3'-11"

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

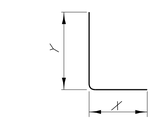
SHT. 2 OF 3

WORKING NUMBER IWS-8-3W-15

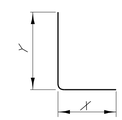
SHEET NUMBER 7056

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

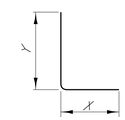
HEIGHT = 8 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		8'	10'	12'	14'	16'	18'	20'			
YS1	#4	2	2	2	2	2	2	2			4'-3 ½"
YS2	#4	2	2	2	2	2	2	2			7'-4"
YS3	#4	2	2	2	2	2	2	2			10'-4"
YS4	#4	2	2	2	2	2	2	2			13'-4"
YS5	#4	2	2	2	2	2	2	2			16'-4 ½"
YS6	#4	2	2	2	2	2	2	2			19'-3 ½"
YS7	#4	6	6	6	6	6	8	8			21'-9"
YL1	#4	2	2	2	2	2	2	2			5'-3 ½"
YL2	#4	2	2	2	2	2	2	2			8'-11 ½"
YL3	#4	2	2	2	2	2	2	2			12'-7 ½"
YL4	#4	2	2	2	2	2	2	2			16'-3 ½"
YL5	#4	2	2	2	2	2	2	2			19'-11 ½"
YL6	#4	2	2	2	2	2	2	2			23'-7 ½"
YL7	#4	6	6	6	6	6	8	8			26'-6 ½"
FS	#4	2	2	2	2	2	2	2			22'-11"
FL	#4	2	2	2	2	2	2	2			27'-6"
N	#4	12	14	17	19	22	24	27	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.035(S+2V)+0'-10 ½"
K	#4	11	13	15	17	19	21	23	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.035S+1'-1 ½"
OS	#7	10	10	10	10	10	11	11	3'-0"	3'-0"	6'-0"
OL	#7	10	10	10	10	10	11	11	3'-0"	3'-0"	6'-0"
OSS	#4	1	1	1	1	1	1	1			8'-0"+T1
OSL	#4	1	1	1	1	1	1	1			8'-0"+T1



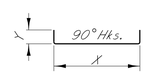
BARS DRS/DRL - #4



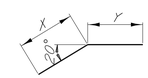
BARS DWS/DWL - #5



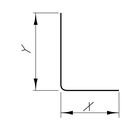
BARS RSn/RLn - #4



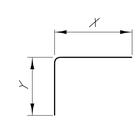
BARS N - #4



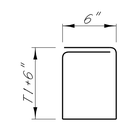
DOWELS OS/OL - #7



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 3 OF 3

WORKING NUMBER
IWS-8-3W-15

SHEET NUMBER
7057

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DATE | REVISIONS | BY

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-4"	25'-1 1/8"	30'-6 1/4"	0'-0 7/8"	0'-5 15/16"	25'-0"	0'-11"	0'-10"	4'-0"	2'-3"	31'-8"	33'-8 7/8"	35'-9 11/16"	37'-10 9/16"	39'-11 3/8"	42'-0 1/4"	44'-1 1/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	31.8831	4437.537	0.6558	40.692	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	31.9246	4437.537	0.6558	40.692	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	31.7812	4424.319	0.6601	40.804	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	32.1565	4450.755	0.6771	41.249	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	32.2284	4457.364	0.6771	41.249	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	32.5137	4477.192	0.6899	41.583	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	33.1760	4537.428	0.7581	46.537	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	33.2479	4537.428	0.7581	46.537	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	33.1768	4530.708	0.7624	46.704	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	33.5918	4557.590	0.7794	47.150	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	33.6905	4564.310	0.7837	47.261	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	33.6247	4557.590	0.7964	47.595	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	34.4466	4624.046	0.8603	52.438	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	34.4466	4624.046	0.8603	52.438	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	34.5930	4637.709	0.8689	52.661	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	35.1271	4671.868	0.8859	53.162	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	35.2990	4685.532	0.8859	53.162	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	35.2383	4678.700	0.9029	53.607	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	35.6375	4710.579	0.9711	60.120	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	35.8119	4724.466	0.9711	60.120	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	36.2706	4759.181	0.9839	60.454	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	36.3450	4766.124	0.9882	60.565	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	36.3418	4759.181	0.9967	60.788	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	36.8395	4793.897	1.0095	61.178	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	36.7743	4797.280	1.0819	66.243	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	37.1302	4825.498	1.0819	66.243	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	37.4936	4853.716	1.0947	66.577	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	37.4270	4846.661	1.1032	66.800	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	37.8254	4867.825	1.1117	67.023	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	38.2012	4888.988	1.1287	67.524	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	38.4884	5025.102	1.1841	73.647	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	38.3119	5010.770	1.1927	73.925	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	38.5756	5032.268	1.2097	74.371	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	39.1138	5060.931	1.2310	74.927	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	39.4219	5082.428	1.2438	75.261	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	40.0470	5125.423	1.2693	75.985	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	39.6446	5112.443	1.3034	79.993	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	39.7244	5119.720	1.3162	80.383	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	40.0004	5134.274	1.3247	80.605	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	40.8670	5192.491	1.3588	81.496	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-10-3W-15

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7058

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.035S+6'-5"
T2	#4	1	1	1	1	1	1	1			1.035S+7'-2"
T3	#4	1	1	1	1	1	1	1			1.035S+7'-11 1/2"
T4	#4	1	1	1	1	1	1	1			1.035S+8'-9"
T5	#4	1	1	1	1	1	1	1			1.035S+9'-6"
T6	#4	1	1	1	1	1	1	1			1.035S+10'-3 1/2"
T7	#4	1	1	1	1	1	1	1			1.035S+11'-1"
T8	#4	1	1	1	1	1	1	1			1.035S+11'-10"
T9	#4	1	1	1	1	1	1	1			1.035S+12'-7 1/2"
T10	#4	1	1	1	1	1	1	1			1.035S+13'-5"
T11	#4	1	1	1	1	1	1	1			1.035S+14'-2"
T12	#4	1	1	1	1	1	1	1			1.035S+14'-11 1/2"
T13	#4	1	1	1	1	1	1	1			1.035S+15'-9"
T14	#4	1	1	1	1	1	1	1			1.035S+16'-6"
T15	#4	1	1	1	1	1	1	1			1.035S+17'-3 1/2"
T16	#4	1	1	1	1	1	1	1			1.035S+18'-1"
T17	#4	1	1	1	1	1	1	1			1.035S+18'-10"
T18	#4	1	1	1	1	1	1	1			1.035S+19'-7 1/2"
T19	#4	1	1	1	1	1	1	1			1.035S+20'-5"
T20	#4	1	1	1	1	1	1	1			1.035S+21'-2"
T21	#4	1	1	1	1	1	1	1			1.035S+21'-11 1/2"
T22	#4	1	1	1	1	1	1	1			1.035S+22'-8 1/2"
T23	#4	1	1	1	1	1	1	1			1.035S+23'-6"
T24	#4	1	1	1	1	1	1	1			1.035S+24'-3 1/2"
T25	#4	1	1	1	1	1	1	1			1.035S+24'-8"
T26	#4	3	3	3	3	3	3	3			1.035S+20'-10"
V1	#4	16	18	20	22	24	26	28	25'-6 1/2"	1'-8"	27'-2 1/2"
VL1	#4	1	1	1	1	1	1	1	25'-1"	1'-8"	26'-9"
VL2	#4	1	1	1	1	1	1	1	22'-7"	1'-8"	24'-3"
VL3	#4	1	1	1	1	1	1	1	20'-1 1/2"	1'-8"	21'-9 1/2"
VL4	#4	1	1	1	1	1	1	1	17'-7 1/2"	1'-8"	19'-3 1/2"
VL5	#4	1	1	1	1	1	1	1	15'-1 1/2"	1'-8"	16'-9 1/2"
VL6	#4	1	1	1	1	1	1	1	12'-8"	1'-8"	14'-4"
VL7	#4	1	1	1	1	1	1	1	10'-2"	1'-8"	11'-10"
VL8	#4	1	1	1	1	1	1	1	7'-8 1/2"	1'-8"	9'-4 1/2"
VL9	#4	1	1	1	1	1	1	1	5'-0 1/2"		5'-0 1/2"
VL10	#4	1	1	1	1	1	1	1	1'-11"		1'-11"
VS1	#4	1	1	1	1	1	1	1	23'-7 1/2"	1'-8"	25'-3 1/2"
VS2	#4	1	1	1	1	1	1	1	20'-7"	1'-8"	22'-3"
VS3	#4	1	1	1	1	1	1	1	17'-5"	1'-8"	19'-3"
VS4	#4	1	1	1	1	1	1	1	14'-6 1/2"	1'-8"	16'-2 1/2"
VS5	#4	1	1	1	1	1	1	1	11'-6 1/2"	1'-8"	13'-2 1/2"
VS6	#4	1	1	1	1	1	1	1	8'-6 1/2"	1'-8"	10'-2 1/2"
VS7	#4	1	1	1	1	1	1	1	5'-6"		5'-6"
VS8	#4	1	1	1	1	1	1	1	2'-4 1/2"		2'-4 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-3 1/2"
FTL2	#5	1	1	1	1	1	1	1			2'-1 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-11 1/2"
FTL4	#5	1	1	1	1	1	1	1			3'-9 1/2"
FTL5	#5	47	47	47	47	47	47	47			6'-9"
FTL6	#5	1	1	1	1	1	1	1			6'-2"
FTL7	#5	1	1	1	1	1	1	1			5'-4"
FTL8	#5	1	1	1	1	1	1	1			4'-6"
FTL9	#5	1	1	1	1	1	1	1			3'-8 1/2"
FTL10	#5	1	1	1	1	1	1	1			2'-10 1/2"
FTL11	#5	1	1	1	1	1	1	1			2'-9"
FLL	#4	8	8	8	8	8	8	8			30'-1 1/2"
FTS1	#5	43	43	43	43	43	43	43			6'-9"
FTS2	#5	1	1	1	1	1	1	1			2'-1"
FLS	#4	8	8	8	8	8	8	8			24'-9"
WS1	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WS2	#5	1	1	1	1	1	1	1		W+7'-6"	W+7'-6"
WS3	#5	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WS4	#5	1	1	1	1	1	1	1		W+7'-1 1/2"	W+7'-1 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WS5	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WS6	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WS7	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WS8	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS9	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WS10	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WS11	#5	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
WS12	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WS13	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WS14	#5	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
WS15	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WS16	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WS17	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS18	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WS19	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WS20	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS21	#5	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS22	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WS23	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WS24	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WS25	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WS26	#5	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
WS27	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WS28	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WS29	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS30	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WS31	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WS32	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS33	#5	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WS34	#5	1	1	1	1	1	1	1		W+1'-4 1/2"	W+1'-4 1/2"
WS35	#5	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
WS36	#5	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
WS37	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WS38	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WS39	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WS40	#5	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
WS41	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WS42	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10"	W+2'-4"
WS43	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WS44	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	41	41	41	41	41	41	41	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WL3	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
WL4	#5	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
WL5	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL6	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL7	#5	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
WL8	#5	1	1	1	1	1	1	1		W+6'-7"	W+6'-7"
WL9	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL10	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL11	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WL12	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL13	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL14	#5	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
WL15	#5	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
WL16	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WL17	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL18	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL19	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL20	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL21	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL22	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL23	#5	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WL24	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WL25	#5	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WL26	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL27	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WL28	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WL29	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL30	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL31	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL32	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WL33	#5	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
WL34	#5	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
WL35	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL36	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL37	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL38	#5	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL39	#5	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WL40	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL41	#5	1	1	1	1	1	1	1		W+1'-4 1/2"	W+1'-4 1/2"
WL42	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL43	#5	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
WL44	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WL45	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WL46	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WL47	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL48	#5	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
WL49	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WL50	#5	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
WL51	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL52	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WL53	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	50	50	50	50	50	50	50	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RS2	#4	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
RS3	#4	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
RS4	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RS5	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RS6	#4	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
RS7	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RS8	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RS9	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RS10	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RS11	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS12	#4	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RS13	#4	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RS14	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS15	#4	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RS16	#4	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
RS17	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS18	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RS19	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 3

WORKING NUMBER IWS-10-3W-15

SHEET NUMBER 7059

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

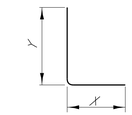
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RS20	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS21	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RS22	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RS23	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RS24	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RS25	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RS26	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	25	25	25	25	25	25	25	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
RL3	#4	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
RL4	#4	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
RL5	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RL6	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RL7	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RL8	#4	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
RL9	#4	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
RL10	#4	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
RL11	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RL12	#4	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
RL13	#4	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
RL14	#4	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL15	#4	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
RL16	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL17	#4	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RL18	#4	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL19	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RL20	#4	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
RL21	#4	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
RL22	#4	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL23	#4	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RL24	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL25	#4	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RL26	#4	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL27	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RL28	#4	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
RL29	#4	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
RL30	#4	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
RL31	#4	1	1	1	1	1	1	1		W-0'-3 1/2"	W-0'-3 1/2"
RL32	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	31	31	31	31	31	31	31	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			4'-3 1/2"
YS2	#4	2	2	2	2	2	2	2			7'-4"
YS3	#4	2	2	2	2	2	2	2			10'-4"
YS4	#4	2	2	2	2	2	2	2			13'-4"
YS5	#4	2	2	2	2	2	2	2			16'-4 1/2"
YS6	#4	2	2	2	2	2	2	2			19'-4 1/2"
YS7	#4	2	2	2	2	2	2	2			22'-4 1/2"
YS8	#4	8	8	8	8	8	10	10			24'-9"
YL1	#4	2	2	2	2	2	2	2			5'-3 1/2"
YL2	#4	2	2	2	2	2	2	2			8'-11 1/2"
YL3	#4	2	2	2	2	2	2	2			12'-7 1/2"
YL4	#4	2	2	2	2	2	2	2			16'-3 1/2"
YL5	#4	2	2	2	2	2	2	2			19'-11 1/2"
YL6	#4	2	2	2	2	2	2	2			23'-7 1/2"
YL7	#4	2	2	2	2	2	2	2			27'-3"
YL8	#4	8	8	8	8	8	10	10			30'-2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
FS	#4	2	2	2	2	2	2	2			26'-1"
FL	#4	2	2	2	2	2	2	2			31'-3 1/2"
N	#4	15	17	19	22	24	27	29	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.035(S+2V)+10 1/2"
K	#4	13	15	17	19	21	23	25	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.0355+1'-3 1/2"
OS	#7	12	12	12	12	12	13	13	3'-0 1/2"	3'-0 1/2"	6'-1"
OL	#7	12	12	12	12	12	13	13	3'-0 1/2"	3'-0 1/2"	6'-1"
OSS	#4	1	1	1	1	1	1	1			10'-0"+T1
OSL	#4	1	1	1	1	1	1	1			10'-0"+T1



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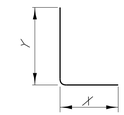

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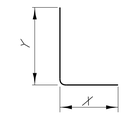

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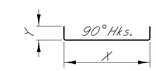
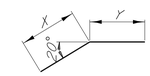
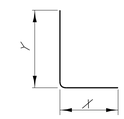


BARS N - #4



DOWELS OS/OL ~ #7



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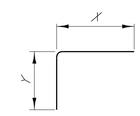

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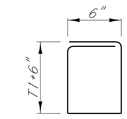


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 3 OF 3

WORKING NUMBER IWS-10-3W-15

SHEET NUMBER 7060

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DATE | REVISIONS | BY

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-7"	28'-10 5/16"	35'-1 3/16"	0'-1 1/16"	0'-7 1/8"	28'-9"	0'-11"	1'-0"	5'-0"	2'-3"	37'-0 3/16"	39'-1"	41'-1 7/8"	43'-2 3/8"	45'-3 9/16"	47'-4 7/16"	49'-5 1/4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	46.2017	6465.145	0.7666	46.816	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	46.2755	6465.145	0.7751	47.038	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	46.3266	6465.145	0.7837	47.261	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	46.9289	6507.032	0.8007	47.706	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	47.1529	6523.786	0.8007	47.706	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	46.9430	6507.032	0.7751	47.038	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	47.6967	6571.635	0.8689	54.219	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	47.8255	6580.124	0.8774	54.442	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	47.9832	6588.612	0.8859	54.720	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	48.6292	6631.055	0.9029	55.166	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	48.6028	6631.055	0.9072	55.277	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	48.8646	6648.032	0.9157	55.500	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	48.9716	6672.921	0.9711	60.120	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	49.2646	6690.232	0.9796	60.343	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	49.9271	6733.510	1.0009	60.899	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	49.6970	6716.198	1.0009	60.899	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	50.0986	6742.165	1.0137	61.289	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	50.4861	6768.132	1.0052	61.066	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	50.5799	6788.400	1.0734	66.021	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	50.8497	6805.934	1.0819	66.243	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	51.3591	6841.001	1.0989	66.689	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	51.3618	6841.001	1.1032	66.800	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	51.8884	6867.302	1.1245	67.357	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	52.4695	6911.137	1.1373	67.746	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	51.8336	6886.707	1.1841	72.088	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	52.1855	6904.464	1.1927	72.367	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	53.0393	6966.611	1.2054	72.701	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	53.3454	6975.490	1.2225	73.146	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	53.6699	6993.246	1.2310	73.369	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	53.4050	7002.855	1.3034	79.993	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	53.8212	7029.823	1.2949	79.770	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	54.2595	7056.792	1.3205	80.494	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	55.2653	7119.719	1.3375	80.939	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	55.8836	7164.667	1.3673	81.774	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	54.7361	7101.273	1.3972	85.671	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	55.4641	7146.778	1.4142	86.116	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	56.1091	7192.282	1.4312	86.617	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	57.1343	7255.989	1.4781	87.842	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications "For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-12-3W-15

SHEET NUMBER 7061

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.035S+6'-8 1/2"
T2	#4	1	1	1	1	1	1	1			1.035S+7'-6"
T3	#4	1	1	1	1	1	1	1			1.035S+8'-3"
T4	#4	1	1	1	1	1	1	1			1.035S+9'-0 1/2"
T5	#4	1	1	1	1	1	1	1			1.035S+9'-9 1/2"
T6	#4	1	1	1	1	1	1	1			1.035S+10'-7"
T7	#4	1	1	1	1	1	1	1			1.035S+11'-4"
T8	#4	1	1	1	1	1	1	1			1.035S+12'-1 1/2"
T9	#4	1	1	1	1	1	1	1			1.035S+12'-10 1/2"
T10	#4	1	1	1	1	1	1	1			1.035S+13'-8"
T11	#4	1	1	1	1	1	1	1			1.035S+14'-5"
T12	#4	1	1	1	1	1	1	1			1.035S+15'-2 1/2"
T13	#4	1	1	1	1	1	1	1			1.035S+16'-0"
T14	#4	1	1	1	1	1	1	1			1.035S+16'-9"
T15	#4	1	1	1	1	1	1	1			1.035S+17'-6 1/2"
T16	#4	1	1	1	1	1	1	1			1.035S+18'-3 1/2"
T17	#4	1	1	1	1	1	1	1			1.035S+19'-1"
T18	#4	1	1	1	1	1	1	1			1.035S+19'-10"
T19	#4	1	1	1	1	1	1	1			1.035S+20'-7 1/2"
T20	#4	1	1	1	1	1	1	1			1.035S+21'-4 1/2"
T21	#4	1	1	1	1	1	1	1			1.035S+22'-2"
T22	#4	1	1	1	1	1	1	1			1.035S+22'-11"
T23	#4	1	1	1	1	1	1	1			1.035S+23'-8 1/2"
T24	#4	1	1	1	1	1	1	1			1.035S+24'-5 1/2"
T25	#4	1	1	1	1	1	1	1			1.035S+25'-3"
T26	#4	1	1	1	1	1	1	1			1.035S+26'-0"
T27	#4	1	1	1	1	1	1	1			1.035S+26'-9 1/2"
T28	#4	1	1	1	1	1	1	1			1.035S+27'-6 1/2"
T29	#4	1	1	1	1	1	1	1			1.035S+27'-11"
T30	#4	3	3	3	3	3	3	3			1.035S+24'-1"
V1	#4	19	21	23	25	27	29	31	29'-5"	1'-8"	31'-1"
VL1	#4	1	1	1	1	1	1	1	26'-10 1/2"	1'-8"	28'-6 1/2"
VL2	#4	1	1	1	1	1	1	1	24'-4 1/2"	1'-8"	26'-0 1/2"
VL3	#4	1	1	1	1	1	1	1	21'-1"	1'-8"	23'-5"
VL4	#4	1	1	1	1	1	1	1	19'-5"	1'-8"	21'-1"
VL5	#4	1	1	1	1	1	1	1	16'-11"	1'-8"	18'-7"
VL6	#4	1	1	1	1	1	1	1	14'-5 1/2"	1'-8"	16'-1 1/2"
VL7	#4	1	1	1	1	1	1	1	11'-11 1/2"	1'-8"	13'-7 1/2"
VL8	#4	1	1	1	1	1	1	1	9'-6"	1'-8"	11'-2"
VL9	#4	1	1	1	1	1	1	1	7'-0"	1'-8"	8'-8"
VL10	#4	1	1	1	1	1	1	1	4'-2"		4'-2"
VL11	#4	1	1	1	1	1	1	1	1'-1"		1'-1"
VS1	#4	1	1	1	1	1	1	1	27'-11 1/2"	1'-8"	29'-7 1/2"
VS2	#4	1	1	1	1	1	1	1	24'-11 1/2"	1'-8"	26'-7 1/2"
VS3	#4	1	1	1	1	1	1	1	21'-11"	1'-8"	23'-7"
VS4	#4	1	1	1	1	1	1	1	18'-11"	1'-8"	20'-7"
VS5	#4	1	1	1	1	1	1	1	15'-11"	1'-8"	17'-7"
VS6	#4	1	1	1	1	1	1	1	12'-10 1/2"	1'-8"	14'-6 1/2"
VS7	#4	1	1	1	1	1	1	1	9'-10 1/2"	1'-8"	11'-6 1/2"
VS8	#4	1	1	1	1	1	1	1	6'-10 1/2"	1'-8"	8'-6 1/2"
VS9	#4	1	1	1	1	1	1	1	3'-9"		3'-9"
FTL1	#5	1	1	1	1	1	1	1			1'-6 1/2"
FTL2	#5	1	1	1	1	1	1	1			2'-3"
FTL3	#5	1	1	1	1	1	1	1			2'-11 1/2"
FTL4	#5	1	1	1	1	1	1	1			3'-8"
FTL5	#5	1	1	1	1	1	1	1			4'-4 1/2"
FTL6	#5	1	1	1	1	1	1	1			5'-1"
FTL7	#5	62	62	62	62	62	62	62			7'-11"
FTL8	#5	1	1	1	1	1	1	1			7'-8 1/2"
FTL9	#5	1	1	1	1	1	1	1			7'-0"
FTL10	#5	1	1	1	1	1	1	1			6'-3 1/2"
FTL11	#5	1	1	1	1	1	1	1			5'-7"
FTL12	#5	1	1	1	1	1	1	1			4'-10 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
FTL13	#5	1	1	1	1	1	1	1			4'-2"
FTL14	#5	1	1	1	1	1	1	1			3'-5 1/2"
FTL15	#5	2	2	2	2	2	2	2			2'-11"
FLL	#4	9	9	9	9	9	9	9			34'-8 1/2"
FTS1	#5	58	58	58	58	58	58	58			7'-11"
FTS2	#5	1	1	1	1	1	1	1			2'-1"
FLS	#4	9	9	9	9	9	9	9			28'-6 1/2"
WS1	#5	1	1	1	1	1	1	1		W+8'-11"	W+8'-11"
WS2	#5	1	1	1	1	1	1	1		W+8'-9"	W+8'-9"
WS3	#5	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
WS4	#5	1	1	1	1	1	1	1		W+8'-5 1/2"	W+8'-5 1/2"
WS5	#5	1	1	1	1	1	1	1		W+8'-3 1/2"	W+8'-3 1/2"
WS6	#5	1	1	1	1	1	1	1		W+8'-1 1/2"	W+8'-1 1/2"
WS7	#5	1	1	1	1	1	1	1		W+7'-11 1/2"	W+7'-11 1/2"
WS8	#5	1	1	1	1	1	1	1		W+7'-9 1/2"	W+7'-9 1/2"
WS9	#5	1	1	1	1	1	1	1		W+7'-7 1/2"	W+7'-7 1/2"
WS10	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WS11	#5	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WS12	#5	1	1	1	1	1	1	1		W+7'-1 1/2"	W+7'-1 1/2"
WS13	#5	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
WS14	#5	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
WS15	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WS16	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WS17	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS18	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WS19	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WS20	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WS21	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WS22	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WS23	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WS24	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WS25	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WS26	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WS27	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WS28	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WS29	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WS30	#5	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
WS31	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS32	#5	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS33	#5	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
WS34	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WS35	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WS36	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WS37	#5	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
WS38	#5	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WS39	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WS40	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WS41	#5	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WS42	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WS43	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WS44	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WS45	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS46	#5	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
WS47	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WS48	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WS49	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WS50	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WS51	#5	1	1	1	1	1	1	1		W+0'-9"	W+0'-9"
WS52	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WS53	#5	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
WS54	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WS55	#5	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
WS56	#5	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
WS57	#5	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
WS58	#5	1	1	1	1	1	1	1		W-0'-4 1/2"	W-0'-4 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WS59	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	59	59	59	59	59	59	59	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-11 1/2"	W+8'-11 1/2"
WL2	#5	1	1	1	1	1	1	1		W+8'-9 1/2"	W+8'-9 1/2"
WL3	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WL4	#5	1	1	1	1	1	1	1		W+8'-6 1/2"	W+8'-6 1/2"
WL5	#5	1	1	1	1	1	1	1		W+8'-5"	W+8'-5"
WL6	#5	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
WL7	#5	1	1	1	1	1	1	1		W+8'-1 1/2"	W+8'-1 1/2"
WL8	#5	1	1	1	1	1	1	1		W+8'-0"	W+8'-0"
WL9	#5	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
WL10	#5	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
WL11	#5	1	1	1	1	1	1	1		W+7'-7"	W+7'-7"
WL12	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL13	#5	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
WL14	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WL15	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL16	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL17	#5	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
WL18	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL19	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL20	#5	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
WL21	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL22	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL23	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL24	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WL25	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WL26	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WL27	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL28	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WL29	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL30	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL31	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL32	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WL33	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WL34	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL35	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL36	#5	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
WL37	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL38	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL39	#5	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL40	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL41	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WL42	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WL43	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL44	#5	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WL45	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL46	#5	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL47	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WL48	#5	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL49	#5	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL50	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 3

WORKING NUMBER
IWS-12-3W-15

SHEET NUMBER
7062

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

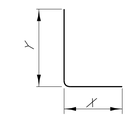
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL51	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL52	#5	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
WL53	#5	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WL54	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WL55	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL56	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL57	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL58	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL59	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WL60	#5	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
WL61	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WL62	#5	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
WL63	#5	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
WL64	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL65	#5	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
WL66	#5	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
WL67	#5	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
WL68	#5	1	1	1	1	1	1	1		W-0'-1 1/2"	W-0'-1 1/2"
WL69	#5	1	1	1	1	1	1	1		W-0'-3 1/2"	W-0'-3 1/2"
WL70	#5	1	1	1	1	1	1	1		W-0'-5"	W-0'-5"
WL71	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	71	71	71	71	71	71	71	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+8'-11"	W+8'-11"
RS2	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RS3	#4	1	1	1	1	1	1	1		W+8'-3 1/2"	W+8'-3 1/2"
RS4	#4	1	1	1	1	1	1	1		W+7'-11 1/2"	W+7'-11 1/2"
RS5	#4	1	1	1	1	1	1	1		W+7'-7 1/2"	W+7'-7 1/2"
RS6	#4	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
RS7	#4	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
RS8	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RS9	#4	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
RS10	#4	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
RS11	#4	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
RS12	#4	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
RS13	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RS14	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RS15	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS16	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS17	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RS18	#4	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
RS19	#4	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
RS20	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RS21	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS22	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RS23	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RS24	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS25	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RS26	#4	1	1	1	1	1	1	1		W+0'-9"	W+0'-9"
RS27	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RS28	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RS29	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RS30	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	30	30	30	30	30	30	30	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+8'-11 1/2"	W+8'-11 1/2"
RL2	#4	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
RL3	#4	1	1	1	1	1	1	1		W+8'-5"	W+8'-5"
RL4	#4	1	1	1	1	1	1	1		W+8'-1 1/2"	W+8'-1 1/2"
RL5	#4	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
RL6	#4	1	1	1	1	1	1	1		W+7'-7"	W+7'-7"
RL7	#4	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
RL8	#4	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
RL9	#4	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
RL10	#4	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
RL11	#4	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
RL12	#4	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"

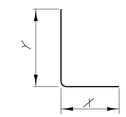
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

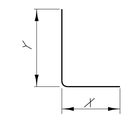
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
RL13	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RL14	#4	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
RL15	#4	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
RL16	#4	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
RL17	#4	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
RL18	#4	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RL19	#4	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RL20	#4	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
RL21	#4	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RL22	#4	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
RL23	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL24	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RL25	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RL26	#4	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RL27	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RL28	#4	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
RL29	#4	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RL30	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RL31	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RL32	#4	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
RL33	#4	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
RL34	#4	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
RL35	#4	1	1	1	1	1	1	1		W-0'-3 1/2"	W-0'-3 1/2"
RL36	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	36	36	36	36	36	36	36	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			3'-9 1/2"
YS2	#4	2	2	2	2	2	2	2			6'-4"
YS3	#4	2	2	2	2	2	2	2			8'-10"
YS4	#4	2	2	2	2	2	2	2			11'-4"
YS5	#4	2	2	2	2	2	2	2			13'-10"
YS6	#4	2	2	2	2	2	2	2			16'-4 1/2"
YS7	#4	2	2	2	2	2	2	2			18'-10 1/2"
YS8	#4	2	2	2	2	2	2	2			21'-4 1/2"
YS9	#4	2	2	2	2	2	2	2			23'-10 1/2"
YS10	#4	2	2	2	2	2	2	2			26'-4 1/2"
YS11	#4	12	12	12	12	12	12	12			28'-6 1/2"
YL1	#4	2	2	2	2	2	2	2			4'-8"
YL2	#4	2	2	2	2	2	2	2			7'-9"
YL3	#4	2	2	2	2	2	2	2			10'-9 1/2"
YL4	#4	2	2	2	2	2	2	2			13'-10"
YL5	#4	2	2	2	2	2	2	2			16'-10 1/2"
YL6	#4	2	2	2	2	2	2	2			19'-11 1/2"
YL7	#4	2	2	2	2	2	2	2			23'-0"
YL8	#4	2	2	2	2	2	2	2			26'-0 1/2"
YL9	#4	2	2	2	2	2	2	2			29'-1"
YL10	#4	2	2	2	2	2	2	2			32'-2"
YL11	#4	12	12	12	12	12	12	12			34'-9"
FS	#4	2	2	2	2	2	2	2			30'-0 1/2"
FL	#4	2	2	2	2	2	2	2			36'-0 1/2"
N	#4	17	20	22	24	26	29	31	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.035(S+2V)+10 1/2"
K	#4	15	17	20	22	24	26	28	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			1.035S+1'-7 1/2"
OS	#7	17	17	17	17	17	17	17	3'-2"	3'-2"	6'-4"
OL	#7	17	17	17	17	17	17	17	3'-2"	3'-2"	6'-4"
OSS	#4	1	1	1	1	1	1	1			12'-0"+T1
OSL	#4	1	1	1	1	1	1	1			12'-0"+T1



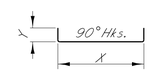
BARS DRS/DRL - #4



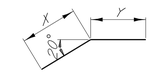
BARS DWS/DWL - #5



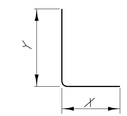
BARS RSn/RLn - #4



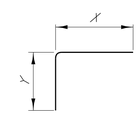
BARS N - #4



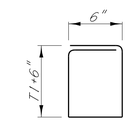
DOWELS OS/OL - #7



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

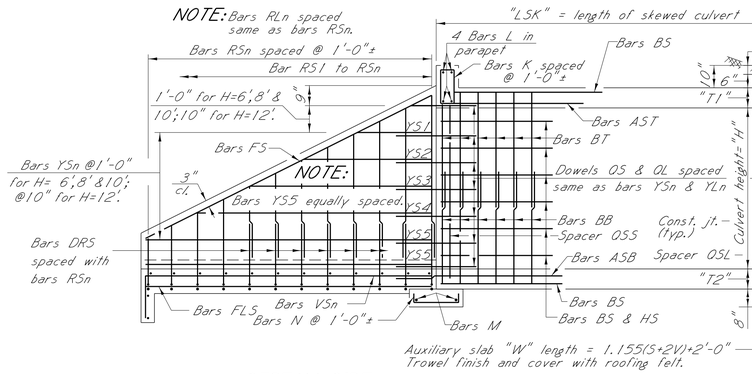
SHT. 3 OF 3

WORKING NUMBER IWS-12-3W-15

SHEET NUMBER 7063

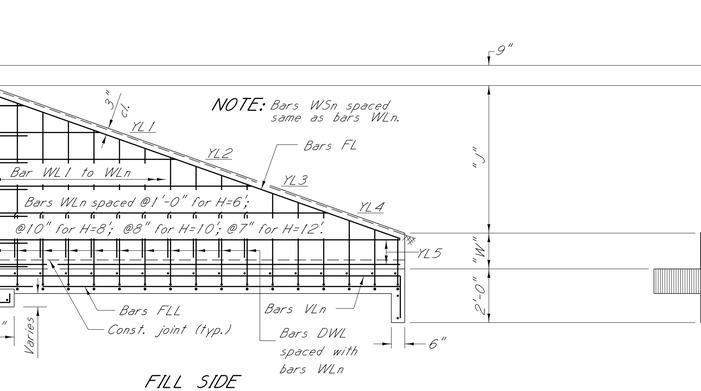
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



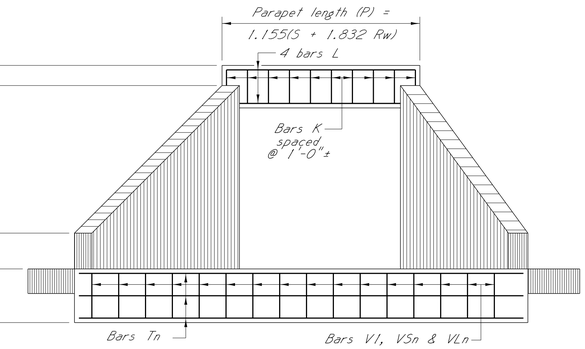
STREAM SIDE

Showing reinforcement in stream side of "LW1" wingwall



FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall



END ELEVATION

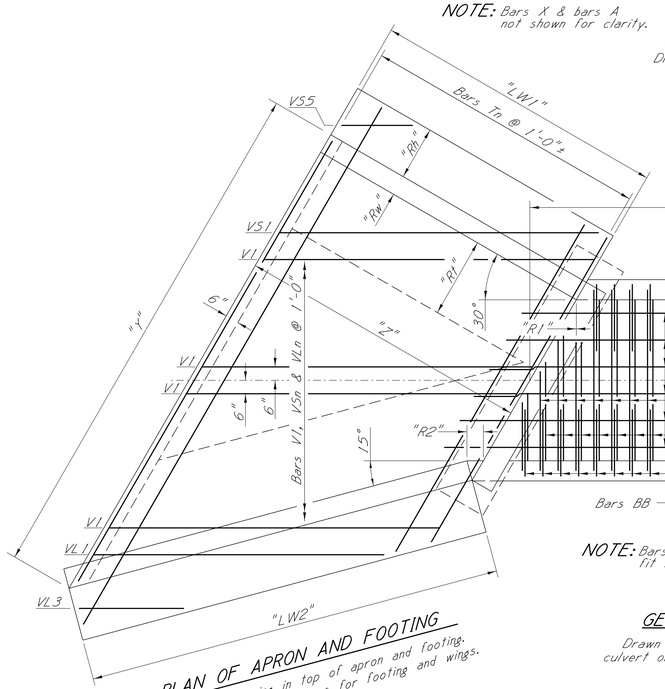
Showing reinforcing in pararpet & toe wall

NOTE: Bars X & bars A not shown for clarity.

NOTE: Culvert shall be sloped to conform to gradient of stream.

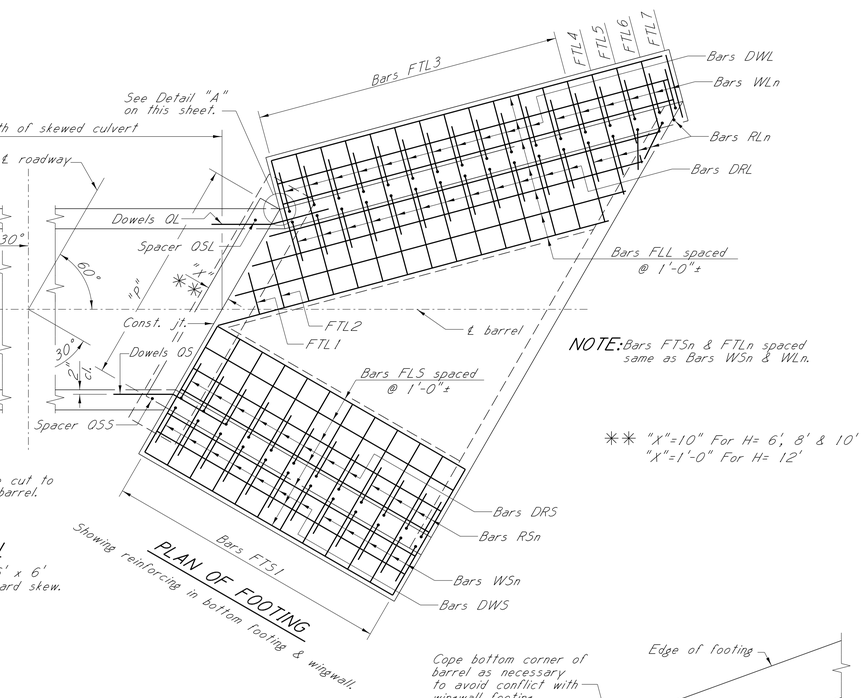
LONGITUDINAL SECTION

Drawn for single cell 6' x 6' culvert



PLAN OF APRON AND FOOTING

Showing reinforcing in top of apron and footing.
Showing concrete dimensions for footing and wings.



NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.

** "X"=10" For H= 6', 8' & 10'
"X"=1'-0" For H= 12'

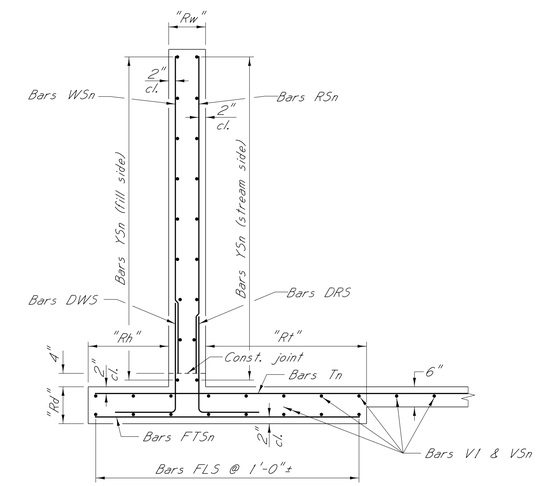
PLAN OF FOOTING

Showing reinforcing in bottom footing & wingwall.

NOTE: Bars A & X shall be cut to fit skew at end of barrel.

GENERAL PLAN

Drawn for single cell 6' x 6' culvert on 30° right forward skew.



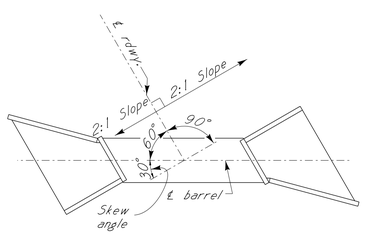
CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

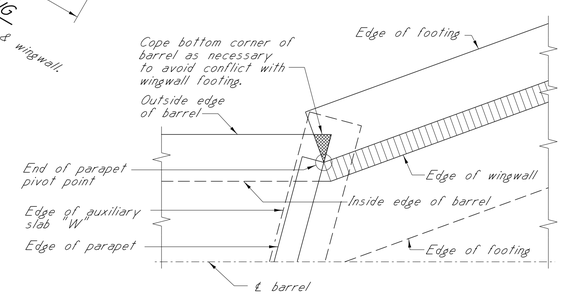
NOTE: For bar bending details and quantities, see drawings IWS-6-2W-30, IWS-8-2W-30, IWS-10-2W-30 & IWS-12-2W-30.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)



PLAN OF 30° LEFT FORWARD SKEW



DETAIL "A"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 6-24 FT.

SHT. 1 OF 1

WORKING NUMBER IWS-2W-30

SHEET NUMBER 7064

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN							
											6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-6"	11'-0"	15'-6 11/16"	0'-0"	0'-7 3/8"	11'-0"	0'-11"	0'-9"	3'-0"	2'-0"	19'-6 3/16"	21'-9 7/8"	24'-1 5/8"	26'-5 5/16"	28'-9"	31'-0 3/4"	33'-4 7/16"	35'-8 3/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	9.8874	1363.885	0.5176	32.287	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	9.8874	1363.885	0.5176	32.287	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	9.8874	1363.885	0.5176	32.287	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	9.9211	1363.885	0.5176	32.287	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	9.9211	1363.885	0.5176	32.287	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	9.9211	1363.885	0.5176	32.287	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	10.5452	1475.830	0.6317	38.466	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	10.5452	1475.830	0.6317	38.466	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	10.5656	1475.830	0.6317	38.466	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	10.6891	1481.412	0.6317	38.466	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	10.6686	1481.412	0.6317	38.466	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	10.7716	1486.994	0.6317	38.466	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	11.2397	1527.683	0.7457	46.203	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	11.2397	1527.683	0.7457	46.203	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	11.3258	1533.488	0.7457	46.203	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	11.5221	1545.098	0.7457	46.203	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	11.5487	1545.098	0.7552	46.482	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	11.6945	1553.805	0.7647	46.760	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	11.9039	1582.495	0.8597	52.438	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	12.0487	1588.522	0.8597	52.438	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	12.1395	1594.550	0.8645	52.549	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	12.3790	1606.605	0.8740	52.828	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	12.4453	1609.619	0.8883	53.217	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	12.3875	1606.605	0.8930	53.329	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	12.6624	1640.285	0.9785	60.343	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	12.8196	1649.827	0.9833	60.454	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	12.9460	1659.369	0.9880	60.565	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	13.3013	1675.273	1.0023	60.955	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	13.0868	1662.550	1.0166	61.345	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	13.2557	1672.093	1.0308	61.734	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	13.5140	1702.209	1.1211	68.860	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	13.6124	1708.794	1.1211	68.860	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	13.9804	1728.546	1.1211	68.860	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	13.7487	1718.670	1.1354	69.249	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	14.0002	1728.546	1.1496	69.639	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	14.2164	1741.715	1.1686	70.140	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	14.1569	1757.995	1.2256	76.375	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	14.5913	1778.416	1.2446	76.876	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	14.5594	1778.416	1.2589	77.265	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	14.7107	1785.223	1.2684	77.488	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	14.8921	1798.837	1.2874	78.045	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	15.3702	1819.257	1.3159	78.824	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	15.0491	1820.636	1.3539	82.943	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	15.2637	1834.918	1.3587	83.055	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	15.2962	1842.058	1.3824	83.723	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	15.9020	1870.622	1.4205	84.725	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	16.1567	1881.334	1.4347	85.114	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-2W-30

SHEET NUMBER 7065

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

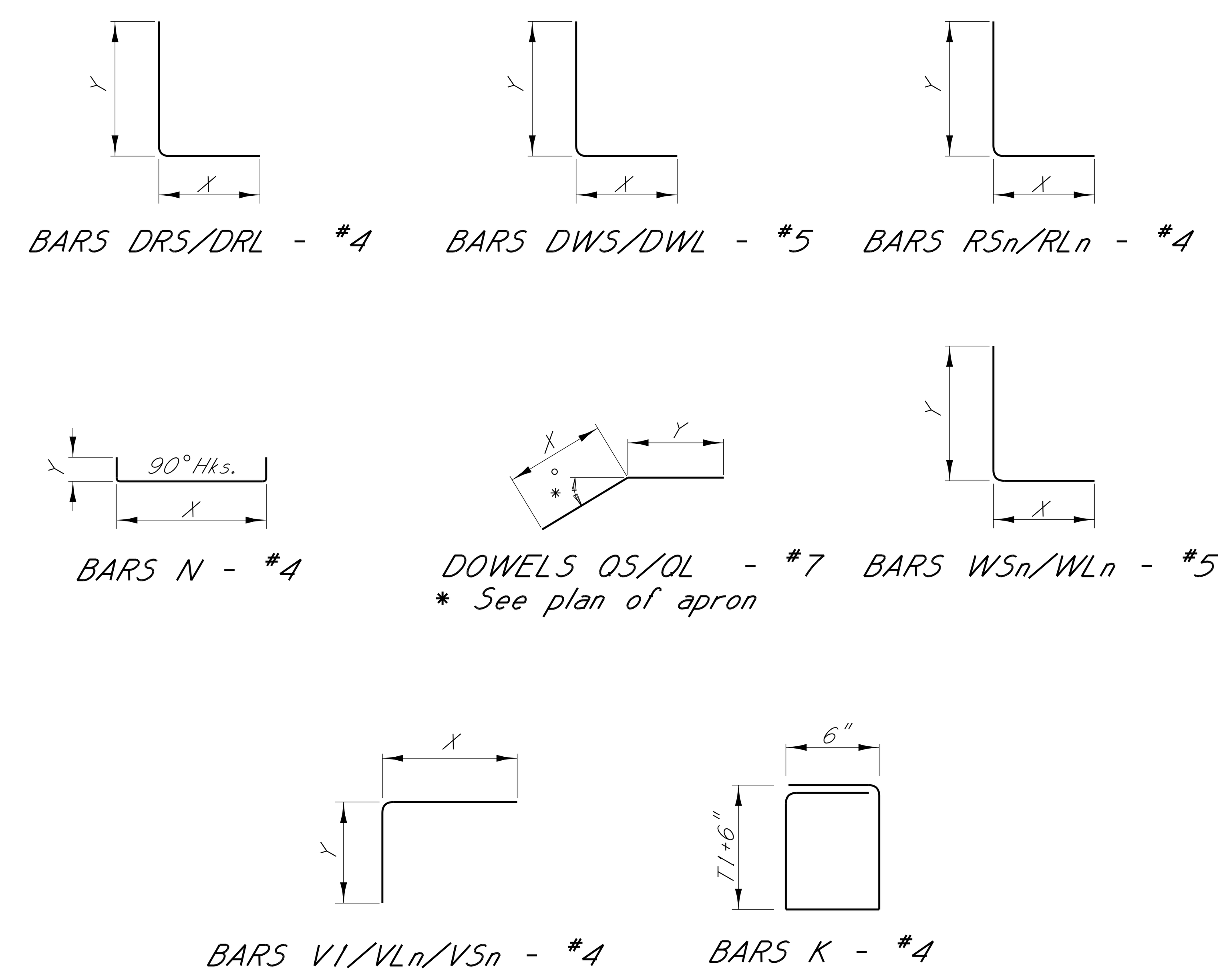
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED								DIM.	DIM.	LENGTH
		SPAN								X	Y	
		6'	8'	10'	12'	14'	16'	18'	20'			
T1	#4	1	1	1	1	1	1	1	1			1.155S+6'-2 ½"
T2	#4	1	1	1	1	1	1	1	1			1.155S+7'-2"
T3	#4	1	1	1	1	1	1	1	1			1.155S+8'-1 ½"
T4	#4	1	1	1	1	1	1	1	1			1.155S+9'-1"
T5	#4	1	1	1	1	1	1	1	1			1.155S+10'-1"
T6	#4	1	1	1	1	1	1	1	1			1.155S+11'-0 ½"
T7	#4	1	1	1	1	1	1	1	1			1.155S+12'-0"
T8	#4	1	1	1	1	1	1	1	1			1.155S+12'-11 ½"
T9	#4	1	1	1	1	1	1	1	1			1.155S+13'-11 ½"
T10	#4	1	1	1	1	1	1	1	1			1.155S+14'-11"
T11	#4	1	1	1	1	1	1	1	1			1.155S+15'-4"
T12	#4	3	3	3	3	3	3	3	3			1.155S+12'-0 ½"
V1	#4	11	13	15	17	19	21	23	25	12'-4"	1'-8"	14'-0"
VL1	#4	1	1	1	1	1	1	1	1	10'-10"	1'-8"	12'-6"
VL2	#4	1	1	1	1	1	1	1	1	7'-8"		7'-8"
VL3	#4	1	1	1	1	1	1	1	1	3'-11"		3'-11"
VS1	#4	1	1	1	1	1	1	1	1	11'-11"	1'-8"	13'-7"
VS2	#4	1	1	1	1	1	1	1	1	9'-7"	1'-8"	11'-3"
VS3	#4	1	1	1	1	1	1	1	1	7'-3 ½"	1'-8"	8'-11 ½"
VS4	#4	1	1	1	1	1	1	1	1	4'-11 ½"	1'-8"	6'-7 ½"
VS5	#4	1	1	1	1	1	1	1	1	2'-8"		2'-8"
FTL1	#5	1	1	1	1	1	1	1	1			1'-7 ½"
FTL2	#5	1	1	1	1	1	1	1	1			2'-7"
FTL3	#5	13	13	13	13	13	13	13	13			5'-5"
FTL4	#5	1	1	1	1	1	1	1	1			4'-7 ½"
FTL5	#5	1	1	1	1	1	1	1	1			3'-8"
FTL6	#5	1	1	1	1	1	1	1	1			2'-8 ½"
FTL7	#5	1	1	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7	7	7			15'-1"
FTS1	#5	12	12	12	12	12	12	12	12			5'-5"
FLS	#4	7	7	7	7	7	7	7	7			10'-8"
WS1	#5	1	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
WS2	#5	1	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WS3	#5	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WS4	#5	1	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
WS5	#5	1	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
WS6	#5	1	1	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
WS7	#5	1	1	1	1	1	1	1	1		W+1'-10 ½"	W+1'-10 ½"
WS8	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-5"	W+3'-11"
WS9	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WS10	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
WS11	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-11 ½"	W+2'-5 ½"
WS12	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	7	7	7	7	7	7	7	7	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL2	#5	1	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WL3	#5	1	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL4	#5	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL5	#5	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL6	#5	1	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL7	#5	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL8	#5	1	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WL9	#5	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL10	#5	1	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL11	#5	1	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
WL12	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-1 ½"	W+3'-7 ½"
WL13	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
WL14	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-5 ½"	W+2'-11 ½"
WL15	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 ½"	W+2'-7 ½"
WL16	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"
WL17	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	11	11	11	11	11	11	11	11	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
RS2	#4	1	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED								DIM.	DIM.	LENGTH
		SPAN								X	Y	
		6'	8'	10'	12'	14'	16'	18'	20'			
RS3	#4	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS4	#4	1	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS5	#4	1	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
RS6	#4	1	1	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
RS7	#4	1	1	1	1	1	1	1	1		W+1'-10 ½"	W+1'-10 ½"
RS8	#4	1	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS9	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
RS10	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
RS11	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-11 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	8	8	8	8	8	8	8	8	1'-6"	2'-5"	W+3'-11"
RL1	#4	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL2	#4	1	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
RL3	#4	1	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
RL4	#4	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RL5	#4	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
RL6	#4	1	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL7	#4	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL8	#4	1	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
RL9	#4	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RL10	#4	1	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RL11	#4	1	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
RL12	#4	1	1	1	1	1	1	1	1		W+1'-1 ½"	W+1'-1 ½"
RL13	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
RL14	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-5 ½"	W+2'-11 ½"
RL15	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 ½"	W+2'-7 ½"
RL16	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"
RL17	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	12	12	12	12	12	12	12	12	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2	2			2'-9 ½"
YS2	#4	2	2	2	2	2	2	2	2			4'-9 ½"
YS3	#4	2	2	2	2	2	2	2	2			6'-9 ½"
YS4	#4	2	2	2	2	2	2	2	2			8'-9 ½"
YS5	#4	4	6	6	6	6	6	6	6			10'-8"
YL1	#4	2	2	2	2	2	2	2	2			4'-0 ½"
YL2	#4	2	2	2	2	2	2	2	2			6'-10 ½"
YL3	#4	2	2	2	2	2	2	2	2			9'-8 ½"
YL4	#4	2	2	2	2	2	2	2	2			12'-6"
YL5	#4	4	6	6	6	6	6	6	6			15'-2 ½"
FS	#4	2	2	2	2	2	2	2	2			11'-11"
FL	#4	2	2	2	2	2	2	2	2			16'-2"
N	#4	12	14	17	19	22	25	28	30	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	10	12	14	16	19	21	23	26	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			1.155S+1'-3"
OS	#7	7	7	7	7	7	7	7	7	3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	7	7	7	7	7	7	7	7	3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1	1	1	1			6'-0"+T1
OSL	#4	1	1	1	1	1	1	1	1			6'-0"+T1



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-6-2W-30

SHEET NUMBER 7066

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-1"	14'-2"	20'-0 7/16"	0'-0"	0'-7 3/8"	14'-2"	0'-11"	0'-9"	3'-0"	2'-0"	24'-11 7/8"	27'-3 5/8"	29'-7 5/16"	31'-11"	34'-2 3/4"	36'-6 7/16"	38'-10 3/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 COLLAR (0° SKEW) CONC. cu. yd.	1 COLLAR (0° SKEW) REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	14.9580	2121.844	0.6317	38.466	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	14.9580	2121.844	0.6317	38.466	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	15.0193	2121.844	0.6317	38.466	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	15.1609	2129.032	0.6364	38.577	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	15.1609	2129.032	0.6364	38.577	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	15.2627	2136.221	0.6459	38.855	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	15.8367	2190.516	0.7457	44.645	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	15.8846	2190.516	0.7457	44.645	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	15.9730	2194.222	0.7505	44.812	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	16.1909	2205.339	0.7552	44.923	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	16.2153	2205.339	0.7552	44.923	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	16.2153	2205.339	0.7552	44.923	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	16.6772	2252.083	0.8597	52.438	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	16.8296	2255.900	0.8692	52.661	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	16.9094	2263.535	0.8692	52.661	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	17.1832	2278.803	0.8740	52.828	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	17.2560	2282.620	0.8835	53.050	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	17.2560	2282.620	0.8835	53.050	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	17.6208	2324.235	0.9833	60.454	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	17.7239	2328.219	0.9833	60.454	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	17.9086	2340.171	0.9880	60.565	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	18.2732	2360.092	0.9975	60.844	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	18.0639	2348.139	1.0118	61.233	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	18.3625	2364.076	1.0213	61.456	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	18.4704	2385.997	1.0973	68.192	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	18.8133	2402.379	1.1116	68.581	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	19.0876	2422.856	1.1163	68.748	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	18.8639	2406.474	1.1306	69.082	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	19.1746	2422.856	1.1354	69.249	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	19.3623	2439.237	1.1686	70.140	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	19.4177	2456.173	1.2209	76.208	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	19.7396	2473.000	1.2304	76.486	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	19.8313	2481.413	1.2494	76.987	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	19.9197	2481.413	1.2589	77.265	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	20.3104	2506.653	1.2874	78.045	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	20.7093	2523.480	1.3064	78.546	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	20.8003	2626.459	1.3539	84.502	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	20.8073	2626.459	1.3634	84.780	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	20.7783	2622.086	1.3777	85.170	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	21.2750	2643.954	1.4015	85.782	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	21.5978	2670.197	1.4300	86.562	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	22.0785	2692.065	1.4537	87.230	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 8 FT. SHT. 1 OF 2

SPANS 8-20 FT.

WORKING NUMBER IWS-8-2W-30

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7067

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.155S+6'-2"
T2	#4	1	1	1	1	1	1	1			1.155S+7'-2"
T3	#4	1	1	1	1	1	1	1			1.155S+8'-1 1/2"
T4	#4	1	1	1	1	1	1	1			1.155S+9'-1 1/2"
T5	#4	1	1	1	1	1	1	1			1.155S+10'-1 1/2"
T6	#4	1	1	1	1	1	1	1			1.155S+11'-1 1/2"
T7	#4	1	1	1	1	1	1	1			1.155S+12'-1"
T8	#4	1	1	1	1	1	1	1			1.155S+13'-1"
T9	#4	1	1	1	1	1	1	1			1.155S+14'-1"
T10	#4	1	1	1	1	1	1	1			1.155S+15'-0 1/2"
T11	#4	1	1	1	1	1	1	1			1.155S+16'-0 1/2"
T12	#4	1	1	1	1	1	1	1			1.155S+17'-0 1/2"
T13	#4	1	1	1	1	1	1	1			1.155S+18'-0 1/2"
T14	#4	1	1	1	1	1	1	1			1.155S+18'-6"
T15	#4	3	3	3	3	3	3	3			1.155S+15'-2"
V1	#4	13	15	17	19	21	23	25	15'-11 1/2"	1'-8"	17'-7 1/2"
VL1	#4	1	1	1	1	1	1	1	14'-6"	1'-8"	16'-2"
VL2	#4	1	1	1	1	1	1	1	11'-4"	1'-8"	13'-0"
VL3	#4	1	1	1	1	1	1	1	8'-2"	1'-8"	9'-10"
VL4	#4	1	1	1	1	1	1	1	4'-6 1/2"		4'-6 1/2"
VS1	#4	1	1	1	1	1	1	1	15'-6 1/2"	1'-8"	17'-2 1/2"
VS2	#4	1	1	1	1	1	1	1	13'-3"	1'-8"	14'-11"
VS3	#4	1	1	1	1	1	1	1	10'-11 1/2"	1'-8"	12'-6 1/2"
VS4	#4	1	1	1	1	1	1	1	8'-7 1/2"	1'-8"	10'-3 1/2"
VS5	#4	1	1	1	1	1	1	1	6'-4"	1'-8"	8'-0"
VS6	#4	1	1	1	1	1	1	1	4'-0"	1'-8"	5'-8"
VS7	#4	1	1	1	1	1	1	1	1'-8 1/2"		1'-8 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-0 1/2"
FTL2	#5	1	1	1	1	1	1	1			1'-10 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-8 1/2"
FTL4	#5	20	20	20	20	20	20	20			5'-5"
FTL5	#5	1	1	1	1	1	1	1			5'-0 1/2"
FTL6	#5	1	1	1	1	1	1	1			4'-2 1/2"
FTL7	#5	1	1	1	1	1	1	1			3'-5"
FTL8	#5	1	1	1	1	1	1	1			2'-7"
FTL9	#5	1	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7	7			19'-7"
FTS	#5	18	18	18	18	18	18	18			5'-5"
FLS	#4	7	7	7	7	7	7	7			13'-10"
WS1	#5	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
WS2	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WS3	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WS4	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WS5	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WS6	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WS7	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WS8	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WS9	#5	1	1	1	1	1	1	1		W+3'-1 1/2""	W+3'-1 1/2"
WS10	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WS11	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS12	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WS13	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WS14	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WS15	#5	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
WS16	#5	1	1	1	1	1	1	1	1'-6"	W+1'-3 1/2"	W+2'-9 1/2"
WS17	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WS18	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	14	14	14	14	14	14	14	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL2	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WL3	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WL4	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WL5	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL6	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"

HEIGHT = 8 FT.

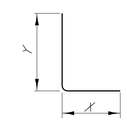
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WL7	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL8	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL9	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL10	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL11	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WL12	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL13	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL14	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL15	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL16	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL17	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL18	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL19	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL20	#5	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WL21	#5	1	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WL22	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL23	#5	1	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
WL24	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL25	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	19	19	19	19	19	19	19	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RS2	#4	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RS3	#4	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
RS4	#4	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
RS5	#4	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RS6	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS7	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS8	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RS9	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS10	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RS11	#4	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
RS12	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RS13	#4	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RS14	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RS15	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	12	12	12	12	12	12	12	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
RL2	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RL3	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RL4	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RL5	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RL6	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL7	#4	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RL8	#4	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
RL9	#4	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
RL10	#4	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
RL11	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL12	#4	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RL13	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RL14	#4	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RL15	#4	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
RL16	#4	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL17	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL18	#4	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL19	#4	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
RL20	#4	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RL21	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	17	17	17	17	17	17	17	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-9 1/2"
YS2	#4	2	2	2	2	2	2	2			4'-9 1/2"
YS3	#4	2	2	2	2	2	2	2			6'-9 1/2"
YS4	#4	2	2	2	2	2	2	2			8'-9 1/2"
YS5	#4	2	2	2	2	2	2	2			10'-9 1/2"
YS6	#4	2	2	2	2	2	2	2			12'-9 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
YS7	#4	6	6	6	6	6	6	8			13'-10"
YL1	#4	2	2	2	2	2	2	2			4'-0 1/2"
YL2	#4	2	2	2	2	2	2	2			6'-10 1/2"
YL3	#4	2	2	2	2	2	2	2			9'-8 1/2"
YL4	#4	2	2	2	2	2	2	2			12'-6"
YL5	#4	2	2	2	2	2	2	2			15'-4"
YL6	#4	2	2	2	2	2	2	2			18'-2"
YL7	#4	6	6	6	6	6	6	8			19'-8 1/2"
FS	#4	2	2	2	2	2	2	2			15'-5 1/2"
FL	#4	2	2	2	2	2	2	2			20'-11"
N	#4	14	16	19	22	25	28	31	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	12	14	16	19	21	23	26	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.155S+1'-3"
OS	#7	10	10	10	10	10	10	11	3'-1 1/2"	3'-1 1/2"	6'-3"
OL	#7	10	10	10	10	10	10	11	3'-1 1/2"	3'-1 1/2"	6'-3"
OSS	#4	1	1	1	1	1	1	1			8'-0"+T1
OSL	#4	1	1	1	1	1	1	1			8'-0"+T1



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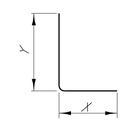

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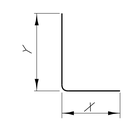

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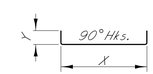
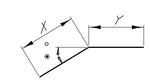
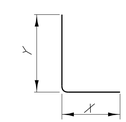


BARS N - #4

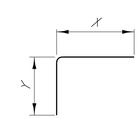


DOWELS OS/OL - #7

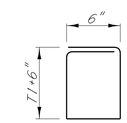
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-8-2W-30

SHEET NUMBER 7068

DATE | REVISIONS | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"Y" CLEAR SPAN						
											10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-1"	16'-2"	22'-10 3/8"	0'-0"	0'-8 3/16"	16'-2"	0'-11"	0'-10"	4'-0"	2'-0"	29'-5 11/16"	31'-9 7/16"	34'-1 1/8"	36'-4 7/8"	38'-8 9/16"	41'-0 1/4"	43'-4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	21.5684	3033.477	0.7552	46.482	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	21.6170	3033.477	0.7552	46.482	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	21.5162	3024.309	0.7600	46.593	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	21.8222	3042.644	0.7790	47.150	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	21.8728	3047.228	0.7790	47.150	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	22.1074	3060.979	0.7932	47.539	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	22.5759	3113.870	0.8692	54.219	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	22.6595	3113.870	0.8692	54.219	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	22.6099	3109.119	0.8740	54.386	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	22.9619	3128.122	0.8930	54.887	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	23.0441	3132.872	0.8978	54.999	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	23.0016	3128.122	0.9120	55.388	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	23.6221	3182.033	0.9833	60.454	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	23.6221	3182.033	0.9833	60.454	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	23.7269	3191.757	0.9928	60.677	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	24.1841	3216.067	1.0118	61.233	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	24.3182	3225.791	1.0118	61.233	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	24.2824	3220.929	1.0308	61.734	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	24.5756	3250.169	1.1068	66.911	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	24.7122	3260.116	1.1068	66.911	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	25.0813	3284.983	1.1211	67.301	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	25.1352	3289.956	1.1258	67.412	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	25.1651	3284.983	1.1354	67.691	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	25.5807	3309.849	1.1496	68.080	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	25.4664	3321.256	1.2304	74.927	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	25.7477	3341.817	1.2304	74.927	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	26.0391	3362.378	1.2446	75.317	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	25.9954	3357.238	1.2541	75.595	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	26.3602	3372.659	1.2637	75.818	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	26.7010	3388.080	1.2827	76.319	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	26.8283	3421.097	1.3444	82.665	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	26.6902	3410.593	1.3539	82.943	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	26.8994	3426.348	1.3729	83.444	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	27.3950	3447.355	1.3967	84.112	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	27.6567	3463.110	1.4110	84.502	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	28.1927	3494.620	1.4395	85.281	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	27.7423	3489.761	1.4775	89.401	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	27.8035	3495.124	1.4917	89.790	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	28.0585	3505.850	1.5012	90.069	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	28.8076	3548.754	1.5393	91.071	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.

All concrete shall be Class "B".

Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2

Expansion joint material shall be bituminous fiber type unless otherwise noted.

All exposed corners shall be chamfered 3/4".

Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.

All bars shall be accurately spaced and securely wired at each intersection before placing concrete.

Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).

Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.

Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.

Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.

Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.

The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-10-2W-30

SHEET NUMBER 7069

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.155S+6'-4 ½"
T2	#4	1	1	1	1	1	1	1			1.155S+7'-4"
T3	#4	1	1	1	1	1	1	1			1.155S+8'-4"
T4	#4	1	1	1	1	1	1	1			1.155S+9'-4"
T5	#4	1	1	1	1	1	1	1			1.155S+10'-4"
T6	#4	1	1	1	1	1	1	1			1.155S+11'-3 ½"
T7	#4	1	1	1	1	1	1	1			1.155S+12'-3 ½"
T8	#4	1	1	1	1	1	1	1			1.155S+13'-3 ½"
T9	#4	1	1	1	1	1	1	1			1.155S+14'-3 ½"
T10	#4	1	1	1	1	1	1	1			1.155S+15'-3"
T11	#4	1	1	1	1	1	1	1			1.155S+16'-3"
T12	#4	1	1	1	1	1	1	1			1.155S+17'-3"
T13	#4	1	1	1	1	1	1	1			1.155S+18'-3"
T14	#4	1	1	1	1	1	1	1			1.155S+19'-2 ½"
T15	#4	1	1	1	1	1	1	1			1.155S+20'-2 ½"
T16	#4	1	1	1	1	1	1	1			1.155S+20'-8 ½"
T17	#4	3	3	3	3	3	3	3			1.155S+17'-4 ½"
V1	#4	15	17	19	21	23	25	27	18'-3 ½"	1'-8"	19'-11 ½"
VL1	#4	1	1	1	1	1	1	1	17'-0 ½"	1'-8"	18'-8 ½"
VL2	#4	1	1	1	1	1	1	1	13'-11"	1'-8"	15'-7"
VL3	#4	1	1	1	1	1	1	1	10'-9"	1'-8"	12'-5"
VL4	#4	1	1	1	1	1	1	1	7'-7"		7'-7"
VL5	#4	1	1	1	1	1	1	1	3'-9 ½"		3'-9 ½"
VS1	#4	1	1	1	1	1	1	1	18'-0 ½"	1'-8"	19'-8 ½"
VS2	#4	1	1	1	1	1	1	1	15'-8 ½"	1'-8"	17'-4 ½"
VS3	#4	1	1	1	1	1	1	1	13'-5"	1'-8"	15'-1"
VS4	#4	1	1	1	1	1	1	1	11'-1 ½"	1'-8"	12'-9 ½"
VS5	#4	1	1	1	1	1	1	1	8'-9 ½"	1'-8"	10'-5 ½"
VS6	#4	1	1	1	1	1	1	1	6'-6"	1'-8"	8'-2"
VS7	#4	1	1	1	1	1	1	1	4'-2"	1'-8"	5'-10"
VS8	#4	1	1	1	1	1	1	1	1'-10 ½"		1'-10 ½"
FTL1	#5	1	1	1	1	1	1	1			1'-3 ½"
FTL2	#5	1	1	1	1	1	1	1			1'-11 ½"
FTL3	#5	1	1	1	1	1	1	1			2'-7 ½"
FTL4	#5	1	1	1	1	1	1	1			3'-3 ½"
FTL5	#5	1	1	1	1	1	1	1			3'-11"
FTL6	#5	27	27	27	27	27	27	27			6'-6"
FTL7	#5	1	1	1	1	1	1	1			6'-5"
FTL8	#5	1	1	1	1	1	1	1			5'-9"
FTL9	#5	1	1	1	1	1	1	1			5'-1"
FTL10	#5	1	1	1	1	1	1	1			4'-5"
FTL11	#5	1	1	1	1	1	1	1			3'-9"
FTL12	#5	1	1	1	1	1	1	1			3'-1"
FTL13	#5	2	2	2	2	2	2	2			2'-6"
FLL	#4	8	8	8	8	8	8	8			22'-4 ½"
FTS1	#5	25	25	25	25	25	25	25			6'-6"
FLS	#4	8	8	8	8	8	8	8			15'-10"
WS1	#5	1	1	1	1	1	1	1		W+7'-4 ½"	W+7'-4 ½"
WS2	#5	1	1	1	1	1	1	1		W+7'-0 ½"	W+7'-0 ½"
WS3	#5	1	1	1	1	1	1	1		W+6'-8 ½"	W+6'-8 ½"
WS4	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WS5	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WS6	#5	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
WS7	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WS8	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS9	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WS10	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WS11	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WS12	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WS13	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS14	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WS15	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WS16	#5	1	1	1	1	1	1	1		W+2'-5 ½"	W+2'-5 ½"
WS17	#5	1	1	1	1	1	1	1		W+2'-1 ½"	W+2'-1 ½"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WS18	#5	1	1	1	1	1	1	1		W+1'-9 ½"	W+1'-9 ½"
WS19	#5	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
WS20	#5	1	1	1	1	1	1	1		W+1'-1 ½"	W+1'-1 ½"
WS21	#5	1	1	1	1	1	1	1		W+0'-9 ½"	W+0'-9 ½"
WS22	#5	1	1	1	1	1	1	1		W+0'-5 ½"	W+0'-5 ½"
WS23	#5	1	1	1	1	1	1	1		W+0'-1 ½"	W+0'-1 ½"
WS24	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"
WS25	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	23	23	23	23	23	23	23	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
WL2	#5	1	1	1	1	1	1	1		W+7'-2 ½"	W+7'-2 ½"
WL3	#5	1	1	1	1	1	1	1		W+6'-11 ½"	W+6'-11 ½"
WL4	#5	1	1	1	1	1	1	1		W+6'-8 ½"	W+6'-8 ½"
WL5	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL6	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL7	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL8	#5	1	1	1	1	1	1	1		W+5'-9 ½"	W+5'-9 ½"
WL9	#5	1	1	1	1	1	1	1		W+5'-6 ½"	W+5'-6 ½"
WL10	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WL11	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WL12	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL13	#5	1	1	1	1	1	1	1		W+4'-7 ½"	W+4'-7 ½"
WL14	#5	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
WL15	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL16	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL17	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL18	#5	1	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"
WL19	#5	1	1	1	1	1	1	1		W+3'-2 ½"	W+3'-2 ½"
WL20	#5	1	1	1	1	1	1	1		W+2'-11 ½"	W+2'-11 ½"
WL21	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL22	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WL23	#5	1	1	1	1	1	1	1		W+2'-3 ½"	W+2'-3 ½"
WL24	#5	1	1	1	1	1	1	1		W+2'-0 ½"	W+2'-0 ½"
WL25	#5	1	1	1	1	1	1	1		W+1'-9 ½"	W+1'-9 ½"
WL26	#5	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
WL27	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL28	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WL29	#5	1	1	1	1	1	1	1		W+0'-10 ½"	W+0'-10 ½"
WL30	#5	1	1	1	1	1	1	1		W+0'-7½"	W+0'-7 ½"
WL31	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL32	#5	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
WL33	#5	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
WL34	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WL35	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	33	33	33	33	33	33	33	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+7'-4 ½"	W+7'-4 ½"
RS2	#4	1	1	1	1	1	1	1		W+6'-10 ½"	W+6'-10 ½"
RS3	#4	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
RS4	#4	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
RS5	#4	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
RS6	#4	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
RS7	#4	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RS8	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS9	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS10	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RS11	#4	1	1	1	1	1	1	1		W+2'-5 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1	1	1		W+1'-11 ½"	W+1'-11 ½"
RS13	#4	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
RS14	#4	1	1	1	1	1	1	1		W+0'-11 ½"	W+0'-11 ½"
RS15	#4	1	1	1	1	1	1	1		W+0'-5 ½"	W+0'-5 ½"
RS16	#4	1	1	1	1	1	1	1		W-0'-0 ½"	W-0'-0 ½"
RS17	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	16	16	16	16	16	16	16	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RL2	#4	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
RL3	#4	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
RL4	#4	1	1	1	1	1	1	1		W+6'-4 ½"	W+6'-4 ½"
RL5	#4	1	1	1	1	1	1	1		W+6'-0 ½"	W+6'-0 ½"
RL6	#4	1	1	1	1	1	1	1		W+5'-8 ½"	W+5'-8 ½"
RL7	#4	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
RL8	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RL9	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL10	#4	1	1	1	1	1	1	1		W+4'-3 ½"	W+4'-3 ½"
RL11	#4	1	1	1	1	1	1	1		W+3'-11 ½"	W+3'-11 ½"
RL12	#4	1	1	1	1	1	1	1		W+3'-7 ½"	W+3'-7 ½"
RL13	#4	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
RL14	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RL15	#4	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RL16	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RL17	#4	1	1	1	1	1	1	1		W+1'-10 ½"	W+1'-10 ½"
RL18	#4	1	1	1	1	1	1	1		W+1'-6 ½"	W+1'-6 ½"
RL19	#4	1	1	1	1	1	1	1		W+1'-2 ½"	W+1'-2 ½"
RL20	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL21	#4	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
RL22	#4	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
RL23	#4	1	1	1	1	1	1	1		W-0'-2 ½"	W-0'-2 ½"
RL24	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	23	23	23	23	23	23	23	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-9 ½"
YS2	#4	2	2	2	2	2	2	2			4'-9 ½"
YS3	#4	2	2	2	2	2	2	2			6'-9 ½"
YS4	#4	2	2	2	2	2	2	2			8'-9 ½"
YS5	#4	2	2	2	2	2	2	2			10'-9 ½"
YS6	#4	2	2	2	2	2	2	2			12'-9 ½"
YS7	#4	2	2	2	2	2	2	2			14'-9 ½"
YS8	#4	8	8	8	8	8	8	8			15'-10"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 3

WORKING NUMBER IWS-10-2W-30

SHEET NUMBER 7070

REVISIONS | BY | DATE

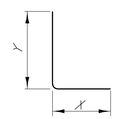
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		10'	12'	14'	16'	18'	20'	22'			
YL1	#4	2	2	2	2	2	2	2			4'-0 ½"
YL2	#4	2	2	2	2	2	2	2			6'-10 ½"
YL3	#4	2	2	2	2	2	2	2			9'-8 ½"
YL4	#4	2	2	2	2	2	2	2			12'-6"
YL5	#4	2	2	2	2	2	2	2			15'-4"
YL6	#4	2	2	2	2	2	2	2			18'-2"
YL7	#4	2	2	2	2	2	2	2			21'-0"
YL8	#4	8	8	8	8	8	8	8			22'-6 ½"
FS	#4	2	2	2	2	2	2	2			17'-8 ½"
FL	#4	2	2	2	2	2	2	2			23'-11"
N	#4	17	20	22	24	27	30	32	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.155(S+2V1)+1'-6"
K	#4	14	17	19	21	24	26	28	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.155S+1'-5"
OS	#7	12	12	12	12	12	12	12	3'-2 ½"	3'-2 ½"	6'-5"
OL	#7	12	12	12	12	12	12	12	3'-2 ½"	3'-2 ½"	6'-5"
OSS	#4	1	1	1	1	1	1	1			10'-0"+T1
OSL	#4	1	1	1	1	1	1	1			10'-0"+T1



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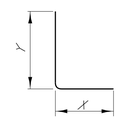

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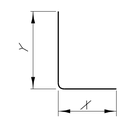

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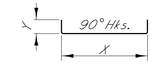
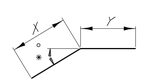
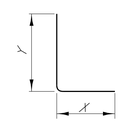


BARS N - #4



DOWELS OS/OL - #5

* See plan of apron



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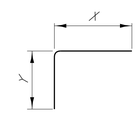

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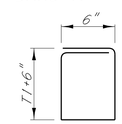


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 3 OF 3

WORKING NUMBER
IWS-10-2W-30

SHEET NUMBER
7071

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-4"	18'-8"	26'-4 13/16"	0'-0"	0'-9"	18'-8"	0'-11"	0'-11"	5'-0"	2'-0"	34'-5 9/16"	36'-9 1/4"	39'-1"	41'-4 11/16"	43'-8 3/8"	46'-0 1/8"	48'-3 13/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	30.2361	4307.184	0.8788	54.498	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	30.3223	4307.184	0.8883	54.776	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	30.3823	4307.184	0.8978	54.999	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	30.8294	4336.040	0.9168	55.555	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	30.9880	4347.583	0.9168	55.555	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	30.8438	4336.040	0.8883	54.776	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	31.4319	4476.585	0.9928	60.677	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	31.5310	4482.468	1.0023	60.955	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	31.6637	4488.351	1.0118	61.233	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	32.1616	4517.763	1.0308	61.734	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	32.1312	4517.763	1.0356	61.846	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	32.3350	4529.528	1.0451	62.124	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	32.4227	4553.795	1.1068	68.470	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	32.6610	4565.783	1.1163	68.748	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	33.1774	4595.752	1.1401	69.361	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	33.0120	4583.765	1.1401	69.361	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	33.3274	4601.746	1.1544	69.750	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	33.6236	4619.728	1.1449	69.472	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	33.6973	4646.778	1.2209	74.649	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	33.9089	4659.100	1.2304	74.927	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	34.2978	4683.743	1.2494	75.428	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	34.3014	4683.743	1.2541	75.595	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	34.7635	4702.226	1.2779	76.208	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	35.1867	4733.030	1.2922	76.597	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	34.6639	4724.294	1.3444	81.106	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	34.9698	4736.838	1.3539	81.385	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	35.6051	4780.744	1.3682	81.774	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	35.9115	4787.016	1.3872	82.275	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	36.1882	4799.560	1.3967	82.554	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	35.8970	4814.604	1.4775	90.959	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	36.2252	4833.755	1.4680	90.681	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	36.5835	4852.906	1.4965	91.460	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	37.3968	4897.591	1.5155	92.017	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	37.8681	4929.508	1.5488	92.908	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	36.9508	4895.933	1.5820	96.916	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	37.5406	4928.686	1.6010	97.417	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	38.0365	4961.439	1.6200	97.918	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	38.8813	5007.293	1.6723	99.365	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-12-2W-30

SHEET NUMBER 7072

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.155S+6'-6"
T2	#4	1	1	1	1	1	1	1			1.155S+7'-5 1/2"
T3	#4	1	1	1	1	1	1	1			1.155S+8'-5 1/2"
T4	#4	1	1	1	1	1	1	1			1.155S+9'-5"
T5	#4	1	1	1	1	1	1	1			1.155S+10'-4 1/2"
T6	#4	1	1	1	1	1	1	1			1.155S+11'-4"
T7	#4	1	1	1	1	1	1	1			1.155S+12'-3 1/2"
T8	#4	1	1	1	1	1	1	1			1.155S+13'-3"
T9	#4	1	1	1	1	1	1	1			1.155S+14'-3"
T10	#4	1	1	1	1	1	1	1			1.155S+15'-2 1/2"
T11	#4	1	1	1	1	1	1	1			1.155S+16'-2"
T12	#4	1	1	1	1	1	1	1			1.155S+17'-1 1/2"
T13	#4	1	1	1	1	1	1	1			1.155S+18'-1"
T14	#4	1	1	1	1	1	1	1			1.155S+19'-0 1/2"
T15	#4	1	1	1	1	1	1	1			1.155S+20'-0 1/2"
T16	#4	1	1	1	1	1	1	1			1.155S+21'-0"
T17	#4	1	1	1	1	1	1	1			1.155S+21'-11 1/2"
T18	#4	1	1	1	1	1	1	1			1.155S+22'-11"
T19	#4	1	1	1	1	1	1	1			1.155S+23'-4"
T20	#4	3	3	3	3	3	3	3			1.155S+20'-0"
V1	#4	18	20	22	24	26	28	30	21'-2"	1'-8"	22'-10"
VL1	#4	1	1	1	1	1	1	1	20'-2 1/2"	1'-8"	21'-10 1/2"
VL2	#4	1	1	1	1	1	1	1	17'-0 1/2"	1'-8"	18'-8 1/2"
VL3	#4	1	1	1	1	1	1	1	13'-10 1/2"	1'-8"	15'-6 1/2"
VL4	#4	1	1	1	1	1	1	1	10'-9"	1'-8"	12'-5"
VL5	#4	1	1	1	1	1	1	1	7'-7"		7'-7"
VL6	#4	1	1	1	1	1	1	1	3'-9 1/2"		3'-9 1/2"
VS1	#4	1	1	1	1	1	1	1	18'-9 1/2"	1'-8"	20'-5 1/2"
VS2	#4	1	1	1	1	1	1	1	16'-5 1/2"	1'-8"	18'-1 1/2"
VS3	#4	1	1	1	1	1	1	1	14'-2"	1'-8"	15'-10"
VS4	#4	1	1	1	1	1	1	1	11'-10"	1'-8"	13'-6"
VS5	#4	1	1	1	1	1	1	1	9'-6 1/2"	1'-8"	11'-2 1/2"
VS6	#4	1	1	1	1	1	1	1	7'-3"	1'-8"	8'-11"
VS7	#4	1	1	1	1	1	1	1	4'-11"	1'-8"	6'-7"
VS8	#4	1	1	1	1	1	1	1	2'-7 1/2"		2'-7 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-0 1/2"
FTL2	#5	1	1	1	1	1	1	1			1'-7 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-2 1/2"
FTL4	#5	1	1	1	1	1	1	1			2'-9 1/2"
FTL5	#5	1	1	1	1	1	1	1			3'-4 1/2"
FTL6	#5	1	1	1	1	1	1	1			3'-11 1/2"
FTL7	#5	1	1	1	1	1	1	1			4'-6 1/2"
FTL8	#5	1	1	1	1	1	1	1			5'-1"
FTL9	#5	36	36	36	36	36	36	36			7'-7"
FTL10	#5	1	1	1	1	1	1	1			6'-11 1/2"
FTL11	#5	1	1	1	1	1	1	1			6'-5"
FTL12	#5	1	1	1	1	1	1	1			5'-10"
FTL13	#5	1	1	1	1	1	1	1			5'-3"
FTL14	#5	1	1	1	1	1	1	1			4'-8"
FTL15	#5	1	1	1	1	1	1	1			4'-1"
FTL16	#5	1	1	1	1	1	1	1			3'-6"
FTL17	#5	1	1	1	1	1	1	1			2'-11"
FTL18	#5	2	2	2	2	2	2	2			2'-7"
FLL	#4	9	9	9	9	9	9	9			25'-11"
FTS	#5	33	33	33	33	33	33	33			7'-7"
FLS	#4	9	9	9	9	9	9	9			18'-4"
WS1	#5	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
WS2	#5	1	1	1	1	1	1	1		W+8'-4"	W+8'-4"
WS3	#5	1	1	1	1	1	1	1		W+8'-1"	W+8'-1"
WS4	#5	1	1	1	1	1	1	1		W+7'-9 1/2"	W+7'-9 1/2"
WS5	#5	1	1	1	1	1	1	1		W+7'-6"	W+7'-6"
WS6	#5	1	1	1	1	1	1	1		W+7'-2 1/2""	W+7'-2 1/2"
WS7	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WS8	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WS9	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS10	#5	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
WS11	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WS12	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WS13	#5	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
WS14	#5	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WS15	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS16	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WS17	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS18	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WS19	#5	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WS20	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WS21	#5	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
WS22	#5	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
WS23	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS24	#5	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
WS25	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS26	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WS27	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WS28	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WS29	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WS30	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WS31	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WS32	#5	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
WS33	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	33	33	33	33	33	33	33	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WL2	#5	1	1	1	1	1	1	1		W+8'-5 1/2"	W+8'-5 1/2"
WL3	#5	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
WL4	#5	1	1	1	1	1	1	1		W+8'-0 1/2"	W+8'-0 1/2"
WL5	#5	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
WL6	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WL7	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL8	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WL9	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL10	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WL11	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL12	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL13	#5	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
WL14	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL15	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL16	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WL17	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL18	#5	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
WL19	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL20	#5	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
WL21	#5	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL22	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL23	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL24	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL25	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL26	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WL27	#5	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
WL28	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL29	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL30	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL31	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL32	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WL33	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WL34	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL35	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL36	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL37	#5	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
WL38	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL39	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WL40	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WL41	#5	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
WL42	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WL43	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WL44	#5	1	1	1	1	1	1	1		W-0'-1 1/2"	W-0'-1 1/2"
WL45	#5	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
WL46	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	46	46	46	46	46	46	46	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RS2	#4	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
RS3	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RS4	#4	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
RS5	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RS6	#4	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
RS7	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RS8	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RS9	#4	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RS10	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RS11	#4	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS12	#4	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS13	#4	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RS14	#4	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
RS15	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RS16	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS17	#4	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
RS18	#4	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
RS19	#4	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
RS20	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	20	20	20	20	20	20	20	1'-6"	2'-5"	3'-11"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 3

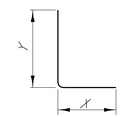
WORKING NUMBER IWS-12-2W-30

SHEET NUMBER 7073

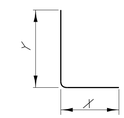
BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

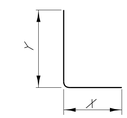
HEIGHT = 12 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM.	DIM.	LENGTH
		SPAN							X	Y	
		12'	14'	16'	18'	20'	22'	24'			
RL1	#4	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
RL2	#4	1	1	1	1	1	1	1		W+8'-4"	W+8'-4"
RL3	#4	1	1	1	1	1	1	1		W+8'-0"	W+8'-0"
RL4	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RL5	#4	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
RL6	#4	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
RL7	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RL8	#4	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
RL9	#4	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
RL10	#4	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
RL11	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RL12	#4	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
RL13	#4	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL14	#4	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL15	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RL16	#4	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RL17	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL18	#4	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
RL19	#4	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
RL20	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RL21	#4	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RL22	#4	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
RL23	#4	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
RL24	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL25	#4	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
RL26	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RL27	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RL28	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	28	28	28	28	28	28	28	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-5 1/2"
YS2	#4	2	2	2	2	2	2	2			4'-1 1/2"
YS3	#4	2	2	2	2	2	2	2			5'-9 1/2"
YS4	#4	2	2	2	2	2	2	2			7'-5 1/2"
YS5	#4	2	2	2	2	2	2	2			9'-1 1/2"
YS6	#4	2	2	2	2	2	2	2			10'-9 1/2"
YS7	#4	2	2	2	2	2	2	2			12'-5 1/2"
YS8	#4	2	2	2	2	2	2	2			14'-1 1/2"
YS9	#4	2	2	2	2	2	2	2			15'-9 1/2"
YS10	#4	2	2	2	2	2	2	2			17'-5 1/2"
YS11	#4	10	12	12	12	12	12	12			18'-4"
YL1	#4	2	2	2	2	2	2	2			3'-6 1/2"
YL2	#4	2	2	2	2	2	2	2			5'-11"
YL3	#4	2	2	2	2	2	2	2			8'-3 1/2"
YL4	#4	2	2	2	2	2	2	2			10'-7 1/2"
YL5	#4	2	2	2	2	2	2	2			13'-0"
YL6	#4	2	2	2	2	2	2	2			15'-4"
YL7	#4	2	2	2	2	2	2	2			17'-8 1/2"
YL8	#4	2	2	2	2	2	2	2			20'-0 1/2"
YL9	#4	2	2	2	2	2	2	2			22'-5"
YL10	#4	2	2	2	2	2	2	2			24'-9 1/2"
YL11	#4	10	12	12	12	12	12	12			26'-1"
FS	#4	2	2	2	2	2	2	2			20'-6"
FL	#4	2	2	2	2	2	2	2			27'-8"
N	#4	20	22	25	27	29	33	35	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	17	19	21	24	26	28	31	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			1.155S+1'-7"
OS	#7	16	16	16	16	16	16	16	3'-3 1/2"	3'-3 1/2"	6'-7"
OL	#7	16	16	16	16	16	16	16	3'-3 1/2"	3'-3 1/2"	6'-7"
OSS	#4	1	1	1	1	1	1	1			12'-0"+T1
OSL	#4	1	1	1	1	1	1	1			12'-0"+T1



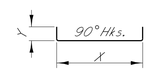
BARS DRS/DRL - #4



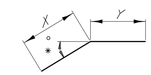
BARS DWS/DWL - #5



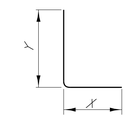
BARS RSn/RLn - #4



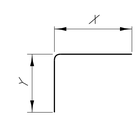
BARS N - #4



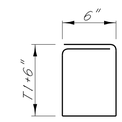
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

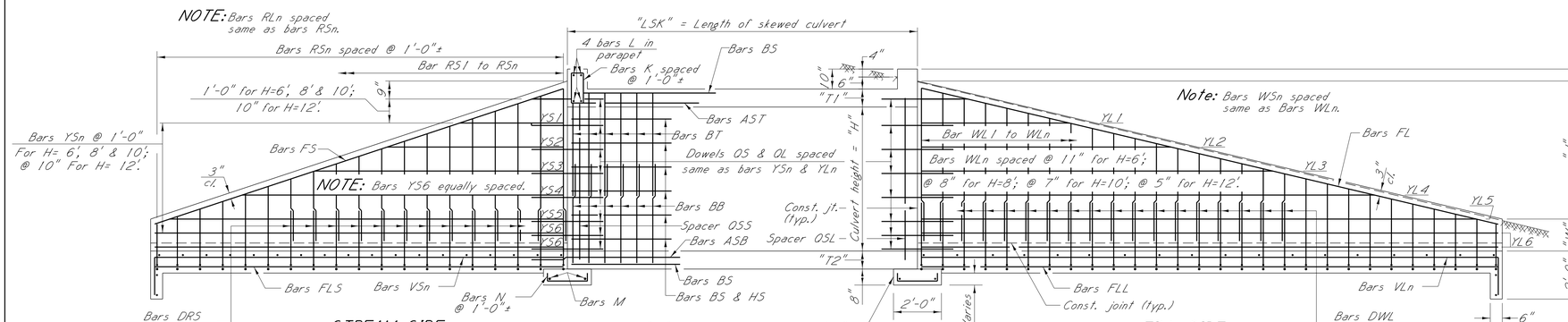
SHT. 3 OF 3

WORKING NUMBER
IWS-12-2W-30

SHEET NUMBER
7074

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI



STREAM SIDE

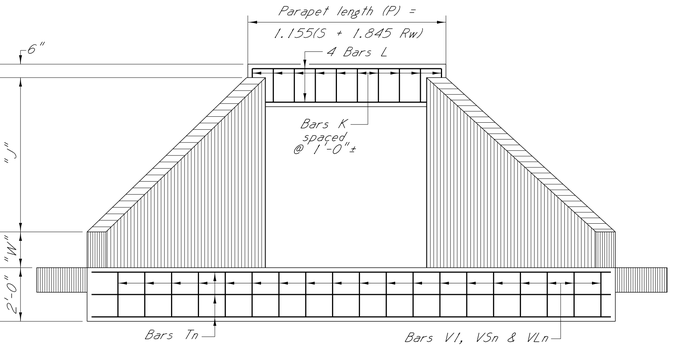
Showing reinforcement in stream side of "LW1" wingwall

LONGITUDINAL SECTION

Drawn for single cell 6' x 6' culvert

FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall

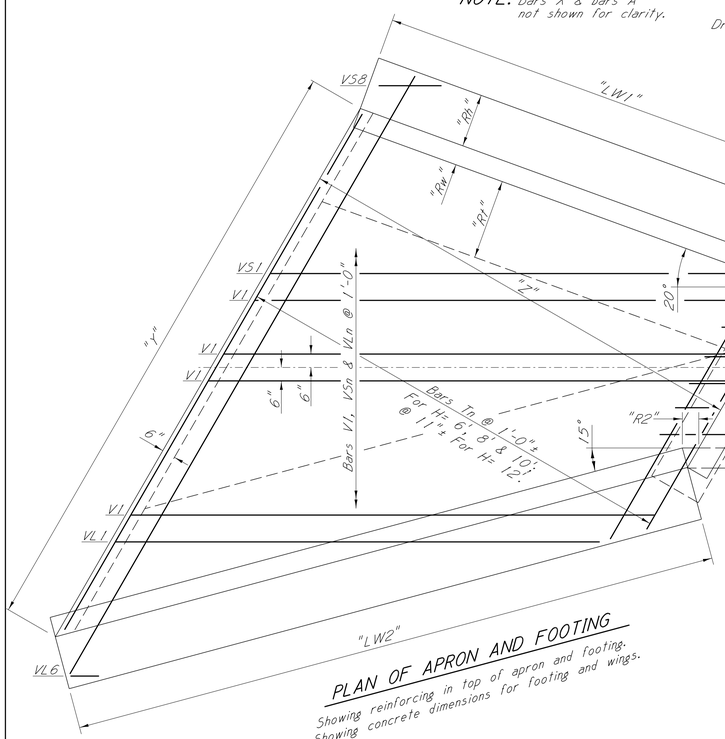


END ELEVATION

Showing reinforcing in pararpet & toe wall

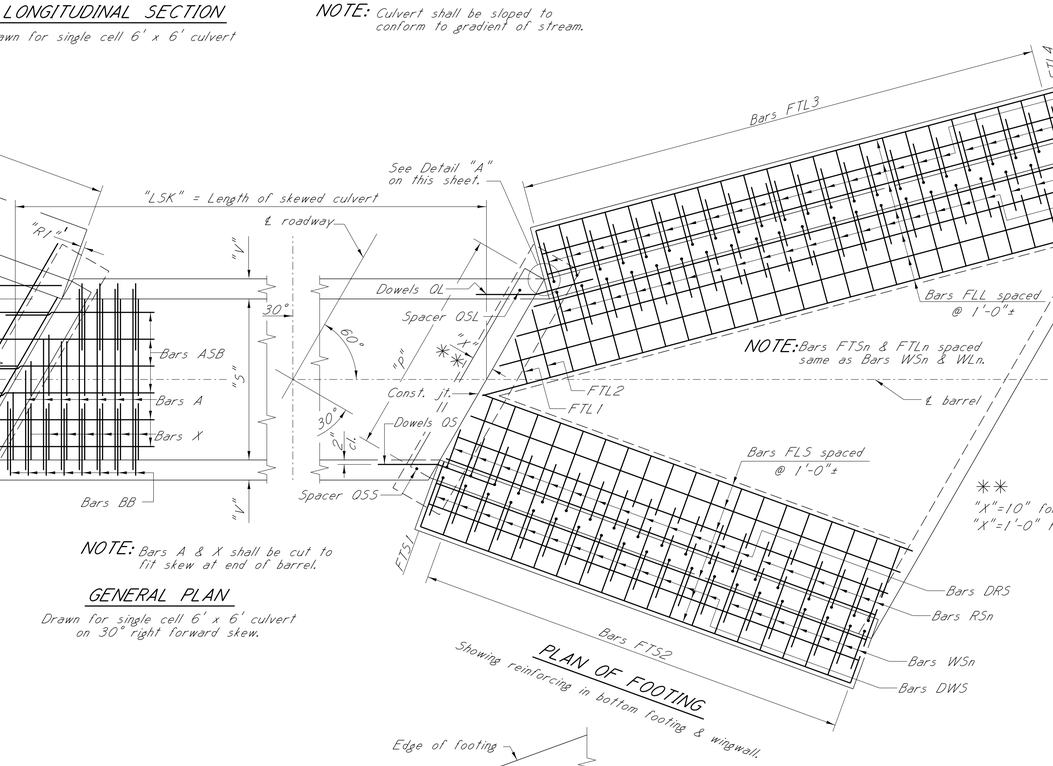
NOTE: Bars X & bars A not shown for clarity.

NOTE: Culvert shall be sloped to conform to gradient of stream.



PLAN OF APRON AND FOOTING

Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.



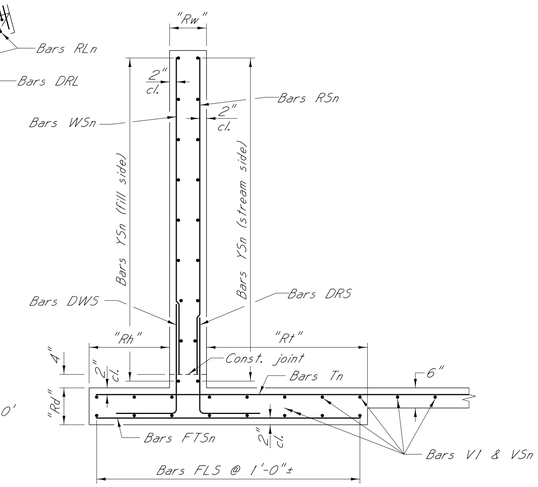
NOTE: Bars A & X shall be cut to fit skew at end of barrel.

GENERAL PLAN

Drawn for single cell 6' x 6' culvert on 30° right forward skew.

PLAN OF FOOTING

Showing reinforcing in bottom footing & wingwall.

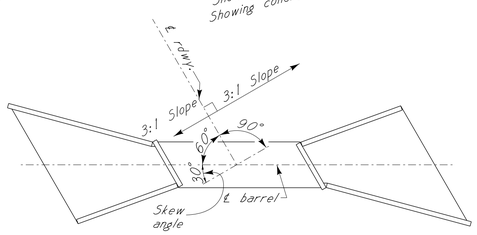


CROSS SECTION WINGWALL

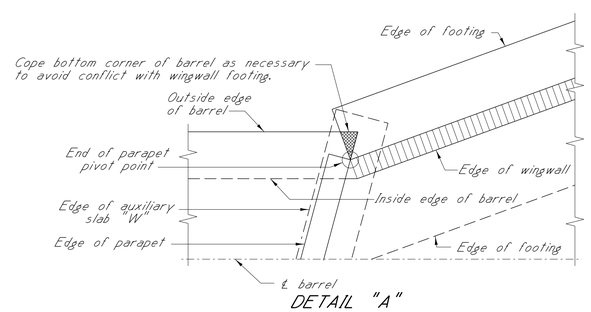
Showing reinforcing in "LW1" wingwall, footing and apron.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)



PLAN OF 30° LEFT FORWARD SKEW



DETAIL "A"

NOTE: For bar bending details and quantities, see drawings IWS-6-3W-30, IWS-8-3W-30, IWS-10-3W-30 & IWS-12-3W-30.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 6-24 FT.

SHT. 1 OF 1

WORKING NUMBER IWS-3W-30

SHEET NUMBER 7075

DATE	REVISIONS	BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN							
											6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-9"	17'-4 3/8"	24'-4 3/4"	0'-1 3/16"	0'-7 3/8"	17'-3"	0'-11"	0'-9"	3'-0"	2'-0"	22'-8 13/16"	25'-0 1/2"	27'-4 1/4"	29'-7 15/16"	31'-11 11/16"	34'-3 3/8"	35'-7 1/16"	38'-10 13/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	15.9256	2139.822	0.5176	32.287	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	15.9256	2139.822	0.5176	32.287	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	15.9256	2139.822	0.5176	32.287	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	15.9586	2139.822	0.5176	32.287	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	15.9586	2139.822	0.5176	32.287	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	15.9586	2139.822	0.5176	32.287	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	16.8494	2210.436	0.6317	38.466	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	16.8494	2210.436	0.6317	38.466	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	16.8692	2210.436	0.6317	38.466	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	17.0262	2218.560	0.6317	38.466	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	17.0064	2218.560	0.6317	38.466	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	17.1435	2226.684	0.6317	38.466	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	17.8093	2280.993	0.7457	46.203	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	17.8093	2280.993	0.7457	46.203	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	17.9302	2289.340	0.7457	46.203	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	18.1954	2306.034	0.7457	46.203	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	18.2211	2306.034	0.7552	46.482	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	18.4182	2318.555	0.7647	46.760	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	18.7585	2356.114	0.8597	52.438	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	18.9369	2364.683	0.8597	52.438	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	19.0623	2373.253	0.8645	52.549	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	19.3695	2390.392	0.8740	52.828	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	19.4521	2394.677	0.8883	53.217	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	19.3771	2390.392	0.8930	53.329	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	19.8000	2434.073	0.9785	60.343	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	20.0089	2447.429	0.9833	60.454	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	20.1876	2460.784	0.9880	60.565	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	20.6261	2483.044	1.0023	60.955	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	20.3423	2465.236	1.0166	61.345	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	20.5615	2478.592	1.0308	61.734	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	20.9690	2518.766	1.1211	68.860	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	21.1020	2527.892	1.1211	68.860	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	21.5721	2555.271	1.1211	68.860	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	21.2898	2541.582	1.1354	69.249	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	21.5896	2555.271	1.1496	69.639	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	21.8727	2573.524	1.1686	70.140	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	21.8980	2675.020	1.2256	76.375	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	22.4328	2703.067	1.2446	76.876	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	22.4044	2703.067	1.2589	77.265	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	22.5847	2712.416	1.2684	77.488	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	22.8340	2731.114	1.2874	78.045	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	23.4070	2759.161	1.3159	78.824	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	23.0890	2759.212	1.3539	82.943	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	23.3724	2778.578	1.3587	83.055	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	23.4395	2788.261	1.3824	83.723	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	24.1748	2826.993	1.4205	84.725	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	24.4763	2841.518	1.4347	85.114	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-3W-30

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7076

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			1.155S+3'-7"
T2	#4	1	1	1	1	1	1	1	1			1.155S+7'-0 1/2"
T3	#4	1	1	1	1	1	1	1	1			1.155S+7'-10"
T4	#4	1	1	1	1	1	1	1	1			1.155S+8'-8"
T5	#4	1	1	1	1	1	1	1	1			1.155S+9'-6"
T6	#4	1	1	1	1	1	1	1	1			1.155S+10'-3 1/2"
T7	#4	1	1	1	1	1	1	1	1			1.155S+11'-1 1/2"
T8	#4	1	1	1	1	1	1	1	1			1.155S+11'-11 1/2"
T9	#4	1	1	1	1	1	1	1	1			1.155S+12'-9"
T10	#4	1	1	1	1	1	1	1	1			1.155S+13'-7"
T11	#4	1	1	1	1	1	1	1	1			1.155S+14'-5"
T12	#4	1	1	1	1	1	1	1	1			1.155S+15'-2 1/2"
T13	#4	1	1	1	1	1	1	1	1			1.155S+16'-0 1/2"
T14	#4	1	1	1	1	1	1	1	1			1.155S+16'-10 1/2"
T15	#4	1	1	1	1	1	1	1	1			1.155S+17'-8"
T16	#4	1	1	1	1	1	1	1	1			1.155S+18'-6"
T17	#4	1	1	1	1	1	1	1	1			1.155S+18'-9 1/2"
T18	#4	3	3	3	3	3	3	3	3			1.155S+15'-3 1/2"
V1	#4	9	11	13	15	17	19	21	23	19'-6 1/2"	1'-8"	21'-2 1/2"
VL1	#4	1	1	1	1	1	1	1	1	18'-0 1/2"	1'-8"	19'-8 1/2"
VL2	#4	1	1	1	1	1	1	1	1	14'-11"	1'-8"	16'-7"
VL3	#4	1	1	1	1	1	1	1	1	11'-9"	1'-8"	13'-5"
VL4	#4	1	1	1	1	1	1	1	1	8'-7"	1'-8"	10'-3"
VL5	#4	1	1	1	1	1	1	1	1	5'-1"		5'-1"
VL6	#4	1	1	1	1	1	1	1	1	1'-1"		1'-1"
VS1	#4	1	1	1	1	1	1	1	1	19'-5 1/2"	1'-8"	21'-1 1/2"
VS2	#4	1	1	1	1	1	1	1	1	19'-2 1/2"	1'-8"	20'-10 1/2"
VS3	#4	1	1	1	1	1	1	1	1	19'-0"	1'-8"	20'-8"
VS4	#4	1	1	1	1	1	1	1	1	15'-7 1/2"	1'-8"	17'-3 1/2"
VS5	#4	1	1	1	1	1	1	1	1	12'-4"	1'-8"	14'-0"
VS6	#4	1	1	1	1	1	1	1	1	9'-0"	1'-8"	10'-8"
VS7	#4	1	1	1	1	1	1	1	1	5'-8"		5'-8"
VS8	#4	1	1	1	1	1	1	1	1	2'-4"		2'-4"
FTL1	#5	1	1	1	1	1	1	1	1			1'-9"
FTL2	#5	1	1	1	1	1	1	1	1			2'-7 1/2"
FTL3	#5	23	23	23	23	23	23	23	23			5'-5"
FTL4	#5	1	1	1	1	1	1	1	1			5'-4"
FTL5	#5	1	1	1	1	1	1	1	1			4'-5 1/2"
FTL6	#5	1	1	1	1	1	1	1	1			3'-6 1/2"
FTL7	#5	1	1	1	1	1	1	1	1			2'-8"
FTL8	#5	1	1	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7	7	7			23'-11"
FTS1	#5	1	1	1	1	1	1	1	1			2'-7"
FTS2	#5	19	19	19	19	19	19	19	19			5'-5"
FLS	#4	7	7	7	7	7	7	7	7			17'-0 1/2"
WS1	#5	1	1	1	1	1	1	1	1			W+5'-1"
WS2	#5	1	1	1	1	1	1	1	1			W+4'-9 1/2"
WS3	#5	1	1	1	1	1	1	1	1			W+4'-6"
WS4	#5	1	1	1	1	1	1	1	1			W+4'-2 1/2"
WS5	#5	1	1	1	1	1	1	1	1			W+3'-11"
WS6	#5	1	1	1	1	1	1	1	1			W+3'-7 1/2"
WS7	#5	1	1	1	1	1	1	1	1			W+3'-4"
WS8	#5	1	1	1	1	1	1	1	1			W+3'-0"
WS9	#5	1	1	1	1	1	1	1	1			W+2'-8 1/2"
WS10	#5	1	1	1	1	1	1	1	1			W+2'-5"
WS11	#5	1	1	1	1	1	1	1	1			W+2'-1 1/2"
WS12	#5	1	1	1	1	1	1	1	1			W+1'-10"
WS13	#5	1	1	1	1	1	1	1	1			W+1'-6 1/2"
WS14	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-2 1/2"	W+3'-8 1/2"
WS15	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WS16	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WS17	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS18	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
WS19	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"

HEIGHT = 6 FT.

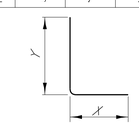
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WS20	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	13	13	13	13	13	13	13	13	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL2	#5	1	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WL3	#5	1	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WL4	#5	1	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WL5	#5	1	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WL6	#5	1	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL7	#5	1	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WL8	#5	1	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL9	#5	1	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WL10	#5	1	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL11	#5	1	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WL12	#5	1	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WL13	#5	1	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL14	#5	1	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL15	#5	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL16	#5	1	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WL17	#5	1	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WL18	#5	1	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WL19	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-4"	W+3'-10"
WL20	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-1 1/2"	W+3'-7 1/2"
WL21	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WL22	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-8 1/2"	W+3'-2 1/2"
WL23	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL24	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-3 1/2"	W+2'-9 1/2"
WL25	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-1"	W+2'-7"
WL26	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WL27	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WL28	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	18	18	18	18	18	18	18	18	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RS2	#4	1	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RS3	#4	1	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RS4	#4	1	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
RS5	#4	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS6	#4	1	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RS7	#4	1	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RS8	#4	1	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RS9	#4	1	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RS10	#4	1	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
RS11	#4	1	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RS12	#4	1	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
RS13	#4	1	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RS14	#4	1	1	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
RS15	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-8 1/2"	W+3'-2 1/2"
RS16	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-4 1/2"	W+2'-10 1/2"
RS17	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-1"	W+2'-7"
RS18	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
RS19	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	13	13	13	13	13	13	13	13	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
RL2	#4	1	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
RL3	#4	1	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL4	#4	1	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RL5	#4	1	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
RL6	#4	1	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
RL7	#4	1	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RL8	#4	1	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RL9	#4	1	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
RL10	#4	1	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RL11	#4	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL12	#4	1	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
RL13	#4	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"

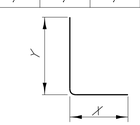
HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

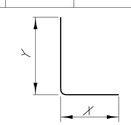
BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RL14	#4	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RL15	#4	1	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL16	#4	1	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
RL17	#4	1	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
RL18	#4	1	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RL19	#4	1	1	1	1	1	1	1	1	1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
RL20	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
RL21	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-7"	W+3'-1"
RL22	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RL23	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RL24	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
RL25	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
RL26	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	18	18	18	18	18	18	18	18	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2	2			4'-4"
YS2	#4	2	2	2	2	2	2	2	2			7'-4"
YS3	#4	2	2	2	2	2	2	2	2			10'-4 1/2"
YS4	#4	2	2	2	2	2	2	2	2			13'-5"
YS5	#4	2	2	2	2	2	2	2	2			16'-5"
YS6	#4	4	4	4	4	4	4	6	6			17'-0 1/2"
YL1	#4	2	2	2	2	2	2	2	2			6'-2"
YL2	#4	2	2	2	2	2	2	2	2			10'-5"
YL3	#4	2	2	2	2	2	2	2	2			14'-8"
YL4	#4	2	2	2	2	2	2	2	2			18'-11"
YL5	#4	2	2	2	2	2	2	2	2			23'-1 1/2"
YL6	#4	4	4	4	4	4	4	6	6			24'-0 1/2"
FS	#4	2	2	2	2	2	2	2	2			17'-11 1/2"
FL	#4	2	2	2	2	2	2	2	2			24'-8 1/2"
N	#4	12	14	17	19	22	25	28	30	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	10	12	14	16	19	21	23	26	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			1.155S+1'-3 1/2"
OS	#7	8	8	8	8	8	8	9	9	3'-1 1/2"	3'-1 1/2"	6'-3"
OL	#7	8	8	8	8	8	8	9	9	3'-1 1/2"	3'-1 1/2"	6'-3"
OSS	#4	1	1	1	1	1	1	1	1			6'-0"+T1
OSL	#4	1	1	1	1	1	1	1	1			6'-0"+T1



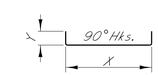
BARS DRS/DRL - #4



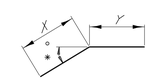
BARS DWS/DWL - #5



BARS RSn/RLn - #4

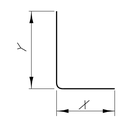


BARS N - #4

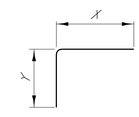


DOWELS OS/OL - #7

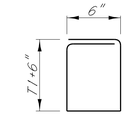
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-6-3W-30

SHEET NUMBER 7077

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-4"	22'-2 1/2"	31'-1 3/8"	0'-1 9/16"	0'-7 3/8"	22'-0"	0'-11"	0'-9"	3'-0"	2'-3"	28'-11 1/2"	31'-3 13/16"	33'-6 7/8"	35'-10 5/8"	38'-2 5/16"	40'-6 11/16"	42'-9 3/4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	24.3565	3418.191	0.6317	38.466	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	24.3565	3418.191	0.6317	38.466	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	24.4159	3418.191	0.6317	38.466	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	24.5999	3429.827	0.6317	38.577	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	24.5999	3429.827	0.6317	38.577	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	24.7454	3441.463	0.6364	38.855	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	25.6133	3515.693	0.7457	44.645	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	25.6600	3515.693	0.7457	44.645	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	25.7692	3521.622	0.7505	44.812	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	26.0511	3539.410	0.7552	44.923	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	26.0748	3539.410	0.7552	44.923	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	26.0748	3539.410	0.7552	44.923	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	26.7870	3601.698	0.8597	52.438	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	26.9588	3607.738	0.8692	52.661	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	27.0830	3619.820	0.8692	52.661	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	27.4427	3643.983	0.8740	52.828	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	27.5365	3650.024	0.8835	53.050	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	27.5365	3650.024	0.8835	53.050	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	28.1079	3702.762	0.9833	60.454	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	28.2318	3708.970	0.9833	60.454	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	28.4816	3727.593	0.9880	60.565	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	28.9531	3758.632	0.9975	60.844	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	28.6786	3740.009	1.0118	61.233	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	29.0619	3764.840	1.0213	61.456	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	29.2911	3789.018	1.0973	68.192	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	29.7187	3814.294	1.1116	68.581	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	30.1022	3845.889	1.1163	68.748	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	29.7903	3820.613	1.1306	69.082	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	30.1858	3845.889	1.1354	69.249	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	30.4590	3871.166	1.1686	70.140	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	30.6161	3983.852	1.2209	76.208	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	31.0233	4009.574	1.2304	76.486	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	31.1581	4022.434	1.2494	76.987	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	31.2439	4022.434	1.2589	77.265	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	31.7616	4061.017	1.2874	78.045	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	32.2405	4086.739	1.3064	78.546	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	32.5055	4126.060	1.3539	84.502	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	32.5117	4126.060	1.3634	84.780	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	32.4592	4119.462	1.3777	85.170	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	33.0577	4152.449	1.4015	84.782	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	33.5080	4192.034	1.4300	85.562	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	34.0877	4225.021	1.4537	87.230	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-8-3W-30

SHEET NUMBER 7078

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.155S+3'-11"
T2	#4	1	1	1	1	1	1	1			1.155S+7'-7"
T3	#4	1	1	1	1	1	1	1			1.155S+8'-5"
T4	#4	1	1	1	1	1	1	1			1.155S+9'-2 1/2"
T5	#4	1	1	1	1	1	1	1			1.155S+10'-0 1/2"
T6	#4	1	1	1	1	1	1	1			1.155S+10'-10"
T7	#4	1	1	1	1	1	1	1			1.155S+11'-8"
T8	#4	1	1	1	1	1	1	1			1.155S+12'-5 1/2"
T9	#4	1	1	1	1	1	1	1			1.155S+13'-3 1/2"
T10	#4	1	1	1	1	1	1	1			1.155S+14'-1"
T11	#4	1	1	1	1	1	1	1			1.155S+14'-11"
T12	#4	1	1	1	1	1	1	1			1.155S+15'-8 1/2"
T13	#4	1	1	1	1	1	1	1			1.155S+16'-6"
T14	#4	1	1	1	1	1	1	1			1.155S+17'-4"
T15	#4	1	1	1	1	1	1	1			1.155S+18'-1 1/2"
T16	#4	1	1	1	1	1	1	1			1.155S+18'-11 1/2"
T17	#4	1	1	1	1	1	1	1			1.155S+19'-9"
T18	#4	1	1	1	1	1	1	1			1.155S+20'-7"
T19	#4	1	1	1	1	1	1	1			1.155S+21'-4 1/2"
T20	#4	1	1	1	1	1	1	1			1.155S+22'-2 1/2"
T21	#4	1	1	1	1	1	1	1			1.155S+23'-0"
T22	#4	1	1	1	1	1	1	1			1.155S+22'-11 1/2"
T23	#4	3	3	3	3	3	3	3			1.155S+19'-2"
V1	#4	11	13	15	17	19	21	23	25'-0"	1'-8"	26'-8"
VL1	#4	1	1	1	1	1	1	1	24'-6"	1'-8"	26'-2"
VL2	#4	1	1	1	1	1	1	1	21'-4"	1'-8"	23'-0"
VL3	#4	1	1	1	1	1	1	1	18'-2 1/2"	1'-8"	19'-10 1/2"
VL4	#4	1	1	1	1	1	1	1	15'-0 1/2"	1'-8"	16'-8 1/2"
VL5	#4	1	1	1	1	1	1	1	11'-10 1/2"	1'-8"	13'-6 1/2"
VL6	#4	1	1	1	1	1	1	1	8'-9"	1'-8"	10'-5"
VL7	#4	1	1	1	1	1	1	1	5'-0"		5'-0"
VS1	#4	1	1	1	1	1	1	1	24'-11"	1'-8"	26'-7"
VS2	#4	1	1	1	1	1	1	1	24'-8 1/2"	1'-8"	26'-4 1/2"
VS3	#4	1	1	1	1	1	1	1	24'-6"	1'-8"	26'-2"
VS4	#4	1	1	1	1	1	1	1	21'-10 1/2"	1'-8"	23'-6 1/2"
VS5	#4	1	1	1	1	1	1	1	18'-6 1/2"	1'-8"	20'-2 1/2"
VS6	#4	1	1	1	1	1	1	1	15'-2 1/2"	1'-8"	16'-10 1/2"
VS7	#4	1	1	1	1	1	1	1	11'-10 1/2"	1'-8"	13'-6 1/2"
VS8	#4	1	1	1	1	1	1	1	8'-6 1/2"	1'-8"	10'-2 1/2"
VS9	#4	1	1	1	1	1	1	1	5'-3"		5'-3"
VS10	#4	1	1	1	1	1	1	1	1'-11"		1'-11"
FTL1	#5	1	1	1	1	1	1	1			1'-6 1/2"
FTL2	#5	1	1	1	1	1	1	1			2'-2 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-10 1/2"
FTL4	#5	42	42	42	42	42	42	42			5'-8"
FTL5	#5	1	1	1	1	1	1	1			5'-3 1/2"
FTL6	#5	1	1	1	1	1	1	1			4'-7 1/2"
FTL7	#5	1	1	1	1	1	1	1			3'-11 1/2"
FTL8	#5	1	1	1	1	1	1	1			3'-4"
FTL9	#5	1	1	1	1	1	1	1			2'-8"
FTL10	#5	1	1	1	1	1	1	1			2'-8"
FLL	#4	7	7	7	7	7	7	7			30'-7 1/2"
FTS1	#5	1	1	1	1	1	1	1			2'-10"
FTS2	#5	33	33	33	33	33	33	33			5'-8"
FLS	#4	7	7	7	7	7	7	7			21'-10 1/2"
WS1	#5	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
WS2	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WS3	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WS4	#5	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
WS5	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WS6	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WS7	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WS8	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WS9	#5	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WS10	#5	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WS11	#5	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WS12	#5	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WS13	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS14	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WS15	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS16	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS17	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WS18	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WS19	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WS20	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WS21	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WS22	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WS23	#5	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WS24	#5	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WS25	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WS26	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WS27	#5	1	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
WS28	#5	1	1	1	1	1	1	1	1'-6"	W+1'-9"	W+3'-3"
WS29	#5	1	1	1	1	1	1	1	1'-6"	W+1'-6 1/2"	W+3'-0 1/2"
WS30	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS31	#5	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS32	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WS33	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WS34	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	26	26	26	26	26	26	26	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WL3	#5	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
WL4	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL5	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL6	#5	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
WL7	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL8	#5	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
WL9	#5	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
WL10	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WL11	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL12	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL13	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL14	#5	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WL15	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL16	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL17	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL18	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL19	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL20	#5	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL21	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL22	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WL23	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WL24	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL25	#5	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WL26	#5	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL27	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WL28	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL29	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL30	#5	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
WL31	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL32	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL33	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WL34	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL35	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WL36	#5	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
WL37	#5	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
WL38	#5	1	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
WL39	#5	1	1	1	1	1	1	1	1'-6"	W+1'-10"	W+3'-4"
WL40	#5	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WL41	#5	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL42	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4 1/2"	W+2'-10 1/2"
WL43	#5	1	1	1	1	1	1	1	1'-6"	W+1'-2 1/2"	W+2'-8 1/2"
WL44	#5	1	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
WL45	#5	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WL46	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL47	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WL48	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	37	37	37	37	37	37	37	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
RS2	#4	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
RS3	#4	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
RS4	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RS5	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RS6	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RS7	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RS8	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS9	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS10	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RS11	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS12	#4	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RS13	#4	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
RS14	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS15	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RS16	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RS17	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS18	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RS19	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RS20	#4	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
RS21	#4	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RS22	#4	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RS23	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	19	19	19	19	19	19	19	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RL3	#4	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
RL4	#4	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
RL5	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RL6	#4	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
RL7	#4	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
RL8	#4	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RL9	#4	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL10	#4	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL11	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RL12	#4	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
RL13	#4	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
RL14	#4	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
RL15	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RL16	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL17	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL18	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RL19	#4	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 2 OF 3

WORKING NUMBER
IWS-8-3W-30

SHEET NUMBER
7079

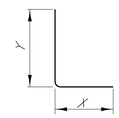
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

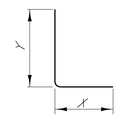
HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RL20	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RL21	#4	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
RL22	#4	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
RL23	#4	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
RL24	#4	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RL25	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RL26	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL27	#4	1	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
RL28	#4	1	1	1	1	1	1	1	1'-6"	W+1'-4 1/2"	W+2'-10 1/2"
RL29	#4	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RL30	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
RL31	#4	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
RL32	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	26	26	26	26	26	26	26	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			4'-4"
YS2	#4	2	2	2	2	2	2	2			7'-4 1/2"
YS3	#4	2	2	2	2	2	2	2			10'-4 1/2"
YS4	#4	2	2	2	2	2	2	2			13'-5"
YS5	#4	2	2	2	2	2	2	2			16'-5 1/2"
YS6	#4	2	2	2	2	2	2	2			19'-5 1/2"
YS7	#4	6	6	6	6	6	8	8			21'-10 1/2"
YL1	#4	2	2	2	2	2	2	2			6'-2"
YL2	#4	2	2	2	2	2	2	2			10'-5"
YL3	#4	2	2	2	2	2	2	2			14'-8"
YL4	#4	2	2	2	2	2	2	2			18'-11"
YL5	#4	2	2	2	2	2	2	2			23'-1 1/2"
YL6	#4	2	2	2	2	2	2	2			27'-4 1/2"
YL7	#4	6	6	6	6	6	8	8			30'-9 1/2"
FS	#4	2	2	2	2	2	2	2			23'-0 1/2"
FL	#4	2	2	2	2	2	2	2			31'-7 1/2"
N	#4	14	16	19	22	25	28	31	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	12	14	16	19	21	23	26	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.155S+1'-3"
OS	#7	10	10	10	10	10	11	11	3'-1 1/2"	3'-1 1/2"	6'-3"
OL	#7	10	10	10	10	10	11	11	3'-1 1/2"	3'-1 1/2"	6'-3"
OSS	#4	1	1	1	1	1	1	1			8'-0"+T1
OSL	#4	1	1	1	1	1	1	1			8'-0"+T1



BARS DRS/DRL - #4



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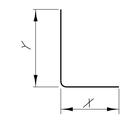

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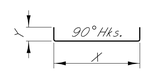
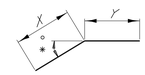
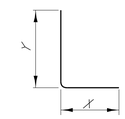


BARS N - #4



DOWELS OS/OL - #7
* See plan of apron



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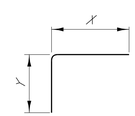

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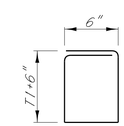


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 3 OF 3

WORKING NUMBER
IWS-8-3W-30

SHEET NUMBER
7080

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-4"	25'-2 11/16"	35'-4 1/4"	0'-1 15/16"	0'-9"	25'-0"	0'-11"	0'-11"	4'-0"	2'-6"	34'-1 1/8"	36'-4 13/16"	38'-8 1/2"	41'-0 1/4"	43'-3 15/16"	45'-7 11/16"	47'-11 3/8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	36.7460	4930.916	0.7552	46.482	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	36.7931	4930.916	0.7552	46.482	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	36.6208	4916.414	0.7600	46.593	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	37.0657	4945.417	0.7790	47.150	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	37.1520	4952.668	0.7790	47.150	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	37.4900	4974.420	0.7932	47.539	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	38.2012	5041.108	0.8692	54.219	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	38.2825	5041.108	0.8692	54.219	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	38.1971	5033.746	0.8740	54.386	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	38.6866	5063.194	0.8930	54.887	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	38.8032	5070.556	0.8978	54.999	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	38.7238	5063.194	0.9120	55.3883	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	39.6206	5136.883	0.9833	60.454	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	39.6206	5136.883	0.9833	60.454	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	39.7963	5151.829	0.9928	60.677	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	40.4253	5189.197	1.0118	61.233	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	40.6297	5204.143	1.0118	61.233	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	40.5560	5196.670	1.0308	61.734	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	40.9497	5232.518	1.1068	66.911	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	41.1570	5247.687	1.1068	66.911	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	41.7007	5285.611	1.1211	67.301	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	41.7898	5293.196	1.1258	67.412	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	41.7809	5285.611	1.1354	67.691	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	42.3687	5323.535	1.1496	68.080	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	42.2176	5331.382	1.2304	74.927	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	42.6400	5362.389	1.2304	74.927	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	43.0710	5393.396	1.2446	75.317	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	42.9905	5385.644	1.2541	75.595	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	43.4557	5408.899	1.2637	75.818	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	43.8954	5432.155	1.2827	76.319	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	44.1680	5581.129	1.3444	82.665	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	43.9585	5565.403	1.3539	82.943	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	44.2718	5588.992	1.3729	83.444	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	44.8997	5620.445	1.3967	84.112	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	45.2631	5644.034	1.4110	84.502	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	46.0007	5691.212	1.4395	85.281	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	45.4577	5677.433	1.4775	89.401	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	45.5531	5685.407	1.4917	89.790	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	45.8747	5701.356	1.5012	90.069	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	46.8945	5765.151	1.5393	91.071	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-10-3W-30

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7081

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.155S+4'-6"
T2	#4	1	1	1	1	1	1	1			1.155S+8'-7"
T3	#4	1	1	1	1	1	1	1			1.155S+9'-4 1/2"
T4	#4	1	1	1	1	1	1	1			1.155S+10'-2 1/2"
T5	#4	1	1	1	1	1	1	1			1.155S+11'-0"
T6	#4	1	1	1	1	1	1	1			1.155S+11'-10"
T7	#4	1	1	1	1	1	1	1			1.155S+12'-7 1/2"
T8	#4	1	1	1	1	1	1	1			1.155S+13'-5 1/2"
T9	#4	1	1	1	1	1	1	1			1.155S+14'-3"
T10	#4	1	1	1	1	1	1	1			1.155S+15'-1"
T11	#4	1	1	1	1	1	1	1			1.155S+15'-10 1/2"
T12	#4	1	1	1	1	1	1	1			1.155S+16'-8 1/2"
T13	#4	1	1	1	1	1	1	1			1.155S+17'-6"
T14	#4	1	1	1	1	1	1	1			1.155S+18'-4"
T15	#4	1	1	1	1	1	1	1			1.155S+19'-1 1/2"
T16	#4	1	1	1	1	1	1	1			1.155S+19'-11 1/2"
T17	#4	1	1	1	1	1	1	1			1.155S+20'-9"
T18	#4	1	1	1	1	1	1	1			1.155S+21'-7"
T19	#4	1	1	1	1	1	1	1			1.155S+22'-4 1/2"
T20	#4	1	1	1	1	1	1	1			1.155S+23'-2 1/2"
T21	#4	1	1	1	1	1	1	1			1.155S+24'-0"
T22	#4	1	1	1	1	1	1	1			1.155S+24'-10"
T23	#4	1	1	1	1	1	1	1			1.155S+25'-7 1/2"
T24	#4	1	1	1	1	1	1	1			1.155S+26'-5 1/2"
T25	#4	1	1	1	1	1	1	1			1.155S+26'-0 1/2"
T26	#4	3	3	3	3	3	3	3			1.155S+22'-0"
V1	#4	14	16	18	20	22	24	26	28'-6"	1'-8"	30'-2"
VL1	#4	1	1	1	1	1	1	1	26'-3 1/2"	1'-8"	27'-11 1/2"
VL2	#4	1	1	1	1	1	1	1	23'-1 1/2"	1'-8"	24'-9 1/2"
VL3	#4	1	1	1	1	1	1	1	19'-11 1/2"	1'-8"	21'-7 1/2"
VL4	#4	1	1	1	1	1	1	1	16'-10"	1'-8"	18'-6"
VL5	#4	1	1	1	1	1	1	1	13'-8"	1'-8"	15'-4"
VL6	#4	1	1	1	1	1	1	1	10'-6"	1'-8"	12'-2"
VL7	#4	1	1	1	1	1	1	1	7'-0"		7'-0"
VL8	#4	1	1	1	1	1	1	1	3'-0"		3'-0"
VS1	#4	1	1	1	1	1	1	1	28'-4 1/2"	1'-8"	30'-0 1/2"
VS2	#4	1	1	1	1	1	1	1	28'-2"	1'-8"	29'-10"
VS3	#4	1	1	1	1	1	1	1	27'-11 1/2"	1'-8"	29'-7 1/2"
VS4	#4	1	1	1	1	1	1	1	26'-6 1/2"	1'-8"	28'-2 1/2"
VS5	#4	1	1	1	1	1	1	1	23'-2 1/2"	1'-8"	24'-10 1/2"
VS6	#4	1	1	1	1	1	1	1	19'-10 1/2"	1'-8"	21'-6 1/2"
VS7	#4	1	1	1	1	1	1	1	16'-7"	1'-8"	18'-3"
VS8	#4	1	1	1	1	1	1	1	13'-3"	1'-8"	14'-11"
VS9	#4	1	1	1	1	1	1	1	9'-11"	1'-8"	11'-7"
VS10	#4	1	1	1	1	1	1	1	6'-7"		6'-7"
VS11	#4	1	1	1	1	1	1	1	3'-3"		3'-3"
FTL1	#5	1	1	1	1	1	1	1			1'-3"
FTL2	#5	1	1	1	1	1	1	1			1'-9 1/2"
FTL3	#5	1	1	1	1	1	1	1			2'-4 1/2"
FTL4	#5	1	1	1	1	1	1	1			2'-11 1/2"
FTL5	#5	1	1	1	1	1	1	1			3'-6 1/2"
FTL6	#5	1	1	1	1	1	1	1			4'-1 1/2"
FTL7	#5	53	53	53	53	53	53	53			7'-1"
FTL8	#5	1	1	1	1	1	1	1			6'-10 1/2"
FTL9	#5	1	1	1	1	1	1	1			6'-3 1/2"
FTL10	#5	1	1	1	1	1	1	1			5'-8 1/2"
FTL11	#5	1	1	1	1	1	1	1			5'-1 1/2"
FTL12	#5	1	1	1	1	1	1	1			4'-6 1/2"
FTL13	#5	1	1	1	1	1	1	1			4'-0"
FTL14	#5	1	1	1	1	1	1	1			3'-5"
FTL15	#5	2	2	2	2	2	2	2			3'-1"
FLL	#4	9	9	9	9	9	9	9			34'-10 1/2"
FTS1	#5	1	1	1	1	1	1	1			3'-3"
FTS2	#5	43	43	43	43	43	43	43			7'-1"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
FTS3	#5	1	1	1	1	1	1	1			1'-5 1/2"
FLS	#4	9	9	9	9	9	9	9			24'-10 1/2"
WS1	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WS2	#5	1	1	1	1	1	1	1		W+7'-6"	W+7'-6"
WS3	#5	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WS4	#5	1	1	1	1	1	1	1		W+7'-1 1/2"	W+7'-1 1/2"
WS5	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WS6	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WS7	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WS8	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS9	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WS10	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WS11	#5	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
WS12	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WS13	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WS14	#5	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
WS15	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WS16	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WS17	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS18	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WS19	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WS20	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS21	#5	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS22	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WS23	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WS24	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WS25	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WS26	#5	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
WS27	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WS28	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WS29	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS30	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WS31	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WS32	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS33	#5	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WS34	#5	1	1	1	1	1	1	1		W+1'-4 1/2"	W+1'-4 1/2"
WS35	#5	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
WS36	#5	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
WS37	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WS38	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WS39	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WS40	#5	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
WS41	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WS42	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10"	W+2'-4"
WS43	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WS44	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	41	41	41	41	41	41	41	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+7'-7"	W+7'-7"
WL3	#5	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
WL4	#5	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WL5	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WL6	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL7	#5	1	1	1	1	1	1	1		W+6'-10 1/2"	W+6'-10 1/2"
WL8	#5	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
WL9	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL10	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL11	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WL12	#5	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
WL13	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL14	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL15	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL16	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WL17	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WL18	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL19	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL20	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL21	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL22	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL23	#5	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WL24	#5	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL25	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL26	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL27	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL28	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WL29	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL30	#5	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL31	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL32	#5	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL33	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WL34	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL35	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL36	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL37	#5	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL38	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WL39	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL40	#5	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL41	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL42	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL43	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL44	#5	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WL45	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WL46	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL47	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WL48	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL49	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL50	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WL51	#5	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
WL52	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WL53	#5	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
WL54	#5	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
WL55	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL56	#5	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
WL57	#5	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
WL58	#5	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
WL59	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10"	W+2'-4"
WL60	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WL61	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WL62	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	58	58	58	58	58	58	58	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RS2	#4	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
RS3	#4	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
RS4	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RS5	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RS6	#4	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 3

WORKING NUMBER
IWS-10-3W-30

SHEET NUMBER
7082

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

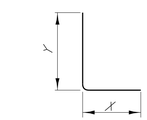
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RS7	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RS8	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RS9	#4	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RS10	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RS11	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS12	#4	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RS13	#4	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RS14	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS15	#4	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RS16	#4	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
RS17	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS18	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RS19	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RS20	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS21	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RS22	#4	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RS23	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RS24	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RS25	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RS26	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	25	25	25	25	25	25	25	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
RL3	#4	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
RL4	#4	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
RL5	#4	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
RL6	#4	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
RL7	#4	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
RL8	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RL9	#4	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RL10	#4	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
RL11	#4	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
RL12	#4	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
RL13	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RL14	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RL15	#4	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
RL16	#4	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL17	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RL18	#4	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
RL19	#4	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
RL20	#4	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RL21	#4	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
RL22	#4	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
RL23	#4	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
RL24	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RL25	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RL26	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL27	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RL28	#4	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
RL29	#4	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
RL30	#4	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL31	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL32	#4	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
RL33	#4	1	1	1	1	1	1	1		W+0'-4 1/2"	W+0'-4 1/2"
RL34	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RL35	#4	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
RL36	#4	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
RL37	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	36	36	36	36	36	36	36	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			4'-4"
YS2	#4	2	2	2	2	2	2	2			7'-4 1/2"
YS3	#4	2	2	2	2	2	2	2			10'-4 1/2"
YS4	#4	2	2	2	2	2	2	2			13'-5"
YS5	#4	2	2	2	2	2	2	2			16'-5 1/2"

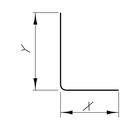
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

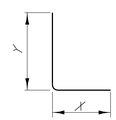
BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
YS6	#4	2	2	2	2	2	2	2			19'-5 1/2"
YS7	#4	2	2	2	2	2	2	2			22'-6"
YS8	#4	8	8	8	8	8	10	10			24'-10 1/2"
YL1	#4	2	2	2	2	2	2	2			6'-2"
YL2	#4	2	2	2	2	2	2	2			10'-5"
YL3	#4	2	2	2	2	2	2	2			14'-8"
YL4	#4	2	2	2	2	2	2	2			18'-11"
YL5	#4	2	2	2	2	2	2	2			23'-1 1/2"
YL6	#4	2	2	2	2	2	2	2			27'-4 1/2"
YL7	#4	2	2	2	2	2	2	2			31'-7 1/2"
YL8	#4	8	8	8	8	8	10	10			35'-0 1/2"
FS	#4	2	2	2	2	2	2	2			26'-2 1/2"
FL	#4	2	2	2	2	2	2	2			36'-0"
N	#4	17	20	22	24	27	30	32	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	15	17	19	21	24	26	28	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.155S+1'-7 1/2"
OS	#7	12	12	12	12	12	13	13	3'-3 1/2"	3'-3 1/2"	6'-7"
OL	#7	12	12	12	12	12	13	13	3'-3 1/2"	3'-3 1/2"	6'-7"
OSS	#4	1	1	1	1	1	1	1			10'-0"+T1
OSL	#4	1	1	1	1	1	1	1			10'-0"+T1



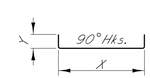
BARS DRS/DRL - #4



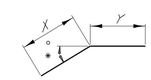
BARS DWS/DWL - #5



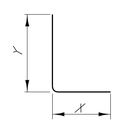
BARS RSn/RLn - #4



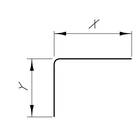
BARS N - #4



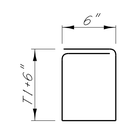
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 3 OF 3

WORKING NUMBER IWS-10-3W-30

SHEET NUMBER 7083

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-7"	29'-0 3/16"	40'-7 7/8"	0'-2 1/8"	0'-9 13/16"	28'-9"	0'-11"	1'-0"	5'-0"	2'-6"	39'-8"	41'-11 3/4"	44'-3 7/16"	46'-7 1/8"	48'-10 7/8"	51'-2 9/16"	53'-6 5/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	50.9193	7726.411	0.8788	54.498	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	51.0029	7726.411	0.8883	54.776	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	51.0607	7726.411	0.8978	54.999	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	51.7227	7777.946	0.9168	55.555	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	51.9682	7798.560	0.9168	55.555	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	51.7384	7777.946	0.8883	54.776	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	52.5864	7848.079	0.9928	60.677	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	52.7282	7858.497	1.0023	60.955	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	52.9026	7868.915	1.0118	61.233	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	53.6138	7921.007	1.0308	61.734	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	53.5840	7921.007	1.0356	61.846	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	53.8725	7941.844	1.0451	62.124	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	54.0084	7962.891	1.1068	68.470	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	54.3318	7984.062	1.1163	68.748	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	55.0614	8036.989	1.1401	69.361	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	54.8090	8015.818	1.1401	69.361	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	55.2515	8047.574	1.1544	69.750	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	55.6777	8079.330	1.1449	69.472	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	55.7991	8095.590	1.2209	74.649	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	56.0963	8116.983	1.2304	74.927	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	56.6565	8159.770	1.2494	75.428	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	56.6596	8159.770	1.2541	75.595	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	57.2434	8191.860	1.2779	76.208	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	57.8813	8245.343	1.2922	76.597	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	57.1971	8207.230	1.3444	81.106	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	57.5867	8228.846	1.3539	81.385	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	58.5244	8304.502	1.3682	81.774	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	58.8664	8315.310	1.3872	82.275	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	59.2255	8336.926	1.3967	82.554	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	58.9462	8344.270	1.4775	90.959	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	59.4044	8377.195	1.4680	90.681	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	59.8881	8410.120	1.4965	91.460	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	60.9976	8486.945	1.5155	92.017	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	61.6783	8541.820	1.5488	92.908	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	60.4311	8456.133	1.5820	96.916	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	61.2338	8511.564	1.6010	97.417	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	61.9434	8566.996	1.6200	97.918	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	63.0764	8644.600	1.6723	99.365	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 4

WORKING NUMBER IWS-12-3W-30

SHEET NUMBER 7084

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.155S+4'-6 ½"
T2	#4	1	1	1	1	1	1	1			1.155S+8'-8"
T3	#4	1	1	1	1	1	1	1			1.155S+9'-5"
T4	#4	1	1	1	1	1	1	1			1.155S+10'-2"
T5	#4	1	1	1	1	1	1	1			1.155S+10'-11 ½"
T6	#4	1	1	1	1	1	1	1			1.155S+11'-8 ½"
T7	#4	1	1	1	1	1	1	1			1.155S+12'-5 ½"
T8	#4	1	1	1	1	1	1	1			1.155S+13'-2 ½"
T9	#4	1	1	1	1	1	1	1			1.155S+13'-11 ½"
T10	#4	1	1	1	1	1	1	1			1.155S+14'-8 ½"
T11	#4	1	1	1	1	1	1	1			1.155S+15'-5 ½"
T12	#4	1	1	1	1	1	1	1			1.155S+16'-2 ½"
T13	#4	1	1	1	1	1	1	1			1.155S+16'-11 ½"
T14	#4	1	1	1	1	1	1	1			1.155S+17'-9"
T15	#4	1	1	1	1	1	1	1			1.155S+18'-6"
T16	#4	1	1	1	1	1	1	1			1.155S+19'-3"
T17	#4	1	1	1	1	1	1	1			1.155S+20'-0"
T18	#4	1	1	1	1	1	1	1			1.155S+20'-9"
T19	#4	1	1	1	1	1	1	1			1.155S+21'-6"
T20	#4	1	1	1	1	1	1	1			1.155S+22'-3"
T21	#4	1	1	1	1	1	1	1			1.155S+23'-0"
T22	#4	1	1	1	1	1	1	1			1.155S+23'-9 ½"
T23	#4	1	1	1	1	1	1	1			1.155S+24'-6 ½"
T24	#4	1	1	1	1	1	1	1			1.155S+25'-3 ½"
T25	#4	1	1	1	1	1	1	1			1.155S+26'-0 ½"
T26	#4	1	1	1	1	1	1	1			1.155S+26'-9 ½"
T27	#4	1	1	1	1	1	1	1			1.155S+27'-6 ½"
T28	#4	1	1	1	1	1	1	1			1.155S+28'-3 ½"
T29	#4	1	1	1	1	1	1	1			1.155S+29'-0 ½"
T30	#4	1	1	1	1	1	1	1			1.155S+29'-10"
T31	#4	1	1	1	1	1	1	1			1.155S+29'-2 ½"
T32	#4	3	3	3	3	3	3	3			1.155S+25'-3"
V1	#4	16	18	20	22	24	26	28	32'-10"	1'-8"	34'-6"
VL1	#4	1	1	1	1	1	1	1	30'-10 ½"	1'-8"	32'-6 ½"
VL2	#4	1	1	1	1	1	1	1	27'-8 ½"	1'-8"	29'-4 ½"
VL3	#4	1	1	1	1	1	1	1	24'-6 ½"	1'-8"	26'-2 ½"
VL4	#4	1	1	1	1	1	1	1	21'-5"	1'-8"	23'-1"
VL5	#4	1	1	1	1	1	1	1	18'-3"	1'-8"	19'-11"
VL6	#4	1	1	1	1	1	1	1	15'-1"	1'-8"	16'-9"
VL7	#4	1	1	1	1	1	1	1	11'-11 ½"	1'-8"	13'-7 ½"
VL8	#4	1	1	1	1	1	1	1	8'-9 ½"		8'-9 ½"
VL9	#4	1	1	1	1	1	1	1	4'-9 ½"		4'-9 ½"
VS1	#4	1	1	1	1	1	1	1	32'-8 ½"	1'-8"	34'-4 ½"
VS2	#4	1	1	1	1	1	1	1	32'-6"	1'-8"	34'-2"
VS3	#4	1	1	1	1	1	1	1	32'-3 ½"	1'-8"	33'-11 ½"
VS4	#4	1	1	1	1	1	1	1	31'-1 ½"	1'-8"	32'-9 ½"
VS5	#4	1	1	1	1	1	1	1	27'-9 ½"	1'-8"	29'-5 ½"
VS6	#4	1	1	1	1	1	1	1	24'-5 ½"	1'-8"	26'-1 ½"
VS7	#4	1	1	1	1	1	1	1	21'-1 ½"	1'-8"	22'-9 ½"
VS8	#4	1	1	1	1	1	1	1	17'-10"	1'-8"	19'-6"
VS9	#4	1	1	1	1	1	1	1	14'-6"	1'-8"	16'-2"
VS10	#4	1	1	1	1	1	1	1	11'-2"	1'-8"	12'-10"
VS11	#4	1	1	1	1	1	1	1	7'-10"	1'-8"	9'-6"
VS12	#4	1	1	1	1	1	1	1	4'-6"		4'-6"
VS13	#4	1	1	1	1	1	1	1	1'-2 ½"		1'-2 ½"
FTL1	#5	1	1	1	1	1	1	1			1'-2 ½"
FTL2	#5	1	1	1	1	1	1	1			1'-7 ½"
FTL3	#5	1	1	1	1	1	1	1			2'-0 ½"
FTL4	#5	1	1	1	1	1	1	1			2'-5 ½"
FTL5	#5	1	1	1	1	1	1	1			2'-10 ½"
FTL6	#5	1	1	1	1	1	1	1			3'-3"
FTL7	#5	1	1	1	1	1	1	1			3'-8"
FTL8	#5	1	1	1	1	1	1	1			4'-1"
FTL9	#5	1	1	1	1	1	1	1			4'-6"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
FTL10	#5	1	1	1	1	1	1	1			4'-11"
FTL11	#5	1	1	1	1	1	1	1			5'-4"
FTL12	#5	83	83	83	83	83	83	83			8'-2"
FTL13	#5	1	1	1	1	1	1	1			8'-1"
FTL14	#5	1	1	1	1	1	1	1			7'-8"
FTL15	#5	1	1	1	1	1	1	1			7'-3"
FTL16	#5	1	1	1	1	1	1	1			6'-10"
FTL17	#5	1	1	1	1	1	1	1			6'-5"
FTL18	#5	1	1	1	1	1	1	1			6'-0"
FTL19	#5	1	1	1	1	1	1	1			5'-7"
FTL20	#5	1	1	1	1	1	1	1			5'-2"
FTL21	#5	1	1	1	1	1	1	1			4'-9"
FTL22	#5	1	1	1	1	1	1	1			4'-4"
FTL23	#5	1	1	1	1	1	1	1			3'-11"
FTL24	#5	1	1	1	1	1	1	1			3'-6"
FTL25	#5	3	3	3	3	3	3	3			3'-2"
FLL	#4	10	10	10	10	10	10	10			40'-2"
FTS1	#5	1	1	1	1	1	1	1			3'-4"
FTS2	#5	1	1	1	1	1	1	1			5'-8"
FTS3	#5	68	68	68	68	68	68	68			8'-2"
FTS4	#5	1	1	1	1	1	1	1			3'-5 ½"
FTS5	#5	1	1	1	1	1	1	1			1'-1"
FLS	#4	10	10	10	10	10	10	10			28'-8"
WS1	#5	1	1	1	1	1	1	1		W+8'-11"	W+8'-11"
WS2	#5	1	1	1	1	1	1	1		W+8'-9 ½"	W+8'-9 ½"
WS3	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WS4	#5	1	1	1	1	1	1	1		W+8'-6"	W+8'-6"
WS5	#5	1	1	1	1	1	1	1		W+8'-4 ½"	W+8'-4 ½"
WS6	#5	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
WS7	#5	1	1	1	1	1	1	1		W+8'-1 ½"	W+8'-1 ½"
WS8	#5	1	1	1	1	1	1	1		W+7'-11 ½"	W+7'-11 ½"
WS9	#5	1	1	1	1	1	1	1		W+7'-10"	W+7'-10"
WS10	#5	1	1	1	1	1	1	1		W+7'-8 ½"	W+7'-8 ½"
WS11	#5	1	1	1	1	1	1	1		W+7'-6 ½"	W+7'-6 ½"
WS12	#5	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
WS13	#5	1	1	1	1	1	1	1		W+7'-3 ½"	W+7'-3 ½"
WS14	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WS15	#5	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
WS16	#5	1	1	1	1	1	1	1		W+6'-10 ½"	W+6'-10 ½"
WS17	#5	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
WS18	#5	1	1	1	1	1	1	1		W+6'-7"	W+6'-7"
WS19	#5	1	1	1	1	1	1	1		W+6'-5 ½"	W+6'-5 ½"
WS20	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS21	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WS22	#5	1	1	1	1	1	1	1		W+6'-0 ½"	W+6'-0 ½"
WS23	#5	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
WS24	#5	1	1	1	1	1	1	1		W+5'-9 ½"	W+5'-9 ½"
WS25	#5	1	1	1	1	1	1	1		W+5'-7 ½"	W+5'-7 ½"
WS26	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WS27	#5	1	1	1	1	1	1	1		W+5'-4 ½"	W+5'-4 ½"
WS28	#5	1	1	1	1	1	1	1		W+5'-2 ½"	W+5'-2 ½"
WS29	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS30	#5	1	1	1	1	1	1	1		W+4'-11 ½"	W+4'-11 ½"
WS31	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WS32	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WS33	#5	1	1	1	1	1	1	1		W+4'-6 ½"	W+4'-6 ½"
WS34	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WS35	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WS36	#5	1	1	1	1	1	1	1		W+4'-1 ½"	W+4'-1 ½"
WS37	#5	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
WS38	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WS39	#5	1	1	1	1	1	1	1		W+3'-8 ½"	W+3'-8 ½"
WS40	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WS41	#5	1	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WS42	#5	1	1	1	1	1	1	1		W+3'-3 ½"	W+3'-3 ½"
WS43	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WS44	#5	1	1	1	1	1	1	1		W+3'-0 ½"	W+3'-0 ½"
WS45	#5	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
WS46	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WS47	#5	1	1	1	1	1	1	1		W+2'-7 ½"	W+2'-7 ½"
WS48	#5	1	1	1	1	1	1	1		W+2'-5 ½"	W+2'-5 ½"
WS49	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS50	#5	1	1	1	1	1	1	1		W+2'-2 ½"	W+2'-2 ½"
WS51	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WS52	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WS53	#5	1	1	1	1	1	1	1		W+1'-9 ½"	W+1'-9 ½"
WS54	#5	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WS55	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WS56	#5	1	1	1	1	1	1	1		W+1'-4 ½"	W+1'-4 ½"
WS57	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WS58	#5	1	1	1	1	1	1	1		W+1'-1 ½"	W+1'-1 ½"
WS59	#5	1	1	1	1	1	1	1		W+0'-11 ½"	W+0'-11 ½"
WS60	#5	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
WS61	#5	1	1	1	1	1	1	1		W+0'-8 ½"	W+0'-8 ½"
WS62	#5	1	1	1	1	1	1	1		W+0'-6 ½"	W+0'-6 ½"
WS63	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WS64	#5	1	1	1	1	1	1	1		W+0'-3 ½"	W+0'-3 ½"
WS65	#5	1	1	1	1	1	1	1		W+0'-1 ½"	W+0'-1 ½"
WS66	#5	1	1	1	1	1	1	1		W-0'-0"	W-0'-0"
WS67	#5	1	1	1	1	1	1	1		W-0'-1 ½"	W-0'-1 ½"
WS68	#5	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
WS69	#5	1	1	1	1	1	1	1		W-0'-5"	W-0'-5"
WS70	#5	1	1	1	1	1	1	1		W-0'-6 ½"	W-0'-6 ½"
DWS	#5	70	70	70	70	70	70	70	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-11 ½"	W+8'-11 ½"
WL2	#5	1	1	1	1	1	1	1		W+8'-10 ½"	W+8'-10 ½"
WL3	#5	1	1	1	1	1	1	1		W+8'-9"	W+8'-9"
WL4	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WL5	#5	1	1	1	1	1	1	1		W+8'-6 ½"	W+8'-6 ½"
WL6	#5	1	1	1	1	1	1	1		W+8'-5 ½"	W+8'-5 ½"
WL7	#5	1	1	1	1	1	1	1		W+8'-4 ½"	W+8'-4 ½"
WL8	#5	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
WL9	#5	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
WL10	#5	1	1	1	1	1	1	1		W+8'-1"	W+8'-1"
WL11	#5	1	1	1	1	1	1	1		W+7'-11 ½"	W+7'-11 ½"
WL12	#5	1	1	1	1	1	1	1		W+7'-10 ½"	W+7'-10 ½"
WL13	#5	1	1	1	1	1	1	1		W+7'-9 ½"	W+7'-9 ½"
WL14	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WL15	#5	1	1	1	1	1	1	1		W+7'-7"	W+7'-7"
WL16	#5	1	1	1	1	1	1	1		W+7'-6"	W+7'-6"
WL17	#5	1	1	1	1	1	1	1		W+7'-4 ½"	W+7'-4 ½"
WL18	#5	1	1	1	1	1	1	1		W+7'-3 ½"	W+7'-3 ½"
WL19	#5	1	1	1	1	1	1	1		W+7'-2 ½"	W+7'-2 ½"
WL20	#5	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
WL21	#5	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
WL22	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL23	#5	1	1	1	1	1	1	1		W+6'-9 ½"	W+6'-9 ½"

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 4

WORKING NUMBER
IWS-12-3W-30

SHEET NUMBER
7085

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL24	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL25	#5	1	1	1	1	1	1	1		W+6'-7"	W+6'-7"
WL26	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL27	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL28	#5	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WL29	#5	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
WL30	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WL31	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL32	#5	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
WL33	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WL34	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WL35	#5	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
WL36	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WL37	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL38	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WL39	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL40	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL41	#5	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
WL42	#5	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WL43	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL44	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WL45	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WL46	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL47	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL48	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL49	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL50	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WL51	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WL52	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL53	#5	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WL54	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL55	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL56	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WL57	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WL58	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WL59	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL60	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL61	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL62	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL63	#5	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL64	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WL65	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL66	#5	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL67	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WL68	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL69	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL70	#5	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
WL71	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL72	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL73	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL74	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL75	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL76	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL77	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL78	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WL79	#5	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
WL80	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL81	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WL82	#5	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
WL83	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WL84	#5	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
WL85	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WL86	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WL87	#5	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
WL88	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL89	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WL90	#5	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
WL91	#5	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
WL92	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WL93	#5	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
WL94	#5	1	1	1	1	1	1	1		W-0'-2"	W-0'-2"
WL95	#5	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
WL96	#5	1	1	1	1	1	1	1		W-0'-4 1/2"	W-0'-4 1/2"
WL97	#5	1	1	1	1	1	1	1		W-0'-5 1/2"	W-0'-5 1/2"
WL98	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	98	98	98	98	98	98	98	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+8'-11"	W+8'-11"
RS2	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RS3	#4	1	1	1	1	1	1	1		W+8'-3 1/2"	W+7'-11 1/2"
RS4	#4	1	1	1	1	1	1	1		W+7'-11 1/2"	W+8'-3 1/2"
RS5	#4	1	1	1	1	1	1	1		W+7'-7 1/2"	W+7'-7 1/2"
RS6	#4	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
RS7	#4	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
RS8	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RS9	#4	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
RS10	#4	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
RS11	#4	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
RS12	#4	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
RS13	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RS14	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RS15	#4	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS16	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS17	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RS18	#4	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
RS19	#4	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
RS20	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RS21	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS22	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RS23	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RS24	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS25	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RS26	#4	1	1	1	1	1	1	1		W+0'-9"	W+0'-9"
RS27	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RS28	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RS29	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RS30	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	30	30	30	30	30	30	30	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+8'-11 1/2"	W+8'-11 1/2"
RL2	#4	1	1	1	1	1	1	1		W+8'-8 1/2"	W+8'-8 1/2"
RL3	#4	1	1	1	1	1	1	1		W+8'-6"	W+8'-6"
RL4	#4	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
RL5	#4	1	1	1	1	1	1	1		W+8'-0 1/2"	W+8'-0 1/2"
RL6	#4	1	1	1	1	1	1	1		W+7'-9 1/2"	W+7'-9 1/2"
RL7	#4	1	1	1	1	1	1	1		W+7'-7"	W+7'-7"
RL8	#4	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
RL9	#4	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
RL10	#4	1	1	1	1	1	1	1		W+6'-10 1/2"	W+6'-10 1/2"
RL11	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RL12	#4	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
RL13	#4	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
RL14	#4	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
RL15	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RL16	#4	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
RL17	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RL18	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RL19	#4	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RL20	#4	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
RL21	#4	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RL22	#4	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RL23	#4	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
RL24	#4	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
RL25	#4	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
RL26	#4	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL27	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RL28	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RL29	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL30	#4	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
RL31	#4	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
RL32	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RL33	#4	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
RL34	#4	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
RL35	#4	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
RL36	#4	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
RL37	#4	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
RL38	#4	1	1	1	1	1	1	1		W+0'-4 1/2"	W+0'-4 1/2"
RL39	#4	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
RL40	#4	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
RL41	#4	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
RL42	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	42	42	42	42	42	42	42	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			3'-10"
YS2	#4	2	2	2	2	2	2	2			6'-4"
YS3	#4	2	2	2	2	2	2	2			8'-10 1/2"
YS4	#4	2	2	2	2	2	2	2			11'-5"
YS5	#4	2	2	2	2	2	2	2			13'-11"
YS6	#4	2	2	2	2	2	2	2			16'-5 1/2"
YS7	#4	2	2	2	2	2	2	2			18'-11 1/2"
YS8	#4	2	2	2	2	2	2	2			21'-6"
YS9	#4	2	2	2	2	2	2	2			24'-0"
YS10	#4	2	2	2	2	2	2	2			26'-6 1/2"
YS11	#4	12	12	12	12	12	12	12			28'-8"
YL1	#4	2	2	2	2	2	2	2			5'-5 1/2"
YL2	#4	2	2	2	2	2	2	2			9'-0"
YL3	#4	2	2	2	2	2	2	2			12'-6 1/2"
YL4	#4	2	2	2	2	2	2	2			16'-1"
YL5	#4	2	2	2	2	2	2	2			19'-7"
YL6	#4	2	2	2	2	2	2	2			23'-1 1/2"
YL7	#4	2	2	2	2	2	2	2			26'-8"
YL8	#4	2	2	2	2	2	2	2			30'-2 1/2"
YL9	#4	2	2	2	2	2	2	2			33'-9"
YL10	#4	2	2	2	2	2	2	2			37'-3 1/2"
YL11	#4	12	12	12	12	12	12	12			40'-4"
FS	#4	2	2	2	2	2	2	2			30'-2 1/2"
FL	#4	2	2	2	2	2	2	2			41'-5"
N	#4	20	22	25	27	29	33	35	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.155(S+2V)+1'-6"
K	#4	17	19	22	24	26	29	31	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			1.155S+1'-9 1/2"
OS	#7	17	17	17	17	17	17	17	3'-4"	3'-4"	6'-8"
OL	#7	17	17	17	17	17	17	17	3'-4"	3'-4"	6'-8"
OSS	#4	1	1	1	1	1	1	1			12'-0"+T1
OSL	#4	1	1	1	1	1	1	1			12'-0"+T1

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 3 OF 4

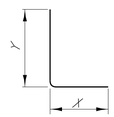
WORKING NUMBER IWS-12-3W-30

SHEET NUMBER 7086

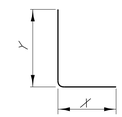
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

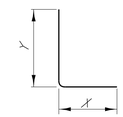
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI



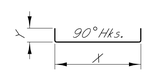
BARS DRS/DRL - #4



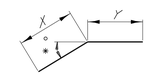
BARS DWS/DWL - #5



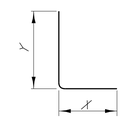
BARS RSn/RLn - #4



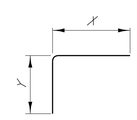
BARS N - #4



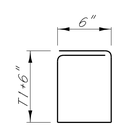
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

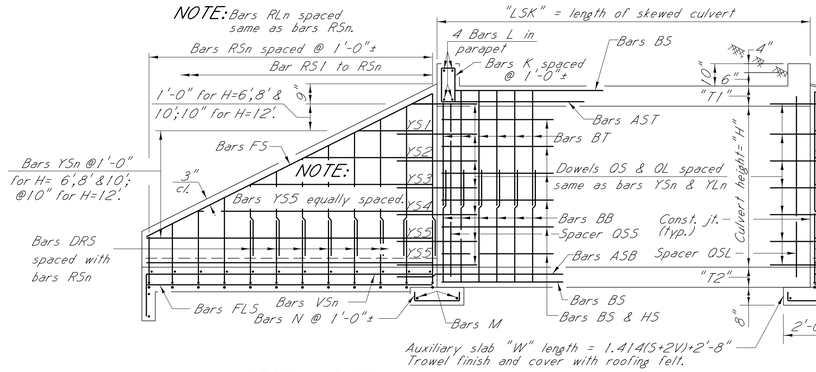
SHT. 4 OF 4

WORKING NUMBER
IWS-12-3W-30

SHEET NUMBER
7087

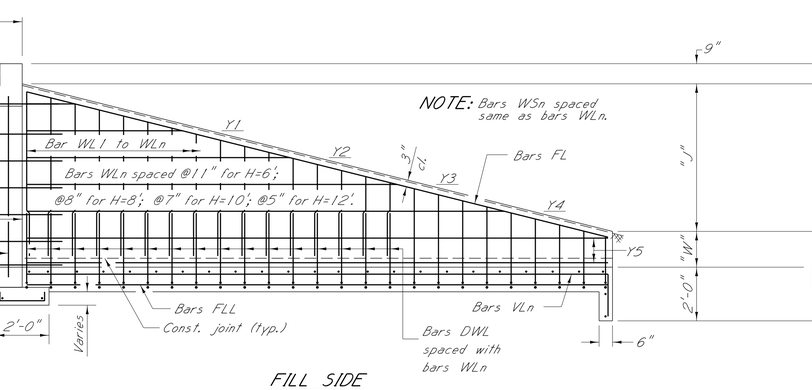
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



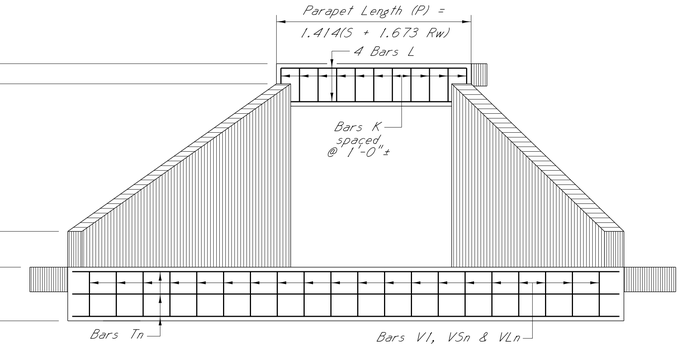
STREAM SIDE

Showing reinforcement in stream side of "LW1" wingwall



FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall



END ELEVATION

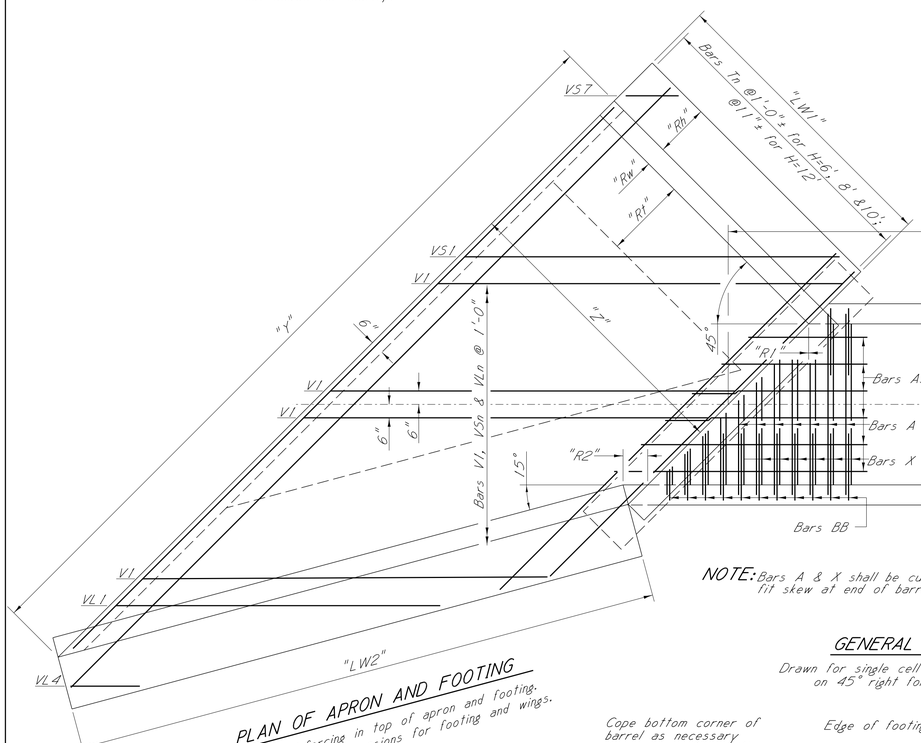
Showing reinforcing in pararpet & toe wall

LONGITUDINAL SECTION

Drawn for single cell 6' x 6' culvert

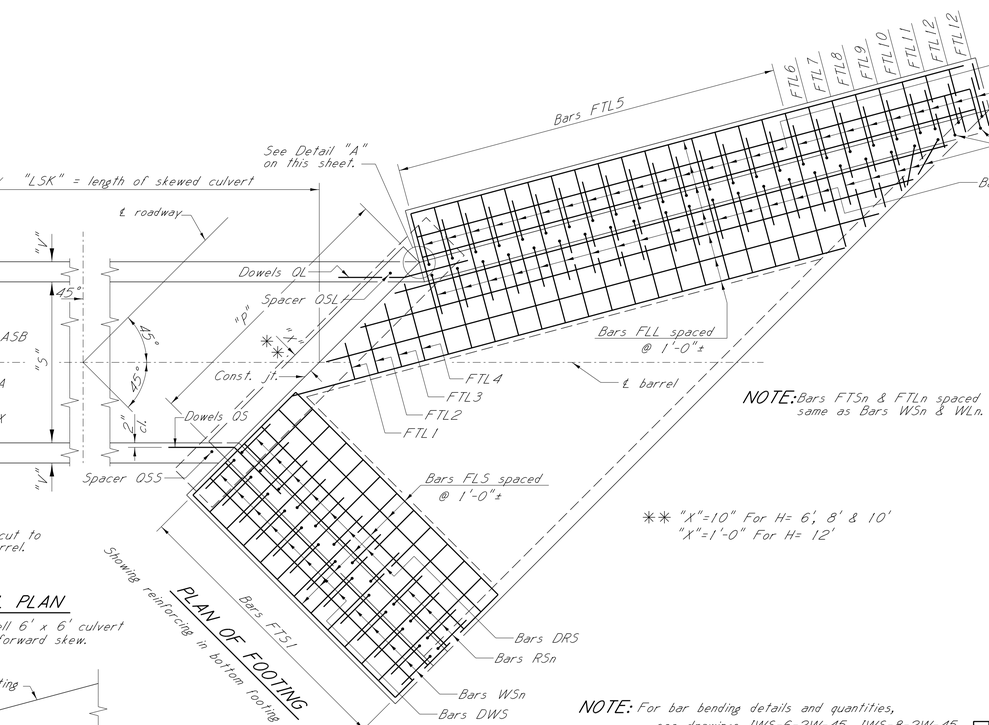
NOTE: Bars X & Bars A not shown for clarity.

NOTE: Culvert shall be sloped to conform to gradient of stream.



PLAN OF APRON AND FOOTING

Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.



PLAN OF FOOTING

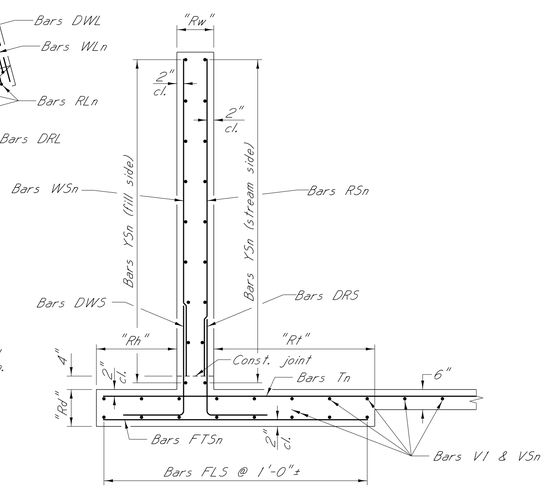
NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.

** "X"=10" For H= 6', 8' & 10'
"X"=1'-0" For H= 12'

NOTE: Bars A & X shall be cut to fit skew at end of barrel.

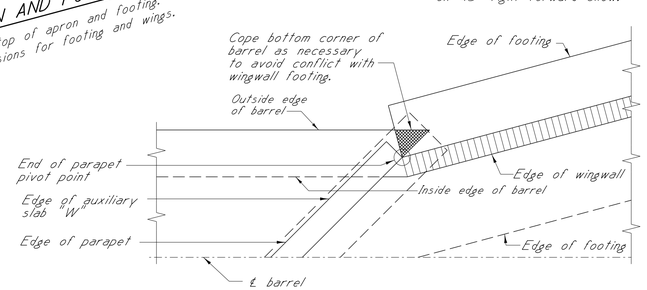
GENERAL PLAN

Drawn for single cell 6' x 6' culvert on 45° right forward skew.

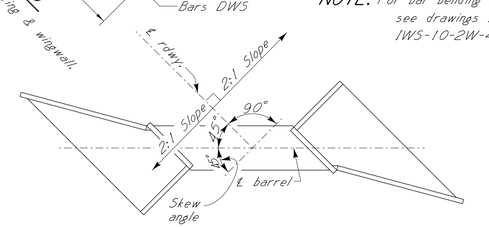


CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.



DETAIL "A"



PLAN OF 45° LEFT FORWARD SKEW

NOTE: For bar bending details and quantities, see drawings IWS-6-2W-45, IWS-8-2W-45, IWS-10-2W-45 & IWS-12-2W-45.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 6-24 FT.

SHT. 1 OF 1

WORKING NUMBER IWS-2W-45

SHEET NUMBER 7088

DATE	REVISIONS	BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN							
											6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-6"	11'-0"	22'-0"	0'-0"	0'-11"	11'-0"	0'-11"	0'-9"	3'-0"	2'-0"	29'-3 3/4"	32'-1 11/16"	34'-11 5/8"	37'-9 9/16"	40'-7 1/2"	43'-5 7/16"	46'-3 3/8"	49'-1 5/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	12.9077	1723.258	0.6555	39.134	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	12.9077	1723.258	0.6555	39.134	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	12.9077	1723.258	0.6555	39.134	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	12.9537	1723.258	0.6555	39.134	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	12.9537	1723.258	0.6555	39.134	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	12.9537	1723.258	0.6555	39.134	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	13.7185	1858.428	0.7951	47.539	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	13.7185	1858.428	0.7951	47.539	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	13.7459	1858.428	0.7951	47.539	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	13.9054	1865.349	0.7951	47.539	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	13.8780	1865.349	0.7951	47.539	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	14.0101	1872.270	0.7951	47.539	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	14.5761	1922.806	0.9348	57.559	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	14.5761	1922.806	0.9348	57.559	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	14.6852	1930.062	0.9348	57.559	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	14.9352	1944.572	0.9348	57.559	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	14.9718	1944.572	0.9465	57.893	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	15.1598	1955.455	0.9581	58.227	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	15.3903	1991.035	1.0745	66.021	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	15.5760	1998.624	1.0745	66.021	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	15.6915	2006.213	1.0803	66.188	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	15.9997	2021.392	1.0920	66.522	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	16.0890	2025.186	1.1094	66.967	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	16.0157	2021.392	1.1152	67.134	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	16.3274	2059.598	1.2200	74.649	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	16.5277	2071.483	1.2258	74.816	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	16.6881	2083.367	1.2316	74.983	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	17.1489	2103.175	1.2491	75.428	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	16.8790	2087.329	1.2665	75.929	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	17.1018	2099.214	1.2840	76.375	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	17.3861	2133.801	1.3946	85.615	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	17.5113	2141.947	1.3946	85.615	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	17.9827	2166.385	1.3946	85.615	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	17.6881	2154.166	1.4120	86.061	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	18.0209	2166.385	1.4295	86.562	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	18.3095	2182.676	1.4528	87.174	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	18.1688	2203.283	1.5226	93.743	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	18.7310	2228.722	1.5459	94.355	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	18.6942	2228.722	1.5634	94.856	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	18.8943	2237.202	1.5750	95.134	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	19.1354	2254.162	1.5983	95.802	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	19.7857	2279.601	1.6332	96.749	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	19.2799	2277.449	1.6798	102.649	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	19.5545	2295.077	1.6856	102.816	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	19.6021	2303.891	1.7147	103.596	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	20.4132	2339.146	1.7612	104.876	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	20.7617	2352.367	1.7787	105.321	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-6-2W-45

SHEET NUMBER 7089

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			1.414S+7'-6 ½"
T2	#4	1	1	1	1	1	1	1	1			1.414S+9'-2 ½"
T3	#4	1	1	1	1	1	1	1	1			1.414S+10'-11"
T4	#4	1	1	1	1	1	1	1	1			1.414S+12'-7"
T5	#4	1	1	1	1	1	1	1	1			1.414S+14'-3"
T6	#4	1	1	1	1	1	1	1	1			1.414S+15'-11 ½"
T7	#4	1	1	1	1	1	1	1	1			1.414S+17'-7 ½"
T8	#4	1	1	1	1	1	1	1	1			1.414S+19'-3 ½"
T9	#4	1	1	1	1	1	1	1	1			1.414S+21'-0"
T10	#4	1	1	1	1	1	1	1	1			1.414S+22'-8"
T11	#4	1	1	1	1	1	1	1	1			1.414S+23'-1 ½"
T12	#4	3	3	3	3	3	3	3	3			1.414S+20'-0 ½"
V1	#4	12	14	16	18	20	22	24	26	15'-1"	1'-8"	16'-9"
VL1	#4	1	1	1	1	1	1	1	1	12'-1"	1'-8"	13'-9"
VL2	#4	1	1	1	1	1	1	1	1	9'-4 ½"	1'-8"	11'-0 ½"
VL3	#4	1	1	1	1	1	1	1	1	6'-7"		6'-7"
VL4	#4	1	1	1	1	1	1	1	1	2'-7"		2'-7"
VS1	#4	1	1	1	1	1	1	1	1	13'-11 ½"	1'-8"	15'-7 ½"
VS2	#4	1	1	1	1	1	1	1	1	11'-11 ½"	1'-8"	13'-7 ½"
VS3	#4	1	1	1	1	1	1	1	1	9'-11 ½"	1'-8"	11'-7 ½"
VS4	#4	1	1	1	1	1	1	1	1	7'-11 ½"	1'-8"	9'-7 ½"
VS5	#4	1	1	1	1	1	1	1	1	5'-11 ½"	1'-8"	7'-7 ½"
VS6	#4	1	1	1	1	1	1	1	1	3'-11 ½"	1'-8"	5'-7 ½"
VS7	#4	1	1	1	1	1	1	1	1	1'-11 ½"		1'-11 ½"
FTL1	#5	1	1	1	1	1	1	1	1			1'-5"
FTL2	#5	1	1	1	1	1	1	1	1			1'-11"
FTL3	#5	1	1	1	1	1	1	1	1			2'-5 ½"
FTL4	#5	1	1	1	1	1	1	1	1			2'-11 ½"
FTL5	#5	17	17	17	17	17	17	17	17			5'-5"
FTL6	#5	1	1	1	1	1	1	1	1			5'-4 ½"
FTL7	#5	1	1	1	1	1	1	1	1			4'-10 ½"
FTL8	#5	1	1	1	1	1	1	1	1			4'-4"
FTL9	#5	1	1	1	1	1	1	1	1			3'-10"
FTL10	#5	1	1	1	1	1	1	1	1			3'-3 ½"
FTL11	#5	1	1	1	1	1	1	1	1			2'-9 ½"
FTL12	#5	2	2	2	2	2	2	2	2			2'-5"
FLL	#4	7	7	7	7	7	7	7	7			21'-4"
FTS	#5	13	13	13	13	13	13	13	13			5'-5"
FLS	#4	7	7	7	7	7	7	7	7			10'-8"
WS1	#5	1	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
WS2	#5	1	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
WS3	#5	1	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WS4	#5	1	1	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"
WS5	#5	1	1	1	1	1	1	1	1		W+3'-0 ½"	W+3'-0 ½"
WS6	#5	1	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WS7	#5	1	1	1	1	1	1	1	1		W+2'-1 ½"	W+2'-1 ½"
WS8	#5	1	1	1	1	1	1	1	1		W+1'-8 ½"	W+1'-8 ½"
WS9	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-3"	W+3'-9"
WS10	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
WS11	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS12	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WS13	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½""	W+1'-11 ½"
DWS	#5	8	8	8	8	8	8	8	8	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1	1		W+4'-10 ½"	W+4'-10 ½"
WL2	#5	1	1	1	1	1	1	1	1		W+4'-7 ½"	W+4'-7 ½"
WL3	#5	1	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WL4	#5	1	1	1	1	1	1	1	1		W+4'-2 ½"	W+4'-2 ½"
WL5	#5	1	1	1	1	1	1	1	1		W+3'-11 ½"	W+3'-11 ½"
WL6	#5	1	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL7	#5	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL8	#5	1	1	1	1	1	1	1	1		W+3'-3 ½"	W+3'-3 ½"
WL9	#5	1	1	1	1	1	1	1	1		W+3'-0 ½"	W+3'-0 ½"
WL10	#5	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL11	#5	1	1	1	1	1	1	1	1		W+2'-7 ½"	W+2'-7 ½"

HEIGHT = 6 FT.

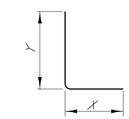
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WL12	#5	1	1	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
WL13	#5	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL14	#5	1	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL15	#5	1	1	1	1	1	1	1	1		W+1'-8 ½"	W+1'-8 ½"
WL16	#5	1	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL17	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-3"	W+3'-9"
WL18	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
WL19	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
WL20	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-7"	W+3'-1"
WL21	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL22	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 ½"	W+2'-7 ½"
WL23	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-10 ½"	W+2'-4 ½"
WL24	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WL25	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	16	16	16	16	16	16	16	16	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
RS2	#4	1	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RS3	#4	1	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS4	#4	1	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS5	#4	1	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
RS6	#4	1	1	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
RS7	#4	1	1	1	1	1	1	1	1		W+1'-10 ½"	W+1'-10 ½"
RS8	#4	1	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS9	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
RS10	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
RS11	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-11 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	8	8	8	8	8	8	8	8	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1	1		W+4'-10 ½"	W+4'-10 ½"
RL2	#4	1	1	1	1	1	1	1	1		W+4'-7 ½"	W+4'-7 ½"
RL3	#4	1	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
RL4	#4	1	1	1	1	1	1	1	1		W+4'-1 ½"	W+4'-1 ½"
RL5	#4	1	1	1	1	1	1	1	1		W+3'-10 ½"	W+3'-10 ½"
RL6	#4	1	1	1	1	1	1	1	1		W+3'-7 ½"	W+3'-7 ½"
RL7	#4	1	1	1	1	1	1	1	1		W+3'-4 ½"	W+3'-4 ½"
RL8	#4	1	1	1	1	1	1	1	1		W+3'-1 ½"	W+3'-1 ½"
RL9	#4	1	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RL10	#4	1	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
RL11	#4	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RL12	#4	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RL13	#4	1	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RL14	#4	1	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
RL15	#4	1	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RL16	#4	1	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
RL17	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
RL18	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
RL19	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
RL20	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
RL21	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
RL22	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
RL23	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	16	16	16	16	16	16	16	16	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2	2			2'-9 ½"
YS2	#4	2	2	2	2	2	2	2	2			4'-9 ½"
YS3	#4	2	2	2	2	2	2	2	2			6'-9 ½"
YS4	#4	2	2	2	2	2	2	2	2			8'-9 ½"
YS5	#4	4	6	6	6	6	6	6	6			10'-8"
YL1	#4	2	2	2	2	2	2	2	2			5'-9 ½"
YL2	#4	2	2	2	2	2	2	2	2			9'-9 ½"
YL3	#4	2	2	2	2	2	2	2	2			13'-9 ½"
YL4	#4	2	2	2	2	2	2	2	2			17'-9 ½"
YL5	#4	4	6	6	6	6	6	6	6			21'-8"
FS	#4	2	2	2	2	2	2	2	2			11'-11"
FL	#4	2	2	2	2	2	2	2	2			22'-4"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
N	#4	14	17	21	24	27	31	34	37	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	11	14	17	20	23	25	28	31	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			1.414S+1'-5"
OS	#7	7	7	7	7	7	7	7	7	3'-4 ½"	3'-4 ½"	6'-9"
OL	#7	7	7	7	7	7	7	7	7	3'-4 ½"	3'-4 ½"	6'-9"
OSS	#4	1	1	1	1	1	1	1	1			6'-0"+T1
OSL	#4	1	1	1	1	1	1	1	1			6'-0"+T1



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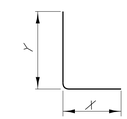

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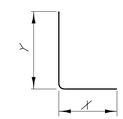
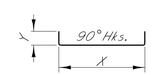
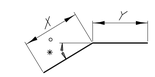


BARS RSn/RLn - #4

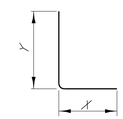


BARS N - #4

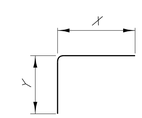


DOWELS OS/OL - #5

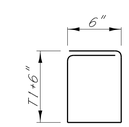
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 2

WORKING NUMBER IWS-6-2W-45

SHEET NUMBER 7090

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-1"	14'-2"	28'-4"	0'-0"	0'-11"	14'-2"	0'-11"	0'-9"	3'-0"	2'-3"	37'-7 1/2"	40'-5 7/16"	43'-3 3/8"	46'-1 5/16"	48'-11 1/4"	51'-9 3/16"	54'-7 1/8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	19.9461	2850.880	0.7951	49.098	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	19.9461	2850.880	0.7951	49.098	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	20.0281	2850.880	0.7951	49.098	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	20.2104	2860.649	0.8010	49.265	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	20.2104	2860.649	0.8010	49.265	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	20.3401	2870.418	0.8126	49.599	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	21.0284	2937.107	0.9348	56.001	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	21.0919	2937.107	0.9348	56.001	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	21.2058	2942.159	0.9406	56.168	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	21.4859	2957.313	0.9465	56.335	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	21.5184	2957.313	0.9465	56.335	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	21.5184	2957.313	0.9465	56.335	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	22.0650	3013.538	1.0745	66.021	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	22.2631	3018.756	1.0861	66.355	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	22.3625	3029.193	1.0861	66.355	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	22.7127	3050.067	1.0920	66.522	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	22.8084	3055.285	1.1036	66.800	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	22.8084	3055.285	1.1036	66.800	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	23.2303	3100.767	1.2258	74.816	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	23.3625	3106.152	1.2258	74.816	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	23.5975	3122.309	1.2316	74.983	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	24.0658	3149.236	1.2433	75.261	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	23.8028	3133.080	1.2607	75.762	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	24.1907	3154.621	1.2724	76.041	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	24.2760	3174.637	1.3655	84.836	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	24.7172	3196.624	1.3829	85.281	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	25.0653	3224.108	1.3888	85.448	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	24.7872	3202.120	1.4062	85.894	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	25.1884	3224.108	1.4120	86.061	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	25.4421	3246.095	1.4528	87.174	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	25.4454	3262.673	1.5168	93.576	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	25.8582	3285.328	1.5284	93.910	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	25.9803	3296.656	1.5517	94.522	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	26.1015	3296.656	1.5634	94.856	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	26.6183	3330.638	1.5983	95.802	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	27.1577	3353.293	1.6216	96.415	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	27.1716	3469.789	1.6798	104.208	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	27.1850	3469.789	1.6914	104.542	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	27.1565	3463.959	1.7089	105.043	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	27.8161	3493.113	1.7380	105.822	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	28.2512	3528.097	1.7729	106.769	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	28.9122	3557.251	1.8020	107.548	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-8-2W-45

SHEET NUMBER 7091

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.414S+8'-3 1/2"
T2	#4	1	1	1	1	1	1	1			1.414S+10'-0"
T3	#4	1	1	1	1	1	1	1			1.414S+11'-8 1/2"
T4	#4	1	1	1	1	1	1	1			1.414S+13'-5"
T5	#4	1	1	1	1	1	1	1			1.414S+15'-1 1/2"
T6	#4	1	1	1	1	1	1	1			1.414S+16'-10"
T7	#4	1	1	1	1	1	1	1			1.414S+18'-6 1/2"
T8	#4	1	1	1	1	1	1	1			1.414S+20'-3 1/2"
T9	#4	1	1	1	1	1	1	1			1.414S+22'-0"
T10	#4	1	1	1	1	1	1	1			1.414S+23'-8 1/2"
T11	#4	1	1	1	1	1	1	1			1.414S+25'-5"
T12	#4	1	1	1	1	1	1	1			1.414S+27'-1 1/2"
T13	#4	1	1	1	1	1	1	1			1.414S+28'-10"
T14	#4	1	1	1	1	1	1	1			1.414S+28'-10"
T15	#4	3	3	3	3	3	3	3			1.414S+25'-6"
V1	#4	14	16	18	20	22	24	26	19'-7"	1'-8"	21'-3"
VL1	#4	1	1	1	1	1	1	1	17'-6 1/2"	1'-8"	19'-2 1/2"
VL2	#4	1	1	1	1	1	1	1	14'-9 1/2"	1'-8"	16'-5 1/2"
VL3	#4	1	1	1	1	1	1	1	12'-1"	1'-8"	13'-9"
VL4	#4	1	1	1	1	1	1	1	9'-4"	1'-8"	11'-0"
VL5	#4	1	1	1	1	1	1	1	6'-1 1/2"		6'-1 1/2"
VL6	#4	1	1	1	1	1	1	1	2'-1 1/2"		2'-1 1/2"
VS1	#4	1	1	1	1	1	1	1	18'-9 1/2"	1'-8"	20'-5 1/2"
VS2	#4	1	1	1	1	1	1	1	16'-9 1/2"	1'-8"	18'-5 1/2"
VS3	#4	1	1	1	1	1	1	1	14'-9 1/2"	1'-8"	16'-5 1/2"
VS4	#4	1	1	1	1	1	1	1	12'-9 1/2"	1'-8"	14'-5 1/2"
VS5	#4	1	1	1	1	1	1	1	10'-9 1/2"	1'-8"	12'-5 1/2"
VS6	#4	1	1	1	1	1	1	1	8'-9 1/2"	1'-8"	10'-5 1/2"
VS7	#4	1	1	1	1	1	1	1	6'-9 1/2"	1'-8"	8'-5 1/2"
VS8	#4	1	1	1	1	1	1	1	4'-9 1/2"	1'-8"	6'-5 1/2"
VS9	#4	1	1	1	1	1	1	1	2'-9 1/2"		2'-9 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-2"
FTL2	#5	1	1	1	1	1	1	1			1'-7"
FTL3	#5	1	1	1	1	1	1	1			1'-11 1/2"
FTL4	#5	1	1	1	1	1	1	1			2'-4"
FTL5	#5	1	1	1	1	1	1	1			2'-8 1/2"
FTL6	#5	1	1	1	1	1	1	1			3'-1"
FTL7	#5	33	33	33	33	33	33	33			5'-8"
FTL8	#5	1	1	1	1	1	1	1			5'-5 1/2"
FTL9	#5	1	1	1	1	1	1	1			5'-1"
FTL10	#5	1	1	1	1	1	1	1			4'-8"
FTL11	#5	1	1	1	1	1	1	1			4'-3 1/2"
FTL12	#5	1	1	1	1	1	1	1			3'-11"
FTL13	#5	1	1	1	1	1	1	1			3'-6 1/2"
FTL14	#5	1	1	1	1	1	1	1			3'-1 1/2"
FTL15	#5	1	1	1	1	1	1	1			2'-9"
FTL16	#5	2	2	2	2	2	2	2			2'-8"
FLL	#4	7	7	7	7	7	7	7			27'-8"
FTS	#5	22	22	22	22	22	22	22			5'-8"
FLS	#4	7	7	7	7	7	7	7			13'-10"
WS1	#5	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
WS2	#5	1	1	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
WS3	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WS4	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WS5	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS6	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WS7	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WS8	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WS9	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WS10	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS11	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WS12	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WS13	#5	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WS14	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WS15	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WS16	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WS17	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WS18	#5	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WS19	#5	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
WS20	#5	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS21	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WS22	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	17	17	17	17	17	17	17	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WL2	#5	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WL3	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WL4	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL5	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL6	#5	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
WL7	#5	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
WL8	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WL9	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL10	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
WL11	#5	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
WL12	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WL13	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL14	#5	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WL15	#5	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WL16	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL17	#5	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL18	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL19	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WL20	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WL21	#5	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WL22	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL23	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WL24	#5	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
WL25	#5	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
WL26	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL27	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WL28	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WL29	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL30	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL31	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WL32	#5	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
WL33	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WL34	#5	1	1	1	1	1	1	1	1'-6"	W+1'-11 1/2"	W+3'-5 1/2"
WL35	#5	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WL36	#5	1	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WL37	#5	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
WL38	#5	1	1	1	1	1	1	1	1'-6"	W+1'-3 1/2"	W+2'-9 1/2"
WL39	#5	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WL40	#5	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
WL41	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WL42	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WL43	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	33	33	33	33	33	33	33	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RS2	#4	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RS3	#4	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
RS4	#4	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
RS5	#4	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RS6	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS7	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS8	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RS9	#4	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS10	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RS11	#4	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RS12	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RS13	#4	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RS14	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RS15	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	12	12	12	12	12	12	12	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RL2	#4	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
RL3	#4	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
RL4	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RL5	#4	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
RL6	#4	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
RL7	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RL8	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RL9	#4	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RL10	#4	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
RL11	#4	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
RL12	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL13	#4	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RL14	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL15	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL16	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RL17	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL18	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RL19	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL20	#4	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
RL21	#4	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
RL22	#4	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL23	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RL24	#4	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
RL25	#4	1	1	1	1	1	1	1	1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RL26	#4	1	1	1	1	1	1	1	1'-6"	W+1'-2 1/2"	W+2'-8 1/2"
RL27	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL28	#4	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
RL29	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	24	24	24	24	24	24	24	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-9 1/2"
YS2	#4	2	2	2	2	2	2	2			4'-9 1/2"
YS3	#4	2	2	2	2	2	2	2			6'-9 1/2"
YS4	#4	2	2	2	2	2	2	2			8'-9 1/2"
YS5	#4	2	2	2	2	2	2	2			10'-9 1/2"
YS6	#4	2	2	2	2	2	2	2			12'-9 1/2"
YS7	#4	6	6	6	6	6	6	8			13'-10"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

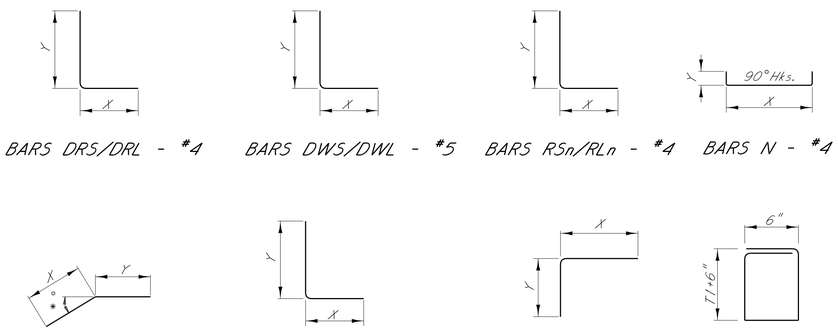
SHT. 2 OF 3

WORKING NUMBER IWS-8-2W-45

SHEET NUMBER 7092

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		8'	10'	12'	14'	16'	18'	20'			
YL1	#4	2	2	2	2	2	2	2			5'-9 ½"
YL2	#4	2	2	2	2	2	2	2			9'-9 ½"
YL3	#4	2	2	2	2	2	2	2			13'-9 ½"
YL4	#4	2	2	2	2	2	2	2			17'-9 ½"
YL5	#4	2	2	2	2	2	2	2			21'-9 ½"
YL6	#4	2	2	2	2	2	2	2			25'-9 ½"
YL7	#4	6	6	6	6	6	6	8			28'-0"
FS	#4	2	2	2	2	2	2	2			15'-5 ½"
FL	#4	2	2	2	2	2	2	2			28'-10 ½"
N	#4	18	20	24	27	31	34	38	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	14	17	20	23	25	28	31	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.414S+1'-5"
OS	#7	10	10	10	10	10	10	11	3'-4 ½"	3'-4 ½"	6'-9"
OL	#7	10	10	10	10	10	10	11	3'-4 ½"	3'-4 ½"	6'-9"
OSS	#4	1	1	1	1	1	1	1			8'-0"+T1
OSL	#4	1	1	1	1	1	1	1			8'-0"+T1



BARS DRS/DRL - #4 BARS DWS/DWL - #5 BARS RSn/RLn - #4 BARS N - #4

DOWELS OS/OL - #7 BARS WSn/WLn - #5 BARS V1/VLn/VSn - #4 BARS K - #4

* See plan of apron

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 3 OF 3

WORKING NUMBER IWS-8-2W-45

SHEET NUMBER 7093

REVISIONS BY DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"Y" CLEAR SPAN						
											10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-1"	16'-2"	32'-4"	0'-0"	1'-1 1/2"	16'-2"	0'-11"	0'-11"	4'-0"	2'-6"	44'-3 3/4"	47'-1 11/16"	49'-11 9/8"	52'-9 9/16"	55'-7 1/2"	58'-9 7/16"	61'-3 3/8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	30.1186	4107.643	0.9465	57.893	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	30.1820	4107.643	0.9465	57.893	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	30.0440	4095.467	0.9523	58.060	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	30.4596	4119.818	0.9756	58.673	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	30.5290	4125.905	0.9756	58.673	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	30.8502	4144.168	0.9930	59.174	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	31.3712	4204.348	1.0861	66.355	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	31.4794	4204.348	1.0861	66.355	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	31.4119	4198.093	1.0920	66.522	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	31.8880	4223.111	1.1152	67.134	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	32.0002	4229.366	1.1211	67.301	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	31.9457	4223.111	1.1385	67.746	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	32.6642	4288.961	1.2258	74.816	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	32.6642	4288.961	1.2258	74.816	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	32.8092	4301.804	1.2375	75.094	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	33.4267	4333.912	1.2607	75.762	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	33.6084	4346.756	1.2607	75.762	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	33.5663	4340.334	1.2840	76.375	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	33.8383	4373.574	1.3771	83.556	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	34.0226	4386.752	1.3771	83.556	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	34.5236	4419.695	1.3946	84.057	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	34.5990	4426.283	1.4004	84.224	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	34.6383	4419.695	1.4120	84.502	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	35.2058	4452.638	1.4295	85.003	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	34.9318	4458.160	1.5284	92.351	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	35.3109	4485.182	1.5284	92.351	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	35.7080	4512.205	1.5459	92.796	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	35.6513	4505.449	1.5575	93.130	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	36.1422	4525.716	1.5692	93.464	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	36.6120	4545.983	1.5925	94.077	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	36.6540	4580.969	1.6681	102.371	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	36.4712	4567.235	1.6798	102.649	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	36.7608	4587.836	1.7030	103.317	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	37.4346	4615.304	1.7321	104.097	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	37.7985	4635.905	1.7496	104.542	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	38.5520	4677.106	1.7845	105.488	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	37.7812	4666.612	1.8311	111.445	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	37.8703	4673.646	1.8485	111.890	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	38.2137	4687.714	1.8602	112.224	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	39.2494	4743.986	1.9067	113.504	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-10-2W-45

SHEET NUMBER 7094

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.4145+9'-5 1/2"
T2	#4	1	1	1	1	1	1	1			1.4145+11'-2 1/2"
T3	#4	1	1	1	1	1	1	1			1.4145+12'-11"
T4	#4	1	1	1	1	1	1	1			1.4145+14'-7 1/2"
T5	#4	1	1	1	1	1	1	1			1.4145+16'-4"
T6	#4	1	1	1	1	1	1	1			1.4145+18'-0 1/2"
T7	#4	1	1	1	1	1	1	1			1.4145+19'-9"
T8	#4	1	1	1	1	1	1	1			1.4145+21'-5 1/2"
T9	#4	1	1	1	1	1	1	1			1.4145+23'-2"
T10	#4	1	1	1	1	1	1	1			1.4145+24'-11"
T11	#4	1	1	1	1	1	1	1			1.4145+26'-7 1/2"
T12	#4	1	1	1	1	1	1	1			1.4145+28'-4"
T13	#4	1	1	1	1	1	1	1			1.4145+30'-0 1/2"
T14	#4	1	1	1	1	1	1	1			1.4145+31'-9"
T15	#4	1	1	1	1	1	1	1			1.4145+33'-7"
T16	#4	1	1	1	1	1	1	1			1.4145+33'-0"
T17	#4	3	3	3	3	3	3	3			1.4145+29'-5"
V1	#4	16	18	20	22	24	26	28	22'-4 1/2"	1'-8"	24'-0 1/2"
VL1	#4	1	1	1	1	1	1	1	21'-9"	1'-8"	23'-5"
VL2	#4	1	1	1	1	1	1	1	19'-0 1/2"	1'-8"	20'-8 1/2"
VL3	#4	1	1	1	1	1	1	1	16'-3 1/2"	1'-8"	17'-11 1/2"
VL4	#4	1	1	1	1	1	1	1	13'-7"	1'-8"	15'-3"
VL5	#4	1	1	1	1	1	1	1	10'-10"	1'-8"	12'-6"
VL6	#4	1	1	1	1	1	1	1	7'-10 1/2"		7'-10 1/2"
VL7	#4	1	1	1	1	1	1	1	3'-10 1/2"		3'-10 1/2"
VS1	#4	1	1	1	1	1	1	1	22'-2 1/2"	1'-8"	23'-10 1/2"
VS2	#4	1	1	1	1	1	1	1	20'-2 1/2"	1'-8"	21'-10 1/2"
VS3	#4	1	1	1	1	1	1	1	18'-2 1/2"	1'-8"	19'-10 1/2"
VS4	#4	1	1	1	1	1	1	1	16'-2 1/2"	1'-8"	17'-10 1/2"
VS5	#4	1	1	1	1	1	1	1	14'-2 1/2"	1'-8"	15'-10 1/2"
VS6	#4	1	1	1	1	1	1	1	12'-2 1/2"	1'-8"	13'-10 1/2"
VS7	#4	1	1	1	1	1	1	1	10'-2 1/2"	1'-8"	11'-10 1/2"
VS8	#4	1	1	1	1	1	1	1	8'-2 1/2"	1'-8"	9'-10 1/2"
VS9	#4	1	1	1	1	1	1	1	6'-2 1/2"	1'-8"	7'-10 1/2"
VS10	#4	1	1	1	1	1	1	1	4'-2 1/2"	1'-8"	5'-10 1/2"
VS11	#4	1	1	1	1	1	1	1	2'-2 1/2"		2'-2 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-3 1/2"
FTL2	#5	1	1	1	1	1	1	1			1'-7 1/2"
FTL3	#5	1	1	1	1	1	1	1			1'-11 1/2"
FTL4	#5	1	1	1	1	1	1	1			2'-3 1/2"
FTL5	#5	1	1	1	1	1	1	1			2'-7 1/2"
FTL6	#5	1	1	1	1	1	1	1			2'-11 1/2"
FTL7	#5	1	1	1	1	1	1	1			3'-3 1/2"
FTL8	#5	1	1	1	1	1	1	1			3'-8"
FTL9	#5	1	1	1	1	1	1	1			4'-0"
FTL10	#5	1	1	1	1	1	1	1			4'-4"
FTL11	#5	41	41	41	41	41	41	41			7'-1"
FTL12	#5	1	1	1	1	1	1	1			6'-11 1/2"
FTL13	#5	1	1	1	1	1	1	1			6'-7"
FTL14	#5	1	1	1	1	1	1	1			6'-3"
FTL15	#5	1	1	1	1	1	1	1			5'-11"
FTL16	#5	1	1	1	1	1	1	1			5'-7"
FTL17	#5	1	1	1	1	1	1	1			5'-3"
FTL18	#5	1	1	1	1	1	1	1			4'-11"
FTL19	#5	1	1	1	1	1	1	1			4'-7"
FTL20	#5	1	1	1	1	1	1	1			4'-3"
FTL21	#5	1	1	1	1	1	1	1			3'-11"
FTL22	#5	1	1	1	1	1	1	1			3'-7"
FTL23	#5	1	1	1	1	1	1	1			3'-3"
FTL24	#5	3	3	3	3	3	3	3			3'-1"
FLL	#4	9	9	9	9	9	9	9			31'-8"
FTS	#5	29	29	29	29	29	29	29			7'-1"
FLS	#4	9	9	9	9	9	9	9			15'-10"
WS1	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WS2	#5	1	1	1	1	1	1	1		W+7'-1 1/2"	W+7'-1 1/2"
WS3	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WS4	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WS5	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WS6	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WS7	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WS8	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WS9	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WS10	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WS11	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WS12	#5	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WS13	#5	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
WS14	#5	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
WS15	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS16	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WS17	#5	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WS18	#5	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WS19	#5	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WS20	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WS21	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS22	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WS23	#5	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
WS24	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WS25	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WS26	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WS27	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WS28	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WS29	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	27	27	27	27	27	27	27	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL2	#5	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WL3	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WL4	#5	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
WL5	#5	1	1	1	1	1	1	1		W+6'-10 1/2"	W+6'-10 1/2"
WL6	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL7	#5	1	1	1	1	1	1	1		W+6'-7"	W+6'-7"
WL8	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL9	#5	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WL10	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WL11	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL12	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WL13	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WL14	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WL15	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL16	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL17	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL18	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
WL19	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL20	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL21	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL22	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WL23	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL24	#5	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WL25	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL26	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL27	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL28	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WL29	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WL30	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3'
WL31	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL32	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL33	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WL34	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL35	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WL36	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL37	#5	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
WL38	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL39	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL40	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL41	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL42	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL43	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL44	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL45	#5	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
WL46	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WL47	#5	1	1	1	1	1	1	1		W+0'-9"	W+0'-9"
WL48	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WL49	#5	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
WL50	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WL51	#5	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
WL52	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WL53	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WL54	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL55	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WL56	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	52	52	52	52	52	52	52	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
RS2	#4	1	1	1	1	1	1	1		W+6'-10 1/2"	W+6'-10 1/2"
RS3	#4	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
RS4	#4	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
RS5	#4	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
RS6	#4	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
RS7	#4	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RS8	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS9	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS10	#4	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RS11	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RS12	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RS13	#4	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
RS14	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RS15	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RS16	#4	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
RS17	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+0'-11 1/2"
DRS	#4	16	16	16	16	16	16	16	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
RL2	#4	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
RL3	#4	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
RL4	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RL5	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RL6	#4	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
RL7	#4	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
RL8	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RL9	#4	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
RL10	#4	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
RL11	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 3

WORKING NUMBER IWS-10-2W-45

SHEET NUMBER 7095

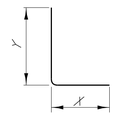
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

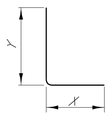
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

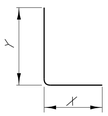
BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RL12	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RL13	#4	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RL14	#4	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
RL15	#4	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
RL16	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL17	#4	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RL18	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL19	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL20	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RL21	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL22	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RL23	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL24	#4	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
RL25	#4	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
RL26	#4	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL27	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RL28	#4	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
RL29	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RL30	#4	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
RL31	#4	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
RL32	#4	1	1	1	1	1	1	1		W-0'-3 1/2"	W-0'-3 1/2"
RL33	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	32	32	32	32	32	32	32	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-9 1/2"
YS2	#4	2	2	2	2	2	2	2			4'-9 1/2"
YS3	#4	2	2	2	2	2	2	2			6'-9 1/2"
YS4	#4	2	2	2	2	2	2	2			8'-9 1/2"
YS5	#4	2	2	2	2	2	2	2			10'-9 1/2"
YS6	#4	2	2	2	2	2	2	2			12'-9 1/2"
YS7	#4	2	2	2	2	2	2	2			14'-9 1/2"
YS8	#4	8	8	8	8	8	8	8			15'-10"
YL1	#4	2	2	2	2	2	2	2			5'-9 1/2"
YL2	#4	2	2	2	2	2	2	2			9'-9 1/2"
YL3	#4	2	2	2	2	2	2	2			13'-9 1/2"
YL4	#4	2	2	2	2	2	2	2			17'-9 1/2"
YL5	#4	2	2	2	2	2	2	2			21'-9 1/2"
YL6	#4	2	2	2	2	2	2	2			25'-9 1/2"
YL7	#4	2	2	2	2	2	2	2			29'-9 1/2"
YL8	#4	8	8	8	8	8	8	8			32'-0"
FS	#4	2	2	2	2	2	2	2			17'-8 1/2"
FL	#4	2	2	2	2	2	2	2			33'-0"
N	#4	21	24	27	30	33	37	40	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	17	20	23	26	29	31	34	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.414S+1'-10"
OS	#7	12	12	12	12	12	12	12	3'-7"	3'-7"	7'-2"
OL	#7	12	12	12	12	12	12	12	3'-7"	3'-7"	7'-2"
OSS	#4	1	1	1	1	1	1	1			10'-0"+T1
OSL	#4	1	1	1	1	1	1	1			10'-0"+T1



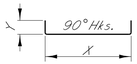
BARS DRS/DRL - #4



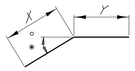
BARS DWS/DWL - #5



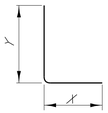
BARS RSn/RLn - #4



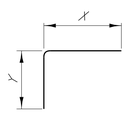
BARS N - #4



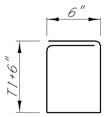
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 3 OF 3

WORKING NUMBER IWS-10-2W-45

SHEET NUMBER 7096

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"Y" CLEAR SPAN						
											12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-4"	18'-8"	37'-4"	0'-0"	1'-2 11/16"	18'-8"	0'-11"	1'-0"	5'-0"	2'-6"	51'-8"	54'-5 15/16"	57'-3 7/8"	60'-1 13/16"	62'-11 13/16"	65'-9 3/4"	68'-7 11/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	41.8477	6331.113	1.0978	66.689	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	41.9602	6331.113	1.1894	66.687	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	42.0395	6331.113	1.1094	67.301	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	42.6458	6374.364	1.1443	67.913	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	42.8602	6391.665	1.1443	67.913	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	42.6574	6374.364	1.1094	66.967	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	43.3307	6541.585	1.2375	76.653	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	43.4643	6550.402	1.2491	76.987	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	43.6422	6559.220	1.2607	77.321	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	44.3153	6603.306	1.2840	77.933	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	44.2771	6603.306	1.2898	78.100	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	44.5552	6620.940	1.3015	78.434	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	44.5441	6639.503	1.3771	83.556	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	44.8613	6657.471	1.3888	83.890	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	45.5573	6702.392	1.4179	84.669	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	45.3346	6684.424	1.4179	84.669	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	45.7629	6711.377	1.4353	85.170	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	46.1555	6738.329	1.4237	84.836	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	46.1304	6755.695	1.5168	93.576	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	46.4135	6773.998	1.5284	93.910	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	46.9388	6810.602	1.5517	94.522	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	46.9454	6810.602	1.5575	94.689	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	47.5713	6838.056	1.5866	95.468	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	48.1524	6883.812	1.6041	95.969	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	47.3144	6853.975	1.6681	100.812	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	47.7184	6872.611	1.6798	101.091	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	48.5737	6937.839	1.6972	101.592	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	48.9859	6947.157	1.7205	102.204	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	49.3611	6965.793	1.7321	102.538	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	48.8520	6967.523	1.8311	111.445	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	49.2842	6995.811	1.8194	111.111	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	49.7713	7024.100	1.8544	112.057	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	50.8676	7090.107	1.8776	112.725	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	51.5322	7137.254	1.9184	113.783	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	50.1421	7065.997	1.9591	119.572	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	50.9296	7113.980	1.9824	120.184	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	51.6021	7161.962	2.0057	120.852	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	52.7760	7229.138	2.0697	122.578	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-12-2W-45

SHEET NUMBER 7097

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr, P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.414S+9'-8"
T2	#4	1	1	1	1	1	1	1			1.414S+11'-3"
T3	#4	1	1	1	1	1	1	1			1.414S+12'-10"
T4	#4	1	1	1	1	1	1	1			1.414S+14-5"
T5	#4	1	1	1	1	1	1	1			1.414S+16'-0"
T6	#4	1	1	1	1	1	1	1			1.414S+17'-7 1/2"
T7	#4	1	1	1	1	1	1	1			1.414S+19'-2 1/2"
T8	#4	1	1	1	1	1	1	1			1.414S+20'-9 1/2"
T9	#4	1	1	1	1	1	1	1			1.414S+22'-4 1/2"
T10	#4	1	1	1	1	1	1	1			1.414S+23'-11 1/2"
T11	#4	1	1	1	1	1	1	1			1.414S+25'-6 1/2"
T12	#4	1	1	1	1	1	1	1			1.414S+27'-1 1/2"
T13	#4	1	1	1	1	1	1	1			1.414S+28'-8 1/2"
T14	#4	1	1	1	1	1	1	1			1.414S+30'-3 1/2"
T15	#4	1	1	1	1	1	1	1			1.414S+31'-10 1/2"
T16	#4	1	1	1	1	1	1	1			1.414S+33'-6"
T17	#4	1	1	1	1	1	1	1			1.414S+35'-1"
T18	#4	1	1	1	1	1	1	1			1.414S+36'-8"
T19	#4	1	1	1	1	1	1	1			1.414S+38'-0"
T20	#4	1	1	1	1	1	1	1			1.414S+37'-5 1/2"
T21	#4	3	3	3	3	3	3	3			1.414S+33'-11"
V1	#4	19	21	23	25	27	29	31	25'-11"	1'-8"	27'-7"
VL1	#4	1	1	1	1	1	1	1	22'-9 1/2"	1'-8"	24'-5 1/2"
VL2	#4	1	1	1	1	1	1	1	20'-0 1/2"	1'-8"	21'-8 1/2"
VL3	#4	1	1	1	1	1	1	1	17'-4"	1'-8"	19'-0"
VL5	#4	1	1	1	1	1	1	1	14'-7"	1'-8"	16'-3"
VL5	#4	1	1	1	1	1	1	1	11'-10 1/2"	1'-8"	13'-6 1/2"
VL6	#4	1	1	1	1	1	1	1	9'-1 1/2"		9'-1 1/2"
VL7	#4	1	1	1	1	1	1	1	5'-4 1/2"		5'-4 1/2"
VL8	#4	1	1	1	1	1	1	1	1'-4 1/2"		1'-4 1/2"
VS1	#4	1	1	1	1	1	1	1	25'-10 1/2"	1'-8"	27'-6 1/2"
VS2	#4	1	1	1	1	1	1	1	23'-10 1/2"	1'-8"	25'-6 1/2"
VS3	#4	1	1	1	1	1	1	1	21'-10 1/2"	1'-8"	23'-6 1/2"
VS4	#4	1	1	1	1	1	1	1	19'-10 1/2"	1'-8"	21'-6 1/2"
VS5	#4	1	1	1	1	1	1	1	17'-10 1/2"	1'-8"	19'-6 1/2"
VS6	#4	1	1	1	1	1	1	1	15'-10 1/2"	1'-8"	17'-6 1/2"
VS7	#4	1	1	1	1	1	1	1	13'-10 1/2"	1'-8"	15'-6 1/2"
VS8	#4	1	1	1	1	1	1	1	11'-10 1/2"	1'-8"	13'-6 1/2"
VS9	#4	1	1	1	1	1	1	1	9'-10 1/2"	1'-8"	11'-6 1/2"
VS10	#4	1	1	1	1	1	1	1	7'-10 1/2"	1'-8"	9'-6 1/2"
VS11	#4	1	1	1	1	1	1	1	5'-10 1/2"	1'-8"	7'-6 1/2"
VS12	#4	1	1	1	1	1	1	1	3'-10 1/2"	1'-8"	5'-6 1/2"
VS13	#4	1	1	1	1	1	1	1	1'-10 1/2"		1'-10 1/2"
FTL1	#5	1	1	1	1	1	1	1			1'-2"
FTL2	#5	1	1	1	1	1	1	1			1'-5"
FTL3	#5	1	1	1	1	1	1	1			1'-8"
FTL4	#5	1	1	1	1	1	1	1			1'-11"
FTL5	#5	1	1	1	1	1	1	1			2'-1 1/2"
FTL6	#5	1	1	1	1	1	1	1			2'-4 1/2"
FTL7	#5	1	1	1	1	1	1	1			2'-7 1/2"
FTL8	#5	1	1	1	1	1	1	1			2'-10 1/2"
FTL9	#5	1	1	1	1	1	1	1			3'-1"
FTL10	#5	1	1	1	1	1	1	1			3'-4"
FTL11	#5	1	1	1	1	1	1	1			3'-7"
FTL12	#5	1	1	1	1	1	1	1			3'-10"
FTL13	#5	1	1	1	1	1	1	1			4'-0 1/2"
FTL14	#5	1	1	1	1	1	1	1			4'-3 1/2"
FTL15	#5	1	1	1	1	1	1	1			3'-6 1/2"
FTL16	#5	1	1	1	1	1	1	1			4'-9 1/2"
FTL17	#5	1	1	1	1	1	1	1			5'-0"
FTL18	#5	1	1	1	1	1	1	1			5'-3"
FTL19	#5	1	1	1	1	1	1	1			5'-6"
FTL20	#5	65	65	65	65	65	65	65			8'-2"
FTL21	#5	1	1	1	1	1	1	1			8'-0"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
FTL22	#5	1	1	1	1	1	1	1			7'-9"
FTL23	#5	1	1	1	1	1	1	1			7'-6"
FTL24	#5	1	1	1	1	1	1	1			7'-3 1/2"
FTL25	#5	1	1	1	1	1	1	1			7'-0 1/2"
FTL26	#5	1	1	1	1	1	1	1			6'-9 1/2"
FTL27	#5	1	1	1	1	1	1	1			6'-6 1/2"
FTL28	#5	1	1	1	1	1	1	1			6'-4"
FTL29	#5	1	1	1	1	1	1	1			6'-1"
FTL30	#5	1	1	1	1	1	1	1			5'-10"
FTL31	#5	1	1	1	1	1	1	1			5'-7"
FTL32	#5	1	1	1	1	1	1	1			5'-4 1/2"
FTL33	#5	1	1	1	1	1	1	1			5'-1 1/2"
FTL34	#5	1	1	1	1	1	1	1			4'-10 1/2"
FTL35	#5	1	1	1	1	1	1	1			4'-7 1/2"
FTL36	#5	1	1	1	1	1	1	1			4'-5"
FTL37	#5	1	1	1	1	1	1	1			4'-2"
FTL38	#5	1	1	1	1	1	1	1			3'-11"
FTL39	#5	1	1	1	1	1	1	1			3'-8"
FTL40	#5	1	1	1	1	1	1	1			3'-5"
FTL41	#5	1	1	1	1	1	1	1			3'-2 1/2"
FTL42	#5	4	4	4	4	4	4	4			3'-2"
FLL	#4	10	10	10	10	10	10	10			36'-8"
FTS	#5	45	45	45	45	45	45	45			8'-2"
FLS	#4	10	10	10	10	10	10	10			18'-4"
WS1	#5	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
WS2	#5	1	1	1	1	1	1	1		W+8'-5"	W+8'-5"
WS3	#5	1	1	1	1	1	1	1		W+8'-2 1/2"	W+8'-2 1/2"
WS4	#5	1	1	1	1	1	1	1		W+8'-0"	W+8'-0"
WS5	#5	1	1	1	1	1	1	1		W+7'-9 1/2"	W+7'-9 1/2"
WS6	#5	1	1	1	1	1	1	1		W+7'-7"	W+7'-7"
WS7	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
WS8	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WS9	#5	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
WS10	#5	1	1	1	1	1	1	1		W+6'-9"	W+6'-9"
WS11	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WS12	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS13	#5	1	1	1	1	1	1	1		W+6'-1 1/2"	W+6'-1 1/2"
WS14	#5	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
WS15	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WS16	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WS17	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WS18	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS19	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WS20	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WS21	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WS22	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WS23	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS24	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WS25	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS26	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS27	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WS28	#5	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WS29	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WS30	#5	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WS31	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WS32	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WS33	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WS34	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS35	#5	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WS36	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WS37	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WS38	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WS39	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WS40	#5	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WS41	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WS42	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WS43	#5	1	1	1	1	1	1	1		W-0'-1 1/2"	W-0'-1 1/2"
WS44	#5	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
WS45	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	45	45	45	45	45	45	45	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-8 1/2"	W+8'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+8'-7"	W+8'-7"
WL3	#5	1	1	1	1	1	1	1		W+8'-6"	W+8'-6"
WL4	#5	1	1	1	1	1	1	1		W+8'-4 1/2"	W+8'-4 1/2"
WL5	#5	1	1	1	1	1	1	1		W+8'-3 1/2"	W+8'-3 1/2"
WL6	#5	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
WL7	#5	1	1	1	1	1	1	1		W+8'-1"	W+8'-1"
WL8	#5	1	1	1	1	1	1	1		W+7'-11 1/2"	W+7'-11 1/2"
WL9	#5	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
WL10	#5	1	1	1	1	1	1	1		W+7'-9"	W+7'-9"
WL11	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WL12	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WL13	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL14	#5	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
WL15	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WL16	#5	1	1	1	1	1	1	1		W+7'-1 1/2"	W+7'-1 1/2"
WL17	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL18	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL19	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WL20	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL21	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL22	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL23	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL24	#5	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WL25	#5	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
WL26	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL27	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL28	#5	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
WL29	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL30	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WL31	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WL32	#5	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
WL33	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WL34	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WL35	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL36	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WL37	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
WL38	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL39	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WL40	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL41	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL42	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL43	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL44	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL45	#5	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WL46	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 3

WORKING NUMBER IWS-12-2W-45

SHEET NUMBER 7098

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL47	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL48	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL49	#5	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
WL50	#5	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL51	#5	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL52	#5	1	1	1	1	1	1	1		W+3'-5"	W+3-5"
WL53	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WL54	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WL55	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL56	#5	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WL57	#5	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL58	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WL59	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL60	#5	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL61	#5	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
WL62	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL63	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WL64	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL65	#5	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
WL66	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WL67	#5	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL68	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WL69	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL70	#5	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WL71	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WL72	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL73	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WL74	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WL75	#5	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
WL76	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WL77	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WL78	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WL79	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WL80	#5	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
WL81	#5	1	1	1	1	1	1	1		W+0'-4 1/2"	W+0'-4 1/2"
WL82	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WL83	#5	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
WL84	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WL85	#5	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
WL86	#5	1	1	1	1	1	1	1		W-0'-1 1/2"	W-0'-1 1/2"
WL87	#5	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
WL88	#5	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
WL89	#5	1	1	1	1	1	1	1		W-0'-5 1/2"	W-0'-5 1/2"
WL90	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	90	90	90	90	90	90	90	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RS2	#4	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
RS3	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RS4	#4	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
RS5	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RS6	#4	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
RS7	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RS8	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RS9	#4	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RS10	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RS11	#4	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS12	#4	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS13	#4	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RS14	#4	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
RS15	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RS16	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RS17	#4	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
RS18	#4	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
RS19	#4	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"

HEIGHT = 12 FT.

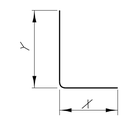
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
RS20	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	20	20	20	20	20	20	20	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+8'-8 1/2"	W+8'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+8'-5 1/2"	W+8'-5 1/2"
RL3	#4	1	1	1	1	1	1	1		W+8'-2 1/2"	W+8'-2 1/2"
RL4	#4	1	1	1	1	1	1	1		W+7'-11 1/2"	W+7'-11 1/2"
RL5	#4	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
RL6	#4	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
RL7	#4	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
RL8	#4	1	1	1	1	1	1	1		W+6'-11 1/2"	W+6'-11 1/2"
RL9	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RL10	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RL11	#4	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
RL12	#4	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
RL13	#4	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RL14	#4	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
RL15	#4	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
RL16	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RL17	#4	1	1	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RL18	#4	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RL19	#4	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
RL20	#4	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
RL21	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL22	#4	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RL23	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL24	#4	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL25	#4	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RL26	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL27	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RL28	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL29	#4	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
RL30	#4	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
RL31	#4	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL32	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RL33	#4	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
RL34	#4	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
RL35	#4	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
RL36	#4	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
RL37	#4	1	1	1	1	1	1	1		W-0'-3 1/2"	W-0'-3 1/2"
RL38	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	38	38	38	38	38	38	38	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			2'-5 1/2"
YS2	#4	2	2	2	2	2	2	2			4'-1 1/2"
YS3	#4	2	2	2	2	2	2	2			5'-9 1/2"
YS4	#4	2	2	2	2	2	2	2			7'-5 1/2"
YS5	#4	2	2	2	2	2	2	2			9'-1 1/2"
YS6	#4	2	2	2	2	2	2	2			10'-9 1/2"
YS7	#4	2	2	2	2	2	2	2			12'-5 1/2"
YS8	#4	2	2	2	2	2	2	2			14'-1 1/2"
YS9	#4	2	2	2	2	2	2	2			15'-9 1/2"
YS10	#4	2	2	2	2	2	2	2			17'-5 1/2"
YS11	#4	10	12	12	12	12	12	12			18'-4"
YL1	#4	2	2	2	2	2	2	2			5'-1 1/2"
YL2	#4	2	2	2	2	2	2	2			8'-5 1/2"
YL3	#4	2	2	2	2	2	2	2			11'-9 1/2"
YL4	#4	2	2	2	2	2	2	2			15'-1 1/2"
YL5	#4	2	2	2	2	2	2	2			18'-5 1/2"
YL6	#4	2	2	2	2	2	2	2			21'-9 1/2"
YL7	#4	2	2	2	2	2	2	2			25'-1 1/2"
YL8	#4	2	2	2	2	2	2	2			28'-5 1/2"
YL9	#4	2	2	2	2	2	2	2			31'-9 1/2"
YL10	#4	2	2	2	2	2	2	2			35'-1 1/2"
YL11	#4	10	12	12	12	12	12	12			37'-0"
FS	#4	2	2	2	2	2	2	2			20'-6"

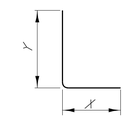
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

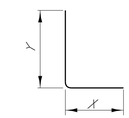
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
FL	#4	2	2	2	2	2	2	2			38'-1 1/2"
N	#4	24	28	30	34	36	40	43	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	20	23	26	29	32	34	37	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			1.414S+2'-0 1/2"
OS	#7	16	17	17	17	17	17	17	3'-8"	3'-8"	7'-4"
OL	#7	16	17	17	17	17	17	17	3'-8"	3'-8"	7'-4"
OSS	#4	1	1	1	1	1	1	1			12'-0+T1
OSL	#4	1	1	1	1	1	1	1			12'-0+T1



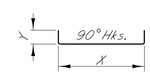
BARS DRS/DRL - #4



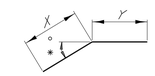
BARS DWS/DWL - #5



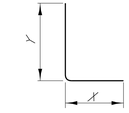
BARS RSn/RLn - #4



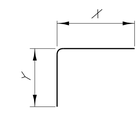
BARS N - #4



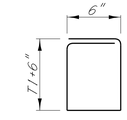
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

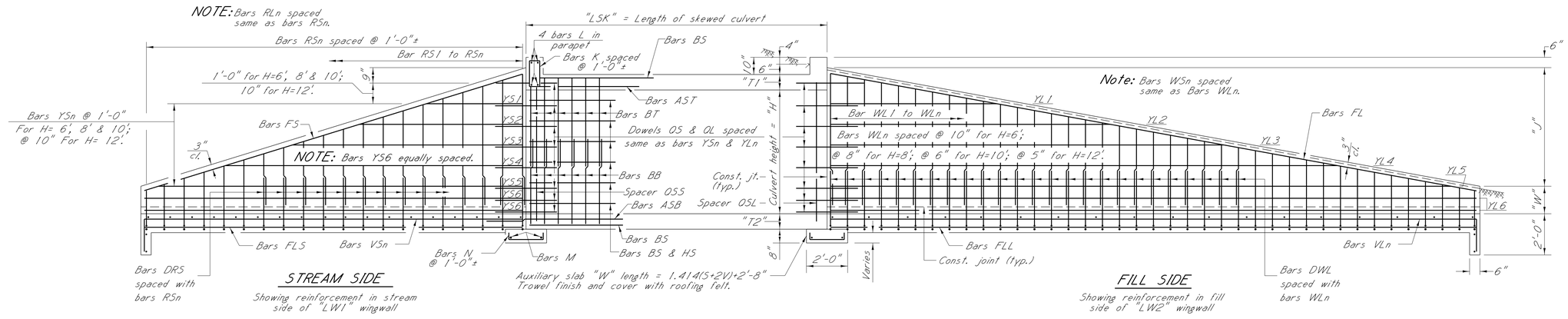
SHT. 3 OF 3

WORKING NUMBER IWS-12-2W-45

SHEET NUMBER 7099

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

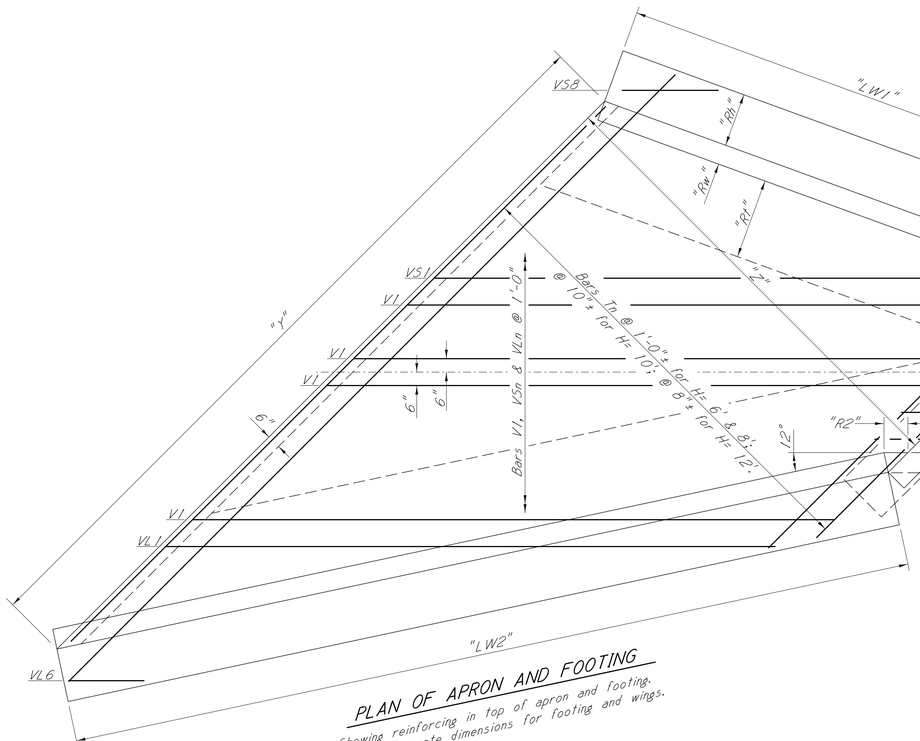


NOTE: Bars X & bars A not shown for clarity.

LONGITUDINAL SECTION

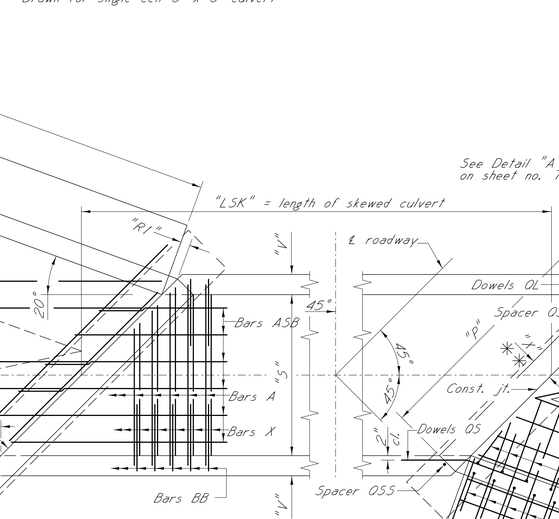
Drawn for single cell 6' x 6' culvert

NOTE: Culvert shall be sloped to conform to gradient of stream.



PLAN OF APRON AND FOOTING

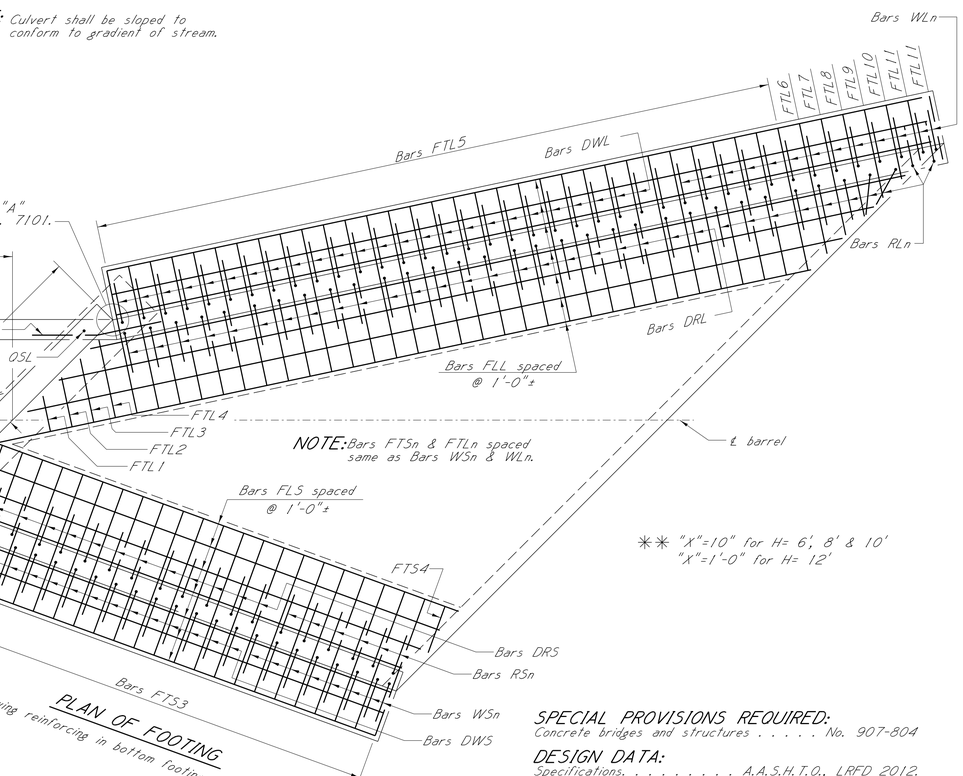
Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.



NOTE: Bars A & X shall be cut to fit skew at end of barrel.

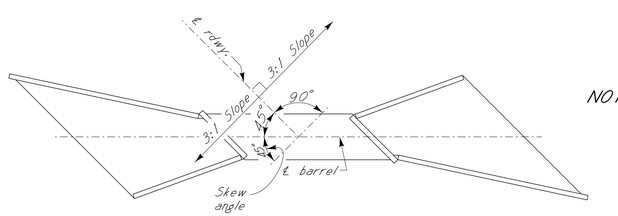
GENERAL PLAN

Drawn for single cell 6' x 6' culvert on 45° right forward skew.



PLAN OF FOOTING

Showing reinforcing in bottom footing & wingwall.



PLAN OF 45° LEFT FORWARD SKEW

NOTE: For bar bending details and quantities, see drawings IWS-6-3W-45, IWS-8-3W-45, IWS-10-3W-45 & IWS-12-3W-45.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHTS 6-12 FT.

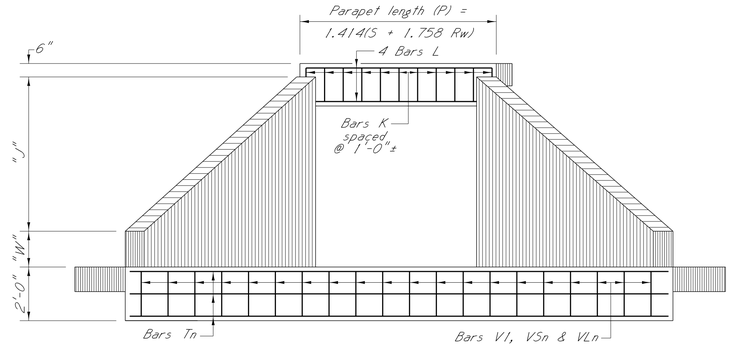
SPANS 6-24 FT.

SHT. 1 OF 2

WORKING NUMBER IWS-3W-45

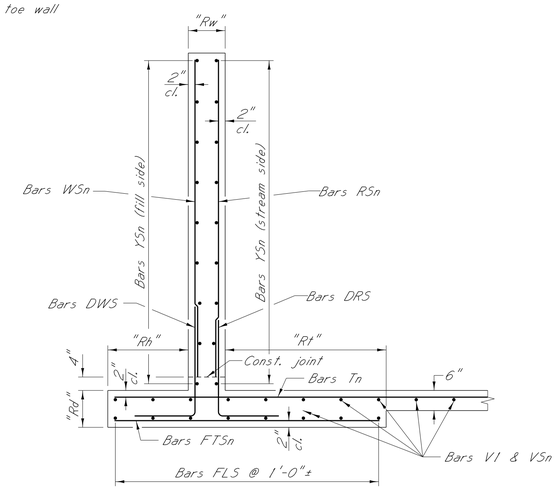
SHEET NUMBER 7100

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



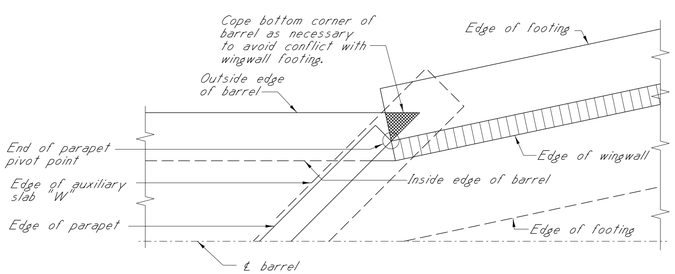
END ELEVATION

Showing reinforcing in pararpet & toe wall



CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.



DETAIL "A"

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
REVISIONS	WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS	
	HEIGHTS 6-12 FT.	SHT. 2 OF 2
	SPANS 6-24 FT.	WORKING NUMBER IWS-3W-45
DATE	DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E. DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	SHEET NUMBER 7101

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN							
											6'	8'	10'	12'	14'	16'	18'	20'
6'-0"	5'-9"	18'-8 3/16"	31'-8 1/16"	0'-4 3/16"	0'-10 11/16"	17'-3"	0'-11"	0'-9"	3'-0"	2'-0"	28'-10 7/16"	31'-8 3/8"	34'-6 5/16"	37'-4 1/4"	40'-2 3/16"	43'-0 1/8"	45'-10 1/16"	48'-8"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
36	6x6	5'-0"	9"	9"	9"	1'-4"	19.5282	2627.350	0.6555	39.134	1.3750	514.464
		10'-0"	9"	9"	9"	1'-4"	19.5282	2627.350	0.6555	39.134	1.3750	514.464
		15'-0"	9"	9"	9"	1'-4"	19.5282	2627.350	0.6555	39.134	1.3750	514.464
		20'-0"	9"	10"	9"	1'-4"	19.5698	2627.350	0.6555	39.134	1.3819	515.963
		25'-0"	9"	10"	9"	1'-4"	19.5698	2627.350	0.6555	39.134	1.3819	515.963
		30'-0"	9"	10"	9"	1'-4"	19.5698	2627.350	0.6555	39.134	1.3819	515.963
48	8x6	5'-0"	9"	10"	9"	1'-4"	20.6621	2714.858	0.7951	47.539	1.5486	581.536
		10'-0"	9"	10"	9"	1'-4"	20.6621	2714.858	0.7951	47.539	1.5486	581.536
		15'-0"	9"	10 1/2"	9"	1'-4"	20.6866	2714.858	0.7951	47.539	1.5521	582.372
		20'-0"	10"	1'-0"	9"	1'-5"	20.8779	2724.954	0.7951	47.539	1.5694	586.555
		25'-0"	10"	11 1/2"	9"	1'-5"	20.8535	2724.954	0.7951	47.539	1.5660	585.718
		30'-0"	11"	1'-0 1/2"	9"	1'-6"	21.0204	2735.050	0.7951	47.539	1.5799	589.064
60	10x6	5'-0"	9"	11 1/2"	9"	1'-4"	21.8383	2802.421	0.9348	57.559	1.7257	649.879
		10'-0"	9"	11 1/2"	9"	1'-4"	21.8383	2802.421	0.9348	57.559	1.7257	649.879
		15'-0"	10"	1'-0"	9"	1'-5"	22.9851	2812.851	0.9348	57.559	1.7361	652.649
		20'-0"	1'-0"	1'-1 1/2"	9"	1'-7"	22.3076	2833.712	0.9348	57.559	1.7604	659.113
		25'-0"	1'-0"	1'-2"	10"	1'-7"	22.3397	2833.712	0.9465	57.893	1.7778	663.034
		30'-0"	1'-1 1/2"	1'-3"	11"	1'-8 1/2"	22.5800	2849.357	0.9581	58.227	1.8090	670.650
72	12x6	5'-0"	9 1/2"	11 1/2"	9"	1'-4 1/2"	23.0002	2895.284	1.0745	66.021	1.8958	716.723
		10'-0"	10 1/2"	1'-1"	9"	1'-5 1/2"	23.2177	2906.048	1.0745	66.021	1.9132	721.775
		15'-0"	11 1/2"	1'-1 1/2"	9 1/2"	1'-6 1/2"	23.3702	2916.812	1.0803	66.188	1.9306	726.305
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	1'-8 1/2"	23.7451	2938.340	1.0920	66.522	1.9722	737.385
		25'-0"	1'-2"	1'-4"	1'-0"	1'-9"	23.8470	2943.722	1.1094	66.967	2.0000	743.903
		30'-0"	1'-1 1/2"	1'-3 1/2"	1'-0 1/2"	1'-8 1/2"	23.7559	2938.340	1.1152	67.134	2.0000	743.382
84	14x6	5'-0"	10"	1'-1"	9 1/2"	1'-5"	24.2758	2988.563	1.2200	74.649	2.0833	788.532
		10'-0"	11 1/2"	1'-2"	10"	1'-6 1/2"	24.5301	3005.210	1.2258	74.816	2.1076	795.517
		15'-0"	1'-1"	1'-2 1/2"	10 1/2"	1'-8"	24.7471	3021.858	1.2316	74.983	2.1285	801.405
		20'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	1'-10 1/2"	25.2839	3049.603	1.2491	75.428	2.1875	817.972
		25'-0"	1'-1 1/2"	1'-4"	1'-1 1/2"	1'-8 1/2"	24.9396	3027.407	1.2665	75.929	2.1840	814.788
		30'-0"	1'-3"	1'-5"	1'-3"	1'-10"	25.2089	3044.054	1.2840	76.375	2.2222	824.772
96	16x6	5'-0"	11 1/2"	1'-2 1/2"	1'-0 1/2"	1'-6 1/2"	25.7076	3090.659	1.3946	85.615	2.3125	870.900
		10'-0"	1'-0 1/2"	1'-3"	1'-0 1/2"	1'-7 1/2"	25.8695	3101.980	1.3946	85.615	2.3229	874.452
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0 1/2"	1'-10 1/2"	26.4432	3135.942	1.3946	85.615	2.3611	887.478
		20'-0"	1'-2"	1'-3 1/2"	1'-2"	1'-9"	26.0990	3118.961	1.4120	86.061	2.3576	883.686
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	1'-10 1/2"	26.4687	3135.942	1.4295	86.562	2.4028	896.472
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-0 1/2"	26.8179	3158.583	1.4528	87.174	2.4514	909.573
108	18x6	5'-0"	1'-0"	1'-2"	11 1/2"	1'-7"	26.8436	3278.521	1.5226	93.743	2.4653	934.692
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	27.4987	3313.485	1.5459	94.355	2.5347	955.940
		15'-0"	1'-3"	1'-4 1/2"	1'-3"	1'-10"	27.4607	3313.485	1.5634	94.856	2.5521	959.167
		20'-0"	1'-4"	1'-5 1/2"	1'-4"	1'-11"	27.6875	3325.140	1.5750	95.134	2.5799	967.249
		25'-0"	1'-6"	1'-6"	1'-6"	2'-1"	27.9943	3348.450	1.5983	95.802	2.6250	979.600
		30'-0"	1'-9"	1'-9"	1'-9"	2'-4"	28.7077	3383.413	1.6332	96.749	2.7083	1003.847
120	20x6	5'-0"	1'-1"	1'-4"	1'-1"	1'-8"	28.3038	3379.075	1.6798	102.649	2.6736	1014.127
		10'-0"	1'-3"	1'-5"	1'-1 1/2"	1'-10"	28.6496	3403.053	1.6856	102.816	2.7014	1023.773
		15'-0"	1'-4"	1'-4 1/2"	1'-4"	1'-11"	28.7327	3415.041	1.7147	103.596	2.7396	1032.627
		20'-0"	1'-8"	1'-8"	1'-8"	2'-3"	29.6434	3462.996	1.7612	104.876	2.8472	1064.989
		25'-0"	1'-9 1/2"	1'-9 1/2"	1'-9 1/2"	2'-4 1/2"	30.0199	3480.979	1.7787	105.321	2.8889	1077.634

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-6-3W-45

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7102

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1	1			1.414S+4'-7 1/2"
T2	#4	1	1	1	1	1	1	1	1			1.414S+8'-3 1/2"
T3	#4	1	1	1	1	1	1	1	1			1.414S+9'-6 1/2"
T4	#4	1	1	1	1	1	1	1	1			1.414S+10'-7 1/2"
T5	#4	1	1	1	1	1	1	1	1			1.414S+11'-8 1/2"
T6	#4	1	1	1	1	1	1	1	1			1.414S+12'-9"
T7	#4	1	1	1	1	1	1	1	1			1.414S+13'-10"
T8	#4	1	1	1	1	1	1	1	1			1.414S+14'-11"
T9	#4	1	1	1	1	1	1	1	1			1.414S+15'-11 1/2"
T10	#4	1	1	1	1	1	1	1	1			1.414S+17'-0 1/2"
T11	#4	1	1	1	1	1	1	1	1			1.414S+18'-1"
T12	#4	1	1	1	1	1	1	1	1			1.414S+19'-2"
T13	#4	1	1	1	1	1	1	1	1			1.414S+20'-3"
T14	#4	1	1	1	1	1	1	1	1			1.414S+21'-3 1/2"
T15	#4	1	1	1	1	1	1	1	1			1.414S+22'-4 1/2"
T16	#4	1	1	1	1	1	1	1	1			1.414S+23'-5 1/2"
T17	#4	1	1	1	1	1	1	1	1			1.414S+23'-6"
T18	#4	3	3	3	3	3	3	3	3			1.414S+19'-8 1/2"
V1	#4	9	11	13	15	17	19	21	23	23'-11"	1'-8"	25'-7"
VL1	#4	1	1	1	1	1	1	1	1	22'-8 1/2"	1'-8"	24'-4 1/2"
VL2	#4	1	1	1	1	1	1	1	1	19'-0 1/2"	1'-8"	20'-8 1/2"
VL3	#4	1	1	1	1	1	1	1	1	15'-4"	1'-8"	17'-0"
VL4	#4	1	1	1	1	1	1	1	1	11'-7 1/2"	1'-8"	13'-3 1/2"
VL5	#4	1	1	1	1	1	1	1	1	7'-9"		7'-9"
VL6	#4	1	1	1	1	1	1	1	1	2'-10"		2'-10"
VS1	#4	1	1	1	1	1	1	1	1	23'-8"	1'-8"	25'-4"
VS2	#4	1	1	1	1	1	1	1	1	23'-0 1/2"	1'-8"	24'-8 1/2"
VS3	#4	1	1	1	1	1	1	1	1	22'-4 1/2"	1'-8"	24'-0 1/2"
VS4	#4	1	1	1	1	1	1	1	1	18'-7"	1'-8"	20'-3"
VS5	#4	1	1	1	1	1	1	1	1	14'-10"	1'-8"	16'-6"
VS6	#4	1	1	1	1	1	1	1	1	11'-1"	1'-8"	12'-9"
VS7	#4	1	1	1	1	1	1	1	1	7'-4"	1'-8"	9'-0"
VS8	#4	1	1	1	1	1	1	1	1	3'-7 1/2"		3'-7 1/2"
FTL1	#5	1	1	1	1	1	1	1	1			1'-4"
FTL2	#5	1	1	1	1	1	1	1	1			1'-10 1/2"
FTL3	#5	1	1	1	1	1	1	1	1			2'-5"
FTL4	#5	1	1	1	1	1	1	1	1			2'-11 1/2"
FTL5	#5	32	32	32	32	32	32	32	32			5'-5"
FTL6	#5	1	1	1	1	1	1	1	1			4'-11 1/2"
FTL7	#5	1	1	1	1	1	1	1	1			4'-5"
FTL8	#5	1	1	1	1	1	1	1	1			3'-10 1/2"
FTL9	#5	1	1	1	1	1	1	1	1			3'-4"
FTL10	#5	1	1	1	1	1	1	1	1			2'-10"
FTL11	#5	2	2	2	2	2	2	2	2			2'-5"
FLL	#4	7	7	7	7	7	7	7	7			31'-0 1/2"
FTS1	#5	1	1	1	1	1	1	1	1			2'-6 1/2"
FTS2	#5	1	1	1	1	1	1	1	1			4'-3"
FTS3	#5	22	22	22	22	22	22	22	22			5'-5"
FTS4	#5	1	1	1	1	1	1	1	1			1'-10"
FLS	#4	7	7	7	7	7	7	7	7			18'-4"
WS1	#5	1	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS2	#5	1	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WS3	#5	1	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS4	#5	1	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WS5	#5	1	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WS6	#5	1	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS7	#5	1	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS8	#5	1	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WS9	#5	1	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WS10	#5	1	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WS11	#5	1	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WS12	#5	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WS13	#5	1	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WS14	#5	1	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WS15	#5	1	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WS16	#5	1	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WS17	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-2"	W+3'-8"
WS18	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WS19	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
WS20	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
WS21	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WS22	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WS23	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WS24	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	16	16	16	16	16	16	16	16	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL2	#5	1	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL3	#5	1	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL4	#5	1	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL5	#5	1	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL6	#5	1	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL7	#5	1	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL8	#5	1	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL9	#5	1	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL10	#5	1	1	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL11	#5	1	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL12	#5	1	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL13	#5	1	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
WL14	#5	1	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL15	#5	1	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
WL16	#5	1	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL17	#5	1	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL18	#5	1	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL19	#5	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL20	#5	1	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL21	#5	1	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WL22	#5	1	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL23	#5	1	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL24	#5	1	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL25	#5	1	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WL26	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-4 1/2"	W+3'-10 1/2"
WL27	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-2 1/2"	W+3'-8 1/2"
WL28	#5	1	1	1	1	1	1	1	1	1'-6"	W+2'-1"	W+3'-7"
WL29	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WL30	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WL31	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WL32	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL33	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL34	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WL35	#5	1	1	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
WL36	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WL37	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL38	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WL39	#5	1	1	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DWL	#5	25	25	25	25	25	25	25	25	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RS2	#4	1	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RS3	#4	1	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
RS4	#4	1	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
RS5	#4	1	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS6	#4	1	1	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
RS7	#4	1	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS8	#4	1	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
RS9	#4	1	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RS10	#4	1	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS11	#4	1	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RS12	#4	1	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RS13	#4	1	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RS14	#4	1	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RS15	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
RS16	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
RS17	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RS18	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
RS19	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
RS20	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	14	14	14	14	14	14	14	14	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
RL2	#4	1	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RL3	#4	1	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RL4	#4	1	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL5	#4	1	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RL6	#4	1	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL7	#4	1	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RL8	#4	1	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
RL9	#4	1	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL10	#4	1	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RL11	#4	1	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
RL12	#4	1	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL13	#4	1	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
RL14	#4	1	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL15	#4	1	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
RL16	#4	1	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL17	#4	1	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
RL18	#4	1	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL19	#4	1	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RL20	#4	1	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RL21	#4	1	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL22	#4	1	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RL23	#4	1	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL24	#4	1	1	1	1	1	1	1	1	1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
RL25	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-10 1/2"	W+3'-4 1/2"
RL26	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
RL27	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL28	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RL29	#4	1	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RL30	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL31	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RL32	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
RL33	#4	1	1	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DRL	#4	23	23	23	23	23	23	23	23	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2	2			4'-8"
YS2	#4	2	2	2	2	2	2	2	2			7'-11"
YS3	#4	2	2	2	2	2	2	2	2			11'-2"
YS4	#4	2	2	2	2	2	2	2	2			14'-5"
YS5	#4	2	2	2	2	2	2	2	2			17'-8"
YS6	#4	4	4	4	4	4	4	6	6			18'-4"
YL1	#4	2	2	2	2	2	2	2	2			8'-1"
YL2	#4	2	2	2	2	2	2	2	2			13'-7"
YL3	#4	2	2	2	2	2	2	2	2			19'-1"
YL4	#4	2	2	2	2	2	2	2	2			24'-7"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 2 OF 3

WORKING NUMBER IWS-6-3W-45

SHEET NUMBER 7103

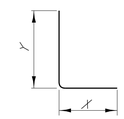
REVISIONS | BY

DATE

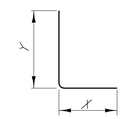
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

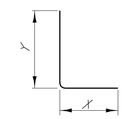
HEIGHT = 6 FT.												
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB												
BAR	SIZE	NO. REQUIRED								DIM. X	DIM. Y	LENGTH
		SPAN										
		6'	8'	10'	12'	14'	16'	18'	20'			
YL5	#4	2	2	2	2	2	2	2	2			30'-1 ½"
YL6	#4	4	4	4	4	4	4	6	6			31'-4"
FS	#4	2	2	2	2	2	2	2	2			19'-2 ½"
FL	#4	2	2	2	2	2	2	2	2			31'-10"
N	#4	14	17	21	24	27	31	34	37	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	11	14	17	20	23	25	28	31	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4	4			1.414S+1'-6"
OS	#7	8	8	8	8	8	8	9	9	3'-4"	3'-4"	6'-8"
OL	#7	8	8	8	8	8	8	9	9	3'-4"	3'-4"	6'-8"
OSS	#4	1	1	1	1	1	1	1	1			6'-0"+T1
OSL	#4	1	1	1	1	1	1	1	1			6'-0"+T1



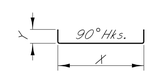
BARS DRS/DRL - #4



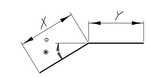
BARS DWS/DWL - #5



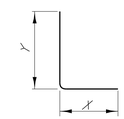
BARS RSn/RLn - #4



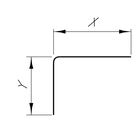
BARS N - #4



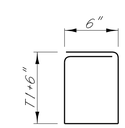
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS
Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 6-20 FT.

SHT. 3 OF 3

WORKING NUMBER
IWS-6-3W-45

SHEET NUMBER
7104

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											8'	10'	12'	14'	16'	18'	20'
8'-0"	7'-4"	23'-10 8/16"	40'-4 3/4"	0'-5 1/8"	1'-1 1/16"	22'-0"	0'-11"	0'-11"	4'-0"	2'-3"	37'-2 8/16"	40'-0 1/2"	42'-10 7/16"	45'-8 3/8"	48'-6 5/16"	51'-4 1/4"	54'-2 3/16"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
64	8x8	5'-0"	9"	9"	9"	1'-9"	33.3898	4313.888	0.7951	49.098	3.1111	729.042
		10'-0"	9"	9"	9"	1'-9"	33.3898	4313.888	0.7951	49.098	3.1111	729.042
		15'-0"	9"	10 1/2"	9"	1'-9"	33.4636	4313.888	0.7951	49.098	3.1296	731.552
		20'-0"	10"	1'-0"	9 1/2"	1'-10"	33.7217	4328.004	0.8010	49.265	3.1728	737.407
		25'-0"	10"	1'-0"	9 1/2"	1'-10"	33.7217	4328.004	0.8010	49.265	3.1728	737.407
		30'-0"	11"	1'-0 1/2"	10 1/2"	1'-11"	33.9319	4342.120	0.8126	49.599	3.2160	743.262
80	10x8	5'-0"	10"	10"	9"	1'-10"	34.9632	4431.544	0.9348	56.000	3.4321	806.479
		10'-0"	10"	11"	9"	1'-10"	35.0197	4431.544	0.9348	56.000	3.4444	808.326
		15'-0"	10 1/2"	1'-0"	9 1/2"	1'-10 1/2"	35.1686	4438.713	0.9406	56.168	3.4753	812.769
		20'-0"	1'-0"	1'-2"	10"	2'-0"	35.5598	4460.221	0.9465	56.335	3.5309	820.905
		25'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	35.5885	4460.221	0.9465	56.335	3.5370	821.829
		30'-0"	1'-0"	1'-2 1/2"	10"	2'-0"	35.5885	4460.221	0.9465	56.335	3.5370	821.829
96	12x8	5'-0"	10"	11 1/2"	9"	1'-10"	36.3996	4537.840	1.0745	66.021	3.7469	883.601
		10'-0"	10 1/2"	1'-1 1/2"	10"	1'-10 1/2"	36.6244	4545.176	1.0861	66.355	3.8025	891.998
		15'-0"	11 1/2"	1'-1 1/2"	10"	1'-11 1/2"	36.8082	4559.848	1.0861	66.355	3.8148	894.019
		20'-0"	1'-1 1/2"	1'-3 1/2"	10 1/2"	2'-1 1/2"	37.3106	4589.193	1.0920	66.522	3.8765	903.774
		25'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	37.4411	4596.530	1.1036	66.800	3.9136	909.140
		30'-0"	1'-2"	1'-4"	11 1/2"	2'-2"	37.4411	4596.529	1.1036	66.800	3.9136	909.140
112	14x8	5'-0"	11"	1'-1"	10"	1'-11"	38.0479	4659.169	1.2258	74.816	4.0988	966.785
		10'-0"	11 1/2"	1'-2"	10"	1'-11 1/2"	38.2148	4666.673	1.2258	74.816	4.1173	970.076
		15'-0"	1'-1"	1'-3"	10 1/2"	2'-1"	38.5675	4689.182	1.2316	74.983	4.1605	977.235
		20'-0"	1'-3 1/2"	1'-5 1/2"	11 1/2"	2'-3 1/2"	39.2225	4726.698	1.2433	75.261	4.2469	991.553
		25'-0"	1'-2"	1'-4"	1'-1"	2'-2"	38.8403	4704.189	1.2607	75.762	4.2469	989.989
		30'-0"	1'-4"	1'-6"	1'-2"	2'-4"	39.3724	4734.201	1.2724	76.041	4.3210	1002.112
128	16x8	5'-0"	11"	1'-2"	10"	1'-11"	39.4963	4765.827	1.3655	84.836	4.4074	1043.939
		10'-0"	1'-1"	1'-4 1/2"	11 1/2"	2'-1"	40.0817	4796.508	1.3829	85.281	4.5000	1059.615
		15'-0"	1'-3 1/2"	1'-5 1/2"	1'-0"	2'-3 1/2"	40.6301	4834.859	1.3888	85.448	4.5556	1069.577
		20'-0"	1'-1 1/2"	1'-4 1/2"	1'-1 1/2"	2'-1 1/2"	40.1859	4804.178	1.4062	85.894	4.5556	1067.491
		25'-0"	1'-3 1/2"	1'-6 1/2"	1'-2"	2'-3 1/2"	40.7328	4834.859	1.4120	86.061	4.6173	1078.637
		30'-0"	1'-5 1/2"	1'-6 1/2"	1'-5 1/2"	2'-5 1/2"	41.1337	4865.539	1.4528	87.174	4.7284	1095.084
144	18x8	5'-0"	1'-0"	1'-3"	11"	2'-0"	41.1501	5001.868	1.5168	93.576	4.7531	1127.329
		10'-0"	1'-2"	1'-5"	1'-0"	2'-2"	41.7111	5033.216	1.5284	93.910	4.8272	1140.843
		15'-0"	1'-3"	1'-5"	1'-2"	2'-3"	41.9086	5048.891	1.5517	94.522	4.8889	1150.077
		20'-0"	1'-3"	1'-6"	1'-3"	2'-3"	42.0137	5048.891	1.5634	94.856	4.9259	1155.965
		25'-0"	1'-6"	1'-7 1/2"	1'-6"	2'-6"	42.7453	5095.914	1.5983	95.802	5.0556	1177.442
		30'-0"	1'-8"	1'-10"	1'-8"	2'-8"	43.3987	5127.263	1.6216	96.415	5.1605	1195.573
160	20x8	5'-0"	1'-4"	1'-6"	1'-1"	2'-4"	43.5894	5172.865	1.6798	104.208	5.1852	1228.340
		10'-0"	1'-4"	1'-6"	1'-2"	2'-4"	43.5976	5172.865	1.6914	104.542	5.2099	1231.686
		15'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	2'-3 1/2"	43.5184	5164.861	1.7089	105.043	5.2407	1235.347
		20'-0"	1'-6"	1'-9"	1'-6"	2'-6"	44.3326	5204.882	1.7380	105.822	5.3704	1258.649
		25'-0"	1'-9"	1'-9 1/2"	1'-9"	2'-9"	44.9847	5252.907	1.7729	106.769	5.4877	1278.192
		30'-0"	1'-11 1/2"	2'-0"	1'-11 1/2"	2'-11 1/2"	45.7823	5292.928	1.8020	107.548	5.6111	1300.136

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-8-3W-45

SHEET NUMBER 7105

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.414S+5'-3 ½"
T2	#4	1	1	1	1	1	1	1			1.414S+8'-11"
T3	#4	1	1	1	1	1	1	1			1.414S+10'-8"
T4	#4	1	1	1	1	1	1	1			1.414S+11'-9"
T5	#4	1	1	1	1	1	1	1			1.414S+12'-9 ½"
T6	#4	1	1	1	1	1	1	1			1.414S+13'-10"
T7	#4	1	1	1	1	1	1	1			1.414S+14'-11"
T8	#4	1	1	1	1	1	1	1			1.414S+15'-11 ½"
T9	#4	1	1	1	1	1	1	1			1.414S+17'-0 ½"
T10	#4	1	1	1	1	1	1	1			1.414S+18'-1"
T11	#4	1	1	1	1	1	1	1			1.414S+19'-1 ½"
T12	#4	1	1	1	1	1	1	1			1.414S+20'-2 ½"
T13	#4	1	1	1	1	1	1	1			1.414S+21'-3"
T14	#4	1	1	1	1	1	1	1			1.414S+22'-3 ½"
T15	#4	1	1	1	1	1	1	1			1.414S+23'-4 ½"
T16	#4	1	1	1	1	1	1	1			1.414S+24'-5"
T17	#4	1	1	1	1	1	1	1			1.414S+25'-6"
T18	#4	1	1	1	1	1	1	1			1.414S+26'-6 ½"
T19	#4	1	1	1	1	1	1	1			1.414S+27'-7"
T20	#4	1	1	1	1	1	1	1			1.414S+28'-8"
T21	#4	1	1	1	1	1	1	1			1.414S+29'-8 ½"
T22	#4	1	1	1	1	1	1	1			1.414S+29'-3"
T23	#4	3	3	3	3	3	3	3			1.414S+25'-2 ½"
V1	#4	12	14	16	18	20	22	24	30'-7 ½"	1'-8"	32'-3 ½"
VL1	#4	1	1	1	1	1	1	1	27'-6 ½"	1'-8"	29'-2 ½"
VL2	#4	1	1	1	1	1	1	1	23'-10"	1'-8"	25'-0"
VL3	#4	1	1	1	1	1	1	1	20'-1 ½"	1'-8"	21'-9 ½"
VL4	#4	1	1	1	1	1	1	1	16'-5"	1'-8"	18'-1"
VL5	#4	1	1	1	1	1	1	1	12'-9"	1'-8"	14'-5"
VL6	#4	1	1	1	1	1	1	1	8'-10"		8'-10"
VL7	#4	1	1	1	1	1	1	1	3'-11"		3'-11"
VS1	#4	1	1	1	1	1	1	1	30'-4 ½"	1'-8"	32'-0 ½"
VS2	#4	1	1	1	1	1	1	1	29'-9"	1'-8"	31'-5"
VS3	#4	1	1	1	1	1	1	1	29'-1 ½"	1'-8"	30'-9 ½"
VS4	#4	1	1	1	1	1	1	1	26'-6 ½"	1'-8"	28'-2 ½"
VS5	#4	1	1	1	1	1	1	1	22'-9 ½"	1'-8"	24'-5 ½"
VS6	#4	1	1	1	1	1	1	1	19'-0 ½"	1'-8"	20'-8 ½"
VS7	#4	1	1	1	1	1	1	1	15'-3 ½"	1'-8"	16'-11 ½"
VS8	#4	1	1	1	1	1	1	1	11'-6 ½"	1'-8"	13'-2 ½"
VS9	#4	1	1	1	1	1	1	1	7'-9 ½"	1'-8"	9'-5 ½"
VS10	#4	1	1	1	1	1	1	1	4'-0 ½"		4'-0 ½"
FTL1	#5	1	1	1	1	1	1	1			1'-3"
FTL2	#5	1	1	1	1	1	1	1			1'-8"
FTL3	#5	1	1	1	1	1	1	1			2'-1"
FTL4	#5	1	1	1	1	1	1	1			2'-6 ½"
FTL5	#5	1	1	1	1	1	1	1			2'-11 ½"
FTL6	#5	1	1	1	1	1	1	1			3'-4 ½"
FTL7	#5	1	1	1	1	1	1	1			3'-9 ½"
FTL8	#5	1	1	1	1	1	1	1			4'-3"
FTL9	#5	50	50	50	50	50	50	50			6'-10"
FTL10	#5	1	1	1	1	1	1	1			6'-8"
FTL11	#5	1	1	1	1	1	1	1			6'-3"
FTL12	#5	1	1	1	1	1	1	1			5'-10"
FTL13	#5	1	1	1	1	1	1	1			5'-5"
FTL14	#5	1	1	1	1	1	1	1			4'-11 ½"
FTL15	#5	1	1	1	1	1	1	1			4'-6 ½"
FTL16	#5	1	1	1	1	1	1	1			4'-1 ½"
FTL17	#5	1	1	1	1	1	1	1			3'-8 ½"
FTL18	#5	1	1	1	1	1	1	1			3'-3 ½"
FTL19	#5	1	1	1	1	1	1	1			2'-10"
FTL20	#5	2	2	2	2	2	2	2			2'-10"
FLL	#4	8	8	8	8	8	8	8			39'-9 ½"
FTS1	#5	1	1	1	1	1	1	1			2'-11 ½"
FTS2	#5	1	1	1	1	1	1	1			4'-4 ½"
FTS3	#5	1	1	1	1	1	1	1			5'-9"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
FTS4	#5	34	34	34	34	34	34	34			6'-10"
FTS5	#5	1	1	1	1	1	1	1			3'-3 ½"
FTS6	#5	1	1	1	1	1	1	1			1'-11"
FLS	#4	8	8	8	8	8	8	8			23'-6"
WS1	#5	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
WS2	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WS3	#5	1	1	1	1	1	1	1		W+6'-3 ½"	W+6'-3 ½"
WS4	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WS5	#5	1	1	1	1	1	1	1		W+5'-10 ½"	W+5'-10 ½"
WS6	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WS7	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WS8	#5	1	1	1	1	1	1	1		W+5'-3 ½"	W+5'-3 ½"
WS9	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS10	#5	1	1	1	1	1	1	1		W+4'-10 ½"	W+4'-10 ½"
WS11	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WS12	#5	1	1	1	1	1	1	1		W+4'-5 ½"	W+4'-5 ½"
WS13	#5	1	1	1	1	1	1	1		W+4'-3 ½"	W+4'-3 ½"
WS14	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WS15	#5	1	1	1	1	1	1	1		W+3'-10 ½"	W+3'-10 ½"
WS16	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WS17	#5	1	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"
WS18	#5	1	1	1	1	1	1	1		W+3'-3 ½"	W+3'-3 ½"
WS19	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WS20	#5	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
WS21	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WS22	#5	1	1	1	1	1	1	1		W+2'-5 ½"	W+2'-5 ½"
WS23	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WS24	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WS25	#5	1	1	1	1	1	1	1		W+1'-10 ½"	W+1'-10 ½"
WS26	#5	1	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WS27	#5	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
WS28	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WS29	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WS30	#5	1	1	1	1	1	1	1	1'-6"	W+1'-10"	W+3'-4"
WS31	#5	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
WS32	#5	1	1	1	1	1	1	1	1'-6"	W+1'-5 ½"	W+2'-11 ½"
WS33	#5	1	1	1	1	1	1	1	1'-6"	W+1'-3"	W+2'-9"
WS34	#5	1	1	1	1	1	1	1	1'-6"	W+1'-0 ½"	W+2'-6 ½"
WS35	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10"	W+2'-4"
WS36	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WS37	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	29	29	29	29	29	29	29	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+6'-8 ½"	W+6'-8 ½"
WL2	#5	1	1	1	1	1	1	1		W+6'-7"	W+6'-7"
WL3	#5	1	1	1	1	1	1	1		W+6'-5 ½"	W+6'-5 ½"
WL4	#5	1	1	1	1	1	1	1		W+6'-4 ½"	W+6'-4 ½"
WL5	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL6	#5	1	1	1	1	1	1	1		W+6'-1 ½"	W+6'-1 ½"
WL7	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL8	#5	1	1	1	1	1	1	1		W+5'-10 ½"	W+5'-10 ½"
WL9	#5	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
WL10	#5	1	1	1	1	1	1	1		W+5'-7 ½"	W+5'-7 ½"
WL11	#5	1	1	1	1	1	1	1		W+5'-6 ½"	W+5'-6 ½"
WL12	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL13	#5	1	1	1	1	1	1	1		W+5'-3 ½"	W+5'-3 ½"
WL14	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL15	#5	1	1	1	1	1	1	1		W+5'-0 ½"	W+5'-0 ½"
WL16	#5	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WL17	#5	1	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
WL18	#5	1	1	1	1	1	1	1		W+4'-8 ½"	W+4'-8 ½"
WL19	#5	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL20	#5	1	1	1	1	1	1	1		W+4'-5 ½"	W+4'-5 ½"
WL21	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL22	#5	1	1	1	1	1	1	1		W+4'-2 ½"	W+4'-2 ½"
WL23	#5	1	1	1	1	1	1	1		W+4'-1"	W+4'-1"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WL24	#5	1	1	1	1	1	1	1		W+3'-11 ½"	W+3'-11 ½"
WL25	#5	1	1	1	1	1	1	1		W+3'-10 ½"	W+3'-10 ½"
WL26	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL27	#5	1	1	1	1	1	1	1		W+3'-7 ½"	W+3'-7 ½"
WL28	#5	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL29	#5	1	1	1	1	1	1	1		W+3'-4 ½"	W+3'-4 ½"
WL30	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL31	#5	1	1	1	1	1	1	1		W+3'-1 ½"	W+3'-1 ½"
WL32	#5	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WL33	#5	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
WL34	#5	1	1	1	1	1	1	1		W+2'-9 ½"	W+2'-9 ½"
WL35	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL36	#5	1	1	1	1	1	1	1		W+2'-6 ½"	W+2'-6 ½"
WL37	#5	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL38	#5	1	1	1	1	1	1	1		W+2'-3 ½"	W+2'-3 ½"
WL39	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL40	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL41	#5	1	1	1	1	1	1	1		W+1'-11 ½"	W+1'-11 ½"
WL42	#5	1	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL43	#5	1	1	1	1	1	1	1		W+1'-8 ½"	W+1'-8 ½"
WL44	#5	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
WL45	#5	1	1	1	1	1	1	1		W+1'-5 ½"	W+1'-5 ½"
WL46	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL47	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WL48	#5	1	1	1	1	1	1	1		W+1'-1 ½"	W+1'-1 ½"
WL49	#5	1	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
WL50	#5	1	1	1	1	1	1	1	1'-6"	W+1'-10 ½"	W+3'-4 ½"
WL51	#5	1	1	1	1	1	1	1	1'-6"	W+1'-9"	W+3'-3"
WL52	#5	1	1	1	1	1	1	1	1'-6"	W+1'-7 ½"	W+3'-1 ½"
WL53	#5	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL54	#5	1	1	1	1	1	1	1	1'-6"	W+1'-4 ½"	W+2'-10 ½"
WL55	#5	1	1	1	1	1	1	1	1'-6"	W+1'-3"	W+2'-9"
WL56	#5	1	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WL57	#5	1	1	1	1	1	1	1	1'-6"	W+1'-0 ½"	W+2'-6 ½"
WL58	#5	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WL59	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 ½"	W+2'-3 ½"
WL60	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WL61	#5	1	1	1	1	1	1	1	1'-6"	W+0'-6 ½"	W+2'-0 ½"
WL62	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DWL	#5	48	48	48	48	48	48	48	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
RS2	#4	1	1	1	1	1	1	1		W+6'-4 ½"	W+6'-4 ½"
RS3	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RS4	#4	1	1	1	1	1	1	1		W+5'-9 ½"	W+5'-9 ½"
RS5	#4	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
RS6	#4	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
RS7	#4	1	1	1	1	1	1	1		W+4'-10 ½"	W+4'-10 ½"
RS8	#4	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RS9	#4	1	1	1	1	1	1	1		W+4'-3 ½"	W+4'-3 ½"
RS10	#4	1	1	1	1	1	1	1		W+3'-11 ½"	W+3'-11 ½"
RS11	#4	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
RS12	#4	1	1	1	1	1	1	1		W+3'-4 ½"	W+3'-4 ½"

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 2 OF 3

WORKING NUMBER
IWS-8-3W-45

SHEET NUMBER
7106

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

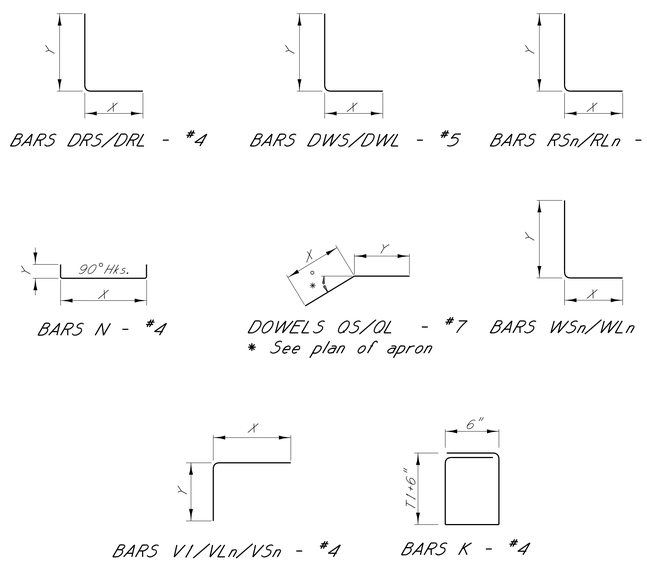
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
RS13	#4	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RS14	#4	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
RS15	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RS16	#4	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
RS17	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RS18	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RS19	#4	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RS20	#4	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
RS21	#4	1	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
RS22	#4	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RS23	#4	1	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
RS24	#4	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
RS25	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	20	20	20	20	20	20	20	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
RL3	#4	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
RL4	#4	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
RL5	#4	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
RL6	#4	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
RL7	#4	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
RL8	#4	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
RL9	#4	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
RL10	#4	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
RL11	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RL12	#4	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
RL13	#4	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL14	#4	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RL15	#4	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL16	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RL17	#4	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
RL18	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL19	#4	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RL20	#4	1	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RL21	#4	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL22	#4	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
RL23	#4	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL24	#4	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
RL25	#4	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL26	#4	1	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
RL27	#4	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
RL28	#4	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RL29	#4	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RL30	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL31	#4	1	1	1	1	1	1	1		W+1'-4 1/2"	W+1'-4 1/2"
RL32	#4	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL33	#4	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL34	#4	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
RL35	#4	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
RL36	#4	1	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL37	#4	1	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RL38	#4	1	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RL39	#4	1	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL40	#4	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RL41	#4	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
RL42	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DRL	#4	35	35	35	35	35	35	35	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			4'-8"
YS2	#4	2	2	2	2	2	2	2			7'-11"
YS3	#4	2	2	2	2	2	2	2			11'-2"
YS4	#4	2	2	2	2	2	2	2			14'-5"
YS5	#4	2	2	2	2	2	2	2			17'-8"
YS6	#4	2	2	2	2	2	2	2			20'-11"
YS7	#4	6	6	6	6	6	8	8			23'-6"
YL1	#4	2	2	2	2	2	2	2			8'-1"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
YL2	#4	2	2	2	2	2	2	2			13'-7"
YL3	#4	2	2	2	2	2	2	2			19'-1"
YL4	#4	2	2	2	2	2	2	2			24'-7"
YL5	#4	2	2	2	2	2	2	2			30'-1 1/2"
YL6	#4	2	2	2	2	2	2	2			35'-7 1/2"
YL7	#4	6	6	6	6	6	8	8			40'-0 1/2"
FS	#4	2	2	2	2	2	2	2			24'-7"
FL	#4	2	2	2	2	2	2	2			40'-8 1/2"
N	#4	18	20	24	27	31	34	38	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	15	17	20	23	26	29	32	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.414S+1'-11"
OS	#5	10	10	10	10	10	11	11	3'-6 1/2"	3'-6 1/2"	7'-1"
OL	#5	10	10	10	10	10	11	11	3'-6 1/2"	3'-6 1/2"	7'-1"
OSS	#4	1	1	1	1	1	1	1			8'-0"+T1
OSL	#4	1	1	1	1	1	1	1			8'-0"+T1



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 8-20 FT.

SHT. 3 OF 3

WORKING NUMBER IWS-8-3W-45

SHEET NUMBER 7107

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

REVISIONS BY DATE

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											10'	12'	14'	16'	18'	20'	22'
10'-0"	8'-4"	27'-1 7/16"	45'-10 13/16"	0'-5 5/8"	1'-2 1/4"	25'-0"	0'-11"	1'-0"	4'-0"	2'-9"	43'-5 5/8"	46'-3 9/16"	49'-1 1/2"	51'-11 7/16"	54'-9 3/8"	57'-7 5/16"	60'-5 1/4"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
100	10x10	5'-0"	11"	11"	10"	2'-11"	47.4729	6524.487	0.9465	57.893	3.7778	887.609
		10'-0"	11"	1'-0"	10"	2'-11"	47.5298	6524.487	0.9465	57.893	3.7901	889.456
		15'-0"	10"	1'-0"	10 1/2"	2'-10"	47.3024	6505.333	0.9523	58.060	3.7901	889.456
		20'-0"	1'-0"	1'-2"	1'-0 1/2"	3'-0"	47.8789	6543.641	0.9756	58.673	3.8889	904.230
		25'-0"	1'-0 1/2"	1'-2"	1'-0 1/2"	3'-0 1/2"	47.9929	6553.218	0.9756	58.673	3.8951	905.154
		30'-0"	1'-2"	1'-3 1/2"	1'-2"	3'-2"	48.4311	6581.949	0.9930	59.174	3.9691	916.234
120	12x10	5'-0"	1'-0"	1'-0"	10"	3'-0"	49.2708	6668.418	1.0861	66.355	4.0988	966.089
		10'-0"	1'-0"	1'-1 1/2"	10"	3'-0"	49.3693	6668.418	1.0861	66.355	4.1173	969.120
		15'-0"	11 1/2"	1'-1 1/2"	10 1/2"	2'-11 1/2"	49.2565	6658.730	1.0920	66.522	4.1235	969.957
		20'-0"	1'-1 1/2"	1'-4"	1'-0 1/2"	3'-1 1/2"	49.8876	6697.483	1.1152	67.134	4.2284	986.436
		25'-0"	1'-2"	1'-4 1/2"	1'-1"	3'-2"	50.0385	6707.171	1.1211	67.301	4.2531	990.303
		30'-0"	1'-1 1/2"	1'-4 1/2"	1'-2 1/2"	3'-1 1/2"	49.9337	6697.483	1.1385	67.746	4.2840	994.833
140	14x10	5'-0"	1'-0"	1'-3"	10"	3'-0"	51.0071	6796.173	1.2258	74.816	4.4321	1047.459
		10'-0"	1'-0"	1'-3"	10"	3'-0"	51.0071	6796.173	1.2258	74.816	4.4321	1047.459
		15'-0"	1'-1"	1'-3"	11"	3'-1"	51.2388	6815.884	1.2375	75.094	4.4691	1053.347
		20'-0"	1'-3 1/2"	1'-6"	1'-1"	3'-3 1/2"	52.0489	6865.160	1.2607	75.762	4.5864	1072.803
		25'-0"	1'-4 1/2"	1'-6 1/2"	1'-1"	3'-4 1/2"	52.3154	6884.871	1.2607	75.762	4.6049	1076.095
		30'-0"	1'-4"	1'-6 1/2"	1'-3"	3'-4"	52.2183	6875.016	1.2840	76.375	4.6481	1082.384
160	16x10	5'-0"	1'-0"	1'-4"	11"	3'-0"	52.6343	6923.956	1.3771	83.556	4.7654	1128.828
		10'-0"	1'-1"	1'-4 1/2"	11"	3'-1"	52.9042	6944.001	1.3771	83.556	4.7840	1132.381
		15'-0"	1'-3 1/2"	1'-6"	1'-0 1/2"	3'-3 1/2"	53.6107	6994.112	1.3946	84.057	4.8704	1147.394
		20'-0"	1'-4"	1'-6"	1'-1"	3'-4"	53.7283	7004.135	1.4004	84.224	4.8889	1150.425
		25'-0"	1'-3 1/2"	1'-7"	1'-2"	3'-3 1/2"	53.7093	6994.112	1.4120	84.502	4.9198	1155.302
		30'-0"	1'-6"	1'-9"	1'-3 1/2"	3'-6"	54.4707	7044.224	1.4295	85.003	5.0123	1171.500
180	18x10	5'-0"	1'-0"	1'-4"	1'-0"	3'-0"	54.1874	7051.739	1.5284	92.351	5.0864	1208.003
		10'-0"	1'-2"	1'-5"	1'-0"	3'-2"	54.7370	7092.496	1.5284	92.351	5.1235	1215.630
		15'-0"	1'-4"	1'-6"	1'-1 1/2"	3'-4"	55.2977	7133.253	1.5459	92.796	5.1975	1228.796
		20'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	3'-3 1/2"	55.1915	7123.064	1.5575	93.130	5.2160	1231.219
		25'-0"	1'-5"	1'-8 1/2"	1'-3 1/2"	3'-5"	55.7857	7153.632	1.5692	93.464	5.2901	1245.080
		30'-0"	1'-6 1/2"	1'-10 1/2"	1'-5 1/2"	3'-6 1/2"	56.3512	7184.200	1.5925	94.077	5.3827	1261.365
200	20x10	5'-0"	1'-3"	1'-6"	1'-0"	3'-3"	56.6242	7368.331	1.6681	102.371	5.4444	1297.065
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-2"	56.3519	7347.619	1.6798	102.649	5.4506	1296.684
		15'-0"	1'-3 1/2"	1'-6"	1'-3"	3'-3 1/2"	56.7611	7378.688	1.7030	103.317	5.5247	1309.503
		20'-0"	1'-5 1/2"	1'-9"	1'-5 1/2"	3'-5 1/2"	57.5648	7420.113	1.7321	104.097	5.6481	1332.316
		25'-0"	1'-7"	1'-10"	1'-7"	3'-7"	58.0372	7451.182	1.7496	104.542	5.7160	1344.646
		30'-0"	1'-10"	2'-0"	1'-10"	3'-10"	58.9977	7513.320	1.7845	105.488	5.8519	1369.307
220	22x10	5'-0"	1'-3"	1'-6"	1'-2"	3'-3"	58.2047	7496.921	1.8311	111.445	5.7901	1380.802
		10'-0"	1'-3 1/2"	1'-6"	1'-3 1/2"	3'-3 1/2"	58.3307	7507.445	1.8485	111.890	5.8333	1387.788
		15'-0"	1'-4 1/2"	1'-7 1/2"	1'-4 1/2"	3'-4 1/2"	58.7416	7528.491	1.8602	112.224	5.8889	1398.705
		20'-0"	1'-8 1/2"	1'-10 1/2"	1'-8 1/2"	3'-8 1/2"	60.0631	7612.678	1.9067	113.504	6.0741	1433.708

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 1 OF 3

WORKING NUMBER IWS-10-3W-45

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7108

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.414S+6'-4 1/2"
T2	#4	1	1	1	1	1	1	1			1.414S+9'-4 1/2"
T3	#4	1	1	1	1	1	1	1			1.414S+12'-0 1/2"
T4	#4	1	1	1	1	1	1	1			1.414S+12'-11"
T5	#4	1	1	1	1	1	1	1			1.414S+13'-9 1/2"
T6	#4	1	1	1	1	1	1	1			1.414S+14'-8 1/2"
T7	#4	1	1	1	1	1	1	1			1.414S+15'-7"
T8	#4	1	1	1	1	1	1	1			1.414S+16'-5 1/2"
T9	#4	1	1	1	1	1	1	1			1.414S+17'-4"
T10	#4	1	1	1	1	1	1	1			1.414S+18'-2 1/2"
T11	#4	1	1	1	1	1	1	1			1.414S+19'-1"
T12	#4	1	1	1	1	1	1	1			1.414S+20'-0"
T13	#4	1	1	1	1	1	1	1			1.414S+20'-10 1/2"
T14	#4	1	1	1	1	1	1	1			1.414S+21'-9"
T15	#4	1	1	1	1	1	1	1			1.414S+22'-7 1/2"
T16	#4	1	1	1	1	1	1	1			1.414S+23'-6"
T17	#4	1	1	1	1	1	1	1			1.414S+24'-5"
T18	#4	1	1	1	1	1	1	1			1.414S+25'-3 1/2"
T19	#4	1	1	1	1	1	1	1			1.414S+26'-2"
T20	#4	1	1	1	1	1	1	1			1.414S+27'-0 1/2"
T21	#4	1	1	1	1	1	1	1			1.414S+27'-11"
T22	#4	1	1	1	1	1	1	1			1.414S+28'-10"
T23	#4	1	1	1	1	1	1	1			1.414S+29'-8 1/2"
T24	#4	1	1	1	1	1	1	1			1.414S+30'-7"
T25	#4	1	1	1	1	1	1	1			1.414S+31-5 1/2"
T26	#4	1	1	1	1	1	1	1			1.414S+32'-4"
T27	#4	1	1	1	1	1	1	1			1.414S+33'-2 1/2"
T28	#4	1	1	1	1	1	1	1			1.414S+34'-1 1/2"
T29	#4	1	1	1	1	1	1	1			1.414S+34'-0"
T30	#4	1	1	1	1	1	1	1			1.414S+33'-1"
T31	#4	3	3	3	3	3	3	3			1.414S+28'-8"
V1	#4	15	17	19	21	23	25	27	34'-10 1/2"	1'-8"	36'-6 1/2"
VL1	#4	1	1	1	1	1	1	1	30'-9 1/2"	1'-8"	32'-5 1/2"
VL2	#4	1	1	1	1	1	1	1	27'-1"	1'-8"	28'-9"
VL3	#4	1	1	1	1	1	1	1	23'-4 1/2"	1'-8"	25'-0 1/2"
VL4	#4	1	1	1	1	1	1	1	19'-8"	1'-8"	21'-4"
VL5	#4	1	1	1	1	1	1	1	15'-11 1/2"	1'-8"	17'-7 1/2"
VL6	#4	1	1	1	1	1	1	1	12'-3"		12'-3"
VL7	#4	1	1	1	1	1	1	1	7'-5 1/2"		7'-5 1/2"
VL8	#4	1	1	1	1	1	1	1	2'-6 1/2"		2'-6 1/2"
VS1	#4	1	1	1	1	1	1	1	34'-7 1/2"	1'-8"	36'-3 1/2"
VS2	#4	1	1	1	1	1	1	1	34'-0"	1'-8"	35'-8"
VS3	#4	1	1	1	1	1	1	1	33'-4"	1'-8"	35'-0"
VS4	#4	1	1	1	1	1	1	1	32'-8 1/2"	1'-8"	34'-4 1/2"
VS5	#4	1	1	1	1	1	1	1	28'-9"	1'-8"	30'-5"
VS6	#4	1	1	1	1	1	1	1	25'-0"	1'-8"	26'-8"
VS7	#4	1	1	1	1	1	1	1	21'-3"	1'-8"	22'-11"
VS8	#4	1	1	1	1	1	1	1	17'-6"	1'-8"	19'-2"
VS9	#4	1	1	1	1	1	1	1	13'-9"	1'-8"	15'-5"
VS10	#4	1	1	1	1	1	1	1	10'-0"	1'-8"	11'-8"
VS11	#4	1	1	1	1	1	1	1	6'-3"		6'-3"
VS12	#4	1	1	1	1	1	1	1	2'-6"		2'-6"
FTL1	#5	1	1	1	1	1	1	1			1'-2 1/2"
FTL2	#5	1	1	1	1	1	1	1			1'-6 1/2"
FTL3	#5	1	1	1	1	1	1	1			1'-10"
FTL4	#5	1	1	1	1	1	1	1			2'-2"
FTL5	#5	1	1	1	1	1	1	1			2'-6"
FTL6	#5	1	1	1	1	1	1	1			2'-10"
FTL7	#5	1	1	1	1	1	1	1			3'-1 1/2"
FTL8	#5	1	1	1	1	1	1	1			3'-5 1/2"
FTL9	#5	1	1	1	1	1	1	1			3'-9 1/2"
FTL10	#5	1	1	1	1	1	1	1			4'-1"
FTL11	#5	1	1	1	1	1	1	1			4'-5"
FTL12	#5	77	77	77	77	77	77	77			7'-5"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
FTL13	#5	1	1	1	1	1	1	1			7'-4"
FTL14	#5	1	1	1	1	1	1	1			7'-0"
FTL15	#5	1	1	1	1	1	1	1			6'-8"
FTL16	#5	1	1	1	1	1	1	1			6'-4"
FTL17	#5	1	1	1	1	1	1	1			6'-0 1/2"
FTL18	#5	1	1	1	1	1	1	1			5'-8 1/2"
FTL19	#5	1	1	1	1	1	1	1			5'-4 1/2"
FTL20	#5	1	1	1	1	1	1	1			5'-1"
FTL21	#5	1	1	1	1	1	1	1			4'-9"
FTL22	#5	1	1	1	1	1	1	1			4'-5"
FTL23	#5	1	1	1	1	1	1	1			4'-1"
FTL24	#5	1	1	1	1	1	1	1			3'-9 1/2"
FTL25	#5	1	1	1	1	1	1	1			3'-5 1/2"
FTL26	#5	3	3	3	3	3	3	3			3'-5"
FLL	#4	9	9	9	9	9	9	9			45'-3 1/2"
FTS1	#5	1	1	1	1	1	1	1			3'-6 1/2"
FTS2	#5	1	1	1	1	1	1	1			4'-7 1/2"
FTS3	#5	1	1	1	1	1	1	1			5'-8"
FTS4	#5	1	1	1	1	1	1	1			6'-9"
FTS5	#5	51	51	51	51	51	51	51			7'-5"
FTS6	#5	1	1	1	1	1	1	1			3'-9"
FTS7	#5	1	1	1	1	1	1	1			2'-8"
FTS8	#5	1	1	1	1	1	1	1			1'-7 1/2"
FLS	#4	9	9	9	9	9	9	9			26'-9 1/2"
WS1	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WS2	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WS3	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
WS4	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WS5	#5	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
WS6	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WS7	#5	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
WS8	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WS9	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WS10	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WS11	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WS12	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WS13	#5	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
WS14	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WS15	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WS16	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WS17	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WS18	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS19	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
WS20	#5	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
WS21	#5	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS22	#5	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WS23	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WS24	#5	1	1	1	1	1	1	1		W+4'-2"	W+4'-2"
WS25	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS26	#5	1	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS27	#5	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
WS28	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WS29	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WS30	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WS31	#5	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WS32	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WS33	#5	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
WS34	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WS35	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WS36	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WS37	#5	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
WS38	#5	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
WS39	#5	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WS40	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WS41	#5	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
WS42	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WS43	#5	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
WS44	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WS45	#5	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
WS46	#5	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
WS47	#5	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
WS48	#5	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
WS49	#5	1	1	1	1	1	1	1		W+0'-4 1/2"	W+0'-4 1/2"
WS50	#5	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
WS51	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WS52	#5	1	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WS53	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WS54	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WS55	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	51	51	51	51	51	51	51	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+7'-7 1/2"	W+7'-7 1/2"
WL3	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WL4	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL5	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
WL6	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WL7	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WL8	#5	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
WL9	#5	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
WL10	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL11	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WL12	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL13	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL14	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WL15	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WL16	#5	1	1	1	1	1	1	1		W+6'-4 1/2"	W+6'-4 1/2"
WL17	#5	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WL18	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WL19	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL20	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL21	#5	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
WL22	#5	1	1	1	1	1	1	1		W+5'-10"	W+5'-10"
WL23	#5	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
WL24	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WL25	#5	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WL26	#5	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
WL27	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WL28	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WL29	#5	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
WL30	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL31	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL32	#5	1	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WL33	#5	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL34	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WL35	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 2 OF 3

WORKING NUMBER IWS-10-3W-45

SHEET NUMBER 7109

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
WL36	#5	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL37	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL38	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL39	#5	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WL40	#5	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
WL41	#5	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WL42	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WL43	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL44	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL45	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL46	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL47	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WL48	#5	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL49	#5	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
WL50	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WL51	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WL52	#5	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WL53	#5	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
WL54	#5	1	1	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WL55	#5	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL56	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL57	#5	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WL58	#5	1	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL59	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WL60	#5	1	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL61	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WL62	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WL63	#5	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WL64	#5	1	1	1	1	1	1	1		W+2'-0 1/2"	W+2'-0 1/2"
WL65	#5	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
WL66	#5	1	1	1	1	1	1	1		W-1'-10 1/2"	W-1'-10 1/2"
WL67	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL68	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL69	#5	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
WL70	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL71	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WL72	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL73	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WL74	#5	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
WL75	#5	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
WL76	#5	1	1	1	1	1	1	1		W+0'-11"	W+0'-11"
WL77	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WL78	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WL79	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WL80	#5	1	1	1	1	1	1	1		W+0'-7 1/2"	W+0'-7 1/2"
WL81	#5	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
WL82	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL83	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WL84	#5	1	1	1	1	1	1	1		W+0'-3"	W+0'-3"
WL85	#5	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
WL86	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WL87	#5	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
WL88	#5	1	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WL89	#5	1	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WL90	#5	1	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WL91	#5	1	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WL92	#5	1	1	1	1	1	1	1	1'-6"	W+0'-6 1/2"	W+2'-0 1/2"
WL93	#5	1	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DWL	#5	87	87	87	87	87	87	87	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
RS2	#4	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
RS3	#4	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
RS4	#4	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
RS5	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"

HEIGHT = 10 FT.

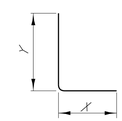
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RS6	#4	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
RS7	#4	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RS8	#4	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
RS9	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RS10	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RS11	#4	1	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
RS12	#4	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RS13	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS14	#4	1	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RS15	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS16	#4	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
RS17	#4	1	1	1	1	1	1	1		W+2'-9 1/2"	W+2'-9 1/2"
RS18	#4	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
RS19	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RS20	#4	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RS21	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RS22	#4	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
RS23	#4	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
RS24	#4	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
RS25	#4	1	1	1	1	1	1	1		W+0'-4 1/2"	W+0'-4 1/2"
RS26	#4	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
RS27	#4	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
RS28	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	27	27	27	27	27	27	27	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
RL2	#4	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
RL3	#4	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
RL4	#4	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
RL5	#4	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
RL6	#4	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
RL7	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RL8	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RL9	#4	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
RL10	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RL11	#4	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
RL12	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RL13	#4	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
RL14	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RL15	#4	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
RL16	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RL17	#4	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL18	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL19	#4	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RL20	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RL21	#4	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
RL22	#4	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
RL23	#4	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RL24	#4	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
RL25	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RL26	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL27	#4	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
RL28	#4	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
RL29	#4	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
RL30	#4	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
RL31	#4	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
RL32	#4	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL33	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL34	#4	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
RL35	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL36	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RL37	#4	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RL38	#4	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL39	#4	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
RL40	#4	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"

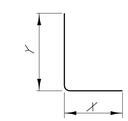
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

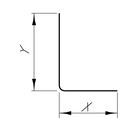
BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'	20'	22'	DIM. X	DIM. Y	LENGTH
RL41	#4	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
RL42	#4	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
RL43	#4	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
RL44	#4	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
RL45	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RL46	#4	1	1	1	1	1	1	1		W-0'-4 1/2"	W-0'-4 1/2"
RL47	#4	1	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DRL	#4	46	46	46	46	46	46	46	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			4'-8"
YS2	#4	2	2	2	2	2	2	2			7'-11"
YS3	#4	2	2	2	2	2	2	2			11'-2"
YS4	#4	2	2	2	2	2	2	2			14'-5 1/2"
YS5	#4	2	2	2	2	2	2	2			17'-8 1/2"
YS6	#4	2	2	2	2	2	2	2			20'-11 1/2"
YS7	#4	2	2	2	2	2	2	2			24'-2 1/2"
YS8	#4	8	8	8	8	8	10	10			26'-9 1/2"
YL1	#4	2	2	2	2	2	2	2			8'-1"
YL2	#4	2	2	2	2	2	2	2			13'-7"
YL3	#4	2	2	2	2	2	2	2			19'-1"
YL4	#4	2	2	2	2	2	2	2			24'-7"
YL5	#4	2	2	2	2	2	2	2			30'-1 1/2"
YL6	#4	2	2	2	2	2	2	2			36'-7 1/2"
YL7	#4	8	8	8	8	8	8	8			41'-1 1/2"
YL8	#4	8	8	8	8	8	10	10			45'-7"
FS	#4	2	2	2	2	2	2	2			28'-0 1/2"
FL	#4	2	2	2	2	2	2	2			46'-4"
N	#4	21	24	27	30	33	37	40	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	18	20	23	26	29	32	35	0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4	4			1.414S+2'-2"
OS	#7	12	12	12	12	12	13	13	3'-8"	3'-8"	7'-4"
OL	#7	12	12	12	12	12	13	13	3'-8"	3'-8"	7'-4"
OSS	#4	1	1	1	1	1	1	1			10'-0"+T1
OSL	#4	1	1	1	1	1	1	1			10'-0"+T1



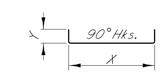
BARS DRS/DRL - #4



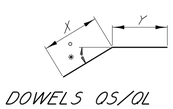
BARS DWS/DWL - #5



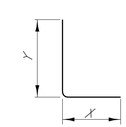
BARS RSn/RLn - #4



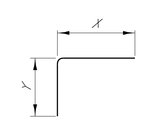
BARS N - #4



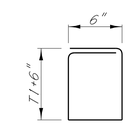
DOWELS OS/OL - #5
* See plan of apron



BARS WSn/WLn - #7



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 10-22 FT.

SHT. 3 OF 3

WORKING NUMBER IWS-10-3W-45

SHEET NUMBER 7110

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"Y" CLEAR SPAN						
											12'	14'	16'	18'	20'	22'	24'
12'-0"	9'-7"	31'-2 5/8"	52'-9 7/16"	0'-6 1/16"	1'-3 7/16"	28'-9"	1'-0"	1'-1"	5'-0"	3'-0"	50'-6 3/8"	53'-4 5/16"	56'-2 1/4"	59'-0 3/16"	61'-10 1/8"	64'-8 1/16"	67'-6"

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"						ESTIMATED QUANTITIES					
							TOTAL HEADWALL		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
144	12x12	5'-0"	11 1/2"	11 1/2"	11"	3'-8 1/2"	66.2594	9868.487	1.0978	66.689	4.4074	1042.201
		10'-0"	11 1/2"	1'-1"	1'-0"	3'-8 1/2"	66.3604	9868.487	1.1094	66.967	4.4506	1049.273
		15'-0"	11 1/2"	1'-2"	1'-1"	3'-8 1/2"	66.4304	9868.487	1.1211	67.301	4.4877	1055.335
		20'-0"	1'-2"	1'-4"	1'-3"	3'-11"	67.2865	9930.689	1.1443	67.913	4.5926	1072.509
		25'-0"	1'-3"	1'-4 1/2"	1'-3"	4'-0"	67.6053	9955.569	1.1443	67.913	4.6111	1075.540
		30'-0"	1'-2"	1'-4 1/2"	1'-0"	3'-11"	67.3045	9930.689	1.1094	66.967	4.5247	1061.396
168	14x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	68.3081	10037.963	1.2375	76.653	4.7407	1123.396
		10'-0"	1'-0 1/2"	1'-2 1/2"	1'-0"	3'-9 1/2"	68.4907	10050.515	1.2491	76.987	4.7778	1129.632
		15'-0"	1'-1"	1'-3 1/2"	1'-1"	3'-10"	68.7128	10063.066	1.2607	77.321	4.8210	1136.965
		20'-0"	1'-3 1/2"	1'-6"	1'-3"	4'-0 1/2"	69.6289	10125.825	1.2840	77.933	4.9321	1156.019
		25'-0"	1'-3 1/2"	1'-5 1/2"	1'-3 1/2"	4'-0 1/2"	69.5931	10125.825	1.2898	78.100	4.9383	1156.943
		30'-0"	1'-4 1/2"	1'-6 1/2"	1'-4 1/2"	4'-1 1/2"	69.9649	10150.928	1.3015	78.434	4.9877	1165.373
192	16x12	5'-0"	1'-0"	1'-2"	11"	3'-9"	70.0497	10198.311	1.3771	83.556	5.0370	1198.530
		10'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	70.4630	10223.748	1.3888	83.890	5.0926	1208.492
		15'-0"	1'-3 1/2"	1'-6"	1'-2 1/2"	4'-0 1/2"	71.4016	10287.342	1.4179	84.669	5.2160	1230.436
		20'-0"	1'-2 1/2"	1'-5 1/2"	1'-2 1/2"	3'-11 1/2"	71.0743	10261.904	1.4179	84.669	5.1975	1226.884
		25'-0"	1'-4"	1'-7"	1'-4"	4'-1"	71.6439	10300.060	1.4353	85.170	5.2716	1240.050
		30'-0"	1'-5 1/2"	1'-8 1/2"	1'-3"	4'-2 1/2"	72.1920	10338.217	1.4237	84.836	5.2840	1243.114
216	18x12	5'-0"	1'-1"	1'-4"	11"	3'-10"	72.2596	10384.458	1.5168	93.576	5.3704	1281.291
		10'-0"	1'-2"	1'-5"	1'-0"	3'-11"	72.6413	10410.229	1.5284	93.910	5.4198	1290.416
		15'-0"	1'-4"	1'-6 1/2"	1'-2"	4'-1"	73.3639	10461.772	1.5517	94.522	5.5123	1307.396
		20'-0"	1'-4"	1'-6 1/2"	1'-2 1/2"	4'-1"	73.3679	10461.772	1.5575	94.689	5.5247	1309.416
		25'-0"	1'-5 1/2"	1'-9 1/2"	1'-5"	4'-2 1/2"	74.1106	10500.429	1.5866	95.468	5.6420	1330.958
		30'-0"	1'-8"	1'-10 1/2"	1'-6 1/2"	4'-5"	74.9399	10564.858	1.6041	95.969	5.7222	1345.917
240	20x12	5'-0"	1'-1"	1'-3 1/2"	1'-0"	3'-10"	73.9724	10545.084	1.6681	100.812	5.6852	1359.629
		10'-0"	1'-2"	1'-5 1/2"	1'-1"	3'-11"	74.4665	10571.189	1.6798	101.091	5.7469	1371.818
		15'-0"	1'-5 1/2"	1'-7 1/2"	1'-2 1/2"	4'-2 1/2"	75.6789	10662.558	1.6972	101.592	5.8519	1392.817
		20'-0"	1'-6"	1'-10"	1'-4 1/2"	4'-3"	76.1067	10675.611	1.7205	102.204	5.9383	1409.048
		25'-0"	1'-7"	1'-11 1/2"	1'-5 1/2"	4'-4"	76.5655	10701.716	1.7321	102.538	5.9938	1419.879
264	22x12	5'-0"	1'-2"	1'-4 1/2"	1'-2"	3'-11"	76.1326	10732.289	1.8311	111.445	6.0556	1449.060
		10'-0"	1'-3 1/2"	1'-6"	1'-1"	4'-0 1/2"	76.7201	10771.948	1.8194	111.111	6.0679	1453.688
		15'-0"	1'-5"	1'-7 1/2"	1'-4"	4'-2"	77.3408	10811.607	1.8544	112.057	6.1790	1474.480
		20'-0"	1'-8 1/2"	1'-11"	1'-6"	4'-5 1/2"	78.7648	10904.145	1.8776	112.725	6.3148	1502.791
		25'-0"	1'-11"	2'-0"	1'-9 1/2"	4'-8"	79.6516	10970.243	1.9184	113.783	6.4444	1527.049
288	24x12	5'-0"	1'-2"	1'-5"	1'-1"	3'-11"	77.9505	10893.332	1.9591	119.572	6.3333	1522.466
		10'-0"	1'-4 1/2"	1'-7 1/2"	1'-3"	4'-1 1/2"	78.9789	10960.266	1.9824	120.184	6.4444	1545.867
		15'-0"	1'-7"	1'-9"	1'-5"	4'-4"	79.8951	11027.200	2.0057	120.852	6.5432	1566.203
		20'-0"	1'-10 1/2"	2'-0"	1'-10 1/2"	4'-7 1/2"	81.3570	11120.906	2.0697	122.578	6.7593	1608.343

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 1 OF 4

WORKING NUMBER IWS-12-3W-45

SHEET NUMBER 7111

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1	1			1.414S+6'-11"
T2	#4	1	1	1	1	1	1	1			1.414S+9'-4"
T3	#4	1	1	1	1	1	1	1			1.414S+11'-9 ½"
T4	#4	1	1	1	1	1	1	1			1.414S+13'-4"
T5	#4	1	1	1	1	1	1	1			1.414S+14'-0 ½"
T6	#4	1	1	1	1	1	1	1			1.414S+14'-9"
T7	#4	1	1	1	1	1	1	1			1.414S+15'-5 ½"
T8	#4	1	1	1	1	1	1	1			1.414S+16'-2"
T9	#4	1	1	1	1	1	1	1			1.414S+16'-10 ½"
T10	#4	1	1	1	1	1	1	1			1.414S+17'-7"
T11	#4	1	1	1	1	1	1	1			1.414S+18'-3 ½"
T12	#4	1	1	1	1	1	1	1			1.414S+19'-0"
T13	#4	1	1	1	1	1	1	1			1.414S+19'-8 ½"
T14	#4	1	1	1	1	1	1	1			1.414S+20'-5"
T15	#4	1	1	1	1	1	1	1			1.414S+21'-1 ½"
T16	#4	1	1	1	1	1	1	1			1.414S+21'-10 ½"
T17	#4	1	1	1	1	1	1	1			1.414S+22'-6 ½"
T18	#4	1	1	1	1	1	1	1			1.414S+23'-3"
T19	#4	1	1	1	1	1	1	1			1.414S+23'-11 ½"
T20	#4	1	1	1	1	1	1	1			1.414S+24'-8"
T21	#4	1	1	1	1	1	1	1			1.414S+25'-4 ½"
T22	#4	1	1	1	1	1	1	1			1.414S+26'-1"
T23	#4	1	1	1	1	1	1	1			1.414S+26'-9 ½"
T24	#4	1	1	1	1	1	1	1			1.414S+27'-6"
T25	#4	1	1	1	1	1	1	1			1.414S+28'-2 ½"
T26	#4	1	1	1	1	1	1	1			1.414S+28'-11"
T27	#4	1	1	1	1	1	1	1			1.414S+29'-7 ½"
T28	#4	1	1	1	1	1	1	1			1.414S+30'-4"
T29	#4	1	1	1	1	1	1	1			1.414S+31'-0 ½"
T30	#4	1	1	1	1	1	1	1			1.414S+31'-9"
T31	#4	1	1	1	1	1	1	1			1.414S+32'-5 ½"
T32	#4	1	1	1	1	1	1	1			1.414S+33'-2"
T33	#4	1	1	1	1	1	1	1			1.414S+33'-10 ½"
T34	#4	1	1	1	1	1	1	1			1.414S+34'-7"
T35	#4	1	1	1	1	1	1	1			1.414S+35'-3 ½"
T36	#4	1	1	1	1	1	1	1			1.414S+36'-0"
T37	#4	1	1	1	1	1	1	1			1.414S+36'-9"
T38	#4	1	1	1	1	1	1	1			1.414S+37'-5 ½"
T39	#4	1	1	1	1	1	1	1			1.414S+38'-2"
T40	#4	1	1	1	1	1	1	1			1.414S+38'-10 ½"
T41	#4	1	1	1	1	1	1	1			1.414S+38'-10 ½"
T42	#4	1	1	1	1	1	1	1			1.414S+38'-1 ½"
T43	#4	1	1	1	1	1	1	1			1.414S+37'-5"
T44	#4	3	3	3	3	3	3	3			1.414S+32'-10 ½"
V1	#4	17	17	17	17	17	17	17	40'-2"	1'-8"	41'-10"
VL1	#4	1	1	1	1	1	1	1	37'-7"	1'-8"	39'-3"
VL2	#4	1	1	1	1	1	1	1	33'-11"	1'-8"	35'-7"
VL3	#4	1	1	1	1	1	1	1	30'-2 ½"	1'-8"	31'-10 ½"
VL4	#4	1	1	1	1	1	1	1	26'-6"	1'-8"	28'-2"
VL5	#4	1	1	1	1	1	1	1	22'-9 ½"	1'-8"	24'-5 ½"
VL6	#4	1	1	1	1	1	1	1	19'-1"	1'-8"	20'-9"
VL7	#4	1	1	1	1	1	1	1	15'-4 ½"	1'-8"	17'-0 ½"
VL8	#4	1	1	1	1	1	1	1	11'-2"		11'-2"
VL9	#4	1	1	1	1	1	1	1	6'-3"		6'-3"
VL10	#4	1	1	1	1	1	1	1	1'-4"		1'-4"
VS1	#4	1	1	1	1	1	1	1	39'-11"	1'-8"	41'-7"
VS2	#4	1	1	1	1	1	1	1	39'-3 ½"	1'-8"	40'-11 ½"
VS3	#4	1	1	1	1	1	1	1	38'-8"	1'-8"	40'-4"
VS4	#4	1	1	1	1	1	1	1	38'-0"	1'-8"	39'-8"
VS5	#4	1	1	1	1	1	1	1	35'-0"	1'-8"	36'-8"
VS6	#4	1	1	1	1	1	1	1	31'-3"	1'-8"	32'-11"
VS7	#4	1	1	1	1	1	1	1	27'-6"	1'-8"	29'-2"
VS8	#4	1	1	1	1	1	1	1	23'-9"	1'-8"	25'-5"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
VS9	#4	1	1	1	1	1	1	1	20'-0 ½"	1'-8"	21'-8 ½"
VS10	#4	1	1	1	1	1	1	1	16'-3 ½"	1'-8"	17'-11 ½"
VS11	#4	1	1	1	1	1	1	1	12'-6 ½"	1'-8"	14'-2 ½"
VS12	#4	1	1	1	1	1	1	1	8'-9 ½"	1'-8"	10'-5 ½"
VS13	#4	1	1	1	1	1	1	1			5'-0 ½"
VS14	#4	1	1	1	1	1	1	1			1'-3 ½"
FTL1	#5	1	1	1	1	1	1	1			1'-3"
FTL2	#5	1	1	1	1	1	1	1			1'-6"
FTL3	#5	1	1	1	1	1	1	1			1'-9 ½"
FTL4	#5	1	1	1	1	1	1	1			2'-0 ½"
FTL5	#5	1	1	1	1	1	1	1			2'-3 ½"
FTL6	#5	1	1	1	1	1	1	1			2'-7"
FTL7	#5	1	1	1	1	1	1	1			2'-10"
FTL8	#5	1	1	1	1	1	1	1			3'-1 ½"
FTL9	#5	1	1	1	1	1	1	1			3'-4 ½"
FTL10	#5	1	1	1	1	1	1	1			3'-8"
FTL11	#5	1	1	1	1	1	1	1			3'-11"
FTL12	#5	1	1	1	1	1	1	1			4'-2 ½"
FTL13	#5	1	1	1	1	1	1	1			4'-5 ½"
FTL14	#5	1	1	1	1	1	1	1			4'-9"
FTL15	#5	1	1	1	1	1	1	1			5'-0"
FTL16	#5	1	1	1	1	1	1	1			5'-3 ½"
FTL17	#5	1	1	1	1	1	1	1			5'-6 ½"
FTL18	#5	104	104	104	104	104	104	104			8'-9"
FTL19	#5	1	1	1	1	1	1	1			8'-8 ½"
FTL20	#5	1	1	1	1	1	1	1			8'-5"
FTL21	#5	1	1	1	1	1	1	1			8'-2"
FTL22	#5	1	1	1	1	1	1	1			7'-10 ½"
FTL23	#5	1	1	1	1	1	1	1			7'-7 ½"
FTL24	#5	1	1	1	1	1	1	1			7'-4"
FTL25	#5	1	1	1	1	1	1	1			7'-1"
FTL26	#5	1	1	1	1	1	1	1			6'-9 ½"
FTL27	#5	1	1	1	1	1	1	1			6'-6 ½"
FTL28	#5	1	1	1	1	1	1	1			6'-3"
FTL29	#5	1	1	1	1	1	1	1			6'-0"
FTL30	#5	1	1	1	1	1	1	1			5'-8 ½"
FTL31	#5	1	1	1	1	1	1	1			5'-5 ½"
FTL32	#5	1	1	1	1	1	1	1			5'-2"
FTL33	#5	1	1	1	1	1	1	1			4'-11"
FTL34	#5	1	1	1	1	1	1	1			4'-7 ½"
FTL35	#5	1	1	1	1	1	1	1			4'-4 ½"
FTL36	#5	1	1	1	1	1	1	1			4'-1"
FTL37	#5	1	1	1	1	1	1	1			3'-10"
FTL38	#5	4	4	4	4	4	4	4			3'-9"
FLL	#4	10	10	10	10	10	10	10			52'-2"
FTS1	#5	1	1	1	1	1	1	1			3'-10 ½"
FTS2	#5	1	1	1	1	1	1	1			4'-9"
FTS3	#5	1	1	1	1	1	1	1			5'-7 ½"
FTS4	#5	1	1	1	1	1	1	1			6'-6 ½"
FTS5	#5	1	1	1	1	1	1	1			7'-5"
FTS6	#5	1	1	1	1	1	1	1			8'-3 ½"
FTS7	#5	70	70	70	70	70	70	70			8'-9"
FTS8	#5	1	1	1	1	1	1	1			5'-0"
FTS9	#5	1	1	1	1	1	1	1			4'-1 ½"
FTS10	#5	1	1	1	1	1	1	1			3'-3"
FTS11	#5	1	1	1	1	1	1	1			2'-4"
FTS12	#5	1	1	1	1	1	1	1			1'-5 ½"
FLS	#4	10	10	10	10	10	10	10			30'-10 ½"
WS1	#5	1	1	1	1	1	1	1		W+8'-11"	W+8'-11"
WS2	#5	1	1	1	1	1	1	1		W+8'-9 ½"	W+8'-9 ½"
WS3	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WS4	#5	1	1	1	1	1	1	1		W+8'-6 ½"	W+8'-6 ½"
WS5	#5	1	1	1	1	1	1	1		W+8'-5"	W+8'-5"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WS6	#5	1	1	1	1	1	1	1		W+8'-3 ½"	W+8'-3 ½"
WS7	#5	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
WS8	#5	1	1	1	1	1	1	1		W+8'-0 ½"	W+8'-0 ½"
WS9	#5	1	1	1	1	1	1	1		W+7'-11"	W+7'-11"
WS10	#5	1	1	1	1	1	1	1		W+7'-9 ½"	W+7'-9 ½"
WS11	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WS12	#5	1	1	1	1	1	1	1		W+7'-6 ½"	W+7'-6 ½"
WS13	#5	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
WS14	#5	1	1	1	1	1	1	1		W+7'-3 ½"	W+7'-3 ½"
WS15	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WS16	#5	1	1	1	1	1	1	1		W+7'-0 ½"	W+7'-0 ½"
WS17	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WS18	#5	1	1	1	1	1	1	1		W+6'-9 ½"	W+6'-9 ½"
WS19	#5	1	1	1	1	1	1	1		W+6'-8"	W+6'-8"
WS20	#5	1	1	1	1	1	1	1		W+6'-6 ½"	W+6'-6 ½"
WS21	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WS22	#5	1	1	1	1	1	1	1		W+6'-3 ½"	W+6'-3 ½"
WS23	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WS24	#5	1	1	1	1	1	1	1		W+6'-0 ½"	W+6'-0 ½"
WS25	#5	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
WS26	#5	1	1	1	1	1	1	1		W+5'-9 ½"	W+5'-9 ½"
WS27	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WS28	#5	1	1	1	1	1	1	1		W+5'-6 ½"	W+5'-6 ½"
WS29	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WS30	#5	1	1	1	1	1	1	1		W+5'-3 ½"	W+5'-3 ½"
WS31	#5	1	1	1	1	1	1	1		W+5'-1 ½"	W+5'-1 ½"
WS32	#5	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WS33	#5	1	1	1	1	1	1	1		W+4'-10 ½"	W+4'-10 ½"
WS34	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WS35	#5	1	1	1	1	1	1	1		W+4'-7 ½"	W+4'-7 ½"
WS36	#5	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WS37	#5	1	1	1	1	1	1	1		W+4'-4 ½"	W+4'-4 ½"
WS38	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WS39	#5	1	1	1	1	1	1	1		W+4'-1 ½"	W+4'-1 ½"
WS40	#5	1	1	1	1	1	1	1		W+4'-0"	W+4'-0"
WS41	#5	1	1	1	1	1	1	1		W+3'-10 ½"	W+3'-10 ½"
WS42	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WS43	#5	1	1	1	1	1	1	1		W+3'-7 ½"	W+3'-7 ½"
WS44	#5	1	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WS45	#5	1	1	1	1	1	1	1		W+3'-4 ½"	W+3'-4 ½"
WS46	#5	1	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WS47	#5	1	1	1	1	1	1	1		W+3'-1 ½"	W+3'-1 ½"
WS48	#5	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WS49	#5	1	1	1	1	1	1	1		W+2'-10 ½"	W+2'-10 ½"
WS50	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WS51	#5	1	1	1	1	1	1	1		W+2'-7 ½"	W+2'-7 ½"
WS52	#5	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
WS53	#5	1	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
WS54	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WS55	#5	1	1	1	1	1	1	1		W+2'-1 ½"	W+2'-1 ½"
WS56	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WS57	#5	1	1	1	1	1	1	1		W+1'-10 ½"	W+1'-10 ½"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING SINGLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 2 OF 4

WORKING NUMBER IWS-12-3W-45

SHEET NUMBER 7112

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WS58	#5	1	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WS59	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WS60	#5	1	1	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WS61	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WS62	#5	1	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WS63	#5	1	1	1	1	1	1	1		W+1'-1"	W+1'-1"
WS64	#5	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
WS65	#5	1	1	1	1	1	1	1		W+0'-10"	W+0'-10"
WS66	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
WS67	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WS68	#5	1	1	1	1	1	1	1		W+0'-5 1/2"	W+0'-5 1/2"
WS69	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WS70	#5	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
WS71	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WS72	#5	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
WS73	#5	1	1	1	1	1	1	1		W-0'-2"	W-0'-2"
WS74	#5	1	1	1	1	1	1	1		W-0'-3 1/2"	W-0'-3 1/2"
WS75	#5	1	1	1	1	1	1	1		W-0'-5"	W-0'-5"
WS76	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	76	76	76	76	76	76	76	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-11 1/2"	W+8'-11 1/2"
WL2	#5	1	1	1	1	1	1	1		W+8'-10 1/2"	W+8'-10 1/2"
WL3	#5	1	1	1	1	1	1	1		W+8'-10"	W+8'-10"
WL4	#5	1	1	1	1	1	1	1		W+8'-9"	W+8'-9"
WL5	#5	1	1	1	1	1	1	1		W+8'-8"	W+8'-8"
WL6	#5	1	1	1	1	1	1	1		W+8'-7"	W+8'-7"
WL7	#5	1	1	1	1	1	1	1		W+8'-6"	W+8'-6"
WL8	#5	1	1	1	1	1	1	1		W+8'-5"	W+8'-5"
WL9	#5	1	1	1	1	1	1	1		W+8'-4 1/2"	W+8'-4 1/2"
WL10	#5	1	1	1	1	1	1	1		W+8'-3 1/2"	W+8'-3 1/2"
WL11	#5	1	1	1	1	1	1	1		W+8'-2 1/2"	W+8'-2 1/2"
WL12	#5	1	1	1	1	1	1	1		W+8'-1 1/2"	W+8'-1 1/2"
WL13	#5	1	1	1	1	1	1	1		W+8'-0 1/2"	W+8'-0 1/2"
WL14	#5	1	1	1	1	1	1	1		W+8'-0"	W+8'-0"
WL15	#5	1	1	1	1	1	1	1		W+7'-11"	W+7'-11"
WL16	#5	1	1	1	1	1	1	1		W+7'-10"	W+7'-10"
WL17	#5	1	1	1	1	1	1	1		W+7'-9"	W+7'-9"
WL18	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WL19	#5	1	1	1	1	1	1	1		W+7'-7 1/2"	W+7'-7 1/2"
WL20	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WL21	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL22	#5	1	1	1	1	1	1	1		W+7'-4 1/2"	W+7'-4 1/2"
WL23	#5	1	1	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WL24	#5	1	1	1	1	1	1	1		W+7'-2 1/2"	W+7'-2 1/2"
WL25	#5	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
WL26	#5	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
WL27	#5	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
WL28	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL29	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WL30	#5	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
WL31	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL32	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL33	#5	1	1	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WL34	#5	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WL35	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL36	#5	1	1	1	1	1	1	1		W+6'-4"	W+6'-4"
WL37	#5	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
WL38	#5	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
WL39	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL40	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL41	#5	1	1	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL42	#5	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
WL43	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL44	#5	1	1	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
WL45	#5	1	1	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL46	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WL47	#5	1	1	1	1	1	1	1		W+5'-6"	W+5'-6"
WL48	#5	1	1	1	1	1	1	1		W+5'-5"	W+5'-5"
WL49	#5	1	1	1	1	1	1	1		W+5'-4"	W+5'-4"
WL50	#5	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
WL51	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL52	#5	1	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL53	#5	1	1	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
WL54	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
WL55	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL56	#5	1	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
WL57	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WL58	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL59	#5	1	1	1	1	1	1	1		W+4'-7"	W+4'-7"
WL60	#5	1	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WL61	#5	1	1	1	1	1	1	1		W+4'-5"	W+4'-5"
WL62	#5	1	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL63	#5	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WL64	#5	1	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
WL65	#5	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WL66	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WL67	#5	1	1	1	1	1	1	1		W+3'-11 1/2"	W+3'-11 1/2"
WL68	#5	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL69	#5	1	1	1	1	1	1	1		W+3'-10"	W+3'-10"
WL70	#5	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
WL71	#5	1	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL72	#5	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
WL73	#5	1	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
WL74	#5	1	1	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
WL75	#5	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WL76	#5	1	1	1	1	1	1	1		W+3'-3 1/2"	W+3'-3 1/2"
WL77	#5	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
WL78	#5	1	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL79	#5	1	1	1	1	1	1	1		W+3'-1"	W+3'-1"
WL80	#5	1	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WL81	#5	1	1	1	1	1	1	1		W+2'-11"	W+2'-11"
WL82	#5	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
WL83	#5	1	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL84	#5	1	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WL85	#5	1	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
WL86	#5	1	1	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL87	#5	1	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
WL88	#5	1	1	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WL89	#5	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
WL90	#5	1	1	1	1	1	1	1		W+2'-3"	W+2'-3"
WL91	#5	1	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL92	#5	1	1	1	1	1	1	1		W+2'-1"	W+2'-1"
WL93	#5	1	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL94	#5	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
WL95	#5	1	1	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WL96	#5	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL97	#5	1	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL98	#5	1	1	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL99	#5	1	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WL100	#5	1	1	1	1	1	1	1		W+1'-6"	W+1'-6"
WL101	#5	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WL102	#5	1	1	1	1	1	1	1		W+1'-4"	W+1'-4"
WL103	#5	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
WL104	#5	1	1	1	1	1	1	1		W+1'-2"	W+1'-2"
WL105	#5	1	1	1	1	1	1	1		W+1'-1 1/2"	W+1'-1 1/2"
WL106	#5	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
WL107	#5	1	1	1	1	1	1	1		W+0'-11 1/2"	W+0'-11 1/2"
WL108	#5	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
WL109	#5	1	1	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
WL110	#5	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
WL111	#5	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
WL112	#5	1	1	1	1	1	1	1		W+0'-7"	W+0'-7"
WL113	#5	1	1	1	1	1	1	1		W+0'-6"	W+0'-6"
WL114	#5	1	1	1	1	1	1	1		W+0'-5"	W+0'-5"
WL115	#5	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
WL116	#5	1	1	1	1	1	1	1		W+0'-3 1/2"	W+0'-3 1/2"
WL117	#5	1	1	1	1	1	1	1		W+0'-2 1/2"	W+0'-2 1/2"
WL118	#5	1	1	1	1	1	1	1		W+0'-1 1/2"	W+0'-1 1/2"
WL119	#5	1	1	1	1	1	1	1		W+0'-0 1/2"	W+0'-0 1/2"
WL120	#5	1	1	1	1	1	1	1		W-0'-0 1/2"	W-0'-0 1/2"
WL121	#5	1	1	1	1	1	1	1		W-0'-1"	W-0'-1"
WL122	#5	1	1	1	1	1	1	1		W-0'-2"	W-0'-2"
WL123	#5	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
WL124	#5	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
WL125	#5	1	1	1	1	1	1	1		W-0'-5"	W-0'-5"
WL126	#5	1	1	1	1	1	1	1		W-0'-6"	W-0'-6"
WL127	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	127	127	127	127	127	127	127	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1	1		W+8'-11"	W+8'-11"
RS2	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RS3	#4	1	1	1	1	1	1	1		W+8'-4"	W+8'-4"
RS4	#4	1	1	1	1	1	1	1		W+8'-0"	W+8'-0"
RS5	#4	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
RS6	#4	1	1	1	1	1	1	1		W+7'-5"	W+7'-5"
RS7	#4	1	1	1	1	1	1	1		W+7'-1"	W+7'-1"
RS8	#4	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
RS9	#4	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
RS10	#4	1	1	1	1	1	1	1		W+6'-2"	W+6'-2"
RS11	#4	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RS12	#4	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
RS13	#4	1	1	1	1	1	1	1		W+5'-3"	W+5'-3"
RS14	#4	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RS15	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RS16	#4	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
RS17	#4	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS18	#4	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RS19	#4	1	1	1	1	1	1	1		W+3'-5"	W+3'-5"
RS20	#4	1	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
RS21	#4	1	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RS22	#4	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
RS23	#4	1	1	1	1	1	1	1		W+2'-2 1/2"	W+2'-2 1/2"
RS24	#4	1	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RS25	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RS26	#4	1	1	1	1	1	1	1		W+1'-3 1/2"	W+1'-3 1/2"
RS27	#4	1	1	1	1	1	1	1		W+1'-0"	W+1'-0"
RS28	#4	1	1	1	1	1	1	1		W+0'-8"	W+0'-8"
RS29	#4	1	1	1	1	1	1	1		W+0'-4 1/2"	W+0'-4 1/2"
RS30	#4	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
RS31	#4	1	1	1	1	1	1	1		W-0'-3"	W-0'-3"
RS32	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	32	32	32	32	32	32	32	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1	1		W+8'-11 1/2"	W+8'-11 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

SHT. 3 OF 4

WORKING NUMBER
WS-12-3W-45

SHEET NUMBER
7113

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

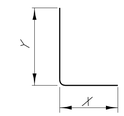
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
RL2	#4	1	1	1	1	1	1	1		W+8'-9 1/2"	W+8'-9 1/2"
RL3	#4	1	1	1	1	1	1	1		W+8'-7 1/2"	W+8'-7 1/2"
RL4	#4	1	1	1	1	1	1	1		W+8'-5"	W+8'-5"
RL5	#4	1	1	1	1	1	1	1		W+8'-3"	W+8'-3"
RL6	#4	1	1	1	1	1	1	1		W+8'-1"	W+8'-1"
RL7	#4	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
RL8	#4	1	1	1	1	1	1	1		W+7'-8 1/2"	W+7'-8 1/2"
RL9	#4	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
RL10	#4	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
RL11	#4	1	1	1	1	1	1	1		W+7'-2"	W+7'-2"
RL12	#4	1	1	1	1	1	1	1		W+7'-0"	W+7'-0"
RL13	#4	1	1	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
RL14	#4	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
RL15	#4	1	1	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
RL16	#4	1	1	1	1	1	1	1		W+6'-3"	W+6'-3"
RL17	#4	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
RL18	#4	1	1	1	1	1	1	1		W+5'-11"	W+5'-11"
RL19	#4	1	1	1	1	1	1	1		W+5'-9"	W+5'-9"
RL20	#4	1	1	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
RL21	#4	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RL22	#4	1	1	1	1	1	1	1		W+5'-2 1/2"	W+5'-2 1/2"
RL23	#4	1	1	1	1	1	1	1		W+5'-0"	W+5'-0"
RL24	#4	1	1	1	1	1	1	1		W+4'-10"	W+4'-10"
RL25	#4	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL26	#4	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
RL27	#4	1	1	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RL28	#4	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
RL29	#4	1	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RL30	#4	1	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RL31	#4	1	1	1	1	1	1	1		W+3'-7"	W+3'-7"
RL32	#4	1	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
RL33	#4	1	1	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL34	#4	1	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
RL35	#4	1	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
RL36	#4	1	1	1	1	1	1	1		W+2'-8"	W+2'-8"
RL37	#4	1	1	1	1	1	1	1		W+2'-6"	W+2'-6"
RL38	#4	1	1	1	1	1	1	1		W+2'-4"	W+2'-4"
RL39	#4	1	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL40	#4	1	1	1	1	1	1	1		W+1'-11 1/2"	W+1'-11 1/2"
RL41	#4	1	1	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
RL42	#4	1	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL43	#4	1	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RL44	#4	1	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RL45	#4	1	1	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL46	#4	1	1	1	1	1	1	1		W+0'-10 1/2"	W+0'-10 1/2"
RL47	#4	1	1	1	1	1	1	1		W+0'-8 1/2"	W+0'-8 1/2"
RL48	#4	1	1	1	1	1	1	1		W+0'-6 1/2"	W+0'-6 1/2"
RL49	#4	1	1	1	1	1	1	1		W+0'-4"	W+0'-4"
RL50	#4	1	1	1	1	1	1	1		W+0'-2"	W+0'-2"
RL51	#4	1	1	1	1	1	1	1		W+0'-0"	W+0'-0"
RL52	#4	1	1	1	1	1	1	1		W-0'-2 1/2"	W-0'-2 1/2"
RL53	#4	1	1	1	1	1	1	1		W-0'-4 1/2"	W-0'-4 1/2"
RL54	#4	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	54	54	54	54	54	54	54	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2	2			4'-1 1/2"
YS2	#4	2	2	2	2	2	2	2			6'-10"
YS3	#4	2	2	2	2	2	2	2			9'-7"
YS4	#4	2	2	2	2	2	2	2			12'-3 1/2"
YS5	#4	2	2	2	2	2	2	2			15'-0"
YS6	#4	2	2	2	2	2	2	2			17'-8 1/2"
YS7	#4	2	2	2	2	2	2	2			20'-5"
YS8	#4	2	2	2	2	2	2	2			23'-1 1/2"
YS9	#4	2	2	2	2	2	2	2			25'-10 1/2"
YS10	#4	2	2	2	2	2	2	2			28'-7"
YS11	#4	12	12	12	12	12	12	12			30'-10 1/2"

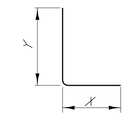
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

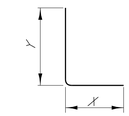
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	22'	24'	DIM. X	DIM. Y	LENGTH
YL1	#4	2	2	2	2	2	2	2			7'-2"
YL2	#4	2	2	2	2	2	2	2			11'-9"
YL3	#4	2	2	2	2	2	2	2			16'-4"
YL4	#4	2	2	2	2	2	2	2			20'-11"
YL5	#4	2	2	2	2	2	2	2			25'-6"
YL6	#4	2	2	2	2	2	2	2			30'-1 1/2"
YL7	#4	2	2	2	2	2	2	2			34'-8 1/2"
YL8	#4	2	2	2	2	2	2	2			39'-3 1/2"
YL9	#4	2	2	2	2	2	2	2			43'-10 1/2"
YL10	#4	2	2	2	2	2	2	2			48'-5 1/2"
YL11	#4	12	12	12	12	12	12	12			52'-5 1/2"
FS	#4	2	2	2	2	2	2	2			32'-3 1/2"
FL	#4	2	2	2	2	2	2	2			53'-3 1/2"
N	#4	24	28	30	34	36	40	43	1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2	2			1.414(S+2V)+2'-4"
K	#4	21	23	26	29	32	35	38	0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4	4	4			1.414S+2'-4"
OS	#7	17	17	17	17	17	17	17	3'-9"	3'-9"	7'-6"
OL	#7	17	17	17	17	17	17	17	3'-9"	3'-9"	7'-6"
OSS	#4	1	1	1	1	1	1	1			12'-0"+T1
OSL	#4	1	1	1	1	1	1	1			12'-0"+T1



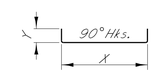
BARS DRS/DRL - #4



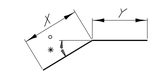
BARS DWS/DWL - #5



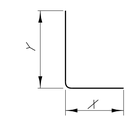
BARS RSn/RLn - #4



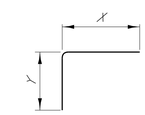
BARS N - #4



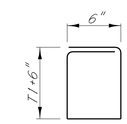
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
SINGLE CELL
45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 12-24 FT.

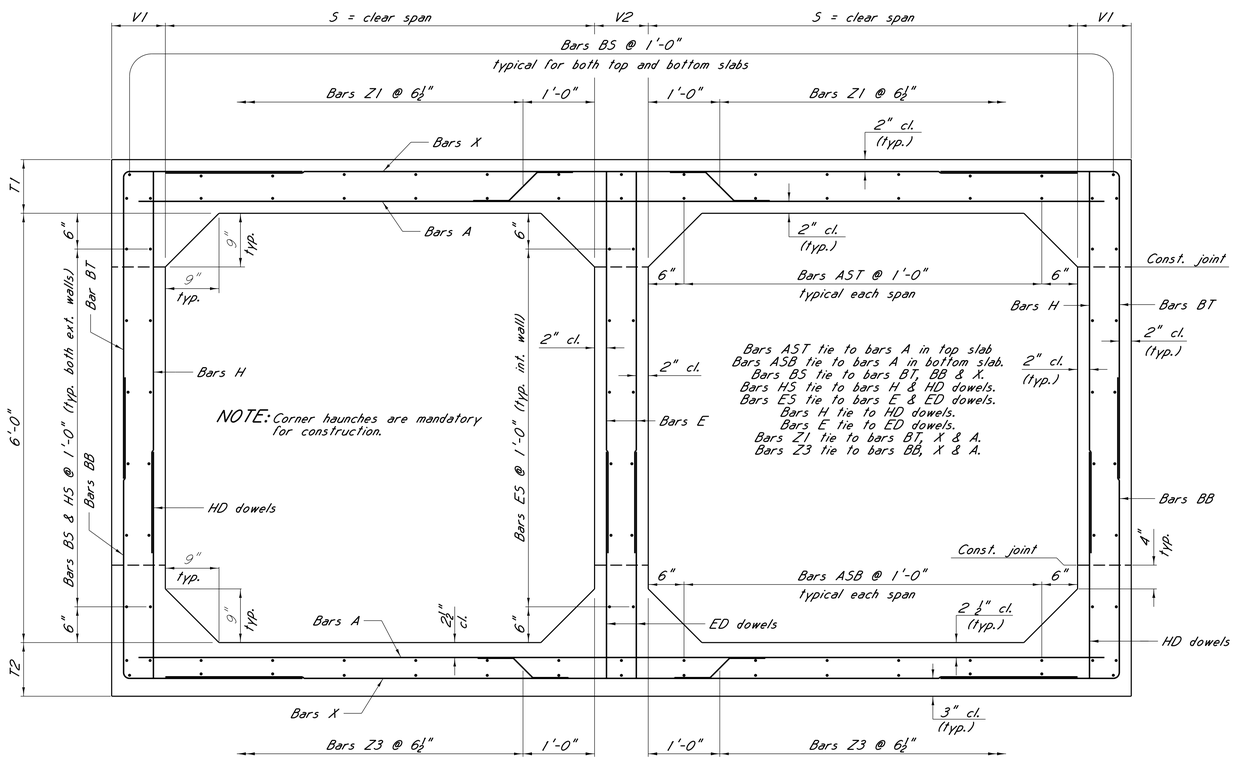
SHT. 4 OF 4

WORKING NUMBER
IWS-12-3W-45

SHEET NUMBER
7114

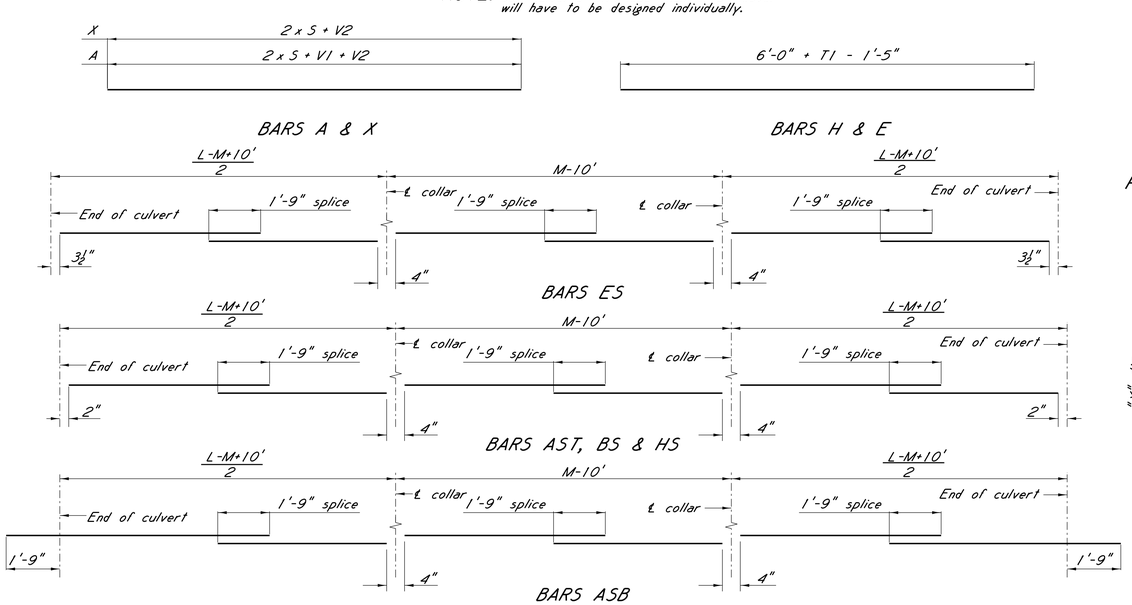
BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



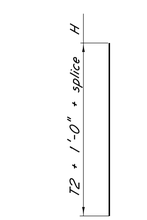
CROSS SECTION

NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.

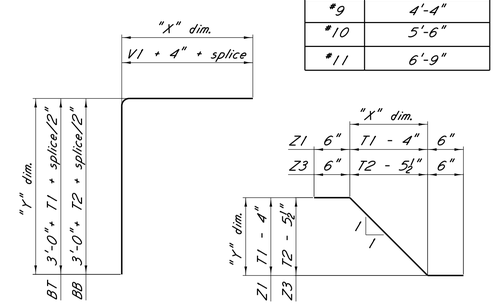


BAR BENDING DETAILS

Dimensions are out to out



HD & ED DOWELS

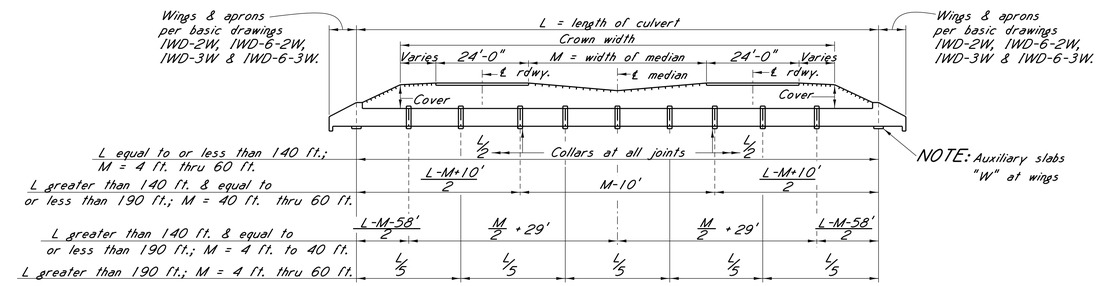


BARS BT & BB

BARS Zn

NOTE: The diagrams for bars ASB, AST, BS, HS & ES are for a culvert length greater than 140 ft. and equal to or less than 190 ft. with a median of 40 ft. thru 60 ft. for conditions other than these, use sections as shown on elevation of culvert.

NOTE: See basic drawing IBJL-1 for additional collar locations.



SIDE ELEVATION OF CULVERT

Showing collar locations
Drawn for L=150 ft. and M=60 ft.

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWD-2W, IWD-6-2W, IWD-3W & IWD-6-3W.

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7116 & 7117.

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"

GENERAL NOTES:

Specifications: Mississippi Standard Specifications for Road and Bridge Construction, 2004.
Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBD-6.
No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.
All concrete shall be class "B".
Expansion joint material shall be bituminous fiber type unless unless otherwise noted.
all exposed edges shall be chamfered ¾".
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.
Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.
Finish concrete per section 804.03.19.6.2 of the specifications.
Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.
Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.
Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.

SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. HL-93
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 6 FT.

SPANS 12 - 32 FT.

REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHT. 1 OF 3
WORKING NUMBER IBD-6
SHEET NUMBER 7115

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																		EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V1	V2	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"			BARS "ES"		BARS "Z1"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
							SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO. (WALLS)	NO. (SLABS)	SIZE	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
72	6x6	5'-0"	9"	9"	9"	9"	#5	8½"	#4	8½"	#4	8½"	#4	8½"	#4	8½"	#4	8½"	#4	8½"	#4	8½"	#4	17	#4	17	#4	12	#4	12	30	#4	12							1.3750	211.629
		10'-0"	9"	9"	9"	9"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	17	#4	17	#4	12	#4	12	30	#4	12							1.3750	219.262
		15'-0"	9"	9"	9"	9"	#5	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	17	#4	17	#4	12	#4	12	30	#4	12							1.3750	227.911
		20'-0"	9"	10½"	9"	9"	#5	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	17	#4	17	#4	12	#4	12	30	#4	12							1.4410	228.713
		25'-0"	10½"	1'-0"	9"	9"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	17	#4	17	#4	12	#4	12	30	#4	12							1.5729	221.516
		30'-0"	11½"	1'-1"	9"	9"	#5	9"	#4	9"	#4	9"	#4	9"	#4	9"	#4	9"	#4	9"	#4	9"	#4	17	#4	17	#4	12	#4	12	30	#4	12							1.6609	207.740
96	8x6	5'-0"	9"	9½"	9"	9"	#5	6"	#4	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	21	#4	21	#4	12	#4	12	38	#4	12							1.6254	283.430
		10'-0"	9"	11"	9"	9"	#5	7"	#4	7"	#4	7"	#5	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	21	#4	21	#4	12	#4	12	38	#4	12							1.7099	299.975
		15'-0"	11"	1'-1"	9"	9"	#5	7½"	#4	7½"	#4	7½"	#5	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	21	#4	21	#4	12	#4	12	38	#4	12							1.9352	298.151
		20'-0"	1'-0"	1'-2"	9"	9"	#5	7½"	#4	7½"	#4	7½"	#5	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	21	#4	21	#4	12	#4	12	38	#4	12							2.0478	290.219
		25'-0"	1'-2"	1'-4"	9"	9"	#5	8"	#4	8"	#4	8"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	21	#4	21	#4	12	#4	12	38	#4	12							2.2731	280.681
		30'-0"	1'-4"	1'-5½"	9"	9"	#5	8"	#4	8"	#4	8"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	21	#4	21	#4	12	#4	12	38	#4	12							2.4703	282.435
120	10x6	5'-0"	9"	10"	9"	9"	#6	6½"	#4	6½"	#4	6½"	#5	6½"	#4	6½"	#4	6½"	#4	6½"	#4	6½"	#4	25	#4	25	#4	12	#4	12	46	#4	12							1.8881	397.593
		10'-0"	10"	1'-0½"	9"	9"	#5	6"	#4	6"	#4	6"	#5	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	12	#4	12	46	#4	12							2.1285	359.744
		15'-0"	1'-1"	1'-3½"	9"	9"	#5	6"	#4	6"	#4	6"	#5	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	12	#4	12	46	#4	12							2.5405	362.416
		20'-0"	1'-4"	1'-6"	9"	9"	#5	6"	#4	6"	#4	6"	#5	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	12	#4	12	46	#4	12							2.9182	364.866
		25'-0"	1½"	1'-0½"	9"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	12	#4	12	46	#4	12	#4	6"	14	#4	6"	14	2.2315	624.749
		30'-0"	1'-0"	1'-1½"	9"	9"	#7	6"	#5	6"	#5	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	12	#4	12	46	#4	12	#4	6"	14	#4	6"	14	2.3345	680.868
144	12x6	5'-0"	10½"	11½"	9"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#4	1'-0"	#4	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	12	#4	12	54	#4	12							2.3657	534.056
		10'-0"	1'-0"	1'-1½"	9"	9"	#6	6"	#4	6"	#4	6"	#6	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	12	#4	12	54	#4	12							2.6493	502.747
		15'-0"	1'-2½"	1'-5½"	9"	9"	#6	6"	#4	6"	#4	6"	#6	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	12	#4	12	54	#4	12							3.1759	505.642
		20'-0"	1'-0½"	1'-1"	9"	9"	#8	6"	#5	6"	#5	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	12	#4	12	54	#4	12	#4	6"	16	#4	6"	16	2.6493	846.559
		25'-0"	1'-1"	1'-2"	9"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	12	#4	12	54	#4	12	#4	6"	16	#4	6"	16	2.7708	885.965
		30'-0"	1'-2"	1'-3½"	9"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	12	#4	12	54	#4	12	#4	6"	16	#4	6"	16	2.9734	966.341
168	14x6	5'-0"	11½"	1'-0½"	9"	9"	#7	6"	#5	6"	#5	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	33	#4	33	#4	12	#4	12	62	#4	12							2.8241	679.976
		10'-0"	1'-1½"	1'-3"	9½"	9"	#6	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	12	#4	12	64	#4	12							3.2701	658.803
		15'-0"	1'-0"	1'-1"	10½"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	12	#4	12	64	#4	12	#4	1'-0"	14	#4	1'-0"	14	2.9923	939.113
		20'-0"	1'-3"	1'-3"	9"	9"	#8	6"	#5	6"	#5	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	12	#4	12	62	#4	12	#4	6"	20	#4	6"	20	3.3843	1069.482
		25'-0"	1'-3"	1'-4½"	10"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	12	#4	12	64	#4	12	#4	6"	20	#4	6"	20	3.5775	1113.749
		30'-0"	1'-4"	1'-6"	10"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	12	#4	12	64	#4	12	#4	6"	20	#4	6"	20	3.8122	1123.430
192	16x6	5'-0"	1'-1"	1'-1½"	10"	9"	#7	6"	#6	6"	#6	6"	#7	6"	#4	1'-0"	#4	1'-0"	#5	1'-0"	#5	1'-0"	#4	37	#4	37	#4	12	#4	12	72	#4	12							3.4353	846.440
		10'-0"	1'-3½"	1'-4½"	10½"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	12	#4	12	72	#4	12							4.0463	807.662
		15'-0"	1'-2"	1'-3"	9"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	12	#4	12	70	#4	12	#4	6"	16	#4	6"	16	3.6489	1191.024
		20'-0"	1'-4½"	1'-4½"	9"	9"	#9	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	12	#4	12	70	#4	12	#4	6"	22	#4	6"	22	4.0718	1340.047
		25'-0"	1'-5½"	1'-6½"	9"	9"	#9	6"	#6	6"	#6	6"	#10	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	12	#4	12	70	#4	12	#5	6"	22	#5	6"	22	4.3889	1555.432
		30'-0"	1'-7½"	1'-8½"	9"	9"	#9	6"	#6	6"	#6	6"	#10	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#5	37	#5	37	#5	12	#5	12	70	#5	12	#5	6"	22	#5	6"	22	4.8117	1675.209

REVISIONS	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 6 FT.

SPANS 12 - 32 FT.

SHT. 2 OF 3

WORKING NUMBER IBD-6

SHEET NUMBER 7116

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																												
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "Z1"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
72	6x6	5'-0"	#5	13'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-5½"	6'-11½"	#4	12'-9"	#4	5'-4"	#4	3'-2"	#4	5'-4"	#4	3'-2"								
		10'-0"	#5	13'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-5½"	6'-11½"	#4	12'-9"	#4	5'-4"	#4	3'-2"	#4	5'-4"	#4	3'-2"								
		15'-0"	#5	13'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-5½"	6'-11½"	#4	12'-9"	#4	5'-4"	#4	3'-2"	#4	5'-4"	#4	3'-2"								
		20'-0"	#5	13'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-7"	7'-1"	#4	12'-9"	#4	5'-4"	#4	3'-3½"	#4	5'-4"	#4	3'-3½"								
		25'-0"	#5	13'-6"	#4	2'-6"	4'-7"	7'-1"	#4	2'-6"	4'-8½"	7'-2½"	#4	12'-9"	#4	5'-5½"	#4	3'-5"	#4	5'-5½"	#4	3'-5"								
		30'-0"	#5	13'-6"	#4	2'-6"	4'-8"	7'-2"	#4	2'-6"	4'-9½"	7'-3½"	#4	12'-9"	#4	5'-6½"	#4	3'-6"	#4	5'-6½"	#4	3'-6"								
96	8x6	5'-0"	#5	17'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6"	7'-0"	#4	16'-9"	#4	5'-4"	#4	3'-2½"	#4	5'-4"	#4	3'-2½"								
		10'-0"	#5	17'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-7½"	7'-1½"	#5	16'-9"	#4	5'-4"	#4	3'-4"	#4	5'-4"	#4	3'-4"								
		15'-0"	#5	17'-6"	#4	2'-6"	4'-7½"	7'-1½"	#4	2'-6"	4'-9½"	7'-3½"	#5	16'-9"	#4	5'-6"	#4	3'-6"	#4	5'-6"	#4	3'-6"								
		20'-0"	#5	17'-6"	#4	2'-6"	4'-8½"	7'-2½"	#4	2'-6"	4'-10½"	7'-4½"	#5	16'-9"	#4	5'-7"	#4	3'-7"	#4	5'-7"	#4	3'-7"								
		25'-0"	#5	17'-6"	#4	2'-6"	4'-10½"	7'-4½"	#4	2'-6"	5'-0½"	7'-6½"	#5	16'-9"	#4	5'-9"	#4	3'-9"	#4	5'-9"	#4	3'-9"								
		30'-0"	#5	17'-6"	#4	2'-6"	5'-0½"	7'-6½"	#4	2'-6"	5'-2"	7'-8"	#5	16'-9"	#4	5'-11"	#4	3'-10½"	#4	5'-11"	#4	3'-10½"								
120	10x6	5'-0"	#6	21'-6"	#4	2'-6"	4'-5½"	6'-11½"	#4	2'-6"	4'-6½"	7'-0½"	#5	20'-9"	#4	5'-4"	#4	3'-3"	#4	5'-4"	#4	3'-3"								
		10'-0"	#5	21'-6"	#4	2'-6"	4'-6½"	7'-0½"	#4	2'-6"	4'-9"	7'-3"	#5	20'-9"	#4	5'-5"	#4	3'-5½"	#4	5'-5"	#4	3'-5½"								
		15'-0"	#5	21'-6"	#4	2'-6"	4'-9½"	7'-3½"	#4	2'-6"	5'-0"	7'-6"	#5	20'-9"	#4	5'-8"	#4	3'-8½"	#4	5'-8"	#4	3'-8½"								
		20'-0"	#5	21'-6"	#4	2'-6"	5'-0½"	7'-6½"	#4	2'-6"	5'-2½"	7'-8½"	#5	20'-9"	#4	5'-11"	#4	3'-11"	#4	5'-11"	#4	3'-11"								
		25'-0"	#7	21'-6"	#5	2'-10"	4'-10"	7'-8"	#5	2'-10"	4'-11"	7'-9"	#7	20'-9"	#4	5'-6½"	#4	3'-5½"	#4	5'-6½"	#4	3'-5½"	#4	7½"	7½"	1'-10⅝"	#4	7"	7"	1'-9⅞"
		30'-0"	#7	21'-6"	#5	2'-10"	4'-10½"	7'-8½"	#5	2'-10"	5'-0"	7'-10"	#8	20'-9"	#4	5'-7"	#4	3'-6½"	#4	5'-7"	#4	3'-6½"	#4	8"	8"	1'-11⅝"	#4	8"	8"	1'-11⅝"
144	12x6	5'-0"	#6	25'-6"	#5	2'-10"	4'-9"	7'-7"	#5	2'-10"	4'-10"	7'-8"	#6	24'-9"	#4	5'-5½"	#4	3'-4½"	#5	5'-5½"	#5	3'-8½"								
		10'-0"	#6	25'-6"	#4	2'-6"	4'-8½"	7'-2½"	#4	2'-6"	4'-10"	7'-4"	#6	24'-9"	#4	5'-7"	#4	3'-6½"	#4	5'-7"	#4	3'-6½"								
		15'-0"	#6	25'-6"	#4	2'-6"	4'-11"	7'-5"	#4	2'-6"	5'-2"	7'-8"	#6	24'-9"	#4	5'-9½"	#4	3'-10½"	#4	5'-9½"	#4	3'-10½"								
		20'-0"	#8	25'-6"	#5	2'-10"	4'-11"	7'-9"	#5	2'-10"	4'-11½"	7'-9½"	#8	24'-9"	#4	5'-7½"	#4	3'-6"	#4	5'-7½"	#4	3'-6"	#4	8½"	8½"	2'-0"	#4	7½"	7½"	1'-10⅝"
		25'-0"	#8	25'-6"	#6	3'-2"	5'-1½"	8'-3½"	#6	3'-2"	5'-2½"	8'-4½"	#8	24'-9"	#4	5'-8"	#4	3'-7"	#4	5'-8"	#4	3'-7"	#4	9"	9"	2'-0⅜"	#4	8½"	8½"	2'-0"
		30'-0"	#8	25'-6"	#6	3'-2"	5'-2½"	8'-4½"	#6	3'-2"	5'-4"	8'-6"	#9	24'-9"	#4	5'-9"	#4	3'-8½"	#4	5'-9"	#4	3'-8½"	#4	10"	10"	2'-2⅛"	#4	10"	10"	2'-2⅛"
168	14x6	5'-0"	#7	29'-6"	#5	2'-10"	4'-10"	7'-8"	#5	2'-10"	4'-11"	7'-9"	#6	28'-9"	#4	5'-6½"	#4	3'-5½"	#4	5'-6½"	#4	3'-5½"								
		10'-0"	#6	29'-6½"	#5	2'-10½"	5'-0"	7'-10½"	#5	2'-10½"	5'-1½"	8'-0"	#7	28'-9"	#4	5'-8½"	#4	3'-8"	#4	5'-8½"	#4	3'-8"								
		15'-0"	#8	29'-7½"	#6	3'-3½"	5'-0½"	8'-4"	#6	3'-3½"	5'-1½"	8'-5"	#8	28'-9"	#4	5'-7"	#4	3'-6"	#4	5'-7"	#4	3'-6"	#4	8"	8"	1'-11⅝"	#4	7½"	7½"	1'-10⅝"
		20'-0"	#8	29'-6"	#5	2'-10"	5'-1½"	7'-11½"	#5	2'-10"	5'-1½"	7'-11½"	#9	28'-9"	#4	5'-10"	#4	3'-8"	#4	5'-10"	#4	3'-8"	#4	11"	11"	2'-3⅜"	#4	9½"	9½"	2'-1⅞"
		25'-0"	#8	29'-7"	#6	3'-3"	5'-3½"	8'-6½"	#6	3'-3"	5'-5"	8'-8"	#9	28'-9"	#4	5'-10"	#4	3'-9½"	#4	5'-10"	#4	3'-9½"	#4	11"	11"	2'-3⅜"	#4	11"	11"	2'-3⅜"
		30'-0"	#8	29'-7"	#6	3'-3"	5'-4½"	8'-7½"	#6	3'-3"	5'-6½"	8'-9½"	#9	28'-9"	#4	5'-11"	#4	3'-11"	#4	5'-11"	#4	3'-11"	#4	1'-0"	1'-0"	2'-5"	#4	1'-0½"	1'-0½"	2'-5⅛"
192	16x6	5'-0"	#7	33'-7"	#6	3'-3"	5'-1½"	8'-4½"	#6	3'-3"	5'-2"	8'-5"	#7	32'-9"	#4	5'-8"	#4	3'-6½"	#5	5'-8"	#5	3'-10½"								
		10'-0"	#7	33'-7½"	#5	2'-11½"	5'-2"	8'-1½"	#5	2'-11½"	5'-3"	8'-2½"	#7	32'-9"	#4	5'-10½"	#4	3'-9½"	#4	5'-10½"	#4	3'-9½"								
		15'-0"	#8	33'-6"	#6	3'-2"	5'-2½"	8'-4½"	#6	3'-2"	5'-3½"	8'-5½"	#9	32'-9"	#4	5'-9"	#4	3'-8"	#4	5'-9"	#4	3'-8"	#4	10"	10"	2'-2⅛"	#4	9½"	9½"	2'-1⅞"
		20'-0"	#9	33'-6"	#6	3'-2"	5'-5"	8'-7"	#6	3'-2"	5'-5"	8'-7"	#9	32'-9"	#4	5'-11½"	#4	3'-9½"	#4	5'-11½"	#4	3'-9½"	#4	1'-0½"	1'-0½"	2'-5⅛"	#4	11"	11"	2'-3⅜"
		25'-0"	#9	33'-6"	#6	3'-2"	5'-6"	8'-8"	#6	3'-2"	5'-7"	8'-9"	#10	32'-9"	#4	6'-0½"	#4	3'-11½"	#4	6'-0½"	#4	3'-11½"	#5	1'-1½"	1'-1½"	2'-7⅛"	#5	1'-1"	1'-1"	2'-6⅜"
		30'-0"	#9	33'-6"	#6	3'-2"	5'-8"	8'-10"	#6	3'-2"	5'-9"	8'-11"	#10	32'-9"	#4	6'-2½"	#4	4'-1½"	#4	6'-2½"	#4	4'-1½"	#5	1'-3½"	1'-3½"	2'-9⅝"	#5	1'-3"	1'-3"	2'-9⅜"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR
DOUBLE CELL BOX CULVERT

HEIGHT 6 FT.

SPANS 12 - 32 FT.

SHT. 3 OF 3

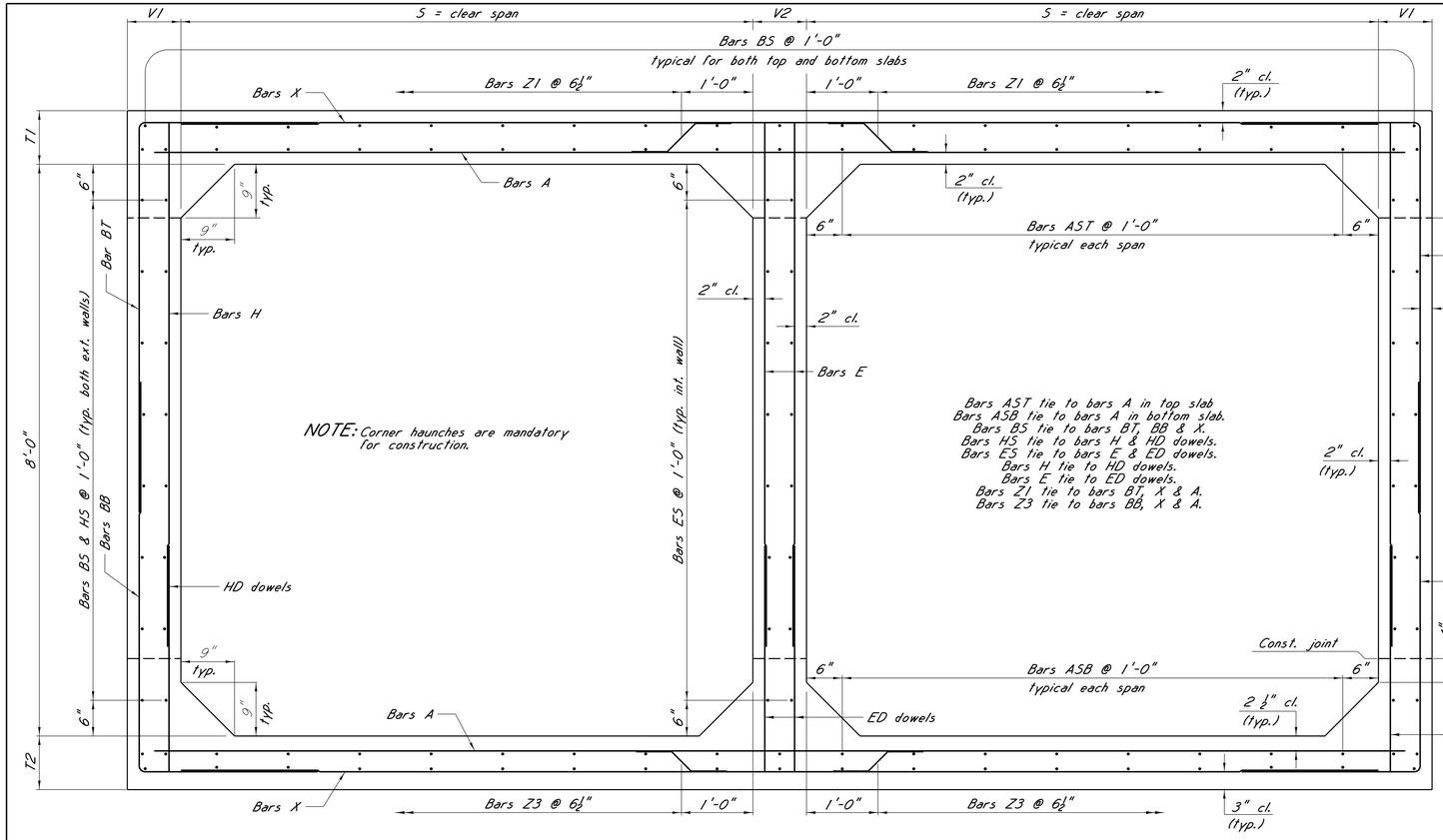
WORKING NUMBER
IBD-6

SHEET NUMBER
7117

REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

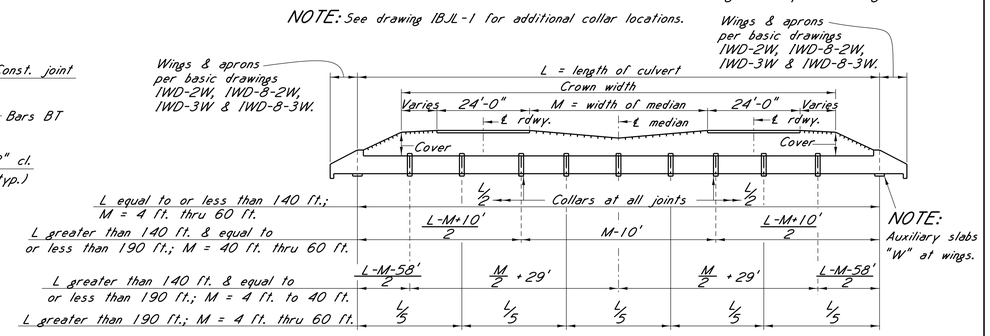


CROSS SECTION

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

note: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: See drawing IBJL-1 for additional collar locations.



NOTE: Auxiliary slabs "W" at wings.

SIDE ELEVATION OF CULVERT

Showing collar locations
Drawn for L = 150 ft. and M = 60 ft.

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7119 & 7120.

NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWD-2W, IWD-8-2W, IWD-3W & IWD-8-3W.

NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.

GENERAL NOTES:

Specifications: Mississippi standard specifications for road and bridge construction, 2004.
Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBD-8.
no change of plans will be permitted expect by written approval of the director of structures, state bridge engineer. minor changes in detail of design or construction procedure may be authorized by the director of structures, state bridge engineer provided such changes will not be cause for contract price adjustment.
All concrete shall be class "B".
Expansion joint material shall be bituminous fiber type unless unless otherwise noted.
All exposed edges shall be chamfered ¾".
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.
Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.
Finish concrete per section 804.03.19.6.2 of the specifications.
Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.
Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.
Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.

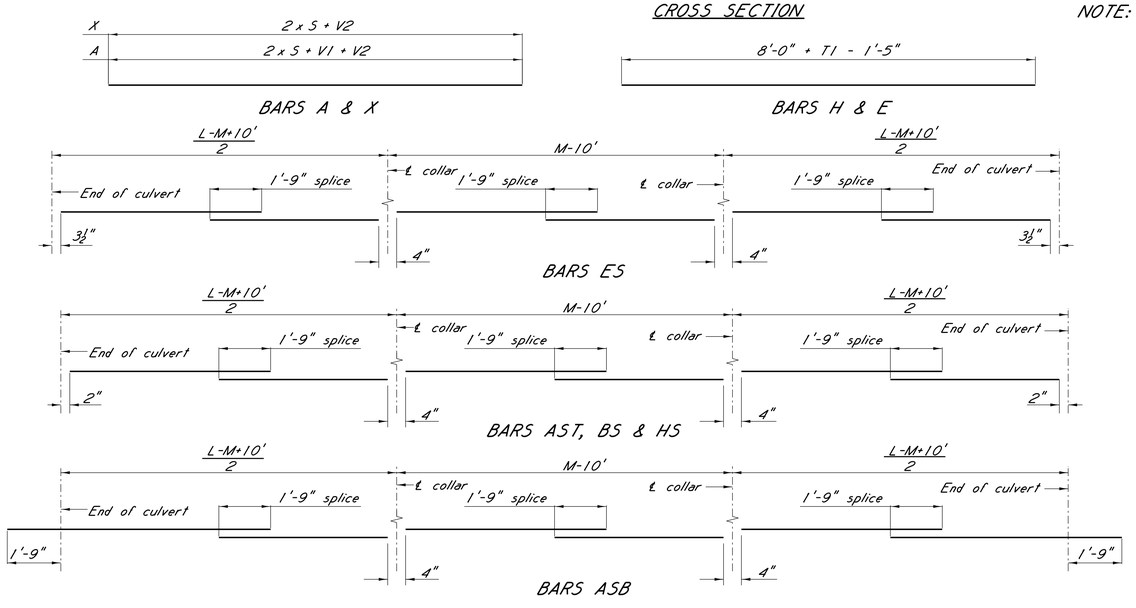
SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. . . . . HL-93.
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"



BAR BENDING DETAILS

Dimensions are out to out

NOTE: The diagrams for Bars ASB, AST, BS, HS & ES are for a culvert length greater than 140 ft. and equal to or less than 190 ft. with a median of 40 ft. thru 60 ft. for conditions other than these, use sections as shown on elevation of culvert.

REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 8 FT.

SPANS 16 - 32 FT.

SHT. 1 OF 3

WORKING NUMBER IBD-8

SHEET NUMBER 7118

DATE
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																				EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V1	V2	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"			BARS "ES"		BARS "Z1"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
							SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO. (WALLS)	NO. (SLABS)	SIZE	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
128	8x8	5'-0"	9"	9"	9"	9"	#6	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	21	#4	21	#4	16	#4	16	38	#4	16						1.7639	298.536
		10'-0"	9"	10½"	9"	9"	#5	7"	#4	7"	#4	7"	#5	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	21	#4	21	#4	16	#4	16	38	#4	16						1.8484	293.391
		15'-0"	11"	1'-0½"	9"	9"	#5	7½"	#4	7½"	#4	7½"	#5	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	21	#4	21	#4	16	#4	16	38	#4	16						2.0737	281.669
		20'-0"	1'-0"	1'-1½"	9"	9"	#5	8"	#4	8"	#4	8"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	21	#4	21	#4	16	#4	16	38	#4	16						2.1863	270.411
		25'-0"	1'-2"	1'-3½"	9½"	9"	#5	8"	#4	8"	#4	8"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	21	#4	21	#4	16	#4	16	40	#4	16						2.4439	274.048
		30'-0"	1'-3½"	1'-5"	10½"	9"	#5	8"	#4	8"	#4	8"	#5	8"	#4	8"	#4	8"	#4	8"	#4	8"	#4	21	#4	21	#4	16	#4	16	40	#4	16						2.6798	276.146
160	10x8	5'-0"	9"	10½"	9"	9"	#6	6½"	#4	6½"	#4	6½"	#5	6½"	#4	1'-1"	#4	1'-1"	#4	1'-1"	#4	1'-1"	#4	25	#4	25	#4	16	#4	16	46	#4	16						2.0891	361.110
		10'-0"	10½"	1'-0½"	9"	9"	#5	6"	#4	6"	#4	6"	#5	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	16	#4	16	46	#4	16						2.3295	345.271
		15'-0"	1'-1"	1'-3"	9"	9"	#5	6"	#4	6"	#4	6"	#5	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	16	#4	16	46	#4	16						2.6728	347.498
		20'-0"	1'-4"	1'-5½"	9"	9"	#5	6½"	#4	6½"	#4	6½"	#5	6½"	#4	1'-1"	#4	1'-1"	#4	1'-1"	#4	1'-1"	#4	25	#4	25	#4	16	#4	16	46	#4	16						3.0505	330.427
		25'-0"	1'-0"	1'-0½"	9½"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	16	#4	16	48	#4	16	#5	1'-0"	14	#5	1'-0"	14	2.4635	601.009
		30'-0"	1'-1½"	1'-2"	11"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	25	#4	25	#4	16	#4	16	48	#4	16	#5	1'-0"	14	#5	1'-0"	14	2.7656	609.947
192	12x8	5'-0"	10½"	11½"	9"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	16	#4	16	54	#4	16						2.5324	527.336
		10'-0"	1'-0"	1'-1"	9"	9"	#6	6"	#4	6"	#4	6"	#6	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	16	#4	16	54	#4	16						2.7755	482.485
		15'-0"	1'-3"	1'-5½"	9"	9"	#6	6"	#4	6"	#4	6"	#6	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	16	#4	16	54	#4	16						3.3831	485.825
		20'-0"	1'-1"	1'-1"	9½"	9½"	#8	6½"	#5	6½"	#5	6½"	#8	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	29	#4	29	#4	16	#4	16	56	#4	16	#5	1'-1"	16	#5	1'-1"	16	2.9035	777.922
		25'-0"	1'-2"	1'-2½"	9½"	9"	#7	6"	#5	6"	#5	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	16	#4	16	56	#4	16	#5	1'-0"	16	#5	1'-0"	16	3.0910	757.086
		30'-0"	1'-3"	1'-4"	11½"	9"	#7	6"	#5	6"	#5	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	16	#4	16	56	#4	16	#4	6"	16	#4	6"	16	3.4249	786.632
224	14x8	5'-0"	1'-0"	1'-0½"	9"	9"	#7	6"	#5	6"	#5	6"	#6	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	33	#4	33	#4	16	#4	16	62	#4	16						3.0374	651.783
		10'-0"	1'-1½"	1'-3"	9"	9"	#6	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	16	#4	16	62	#4	16						3.4109	634.485
		15'-0"	1'-1"	1'-1"	9"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	16	#4	16	62	#4	16	#5	1'-0"	14	#5	1'-0"	14	3.1775	938.762
		20'-0"	1'-3"	1'-3"	11"	9"	#8	6"	#5	6"	#5	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	16	#4	16	64	#4	16	#5	1'-0"	20	#5	1'-0"	20	3.6806	941.778
		25'-0"	1'-4"	1'-5"	11½"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	16	#4	16	64	#4	16	#4	6"	20	#4	6"	20	3.9969	1103.683
		30'-0"	1'-5"	1'-6½"	1'-0"	9"	#8	6½"	#6	6½"	#6	6½"	#9	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	33	#4	33	#4	16	#4	16	64	#4	16	#4	6½"	20	#4	6½"	20	4.2674	1055.581
256	16x8	5'-0"	1'-1"	1'-1½"	9½"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	37	#4	37	#4	16	#4	16	72	#4	16						3.5828	793.624
		10'-0"	1'-3½"	1'-5"	10"	9"	#7	6½"	#5	6½"	#5	6½"	#7	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	37	#4	37	#4	16	#4	16	72	#4	16						4.2517	747.031
		15'-0"	1'-2½"	1'-2½"	11"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	16	#4	16	72	#4	16	#5	1'-0"	16	#5	1'-0"	16	3.9442	1151.937
		20'-0"	1'-5"	1'-5"	1'-0"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	16	#4	16	72	#4	16	#5	1'-0"	16	#5	1'-0"	16	4.5448	1167.279
		25'-0"	1'-7"	1'-7"	1'-1"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	16	#4	16	72	#4	16	#4	6"	22	#4	6"	22	5.0427	1248.008
		30'-0"	1'-8"	1'-9"	1'-2"	10"	#9	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#5	37	#5	37	#5	16	#5	16	72	#5	16	#5	6"	22	#5	6"	22	5.4717	1530.767

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 8 FT.

SPANS 16 - 32 FT.

SHT. 2 OF 3

WORKING NUMBER IBD-8

SHEET NUMBER 7119

REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																												
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "Z1"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
128	8x8	5'-0"	#6	17'-6"	#4	2'-6"	5'-5½"	7'-11½"	#4	2'-6"	5'-5½"	7'-11½"	#4	16'-9"	#4	7'-4"	#4	3'-2"	#4	7'-4"	#4	3'-2"								
		10'-0"	#5	17'-6"	#4	2'-6"	5'-5½"	7'-11½"	#4	2'-6"	5'-7"	8'-1"	#5	16'-9"	#4	7'-4"	#4	3'-3½"	#4	7'-4"	#4	3'-3½"								
		15'-0"	#5	17'-6"	#4	2'-6"	5'-7½"	8'-1½"	#4	2'-6"	5'-9"	8'-3"	#5	16'-9"	#4	7'-6"	#4	3'-5½"	#4	7'-6"	#4	3'-5½"								
		20'-0"	#5	17'-6"	#4	2'-6"	5'-8½"	8'-2½"	#4	2'-6"	5'-10"	8'-4"	#5	16'-9"	#4	7'-7"	#4	3'-6½"	#4	7'-7"	#4	3'-6½"								
		25'-0"	#5	17'-6½"	#4	2'-6½"	5'-10½"	8'-5"	#4	2'-6½"	6'-0"	8'-6½"	#5	16'-9"	#4	7'-9"	#4	3'-8½"	#4	7'-9"	#4	3'-8½"								
		30'-0"	#5	17'-7½"	#4	2'-7½"	6'-0"	8'-7½"	#4	2'-7½"	6'-1½"	8'-9"	#5	16'-9"	#4	7'-10½"	#4	3'-10"	#4	7'-10½"	#4	3'-10"								
160	10x8	5'-0"	#6	21'-6"	#4	2'-6"	5'-5½"	7'-11½"	#4	2'-6"	5'-7"	8'-1"	#5	20'-9"	#4	7'-4"	#4	3'-3½"	#4	7'-4"	#4	3'-3½"								
		10'-0"	#5	21'-6"	#4	2'-6"	5'-7"	8'-1"	#4	2'-6"	5'-9"	8'-3"	#5	20'-9"	#4	7'-5½"	#4	3'-5½"	#4	7'-5½"	#4	3'-5½"								
		15'-0"	#5	21'-6"	#4	2'-6"	5'-9½"	8'-3½"	#4	2'-6"	5'-11½"	8'-5½"	#5	20'-9"	#4	7'-8"	#4	3'-8"	#4	7'-8"	#4	3'-8"								
		20'-0"	#5	21'-6"	#4	2'-6"	6'-0½"	8'-6½"	#4	2'-6"	6'-2"	8'-8"	#5	20'-9"	#4	7'-11"	#4	3'-10½"	#4	7'-11"	#4	3'-10½"								
		25'-0"	#7	21'-6½"	#5	2'-10½"	5'-10½"	8'-9"	#5	2'-10½"	5'-11"	8'-9½"	#7	20'-9"	#4	7'-7"	#4	3'-5½"	#4	7'-7"	#4	3'-5½"	#5	8"	8"	1'-11 5/16"	#5	7"	7"	1'-9⅞"
		30'-0"	#7	21'-8"	#5	3'-0"	6'-0"	9'-0"	#5	3'-0"	6'-0½"	9'-0½"	#7	20'-9"	#4	7'-8½"	#4	3'-7"	#4	7'-8½"	#4	3'-7"	#5	9½"	9½"	2'-1 7/16"	#5	8½"	8½"	2'-0"
192	12x8	5'-0"	#6	25'-6"	#5	2'-10"	5'-9"	8'-7"	#5	2'-10"	5'-10"	8'-8"	#6	24'-9"	#5	7'-5½"	#5	3'-8½"	#5	7'-5½"	#5	3'-8½"								
		10'-0"	#6	25'-6"	#4	2'-6"	5'-8½"	8'-2½"	#4	2'-6"	5'-9½"	8'-3½"	#6	24'-9"	#4	7'-7"	#4	3'-6"	#4	7'-7"	#4	3'-6"								
		15'-0"	#6	25'-6"	#4	2'-6"	5'-11½"	8'-5½"	#4	2'-6"	6'-2"	8'-8"	#6	24'-9"	#4	7'-10"	#4	3'-10½"	#4	7'-10"	#4	3'-10½"								
		20'-0"	#8	25'-7"	#5	2'-10½"	5'-11½"	8'-10"	#5	2'-10½"	5'-11½"	8'-10"	#8	24'-9½"	#5	7'-8"	#5	3'-10"	#5	7'-8"	#5	3'-10"	#5	9"	9"	2'-0¾"	#5	7½"	7½"	1'-10⅝"
		25'-0"	#7	25'-6½"	#5	2'-10½"	6'-0½"	8'-11"	#5	2'-10½"	6'-1"	8'-11½"	#8	24'-9"	#4	7'-9"	#4	3'-7½"	#4	7'-9"	#4	3'-7½"	#5	10"	10"	2'-2¼"	#5	9"	9"	2'-0¾"
		30'-0"	#7	25'-8½"	#5	3'-0½"	6'-1½"	9'-2"	#5	3'-0½"	6'-2½"	9'-3"	#8	24'-9"	#4	7'-10"	#4	3'-9"	#4	7'-10"	#4	3'-9"	#4	11"	11"	2'-3 9/16"	#4	10½"	10½"	2'-2⅞"
224	14x8	5'-0"	#7	29'-6"	#5	2'-10"	5'-10½"	8'-8½"	#5	2'-10"	5'-11"	8'-9"	#6	28'-9"	#5	7'-7"	#5	3'-9½"	#5	7'-7"	#5	3'-9½"								
		10'-0"	#6	29'-6"	#5	2'-10"	6'-0"	8'-10"	#5	2'-10"	6'-1½"	8'-11½"	#7	28'-9"	#4	7'-8½"	#4	3'-8"	#4	7'-8½"	#4	3'-8"								
		15'-0"	#8	29'-6"	#6	3'-2"	6'-1½"	9'-3½"	#6	3'-2"	6'-1½"	9'-3½"	#8	28'-9"	#4	7'-8"	#4	3'-6"	#4	7'-8"	#4	3'-6"	#5	9"	9"	2'-0¾"	#5	7½"	7½"	1'-10⅝"
		20'-0"	#8	29'-8"	#5	3'-0"	6'-1½"	9'-1½"	#5	3'-0"	6'-1½"	9'-1½"	#8	28'-9"	#4	7'-10"	#4	3'-8"	#4	7'-10"	#4	3'-8"	#5	11"	11"	2'-3 9/16"	#5	9½"	9½"	2'-1 9/16"
		25'-0"	#8	29'-8½"	#6	3'-4½"	6'-4½"	9'-9"	#6	3'-4½"	6'-5½"	9'-10"	#9	28'-9"	#4	7'-11"	#4	3'-10"	#4	7'-11"	#4	3'-10"	#4	1'-0"	1'-0"	2'-5"	#4	11½"	11½"	2'-4¼"
		30'-0"	#8	29'-9"	#6	3'-5"	6'-5½"	9'-10½"	#6	3'-5"	6'-7"	10'-0"	#9	28'-9"	#5	8'-0"	#5	4'-3½"	#5	8'-0"	#5	4'-3½"	#4	1'-1"	1'-1"	2'-6⅜"	#4	1'-1"	1'-1"	2'-6⅜"
256	16x8	5'-0"	#7	33'-6½"	#5	2'-10½"	5'-11½"	8'-10"	#5	2'-10½"	6'-0"	8'-10½"	#7	32'-9"	#5	7'-8"	#5	3'-10½"	#5	7'-8"	#5	3'-10½"								
		10'-0"	#7	33'-7"	#5	2'-11"	6'-2"	9'-1"	#5	2'-11"	6'-3½"	9'-2½"	#7	32'-9"	#5	7'-10½"	#5	4'-2"	#5	7'-10½"	#5	4'-2"								
		15'-0"	#8	33'-8"	#6	3'-4"	6'-3"	9'-7"	#6	3'-4"	6'-3"	9'-7"	#9	32'-9"	#4	7'-9½"	#4	3'-7½"	#4	7'-9½"	#4	3'-7½"	#5	10½"	10½"	2'-2⅞"	#5	9"	9"	2'-0¾"
		20'-0"	#8	33'-9"	#6	3'-5"	6'-5½"	9'-10½"	#6	3'-5"	6'-5½"	9'-10½"	#9	32'-9"	#4	8'-0"	#4	3'-10"	#4	8'-0"	#4	3'-10"	#5	1'-1"	1'-1"	2'-6⅜"	#5	11½"	11½"	2'-4¼"
		25'-0"	#8	33'-10"	#6	3'-6"	6'-7½"	10'-1½"	#6	3'-6"	6'-7½"	10'-1½"	#9	32'-9"	#4	8'-2"	#4	4'-0"	#4	8'-2"	#4	4'-0"	#4	1'-3"	1'-3"	2'-9 3/16"	#4	1'-1½"	1'-1½"	2'-7⅛"
		30'-0"	#9	34'-0"	#6	3'-7"	6'-8½"	10'-3½"	#6	3'-7"	6'-9½"	10'-4½"	#9	32'-10"	#4	8'-3"	#4	4'-2"	#4	8'-3"	#4	4'-2"	#5	1'-4"	1'-4"	2'-10⅜"	#5	1'-3½"	1'-3½"	2'-9 15/16"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 8 FT.

SPANS 16 - 32 FT.

SHT. 3 OF 3

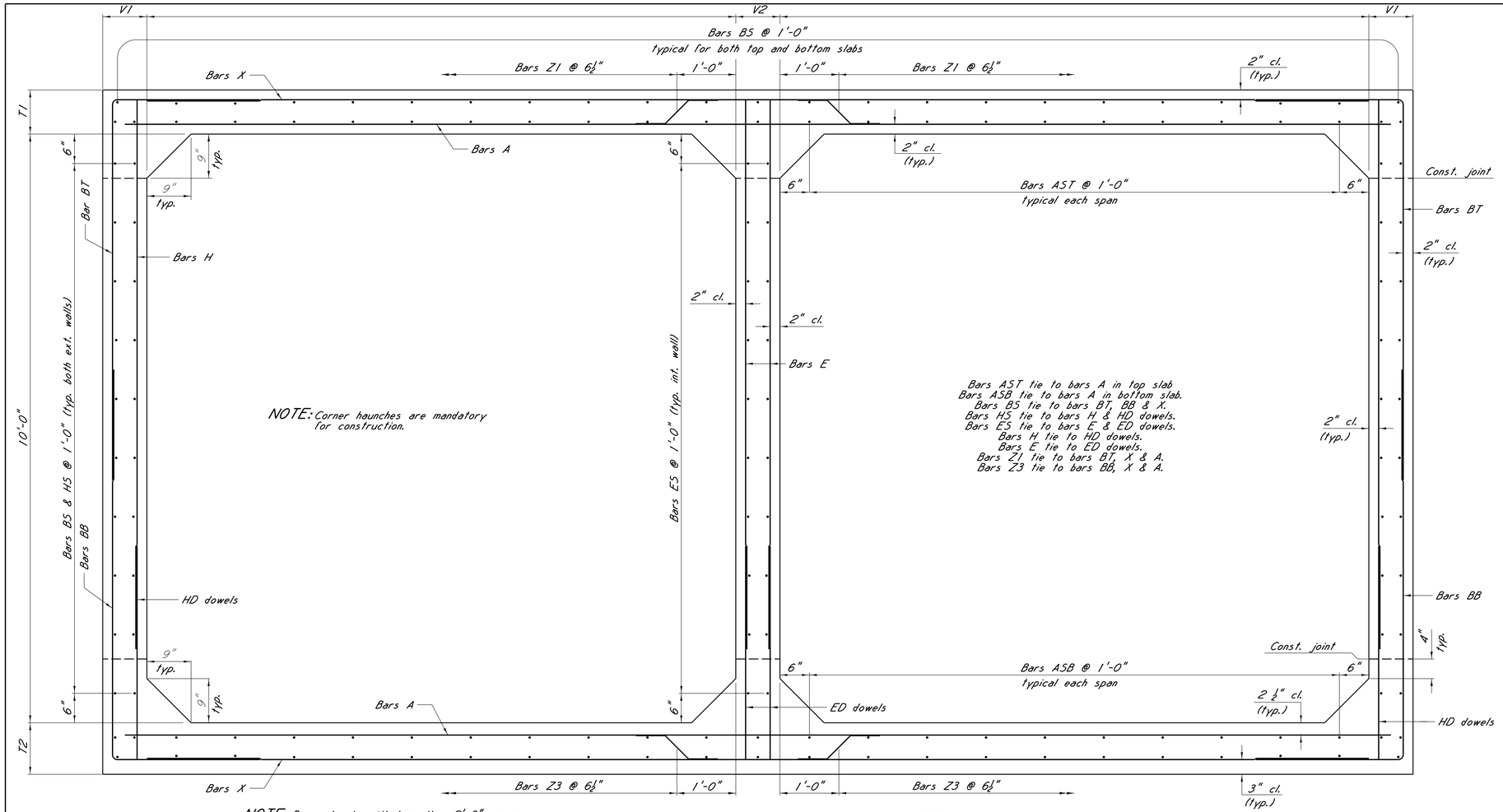
WORKING NUMBER IBD-8

SHEET NUMBER 7120

REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.

CROSS SECTION

NOTE: The diagrams for Bars ASB, AST, BS, HS & ES are for a culvert length greater than 140 ft. and equal to or less than 190 ft. with a median of 40 ft. thru 60 ft. for conditions other than these, use sections as shown on elevation of culvert.

NOTE: For joint locations and joint details see sheet no. 7122.

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7122 & 7123.

NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWD-2W, IWD-10-2W, IWD-3W & IWD-10-3W.

GENERAL NOTES:

Specifications: Mississippi Standard Specifications for Road and Bridge Construction, 2004.

Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBD-10.

No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.

All concrete shall be class "B".

Expansion joint material shall be bituminous fiber type unless unless otherwise noted.

All exposed edges shall be chamfered ¾".

Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).

Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.

Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.

Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.

All bars shall be accurately spaced and securely wired at each intersection before placing concrete.

All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.

Finish concrete per section 804.03.19.6.2 of the specifications.

Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.

Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.

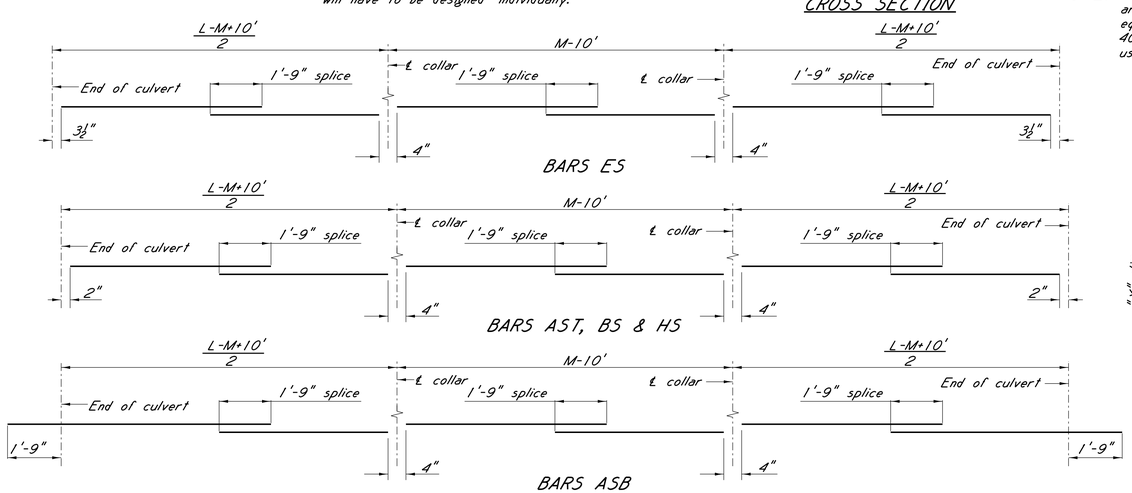
Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.

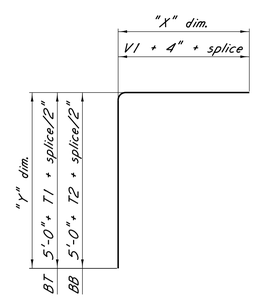
SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

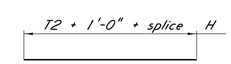
DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. HL-93
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

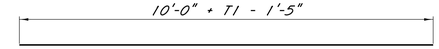




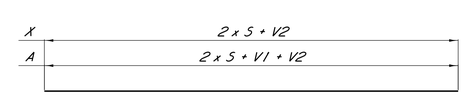
BARS BT & BB



HD & ED DOWELS



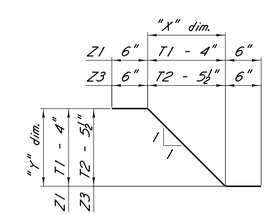
BARS H & E



BARS A & X

BAR BENDING DETAILS

Dimensions are out to out



BARS Zn

REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 10 FT.

SPANS 20 - 36 FT.

SHT. 1 OF 3

WORKING NUMBER IBD-10

SHEET NUMBER 7121

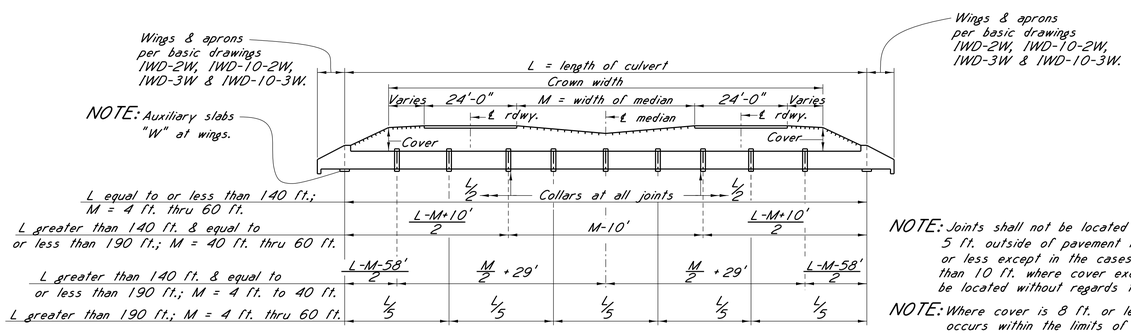
REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																																						EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V1	V2	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"			BARS "ES"		BARS "Z1"			BARS "Z3"			CONC. CU. YD.	REINF. STEEL LBS.
							SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO. (WALLS)	NO. (SLABS)	SIZE	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.		
200	10x10	5'-0"	9"	10 ½"	9"	9"	#6	6"	#4	6"	#4	6"	#5	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	25	#4	25	#4	20	#4	20	42	#4	20							2.2558	419.547
		10'-0"	10"	1'-0½"	9"	9"	#5	6"	#5	6"	#5	6"	#5	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	25	#4	25	#4	20	#4	20	42	#4	20							2.4618	413.393
		15'-0"	1'-1"	1'-2½"	10"	9"	#5	6"	#5	6"	#5	6"	#5	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	25	#4	25	#4	20	#4	20	43	#4	20							2.8810	418.581
		20'-0"	1'-3½"	1'-5"	11½"	9"	#5	6"	#4	6"	#4	6"	#5	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	25	#4	25	#4	20	#4	20	43	#4	20							3.3447	390.137
		25'-0"	1'-1"	1'-2"	1'-0½"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	25	#4	25	#4	20	#4	20	44	#4	20	#4	1'-0"	10	#4	1'-0"	10	3.0355	540.890
		30'-0"	1'-2½"	1'-3½"	1'-2"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	25	#4	25	#4	20	#4	20	44	#4	20	#5	1'-0"	10	#5	1'-0"	10	3.3627	573.073
240	12x10	5'-0"	10½"	1'-0"	9"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	20	#4	20	50	#4	20							2.7396	549.716
		10'-0"	1'-0"	1'-2"	9"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	20	#4	20	50	#4	20							3.0231	552.150
		15'-0"	1'-2½"	1'-5"	10"	9"	#6	6½"	#5	6½"	#5	6½"	#6	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	29	#4	29	#4	20	#4	20	51	#4	20							3.5467	523.611
		20'-0"	1'-2"	1'-2"	11½"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	20	#4	20	51	#4	20	#4	1'-0"	12	#4	1'-0"	12	3.3755	700.101
		25'-0"	1'-3"	1'-3½"	1'-0½"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	20	#4	20	52	#4	20	#5	1'-0"	16	#5	1'-0"	16	3.6587	745.052
		30'-0"	1'-4½"	1'-5"	1'-2"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	20	#4	20	52	#4	20	#5	1'-0"	16	#5	1'-0"	16	4.0256	755.103
280	14x10	5'-0"	1'-0"	1'-0½"	9"	9"	#7	6"	#5	6"	#5	6"	#6	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	33	#4	33	#4	20	#4	20	58	#4	20							3.2041	673.815
		10'-0"	1'-2"	1'-3"	9"	9"	#6	6"	#5	6"	#5	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	33	#4	33	#4	20	#4	20	58	#4	20							3.6242	675.318
		15'-0"	1'-1"	1'-1"	10"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	33	#4	33	#4	20	#4	20	59	#4	20	#5	1'-0"	14	#5	1'-0"	14	3.4192	985.166
		20'-0"	1'-3½"	1'-3½"	11½"	9"	#8	6½"	#6	6½"	#6	6½"	#8	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	33	#4	33	#4	20	#4	20	60	#4	20	#5	1'-1"	14	#5	1'-1"	14	4.0051	934.035
		25'-0"	1'-5½"	1'-5½"	1'-1½"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	20	#4	20	60	#4	20	#5	1'-0"	20	#5	1'-0"	20	4.5432	1024.634
		30'-0"	1'-6½"	1'-7"	1'-2"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	20	#4	20	60	#4	20	#4	6"	20	#4	6"	20	4.8229	1064.591
320	16x10	5'-0"	1'-1"	1'-1½"	9½"	9"	#7	6"	#6	6"	#6	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	37	#4	37	#4	20	#4	20	67	#4	20							3.7557	857.180
		10'-0"	1'-3½"	1'-4½"	10"	9"	#7	6½"	#5	6½"	#5	6½"	#7	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	37	#4	37	#4	20	#4	20	67	#4	20							4.3776	766.790
		15'-0"	1'-2½"	1'-2½"	11"	9"	#8	6"	#6	6"	#6	6"	#8	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	20	#4	20	67	#4	20	#5	1'-0"	16	#5	1'-0"	16	4.1355	1078.343
		20'-0"	1'-5½"	1'-5½"	1'-0"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	20	#4	20	68	#4	20	#5	1'-0"	16	#5	1'-0"	16	4.8557	1192.673
		25'-0"	1'-7½"	1'-7½"	1'-2"	9"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	20	#4	20	68	#4	20	#4	6"	22	#4	6"	22	5.4483	1267.790
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	#8	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#5	37	#5	37	#5	20	#5	20	69	#5	20	#5	6"	22	#5	6"	22	6.0910	1476.436
360	18x10	5'-0"	1'-2½"	1'-2½"	10½"	9"	#8	6½"	#6	6½"	#6	6½"	#7	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	41	#4	41	#4	20	#4	20	76	#4	20							4.4552	963.781
		10'-0"	1'-5½"	1'-6"	11"	9"	#7	6"	#5	6"	#5	6"	#7	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	41	#4	41	#4	20	#4	20	76	#4	20							5.2676	877.747
		15'-0"	1'-4½"	1'-4½"	1'-0"	9"	#9	6½"	#6	6½"	#6	6½"	#9	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	41	#4	41	#4	20	#4	20	76	#4	20	#5	1'-0"	20	#5	1'-0"	20	5.0486	1354.773
		20'-0"	1'-7"	1'-7"	1'-1"	9"	#9	6"	#6	6"	#6	6"	#9	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	41	#4	41	#4	20	#4	20	76	#4	20	#5	1'-0"	20	#5	1'-0"	20	5.7279	1443.272
		25'-0"	1'-8"	1'-9"	1'-2"	9"	#9	6"	#7	6"	#7	6"	#10	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#5	41	#5	41	#5	20	#5	20	76	#5	20	#5	6"	26	#5	6"	26	6.1710	1923.547
		30'-0"	1'-10½"	2'-0"	1'-3½"	1'-0"	#9	6"	#7	6"	#7	6"	#10	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#5	41	#5	41	#5	20	#5	20	77	#5	20	#5	6"	26	#5	6"	26	7.0914	1976.163

NOTE: See basic drawing IBJL-1 for additional collar locations.



SIDE ELEVATION OF CULVERT
Showing collar locations
Drawn for L = 150 ft. and M = 60 ft.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 10 FT.

SPANS 20 - 36 FT.

SHT. 2 OF 3

WORKING NUMBER IBD-10

SHEET NUMBER 7122

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																													
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "Z1"				BARS "Z3"			
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
200	10x10	5'-0"	#6	21'-6"	#4	2'-6"	6'-5½"	8'-11½"	#4	2'-6"	6'-7"	9'-1"	#5	20'-9"	#5	9'-4"	#5	3'-7½"	#5	9'-4"	#5	3'-7½"								
		10'-0"	#5	21'-6"	#5	2'-10"	6'-8½"	9'-6½"	#5	2'-10"	6'-11"	9'-9"	#5	20'-9"	#5	9'-5"	#5	3'-9½"	#5	9'-5"	#5	3'-9½"								
		15'-0"	#5	21'-7"	#5	2'-11"	6'-11½"	9'-10½"	#5	2'-11"	7'-1"	10'-0"	#5	20'-9"	#5	9'-8"	#5	3'-11½"	#5	9'-8"	#5	3'-11½"								
		20'-0"	#5	21'-8½"	#4	2'-8½"	7'-0"	9'-8½"	#4	2'-8½"	7'-1½"	9'-10"	#5	20'-9"	#5	9'-10½"	#5	4'-2"	#5	9'-10½"	#5	4'-2"								
		25'-0"	#6	21'-9½"	#5	3'-1½"	6'-11½"	10'-1"	#5	3'-1½"	7'-0½"	10'-2"	#6	20'-9"	#4	9'-8"	#4	3'-7"	#4	9'-8"	#4	3'-7"	#4	9"	9"	2'-0¾"	#4	8½"	8½"	2'-0"
		30'-0"	#6	21'-11"	#5	3'-3"	7'-1"	10'-4"	#5	3'-3"	7'-2"	10'-5"	#6	20'-9"	#4	9'-9½"	#4	3'-8½"	#4	9'-9½"	#4	3'-8½"	#5	10½"	10½"	2'-2⅜"	#5	10"	10"	2'-2⅛"
240	12x10	5'-0"	#6	25'-6"	#5	2'-10"	6'-9"	9'-7"	#5	2'-10"	6'-10½"	9'-8½"	#6	24'-9"	#5	9'-5½"	#5	3'-9"	#5	9'-5½"	#5	3'-9"								
		10'-0"	#6	25'-6"	#5	2'-10"	6'-10½"	9'-8½"	#5	2'-10"	7'-0½"	9'-10½"	#6	24'-9"	#5	9'-7"	#5	3'-11"	#5	9'-7"	#5	3'-11"								
		15'-0"	#6	25'-7"	#5	2'-11"	7'-1"	10'-0"	#5	2'-11"	7'-3½"	10'-2½"	#6	24'-9"	#5	9'-9½"	#5	4'-2"	#5	9'-9½"	#5	4'-2"								
		20'-0"	#7	25'-8½"	#5	3'-0½"	7'-0½"	10'-1"	#5	3'-0½"	7'-0½"	10'-1"	#7	24'-9"	#5	9'-9"	#5	3'-11"	#5	9'-9"	#5	3'-11"	#4	10"	10"	2'-2⅜"	#4	8½"	8½"	2'-0"
		25'-0"	#7	25'-9½"	#5	3'-1½"	7'-1½"	10'-3"	#5	3'-1½"	7'-2"	10'-3½"	#7	24'-9"	#5	9'-10"	#5	4'-0½"	#5	9'-10"	#5	4'-0½"	#5	11"	11"	2'-3⅜"	#5	10"	10"	2'-2⅛"
		30'-0"	#7	25'-11"	#5	3'-3"	7'-3"	10'-6"	#5	3'-3"	7'-3½"	10'-6½"	#7	24'-9"	#5	9'-11½"	#5	4'-2"	#5	9'-11½"	#5	4'-2"	#5	1'-0½"	1'-0½"	2'-5⅛"	#5	11½"	11½"	2'-4½"
280	14x10	5'-0"	#7	29'-6"	#5	2'-10"	6'-10½"	9'-8½"	#5	2'-10"	6'-11"	9'-9"	#6	28'-9"	#5	9'-7"	#5	3'-9½"	#5	9'-7"	#5	3'-9½"								
		10'-0"	#6	29'-6"	#5	2'-10"	7'-0½"	9'-10½"	#5	2'-10"	7'-1½"	9'-11½"	#7	28'-9"	#5	9'-9"	#5	4'-0"	#5	9'-9"	#5	4'-0"								
		15'-0"	#8	29'-7"	#6	3'-3"	7'-1½"	10'-4½"	#6	3'-3"	7'-1½"	10'-4½"	#8	28'-9"	#5	9'-8"	#5	3'-10"	#5	9'-8"	#5	3'-10"	#5	9"	9"	2'-0¾"	#5	7½"	7½"	1'-10⅝"
		20'-0"	#8	29'-8½"	#6	3'-4½"	7'-4"	10'-8½"	#6	3'-4½"	7'-4"	10'-8½"	#8	28'-9"	#5	9'-10½"	#5	4'-0½"	#5	9'-10½"	#5	4'-0½"	#5	11½"	11½"	2'-4½"	#5	10"	10"	2'-2⅛"
		25'-0"	#8	29'-10½"	#6	3'-6½"	7'-6"	11'-0½"	#6	3'-6½"	7'-6"	11'-0½"	#8	28'-9"	#4	10'-0½"	#4	3'-10½"	#4	10'-0½"	#4	3'-10½"	#5	1'-1½"	1'-1½"	2'-7⅛"	#5	1'-0"	1'-0"	2'-5"
		30'-0"	#8	29'-11"	#6	3'-7"	7'-7"	11'-2"	#6	3'-7"	7'-7½"	11'-2½"	#8	28'-9"	#4	10'-1½"	#4	4'-0"	#4	10'-1½"	#4	4'-0"	#4	1'-2½"	1'-2½"	2'-8½"	#4	1'-1½"	1'-1½"	2'-7⅛"
320	16x10	5'-0"	#7	33'-6½"	#6	3'-2½"	7'-1½"	10'-4"	#6	3'-2½"	7'-2"	10'-4½"	#7	32'-9"	#5	9'-8"	#5	3'-10½"	#5	9'-8"	#5	3'-10½"								
		10'-0"	#7	33'-7"	#5	2'-11"	7'-2"	10'-1"	#5	2'-11"	7'-3"	10'-2"	#7	32'-9"	#5	9'-10½"	#5	4'-1½"	#5	9'-10½"	#5	4'-1½"								
		15'-0"	#8	33'-8"	#6	3'-4"	7'-3"	10'-7"	#6	3'-4"	7'-3"	10'-7"	#8	32'-9"	#4	9'-9½"	#4	3'-7½"	#4	9'-9½"	#4	3'-7½"	#5	10½"	10½"	2'-2⅞"	#5	9"	9"	2'-0¾"
		20'-0"	#8	33'-9"	#6	3'-5"	7'-6"	10'-11"	#6	3'-5"	7'-6"	10'-11"	#9	32'-9"	#4	10'-0½"	#4	3'-10½"	#4	10'-0½"	#4	3'-10½"	#5	1'-1½"	1'-1½"	2'-7⅛"	#5	1'-0"	1'-0"	2'-5"
		25'-0"	#8	33'-11"	#6	3'-7"	7'-8"	11'-3"	#6	3'-7"	7'-8"	11'-3"	#9	32'-9"	#4	10'-2½"	#4	4'-0½"	#4	10'-2½"	#4	4'-0½"	#4	1'-3½"	1'-3½"	2'-9⅝"	#4	1'-2"	1'-2"	2'-7⅜"
		30'-0"	#8	34'-3"	#6	3'-8"	7'-9½"	11'-5½"	#6	3'-8"	7'-10½"	11'-6½"	#9	33'-0"	#4	10'-4"	#4	4'-3"	#4	10'-4"	#4	4'-3"	#5	1'-5"	1'-5"	3'-0⅛"	#5	1'-4½"	1'-4½"	2'-11⅜"
360	18x10	5'-0"	#8	37'-7½"	#6	3'-3½"	7'-3"	10'-6½"	#6	3'-3½"	7'-3"	10'-6½"	#7	36'-9"	#5	9'-9½"	#5	3'-11½"	#5	9'-9½"	#5	3'-11½"								
		10'-0"	#7	37'-8"	#5	3'-0"	7'-4"	10'-4"	#5	3'-0"	7'-4½"	10'-4½"	#7	36'-9"	#4	10'-0½"	#4	3'-11"	#4	10'-0½"	#4	3'-11"								
		15'-0"	#9	37'-9"	#6	3'-5"	7'-5"	10'-10"	#6	3'-5"	7'-5"	10'-10"	#9	36'-9"	#5	9'-11½"	#5	4'-1½"	#5	9'-11½"	#5	4'-1½"	#5	1'-0½"	1'-0½"	2'-5⅛"	#5	11"	11"	2'-3⅜"
		20'-0"	#9	37'-10"	#6	3'-6"	7'-7½"	11'-1½"	#6	3'-6"	7'-7½"	11'-1½"	#9	36'-9"	#4	10'-2"	#4	4'-0"	#4	10'-2"	#4	4'-0"	#5	1'-3"	1'-3"	2'-9⅜"	#5	1'-1½"	1'-1½"	2'-7⅛"
		25'-0"	#9	37'-11"	#7	4'-2"	8'-0"	12'-2"	#7	4'-2"	8'-1"	12'-3"	#10	36'-9"	#4	10'-3"	#4	4'-2"	#4	10'-3"	#4	4'-2"	#5	1'-4"	1'-4"	2'-10⅝"	#5	1'-3½"	1'-3½"	2'-9⅝"
		30'-0"	#9	38'-3½"	#7	4'-3½"	8'-2½"	12'-6"	#7	4'-3½"	8'-4"	12'-7½"	#10	37'-0"	#4	10'-5½"	#4	4'-5"	#4	10'-5½"	#4	4'-5"	#5	1'-6½"	1'-6½"	3'-2⅜"	#5	1'-6½"	1'-6½"	3'-2⅜"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 10 FT.

SPANS 20 - 36 FT.

SHT. 3 OF 3

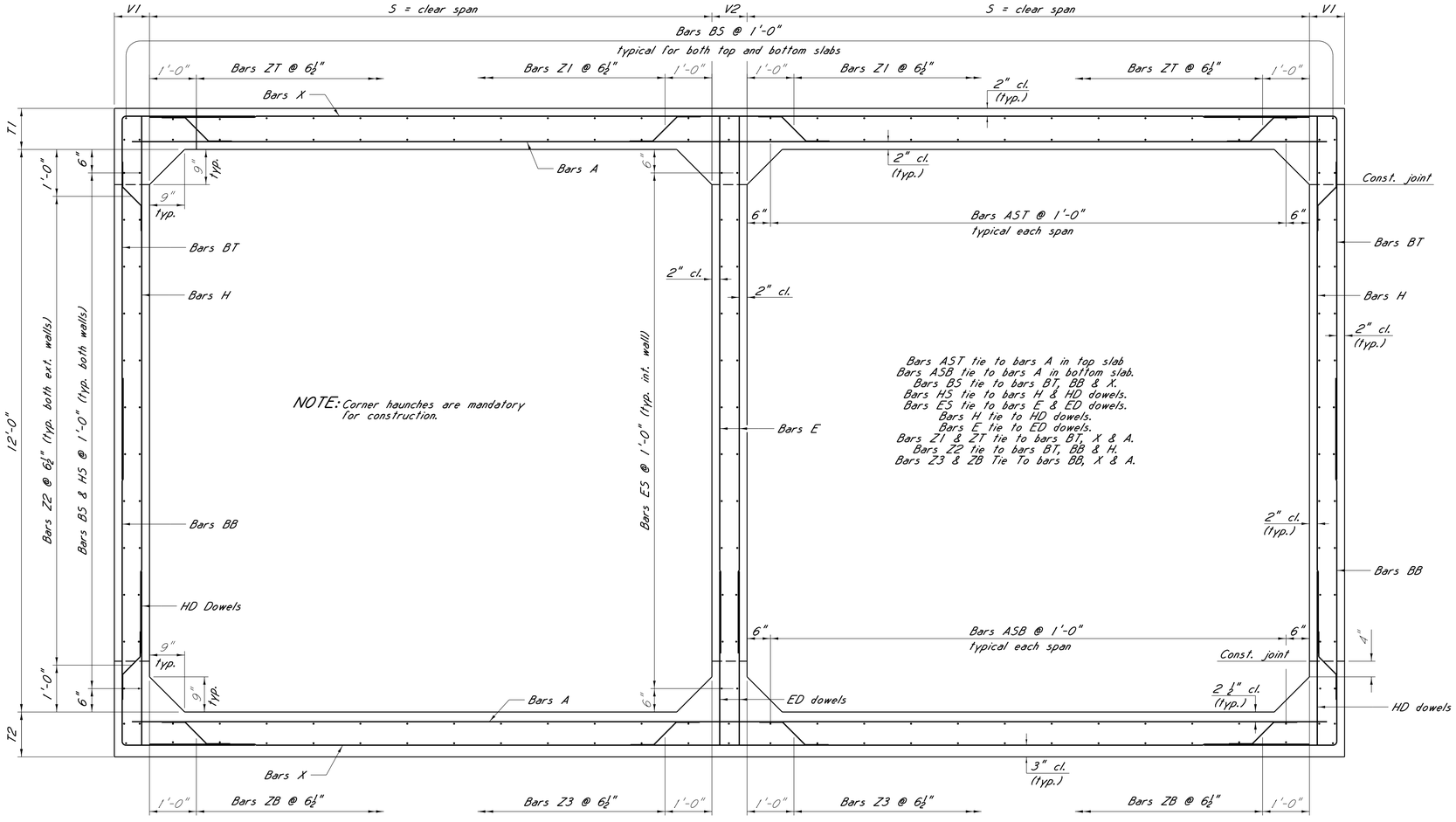
WORKING NUMBER IBD-10

SHEET NUMBER 7123

REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



NOTE: Box culverts with less than 2'-6" cover will have to be designed individually.

CROSS SECTION

NOTE: For joint locations and joint details see sheet no. 7125.

NOTE: For bar lengths, number of bars and estimated quantities see sheet no. 7125 & 7126.

NOTE: For reinforcing required in parapet & wingwalls to be placed prior to barrel construction, see basic drawings IWD-2W, IWD-12-2W, IWD-3W & IWD-12-3W.

GENERAL NOTES:

Specifications: Mississippi Standard Specifications for Road and Bridge Construction, 2004.

Barrel details on this sheet shall be used with cover from 2'-6" to the maximum shown on basic drawing IBD-12.

No change of plans will be permitted expect by written approval of the Director Of Structures, State Bridge Engineer. Minor changes in detail of design or construction procedure may be authorized by the Director Of Structures, State Bridge Engineer provided such changes will not be cause for contract price adjustment.

All concrete shall be class "B".

Expansion joint material shall be bituminous fiber type unless unless otherwise noted.

All exposed edges shall be chamfered ¾".

Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).

Reinforcement order lists and required placing plans shall be furnished in accordance with section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.

Horizontal construction joints may be placed only at the locations shown and concrete shall be allowed to set a minimum of 2 hours before continuing pour.

Reinforcing steel shall be placed in accordance with cross sections and shall be adequately supported from the forms.

All bars shall be accurately spaced and securely wired at each intersection before placing concrete.

All dimensions shall be verified in the field prior to fabrication of the reinforcing steel.

Finish concrete per section 804.03.19.6.2 of the specifications.

Reinforcing steel shall be ASTM A615, grade 60, unless otherwise noted.

Work for which no pay item is provided in the proposal will not be paid for directly and compensation therefor will be included in the prices and payments for bid items.

Concrete in collars shall be allowed to set a minimum of 24 hours before continuing pour.

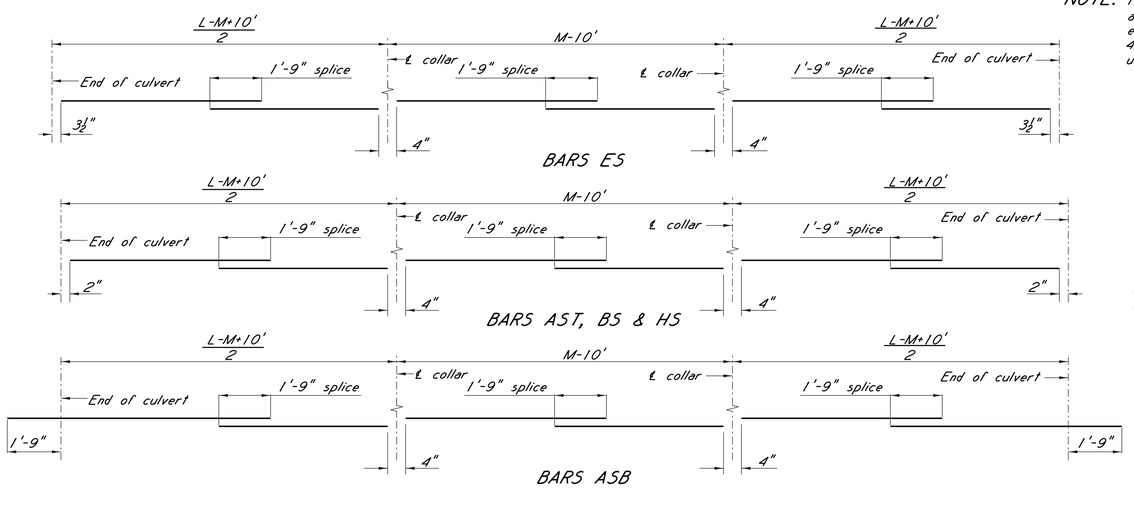
SPECIAL PROVISIONS REQUIRED:

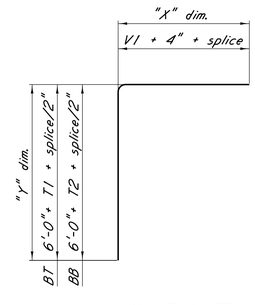
Concrete bridges and structures . . . . . No. 907-804

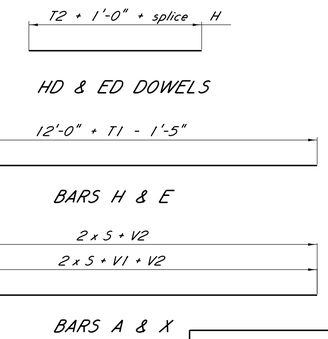
DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., 2010 LRFD
Loading. HL-93
Box bridge concrete. . . . . Class "B" (3,500 p.s.i.)
Equivalent fluid pressure. . . 45 lbs. per cu. ft.

NOTE: The diagrams for Bars ASB, AST, BS, HS & ES are for a culvert length greater than 140 ft. and equal to or less than 190 ft. with a median of 40 ft. thru 60 ft. for conditions other than these, use sections as shown on elevation of culvert.

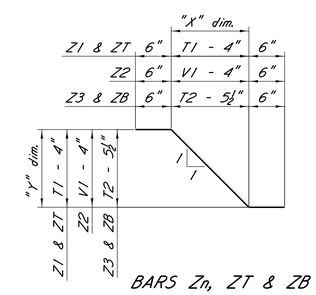






BAR BENDING DETAILS

Dimensions are out to out



REBAR TABLE	
SIZE	SPLICE (FT.)
#4	1'-5"
#5	1'-9"
#6	2'-1"
#7	2'-8"
#8	3'-5"
#9	4'-4"
#10	5'-6"
#11	6'-9"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 12 FT.

SPANS 24 - 40 FT.

SHT. 1 OF 3

WORKING NUMBER IBD-12

SHEET NUMBER 7124

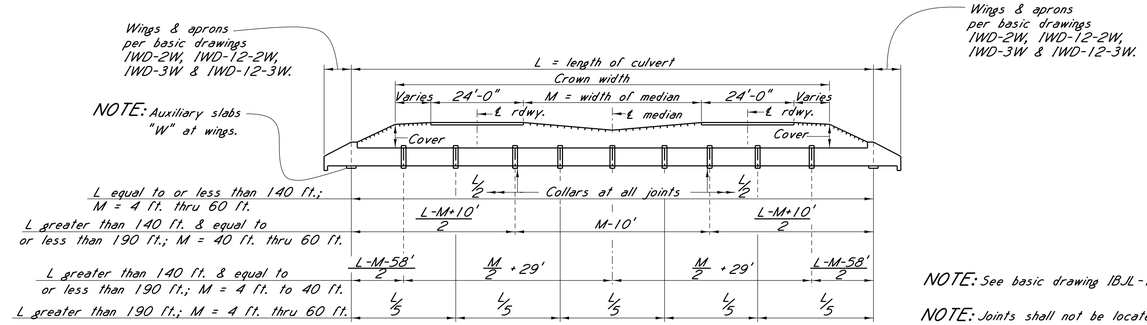
REVISIONS | BY | DATE

DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL																													EST. QUANTITIES PER LIN. FT. BARREL	
		COVER	T1	T2	V1	V2	BARS "A"		BARS "BT"		BARS "BB"		BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS		BARS "AST"		BARS "ASB"		BARS "HS"		BARS "BS"			BARS "ES"		CONC. CU. YD.	REINF. STEEL LBS.
							SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	SPACING	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO. (WALLS)	NO. (SLABS)	SIZE	NO.		
288	12x12	5'-0"	10½"	11½"	9"	9"	#6	6"	#5	6"	#5	6"	#6	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	29	#4	29	#4	24	#4	24	54	#4	24	2.8657	592.738
		10'-0"	1'-0"	1'-2"	10½"	9"	#6	6½"	#5	6½"	#5	6½"	#6	6½"	#4	6½"	#4	6½"	#4	6½"	#4	6½"	#4	29	#4	29	#4	24	#4	24	56	#4	24	3.3210	562.518
		15'-0"	1'-2½"	1'-5"	1'-0½"	9"	#6	7"	#5	7"	#5	7"	#6	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	29	#4	29	#4	24	#4	24	56	#4	24	3.9514	537.002
		20'-0"	1'-0"	1'-1"	10"	9"	#7	6"	#7	6"	#7	6"	#8	6"	#5	6"	#5	6"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	24	#4	24	56	#4	24	3.1957	1032.378
		25'-0"	1'-1"	1'-1½"	10½"	9"	#8	6"	#7	6"	#7	6"	#8	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	29	#4	29	#4	24	#4	24	56	#4	24	3.3619	1068.964
		30'-0"	1'-2"	1'-2½"	11"	9"	#8	6"	#7	6"	#7	6"	#8	6"	#5	6"	#5	6"	#5	1'-0"	#5	1'-0"	#4	29	#4	29	#4	24	#4	24	56	#4	24	3.5698	1181.473
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	#7	6"	#6	6"	#6	6"	#6	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	24	#4	24	62	#4	24	3.4174	743.156
		10'-0"	1'-1½"	1'-4"	10½"	9"	#7	7½"	#6	7½"	#6	7½"	#7	7½"	#4	7½"	#4	7½"	#4	7½"	#4	7½"	#4	33	#4	33	#4	24	#4	24	64	#4	24	3.9715	693.991
		15'-0"	1'-0½"	1'-1½"	1'-0½"	9"	#8	6½"	#6	6½"	#6	6½"	#8	6½"	#4	6½"	#4	6½"	#4	6½"	#4	6½"	#4	33	#4	33	#4	24	#4	24	64	#4	24	3.8169	973.736
		20'-0"	1'-2"	1'-2½"	11"	9"	#9	7"	#7	7"	#7	7"	#9	7"	#4	7"	#4	7"	#4	7"	#4	7"	#4	33	#4	33	#4	24	#4	24	64	#4	24	3.9217	1256.448
		25'-0"	1'-3"	1'-4"	1'-0"	9"	#9	6½"	#7	6½"	#7	6½"	#9	6½"	#4	6½"	#4	6½"	#4	6½"	#4	6½"	#4	33	#4	33	#4	24	#4	24	64	#4	24	4.2477	1361.939
		30'-0"	1'-4"	1'-4½"	1'-0"	9"	#9	6"	#7	6"	#7	6"	#9	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	33	#4	33	#4	24	#4	24	64	#4	24	4.3900	1632.319
384	16x12	5'-0"	1'-1"	1'-1½"	9½"	9"	#7	6"	#6	6"	#6	6"	#7	6"	#4	6"	#4	6"	#4	6"	#4	6"	#4	37	#4	37	#4	24	#4	24	72	#4	24	3.9285	905.330
		10'-0"	1'-3½"	1'-4½"	10½"	9"	#7	6½"	#6	6½"	#6	6½"	#7	6½"	#4	6½"	#4	6½"	#4	6½"	#4	6½"	#4	37	#4	37	#4	24	#4	24	72	#4	24	4.6019	853.247
		15'-0"	1'-2"	1'-2½"	1'-0½"	9"	#9	6"	#6	6"	#6	6"	#9	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	24	#4	24	72	#4	24	4.4066	1367.609
		20'-0"	1'-3½"	1'-4"	1'-0"	9"	#9	6"	#7	6"	#7	6"	#9	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	24	#4	24	72	#4	24	4.6840	1578.076
		25'-0"	1'-5"	1'-5½"	1'-1"	1'-0"	#9	6"	#7	6"	#7	6"	#10	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	24	#4	24	72	#4	24	5.2353	1884.311
		30'-0"	1'-6"	1'-7"	1'-1½"	1'-0"	#9	6"	#7	6"	#7	6"	#10	6"	#4	6"	#4	6"	#4	1'-0"	#4	1'-0"	#4	37	#4	37	#4	24	#4	24	72	#4	24	5.5532	1976.309
432	18x12	5'-0"	1'-2½"	1'-2½"	10½"	9"	#8	6½"	#6	6½"	#6	6½"	#7	6½"	#4	6½"	#4	6½"	#4	6½"	#4	6½"	#4	41	#4	41	#4	24	#4	24	80	#4	24	4.6404	1008.658
		10'-0"	1'-5½"	1'-6"	11"	9"	#7	6"	#6	6"	#6	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	41	#4	41	#4	24	#4	24	80	#4	24	5.4590	975.151
		15'-0"	1'-3"	1'-3½"	1'-0½"	9"	#9	6"	#7	6"	#7	6"	#9	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	41	#4	41	#4	24	#4	24	80	#4	24	4.9982	1592.447
		20'-0"	1'-5"	1'-5½"	1'-1"	1'-0"	#9	6"	#7	6"	#7	6"	#10	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	41	#4	41	#4	24	#4	24	80	#4	24	5.6613	1884.063
		25'-0"	1'-6½"	1'-7½"	1'-2"	1'-0"	#9	6"	#7	6"	#7	6"	#10	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	41	#4	41	#4	24	#4	24	82	#4	24	6.1780	2130.178
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	#10	6"	#7	6"	#7	6"	#10	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	41	#5	41	#5	24	#5	24	82	#5	24	6.8812	2417.088
480	20x12	5'-0"	1'-3½"	1'-3½"	11"	9"	#8	6"	#6	6"	#6	6"	#7	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	45	#4	45	#4	24	#4	24	88	#4	24	5.3058	1151.763
		10'-0"	1'-3"	1'-4"	1'-0"	9"	#9	6"	#7	6"	#7	6"	#9	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	45	#4	45	#4	24	#4	24	88	#4	24	5.3958	1622.420
		15'-0"	1'-4½"	1'-5"	1'-1"	1'-0"	#10	6½"	#7	6½"	#7	6½"	#10	6½"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#5	1'-1"	#4	45	#4	45	#4	24	#4	24	88	#4	24	5.9540	1923.818
		20'-0"	1'-6½"	1'-7"	1'-2"	1'-0"	#10	6"	#7	6"	#7	6"	#10	6"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#5	1'-0"	#4	45	#4	45	#4	24	#4	24	90	#4	24	6.5802	2419.102
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	#10	6"	#7	6"	#7	6"	#10	6"	#5	1'-6"	#5	1'-6"	#5	1'-6"	#5	1'-6"	#5	45	#5	45	#5	24	#5	24	90	#5	24	7.5463	2570.493
		30'-0"	1'-11½"	2'-0"	1'-3½"	1'-0"	#10	6"	#7	6"	#7	6"	#11	6"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#5	45	#5	45	#5	24	#5	24	90	#5	24	8.0655	2815.356

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LIST FOR BARREL														
		COVER	BARS "ZT"			BARS "Z1"			BARS "Z2"			BARS "Z3"			BARS "ZB"		
			SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.	SIZE	SPACING	NO.
288	12x12	5'-0"															
		10'-0"															
		15'-0"															
		20'-0"	#5	1'-0"	8	#5	1'-0"	16	#5	1'-0"	24	#5	1'-0"	16	#5	1'-0"	8
		25'-0"	#5	1'-0"	8	#5	1'-0"	16	#5	1'-0"	24	#5	1'-0"	16	#5	1'-0"	8
		30'-0"	#4	6"	12	#4	6"	16	#4	6"	24	#4	6"	16	#4	6"	12
336	14x12	5'-0"															
		10'-0"															
		15'-0"	#4	1'-1"	10	#4	1'-1"	14				#4	1'-1"	14	#4	1'-1"	10
		20'-0"	#4	7"	10	#4	7"	20	#4	7"	24	#4	7"	20	#4	7"	10
		25'-0"	#4	6½"	10	#4	6½"	20	#4	6½"	24	#4	6½"	20	#4	6½"	10
		30'-0"	#5	6"	14	#5	6"	20	#5	6"	24	#5	6"	20	#5	6"	14
384	16x12	5'-0"															
		10'-0"															
		15'-0"	#5	1'-0"	10	#5	1'-0"	16				#5	1'-0"	16	#5	1'-0"	10
		20'-0"	#4	6"	10	#4	6"	22	#4	6"	24	#4	6"	22	#4	6"	10
		25'-0"	#5	6"	10	#5	6"	22	#5	6"	24	#5	6"	22	#5	6"	10
		30'-0"	#5	6"	16	#5	6"	22	#5	6"	24	#5	6"	22	#5	6"	16
432	18x12	5'-0"															
		10'-0"															
		15'-0"	#5	1'-0"	12	#5	1'-0"	20				#5	1'-0"	20	#5	1'-0"	12
		20'-0"	#4	6"	12	#4	6"	26	#4	6"	16	#4	6"	26	#4	6"	12
		25'-0"	#5	6"	12	#5	6"	26	#5	6"	24	#5	6"	26	#5	6"	12
		30'-0"	#5	6"	12	#5	6"	26	#5	6"	24	#5	6"	26	#5	6"	12
480	20x12	5'-0"															
		10'-0"	#4	1'-0"	6	#4	1'-0"	14				#4	1'-0"	14	#4	1'-0"	6
		15'-0"	#5	1'-0"	14	#5	1'-0"	22				#5	1'-0"	22	#5	1'-0"	14
		20'-0"	#5	6"	14	#5	6"	28	#5	6"	16	#5	6"	28	#5	6"	14
		25'-0"	#5	6"	14	#5	6"	28	#5	6"	16	#5	6"	28	#5	6"	14
		30'-0"	#5	6"	14	#5	6"	28	#5	6"	24	#5	6"	28	#5	6"	14



SIDE ELEVATION OF CULVERT

Showing collar locations

Drawn for L = 150 ft. and M = 60 ft.

NOTE: See basic drawing IBJL-1 for additional collar locations.

NOTE: Joints shall not be located closer than 5 ft. outside of pavement for cover of 8 ft. or less except in the cases where median is less than 10 ft. where cover exceeds 8 ft. joints may be located without regards to pavement edge.

NOTE: Where cover is 8 ft. or less and a joint occurs within the limits of 5 ft. beyond each edge of pavement, use complete collar at joints per basic drawing ICJ-1 or ICJS-1.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 12 FT.

SPANS 24 - 40 FT.

SHT. 2 OF 3

WORKING NUMBER IBD-12

SHEET NUMBER 7125

REVISIONS | BY

DATE | DESIGNER PAUL DEES, P.E. | CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. | ISSUE DATE 1/1/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																					
		COVER	BARS "A"		BARS "BT"				BARS "BB"				BARS "X"		BARS "H"		"HD" DOWELS		BARS "E"		"ED" DOWELS	
			SIZE	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH
288	12x12	5'-0"	#6	25'-6"	#5	2'-10"	7'-9"	10'-7"	#5	2'-10"	7'-10"	10'-8"	#6	24'-9"	#4	11'-5½"	#4	3'-4½"	#4	11'-5½"	#4	3'-4½"
		10'-0"	#6	25'-7½"	#5	2'-11½"	7'-10½"	10'-10"	#5	2'-11½"	8'-0½"	11'-0"	#6	24'-9"	#4	11'-7"	#4	3'-7"	#4	11'-7"	#4	3'-7"
		15'-0"	#6	25'-9½"	#5	3'-1½"	8'-1"	11'-2½"	#5	3'-1½"	8'-3½"	11'-5"	#6	24'-9"	#4	11'-9½"	#4	3'-10"	#4	11'-9½"	#4	3'-10"
		20'-0"	#7	25'-7"	#7	3'-10"	8'-4"	12'-2"	#7	3'-10"	8'-5"	12'-3"	#8	24'-9"	#5	11'-7"	#5	3'-10"	#5	11'-7"	#5	3'-10"
		25'-0"	#8	25'-7½"	#7	3'-10½"	8'-5"	12'-3½"	#7	3'-10½"	8'-5½"	12'-4"	#8	24'-9"	#4	11'-8"	#4	3'-6½"	#4	11'-8"	#4	3'-6½"
		30'-0"	#8	25'-8"	#7	3'-11"	8'-6"	12'-5"	#7	3'-11"	8'-6½"	12'-5½"	#8	24'-9"	#5	11'-9"	#5	3'-11½"	#5	11'-9"	#5	3'-11½"
328	14x12	5'-0"	#7	29'-6"	#6	3'-2"	8'-0½"	11'-2½"	#6	3'-2"	8'-1½"	11'-3½"	#6	28'-9"	#4	11'-7"	#4	3'-6"	#4	11'-7"	#4	3'-6"
		10'-0"	#7	29'-7½"	#6	3'-3½"	8'-2"	11'-5½"	#6	3'-3½"	8'-4½"	11'-8"	#7	28'-9"	#4	11'-8½"	#4	3'-9"	#4	11'-8½"	#4	3'-9"
		15'-0"	#8	29'-9½"	#6	3'-5½"	8'-1"	11'-6½"	#6	3'-5½"	8'-2"	11'-7½"	#8	28'-9"	#4	11'-7½"	#4	3'-6½"	#4	11'-7½"	#4	3'-6½"
		20'-0"	#9	29'-8"	#7	3'-11"	8'-6"	12'-5"	#7	3'-11"	8'-6½"	12'-5½"	#9	28'-9"	#4	11'-9"	#4	3'-7½"	#4	11'-9"	#4	3'-7½"
		25'-0"	#9	29'-9"	#7	4'-0"	8'-7"	12'-7"	#7	4'-0"	8'-8"	12'-8"	#9	28'-9"	#4	11'-10"	#4	3'-9"	#4	11'-10"	#4	3'-9"
		30'-0"	#9	29'-9"	#7	4'-0"	8'-8"	12'-8"	#7	4'-0"	8'-8½"	12'-8½"	#9	28'-9"	#4	11'-11"	#4	3'-9½"	#4	11'-11"	#4	3'-9½"
368	16x12	5'-0"	#7	33'-6½"	#6	3'-2½"	8'-1½"	11'-4"	#6	3'-2½"	8'-2"	11'-4½"	#7	32'-9"	#4	11'-8"	#4	3'-6½"	#4	11'-8"	#4	3'-6½"
		10'-0"	#7	33'-7½"	#6	3'-3½"	8'-4"	11'-7½"	#6	3'-3½"	8'-5"	11'-8½"	#7	32'-9"	#4	11'-10½"	#4	3'-9½"	#4	11'-10½"	#4	3'-9½"
		15'-0"	#9	33'-9½"	#6	3'-5½"	8'-2½"	11'-8"	#6	3'-5½"	8'-3"	11'-8½"	#9	32'-9"	#4	11'-9"	#4	3'-7½"	#4	11'-9"	#4	3'-7½"
		20'-0"	#9	33'-9"	#7	4'-0"	8'-7½"	12'-7½"	#7	4'-0"	8'-8"	12'-8"	#9	32'-9"	#4	11'-10½"	#4	3'-9"	#4	11'-10½"	#4	3'-9"
		25'-0"	#9	34'-1"	#7	4'-1"	8'-9"	12'-10"	#7	4'-1"	8'-9½"	12'-10½"	#10	33'-0"	#4	12'-0"	#4	3'-10½"	#4	12'-0"	#4	3'-10½"
		30'-0"	#9	34'-1½"	#7	4'-1½"	8'-10"	12'-11½"	#7	4'-1½"	8'-11"	13'-0½"	#10	33'-0"	#4	12'-1"	#4	4'-0"	#4	12'-1"	#4	4'-0"
408	18x12	5'-0"	#8	37'-7½"	#6	3'-3½"	8'-3"	11'-6½"	#6	3'-3½"	8'-3"	11'-6½"	#7	36'-9"	#4	11'-9½"	#4	3'-7½"	#4	11'-9½"	#4	3'-7½"
		10'-0"	#7	37'-8"	#6	3'-4"	8'-6"	11'-10"	#6	3'-4"	8'-6½"	11'-10½"	#7	36'-9"	#5	12'-0½"	#5	4'-3"	#5	12'-0½"	#5	4'-3"
		15'-0"	#9	37'-9½"	#7	4'-0½"	8'-7"	12'-7½"	#7	4'-0½"	8'-7½"	12'-8"	#9	36'-9"	#5	11'-10"	#5	4'-0½"	#5	11'-10"	#5	4'-0½"
		20'-0"	#9	38'-1"	#7	4'-1"	8'-9"	12'-10"	#7	4'-1"	8'-9½"	12'-10½"	#10	37'-0"	#5	12'-0"	#5	4'-2½"	#5	12'-0"	#5	4'-2½"
		25'-0"	#9	38'-2"	#7	4'-2"	8'-10½"	13'-0½"	#7	4'-2"	8'-11½"	13'-1½"	#10	37'-0"	#5	12'-1½"	#5	4'-4½"	#5	12'-1½"	#5	4'-4½"
		30'-0"	#10	38'-3"	#7	4'-3"	9'-1"	13'-4"	#7	4'-3"	9'-2"	13'-5"	#10	37'-0"	#5	12'-4"	#5	4'-7"	#5	12'-4"	#5	4'-7"
448	20x12	5'-0"	#8	41'-8"	#6	3'-4"	8'-4"	11'-8"	#6	3'-4"	8'-4"	11'-8"	#7	40'-9"	#5	11'-10½"	#5	4'-0½"	#5	11'-10½"	#5	4'-0½"
		10'-0"	#9	41'-9"	#7	4'-0"	8'-7"	12'-7"	#7	4'-0"	8'-8"	12'-8"	#9	40'-9"	#5	11'-10"	#5	4'-1"	#5	11'-10"	#5	4'-1"
		15'-0"	#10	42'-1"	#7	4'-1"	8'-8½"	12'-9½"	#7	4'-1"	8'-9"	12'-10"	#10	41'-0"	#5	11'-11½"	#5	4'-2"	#5	11'-11½"	#5	4'-2"
		20'-0"	#10	42'-2"	#7	4'-2"	8'-10½"	13'-0½"	#7	4'-2"	8'-11"	13'-1"	#10	41'-0"	#5	12'-1½"	#5	4'-4"	#5	12'-1½"	#5	4'-4"
		25'-0"	#10	42'-3"	#7	4'-3"	9'-2"	13'-5"	#7	4'-3"	9'-2"	13'-5"	#10	41'-0"	#5	12'-5"	#5	4'-7"	#5	12'-5"	#5	4'-7"
		30'-0"	#10	42'-3½"	#7	4'-3½"	9'-3½"	13'-7"	#7	4'-3½"	9'-4"	13'-7½"	#11	41'-0"	#4	12'-6½"	#4	4'-5"	#4	12'-6½"	#4	4'-5"

AREA OF OPENING SQ. FT.	SIZE OF CULVERT FT. x FT. "S"x"H"	BAR LENGTHS FOR BARREL																			
		COVER	BARS "ZT"				BARS "Z1"				BARS "Z2"				BARS "Z3"				BARS "ZB"			
			SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH	SIZE	"X" DIM.	"Y" DIM.	LENGTH
288	12x12	5'-0"																				
		10'-0"																				
		15'-0"																				
		20'-0"	#5	8"	8"	1'-11 5/16"	#5	8"	8"	1'-11 5/16"	#5	6"	6"	1'-8½"	#5	7½"	7½"	1'-10⅝"	#5	7½"	7½"	1'-10⅝"
		25'-0"	#5	9"	9"	2'-0¾"	#5	9"	9"	2'-0¾"	#5	6½"	6½"	1'-9 3/16"	#5	8"	8"	1'-11 5/16"	#5	8"	8"	1'-11 5/16"
		30'-0"	#4	10"	10"	2'-2⅛"	#4	10"	10"	2'-2⅛"	#4	7"	7"	1'-9⅞"	#4	9"	9"	2'-0¾"	#4	9"	9"	2'-0¾"
336	14x12	5'-0"																				
		10'-0"																				
		15'-0"	#4	8½"	8½"	2'-0"	#4	8½"	8½"	2'-0"					#4	8"	8"	1'-11 5/16"	#4	8"	8"	1'-11 5/16"
		20'-0"	#4	10"	10"	2'-2⅛"	#4	10"	10"	2'-2⅛"	#4	7"	7"	1'-9⅞"	#4	9"	9"	2'-0¾"	#4	9"	9"	2'-0¾"
		25'-0"	#4	11"	11"	2'-3 9/16"	#4	11"	11"	2'-3 9/16"	#4	8"	8"	1'-11 5/16"	#4	10½"	10½"	2'-2⅞"	#4	10½"	10½"	2'-2⅞"
		30'-0"	#5	1'-0"	1'-0"	2'-5"	#5	1'-0"	1'-0"	2'-5"	#5	8"	8"	1'-11 5/16"	#5	11"	11"	2'-3 9/16"	#5	11"	11"	2'-3 9/16"
384	16x12	5'-0"																				
		10'-0"																				
		15'-0"	#5	10"	10"	2'-2⅛"	#5	10"	10"	2'-2⅛"					#5	9"	9"	2'-0¾"	#5	9"	9"	2'-0¾"
		20'-0"	#4	11½"	11½"	2'-4¼"	#4	11½"	11½"	2'-4¼"	#4	8"	8"	1'-11 5/16"	#4	10½"	10½"	2'-2⅞"	#4	10½"	10½"	2'-2⅞"
		25'-0"	#5	1'-1"	1'-1"	2'-6⅜"	#5	1'-1"	1'-1"	2'-6⅜"	#5	9"	9"	2'-0¾"	#5	1'-0"	1'-0"	2'-5"	#5	1'-0"	1'-0"	2'-5"
		30'-0"	#5	1'-2"	1'-2"	2'-7 13/16"	#5	1'-2"	1'-2"	2'-7 13/16"	#5	9½"	9½"	2'-1 7/16"	#5	1'-1½"	1'-1½"	2'-7⅛"	#5	1'-1½"	1'-1½"	2'-7⅛"
432	18x12	5'-0"																				
		10'-0"																				
		15'-0"	#5	11"	11"	2'-3 9/16"	#5	11"	11"	2'-3 9/16"					#5	10"	10"	2'-2⅛"	#5	10"	10"	2'-2⅛"
		20'-0"	#4	1'-1"	1'-1"	2'-6⅜"	#4	1'-1"	1'-1"	2'-6⅜"	#4	9"	9"	2'-0¾"	#4	1'-0"	1'-0"	2'-5"	#4	1'-0"	1'-0"	2'-5"
		25'-0"	#5	1'-2½"	1'-2½"	2'-8½"	#5	1'-2½"	1'-2½"	2'-8½"	#5	10"	10"	2'-2⅛"	#5	1'-2"	1'-2"	2'-7 13/16"	#5	1'-2"	1'-2"	2'-7 13/16"
		30'-0"	#5	1'-5"	1'-5"	3'-0 1/16"	#5	1'-5"	1'-5"	3'-0 1/16"	#5	11"	11"	2'-3 9/16"	#5	1'-4½"	1'-4½"	2'-11⅜"	#5	1'-4½"	1'-4½"	2'-11⅜"
480	20x12	5'-0"																				
		10'-0"	#4	11"	11"	2'-3 9/16"	#4	11"	11"	2'-3 9/16"					#4	10½"	10½"	2'-2⅞"	#4	10½"	10½"	2'-2⅞"
		15'-0"	#5	1'-0½"	1'-0½"	2'-5 11/16"	#5	1'-0½"	1'-0½"	2'-5 11/16"					#5	11½"	11½"	2'-4¼"	#5	11½"	11½"	2'-4¼"
		20'-0"	#5	1'-2½"	1'-2½"	2'-8½"	#5	1'-2½"	1'-2½"	2'-8½"	#5	10"	10"	2'-2⅛"	#5	1'-1½"	1'-1½"	2'-7⅛"	#5	1'-1½"	1'-1½"	2'-7⅛"
		25'-0"	#5	1'-6"	1'-6"	3'-1 1/16"	#5	1'-6"	1'-6"	3'-1 1/16"	#5	11"	11"	2'-3 9/16"	#5	1'-4½"	1'-4½"	2'-11⅜"	#5	1'-4½"	1'-4½"	2'-11⅜"
		30'-0"	#5	1'-7½"	1'-7½"	3'-3 9/16"	#5	1'-7½"	1'-7½"	3'-3 9/16"	#5	11½"	11½"	2'-4¼"	#5	1'-6½"	1'-6½"	3'-2 3/16"	#5	1'-6½"	1'-6½"	3'-2 3/16"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BASIC BARREL DETAILS FOR DOUBLE CELL BOX CULVERT

HEIGHT 12 FT.

SPANS 24 - 40 FT.

SHT. 3 OF 3

WORKING NUMBER IBD-12

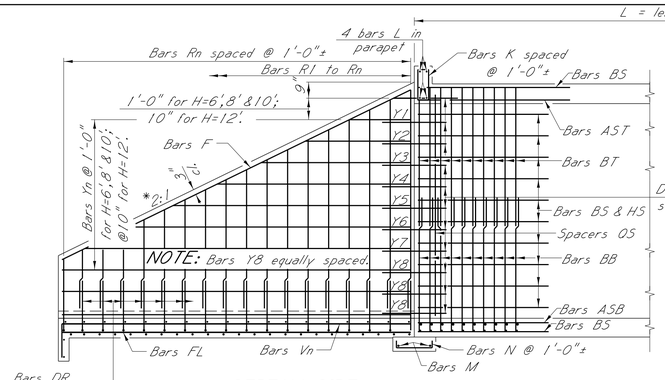
SHEET NUMBER 7126

REVISIONS | BY

DATE

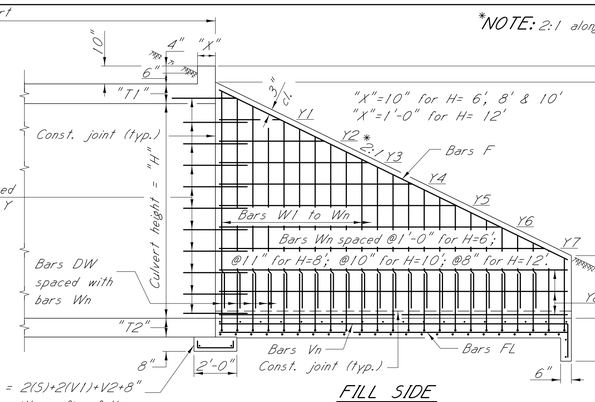
DESIGNER PAUL DEES, P.E. CHECKER PICKERING FIRM, INC.
DETAILER PAUL DEES, P.E. ISSUE DATE 1/1/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



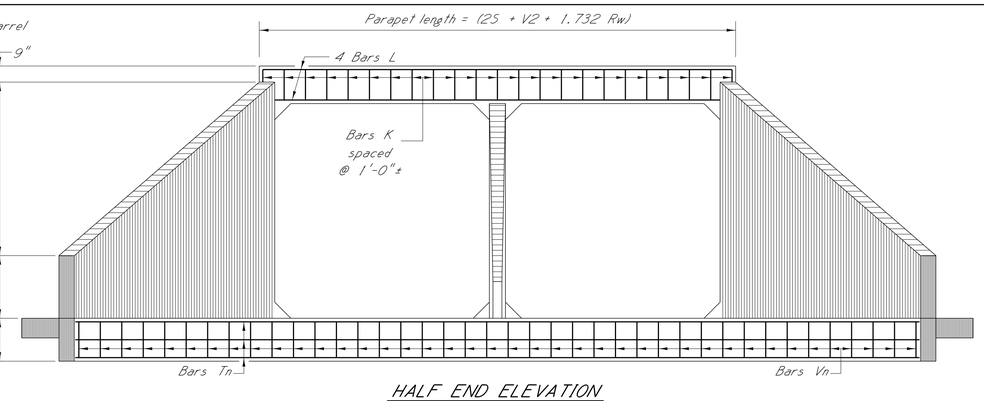
STREAM SIDE

Showing reinforcement in stream side of wingwall



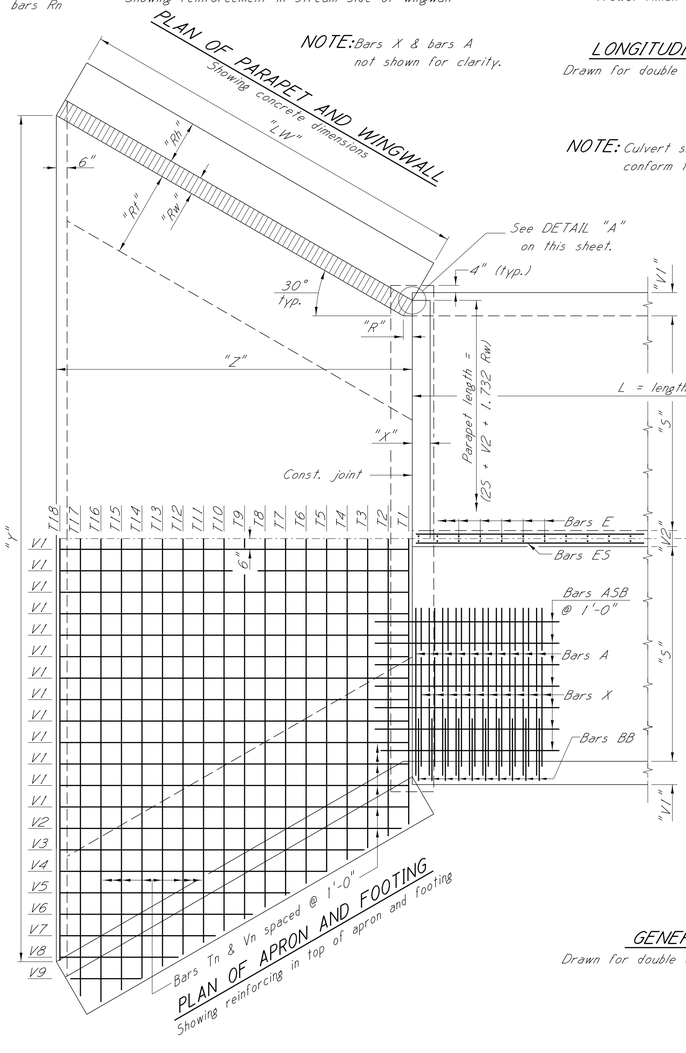
FILL SIDE

Showing reinforcement in fill side of wingwall



HALF END ELEVATION

Showing reinforcement in parapet & toe wall

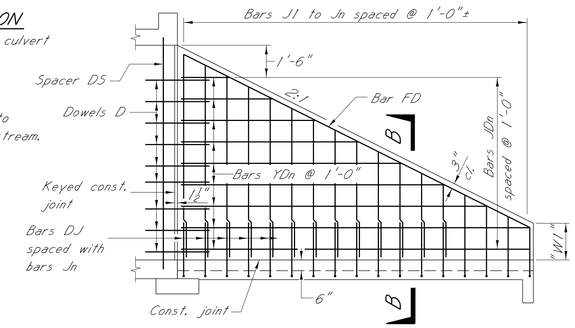


NOTE: Bars X & bars A not shown for clarity.

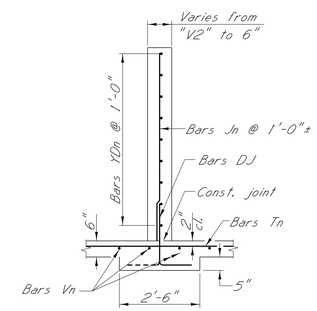
LONGITUDINAL SECTION

Drawn for double cell 10' x 10' culvert

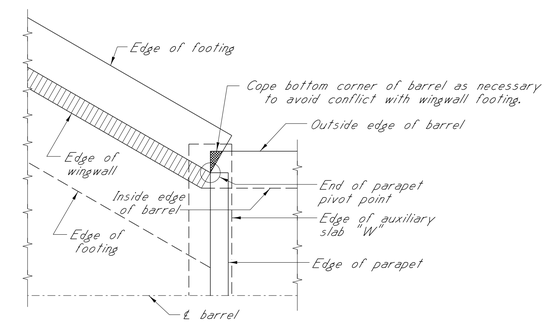
NOTE: Culvert shall be sloped to conform to gradient of stream.



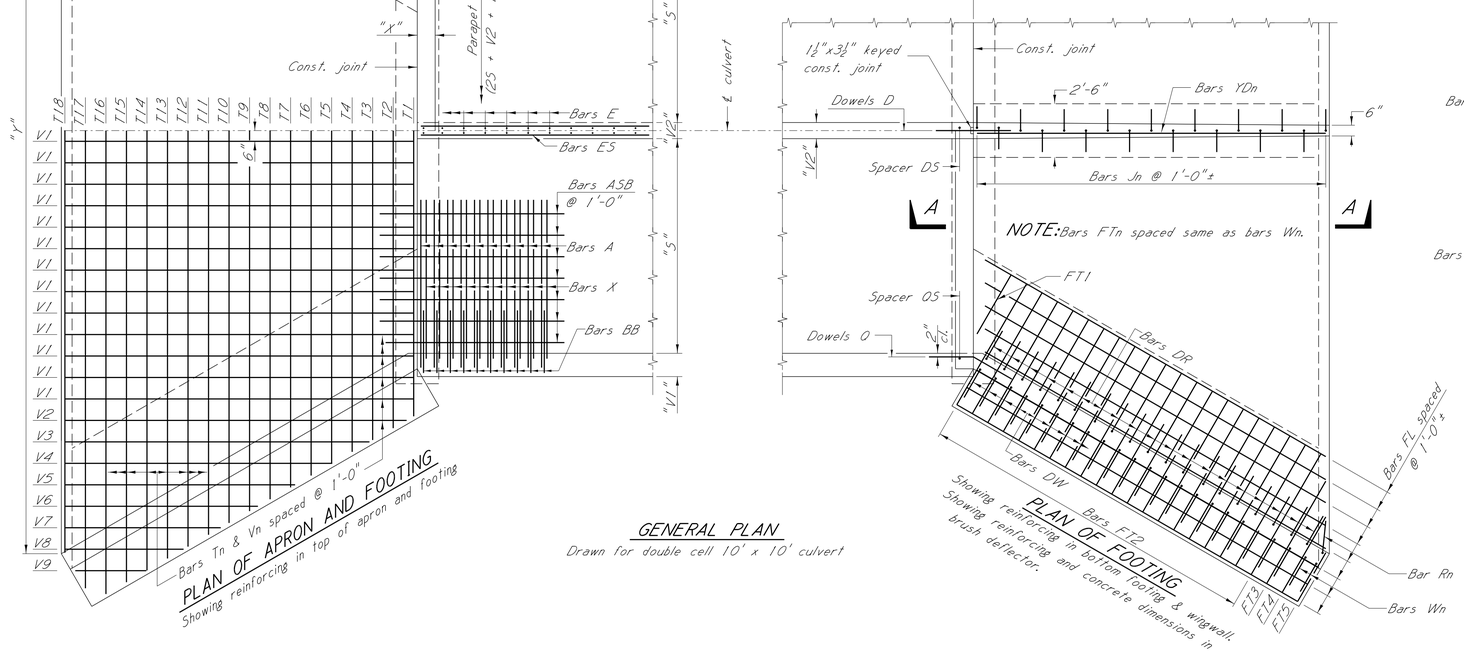
SECTION A-A



SECTION B-B

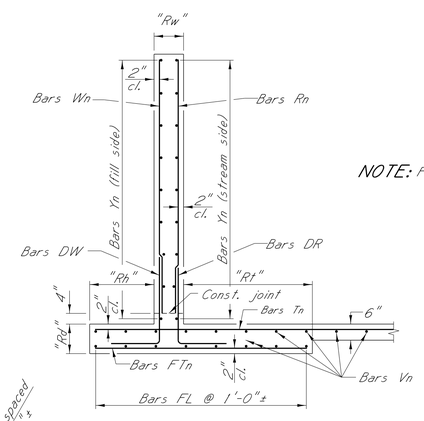


DETAIL "A"



GENERAL PLAN

Drawn for double cell 10' x 10' culvert



CROSS SECTION WINGWALL

NOTE: For bar bending details and quantities, see drawings IWS-6-2W, IWS-8-2W, IWS-10-2W & IWS-12-2W.

SPECIAL PROVISIONS REQUIRED:
Concrete Bridges And Structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-40 FT.

SHT. 1 OF 1

WORKING NUMBER IWD-2W

SHEET NUMBER 7127

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
											6'	8'	10'	12'	14'	16'
6'-0"	5'-6"	12'-8 1/2"	0'-4 1/2"	11'-4 9/16"	11"	9"	3'-0"	2'-0"	0'-6"	11'-4 9/16"	24'-8 1/2"+V2	28'-8 1/2"+V2	32'-8 1/2"+V2	36'-8 1/2"+V2	40'-8 1/2"+V2	44'-8 1/2"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	11.5541	1547.025	1.2374	177.887	0.7366	44.422	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	11.5541	1547.025	1.2374	177.887	0.7366	44.422	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	11.5541	1547.025	1.2374	177.887	0.7366	44.422	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	11.6237	1547.025	1.2374	177.887	0.7366	44.422	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	11.7826	1555.685	1.2374	177.971	0.7366	44.422	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	11.8886	1561.459	1.2374	178.026	0.7366	44.422	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	12.6775	1642.437	1.2374	177.887	0.9342	56.001	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	12.7656	1642.437	1.2374	177.887	0.9342	56.001	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	13.0022	1654.875	1.2374	177.998	0.9342	56.001	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	13.1205	1661.094	1.2374	178.054	0.9342	56.001	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	13.3571	1673.532	1.2374	178.165	0.9342	56.001	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	13.5644	1685.970	1.2374	178.277	0.9342	56.001	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	13.8133	1737.850	1.2374	177.887	1.1317	67.579	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	14.0505	1744.514	1.2374	177.943	1.1317	67.579	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	14.4425	1764.507	1.2374	178.110	1.1317	67.579	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	14.7989	1784.500	1.2374	178.277	1.1317	67.579	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	14.1399	1754.511	1.2374	178.026	1.1317	67.579	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	14.2408	1757.843	1.2374	178.054	1.1317	67.579	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	15.1342	1843.927	1.2374	177.971	1.3292	79.158	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	15.3904	1854.592	1.2374	178.054	1.3292	79.158	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	15.8730	1872.366	1.2374	178.193	1.3292	79.158	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	15.3785	1858.147	1.2374	178.082	1.3292	79.158	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	15.4917	1861.701	1.2374	178.110	1.3292	79.158	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	15.6764	1868.811	1.2374	178.165	1.3292	79.158	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	16.4144	1947.563	1.2374	178.026	1.5267	90.737	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	16.7743	1962.673	1.2374	178.138	1.5309	90.848	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	16.4941	1951.340	1.2374	178.054	1.5391	91.071	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	16.8624	1974.005	1.2374	178.221	1.5267	90.737	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	17.0096	1974.005	1.2374	178.221	1.5350	90.959	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	17.2138	1981.560	1.2374	178.277	1.5350	90.959	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	17.7508	2056.089	1.2374	178.110	1.7325	102.538	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	18.2279	2076.090	1.2374	178.249	1.7366	102.649	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	17.9709	2064.090	1.2374	178.165	1.7243	102.315	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	18.2820	2084.091	1.2374	178.305	1.7243	102.315	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	18.5578	2092.091	1.2374	178.360	1.7243	102.315	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	18.8932	2108.092	1.2374	178.472	1.7243	102.315	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-6-2W

SHEET NUMBER 7128

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB "W"

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1					2S+V2+5'-8 ½"
T2	#4	1	1	1	1	1	1					2S+V2+6'-9 ½"
T3	#4	1	1	1	1	1	1					2S+V2+7'-10"
T4	#4	1	1	1	1	1	1					2S+V2+8'-11"
T5	#4	1	1	1	1	1	1					2S+V2+9'-11 ½"
T6	#4	1	1	1	1	1	1					2S+V2+11'-0 ½"
T7	#4	1	1	1	1	1	1					2S+V2+12'-1"
T8	#4	1	1	1	1	1	1					2S+V2+13'-2"
T9	#4	1	1	1	1	1	1					2S+V2+14'-3"
T10	#4	1	1	1	1	1	1					2S+V2+15'-3 ½"
T11	#4	1	1	1	1	1	1					2S+V2+16'-4 ½"
T12	#4	1	1	1	1	1	1					2S+V2+15'-9 ½"
T13	#4	3	3	3	3	3	3					2S+V2+12'-7 ½"
V1	#4	18	22	26	30	34	38			11'-0 ½"	1'-8"	12'-8 ½"
V2	#4	2	2	2	2	2	2			10'-7"	1'-8"	12'-3"
V3	#4	2	2	2	2	2	2			8'-10 ½"	1'-8"	10'-6 ½"
V4	#4	2	2	2	2	2	2			7'-1 ½"	1'-8"	8'-9 ½"
V5	#4	2	2	2	2	2	2			5'-5"	1'-8"	7'-1"
V6	#4	2	2	2	2	2	2			3'-2 ½"		3'-2 ½"
FT1	#5	2	2	2	2	2	2					1'-10 ½"
FT2	#5	24	24	24	24	24	24					5'-5"
FT3	#5	2	2	2	2	2	2					4'-2"
FT4	#5	2	2	2	2	2	2					2'-6 ½"
FL	#4	14	14	14	14	14	14					12'-4 ½"
W1	#5	2	2	2	2	2	2				W+4'-10"	W+4'-10"
W2	#5	2	2	2	2	2	2				W+4'-5"	W+4'-5"
W3	#5	2	2	2	2	2	2				W+4'-0"	W+4'-0"
W4	#5	2	2	2	2	2	2				W+3'-7"	W+3'-7"
W5	#5	2	2	2	2	2	2				W+3'-2"	W+3'-2"
W6	#5	2	2	2	2	2	2				W+2'-9"	W+2'-9"
W7	#5	2	2	2	2	2	2				W+2'-4"	W+2'-4"
W8	#5	2	2	2	2	2	2				W+1'-11 ½"	W+1'-11 ½"
W9	#5	2	2	2	2	2	2				W+1'-6 ½"	W+1'-6 ½"
W10	#5	2	2	2	2	2	2			1'-6"	W+2'-1"	W+3'-7"
W11	#5	2	2	2	2	2	2			1'-6"	W+1'-8 ½"	W+3'-2 ½"
W12	#5	2	2	2	2	2	2			1'-6"	W+1'-3 ½"	W+2'-9 ½"
W13	#5	2	2	2	2	2	2			1'-6"	W+0'-10 ½"	W+2'-4½"
W14	#5	2	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11½"
R1	#4	2	2	2	2	2	2				W+4'-10"	W+4'-10"
R2	#4	2	2	2	2	2	2				W+4'-5"	W+4'-5"
R3	#4	2	2	2	2	2	2				W+4'-0"	W+4'-0"
R4	#4	2	2	2	2	2	2				W+3'-7"	W+3'-7"
R5	#4	2	2	2	2	2	2				W+3'-2"	W+3'-2"
R6	#4	2	2	2	2	2	2				W+2'-9"	W+2'-9"
R7	#4	2	2	2	2	2	2				W+2'-4"	W+2'-4"
R8	#4	2	2	2	2	2	2				W+1'-11 ½"	W+1'-11 ½"
R9	#4	2	2	2	2	2	2				W+1'-6 ½"	W+1'-6 ½"
R10	#4	2	2	2	2	2	2				W+1'-1 ½"	W+1'-1 ½"
R11	#4	2	2	2	2	2	2			1'-6"	W+1'-8 ½"	W+3'-2 ½"
R12	#4	2	2	2	2	2	2			1'-6"	W+1'-3 ½"	W+2'-9 ½"
R13	#4	2	2	2	2	2	2			1'-6"	W+0'-10 ½"	W+2'-4 ½"
R14	#4	2	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4	4					3'-3"
Y2	#4	4	4	4	4	4	4					5'-6 ½"
Y3	#4	4	4	4	4	4	4					7'-10 ½"
Y4	#4	4	4	4	4	4	4					10'-2"
Y5	#4	12	12	12	12	12	12					12'-4 ½"
F	#4	4	4	4	4	4	4					13'-6"
N	#4	16	20	24	28	32	36			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	15	19	23	27	31	35			0'-6"	T1+0'-6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					2S+V2+0'-11 ½"
O	#7	16	16	16	16	16	16			2'-11 ½"	2'-11 ½"	5'-11"
OS	#4	2	2	2	2	2	2					T1+6'-0"

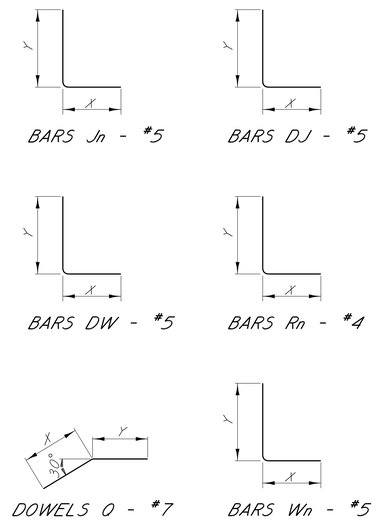
HEIGHT = 6 FT.

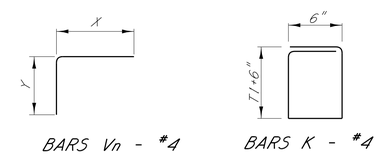
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB "W"

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
DR	#4	20	20	20	20	20	20			1'-6"	2'-5"	3'-11"
DW	#5	18	18	18	18	18	18			1'-6"	2'-9"	4'-3"

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			5'-4"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J2	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J3	#5	1		W1+4'-3"	W1+4'-3"
J4	#5	1		W1+3'-9 ½"	W1+3'-9 ½"
J5	#5	1		W1+3'-4 ½"	W1+3'-4 ½"
J6	#5	1		W1+2'-11"	W1+2'-11"
J7	#5	1		W1+2'-5 ½"	W1+2'-5 ½"
J8	#5	1	1'-0"	W1+2'-9 ½"	W1+3'-9 ½"
J9	#5	1	1'-0"	W1+2'-4"	W1+3'-4"
J10	#5	1	1'-0"	W1+1'-10 ½"	W1+2'-10 ½"
J11	#5	1	1'-0"	W1+1'-5 ½"	W1+2'-5 ½"
J12	#5	1	1'-0"	W1+1'-0"	W1+2'-0"
J13	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
YD1	#5	1			2'-4 ½"
YD2	#5	1			4'-5"
YD3	#5	1			6'-6"
YD4	#5	1			8'-7"
YD5	#5	1			10'-7 ½"
FD	#4	1			12'-3"
DJ	#5	7	1'-0"	2'-6"	3'-6"





BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-6-2W

SHEET NUMBER 7129

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, Ed. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN 8'	10'	12'	14'	16'
8'-0"	7'-1"	16'-4 1/4"	0'-4 1/2"	14'-6 7/16"	0'-11"	0'-9"	3'-0"	2'-0"	0'-8 3/4"	14'-6 7/16"	32'-4 1/4"+V2	36'-4 1/4"+V2	40'-4 1/4"+V2	44'-4 1/4"+V2	48'-4 1/4"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	17.5398	2265.076	1.9718	270.677	0.9342	56.001	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	17.6278	2265.076	1.9718	270.677	0.9342	56.001	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	17.8982	2280.143	1.9718	270.789	0.9342	56.001	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	18.0334	2287.677	1.9718	270.844	0.9342	56.001	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	18.3052	2302.744	1.9718	270.956	0.9383	56.112	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	18.5125	2314.044	1.9718	271.039	0.9465	56.335	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	18.9743	2376.966	1.9718	270.677	1.1317	67.579	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	19.2311	2388.935	1.9718	270.761	1.1317	67.579	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	19.5999	2408.882	1.9718	270.900	1.1317	67.579	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	20.0070	2432.818	1.9718	271.067	1.1317	67.579	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	19.3463	2400.903	1.9718	270.844	1.1358	67.691	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	19.5711	2412.871	1.9718	270.928	1.1481	68.025	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	20.5188	2501.493	1.9718	270.761	1.3292	80.717	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	20.7587	2514.129	1.9718	270.844	1.3292	80.717	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	21.3634	2539.401	1.9718	271.011	1.3292	80.717	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	20.8501	2523.165	2.0208	270.900	1.3354	80.884	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	21.0378	2530.977	1.9718	270.956	1.3333	80.828	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	21.2467	2539.401	1.9718	271.011	1.3498	81.273	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	22.0881	2627.355	1.9718	270.844	1.5267	92.295	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	22.4422	2640.659	1.9718	270.928	1.5267	92.295	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	22.2124	2636.224	1.9718	270.900	1.5267	92.295	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	22.5622	2653.963	1.9718	271.011	1.5432	92.741	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	22.8350	2662.833	1.9718	271.067	1.5473	92.852	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	23.0603	2671.702	1.9718	271.123	1.5514	92.963	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	23.6446	2749.896	1.9718	270.900	1.7284	103.985	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	24.2173	2773.183	1.9718	271.039	1.7325	104.097	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	23.8713	2763.868	1.9718	270.983	1.7407	104.319	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	24.3403	2787.155	1.9718	271.123	1.7490	104.542	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	24.7193	2805.785	1.9718	271.234	1.7572	104.765	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	25.0558	2816.324	2.0698	271.290	1.7695	105.099	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-8-2W

SHEET NUMBER 7130

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					2S+V2+5'-8 ½"
T2	#4	1	1	1	1	1					2S+V2+6'-10"
T3	#4	1	1	1	1	1					2S+V2+7'-11"
T4	#4	1	1	1	1	1					2S+V2+9'-0"
T5	#4	1	1	1	1	1					2S+V2+10'-1"
T6	#4	1	1	1	1	1					2S+V2+11'-2 ½"
T7	#4	1	1	1	1	1					2S+V2+12'-3 ½"
T8	#4	1	1	1	1	1					2S+V2+13'-4 ½"
T9	#4	1	1	1	1	1					2S+V2+14'-5 ½"
T10	#4	1	1	1	1	1					2S+V2+15'-7"
T11	#4	1	1	1	1	1					2S+V2+16'-8"
T12	#4	1	1	1	1	1					2S+V2+17'-9"
T13	#4	1	1	1	1	1					2S+V2+18'-10"
T14	#4	1	1	1	1	1					2S+V2+19'-11 ½"
T15	#4	1	1	1	1	1					2S+V2+19'-6 ½"
T16	#4	3	3	3	3	3					2S+V2+16'-3"
V1	#4	22	26	30	34	38			14'-2 ½"	1'-8"	15'-10 ½"
V2	#4	2	2	2	2	2			13'-9"	1'-8"	15'-5"
V3	#4	2	2	2	2	2			12'-0"	1'-8"	13'-8"
V4	#4	2	2	2	2	2			10'-3 ½"	1'-8"	11'-11 ½"
V5	#4	2	2	2	2	2			8'-6 ½"	1'-8"	10'-2 ½"
V6	#4	2	2	2	2	2			6'-10"	1'-8"	8'-6"
V7	#4	2	2	2	2	2			5'-1"	1'-8"	6'-9"
V8	#4	2	2	2	2	2			2'-9 ½"		2'-9 ½"
FT1	#5	2	2	2	2	2					2'-0"
FT2	#5	34	34	34	34	34					5'-5"
FT3	#5	2	2	2	2	2					4'-1"
FT4	#5	2	2	2	2	2					2'-6 ½"
FL	#4	14	14	14	14	14					16'-0 ½"
W1	#5	2	2	2	2	2				W+6'-5"	W+6'-5"
W2	#5	2	2	2	2	2				W+6'-0"	W+6'-0"
W3	#5	2	2	2	2	2				W+5'-7 ½"	W+5'-7 ½"
W4	#5	2	2	2	2	2				W+5'-3"	W+5'-3"
W5	#5	2	2	2	2	2				W+4'-10 ½"	W+4'-10 ½"
W6	#5	2	2	2	2	2				W+4'-5 ½"	W+4'-5 ½"
W7	#5	2	2	2	2	2				W+4'-1"	W+4'-1"
W8	#5	2	2	2	2	2				W+3'-8 ½"	W+3'-8 ½"
W9	#5	2	2	2	2	2				W+3'-4"	W+3'-4"
W10	#5	2	2	2	2	2				W+2'-11"	W+2'-11"
W11	#5	2	2	2	2	2				W+2'-6 ½"	W+2'-6 ½"
W12	#5	2	2	2	2	2				W+2'-2"	W+2'-2"
W13	#5	2	2	2	2	2				W+1'-9 ½"	W+1'-9 ½"
W14	#5	2	2	2	2	2				W+1'-4 ½"	W+1'-4 ½"
W15	#5	2	2	2	2	2				W+1'-0"	W+1'-0"
W16	#5	2	2	2	2	2			1'-6"	W+1'-7 ½"	W+3'-1 ½"
W17	#5	2	2	2	2	2			1'-6"	W+1'-2 ½"	W+2'-8 ½"
W18	#5	2	2	2	2	2			1'-6"	W+0'-10"	W+2'-4"
W19	#5	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
R1	#4	2	2	2	2	2				W+6'-5"	W+6'-5"
R2	#4	2	2	2	2	2				W+6'-0"	W+6'-0"
R3	#4	2	2	2	2	2				W+5'-7"	W+5'-7"
R4	#4	2	2	2	2	2				W+5'-2"	W+5'-2"
R5	#4	2	2	2	2	2				W+4'-9 ½"	W+4'-9 ½"
R6	#4	2	2	2	2	2				W+4'-4 ½"	W+4'-4 ½"
R7	#4	2	2	2	2	2				W+3'-11 ½"	W+3'-11 ½"
R8	#4	2	2	2	2	2				W+3'-6 ½"	W+3'-6 ½"
R9	#4	2	2	2	2	2				W+3'-1 ½"	W+3'-1 ½"
R10	#4	2	2	2	2	2				W+2'-9"	W+2'-9"
R11	#4	2	2	2	2	2				W+2'-4"	W+2'-4"
R12	#4	2	2	2	2	2				W+1'-11"	W+1'-11"
R13	#4	2	2	2	2	2				W+1'-6"	W+1'-6"
R14	#4	2	2	2	2	2				W+1'-1"	W+1'-1"
R15	#4	2	2	2	2	2				W+0'-8 ½"	W+0'-8 ½"
R16	#4	2	2	2	2	2			1'-6"	W+1'-3 ½"	W+2'-9 ½"

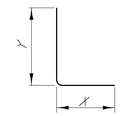
HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
R17	#4	2	2	2	2	2			1'-6"	W+0'-10 ½"	W+2'-4 ½"
R18	#4	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4					3'-3"
Y2	#4	4	4	4	4	4					5'-6 ½"
Y3	#4	4	4	4	4	4					7'-10 ½"
Y4	#4	4	4	4	4	4					10'-2"
Y5	#4	4	4	4	4	4					12'-6"
Y6	#4	4	4	4	4	4					14'-9 ½"
Y7	#4	12	12	12	12	12					16'-0 ½"
F	#4	4	4	4	4	4					17'-5 ½"
N	#4	20	24	29	33	37			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	19	23	27	31	35			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					2S+V2+0'-11 ½"
O	#7	20	20	20	20	20			2'-11 ½"	2'-11 ½"	5'-11"
OS	#4	2	2	2	2	2					T1+8'-0"
DW	#5	30	30	30	30	30			1'-6"	2'-9"	4'-3"
DR	#4	30	30	30	30	30			1'-6"	2'-5"	3'-11"

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			5'-4"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+6'-10 ¾"	W1+6'-10 ¾"
J2	#5	1		W1+6'-5 ¼"	W1+6'-5 ¼"
J3	#5	1		W1+5'-11 ¾"	W1+5'-11 ¾"
J4	#5	1		W1+5'-5 ¼"	W1+5'-5 ¼"
J5	#5	1		W1+5'-0 ¼"	W1+5'-0 ¼"
J6	#5	1		W1+4'-6 ¼"	W1+4'-6 ¼"
J7	#5	1		W1+4'-0 ¾"	W1+4'-0 ¾"
J8	#5	1		W1+3'-7 ¼"	W1+3'-7 ¼"
J9	#5	1		W1+3'-1 ¼"	W1+3'-1 ¼"
J10	#5	1		W1+2'-7 ¾"	W1+2'-7 ¾"
J11	#5	1		W1+2'-2 ¼"	W1+2'-2 ¼"
J12	#5	1	1'-0"	W1+2'-5 ¼"	W1+3'-5 ¼"
J13	#5	1	1'-0"	W1+1'-11 ¼"	W1+2'-11 ¼"
J14	#5	1	1'-0"	W1+1'-6 ¼"	W1+2'-6 ¼"
J15	#5	1	1'-0"	W1+1'-0 ¼"	W1+2'-0 ¼"
J16	#5	1	1'-0"	W1+0'-6 ¾"	W1+1'-6 ¾"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-2 ½"
DJ	#5	11	1'-0"	2'-6"	3'-6"
FD	#4	1			15'-10 ½"



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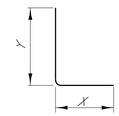

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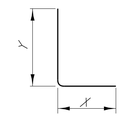

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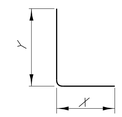

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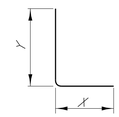

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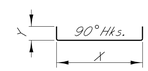

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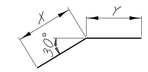
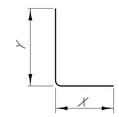


DOWELS O - #7



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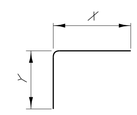

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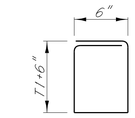


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-8-2W

SHEET NUMBER 7131

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN 10'	12'	14'	16'	18'
10'-0"	8'-1"	18'-8"	0'-5"	16'-7"	0'-11"	0'-10"	4'-0"	2'-0"	1'-8 ½"	16'-7"	38'-8"+V2	42'-8"+V2	46'-8"+V2	50'-8"+V2	54'-8"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 ½"	9"	9"	2'-9"	24.8320	3044.077	2.8290	376.744	1.1317	69.138	5.3148	1283.649
		10'-0"	10"	1'-0 ½"	9"	9"	2'-10"	25.0709	3052.974	2.8290	376.800	1.1317	69.138	5.3519	1292.058
		15'-0"	1'-1"	1'-2 ½"	10"	9"	3'-1"	25.5059	3079.664	2.8290	376.967	1.1399	69.361	5.4383	1309.765
		20'-0"	1'-3 ½"	1'-5"	11 ½"	9"	3'-3 ½"	25.9332	3101.906	2.8290	377.106	1.1523	69.695	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 ½"	9"	3'-1"	25.4752	3079.664	2.8290	376.967	1.1605	69.917	5.4938	1317.598
		30'-0"	1'-2 ½"	1'-3 ½"	1'-2"	9"	3'-2 ½"	25.7354	3093.009	2.8290	377.050	1.1728	70.251	5.5679	1331.546
240	12x10	5'-0"	10 ½"	1'-0"	9"	9"	2'-10 ½"	26.6003	3180.779	2.8290	376.828	1.3292	80.717	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	26.9123	3194.793	2.8290	376.911	1.3292	80.717	5.9877	1452.136
		15'-0"	1'-2 ½"	1'-5"	10"	9"	3'-2 ½"	27.4084	3218.148	2.8290	377.050	1.3374	80.939	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 ½"	9"	3'-2"	27.1111	3213.477	2.8290	377.023	1.3498	81.273	6.0741	1467.670
		25'-0"	1'-3"	1'-3 ½"	1'-0 ½"	9"	3'-3"	27.3386	3222.819	2.8290	377.078	1.3580	81.496	6.1296	1479.240
		30'-0"	1'-4 ½"	1'-5"	1'-2"	9"	3'-4 ½"	27.6190	3236.832	2.8290	377.162	1.3704	81.830	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 ½"	9"	9"	3'-0"	28.3099	3318.818	2.8290	376.911	1.5267	92.295	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	28.7430	3338.393	2.8290	377.023	1.5267	92.295	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	28.4560	3328.605	2.8290	376.967	1.5350	92.518	6.6049	1606.097
		20'-0"	1'-3 ½"	1'-3 ½"	11 ½"	9"	3'-3 ½"	28.9436	3353.074	2.8290	377.106	1.5473	92.852	6.7037	1629.128
		25'-0"	1'-5 ½"	1'-5 ½"	1'-1 ½"	9"	3'-5 ½"	29.3412	3372.649	2.8290	377.217	1.5638	93.297	6.8025	1650.508
		30'-0"	1'-6 ½"	1'-7"	1'-2"	9"	3'-6 ½"	29.5892	3382.437	2.8290	377.273	1.5679	93.409	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 ½"	9 ½"	9"	3'-1"	30.0382	3453.076	2.8290	376.967	1.7284	103.985	7.1914	1756.441
		10'-0"	1'-3 ½"	1'-4 ½"	10"	9"	3'-3 ½"	30.6073	3478.658	2.8290	377.106	1.7325	104.097	7.2716	1779.440
		15'-0"	1'-2 ½"	1'-2 ½"	11"	9"	3'-2 ½"	30.2954	3468.425	2.8290	377.050	1.7407	104.319	7.2593	1771.596
		20'-0"	1'-5 ½"	1'-5 ½"	1'-0"	9"	3'-5 ½"	30.9186	3499.124	2.8290	377.217	1.7490	104.542	7.3580	1798.364
		25'-0"	1'-7 ½"	1'-7 ½"	1'-2"	9"	3'-7 ½"	31.3447	3519.589	2.8290	377.329	1.7654	104.987	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	31.8795	3538.947	3.2785	377.412	1.7860	105.544	7.5679	1842.884
360	18x10	5'-0"	1'-2 ½"	1'-2 ½"	10 ½"	9"	3'-2 ½"	31.8415	3667.079	2.8290	377.050	1.9342	115.787	7.8395	1921.060
		10'-0"	1'-5 ½"	1'-6"	11"	9"	3'-5 ½"	32.5593	3699.113	2.8290	377.217	1.9383	115.898	7.9321	1950.165
		15'-0"	1'-4 ½"	1'-4 ½"	1'-0"	9"	3'-4 ½"	32.2836	3688.435	2.8290	377.162	1.9465	116.121	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	32.8375	3715.130	2.8290	377.301	1.9547	116.343	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	33.1878	3725.809	2.8290	377.357	1.9630	116.566	8.0741	1984.309
		30'-0"	1'-10 ½"	2'-0"	1'-3 ½"	1'-0"	3'-10 ½"	33.9204	3756.512	3.2785	377.496	1.9877	117.234	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered ¾".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-10-2W

SHEET NUMBER 7132

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					2S+V2+5'-10 ½"
T2	#4	1	1	1	1	1					2S+V2+6'-11 ½"
T3	#4	1	1	1	1	1					2S+V2+8'-1"
T4	#4	1	1	1	1	1					2S+V2+9'-2"
T5	#4	1	1	1	1	1					2S+V2+10'-3 ½"
T6	#4	1	1	1	1	1					2S+V2+11'-4 ½"
T7	#4	1	1	1	1	1					2S+V2+12'-6"
T8	#4	1	1	1	1	1					2S+V2+13'-7"
T9	#4	1	1	1	1	1					2S+V2+14'-8 ½"
T10	#4	1	1	1	1	1					2S+V2+15'-9 ½"
T11	#4	1	1	1	1	1					2S+V2+16'-11"
T12	#4	1	1	1	1	1					2S+V2+18'-0"
T13	#4	1	1	1	1	1					2S+V2+19'-1 ½"
T14	#4	1	1	1	1	1					2S+V2+20'-2 ½"
T15	#4	1	1	1	1	1					2S+V2+21'-4"
T16	#4	1	1	1	1	1					2S+V2+22'-5"
T17	#4	1	1	1	1	1					2S+V2+21'-10 ½"
T18	#4	3	3	3	3	3					2S+V2+18'-7"
V1	#4	26	30	34	38	42			16'-3"	1'-8"	17'-11"
V2	#4	2	2	2	2	2			15'-11"	1'-8"	17'-7"
V3	#4	2	2	2	2	2			14'-2 ½"	1'-8"	15'-11 ½"
V4	#4	2	2	2	2	2			12'-5 ½"	1'-8"	14'-1 ½"
V5	#4	2	2	2	2	2			10'-8 ½"	1'-8"	12'-4 ½"
V6	#4	2	2	2	2	2			9'-0"	1'-8"	10'-8"
V7	#4	2	2	2	2	2			7'-3"	1'-8"	8'-11"
V8	#4	2	2	2	2	2			5'-6 ½"	1'-8"	7'-2 ½"
V9	#4	2	2	2	2	2			3'-4"		3'-4"
FT1	#5	2	2	2	2	2					1'-9"
FT2	#5	2	2	2	2	2					3'-2"
FT3	#5	40	40	40	40	40					6'-6"
FT4	#5	2	2	2	2	2					5'-6"
FT5	#5	2	2	2	2	2					4'-1"
FT6	#5	2	2	2	2	2					2'-7 ½"
FL	#4	16	16	16	16	16					18'-4"
W1	#5	2	2	2	2	2				W+7'-5"	W+7'-5"
W2	#5	2	2	2	2	2				W+7'-0 ½"	W+7'-0 ½"
W3	#5	2	2	2	2	2				W+6'-8"	W+6'-8"
W4	#5	2	2	2	2	2				W+6'-4"	W+6'-4"
W5	#5	2	2	2	2	2				W+5'-11"	W+5'-11"
W6	#5	2	2	2	2	2				W+5'-7"	W+5'-7"
W7	#5	2	2	2	2	2				W+5'-3"	W+5'-3"
W8	#5	2	2	2	2	2				W+4'-10 ½"	W+4'-10 ½"
W9	#5	2	2	2	2	2				W+4'-6"	W+4'-6"
W10	#5	2	2	2	2	2				W+4'-2"	W+4'-2"
W11	#5	2	2	2	2	2				W+3'-9 ½"	W+3'-9 ½"
W12	#5	2	2	2	2	2				W+3'-5"	W+3'-5"
W13	#5	2	2	2	2	2				W+3'-1"	W+3'-1"
W14	#5	2	2	2	2	2				W+2'-8 ½"	W+2'-8 ½"
W15	#5	2	2	2	2	2				W+2'-4"	W+2'-4"
W16	#5	2	2	2	2	2				W+2'-0"	W+2'-0"
W17	#5	2	2	2	2	2				W+1'-7 ½"	W+1'-7 ½"
W18	#5	2	2	2	2	2				W+1'-3"	W+1'-3"
W19	#5	2	2	2	2	2				W+0'-11"	W+0'-11"
W20	#5	2	2	2	2	2				W+0'-6 ½"	W+0'-6 ½"
W21	#5	2	2	2	2	2				W+0'-2 ½"	W+0'-2 ½"
W22	#5	2	2	2	2	2			1'-6"	W+0'-10"	W+2'-4"
W23	#5	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
R1	#4	2	2	2	2	2				W+7'-5"	W+7'-5"
R2	#4	2	2	2	2	2				W+7'-0"	W+7'-0"
R3	#4	2	2	2	2	2				W+6'-7"	W+6'-7"
R4	#4	2	2	2	2	2				W+6'-2"	W+6'-2"
R5	#4	2	2	2	2	2				W+5'-9"	W+5'-9"
R6	#4	2	2	2	2	2				W+5'-4"	W+5'-4"
R7	#4	2	2	2	2	2				W+4'-11"	W+4'-11"

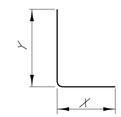
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
R8	#4	2	2	2	2	2				W+4'-6"	W+4'-6"
R9	#4	2	2	2	2	2				W+4'-1"	W+4'-1"
R10	#4	2	2	2	2	2				W+3'-7 ½"	W+3'-7 ½"
R11	#4	2	2	2	2	2				W+3'-2 ½"	W+3'-2 ½"
R12	#4	2	2	2	2	2				W+2'-9 ½"	W+2'-9 ½"
R13	#4	2	2	2	2	2				W+2'-4 ½"	W+2'-4 ½"
R14	#4	2	2	2	2	2				W+1'-11 ½"	W+1'-11 ½"
R15	#4	2	2	2	2	2				W+1'-6 ½"	W+1'-6 ½"
R16	#4	2	2	2	2	2				W+1'-1 ½"	W+1'-1 ½"
R17	#4	2	2	2	2	2				W+0'-8 ½"	W+0'-8 ½"
R18	#4	2	2	2	2	2				W+0'-3 ½"	W+0'-3 ½"
R19	#4	2	2	2	2	2				W-0'-1 ½"	W-0'-1 ½"
R20	#4	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4					3'-3"
Y2	#4	4	4	4	4	4					5'-6 ½"
Y3	#4	4	4	4	4	4					7'-10 ½"
Y4	#4	4	4	4	4	4					10'-2"
Y5	#4	4	4	4	4	4					12'-6"
Y6	#4	4	4	4	4	4					14'-9 ½"
Y7	#4	4	4	4	4	4					17'-1"
Y8	#4	16	16	16	16	20					18'-4"
F	#4	4	4	4	4	4					19'-11 ½"
N	#4	25	29	33	37	41			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	23	27	31	35	39			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					2S+V2+1'-1 ½"
O	#7	24	24	24	24	26			3'-0"	3'-0"	6'-0"
OS	#4	2	2	2	2	2					T1+10'-0"
DW	#5	42	42	42	42	42			1'-6"	2'-9"	4'-3"
DR	#4	38	38	38	38	38			1'-6"	2'-5"	3'-11"

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			5'-4"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+7'-11"	W1+7'-11"
J2	#5	1		W1+7'-5 ½"	W1+7'-5 ½"
J3	#5	1		W1+6'-11 ½"	W1+6'-11 ½"
J4	#5	1		W1+6'-6"	W1+6'-6"
J5	#5	1		W1+6'-0"	W1+6'-0"
J6	#5	1		W1+5'-6 ½"	W1+5'-6 ½"
J7	#5	1		W1+5'-0 ½"	W1+5'-0 ½"
J8	#5	1		W1+4'-7"	W1+4'-7"
J9	#5	1		W1+4'-1 ½"	W1+4'-1 ½"
J10	#5	1		W1+3'-7 ½"	W1+3'-7 ½"
J11	#5	1		W1+3'-2"	W1+3'-2"
J12	#5	1		W1+2'-8"	W1+2'-8"
J13	#5	1		W1+2'-2 ½"	W1+2'-2 ½"
J14	#5	1		W1+1'-8 ½"	W1+1'-8 ½"
J15	#5	1		W1+1'-3"	W1+1'-3"
J16	#5	1	1'-0"	W1+1'-6"	W1+2'-6"
J17	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J18	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	15	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	2			16'-3"
FD	#4	1			18'-2"



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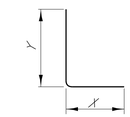

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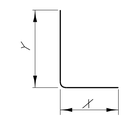

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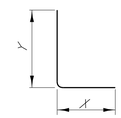

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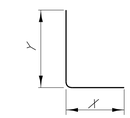

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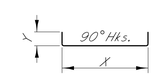

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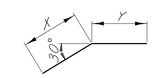
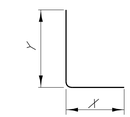


DOWELS O - #7



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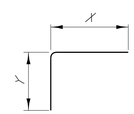

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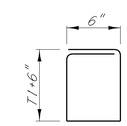


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-10-2W

SHEET NUMBER 7133

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN 12'	14'	16'	18'	20'
12'-0"	9'-4"	21'-6 3/4"	0'-5 1/2"	19'-1 9/16"	11"	11"	5'-0"	2'-0"	2'-5 1/4"	19'-1 9/16"	45'-6 3/4"+V2	49'-6 3/4"+V2	53'-6 3/4"+V2	57'-6 3/4"+V2	61'-6 3/4"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	34.7763	4357.213	3.8772	492.470	1.3292	80.717	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	35.1724	4374.335	3.8772	492.553	1.3416	81.051	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	35.7406	4402.871	3.8772	492.692	1.3580	81.496	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	35.0876	4374.335	3.8772	492.553	1.3374	80.939	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	35.2545	4385.749	3.8772	492.609	1.3416	81.051	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	35.4619	4397.164	3.8772	492.665	1.3457	81.162	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	36.8246	4511.831	3.8772	492.553	1.5267	92.295	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	37.3006	4529.621	3.8772	492.637	1.5391	92.629	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	36.9395	4517.761	3.8772	492.581	1.5556	93.075	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	37.2196	4535.551	3.8772	492.665	1.5432	92.741	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	37.4902	4547.411	3.8772	492.720	1.5514	92.963	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	37.6621	4559.271	3.8772	492.776	1.5514	92.963	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	38.7406	4746.733	3.8772	492.609	1.7284	103.985	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	39.3765	4777.774	3.8772	492.748	1.7366	104.208	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	38.9798	4759.150	3.8772	492.665	1.7531	104.653	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	39.3270	4777.774	3.8772	492.748	1.7490	104.542	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	39.7930	4800.741	4.5166	492.832	1.7695	105.099	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	40.0859	4813.158	4.5166	492.887	1.7737	105.210	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	40.7924	4903.968	3.8772	492.692	1.9342	115.787	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	41.5882	4942.553	3.8772	492.859	1.9383	115.898	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	40.9811	4910.399	3.8772	492.720	1.9506	116.232	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	41.5868	4940.464	4.5166	492.832	1.9671	116.677	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	42.0248	4959.757	4.5166	492.915	1.9753	116.900	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	42.6516	4991.912	4.5166	493.054	1.9835	117.123	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3 1/2"	11"	9"	4'-0 1/2"	42.8072	5055.885	3.8772	492.748	2.1358	127.477	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	42.8159	5049.231	3.8772	492.720	2.1440	127.699	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	43.2509	5073.534	4.5166	492.804	2.1646	128.256	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	43.7748	5100.148	4.5166	492.915	2.1728	128.479	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	44.6240	5146.724	4.5166	493.110	2.1811	128.701	9.0617	2235.611
		30'-0"	1'-11 1/2"	2'-0"	1'-3 1/2"	1'-0"	4'-8 1/2"	45.0885	5166.684	4.5166	493.193	2.1852	128.813	9.1173	2253.525

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-12-2W

SHEET NUMBER 7134

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					2S+V2+6'-0"
T2	#4	1	1	1	1	1					2S+V2+7'-2"
T3	#4	1	1	1	1	1					2S+V2+8'-3 1/2"
T4	#4	1	1	1	1	1					2S+V2+9'-5 1/2"
T5	#4	1	1	1	1	1					2S+V2+10'-7"
T6	#4	1	1	1	1	1					2S+V2+11'-8 1/2"
T7	#4	1	1	1	1	1					2S+V2+12'-10 1/2"
T8	#4	1	1	1	1	1					2S+V2+14'-0"
T9	#4	1	1	1	1	1					2S+V2+15'-2"
T10	#4	1	1	1	1	1					2S+V2+16'-3 1/2"
T11	#4	1	1	1	1	1					2S+V2+17'-5 1/2"
T12	#4	1	1	1	1	1					2S+V2+18'-7"
T13	#4	1	1	1	1	1					2S+V2+19'-8 1/2"
T14	#4	1	1	1	1	1					2S+V2+20'-10 1/2"
T15	#4	1	1	1	1	1					2S+V2+22'-0"
T16	#4	1	1	1	1	1					2S+V2+23'-2"
T17	#4	1	1	1	1	1					2S+V2+24'-3 1/2"
T18	#4	1	1	1	1	1					2S+V2+25'-5"
T19	#4	1	1	1	1	1					2S+V2+24'-11"
T20	#4	3	3	3	3	3					2S+V2+21'-5 1/2"
V1	#4	30	34	38	42	46			18'-9 1/2"	1'-8"	20'-5 1/2"
V2	#4	2	2	2	2	2			18'-7"	1'-8"	20'-3"
V3	#4	2	2	2	2	2			16'-10 1/2"	1'-8"	18'-6 1/2"
V4	#4	2	2	2	2	2			15'-1 1/2"	1'-8"	16'-9 1/2"
V5	#4	2	2	2	2	2			13'-5"	1'-8"	15'-1"
V6	#4	2	2	2	2	2			11'-8"	1'-8"	13'-4"
V7	#4	2	2	2	2	2			9'-11"	1'-8"	11'-7"
V8	#4	2	2	2	2	2			8'-2 1/2"	1'-8"	9'-10 1/2"
V9	#4	2	2	2	2	2			6'-5 1/2"	1'-8"	8'-1 1/2"
V10	#4	2	2	2	2	2			4'-6"		4'-6"
V11	#4	2	2	2	2	2			2'-2 1/2"		2'-2 1/2"
FT1	#5	2	2	2	2	2					2'-3"
FT2	#5	2	2	2	2	2					3'-5"
FT3	#5	2	2	2	2	2					4'-6 1/2"
FT4	#5	56	56	56	56	56					7'-7"
FT5	#5	2	2	2	2	2					7'-3 1/2"
FT6	#5	2	2	2	2	2					6'-2"
FT7	#5	2	2	2	2	2					5'-0"
FT8	#5	2	2	2	2	2					3'-10 1/2"
FT9	#5	2	2	2	2	2					2'-8 1/2"
FL	#4	18	18	18	18	18					21'-3"
W1	#5	2	2	2	2	2				W+8'-8"	W+8'-8"
W2	#5	2	2	2	2	2				W+8'-4 1/2"	W+8'-4 1/2"
W3	#5	2	2	2	2	2				W+8'-1"	W+8'-1"
W4	#5	2	2	2	2	2				W+7'-9 1/2"	W+7'-9 1/2"
W5	#5	2	2	2	2	2				W+7'-6"	W+7'-6"
W6	#5	2	2	2	2	2				W+7'-2 1/2"	W+7'-2 1/2"
W7	#5	2	2	2	2	2				W+6'-11"	W+6'-11"
W8	#5	2	2	2	2	2				W+6'-7 1/2"	W+6'-7 1/2"
W9	#5	2	2	2	2	2				W+6'-4 1/2"	W+6'-4 1/2"
W10	#5	2	2	2	2	2				W+6'-1"	W+6'-1"
W11	#5	2	2	2	2	2				W+5'-9 1/2"	W+5'-9 1/2"
W12	#5	2	2	2	2	2				W+5'-6"	W+5'-6"
W13	#5	2	2	2	2	2				W+5'-2 1/2"	W+5'-2 1/2"
W14	#5	2	2	2	2	2				W+4'-11"	W+4'-11"
W15	#5	2	2	2	2	2				W+4'-7 1/2"	W+4'-7 1/2"
W16	#5	2	2	2	2	2				W+4'-4"	W+4'-4"
W17	#5	2	2	2	2	2				W+4'-0 1/2"	W+4'-0 1/2"
W18	#5	2	2	2	2	2				W+3'-9 1/2"	W+3'-9 1/2"
W19	#5	2	2	2	2	2				W+3'-6"	W+3'-6"
W20	#5	2	2	2	2	2				W+3'-2 1/2"	W+3'-2 1/2"
W21	#5	2	2	2	2	2				W+2'-11"	W+2'-11"
W22	#5	2	2	2	2	2				W+2'-7 1/2"	W+2'-7 1/2"
W23	#5	2	2	2	2	2				W+2'-4"	W+2'-4"

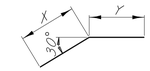
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

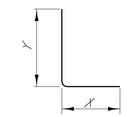
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
W24	#5	2	2	2	2	2				W+2'-0 1/2"	W+2'-0 1/2"
W25	#5	2	2	2	2	2				W+1'-9"	W+1'-9"
W26	#5	2	2	2	2	2				W+1'-5 1/2"	W+1'-5 1/2"
W27	#5	2	2	2	2	2				W+1'-2 1/2"	W+1'-2 1/2"
W28	#5	2	2	2	2	2				W+0'-11"	W+0'-11"
W29	#5	2	2	2	2	2				W+0'-7 1/2"	W+0'-7 1/2"
W30	#5	2	2	2	2	2				W+0'-4"	W+0'-4"
W31	#5	2	2	2	2	2				W+0'-0 1/2"	W+0'-0 1/2"
W32	#5	2	2	2	2	2				W-0'-3"	W-0'-3"
W33	#5	2	2	2	2	2				W-0'-6 1/2"	W-0'-6 1/2"
R1	#4	2	2	2	2	2				W+8'-8"	W+8'-8"
R2	#4	2	2	2	2	2				W+8'-3"	W+8'-3"
R3	#4	2	2	2	2	2				W+7'-10"	W+7'-10"
R4	#4	2	2	2	2	2				W+7'-5"	W+7'-5"
R5	#4	2	2	2	2	2				W+7'-0"	W+7'-0"
R6	#4	2	2	2	2	2				W+6'-7"	W+6'-7"
R7	#4	2	2	2	2	2				W+6'-2"	W+6'-2"
R8	#4	2	2	2	2	2				W+5'-9"	W+5'-9"
R9	#4	2	2	2	2	2				W+5'-4"	W+5'-4"
R10	#4	2	2	2	2	2				W+4'-11"	W+4'-11"
R11	#4	2	2	2	2	2				W+4'-5 1/2"	W+4'-5 1/2"
R12	#4	2	2	2	2	2				W+4'-0 1/2"	W+4'-0 1/2"
R13	#4	2	2	2	2	2				W+3'-7 1/2"	W+3'-7 1/2"
R14	#4	2	2	2	2	2				W+3'-2 1/2"	W+3'-2 1/2"
R15	#4	2	2	2	2	2				W+2'-9 1/2"	W+2'-9 1/2"
R16	#4	2	2	2	2	2				W+2'-4 1/2"	W+2'-4 1/2"
R17	#4	2	2	2	2	2				W+1'-11 1/2"	W+1'-11 1/2"
R18	#4	2	2	2	2	2				W+1'-6 1/2"	W+1'-6 1/2"
R19	#4	2	2	2	2	2				W+1'-1 1/2"	W+1'-1 1/2"
R20	#4	2	2	2	2	2				W+0'-8 1/2"	W+0'-8 1/2"
R21	#4	2	2	2	2	2				W+0'-3 1/2"	W+0'-3 1/2"
R22	#4	2	2	2	2	2				W-0'-1 1/2"	W-0'-1 1/2"
R23	#4	2	2	2	2	2				W-0'-6 1/2"	W-0'-6 1/2"
Y1	#4	4	4	4	4	4					2'-10 1/2"
Y2	#4	4	4	4	4	4					4'-9 1/2"
Y3	#4	4	4	4	4	4					6'-8 1/2"
Y4	#4	4	4	4	4	4					8'-7 1/2"
Y5	#4	4	4	4	4	4					10'-7"
Y6	#4	4	4	4	4	4					12'-6"
Y7	#4	4	4	4	4	4					14'-5"
Y8	#4	4	4	4	4	4					16'-4"
Y9	#4	4	4	4	4	4					18'-3"
Y10	#4	4	4	4	4	4					20'-2 1/2"
Y11	#4	20	20	24	24	24					21'-3"
F	#4	4	4	4	4	4					23'-1 1/2"
N	#4	29	33	37	41	45			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	27	31	35	39	43			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					2S+V2+1'-3"
O	#7	32	32	34	34	34			3'-0 1/2"	3'-0 1/2"	6'-1"
DW1	#5	66	66	66	66	66			1'-6"	2'-9"	4'-3"
DR1	#4	46	46	46	46	46			1'-6"	2'-5"	3'-11"
OS	#4	2	2	2	2	2					12'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

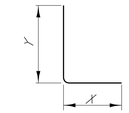
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			5'-4"
DS	#4	1			12'-0"+T1
J1	#5	1		W1+9'-2 1/4"	W1+9'-2 1/4"
J2	#5	1		W1+8'-8 1/4"	W1+8'-8 1/4"
J3	#5	1		W1+8'-2 3/4"	W1+8'-2 3/4"
J4	#5	1		W1+7'-8 3/4"	W1+7'-8 3/4"
J5	#5	1		W1+7'-2 3/4"	W1+7'-2 3/4"
J6	#5	1		W1+6'-8 3/4"	W1+6'-8 3/4"
J7	#5	1		W1+6'-2 3/4"	W1+6'-2 3/4"
J8	#5	1		W1+5'-8 3/4"	W1+5'-8 3/4"
J9	#5	1		W1+5'-2 3/4"	W1+5'-2 3/4"
J10	#5	1		W1+4'-8 3/4"	W1+4'-8 3/4"
J11	#5	1		W1+4'-3 1/4"	W1+4'-3 1/4"
J12	#5	1		W1+3'-9 1/4"	W1+3'-9 1/4"
J13	#5	1		W1+3'-3 1/4"	W1+3'-3 1/4"
J14	#5	1		W1+2'-9 1/4"	W1+2'-9 1/4"
J15	#5	1		W1+2'-3 1/4"	W1+2'-3 1/4"
J16	#5	1		W1+1'-9 1/4"	W1+1'-9 1/4"
J17	#5	1		W1+1'-3 1/4"	W1+1'-3 1/4"
J18	#5	1		W1+0'-9 3/4"	W1+0'-9 3/4"
J19	#5	1	1'-0"	W1+2'-0 3/4"	W1+2'-0 3/4"
J20	#5	1	1'-0"	W1+1'-6 1/2"	W1+1'-6 1/2"
YD1	#5	1		2'-3 1/2"	2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			14'-3 1/2"
YD8	#5	1			16'-3 1/2"
YD9	#5	1			18'-3 1/2"
YD10	#5	2			18'-9 1/2"
FD	#4	1			21'-0"
DJ	#5	18	1'-0"	2'-6"	3'-6"



DOWELS O - #7



BARS DW - #5



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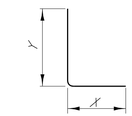

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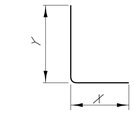

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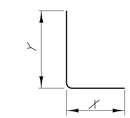

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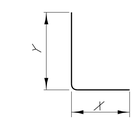

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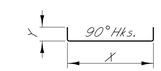

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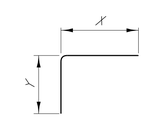

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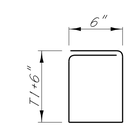


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 2

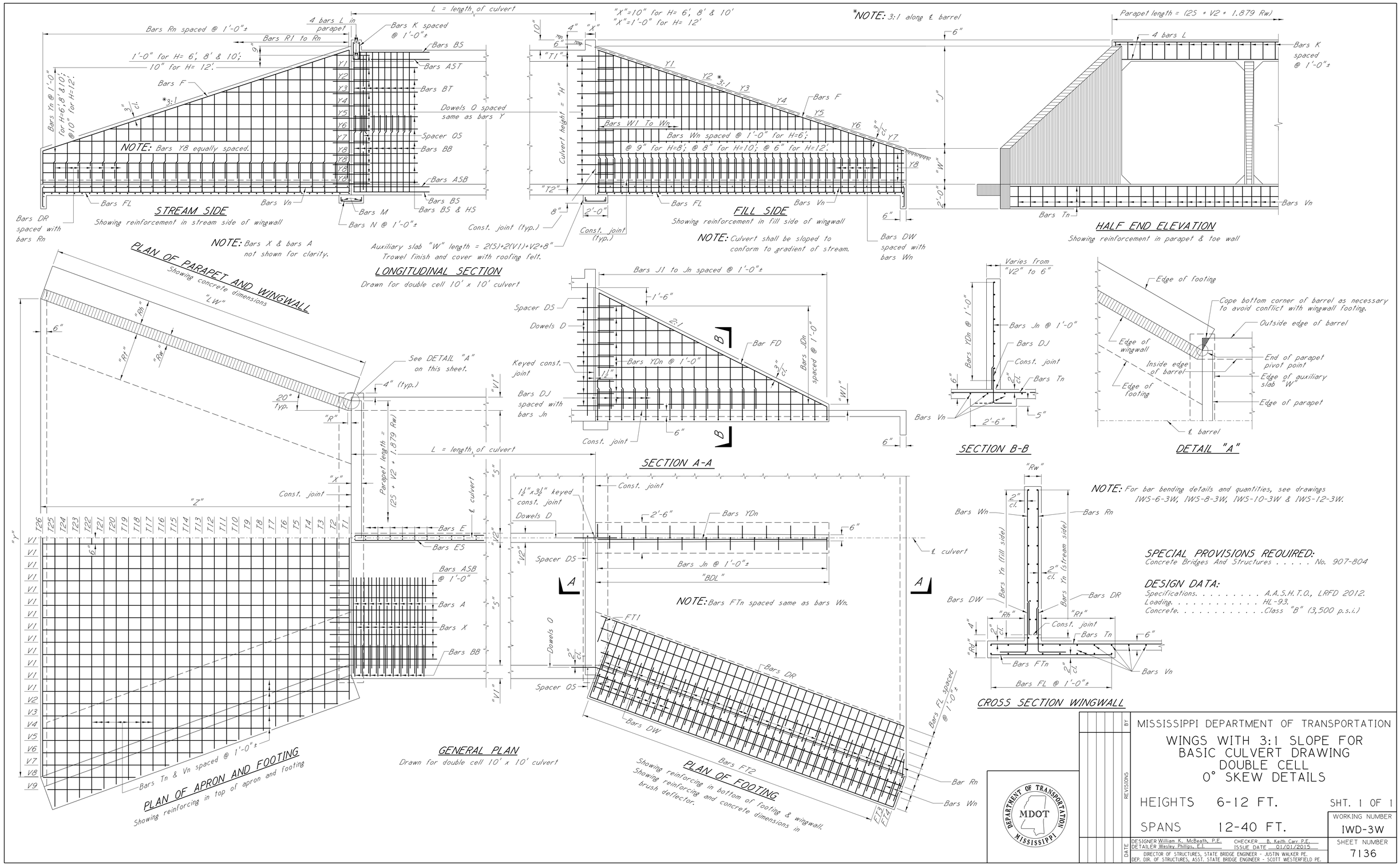
WORKING NUMBER IWD-12-2W

SHEET NUMBER 7135

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI


STREAM SIDE
Showing reinforcement in stream side of wingwall
NOTE: Bars Y8 equally spaced.
FILL SIDE
Showing reinforcement in fill side of wingwall
NOTE: Culvert shall be sloped to conform to gradient of stream.
*NOTE: 3:1 along ℄ barrel
"X"=10" for H= 6', 8' & 10'
"X"=1'-0" for H= 12'
HALF END ELEVATION
Showing reinforcement in parapet & toe wall
Parapet length = (25 + V2 + 1.879 Rw)
LONGITUDINAL SECTION
Drawn for double cell 10' x 10' culvert
NOTE: Bars X & bars A not shown for clarity.
Auxiliary slab "W" length = 2(S)+2(V1)+V2+8"
Trowel finish and cover with roofing felt.
PLAN OF PARAPET AND WINGWALL
Showing concrete dimensions
SECTION A-A
SECTION B-B
DETAIL "A"
PLAN OF APRON AND FOOTING
Showing reinforcing in top of apron and footing
GENERAL PLAN
Drawn for double cell 10' x 10' culvert
PLAN OF FOOTING
Showing reinforcing in bottom of footing & wingwall.
Showing reinforcing and concrete dimensions in brush deflector.
CROSS SECTION WINGWALL
NOTE: For bar bending details and quantities, see drawings IWS-6-3W, IWS-8-3W, IWS-10-3W & IWS-12-3W.
SPECIAL PROVISIONS REQUIRED:
Concrete Bridges And Structures . . . . . No. 907-804
DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS
HEIGHTS 6-12 FT.
SPANS 12-40 FT.
SHT. 1 OF 1
WORKING NUMBER IWD-3W
SHEET NUMBER 7136
DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.
REVISIONS
DATE
BY
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN 6'	8'	10'	12'	14'	16'
6'-0"	5'-9"	18'-4 5/16"	0'-3 1/16"	17'-6 1/8"	11"	9"	3'-0"	2'-0"	0'-6"	11'-0"	24'-6 11/16"+V2	28'-6 11/16"+V2	32'-6 11/16"+V2	36'-6 11/16"+V2	40'-6 11/16"+V2	44'-6 11/16"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	16.6851	2093.870	1.2133	169.798	0.7366	44.422	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	16.6851	2093.870	1.2133	169.798	0.7366	44.422	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	16.6851	2093.870	1.2133	169.798	0.7366	44.422	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	16.7544	2093.870	1.2133	169.798	0.7366	44.422	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	16.9520	2105.097	1.2133	169.882	0.7366	44.422	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	17.0838	2112.581	1.2133	169.938	0.7366	44.422	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	18.2623	2221.680	1.2133	169.798	0.9342	56.001	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	18.3502	2221.680	1.2133	169.798	0.9342	56.001	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	18.6384	2237.540	1.2133	169.910	0.9342	56.001	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	18.7825	2245.470	1.2133	169.965	0.9342	56.001	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	19.0707	2261.330	1.2133	170.077	0.9342	56.001	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	19.3296	2277.190	1.2133	170.188	0.9342	56.001	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	19.8519	2349.491	1.2133	169.798	1.1317	67.579	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	20.1147	2357.866	1.2133	169.854	1.1317	67.579	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	20.5840	2382.992	1.2133	170.021	1.1317	67.579	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	21.0179	2408.118	1.2133	170.188	1.1317	67.579	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	20.2430	2370.429	1.2133	169.938	1.1317	67.579	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	20.3567	2374.617	1.2133	169.965	1.1317	67.579	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	21.6654	2490.533	1.2133	169.882	1.3292	79.158	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	21.9602	2503.764	1.2133	169.965	1.3292	79.158	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	22.5071	2525.815	1.2133	170.105	1.3292	79.158	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	21.9614	2508.174	1.2133	169.993	1.3292	79.158	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	22.0874	2512.584	1.2133	170.021	1.3292	79.158	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	22.2978	2521.405	1.2133	170.077	1.3292	79.158	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	23.4254	2628.277	1.2133	169.938	1.5267	90.737	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	23.8366	2646.809	1.2133	170.049	1.5309	90.848	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	23.5178	2632.910	1.2133	169.965	1.5391	91.071	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	23.9638	2660.708	1.2133	170.132	1.5267	90.737	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	24.1104	2660.708	1.2133	170.132	1.5350	90.959	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	24.3403	2669.974	1.2133	170.188	1.5350	90.959	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	25.2543	2843.482	1.2133	170.021	1.7325	102.538	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	25.7954	2867.760	1.2133	170.160	1.7366	102.649	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	25.5003	2853.193	1.2133	170.077	1.7243	102.315	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	25.8761	2877.471	1.2133	170.216	1.7243	102.315	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	26.1775	2887.183	1.2133	170.272	1.7243	102.315	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	26.5644	2906.605	1.2133	170.383	1.7243	102.315	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-6-3W

SHEET NUMBER 7137

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1					2S+V2+5'-5"
T2	#4	1	1	1	1	1	1					2S+V2+6'-1 1/2"
T3	#4	1	1	1	1	1	1					2S+V2+6'-10"
T4	#4	1	1	1	1	1	1					2S+V2+7'-6"
T5	#4	1	1	1	1	1	1					2S+V2+8'-2 1/2"
T6	#4	1	1	1	1	1	1					2S+V2+8'-11"
T7	#4	1	1	1	1	1	1					2S+V2+9'-7"
T8	#4	1	1	1	1	1	1					2S+V2+10'-3 1/2"
T9	#4	1	1	1	1	1	1					2S+V2+11'-0"
T10	#4	1	1	1	1	1	1					2S+V2+11'-8"
T11	#4	1	1	1	1	1	1					2S+V2+12'-4 1/2"
T12	#4	1	1	1	1	1	1					2S+V2+13'-1"
T13	#4	1	1	1	1	1	1					2S+V2+13'-9"
T14	#4	1	1	1	1	1	1					2S+V2+14'-5 1/2"
T15	#4	1	1	1	1	1	1					2S+V2+15'-2"
T16	#4	1	1	1	1	1	1					2S+V2+15'-10"
T17	#4	1	1	1	1	1	1					2S+V2+16'-6 1/2"
T18	#4	1	1	1	1	1	1					2S+V2+17'-3"
T19	#4	3	3	3	3	3	3					2S+V2+12'-6"
V1	#4	18	22	26	30	34	38			17'-2"	1'-8"	18'-10"
V2	#4	2	2	2	2	2	2			16'-0 1/2"	1'-8"	17'-8 1/2"
V3	#4	2	2	2	2	2	2			13'-3 1/2"	1'-8"	14'-11 1/2"
V4	#4	2	2	2	2	2	2			10'-6 1/2"	1'-8"	12'-2 1/2"
V5	#4	2	2	2	2	2	2			7'-9 1/2"	1'-8"	9'-5 1/2"
V6	#4	2	2	2	2	2	2			4'-9"		4'-9"
FT1	#5	38	38	38	38	38	38					5'-5"
FT2	#5	2	2	2	2	2	2					2'-6 1/2"
FL	#4	14	14	14	14	14	14					18'-0 1/2"
W1	#5	2	2	2	2	2	2				W+5'-1"	W+5'-1"
W2	#5	2	2	2	2	2	2				W+4'-9 1/2"	W+4'-9 1/2"
W3	#5	2	2	2	2	2	2				W+4'-6"	W+4'-6"
W4	#5	2	2	2	2	2	2				W+4'-2 1/2"	W+4'-2 1/2"
W5	#5	2	2	2	2	2	2				W+3'-11"	W+3'-11"
W6	#5	2	2	2	2	2	2				W+3'-7 1/2"	W+3'-7 1/2"
W7	#5	2	2	2	2	2	2				W+3'-4"	W+3'-4"
W8	#5	2	2	2	2	2	2				W+3'-0 1/2"	W+3'-0 1/2"
W9	#5	2	2	2	2	2	2				W+2'-8 1/2"	W+2'-8 1/2"
W10	#5	2	2	2	2	2	2				W+2'-5"	W+2'-5"
W11	#5	2	2	2	2	2	2				W+2'-1 1/2"	W+2'-1 1/2"
W12	#5	2	2	2	2	2	2				W+1'-10"	W+1'-10"
W13	#5	2	2	2	2	2	2				W+1'-6 1/2"	W+1'-6 1/2"
W14	#5	2	2	2	2	2	2			1'-6"	W+2'-3"	W+3'-9"
W15	#5	2	2	2	2	2	2			1'-6"	W+1'-11"	W+3'-5"
W16	#5	2	2	2	2	2	2			1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
W17	#5	2	2	2	2	2	2			1'-6"	W+1'-4"	W+2'-10"
W18	#5	2	2	2	2	2	2			1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
W19	#5	2	2	2	2	2	2			1'-6"	W+0'-9"	W+2'-3"
W20	#5	2	2	2	2	2	2			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
R1	#4	2	2	2	2	2	2				W+5'-1"	W+5'-1"
R2	#4	2	2	2	2	2	2				W+4'-9 1/2"	W+4'-9 1/2"
R3	#4	2	2	2	2	2	2				W+4'-6"	W+4'-6"
R4	#4	2	2	2	2	2	2				W+4'-2 1/2"	W+4'-2 1/2"
R5	#4	2	2	2	2	2	2				W+3'-11"	W+3'-11"
R6	#4	2	2	2	2	2	2				W+3'-7 1/2"	W+3'-7 1/2"
R7	#4	2	2	2	2	2	2				W+3'-4"	W+3'-4"
R8	#4	2	2	2	2	2	2				W+3'-0 1/2"	W+3'-0 1/2"
R9	#4	2	2	2	2	2	2				W+2'-8 1/2"	W+2'-8 1/2"
R10	#4	2	2	2	2	2	2				W+2'-5"	W+2'-5"
R11	#4	2	2	2	2	2	2				W+2'-1 1/2"	W+2'-1 1/2"
R12	#4	2	2	2	2	2	2				W+1'-10"	W+1'-10"
R13	#4	2	2	2	2	2	2				W+1'-6 1/2"	W+1'-6 1/2"
R14	#4	2	2	2	2	2	2				W+1'-3"	W+1'-3"
R15	#4	2	2	2	2	2	2			1'-6"	W+1'-11"	W+3'-5"
R16	#4	2	2	2	2	2	2			1'-6"	W+1'-7 1/2"	W+3'-1 1/2"

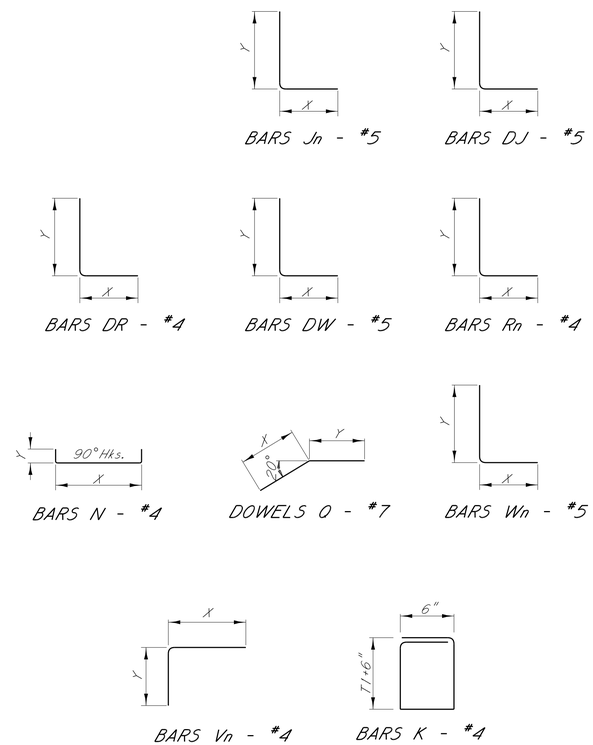
HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
R17	#4	2	2	2	2	2	2			1'-6"	W+1'-4"	W+2'-10"
R18	#4	2	2	2	2	2	2			1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
R19	#4	2	2	2	2	2	2			1'-6"	W+0'-9"	W+2'-3"
R20	#4	2	2	2	2	2	2			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
Y1	#4	4	4	4	4	4	4					4'-7"
Y2	#4	4	4	4	4	4	4					7'-9 1/2"
Y3	#4	4	4	4	4	4	4					10'-11 1/2"
Y4	#4	4	4	4	4	4	4					14'-2"
Y5	#4	4	4	4	4	4	4					17'-4 1/2"
Y6	#4	8	8	8	8	8	12					18'-0 1/2"
F	#4	4	4	4	4	4	4					18'-10 1/2"
N	#4	16	20	24	28	32	36			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	15	19	23	27	31	35			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					2S+V2+1'-1"
O	#7	16	16	16	16	16	18			2'-10 1/2"	2'-10 1/2"	5'-9"
OS	#4	2	2	2	2	2	2					6'-0"+T1
DW	#5	26	26	26	26	26	26			1'-6"	2'-9"	4'-3"
DR	#4	28	28	28	28	28	28			1'-6"	2'-5"	3'-11"

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			5'-4"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 1/2"	W1+5'-1 1/2"
J2	#5	1		W1+4'-8"	W1+4'-8"
J3	#5	1		W1+4'-2"	W1+4'-2"
J4	#5	1		W1+3'-8"	W1+3'-8"
J5	#5	1		W1+3'-2 1/2"	W1+3'-2 1/2"
J6	#5	1		W1+2'-8 1/2"	W1+2'-8 1/2"
J7	#5	1	1'-0"	W1+2'-11 1/2"	W1+3'-11 1/2"
J8	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J9	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J10	#5	1	1'-0"	W1+1'-6 1/2"	W1+2'-6 1/2"
J11	#5	1	1'-0"	W1+1'-0 1/2"	W1+2'-0 1/2"
J12	#5	1	1'-0"	W1+0'-6 1/2"	W1+1'-6 1/2"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
DJ	#5	6	1'-0"	2'-6"	3'-6"
FD	#4	1			11'-11"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-6-3W

SHEET NUMBER 7138

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
											8'	10'	12'	14'	16'
8'-0"	7'-4"	23'-4 15/16"	0'-3 1/16"	22'-3 1/16"	0'-11"	0'-9"	3'-0"	2'-0"	0'-6"	15'-0"	32'-0 3/16"+V2	36'-0 3/16"+V2	40'-0 3/16"+V2	44'-0 3/16"+V2	48'-0 3/16"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	25.2349	3211.280	2.0158	267.345	0.9342	56.001	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	25.3228	3211.280	2.0158	267.345	0.9342	56.001	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	25.6577	3232.425	2.0158	267.456	0.9342	56.001	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	25.8252	3242.998	2.0158	267.512	0.9342	56.001	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	26.1615	3264.143	2.0158	267.623	0.9342	56.112	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	26.4168	3280.002	2.0158	267.707	0.9465	56.335	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	27.2409	3362.470	2.0158	267.345	1.1317	56.579	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	27.5461	3378.997	2.0158	267.429	1.1317	67.579	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	27.9957	3406.542	2.0158	267.568	1.1317	67.579	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	28.4998	3439.596	2.0158	267.735	1.1317	67.579	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	27.7100	3395.524	2.0158	267.512	1.1358	67.025	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	27.9829	3412.051	2.0158	267.596	1.1481	67.691	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	29.4057	3530.856	2.0158	267.429	1.3292	80.717	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	29.6940	3548.051	2.0158	267.512	1.3292	80.717	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	30.3954	3582.441	2.0158	267.679	1.3292	80.717	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	29.8238	3560.322	2.0650	267.568	1.3354	80.884	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	30.0377	3570.978	2.0158	267.623	1.3333	80.828	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	30.2781	3582.441	2.0158	267.679	1.3498	80.273	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	31.5952	3700.578	2.0158	267.512	1.5267	92.295	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	31.9976	3718.441	2.0158	267.596	1.5267	92.295	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	31.7519	3712.486	2.0158	267.568	1.5267	92.295	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	32.1658	3736.304	2.0158	267.679	1.5432	92.741	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	32.4702	3748.212	2.0158	267.735	1.5473	92.852	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	32.7271	3760.121	2.0158	267.790	1.5514	92.963	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	33.7556	3950.643	2.0158	267.568	1.7284	103.985	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	34.4086	3981.528	2.0158	267.707	1.7325	104.097	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	34.0305	3969.174	2.0158	267.651	1.7407	104.319	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	34.5794	4000.059	2.0158	267.790	1.7490	104.542	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	35.0219	4024.767	2.0158	267.902	1.7572	104.765	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	35.4009	4038.735	2.1142	267.957	1.7695	105.099	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.

All concrete shall be Class "B".

Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2

Expansion joint material shall be bituminous fiber type unless otherwise noted.

All exposed corners shall be chamfered 3/4".

Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.

All bars shall be accurately spaced and securely wired at each intersection before placing concrete.

Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).

Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.

Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.

Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.

Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.

The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-8-3W

SHEET NUMBER 7139

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					2S+V2+5'-5"
T2	#4	1	1	1	1	1					2S+V2+6'-2"
T3	#4	1	1	1	1	1					2S+V2+6'-10 ½"
T4	#4	1	1	1	1	1					2S+V2+7'-7 ½"
T5	#4	1	1	1	1	1					2S+V2+8'-4"
T6	#4	1	1	1	1	1					2S+V2+9'-0 ½"
T7	#4	1	1	1	1	1					2S+V2+9'-9 ½"
T8	#4	1	1	1	1	1					2S+V2+10'-6"
T9	#4	1	1	1	1	1					2S+V2+11'-3"
T10	#4	1	1	1	1	1					2S+V2+11'-11 ½"
T11	#4	1	1	1	1	1					2S+V2+12'-8"
T12	#4	1	1	1	1	1					2S+V2+13'-5"
T13	#4	1	1	1	1	1					2S+V2+14'-1 ½"
T14	#4	1	1	1	1	1					2S+V2+14'-10 ½"
T15	#4	1	1	1	1	1					2S+V2+15'-7"
T16	#4	1	1	1	1	1					2S+V2+16'-4"
T17	#4	1	1	1	1	1					2S+V2+17'-0 ½"
T18	#4	1	1	1	1	1					2S+V2+17'-9"
T19	#4	1	1	1	1	1					2S+V2+18'-6"
T20	#4	1	1	1	1	1					2S+V2+19'-2 ½"
T21	#4	1	1	1	1	1					2S+V2+19'-11 ½"
T22	#4	1	1	1	1	1					2S+V2+20'-8"
T23	#4	3	3	3	3	3					2S+V2+15'-11 ½"
V1	#4	22	26	30	34	38			21'-11"	1'-8"	23'-7"
V2	#4	2	2	2	2	2			19'-9 ½"	1'-8"	22'-5 ½"
V3	#4	2	2	2	2	2			18'-0 ½"	1'-8"	19'-8 ½"
V4	#4	2	2	2	2	2			15'-3 ½"	1'-8"	16'-11 ½"
V5	#4	2	2	2	2	2			12'-6 ½"	1'-8"	14'-2 ½"
V6	#4	2	2	2	2	2			9'-9 ½"	1'-8"	11'-5 ½"
V7	#4	2	2	2	2	2			7'-0"	1'-8"	8'-8"
V8	#4	2	2	2	2	2			3'-11"		3'-11"
FT1	#5	2	2	2	2	2					1'-6"
FT2	#5	60	60	60	60	60					5'-5"
FT3	#5	2	2	2	2	2					4'-7"
FT4	#5	2	2	2	2	2					2'-6 ½"
FL	#4	14	14	14	14	14					23'-1"
W1	#5	2	2	2	2	2				W+6'-8"	W+6'-8"
W2	#5	2	2	2	2	2				W+6'-5 ½"	W+6'-5 ½"
W3	#5	2	2	2	2	2				W+6'-2 ½"	W+6'-2 ½"
W4	#5	2	2	2	2	2				W+6'-0"	W+6'-0"
W5	#5	2	2	2	2	2				W+5'-9"	W+5'-9"
W6	#5	2	2	2	2	2				W+5'-6"	W+5'-6"
W7	#5	2	2	2	2	2				W+5'-3 ½"	W+5'-3 ½"
W8	#5	2	2	2	2	2				W+5'-0 ½"	W+5'-0 ½"
W9	#5	2	2	2	2	2				W+4'-10"	W+4'-10"
W10	#5	2	2	2	2	2				W+4'-7"	W+4'-7"
W11	#5	2	2	2	2	2				W+4'-4"	W+4'-4"
W12	#5	2	2	2	2	2				W+4'-1 ½"	W+4'-1 ½"
W13	#5	2	2	2	2	2				W+3'-10 ½"	W+3'-10 ½"
W14	#5	2	2	2	2	2				W+3'-8"	W+3'-8"
W15	#5	2	2	2	2	2				W+3'-5"	W+3'-5"
W16	#5	2	2	2	2	2				W+3'-2 ½"	W+3'-2 ½"
W17	#5	2	2	2	2	2				W+2'-11 ½"	W+2'-11 ½"
W18	#5	2	2	2	2	2				W+2'-8 ½"	W+2'-8 ½"
W19	#5	2	2	2	2	2				W+2'-6"	W+2'-6"
W20	#5	2	2	2	2	2				W+2'-3"	W+2'-3"
W21	#5	2	2	2	2	2				W+2'-0 ½"	W+2'-0 ½"
W22	#5	2	2	2	2	2				W+1'-9 ½"	W+1'-9 ½"
W23	#5	2	2	2	2	2				W+1'-6 ½"	W+1'-6 ½"
W24	#5	2	2	2	2	2				W+1'-4"	W+1'-4"
W25	#5	2	2	2	2	2				W+1'-1"	W+1'-1"
W26	#5	2	2	2	2	2			1'-6"	W+1'-10"	W+3'-4"
W27	#5	2	2	2	2	2			1'-6"	W+1'-7 ½"	W+3'-1 ½"
W28	#5	2	2	2	2	2			1'-6"	W+1'-4 ½"	W+2'-10 ½"
W29	#5	2	2	2	2	2			1'-6"	W+1'-8"	W+2'-8"

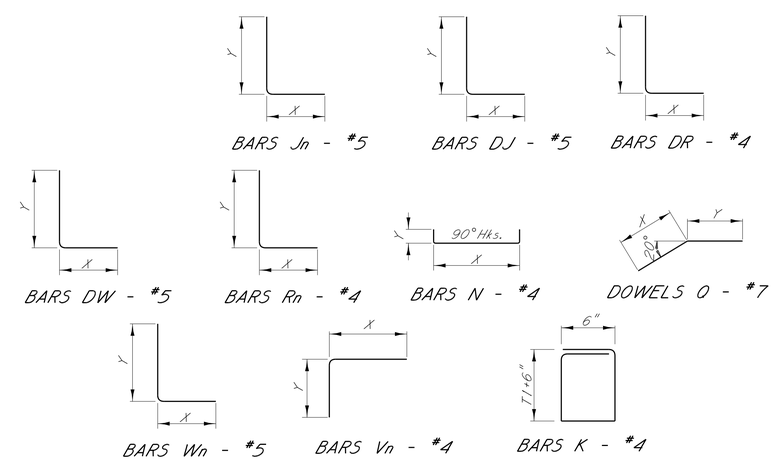
HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
W30	#5	2	2	2	2	2			1'-6"	W+0'-11"	W+2'-5"
W31	#5	2	2	2	2	2			1'-6"	W+0'-8"	W+2'-2"
W32	#5	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
R1	#4	2	2	2	2	2				W+6'-8"	W+6'-8"
R2	#4	2	2	2	2	2				W+6'-4 ½"	W+6'-4 ½"
R3	#4	2	2	2	2	2				W+6'-1"	W+6'-1"
R4	#4	2	2	2	2	2				W+5'-9 ½"	W+5'-9 ½"
R5	#4	2	2	2	2	2				W+5'-6"	W+5'-6"
R6	#4	2	2	2	2	2				W+5'-2"	W+5'-2"
R7	#4	2	2	2	2	2				W+4'-10 ½"	W+4'-10 ½"
R8	#4	2	2	2	2	2				W+4'-7"	W+4'-7"
R9	#4	2	2	2	2	2				W+4'-3 ½"	W+4'-3 ½"
R10	#4	2	2	2	2	2				W+3'-11 ½"	W+3'-11 ½"
R11	#4	2	2	2	2	2				W+3'-8"	W+3'-8"
R12	#4	2	2	2	2	2				W+3'-4 ½"	W+3'-4 ½"
R13	#4	2	2	2	2	2				W+3'-1"	W+3'-1"
R14	#4	2	2	2	2	2				W+2'-9"	W+2'-9"
R15	#4	2	2	2	2	2				W+2'-5 ½"	W+2'-5 ½"
R16	#4	2	2	2	2	2				W+2'-2"	W+2'-2"
R17	#4	2	2	2	2	2				W+1'-10 ½"	W+1'-10 ½"
R18	#4	2	2	2	2	2				W+1'-7"	W+1'-7"
R19	#4	2	2	2	2	2				W+1'-3"	W+1'-3"
R20	#4	2	2	2	2	2				W+0'-11 ½"	W+0'-11 ½"
R21	#4	2	2	2	2	2			1'-6"	W+1'-8"	W+3'-2"
R22	#4	2	2	2	2	2			1'-6"	W+1'-4"	W+2'-10"
R23	#4	2	2	2	2	2			1'-6"	W+1'-0 ½"	W+2'-6 ½"
R24	#4	2	2	2	2	2			1'-6"	W+0'-9"	W+2'-3"
R25	#4	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4					4'-7"
Y2	#4	4	4	4	4	4					7'-9 ½"
Y3	#4	4	4	4	4	4					10'-11 ½"
Y4	#4	4	4	4	4	4					14'-2"
Y5	#4	4	4	4	4	4					17'-4"
Y6	#4	4	4	4	4	4					20'-6 ½"
Y7	#4	12	12	12	12	16					23'-1"
F	#4	4	4	4	4	4					24'-2"
N	#4	20	24	29	33	37			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	19	23	27	31	35			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					2S+V2+1'-1"
O	#7	20	20	20	20	22			2'-10 ½"	2'-10 ½"	5'-9"
OS	#4	2	2	2	2	2					8'-0"+T1
DW	#5	50	50	50	50	50			1'-6"	2'-9"	4'-3"
DR	#4	40	40	40	40	40			1'-6"	2'-5"	3'-11"

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			5'-4"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+7'-1 ½"	W1+7'-1 ½"
J2	#5	1		W1+6'-8"	W1+6'-8"
J3	#5	1		W1+6'-2"	W1+6'-2"
J4	#5	1		W1+5'-8"	W1+5'-8"
J5	#5	1		W1+5'-2"	W1+5'-2"
J6	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J7	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J8	#5	1		W1+3'-8 ½"	W1+3'-8 ½"
J9	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J10	#5	1		W1+2'-9"	W1+2'-9"
J11	#5	1	1'-0"	W1+3'-0"	W1+4'-0"
J12	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J13	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J14	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J15	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J16	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
DJ	#5	10	1'-0"	2'-6"	3'-6"
FD	#4	1			16'-5"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-8-3W

SHEET NUMBER 7140

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
											10'	12'	14'	16'	18'
10'-0"	8'-4"	26'-7 1/4"	0'-3 7/16"	25'-3 7/16"	0'-11"	0'-10"	4'-0"	2'-0"	0'-6"	19'-0"	38'-2 3/8"+V2	42'-2 3/8"+V2	46'-2 3/8"+V2	50'-2 3/8"+V2	54'-2 3/8"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
100	10x10	5'-0"	9"	10 1/2"	9"	9"	2'-9"	35.5935	4436.022	3.0035	383.421	1.1317	69.138	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	35.8727	4448.939	3.0035	383.476	1.1317	69.138	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	36.4290	4487.688	3.0035	383.643	1.1399	69.361	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	36.9567	4519.980	3.0035	383.783	1.1523	69.695	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	36.3978	4487.688	3.0035	383.643	1.1605	69.917	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	36.7178	4507.063	3.0035	383.727	1.1728	70.251	5.5679	1331.546
120	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	38.0670	4623.399	3.0035	383.504	1.3292	80.717	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	38.4397	4643.442	3.0035	383.588	1.3292	80.717	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	39.0366	4676.846	3.0035	383.727	1.3374	80.939	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	38.7192	4670.166	3.0035	383.699	1.3498	81.273	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	38.9865	4683.527	3.0035	383.755	1.3580	81.496	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	39.3265	4703.570	3.0035	383.838	1.3704	81.830	6.2037	1494.232
140	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	40.4821	4812.112	3.0035	383.588	1.5267	92.295	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	40.9960	4839.726	3.0035	383.699	1.5267	92.295	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	40.6686	4825.919	3.0035	383.643	1.5350	92.518	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	41.2567	4860.437	3.0035	383.783	1.5473	92.852	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	41.7339	4888.051	3.0035	383.894	1.5638	93.297	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	42.0214	4901.858	3.0035	383.950	1.5679	93.409	6.8457	1661.100
160	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	42.8954	5091.909	3.0035	383.643	1.7284	103.985	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	43.5653	5127.819	3.0035	383.783	1.7325	104.097	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	43.2130	5113.455	3.0035	383.727	1.7407	104.319	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	43.9567	5156.546	3.0035	383.894	1.7490	104.542	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	44.4618	5185.274	3.0035	384.005	1.7654	104.987	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	45.0955	5212.164	3.4653	384.089	1.7860	105.544	7.5679	1842.884
180	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	45.4038	5283.238	3.0035	383.727	1.9342	115.787	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	46.2423	5327.666	3.0035	383.894	1.9383	115.898	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	45.9261	5312.856	3.0035	383.838	1.9465	116.121	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	46.5799	5349.879	3.0035	383.977	1.9547	116.343	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	46.9691	5364.689	3.0035	384.033	1.9630	116.566	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	47.8400	5407.055	3.4653	384.172	1.9877	117.234	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
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The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-10-3W

SHEET NUMBER 7141

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					2S+V2+5'-7"
T2	#4	1	1	1	1	1					2S+V2+6'-4"
T3	#4	1	1	1	1	1					2S+V2+7'-0 ½"
T4	#4	1	1	1	1	1					2S+V2+7'-9"
T5	#4	1	1	1	1	1					2S+V2+8'-6"
T6	#4	1	1	1	1	1					2S+V2+9'-2 ½"
T7	#4	1	1	1	1	1					2S+V2+9'-11 ½"
T8	#4	1	1	1	1	1					2S+V2+10'-8"
T9	#4	1	1	1	1	1					2S+V2+11'-5"
T10	#4	1	1	1	1	1					2S+V2+12'-1 ½"
T11	#4	1	1	1	1	1					2S+V2+12'-10 ½"
T12	#4	1	1	1	1	1					2S+V2+13'-7"
T13	#4	1	1	1	1	1					2S+V2+14'-3 ½"
T14	#4	1	1	1	1	1					2S+V2+15'-0 ½"
T15	#4	1	1	1	1	1					2S+V2+15'-9"
T16	#4	1	1	1	1	1					2S+V2+16'-6"
T17	#4	1	1	1	1	1					2S+V2+17'-2 ½"
T18	#4	1	1	1	1	1					2S+V2+17'-11 ½"
T19	#4	1	1	1	1	1					2S+V2+18'-8"
T20	#4	1	1	1	1	1					2S+V2+19'-4 ½"
T21	#4	1	1	1	1	1					2S+V2+20'-1 ½"
T22	#4	1	1	1	1	1					2S+V2+20'-10"
T23	#4	1	1	1	1	1					2S+V2+21'-7"
T24	#4	1	1	1	1	1					2S+V2+22'-3 ½"
T25	#4	1	1	1	1	1					2S+V2+23'-0 ½"
T26	#4	3	3	3	3	3					2S+V2+18'-1 ½"
V1	#4	26	30	34	38	42			24'-11 ½"	1'-8"	26'-7 ½"
V2	#4	2	2	2	2	2			24'-0 ½"	1'-8"	25'-8 ½"
V3	#4	2	2	2	2	2			21'-3 ½"	1'-8"	22'-11 ½"
V4	#4	2	2	2	2	2			18'-6 ½"	1'-8"	20'-2 ½"
V5	#4	2	2	2	2	2			15'-9 ½"	1'-8"	17'-5 ½"
V6	#4	2	2	2	2	2			13'-0 ½"	1'-8"	14'-8 ½"
V7	#4	2	2	2	2	2			10'-3 ½"	1'-8"	11'-11 ½"
V8	#4	2	2	2	2	2			7'-6 ½"	1'-8"	9'-2 ½"
V9	#4	2	2	2	2	2			4-5"		4'-5"
FT1	#5	2	2	2	2	2					2'-10"
FT2	#5	78	78	78	78	78					6'-6"
FT3	#5	2	2	2	2	2					4'-5 ½"
FT4	#5	2	2	2	2	2					2'-7 ½"
FL	#4	16	16	16	16	16					26'-3 ½"
W1	#5	2	2	2	2	2				W+7'-8"	W+7'-8"
W2	#5	2	2	2	2	2				W+7'-6"	W+7'-6"
W3	#5	2	2	2	2	2				W+7'-3 ½"	W+7'-3 ½"
W4	#5	2	2	2	2	2				W+7'-1"	W+7'-1"
W5	#5	2	2	2	2	2				W+6'-10 ½"	W+6'-10 ½"
W6	#5	2	2	2	2	2				W+6'-8"	W+6'-8"
W7	#5	2	2	2	2	2				W+6'-5 ½"	W+6'-5 ½"
W8	#5	2	2	2	2	2				W+6'-3"	W+6'-3"
W9	#5	2	2	2	2	2				W+6'-0 ½"	W+6'-0 ½"
W10	#5	2	2	2	2	2				W+5'-10"	W+5'-10"
W11	#5	2	2	2	2	2				W+5'-7 ½"	W+5'-7 ½"
W12	#5	2	2	2	2	2				W+5'-5"	W+5'-5"
W13	#5	2	2	2	2	2				W+5'-2 ½"	W+5'-2 ½"
W14	#5	2	2	2	2	2				W+5'-0"	W+5'-0"
W15	#5	2	2	2	2	2				W+4'-9 ½"	W+4'-9 ½"
W16	#5	2	2	2	2	2				W+4'-7"	W+4'-7"
W17	#5	2	2	2	2	2				W+4'-4 ½"	W+4'-4 ½"
W18	#5	2	2	2	2	2				W+4'-2 ½"	W+4'-2 ½"
W19	#5	2	2	2	2	2				W+4'-0"	W+4'-0"
W20	#5	2	2	2	2	2				W+3'-9 ½"	W+3'-9 ½"
W21	#5	2	2	2	2	2				W+3'-7"	W+3'-7"
W22	#5	2	2	2	2	2				W+3'-4 ½"	W+3'-4 ½"
W23	#5	2	2	2	2	2				W+3'-2"	W+3'-2"
W24	#5	2	2	2	2	2				W+2'-11 ½"	W+2'-11 ½"

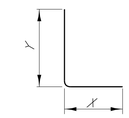
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
W25	#5	2	2	2	2	2				W+2'-9"	W+2'-9"
W26	#5	2	2	2	2	2				W+2'-6 ½"	W+2'-6 ½"
W27	#5	2	2	2	2	2				W+2'-4"	W+2'-4"
W28	#5	2	2	2	2	2				W+2'-1 ½"	W+2'-1 ½"
W29	#5	2	2	2	2	2				W+1'-11"	W+1'-11"
W30	#5	2	2	2	2	2				W+1'-8 ½"	W+1'-8 ½"
W31	#5	2	2	2	2	2				W+1'-6"	W+1'-6"
W32	#5	2	2	2	2	2				W+1'-3 ½"	W+1'-3 ½"
W33	#5	2	2	2	2	2				W+1'-1"	W+1'-1"
W34	#5	2	2	2	2	2				W+0'-11"	W+0'-11"
W35	#5	2	2	2	2	2				W+0'-8 ½"	W+0'-8 ½"
W36	#5	2	2	2	2	2				W+0'-6"	W+0'-6"
W37	#5	2	2	2	2	2				W+0'-3 ½"	W+0'-3 ½"
W38	#5	2	2	2	2	2				W+0'-1"	W+0'-1"
W39	#5	2	2	2	2	2			1'-6"	W+0'-10 ½"	W+2'-4 ½"
W40	#5	2	2	2	2	2			1'-6"	W+0'-8"	W+2'-2"
W41	#5	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
R1	#4	2	2	2	2	2				W+7'-8"	W+7'-8"
R2	#4	2	2	2	2	2				W+7'-4 ½"	W+7'-4 ½"
R3	#4	2	2	2	2	2				W+7'-1"	W+7'-1"
R4	#4	2	2	2	2	2				W+6'-9 ½"	W+6'-9 ½"
R5	#4	2	2	2	2	2				W+6'-5 ½"	W+6'-5 ½"
R6	#4	2	2	2	2	2				W+6'-2"	W+6'-2"
R7	#4	2	2	2	2	2				W+5'-10 ½"	W+5'-10 ½"
R8	#4	2	2	2	2	2				W+5'-6 ½"	W+5'-6 ½"
R9	#4	2	2	2	2	2				W+5'-3"	W+5'-3"
R10	#4	2	2	2	2	2				W+4'-11 ½"	W+4'-11 ½"
R11	#4	2	2	2	2	2				W+4'-7 ½"	W+4'-7 ½"
R12	#4	2	2	2	2	2				W+4'-4"	W+4'-4"
R13	#4	2	2	2	2	2				W+4'-0 ½"	W+4'-0 ½"
R14	#4	2	2	2	2	2				W+3'-8 ½"	W+3'-8 ½"
R15	#4	2	2	2	2	2				W+3'-5"	W+3'-5"
R16	#4	2	2	2	2	2				W+3'-1 ½"	W+3'-1 ½"
R17	#4	2	2	2	2	2				W+2'-9 ½"	W+2'-9 ½"
R18	#4	2	2	2	2	2				W+2'-6"	W+2'-6"
R19	#4	2	2	2	2	2				W+2'-2 ½"	W+2'-2 ½"
R20	#4	2	2	2	2	2				W+1'-10 ½"	W+1'-10 ½"
R21	#4	2	2	2	2	2				W+1'-7"	W+1'-7"
R22	#4	2	2	2	2	2				W+1'-3 ½"	W+1'-3 ½"
R23	#4	2	2	2	2	2				W+1'-0"	W+1'-0"
R24	#4	2	2	2	2	2				W+0'-8"	W+0'-8"
R25	#4	2	2	2	2	2				W+0'-4 ½"	W+0'-4 ½"
R26	#4	2	2	2	2	2				W+0'-1"	W+0'-1"
R27	#4	2	2	2	2	2				W-0'-3"	W-0'-3"
R28	#4	2	2	2	2	2			1'-6"	W+0'-5 ½"	W+1'-11 ½"
Y1	#4	4	4	4	4	4					4'-7"
Y2	#4	4	4	4	4	4					7'-9 ½"
Y3	#4	4	4	4	4	4					10'-11 ½"
Y4	#4	4	4	4	4	4					14'-2"
Y5	#4	4	4	4	4	4					17'-4"
Y6	#4	4	4	4	4	4					20'-6 ½"
Y7	#4	4	4	4	4	4					23'-9"
Y8	#4	16	16	16	20	20					26'-3 ½"
F	#4	4	4	4	4	4					27'-6 ½"
N	#4	25	29	33	37	41			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	23	27	31	35	39			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					2S+V2+1'-3"
O	#7	24	24	24	26	26			2'-10 ½"	2'-10 ½"	5'-9"
OS	#4	2	2	2	2	2					10'-0"+T1
DW	#5	76	76	76	76	76			1'-6"	2'-9"	4'-3"
DR	#4	54	54	54	54	54			1'-6"	2'-5"	3'-11"

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			5'-4"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+9'-1 ½"	W1+9'-1 ½"
J2	#5	1		W1+8'-8"	W1+8'-8"
J3	#5	1		W1+8'-2"	W1+8'-2"
J4	#5	1		W1+7'-8"	W1+7'-8"
J5	#5	1		W1+7'-2"	W1+7'-2"
J6	#5	1		W1+6'-8"	W1+6'-8"
J7	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J8	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J9	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J10	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J11	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J12	#5	1		W1+3'-9"	W1+3'-9"
J13	#5	1		W1+3'-3"	W1+3'-3"
J14	#5	1		W1+2'-9"	W1+2'-9"
J15	#5	1		W1+2'-3"	W1+2'-3"
J16	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J17	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J18	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J19	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J20	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
DJ	#5	15	1'-0"	2'-6"	3'-6"
FD	#4	1			20'-10 ½"



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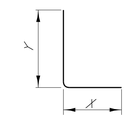

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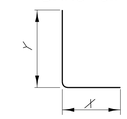

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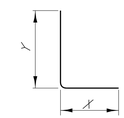

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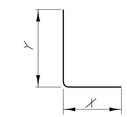

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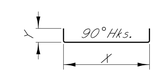

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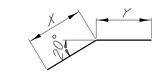
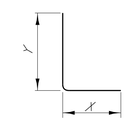


DOWELS O - #7



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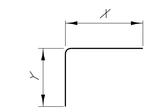

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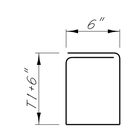


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-10-3W

SHEET NUMBER 7142

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS															
CULVERT HEIGHT "H"	"J"	"LW"	"R"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN 12'	14'	16'	18'	20'
12'-0"	9'-7"	30'-7 ⅛"	0'-3 ¾"	29'-0 ¾"	11"	11"	5'-0"	2'-0"	0'-6"	23'-0"	44'-11 ⅛"+V2	48'-11 ⅛"+V2	52'-11 ⅛"+V2	56'-11 ⅛"+V2	60'-11 ⅛"+V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
288	12x12	5'-0"	10 ½"	11 ½"	9"	9"	3'-7 ½"	49.6358	6691.004	4.1763	514.399	1.3292	80.717	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 ½"	9"	3'-9"	50.1071	6717.191	4.1763	514.483	1.3416	81.051	6.3210	1531.941
		15'-0"	1'-2 ½"	1'-5"	1'-0 ½"	9"	3'-11 ½"	50.8010	6760.835	4.1763	514.622	1.3580	81.496	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	50.0225	6717.191	4.1763	514.483	1.3374	80.939	6.2963	1526.770
		25'-0"	1'-1"	1'-1 ½"	10 ½"	9"	3'-10"	50.2390	6734.648	4.1763	514.538	1.3416	81.051	6.3272	1533.516
		30'-0"	1'-2"	1'-2 ½"	11"	9"	3'-11"	51.4980	6752.106	4.1763	514.594	1.3457	81.162	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	52.4951	6907.905	4.1763	514.483	1.5267	92.295	6.8642	1672.649
		10'-0"	1'-1 ½"	1'-4"	10 ½"	9"	3'-10 ½"	53.0467	6934.759	4.1763	514.566	1.5391	92.629	6.9568	1694.452
		15'-0"	1'-0 ½"	1'-1 ½"	1'-0 ½"	9"	3'-9 ½"	52.6349	6916.856	4.1763	514.510	1.5556	93.075	6.9630	1690.291
		20'-0"	1'-2"	1'-2 ½"	11"	9"	3'-11"	52.9902	6943.711	4.1763	514.594	1.5432	92.741	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	53.3121	6961.614	4.1763	514.650	1.5514	92.963	7.0123	1705.761
		30'-0"	1'-4"	1'-4 ½"	1'-0"	9"	4'-1"	53.5346	6979.517	4.1763	514.705	1.5514	92.963	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 ½"	9 ½"	9"	3'-10"	55.1974	7120.418	4.1763	514.538	1.7284	103.985	7.4877	1830.358
		10'-0"	1'-3 ½"	1'-4 ½"	10 ½"	9"	4'-0 ½"	55.9598	7166.567	4.1763	514.677	1.7366	104.208	7.5802	1855.551
		15'-0"	1'-2"	1'-2 ½"	1'-0 ½"	9"	3'-11"	55.4856	7138.878	4.1763	514.594	1.7531	104.653	7.5864	1850.173
		20'-0"	1'-3 ½"	1'-4"	1'-0"	9"	4'-0 ½"	55.9098	7166.567	4.1763	514.677	1.7490	104.542	7.6111	1859.690
		25'-0"	1'-5"	1'-5 ½"	1'-1"	1'-0"	4'-2"	56.4972	7200.269	4.8418	514.761	1.7695	105.099	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 ½"	1'-0"	4'-3"	56.8400	7218.729	4.8418	514.817	1.7737	105.210	7.7531	1889.576
432	18x12	5'-0"	1'-2 ½"	1'-2 ½"	10 ½"	9"	3'-11 ½"	58.0607	7339.935	4.1763	514.622	1.9342	115.787	8.1358	1995.325
		10'-0"	1'-5 ½"	1'-6"	11"	9"	4'-2 ½"	59.0082	7396.650	4.1763	514.789	1.9383	115.898	8.2284	2024.603
		15'-0"	1'-3"	1'-3 ½"	1'-0 ½"	9"	4'-0"	58.2741	7349.388	4.1763	514.650	1.9506	116.232	8.2037	2009.697
		20'-0"	1'-5"	1'-5 ½"	1'-1"	1'-0"	4'-2"	59.0265	7393.210	4.8418	514.761	1.9671	116.677	8.3025	2031.164
		25'-0"	1'-6 ½"	1'-7 ½"	1'-2"	1'-0"	4'-3 ½"	59.5393	7421.567	4.8418	514.844	1.9753	116.900	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	60.2910	7468.830	4.8418	514.984	1.9835	117.123	8.4568	2074.891
480	20x12	5'-0"	1'-3 ½"	1'-3 ½"	11"	9"	4'-0 ½"	60.8616	7655.787	4.1763	514.677	2.1358	127.477	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	60.8444	7646.112	4.1763	514.650	2.1440	127.699	8.7901	2161.780
		15'-0"	1'-4 ½"	1'-5"	1'-1"	1'-0"	4'-1 ½"	61.4010	7681.150	4.8418	514.733	2.1646	128.256	8.8827	2179.846
		20'-0"	1'-6 ½"	1'-7"	1'-2"	1'-0"	4'-3 ½"	62.0251	7719.850	4.8418	514.844	2.1728	128.479	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	63.0498	7787.577	4.8418	515.039	2.1811	128.701	9.0617	2235.611
		30'-0"	1'-11 ½"	2'-0"	1'-3 ½"	1'-0"	4'-8 ½"	63.5888	7816.602	4.8418	515.123	2.1852	128.813	9.1173	2253.525

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered ¾".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-12-3W

SHEET NUMBER 7143

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					2S+V2+5'-9"
T2	#4	1	1	1	1	1					2S+V2+6'-5 1/2"
T3	#4	1	1	1	1	1					2S+V2+7'-2 1/2"
T4	#4	1	1	1	1	1					2S+V2+7'-11"
T5	#4	1	1	1	1	1					2S+V2+8'-7 1/2"
T6	#4	1	1	1	1	1					2S+V2+9'-4"
T7	#4	1	1	1	1	1					2S+V2+10'-1"
T8	#4	1	1	1	1	1					2S+V2+10'-9 1/2"
T9	#4	1	1	1	1	1					2S+V2+11'-6"
T10	#4	1	1	1	1	1					2S+V2+12'-3"
T11	#4	1	1	1	1	1					2S+V2+12'-11 1/2"
T12	#4	1	1	1	1	1					2S+V2+13'-8"
T13	#4	1	1	1	1	1					2S+V2+14'-5"
T14	#4	1	1	1	1	1					2S+V2+15'-1 1/2"
T15	#4	1	1	1	1	1					2S+V2+15'-10"
T16	#4	1	1	1	1	1					2S+V2+16'-7"
T17	#4	1	1	1	1	1					2S+V2+17'-3 1/2"
T18	#4	1	1	1	1	1					2S+V2+18'-0"
T19	#4	1	1	1	1	1					2S+V2+18'-8 1/2"
T20	#4	1	1	1	1	1					2S+V2+19'-5 1/2"
T21	#4	1	1	1	1	1					2S+V2+20'-2"
T22	#4	1	1	1	1	1					2S+V2+20'-10 1/2"
T23	#4	1	1	1	1	1					2S+V2+21'-7 1/2"
T24	#4	1	1	1	1	1					2S+V2+22'-4"
T25	#4	1	1	1	1	1					2S+V2+23'-0 1/2"
T26	#4	1	1	1	1	1					2S+V2+23'-9 1/2"
T27	#4	1	1	1	1	1					2S+V2+24'-6"
T28	#4	1	1	1	1	1					2S+V2+25'-2 1/2"
T29	#4	1	1	1	1	1					2S+V2+25'-11 1/2"
T30	#4	3	3	3	3	3					2S+V2+20'-10 1/2"
V1	#4	30	34	38	42	46			28'-8 1/2"	1'-8"	30'-4 1/2"
V2	#4	2	2	2	2	2			28'-0 1/2"	1'-8"	29'-8 1/2"
V3	#4	2	2	2	2	2			25'-3 1/2"	1'-8"	26'-11 1/2"
V4	#4	2	2	2	2	2			22'-6 1/2"	1'-8"	24'-2 1/2"
V5	#4	2	2	2	2	2			19'-9 1/2"	1'-8"	21'-5 1/2"
V6	#4	2	2	2	2	2			17'-0 1/2"	1'-8"	18'-8 1/2"
V7	#4	2	2	2	2	2			14'-3 1/2"	1'-8"	15'-11 1/2"
V8	#4	2	2	2	2	2			11'-6 1/2"	1'-8"	13'-2 1/2"
V9	#4	2	2	2	2	2			8'-9 1/2"	1'-8"	10'-5 1/2"
V10	#4	2	2	2	2	2			5'-9 1/2"		5'-9 1/2"
V11	#4	2	2	2	2	2			2'-8 1/2"		2'-8 1/2"
FT1	#5	2	2	2	2	2					1'-7 1/2"
FT2	#5	2	2	2	2	2					3'-0"
FT3	#5	2	2	2	2	2					4'-4 1/2"
FT4	#5	116	116	116	116	116					7'-7"
FT5	#5	2	2	2	2	2					6'-9 1/2"
FT6	#5	2	2	2	2	2					5'-5 1/2"
FT7	#5	2	2	2	2	2					4'-1"
FT8	#5	2	2	2	2	2					2'-8 1/2"
FL	#4	18	18	18	18	18					30'-3"
W1	#5	2	2	2	2	2				W+8'-11"	W+8'-11"
W2	#5	2	2	2	2	2				W+8'-9 1/2"	W+8'-9 1/2"
W3	#5	2	2	2	2	2				W+8'-7 1/2"	W+8'-7 1/2"
W4	#5	2	2	2	2	2				W+8'-5 1/2"	W+8'-5 1/2"
W5	#5	2	2	2	2	2				W+8'-4"	W+8'-4"
W6	#5	2	2	2	2	2				W+8'-2"	W+8'-2"
W7	#5	2	2	2	2	2				W+8'-0"	W+8'-0"
W8	#5	2	2	2	2	2				W+7'-10"	W+7'-10"
W9	#5	2	2	2	2	2				W+7'-8 1/2"	W+7'-8 1/2"
W10	#5	2	2	2	2	2				W+7'-6 1/2"	W+7'-6 1/2"
W11	#5	2	2	2	2	2				W+7'-4 1/2"	W+7'-4 1/2"
W12	#5	2	2	2	2	2				W+7'-2 1/2"	W+7'-2 1/2"
W13	#5	2	2	2	2	2				W+7'-1"	W+7'-1"
W14	#5	2	2	2	2	2				W+6'-11"	W+6'-11"
W15	#5	2	2	2	2	2				W+6'-9"	W+6'-9"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
W16	#5	2	2	2	2	2				W+6'-7 1/2"	W+6'-7 1/2"
W17	#5	2	2	2	2	2				W+6'-5 1/2"	W+6'-5 1/2"
W18	#5	2	2	2	2	2				W+6'-3 1/2"	W+6'-3 1/2"
W19	#5	2	2	2	2	2				W+6'-1 1/2"	W+6'-1 1/2"
W20	#5	2	2	2	2	2				W+6'-0"	W+6'-0"
W21	#5	2	2	2	2	2				W+5'-10"	W+5'-10"
W22	#5	2	2	2	2	2				W+5'-8"	W+5'-8"
W23	#5	2	2	2	2	2				W+5'-6"	W+5'-6"
W24	#5	2	2	2	2	2				W+5'-4 1/2"	W+5'-4 1/2"
W25	#5	2	2	2	2	2				W+5'-2 1/2"	W+5'-2 1/2"
W26	#5	2	2	2	2	2				W+5'-0 1/2"	W+5'-0 1/2"
W27	#5	2	2	2	2	2				W+4'-10 1/2"	W+4'-10 1/2"
W28	#5	2	2	2	2	2				W+4'-9"	W+4'-9"
W29	#5	2	2	2	2	2				W+4'-7"	W+4'-7"
W30	#5	2	2	2	2	2				W+4'-5"	W+4'-5"
W31	#5	2	2	2	2	2				W+4'-3 1/2"	W+4'-3 1/2"
W32	#5	2	2	2	2	2				W+4'-1 1/2"	W+4'-1 1/2"
W33	#5	2	2	2	2	2				W+3'-11 1/2"	W+3'-11 1/2"
W34	#5	2	2	2	2	2				W+3'-9 1/2"	W+3'-9 1/2"
W35	#5	2	2	2	2	2				W+3'-8"	W+3'-8"
W36	#5	2	2	2	2	2				W+3'-6"	W+3'-6"
W37	#5	2	2	2	2	2				W+3'-4"	W+3'-4"
W38	#5	2	2	2	2	2				W+3'-2"	W+3'-2"
W39	#5	2	2	2	2	2				W+3'-0 1/2"	W+3'-0 1/2"
W40	#5	2	2	2	2	2				W+2'-10 1/2"	W+2'-10 1/2"
W41	#5	2	2	2	2	2				W+2'-8 1/2"	W+2'-8 1/2"
W42	#5	2	2	2	2	2				W+2'-7"	W+2'-7"
W43	#5	2	2	2	2	2				W+2'-5"	W+2'-5"
W44	#5	2	2	2	2	2				W+2'-3"	W+2'-3"
W45	#5	2	2	2	2	2				W+2'-1"	W+2'-1"
W46	#5	2	2	2	2	2				W+1'-11 1/2"	W+1'-11 1/2"
W47	#5	2	2	2	2	2				W+1'-9 1/2"	W+1'-9 1/2"
W48	#5	2	2	2	2	2				W+1'-7 1/2"	W+1'-7 1/2"
W49	#5	2	2	2	2	2				W+1'-5 1/2"	W+1'-5 1/2"
W50	#5	2	2	2	2	2				W+1'-4"	W+1'-4"
W51	#5	2	2	2	2	2				W+1'-2"	W+1'-2"
W52	#5	2	2	2	2	2				W+1'-0"	W+1'-0"
W53	#5	2	2	2	2	2				W+0'-10 1/2"	W+0'-10 1/2"
W54	#5	2	2	2	2	2				W+0'-8 1/2"	W+0'-8 1/2"
W55	#5	2	2	2	2	2				W+0'-6 1/2"	W+0'-6 1/2"
W56	#5	2	2	2	2	2				W+0'-4 1/2"	W+0'-4 1/2"
W57	#5	2	2	2	2	2				W+0'-3"	W+0'-3"
W58	#5	2	2	2	2	2				W+0'-1"	W+0'-1"
W59	#5	2	2	2	2	2				W-0'-1"	W-0'-1"
W60	#5	2	2	2	2	2				W-0'-3"	W-0'-3"
W61	#5	2	2	2	2	2				W-0'-4 1/2"	W-0'-4 1/2"
W62	#5	2	2	2	2	2				W-0'-6 1/2"	W-0'-6 1/2"
R1	#4	2	2	2	2	2				W+8'-11"	W+8'-11"
R2	#4	2	2	2	2	2				W+8'-7 1/2"	W+8'-7 1/2"
R3	#4	2	2	2	2	2				W+8'-4"	W+8'-4"
R4	#4	2	2	2	2	2				W+8'-0"	W+8'-0"
R5	#4	2	2	2	2	2				W+7'-8 1/2"	W+7'-8 1/2"
R6	#4	2	2	2	2	2				W+7'-5"	W+7'-5"
R7	#4	2	2	2	2	2				W+7'-1"	W+7'-1"
R8	#4	2	2	2	2	2				W+6'-9 1/2"	W+6'-9 1/2"
R9	#4	2	2	2	2	2				W+6'-6"	W+6'-6"
R10	#4	2	2	2	2	2				W+6'-2"	W+6'-2"
R11	#4	2	2	2	2	2				W+5'-10 1/2"	W+5'-10 1/2"
R12	#4	2	2	2	2	2				W+5'-7"	W+5'-7"
R13	#4	2	2	2	2	2				W+5'-3"	W+5'-3"
R14	#4	2	2	2	2	2				W+4'-11 1/2"	W+4'-11 1/2"
R15	#4	2	2	2	2	2				W+4'-8"	W+4'-8"
R16	#4	2	2	2	2	2				W+4'-4"	W+4'-4"
R17	#4	2	2	2	2	2				W+4'-0 1/2"	W+4'-0 1/2"
R18	#4	2	2	2	2	2				W+3'-9"	W+3'-9"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
R19	#4	2	2	2	2	2				W+3'-5"	W+3'-5"
R20	#4	2	2	2	2	2				W+3'-1 1/2"	W+3'-1 1/2"
R21	#4	2	2	2	2	2				W+2'-10"	W+2'-10"
R22	#4	2	2	2	2	2				W+2'-6"	W+2'-6"
R23	#4	2	2	2	2	2				W+2'-2 1/2"	W+2'-2 1/2"
R24	#4	2	2	2	2	2				W+1'-11"	W+1'-11"
R25	#4	2	2	2	2	2				W+1'-7"	W+1'-7"
R26	#4	2	2	2	2	2				W+1'-3 1/2"	W+1'-3 1/2"
R27	#4	2	2	2	2	2				W+1'-0"	W+1'-0"
R28	#4	2	2	2	2	2				W+0'-8"	W+0'-8"
R29	#4	2	2	2	2	2				W+0'-4 1/2"	W+0'-4 1/2"
R30	#4	2	2	2	2	2				W+0'-1"	W+0'-1"
R31	#4	2	2	2	2	2				W-0'-3"	W-0'-3"
R32	#4	2	2	2	2	2				W-0'-6 1/2"	W-0'-6 1/2"
Y1	#4	4	4	4	4	4					4'-0 1/2"
Y2	#4	4	4	4	4	4					6'-8 1/2"
Y3	#4	4	4	4	4	4					9'-4 1/2"
Y4	#4	4	4	4	4	4					12'-0 1/2"
Y5	#4	4	4	4	4	4					14'-8 1/2"
Y6	#4	4	4	4	4	4					17'-4"
Y7	#4	4	4	4	4	4					20'-0"
Y8	#4	4	4	4	4	4					22'-8"
Y9	#4	4	4	4	4	4					25'-4"
Y10	#4	4	4	4	4	4					28'-0"
Y11	#4	24	24	24	24	28					30'-3"
F	#4	4	4	4	4	4					31'-8 1/2"
N	#4	29	33	37	41	45			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					2S+2V1+V2+0'-4"
K	#4	27	31	35	39	43			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					2S+V2+1'-4 1/2"
O	#7	34	34	34	34	36			2'-11"	2'-11"	5'-10"
OS	#4	2	2	2	2	2					12'-0"+T1
DW	#5	124	124	124	124	124			1'-6"	2'-9"	4'-3"
DR	#4	64	64	64	64	64			1'-6"	2'-5"	3'-11"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-12-3W

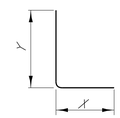
SHEET NUMBER 7144

REVISIONS | BY | DATE

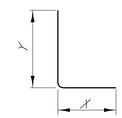
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			5'-4"
D5	#4	1			12'-0"+T1
J1	#5	1		W1+11'-1 ½"	W1+11'-1 ½"
J2	#5	1		W1+10'-7 ½"	W1+10'-7 ½"
J3	#5	1		W1+10'-2"	W1+10'-2"
J4	#5	1		W1+9'-8"	W1+9'-8"
J5	#5	1		W1+9'-2"	W1+9'-2"
J6	#5	1		W1+8'-8"	W1+8'-8"
J7	#5	1		W1+8'-2"	W1+8'-2"
J8	#5	1		W1+7'-8 ½"	W1+7'-8 ½"
J9	#5	1		W1+7'-2 ½"	W1+7'-2 ½"
J10	#5	1		W1+6'-8 ½"	W1+6'-8 ½"
J11	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J12	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J13	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J14	#5	1		W1+4'-9"	W1+4'-9"
J15	#5	1		W1+4'-3"	W1+4'-3"
J16	#5	1		W1+3'-9"	W1+3'-9"
J17	#5	1		W1+3'-3"	W1+3'-3"
J18	#5	1		W1+2'-9"	W1+2'-9"
J19	#5	1		W1+2'-3"	W1+2'-3"
J20	#5	1	1'-0"	W1+2'-6 ½"	W1+3'-6 ½"
J21	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J22	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J23	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J24	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
YD10	#5	1			20'-3 ½"
YD11	#5	1			22'-3 ½"
DJ	#5	19	1'-0"	2'-6"	3'-6"
FD	#4	1			25'-4"



BARS Jn - #5



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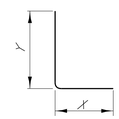

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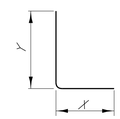

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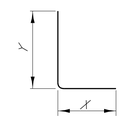
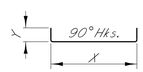
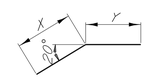


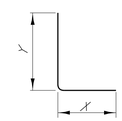
BARS Rn - #4



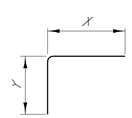
BARS N - #4



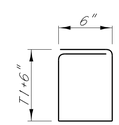
DOWELS O - #7



BARS Wn - #5



BARS Vn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
0° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

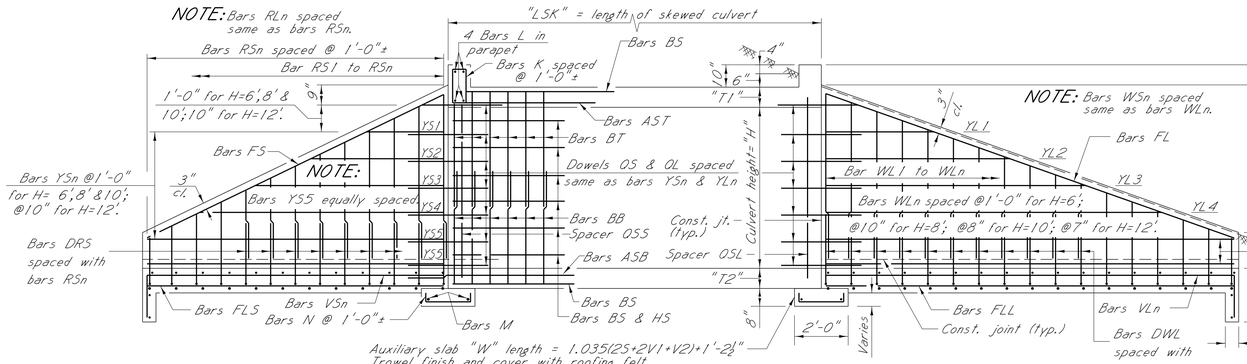
SHT. 3 OF 3

WORKING NUMBER IWD-12-3W

SHEET NUMBER 7145

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



STREAM SIDE

Showing reinforcement in stream side of "LW1" wingwall

FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall

END ELEVATION

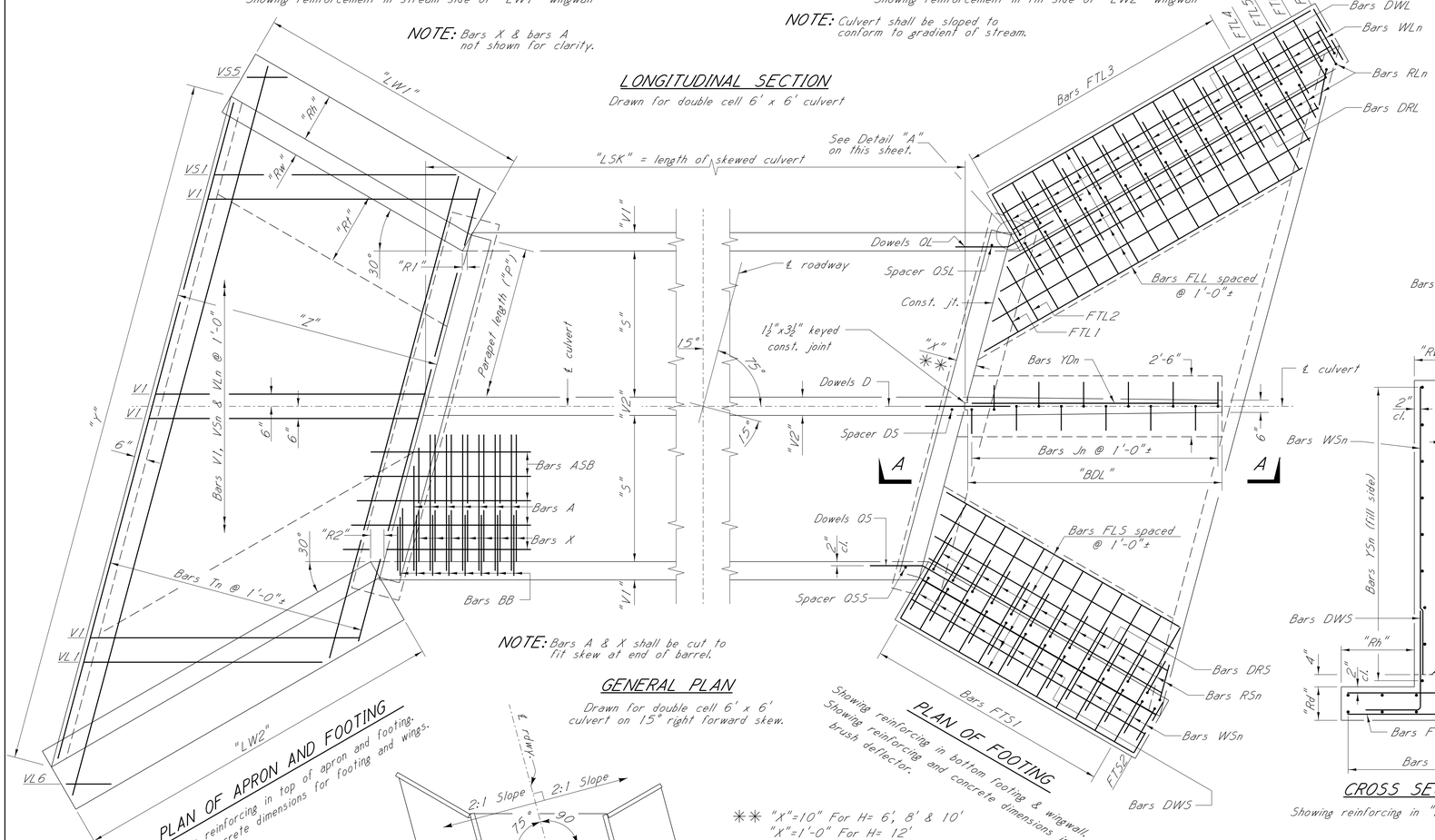
Showing reinforcing in pararpet & toe wall

NOTE: Bars X & bars A not shown for clarity.

NOTE: Culvert shall be sloped to conform to gradient of stream.

LONGITUDINAL SECTION

Drawn for double cell 6' x 6' culvert



PLAN OF APRON AND FOOTING

Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.

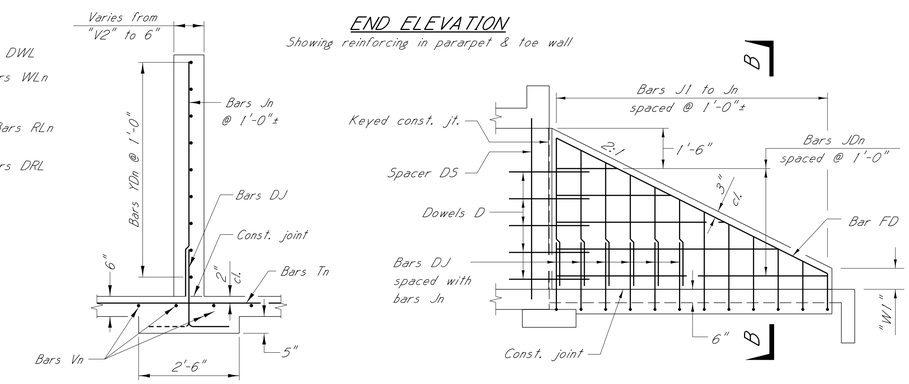
PLAN OF FOOTING

Showing reinforcing in bottom footing & wingwall. Showing reinforcing and concrete dimensions in brush deflector.

NOTE: Bars A & X shall be cut to fit skew at end of barrel.

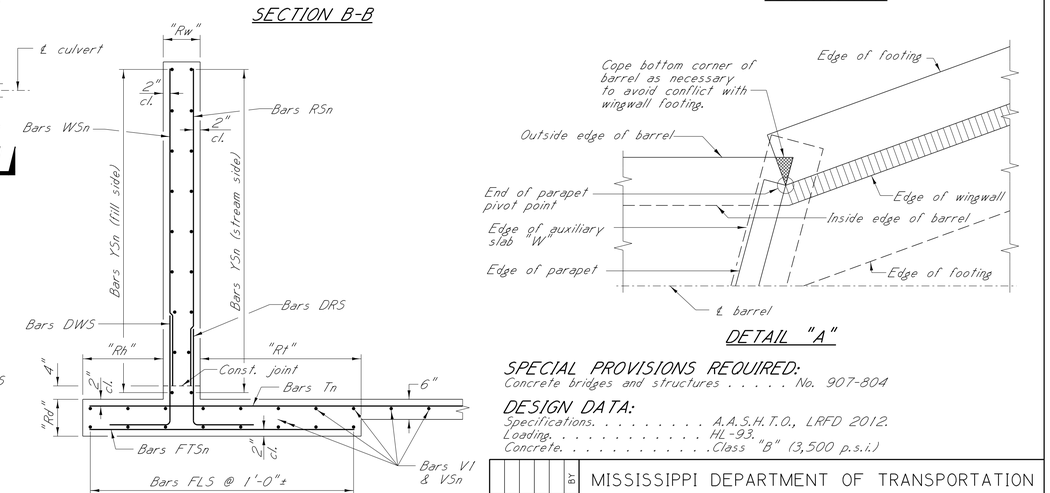
GENERAL PLAN

Drawn for double cell 6' x 6' culvert on 15° right forward skew.



SECTION B-B

SECTION A-A



CROSS SECTION WINGWALL

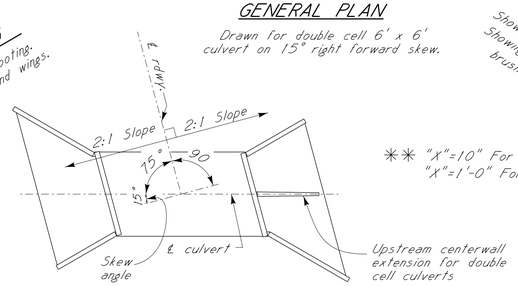
Showing reinforcing in "LW1" wingwall, footing and apron.

DETAIL "A"

✱✱ "X"=10" For H= 6', 8' & 10'
"X"=1'-0" For H= 12'

NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.

NOTE: For bar bending details and quantities, see drawings IWS-6-2W-15, IWS-8-2W-15, IWS-10-2W-15 & IWS-12-2W-15.



PLAN OF 15° LEFT FORWARD SKEW

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-40 FT.

SHT. 1 OF 1

WORKING NUMBER	IWD-2W-15
SHEET NUMBER	7146

DATE	REVISIONS	BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
													6'	8'	10'	12'	14'	16'
6'-0"	5'-6"	11'-4 11/16"	15'-6 11/16"	0'-2 7/16"	0'-6 9/16"	11'-0"	0'-11"	0'-9"	3'-0"	2'-0"	0'-9 1/2"	10'-5 1/4"	27'-8 9/16"+1.035V2	31'-10 1/4"+1.035V2	36'-0"+1.035V2	40'-1 11/16"+1.035V2	44'-3 3/8"+1.035V2	48'-5 1/16"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	11.9801	1611.435	1.2035	174.387	0.7879	47.372	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	11.9801	1611.435	1.2035	174.387	0.7879	47.372	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	11.9801	1611.435	1.2035	174.387	0.7879	47.372	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	12.0554	1611.435	1.2035	174.387	0.7879	47.372	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	12.2254	1620.691	1.2035	174.471	0.7879	47.372	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	12.3387	1626.86	1.2035	174.526	0.7879	47.372	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	13.1150	1705.818	1.2035	174.387	0.9924	59.118	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	13.2095	1705.818	1.2035	174.387	0.9924	59.118	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	13.4617	1719.050	1.2035	174.498	0.9924	59.118	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	13.5879	1725.665	1.2035	174.554	0.9924	59.118	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	13.8401	1738.897	1.2035	174.665	0.9924	59.118	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	14.0608	1752.126	1.2035	174.777	0.9924	59.118	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	14.2627	1800.396	1.2035	174.387	1.1969	70.919	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	14.5153	1807.456	1.2035	174.443	1.1969	70.919	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	14.9320	1828.638	1.2035	174.610	1.1969	70.919	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	15.3108	1849.821	1.2035	174.777	1.1969	70.919	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	14.6100	1818.047	1.2035	174.526	1.1969	70.919	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	14.7173	1821.578	1.2035	174.554	1.1969	70.919	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	15.6064	1906.066	1.2035	174.471	1.4014	84.224	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	15.8783	1917.325	1.2035	174.554	1.4014	84.224	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	16.3903	1936.089	1.2035	174.693	1.4014	84.224	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	15.8655	1921.079	1.2035	174.582	1.4014	84.224	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	15.9857	1924.830	1.2035	174.610	1.4014	84.224	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	16.1817	1932.339	1.2035	174.665	1.4014	84.224	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	16.9063	2009.122	1.2035	174.526	1.6059	95.969	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	17.2875	2025.027	1.2035	174.638	1.6102	96.136	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	16.9909	2013.100	1.2035	174.554	1.6187	96.359	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	17.3806	2036.954	1.2035	174.721	1.6059	95.969	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	17.5370	2036.954	1.2035	174.721	1.6144	96.248	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	17.7532	2044.904	1.2035	174.777	1.6144	96.248	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	18.2653	2117.241	1.2035	174.610	1.8189	107.993	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	18.7701	2138.237	1.2035	174.749	1.8232	108.105	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	18.4977	2125.641	1.2035	174.665	1.8104	107.771	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	18.8266	2146.632	1.2035	174.805	1.8104	107.771	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	19.1180	2155.027	1.2035	174.860	1.8104	107.771	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	19.4724	2171.822	1.2035	174.972	1.8104	107.771	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-6-2W-15

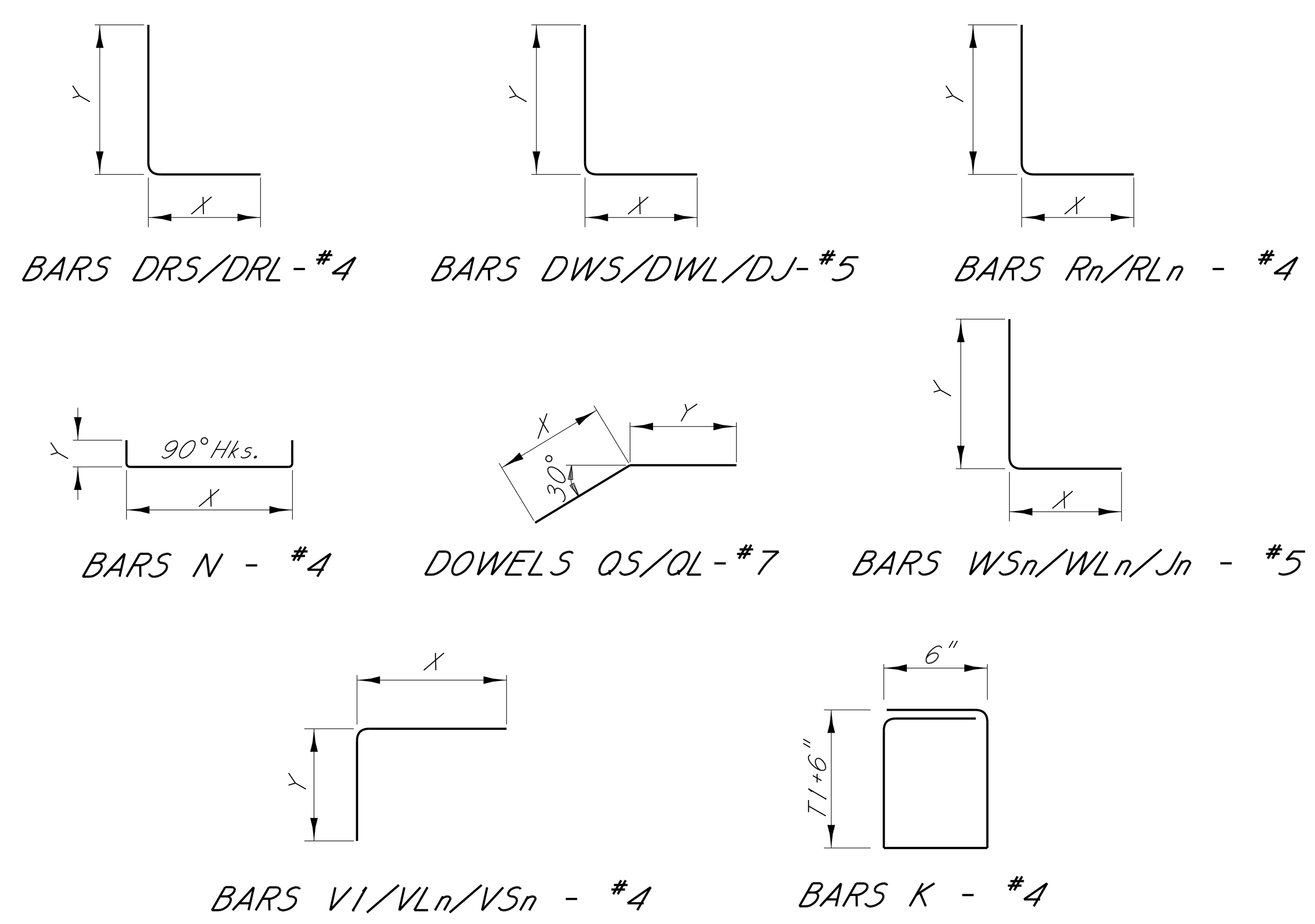
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7147

HEIGHT = 6 FT.												
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB												
BAR	SIZE	NO. REQUIRED								DIM. X	DIM. Y	LENGTH
		SPAN										
		6'	8'	10'	12'	14'	16'					
T1	#4	1	1	1	1	1	1					1.035(2S+V2)+6'-0 ½"
T2	#4	1	1	1	1	1	1					1.035(2S+V2)+7'-3"
T3	#4	1	1	1	1	1	1					1.035(2S+V2)+8'-6"
T4	#4	1	1	1	1	1	1					1.035(2S+V2)+9'-9 ½"
T5	#4	1	1	1	1	1	1					1.035(2S+V2)+10'-11 ½"
T6	#4	1	1	1	1	1	1					1.035(2S+V2)+12'-2"
T7	#4	1	1	1	1	1	1					1.035(2S+V2)+13'-5"
T8	#4	1	1	1	1	1	1					1.035(2S+V2)+14'-7 ½"
T9	#4	1	1	1	1	1	1					1.035(2S+V2)+15'-10 ½"
T10	#4	1	1	1	1	1	1					1.035(2S+V2)+17'-1 ½"
T11	#4	1	1	1	1	1	1					1.035(2S+V2)+17'-9 ½"
T12	#4	3	3	3	3	3	3					1.035(2S+V2)+14'-8"
V1	#4	19	23	27	31	35	39			11'-0 ½"	1'-8"	12'-8 ½"
VL1	#4	1	1	1	1	1	1			9'-9 ½"	1'-8"	11'-5 ½"
VL2	#4	1	1	1	1	1	1			8'-4"	1'-8"	10'-0"
VL3	#4	1	1	1	1	1	1			6'-10 ½"	1'-8"	8'-6 ½"
VL4	#4	1	1	1	1	1	1			5'-5"	1'-8"	7'-1"
VL5	#4	1	1	1	1	1	1			3'-11"		3'-11"
VL6	#4	1	1	1	1	1	1			1'-10 ½"		1'-10 ½"
VS1	#4	1	1	1	1	1	1			9'-11"	1'-8"	11'-7"
VS2	#4	1	1	1	1	1	1			7'-11"	1'-8"	9'-7"
VS3	#4	1	1	1	1	1	1			5'-11"	1'-8"	7'-7"
VS4	#4	1	1	1	1	1	1			3'-11"		3'-11"
VS5	#4	1	1	1	1	1	1			1'-8"		1'-8"
FTL1	#5	1	1	1	1	1	1					1'-7 ½"
FTL2	#5	1	1	1	1	1	1					2'-7"
FTL3	#5	13	13	13	13	13	13					5'-5"
FTL4	#5	1	1	1	1	1	1					4'-7 ½"
FTL5	#5	1	1	1	1	1	1					3'-8"
FTL6	#5	1	1	1	1	1	1					2'-8 ½"
FTL7	#5	1	1	1	1	1	1					2'-5"
FLL1	#4	7	7	7	7	7	7					15'-1"
FTS1	#5	12	12	12	12	12	12					5'-5"
FTS2	#5	1	1	1	1	1	1					2'-5"
FLS1	#4	7	7	7	7	7	7					11'-0 ½"
WS1	#5	1	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
WS2	#5	1	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WS3	#5	1	1	1	1	1	1				W+3'-11"	W+3'-11"
WS4	#5	1	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
WS5	#5	1	1	1	1	1	1				W+3'-0 ½"	W+3'-0 ½"
WS6	#5	1	1	1	1	1	1				W+2'-7"	W+2'-7"
WS7	#5	1	1	1	1	1	1				W+2'-1 ½"	W+2'-1 ½"
WS8	#5	1	1	1	1	1	1				W+1'-8 ½"	W+1'-8 ½"
WS9	#5	1	1	1	1	1	1			1'-6"	W+2'-3"	W+3'-9"
WS10	#5	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
WS11	#5	1	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
WS12	#5	1	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WS13	#5	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	8	8	8	8	8	8			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1				W+4'-10"	W+4'-10"
WL2	#5	1	1	1	1	1	1				W+4'-6"	W+4'-6"
WL3	#5	1	1	1	1	1	1				W+4'-2"	W+4'-2"
WL4	#5	1	1	1	1	1	1				W+3'-10"	W+3'-10"
WL5	#5	1	1	1	1	1	1				W+3'-6"	W+3'-6"
WL6	#5	1	1	1	1	1	1				W+3'-2"	W+3'-2"
WL7	#5	1	1	1	1	1	1				W+2'-10"	W+2'-10"
WL8	#5	1	1	1	1	1	1				W+2'-6"	W+2'-6"
WL9	#5	1	1	1	1	1	1				W+2'-2"	W+2'-2"
WL10	#5	1	1	1	1	1	1				W+1'-10"	W+1'-10"
WL11	#5	1	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WL12	#5	1	1	1	1	1	1			1'-6"	W+2'-1 ½"	W+3'-7 ½"
WL13	#5	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
WL14	#5	1	1	1	1	1	1			1'-6"	W+1'-5 ½"	W+2'-11 ½"
WL15	#5	1	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"

HEIGHT = 6 FT.												
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB												
BAR	SIZE	NO. REQUIRED								DIM. X	DIM. Y	LENGTH
		SPAN										
		6'	8'	10'	12'	14'	16'					
WL16	#5	1	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
WL17	#5	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	11	11	11	11	11	11			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
RS2	#4	1	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
RS3	#4	1	1	1	1	1	1				W+3'-11"	W+3'-11"
RS4	#4	1	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
RS5	#4	1	1	1	1	1	1				W+3'-0 ½"	W+3'-0 ½"
RS6	#4	1	1	1	1	1	1				W+2'-7"	W+2'-7"
RS7	#4	1	1	1	1	1	1				W+2'-1 ½"	W+2'-1 ½"
RS8	#4	1	1	1	1	1	1				W+1'-8 ½"	W+1'-8 ½"
RS9	#4	1	1	1	1	1	1				W+1'-3"	W+1'-3"
RS10	#4	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
RS11	#4	1	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
RS12	#4	1	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
RS13	#4	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	9	9	9	9	9	9			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1				W+4'-10"	W+4'-10"
RL2	#4	1	1	1	1	1	1				W+4'-6"	W+4'-6"
RL3	#4	1	1	1	1	1	1				W+4'-2"	W+4'-2"
RL4	#4	1	1	1	1	1	1				W+3'-10"	W+3'-10"
RL5	#4	1	1	1	1	1	1				W+3'-6"	W+3'-6"
RL6	#4	1	1	1	1	1	1				W+3'-2"	W+3'-2"
RL7	#4	1	1	1	1	1	1				W+2'-10"	W+2'-10"
RL8	#4	1	1	1	1	1	1				W+2'-6"	W+2'-6"
RL9	#4	1	1	1	1	1	1				W+2'-2"	W+2'-2"
RL10	#4	1	1	1	1	1	1				W+1'-10"	W+1'-10"
RL11	#4	1	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
RL12	#4	1	1	1	1	1	1				W+1'-1 ½"	W+1'-1 ½"
RL13	#4	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
RL14	#4	1	1	1	1	1	1			1'-6"	W+1'-5 ½"	W+2'-11 ½"
RL15	#4	1	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
RL16	#4	1	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
RL17	#4	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	12	12	12	12	12	12			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2					2'-10 ½"
YS2	#4	2	2	2	2	2	2					4'-11 ½"
YS3	#4	2	2	2	2	2	2					7'-0 ½"
YS4	#4	2	2	2	2	2	2					9'-1"
YS5	#4	6	6	6	6	6	6					11'-0 ½"
YL1	#4	2	2	2	2	2	2					4'-0 ½"
YL2	#4	2	2	2	2	2	2					6'-10 ½"
YL3	#4	2	2	2	2	2	2					9'-8 ½"
YL4	#4	2	2	2	2	2	2					12'-6"
YL5	#4	6	6	6	6	6	6					15'-2 ½"
FS	#4	2	2	2	2	2	2					12'-3 ½"
FL	#4	2	2	2	2	2	2					16'-2"
N	#4	17	21	25	30	34	38			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					1.035(2S+2V1+V2)+10 ½"
K	#4	16	20	24	28	32	36			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					1.035(2S+V2)+1'-0"
OS	#7	8	8	8	8	8	8			3'-1"	3'-1"	6'-2"
OL	#7	8	8	8	8	8	8			3'-1"	3'-1"	6'-2"
OSS	#4	1	1	1	1	1	1					6'-0"+T1
OSL	#4	1	1	1	1	1	1					6'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			5'-6"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+4'-10"	W1+4'-10"
J2	#5	1		W1+4'-4 ½"	W1+4'-4 ½"
J3	#5	1		W1+3'-11"	W1+3'-11"
J4	#5	1		W1+3'-5 ½"	W1+3'-5 ½"
J5	#5	1		W1+3'-0"	W1+3'-0"
J6	#5	1		W1+2'-6 ½"	W1+2'-6 ½"
J7	#5	1		W1+2'-1"	W1+2'-1"
J8	#5	1	1'-0"	W1+2'-4 ½"	W1+3'-4 ½"
J9	#5	1	1'-0"	W1+1'-11"	W1+2'-11"
J10	#5	1	1'-0"	W1+1'-5 ½"	W1+2'-5 ½"
J11	#5	1	1'-0"	W1+1'-0"	W1+2'-0"
J12	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	7	1'-0"	2'-6"	3'-6"
FD	#4	1			11'-3 ½"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-1"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-6-2W-15

SHEET NUMBER 7148

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													8'	10'	12'	14'	16'
8'-0"	7'-1"	14'-8"	20'-0 7/16"	0'-2 7/16"	0'-6 9/16"	14'-2"	0'-11"	0'-9"	3'-0"	2'-0"	1'-1 3/4"	13'-8 7/16"	35'-10 7/16"+1.035V2	40'-0 1/8"+1.035V2	44'-1 7/8"+1.035V2	48'-3 9/16"+1.035V2	52'-5 1/4"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	18.2646	2403.764	1.9670	269.948	0.9924	60.677	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	18.3591	2403.764	1.9670	269.948	0.9924	60.677	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	18.6473	2420.209	1.9670	270.059	0.9924	60.677	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	18.7913	2428.430	1.9670	270.115	0.9924	60.677	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	19.0813	2444.875	1.9670	270.226	0.9967	60.788	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	19.3028	2457.208	1.9670	270.310	1.0052	61.066	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	19.7246	2515.292	1.9670	269.948	1.1969	72.478	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	19.9978	2528.293	1.9670	270.031	1.1969	72.478	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	20.3898	2549.960	1.9670	270.171	1.1969	72.478	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	20.8225	2575.962	1.9670	270.338	1.1969	72.478	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	20.1200	2541.294	1.9670	270.115	1.2012	72.589	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	20.3596	2554.295	1.9670	270.198	1.2140	79.923	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	21.3002	2640.434	1.9670	270.031	1.4014	84.224	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	21.5546	2654.103	1.9670	270.115	1.4014	84.224	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	22.1964	2681.441	1.9670	270.282	1.4014	84.224	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	21.6510	2663.826	2.0173	270.171	1.4078	84.391	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	21.8510	2672.329	1.9670	270.226	1.4057	84.335	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	22.0736	2681.441	1.9670	270.282	1.4227	84.780	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	22.9014	2767.106	1.9670	270.115	1.6059	95.969	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	23.2764	2781.443	1.9670	270.198	1.6059	95.969	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	23.0331	2776.662	1.9670	270.171	1.6059	95.969	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	23.4044	2795.780	1.9670	270.282	1.6230	96.470	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	23.6939	2805.336	1.9670	270.338	1.6272	96.582	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	23.9332	2814.897	1.9670	270.393	1.6315	96.693	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	24.4886	2889.860	1.9670	270.171	1.8147	109.441	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	25.0945	2914.872	1.9670	270.310	1.8189	109.552	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	24.7289	2904.865	1.9670	270.254	1.8275	109.775	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	25.2261	2929.877	1.9670	270.393	1.8360	109.997	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	25.6282	2949.880	1.9670	270.505	1.8445	110.220	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	25.9845	2961.084	2.0685	270.430	1.8573	110.610	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-8-2W-15

SHEET NUMBER 7149

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.035(2S+V2)+6'-0 1/2"
T2	#4	1	1	1	1	1					1.035(2S+V2)+7'-3 1/2"
T3	#4	1	1	1	1	1					1.035(2S+V2)+8'-6 1/2"
T4	#4	1	1	1	1	1					1.035(2S+V2)+9'-10"
T5	#4	1	1	1	1	1					1.035(2S+V2)+11'-1"
T6	#4	1	1	1	1	1					1.035(2S+V2)+12'-4"
T7	#4	1	1	1	1	1					1.035(2S+V2)+13'-7"
T8	#4	1	1	1	1	1					1.035(2S+V2)+14'-10"
T9	#4	1	1	1	1	1					1.035(2S+V2)+16'-1"
T10	#4	1	1	1	1	1					1.035(2S+V2)+17'-4"
T11	#4	1	1	1	1	1					1.035(2S+V2)+18'-7"
T12	#4	1	1	1	1	1					1.035(2S+V2)+19'-10"
T13	#4	1	1	1	1	1					1.035(2S+V2)+21'-1"
T14	#4	1	1	1	1	1					1.035(2S+V2)+21'-10"
T15	#4	3	3	3	3	3					1.035(2S+V2)+18'-8 1/2"
V1	#4	23	27	31	35	39			14'-4"	1'-8"	16'-0"
VL1	#4	1	1	1	1	1			13'-1"	1'-8"	14'-9"
VL2	#4	1	1	1	1	1			11'-7 1/2"	1'-8"	13'-3 1/2"
VL3	#4	1	1	1	1	1			10'-1 1/2"	1'-8"	11'-9 1/2"
VL4	#4	1	1	1	1	1			8'-8"	1'-8"	10'-4"
VL5	#4	1	1	1	1	1			7'-2 1/2"	1'-8"	8'-10 1/2"
VL6	#4	1	1	1	1	1			5'-9"	1'-8"	7'-5"
VL7	#4	1	1	1	1	1			4'-3 1/2"	1'-8"	5'-11 1/2"
VL8	#4	1	1	1	1	1			2'-5"		2'-5"
VS1	#4	1	1	1	1	1			13'-2 1/2"	1'-8"	14'-10 1/2"
VS2	#4	1	1	1	1	1			11'-2 1/2"	1'-8"	12'-10 1/2"
VS3	#4	1	1	1	1	1			9'-2 1/2"	1'-8"	10'-10 1/2"
VS4	#4	1	1	1	1	1			7'-2 1/2"	1'-8"	8'-10 1/2"
VS5	#4	1	1	1	1	1			5'-2 1/2"	1'-8"	6'-10 1/2"
VS6	#4	1	1	1	1	1			3'-1 1/2"		3'-1 1/2"
FTL1	#5	1	1	1	1	1					1'-0 1/2"
FTL2	#5	1	1	1	1	1					1'-10 1/2"
FTL3	#5	1	1	1	1	1					2'-8 1/2"
FTL4	#5	20	20	20	20	20					5'-5"
FTL5	#5	1	1	1	1	1					5'-0 1/2"
FTL6	#5	1	1	1	1	1					4'-2 1/2"
FTL7	#5	1	1	1	1	1					3'-5"
FTL8	#5	1	1	1	1	1					2'-7"
FTL9	#5	1	1	1	1	1					2'-5"
FLL	#4	7	7	7	7	7					19'-7"
FTS1	#5	17	17	17	17	17					5'-5"
FTS2	#5	1	1	1	1	1					4'-9 1/2"
FTS3	#5	1	1	1	1	1					2'-5"
FLS	#4	7	7	7	7	7					14'-4"
WS1	#5	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
WS2	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WS3	#5	1	1	1	1	1				W+5'-7 1/2"	W+5'-7 1/2"
WS4	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WS5	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WS6	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WS7	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WS8	#5	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
WS9	#5	1	1	1	1	1				W+3'-4"	W+3'-4"
WS10	#5	1	1	1	1	1				W+2'-11"	W+2'-11"
WS11	#5	1	1	1	1	1				W+2'-6 1/2"	W+2'-6 1/2"
WS12	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WS13	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WS14	#5	1	1	1	1	1				W+1'-4 1/2"	W+1'-4 1/2"
WS15	#5	1	1	1	1	1				W+1'-0"	W+1'-0"
WS16	#5	1	1	1	1	1			1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WS17	#5	1	1	1	1	1			1'-6"	W+1'-2 1/2"	W+2'-8 1/2"
WS18	#5	1	1	1	1	1			1'-6"	W+0'-10"	W+2'-4"
WS19	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	15	15	15	15	15			1'-6"	2'-9"	4'-3"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WL1	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL2	#5	1	1	1	1	1				W+6'-1 1/2"	W+6'-1 1/2"
WL3	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WL4	#5	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
WL5	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WL6	#5	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
WL7	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WL8	#5	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
WL9	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WL10	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL11	#5	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"
WL12	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL13	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL14	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL15	#5	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
WL16	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL17	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WL18	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL19	#5	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
WL20	#5	1	1	1	1	1			1'-6"	W+1'-11"	W+3'-5"
WL21	#5	1	1	1	1	1			1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WL22	#5	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
WL23	#5	1	1	1	1	1			1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
WL24	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WL25	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	19	19	19	19	19			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
RS2	#4	1	1	1	1	1				W+5'-11"	W+5'-11"
RS3	#4	1	1	1	1	1				W+5'-5 1/2"	W+5'-5 1/2"
RS4	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RS5	#4	1	1	1	1	1				W+4'-6 1/2"	W+4'-6 1/2"
RS6	#4	1	1	1	1	1				W+4'-1"	W+4'-1"
RS7	#4	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
RS8	#4	1	1	1	1	1				W+3'-2"	W+3'-2"
RS9	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RS10	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RS11	#4	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
RS12	#4	1	1	1	1	1				W+1'-4"	W+1'-4"
RS13	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RS14	#4	1	1	1	1	1			1'-6"	W+1'-4 1/2"	W+2'-10 1/2"
RS15	#4	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
RS16	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	13	13	13	13	13			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+6'-5"	W+6'-5"
RL2	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RL3	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RL4	#4	1	1	1	1	1				W+5'-4 1/2"	W+5'-4 1/2"
RL5	#4	1	1	1	1	1				W+5'-0 1/2"	W+5'-0 1/2"
RL6	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RL7	#4	1	1	1	1	1				W+4'-4"	W+4'-4"
RL8	#4	1	1	1	1	1				W+4'-0"	W+4'-0"
RL9	#4	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
RL10	#4	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
RL11	#4	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
RL12	#4	1	1	1	1	1				W+2'-7"	W+2'-7"
RL13	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RL14	#4	1	1	1	1	1				W+1'-11"	W+1'-11"
RL15	#4	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
RL16	#4	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
RL17	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL18	#4	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
RL19	#4	1	1	1	1	1			1'-6"	W+1'-2"	W+2'-8"
RL20	#4	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RL21	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
DRL	#4	17	17	17	17	17			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-10 1/2"
YS2	#4	2	2	2	2	2					4'-11 1/2"
YS3	#4	2	2	2	2	2					7'-0 1/2"
YS4	#4	2	2	2	2	2					9'-1"
YS5	#4	2	2	2	2	2					11'-2"
YS6	#4	2	2	2	2	2					13'-3"
YS7	#4	6	6	6	6	6					14'-4"
YL1	#4	2	2	2	2	2					4'-0 1/2"
YL2	#4	2	2	2	2	2					6'-10 1/2"
YL3	#4	2	2	2	2	2					9'-8 1/2"
YL4	#4	2	2	2	2	2					12'-6"
YL5	#4	2	2	2	2	2					15'-4"
YL6	#4	2	2	2	2	2					18'-2"
YL7	#4	6	6	6	6	6					19'-8 1/2"
FS	#4	2	2	2	2	2					15'-11"
FL	#4	2	2	2	2	2					20'-11"
N	#4	22	26	30	34	39			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.035(2S+2V1+V2)+10 1/2"
K	#4	20	24	28	32	36			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.035(2S+V2)+1'-0"
OS	#7	10	10	10	10	10			3'-1"	3'-1"	6'-2"
OL	#7	10	10	10	10	10			3'-1"	3'-1"	6'-2"
OSS	#4	1	1	1	1	1					8'-0"+T1
OSL	#4	1	1	1	1	1					8'-0"+T1

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 3

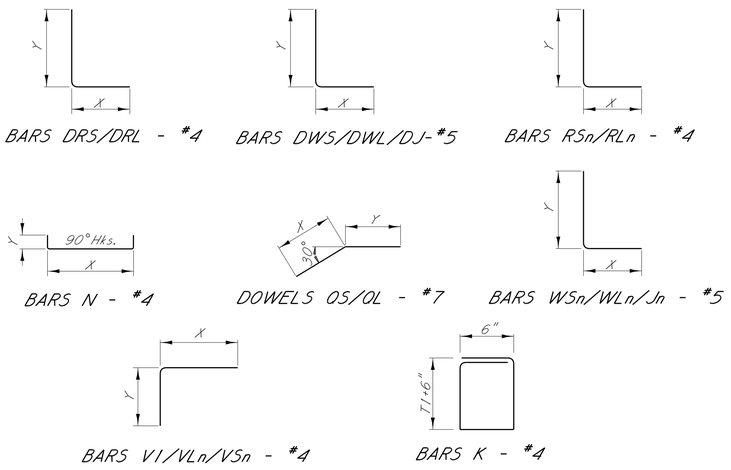
WORKING NUMBER IWD-8-2W-15

SHEET NUMBER 7150

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			5'-7"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+6'-5 3/4"	W1+6'-5 3/4"
J2	#5	1		W1+6'-0 1/4"	W1+6'-0 1/4"
J3	#5	1		W1+5'-6 1/4"	W1+5'-6 1/4"
J4	#5	1		W1+5'-0 3/4"	W1+5'-0 3/4"
J5	#5	1		W1+4'-6 3/4"	W1+4'-6 3/4"
J6	#5	1		W1+4'-1 1/4"	W1+4'-1 1/4"
J7	#5	1		W1+3'-7 3/4"	W1+3'-7 3/4"
J8	#5	1		W1+3'-1 3/4"	W1+3'-1 3/4"
J9	#5	1		W1+2'-8 1/4"	W1+2'-8 1/4"
J10	#5	1		W1+2'-2 1/4"	W1+2'-2 1/4"
J11	#5	1		W1+1'-8 3/4"	W1+1'-8 3/4"
J12	#5	1	1'-0"	W1+2'-11 3/4"	W1+3'-11 3/4"
J13	#5	1	1'-0"	W1+1'-6 1/4"	W1+2'-6 1/4"
J14	#5	1	1'-0"	W1+1'-0 1/4"	W1+2'-0 1/4"
J15	#5	1	1'-0"	W1+0'-6 1/4"	W1+1'-6 1/4"
DJ	#5	11	1'-0"	2'-6"	3'-6"
FD	#4	1			14'-11 1/2"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			13'-4 1/2"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-8-2W-15

SHEET NUMBER
7151

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													10'	12'	14'	16'	18'
10'-0"	8'-1"	16'-8 13/16"	22'-10 3/8"	0'-2 11/16"	0'-7 5/16"	16'-2"	0'-11"	0'-10"	4'-0"	2'-0"	2'-1 1/4"	15'-9 7/16"	42'-8 3/8"+1.035V2	46'-10 1/16"+1.035V2	50'-11 3/4"+1.035V2	55'-1 7/16"+1.035V2	59'-3 1/8"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet. Total brush deflector quantities include brushwalls and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 1/2"	9"	9"	2'-9"	25.8682	3384.470	2.8120	374.848	1.1969	72.478	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	26.1221	3394.892	2.8120	374.904	1.1969	72.478	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	26.5842	3426.162	2.8120	375.071	1.2054	72.701	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	27.0393	3452.222	2.8120	375.210	1.2182	73.035	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	26.5522	3426.162	2.8120	375.071	1.2267	73.257	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	26.8298	3441.797	2.8120	375.155	1.2395	73.591	5.5679	1331.546
240	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	27.6737	3523.295	2.8120	374.932	1.4014	84.224	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	28.0047	3539.598	2.8120	375.015	1.4014	84.224	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	28.5312	3566.768	2.8120	375.155	1.4099	84.446	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	28.2161	3561.336	2.8120	375.127	1.4227	84.780	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	28.4581	3572.204	2.8120	375.182	1.4312	85.059	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	28.7568	3588.507	2.8120	375.266	1.4440	85.393	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	29.4165	3663.373	2.8120	375.015	1.6059	97.528	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	29.8749	3686.002	2.8120	375.127	1.6059	97.528	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	29.5713	3674.685	2.8120	375.071	1.6144	97.806	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	30.0885	3702.973	2.8120	375.210	1.6272	98.140	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	30.5111	3725.598	2.8120	375.322	1.6443	98.586	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	30.7747	3736.915	2.8120	375.377	1.6485	98.697	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	31.1785	3802.245	2.8120	375.071	1.8147	109.441	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	31.7805	3831.925	2.8120	375.210	1.8189	109.552	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	31.4510	3820.051	2.8120	375.155	1.8275	109.775	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	32.1111	3855.663	2.8120	375.322	1.8360	109.997	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	32.5640	3879.406	2.8120	375.433	1.8530	110.498	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	33.1272	3901.136	3.2749	375.706	1.8743	111.055	7.5679	1842.884
360	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	33.0196	4022.510	2.8120	375.155	2.0277	121.409	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	33.7783	4059.457	2.8120	375.322	2.0320	121.576	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	33.4876	4047.143	2.8120	375.266	2.0405	121.799	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	34.0739	4077.931	2.8120	375.405	2.0490	122.021	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	34.4455	4090.251	2.8120	375.461	2.0575	122.244	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	35.2183	4124.963	3.2749	375.789	2.0831	122.912	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-10-2W-15

SHEET NUMBER 7152

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.035(2S+V2)+6'-2"
T2	#4	1	1	1	1	1					1.035(2S+V2)+7'-5"
T3	#4	1	1	1	1	1					1.035(2S+V2)+8'-8 1/2"
T4	#4	1	1	1	1	1					1.035(2S+V2)+9'-11 1/2"
T5	#4	1	1	1	1	1					1.035(2S+V2)+11'-2 1/2"
T6	#4	1	1	1	1	1					1.035(2S+V2)+12'-5 1/2"
T7	#4	1	1	1	1	1					1.035(2S+V2)+13'-8 1/2"
T8	#4	1	1	1	1	1					1.035(2S+V2)+14'-11 1/2"
T9	#4	1	1	1	1	1					1.035(2S+V2)+16'-2 1/2"
T10	#4	1	1	1	1	1					1.035(2S+V2)+17'-5 1/2"
T11	#4	1	1	1	1	1					1.035(2S+V2)+18'-8 1/2"
T12	#4	1	1	1	1	1					1.035(2S+V2)+20'-0"
T13	#4	1	1	1	1	1					1.035(2S+V2)+21'-3"
T14	#4	1	1	1	1	1					1.035(2S+V2)+22'-6"
T15	#4	1	1	1	1	1					1.035(2S+V2)+23'-9"
T16	#4	1	1	1	1	1					1.035(2S+V2)+24'-6"
T17	#4	3	3	3	3	3					1.035(2S+V2)+21'-4 1/2"
V1	#4	27	31	35	39	43			16'-4 1/2"	1'-8"	18'-0 1/2"
VL1	#4	1	1	1	1	1			15'-3"	1'-8"	16'-11"
VL2	#4	1	1	1	1	1			13'-9 1/2"	1'-8"	15'-5 1/2"
VL3	#4	1	1	1	1	1			12'-4"	1'-8"	14'-0"
VL4	#4	1	1	1	1	1			10'-10 1/2"	1'-8"	12'-6 1/2"
VL5	#4	1	1	1	1	1			9'-4 1/2"	1'-8"	11'-0 1/2"
VL6	#4	1	1	1	1	1			7'-11"	1'-8"	9'-7"
VL7	#4	1	1	1	1	1			6'-5 1/2"	1'-8"	8'-1 1/2"
VL8	#4	1	1	1	1	1			5'-0"	1'-8"	6'-8"
VL9	#4	1	1	1	1	1			3'-6 1/2"		3'-6 1/2"
VL10	#4	1	1	1	1	1			1'-4"		1'-4"
VS1	#4	1	1	1	1	1			15'-5"	1'-8"	17'-1"
VS2	#4	1	1	1	1	1			13'-5"	1'-8"	15'-1"
VS3	#4	1	1	1	1	1			11'-5"	1'-8"	13'-1"
VS4	#4	1	1	1	1	1			9'-5"	1'-8"	11'-1"
VS5	#4	1	1	1	1	1			7'-5"	1'-8"	9'-1"
VS6	#4	1	1	1	1	1			5'-5"	1'-8"	7'-1"
VS7	#4	1	1	1	1	1			3'-4 1/2"		3'-4 1/2"
VS8	#4	1	1	1	1	1			1'-1"		1'-1"
FTL1	#5	1	1	1	1	1					1'-3 1/2"
FTL2	#5	1	1	1	1	1					1'-11 1/2"
FTL3	#5	1	1	1	1	1					2'-7 1/2"
FTL4	#5	1	1	1	1	1					3'-3 1/2"
FTL5	#5	1	1	1	1	1					3'-11"
FTL6	#5	27	27	27	27	27					6'-6"
FTL7	#5	1	1	1	1	1					6'-5"
FTL8	#5	1	1	1	1	1					5'-9"
FTL9	#5	1	1	1	1	1					5'-1"
FTL10	#5	1	1	1	1	1					4'-5"
FTL11	#5	1	1	1	1	1					3'-9"
FTL12	#5	1	1	1	1	1					3'-1"
FTL13	#5	2	2	2	2	2					2'-6"
FLL	#4	8	8	8	8	8					22'-4 1/2"
FTS1	#5	1	1	1	1	1					2'-2 1/2"
FTS2	#5	24	24	24	24	24					6'-6"
FTS3	#5	1	1	1	1	1					4'-3"
FTS4	#5	1	1	1	1	1					2'-6"
FLS	#4	8	8	8	8	8					16'-4 1/2"
WS1	#5	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
WS2	#5	1	1	1	1	1				W+7'-1"	W+7'-1"
WS3	#5	1	1	1	1	1				W+6'-9"	W+6'-9"
WS4	#5	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
WS5	#5	1	1	1	1	1				W+6'-1 1/2"	W+6'-1 1/2"
WS6	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WS7	#5	1	1	1	1	1				W+5'-6"	W+5'-6"
WS8	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WS9	#5	1	1	1	1	1				W+4'-10 1/2"	W+4'-10 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WS10	#5	1	1	1	1	1				W+4'-6 1/2"	W+4'-6 1/2"
WS11	#5	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
WS12	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WS13	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WS14	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
WS15	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WS16	#5	1	1	1	1	1				W+2'-7 1/2"	W+2'-7 1/2"
WS17	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WS18	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WS19	#5	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
WS20	#5	1	1	1	1	1				W+1'-4 1/2"	W+1'-4 1/2"
WS21	#5	1	1	1	1	1				W+1'-0 1/2"	W+1'-0 1/2"
WS22	#5	1	1	1	1	1				W+0'-9"	W+0'-9"
WS23	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WS24	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WS25	#5	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WS26	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	24	24	24	24	24			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+7'-5"	W+7'-5"
WL2	#5	1	1	1	1	1				W+7'-2 1/2"	W+7'-2 1/2"
WL3	#5	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
WL4	#5	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
WL5	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WL6	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL7	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL8	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WL9	#5	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
WL10	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WL11	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WL12	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL13	#5	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
WL14	#5	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
WL15	#5	1	1	1	1	1				W+4'-2"	W+4'-2"
WL16	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL17	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL18	#5	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WL19	#5	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WL20	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL21	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WL22	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WL23	#5	1	1	1	1	1				W+2'-3 1/2"	W+2'-3 1/2"
WL24	#5	1	1	1	1	1				W+2'-0 1/2"	W+2'-0 1/2"
WL25	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WL26	#5	1	1	1	1	1				W+1'-7"	W+1'-7"
WL27	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL28	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WL29	#5	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
WL30	#5	1	1	1	1	1				W+0'-7 1/2"	W+0'-7 1/2"
WL31	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL32	#5	1	1	1	1	1				W+0'-2"	W+0'-2"
WL33	#5	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WL34	#5	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
WL35	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	32	32	32	32	32			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
RS2	#4	1	1	1	1	1				W+6'-11"	W+6'-11"
RS3	#4	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
RS4	#4	1	1	1	1	1				W+6'-0"	W+6'-0"
RS5	#4	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
RS6	#4	1	1	1	1	1				W+5'-0 1/2"	W+5'-0 1/2"
RS7	#4	1	1	1	1	1				W+4'-7"	W+4'-7"
RS8	#4	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
RS9	#4	1	1	1	1	1				W+3'-8"	W+3'-8"
RS10	#4	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RS11	#4	1	1	1	1	1				W+2'-9"	W+2'-9"
RS12	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RS13	#4	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
RS14	#4	1	1	1	1	1				W+1'-4"	W+1'-4"
RS15	#4	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
RS16	#4	1	1	1	1	1				W+0'-5"	W+0'-5"
RS17	#4	1	1	1	1	1				W-0'-1"	W-0'-1"
RS18	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	17	17	17	17	17			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+7'-5"	W+7'-5"
RL2	#4	1	1	1	1	1				W+7'-1"	W+7'-1"
RL3	#4	1	1	1	1	1				W+6'-9"	W+6'-9"
RL4	#4	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
RL5	#4	1	1	1	1	1				W+6'-0 1/2"	W+6'-0 1/2"
RL6	#4	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
RL7	#4	1	1	1	1	1				W+5'-4"	W+5'-4"
RL8	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RL9	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RL10	#4	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
RL11	#4	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
RL12	#4	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
RL13	#4	1	1	1	1	1				W+3'-3"	W+3'-3"
RL14	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RL15	#4	1	1	1	1	1				W+2'-7"	W+2'-7"
RL16	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RL17	#4	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RL18	#4	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
RL19	#4	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
RL20	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL21	#4	1	1	1	1	1				W+0'-6"	W+0'-6"
RL22	#4	1	1	1	1	1				W+0'-2"	W+0'-2"
RL23	#4	1	1	1	1	1				W-0'-2 1/2"	W-0'-2 1/2"
RL24	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	23	23	23	23	23			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-10 1/2"
YS2	#4	2	2	2	2	2					4'-11 1/2"
YS3	#4	2	2	2	2	2					7'-0 1/2"
YS4	#4	2	2	2	2	2					9'-1"
YS5	#4	2	2	2	2	2					11'-2"
YS6	#4	2	2	2	2	2					13'-3"
YS7	#4	2	2	2	2	2					15'-3 1/2"
YS8	#4	8	8	8	8	10					16'-5"
YL1	#4	2	2	2	2	2					4'-0 1/2"
YL2	#4	2	2	2	2	2					6'-10 1/2"
YL3	#4	2	2	2	2	2					9'-8 1/2"
YL4	#4	2	2	2	2	2					12'-6"
YL5	#4	2	2	2	2	2					15'-4"
YL6	#4	2	2	2	2	2					18'-2"
YL7	#4	2	2	2	2	2					21'-0"
YL8	#4	8	8	8	8	10					22'-6 1/2"
FS	#4	2	2	2	2	2					18'-2 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-10-2W-15

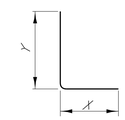
SHEET NUMBER 7153

REVISIONS | BY | DATE

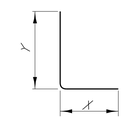
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		10'	12'	14'	16'	18'					
FL	#4	2	2	2	2	2					23'-11"
N	#4	26	30	35	39	43			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.035(2S+2V1+V2)+10 ½"
K	#4	24	28	32	36	41			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.035(2S+V2)+1'-1 ½"
OS	#7	12	12	12	12	13			3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	12	12	12	12	13			3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1					10'-0"+T1
OSL	#4	1	1	1	1	1					10'-0"+T1

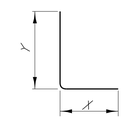
BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			5'-7"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+7'-6 ¼"	W1+7'-6 ¼"
J2	#5	1		W1+7'-0 ¾"	W1+7'-0 ¾"
J3	#5	1		W1+6'-6 ¾"	W1+6'-6 ¾"
J4	#5	1		W1+6'-1 ¼"	W1+6'-1 ¼"
J5	#5	1		W1+5'-7 ¼"	W1+5'-7 ¼"
J6	#5	1		W1+5'-1 ¼"	W1+5'-1 ¼"
J7	#5	1		W1+4'-7 ¾"	W1+4'-7 ¾"
J8	#5	1		W1+4'-1 ¾"	W1+4'-1 ¾"
J9	#5	1		W1+3'-7 ¾"	W1+3'-7 ¾"
J10	#5	1		W1+3'-2 ¼"	W1+3'-2 ¼"
J11	#5	1		W1+2'-7 ¼"	W1+2'-7 ¼"
J12	#5	1		W1+2'-2 ¾"	W1+2'-2 ¾"
J13	#5	1		W1+1'-8 ¾"	W1+1'-8 ¾"
J14	#5	1		W1+1'-3 ¼"	W1+1'-3 ¼"
J15	#5	1		W1+0'-9 ¼"	W1+0'-9 ¼"
J16	#5	1	1'-0"	W1+1'-0 ¼"	W1+2'-0 ¼"
J17	#5	1	1'-0"	W1+0'-6 ¾"	W1+1'-6 ¾"
DJ	#5	15	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3"
YD5	#5	1			10'-3"
YD6	#5	1			12'-3"
YD7	#5	1			14'-3"
YD8	#5	1			15'-5 ½"
FD	#4	1			17'-3 ½"



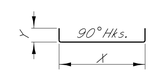
BARS DRS/DRL - #4



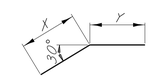
BARS DWS/DWL/DJ-#5



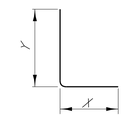
BARS RSn/RLn - #4



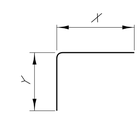
BARS N - #4



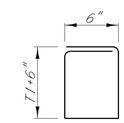
DOWELS OS/OL - #7



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 3 OF 3

WORKING NUMBER IWD-10-2W-15

SHEET NUMBER 7154

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													12'	14'	16'	18'	20'
12'-0"	9'-4"	19'-3 7/8"	26'-4 13/16"	0'-2 15/16"	0'-8 1/16"	18'-8"	0'-11"	0'-11"	5'-0"	2'-0"	2'-9 3/4"	18'-4 7/16"	50'-1 7/8"+1.035V2	54'-3 5/8"+1.035V2	58'-5 5/16"+1.035V2	62'-7"+1.035V2	66'-8 11/16"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet. Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	36.2471	4782.701	3.8560	501.489	1.4014	84.224	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	36.6667	4801.982	3.8560	501.572	1.4142	84.558	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	37.2703	4834.116	3.8560	501.711	1.4312	85.059	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	36.5765	4801.982	3.8560	501.572	1.4099	84.446	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	36.7524	4814.835	3.8560	501.628	1.4142	84.558	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	36.9736	4827.691	3.8560	501.684	1.4185	84.669	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	38.3389	4942.540	3.8560	501.572	1.6059	95.969	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	38.8431	4962.489	3.8560	501.656	1.6187	96.359	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	38.4614	4949.191	3.8560	501.600	1.6357	96.804	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	38.7566	4969.140	3.8560	501.684	1.6230	96.470	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	39.0447	4982.438	3.8560	501.739	1.6315	96.693	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	39.2268	4995.736	3.8560	501.795	1.6315	96.693	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	40.2909	5186.589	3.8560	501.628	1.8147	109.441	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	40.9637	5221.232	3.8560	501.767	1.8232	109.663	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	40.5438	5200.448	3.8560	501.684	1.8402	110.109	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	40.9121	5221.232	3.8560	501.767	1.8360	109.997	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	41.4011	5246.581	4.5090	501.866	1.8573	110.610	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	41.7114	5260.435	4.5090	501.922	1.8615	110.721	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	42.3863	5349.128	3.8560	501.711	2.0277	121.409	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	43.2273	5392.032	3.8560	501.878	2.0320	121.576	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	42.5865	5356.280	3.8560	501.739	2.0447	121.910	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	43.2224	5389.366	4.5090	501.866	2.0618	122.355	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	43.6863	5410.818	4.5090	501.950	2.0703	122.578	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	44.3504	5446.569	4.5090	502.089	2.0788	122.801	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3 1/2"	11"	9"	4'-0 1/2"	44.4422	5505.466	3.8560	501.767	2.2365	133.322	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	44.4511	5498.091	3.8560	501.739	2.2450	133.544	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	44.9069	5524.609	4.5090	501.838	2.2663	134.101	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	45.4611	5554.104	4.5090	501.950	2.2748	134.379	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7	46.3597	5605.713	4.5090	502.144	2.2833	134.602	9.0617	2235.611

GENERAL NOTES:

Specifications: Mississippi Standard Specifications "For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING
DOUBLE CELL
15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 3

WORKING NUMBER: IWD-12-2W-15

SHEET NUMBER: 7155

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.035(2S+V2)+6'-4"
T2	#4	1	1	1	1	1					1.035(2S+V2)+7'-7"
T3	#4	1	1	1	1	1					1.035(2S+V2)+8'-9 1/2"
T4	#4	1	1	1	1	1					1.035(2S+V2)+10'-0"
T5	#4	1	1	1	1	1					1.035(2S+V2)+11'-3"
T6	#4	1	1	1	1	1					1.035(2S+V2)+12'-5 1/2"
T7	#4	1	1	1	1	1					1.035(2S+V2)+13'-8"
T8	#4	1	1	1	1	1					1.035(2S+V2)+14'-11"
T9	#4	1	1	1	1	1					1.035(2S+V2)+16'-1 1/2"
T10	#4	1	1	1	1	1					1.035(2S+V2)+17'-4 1/2"
T11	#4	1	1	1	1	1					1.035(2S+V2)+18'-7"
T12	#4	1	1	1	1	1					1.035(2S+V2)+19'-9 1/2"
T13	#4	1	1	1	1	1					1.035(2S+V2)+21'-0 1/2"
T14	#4	1	1	1	1	1					1.035(2S+V2)+22'-3"
T15	#4	1	1	1	1	1					1.035(2S+V2)+23'-5 1/2"
T16	#4	1	1	1	1	1					1.035(2S+V2)+24'-8 1/2"
T17	#4	1	1	1	1	1					1.035(2S+V2)+25'-11"
T18	#4	1	1	1	1	1					1.035(2S+V2)+27'-1 1/2"
T19	#4	1	1	1	1	1					1.035(2S+V2)+27'-9 1/2"
T20	#4	3	3	3	3	3					1.035(2S+V2)+24'-8 1/2"
V1	#4	31	35	39	43	47			19'-0"	1'-8"	20'-8"
VL1	#4	1	1	1	1	1			17'-11 1/2"	1'-8"	19'-7 1/2"
VL2	#4	1	1	1	1	1			16'-5 1/2"	1'-8"	18'-1 1/2"
VL3	#4	1	1	1	1	1			15'-0"	1'-8"	16'-8"
VL4	#4	1	1	1	1	1			13'-6 1/2"	1'-8"	15'-2 1/2"
VL5	#4	1	1	1	1	1			12'-1"	1'-8"	13'-9"
VL6	#4	1	1	1	1	1			10'-7 1/2"	1'-8"	12'-3 1/2"
VL7	#4	1	1	1	1	1			9'-2"	1'-8"	10'-10"
VL8	#4	1	1	1	1	1			7'-8 1/2"	1'-8"	9'-4 1/2"
VL9	#4	1	1	1	1	1			6'-3"	1'-8"	7'-11"
VL10	#4	1	1	1	1	1			4'-9"	1'-8"	6'-5"
VL11	#4	1	1	1	1	1			3'-2"		3'-2"
VS1	#4	1	1	1	1	1			18'-2"	1'-8"	19'-10"
VS2	#4	1	1	1	1	1			16'-2"	1'-8"	17'-10"
VS3	#4	1	1	1	1	1			14'-2"	1'-8"	15'-10"
VS4	#4	1	1	1	1	1			12'-2"	1'-8"	13'-10"
VS5	#4	1	1	1	1	1			10'-2"	1'-8"	11'-10"
VS6	#4	1	1	1	1	1			8'-2"	1'-8"	9'-10"
VS7	#4	1	1	1	1	1			6'-2"	1'-8"	7'-10"
VS8	#4	1	1	1	1	1			4'-2"	1'-8"	5'-10"
VS9	#4	1	1	1	1	1			1'-11"		1'-11"
FTL1	#5	1	1	1	1	1					1'-0 1/2"
FTL2	#5	1	1	1	1	1					1'-7 1/2"
FTL3	#5	1	1	1	1	1					2'-2 1/2"
FTL4	#5	1	1	1	1	1					2'-9 1/2"
FTL5	#5	1	1	1	1	1					3'-4 1/2"
FTL6	#5	1	1	1	1	1					3'-11 1/2"
FTL7	#5	1	1	1	1	1					4'-6 1/2"
FTL8	#5	1	1	1	1	1					5'-1"
FTL9	#5	36	36	36	36	36					7'-7"
FTL10	#5	1	1	1	1	1					6'-11 1/2"
FTL11	#5	1	1	1	1	1					6'-5"
FTL12	#5	1	1	1	1	1					5'-10"
FTL13	#5	1	1	1	1	1					5'-3"
FTL14	#5	1	1	1	1	1					4'-8"
FTL15	#5	1	1	1	1	1					4'-1"
FTL16	#5	1	1	1	1	1					3'-6"
FTL17	#5	1	1	1	1	1					2'-11"
FTL18	#5	2	2	2	2	2					2'-7"
FLL	#4	9	9	9	9	9					25'-11"
FTS1	#5	1	1	1	1	1					1'-5"
FTS2	#5	1	1	1	1	1					3'-7"
FTS3	#5	31	31	31	31	31					7'-7"
FTS4	#5	1	1	1	1	1					6'-1 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
FTS5	#5	1	1	1	1	1					3'-11 1/2"
FTS6	#5	1	1	1	1	1					2'-7"
FLS	#4	9	9	9	9	9					19'-0"
WS1	#5	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
WS2	#5	1	1	1	1	1				W+8'-4 1/2"	W+8'-4 1/2"
WS3	#5	1	1	1	1	1				W+8'-1"	W+8'-1"
WS4	#5	1	1	1	1	1				W+7'-9 1/2"	W+7'-9 1/2"
WS5	#5	1	1	1	1	1				W+7'-6 1/2"	W+7'-6 1/2"
WS6	#5	1	1	1	1	1				W+7'-3"	W+7'-3"
WS7	#5	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
WS8	#5	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
WS9	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WS10	#5	1	1	1	1	1				W+6'-1 1/2"	W+6'-1 1/2"
WS11	#5	1	1	1	1	1				W+5'-10 1/2"	W+5'-10 1/2"
WS12	#5	1	1	1	1	1				W+5'-7"	W+5'-7"
WS13	#5	1	1	1	1	1				W+5'-3 1/2"	W+5'-3 1/2"
WS14	#5	1	1	1	1	1				W+5'-0 1/2"	W+5'-0 1/2"
WS15	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WS16	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WS17	#5	1	1	1	1	1				4'-2 1/2"	W+4'-2 1/2"
WS18	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WS19	#5	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
WS20	#5	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
WS21	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS22	#5	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
WS23	#5	1	1	1	1	1				W+2'-6 1/2"	W+2'-6 1/2"
WS24	#5	1	1	1	1	1				W+2'-3"	W+2'-3"
WS25	#5	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
WS26	#5	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
WS27	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WS28	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WS29	#5	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
WS30	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WS31	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"
WS32	#5	1	1	1	1	1				W+0'-0 1/2"	W+0'-0 1/2"
WS33	#5	1	1	1	1	1				W-0'-3"	W-0'-3"
WS34	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	34	34	34	34	34			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+8'-8"	W+8'-8"
WL2	#5	1	1	1	1	1				W+8'-5 1/2"	W+8'-5 1/2"
WL3	#5	1	1	1	1	1				W+8'-3"	W+8'-3"
WL4	#5	1	1	1	1	1				W+8'-0 1/2"	W+8'-0 1/2"
WL5	#5	1	1	1	1	1				W+7'-10 1/2"	W+7'-10 1/2"
WL6	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WL7	#5	1	1	1	1	1				W+7'-5 1/2"	W+7'-5 1/2"
WL8	#5	1	1	1	1	1				W+7'-3"	W+7'-3"
WL9	#5	1	1	1	1	1				W+7'-0 1/2"	W+7'-0 1/2"
WL10	#5	1	1	1	1	1				W+6'-10"	W+6'-10"
WL11	#5	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
WL12	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL13	#5	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
WL14	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL15	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WL16	#5	1	1	1	1	1				W+5'-7"	W+5'-7"
WL17	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL18	#5	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
WL19	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL20	#5	1	1	1	1	1				W+4'-9 1/2"	W+4'-9 1/2"
WL21	#5	1	1	1	1	1				W+4'-7"	W+4'-7"
WL22	#5	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
WL23	#5	1	1	1	1	1				W+4'-2"	W+4'-2"
WL24	#5	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
WL25	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WL26	#5	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL27	#5	1	1	1	1	1				W+3'-4"	W+3'-4"
WL28	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WL29	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL30	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WL31	#5	1	1	1	1	1				W+2'-6 1/2"	W+2'-6 1/2"
WL32	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WL33	#5	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
WL34	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WL35	#5	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
WL36	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL37	#5	1	1	1	1	1				W+1'-3 1/2"	W+1'-3 1/2"
WL38	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WL39	#5	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
WL40	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WL41	#5	1	1	1	1	1				W+0'-6"	W+0'-6"
WL42	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"
WL43	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WL44	#5	1	1	1	1	1				W-0'-1 1/2"	W-0'-1 1/2"
WL45	#5	1	1	1	1	1				W-0'-4"	W-0'-4"
WL46	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	46	46	46	46	46			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
RS2	#4	1	1	1	1	1				W+8'-2"	W+8'-2"
RS3	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RS4	#4	1	1	1	1	1				W+7'-2 1/2"	W+7'-2 1/2"
RS5	#4	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
RS6	#4	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
RS7	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RS8	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RS9	#4	1	1	1	1	1				W+4'-9 1/2"	W+4'-9 1/2"
RS10	#4	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
RS11	#4	1	1	1	1	1				W+3'-10"	W+3'-10"
RS12	#4	1	1	1	1	1				W+3'-4"	W+3'-4"
RS13	#4	1	1	1	1	1				W+2'-10"	W+2'-10"
RS14	#4	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
RS15	#4	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RS16	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS17	#4	1	1	1	1	1				W+0'-11"	W+0'-11"
RS18	#4	1	1	1	1	1				W+0'-5"	W+0'-5"
RS19	#4	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
RS20	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-12-2W-15

SHEET NUMBER 7156

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, Ed. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

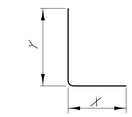
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

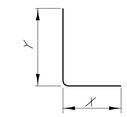
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
DRS	#4	20	20	20	20	20			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+8'-8"	W+8'-8"
RL2	#4	1	1	1	1	1				W+8'-4"	W+8'-4"
RL3	#4	1	1	1	1	1				W+8'-0"	W+8'-0"
RL4	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RL5	#4	1	1	1	1	1				W+7'-3 ¼"	W+7'-3 ½"
RL6	#4	1	1	1	1	1				W+6'-11 ¼"	W+6'-11 ½"
RL7	#4	1	1	1	1	1				W+6'-7 ¼"	W+6'-7 ½"
RL8	#4	1	1	1	1	1				W+6'-3 ¼"	W+6'-3 ½"
RL9	#4	1	1	1	1	1				W+5'-11 ¼"	W+5'-11 ½"
RL10	#4	1	1	1	1	1				W+5'-7"	W+5'-7"
RL11	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RL12	#4	1	1	1	1	1				W+4'-11"	W+4'-11"
RL13	#4	1	1	1	1	1				W+4'-7"	W+4'-7"
RL14	#4	1	1	1	1	1				W+4'-3"	W+4'-3"
RL15	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RL16	#4	1	1	1	1	1				W+3'-6 ¼"	W+3'-6 ½"
RL17	#4	1	1	1	1	1				W+3'-2 ¼"	W+3'-2 ½"
RL18	#4	1	1	1	1	1				W+2'-10 ¼"	W+2'-10 ½"
RL19	#4	1	1	1	1	1				W+2'-6 ¼"	W+2'-6 ½"
RL20	#4	1	1	1	1	1				W+2'-2 ¼"	W+2'-2 ½"
RL21	#4	1	1	1	1	1				W+1'-10"	W+1'-10"
RL22	#4	1	1	1	1	1				W+1'-6"	W+1'-6"
RL23	#4	1	1	1	1	1				W+1'-2"	W+1'-2"
RL24	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL25	#4	1	1	1	1	1				W+0'-6"	W+0'-6"
RL26	#4	1	1	1	1	1				W+0'-1 ¼"	W+0'-1 ½"
RL27	#4	1	1	1	1	1				W-0'-2 ¼"	W-0'-2 ½"
RL28	#4	1	1	1	1	1				W-0'-6 ¼"	W-0'-6 ½"
DRL	#4	28	28	28	28	28			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-6 ¼"
YS2	#4	2	2	2	2	2					4'-3"
YS3	#4	2	2	2	2	2					6'-0"
YS4	#4	2	2	2	2	2					7'-8 ¼"
YS5	#4	2	2	2	2	2					9'-5 ¼"
YS6	#4	2	2	2	2	2					11'-2"
YS7	#4	2	2	2	2	2					12'-10 ¼"
YS8	#4	2	2	2	2	2					14'-7 ¼"
YS9	#4	2	2	2	2	2					16'-4"
YS10	#4	2	2	2	2	2					18'-1"
YS11	#4	10	10	12	12	12					19'-0"
YL1	#4	2	2	2	2	2					3'-6 ¼"
YL2	#4	2	2	2	2	2					5'-11"
YL3	#4	2	2	2	2	2					8'-3 ¼"
YL4	#4	2	2	2	2	2					10'-7 ¼"
YL5	#4	2	2	2	2	2					13'-0"
YL6	#4	2	2	2	2	2					15'-4"
YL7	#4	2	2	2	2	2					17'-8 ¼"
YL8	#4	2	2	2	2	2					20'-0 ¼"
YL9	#4	2	2	2	2	2					22'-5"
YL10	#4	2	2	2	2	2					24'-9 ¼"
YL11	#4	10	10	12	12	12					26'-1"
FS	#4	2	2	2	2	2					21'-1"
FL	#4	2	2	2	2	2					27'-8"
N	#4	30	34	39	43	47			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.035(25+2V1+V2)+10 ½"
K	#4	28	32	37	41	45			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					1.035(25+V2)+1'-3 ½"
OS	#7	16	16	17	17	17			3'-2 ¼"	3'-2 ¼"	6'-5"
OL	#7	16	16	17	17	17			3'-2 ¼"	3'-2 ¼"	6'-5"
OSS	#4	1	1	1	1	1					12'-0"+T1
OSL	#4	1	1	1	1	1					12'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

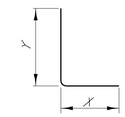
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			5'-7"
DS	#4	1			12'-0"+T1
J1	#5	1			W1+8'-9 ¾"
J2	#5	1			W1+8'-4 ¼"
J3	#5	1			W1+7'-10 ¾"
J4	#5	1			W1+7'-4 ¾"
J5	#5	1			W1+6'-11 ¼"
J6	#5	1			W1+6'-5 ¼"
J7	#5	1			W1+5'-11 ¾"
J8	#5	1			W1+5'-6 ¼"
J9	#5	1			W1+5'-0 ¼"
J10	#5	1			W1+4'-6 ¾"
J11	#5	1			W1+4'-0 ¾"
J12	#5	1			W1+3'-7 ¼"
J13	#5	1			W1+3'-1 ¾"
J14	#5	1			W1+2'-7 ¾"
J15	#5	1			W1+2'-2 ¼"
J16	#5	1			W1+1'-8 ¼"
J17	#5	1			W1+1'-2 ¾"
J18	#5	1			W1+0'-9 ¼"
J19	#5	1			W1+0'-3 ¼"
J20	#5	1	1'-0"	W1+0'-6 ¾"	W1+1'-6 ¾"
DJ	#5	19	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	3			18'-0 ½"
FD	#4	1			20'-2"



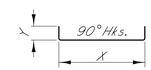
BARS DRS/DRL - #4



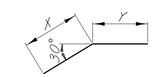
BARS DWS/DWL/DJ-#5



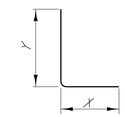
BARS RSn/RLn - #4



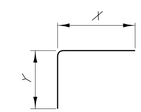
BARS N - #4



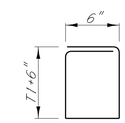
DOWELS OS/OL - #7



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

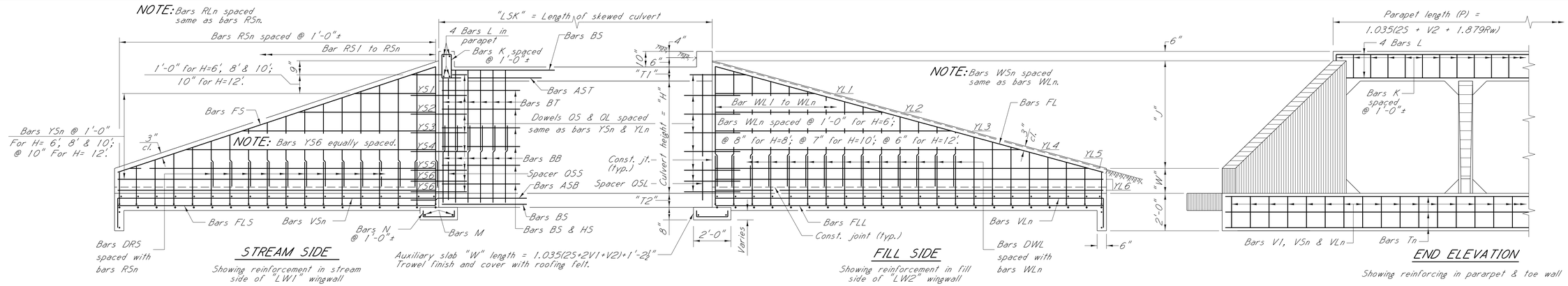
SHT. 3 OF 3

WORKING NUMBER IWD-12-2W-15

SHEET NUMBER 7157

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

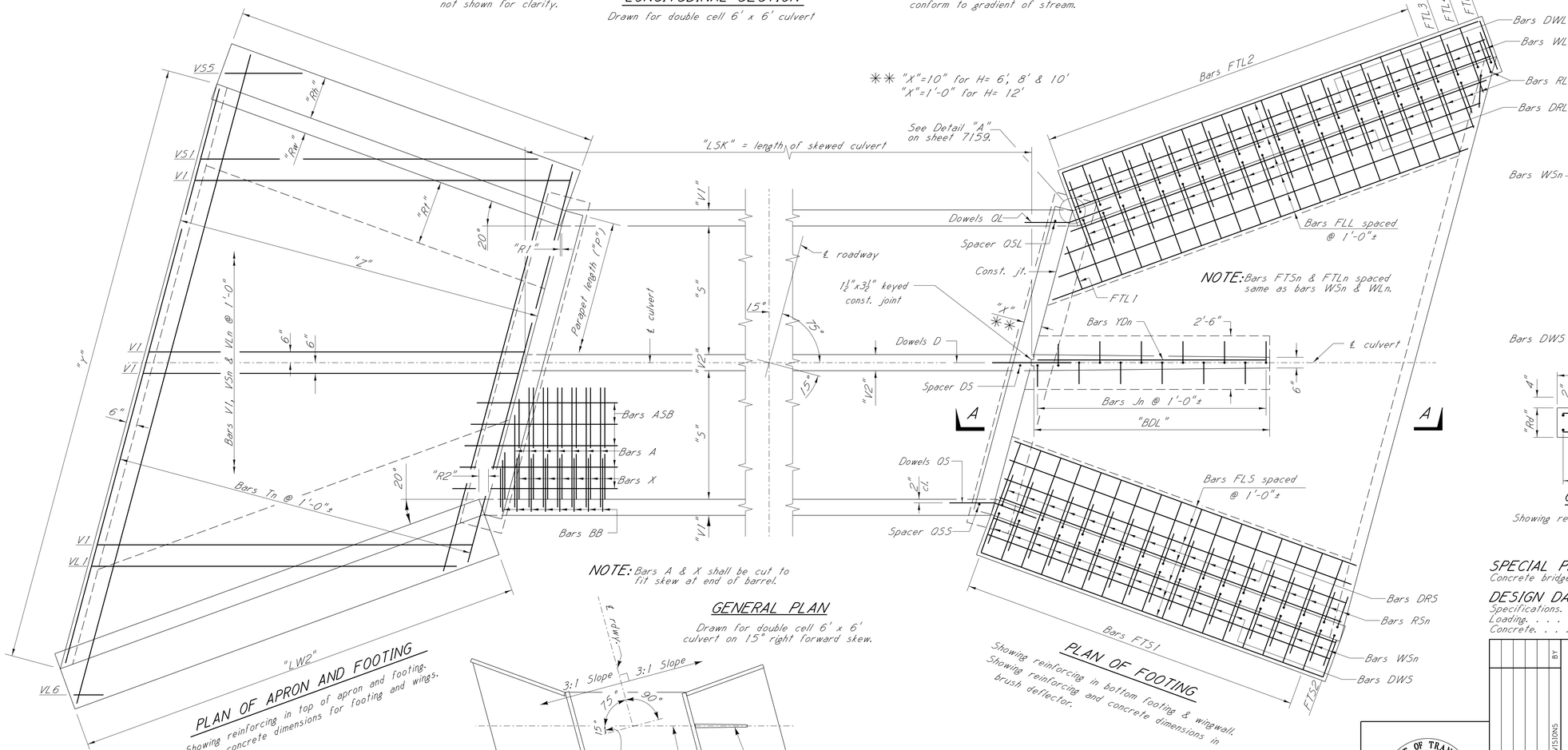


NOTE: Bars X & bars A not shown for clarity.

LONGITUDINAL SECTION

Drawn for double cell 6' x 6' culvert

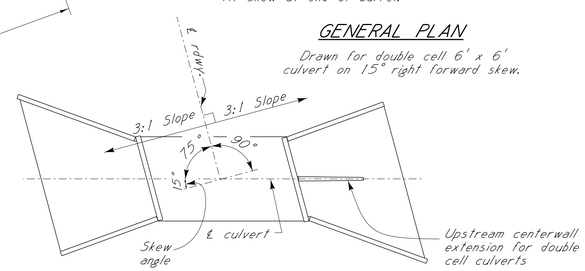
NOTE: Culvert shall be sloped to conform to gradient of stream.



NOTE: Bars A & X shall be cut to fit skew at end of barrel.

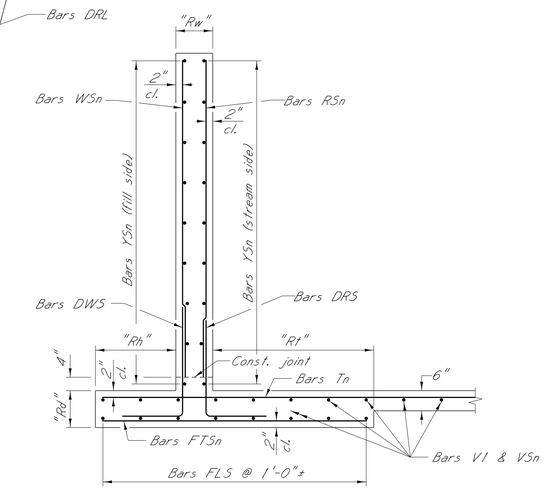
GENERAL PLAN

Drawn for double cell 6' x 6' culvert on 15° right forward skew.



PLAN OF 15° LEFT FORWARD SKEW

NOTE: For bar bending details and quantities, see drawings IWS-6-3W-15, IWS-8-3W-15, IWS-10-3W-15 & IWS-12-3W-15.



CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-40 FT.

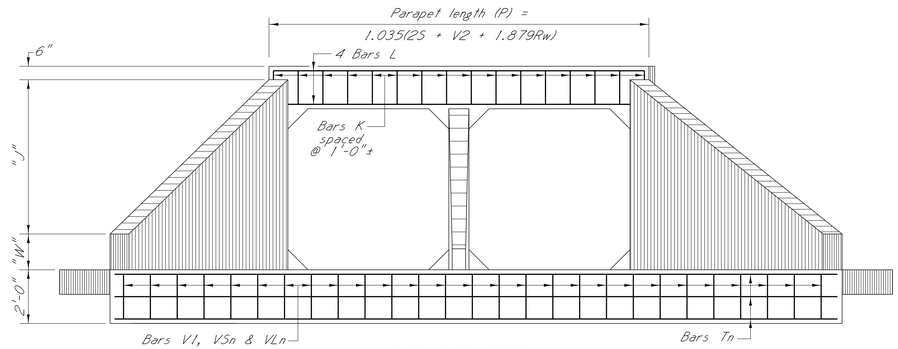
SHT. 1 OF 2

WORKING NUMBER IWD-3W-15

SHEET NUMBER 7158

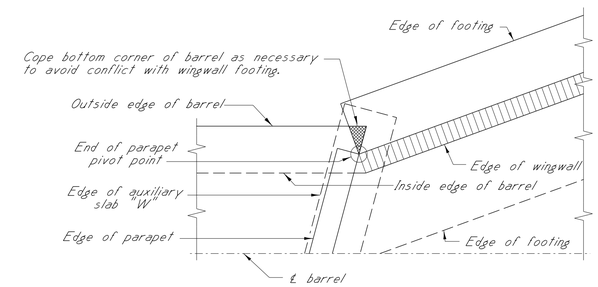
DATE | REVISIONS | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

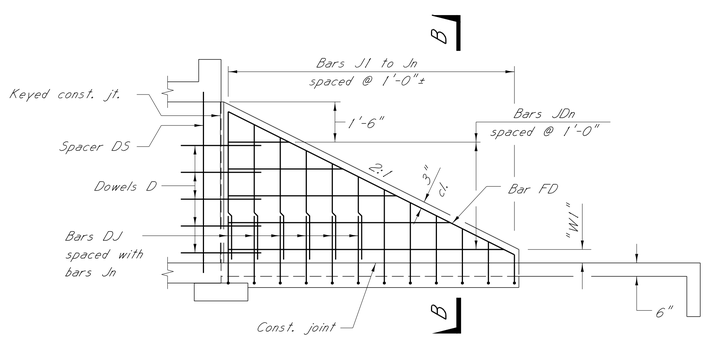


END ELEVATION

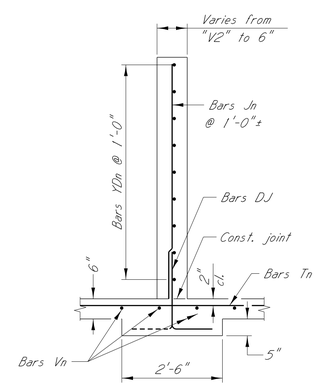
Showing reinforcing in pararpet & toe wall



DETAIL "A"



SECTION A-A



SECTION B-B

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

REVISIONS	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION
		WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS
		HEIGHTS 6-12 FT. — SHT. 2 OF 2
		SPANS 12-40 FT. — WORKING NUMBER IWD-3W-15
DATE		DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E. DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015 — SHEET NUMBER 7159
		DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
													6'	8'	10'	12'	14'	16'
6'-0"	5'-9"	17'-3 13/16"	21'-0 11/16"	0'-0 13/16"	0'-5 3/8"	17'-3"	0'-11"	0'-9"	3'-0"	2'-0"	0'-6"	11'-0"	27'-5 5/8"+1.035V2	31'-7 5/16"+1.035V2	35'-9"+1.035V2	39'-10 3/4"+1.035V2	44'-0 7/16"+1.035V2	48'-2 1/8"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	17.3161	2137.985	1.2326	171.502	0.7879	47.372	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	17.3161	2137.985	1.2326	171.502	0.7879	47.372	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	17.3161	2137.985	1.2326	171.502	0.7879	47.372	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	17.3907	2137.985	1.2326	171.502	0.7879	47.372	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	17.5995	2149.379	1.2326	171.585	0.7879	47.372	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	17.7385	2156.974	1.2326	171.641	0.7879	47.372	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	18.9301	2266.185	1.2326	171.502	0.9924	59.118	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	19.0239	2266.185	1.2326	171.502	0.9924	59.118	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	19.3278	2282.269	1.2326	171.613	0.9924	59.118	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	19.4797	2290.309	1.2326	171.669	0.9924	59.118	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	19.7835	2306.393	1.2326	171.780	0.9924	59.118	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	20.0561	2322.474	1.2326	171.891	0.9924	59.118	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	20.5569	2394.608	1.2326	171.502	1.1969	70.919	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	20.8346	2403.094	1.2326	171.557	1.1969	70.919	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	21.3287	2428.554	1.2326	171.724	1.1969	70.919	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	21.7851	2454.014	1.2326	171.891	1.1969	70.919	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	20.9687	2415.824	1.2326	171.641	1.1969	70.919	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	21.0887	2420.068	1.2326	171.669	1.1969	70.919	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	22.4186	2536.234	1.2326	171.585	1.4014	84.224	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	22.7289	2549.632	1.2326	171.669	1.4014	84.224	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	23.3047	2571.961	1.2326	171.808	1.4014	84.224	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	22.7296	2554.100	1.2326	171.697	1.4014	84.224	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	22.8624	2558.563	1.2326	171.724	1.4014	84.224	3.0000	1161.439
		30'-0"	1'-2 1/2"	1'-3 1/2"	9"	9"	1'-9"	23.0840	2567.498	1.2326	171.780	1.4014	84.224	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	24.2236	2674.478	1.2326	171.641	1.6059	95.969	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	24.6559	2693.235	1.2326	171.752	1.6102	96.136	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	24.3207	2679.169	1.2326	171.669	1.6187	96.359	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	24.7887	2707.301	1.2326	171.836	1.6059	95.969	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	24.9437	2707.301	1.2326	171.836	1.6144	96.248	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	25.1854	2716.676	1.2326	171.891	1.6144	96.248	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	26.1005	2893.655	1.2326	171.724	1.8189	107.993	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	26.6689	2918.215	1.2326	171.864	1.8232	108.105	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	26.3587	2903.481	1.2326	171.780	1.8104	107.771	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	26.7527	2928.036	1.2326	171.919	1.8104	107.771	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	27.0694	2937.857	1.2326	171.975	1.8104	107.771	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	27.4754	2957.504	1.2326	172.086	1.8104	107.771	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-6-3W-15

SHEET NUMBER 7160

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1					1.035(2S+V2)+5'-8"
T2	#4	1	1	1	1	1	1					1.035(2S+V2)+6'-5 1/2"
T3	#4	1	1	1	1	1	1					1.035(2S+V2)+7'-2 1/2"
T4	#4	1	1	1	1	1	1					1.035(2S+V2)+8'-0"
T5	#4	1	1	1	1	1	1					1.035(2S+V2)+8'-9 1/2"
T6	#4	1	1	1	1	1	1					1.035(2S+V2)+9'-7"
T7	#4	1	1	1	1	1	1					1.035(2S+V2)+10'-4 1/2"
T8	#4	1	1	1	1	1	1					1.035(2S+V2)+11'-2"
T9	#4	1	1	1	1	1	1					1.035(2S+V2)+11'-11"
T10	#4	1	1	1	1	1	1					1.035(2S+V2)+12'-8 1/2"
T11	#4	1	1	1	1	1	1					1.035(2S+V2)+13'-6"
T12	#4	1	1	1	1	1	1					1.035(2S+V2)+14'-3 1/2"
T13	#4	1	1	1	1	1	1					1.035(2S+V2)+15'-1"
T14	#4	1	1	1	1	1	1					1.035(2S+V2)+15'-10"
T15	#4	1	1	1	1	1	1					1.035(2S+V2)+16'-7 1/2"
T16	#4	1	1	1	1	1	1					1.035(2S+V2)+17'-5"
T17	#4	1	1	1	1	1	1					1.035(2S+V2)+18'-2 1/2"
T18	#4	3	3	3	3	3	3					1.035(2S+V2)+14'-6 1/2"
V1	#4	18	22	26	30	34	38			17'-6"	1'-8"	19'-2"
VL1	#4	1	1	1	1	1	1			17'-0 1/2"	1'-8"	18'-8 1/2"
VL2	#4	1	1	1	1	1	1			14'-7"	1'-8"	16'-3"
VL3	#4	1	1	1	1	1	1			12'-1"	1'-8"	13'-9"
VL4	#4	1	1	1	1	1	1			9'-7 1/2"	1'-8"	11'-3 1/2"
VL5	#4	1	1	1	1	1	1			7'-1 1/2"	1'-8"	8'-9 1/2"
VL6	#4	1	1	1	1	1	1			4'-6"		4'-6"
VL7	#4	1	1	1	1	1	1			1'-4 1/2"		1'-4 1/2"
VS1	#4	1	1	1	1	1	1			15'-9"	1'-8"	17'-5"
VS2	#4	1	1	1	1	1	1			12'-9"	1'-8"	14'-5"
VS3	#4	1	1	1	1	1	1			9'-8 1/2"	1'-8"	11'-4 1/2"
VS4	#4	1	1	1	1	1	1			6'-8 1/2"	1'-8"	8'-4 1/2"
VS5	#4	1	1	1	1	1	1			3'-7 1/2"		3'-7 1/2"
FTL1	#5	1	1	1	1	1	1					2'-1 1/2"
FTL2	#5	19	19	19	19	19	19					5'-5"
FTL3	#5	1	1	1	1	1	1					4'-7"
FTL4	#5	1	1	1	1	1	1					3'-2 1/2"
FTL5	#5	1	1	1	1	1	1					2'-5"
FLL	#4	7	7	7	7	7	7					20'-8"
FTS1	#5	17	17	17	17	17	17					5'-5"
FTS2	#5	1	1	1	1	1	1					1'-10"
FLS	#4	7	7	7	7	7	7					17'-0"
WS1	#5	1	1	1	1	1	1				W+5'-1"	W+5'-1"
WS2	#5	1	1	1	1	1	1				W+4'-9"	W+4'-9"
WS3	#5	1	1	1	1	1	1				W+4'-5"	W+4'-5"
WS4	#5	1	1	1	1	1	1				W+4'-1"	W+4'-1"
WS5	#5	1	1	1	1	1	1				W+3'-9 1/2"	W+3'-9 1/2"
WS6	#5	1	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WS7	#5	1	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
WS8	#5	1	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
WS9	#5	1	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
WS10	#5	1	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
WS11	#5	1	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WS12	#5	1	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
WS13	#5	1	1	1	1	1	1			1'-6"	W+2'-1 1/2"	W+3'-7 1/2"
WS14	#5	1	1	1	1	1	1			1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WS15	#5	1	1	1	1	1	1			1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
WS16	#5	1	1	1	1	1	1			1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS17	#5	1	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WS18	#5	1	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	12	12	12	12	12	12			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
WL2	#5	1	1	1	1	1	1				W+4'-10"	W+4'-10"
WL3	#5	1	1	1	1	1	1				W+4'-7"	W+4'-7"
WL4	#5	1	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
WL5	#5	1	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WL6	#5	1	1	1	1	1	1				W+3'-9"	W+3'-9"
WL7	#5	1	1	1	1	1	1				W+3'-6"	W+3'-6"
WL8	#5	1	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WL9	#5	1	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL10	#5	1	1	1	1	1	1				W+2'-8"	W+2'-8"
WL11	#5	1	1	1	1	1	1				W+2'-5"	W+2'-5"
WL12	#5	1	1	1	1	1	1				W+2'-2"	W+2'-2"
WL13	#5	1	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
WL14	#5	1	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL15	#5	1	1	1	1	1	1			1'-6"	W+2'-4"	W+3'-10"
WL16	#5	1	1	1	1	1	1			1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
WL17	#5	1	1	1	1	1	1			1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WL18	#5	1	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
WL19	#5	1	1	1	1	1	1			1'-6"	W+1'-3"	W+2'-9"
WL20	#5	1	1	1	1	1	1			1'-6"	W+1'-0"	W+2'-6"
WL21	#5	1	1	1	1	1	1			1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WL22	#5	1	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	14	14	14	14	14	14			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1				W+5'-1"	W+5'-1"
RS2	#4	1	1	1	1	1	1				W+4'-9"	W+4'-9"
RS3	#4	1	1	1	1	1	1				W+4'-5"	W+4'-5"
RS4	#4	1	1	1	1	1	1				W+4'-1"	W+4'-1"
RS5	#4	1	1	1	1	1	1				W+3'-9 1/2"	W+3'-9 1/2"
RS6	#4	1	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
RS7	#4	1	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
RS8	#4	1	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
RS9	#4	1	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
RS10	#4	1	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
RS11	#4	1	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
RS12	#4	1	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
RS13	#4	1	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
RS14	#4	1	1	1	1	1	1			1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
RS15	#4	1	1	1	1	1	1			1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RS16	#4	1	1	1	1	1	1			1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RS17	#4	1	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RS18	#4	1	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	13	13	13	13	13	13			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
RL2	#4	1	1	1	1	1	1				W+4'-10"	W+4'-10"
RL3	#4	1	1	1	1	1	1				W+4'-7"	W+4'-7"
RL4	#4	1	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
RL5	#4	1	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
RL6	#4	1	1	1	1	1	1				W+3'-9"	W+3'-9"
RL7	#4	1	1	1	1	1	1				W+3'-6"	W+3'-6"
RL8	#4	1	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
RL9	#4	1	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
RL10	#4	1	1	1	1	1	1				W+2'-8"	W+2'-8"
RL11	#4	1	1	1	1	1	1				W+2'-5"	W+2'-5"
RL12	#4	1	1	1	1	1	1				W+2'-2"	W+2'-2"
RL13	#4	1	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RL14	#4	1	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
RL15	#4	1	1	1	1	1	1				W+1'-4"	W+1'-4"
RL16	#4	1	1	1	1	1	1			1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
RL17	#4	1	1	1	1	1	1			1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
RL18	#4	1	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
RL19	#4	1	1	1	1	1	1			1'-6"	W+1'-3"	W+2'-9"
RL20	#4	1	1	1	1	1	1			1'-6"	W+1'-0"	W+2'-6"
RL21	#4	1	1	1	1	1	1			1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
RL22	#4	1	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	15	5	15	15	15	15			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2					4'-3 1/2"
YS2	#4	2	2	2	2	2	2					7'-4"
YS3	#4	2	2	2	2	2	2					10'-4"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
YS4	#4	2	2	2	2	2	2					13'-4 1/2"
YS5	#4	2	2	2	2	2	2					16'-4 1/2"
YS6	#4	4	4	4	4	4	6					17'-0"
YL1	#4	2	2	2	2	2	2					5'-3 1/2"
YL2	#4	2	2	2	2	2	2					8'-11 1/2"
YL3	#4	2	2	2	2	2	2					12'-7 1/2"
YL4	#4	2	2	2	2	2	2					16'-3 1/2"
YL5	#4	2	2	2	2	2	2					19'-11 1/2"
YL6	#4	4	4	4	4	4	6					20'-8 1/2"
FS	#4	2	2	2	2	2	2					17'-10 1/2"
FL	#4	2	2	2	2	2	2					21'-6"
N	#4	17	21	25	30	34	38			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					1.035(2S+2V1+V2)+10 1/2"
K	#4	16	20	24	28	32	36			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					1.035(2S+V2)+1'-1 1/2"
OS	#7	8	8	8	8	8	9			3'-0"	3'-0"	6'-0"
OL	#7	8	8	8	8	8	9			3'-0"	3'-0"	6'-0"
OSS	#4	1	1	1	1	1	1					6'-0"+T1
OSL	#4	1	1	1	1	1	1					6'-0"+T1

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 3

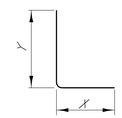
WORKING NUMBER
IWD-6-3W-15

SHEET NUMBER
7161

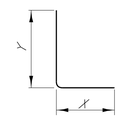
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			5'-6"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J2	#5	1		W1+4'-8"	W1+4'-8"
J3	#5	1		W1+4'-2"	W1+4'-2"
J4	#5	1		W1+3'-8"	W1+3'-8"
J5	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J6	#5	1		W1+2'-8 ½"	W1+2'-8 ½"
J7	#5	1	1'-0"	W1+2'-11 ½"	W1+3'-11 ½"
J8	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J9	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J10	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J11	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J12	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	6	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
FD	#4	1			11'-11"



BARS DRS/DRL - #4



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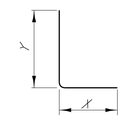

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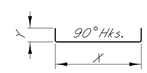
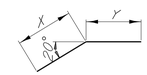
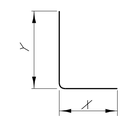


BARS N - #4



DOWELS OS/OL - #7



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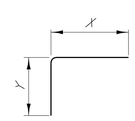

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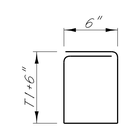


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
15° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-6-3W-15

SHEET NUMBER
7162

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													8'	10'	12'	14'	16'
8'-0"	7'-4"	22'-1"	26'-10 5/16"	0'-0 13/16"	0'-5 3/8"	22'-0"	0'-11"	0'-9"	3'-0"	2'-3"	0'-6"	15'-0"	35'-4 1/4"+1.035V2	39'-5 15/16"+1.035V2	43'-7 5/8"+1.035V2	47'-9 5/16"+1.035V2	51'-11"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	26.6520	3498.041	2.0407	270.922	0.9924	60.677	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	26.7458	3498.041	2.0407	270.922	0.9924	60.677	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	27.0987	3521.433	2.0407	271.033	0.9924	60.677	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	27.2750	3533.128	2.0407	271.089	0.9924	60.677	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	27.6293	3556.521	2.0407	271.200	0.9967	60.788	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	27.8985	3574.064	2.0407	271.284	1.0052	61.066	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	28.7120	3653.351	2.0407	270.922	1.1969	72.478	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	29.0334	3671.563	2.0407	271.006	1.1969	72.478	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	29.5063	3701.886	2.0407	271.145	1.1969	72.478	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	30.0361	3738.310	2.0407	271.312	1.1969	72.478	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	29.2047	3689.774	2.0407	271.089	1.2012	72.589	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	29.4921	3707.986	2.0407	271.173	1.2140	72.923	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	30.9370	3827.485	2.0407	271.006	1.4014	84.224	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	31.2399	3846.364	2.0407	271.089	1.4014	84.224	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	31.9779	3884.124	2.0407	271.256	1.4014	84.224	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	31.3752	3859.757	2.0927	271.145	1.4078	84.391	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	31.6010	3871.539	2.0407	271.200	1.4057	84.335	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	31.8544	3884.124	2.0407	271.256	1.4227	84.780	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	33.1877	4002.899	2.0407	271.089	1.6059	95.969	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	33.6106	4022.447	2.0407	271.173	1.6059	95.969	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	33.3519	4015.902	2.0407	271.145	1.6059	95.969	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	33.7869	4041.994	2.0407	271.256	1.6230	96.470	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	34.1074	4054.997	2.0407	271.312	1.6272	96.582	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	34.3779	4068.059	2.0407	271.367	1.6315	96.693	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	35.4077	4262.094	2.0407	271.145	1.8147	109.441	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	36.0935	4295.818	2.0407	271.284	1.8189	109.552	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	35.6960	4282.310	2.0407	271.228	1.8275	109.775	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	36.2727	4316.034	2.0407	271.367	1.8360	109.997	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	36.7376	4342.957	2.0407	271.479	1.8445	110.220	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	37.1358	4358.135	2.1447	271.534	1.8573	110.610	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-8-3W-15

SHEET NUMBER 7163

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1			1.035(2S+V2)+6'-3"
T2	#4	1	1	1	1	1			1.035(2S+V2)+7'-0"
T3	#4	1	1	1	1	1			1.035(2S+V2)+7'-9 1/2"
T4	#4	1	1	1	1	1			1.035(2S+V2)+8'-6 1/2"
T5	#4	1	1	1	1	1			1.035(2S+V2)+9'-4"
T6	#4	1	1	1	1	1			1.035(2S+V2)+10'-1 1/2"
T7	#4	1	1	1	1	1			1.035(2S+V2)+10'-10 1/2"
T8	#4	1	1	1	1	1			1.035(2S+V2)+11'-8"
T9	#4	1	1	1	1	1			1.035(2S+V2)+12'-5 1/2"
T10	#4	1	1	1	1	1			1.035(2S+V2)+13'-2 1/2"
T11	#4	1	1	1	1	1			1.035(2S+V2)+14'-0"
T12	#4	1	1	1	1	1			1.035(2S+V2)+14'-9"
T13	#4	1	1	1	1	1			1.035(2S+V2)+15'-6 1/2"
T14	#4	1	1	1	1	1			1.035(2S+V2)+16'-4"
T15	#4	1	1	1	1	1			1.035(2S+V2)+17'-1"
T16	#4	1	1	1	1	1			1.035(2S+V2)+17'-10 1/2"
T17	#4	1	1	1	1	1			1.035(2S+V2)+18'-7 1/2"
T18	#4	1	1	1	1	1			1.035(2S+V2)+19'-5"
T19	#4	1	1	1	1	1			1.035(2S+V2)+20'-2 1/2"
T20	#4	1	1	1	1	1			1.035(2S+V2)+20'-11 1/2"
T21	#4	1	1	1	1	1			1.035(2S+V2)+21'-9"
T22	#4	1	1	1	1	1			1.035(2S+V2)+22'-1 1/2"
T23	#4	3	3	3	3	3			1.035(2S+V2)+18'-3 1/2"
V1	#4	23	27	31	35	39	22'-5"	1'-8"	24'-1"
VL1	#4	1	1	1	1	1	20'-2 1/2"	1'-8"	21'-10 1/2"
VL2	#4	1	1	1	1	1	17'-9"	1'-8"	19'-5"
VL3	#4	1	1	1	1	1	15'-3"	1'-8"	16'-11"
VL4	#4	1	1	1	1	1	12'-9 1/2"	1'-8"	14'-5 1/2"
VL5	#4	1	1	1	1	1	10'-3 1/2"	1'-8"	11'-11 1/2"
VL6	#4	1	1	1	1	1	7'-10"	1'-8"	9'-6"
VL7	#4	1	1	1	1	1	5'-2"		5'-2"
VL8	#4	1	1	1	1	1	2'-1"		2'-1"
VS1	#4	1	1	1	1	1	21'-5"	1'-8"	23'-1"
VS2	#4	1	1	1	1	1	18'-4 1/2"	1'-8"	20'-0 1/2"
VS3	#4	1	1	1	1	1	15'-4 1/2"	1'-8"	17'-0 1/2"
VS4	#4	1	1	1	1	1	12'-4"	1'-8"	14'-0"
VS5	#4	1	1	1	1	1	9'-4"	1'-8"	11'-0"
VS6	#4	1	1	1	1	1	6'-4"		6'-4"
VS7	#4	1	1	1	1	1	3'-2 1/2"		3'-2 1/2"
FTL1	#5	1	1	1	1	1			1'-7 1/2"
FTL2	#5	1	1	1	1	1			2'-7"
FTL3	#5	37	37	37	37	37			5'-8"
FTL4	#5	1	1	1	1	1			4'-10 1/2"
FTL5	#5	1	1	1	1	1			3'-11"
FTL6	#5	1	1	1	1	1			2'-11 1/2"
FTL7	#5	1	1	1	1	1			2'-8"
FLL	#4	7	7	7	7	7			26'-5 1/2"
FTS1	#5	33	33	33	33	33			5'-8"
FTS2	#5	1	1	1	1	1			2'-1"
FLS	#4	7	7	7	7	7			21'-9"
WS1	#5	1	1	1	1	1		W+6'-8"	W+6'-8"
WS2	#5	1	1	1	1	1		W+6'-5 1/2"	W+6'-5 1/2"
WS3	#5	1	1	1	1	1		W+6'-3"	W+6'-3"
WS4	#5	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
WS5	#5	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WS6	#5	1	1	1	1	1		W+5'-7"	W+5'-7"
WS7	#5	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WS8	#5	1	1	1	1	1		W+5'-2"	W+5'-2"
WS9	#5	1	1	1	1	1		W+4'-11"	W+4'-11"
WS10	#5	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WS11	#5	1	1	1	1	1		W+4'-6"	W+4'-6"
WS12	#5	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
WS13	#5	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
WS14	#5	1	1	1	1	1		W+3'-10"	W+3'-10"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
WS15	#5	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS16	#5	1	1	1	1	1		W+3'-5"	W+3'-5"
WS17	#5	1	1	1	1	1		W+3'-2"	W+3'-2"
WS18	#5	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
WS19	#5	1	1	1	1	1		W+2'-9"	W+2'-9"
WS20	#5	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WS21	#5	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WS22	#5	1	1	1	1	1		W+2'-1"	W+2'-1"
WS23	#5	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WS24	#5	1	1	1	1	1		W+1'-8"	W+1'-8"
WS25	#5	1	1	1	1	1		W+1'-5"	W+1'-5"
WS26	#5	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
WS27	#5	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
WS28	#5	1	1	1	1	1	1'-6"	W+1'-9"	W+3'-3"
WS29	#5	1	1	1	1	1	1'-6"	W+1'-6 1/2"	W+3'-0 1/2"
WS30	#5	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS31	#5	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS32	#5	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WS33	#5	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WS34	#5	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	26	26	26	26	26	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL2	#5	1	1	1	1	1		W+6'-6"	W+6'-6"
WL3	#5	1	1	1	1	1		W+6'-4"	W+6'-4"
WL4	#5	1	1	1	1	1		W+6'-2"	W+6'-2"
WL5	#5	1	1	1	1	1		W+5'-11 1/2"	W+5'-11 1/2"
WL6	#5	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL7	#5	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
WL8	#5	1	1	1	1	1		W+5'-5"	W+5'-5"
WL9	#5	1	1	1	1	1		W+5'-3"	W+5'-3"
WL10	#5	1	1	1	1	1		W+5'-1"	W+5'-1"
WL11	#5	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL12	#5	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
WL13	#5	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL14	#5	1	1	1	1	1		W+4'-4"	W+4'-4"
WL15	#5	1	1	1	1	1		W+4'-2"	W+4'-2"
WL16	#5	1	1	1	1	1		W+4'-0"	W+4'-0"
WL17	#5	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL18	#5	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL19	#5	1	1	1	1	1		W+3'-5"	W+3'-5"
WL20	#5	1	1	1	1	1		W+3'-3"	W+3'-3"
WL21	#5	1	1	1	1	1		W+3'-1"	W+3'-1"
WL22	#5	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL23	#5	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
WL24	#5	1	1	1	1	1		W+2'-6 1/2"	W+2'-6 1/2"
WL25	#5	1	1	1	1	1		W+2'-4"	W+2'-4"
WL26	#5	1	1	1	1	1		W+2'-2"	W+2'-2"
WL27	#5	1	1	1	1	1		W+2'-0"	W+2'-0"
WL28	#5	1	1	1	1	1		W+1'-9 1/2"	W+1'-9 1/2"
WL29	#5	1	1	1	1	1		W+1'-7 1/2"	W+1'-7 1/2"
WL30	#5	1	1	1	1	1		W+1'-5 1/2"	W+1'-5 1/2"
WL31	#5	1	1	1	1	1		W+1'-3"	W+1'-3"
WL32	#5	1	1	1	1	1		W+1'-1"	W+1'-1"
WL33	#5	1	1	1	1	1	1'-6"	W+1'-10 1/2"	W+3'-4 1/2"
WL34	#5	1	1	1	1	1	1'-6"	W+1'-8 1/2"	W+3'-2 1/2"
WL35	#5	1	1	1	1	1	1'-6"	W+1'-6 1/2"	W+3'-0 1/2"
WL36	#5	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL37	#5	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WL38	#5	1	1	1	1	1	1'-6"	W+1'-0"	W+2'-6"
WL39	#5	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WL40	#5	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WL41	#5	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	32	32	32	32	32	1'-6"	2'-9"	4'-3"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
RS1	#4	1	1	1	1	1		W+6'-8"	W+6'-8"
RS2	#4	1	1	1	1	1		W+6'-4"	W+6'-4"
RS3	#4	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
RS4	#4	1	1	1	1	1		W+5'-8 1/2"	W+5'-8 1/2"
RS5	#4	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RS6	#4	1	1	1	1	1		W+5'-0 1/2"	W+5'-0 1/2"
RS7	#4	1	1	1	1	1		W+4'-8 1/2"	W+4'-8 1/2"
RS8	#4	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
RS9	#4	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"
RS10	#4	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RS11	#4	1	1	1	1	1		W+3'-5"	W+3'-5"
RS12	#4	1	1	1	1	1		W+3'-1"	W+3'-1"
RS13	#4	1	1	1	1	1		W+2'-9"	W+2'-9"
RS14	#4	1	1	1	1	1		W+2'-5"	W+2'-5"
RS15	#4	1	1	1	1	1		W+2'-1"	W+2'-1"
RS16	#4	1	1	1	1	1		W+1'-9"	W+1'-9"
RS17	#4	1	1	1	1	1		W+1'-5"	W+1'-5"
RS18	#4	1	1	1	1	1		W+1'-1"	W+1'-1"
RS19	#4	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RS20	#4	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
RS21	#4	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RS22	#4	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RS23	#4	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	19	19	19	19	19	1'-6"	W+2'-5"	W+3'-11"
RL1	#4	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
RL2	#4	1	1	1	1	1		W+6'-5"	W+6'-5"
RL3	#4	1	1	1	1	1		W+6'-2"	W+6'-2"
RL4	#4	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
RL5	#4	1	1	1	1	1		W+5'-7 1/2"	W+5'-7 1/2"
RL6	#4	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
RL7	#4	1	1	1	1	1		W+5'-1"	W+5'-1"
RL8	#4	1	1	1	1	1		W+4'-10"	W+4'-10"
RL9	#4	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
RL10	#4	1	1	1	1	1		W+4'-3 1/2"	W+4'-3 1/2"
RL11	#4	1	1	1	1	1		W+4'-0"	W+4'-0"
RL12	#4	1	1	1	1	1		W+3'-9"	W+3'-9"
RL13	#4	1	1	1	1	1		W+3'-5 1/2"	W+3'-5 1/2"
RL14	#4	1	1	1	1	1		W+3'-2 1/2"	W+3'-2 1/2"
RL15	#4	1	1	1	1	1		W+2'-11 1/2"	W+2'-11 1/2"
RL16	#4	1	1	1	1	1		W+2'-8"	W+2'-8"
RL17	#4	1	1	1	1	1		W+2'-5"	W+2'-5"
RL18	#4	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL19	#4	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
RL20	#4	1	1	1	1	1		W+1'-7"	W+1'-7"
RL21	#4	1	1	1	1	1		W+1'-4"	W+1'-4"
RL22	#4	1	1	1	1	1		W+1'-0 1/2"	W+1'-0 1/2"
RL23	#4	1	1	1	1	1		W+0'-9 1/2"	W+0'-9 1/2"
RL24	#4	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL25	#4	1	1	1	1	1	1'-6"	W+1'-3"	W+2'-9"
RL26	#4	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL27	#4	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 3

REVISIONS | BY

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

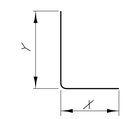
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER IWD-8-3W-15

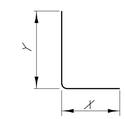
SHEET NUMBER 7164

HEIGHT = 8 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		8'	10'	12'	14'	16'					
RL28	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	23	23	23	23	23			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					4'-3 ½"
YS2	#4	2	2	2	2	2					7'-4"
YS3	#4	2	2	2	2	2					10'-4"
YS4	#4	2	2	2	2	2					13'-4"
YS5	#4	2	2	2	2	2					16'-4 ½"
YS6	#4	2	2	2	2	2					19'-4 ½"
YS7	#4	6	6	6	6	8					21'-9"
YL1	#4	2	2	2	2	2					5'-3 ½"
YL2	#4	2	2	2	2	2					8'-11 ½"
YL3	#4	6	6	6	6	6					12'-7 ½"
YL4	#4	2	2	2	2	2					16'-3 ½"
YL5	#4	2	2	2	2	2					19'-11 ½"
YL6	#4	2	2	2	2	2					23'-7 ½"
YL7	#4	6	6	6	6	8					26'-6 ½"
FS	#4	2	2	2	2	2					22'-11"
FL	#4	2	2	2	2	2					27'-6"
N	#4	22	26	30	34	39			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.035(2S+2V1+V2)+10 ½"
K	#4	20	24	28	32	36			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.035(2S+V2)+1'-1 ½"
OS	#7	10	10	10	10	11			3'-0"	3'-0"	6'-0"
OL	#7	10	10	10	10	11			3'-0"	3'-0"	6'-0"
OSS	#4	1	1	1	1	1					8'-0"+T1
OSL	#4	1	1	1	1	1					8'-0"+T1

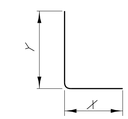
BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			5'-7"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+7'-1 ½"	W1+7'-1 ½"
J2	#5	1		W1+6'-8"	W1+6'-8"
J3	#5	1		W1+6'-2"	W1+6'-2"
J4	#5	1		W1+5'-8"	W1+5'-8"
J5	#5	1		W1+5'-2"	W1+5'-2"
J6	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J7	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J8	#5	1		W1+3'-8 ½"	W1+3'-8 ½"
J9	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J10	#5	1		W1+2'-9"	W1+2'-9"
J11	#5	1	1'-0"	W1+3'-0"	W1+4'-0"
J12	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J13	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J14	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J15	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J16	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	10	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
FD	#4	1			16'-5"



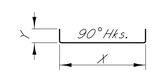
BARS DRS/DRL - #4



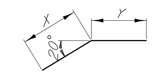
BARS DWS/DWL/DJ-#5



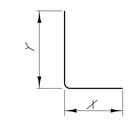
BARS RSn/RLn - #4



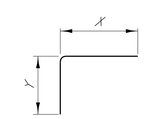
BARS N - #4



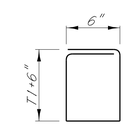
DOWELS OS/OL - #7



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

REVISIONS	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 3 OF 3

WORKING NUMBER IWD-8-3W-15

SHEET NUMBER 7165

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, Ed. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													10'	12'	14'	16'	18'
10'-0"	8'-4"	25'-1 1/8"	30'-6 1/4"	0'-0 7/8"	0'-5 15/16"	25'-0"	0'-11"	0'-10"	4'-0"	2'-3"	0'-6"	19'-0"	42'-0 1/4"+1.035V2	46'-1 15/16"+1.035V2	50'-3 5/8"+1.035V2	54'-5 5/16"+1.035V2	58'-7"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet. Total brush deflector quantities include brushwalls and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 1/2"	9"	9"	2'-9"	37.4776	4871.670	3.0339	388.020	1.1969	72.478	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	37.7717	4886.112	3.0339	388.075	1.1969	72.478	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	38.3555	4929.441	3.0339	388.242	1.2054	72.701	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	38.9108	4965.550	3.0339	388.382	1.2182	73.035	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	38.3228	4929.441	3.0339	388.242	1.2267	73.257	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	38.6597	4951.105	3.0339	388.326	1.2395	73.591	5.5679	1331.546
240	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	40.0214	5065.957	3.0339	388.103	1.4014	84.224	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	40.4129	5088.289	3.0339	388.187	1.4014	84.224	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	41.0401	5125.509	3.0339	388.326	1.4099	84.446	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	40.7055	5118.067	3.0339	388.298	1.4227	84.780	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	40.9868	5132.954	3.0339	388.354	1.4312	85.059	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	41.3445	5155.287	3.0339	388.437	1.4440	85.393	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	42.5028	5261.552	3.0339	388.187	1.6059	97.528	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	43.0421	5292.221	3.0339	388.298	1.6059	97.528	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	42.6981	5276.884	3.0339	388.242	1.6144	97.806	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	43.3157	5315.221	3.0339	388.382	1.6272	98.140	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	43.8172	5345.885	3.0339	388.493	1.6443	98.586	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	44.1198	5361.222	3.0339	388.549	1.6485	98.697	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	44.9826	5551.974	3.0339	388.242	1.8147	109.441	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	45.6854	5591.703	3.0339	388.382	1.8189	109.552	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	45.3155	5575.810	3.0339	388.326	1.8275	109.775	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	46.0959	5623.480	3.0339	388.493	1.8360	109.997	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	46.6269	5655.263	3.0339	388.604	1.8530	110.498	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	47.2897	5684.553	3.5187	388.688	1.8743	111.055	7.5679	1842.884
360	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	47.5617	5750.157	3.0339	388.326	2.0277	121.409	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	48.4409	5799.164	3.0339	388.493	2.0320	121.576	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	48.1096	5782.830	3.0339	388.437	2.0405	121.799	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	48.7954	5823.668	3.0339	388.576	2.0490	122.021	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	49.2048	5840.007	3.0339	388.632	2.0575	122.244	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	50.1162	5886.327	3.5187	388.771	2.0831	122.912	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 605 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-10-3W-15

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, Ed. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7166

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.035(2S+V2)+6'-4 ½"
T2	#4	1	1	1	1	1					1.035(2S+V2)+7'-2"
T3	#4	1	1	1	1	1					1.035(2S+V2)+7'-11"
T4	#4	1	1	1	1	1					1.035(2S+V2)+8'-8 ½"
T5	#4	1	1	1	1	1					1.035(2S+V2)+9'-5 ½"
T6	#4	1	1	1	1	1					1.035(2S+V2)+10'-3"
T7	#4	1	1	1	1	1					1.035(2S+V2)+11'-0 ½"
T8	#4	1	1	1	1	1					1.035(2S+V2)+11'-9 ½"
T9	#4	1	1	1	1	1					1.035(2S+V2)+12'-7"
T10	#4	1	1	1	1	1					1.035(2S+V2)+13'-4 ½"
T11	#4	1	1	1	1	1					1.035(2S+V2)+14'-1 ½"
T12	#4	1	1	1	1	1					1.035(2S+V2)+14'-11"
T13	#4	1	1	1	1	1					1.035(2S+V2)+15'-8 ½"
T14	#4	1	1	1	1	1					1.035(2S+V2)+16'-5 ½"
T15	#4	1	1	1	1	1					1.035(2S+V2)+17'-3"
T16	#4	1	1	1	1	1					1.035(2S+V2)+18'-0 ½"
T17	#4	1	1	1	1	1					1.035(2S+V2)+18'-9 ½"
T18	#4	1	1	1	1	1					1.035(2S+V2)+19'-7"
T19	#4	1	1	1	1	1					1.035(2S+V2)+20'-4 ½"
T20	#4	1	1	1	1	1					1.035(2S+V2)+21'-1 ½"
T21	#4	1	1	1	1	1					1.035(2S+V2)+21'-11"
T22	#4	1	1	1	1	1					1.035(2S+V2)+22'-8 ½"
T23	#4	1	1	1	1	1					1.035(2S+V2)+23'-5 ½"
T24	#4	1	1	1	1	1					1.035(2S+V2)+24'-3"
T25	#4	1	1	1	1	1					1.035(2S+V2)+24'-7 ½"
T26	#4	3	3	3	3	3					1.035(2S+V2)+20'-9 ½"
V1	#4	27	31	35	39	43			25'-6 ½"	1'-8"	27'-2 ½"
VL1	#4	1	1	1	1	1			23'-6"	1'-8"	25'-2"
VL2	#4	1	1	1	1	1			21'-0 ½"	1'-8"	22'-8 ½"
VL3	#4	1	1	1	1	1			18'-6 ½"	1'-8"	20'-2 ½"
VL4	#4	1	1	1	1	1			16'-1"	1'-8"	17'-9"
VL5	#4	1	1	1	1	1			13'-7"	1'-8"	15'-3"
VL6	#4	1	1	1	1	1			11'-1 ½"	1'-8"	12'-9 ½"
VL7	#4	1	1	1	1	1			8'-7 ½"	1'-8"	10'-3 ½"
VL8	#4	1	1	1	1	1			6'-2"		6'-2"
VL9	#4	1	1	1	1	1			3'-1"		3'-1"
VS1	#4	1	1	1	1	1			24'-9"	1'-8"	26'-5"
VS2	#4	1	1	1	1	1			21'-8 ½"	1'-8"	23'-4 ½"
VS3	#4	1	1	1	1	1			18'-8 ½"	1'-8"	20'-4 ½"
VS4	#4	1	1	1	1	1			15'-8 ½"	1'-8"	17'-4 ½"
VS5	#4	1	1	1	1	1			12'-8"	1'-8"	14'-4"
VS6	#4	1	1	1	1	1			9'-8"	1'-8"	11'-4"
VS7	#4	1	1	1	1	1			6'-8"	1'-8"	8'-4"
VS8	#4	1	1	1	1	1			3'-6 ½"		3'-6 ½"
FTL1	#5	1	1	1	1	1					1'-3 ½"
FTL2	#5	1	1	1	1	1					2'-1 ½"
FTL3	#5	1	1	1	1	1					2'-11 ½"
FTL4	#5	1	1	1	1	1					3'-9 ½"
FTL5	#5	47	47	47	47	47					6'-9"
FTL6	#5	1	1	1	1	1					6'-2"
FTL7	#5	1	1	1	1	1					5'-4"
FTL8	#5	1	1	1	1	1					4'-6"
FTL9	#5	1	1	1	1	1					3'-8 ½"
FTL10	#5	1	1	1	1	1					2'-10 ½"
FTL11	#5	1	1	1	1	1					2'-9"
FLL	#4	8	8	8	8	8					30'-1 ½"
FTS1	#5	43	43	43	43	43					6'-9"
FTS2	#5	1	1	1	1	1					2'-1"
FLS	#4	8	8	8	8	8					24'-9"
WS1	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WS2	#5	1	1	1	1	1				W+7'-6"	W+7'-6"
WS3	#5	1	1	1	1	1				W+7'-3 ½"	W+7'-3 ½"
WS4	#5	1	1	1	1	1				W+7'-1 ½"	W+7'-1 ½"
WS5	#5	1	1	1	1	1				W+6'-11"	W+6'-11"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WS6	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WS7	#5	1	1	1	1	1				W+6'-6 ½"	W+6'-6 ½"
WS8	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS9	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WS10	#5	1	1	1	1	1				W+5'-11 ½"	W+5'-11 ½"
WS11	#5	1	1	1	1	1				W+5'-9"	W+5'-9"
WS12	#5	1	1	1	1	1				W+5'-7"	W+5'-7"
WS13	#5	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
WS14	#5	1	1	1	1	1				W+5'-2 ½"	W+5'-2 ½"
WS15	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WS16	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WS17	#5	1	1	1	1	1				W+4'-7 ½"	W+4'-7 ½"
WS18	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WS19	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WS20	#5	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"
WS21	#5	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
WS22	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WS23	#5	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
WS24	#5	1	1	1	1	1				W+3'-3 ½"	W+3'-3 ½"
WS25	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS26	#5	1	1	1	1	1				W+2'-11"	W+2'-11"
WS27	#5	1	1	1	1	1				W+2'-8 ½"	W+2'-8 ½"
WS28	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WS29	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WS30	#5	1	1	1	1	1				W+2'-1 ½"	W+2'-1 ½"
WS31	#5	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
WS32	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WS33	#5	1	1	1	1	1				W+1'-6 ½"	W+1'-6 ½"
WS34	#5	1	1	1	1	1				W+1'-4 ½"	W+1'-4 ½"
WS35	#5	1	1	1	1	1				W+1'-2"	W+1'-2"
WS36	#5	1	1	1	1	1				W+1'-0"	W+1'-0"
WS37	#5	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
WS38	#5	1	1	1	1	1				W+0'-7 ½"	W+0'-7 ½"
WS39	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WS40	#5	1	1	1	1	1				W+0'-2 ½"	W+0'-2 ½"
WS41	#5	1	1	1	1	1				W+0'-0 ½"	W+0'-0 ½"
WS42	#5	1	1	1	1	1			1'-6"	W+0'-10"	W+2'-4"
WS43	#5	1	1	1	1	1			1'-6"	W+0'-7 ½"	W+2'-1 ½"
WS44	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	41	41	41	41	41			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+7'-8 ½"	W+7'-8 ½"
WL2	#5	1	1	1	1	1				W+7'-6 ½"	W+7'-6 ½"
WL3	#5	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
WL4	#5	1	1	1	1	1				W+7'-2 ½"	W+7'-2 ½"
WL5	#5	1	1	1	1	1				W+7'-0 ½"	W+7'-0 ½"
WL6	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WL7	#5	1	1	1	1	1				W+6'-9"	W+6'-9"
WL8	#5	1	1	1	1	1				W+6'-7"	W+6'-7"
WL9	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL10	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL11	#5	1	1	1	1	1				W+6'-1 ½"	W+6'-1 ½"
WL12	#5	1	1	1	1	1				W+5'-11 ½"	W+5'-11 ½"
WL13	#5	1	1	1	1	1				W+5'-9 ½"	W+5'-9 ½"
WL14	#5	1	1	1	1	1				W+5'-7 ½"	W+5'-7 ½"
WL15	#5	1	1	1	1	1				W+5'-5 ½"	W+5'-5 ½"
WL16	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WL17	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WL18	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL19	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL20	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WL21	#5	1	1	1	1	1				W+4'-6 ½"	W+4'-6 ½"
WL22	#5	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WL23	#5	1	1	1	1	1				W+4'-2 ½"	W+4'-2 ½"
WL24	#5	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WL25	#5	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
WL26	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WL27	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WL28	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WL29	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL30	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WL31	#5	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
WL32	#5	1	1	1	1	1				W+2'-9 ½"	W+2'-9 ½"
WL33	#5	1	1	1	1	1				W+2'-7 ½"	W+2'-7 ½"
WL34	#5	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
WL35	#5	1	1	1	1	1				W+2'-3 ½"	W+2'-3 ½"
WL36	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WL37	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WL38	#5	1	1	1	1	1				W+1'-10"	W+1'-10"
WL39	#5	1	1	1	1	1				W+1'-8"	W+1'-8"
WL40	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL41	#5	1	1	1	1	1				W+1'-4 ½"	W+1'-4 ½"
WL42	#5	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
WL43	#5	1	1	1	1	1				W+1'-0 ½"	W+1'-0 ½"
WL44	#5	1	1	1	1	1				W+0'-10 ½"	W+0'-10 ½"
WL45	#5	1	1	1	1	1				W+0'-8 ½"	W+0'-8 ½"
WL46	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WL47	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL48	#5	1	1	1	1	1				W+0'-3"	W+0'-3"
WL49	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WL50	#5	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WL51	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WL52	#5	1	1	1	1	1			1'-6"	W+0'-7"	W+2'-1"
WL53	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	49	49	49	49	49			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RS2	#4	1	1	1	1	1				W+7'-4"	W+7'-4"
RS3	#4	1	1	1	1	1				W+7'-0 ½"	W+7'-0 ½"
RS4	#4	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
RS5	#4	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
RS6	#4	1	1	1	1	1				W+6'-0 ½"	W+6'-0 ½"
RS7	#4	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
RS8	#4	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
RS9	#4	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
RS10	#4	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
RS11	#4	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
RS12	#4	1	1	1	1	1				W+4'-1"	W+4'-1"
RS13	#4	1	1	1	1	1				W+3'-9"	W+3'-9"
RS14	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS15	#4	1	1	1	1	1				W+3'-1"	W+3'-1"
RS16	#4	1	1	1	1	1				W+2'-9"	W+2'-9"
RS17	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS18	#4	1	1	1	1	1				W+2'-1"	W+2'-1"
RS19	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RS20	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS21	#4	1	1	1	1	1				W+1'-1"	W+1'-1"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-10-3W-15

SHEET NUMBER 7167

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RS22	#4	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
RS23	#4	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
RS24	#4	1	1	1	1	1				W+0'-1 ½"	W+0'-1 ½"
RS25	#4	1	1	1	1	1				W-0'-2 ½"	W-0'-2 ½"
RS26	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	25	25	25	25	25			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+7'-8 ½"	W+7'-8 ½"
RL2	#4	1	1	1	1	1				W+7'-5"	W+7'-5"
RL3	#4	1	1	1	1	1				W+7'-2"	W+7'-2"
RL4	#4	1	1	1	1	1				W+6'-11"	W+6'-11"
RL5	#4	1	1	1	1	1				W+6'-7 ½"	W+6'-7 ½"
RL6	#4	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
RL7	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RL8	#4	1	1	1	1	1				W+5'-10"	W+5'-10"
RL9	#4	1	1	1	1	1				W+5'-7"	W+5'-7"
RL10	#4	1	1	1	1	1				W+5'-3 ½"	W+5'-3 ½"
RL11	#4	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
RL12	#4	1	1	1	1	1				W+4'-9"	W+4'-9"
RL13	#4	1	1	1	1	1				W+4'-6"	W+4'-6"
RL14	#4	1	1	1	1	1				W+4'-3"	W+4'-3"
RL15	#4	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
RL16	#4	1	1	1	1	1				W+3'-8 ½"	W+3'-8 ½"
RL17	#4	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
RL18	#4	1	1	1	1	1				W+3'-2"	W+3'-2"
RL19	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RL20	#4	1	1	1	1	1				W+2'-7 ½"	W+2'-7 ½"
RL21	#4	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
RL22	#4	1	1	1	1	1				W+2'-1 ½"	W+2'-1 ½"
RL23	#4	1	1	1	1	1				W+1'-10"	W+1'-10"
RL24	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RL25	#4	1	1	1	1	1				W+1'-4"	W+1'-4"
RL26	#4	1	1	1	1	1				W+1'-0 ½"	W+1'-0 ½"
RL27	#4	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
RL28	#4	1	1	1	1	1				W+0'-6"	W+0'-6"
RL29	#4	1	1	1	1	1				W+0'-3"	W+0'-3"
RL30	#4	1	1	1	1	1				W+0'-0"	W+0'-0"
RL31	#4	1	1	1	1	1				W-0'-3 ½"	W-0'-3 ½"
RL32	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	31	31	31	31	31			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					4'-3 ½"
YS2	#4	2	2	2	2	2					7'-4"
YS3	#4	2	2	2	2	2					10'-4"
YS4	#4	2	2	2	2	2					13'-4"
YS5	#4	2	2	2	2	2					16'-4 ½"
YS6	#4	2	2	2	2	2					19'-4 ½"
YS7	#4	2	2	2	2	2					22'-4 ½"
YS8	#4	8	8	8	10	10					24'-9"
YL1	#4	2	2	2	2	2					5'-3 ½"
YL2	#4	2	2	2	2	2					8'-11 ½"
YL3	#4	2	2	2	2	2					12'-7 ½"
YL4	#4	2	2	2	2	2					16'-3 ½"
YL5	#4	2	2	2	2	2					19'-11 ½"
YL6	#4	2	2	2	2	2					23'-7 ½"
YL7	#4	2	2	2	2	2					27'-3"
YL8	#4	8	8	8	10	10					30'-2"
FS	#4	2	2	2	2	2					26'-1"
FL	#4	2	2	2	2	2					31'-3 ½"

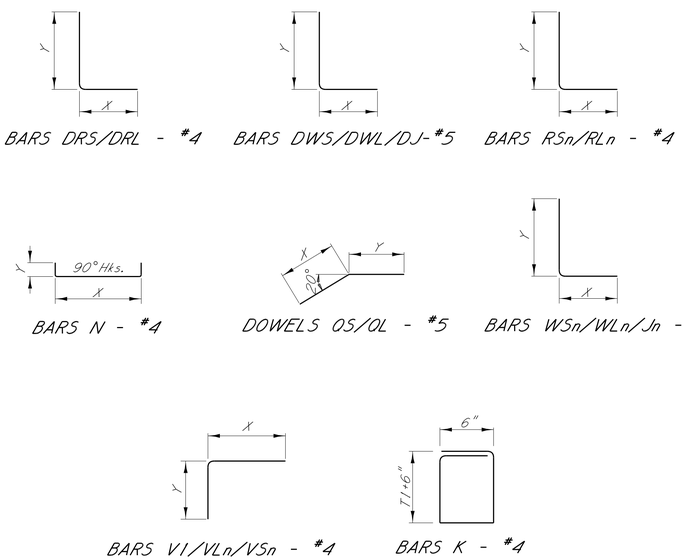
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
N	#4	26	30	35	39	43			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.035(25+2V1+V2)+10 ½"
K	#4	24	28	32	37	41			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.035(25+V2)+1'-3"
OS	#7	12	12	12	13	13			3'-0 ½"	3'-0 ½"	6'-1"
OL	#7	12	12	12	13	13			3'-0 ½"	3'-0 ½"	6'-1"
OSS	#4	1	1	1	1	1					10'-0"+T1
OSL	#4	1	1	1	1	1					10'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			5'-7"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+9'-1 ½"	W1+9'-1 ½"
J2	#5	1		W1+8'-8"	W1+8'-8"
J3	#5	1		W1+8'-2"	W1+8'-2"
J4	#5	1		W1+7'-8"	W1+7'-8"
J5	#5	1		W1+7'-2"	W1+7'-2"
J6	#5	1		W1+6'-8"	W1+6'-8"
J7	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J8	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J9	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J10	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J11	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J12	#5	1		W1+3'-9"	W1+3'-9"
J13	#5	1		W1+3'-3"	W1+3'-3"
J14	#5	1		W1+2'-9"	W1+2'-9"
J15	#5	1		W1+2'-3"	W1+2'-3"
J16	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J17	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J18	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J19	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J20	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	15	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
FD	#4	1			20'-10 ½"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 3 OF 3

WORKING NUMBER IWD-10-3W-15

SHEET NUMBER 7168

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.

DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.

DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													12'	14'	16'	18'	20'
12'-0"	9'-7"	28'-10 5/16"	35'-1 3/16"	0'-1 1/16"	0'-7 1/8"	28'-9"	0'-11"	1'-0"	5'-0"	2'-3"	0'-6"	23'-0"	49'-5 1/4"+1.035V2	53'-6 15/16"+1.035V2	57'-8 5/8"+1.035V2	61'-10 5/16"+1.035V2	66'-0 1/16"+1.035V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	54.0285	7074.669	4.2123	520.020	1.4014	84.224	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	54.5484	7102.138	4.2123	520.104	1.4142	84.558	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	55.3185	7147.920	4.2123	520.243	1.4312	85.059	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	54.4590	7102.138	4.2123	520.104	1.4099	84.446	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	54.7023	7120.450	4.2123	520.159	1.4142	84.558	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	54.9907	7138.766	4.2123	520.215	1.4185	84.669	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	56.9948	7298.057	4.2123	520.104	1.6059	95.969	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	57.5988	7326.195	4.2123	520.187	1.6187	96.359	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	57.1501	7307.438	4.2123	520.131	1.6357	96.804	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	57.547	7335.576	4.2123	520.215	1.6230	96.470	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	59.9013	7354.333	4.2123	520.271	1.6315	96.693	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	58.1509	7373.090	4.2123	520.326	1.6315	96.693	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	59.7877	7513.234	4.2123	520.159	1.8147	109.441	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	60.6283	7561.247	4.2123	520.298	1.8232	109.663	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	60.1067	7532.441	4.2123	520.215	1.8402	110.109	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	60.5760	7561.247	4.2123	520.298	1.8360	109.997	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	61.2131	7596.398	4.9052	520.382	1.8573	110.610	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	61.5893	7615.601	4.9052	520.438	1.8615	110.721	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	62.7573	7739.183	4.2123	520.243	2.0277	121.409	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	63.7996	7798.130	4.2123	520.410	2.0320	121.576	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	62.9897	7749.009	4.2123	520.271	2.0447	121.910	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	63.8077	7794.516	4.9052	520.382	2.0618	122.355	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	64.3704	7823.990	4.9052	520.465	2.0703	122.578	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	65.1997	7873.111	4.9052	520.605	2.0788	122.801	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3 1/2"	11"	9"	4'-0 1/2"	65.6535	7956.453	4.2123	520.298	2.2365	133.322	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	65.6276	7946.403	4.2123	520.271	2.2450	133.544	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	66.2319	7982.696	4.9052	520.354	2.2663	134.101	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	66.9189	8022.887	4.9052	520.465	2.2748	134.379	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	68.0501	8093.214	4.9052	520.660	2.2833	134.602	9.0617	2235.611

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-12-3W-15

SHEET NUMBER 7169

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.035(2S+V2)+6'-8 1/2"
T2	#4	1	1	1	1	1					1.035(2S+V2)+7'-6"
T3	#4	1	1	1	1	1					1.035(2S+V2)+8'-3"
T4	#4	1	1	1	1	1					1.035(2S+V2)+9'-0 1/2"
T5	#4	1	1	1	1	1					1.035(2S+V2)+9'-9 1/2"
T6	#4	1	1	1	1	1					1.035(2S+V2)+10'-7"
T7	#4	1	1	1	1	1					1.035(2S+V2)+11'-4"
T8	#4	1	1	1	1	1					1.035(2S+V2)+12'-1 1/2"
T9	#4	1	1	1	1	1					1.035(2S+V2)+12'-10 1/2"
T10	#4	1	1	1	1	1					1.035(2S+V2)+13'-8"
T11	#4	1	1	1	1	1					1.035(2S+V2)+14'-5"
T12	#4	1	1	1	1	1					1.035(2S+V2)+15'-2 1/2"
T13	#4	1	1	1	1	1					1.035(2S+V2)+15'-11 1/2"
T14	#4	1	1	1	1	1					1.035(2S+V2)+16'-9"
T15	#4	1	1	1	1	1					1.035(2S+V2)+17'-6"
T16	#4	1	1	1	1	1					1.035(2S+V2)+18'-3 1/2"
T17	#4	1	1	1	1	1					1.035(2S+V2)+19'-0 1/2"
T18	#4	1	1	1	1	1					1.035(2S+V2)+19'-10"
T19	#4	1	1	1	1	1					1.035(2S+V2)+20'-7"
T20	#4	1	1	1	1	1					1.035(2S+V2)+21'-4 1/2"
T21	#4	1	1	1	1	1					1.035(2S+V2)+22'-2"
T22	#4	1	1	1	1	1					1.035(2S+V2)+22'-11"
T23	#4	1	1	1	1	1					1.035(2S+V2)+23'-8 1/2"
T24	#4	1	1	1	1	1					1.035(2S+V2)+24'-5 1/2"
T25	#4	1	1	1	1	1					1.035(2S+V2)+25'-3"
T26	#4	1	1	1	1	1					1.035(2S+V2)+26'-0"
T27	#4	1	1	1	1	1					1.035(2S+V2)+26'-9 1/2"
T28	#4	1	1	1	1	1					1.035(2S+V2)+27'-6 1/2"
T29	#4	1	1	1	1	1					1.035(2S+V2)+27'-11"
T30	#4	3	3	3	3	3					1.035(2S+V2)+24'-1"
V1	#4	31	35	39	43	47			29'-5"	1'-8"	31'-1"
VL1	#4	1	1	1	1	1			27'-9 1/2"	1'-8"	29'-5 1/2"
VL2	#4	1	1	1	1	1			25'-3 1/2"	1'-8"	26'-11 1/2"
VL3	#4	1	1	1	1	1			22'-10"	1'-8"	24'-6"
VL4	#4	1	1	1	1	1			20'-4"	1'-8"	22'-0"
VL5	#4	1	1	1	1	1			17'-10 1/2"	1'-8"	19'-6 1/2"
VL6	#4	1	1	1	1	1			15'-4 1/2"	1'-8"	17'-0 1/2"
VL7	#4	1	1	1	1	1			12'-11"	1'-8"	14'-7"
VL8	#4	1	1	1	1	1			10'-5"	1'-8"	12'-1"
VL9	#4	1	1	1	1	1			7'-11 1/2"	1'-8"	9'-7 1/2"
VL10	#4	1	1	1	1	1			5'-4"		5'-4"
VL11	#4	1	1	1	1	1			2'-3"		2'-3"
VS1	#4	1	1	1	1	1			29'-1"	1'-8"	30'-9"
VS2	#4	1	1	1	1	1			26'-1"	1'-8"	27'-9"
VS3	#4	1	1	1	1	1			23'-0 1/2"	1'-8"	24'-8 1/2"
VS4	#4	1	1	1	1	1			20'-0 1/2"	1'-8"	21'-8 1/2"
VS5	#4	1	1	1	1	1			17'-0 1/2"	1'-8"	18'-8 1/2"
VS6	#4	1	1	1	1	1			14'-0"	1'-8"	15'-8"
VS7	#4	1	1	1	1	1			11'-0"	1'-8"	12'-8"
VS8	#4	1	1	1	1	1			8'-0"	1'-8"	9'-8"
VS9	#4	1	1	1	1	1			4'-11"		4'-11"
VS10	#4	1	1	1	1	1			1'-10"		1'-10"
FTL1	#5	1	1	1	1	1					1'-6 1/2"
FTL2	#5	1	1	1	1	1					2'-3"
FTL3	#5	1	1	1	1	1					2'-11 1/2"
FTL4	#5	1	1	1	1	1					3'-8"
FTL5	#5	1	1	1	1	1					4'-4 1/2"
FTL6	#5	1	1	1	1	1					5'-1"
FTL7	#5	62	62	62	62	62					7'-11"
FTL8	#5	1	1	1	1	1					7'-8 1/2"
FTL9	#5	1	1	1	1	1					7'-0"
FTL10	#5	1	1	1	1	1					6'-3 1/2"
FTL11	#5	1	1	1	1	1					5'-7"
FTL12	#5	1	1	1	1	1					4'-10 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
FTL13	#5	1	1	1	1	1					4'-2"
FTL14	#5	1	1	1	1	1					3'-5 1/2"
FTL15	#5	2	2	2	2	2					2'-11"
FLL	#4	9	9	9	9	9					34'-8 1/2"
FTS1	#5	58	58	58	58	58					7'-11"
FTS2	#5	1	1	1	1	1					2'-1"
FLS	#4	9	9	9	9	9					28'-6 1/2"
WS1	#5	1	1	1	1	1				W+8'-11"	W+8'-11"
WS2	#5	1	1	1	1	1				W+8'-9"	W+8'-9"
WS3	#5	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
WS4	#5	1	1	1	1	1				W+8'-5 1/2"	W+8'-5 1/2"
WS5	#5	1	1	1	1	1				W+8'-3 1/2"	W+8'-3 1/2"
WS6	#5	1	1	1	1	1				W+8'-1 1/2"	W+8'-1 1/2"
WS7	#5	1	1	1	1	1				W+7'-11 1/2"	W+7'-11 1/2"
WS8	#5	1	1	1	1	1				W+7'-9 1/2"	W+7'-9 1/2"
WS9	#5	1	1	1	1	1				W+7'-7 1/2"	W+7'-7 1/2"
WS10	#5	1	1	1	1	1				W+7'-5 1/2"	W+7'-5 1/2"
WS11	#5	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
WS12	#5	1	1	1	1	1				W+7'-1 1/2"	W+7'-1 1/2"
WS13	#5	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
WS14	#5	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
WS15	#5	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
WS16	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WS17	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS18	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WS19	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WS20	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WS21	#5	1	1	1	1	1				W+5'-8"	W+5'-8"
WS22	#5	1	1	1	1	1				W+5'-6"	W+5'-6"
WS23	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WS24	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WS25	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WS26	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WS27	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WS28	#5	1	1	1	1	1				W+4'-6 1/2"	W+4'-6 1/2"
WS29	#5	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
WS30	#5	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
WS31	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WS32	#5	1	1	1	1	1				W+3'-10 1/2"	W+3'-10 1/2"
WS33	#5	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
WS34	#5	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"
WS35	#5	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
WS36	#5	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WS37	#5	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
WS38	#5	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
WS39	#5	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
WS40	#5	1	1	1	1	1				W+2'-6 1/2"	W+2'-6 1/2"
WS41	#5	1	1	1	1	1				W+2'-5"	W+2'-5"
WS42	#5	1	1	1	1	1				W+2'-3"	W+2'-3"
WS43	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WS44	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WS45	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WS46	#5	1	1	1	1	1				W+1'-7"	W+1'-7"
WS47	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WS48	#5	1	1	1	1	1				W+1'-3"	W+1'-3"
WS49	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WS50	#5	1	1	1	1	1				W+0'-11"	W+0'-11"
WS51	#5	1	1	1	1	1				W+0'-9"	W+0'-9"
WS52	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WS53	#5	1	1	1	1	1				W+0'-5 1/2"	W+0'-5 1/2"
WS54	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"
WS55	#5	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
WS56	#5	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
WS57	#5	1	1	1	1	1				W-0'-2 1/2"	W-0'-2 1/2"
WS58	#5	1	1	1	1	1				W-0'-4 1/2"	W-0'-4 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WS59	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	59	59	59	59	59			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+8'-11 1/2"	W+8'-11 1/2"
WL2	#5	1	1	1	1	1				W+8'-9 1/2"	W+8'-9 1/2"
WL3	#5	1	1	1	1	1				W+8'-8"	W+8'-8"
WL4	#5	1	1	1	1	1				W+8'-6 1/2"	W+8'-6 1/2"
WL5	#5	1	1	1	1	1				W+8'-5"	W+8'-5"
WL6	#5	1	1	1	1	1				W+8'-3"	W+8'-3"
WL7	#5	1	1	1	1	1				W+8'-1 1/2"	W+8'-1 1/2"
WL8	#5	1	1	1	1	1				W+8'-0"	W+8'-0"
WL9	#5	1	1	1	1	1				W+7'-10 1/2"	W+7'-10 1/2"
WL10	#5	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
WL11	#5	1	1	1	1	1				W+7'-7"	W+7'-7"
WL12	#5	1	1	1	1	1				W+7'-5 1/2"	W+7'-5 1/2"
WL13	#5	1	1	1	1	1				W+7'-4"	W+7'-4"
WL14	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WL15	#5	1	1	1	1	1				W+7'-0 1/2"	W+7'-0 1/2"
WL16	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WL17	#5	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
WL18	#5	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
WL19	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WL20	#5	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
WL21	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL22	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WL23	#5	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
WL24	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WL25	#5	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
WL26	#5	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
WL27	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL28	#5	1	1	1	1	1				W+5'-3 1/2"	W+5'-3 1/2"
WL29	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WL30	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL31	#5	1	1	1	1	1				W+4'-10 1/2"	W+4'-10 1/2"
WL32	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WL33	#5	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
WL34	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WL35	#5	1	1	1	1	1				W+4'-4"	W+4'-4"
WL36	#5	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
WL37	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WL38	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL39	#5	1	1	1	1	1				W+3'-9 1/2"	W+3'-9 1/2"
WL40	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL41	#5	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"
WL42	#5	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
WL43	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL44	#5	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
WL45	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL46	#5	1	1	1	1	1				W+2'-10"	W+2'-10"
WL47	#5	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
WL48	#5	1	1	1	1	1				W+2'-7"	W+2'-7"
WL49	#5	1	1	1	1	1				W+2'-5"	W+2'-5"
WL50	#5	1	1	1	1	1				W+2'-3 1/2"	W+2'-3 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 3

WORKING NUMBER
IWD-12-3W-15

SHEET NUMBER
7170

DATE | REVISIONS | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL51	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WL52	#5	1	1	1	1	1				W+2'-0 1/2"	W+2'-0 1/2"
WL53	#5	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
WL54	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WL55	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL56	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL57	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL58	#5	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
WL59	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WL60	#5	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
WL61	#5	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
WL62	#5	1	1	1	1	1				W+0'-8"	W+0'-8"
WL63	#5	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
WL64	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL65	#5	1	1	1	1	1				W+0'-3"	W+0'-3"
WL66	#5	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
WL67	#5	1	1	1	1	1				W+0'-0"	W+0'-0"
WL68	#5	1	1	1	1	1				W-0'-1 1/2"	W-0'-1 1/2"
WL69	#5	1	1	1	1	1				W-0'-3 1/2"	W-0'-3 1/2"
WL70	#5	1	1	1	1	1				W-0'-5"	W-0'-5"
WL71	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	71	71	71	71	71			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+8'-11"	W+8'-11"
RS2	#4	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
RS3	#4	1	1	1	1	1				W+8'-3 1/2"	W+8'-3 1/2"
RS4	#4	1	1	1	1	1				W+7'-11 1/2"	W+7'-11 1/2"
RS5	#4	1	1	1	1	1				W+7'-7 1/2"	W+7'-7 1/2"
RS6	#4	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
RS7	#4	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
RS8	#4	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
RS9	#4	1	1	1	1	1				W+6'-4"	W+6'-4"
RS10	#4	1	1	1	1	1				W+6'-0"	W+6'-0"
RS11	#4	1	1	1	1	1				W+5'-8"	W+5'-8"
RS12	#4	1	1	1	1	1				W+5'-4"	W+5'-4"
RS13	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RS14	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RS15	#4	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
RS16	#4	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
RS17	#4	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
RS18	#4	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
RS19	#4	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
RS20	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RS21	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS22	#4	1	1	1	1	1				W+2'-1"	W+2'-1"
RS23	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RS24	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS25	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RS26	#4	1	1	1	1	1				W+0'-9"	W+0'-9"
RS27	#4	1	1	1	1	1				W+0'-5 1/2"	W+0'-5 1/2"
RS28	#4	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
RS29	#4	1	1	1	1	1				W-0'-2 1/2"	W-0'-2 1/2"
RS30	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	30	30	30	30	30			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+8'-11 1/2"	W+8'-11 1/2"
RL2	#4	1	1	1	1	1				W+8'-8"	W+8'-8"
RL3	#4	1	1	1	1	1				W+8'-5"	W+8'-5"
RL4	#4	1	1	1	1	1				W+8'-1 1/2"	W+8'-1 1/2"
RL5	#4	1	1	1	1	1				W+7'-10 1/2"	W+7'-10 1/2"
RL6	#4	1	1	1	1	1				W+7'-7"	W+7'-7"
RL7	#4	1	1	1	1	1				W+7'-4"	W+7'-4"
RL8	#4	1	1	1	1	1				W+7'-0 1/2"	W+7'-0 1/2"
RL9	#4	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
RL10	#4	1	1	1	1	1				W+6'-6"	W+6'-6"
RL11	#4	1	1	1	1	1				W+6'-3"	W+6'-3"
RL12	#4	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"

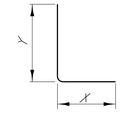
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

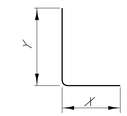
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
RL13	#4	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
RL14	#4	1	1	1	1	1				W+5'-5"	W+5'-5"
RL15	#4	1	1	1	1	1				W+5'-2"	W+5'-2"
RL16	#4	1	1	1	1	1				W+4'-10 1/2"	W+4'-10 1/2"
RL17	#4	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
RL18	#4	1	1	1	1	1				W+4'-4"	W+4'-4"
RL19	#4	1	1	1	1	1				W+4'-1"	W+4'-1"
RL20	#4	1	1	1	1	1				W+3'-9 1/2"	W+3'-9 1/2"
RL21	#4	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"
RL22	#4	1	1	1	1	1				W+3'-3"	W+3'-3"
RL23	#4	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
RL24	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RL25	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RL26	#4	1	1	1	1	1				W+2'-2"	W+2'-2"
RL27	#4	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RL28	#4	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
RL29	#4	1	1	1	1	1				W+1'-4"	W+1'-4"
RL30	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RL31	#4	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
RL32	#4	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
RL33	#4	1	1	1	1	1				W+0'-3"	W+0'-3"
RL34	#4	1	1	1	1	1				W+0'-0"	W+0'-0"
RL35	#4	1	1	1	1	1				W-0'-3 1/2"	W-0'-3 1/2"
RL36	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	36	36	36	36	36			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					3'-9 1/2"
YS2	#4	2	2	2	2	2					6'-4"
YS3	#4	2	2	2	2	2					8'-10"
YS4	#4	2	2	2	2	2					11'-4"
YS5	#4	2	2	2	2	2					13'-10"
YS6	#4	2	2	2	2	2					16'-4 1/2"
YS7	#4	2	2	2	2	2					18'-10 1/2"
YS8	#4	2	2	2	2	2					21'-4 1/2"
YS9	#4	2	2	2	2	2					23'-10 1/2"
YS10	#4	2	2	2	2	2					26'-4 1/2"
YS11	#4	12	12	12	12	12					28'-6 1/2"
YL1	#4	2	2	2	2	2					4'-8"
YL2	#4	2	2	2	2	2					7'-9"
YL3	#4	2	2	2	2	2					10'-9 1/2"
YL4	#4	2	2	2	2	2					13'-10"
YL5	#4	2	2	2	2	2					16'-10 1/2"
YL6	#4	2	2	2	2	2					19'-11 1/2"
YL7	#4	2	2	2	2	2					23'-0"
YL8	#4	2	2	2	2	2					26'-0 1/2"
YL9	#4	2	2	2	2	2					29'-1"
YL10	#4	2	2	2	2	2					32'-2"
YL11	#4	12	12	12	12	12					34'-9"
FS	#4	2	2	2	2	2					30'-0 1/2"
FL	#4	2	2	2	2	2					36'-0 1/2"
N	#4	30	34	39	43	47			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.035(2S+2V1+V2)+10 1/2"
K	#4	29	33	37	41	45			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					1.035(2S+V2)+1'-7 1/2"
OS	#7	17	17	17	17	17			3'-2"	3'-2"	6'-4"
OL	#7	17	17	17	17	17			3'-2"	3'-2"	6'-4"
OSS	#4	1	1	1	1	1					12'-0"+T1
OSL	#4	1	1	1	1	1					12'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			5'-7"
DS	#4	1			12'-0"+T1
J1	#5	1		W1+11'-1 1/2"	W1+11'-1 1/2"
J2	#5	1		W1+10'-7 1/2"	W1+10'-7 1/2"
J3	#5	1		W1+10'-2"	W1+10'-2"
J4	#5	1		W1+9'-8"	W1+9'-8"
J5	#5	1		W1+9'-2"	W1+9'-2"
J6	#5	1		W1+8'-8"	W1+8'-8"
J7	#5	1		W1+8'-2"	W1+8'-2"
J8	#5	1		W1+7'-8 1/2"	W1+7'-8 1/2"
J9	#5	1		W1+7'-2 1/2"	W1+7'-2 1/2"
J10	#5	1		W1+6'-8 1/2"	W1+6'-8 1/2"
J11	#5	1		W1+6'-2 1/2"	W1+6'-2 1/2"
J12	#5	1		W1+5'-8 1/2"	W1+5'-8 1/2"
J13	#5	1		W1+5'-2 1/2"	W1+5'-2 1/2"
J14	#5	1		W1+4'-9"	W1+4'-9"
J15	#5	1		W1+4'-3"	W1+4'-3"
J16	#5	1		W1+3'-9"	W1+3'-9"
J17	#5	1		W1+3'-3"	W1+3'-3"
J18	#5	1		W1+2'-9"	W1+2'-9"
J19	#5	1		W1+2'-3"	W1+2'-3"
J20	#5	1	1'-0"	W1+2'-6 1/2"	W1+3'-6 1/2"
J21	#5	1	1'-0"	W1+2'-0 1/2"	W1+3'-0 1/2"
J22	#5	1	1'-0"	W1+1'-6 1/2"	W1+2'-6 1/2"
J23	#5	1	1'-0"	W1+1'-0 1/2"	W1+2'-0 1/2"
J24	#5	1	1'-0"	W1+0'-6 1/2"	W1+1'-6 1/2"
DJ	#5	19	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			14'-3 1/2"
YD8	#5	1			16'-3 1/2"
YD9	#5	1			18'-3 1/2"
YD10	#5	1			20'-3 1/2"
YD11	#5	1			22'-3 1/2"
FD	#4	1			25'-4"



BARS DWS/DWL/DJ - #5



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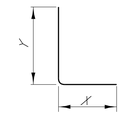
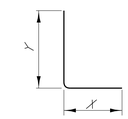
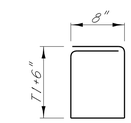


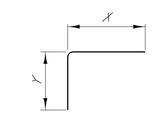
BARS RSn/RLn - #4



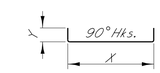
BARS WSn/WLn/Jn - #5



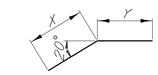
BARS K - #4



BARS V1/VLn/VSn - #4



BARS N - #4



DOWELS OS/OL - #7

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 15° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 3 OF 3

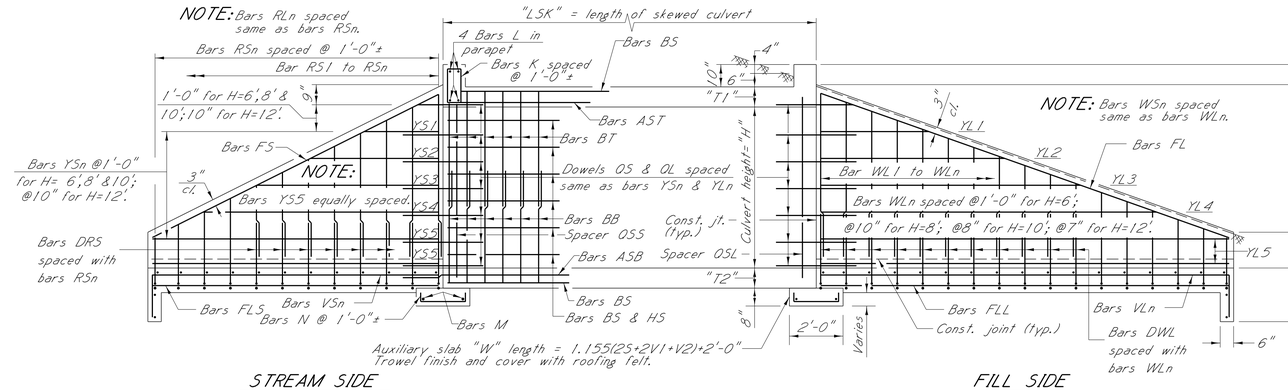
WORKING NUMBER IWD-12-3W-15

SHEET NUMBER 7171

DATE | REVISIONS | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

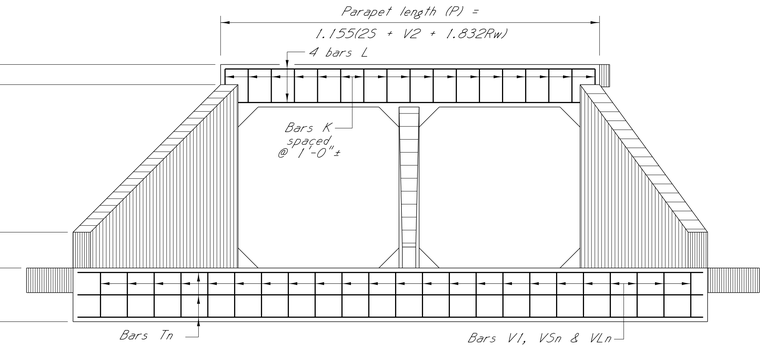


STREAM SIDE

Showing reinforcement in stream side of "LW1" wingwall

FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall



END ELEVATION

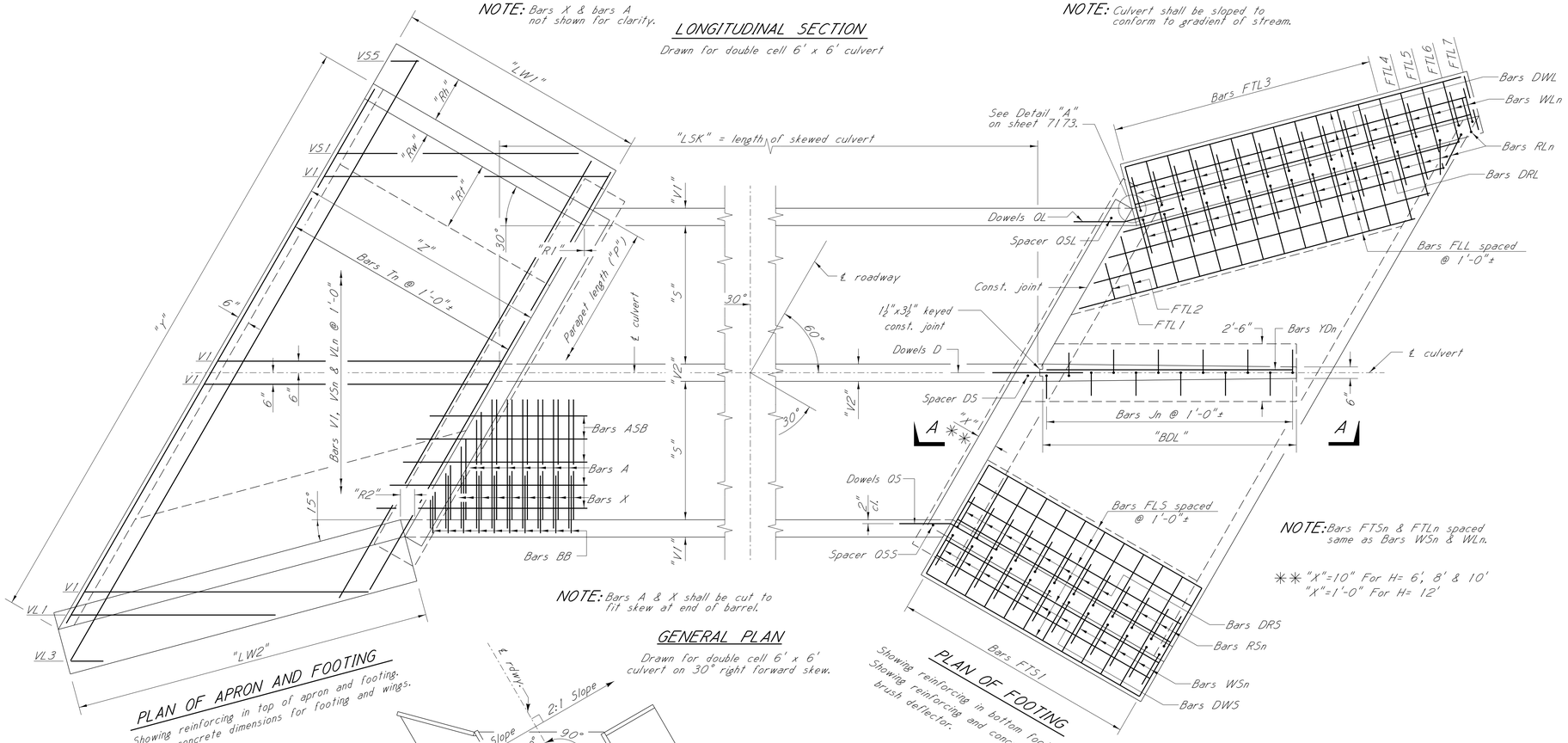
Showing reinforcing in pararpet & toe wall

NOTE: Bars X & bars A not shown for clarity.

LONGITUDINAL SECTION

Drawn for double cell 6' x 6' culvert

NOTE: Culvert shall be sloped to conform to gradient of stream.



PLAN OF APRON AND FOOTING

Showing reinforcing in top of apron and footing. Showing concrete dimensions for footing and wings.

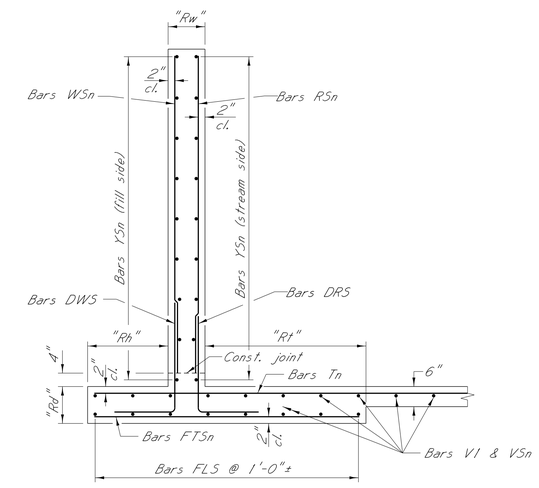
NOTE: Bars A & X shall be cut to fit skew at end of barrel.

GENERAL PLAN

Drawn for double cell 6' x 6' culvert on 30° right forward skew.

PLAN OF FOOTING

Showing reinforcing in bottom footing & wingwall. Showing reinforcing and concrete dimensions in brush deflector.



CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

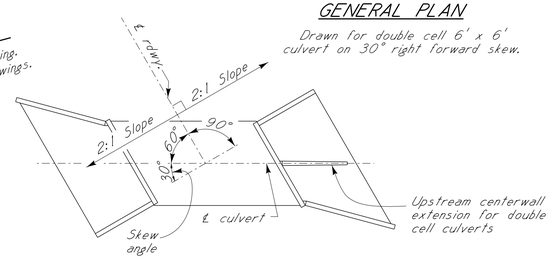
NOTE: For bar bending details and quantities, see drawings IWS-6-2W-30, IWS-8-2W-30, IWS-10-2W-30 & IWS-12-2W-30.

SPECIAL PROVISIONS REQUIRED:

Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:

Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)



PLAN OF 30° LEFT FORWARD SKEW

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-40 FT.

SHT. 1 OF 2

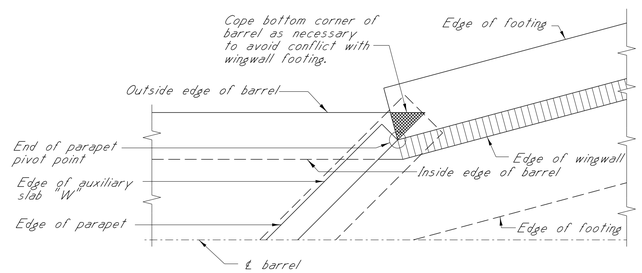
WORKING NUMBER IWS-2W-30

SHEET NUMBER 7172

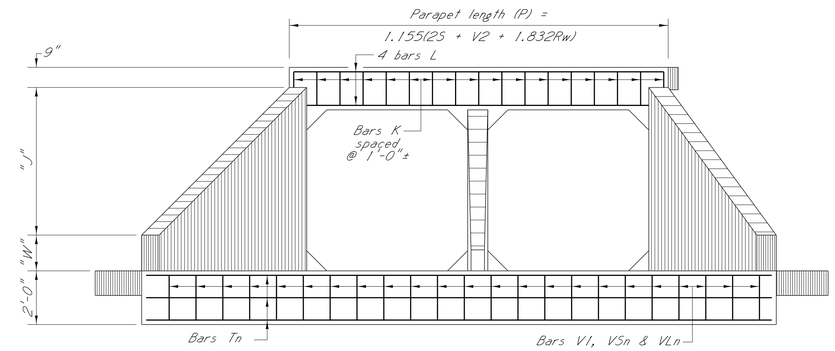
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

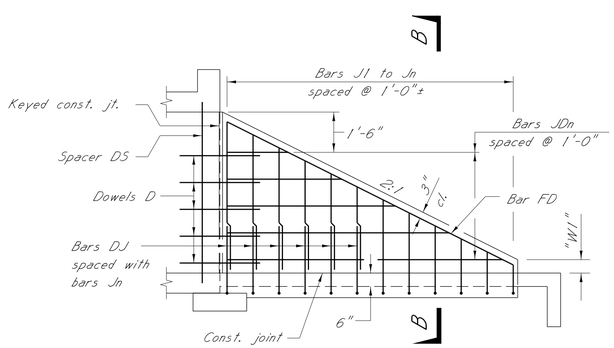


DETAIL "A"

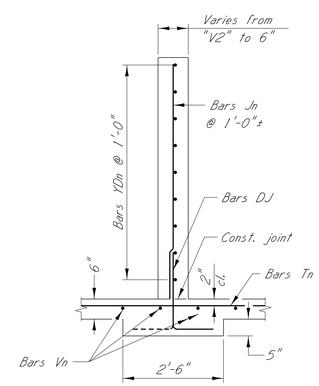


END ELEVATION

Showing reinforcing in pararpet & toe wall



SECTION A-A



SECTION B-B

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER
IWS-2W-30

SHEET NUMBER
7173

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
													6'	8'	10'	12'	14'	16'
6'-0"	5'-6"	11'-0"	15'-6 11/16"	0'-0"	0'-7 3/8"	11'-0"	0'-11"	0'-9"	3'-0"	2'-0"	0'-6"	11'-0"	26'-5 5/16"+1.155V2	31'-0 3/4"+1.155V2	35'-8 3/16"+1.155V2	40'-3 9/16"+1.155V2	44'-11"+1.155V2	49'-6 7/16"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	11.9659	1600.829	1.2518	174.057	0.9025	53.607	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	11.9659	1600.829	1.2518	174.057	0.9025	53.607	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	11.9659	1600.829	1.2518	174.057	0.9025	53.607	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	12.0525	1600.928	1.2518	174.057	0.9025	53.607	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	12.2324	1610.038	1.2518	174.140	0.9025	53.607	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	12.3523	1616.176	1.2518	174.196	0.9025	53.607	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	13.2326	1707.153	1.2518	174.057	1.1306	67.524	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	13.3407	1707.153	1.2518	174.057	1.1306	67.524	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	13.6090	1720.545	1.2518	174.168	1.1306	67.524	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	13.7432	1727.239	1.2518	174.224	1.1306	67.524	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	14.0116	1740.631	1.2518	174.335	1.1306	67.524	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	14.2439	1754.021	1.2518	174.446	1.1306	67.524	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	14.5136	1813.420	1.2518	174.057	1.3587	81.496	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	14.7915	1820.671	1.2518	174.112	1.3587	81.496	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	15.2368	1842.428	1.2518	174.279	1.3587	81.496	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	15.6389	1864.185	1.2518	174.446	1.3587	81.496	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	14.8847	1831.550	1.2518	174.196	1.3587	81.496	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	15.0021	1835.177	1.2518	174.224	1.3587	81.496	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	16.0026	1928.618	1.2518	174.140	1.5868	93.910	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	16.2969	1940.164	1.2518	174.224	1.5868	93.910	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	16.8544	1959.407	1.2518	174.363	1.5868	93.910	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	16.2777	1944.014	1.2518	174.252	1.5868	93.910	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	16.4094	1947.860	1.2518	174.279	1.5868	93.910	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	16.6224	1955.561	1.2518	174.335	1.5868	93.910	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	17.4460	2044.001	1.2518	174.196	1.8149	107.882	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	17.8590	2060.511	1.2518	174.307	1.8196	107.993	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	17.5371	2048.130	1.2518	174.224	1.8291	108.272	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	17.9505	2072.893	1.2518	174.391	1.8149	107.882	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	18.1276	2072.893	1.2518	174.391	1.8244	108.160	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	18.3632	2081.145	1.2518	174.446	1.8244	108.160	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	18.9511	2161.843	1.2518	174.279	2.0525	122.077	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	19.4988	2183.595	1.2518	174.419	2.0572	122.244	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	19.2046	2170.546	1.2518	174.335	2.0430	121.854	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	19.5536	2192.293	1.2518	174.474	2.0430	121.854	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	19.8738	2200.991	1.2518	174.530	2.0430	121.854	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	20.2562	2218.392	1.2518	174.641	2.0430	121.854	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 6 FT. SHT. 1 OF 2

SPANS 12-32 FT.

WORKING NUMBER IWD-6-2W-30

DATE | DESIGNER William K. McBeath, P.E. | CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. | ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7174

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1					1.155(2S+V2)+6'-2 ½"
T2	#4	1	1	1	1	1	1					1.155(2S+V2)+7'-2"
T3	#4	1	1	1	1	1	1					1.155(2S+V2)+8'-1 ½"
T4	#4	1	1	1	1	1	1					1.155(2S+V2)+9'-1"
T5	#4	1	1	1	1	1	1					1.155(2S+V2)+10'-1"
T6	#4	1	1	1	1	1	1					1.155(2S+V2)+11'-0 ½"
T7	#4	1	1	1	1	1	1					1.155(2S+V2)+12'-0"
T8	#4	1	1	1	1	1	1					1.155(2S+V2)+13'-0"
T9	#4	1	1	1	1	1	1					1.155(2S+V2)+13'-11 ½"
T10	#4	1	1	1	1	1	1					1.155(2S+V2)+14'-11"
T11	#4	1	1	1	1	1	1					1.155(2S+V2)+15'-4"
T12	#4	3	3	3	3	3	3					1.155(2S+V2)+12'-0 ½"
V1	#4	19	23	27	31	35	39			12'-4"	1'-8"	14'-0"
VL1	#4	1	1	1	1	1	1			8'-10 ½"	1'-8"	10'-6 ½"
VL2	#4	1	1	1	1	1	1			5'-5"		5'-5"
VL3	#4	1	1	1	1	1	1			1'-5"		1'-5"
VS1	#4	1	1	1	1	1	1			10'-5 ½"	1'-8"	12'-1 ½"
VS2	#4	1	1	1	1	1	1			8'-2"	1'-8"	9'-10"
VS3	#4	1	1	1	1	1	1			5'-10"	1'-8"	7'-6"
VS4	#4	1	1	1	1	1	1			3'-6 ½"		3'-6 ½"
VS5	#4	1	1	1	1	1	1			1'-2 ½"		1'-2 ½"
FTL1	#5	1	1	1	1	1	1					1'-7 ½"
FTL2	#5	1	1	1	1	1	1					2'-7"
FTL3	#5	13	13	13	13	13	13					5'-5"
FTL4	#5	1	1	1	1	1	1					4'-7 ½"
FTL5	#5	1	1	1	1	1	1					3'-8"
FTL6	#5	1	1	1	1	1	1					2'-8 ½"
FTL7	#5	1	1	1	1	1	1					2'-5"
FLL	#4	7	7	7	7	7	7					15'-1"
FTS1	#5	12	12	12	12	12	12					5'-5"
FLS	#4	7	7	7	7	7	7					10'-8"
WS1	#5	1	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
WS2	#5	1	1	1	1	1	1				W+4'-4"	W+4'-4"
WS3	#5	1	1	1	1	1	1				W+3'-10"	W+3'-10"
WS4	#5	1	1	1	1	1	1				W+3'-4"	W+3'-4"
WS5	#5	1	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
WS6	#5	1	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
WS7	#5	1	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
WS8	#5	1	1	1	1	1	1			1'-6"	W+2'-5"	W+3'-11"
WS9	#5	1	1	1	1	1	1			1'-6"	W+1'-11"	W+3'-5"
WS10	#5	1	1	1	1	1	1			1'-6"	W+1'-5"	W+2'-11"
WS11	#5	1	1	1	1	1	1			1'-6"	W+0'-11 ½"	W+2'-5 ½"
WS12	#5	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	7	7	7	7	7	7			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1				W+4'-10"	W+4'-10"
WL2	#5	1	1	1	1	1	1				W+4'-6"	W+4'-6"
WL3	#5	1	1	1	1	1	1				W+4'-2"	W+4'-2"
WL4	#5	1	1	1	1	1	1				W+3'-10"	W+3'-10"
WL5	#5	1	1	1	1	1	1				W+3'-6"	W+3'-6"
WL6	#5	1	1	1	1	1	1				W+3'-2"	W+3'-2"
WL7	#5	1	1	1	1	1	1				W+2'-10"	W+2'-10"
WL8	#5	1	1	1	1	1	1				W+2'-6"	W+2'-6"
WL9	#5	1	1	1	1	1	1				W+2'-2"	W+2'-2"
WL10	#5	1	1	1	1	1	1				W+1'-10"	W+1'-10"
WL11	#5	1	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WL12	#5	1	1	1	1	1	1			1'-6"	W+2'-1 ½"	W+3'-7 ½"
WL13	#5	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
WL14	#5	1	1	1	1	1	1			1'-6"	W+1'-5 ½"	W+2'-11 ½"
WL15	#5	1	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
WL16	#5	1	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
WL17	#5	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	11	11	11	11	11	11			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
RS2	#4	1	1	1	1	1	1				W+4'-4"	W+4'-4"

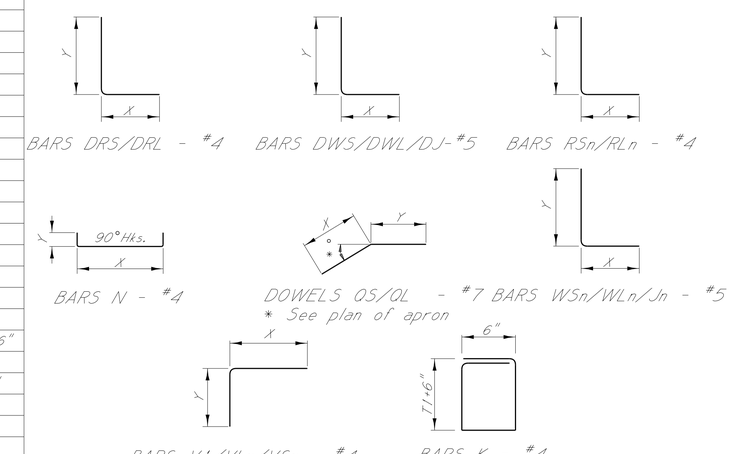
HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
RS3	#4	1	1	1	1	1	1				W+3'-10"	W+3'-10"
RS4	#4	1	1	1	1	1	1				W+3'-4"	W+3'-4"
RS5	#4	1	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
RS6	#4	1	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
RS7	#4	1	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
RS8	#4	1	1	1	1	1	1				W+1'-5"	W+1'-5"
RS9	#4	1	1	1	1	1	1			1'-6"	W+1'-11"	W+3'-5"
RS10	#4	1	1	1	1	1	1			1'-6"	W+1'-5"	W+2'-11"
RS11	#4	1	1	1	1	1	1			1'-6"	W+0'-11 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	8	8	8	8	8	8			1'-6"	2'-5"	W+3'-11"
RL1	#4	1	1	1	1	1	1				W+4'-10"	W+4'-10"
RL2	#4	1	1	1	1	1	1				W+4'-6"	W+4'-6"
RL3	#4	1	1	1	1	1	1				W+4'-2"	W+4'-2"
RL4	#4	1	1	1	1	1	1				W+3'-10"	W+3'-10"
RL5	#4	1	1	1	1	1	1				W+3'-6"	W+3'-6"
RL6	#4	1	1	1	1	1	1				W+3'-2"	W+3'-2"
RL7	#4	1	1	1	1	1	1				W+2'-10"	W+2'-10"
RL8	#4	1	1	1	1	1	1				W+2'-6"	W+2'-6"
RL9	#4	1	1	1	1	1	1				W+2'-2"	W+2'-2"
RL10	#4	1	1	1	1	1	1				W+1'-10"	W+1'-10"
RL11	#4	1	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
RL12	#4	1	1	1	1	1	1				W+1'-1 ½"	W+1'-1 ½"
RL13	#4	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
RL14	#4	1	1	1	1	1	1			1'-6"	W+1'-5 ½"	W+2'-11 ½"
RL15	#4	1	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
RL16	#4	1	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
RL17	#4	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	12	12	12	12	12	12			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2					2'-9 ½"
YS2	#4	2	2	2	2	2	2					4'-9 ½"
YS3	#4	2	2	2	2	2	2					6'-9 ½"
YS4	#4	2	2	2	2	2	2					8'-9 ½"
YS5	#4	6	6	6	6	6	6					10'-8"
YL1	#4	2	2	2	2	2	2					4'-0 ½"
YL2	#4	2	2	2	2	2	2					6'-10 ½"
YL3	#4	2	2	2	2	2	2					9'-8 ½"
YL4	#4	2	2	2	2	2	2					12'-6"
YL5	#4	6	6	6	6	6	6					15'-2 ½"
FS	#4	2	2	2	2	2	2					11'-11"
FL	#4	2	2	2	2	2	2					16'-2"
N	#4	19	24	29	33	38	43			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					1.155(2S+2V1+V2)+1'-6"
K	#4	17	22	27	31	36	40			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					1.155(2S+V2)+1'-3"
OS	#7	8	8	8	8	8	8			3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	8	8	8	8	8	8			3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1	1					6'-0"+T1
OSL	#4	1	1	1	1	1	1					6'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			5'-9"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J2	#5	1		W1+4'-8"	W1+4'-8"
J3	#5	1		W1+4'-2"	W1+4'-2"
J4	#5	1		W1+3'-8"	W1+3'-8"
J5	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J6	#5	1		W1+2'-8 ½"	W1+2'-8 ½"
J7	#5	1	1'-0"	W1+2'-11 ½"	W1+3'-11 ½"
J8	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J9	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J10	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J11	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J12	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	6	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
FD	#4	1			11'-11"



BAR BENDING DETAILS

Dimensions are out to out

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-6-2W-30

SHEET NUMBER 7175

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													8'	10'	12'	14'	16'
8'-0"	7'-1"	14'-2"	20'-0 7/16"	0'-0"	0'-7 3/8"	14'-2"	0'-11"	0'-9"	3'-0"	2'-0"	0'-7"	14'-10 1/8"	34'-2 3/4"+1.155V2	38'-10 3/16"+1.155V2	43'-5 9/16"+1.155V2	48'-1"+1.155V2	52'-8 7/16"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	18.2428	2393.107	2.0591	277.054	1.1306	67.524	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	18.3508	2393.107	2.0591	277.054	1.1306	67.524	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	18.6546	2409.712	2.0591	277.166	1.1306	67.524	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	18.8065	2418.013	2.0591	277.221	1.1306	67.524	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	19.1123	2434.619	2.0591	277.333	1.1354	67.691	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	19.3461	2447.072	2.0591	277.416	1.1449	67.913	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	19.8738	2518.301	2.0591	277.054	1.3587	81.496	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	20.1662	2531.590	2.0591	277.138	1.3587	81.496	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	20.5814	2553.735	2.0591	277.277	1.3587	81.496	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	21.0367	2580.311	2.0591	277.444	1.3587	81.496	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	20.2866	2544.878	2.0591	277.221	1.3634	81.663	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	20.5406	2558.166	2.0591	277.305	1.3777	82.053	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	21.6170	2654.891	2.0591	277.138	1.5868	95.468	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	21.8876	2668.847	2.0591	277.221	1.5868	95.468	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	22.5796	2696.760	2.0591	277.388	1.5868	95.468	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	21.9846	2678.762	2.1125	277.277	1.5939	95.691	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	22.1997	2687.457	2.0591	277.333	1.5915	95.580	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	22.4401	2696.760	2.0591	277.388	1.6105	96.136	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	23.3889	2795.795	2.0591	277.221	1.8149	107.882	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	23.7956	2810.586	2.0591	277.305	1.8149	107.882	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	23.5260	2805.654	2.0591	277.277	1.8149	107.882	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	23.9226	2825.377	2.0591	277.388	1.8339	108.383	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	24.2385	2835.237	2.0591	277.444	1.8386	108.550	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	24.4976	2845.101	2.0591	277.500	1.8434	108.661	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	25.1503	2930.041	2.0591	277.277	2.0477	123.524	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	25.8060	2955.810	2.0591	277.416	2.0525	123.636	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	25.4043	2945.500	2.0591	277.361	2.0620	123.914	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	25.9369	2971.269	2.0591	277.500	2.0715	124.192	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	26.3678	2991.878	2.0591	277.611	2.0810	124.415	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	26.7582	3003.468	2.1661	277.449	2.0952	124.805	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-8-2W-30

SHEET NUMBER 7176

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.155(2S+V2)+6'-2"
T2	#4	1	1	1	1	1					1.155(2S+V2)+7'-2"
T3	#4	1	1	1	1	1					1.155(2S+V2)+8'-2"
T4	#4	1	1	1	1	1					1.155(2S+V2)+9'-2"
T5	#4	1	1	1	1	1					1.155(2S+V2)+10'-1 ½"
T6	#4	1	1	1	1	1					1.155(2S+V2)+11'-1 ½"
T7	#4	1	1	1	1	1					1.155(2S+V2)+12'-1 ½"
T8	#4	1	1	1	1	1					1.155(2S+V2)+13'-1"
T9	#4	1	1	1	1	1					1.155(2S+V2)+14'-1"
T10	#4	1	1	1	1	1					1.155(2S+V2)+15'-1"
T11	#4	1	1	1	1	1					1.155(2S+V2)+16'-1"
T12	#4	1	1	1	1	1					1.155(2S+V2)+17'-0 ½"
T13	#4	1	1	1	1	1					1.155(2S+V2)+18'-0 ½"
T14	#4	1	1	1	1	1					1.155(2S+V2)+18'-6"
T15	#4	3	3	3	3	3					5+15'-2 ½"
V1	#4	23	27	31	35	39			15'-11 ½"	1'-8"	17'-7 ½"
VL1	#4	1	1	1	1	1			12'-6 ½"	1'-8"	14'-2 ½"
VL2	#4	1	1	1	1	1			9'-4 ½"	1'-8"	11'-0 ½"
VL3	#4	1	1	1	1	1			6'-0 ½"		6'-0 ½"
VL4	#4	1	1	1	1	1			2'-0 ½"		2'-0 ½"
VS1	#4	1	1	1	1	1			14'-1 ½"	1'-8"	15'-9 ½"
VS2	#4	1	1	1	1	1			11'-9 ½"	1'-8"	13'-5 ½"
VS3	#4	1	1	1	1	1			9'-6"	1'-8"	11'-2"
VS4	#4	1	1	1	1	1			7'-2"	1'-8"	8'-10"
VS5	#4	1	1	1	1	1			4'-10 ½"	1'-8"	6'-6 ½"
VS6	#4	1	1	1	1	1			2'-7"		2'-7"
FTL1	#5	1	1	1	1	1					1'-0 ½"
FTL2	#5	1	1	1	1	1					1'-10 ½"
FTL3	#5	1	1	1	1	1					2'-8 ½"
FTL4	#5	20	20	20	20	20					5'-5"
FTL5	#5	1	1	1	1	1					5'-0 ½"
FTL6	#5	1	1	1	1	1					4'-2 ½"
FTL7	#5	1	1	1	1	1					3'-5"
FTL8	#5	1	1	1	1	1					2'-7"
FTL9	#5	1	1	1	1	1					2'-5"
FLL	#4	7	7	7	7	7					19'-7"
FTS	#5	18	18	18	18	18					5'-5"
FLS	#4	7	7	7	7	7					13'-10"
WS1	#5	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
WS2	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WS3	#5	1	1	1	1	1				W+5'-7"	W+5'-7"
WS4	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WS5	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WS6	#5	1	1	1	1	1				W+4'-4"	W+4'-4"
WS7	#5	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
WS8	#5	1	1	1	1	1				W+3'-6 ½"	W+3'-6 ½"
WS9	#5	1	1	1	1	1				W+3'-1 ½"	W+3'-1 ½"
WS10	#5	1	1	1	1	1				W+2'-8 ½"	W+2'-8 ½"
WS11	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WS12	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WS13	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WS14	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WS15	#5	1	1	1	1	1			1'-6"	W+1'-8"	W+3'-2"
WS16	#5	1	1	1	1	1			1'-6"	W+1'-3 ½"	W+2'-9 ½"
WS17	#5	1	1	1	1	1			1'-6"	W+0'-10 ½"	W+2'-4 ½"
WS18	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	14	14	14	14	14			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL2	#5	1	1	1	1	1				W+6'-1 ½"	W+6'-1 ½"
WL3	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WL4	#5	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
WL5	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WL6	#5	1	1	1	1	1				W+4'-11 ½"	W+4'-11 ½"
WL7	#5	1	1	1	1	1				W+4'-8"	W+4'-8"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WL8	#5	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WL9	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WL10	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL11	#5	1	1	1	1	1				W+3'-6 ½"	W+3'-6 ½"
WL12	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL13	#5	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
WL14	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL15	#5	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
WL16	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL17	#5	1	1	1	1	1				W+1'-9 ½"	W+1'-9 ½"
WL18	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL19	#5	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
WL20	#5	1	1	1	1	1			1'-6"	W+1'-11"	W+3'-5"
WL21	#5	1	1	1	1	1			1'-6"	W+1'-7 ½"	W+3'-1 ½"
WL22	#5	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
WL23	#5	1	1	1	1	1			1'-6"	W+1'-0 ½"	W+2'-6 ½"
WL24	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WL25	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	19	19	19	19	19			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
RS2	#4	1	1	1	1	1				W+5'-10 ½"	W+5'-10 ½"
RS3	#4	1	1	1	1	1				W+5'-5"	W+5'-5"
RS4	#4	1	1	1	1	1				W+4'-11"	W+4'-11"
RS5	#4	1	1	1	1	1				W+4'-5"	W+4'-5"
RS6	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RS7	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS8	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RS9	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS10	#4	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
RS11	#4	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
RS12	#4	1	1	1	1	1				W+0'-11 ½"	W+0'-11 ½"
RS13	#4	1	1	1	1	1			1'-6"	W+1'-5 ½"	W+2'-11 ½"
RS14	#4	1	1	1	1	1			1'-6"	W+0'-11 ½"	W+2'-5 ½"
RS15	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	12	12	12	12	12			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+6'-5"	W+6'-5"
RL2	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RL3	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RL4	#4	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
RL5	#4	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
RL6	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RL7	#4	1	1	1	1	1				W+4'-4"	W+4'-4"
RL8	#4	1	1	1	1	1				W+4'-0"	W+4'-0"
RL9	#4	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
RL10	#4	1	1	1	1	1				W+3'-3 ½"	W+3'-3 ½"
RL11	#4	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
RL12	#4	1	1	1	1	1				W+2'-7"	W+2'-7"
RL13	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RL14	#4	1	1	1	1	1				W+1'-11"	W+1'-11"
RL15	#4	1	1	1	1	1				W+1'-6 ½"	W+1'-6 ½"
RL16	#4	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
RL17	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL18	#4	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
RL19	#4	1	1	1	1	1			1'-6"	W+1'-2"	W+2'-8"
RL20	#4	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
RL21	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	17	17	17	17	17			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-9 ½"
YS2	#4	2	2	2	2	2					4'-9 ½"
YS3	#4	2	2	2	2	2					6'-9 ½"
YS4	#4	2	2	2	2	2					8'-9 ½"
YS5	#4	2	2	2	2	2					10'-9 ½"
YS6	#4	2	2	2	2	2					12'-9 ½"
YS7	#4	6	6	6	6	6					13'-10"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
YL1	#4	2	2	2	2	2					4'-0 ½"
YL2	#4	2	2	2	2	2					6'-10 ½"
YL3	#4	2	2	2	2	2					9'-8 ½"
YL4	#4	2	2	2	2	2					12'-6"
YL5	#4	2	2	2	2	2					15'-4"
YL6	#4	2	2	2	2	2					18'-2"
YL7	#4	6	6	6	6	6					19'-8 ½"
FS	#4	2	2	2	2	2					15'-5 ½"
FL	#4	2	2	2	2	2					20'-11"
N	#4	24	29	34	38	44			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.155(2S+2V1+V2)+1'-5 ½"
K	#4	22	27	31	36	40			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.155(2S+V2)+1'-3"
OS	#7	10	10	10	10	10			3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	10	10	10	10	10			3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1					8'-0"+T1
OSL	#4	1	1	1	1	1					8'-0"+T1

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 3

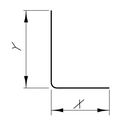
WORKING NUMBER IWD-8-2W-30

SHEET NUMBER 7177

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			5'-10"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+7'-0 ½"	W1+7'-0 ½"
J2	#5	1		W1+6'-7"	W1+6'-7"
J3	#5	1		W1+6'-1"	W1+6'-1"
J4	#5	1		W1+5'-7"	W1+5'-7"
J5	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J6	#5	1		W1+4'-7 ½"	W1+4'-7 ½"
J7	#5	1		W1+4'-2"	W1+4'-2"
J8	#5	1		W1+3'-8"	W1+3'-8"
J9	#5	1		W1+3'-2"	W1+3'-2"
J10	#5	1		W1+2'-8 ½"	W1+2'-8 ½"
J11	#5	1		W1+2'-2 ½"	W1+2'-2 ½"
J12	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J13	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J14	#5	1	1'-0"	W1+1'-6"	W1+2'-6"
J15	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J16	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	11	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-6"
FD	#4	1			16'-2 ½"



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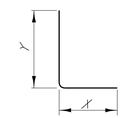

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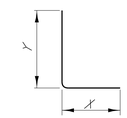
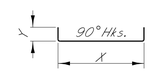
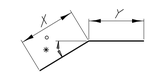


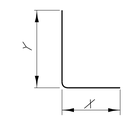
BARS RSn/RLn - #4



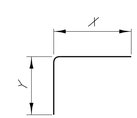
BARS N - #4



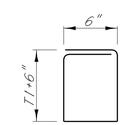
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-8-2W-30

SHEET NUMBER
7178

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													10'	12'	14'	16'	18'
10'-0"	8'-1"	16'-2"	22'-10 3/8"	0'-0"	0'-8 3/16"	16'-2"	0'-11"	0'-10"	4'-0"	2'-0"	1'-5"	17'-1 13/16"	41'-0 1/4"+1.155V2	45'-7 11/16"+1.155V2	50'-3 1/8"+1.155V2	54'-10 9/16"+1.155V2	59'-6"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwalls and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 1/4"	9"	9"	2'-9"	25.8948	3382.498	2.9521	383.677	1.3587	83.055	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	26.1681	3393.112	2.9521	383.733	1.3587	83.055	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	26.6467	3424.956	2.9521	383.900	1.3682	83.333	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	27.1252	3451.495	2.9521	384.039	1.3824	83.723	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	26.6102	3424.956	2.9521	383.900	1.3920	83.945	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	26.9023	3440.878	2.9521	383.983	1.4062	84.335	5.5679	1331.546
240	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	27.8911	3534.052	2.9521	383.761	1.5868	95.468	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	28.2435	3550.642	2.9521	383.844	1.5868	95.468	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	28.8026	3578.291	2.9521	383.983	1.5963	95.747	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	28.4526	3572.763	2.9521	383.956	1.6105	96.136	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	28.7118	3583.822	2.9521	384.011	1.6200	96.359	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	29.0274	3600.412	2.9521	384.095	1.6343	96.749	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	29.8157	3689.976	2.9521	383.844	1.8149	109.441	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	30.3045	3713.211	2.9521	383.956	1.8149	109.441	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	29.9758	3701.591	2.9521	383.900	1.8244	109.719	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	30.5235	3730.636	2.9521	384.039	1.8386	110.109	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	30.9716	3753.866	2.9521	384.150	1.8576	110.610	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	31.2548	3765.486	2.9521	384.206	1.8624	110.721	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	31.7692	3841.481	2.9521	383.900	2.0477	123.524	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	32.4124	3871.918	2.9521	384.039	2.0525	123.636	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	32.0549	3859.741	2.9521	383.983	2.0620	123.914	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	32.7561	3896.261	2.9521	384.150	2.0715	124.192	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	33.2379	3920.609	2.9521	384.262	2.0905	124.693	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	33.8503	3943.350	3.4506	384.898	2.1142	125.361	7.5679	1842.884
360	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	33.8043	4074.654	2.9521	383.983	2.2853	137.775	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	34.6164	4112.510	2.9521	384.150	2.2901	137.886	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	34.3031	4099.893	2.9521	384.095	2.2996	138.165	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	34.9279	4131.438	2.9521	384.234	2.3091	138.387	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	35.3323	4144.061	2.9521	384.290	2.3186	138.666	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	36.1659	4180.087	3.4506	384.982	2.3471	139.445	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-10-2W-30

SHEET NUMBER 7179

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.155(2S+V2)+6'-4 ½"
T2	#4	1	1	1	1	1					1.155(2S+V2)+7'-4"
T3	#4	1	1	1	1	1					1.155(2S+V2)+8'-4"
T4	#4	1	1	1	1	1					1.155(2S+V2)+9'-4"
T5	#4	1	1	1	1	1					1.155(2S+V2)+10'-4"
T6	#4	1	1	1	1	1					1.155(2S+V2)+11'-3 ½"
T7	#4	1	1	1	1	1					1.155(2S+V2)+12'-3 ½"
T8	#4	1	1	1	1	1					1.155(2S+V2)+13'-3 ½"
T9	#4	1	1	1	1	1					1.155(2S+V2)+14'-3 ½"
T10	#4	1	1	1	1	1					1.155(2S+V2)+15'-3"
T11	#4	1	1	1	1	1					1.155(2S+V2)+16'-3"
T12	#4	1	1	1	1	1					1.155(2S+V2)+17'-3"
T13	#4	1	1	1	1	1					1.155(2S+V2)+18'-3"
T14	#4	1	1	1	1	1					1.155(2S+V2)+19'-2 ½"
T15	#4	1	1	1	1	1					1.155(2S+V2)+20'-2 ½"
T16	#4	1	1	1	1	1					1.155(2S+V2)+20'-8"
T17	#4	3	3	3	3	3					1.155(2S+V2)+17'-4 ½"
V1	#4	27	31	35	39	43			18'-3 ½"	1'-8"	19'-11 ½"
VL1	#4	1	1	1	1	1			15'-1"	1'-8"	16'-9"
VL2	#4	1	1	1	1	1			11'-11"	1'-8"	13'-7"
VL3	#4	1	1	1	1	1			8'-9 ½"	1'-8"	10'-5 ½"
VL4	#4	1	1	1	1	1			5'-3 ½"		5'-3 ½"
VL5	#4	1	1	1	1	1			1'-3 ½"		1'-3 ½"
VS1	#4	1	1	1	1	1			16'-7"	1'-8"	18'-3"
VS2	#4	1	1	1	1	1			14'-3 ½"	1'-8"	15'-11 ½"
VS3	#4	1	1	1	1	1			11'-9 ½"	1'-8"	13'-7 ½"
VS4	#4	1	1	1	1	1			9'-8"	1'-8"	11'-4"
VS5	#4	1	1	1	1	1			7'-4"	1'-8"	9'-0"
VS6	#4	1	1	1	1	1			5'-0 ½"	1'-8"	6'-8 ½"
VS7	#4	1	1	1	1	1			2'-9"		2'-9"
FTL1	#5	1	1	1	1	1					1'-3 ½"
FTL2	#5	1	1	1	1	1					1'-11 ½"
FTL3	#5	1	1	1	1	1					2'-7 ½"
FTL4	#5	1	1	1	1	1					3'-3 ½"
FTL5	#5	1	1	1	1	1					3'-11"
FTL6	#5	27	27	27	27	27					6'-6"
FTL7	#5	1	1	1	1	1					6'-5"
FTL8	#5	1	1	1	1	1					5'-9"
FTL9	#5	1	1	1	1	1					5'-1"
FTL10	#5	1	1	1	1	1					4'-5"
FTL11	#5	1	1	1	1	1					3'-9"
FTL12	#5	1	1	1	1	1					3'-1"
FTL13	#5	2	2	2	2	2					2'-6"
FLL	#4	8	8	8	8	8					22'-4 ½"
FTS1	#5	25	25	25	25	25					6'-6"
FLS	#4	8	8	8	8	8					15'-10"
WS1	#5	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
WS2	#5	1	1	1	1	1				W+7'-0 ½"	W+7'-0 ½"
WS3	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WS4	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WS5	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WS6	#5	1	1	1	1	1				W+5'-9"	W+5'-9"
WS7	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WS8	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WS9	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WS10	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WS11	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WS12	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WS13	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS14	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS15	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WS16	#5	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
WS17	#5	1	1	1	1	1				W+2'-1 ½"	W+2'-1 ½"
WS18	#5	1	1	1	1	1				W+1'-9 ½"	W+1'-9 ½"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WS19	#5	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WS20	#5	1	1	1	1	1				W+1'-1 ½"	W+1'-1 ½"
WS21	#5	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
WS22	#5	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
WS23	#5	1	1	1	1	1				W+0'-1 ½"	W+0'-1 ½"
WS24	#5	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
WS25	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	23	23	23	23	23			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+7'-5"	W+7'-5"
WL2	#5	1	1	1	1	1				W+7'-2 ½"	W+7'-2 ½"
WL3	#5	1	1	1	1	1				W+6'-11 ½"	W+6'-11 ½"
WL4	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WL5	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WL6	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL7	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL8	#5	1	1	1	1	1				W+5'-9 ½"	W+5'-9 ½"
WL9	#5	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
WL10	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WL11	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WL12	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL13	#5	1	1	1	1	1				W+4'-7 ½"	W+4'-7 ½"
WL14	#5	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WL15	#5	1	1	1	1	1				W+4'-2"	W+4'-2"
WL16	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL17	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL18	#5	1	1	1	1	1				W+3'-5 ½""	W+3'-5 ½"
WL19	#5	1	1	1	1	1				W+3'-2 ½"	W+3'-2 ½"
WL20	#5	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
WL21	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WL22	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WL23	#5	1	1	1	1	1				W+2'-3 ½"	W+2'-3 ½"
WL24	#5	1	1	1	1	1				W+2'-0 ½"	W+2'-0 ½"
WL25	#5	1	1	1	1	1				W+1'-9 ½"	W+1'-9 ½"
WL26	#5	1	1	1	1	1				W+1'-7"	W+1'-7"
WL27	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL28	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WL29	#5	1	1	1	1	1				W+0'-10 ½"	W+0'-10 ½"
WL30	#5	1	1	1	1	1				W+0'-7½"	W+0'-7 ½"
WL31	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL32	#5	1	1	1	1	1				W+0'-2"	W+0'-2"
WL33	#5	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WL34	#5	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
WL35	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	32	32	32	32	32			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
RS2	#4	1	1	1	1	1				W+6'-10 ½"	W+6'-10 ½"
RS3	#4	1	1	1	1	1				W+6'-5"	W+6'-5"
RS4	#4	1	1	1	1	1				W+5'-11"	W+5'-11"
RS5	#4	1	1	1	1	1				W+5'-5"	W+5'-5"
RS6	#4	1	1	1	1	1				W+4'-11"	W+4'-11"
RS7	#4	1	1	1	1	1				W+4'-5"	W+4'-5"
RS8	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RS9	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS10	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RS11	#4	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
RS13	#4	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
RS14	#4	1	1	1	1	1				W+0'-11 ½"	W+0'-11 ½"
RS15	#4	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
RS16	#4	1	1	1	1	1				W+0'-0 ½"	W+0'-0 ½"
RS17	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	16	16	16	16	16			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+7'-5"	W+7'-5"
RL2	#4	1	1	1	1	1				W+7'-1"	W+7'-1"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RL3	#4	1	1	1	1	1				W+6'-9"	W+6'-9"
RL4	#4	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
RL5	#4	1	1	1	1	1				W+6'-0 ½"	W+6'-0 ½"
RL6	#4	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
RL7	#4	1	1	1	1	1				W+5'-4"	W+5'-4"
RL8	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RL9	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RL10	#4	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
RL11	#4	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
RL12	#4	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
RL13	#4	1	1	1	1	1				W+3'-3"	W+3'-3"
RL14	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RL15	#4	1	1	1	1	1				W+2'-7"	W+2'-7"
RL16	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RL17	#4	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
RL18	#4	1	1	1	1	1				W+1'-6 ½"	W+1'-6 ½"
RL19	#4	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
RL20	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL21	#4	1	1	1	1	1				W+0'-6"	W+0'-6"
RL22	#4	1	1	1	1	1				W+0'-2"	W+0'-2"
RL23	#4	1	1	1	1	1				W-0'-2 ½"	W-0'-2 ½"
RL24	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	23	23	23	23	23			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-9 ½"
YS2	#4	2	2	2	2	2					4'-9 ½"
YS3	#4	2	2	2	2	2					6'-9 ½"
YS4	#4	2	2	2	2	2					8'-9 ½"
YS5	#4	2	2	2	2	2					10'-9 ½"
YS6	#4	2	2	2	2	2					12'-9 ½"
YS7	#4	2	2	2	2	2					14'-9 ½"
YS8	#4	8	8	8	8	10					15'-10"
YL1	#4	2	2	2	2	2					4'-0 ½"
YL2	#4	2	2	2	2	2					6'-10 ½"
YL3	#4	2	2	2	2	2					9'-8 ½"
YL4	#4	2	2	2	2	2					12'-6"
YL5	#4	2	2	2	2	2					15'-4"
YL6	#4	2	2	2	2	2					18'-2"
YL7	#4	2	2	2	2	2					21'-0"
YL8	#4	8	8	8	8	10					22'-6 ½"
FS	#4	2	2	2	2	2					17'-8 ½"
FL	#4	2	2	2	2	2					23'-11"
N	#4	30	34	39	44	49			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.155(2S+2V1+V2)+1'-5 ½"
K	#4	27	31	36	41	45			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.155(2S+V2)+1'-5"
OS	#7	12	12	12	12	13			3'-2 ½"	3'-2 ½"	6'-5"
OL	#7	12	12	12	12	13			3'-2 ½"	3'-2 ½"	6'-5"
OSS	#4	1	1	1	1	1					10'-0"+T1
OSL	#4	1	1	1	1	1					10'-0"+T1

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

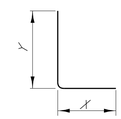
SHT. 2 OF 3

WORKING NUMBER IWD-10-2W-30

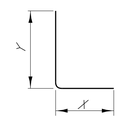
SHEET NUMBER 7180

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

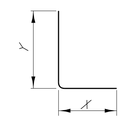
BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			5'-11"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+8'-2 1/2"	W1+8'-2 1/2"
J2	#5	1		W1+7'-8 1/2"	W1+7'-8 1/2"
J3	#5	1		W1+7'-3"	W1+7'-3"
J4	#5	1		W1+6'-9"	W1+6'-9"
J5	#5	1		W1+6'-3"	W1+6'-3"
J6	#5	1		W1+5'-9"	W1+5'-9"
J7	#5	1		W1+5'-3"	W1+5'-3"
J8	#5	1		W1+4'-9"	W1+4'-9"
J9	#5	1		W1+4'-3"	W1+4'-3"
J10	#5	1		W1+3'-9"	W1+3'-9"
J11	#5	1		W1+3'-3"	W1+3'-3"
J12	#5	1		W1+2'-9 1/2"	W1+2'-9 1/2"
J13	#5	1		W1+2'-3 1/2"	W1+2'-3 1/2"
J14	#5	1		W1+1'-9 1/2"	W1+1'-9 1/2"
J15	#5	1	1'-0"	W1+2'-0 1/2"	W1+3'-0 1/2"
J16	#5	1	1'-0"	W1+1'-6 1/2"	W1+2'-6 1/2"
J17	#5	1	1'-0"	W1+1'-0 1/2"	W1+2'-0 1/2"
J18	#5	1	1'-0"	W1+0'-6 1/2"	W1+1'-6 1/2"
DJ	#5	14	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3"
YD3	#5	1			6'-3"
YD4	#5	1			8'-3"
YD5	#5	1			10'-3"
YD6	#5	1			12'-3"
YD7	#5	1			14'-3"
YD8	#5	1			16'-3"
YD9	#5	1			16'-10"
FD	#4	1			18'-9 1/2"



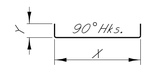
BARS DRS/DRL - #4



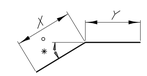
BARS DWS/DWL/DJ - #5



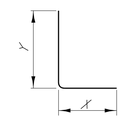
BARS RSn/RLn - #4



BARS N - #4



DOWELS OS/OL - #7
* See plan of apron



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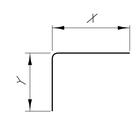
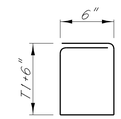


BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS
Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-10-2W-30

SHEET NUMBER
7181

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DATE | REVISIONS | BY

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													12'	14'	16'	18'	20'
12'-0"	9'-4"	18'-8"	26'-4 13/16"	0'-0"	0'-9"	18'-8"	0'-11"	0'-11"	5'-0"	2'-0"	1'-11 3/4"	20'-0 7/16"	48'-3 13/16"+1.155V2	52'-11 1/4"+1.155V2	57'-6 11/16"+1.155V2	62'-2 1/8"+1.155V2	66'-9 1/2"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet. Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	36.3092	4794.137	4.0513	514.060	1.5868	95.468	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	36.7560	4813.955	4.0513	514.144	1.6010	95.858	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	37.3918	4846.985	4.0513	514.283	1.6200	96.359	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	36.6537	4813.955	4.0513	514.144	1.5963	95.747	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	36.8338	4827.166	4.0513	514.199	1.6010	95.858	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	37.0652	4840.382	4.0513	514.255	1.6058	95.969	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	38.6193	4968.597	4.0513	514.144	1.8149	109.441	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	39.1613	4989.084	4.0513	514.227	1.8291	109.830	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	38.7484	4975.428	4.0513	514.172	1.8481	110.331	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	39.0538	4995.915	4.0513	514.255	1.8339	109.942	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	39.3607	5009.571	4.0513	514.311	1.8434	110.220	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	39.5477	5023.227	4.0513	514.366	1.8434	110.220	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	40.7804	5226.934	4.0513	514.199	2.0477	123.524	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	41.4934	5262.474	4.0513	514.339	2.0572	123.803	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	41.0472	5241.152	4.0513	514.255	2.0762	124.304	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	41.4351	5262.474	4.0513	514.339	2.0715	124.192	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	41.9575	5288.805	4.7534	514.671	2.0952	124.805	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	42.2892	5303.018	4.7534	514.726	2.1000	124.972	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	43.0937	5407.573	4.0513	514.283	2.2853	137.775	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	43.9867	5451.887	4.0513	514.450	2.2901	137.886	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	43.3103	5414.961	4.0513	514.311	2.3043	138.276	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	43.9889	5449.543	4.7534	514.671	2.3233	138.777	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	44.4842	5471.700	4.7534	514.754	2.3328	139.055	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	45.1865	5508.625	4.7534	514.893	2.3423	139.278	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3"	11"	9"	4'-0 1/2"	45.3714	5578.522	4.0513	514.339	2.5181	150.300	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	45.3908	5570.911	4.0513	514.311	2.5276	150.523	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	45.8754	5598.774	4.7534	514.643	2.5514	151.191	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	46.4629	5629.209	4.7534	514.754	2.5609	151.469	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	47.4106	5682.462	4.7534	514.949	2.5704	151.692	9.0617	2235.611

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-12-2W-30

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7182

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.155(2S+V2)+6'-6 ½"
T2	#4	1	1	1	1	1					1.155(2S+V2)+7'-6"
T3	#4	1	1	1	1	1					1.155(2S+V2)+8'-5 ½"
T4	#4	1	1	1	1	1					1.155(2S+V2)+9'-5"
T5	#4	1	1	1	1	1					1.155(2S+V2)+10'-4 ½"
T6	#4	1	1	1	1	1					1.155(2S+V2)+11'-4"
T7	#4	1	1	1	1	1					1.155(2S+V2)+12'-4"
T8	#4	1	1	1	1	1					1.155(2S+V2)+13'-3 ½"
T9	#4	1	1	1	1	1					1.155(2S+V2)+14'-3"
T10	#4	1	1	1	1	1					1.155(2S+V2)+15'-2 ½"
T11	#4	1	1	1	1	1					1.155(2S+V2)+16'-2"
T12	#4	1	1	1	1	1					1.155(2S+V2)+17'-1 ½"
T13	#4	1	1	1	1	1					1.155(2S+V2)+18'-1 ½"
T14	#4	1	1	1	1	1					1.155(2S+V2)+19'-1"
T15	#4	1	1	1	1	1					1.155(2S+V2)+20'-0 ½"
T16	#4	1	1	1	1	1					1.155(2S+V2)+21'-0"
T17	#4	1	1	1	1	1					1.155(2S+V2)+21'-11 ½"
T18	#4	1	1	1	1	1					1.155(2S+V2)+22'-11"
T19	#4	1	1	1	1	1					1.155(2S+V2)+23'-4"
T20	#4	3	3	3	3	3					1.155(2S+V2)+20'-0 ½"
V1	#4	31	35	39	43	47			21'-2"	1'-8"	22'-10"
VL1	#4	1	1	1	1	1			18'-2 ½"	1'-8"	19'-10 ½"
VL2	#4	1	1	1	1	1			15'-1"	1'-8"	16'-9"
VL3	#4	1	1	1	1	1			11'-11"	1'-8"	13'-7"
VL4	#4	1	1	1	1	1			9'-9"	1'-8"	10'-5"
VL5	#4	1	1	1	1	1			5'-3 ½"		5'-3 ½"
VL6	#4	1	1	1	1	1			1'-3 ½"		1'-3 ½"
VS1	#4	1	1	1	1	1			19'-7 ½"	1'-8"	21'-3 ½"
VS2	#4	1	1	1	1	1			17'-4"	1'-8"	19'-0"
VS3	#4	1	1	1	1	1			15'-0 ½"	1'-8"	16'-8 ½"
VS4	#4	1	1	1	1	1			12'-8 ½"	1'-8"	14'-4 ½"
VS5	#4	1	1	1	1	1			10'-5"	1'-8"	12'-1"
VS6	#4	1	1	1	1	1			8'-1"	1'-8"	9'-9"
VS7	#4	1	1	1	1	1			5'-9 ½"	1'-8"	7'-5 ½"
VS8	#4	1	1	1	1	1			3'-6"		3'-6"
VS9	#4	1	1	1	1	1			1'-2"		1'-2"
FTL1	#5	1	1	1	1	1					1'-1 ½"
FTL2	#5	1	1	1	1	1					1'-9 ½"
FTL3	#5	1	1	1	1	1					2'-5"
FTL4	#5	1	1	1	1	1					3'-1"
FTL5	#5	1	1	1	1	1					3'-8 ½"
FTL6	#5	1	1	1	1	1					4'-4 ½"
FTL7	#5	1	1	1	1	1					5'-0 ½"
FTL8	#5	32	32	32	32	32					7'-7"
FTL9	#5	1	1	1	1	1					6'-11 ½"
FTL10	#5	1	1	1	1	1					6'-4"
FTL11	#5	1	1	1	1	1					5'-8"
FTL12	#5	1	1	1	1	1					5'-0 ½"
FTL13	#5	1	1	1	1	1					4'-4 ½"
FTL14	#5	1	1	1	1	1					3'-8 ½"
FTL15	#5	1	1	1	1	1					3'-1"
FTL16	#5	2	2	2	2	2					2'-7"
FLL	#4	9	9	9	9	9					25'-11"
FTS	#5	29	29	29	29	29					7'-7"
FLS	#4	9	9	9	9	9					18'-4"
WS1	#5	1	1	1	1	1				W+8'-7 ½"	W+8'-7 ½"
WS2	#5	1	1	1	1	1				W+8'-3 ½"	W+8'-3 ½"
WS3	#5	1	1	1	1	1				W+8'-0"	W+8'-0"
WS4	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WS5	#5	1	1	1	1	1				W+7'-4"	W+7'-4"
WS6	#5	1	1	1	1	1				W+7'-0"	W+7'-0"
WS7	#5	1	1	1	1	1				W+6'-8"	W+6'-8"
WS8	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS9	#5	1	1	1	1	1				W+6'-0"	W+6'-0"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WS10	#5	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
WS11	#5	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
WS12	#5	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
WS13	#5	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
WS14	#5	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WS15	#5	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"
WS16	#5	1	1	1	1	1				W+3'-8 ½"	W+3'-8 ½"
WS17	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS18	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS19	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WS20	#5	1	1	1	1	1				W+2'-5"	W+2'-5"
WS21	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WS22	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WS23	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WS24	#5	1	1	1	1	1				W+1'-1 ½"	W+1'-1 ½"
WS25	#5	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
WS26	#5	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
WS27	#5	1	1	1	1	1				W+0'-1 ½"	W+0'-1 ½"
WS28	#5	1	1	1	1	1				W-0'-2 ½"	W-0'-2 ½"
WS29	#5	1	1	1	1	1				W-0'-6 ½"	W-0'-6 ½"
DWS	#5	29	29	29	29	29			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+8'-8"	W+8'-8"
WL2	#5	1	1	1	1	1				W+8'-5 ½"	W+8'-5 ½"
WL3	#5	1	1	1	1	1				W+8'-2 ½"	W+8'-2 ½"
WL4	#5	1	1	1	1	1				W+8'-0"	W+8'-0"
WL5	#5	1	1	1	1	1				W+7'-9"	W+7'-9"
WL6	#5	1	1	1	1	1				W+7'-6 ½"	W+7'-6 ½"
WL7	#5	1	1	1	1	1				W+7'-3 ½"	W+7'-3 ½"
WL8	#5	1	1	1	1	1				W+7'-1"	W+7'-1"
WL9	#5	1	1	1	1	1				W+6'-10"	W+6'-10"
WL10	#5	1	1	1	1	1				W+6'-7"	W+6'-7"
WL11	#5	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
WL12	#5	1	1	1	1	1				W+6'-1 ½"	W+6'-1 ½"
WL13	#5	1	1	1	1	1				W+5'-11"	W+5'-11"
WL14	#5	1	1	1	1	1				W+5'-8"	W+5'-8"
WL15	#5	1	1	1	1	1				W+5'-5 ½"	W+5'-5 ½"
WL16	#5	1	1	1	1	1				W+5'-2 ½"	W+5'-2 ½"
WL17	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL18	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WL19	#5	1	1	1	1	1				W+4'-6 ½"	W+4'-6 ½"
WL20	#5	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
WL21	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WL22	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL23	#5	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
WL24	#5	1	1	1	1	1				W+3'-4 ½"	W+3'-4 ½"
WL25	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WL26	#5	1	1	1	1	1				W+2'-11"	W+2'-11"
WL27	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL28	#5	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
WL29	#5	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
WL30	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WL31	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WL32	#5	1	1	1	1	1				W+1'-6 ½"	W+1'-6 ½"
WL33	#5	1	1	1	1	1				W+1'-3 ½"	W+1'-3 ½"
WL34	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WL35	#5	1	1	1	1	1				W+0'-10"	W+0'-10"
WL36	#5	1	1	1	1	1				W+0'-7 ½"	W+0'-7 ½"
WL37	#5	1	1	1	1	1				W+0'-4 ½"	W+0'-4 ½"
WL38	#5	1	1	1	1	1				W+0'-2"	W+0'-2"
WL39	#5	1	1	1	1	1				W-0'-1"	W-0'-1"
WL40	#5	1	1	1	1	1				W-0'-3 ½"	W-0'-3 ½"
WL41	#5	1	1	1	1	1				W-0'-6 ½"	W-0'-6 ½"
DWL	#5	41	41	41	41	41			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+8'-7 ½"	W+8'-7 ½"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
RS2	#4	1	1	1	1	1				W+8'-2"	W+8'-2"
RS3	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RS4	#4	1	1	1	1	1				W+7'-2 ½"	W+7'-2 ½"
RS5	#4	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
RS6	#4	1	1	1	1	1				W+6'-2 ½"	W+6'-2 ½"
RS7	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RS8	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RS9	#4	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
RS10	#4	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
RS11	#4	1	1	1	1	1				W+3'-10"	W+3'-10"
RS12	#4	1	1	1	1	1				W+3'-4"	W+3'-4"
RS13	#4	1	1	1	1	1				W+2'-10"	W+2'-10"
RS14	#4	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
RS15	#4	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
RS16	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS17	#4	1	1	1	1	1				W+0'-11"	W+0'-11"
RS18	#4	1	1	1	1	1				W+0'-5"	W+0'-5"
RS19	#4	1	1	1	1	1				W-0'-0 ½"	W-0'-0 ½"
RS20	#4	1	1	1	1	1				W-0'-6 ½"	W-0'-6 ½"
DRS	#4	20	20	20	20	20			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+8'-8"	W+8'-8"
RL2	#4	1	1	1	1	1				W+8'-4"	W+8'-4"
RL3	#4	1	1	1	1	1				W+8'-0"	W+8'-0"
RL4	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RL5	#4	1	1	1	1	1				W+7'-3 ½"	W+7'-3 ½"
RL6	#4	1	1	1	1	1				W+6'-11 ½"	W+6'-11 ½"
RL7	#4	1	1	1	1	1				W+6'-7 ½"	W+6'-7 ½"
RL8	#4	1	1	1	1	1				W+6'-3 ½"	W+6'-3 ½"
RL9	#4	1	1	1	1	1				W+5'-11 ½"	W+5'-11 ½"
RL10	#4	1	1	1	1	1				W+5'-7"	W+5'-7"
RL11	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RL12	#4	1	1	1	1	1				W+4'-11"	W+4'-11"
RL13	#4	1	1	1	1	1				W+4'-7"	W+4'-7"
RL14	#4	1	1	1	1	1				W+4'-3"	W+4'-3"
RL15	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RL16	#4	1	1	1	1	1				W+3'-6 ½"	W+3'-6 ½"
RL17	#4	1	1	1	1	1				W+3'-2 ½"	W+3'-2 ½"
RL18	#4	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
RL19	#4	1	1	1	1	1				W+2'-6 ½"	W+2'-6 ½"
RL20	#4	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
RL21	#4	1	1	1	1	1				W+1'-10"	W+1'-10"
RL22	#4	1	1	1	1	1				W+1'-6"	W+1'-6"
RL23	#4	1	1	1	1	1				W+1'-2"	W+1'-2"
RL24	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL25	#4	1	1	1	1	1				W+0'-6"	W+0'-6"
RL26	#4	1	1	1	1	1				W+0'-1 ½"	W+0'-1 ½"
RL27	#4	1	1	1	1	1				W-0'-2 ½"	W-0'-2 ½"
RL28	#4	1	1	1	1	1				W-0'-6 ½"	W-0'-6 ½"
DRL	#4	28	28	28	28	28			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-5 ½"
YS2	#4	2	2	2	2	2					4'-1 ½"

REVISIONS	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-12-2W-30

SHEET NUMBER 7183

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

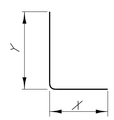
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

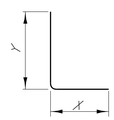
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
YS3	#4	2	2	2	2	2					5'-9 1/2"
YS4	#4	2	2	2	2	2					7'-5 1/2"
YS5	#4	2	2	2	2	2					9'-1 1/2"
YS6	#4	2	2	2	2	2					10'-9 1/2"
YS7	#4	2	2	2	2	2					12'-5 1/2"
YS8	#4	2	2	2	2	2					14'-1 1/2"
YS9	#4	2	2	2	2	2					15'-9 1/2"
YS10	#4	2	2	2	2	2					17'-5 1/2"
YS11	#4	10	10	12	12	12					18'-4"
YL1	#4	2	2	2	2	2					3'-6 1/2"
YL2	#4	2	2	2	2	2					5'-11"
YL3	#4	2	2	2	2	2					8'-3 1/2"
YL4	#4	2	2	2	2	2					10'-7 1/2"
YL5	#4	2	2	2	2	2					13'-0"
YL6	#4	2	2	2	2	2					15'-4"
YL7	#4	2	2	2	2	2					17'-8 1/2"
YL8	#4	2	2	2	2	2					20'-0 1/2"
YL9	#4	2	2	2	2	2					22'-5"
YL10	#4	2	2	2	2	2					24'-9 1/2"
YL11	#4	10	10	12	12	12					26'-1"
FS	#4	2	2	2	2	2					20'-6"
FL	#4	2	2	2	2	2					27'-8"
N	#4	34	39	44	49	53			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.155(2S+2V1+V2)+1'-6"
K	#4	32	36	41	45	50			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					1.155(2S+V2)+1'-7"
OS	#7	16	16	17	17	17			3'-3 1/2"	3'-3 1/2"	6'-7"
OL	#7	16	16	17	17	17			3'-3 1/2"	3'-3 1/2"	6'-7"
OSS	#4	1	1	1	1	1					12'-0"+T1
OSL	#4	1	1	1	1	1					12'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

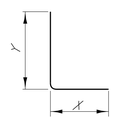
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			5'-11"
DS	#4	1			12'-0"+T1
J1	#5	1		W1+9'-7 3/4"	W1+9'-7 3/4"
J2	#5	1		W1+9'-1 3/4"	W1+9'-1 3/4"
J3	#5	1		W1+8'-8 1/4"	W1+8'-8 1/4"
J4	#5	1		W1+8'-2 1/4"	W1+8'-2 1/4"
J5	#5	1		W1+7'-8 1/4"	W1+7'-8 1/4"
J6	#5	1		W1+7'-2 1/4"	W1+7'-2 1/4"
J7	#5	1		W1+6'-8 1/4"	W1+6'-8 1/4"
J8	#5	1		W1+6'-2 3/4"	W1+6'-2 3/4"
J9	#5	1		W1+5'-8 3/4"	W1+5'-8 3/4"
J10	#5	1		W1+5'-2 3/4"	W1+5'-2 3/4"
J11	#5	1		W1+4'-8 3/4"	W1+4'-8 3/4"
J12	#5	1		W1+4'-2 3/4"	W1+4'-2 3/4"
J13	#5	1		W1+3'-8 3/4"	W1+3'-8 3/4"
J14	#5	1		W1+3'-3 1/4"	W1+3'-3 1/4"
J15	#5	1		W1+2'-9 1/4"	W1+2'-9 1/4"
J16	#5	1		W1+2'-3 1/4"	W1+2'-3 1/4"
J17	#5	1		W1+1'-9 1/4"	W1+1'-9 1/4"
J18	#5	1		W1+1'-3 1/4"	W1+1'-3 1/4"
J19	#5	1		W1+0'-9 1/4"	W1+0'-9 1/4"
J20	#5	1	1'-0"	W1+1'-0 3/4"	W1+2'-0 3/4"
J21	#5	1	1'-0"	W1+0'-6 3/4"	W1+1'-6 3/4"
DJ	#5	19	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			14'-3 1/2"
YD8	#5	1			16'-3 1/2"
YD9	#5	1			18'-3 1/2"
YD10	#5	2			19'-8 1/2"
FD	#4	1			22'-0 1/2"



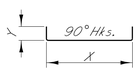
BARS DRS/DRL - #4



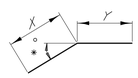
BARS DWS/DWL/DJ - #5



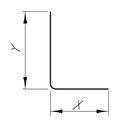
BARS RSn/RLn - #4



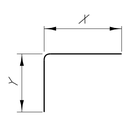
BARS N - #4



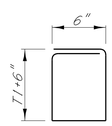
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 3 OF 3

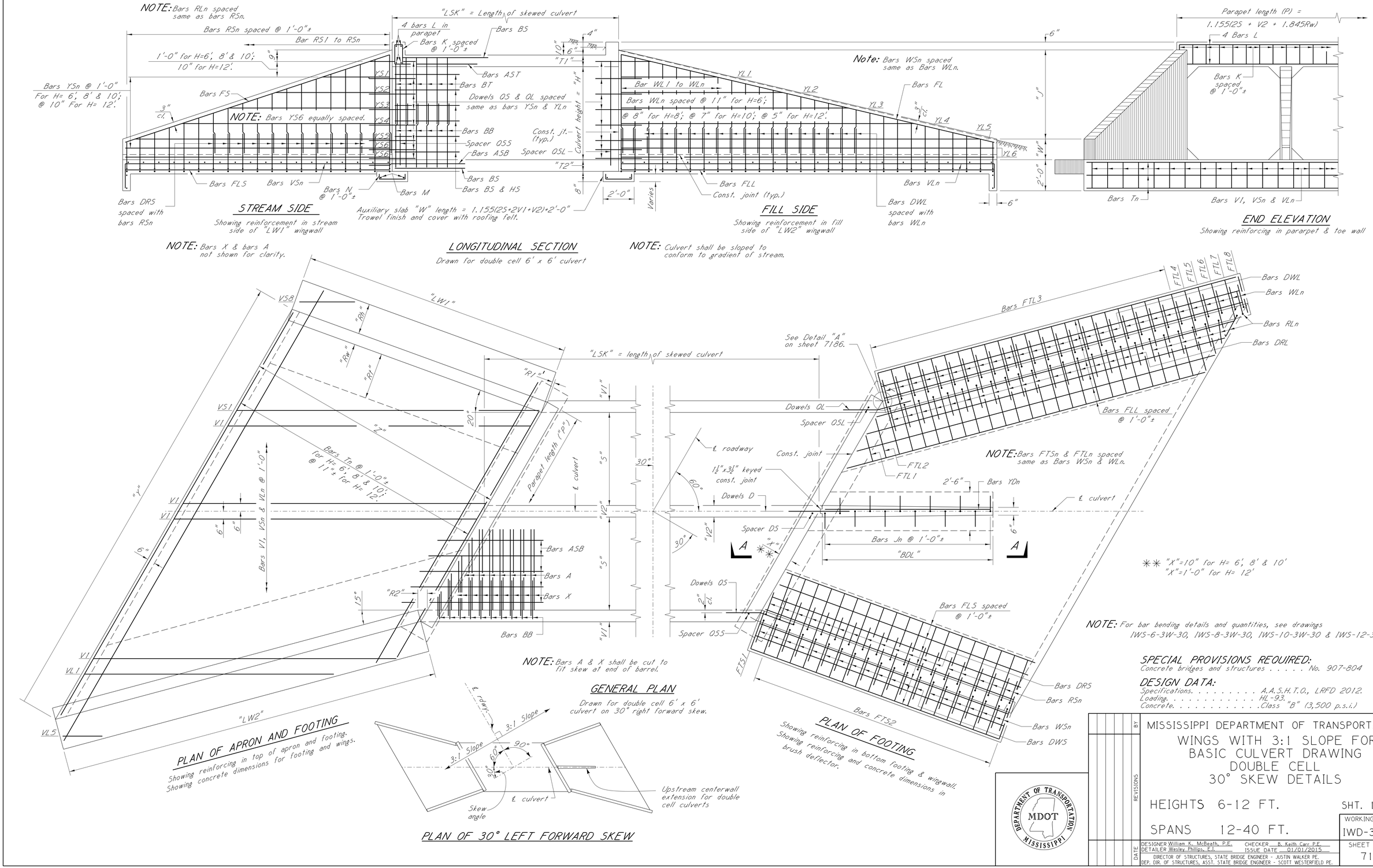
WORKING NUMBER IWD-12-2W-30

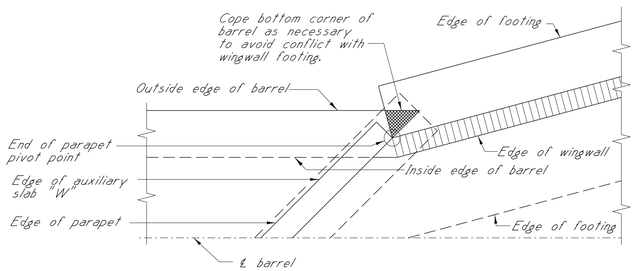
SHEET NUMBER 7184

DATE

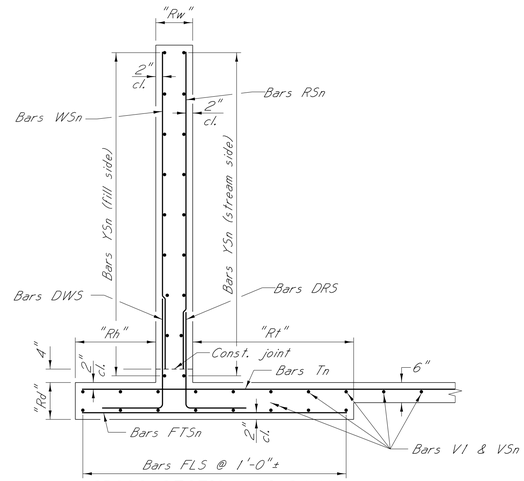
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.


NOTE: Bars RLn spaced same as bars RSn.
"LSK" = Length of skewed culvert
Bars RSn spaced @ 1'-0"±
Bar RS1 to RSn
4 bars L in parapet
Bars K spaced @ 1'-0"±
Bars BS
1'-0" for H=6', 8' & 10'; 10" for H=12'.
Bars YSn @ 1'-0" For H= 6', 8' & 10'; @ 10" For H= 12'.
Bars FS
NOTE: Bars YS6 equally spaced.
Bars AST
Bars BT
Dowels OS & OL spaced same as bars YSn & YLn
Bars BB
Spacer OSS
Bars ASB
Const. jt. (typ.)
Spacer OSL
Culvert height = "H"
Bars FLS
Bars VSn
Bars N @ 1'-0"±
Bars M
Bars BS
Bars BS & HS
Bars DRS spaced with bars RSn
Auxiliary slab "W" length = 1.155(2S+2V1+V2)+2'-0"
Trowel finish and cover with roofing felt.
STREAM SIDE
Showing reinforcement in stream side of "LW1" wingwall
Note: Bars WSn spaced same as Bars WLn.
Bar WL1 to WLn
Bars WLn spaced @ 11" for H=6'; @ 8" for H=8'; @ 7" for H=10'; @ 5" for H=12'.
Bars FL
Bars FLL
Const. joint (typ.)
Bars VLn
Bars DWL spaced with bars WLn
FILL SIDE
Showing reinforcement in fill side of "LW2" wingwall
Parapet length (P) = 1.155(2S + V2 + 1.845Rw)
4 Bars L
Bars K spaced @ 1'-0"±
Bars Tn
Bars V1, VSn & VLn
END ELEVATION
Showing reinforcing in pararpet & toe wall
NOTE: Bars X & bars A not shown for clarity.
LONGITUDINAL SECTION
Drawn for double cell 6' x 6' culvert
NOTE: Culvert shall be sloped to conform to gradient of stream.
"LW1"
"LSK" = length of skewed culvert
Bars Tn @ 1'-0"± for H= 6', 8' & 10'; @ 11"± for H= 12'.
Bars V1, VSn & VLn @ 1'-0"
Parapet length ("P")
℄ culvert
Bars ASB
Bars A
Bars X
Bars BB
NOTE: Bars A & X shall be cut to fit skew at end of barrel.
GENERAL PLAN
Drawn for double cell 6' x 6' culvert on 30° right forward skew.
"LW2"
PLAN OF APRON AND FOOTING
Showing reinforcing in top of apron and footing.
Showing concrete dimensions for footing and wings.
℄ roadway
3:1 Slope
Skew angle
℄ culvert
Upstream centerwall extension for double cell culverts
PLAN OF 30° LEFT FORWARD SKEW
See Detail "A" on sheet 7186.
Dowels OL
Spacer OSL
Const. joint
1½"x3½" keyed const. joint
Dowels D
Spacer DS
Dowels OS
Spacer OSS
Bars FTL3
Bars DWL
Bars WLn
Bars RLn
Bars DRL
Bars FLL spaced @ 1'-0"±
NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.
Bars YDn
Bars Jn @ 1'-0"±
"BDL"
** "X"=10" for H= 6', 8' & 10'
"X"=1'-0" for H= 12'
Bars FLS spaced @ 1'-0"±
NOTE: For bar bending details and quantities, see drawings IWS-6-3W-30, IWS-8-3W-30, IWS-10-3W-30 & IWS-12-3W-30.
Bars FTS2
Bars DRS
Bars RSn
Bars WSn
Bars DWS
PLAN OF FOOTING
Showing reinforcing in bottom footing & wingwall.
Showing reinforcing and concrete dimensions in brush deflector.
SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804
DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . Class "B" (3,500 p.s.i.)
DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI
BY
REVISIONS
DATE
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS
HEIGHTS 6-12 FT.
SPANS 12-40 FT.
SHT. 1 OF 2
WORKING NUMBER IWD-3W-30
DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, Ed.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.
SHEET NUMBER 7185

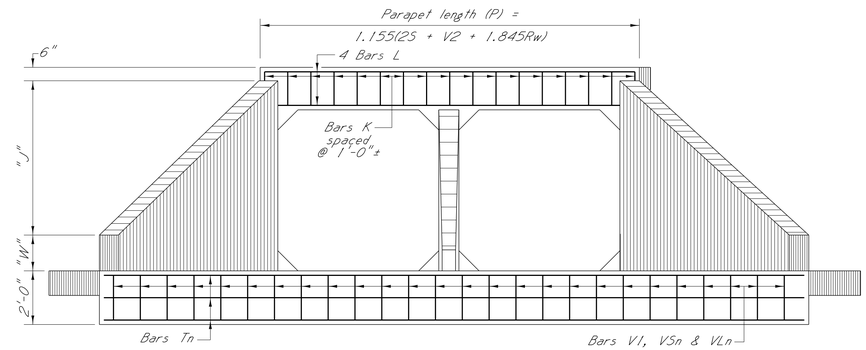


DETAIL "A"



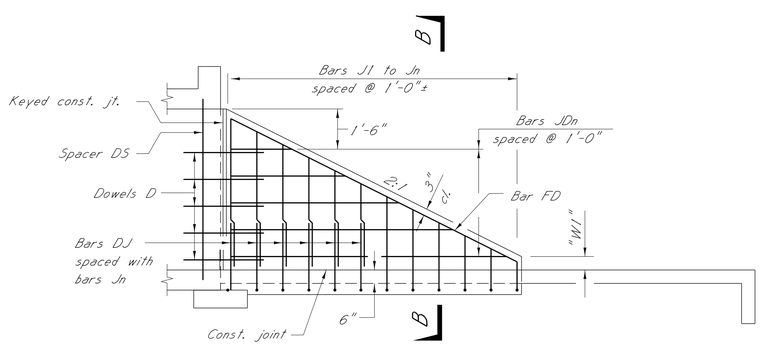
CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

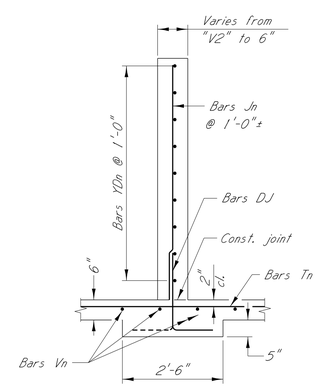


END ELEVATION

Showing reinforcing in pararpet & toe wall



SECTION A-A



SECTION B-B

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-3W-30

SHEET NUMBER 7186

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																			
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
													6'	8'	10'	12'	14'	16'
6'-0"	5'-9"	17'-4 5/8"	24'-4 3/4"	0'-1 9/16"	0'-7 3/8"	17'-3"	0'-11"	0'-9"	3'-0"	2'-0"	0'-6"	11'-0"	29'-7 7/16"+1.155V2	34'-3 3/8"+1.155V2	38'-10 13/16"+1.155V2	43'-6 1/4"+1.155V2	48'-1 11/16"+1.155V2	52'-9 1/16"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	18.9061	2379.300	1.2518	174.057	0.9025	53.607	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	18.9061	2379.300	1.2518	174.057	0.9025	53.607	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	18.9061	2379.300	1.2518	174.057	0.9025	53.607	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	18.9906	2379.300	1.2518	174.057	0.9025	53.607	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	19.2220	2392.322	1.2518	174.140	0.9025	53.607	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	19.3760	2401.002	1.2518	174.196	0.9025	53.607	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	20.7069	2523.310	1.2518	174.057	1.1306	67.524	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	20.8130	2523.310	1.2518	174.057	1.1306	67.524	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	21.1497	2541.786	1.2518	174.168	1.1306	67.524	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	21.3180	2551.023	1.2518	174.224	1.1306	67.524	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	21.6546	2569.499	1.2518	174.335	1.1306	67.524	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	21.9558	2587.973	1.2518	174.446	1.1306	67.524	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	22.5218	2667.292	1.2518	174.057	1.3587	81.496	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	22.8319	2677.085	1.2518	174.112	1.3587	81.496	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	23.3797	2706.468	1.2518	174.279	1.3587	81.496	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	23.8849	2735.851	1.2518	174.446	1.3587	81.496	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	22.9782	2691.776	1.2518	174.196	1.3587	81.496	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	23.1121	2696.675	1.2518	174.224	1.3587	81.496	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	24.5966	2824.072	1.2518	174.140	1.5868	93.910	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	24.9415	2839.432	1.2518	174.224	1.5868	93.910	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	25.5825	2865.030	1.2518	174.363	1.5868	93.910	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	24.9407	2844.553	1.2518	174.252	1.5868	93.910	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	25.0887	2849.670	1.2518	174.279	1.5868	93.910	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	25.3353	2859.913	1.2518	174.335	1.5868	93.910	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	26.6087	2979.823	1.2518	174.196	1.8149	107.882	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	27.0892	3001.417	1.2518	174.307	1.8149	107.993	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	26.7166	2985.223	1.2518	174.224	1.8291	108.272	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	27.2339	3017.612	1.2518	174.391	1.8149	107.882	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	27.4086	3017.612	1.2518	174.391	1.8244	108.160	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	27.6776	3028.407	1.2518	174.446	1.8244	108.160	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	28.6999	3219.713	1.2518	174.279	2.0525	122.077	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	29.3319	3247.821	1.2518	174.419	2.0572	122.244	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	28.9873	3230.958	1.2518	174.335	2.0430	121.854	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	29.4228	3259.061	1.2518	174.474	2.0430	121.854	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	29.7760	3270.300	1.2518	174.530	2.0430	121.854	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	30.2266	3292.786	1.2518	174.641	2.0430	121.854	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-6-3W-30

SHEET NUMBER 7187

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, Ed. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1			1.155(2S+V2)+3'-7"
T2	#4	1	1	1	1	1	1			1.155(2S+V2)+7'-0 ½"
T3	#4	1	1	1	1	1	1			1.155(2S+V2)+7'-10"
T4	#4	1	1	1	1	1	1			1.155(2S+V2)+8'-8"
T5	#4	1	1	1	1	1	1			1.155(2S+V2)+9'-6"
T6	#4	1	1	1	1	1	1			1.155(2S+V2)+10'-3 ½"
T7	#4	1	1	1	1	1	1			1.155(2S+V2)+11'-1 ½"
T8	#4	1	1	1	1	1	1			1.155(2S+V2)+11'-11 ½"
T9	#4	1	1	1	1	1	1			1.155(2S+V2)+12'-9"
T10	#4	1	1	1	1	1	1			1.155(2S+V2)+13'-7"
T11	#4	1	1	1	1	1	1			1.155(2S+V2)+14'-5"
T12	#4	1	1	1	1	1	1			1.155(2S+V2)+15'-2 ½"
T13	#4	1	1	1	1	1	1			1.155(2S+V2)+16'-0 ½"
T14	#4	1	1	1	1	1	1			1.155(2S+V2)+16'-10 ½"
T15	#4	1	1	1	1	1	1			1.155(2S+V2)+17'-8"
T16	#4	1	1	1	1	1	1			1.1555(2S+V2)+18'-6"
T17	#4	1	1	1	1	1	1			1.155(2S+V2)+18'-10"
T18	#4	3	3	3	3	3	3			1.155(2S+V2)+15'-3 ½"
V1	#4	16	20	24	28	32	36	19'-6 ½"	1'-8"	21'-2 ½"
VL1	#4	1	1	1	1	1	1	16'-1"	1'-8"	17'-9"
VL2	#4	1	1	1	1	1	1	12'-11"	1'-8"	14'-7"
VL3	#4	1	1	1	1	1	1	9'-9 ½"	1'-8"	11'-5 ½"
VL4	#4	1	1	1	1	1	1	6'-7"		6'-7"
VL5	#4	1	1	1	1	1	1	2'-7"		2'-7"
VS1	#4	1	1	1	1	1	1	19'-6 ½"	1'-8"	21'-2 ½"
VS2	#4	1	1	1	1	1	1	19'-3 ½"	1'-8"	20'-11 ½"
VS3	#4	1	1	1	1	1	1	19'-1"	1'-8"	20'-9"
VS4	#4	1	1	1	1	1	1	16'-10 ½"	1'-8"	18'-6 ½"
VS5	#4	1	1	1	1	1	1	13'-7"	1'-8"	15'-3"
VS6	#4	1	1	1	1	1	1	10'-3"	1'-8"	11'-11"
VS7	#4	1	1	1	1	1	1	6'-11"	1'-8"	8'-7"
VS8	#4	1	1	1	1	1	1	3'-7"		3'-7"
FTL1	#5	1	1	1	1	1	1			1'-9"
FTL2	#5	1	1	1	1	1	1			2'-7 ½"
FTL3	#5	23	23	23	23	23	23			5'-5"
FTL4	#5	1	1	1	1	1	1			5'-4"
FTL5	#5	1	1	1	1	1	1			4'-5 ½"
FTL6	#5	1	1	1	1	1	1			3'-6 ½"
FTL7	#5	1	1	1	1	1	1			2'-8"
FTL8	#5	1	1	1	1	1	1			2'-5"
FLL	#4	7	7	7	7	7	7			23'-11"
FTS1	#5	1	1	1	1	1	1			2'-7"
FTS2	#5	19	19	19	19	19	19			5'-5"
FLS	#4	7	7	7	7	7	7			17'-0 ½"
WS1	#5	1	1	1	1	1	1			W+5'-1"
WS2	#5	1	1	1	1	1	1			W+4'-9 ½"
WS3	#5	1	1	1	1	1	1			W+4'-6"
WS4	#5	1	1	1	1	1	1			W+4'-2 ½"
WS5	#5	1	1	1	1	1	1			W+3'-11"
WS6	#5	1	1	1	1	1	1			W+3'-7 ½"
WS7	#5	1	1	1	1	1	1			W+3'-4"
WS8	#5	1	1	1	1	1	1			W+3'-0"
WS9	#5	1	1	1	1	1	1			W+2'-8 ½"
WS10	#5	1	1	1	1	1	1			W+2'-5"
WS11	#5	1	1	1	1	1	1			W+2'-1 ½"
WS12	#5	1	1	1	1	1	1			W+1'-10"
WS13	#5	1	1	1	1	1	1			W+1'-6 ½"
WS14	#5	1	1	1	1	1	1	1'-6"	W+2'-2 ½"	W+3'-8 ½"
WS15	#5	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WS16	#5	1	1	1	1	1	1	1'-6"	W+1'-7 ½"	W+3'-1 ½"
WS17	#5	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WS18	#5	1	1	1	1	1	1	1'-6"	W+1'-0 ½"	W+2'-6 ½"
WS19	#5	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WS20	#5	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
DWS	#5	13	13	13	13	13	13	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1		W+5'-1 ½"	W+5'-1 ½"
WL2	#5	1	1	1	1	1	1		W+4'-11"	W+4'-11"
WL3	#5	1	1	1	1	1	1		W+4'-8 ½"	W+4'-8 ½"
WL4	#5	1	1	1	1	1	1		W+4'-6"	W+4'-6"
WL5	#5	1	1	1	1	1	1		W+4'-3 ½"	W+4'-3 ½"
WL6	#5	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL7	#5	1	1	1	1	1	1		W+3'-10 ½"	W+3'-10 ½"
WL8	#5	1	1	1	1	1	1		W+3'-8"	W+3'-8"
WL9	#5	1	1	1	1	1	1		W+3'-5 ½"	W+3'-5 ½"
WL10	#5	1	1	1	1	1	1		W+3'-3"	W+3'-3"
WL11	#5	1	1	1	1	1	1		W+3'-0"	W+3'-0"
WL12	#5	1	1	1	1	1	1		W+2'-9 ½"	W+2'-9 ½"
WL13	#5	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL14	#5	1	1	1	1	1	1		W+2'-4 ½"	W+2'-4 ½"
WL15	#5	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WL16	#5	1	1	1	1	1	1		W+1'-11 ½"	W+1'-11 ½"
WL17	#5	1	1	1	1	1	1		W+1'-9"	W+1'-9"
WL18	#5	1	1	1	1	1	1		W+1'-6 ½"	W+1'-6 ½"
WL19	#5	1	1	1	1	1	1	1'-6"	W+2'-4"	W+3'-10"
WL20	#5	1	1	1	1	1	1	1'-6"	W+2'-1 ½"	W+3'-7 ½"
WL21	#5	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WL22	#5	1	1	1	1	1	1	1'-6"	W+1'-8 ½"	W+3'-2 ½"
WL23	#5	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL24	#5	1	1	1	1	1	1	1'-6"	W+1'-3 ½"	W+2'-9 ½"
WL25	#5	1	1	1	1	1	1	1'-6"	W+1'-1"	W+2'-7"
WL26	#5	1	1	1	1	1	1	1'-6"	W+0'-10 ½"	W+2'-4 ½"
WL27	#5	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
WL28	#5	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	18	18	18	18	18	18	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RS2	#4	1	1	1	1	1	1		W+4'-9 ½"	W+4'-9 ½"
RS3	#4	1	1	1	1	1	1		W+4'-5 ½"	W+4'-5 ½"
RS4	#4	1	1	1	1	1	1		W+4'-2"	W+4'-2"
RS5	#4	1	1	1	1	1	1		W+3'-10"	W+3'-10"
RS6	#4	1	1	1	1	1	1		W+3'-6 ½"	W+3'-6 ½"
RS7	#4	1	1	1	1	1	1		W+3'-2 ½"	W+3'-2 ½"
RS8	#4	1	1	1	1	1	1		W+2'-11"	W+2'-11"
RS9	#4	1	1	1	1	1	1		W+2'-7"	W+2'-7"
RS10	#4	1	1	1	1	1	1		W+2'-3 ½"	W+2'-3 ½"
RS11	#4	1	1	1	1	1	1		W+1'-11 ½"	W+1'-11 ½"
RS12	#4	1	1	1	1	1	1		W+1'-8"	W+1'-8"
RS13	#4	1	1	1	1	1	1		W+1'-4"	W+1'-4"
RS14	#4	1	1	1	1	1	1	1'-6"	W+2'-0"	W+3'-6"
RS15	#4	1	1	1	1	1	1	1'-6"	W+1'-8 ½"	W+3'-2 ½"
RS16	#4	1	1	1	1	1	1	1'-6"	W+1'-4 ½"	W+2'-10 ½"
RS17	#4	1	1	1	1	1	1	1'-6"	W+1'-1"	W+2'-7"
RS18	#4	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
RS19	#4	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	13	13	13	13	13	13	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1		W+5'-1 ½"	W+5'-1 ½"
RL2	#4	1	1	1	1	1	1		W+4'-10 ½"	W+4'-10 ½"
RL3	#4	1	1	1	1	1	1		W+4'-8"	W+4'-8"
RL4	#4	1	1	1	1	1	1		W+4'-5 ½"	W+4'-5 ½"
RL5	#4	1	1	1	1	1	1		W+4'-2 ½"	W+4'-2 ½"
RL6	#4	1	1	1	1	1	1		W+4'-0"	W+4'-0"
RL7	#4	1	1	1	1	1	1		W+3'-9"	W+3'-9"
RL8	#4	1	1	1	1	1	1		W+3'-6 ½"	W+3'-6 ½"
RL9	#4	1	1	1	1	1	1		W+3'-3 ½"	W+3'-3 ½"
RL10	#4	1	1	1	1	1	1		W+3'-1"	W+3'-1"
RL11	#4	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL12	#4	1	1	1	1	1	1		W+2'-7 ½"	W+2'-7 ½"
RL13	#4	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RL14	#4	1	1	1	1	1	1		W+2'-2"	W+2'-2"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
RL15	#4	1	1	1	1	1	1		W+1'-11 ½"	W+1'-11 ½"
RL16	#4	1	1	1	1	1	1		W+1'-8 ½"	W+1'-8 ½"
RL17	#4	1	1	1	1	1	1		W+1'-6"	W+1'-6"
RL18	#4	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RL19	#4	1	1	1	1	1	1	1'-6"	W+2'-0 ½"	W+3'-6 ½"
RL20	#4	1	1	1	1	1	1	1'-6"	W+1'-9 ½"	W+3'-3 ½"
RL21	#4	1	1	1	1	1	1	1'-6"	W+1'-7"	W+3'-1"
RL22	#4	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RL23	#4	1	1	1	1	1	1	1'-6"	W+1'-1 ½"	W+2'-7 ½"
RL24	#4	1	1	1	1	1	1	1'-6"	W+0'-10 ½"	W+2'-4 ½"
RL25	#4	1	1	1	1	1	1	1'-6"	W+0'-8"	W+2'-2"
RL26	#4	1	1	1	1	1	1	1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	18	18	18	18	18	18	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2			4'-4"
YS2	#4	2	2	2	2	2	2			7'-4"
YS3	#4	2	2	2	2	2	2			10'-4 ½"
YS4	#4	2	2	2	2	2	2			13'-5"
YS5	#4	2	2	2	2	2	2			16'-5"
YS6	#4	4	4	4	4	4	6			17'-0 ½"
YL1	#4	2	2	2	2	2	2			6'-2"
YL2	#4	2	2	2	2	2	2			10'-5"
YL3	#4	2	2	2	2	2	2			14'-8"
YL4	#4	2	2	2	2	2	2			18'-11"
YL5	#4	2	2	2	2	2	2			23'-1 ½"
YL6	#4	4	4	4	4	4	6			24'-0 ½"
FS	#4	2	2	2	2	2	2			17'-11 ½"
FL	#4	2	2	2	2	2	2			24'-8 ½"
N	#4	19	24	29	33	38	43		1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2				1.155(2S+2V1+V2)+1'-6"
K	#4	17	22	27	31	36	40		0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4				1.155(2S+V2)+1'-3 ½"
OS	#7	8	8	8	8	8	9		3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	8	8	8	8	8	9		3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1	1				6'-0"+T1
OSL	#4	1	1	1	1	1	1				6'-0"+T1

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 3

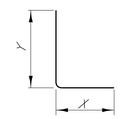
WORKING NUMBER IWD-6-3W-30

SHEET NUMBER 7188

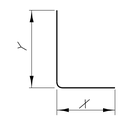
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			5'-9"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J2	#5	1		W1+4'-8"	W1+4'-8"
J3	#5	1		W1+4'-2"	W1+4'-2"
J4	#5	1		W1+3'-8"	W1+3'-8"
J5	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J6	#5	1		W1+2'-8 ½"	W1+2'-8 ½"
J7	#5	1	1'-0"	W1+2'-11 ½"	W1+3'-11 ½"
J8	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J9	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J10	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J11	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J12	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	6	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
FD	#4	1			11'-11"



BARS DRS/DRL - #4



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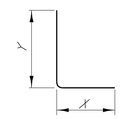
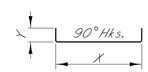
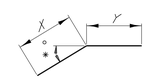


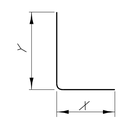
BARS RSn/RLn - #4



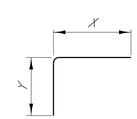
BARS N - #4



DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn - #5



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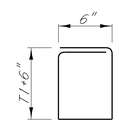


BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-6-3W-30

SHEET NUMBER
7189

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

REVISIONS | BY | DATE

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													8'	10'	12'	14'	16'
8'-0"	7'-4"	22'-2 1/2"	31'-1 3/8"	0'-1 9/16"	0'-7 3/8"	22'-0"	0'-11"	0'-9"	3'-0"	2'-3"	0'-6"	15'-0"	38'-2 5/16"+1.155V2	42'-9 3/4"+1.155V2	47'-5 3/16"+1.155V2	52'-0 5/8"+1.155V2	56'-8 1/16"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	29.1069	3796.139	2.0663	274.499	1.1306	67.524	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	29.2130	3796.139	2.0663	274.499	1.1306	67.524	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	29.6032	3821.639	2.0663	274.610	1.1306	67.524	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	29.7981	3834.388	2.0663	274.666	1.1306	67.524	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	30.1901	3859.888	2.0663	274.777	1.1354	67.691	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	30.4880	3879.012	2.0663	274.861	1.1449	67.913	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	31.4060	3970.153	2.0663	274.499	1.3587	81.496	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	31.7625	3990.113	2.0663	274.583	1.3587	81.496	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	32.2857	4023.377	2.0663	274.722	1.3587	81.496	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	32.8710	4063.295	2.0663	274.889	1.3587	81.496	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	31.9495	4010.072	2.0663	274.666	1.3634	81.663	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	32.2677	4030.031	2.0663	274.750	1.3777	82.053	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	33.8846	4162.178	2.0663	274.583	1.5868	95.468	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	34.2200	4182.805	2.0663	274.666	1.5868	95.468	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	35.0395	4224.060	2.0663	274.833	1.5868	95.468	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	34.3682	4197.502	2.1215	274.722	1.5939	95.691	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	34.6188	4210.310	2.0663	274.777	1.5915	95.580	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	34.9007	4224.060	2.0663	274.833	1.6105	96.136	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	36.3919	4358.601	2.0663	274.666	1.8149	107.882	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	36.8621	4380.063	2.0663	274.750	1.8149	107.882	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	36.5728	4372.907	2.0663	274.722	1.8149	107.882	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	37.0549	4401.525	2.0663	274.833	1.8339	108.383	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	37.4120	4415.832	2.0663	274.889	1.8386	108.550	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	37.7129	4430.143	2.0663	274.944	1.8434	108.661	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	38.8663	4645.172	2.0663	274.722	2.0477	123.524	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	39.6282	4682.338	2.0663	274.861	2.0525	123.636	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	39.1851	4667.469	2.0663	274.805	2.0620	123.914	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	39.8245	4704.635	2.0663	274.944	2.0715	124.192	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	40.3402	4734.361	2.0663	275.056	2.0810	124.415	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	40.7845	4751.038	2.1769	275.111	2.0952	124.805	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 605 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 3

WORKING NUMBER
1WD-8-3W-30

SHEET NUMBER
7190

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.155(2S+V2)+3'-11 ½"
T2	#4	1	1	1	1	1					1.155(2S+V2)+7'-7 ½"
T3	#4	1	1	1	1	1					1.155(2S+V2)+8'-5"
T4	#4	1	1	1	1	1					1.155(2S+V2)+9'-3"
T5	#4	1	1	1	1	1					1.155(2S+V2)+10'-0 ½"
T6	#4	1	1	1	1	1					1.155(2S+V2)+10'-10 ½"
T7	#4	1	1	1	1	1					1.155(2S+V2)+11'-8"
T8	#4	1	1	1	1	1					1.155(2S+V2)+12'-6"
T9	#4	1	1	1	1	1					1.155(2S+V2)+13'-3 ½"
T10	#4	1	1	1	1	1					1.155(2S+V2)+14'-1 ½"
T11	#4	1	1	1	1	1					1.155(2S+V2)+14'-11"
T12	#4	1	1	1	1	1					1.155(2S+V2)+15'-8 ½"
T13	#4	1	1	1	1	1					1.155(2S+V2)+16'-6 ½"
T14	#4	1	1	1	1	1					1.155(2S+V2)+17'-4"
T15	#4	1	1	1	1	1					1.155(2S+V2)+18'-2"
T16	#4	1	1	1	1	1					1.155(2S+V2)+18'-11 ½"
T17	#4	1	1	1	1	1					1.155(2S+V2)+19'-9 ½"
T18	#4	1	1	1	1	1					1.155(2S+V2)+20'-7"
T19	#4	1	1	1	1	1					1.155(2S+V2)+21'-5"
T20	#4	1	1	1	1	1					1.155(2S+V2)+22'-2 ½"
T21	#4	1	1	1	1	1					1.155(2S+V2)+23'-0 ½"
T22	#4	1	1	1	1	1					1.155(2S+V2)+22'-11 ½"
T23	#4	3	3	3	3	3					1.155(2S+V2)+19'-2"
V1	#4	20	24	28	32	36			25'-0"	1'-8"	26'-8"
VL1	#4	1	1	1	1	1			22'-6 ½"	1'-8"	24'-2 ½"
VL2	#4	1	1	1	1	1			19'-4 ½"	1'-8"	21'-0 ½"
VL3	#4	1	1	1	1	1			16'-2 ½"	1'-8"	17'-10 ½"
VL4	#4	1	1	1	1	1			13'-1"	1'-8"	14'-9"
VL5	#4	1	1	1	1	1			9'-11"	1'-8"	11'-7"
VL6	#4	1	1	1	1	1			6'-6"		6'-6"
VL7	#4	1	1	1	1	1			2'-6"		2'-6"
VS1	#4	1	1	1	1	1			25'-0"	1'-8"	26'-8"
VS2	#4	1	1	1	1	1			24'-9 ½"	1'-8"	26'-5 ½"
VS3	#4	1	1	1	1	1			24'-7"	1'-8"	26'-3"
VS4	#4	1	1	1	1	1			23'-1 ½"	1'-8"	24'-9 ½"
VS5	#4	1	1	1	1	1			19'-9 ½"	1'-8"	21'-5 ½"
VS6	#4	1	1	1	1	1			16'-5 ½"	1'-8"	18'-1 ½"
VS7	#4	1	1	1	1	1			13'-1 ½"	1'-8"	14'-9 ½"
VS8	#4	1	1	1	1	1			9'-9 ½"	1'-8"	11'-5 ½"
VS9	#4	1	1	1	1	1			6'-6"		6'-6"
VS10	#4	1	1	1	1	1			3'-2"		3'-2"
FTL1	#5	1	1	1	1	1					1'-6 ½"
FTL2	#5	1	1	1	1	1					2'-2 ½"
FTL3	#5	1	1	1	1	1					2'-10"
FTL4	#5	33	33	33	33	33					5'-8"
FTL5	#5	1	1	1	1	1					5'-3 ½"
FTL6	#5	1	1	1	1	1					4'-7 ½"
FTL7	#5	1	1	1	1	1					3'-11 ½"
FTL8	#5	1	1	1	1	1					3'-4"
FTL9	#5	1	1	1	1	1					2'-8"
FTL10	#5	1	1	1	1	1					2'-8"
FLL	#4	7	7	7	7	7					30'-7 ½"
FTS1	#5	1	1	1	1	1					2'-10"
FTS2	#5	33	33	33	33	33					5'-8"
FLS	#4	7	7	7	7	7					21'-10 ½"
WS1	#5	1	1	1	1	1				W+6'-8"	W+6'-8"
WS2	#5	1	1	1	1	1				W+6'-5 ½"	W+6'-5 ½"
WS3	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WS4	#5	1	1	1	1	1				W+6'-0 ½"	W+6'-0 ½"
WS5	#5	1	1	1	1	1				W+5'-9 ½"	W+5'-9 ½"
WS6	#5	1	1	1	1	1				W+5'-7"	W+5'-7"
WS7	#5	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
WS8	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WS9	#5	1	1	1	1	1				W+4'-11"	W+4'-11"
WS10	#5	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WS11	#5	1	1	1	1	1				W+4'-6"	W+4'-6"
WS12	#5	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
WS13	#5	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"
WS14	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WS15	#5	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
WS16	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS17	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WS18	#5	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
WS19	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WS20	#5	1	1	1	1	1				W+2'-6 ½"	W+2'-6 ½"
WS21	#5	1	1	1	1	1				W+2'-3 ½"	W+2'-3 ½"
WS22	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WS23	#5	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
WS24	#5	1	1	1	1	1				W+1'-8"	W+1'-8"
WS25	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WS26	#5	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
WS27	#5	1	1	1	1	1			1'-6"	W+2'-0"	W+3'-6"
WS28	#5	1	1	1	1	1			1'-6"	W+1'-9"	W+3'-3"
WS29	#5	1	1	1	1	1			1'-6"	W+1'-6 ½"	W+3'-0 ½"
WS30	#5	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
WS31	#5	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
WS32	#5	1	1	1	1	1			1'-6"	W+0'-10 ½"	W+2'-4 ½"
WS33	#5	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
WS34	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	26	26	26	26	26			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WL2	#5	1	1	1	1	1				W+6'-6 ½"	W+6'-6 ½"
WL3	#5	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
WL4	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL5	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WL6	#5	1	1	1	1	1				W+5'-11"	W+5'-11"
WL7	#5	1	1	1	1	1				W+5'-9 ½"	W+5'-9 ½"
WL8	#5	1	1	1	1	1				W+5'-7 ½"	W+5'-7 ½"
WL9	#5	1	1	1	1	1				W+5'-5 ½"	W+5'-5 ½"
WL10	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WL11	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WL12	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL13	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL14	#5	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
WL15	#5	1	1	1	1	1				W+4'-6 ½"	W+4'-6 ½"
WL16	#5	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WL17	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WL18	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WL19	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL20	#5	1	1	1	1	1				W+3'-9 ½"	W+3'-9 ½"
WL21	#5	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
WL22	#5	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
WL23	#5	1	1	1	1	1				W+3'-3 ½"	W+3'-3 ½"
WL24	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WL25	#5	1	1	1	1	1				W+3'-0"	W+3'-0"
WL26	#5	1	1	1	1	1				W+2'-10"	W+2'-10"
WL27	#5	1	1	1	1	1				W+2'-8 ½"	W+2'-8 ½"
WL28	#5	1	1	1	1	1				W+2'-6 ½"	W+2'-6 ½"
WL29	#5	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
WL30	#5	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
WL31	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL32	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WL33	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WL34	#5	1	1	1	1	1				W+1'-7 ½"	W+1'-7 ½"
WL35	#5	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WL36	#5	1	1	1	1	1				W+1'-3 ½"	W+1'-3 ½"
WL37	#5	1	1	1	1	1				W+1'-2"	W+1'-2"
WL38	#5	1	1	1	1	1			1'-6"	W+2'-0"	W+3'-6"
WL39	#5	1	1	1	1	1			1'-6"	W+1'-10"	W+3'-4"
WL40	#5	1	1	1	1	1			1'-6"	W+1'-8"	W+3'-2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WL41	#5	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
WL42	#5	1	1	1	1	1			1'-6"	W+1'-4 ½"	W+2'-10 ½"
WL43	#5	1	1	1	1	1			1'-6"	W+1'-2 ½"	W+2'-8 ½"
WL44	#5	1	1	1	1	1			1'-6"	W+1'-0 ½"	W+2'-6 ½"
WL45	#5	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WL46	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WL47	#5	1	1	1	1	1			1'-6"	W+0'-7"	W+2'-1"
WL48	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	37	37	37	37	37			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+6'-8"	W+6'-8"
RS2	#4	1	1	1	1	1				W+6'-4"	W+6'-4"
RS3	#4	1	1	1	1	1				W+6'-0 ½"	W+6'-0 ½"
RS4	#4	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
RS5	#4	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
RS6	#4	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
RS7	#4	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
RS8	#4	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
RS9	#4	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"
RS10	#4	1	1	1	1	1				W+3'-8 ½"	W+3'-8 ½"
RS11	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS12	#4	1	1	1	1	1				W+3'-1"	W+3'-1"
RS13	#4	1	1	1	1	1				W+2'-9"	W+2'-9"
RS14	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS15	#4	1	1	1	1	1				W+2'-1"	W+2'-1"
RS16	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RS17	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS18	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RS19	#4	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
RS20	#4	1	1	1	1	1			1'-6"	W+1'-5"	W+2'-11"
RS21	#4	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
RS22	#4	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
RS23	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	19	19	19	19	19			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
RL2	#4	1	1	1	1	1				W+6'-5 ½"	W+6'-5 ½"
RL3	#4	1	1	1	1	1				W+6'-3"	W+6'-3"
RL4	#4	1	1	1	1	1				W+6'-0"	W+6'-0"
RL5	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RL6	#4	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
RL7	#4	1	1	1	1	1				W+5'-3 ½"	W+5'-3 ½"
RL8	#4	1	1	1	1	1				W+5'-1"	W+5'-1"
RL9	#4	1	1	1	1	1				W+4'-10"	W+4'-10"
RL10	#4	1	1	1	1	1				W+4'-7"	W+4'-7"
RL11	#4	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
RL12	#4	1	1	1	1	1				W+4'-1 ½"	W+4'-1 ½"
RL13	#4	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
RL14	#4	1	1	1	1	1				W+3'-8"	W+3'-8"
RL15	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RL16	#4	1	1	1	1	1				W+3'-2 ½"	W+3'-2 ½"
RL17	#4	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
RL18	#4	1	1	1	1	1				W+2'-8 ½"	W+2'-8 ½"
RL19	#4	1	1	1	1	1				W+2'-6"	W+2'-6"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-8-3W-30

SHEET NUMBER 7191

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

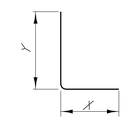
HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

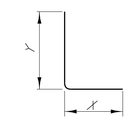
BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
RL20	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RL21	#4	1	1	1	1	1				W+2'-0 ½"	W+2'-0 ½"
RL22	#4	1	1	1	1	1				W+1'-9 ½"	W+1'-9 ½"
RL23	#4	1	1	1	1	1				W+1'-6 ½"	W+1'-6 ½"
RL24	#4	1	1	1	1	1				W+1'-4"	W+1'-4"
RL25	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RL26	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL27	#4	1	1	1	1	1			1'-6"	W+1'-7 ½"	W+3'-1 ½"
RL28	#4	1	1	1	1	1			1'-6"	W+1'-4 ½"	W+2'-10 ½"
RL29	#4	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
RL30	#4	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
RL31	#4	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
RL32	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	26	26	26	26	26			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					4'-4"
YS2	#4	2	2	2	2	2					7'-4 ½"
YS3	#4	2	2	2	2	2					10'-4 ½"
YS4	#4	2	2	2	2	2					13'-5"
YS5	#4	2	2	2	2	2					16'-5 ½"
YS6	#4	2	2	2	2	2					19'-5 ½"
YS7	#4	6	6	6	6	8					21'-10 ½"
YL1	#4	2	2	2	2	2					6'-2"
YL2	#4	2	2	2	2	2					10'-5"
YL3	#4	2	2	2	2	2					14'-8"
YL4	#4	2	2	2	2	2					18'-11"
YL5	#4	2	2	2	2	2					23'-1 ½"
YL6	#4	2	2	2	2	2					27'-4 ½"
YL7	#4	6	6	6	6	8					30'-9 ½"
FS	#4	2	2	2	2	2					23'-0 ½"
FL	#4	2	2	2	2	2					31'-7 ½"
N	#4	24	29	34	38	44			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.155(2S+2V1+V2)+1'-5 ½"
K	#4	22	27	31	36	40			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.155(2S+V2)+1'-3 ½"
OS	#7	10	10	10	10	11			3'-1 ½"	3'-1 ½"	6'-3"
OL	#7	10	10	10	10	11			3'-1 ½"	3'-1 ½"	6'-3"
OSS	#4	1	1	1	1	1					8'-0"+T1
OSL	#4	1	1	1	1	1					8'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			5'-10"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+7'-1 ½"	W1+7'-1 ½"
J2	#5	1		W1+6'-8"	W1+6'-8"
J3	#5	1		W1+6'-2"	W1+6'-2"
J4	#5	1		W1+5'-8"	W1+5'-8"
J5	#5	1		W1+5'-2"	W1+5'-2"
J6	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J7	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J8	#5	1		W1+3'-8 ½"	W1+3'-8 ½"
J9	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J10	#5	1		W1+2'-9"	W1+2'-9"
J11	#5	1	1'-0"	W1+3'-0"	W1+4'-0"
J12	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J13	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J14	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J15	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J16	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	10	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
FD	#4	1			16'-5"



BARS DRS/DRL - #4



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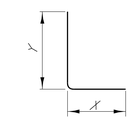
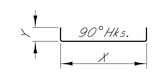
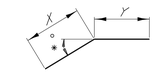


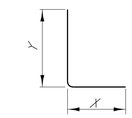
BARS RSn/RLn - #4



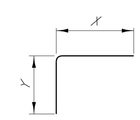
BARS N - #4



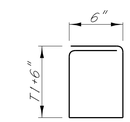
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS
Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-8-3W-30

SHEET NUMBER
7192

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

REVISIONS | BY | DATE

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													10'	12'	14'	16'	18'
10'-0"	8'-4"	25'-2 11/16"	35'-4 1/4"	0'-1 15/16"	0'-9"	25'-0"	0'-11"	0'-11"	4'-0"	2'-6"	0'-6"	19'-0"	45'-7 11/16"+1.155V2	50'-3 1/8"+1.155V2	54'-10 1/2"+1.155V2	59'-5 15/16"+1.155V2	64'-1 3/8"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwalls and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 1/2"	9"	9"	2'-9"	42.9608	5414.614	3.0660	394.152	1.3587	83.055	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	43.3027	5430.451	3.0660	394.207	1.3587	83.055	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	43.9924	5477.963	3.0660	394.374	1.3682	83.333	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	44.6445	5517.559	3.0660	394.514	1.3824	83.723	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	43.9556	5477.963	3.0660	394.374	1.3920	83.945	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	44.3511	5501.719	3.0660	394.458	1.4062	84.335	5.5679	1331.546
240	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	45.8177	5632.035	3.0660	394.235	1.5868	95.468	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	46.2745	5656.626	3.0660	394.319	1.5868	95.468	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	47.0071	5697.610	3.0660	394.458	1.5963	95.747	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	46.6255	5689.416	3.0660	394.430	1.6105	96.136	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	46.9528	5705.809	3.0660	394.486	1.6200	96.359	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	47.3716	5730.400	3.0660	394.569	1.6343	96.749	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	48.6043	5848.036	3.0660	394.319	1.8149	109.441	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	49.2324	5881.717	3.0660	394.430	1.8149	109.441	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	48.8348	5864.874	3.0660	394.374	1.8244	109.719	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	49.5565	5906.976	3.0660	394.514	1.8386	110.109	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	50.1421	5940.652	3.0660	394.625	1.8576	110.610	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	50.4932	5957.494	3.0660	394.681	1.8624	110.721	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	51.3832	6166.501	3.0660	394.374	2.0477	123.524	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	52.2003	6209.995	3.0660	394.514	2.0525	123.636	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	51.7738	6192.596	3.0660	394.458	2.0620	123.914	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	52.6835	6244.784	3.0660	394.625	2.0715	124.192	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	53.3022	6279.578	3.0660	394.736	2.0905	124.693	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	54.0621	6311.907	3.5774	394.820	2.1142	125.361	7.5679	1842.884
360	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	54.2791	6388.486	3.0660	394.458	2.2853	137.775	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	55.2994	6442.345	3.0660	394.625	2.2901	137.886	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	54.9164	6424.394	3.0660	394.569	2.2996	138.165	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	55.7142	6469.274	3.0660	394.708	2.3091	138.387	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	56.1848	6487.231	3.0660	394.764	2.3186	138.666	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	57.2350	6538.262	3.5774	394.903	2.3471	139.445	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-10-3W-30

SHEET NUMBER 7193

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.155(2S+V2)+4'-5 1/2"
T2	#4	1	1	1	1	1					1.155(2S+V2)+8'-7"
T3	#4	1	1	1	1	1					1.155(2S+V2)+9'-4 1/2"
T4	#4	1	1	1	1	1					1.155(2S+V2)+10'-2 1/2"
T5	#4	1	1	1	1	1					1.155(2S+V2)+11'-0"
T6	#4	1	1	1	1	1					1.155(2S+V2)+11'-10"
T7	#4	1	1	1	1	1					1.155(2S+V2)+12'-7 1/2"
T8	#4	1	1	1	1	1					1.155(2S+V2)+13'-5 1/2"
T9	#4	1	1	1	1	1					1.155(2S+V2)+14'-3"
T10	#4	1	1	1	1	1					1.155(2S+V2)+15'-1"
T11	#4	1	1	1	1	1					1.155(2S+V2)+15'-10 1/2"
T12	#4	1	1	1	1	1					1.155(2S+V2)+16'-8 1/2"
T13	#4	1	1	1	1	1					1.155(2S+V2)+17'-6"
T14	#4	1	1	1	1	1					1.155(2S+V2)+18'-4"
T15	#4	1	1	1	1	1					1.155(2S+V2)+19'-1 1/2"
T16	#4	1	1	1	1	1					1.155(2S+V2)+19'-11 1/2"
T17	#4	1	1	1	1	1					1.155(2S+V2)+20'-9"
T18	#4	1	1	1	1	1					1.155(2S+V2)+21'-7"
T19	#4	1	1	1	1	1					1.155(2S+V2)+22'-4 1/2"
T20	#4	1	1	1	1	1					1.155(2S+V2)+23'-2 1/2"
T21	#4	1	1	1	1	1					1.155(2S+V2)+24'-0"
T22	#4	1	1	1	1	1					1.155(2S+V2)+24'-10"
T23	#4	1	1	1	1	1					1.155(2S+V2)+25'-7 1/2"
T24	#4	1	1	1	1	1					1.155(2S+V2)+26'-5 1/2"
T25	#4	1	1	1	1	1					1.155(2S+V2)+26'-0 1/2"
T26	#4	3	3	3	3	3					1.155(2S+V2)+22'-0"
V1	#4	24	28	32	36	40			28'-6"	1'-8"	30'-2"
VL1	#4	1	1	1	1	1			27'-5 1/2"	1'-8"	29'-1 1/2"
VL2	#4	1	1	1	1	1			24'-4"	1'-8"	26'-0"
VL3	#4	1	1	1	1	1			21'-2"	1'-8"	22'-10"
VL4	#4	1	1	1	1	1			18'-0"	1'-8"	19'-8"
VL5	#4	1	1	1	1	1			14'-10"	1'-8"	16'-6"
VL6	#4	1	1	1	1	1			11'-8 1/2"	1'-8"	13'-4 1/2"
VL7	#4	1	1	1	1	1			8'-6"		8'-6"
VL8	#4	1	1	1	1	1			4'-6"		4'-6"
VS1	#4	1	1	1	1	1			28'-5 1/2"	1'-8"	30'-1 1/2"
VS2	#4	1	1	1	1	1			28'-3"	1'-8"	29'-11"
VS3	#4	1	1	1	1	1			28'-0 1/2"	1'-8"	29'-8 1/2"
VS4	#4	1	1	1	1	1			27'-10"	1'-8"	29'-6"
VS5	#4	1	1	1	1	1			24'-5 1/2"	1'-8"	26'-1 1/2"
VS6	#4	1	1	1	1	1			21'-1 1/2"	1'-8"	22'-9 1/2"
VS7	#4	1	1	1	1	1			17'-10"	1'-8"	19'-6"
VS8	#4	1	1	1	1	1			14'-6"	1'-8"	16'-2"
VS9	#4	1	1	1	1	1			11'-2"	1'-8"	12'-10"
VS10	#4	1	1	1	1	1			7'-10"	1'-8"	9'-6"
VS11	#4	1	1	1	1	1			4'-6"		4'-6"
VS12	#4	1	1	1	1	1			1'-2 1/2"		1'-2 1/2"
FTL1	#5	1	1	1	1	1					1'-3"
FTL2	#5	1	1	1	1	1					1'-9 1/2"
FTL3	#5	1	1	1	1	1					2'-4 1/2"
FTL4	#5	1	1	1	1	1					2'-11 1/2"
FTL5	#5	1	1	1	1	1					3'-6 1/2"
FTL6	#5	1	1	1	1	1					4'-1 1/2"
FTL7	#5	53	53	53	53	53					7'-1"
FTL8	#5	1	1	1	1	1					6'-10 1/2"
FTL9	#5	1	1	1	1	1					6'-3 1/2"
FTL10	#5	1	1	1	1	1					5'-8 1/2"
FTL11	#5	1	1	1	1	1					5'-1 1/2"
FTL12	#5	1	1	1	1	1					4'-6 1/2"
FTL13	#5	1	1	1	1	1					4'-0"
FTL14	#5	1	1	1	1	1					3'-5"
FTL15	#5	2	2	2	2	2					3'-1"
FLL	#4	9	9	9	9	9					34'-10 1/2"
FTS1	#5	1	1	1	1	1					3'-3"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
FTS2	#5	43	43	43	43	43					7'-1"
FTS3	#5	1	1	1	1	1					1'-5 1/2"
FLS	#4	9	9	9	9	9					24'-10 1/2"
WS1	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WS2	#5	1	1	1	1	1				W+7'-6"	W+7'-6"
WS3	#5	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
WS4	#5	1	1	1	1	1				W+7'-1 1/2"	W+7'-1 1/2"
WS5	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WS6	#5	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
WS7	#5	1	1	1	1	1				W+6'-6 1/2"	W+6'-6 1/2"
WS8	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS9	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WS10	#5	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
WS11	#5	1	1	1	1	1				W+5'-9"	W+5'-9"
WS12	#5	1	1	1	1	1				W+5'-7"	W+5'-7"
WS13	#5	1	1	1	1	1				W+5'-4 1/2"	W+5'-4 1/2"
WS14	#5	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
WS15	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WS16	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WS17	#5	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
WS18	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WS19	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WS20	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WS21	#5	1	1	1	1	1				W+3'-10 1/2"	W+3'-10 1/2"
WS22	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WS23	#5	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WS24	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
WS25	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS26	#5	1	1	1	1	1				W+2'-11"	W+2'-11"
WS27	#5	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
WS28	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WS29	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WS30	#5	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
WS31	#5	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
WS32	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WS33	#5	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
WS34	#5	1	1	1	1	1				W+1'-4 1/2"	W+1'-4 1/2"
WS35	#5	1	1	1	1	1				W+1'-2"	W+1'-2"
WS36	#5	1	1	1	1	1				W+1'-0"	W+1'-0"
WS37	#5	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
WS38	#5	1	1	1	1	1				W+0'-7 1/2"	W+0'-7 1/2"
WS39	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WS40	#5	1	1	1	1	1				W+0'-2 1/2"	W+0'-2 1/2"
WS41	#5	1	1	1	1	1				W+0'-0 1/2"	W+0'-0 1/2"
WS42	#5	1	1	1	1	1			1'-6"	W+0'-10"	W+2'-4"
WS43	#5	1	1	1	1	1			1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WS44	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	41	41	41	41	41			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
WL2	#5	1	1	1	1	1				W+7'-7"	W+7'-7"
WL3	#5	1	1	1	1	1				W+7'-5"	W+7'-5"
WL4	#5	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
WL5	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WL6	#5	1	1	1	1	1				W+7'-0 1/2"	W+7'-0 1/2"
WL7	#5	1	1	1	1	1				W+6'-10 1/2"	W+6'-10 1/2"
WL8	#5	1	1	1	1	1				W+6'-9"	W+6'-9"
WL9	#5	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
WL10	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WL11	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WL12	#5	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
WL13	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WL14	#5	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
WL15	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WL16	#5	1	1	1	1	1				W+5'-8"	W+5'-8"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WL17	#5	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
WL18	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL19	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WL20	#5	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
WL21	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL22	#5	1	1	1	1	1				W+4'-10 1/2"	W+4'-10 1/2"
WL23	#5	1	1	1	1	1				W+4'-8 1/2"	W+4'-8 1/2"
WL24	#5	1	1	1	1	1				W+4'-7"	W+4'-7"
WL25	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WL26	#5	1	1	1	1	1				W+4'-4"	W+4'-4"
WL27	#5	1	1	1	1	1				W+4'-2"	W+4'-2"
WL28	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WL29	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL30	#5	1	1	1	1	1				W+3'-9 1/2"	W+3'-9 1/2"
WL31	#5	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
WL32	#5	1	1	1	1	1				W+3'-6"	W+3'-6"
WL33	#5	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
WL34	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL35	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WL36	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL37	#5	1	1	1	1	1				W+2'-10"	W+2'-10"
WL38	#5	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
WL39	#5	1	1	1	1	1				W+2'-6 1/2"	W+2'-6 1/2"
WL40	#5	1	1	1	1	1				W+2'-5"	W+2'-5"
WL41	#5	1	1	1	1	1				W+2'-3 1/2"	W+2'-3 1/2"
WL42	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WL43	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WL44	#5	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
WL45	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WL46	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL47	#5	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
WL48	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL49	#5	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
WL50	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WL51	#5	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
WL52	#5	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
WL53	#5	1	1	1	1	1				W+0'-8"	W+0'-8"
WL54	#5	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
WL55	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL56	#5	1	1	1	1	1				W+0'-3"	W+0'-3"
WL57	#5	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
WL58	#5	1	1	1	1	1			1'-6"	W+1'-0"	W+2'-6"
WL59	#5	1	1	1	1	1			1'-6"	W+0'-10"	W+2'-4"
WL60	#5	1	1	1	1	1			1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WL61	#5	1	1	1	1	1			1'-6"	W+0'-7"	W+2'-1"
WL62	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	57	57	57	57	57			1'-6"	2'-9"	4'-3"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 3

WORKING NUMBER
IWD-10-3W-30

SHEET NUMBER
7194

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RS1	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RS2	#4	1	1	1	1	1				W+7'-4"	W+7'-4"
RS3	#4	1	1	1	1	1				W+7'-0 ½"	W+7'-0 ½"
RS4	#4	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
RS5	#4	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
RS6	#4	1	1	1	1	1				W+6'-0 ½"	W+6'-0 ½"
RS7	#4	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
RS8	#4	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
RS9	#4	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
RS10	#4	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
RS11	#4	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
RS12	#4	1	1	1	1	1				W+4'-1"	W+4'-1"
RS13	#4	1	1	1	1	1				W+3'-9"	W+3'-9"
RS14	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS15	#4	1	1	1	1	1				W+3'-1"	W+3'-1"
RS16	#4	1	1	1	1	1				W+2'-9"	W+2'-9"
RS17	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS18	#4	1	1	1	1	1				W+2'-1"	W+2'-1"
RS19	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RS20	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS21	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RS22	#4	1	1	1	1	1				W+0'-9 ½"	W+0'-9 ½"
RS23	#4	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
RS24	#4	1	1	1	1	1				W+0'-1 ½"	W+0'-1 ½"
RS25	#4	1	1	1	1	1				W-0'-2 ½"	W-0'-2 ½"
RS26	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	25	25	25	25	25			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+7'-8 ½"	W+7'-8 ½"
RL2	#4	1	1	1	1	1				W+7'-5 ½"	W+7'-5 ½"
RL3	#4	1	1	1	1	1				W+7'-3"	W+7'-3"
RL4	#4	1	1	1	1	1				W+7'-0"	W+7'-0"
RL5	#4	1	1	1	1	1				W+6'-9 ½"	W+6'-9 ½"
RL6	#4	1	1	1	1	1				W+6'-6 ½"	W+6'-6 ½"
RL7	#4	1	1	1	1	1				W+6'-4"	W+6'-4"
RL8	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RL9	#4	1	1	1	1	1				W+5'-10 ½"	W+5'-10 ½"
RL10	#4	1	1	1	1	1				W+5'-7 ½"	W+5'-7 ½"
RL11	#4	1	1	1	1	1				W+5'-5"	W+5'-5"
RL12	#4	1	1	1	1	1				W+5'-2"	W+5'-2"
RL13	#4	1	1	1	1	1				W+4'-11 ½"	W+4'-11 ½"
RL14	#4	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
RL15	#4	1	1	1	1	1				W+4'-6"	W+4'-6"
RL16	#4	1	1	1	1	1				W+4'-3"	W+4'-3"
RL17	#4	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"
RL18	#4	1	1	1	1	1				W+3'-9 ½"	W+3'-9 ½"
RL19	#4	1	1	1	1	1				W+3'-7"	W+3'-7"
RL20	#4	1	1	1	1	1				W+3'-4"	W+3'-4"
RL21	#4	1	1	1	1	1				W+3'-1 ½"	W+3'-1 ½"
RL22	#4	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
RL23	#4	1	1	1	1	1				W+2'-8"	W+2'-8"
RL24	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RL25	#4	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
RL26	#4	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
RL27	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RL28	#4	1	1	1	1	1				W+1'-6"	W+1'-6"
RL29	#4	1	1	1	1	1				W+1'-3 ½"	W+1'-3 ½"
RL30	#4	1	1	1	1	1				W+1'-0 ½"	W+1'-0 ½"
RL31	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL32	#4	1	1	1	1	1				W+0'-7"	W+0'-7"
RL33	#4	1	1	1	1	1				W+0'-4 ½"	W+0'-4 ½"
RL34	#4	1	1	1	1	1				W+0'-1 ½"	W+0'-1 ½"
RL35	#4	1	1	1	1	1				W-0'-1"	W-0'-1"
RL36	#4	1	1	1	1	1				W-0'-4"	W-0'-4"
RL37	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"

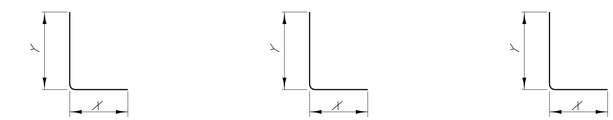
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

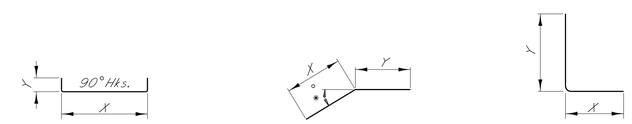
BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
DRL	#4	36	36	36	36	36			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					4'-4"
YS2	#4	2	2	2	2	2					7'-4 ½"
YS3	#4	2	2	2	2	2					10'-4 ½"
YS4	#4	2	2	2	2	2					13'-5"
YS5	#4	2	2	2	2	2					16'-5 ½"
YS6	#4	2	2	2	2	2					19'-5 ½"
YS7	#4	2	2	2	2	2					22'-6"
YS8	#4	8	8	8	10	10					24'-10 ½"
YL1	#4	2	2	2	2	2					6'-2"
YL2	#4	2	2	2	2	2					10'-5"
YL3	#4	2	2	2	2	2					14'-8"
YL4	#4	2	2	2	2	2					18'-11"
YL5	#4	2	2	2	2	2					23'-1 ½"
YL6	#4	2	2	2	2	2					27'-4 ½"
YL7	#4	2	2	2	2	2					31'-7 ½"
YL8	#4	8	8	8	10	10					35'-0 ½"
FS	#4	2	2	2	2	2					26'-2 ½"
FL	#4	2	2	2	2	2					36'-0"
N	#4	30	34	39	44	49			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.155(2S+2V1+V2)+1'-5 ½"
K	#4	27	32	36	41	45			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.155(2S+V2)+1'-7 ½"
OS	#7	12	12	12	12	13			3'-3 ½"	3'-3 ½"	6'-7"
OL	#7	12	12	12	12	13			3'-3 ½"	3'-3 ½"	6'-7"
OSS	#4	1	1	1	1	1					10'-0"+T1
OSL	#4	1	1	1	1	1					10'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			5'-11"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+9'-1 ½"	W1+9'-1 ½"
J2	#5	1		W1+8'-8"	W1+8'-8"
J3	#5	1		W1+8'-2"	W1+8'-2"
J4	#5	1		W1+7'-8"	W1+7'-8"
J5	#5	1		W1+7'-2"	W1+7'-2"
J6	#5	1		W1+6'-8"	W1+6'-8"
J7	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J8	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J9	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J10	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J11	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J12	#5	1		W1+3'-9"	W1+3'-9"
J13	#5	1		W1+3'-6"	W1+3'-6"
J14	#5	1		W1+2'-9"	W1+2'-9"
J15	#5	1		W1+2'-3"	W1+2'-3"
J16	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J17	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J18	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J19	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J20	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	15	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
FD	#4	1			20'-10 ½"

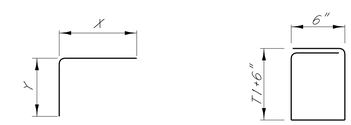


BARS DRS/DRL - #4 BARS DWS/DWL/DJ - #5 BARS RSn/RLn - #4



BARS N - #4 DOWELS OS/OL - #7 BARS WSn/WLn/Jn - #5

* See plan of apron



BARS V1/VLn/VSn - #4 BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 3 OF 3

WORKING NUMBER IWD-10-3W-30

SHEET NUMBER 7195

REVISIONS | DATE | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													12'	14'	16'	18'	20'
12'-0"	9'-7"	29'-0 3/16"	40'-7 7/8"	0'-2 1/8"	0'-9 13/16"	28'-9"	0'-11"	1'-0"	5'-0"	2'-6"	0'-6"	23'-0"	53'-6 5/16"+1.155V2	58'-1 11/16"+1.155V2	62'-9 1/8"+1.155V2	67'-4 9/16"+1.155V2	72'-0"+1.155V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	59.6536	8421.976	4.2509	527.515	1.5868	95.468	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	60.2285	8455.402	4.2509	527.598	1.6010	95.858	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	61.0782	8511.110	4.2509	527.737	1.6200	96.359	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	60.1279	8455.402	4.2509	527.598	1.5963	95.747	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	60.3950	8477.684	4.2509	527.654	1.6010	95.858	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	60.7128	8499.971	4.2509	527.710	1.6058	95.969	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	62.9562	8678.152	4.2509	527.598	1.8149	109.441	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	63.6253	8712.246	4.2509	527.682	1.8291	109.830	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	63.1276	8689.518	4.2509	527.626	1.8481	110.331	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	63.5639	8723.612	4.2509	527.710	1.8339	109.942	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	63.9557	8746.340	4.2509	527.765	1.8434	110.220	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	64.2298	8769.068	4.2509	527.821	1.8434	110.220	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	66.0669	8927.610	4.2509	527.654	2.0477	123.524	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	66.9952	8985.829	4.2509	527.793	2.0572	123.803	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	66.4190	8950.900	4.2509	527.710	2.0762	124.304	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	66.9366	8985.829	4.2509	527.793	2.0715	124.192	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	67.6415	9028.078	4.9753	527.877	2.0952	124.805	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	68.0579	9051.362	4.9753	527.932	2.1000	124.972	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	69.3729	9190.076	4.2509	527.737	2.2853	137.775	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	70.5241	9261.604	4.2509	527.904	2.2901	137.886	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	69.6307	9202.000	4.2509	527.765	2.3043	138.276	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	70.5353	9257.035	4.9753	527.877	2.3233	138.777	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	71.1577	9292.799	4.9753	527.960	2.3328	139.055	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	72.0734	9352.404	4.9753	528.099	2.3423	139.278	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3 1/2"	11"	9"	4'-0 1/2"	72.5993	9438.204	4.2509	527.793	2.5181	150.300	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	72.5732	9426.058	4.2509	527.765	2.5276	150.523	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	73.2412	9469.810	4.9753	527.849	2.5514	151.191	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	73.9999	9518.388	4.9753	527.960	2.5609	151.469	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	75.2479	9603.392	4.9753	528.155	2.5704	151.692	9.0617	2235.611

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 4

WORKING NUMBER IWD-12-3W-30

SHEET NUMBER 7196

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.155(2S+V2)+4'-7"
T2	#4	1	1	1	1	1					1.155(2S+V2)+8'-8 1/2"
T3	#4	1	1	1	1	1					1.155(2S+V2)+9'-5 1/2"
T4	#4	1	1	1	1	1					1.155(2S+V2)+10'-2 1/2"
T5	#4	1	1	1	1	1					1.155(2S+V2)+10'-11 1/2"
T6	#4	1	1	1	1	1					1.155(2S+V2)+11'-8 1/2"
T7	#4	1	1	1	1	1					1.155(2S+V2)+12'-5 1/2"
T8	#4	1	1	1	1	1					1.155(2S+V2)+13'-2 1/2"
T9	#4	1	1	1	1	1					1.155(2S+V2)+13'-11 1/2"
T10	#4	1	1	1	1	1					1.155(2S+V2)+14'-8 1/2"
T11	#4	1	1	1	1	1					1.155(2S+V2)+15'-6"
T12	#4	1	1	1	1	1					1.155(2S+V2)+16'-3"
T13	#4	1	1	1	1	1					1.155(2S+V2)+17'-0"
T14	#4	1	1	1	1	1					1.155(2S+V2)+17'-9"
T15	#4	1	1	1	1	1					1.155(2S+V2)+18'-6"
T16	#4	1	1	1	1	1					1.155(2S+V2)+19'-3"
T17	#4	1	1	1	1	1					1.155(2S+V2)+20'-0"
T18	#4	1	1	1	1	1					1.155(2S+V2)+20'-9"
T19	#4	1	1	1	1	1					1.155(2S+V2)+21'-6 1/2"
T20	#4	1	1	1	1	1					1.155(2S+V2)+22'-3 1/2"
T21	#4	1	1	1	1	1					1.155(2S+V2)+23'-0 1/2"
T22	#4	1	1	1	1	1					1.155(2S+V2)+23'-9 1/2"
T23	#4	1	1	1	1	1					1.155(2S+V2)+24'-6 1/2"
T24	#4	1	1	1	1	1					1.155(2S+V2)+25'-3 1/2"
T25	#4	1	1	1	1	1					1.155(2S+V2)+26'-0 1/2"
T26	#4	1	1	1	1	1					1.155(2S+V2)+26'-9 1/2"
T27	#4	1	1	1	1	1					1.155(2S+V2)+27'-7"
T28	#4	1	1	1	1	1					1.155(2S+V2)+28'-4"
T29	#4	1	1	1	1	1					1.155(2S+V2)+29'-1"
T30	#4	1	1	1	1	1					1.155(2S+V2)+29'-10"
T32	#4	1	1	1	1	1					1.155(2S+V2)+29'-2 1/2"
T32	#4	3	3	3	3	3					1.155(2S+V2)+25'-3"
V1	#4	28	32	36	40	44			32'-10"	1'-8"	34'-6"
VL1	#4	1	1	1	1	1			32'-0 1/2"	1'-8"	33'-7 1/2"
VL2	#4	1	1	1	1	1			28'-11"	1'-8"	30'-7"
VL3	#4	1	1	1	1	1			25'-9"	1'-8"	27'-5"
VL4	#4	1	1	1	1	1			22'-7"	1'-8"	24'-3"
VL5	#4	1	1	1	1	1			19'-5"	1'-8"	21'-1"
VL6	#4	1	1	1	1	1			16'-3 1/2"	1'-8"	17'-11 1/2"
VL7	#4	1	1	1	1	1			13'-1 1/2"	1'-8"	14'-9 1/2"
VL8	#4	1	1	1	1	1			9'-11 1/2"	1'-8"	11'-7 1/2"
VL9	#4	1	1	1	1	1			6'-3 1/2"		6'-3 1/2"
VL10	#4	1	1	1	1	1			2'-3 1/2"		2'-3 1/2"
VS1	#4	1	1	1	1	1			32'-9 1/2"	1'-8"	34'-5 1/2"
VS2	#4	1	1	1	1	1			32'-7"	1'-8"	34'-3"
VS3	#4	1	1	1	1	1			32'-4 1/2"	1'-8"	34'-0 1/2"
VS4	#4	1	1	1	1	1			32'-2"	1'-8"	33'-10"
VS5	#4	1	1	1	1	1			29'-0 1/2"	1'-8"	30'-8 1/2"
VS6	#4	1	1	1	1	1			25'-8 1/2"	1'-8"	27'-4 1/2"
VS7	#4	1	1	1	1	1			22'-4 1/2"	1'-8"	24'-0 1/2"
VS8	#4	1	1	1	1	1			19'-0 1/2"	1'-8"	20'-8 1/2"
VS9	#4	1	1	1	1	1			15'-9"	1'-8"	17'-5"
VS10	#4	1	1	1	1	1			12'-5"	1'-8"	14'-1"
VS11	#4	1	1	1	1	1			9'-1"	1'-8"	10'-9"
VS12	#4	1	1	1	1	1			5'-9"		5'-9"
VS13	#4	1	1	1	1	1			2'-5 1/2"		2'-5 1/2"
FTL1	#5	1	1	1	1	1					1'-2 1/2"
FTL2	#5	1	1	1	1	1					1'-7 1/2"
FTL3	#5	1	1	1	1	1					2'-0 1/2"
FTL4	#5	1	1	1	1	1					2'-5 1/2"
FTL5	#5	1	1	1	1	1					2'-10 1/2"
FTL6	#5	1	1	1	1	1					3'-3"
FTL7	#5	1	1	1	1	1					3'-8"
FTL8	#5	1	1	1	1	1					4'-1"
FTL9	#5	1	1	1	1	1					4'-6"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
FTL10	#5	1	1	1	1	1					4'-11"
FTL11	#5	1	1	1	1	1					5'-4"
FTL12	#5	83	83	83	83	83					8'-2"
FTL13	#5	1	1	1	1	1					8'-1"
FTL14	#5	1	1	1	1	1					7'-8"
FTL15	#5	1	1	1	1	1					7'-3"
FTL16	#5	1	1	1	1	1					6'-10"
FTL17	#5	1	1	1	1	1					6'-5"
FTL18	#5	1	1	1	1	1					6'-0"
FTL19	#5	1	1	1	1	1					5'-7"
FTL20	#5	1	1	1	1	1					5'-2"
FTL21	#5	1	1	1	1	1					4'-9"
FTL22	#5	1	1	1	1	1					4'-4"
FTL23	#5	1	1	1	1	1					3'-11"
FTL24	#5	1	1	1	1	1					3'-6"
FTL25	#5	3	3	3	3	3					3'-2"
FLL	#4	10	10	10	10	10					40'-2"
FTS1	#5	1	1	1	1	1					3'-4"
FTS2	#5	1	1	1	1	1					5'-8"
FTS3	#5	68	68	68	68	68					8'-2"
FTS4	#5	1	1	1	1	1					3'-5 1/2"
FTS5	#5	1	1	1	1	1					1'-1"
FLS	#4	10	10	10	10	10					28'-8"
WS1	#5	1	1	1	1	1				W+8'-11"	W+8'-11"
WS2	#5	1	1	1	1	1				W+8'-9 1/2"	W+8'-9 1/2"
WS3	#5	1	1	1	1	1				W+8'-8"	W+8'-8"
WS4	#5	1	1	1	1	1				W+8'-6"	W+8'-6"
WS5	#5	1	1	1	1	1				W+8'-4 1/2"	W+8'-4 1/2"
WS6	#5	1	1	1	1	1				W+8'-3"	W+8'-3"
WS7	#5	1	1	1	1	1				W+8'-1 1/2"	W+8'-1 1/2"
WS8	#5	1	1	1	1	1				W+7'-11 1/2"	W+7'-11 1/2"
WS9	#5	1	1	1	1	1				W+7'-10"	W+7'-10"
WS10	#5	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
WS11	#5	1	1	1	1	1				W+7'-6 1/2"	W+7'-6 1/2"
WS12	#5	1	1	1	1	1				W+7'-5"	W+7'-5"
WS13	#5	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
WS14	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WS15	#5	1	1	1	1	1				W+7'-0"	W+7'-0"
WS16	#5	1	1	1	1	1				W+6'-10 1/2"	W+6'-10 1/2"
WS17	#5	1	1	1	1	1				W+6'-9"	W+6'-9"
WS18	#5	1	1	1	1	1				W+6'-7"	W+6'-7"
WS19	#5	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
WS20	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS21	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WS22	#5	1	1	1	1	1				W+6'-0 1/2"	W+6'-0 1/2"
WS23	#5	1	1	1	1	1				W+5'-11"	W+5'-11"
WS24	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WS25	#5	1	1	1	1	1				W+5'-7 1/2"	W+5'-7 1/2"
WS26	#5	1	1	1	1	1				W+5'-6"	W+5'-6"
WS27	#5	1	1	1	1	1				W+5'-4 1/2"	W+5'-4 1/2"
WS28	#5	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
WS29	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WS30	#5	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
WS31	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WS32	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WS33	#5	1	1	1	1	1				W+4'-6 1/2"	W+4'-6 1/2"
WS34	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WS35	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WS36	#5	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
WS37	#5	1	1	1	1	1				W+4'-0"	W+4'-0"
WS38	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WS39	#5	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
WS40	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WS41	#5	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WS42	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WS43	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WS44	#5	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
WS45	#5	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
WS46	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WS47	#5	1	1	1	1	1				W+2'-7 1/2"	W+2'-7 1/2"
WS48	#5	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
WS49	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WS50	#5	1	1	1	1	1				W+2'-2 1/2"	W+2'-2 1/2"
WS51	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WS52	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WS53	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WS54	#5	1	1	1	1	1				W+1'-8"	W+1'-8"
WS55	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WS56	#5	1	1	1	1	1				W+1'-4 1/2"	W+1'-4 1/2"
WS57	#5	1	1	1	1	1				W+1'-3"	W+1'-3"
WS58	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WS59	#5	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
WS60	#5	1	1	1	1	1				W+0'-10"	W+0'-10"
WS61	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WS62	#5	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
WS63	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WS64	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"
WS65	#5	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
WS66	#5	1	1	1	1	1				W+0'-0"	W+0'-0"
WS67	#5	1	1	1	1	1				W-0'-1 1/2"	W-0'-1 1/2"
WS68	#5	1	1	1	1	1				W-0'-3"	W-0'-3"
WS69	#5	1	1	1	1	1				W-0'-5"	W-0'-5"
WS70	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	70	70	70	70	70			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+8'-11 1/2"	W+8'-11 1/2"
WL2	#5	1	1	1	1	1				W+8'-10 1/2"	W+8'-10 1/2"
WL3	#5	1	1	1	1	1				W+8'-9"	W+8'-9"
WL4	#5	1	1	1	1	1				W+8'-8"	W+8'-8"
WL5	#5	1	1	1	1	1				W+8'-6 1/2"	W+8'-6 1/2"
WL6	#5	1	1	1	1	1				W+8'-5 1/2"	W+8'-5 1/2"
WL7	#5	1	1	1	1	1				W+8'-4 1/2"	W+8'-4 1/2"
WL8	#5	1	1	1	1	1				W+8'-3"	W+8'-3"
WL9	#5	1	1	1	1	1				W+8'-2"	W+8'-2"
WL10	#5	1	1	1	1	1				W+8'-1"	W+8'-1"
WL11	#5	1	1	1	1	1				W+7'-11 1/2"	W+7'-11 1/2"
WL12	#5	1	1	1	1	1				W+7'-10 1/2"	W+7'-10 1/2"
WL13	#5	1	1	1	1	1				W+7'-9 1/2"	W+7'-9 1/2"
WL14	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WL15	#5	1	1	1	1	1				W+7'-7"	W+7'-7"
WL16	#5	1	1	1	1	1				W+7'-6"	W+7'-6"
WL17	#5	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
WL18	#5	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
WL19	#5	1	1	1	1	1				W+7'-2 1/2"	W+7'-2 1/2"
WL20	#5	1	1	1	1	1				W+7'-1"	W+7'-1"
WL21	#5	1	1	1	1	1				W+7'-0"	W+7'-0"
WL22	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WL23	#5	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 4

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER IWD-12-3W-30

SHEET NUMBER 7197

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL24	#5	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
WL25	#5	1	1	1	1	1				W+6'-7"	W+6'-7"
WL26	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WL27	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL28	#5	1	1	1	1	1				W+6'-3 1/2"	W+6'-3 1/2"
WL29	#5	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
WL30	#5	1	1	1	1	1				W+6'-1 1/2"	W+6'-1 1/2"
WL31	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL32	#5	1	1	1	1	1				W+5'-11"	W+5'-11"
WL33	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WL34	#5	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
WL35	#5	1	1	1	1	1				W+5'-7 1/2"	W+5'-7 1/2"
WL36	#5	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
WL37	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL38	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WL39	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WL40	#5	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
WL41	#5	1	1	1	1	1				W+5'-0 1/2"	W+5'-0 1/2"
WL42	#5	1	1	1	1	1				W+4'-11"	W+4'-11"
WL43	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL44	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WL45	#5	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
WL46	#5	1	1	1	1	1				W+4'-6 1/2"	W+4'-6 1/2"
WL47	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WL48	#5	1	1	1	1	1				W+4'-4"	W+4'-4"
WL49	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WL50	#5	1	1	1	1	1				W+4'-2"	W+4'-2"
WL51	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WL52	#5	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
WL53	#5	1	1	1	1	1				W+3'-10 1/2"	W+3'-10 1/2"
WL54	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WL55	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL56	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WL57	#5	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WL58	#5	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
WL59	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL60	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WL61	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WL62	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL63	#5	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
WL64	#5	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
WL65	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL66	#5	1	1	1	1	1				W+2'-7"	W+2'-7"
WL67	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WL68	#5	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
WL69	#5	1	1	1	1	1				W+2'-3 1/2"	W+2'-3 1/2"
WL70	#5	1	1	1	1	1				W+2'-2 1/2"	W+2'-2 1/2"
WL71	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL72	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WL73	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WL74	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WL75	#5	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
WL76	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL77	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL78	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WL79	#5	1	1	1	1	1				W+1'-3 1/2"	W+1'-3 1/2"
WL80	#5	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
WL81	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WL82	#5	1	1	1	1	1				W+1'-0"	W+1'-0"
WL83	#5	1	1	1	1	1				W+0'-11"	W+0'-11"
WL84	#5	1	1	1	1	1				W+0'-10"	W+0'-10"
WL85	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WL86	#5	1	1	1	1	1				W+0'-7 1/2"	W+0'-7 1/2"
WL87	#5	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
WL88	#5	1	1	1	1	1				W+0'-5"	W+0'-5"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL89	#5	1	1	1	1	1				W+0'-4"	W+0'-4"
WL90	#5	1	1	1	1	1				W+0'-3"	W+0'-3"
WL91	#5	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
WL92	#5	1	1	1	1	1				W+0'-0 1/2"	W+0'-0 1/2"
WL93	#5	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
WL94	#5	1	1	1	1	1				W-0'-2"	W-0'-2"
WL95	#5	1	1	1	1	1				W-0'-3"	W-0'-3"
WL96	#5	1	1	1	1	1				W-0'-4 1/2"	W-0'-4 1/2"
WL97	#5	1	1	1	1	1				W-0'-5 1/2"	W-0'-5 1/2"
WL98	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	98	98	98	98	98			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+8'-11"	W+8'-11"
RS2	#4	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
RS3	#4	1	1	1	1	1				W+8'-3 1/2"	W+8'-3 1/2"
RS4	#4	1	1	1	1	1				W+7'-11 1/2"	W+7'-11 1/2"
RS5	#4	1	1	1	1	1				W+7'-7 1/2"	W+7'-7 1/2"
RS6	#4	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
RS7	#4	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
RS8	#4	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
RS9	#4	1	1	1	1	1				W+6'-4"	W+6'-4"
RS10	#4	1	1	1	1	1				W+6'-0"	W+6'-0"
RS11	#4	1	1	1	1	1				W+5'-8"	W+5'-8"
RS12	#4	1	1	1	1	1				W+5'-4"	W+5'-4"
RS13	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RS14	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RS15	#4	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
RS16	#4	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
RS17	#4	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
RS18	#4	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
RS19	#4	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
RS20	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RS21	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS22	#4	1	1	1	1	1				W+2'-1"	W+2'-1"
RS23	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RS24	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS25	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RS26	#4	1	1	1	1	1				W+0'-9"	W+0'-9"
RS27	#4	1	1	1	1	1				W+0'-5 1/2"	W+0'-5 1/2"
RS28	#4	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
RS29	#4	1	1	1	1	1				W-0'-2 1/2"	W-0'-2 1/2"
RS30	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	30	30	30	30	30			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+8'-11 1/2"	W+8'-11 1/2"
RL2	#4	1	1	1	1	1				W+8'-8 1/2"	W+8'-8 1/2"
RL3	#4	1	1	1	1	1				W+8'-6"	W+8'-6"
RL4	#4	1	1	1	1	1				W+8'-3"	W+8'-3"
RL5	#4	1	1	1	1	1				W+8'-0 1/2"	W+8'-0 1/2"
RL6	#4	1	1	1	1	1				W+7'-9 1/2"	W+7'-9 1/2"
RL7	#4	1	1	1	1	1				W+7'-7"	W+7'-7"
RL8	#4	1	1	1	1	1				W+7'-4"	W+7'-4"
RL9	#4	1	1	1	1	1				W+7'-1"	W+7'-1"
RL10	#4	1	1	1	1	1				W+6'-10 1/2"	W+6'-10 1/2"
RL11	#4	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
RL12	#4	1	1	1	1	1				W+6'-5"	W+6'-5"
RL13	#4	1	1	1	1	1				W+6'-2"	W+6'-2"
RL14	#4	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
RL15	#4	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
RL16	#4	1	1	1	1	1				W+5'-5 1/2"	W+5'-5 1/2"
RL17	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RL18	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RL19	#4	1	1	1	1	1				W+4'-9 1/2"	W+4'-9 1/2"
RL20	#4	1	1	1	1	1				W+4'-6 1/2"	W+4'-6 1/2"
RL21	#4	1	1	1	1	1				W+4'-4"	W+4'-4"
RL22	#4	1	1	1	1	1				W+4'-1"	W+4'-1"
RL23	#4	1	1	1	1	1				W+3'-10"	W+3'-10"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
RL24	#4	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
RL25	#4	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
RL26	#4	1	1	1	1	1				W+3'-2"	W+3'-2"
RL27	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RL28	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RL29	#4	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
RL30	#4	1	1	1	1	1				W+2'-3"	W+2'-3"
RL31	#4	1	1	1	1	1				W+2'-0"	W+2'-0"
RL32	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RL33	#4	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
RL34	#4	1	1	1	1	1				W+1'-3 1/2"	W+1'-3 1/2"
RL35	#4	1	1	1	1	1				W+1'-1"	W+1'-1"
RL36	#4	1	1	1	1	1				W+0'-10"	W+0'-10"
RL37	#4	1	1	1	1	1				W+0'-7 1/2"	W+0'-7 1/2"
RL38	#4	1	1	1	1	1				W+0'-4 1/2"	W+0'-4 1/2"
RL39	#4	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
RL40	#4	1	1	1	1	1				W-0'-1"	W-0'-1"
RL41	#4	1	1	1	1	1				W-0'-4"	W-0'-4"
RL42	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	42	42	42	42	42			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					3'-10"
YS2	#4	2	2	2	2	2					6'-4"
YS3	#4	2	2	2	2	2					8'-10 1/2"
YS4	#4	2	2	2	2	2					11'-5"
YS5	#4	2	2	2	2	2					13'-11"
YS6	#4	2	2	2	2	2					16'-5 1/2"
YS7	#4	2	2	2	2	2					18'-11 1/2"
YS8	#4	2	2	2	2	2					21'-6"
YS9	#4	2	2	2	2	2					24'-0"
YS10	#4	2	2	2	2	2					26'-6 1/2"
YS11	#4	12	12	12	12	12					28'-8"
YL1	#4	2	2	2	2	2					5'-5 1/2"
YL2	#4	2	2	2	2	2					9'-0"
YL3	#4	2	2	2	2	2					12'-6 1/2"
YL4	#4	2	2	2	2	2					16'-1"
YL5	#4	2	2	2	2	2					19'-7"
YL6	#4	2	2	2	2	2					23'-1 1/2"
YL7	#4	2	2	2	2	2					26'-8"
YL8	#4	2	2	2	2	2					30'-2 1/2"
YL9	#4	2	2	2	2	2					33'-9"
YL10	#4	2	2	2	2	2					37'-3 1/2"
YL11	#4	12	12	12	12	12					40'-4"
FS	#4	2	2	2	2	2					30'-2 1/2"
FL	#4	2	2	2	2	2					41'-5"
N	#4	34	39	44	49	53			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.155(2S+2V1+V2)+1'-6"
K	#4	32	36	41	46	50			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					1.155(2S+V2)+1'-9 1/2"
OS	#7	17	17	17	17	17			3'-4"	3'-4"	6'-8"
OL	#7	17	17	17	17	17			3'-4"	3'-4"	6'-8"
OSS	#4	1	1	1	1	1					12'-0"+T1
OSL	#4	1	1	1	1	1					12'-0"+T1

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

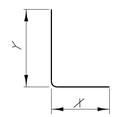
SHT. 3 OF 4

WORKING NUMBER IWD-12-3W-30

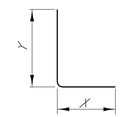
SHEET NUMBER 7198

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

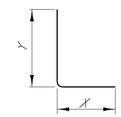
BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			5'-11"
DS	#4	1			12'-0"+T1
J1	#5	1		W1+11'-1 ½"	W1+11'-1 ½"
J2	#5	1		W1+10'-7 ½"	W1+10'-7 ½"
J3	#5	1		W1+10'-2"	W1+10'-2"
J4	#5	1		W1+9'-8"	W1+9'-8"
J5	#5	1		W1+9'-2"	W1+9'-2"
J6	#5	1		W1+8'-8"	W1+8'-8"
J7	#5	1		W1+8'-2"	W1+8'-2"
J8	#5	1		W1+7'-8 ½"	W1+7'-8 ½"
J9	#5	1		W1+7'-2 ½"	W1+7'-2 ½"
J10	#5	1		W1+6'-8 ½"	W1+6'-8 ½"
J11	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J12	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J13	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J14	#5	1		W1+4'-9"	W1+4'-9"
J15	#5	1		W1+4'-3"	W1+4'-3"
J16	#5	1		W1+3'-9"	W1+3'-9"
J17	#5	1		W1+3'-3"	W1+3'-3"
J18	#5	1		W1+2'-9"	W1+2'-9"
J19	#5	1		W1+2'-3"	W1+2'-3"
J20	#5	1	1'-0"	W1+2'-6 ½"	W1+3'-6 ½"
J21	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J22	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J23	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J24	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	19	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
YD10	#5	1			20'-3 ½"
YD11	#5	1			22'-3 ½"
FD	#4	1			25'-4"



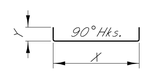
BARS DRS/DRL - #4



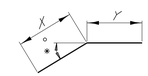
BARS DWS/DWL/DJ - #5



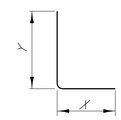
BARS RSn/RLn - #4



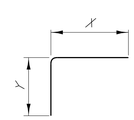
BARS N - #4



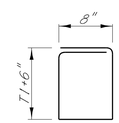
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
30° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

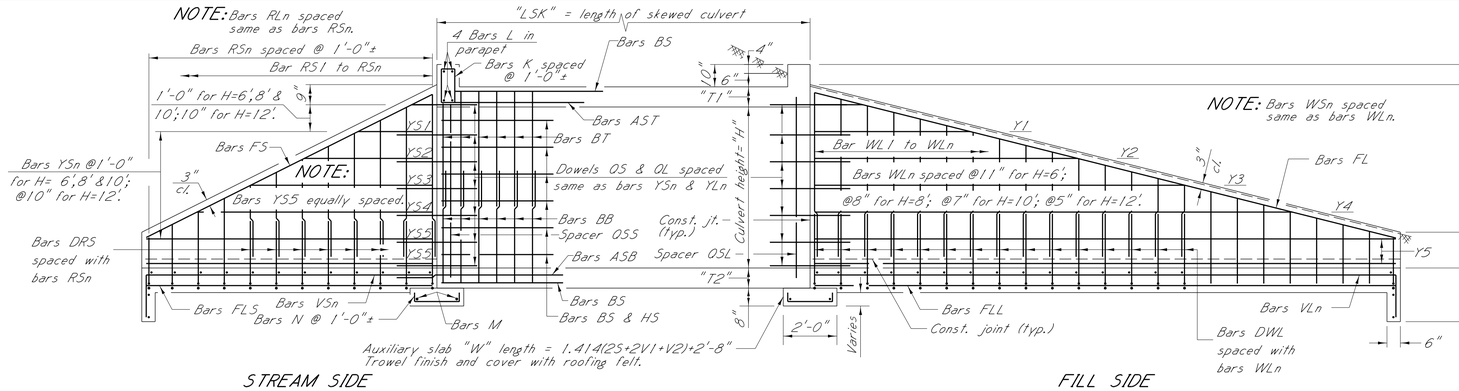
SHT. 4 OF 4

WORKING NUMBER
IWD-12-3W-30

SHEET NUMBER
7199

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.



STREAM SIDE

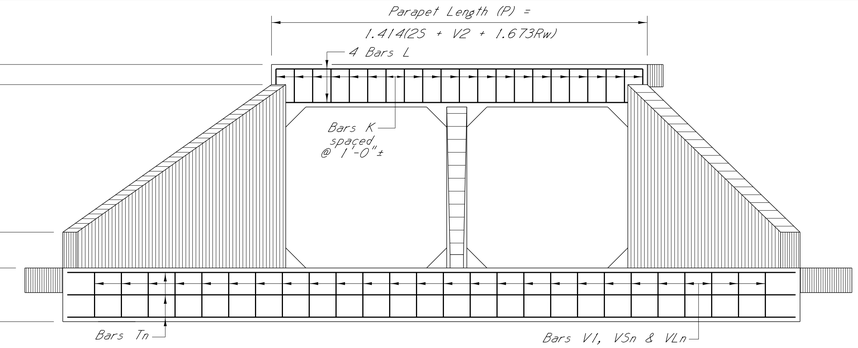
Showing reinforcement in stream side of "LW1" wingwall

LONGITUDINAL SECTION

Drawn for single cell 6' x 6' culvert

FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall

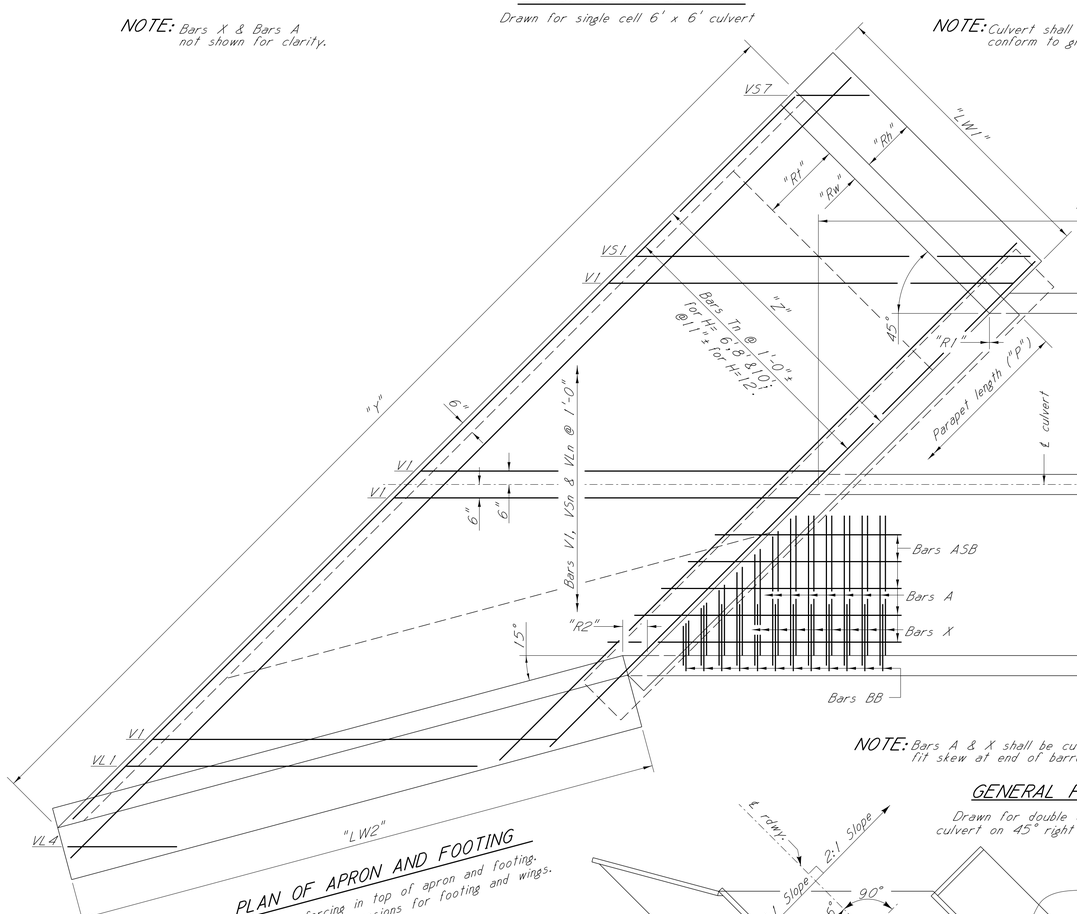


END ELEVATION

Showing reinforcing in pararpet & toe wall

NOTE: Bars X & Bars A not shown for clarity.

NOTE: Culvert shall be sloped to conform to gradient of stream.

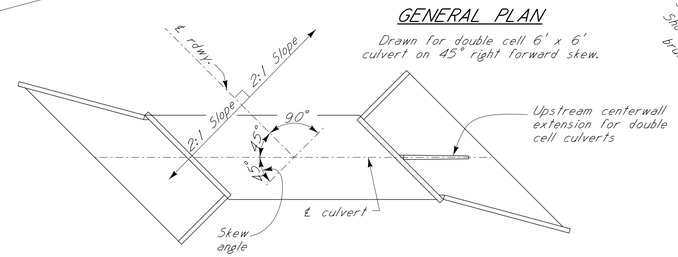


PLAN OF APRON AND FOOTING

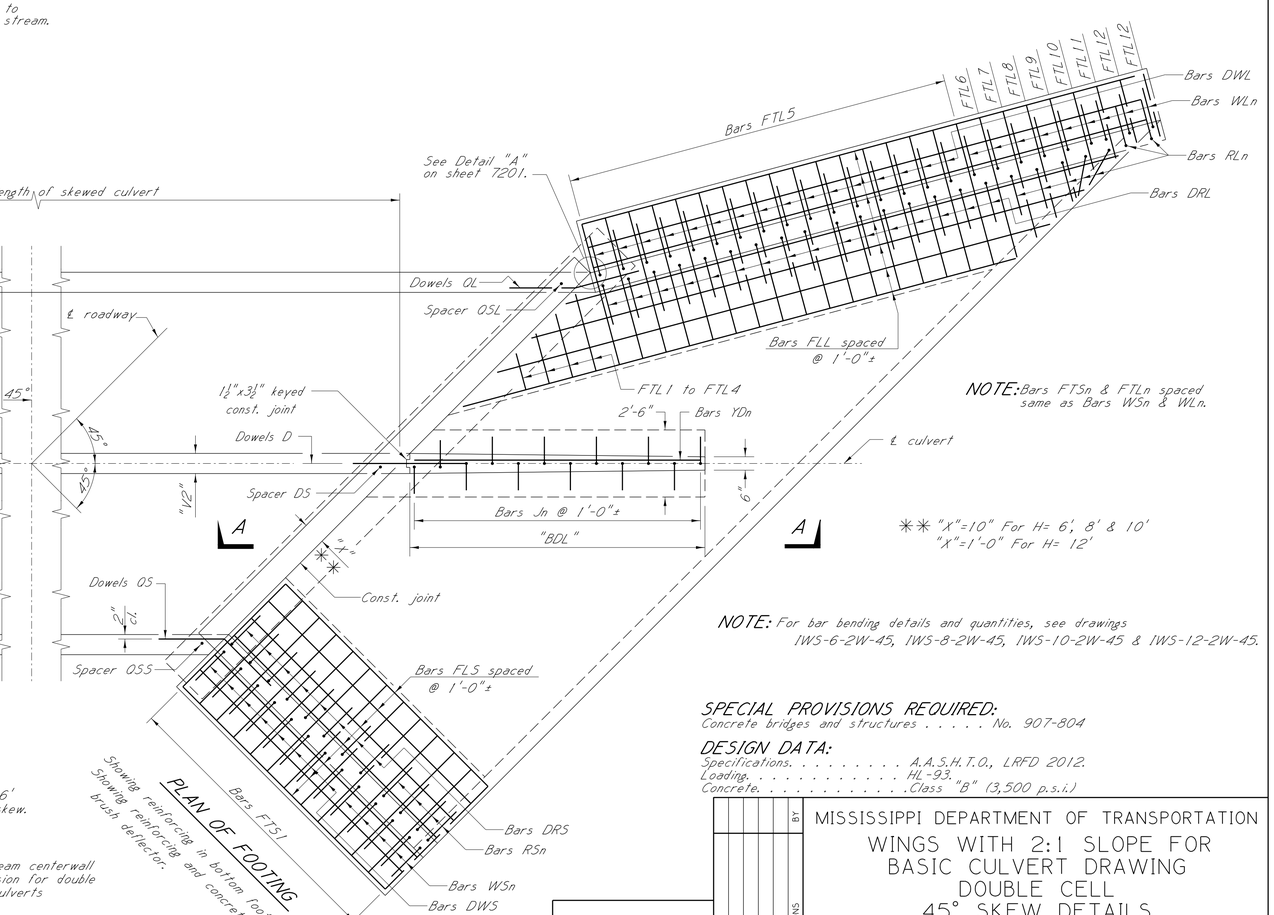
Showing reinforcing in top of apron and footing.
Showing concrete dimensions for footing and wings.

GENERAL PLAN

Drawn for double cell 6' x 6' culvert on 45° right forward skew.



PLAN OF 45° LEFT FORWARD SKEW



NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.

** "X"=10" For H= 6', 8' & 10'
"X"=1'-0" For H= 12'

NOTE: For bar bending details and quantities, see drawings IWS-6-2W-45, IWS-8-2W-45, IWS-10-2W-45 & IWS-12-2W-45.

PLAN OF FOOTING

Showing reinforcing in bottom footing & wingwall.
Showing reinforcing and concrete dimensions in brush deflector.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHTS 6-12 FT.

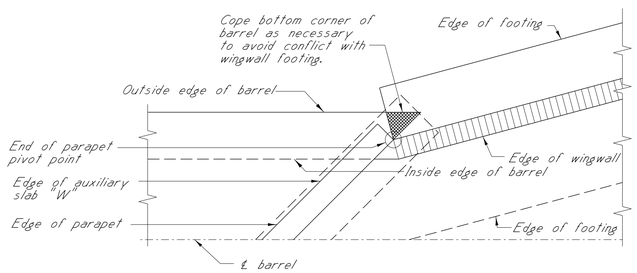
SPANS 12-40 FT.

SHT. 1 OF 2

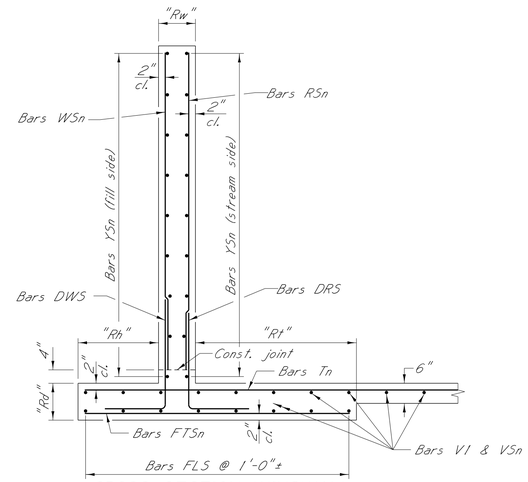
WORKING NUMBER IWD-2W-45

SHEET NUMBER 7200

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

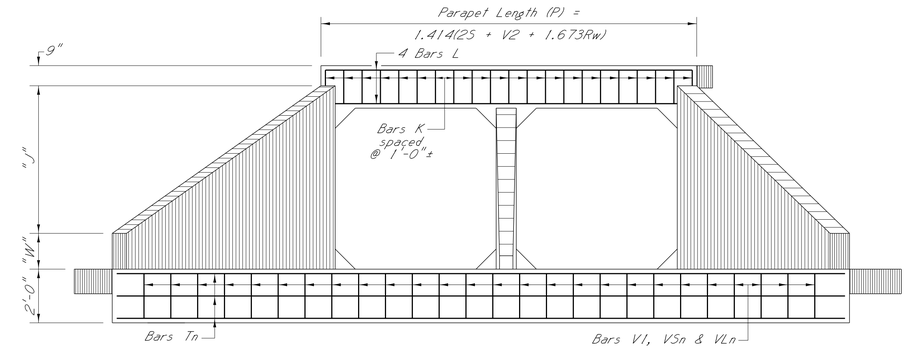


DETAIL "A"



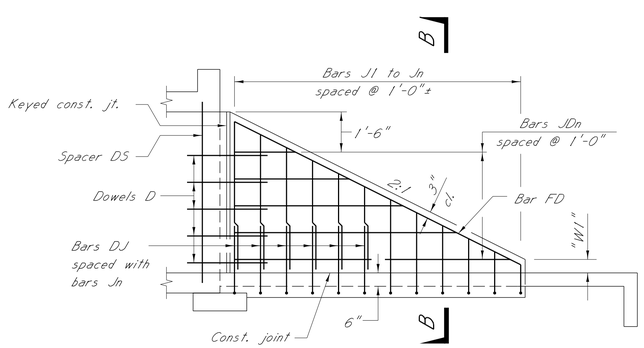
CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

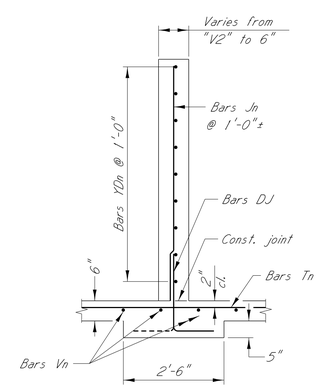


END ELEVATION

Showing reinforcing in pararpet & toe wall



SECTION A-A



SECTION B-B

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
REVISIONS	WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS	
	HEIGHTS 6-12 FT.	SHT. 2 OF 2
	SPANS 12-40 FT.	WORKING NUMBER IWD-2W-45
DATE	DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E. DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.	SHEET NUMBER 7201

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
													6'	8'	10'	12'	14'	16'
6'-0"	5'-6"	11'-0"	22'-0"	0'-0"	0'-11"	11'-0"	0'-11"	0'-9"	3'-0"	2'-0"	0'-6"	11'-0"	37'-9 3/16"+1.414V2	43'-5 7/16"+1.414V2	49'-1 5/16"+1.414V2	54'-9 3/16"+1.414V2	60'-5 1/8"+1.414V2	66'-1"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	15.4538	2009.284	1.2743	177.463	1.1269	67.468	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	15.4538	2009.284	1.2743	177.463	1.1269	67.468	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	15.4538	2009.284	1.2743	177.463	1.1269	67.468	1.9375	740.689
		20'-0"	9"	10 1/2"	9"	9"	1'-4"	15.5670	2009.284	1.2743	177.463	1.1269	67.468	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	15.7962	2020.835	1.2743	177.547	1.1269	67.468	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	15.9490	2028.535	1.2743	177.603	1.1269	67.468	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	17.0076	2135.369	1.2743	177.463	1.4062	84.335	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	17.1470	2135.369	1.2743	177.463	1.4062	84.335	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	17.4876	2151.885	1.2743	177.575	1.4062	84.335	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	17.6579	2160.141	1.2743	177.630	1.4062	84.335	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	17.999	2176.656	1.2743	177.742	1.4062	84.335	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	18.2926	2193.168	1.2743	177.853	1.4062	84.335	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	18.5788	2264.210	1.2743	177.463	1.6856	99.699	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	18.9321	2273.134	1.2743	177.519	1.6856	99.699	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	19.4955	2299.909	1.2743	177.686	1.6856	99.699	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	20.0036	2326.685	1.2743	177.853	1.6856	99.699	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	19.0483	2286.521	1.2743	177.603	1.6856	99.699	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	19.1973	2290.985	1.2743	177.630	1.6856	99.699	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	20.4114	2407.440	1.2743	177.547	1.9649	116.622	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	20.7832	2421.830	1.2743	177.630	1.9649	116.622	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	21.4880	2445.811	1.2743	177.770	1.9649	116.622	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	20.7580	2426.628	1.2743	177.658	1.9649	116.622	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	20.9246	2431.421	1.2743	177.686	1.9649	116.622	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	21.1938	2441.018	1.2743	177.742	1.9649	116.622	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	22.1852	2544.508	1.2743	177.603	2.2443	133.544	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	22.7064	2564.810	1.2743	177.714	2.2501	133.711	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	22.3014	2549.585	1.2743	177.630	2.2617	133.990	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	22.8193	2580.034	1.2743	177.797	2.2443	133.544	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	23.0462	2580.034	1.2743	177.797	2.2559	133.823	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	23.3439	2590.182	1.2743	177.853	2.2559	133.823	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	24.0365	2691.189	1.2743	177.686	2.5353	150.745	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	24.7278	2718.238	1.2743	177.825	2.5411	150.912	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	24.3540	2702.012	1.2743	177.742	2.5236	150.411	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	24.7916	2729.054	1.2743	177.881	2.5236	150.411	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	25.1945	2739.870	1.2743	177.937	2.5236	150.411	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	25.6747	2761.508	1.2743	178.048	2.5236	150.411	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber Type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 2

WORKING NUMBER IWD-6-2W-45

SHEET NUMBER 7202

DATE | DESIGNER William K. McBeath, P.E. | CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. | ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1					1.414(2S+V2)+7'-6 ½"
T2	#4	1	1	1	1	1	1					1.414(2S+V2)+9'-3"
T3	#4	1	1	1	1	1	1					1.414(2S+V2)+10'-11"
T4	#4	1	1	1	1	1	1					1.414(2S+V2)+12'-7"
T5	#4	1	1	1	1	1	1					1.414(2S+V2)+14'-3 ½"
T6	#4	1	1	1	1	1	1					1.414(2S+V2)+15'-11 ½"
T7	#4	1	1	1	1	1	1					1.414(2S+V2)+17'-7 ½"
T8	#4	1	1	1	1	1	1					1.414(2S+V2)+19'-3 ½"
T9	#4	1	1	1	1	1	1					1.414(2S+V2)+21'-0"
T10	#4	1	1	1	1	1	1					1.414(2S+V2)+22'-8"
T11	#4	1	1	1	1	1	1					1.414(2S+V2)+23'-1 ½"
T12	#4	3	3	3	3	3	3					1.414(2S+V2)+20'-0 ½"
V1	#4	18	22	26	30	34	38			15'-1"	1'-8"	16'-9"
VL1	#4	1	1	1	1	1	1			13'-1 ½"	1'-8"	14'-9 ½"
VL2	#4	1	1	1	1	1	1			10'-4 ½"	1'-8"	12'-0 ½"
VL3	#4	1	1	1	1	1	1			7'-8"		7'-8"
VL4	#4	1	1	1	1	1	1			4'-0 ½"		4'-0 ½"
VS1	#4	1	1	1	1	1	1			14'-8 ½"	1'-8"	16'-4 ½"
VS2	#4	1	1	1	1	1	1			12'-8 ½"	1'-8"	14'-4 ½"
VS3	#4	1	1	1	1	1	1			10'-8 ½"	1'-8"	12'-4 ½"
VS4	#4	1	1	1	1	1	1			8'-8 ½"	1'-8"	8'-4 ½"
VS5	#4	1	1	1	1	1	1			6'-8 ½"	1'-8"	6'-4 ½"
VS6	#4	1	1	1	1	1	1			4'-8 ½"	1'-8"	4'-4 ½"
VS7	#4	1	1	1	1	1	1			2'-8 ½"		2'-8 ½"
FTL1	#5	1	1	1	1	1	1					1'-5"
FTL2	#5	1	1	1	1	1	1					1'-11"
FTL3	#5	1	1	1	1	1	1					2'-5 ½"
FTL4	#5	1	1	1	1	1	1					2'-11 ½"
FTL5	#5	17	17	17	17	17	17					5'-5"
FTL6	#5	1	1	1	1	1	1					5'-4 ½"
FTL7	#5	1	1	1	1	1	1					4'-10 ½"
FTL8	#5	1	1	1	1	1	1					4'-4"
FTL9	#5	1	1	1	1	1	1					3'-10"
FTL10	#5	1	1	1	1	1	1					3'-3 ½"
FTL11	#5	1	1	1	1	1	1					2'-9 ½"
FTL12	#5	2	2	2	2	2	2					2'-5"
FLL	#4	7	7	7	7	7	7					21'-4"
FTS	#5	13	13	13	13	13	13					5'-5"
FLS	#4	7	7	7	7	7	7					10'-8"
WS1	#5	1	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
WS2	#5	1	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
WS3	#5	1	1	1	1	1	1				W+3'-11"	W+3'-11"
WS4	#5	1	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
WS5	#5	1	1	1	1	1	1				W+3'-0 ½"	W+3'-0 ½"
WS6	#5	1	1	1	1	1	1				W+2'-7"	W+2'-7"
WS7	#5	1	1	1	1	1	1				W+2'-1 ½"	W+2'-1 ½"
WS8	#5	1	1	1	1	1	1				W+1'-8 ½"	W+1'-8 ½"
WS9	#5	1	1	1	1	1	1			1'-6"	W+2'-3"	W+3'-9"
WS10	#5	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
WS11	#5	1	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
WS12	#5	1	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WS13	#5	1	1	1	1	1	1			1'-6"	W+0'-5 ½""	W+1'-11 ½"
DWS	#5	8	8	8	8	8	8			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1				W+4'-10 ½"	W+4'-10 ½"
WL2	#5	1	1	1	1	1	1				W+4'-7 ½"	W+4'-7 ½"
WL3	#5	1	1	1	1	1	1				W+4'-5"	W+4'-5"
WL4	#5	1	1	1	1	1	1				W+4'-2 ½"	W+4'-2 ½"
WL5	#5	1	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
WL6	#5	1	1	1	1	1	1				W+3'-9"	W+3'-9"
WL7	#5	1	1	1	1	1	1				W+3'-6"	W+3'-6"
WL8	#5	1	1	1	1	1	1				W+3'-3 ½"	W+3'-3 ½"
WL9	#5	1	1	1	1	1	1				W+3'-0 ½"	W+3'-0 ½"
WL10	#5	1	1	1	1	1	1				W+2'-10"	W+2'-10"
WL11	#5	1	1	1	1	1	1				W+2'-7 ½"	W+2'-7 ½"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WL12	#5	1	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
WL13	#5	1	1	1	1	1	1				W+2'-2"	W+2'-2"
WL14	#5	1	1	1	1	1	1				W+1'-11"	W+1'-11"
WL15	#5	1	1	1	1	1	1				W+1'-8 ½"	W+1'-8 ½"
WL16	#5	1	1	1	1	1	1				W+1'-6"	W+1'-6"
WL17	#5	1	1	1	1	1	1			1'-6"	W+2'-3"	W+3'-9"
WL18	#5	1	1	1	1	1	1			1'-6"	W+2'-0"	W+3'-6"
WL19	#5	1	1	1	1	1	1			1'-6"	W+1'-9 ½"	W+3'-3 ½"
WL20	#5	1	1	1	1	1	1			1'-6"	W+1'-7"	W+3'-1"
WL21	#5	1	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
WL22	#5	1	1	1	1	1	1			1'-6"	W+1'-1 ½"	W+2'-7 ½"
WL23	#5	1	1	1	1	1	1			1'-6"	W+0'-10 ½"	W+2'-4 ½"
WL24	#5	1	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
WL25	#5	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	16	16	16	16	16	16			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
RS2	#4	1	1	1	1	1	1				W+4'-4"	W+4'-4"
RS3	#4	1	1	1	1	1	1				W+3'-10"	W+3'-10"
RS4	#4	1	1	1	1	1	1				W+3'-4"	W+3'-4"
RS5	#4	1	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
RS6	#4	1	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"
RS7	#4	1	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
RS8	#4	1	1	1	1	1	1				W+1'-5"	W+1'-5"
RS9	#4	1	1	1	1	1	1			1'-6"	W+1'-11"	W+3'-5"
RS10	#4	1	1	1	1	1	1			1'-6"	W+1'-5"	W+2'-11"
RS11	#4	1	1	1	1	1	1			1'-6"	W+0'-11 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	8	8	8	8	8	8			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1				W+4'-10 ½"	W+4'-10 ½"
RL2	#4	1	1	1	1	1	1				W+4'-7 ½"	W+4'-7 ½"
RL3	#4	1	1	1	1	1	1				W+4'-4 ½"	W+4'-4 ½"
RL4	#4	1	1	1	1	1	1				W+4'-1 ½"	W+4'-1 ½"
RL5	#4	1	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
RL6	#4	1	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
RL7	#4	1	1	1	1	1	1				W+3'-4 ½"	W+3'-4 ½"
RL8	#4	1	1	1	1	1	1				W+3'-1 ½"	W+3'-1 ½"
RL9	#4	1	1	1	1	1	1				W+2'-11"	W+2'-11"
RL10	#4	1	1	1	1	1	1				W+2'-8"	W+2'-8"
RL11	#4	1	1	1	1	1	1				W+2'-5"	W+2'-5"
RL12	#4	1	1	1	1	1	1				W+2'-2"	W+2'-2"
RL13	#4	1	1	1	1	1	1				W+1'-11"	W+1'-11"
RL14	#4	1	1	1	1	1	1				W+1'-8"	W+1'-8"
RL15	#4	1	1	1	1	1	1				W+1'-5"	W+1'-5"
RL16	#4	1	1	1	1	1	1				W+1'-2"	W+1'-2"
RL17	#4	1	1	1	1	1	1			1'-6"	W+1'-11"	W+3'-5"
RL18	#4	1	1	1	1	1	1			1'-6"	W+1'-8"	W+3'-2"
RL19	#4	1	1	1	1	1	1			1'-6"	W+1'-5"	W+2'-11"
RL20	#4	1	1	1	1	1	1			1'-6"	W+1'-2"	W+2'-8"
RL21	#4	1	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
RL22	#4	1	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
RL23	#4	1	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	16	16	16	16	16	16			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2					2'-9 ½"
YS2	#4	2	2	2	2	2	2					4'-9 ½"
YS3	#4	2	2	2	2	2	2					6'-9 ½"
YS4	#4	2	2	2	2	2	2					8'-9 ½"
YS5	#4	6	6	6	6	6	6					10'-8"
YL1	#4	2	2	2	2	2	2					5'-9 ½"
YL2	#4	2	2	2	2	2	2					9'-9 ½"
YL3	#4	2	2	2	2	2	2					13'-9 ½"
YL4	#4	2	2	2	2	2	2					17'-9 ½"
YL5	#4	6	6	6	6	6	6					21'-8"
FS	#4	2	2	2	2	2	2					11'-11"
FL	#4	2	2	2	2	2	2					22'-4"

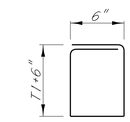
HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

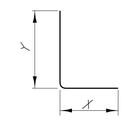
BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
N	#4	24	30	35	41	47	53			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	21	26	32	38	43	49			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					1.414(2S+V2)+1'-5"
OS	#7	8	8	8	8	8	8			3'-4 ½"	3'-4 ½"	6'-9"
OL	#7	8	8	8	8	8	8			3'-4 ½"	3'-4 ½"	6'-9"
OSS	#4	1	1	1	1	1	1					6'-0"+T1
OSL	#4	1	1	1	1	1	1					6'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			6'-1"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J2	#5	1		W1+4'-8"	W1+4'-8"
J3	#5	1		W1+4'-2"	W1+4'-2"
J4	#5	1		W1+3'-8"	W1+3'-8"
J5	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J6	#5	1		W1+2'-8 ½"	W1+2'-8 ½"
J7	#5	1	1'-0"	W1+2'-11 ½"	W1+3'-11 ½"
J8	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J9	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J10	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J11	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J12	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	6	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
FD	#4	1			11'-11"



BARS K - #4



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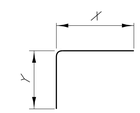

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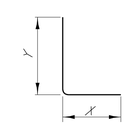

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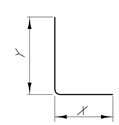

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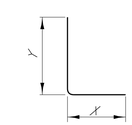

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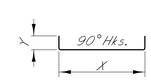

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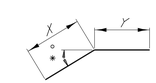


DOWELS OS/OL - #7
* See plan of apron

BAR BENDING DETAILS
Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-6-2W-45

SHEET NUMBER 7203

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, Ent. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													8'	10'	12'	14'	16'
8'-0"	7'-1"	14'-2"	28'-4"	0'-0"	0'-11"	14'-2"	0'-11"	0'-9"	3'-0"	2'-3"	0'-6"	15'-0"	48'-11 1/4"+1.414V2	54'-7 1/8"+1.414V2	60'-3 1/16"+1.414V2	65'-10 15/16"+1.414V2	71'-6 13/16"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	23.9690	3181.485	2.0976	279.268	1.4062	84.335	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	24.1084	3181.485	2.0976	279.268	1.4062	84.335	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	24.4931	3203.696	2.0976	279.380	1.4062	84.335	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	24.6853	3214.799	2.0976	279.435	1.4062	84.335	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	25.0736	3237.010	2.0976	279.547	1.4120	84.502	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5 1/2"	10 1/2"	9"	2'-3 1/2"	25.3733	3253.668	2.0976	279.630	1.4237	84.836	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	25.9736	3333.705	2.0976	279.268	1.6856	101.258	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	26.3435	3351.365	2.0976	279.352	1.6856	101.258	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	26.8678	3380.795	2.0976	279.491	1.6856	101.258	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	27.4419	3416.114	2.0976	279.658	1.6856	101.258	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	26.4938	3369.024	2.0976	279.435	1.6914	101.425	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	26.8172	3386.683	2.0976	279.519	1.7089	101.926	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	28.1157	3504.587	2.0976	279.352	1.9649	118.180	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	28.4566	3523.248	2.0976	279.435	1.9649	118.180	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	29.3300	3560.571	2.0976	279.602	1.9649	118.180	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	28.5775	3536.411	2.1572	279.491	1.9737	118.403	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	28.8500	3548.132	2.0976	279.547	1.9708	118.347	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	29.1593	3560.571	2.0976	279.602	1.9940	118.960	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	30.2929	3674.272	2.0976	279.435	2.2443	133.544	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	30.8052	3693.768	2.0976	279.519	2.2443	133.544	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	30.4648	3687.268	2.0976	279.491	2.2443	133.544	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	30.9676	3713.265	2.0976	279.602	2.2676	134.157	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	31.3695	3726.260	2.0976	279.658	2.2734	134.324	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	31.7000	3739.262	2.0976	279.714	2.2792	134.491	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	32.4572	3842.132	2.0976	279.491	2.5295	152.137	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	33.2832	3876.300	2.0976	279.630	2.5353	152.304	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	32.7786	3862.630	2.0976	279.575	2.5469	152.638	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	33.4532	3896.799	2.0976	279.714	2.5585	152.916	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	34.0022	3924.126	2.0976	279.825	2.5702	153.250	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	34.5031	3939.493	2.2171	279.881	2.5876	153.751	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-8-2W-45

SHEET NUMBER 7204

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.414(2S+V2)+8'-3 1/2"
T2	#4	1	1	1	1	1					1.414(2S+V2)+10'-0"
T3	#4	1	1	1	1	1					1.414(2S+V2)+11'-8 1/2"
T4	#4	1	1	1	1	1					1.414(2S+V2)+13'-5"
T5	#4	1	1	1	1	1					1.414(2S+V2)+15'-1 1/2"
T6	#4	1	1	1	1	1					1.414(2S+V2)+16'-10"
T7	#4	1	1	1	1	1					1.414(2S+V2)+18'-6 1/2"
T8	#4	1	1	1	1	1					1.414(2S+V2)+20'-3 1/2"
T9	#4	1	1	1	1	1					1.414(2S+V2)+22'-0"
T10	#4	1	1	1	1	1					1.414(2S+V2)+23'-8 1/2"
T11	#4	1	1	1	1	1					1.414(2S+V2)+25'-5"
T12	#4	1	1	1	1	1					1.414(2S+V2)+27'-1 1/2"
T13	#4	1	1	1	1	1					1.414(2S+V2)+28'-10"
T14	#4	1	1	1	1	1					1.414(2S+V2)+28'-10"
T15	#4	3	3	3	3	3					1.414(2S+V2)+25'-6"
V1	#4	22	26	30	34	38			19'-7"	1'-8"	21'-3"
VL1	#4	1	1	1	1	1			18'-6 1/2"	1'-8"	20'-2 1/2"
VL2	#4	1	1	1	1	1			15'-10"	1'-8"	17'-6"
VL3	#4	1	1	1	1	1			13'-1"	1'-8"	14'-9"
VL4	#4	1	1	1	1	1			10'-4 1/2"	1'-8"	12'-0 1/2"
VL5	#4	1	1	1	1	1			7'-7 1/2"		7'-7 1/2"
VL6	#4	1	1	1	1	1			3'-7 1/2"		3'-7 1/2"
VS1	#4	1	1	1	1	1			19'-6 1/2"	1'-8"	21'-2 1/2"
VS2	#4	1	1	1	1	1			17'-6 1/2"	1'-8"	19'-2 1/2"
VS3	#4	1	1	1	1	1			15'-6 1/2"	1'-8"	17'-2 1/2"
VS4	#4	1	1	1	1	1			13'-6 1/2"	1'-8"	15'-2 1/2"
VS5	#4	1	1	1	1	1			11'-6 1/2"	1'-8"	13'-2 1/2"
VS6	#4	1	1	1	1	1			9'-6 1/2"	1'-8"	11'-2 1/2"
VS7	#4	1	1	1	1	1			7'-6 1/2"	1'-8"	9'-2 1/2"
VS8	#4	1	1	1	1	1			5'-6 1/2"	1'-8"	7'-2 1/2"
VS9	#4	1	1	1	1	1			3'-6 1/2"	1'-8"	5'-2 1/2"
VS10	#4	1	1	1	1	1			1'-6 1/2"		1'-6 1/2"
FTL1	#5	1	1	1	1	1					1'-2"
FTL2	#5	1	1	1	1	1					1'-7"
FTL3	#5	1	1	1	1	1					1'-11 1/2"
FTL4	#5	1	1	1	1	1					2'-4"
FTL5	#5	1	1	1	1	1					2'-8 1/2"
FTL6	#5	1	1	1	1	1					3'-1"
FTL7	#5	33	33	33	33	33					5'-8"
FTL8	#5	1	1	1	1	1					5'-5 1/2"
FTL9	#5	1	1	1	1	1					5'-1"
FTL10	#5	1	1	1	1	1					4'-8"
FTL11	#5	1	1	1	1	1					4'-3 1/2"
FTL12	#5	1	1	1	1	1					3'-11"
FTL13	#5	1	1	1	1	1					3'-6 1/2"
FTL14	#5	1	1	1	1	1					3'-1 1/2"
FTL15	#5	1	1	1	1	1					2'-9"
FTL16	#5	2	2	2	2	2					2'-8"
FLL	#4	7	7	7	7	7					27'-8"
FTS	#5	22	22	22	22	22					5'-8"
FLS	#4	7	7	7	7	7					13'-10"
WS1	#5	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
WS2	#5	1	1	1	1	1				W+6'-0 1/2"	W+6'-0 1/2"
WS3	#5	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
WS4	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WS5	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WS6	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WS7	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WS8	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WS9	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WS10	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS11	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS12	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WS13	#5	1	1	1	1	1				W+2'-5"	W+2'-5"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WS14	#5	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
WS15	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WS16	#5	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
WS17	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WS18	#5	1	1	1	1	1			1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WS19	#5	1	1	1	1	1			1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
WS20	#5	1	1	1	1	1			1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WS21	#5	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WS22	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	17	17	17	17	17			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
WL2	#5	1	1	1	1	1				W+6'-3 1/2"	W+6'-3 1/2"
WL3	#5	1	1	1	1	1				W+6'-1 1/2"	W+6'-1 1/2"
WL4	#5	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
WL5	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WL6	#5	1	1	1	1	1				W+5'-7 1/2"	W+5'-7 1/2"
WL7	#5	1	1	1	1	1				W+5'-5 1/2"	W+5'-5 1/2"
WL8	#5	1	1	1	1	1				W+5'-3 1/2"	W+5'-3 1/2"
WL9	#5	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
WL10	#5	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
WL11	#5	1	1	1	1	1				W+4'-9 1/2"	W+4'-9 1/2"
WL12	#5	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
WL13	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WL14	#5	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
WL15	#5	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
WL16	#5	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
WL17	#5	1	1	1	1	1				W+3'-9 1/2"	W+3'-9 1/2"
WL18	#5	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
WL19	#5	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WL20	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
WL21	#5	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
WL22	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL23	#5	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
WL24	#5	1	1	1	1	1				W+2'-7 1/2"	W+2'-7 1/2"
WL25	#5	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
WL26	#5	1	1	1	1	1				W+2'-3 1/2"	W+2'-3 1/2"
WL27	#5	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
WL28	#5	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
WL29	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WL30	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL31	#5	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
WL32	#5	1	1	1	1	1				W+1'-3 1/2"	W+1'-3 1/2"
WL33	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WL34	#5	1	1	1	1	1			1'-6"	W+1'-11 1/2"	W+3'-5 1/2"
WL35	#5	1	1	1	1	1			1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WL36	#5	1	1	1	1	1			1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WL37	#5	1	1	1	1	1			1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
WL38	#5	1	1	1	1	1			1'-6"	W+1'-3 1/2"	W+2'-9 1/2"
WL39	#5	1	1	1	1	1			1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
WL40	#5	1	1	1	1	1			1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
WL41	#5	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WL42	#5	1	1	1	1	1			1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WL43	#5	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWL	#5	33	33	33	33	33			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
RS2	#4	1	1	1	1	1				W+5'-10 1/2"	W+5'-10 1/2"
RS3	#4	1	1	1	1	1				W+5'-5"	W+5'-5"
RS4	#4	1	1	1	1	1				W+4'-11"	W+4'-11"
RS5	#4	1	1	1	1	1				W+4'-5"	W+4'-5"
RS6	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RS7	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS8	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RS9	#4	1	1	1	1	1				W+2'-5"	W+2'-5"
RS10	#4	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
RS11	#4	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
RS12	#4	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
RS13	#4	1	1	1	1	1			1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RS14	#4	1	1	1	1	1			1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RS15	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	12	12	12	12	12			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
RL2	#4	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
RL3	#4	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
RL4	#4	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
RL5	#4	1	1	1	1	1				W+5'-5 1/2"	W+5'-5 1/2"
RL6	#4	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
RL7	#4	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
RL8	#4	1	1	1	1	1				W+4'-8 1/2"	W+4'-8 1/2"
RL9	#4	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
RL10	#4	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
RL11	#4	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
RL12	#4	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
RL13	#4	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
RL14	#4	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
RL15	#4	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
RL16	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RL17	#4	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
RL18	#4	1	1	1	1	1				W+2'-2 1/2"	W+2'-2 1/2"
RL19	#4	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
RL20	#4	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
RL21	#4	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
RL22	#4	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
RL23	#4	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
RL24	#4	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
RL25	#4	1	1	1	1	1			1'-6"	W+1'-5 1/2"	W+2'-11 1/2"
RL26	#4	1	1	1	1	1			1'-6"	W+1'-2 1/2"	W+2'-8 1/2"
RL27	#4	1	1	1	1	1			1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL28	#4	1	1	1	1	1			1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
RL29	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRL	#4	24	24	24	24	24			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-9 1/2"
YS2	#4	2	2	2	2	2					4'-9 1/2"
YS3	#4	2	2	2	2	2					6'-9 1/2"
YS4	#4	2	2	2	2	2					8'-9 1/2"
YS5	#4	2	2	2	2	2					10'-9 1/2"
YS6	#4	2	2	2	2	2					12'-9 1/2"
YS7	#4	6	6	6	6	6					13'-10"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-8-2W-45

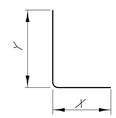
SHEET NUMBER 7205

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.											
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB											
BAR	SIZE	NO. REQUIRED							DIM. X	DIM. Y	LENGTH
		SPAN									
		8'	10'	12'	14'	16'					
YL1	#4	2	2	2	2	2					5'-9 ½"
YL2	#4	2	2	2	2	2					9'-9 ½"
YL3	#4	2	2	2	2	2					13'-9 ½"
YL4	#4	2	2	2	2	2					17'-9 ½"
YL5	#4	2	2	2	2	2					21'-9 ½"
YL6	#4	2	2	2	2	2					25'-9 ½"
YL7	#4	6	6	6	6	6					28'-0"
FS	#4	2	2	2	2	2					15'-5 ½"
FL	#4	2	2	2	2	2					28'-10 ½"
N	#4	30	36	42	47	54			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	26	32	38	43	49			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.414(2S+V2)+1'-5"
OS	#7	10	10	10	10	10			3'-4 ½"	3'-4 ½"	6'-9"
OL	#7	10	10	10	10	10			3'-4 ½"	3'-4 ½"	6'-9"
OSS	#4	1	1	1	1	1					8'-0"+T1
OSL	#4	1	1	1	1	1					8'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			6'-2"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+7'-1 ½"	W1+7'-1 ½"
J2	#5	1		W1+6'-8"	W1+6'-8"
J3	#5	1		W1+6'-2"	W1+6'-2"
J4	#5	1		W1+5'-8"	W1+5'-8"
J5	#5	1		W1+5'-2"	W1+5'-2"
J6	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J7	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J8	#5	1		W1+3'-8 ½"	W1+3'-8 ½"
J9	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J10	#5	1		W1+2'-9"	W1+2'-9"
J11	#5	1	1'-0"	W1+3'-0"	W1+4'-0"
J12	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J13	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J14	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J15	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J16	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	10	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
FD	#4	1			16'-5"



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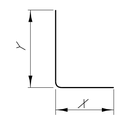

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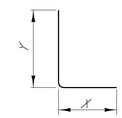

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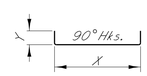
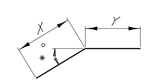
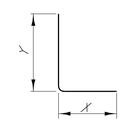


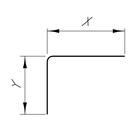
BARS N - #4



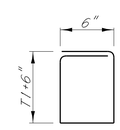
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

DATE	REVISIONS	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS
			HEIGHT 8 FT. — SHT. 3 OF 3
			SPANS 16-32 FT. — WORKING NUMBER IWD-8-2W-45
			DESIGNER William K. McBeath, P.E. — CHECKER B. Keith Carr P.E. DETAILER Wesley Phillips, E.I. — ISSUE DATE 01/01/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.
			SHEET NUMBER 7206

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													10'	12'	14'	16'	18'
10'-0"	8'-1"	16'-2"	33'-4"	0'-0"	1'-1 1/2"	16'-2"	0'-11"	0'-11"	4'-0"	2'-6"	0'-6"	19'-0"	58'-5 7/16"+1.414V2	64'-1 5/16"+1.414V2	69'-9 1/4"+1.414V2	75'-5 1/8"+1.414V2	81'-1"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwalls and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 1/2"	9"	9"	2'-9"	35.3860	4531.158	3.1061	401.817	1.6856	101.258	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	35.7424	4545.113	3.1061	401.872	1.6856	101.258	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	36.3815	4586.983	3.1061	402.039	1.6972	101.592	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	37.0186	4621.877	3.1061	402.179	1.7147	102.037	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	36.3385	4586.983	3.1061	402.039	1.7263	102.371	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	36.7301	4607.918	3.1061	402.123	1.7438	102.816	5.5679	1331.546
240	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	37.8584	4717.507	3.1061	401.900	1.9649	118.180	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	38.3191	4739.276	3.1061	401.984	1.9649	118.180	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	39.0538	4775.558	3.1061	402.123	1.9766	118.514	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	38.6083	4768.305	3.1061	402.095	1.9940	118.960	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	38.9497	4782.816	3.1061	402.151	2.0057	119.294	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	39.3714	4804.586	3.1061	402.234	2.0231	119.739	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	40.2394	4908.475	3.1061	401.984	2.2443	135.103	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	40.8763	4938.840	3.1061	402.095	2.2443	135.103	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	40.4528	4923.654	3.1061	402.039	2.2559	135.381	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	41.1737	4961.612	3.1061	402.179	2.2734	135.882	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	41.7683	4991.970	3.1061	402.290	2.2967	136.495	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	42.1409	5007.155	3.1061	402.346	2.3025	136.662	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	42.6508	5093.605	3.1061	402.039	2.5295	152.137	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	43.4877	5133.232	3.1061	402.179	2.5353	152.304	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	43.0289	5117.378	3.1061	402.123	2.5469	152.638	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	43.9485	5164.926	3.1061	402.290	2.5585	152.916	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	44.5875	5196.627	3.1061	402.401	2.5818	153.584	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	45.3817	5225.717	3.6538	402.485	2.6109	154.364	7.5679	1842.884
360	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	45.1707	5377.998	3.1061	402.123	2.8204	169.394	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	46.2258	5427.216	3.1061	402.290	2.8263	169.561	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	45.8235	5410.813	3.1061	402.234	2.8379	169.839	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	46.6423	5451.825	3.1061	402.373	2.8495	170.173	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	47.1691	5468.236	3.1061	402.429	2.8612	170.507	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	48.2574	5514.731	3.6538	402.568	2.8961	171.453	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications "For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-10-2W-45

SHEET NUMBER 7207

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.414(2S+V2)+9'-5 ½"
T2	#4	1	1	1	1	1					1.414(2S+V2)+11'-2"
T3	#4	1	1	1	1	1					1.414(2S+V2)+12'-11"
T4	#4	1	1	1	1	1					1.414(2S+V2)+14'-7 ½"
T5	#4	1	1	1	1	1					1.414(2S+V2)+16'-4"
T6	#4	1	1	1	1	1					1.414(2S+V2)+18'-0 ½"
T7	#4	1	1	1	1	1					1.414(2S+V2)+19'-9"
T8	#4	1	1	1	1	1					1.414(2S+V2)+21'-5 ½"
T9	#4	1	1	1	1	1					1.414(2S+V2)+23'-2"
T10	#4	1	1	1	1	1					1.414(2S+V2)+24'-10 ½"
T11	#4	1	1	1	1	1					1.414(2S+V2)+26'-7 ½"
T12	#4	1	1	1	1	1					1.414(2S+V2)+28'-4"
T13	#4	1	1	1	1	1					1.414(2S+V2)+30'-0 ½"
T14	#4	1	1	1	1	1					1.414(2S+V2)+31'-9"
T15	#4	1	1	1	1	1					1.414(2S+V2)+33'-6 ½"
T16	#4	1	1	1	1	1					1.414(2S+V2)+33'-0"
T17	#4	3	3	3	3	3					1.414(2S+V2)+29'-4 ½"
V1	#4	28	32	36	40	44			22'-4 ½"	1'-8"	24'-0 ½"
VL1	#4	1	1	1	1	1			20'-0 ½"	1'-8"	21'-8 ½"
VL2	#4	1	1	1	1	1			17'-4"	1'-8"	19'-0"
VL3	#4	1	1	1	1	1			14'-7"	1'-8"	16'-3"
VL4	#4	1	1	1	1	1			11'-10 ½"	1'-8"	13'-6 ½"
VL5	#4	1	1	1	1	1			9'-1 ½"		9'-1 ½"
VL6	#4	1	1	1	1	1			5'-4 ½"		5'-4 ½"
VL7	#4	1	1	1	1	1			1'-4 ½"		1'-4 ½"
VS1	#4	1	1	1	1	1			20'-11 ½"	1'-8"	22'-7 ½"
VS2	#4	1	1	1	1	1			18'-11 ½"	1'-8"	20'-7 ½"
VS3	#4	1	1	1	1	1			16'-11 ½"	1'-8"	18'-7 ½"
VS4	#4	1	1	1	1	1			14'-11 ½"	1'-8"	16'-7 ½"
VS5	#4	1	1	1	1	1			12'-11 ½"	1'-8"	14'-7 ½"
VS6	#4	1	1	1	1	1			10'-11 ½"	1'-8"	12'-7 ½"
VS7	#4	1	1	1	1	1			8'-11 ½"	1'-8"	10'-7 ½"
VS8	#4	1	1	1	1	1			6'-11 ½"	1'-8"	8'-7 ½"
VS9	#4	1	1	1	1	1			4'-11 ½"	1'-8"	6'-7 ½"
VS10	#4	1	1	1	1	1			2'-11 ½"		2'-11 ½"
FTL1	#5	1	1	1	1	1					1'-3 ½"
FTL2	#5	1	1	1	1	1					1'-7 ½"
FTL3	#5	1	1	1	1	1					1'-11 ½"
FTL4	#5	1	1	1	1	1					2'-3 ½"
FTL5	#5	1	1	1	1	1					2'-7 ½"
FTL6	#5	1	1	1	1	1					2'-11 ½"
FTL7	#5	1	1	1	1	1					3'-3 ½"
FTL8	#5	1	1	1	1	1					3'-8"
FTL9	#5	1	1	1	1	1					4'-0"
FTL10	#5	1	1	1	1	1					4'-4"
FTL11	#5	41	41	41	41	41					7'-1"
FTL12	#5	1	1	1	1	1					6'-11 ½"
FTL13	#5	1	1	1	1	1					6'-7"
FTL14	#5	1	1	1	1	1					6'-3"
FTL15	#5	1	1	1	1	1					5'-11"
FTL16	#5	1	1	1	1	1					5'-7"
FTL17	#5	1	1	1	1	1					5'-3"
FTL18	#5	1	1	1	1	1					4'-11"
FTL19	#5	1	1	1	1	1					4'-7"
FTL20	#5	1	1	1	1	1					4'-3"
FTL21	#5	1	1	1	1	1					3'-11"
FTL22	#5	1	1	1	1	1					3'-7"
FTL23	#5	1	1	1	1	1					3'-3"
FTL24	#5	3	3	3	3	3					3'-1"
FLL	#4	9	9	9	9	9					31'-8"
FTS	#5	29	29	29	29	29					7'-1"
FLS	#4	9	9	9	9	9					15'-10"
WS1	#5	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
WS2	#5	1	1	1	1	1				W+7'-1 ½"	W+7'-1 ½"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WS3	#5	1	1	1	1	1				W+6'-10"	W+6'-10"
WS4	#5	1	1	1	1	1				W+6'-6 ½"	W+6'-6 ½"
WS5	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WS6	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WS7	#5	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
WS8	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WS9	#5	1	1	1	1	1				W+5'-1 ½"	W+5'-1 ½"
WS10	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WS11	#5	1	1	1	1	1				W+4'-6 ½"	W+4'-6 ½"
WS12	#5	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
WS13	#5	1	1	1	1	1				W+4'-0"	W+4'-0"
WS14	#5	1	1	1	1	1				W+3'-8 ½"	W+3'-8 ½"
WS15	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS16	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WS17	#5	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
WS18	#5	1	1	1	1	1				W+2'-7"	W+2'-7"
WS19	#5	1	1	1	1	1				W+2'-3 ½"	W+2'-3 ½"
WS20	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WS21	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WS22	#5	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WS23	#5	1	1	1	1	1				W+1'-2"	W+1'-2"
WS24	#5	1	1	1	1	1				W+0'-10 ½"	W+0'-10 ½"
WS25	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WS26	#5	1	1	1	1	1				W+0'-4"	W+0'-4"
WS27	#5	1	1	1	1	1				W+0'-0 ½"	W+0'-0 ½"
WS28	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WS29	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	27	27	27	27	27			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+7'-5 ½"	W+7'-5 ½"
WL2	#5	1	1	1	1	1				W+7'-3 ½"	W+7'-3 ½"
WL3	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WL4	#5	1	1	1	1	1				W+7'-0"	W+7'-0"
WL5	#5	1	1	1	1	1				W+6'-10 ½"	W+6'-10 ½"
WL6	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WL7	#5	1	1	1	1	1				W+6'-7"	W+6'-7"
WL8	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL9	#5	1	1	1	1	1				W+6'-3 ½"	W+6'-3 ½"
WL10	#5	1	1	1	1	1				W+6'-1 ½"	W+6'-1 ½"
WL11	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL12	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WL13	#5	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
WL14	#5	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
WL15	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL16	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WL17	#5	1	1	1	1	1				W+5'-1 ½"	W+5'-1 ½"
WL18	#5	1	1	1	1	1				W+4'-11 ½"	W+4'-11 ½"
WL19	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL20	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WL21	#5	1	1	1	1	1				W+4'-6 ½"	W+4'-6 ½"
WL22	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WL23	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WL24	#5	1	1	1	1	1				W+4'-1 ½"	W+4'-1 ½"
WL25	#5	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
WL26	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL27	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL28	#5	1	1	1	1	1				W+3'-6 ½"	W+3'-6 ½"
WL29	#5	1	1	1	1	1				W+3'-4 ½"	W+3'-4 ½"
WL30	#5	1	1	1	1	1				W+3'-3"	W+3'-3'
WL31	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WL32	#5	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
WL33	#5	1	1	1	1	1				W+2'-9 ½"	W+2'-9 ½"
WL34	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL35	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WL36	#5	1	1	1	1	1				W+2'-4 ½"	W+2'-4 ½"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WL37	#5	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
WL38	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL39	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WL40	#5	1	1	1	1	1				W+1'-9 ½"	W+1'-9 ½"
WL41	#5	1	1	1	1	1				W+1'-7 ½"	W+1'-7 ½"
WL42	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL43	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL44	#5	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
WL45	#5	1	1	1	1	1				W+1'-0 ½"	W+1'-0 ½"
WL46	#5	1	1	1	1	1				W+0'-11"	W+0'-11"
WL47	#5	1	1	1	1	1				W+0'-9"	W+0'-9"
WL48	#5	1	1	1	1	1				W+0'-7 ½"	W+0'-7 ½"
WL49	#5	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
WL50	#5	1	1	1	1	1				W+0'-4"	W+0'-4"
WL51	#5	1	1	1	1	1				W+0'-2"	W+0'-2"
WL52	#5	1	1	1	1	1				W+0'-0 ½"	W+0'-0 ½"
WL53	#5	1	1	1	1	1			1'-6"	W+0'-10 ½"	W+2'-4 ½"
WL54	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WL55	#5	1	1	1	1	1			1'-6"	W+0'-7"	W+2'-1"
WL56	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWL	#5	52	52	52	52	52			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
RS2	#4	1	1	1	1	1				W+6'-10 ½"	W+6'-10 ½"
RS3	#4	1	1	1	1	1				W+6'-5"	W+6'-5"
RS4	#4	1	1	1	1	1				W+5'-11"	W+5'-11"
RS5	#4	1	1	1	1	1				W+5'-5"	W+5'-5"
RS6	#4	1	1	1	1	1				W+4'-11"	W+4'-11"
RS7	#4	1	1	1	1	1				W+4'-5"	W+4'-5"
RS8	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RS9	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS10	#4	1	1	1	1	1				W+2'-11"	W+2'-11"
RS11	#4	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
RS12	#4	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
RS13	#4	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
RS14	#4	1	1	1	1	1				W+0'-11 ½"	W+0'-11 ½"
RS15	#4	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
RS16	#4	1	1	1	1	1				W-0'-0 ½"	W-0'-0 ½"
RS17	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRS	#4	16	16	16	16	16			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+7'-5 ½"	W+7'-5 ½"
RL2	#4	1	1	1	1	1				W+7'-2 ½"	W+7'-2 ½"
RL3	#4	1	1	1	1	1				W+6'-11 ½"	W+6'-11 ½"
RL4	#4	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
RL5	#4	1	1	1	1	1				W+6'-5 ½"	W+6'-5 ½"
RL6	#4	1	1	1	1	1				W+6'-2 ½"	W+6'-2 ½"
RL7	#4	1	1	1	1	1				W+5'-11 ½"	W+5'-11 ½"
RL8	#4	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
RL9	#4	1	1	1	1	1				W+5'-5 ½"	W+5'-5 ½"
RL10	#4	1	1	1	1	1				W+5'-2 ½"	W+5'-2 ½"
RL11	#4	1	1	1	1	1				W+4'-11 ½"	W+4'-11 ½"
RL12	#4	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-10-2W-45

SHEET NUMBER 7208

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

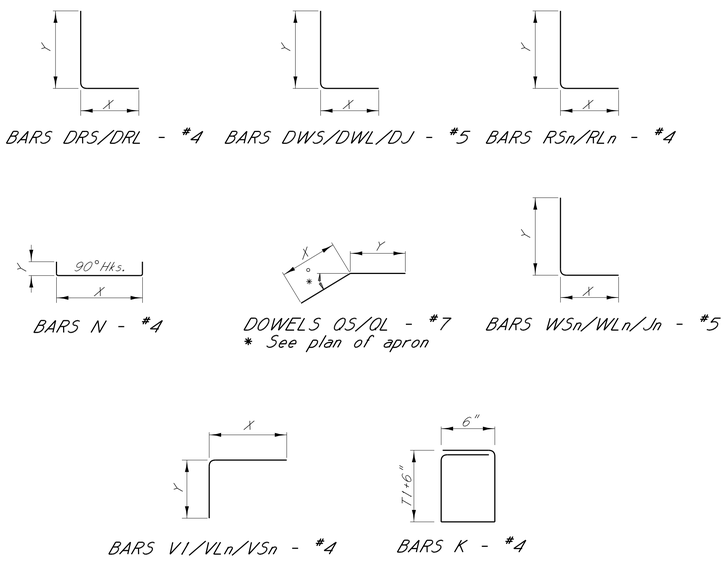
HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RL13	#4	1	1	1	1	1				W+4'-5 ½"	W+4'-5 ½"
RL14	#4	1	1	1	1	1				W+4'-2 ½"	W+4'-2 ½"
RL15	#4	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
RL16	#4	1	1	1	1	1				W+3'-8 ½"	W+3'-8 ½"
RL17	#4	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
RL18	#4	1	1	1	1	1				W+3'-2 ½"	W+3'-2 ½"
RL19	#4	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
RL20	#4	1	1	1	1	1				W+2'-8 ½"	W+2'-8 ½"
RL21	#4	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
RL22	#4	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
RL23	#4	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
RL24	#4	1	1	1	1	1				W+1'-8 ½"	W+1'-8 ½"
RL25	#4	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
RL26	#4	1	1	1	1	1				W+1'-2 ½"	W+1'-2 ½"
RL27	#4	1	1	1	1	1				W+0'-11 ½"	W+0'-11 ½"
RL28	#4	1	1	1	1	1				W+0'-8 ½"	W+0'-8 ½"
RL29	#4	1	1	1	1	1				W+0'-5 ½"	W+0'-5 ½"
RL30	#4	1	1	1	1	1				W+0'-2 ½"	W+0'-2 ½"
RL31	#4	1	1	1	1	1				W-0'-0 ½"	W-0'-0 ½"
RL32	#4	1	1	1	1	1				W-0'-3 ½"	W-0'-3 ½"
RL33	#4	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DRL	#4	32	32	32	32	32			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-9 ½"
YS2	#4	2	2	2	2	2					4'-9 ½"
YS3	#4	2	2	2	2	2					6'-9 ½"
YS4	#4	2	2	2	2	2					8'-9 ½"
YS5	#4	2	2	2	2	2					10'-9 ½"
YS6	#4	2	2	2	2	2					12'-9 ½"
YS7	#4	2	2	2	2	2					14'-9 ½"
YS8	#4	8	8	8	8	10					15'-10"
YL1	#4	2	2	2	2	2					5'-9 ½"
YL2	#4	2	2	2	2	2					9'-9 ½"
YL3	#4	2	2	2	2	2					13'-9 ½"
YL4	#4	2	2	2	2	2					17'-9 ½"
YL5	#4	2	2	2	2	2					21'-9 ½"
YL6	#4	2	2	2	2	2					25'-9 ½"
YL7	#4	2	2	2	2	2					29'-9 ½"
YL8	#4	8	8	8	8	10					32'-0"
FS	#4	2	2	2	2	2					17'-8 ½"
FL	#4	2	2	2	2	2					33'-0"
N	#4	36	42	48	54	60			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	33	38	44	49	55			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.414(2S+V2)+1'-10"
OS	#7	12	12	12	12	13			3'-7"	3'-7"	7'-2"
OL	#7	12	12	12	12	13			3'-7"	3'-7"	7'-2"
OSS	#4	1	1	1	1	1					10'-0"+T1
OSL	#4	1	1	1	1	1					10'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			6'-4"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+9'-1 ½"	W1+9'-1 ½"
J2	#5	1		W1+8'-8"	W1+8'-8"
J3	#5	1		W1+8'-2"	W1+8'-2"
J4	#5	1		W1+7'-8"	W1+7'-8"
J5	#5	1		W1+7'-2"	W1+7'-2"
J6	#5	1		W1+6'-8"	W1+6'-8"
J7	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J8	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J9	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J10	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J11	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J12	#5	1		W1+3'-9"	W1+3'-9"
J13	#5	1		W1+3'-3"	W1+3'-3"
J14	#5	1		W1+2'-9"	W1+2'-9"
J15	#5	1		W1+2'-3"	W1+2'-3"
J16	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J17	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J18	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J19	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J20	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	15	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
FD	#4	1			20'-10 ½"



BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 3 OF 3

WORKING NUMBER IWD-10-2W-45

SHEET NUMBER 7209

BY | REVISIONS | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													12'	14'	16'	18'	20'
12'-0"	9'-4"	18'-8"	37'-4"	0'-0"	1'-2 11/16"	18'-8"	0'-11"	1'-0"	5'-0"	2'-6"	0'-6"	23'-0"	68'-7 11/16"+1.414V2	74'-3 9/16"+1.414V2	79'-11 7/16"+1.414V2	85'-7 5/16"+1.414V2	91'-3 3/16"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	49.2681	6930.572	4.2998	536.883	1.9649	118.180	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	49.8507	6959.528	4.2998	536.967	1.9824	118.626	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	50.6893	7007.744	4.2998	537.106	2.0057	119.294	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	49.7213	6959.528	4.2998	536.967	1.9766	118.514	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	49.9613	6978.788	4.2998	537.022	1.9824	118.626	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	50.2665	6998.139	4.2998	537.078	1.9882	118.793	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	52.1279	7155.392	4.2998	536.967	2.2443	133.544	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	52.8299	7185.350	4.2998	537.050	2.2617	133.990	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	52.3001	7165.380	4.2998	536.994	2.2850	134.658	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	52.7021	7195.338	4.2998	537.078	2.2676	134.157	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	53.1035	7215.309	4.2998	537.134	2.2792	134.491	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	53.3519	7235.236	4.2998	537.189	2.2792	134.491	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	54.7940	7475.475	4.2998	537.022	2.5295	152.137	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	55.7225	7527.124	4.2998	537.161	2.5411	152.471	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	55.1460	7496.163	4.2998	537.078	2.5644	153.083	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	55.6526	7527.124	4.2998	537.161	2.5585	152.916	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	56.3283	7564.570	5.0674	537.245	2.5876	153.751	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	56.7612	7585.208	5.0674	537.301	2.5935	153.863	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	57.6578	7703.913	4.2998	537.106	2.8204	169.394	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	58.8177	7767.838	4.2998	537.273	2.8263	169.561	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	57.9396	7714.613	4.2998	537.134	2.8437	170.006	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	58.8162	7763.745	5.0674	537.245	2.8670	170.618	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	59.4632	7795.708	5.0674	537.328	2.8786	170.952	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	60.3866	7848.977	5.0674	537.468	2.8903	171.286	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3 1/2"	11"	9"	4'-0 1/2"	60.4694	7919.686	4.2998	537.161	3.1056	184.869	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	60.4888	7908.751	4.2998	537.134	3.1172	185.203	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	61.1156	7947.866	5.0674	537.217	3.1463	185.982	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	61.8839	7991.599	5.0674	537.328	3.1580	186.316	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	63.1278	8068.078	5.0674	537.523	3.1696	186.595	9.0617	2235.611

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-12-2W-45

SHEET NUMBER 7210

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.414(2S+V2)+9'-8"
T2	#4	1	1	1	1	1					1.414(2S+V2)+11'-3"
T3	#4	1	1	1	1	1					1.414(2S+V2)+12'-10"
T4	#4	1	1	1	1	1					1.414(2S+V2)+14-5"
T5	#4	1	1	1	1	1					1.414(2S+V2)+16'-0"
T6	#4	1	1	1	1	1					1.414(2S+V2)+17'-7"
T7	#4	1	1	1	1	1					1.414(2S+V2)+19'-2"
T8	#4	1	1	1	1	1					1.414(2S+V2)+20'-9"
T9	#4	1	1	1	1	1					1.414(2S+V2)+22'-4 1/2"
T10	#4	1	1	1	1	1					1.414(2S+V2)+23'-11 1/2"
T11	#4	1	1	1	1	1					1.414(2S+V2)+25'-6 1/2"
T12	#4	1	1	1	1	1					1.414(2S+V2)+27'-1 1/2"
T13	#4	1	1	1	1	1					1.414(2S+V2)+28'-8 1/2"
T14	#4	1	1	1	1	1					1.414(2S+V2)+30'-3 1/2"
T15	#4	1	1	1	1	1					1.414(2S+V2)+31'-10 1/2"
T16	#4	1	1	1	1	1					1.414(2S+V2)+33'-5 1/2"
T17	#4	1	1	1	1	1					1.414(2S+V2)+35'-0 1/2"
T18	#4	1	1	1	1	1					1.414(2S+V2)+36'-8"
T19	#4	1	1	1	1	1					1.414(2S+V2)+38'-0"
T20	#4	1	1	1	1	1					1.414(2S+V2)+37'-5 1/2"
T21	#4	3	3	3	3	3					1.414(2S+V2)+33'-11"
V1	#4	32	36	40	44	48			25'-11"	1'-8"	27'-7"
VL1	#4	1	1	1	1	1			23'-10"	1'-8"	25'-6"
VL2	#4	1	1	1	1	1			21'-1"	1'-8"	22'-9"
VL3	#4	1	1	1	1	1			18'-4"	1'-8"	20'-0"
VL5	#4	1	1	1	1	1			15'-7 1/2"	1'-8"	17'-3 1/2"
VL5	#4	1	1	1	1	1			12'-10 1/2"	1'-8"	14'-6 1/2"
VL6	#4	1	1	1	1	1			10'-2"	1'-8"	11'-10"
VL7	#4	1	1	1	1	1			6'-10 1/2"		6'-10 1/2"
VL8	#4	1	1	1	1	1			2'-10 1/2"		2'-10 1/2"
VS1	#4	1	1	1	1	1			24'-7 1/2"	1'-8"	26'-3 1/2"
VS2	#4	1	1	1	1	1			22'-7 1/2"	1'-8"	24'-3 1/2"
VS3	#4	1	1	1	1	1			20'-7 1/2"	1'-8"	22'-3 1/2"
VS4	#4	1	1	1	1	1			18'-7 1/2"	1'-8"	20'-3 1/2"
VS5	#4	1	1	1	1	1			16'-7 1/2"	1'-8"	18'-3 1/2"
VS6	#4	1	1	1	1	1			14'-7 1/2"	1'-8"	16'-3 1/2"
VS7	#4	1	1	1	1	1			12'-7 1/2"	1'-8"	14'-3 1/2"
VS8	#4	1	1	1	1	1			10'-7 1/2"	1'-8"	12'-3 1/2"
VS9	#4	1	1	1	1	1			8'-7 1/2"	1'-8"	10'-3 1/2"
VS10	#4	1	1	1	1	1			6'-7 1/2"	1'-8"	8'-3 1/2"
VS11	#4	1	1	1	1	1			4'-7 1/2"	1'-8"	6'-3 1/2"
VS12	#4	1	1	1	1	1			2'-7 1/2"		2'-7 1/2"
FTL1	#5	1	1	1	1	1					1'-2"
FTL2	#5	1	1	1	1	1					1'-5"
FTL3	#5	1	1	1	1	1					1'-8"
FTL4	#5	1	1	1	1	1					1'-11"
FTL5	#5	1	1	1	1	1					2'-1 1/2"
FTL6	#5	1	1	1	1	1					2'-4 1/2"
FTL7	#5	1	1	1	1	1					2'-7 1/2"
FTL8	#5	1	1	1	1	1					2'-10 1/2"
FTL9	#5	1	1	1	1	1					3'-1"
FTL10	#5	1	1	1	1	1					3'-4"
FTL11	#5	1	1	1	1	1					3'-7"
FTL12	#5	1	1	1	1	1					3'-10"
FTL13	#5	1	1	1	1	1					4'-0 1/2"
FTL14	#5	1	1	1	1	1					4'-3 1/2"
FTL15	#5	1	1	1	1	1					3'-6 1/2"
FTL16	#5	1	1	1	1	1					4'-9 1/2"
FTL17	#5	1	1	1	1	1					5'-0"
FTL18	#5	1	1	1	1	1					5'-3"
FTL19	#5	1	1	1	1	1					5'-6"
FTL20	#5	65	65	65	65	65					8'-2"
FTL21	#5	1	1	1	1	1					8'-0"
FTL22	#5	1	1	1	1	1					7'-9"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
FTL23	#5	1	1	1	1	1					7'-6"
FTL24	#5	1	1	1	1	1					7'-3 1/2"
FTL25	#5	1	1	1	1	1					7'-0 1/2"
FTL26	#5	1	1	1	1	1					6'-9 1/2"
FTL27	#5	1	1	1	1	1					6'-6 1/2"
FTL28	#5	1	1	1	1	1					6'-4"
FTL29	#5	1	1	1	1	1					6'-1"
FTL30	#5	1	1	1	1	1					5'-10"
FTL31	#5	1	1	1	1	1					5'-7"
FTL32	#5	1	1	1	1	1					5'-4 1/2"
FTL33	#5	1	1	1	1	1					5'-1 1/2"
FTL34	#5	1	1	1	1	1					4'-10 1/2"
FTL35	#5	1	1	1	1	1					4'-7 1/2"
FTL36	#5	1	1	1	1	1					4'-5"
FTL37	#5	1	1	1	1	1					4'-2"
FTL38	#5	1	1	1	1	1					3'-11"
FTL39	#5	1	1	1	1	1					3'-8"
FTL40	#5	1	1	1	1	1					3'-5"
FTL41	#5	1	1	1	1	1					3'-2 1/2"
FTL42	#5	4	4	4	4	4					3'-2"
FLL	#4	10	10	10	10	10					36'-8"
FTS	#5	45	45	45	45	45					8'-2"
FLS	#4	10	10	10	10	10					18'-4"
WS1	#5	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
WS2	#5	1	1	1	1	1				W+8'-5"	W+8'-5"
WS3	#5	1	1	1	1	1				W+8'-2 1/2"	W+8'-2 1/2"
WS4	#5	1	1	1	1	1				W+8'-0"	W+8'-0"
WS5	#5	1	1	1	1	1				W+7'-9 1/2"	W+7'-9 1/2"
WS6	#5	1	1	1	1	1				W+7'-7"	W+7'-7"
WS7	#5	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
WS8	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WS9	#5	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
WS10	#5	1	1	1	1	1				W+6'-9"	W+6'-9"
WS11	#5	1	1	1	1	1				W+6'-6 1/2"	W+6'-6 1/2"
WS12	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS13	#5	1	1	1	1	1				W+6'-1 1/2"	W+6'-1 1/2"
WS14	#5	1	1	1	1	1				W+5'-11"	W+5'-11"
WS15	#5	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
WS16	#5	1	1	1	1	1				W+5'-6"	W+5'-6"
WS17	#5	1	1	1	1	1				W+5'-3 1/2"	W+5'-3 1/2"
WS18	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WS19	#5	1	1	1	1	1				W+4'-10 1/2"	W+4'-10 1/2"
WS20	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WS21	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WS22	#5	1	1	1	1	1				W+4'-3"	W+4'-3"
WS23	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WS24	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WS25	#5	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
WS26	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS27	#5	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WS28	#5	1	1	1	1	1				W+3'-0"	W+3'-0"
WS29	#5	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
WS30	#5	1	1	1	1	1				W+2'-7"	W+2'-7"
WS31	#5	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
WS32	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WS33	#5	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
WS34	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WS35	#5	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
WS36	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WS37	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WS38	#5	1	1	1	1	1				W+0'-11"	W+0'-11"
WS39	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WS40	#5	1	1	1	1	1				W+0'-6"	W+0'-6"
WS41	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WS42	#5	1	1	1	1	1	1	1		W+0'-1"	W+0'-1"
WS43	#5	1	1	1	1	1	1	1		W-0'-1 1/2"	W-0'-1 1/2"
WS44	#5	1	1	1	1	1	1	1		W-0'-4"	W-0'-4"
WS45	#5	1	1	1	1	1	1	1		W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	45	45	45	45	45	45	45	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1	1		W+8'-8 1/2"	W+8'-8 1/2"
WL2	#5	1	1	1	1	1	1	1		W+8'-7"	W+8'-7"
WL3	#5	1	1	1	1	1	1	1		W+8'-6"	W+8'-6"
WL4	#5	1	1	1	1	1	1	1		W+8'-4 1/2"	W+8'-4 1/2"
WL5	#5	1	1	1	1	1	1	1		W+8'-3 1/2"	W+8'-3 1/2"
WL6	#5	1	1	1	1	1	1	1		W+8'-2"	W+8'-2"
WL7	#5	1	1	1	1	1	1	1		W+8'-1"	W+8'-1"
WL8	#5	1	1	1	1	1	1	1		W+7'-11 1/2"	W+7'-11 1/2"
WL9	#5	1	1	1	1	1	1	1		W+7'-10 1/2"	W+7'-10 1/2"
WL10	#5	1	1	1	1	1	1	1		W+7'-9"	W+7'-9"
WL11	#5	1	1	1	1	1	1	1		W+7'-8"	W+7'-8"
WL12	#5	1	1	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WL13	#5	1	1	1	1	1	1	1		W+7'-5 1/2"	W+7'-5 1/2"
WL14	#5	1	1	1	1	1	1	1		W+7'-4"	W+7'-4"
WL15	#5	1	1	1	1	1	1	1		W+7'-3"	W+7'-3"
WL16	#5	1	1	1	1	1	1	1		W+7'-1 1/2"	W+7'-1 1/2"
WL17	#5	1	1	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WL18	#5	1	1	1	1	1	1	1		W+6'-11"	W+6'-11"
WL19	#5	1	1	1	1	1	1	1		W+6'-10"	W+6'-10"
WL20	#5	1	1	1	1	1	1	1		W+6'-8 1/2"	W+6'-8 1/2"
WL21	#5	1	1	1	1	1	1	1		W+6'-7 1/2"	W+6'-7 1/2"
WL22	#5	1	1	1	1	1	1	1		W+6'-6"	W+6'-6"
WL23	#5	1	1	1	1	1	1	1		W+6'-5"	W+6'-5"
WL24	#5	1	1	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WL25	#5	1	1	1	1	1	1	1		W+6'-2 1/2"	W+6'-2 1/2"
WL26	#5	1	1	1	1	1	1	1		W+6'-1"	W+6'-1"
WL27	#5	1	1	1	1	1	1	1		W+6'-0"	W+6'-0"
WL28	#5	1	1	1	1	1	1	1		W+5'-10 1/2"	W+5'-10 1/2"
WL29	#5	1	1	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WL30	#5	1	1	1	1	1	1	1		W+5'-8"	W+5'-8"
WL31	#5	1	1	1	1	1	1	1		W+5'-7"	W+5'-7"
WL32	#5	1	1	1	1	1	1	1		W+5'-5 1/2"	W+5'-5 1/2"
WL33	#5	1	1	1	1	1	1	1		W+5'-4 1/2"	W+5'-4 1/2"
WL34	#5	1	1	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WL35	#5	1	1	1	1	1	1	1		W+5'-2"	W+5'-2"
WL36	#5	1	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WL37	#5	1	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
WL38	#5	1	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WL39	#5	1	1	1	1	1	1	1		W+4'-9"	W+4'-9"
WL40	#5	1	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL41	#5	1	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL42	#5	1	1	1	1	1	1	1		W+4'-5 1/2"	W+4'-5 1/2"
WL43	#5	1	1	1	1	1	1	1		W+4'-4"	W+4'-4"
WL44	#5	1	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL45	#5	1	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WL46	#5	1	1	1	1	1	1	1		W+4'-0 1/2"	W+4'-0 1/2"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 3

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER IWD-12-2W-45

SHEET NUMBER 7211

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL47	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL48	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL49	#5	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
WL50	#5	1	1	1	1	1				W+3'-7 1/2"	W+3'-7 1/2"
WL51	#5	1	1	1	1	1				W+3'-6"	W+3'-6"
WL52	#5	1	1	1	1	1				W+3'-5"	W+3-5"
WL53	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
WL54	#5	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WL55	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WL56	#5	1	1	1	1	1				W+3'-0"	W+3'-0"
WL57	#5	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
WL58	#5	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
WL59	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL60	#5	1	1	1	1	1				W+2'-7"	W+2'-7"
WL61	#5	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
WL62	#5	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
WL63	#5	1	1	1	1	1				W+2'-3"	W+2'-3"
WL64	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WL65	#5	1	1	1	1	1				W+2'-0 1/2"	W+2'-0 1/2"
WL66	#5	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
WL67	#5	1	1	1	1	1				W+1'-10"	W+1'-10"
WL68	#5	1	1	1	1	1				W+1'-9"	W+1'-9"
WL69	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL70	#5	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
WL71	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WL72	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL73	#5	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
WL74	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WL75	#5	1	1	1	1	1				W+1'-0"	W+1'-0"
WL76	#5	1	1	1	1	1				W+0'-11"	W+0'-11"
WL77	#5	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
WL78	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WL79	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WL80	#5	1	1	1	1	1				W+0'-6"	W+0'-6"
WL81	#5	1	1	1	1	1				W+0'-4 1/2"	W+0'-4 1/2"
WL82	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"
WL83	#5	1	1	1	1	1				W+0'-2"	W+0'-2"
WL84	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WL85	#5	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
WL86	#5	1	1	1	1	1				W-0'-1 1/2"	W-0'-1 1/2"
WL87	#5	1	1	1	1	1				W-0'-3"	W-0'-3"
WL88	#5	1	1	1	1	1				W-0'-4"	W-0'-4"
WL89	#5	1	1	1	1	1				W-0'-5 1/2"	W-0'-5 1/2"
WL90	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	90	90	90	90	90			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
RS2	#4	1	1	1	1	1				W+8'-2"	W+8'-2"
RS3	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RS4	#4	1	1	1	1	1				W+7'-2 1/2"	W+7'-2 1/2"
RS5	#4	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
RS6	#4	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
RS7	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RS8	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RS9	#4	1	1	1	1	1				W+4'-9 1/2"	W+4'-9 1/2"
RS10	#4	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
RS11	#4	1	1	1	1	1				W+3'-10"	W+3'-10"
RS12	#4	1	1	1	1	1				W+3'-4"	W+3'-4"
RS13	#4	1	1	1	1	1				W+2'-10"	W+2'-10"
RS14	#4	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
RS15	#4	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RS16	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RS17	#4	1	1	1	1	1				W+0'-11"	W+0'-11"
RS18	#4	1	1	1	1	1				W+0'-5"	W+0'-5"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
RS19	#4	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
RS20	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	20	20	20	20	20			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+8'-8 1/2"	W+8'-8 1/2"
RL2	#4	1	1	1	1	1				W+8'-5 1/2"	W+8'-5 1/2"
RL3	#4	1	1	1	1	1				W+8'-2 1/2"	W+8'-2 1/2"
RL4	#4	1	1	1	1	1				W+7'-11 1/2"	W+7'-11 1/2"
RL5	#4	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
RL6	#4	1	1	1	1	1				W+7'-5 1/2"	W+7'-5 1/2"
RL7	#4	1	1	1	1	1				W+7'-2 1/2"	W+7'-2 1/2"
RL8	#4	1	1	1	1	1				W+6'-11 1/2"	W+6'-11 1/2"
RL9	#4	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
RL10	#4	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
RL11	#4	1	1	1	1	1				W+6'-2 1/2"	W+6'-2 1/2"
RL12	#4	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
RL13	#4	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
RL14	#4	1	1	1	1	1				W+5'-5 1/2"	W+5'-5 1/2"
RL15	#4	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
RL16	#4	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
RL17	#4	1	1	1	1	1				W+4'-8 1/2"	W+4'-8 1/2"
RL18	#4	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
RL19	#4	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
RL20	#4	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
RL21	#4	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
RL22	#4	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
RL23	#4	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
RL24	#4	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
RL25	#4	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
RL26	#4	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
RL27	#4	1	1	1	1	1				W+2'-2 1/2"	W+2'-2 1/2"
RL28	#4	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
RL29	#4	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
RL30	#4	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
RL31	#4	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
RL32	#4	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
RL33	#4	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
RL34	#4	1	1	1	1	1				W+0'-5 1/2"	W+0'-5 1/2"
RL35	#4	1	1	1	1	1				W+0'-2 1/2"	W+0'-2 1/2"
RL36	#4	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
RL37	#4	1	1	1	1	1				W-0'-3 1/2"	W-0'-3 1/2"
RL38	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	38	38	38	38	38			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					2'-5 1/2"
YS2	#4	2	2	2	2	2					4'-1 1/2"
YS3	#4	2	2	2	2	2					5'-9 1/2"
YS4	#4	2	2	2	2	2					7'-5 1/2"
YS5	#4	2	2	2	2	2					9'-1 1/2"
YS6	#4	2	2	2	2	2					10'-9 1/2"
YS7	#4	2	2	2	2	2					12'-5 1/2"
YS8	#4	2	2	2	2	2					14'-1 1/2"
YS9	#4	2	2	2	2	2					15'-9 1/2"
YS10	#4	2	2	2	2	2					17'-5 1/2"
YS11	#4	10	10	12	12	12					18'-4"
YL1	#4	2	2	2	2	2					5'-1 1/2"
YL2	#4	2	2	2	2	2					8'-5 1/2"
YL3	#4	2	2	2	2	2					11'-9 1/2"
YL4	#4	2	2	2	2	2					15'-1 1/2"
YL5	#4	2	2	2	2	2					18'-5 1/2"
YL6	#4	2	2	2	2	2					21'-9 1/2"
YL7	#4	2	2	2	2	2					25'-1 1/2"
YL8	#4	2	2	2	2	2					28'-5 1/2"
YL9	#4	2	2	2	2	2					31'-9 1/2"
YL10	#4	2	2	2	2	2					35'-1 1/2"
YL11	#4	10	10	12	12	12					37'-0"

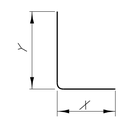
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

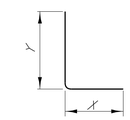
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
FS	#4	2	2	2	2	2					20'-6"
FL	#4	2	2	2	2	2					38'-1 1/2"
N	#4	42	47	54	60	65			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	38	44	50	55	61			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					1.414(2S+V2)+2'-0 1/2"
OS	#7	16	16	17	17	17			3'-8"	3'-8"	7'-4"
OL	#7	16	16	17	17	17			3'-8"	3'-8"	7'-4"
OSS	#4	1	1	1	1	1					12'-0+T1
OSL	#4	1	1	1	1	1					12'-0+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

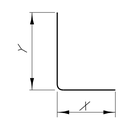
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			6'-4"
DS	#4	1			12'-0"+T1
J1	#5	1		W1+11'-1 1/2"	W1+11'-1 1/2"
J2	#5	1		W1+10'-7 1/2"	W1+10'-7 1/2"
J3	#5	1		W1+10'-2"	W1+10'-2"
J4	#5	1		W1+9'-8"	W1+9'-8"
J5	#5	1		W1+9'-2"	W1+9'-2"
J6	#5	1		W1+8'-8"	W1+8'-8"
J7	#5	1		W1+8'-2"	W1+8'-2"
J8	#5	1		W1+7'-8 1/2"	W1+7'-8 1/2"
J9	#5	1		W1+7'-2 1/2"	W1+7'-2 1/2"
J10	#5	1		W1+6'-8 1/2"	W1+6'-8 1/2"
J11	#5	1		W1+6'-2 1/2"	W1+6'-2 1/2"
J12	#5	1		W1+5'-8 1/2"	W1+5'-8 1/2"
J13	#5	1		W1+5'-2 1/2"	W1+5'-2 1/2"
J14	#5	1		W1+4'-9"	W1+4'-9"
J15	#5	1		W1+4'-3"	W1+4'-3"
J16	#5	1		W1+3'-9"	W1+3'-9"
J17	#5	1		W1+3'-3"	W1+3'-3"
J18	#5	1		W1+2'-9"	W1+2'-9"
J19	#5	1		W1+2'-3"	W1+2'-3"
J20	#5	1	1'-0"	W1+2'-6 1/2"	W1+3'-6 1/2"
J21	#5	1	1'-0"	W1+2'-0 1/2"	W1+3'-0 1/2"
J22	#5	1	1'-0"	W1+1'-6 1/2"	W1+2'-6 1/2"
J23	#5	1	1'-0"	W1+1'-0 1/2"	W1+2'-0 1/2"
J24	#5	1	1'-0"	W1+0'-6 1/2"	W1+1'-6 1/2"
DJ	#5	19	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			14'-3 1/2"
YD8	#5	1			16'-3 1/2"
YD9	#5	1			18'-3 1/2"
YD10	#5	1			20'-3 1/2"
YD11	#5	1			22'-3 1/2"
FD	#4	1			25'-4"



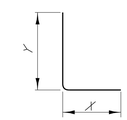
BARS DRS/DRL - #4



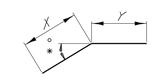
BARS DWS/DWL/DJ - #5



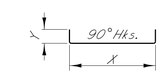
BARS RSn/RLn - #4



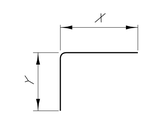
BARS WSn/WLn/Jn - #5



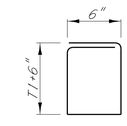
DOWELS OS/OL - #7
* See plan of apron



BARS N - #4



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 2:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 3 OF 3

WORKING NUMBER IWD-12-2W-45

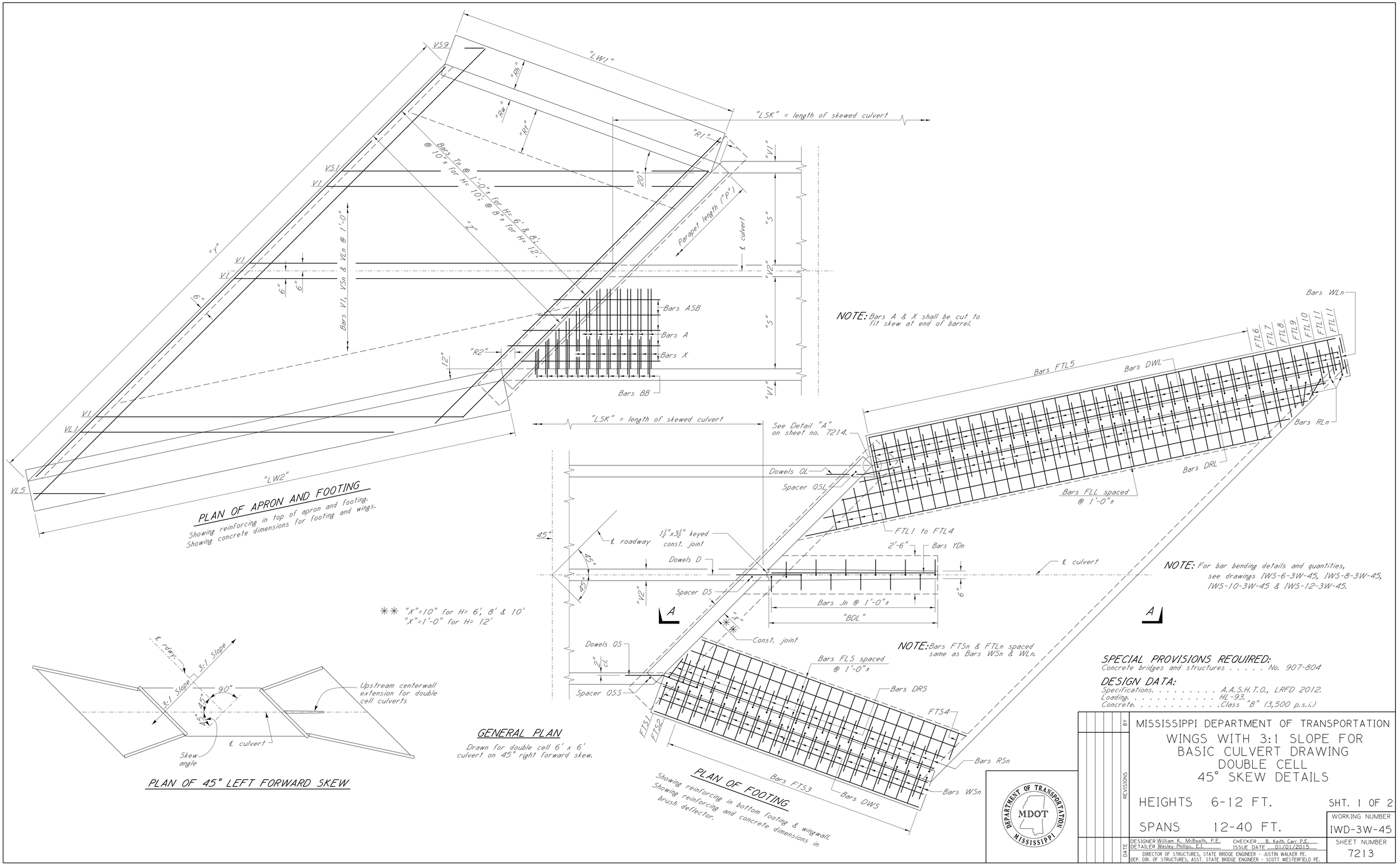
SHEET NUMBER 7212

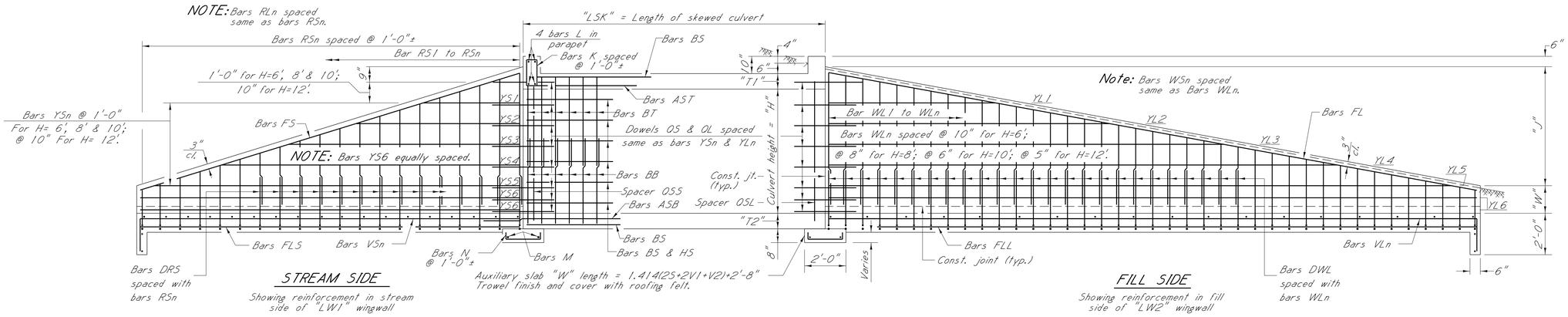
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI


VS9
"LW1"
"Rh"
"Rw"
"Rt"
"LSK" = length of skewed culvert
"R1"
"V1"
VS1
V1
Bars Tn @ 1'-0"± for H= 6' & 8'; @ 10"± for H= 10'; @ 8"± for H= 12'.
20°
"Z"
Parapet length ("P")
℄ culvert
"S"
"V2"
"Y"
V1
V1
6"
6"
9"
Bars V1, VSn & VLn @ 1'-0"
Bars ASB
Bars A
Bars X
"R2"
12°
Bars BB
NOTE: Bars A & X shall be cut to fit skew at end of barrel.
V1
VL
VL5
"LW2"
PLAN OF APRON AND FOOTING
Showing reinforcing in top of apron and footing.
Showing concrete dimensions for footing and wings.
Bars WLn
FTL6
FTL7
FTL8
FTL9
FTL10
FTL11
FTL1
Bars FTL5
Bars DWL
Bars RLn
Bars DRL
Bars FLL spaced @ 1'-0"±
See Detail "A" on sheet no. 7214.
Dowels OL
Spacer OSL
FTL1 to FTL4
45°
℄ roadway
1½"x3½" keyed const. joint
2'-6"
Bars YDn
Dowels D
℄ culvert
Spacer DS
Bars Jn @ 1'-0"±
"BDL"
A
A
NOTE: For bar bending details and quantities, see drawings IWS-6-3W-45, IWS-8-3W-45, IWS-10-3W-45 & IWS-12-3W-45.
** "X"=10" for H= 6', 8' & 10'
"X"=1'-0" for H= 12'
Const. joint
Dowels OS
Bars FLS spaced @ 1'-0"±
NOTE: Bars FTSn & FTLn spaced same as Bars WSn & WLn.
Spacer OSS
Bars DRS
FTS4
FTS1
FTS2
Bars RSn
Bars WSn
Bars FTS3
Bars DWS
PLAN OF FOOTING
Showing reinforcing in bottom footing & wingwall.
Showing reinforcing and concrete dimensions in brush deflector.
SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804
DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)
℄ rdwy.
3:1 Slope
3:1 Slope
90°
45°
Upstream centerwall extension for double cell culverts
℄ culvert
Skew angle
PLAN OF 45° LEFT FORWARD SKEW
GENERAL PLAN
Drawn for double cell 6' x 6' culvert on 45° right forward skew.
DEPARTMENT OF TRANSPORTATION
MDOT
MISSISSIPPI
BY
REVISIONS
DATE
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS
HEIGHTS 6-12 FT.
SHT. 1 OF 2
SPANS 12-40 FT.
WORKING NUMBER
IWD-3W-45
DESIGNER William K. McBeath, P.E.
CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I.
ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.
SHEET NUMBER
7213



STREAM SIDE

Showing reinforcement in stream side of "LW1" wingwall

NOTE: Bars X & bars A not shown for clarity.

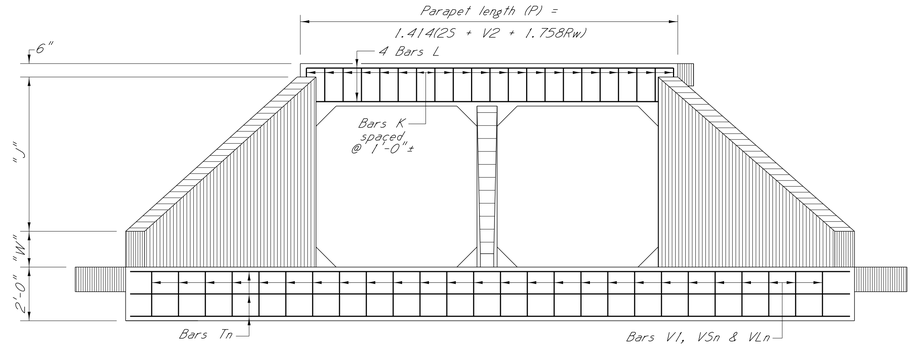
LONGITUDINAL SECTION

Drawn for double cell 6' x 6' culvert

NOTE: Culvert shall be sloped to conform to gradient of stream.

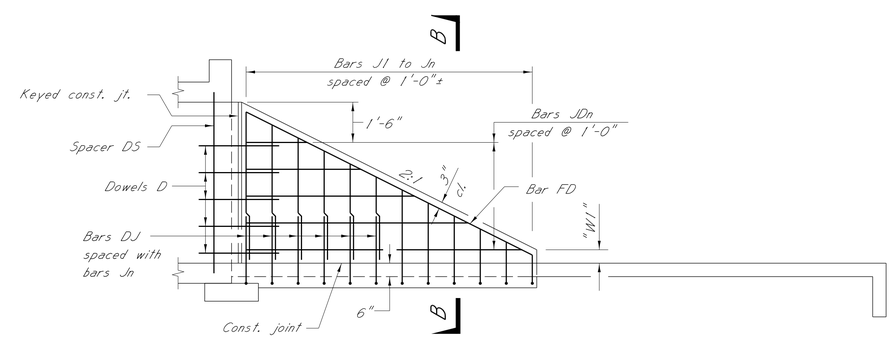
FILL SIDE

Showing reinforcement in fill side of "LW2" wingwall

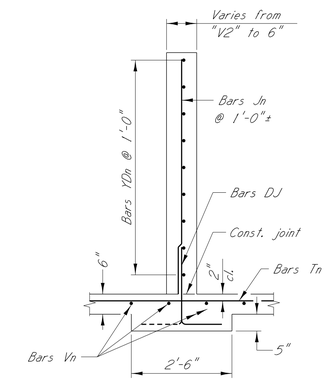


END ELEVATION

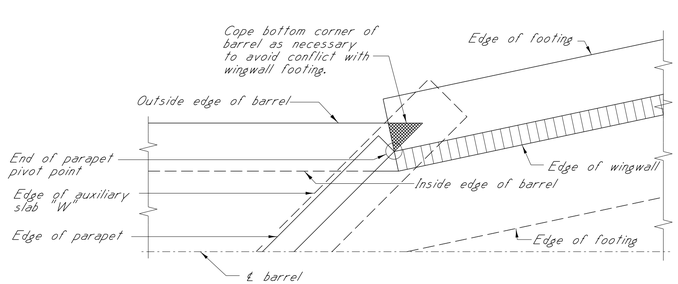
Showing reinforcing in pararpet & toe wall



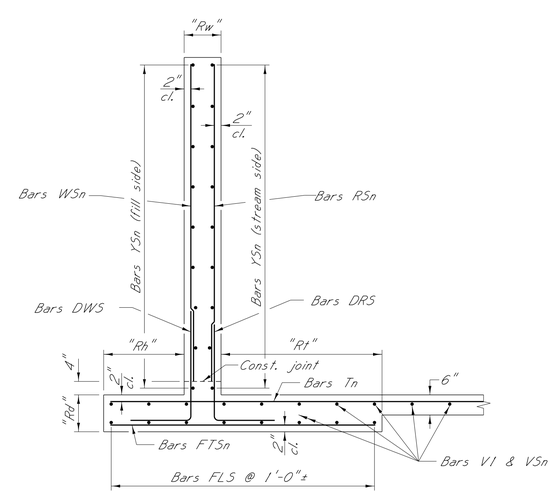
SECTION A-A



SECTION B-B



DETAIL "A"



CROSS SECTION WINGWALL

Showing reinforcing in "LW1" wingwall, footing and apron.

SPECIAL PROVISIONS REQUIRED:
Concrete bridges and structures . . . . . No. 907-804

DESIGN DATA:
Specifications. . . . . A.A.S.H.T.O., LRFD 2012.
Loading. . . . . HL-93.
Concrete. . . . . .Class "B" (3,500 p.s.i.)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHTS 6-12 FT.

SPANS 12-40 FT.

SHT. 2 OF 2

WORKING NUMBER IWD-3W-45

SHEET NUMBER 7214

DATE | REVISIONS | BY

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN					
													6'	8'	10'	12'	14'	16'
6'-0"	5'-9"	18'-8 3/16"	31'-8 1/16"	0'-4 3/16"	0'-10 11/16"	17'-3"	0'-11"	0'-9"	3'-0"	2'-0"	0'-6"	11'-0"	37'-4 1/4"+1.414V2	43'-0 1/8"+1.414V2	48'-8"+1.414V2	54'-3 7/8"+1.414V2	59'-11 13/16"+1.414V2	65'-7 11/16"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
72	6x6	5'-0"	9"	9"	9"	9"	1'-4"	23.1807	2921.548	1.2743	177.463	1.1269	67.468	1.9375	740.689
		10'-0"	9"	9"	9"	9"	1'-4"	23.1807	2921.548	1.2743	177.463	1.1269	67.468	1.9375	740.689
		15'-0"	9"	9"	9"	9"	1'-4"	23.1807	2921.548	1.2743	177.463	1.1269	67.468	1.9375	740.689
		20'-0"	9"	10 1/8"	9"	9"	1'-4"	23.2851	2921.548	1.2743	177.463	1.1269	67.468	1.9479	743.850
		25'-0"	10 1/2"	1'-0"	9"	9"	1'-5 1/2"	23.5666	2937.861	1.2743	177.547	1.1269	67.468	1.9688	750.173
		30'-0"	11 1/2"	1'-1"	9"	9"	1'-6 1/2"	23.7541	2948.736	1.2743	177.603	1.1269	67.468	1.9826	754.388
96	8x6	5'-0"	9"	9 1/2"	9"	9"	1'-4"	25.3863	3096.508	1.2743	177.463	1.4062	84.335	2.2743	872.715
		10'-0"	9"	11"	9"	9"	1'-4"	25.5170	3096.508	1.2743	177.463	1.4062	84.335	2.2847	876.398
		15'-0"	11"	1'-1"	9"	9"	1'-6"	25.9271	3119.596	1.2743	177.575	1.4062	84.335	2.3125	886.219
		20'-0"	1'-0"	1'-2"	9"	9"	1'-7"	26.1322	3131.139	1.2743	177.630	1.4062	84.335	2.3264	891.129
		25'-0"	1'-2"	1'-4"	9"	9"	1'-9"	26.5423	3154.227	1.2743	177.742	1.4062	84.335	2.3542	900.950
		30'-0"	1'-4"	1'-5 1/2"	9"	9"	1'-11"	26.9088	3177.311	1.2743	177.853	1.4062	84.335	2.3785	909.543
120	10x6	5'-0"	9"	10"	9"	9"	1'-4"	27.6093	3268.908	1.2743	177.463	1.6856	99.699	2.6111	1005.089
		10'-0"	10"	1'-0 1/2"	9"	9"	1'-5"	27.9887	3281.007	1.2743	177.519	1.6856	99.699	2.6354	1014.899
		15'-0"	1'-1"	1'-3 1/2"	9"	9"	1'-8"	28.6563	3317.307	1.2743	177.686	1.6856	99.699	2.6771	1031.716
		20'-0"	1'-4"	1'-6"	9"	9"	1'-11"	29.2716	3353.607	1.2743	177.853	1.6856	99.699	2.7153	1047.132
		25'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	28.1657	3299.157	1.2743	177.603	1.6856	99.699	2.6458	1019.103
		30'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	28.3292	3305.208	1.2743	177.630	1.6856	99.699	2.6563	1023.308
144	12x6	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-5 1/2"	30.1488	3463.187	1.2743	177.547	1.9649	116.622	2.9653	1145.687
		10'-0"	1'-0"	1'-1 1/2"	9"	9"	1'-7"	30.5699	3482.340	1.2743	177.630	1.9649	116.622	2.9896	1156.714
		15'-0"	1'-2 1/2"	1'-5 1/2"	9"	9"	1'-9 1/2"	31.3528	3514.258	1.2743	177.770	1.9649	116.622	3.0347	1177.192
		20'-0"	1'-0 1/2"	1'-1"	9"	9"	1'-7 1/2"	30.5678	3488.725	1.2743	177.658	1.9649	116.622	2.9896	1156.714
		25'-0"	1'-1"	1'-2"	9"	9"	1'-8"	30.7489	3495.106	1.2743	177.686	1.9649	116.622	3.0000	1161.439
		30'-0"	1'-2"	1'-3 1/2"	9"	9"	1'-9"	31.0500	3507.877	1.2743	177.742	1.9649	116.622	3.0174	1169.316
168	14x6	5'-0"	11 1/2"	1'-0 1/2"	9"	9"	1'-6 1/2"	32.6120	3652.779	1.2743	177.603	2.2443	133.544	3.3125	1284.873
		10'-0"	1'-1 1/2"	1'-3"	9 1/2"	9"	1'-8 1/2"	33.1989	3679.653	1.2743	177.714	2.2501	133.711	3.3507	1302.113
		15'-0"	1'-0"	1'-1"	10 1/2"	9"	1'-7"	32.7440	3659.499	1.2743	177.630	2.2617	133.990	3.3403	1292.868
		20'-0"	1'-3"	1'-3"	9"	9"	1'-10"	33.3736	3699.807	1.2743	177.797	2.2443	133.544	3.3542	1305.862
		25'-0"	1'-3"	1'-4 1/2"	10"	9"	1'-10"	33.5889	3699.807	1.2743	177.797	2.2559	133.823	3.3785	1314.107
		30'-0"	1'-4"	1'-6"	10"	9"	1'-11"	33.9177	3713.241	1.2743	177.853	2.2559	133.823	3.3958	1322.852
192	16x6	5'-0"	1'-1"	1'-1 1/2"	10"	9"	1'-8"	35.1718	3941.139	1.2743	177.686	2.5353	150.745	3.6771	1430.370
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	1'-10 1/2"	35.9441	3976.125	1.2743	177.825	2.5411	150.912	3.7222	1453.021
		15'-0"	1'-2"	1'-3"	9"	9"	1'-9"	35.5225	3955.136	1.2743	177.742	2.5236	150.411	3.6806	1436.986
		20'-0"	1'-4 1/2"	1'-4 1/2"	9"	9"	1'-11 1/2"	36.0528	3990.116	1.2743	177.881	2.5236	150.411	3.7083	1452.370
		25'-0"	1'-5 1/2"	1'-6 1/2"	9"	9"	2'-0 1/2"	36.4847	4004.106	1.2743	177.937	2.5236	150.411	3.7292	1463.907
		30'-0"	1'-7 1/2"	1'-8 1/2"	9"	9"	2'-2 1/2"	37.0345	4032.094	1.2743	178.048	2.5236	150.411	3.7569	1479.290

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 1 OF 3

WORKING NUMBER IWD-6-3W-45

SHEET NUMBER 7215

DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1	1			1.414(2S+V2)+4'-7 1/2"
T2	#4	1	1	1	1	1	1			1.414(2S+V2)+8'-3 1/2"
T3	#4	1	1	1	1	1	1			1.414(2S+V2)+9'-6 1/2"
T4	#4	1	1	1	1	1	1			1.414(2S+V2)+10'-7 1/2"
T5	#4	1	1	1	1	1	1			1.414(2S+V2)+11'-8 1/2"
T6	#4	1	1	1	1	1	1			1.414(2S+V2)+12'-9"
T7	#4	1	1	1	1	1	1			1.414(2S+V2)+13'-10"
T8	#4	1	1	1	1	1	1			1.414(2S+V2)+14'-11"
T9	#4	1	1	1	1	1	1			1.414(2S+V2)+15'-11 1/2"
T10	#4	1	1	1	1	1	1			1.414(2S+V2)+17'-0 1/2"
T11	#4	1	1	1	1	1	1			1.414(2S+V2)+18'-1 1/2"
T12	#4	1	1	1	1	1	1			1.414(2S+V2)+19'-2"
T13	#4	1	1	1	1	1	1			1.414(2S+V2)+20'-3"
T14	#4	1	1	1	1	1	1			1.414(2S+V2)+21'-3 1/2"
T15	#4	1	1	1	1	1	1			1.414(2S+V2)+22'-4 1/2"
T16	#4	1	1	1	1	1	1			1.414(2S+V2)+23'-5 1/2"
T17	#4	1	1	1	1	1	1			1.414(2S+V2)+23'-6"
T18	#4	3	3	3	3	3	3			1.414(2S+V2)+19'-8 1/2"
V1	#4	16	20	24	28	32	36	23'-11"	1'-8"	25'-7"
VL1	#4	1	1	1	1	1	1	20'-5"	1'-8"	22'-1"
VL2	#4	1	1	1	1	1	1	16'-8 1/2"	1'-8"	18'-4 1/2"
VL3	#4	1	1	1	1	1	1	13'-0"	1'-8"	14'-8"
VL4	#4	1	1	1	1	1	1	9'-3 1/2"		9'-3 1/2"
VL5	#4	1	1	1	1	1	1	4'-8"		4'-8"
VS1	#4	1	1	1	1	1	1	23'-11"	1'-8"	25'-7"
VS2	#4	1	1	1	1	1	1	23'-3"	1'-8"	24'-11"
VS3	#4	1	1	1	1	1	1	22'-7 1/2"	1'-8"	24'-3 1/2"
VS4	#4	1	1	1	1	1	1	20'-0"	1'-8"	21'-8"
VS5	#4	1	1	1	1	1	1	16'-3"	1'-8"	17'-11"
VS6	#4	1	1	1	1	1	1	12'-6"	1'-8"	14'-2"
VS7	#4	1	1	1	1	1	1	8'-9"	1'-8"	10'-5"
VS8	#4	1	1	1	1	1	1	5'-0"		5'-0"
VS9	#4	1	1	1	1	1	1	1'-3"		1'-3"
FTL1	#5	1	1	1	1	1	1			1'-4"
FTL2	#5	1	1	1	1	1	1			1'-10 1/2"
FTL3	#5	1	1	1	1	1	1			2'-5"
FTL4	#5	1	1	1	1	1	1			2'-11 1/2"
FTL5	#5	32	32	32	32	32	32			5'-5"
FTL6	#5	1	1	1	1	1	1			4'-11 1/2"
FTL7	#5	1	1	1	1	1	1			4'-5"
FTL8	#5	1	1	1	1	1	1			3'-10 1/2"
FTL9	#5	1	1	1	1	1	1			3'-4"
FTL10	#5	1	1	1	1	1	1			2'-10"
FTL11	#5	2	2	2	2	2	2			2'-5"
FLL	#4	7	7	7	7	7	7			31'-0 1/2"
FTS1	#5	1	1	1	1	1	1			2'-6 1/2"
FTS2	#5	1	1	1	1	1	1			4'-3"
FTS3	#5	22	22	22	22	22	22			5'-5"
FTS4	#5	1	1	1	1	1	1			1'-10"
FLS	#4	7	7	7	7	7	7			18'-4"
WS1	#5	1	1	1	1	1	1		W+5'-1"	W+5'-1"
WS2	#5	1	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WS3	#5	1	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS4	#5	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WS5	#5	1	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WS6	#5	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS7	#5	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS8	#5	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WS9	#5	1	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WS10	#5	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WS11	#5	1	1	1	1	1	1		W+2'-8"	W+2'-8"
WS12	#5	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WS13	#5	1	1	1	1	1	1		W+2'-2"	W+2'-2"
WS14	#5	1	1	1	1	1	1		W+1'-11"	W+1'-11"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
WS15	#5	1	1	1	1	1	1		W+1'-8"	W+1'-8"
WS16	#5	1	1	1	1	1	1		W+1'-5"	W+1'-5"
WS17	#5	1	1	1	1	1	1	1'-6"	W+2'-2"	W+3'-8"
WS18	#5	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WS19	#5	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
WS20	#5	1	1	1	1	1	1	1'-6"	W+1'-5"	W+2'-11"
WS21	#5	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WS22	#5	1	1	1	1	1	1	1'-6"	W+0'-11"	W+2'-5"
WS23	#5	1	1	1	1	1	1	1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WS24	#5	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DWS	#5	16	16	16	16	16	16	1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WL2	#5	1	1	1	1	1	1		W+5'-0"	W+5'-0"
WL3	#5	1	1	1	1	1	1		W+4'-10"	W+4'-10"
WL4	#5	1	1	1	1	1	1		W+4'-8"	W+4'-8"
WL5	#5	1	1	1	1	1	1		W+4'-6 1/2"	W+4'-6 1/2"
WL6	#5	1	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WL7	#5	1	1	1	1	1	1		W+4'-3"	W+4'-3"
WL8	#5	1	1	1	1	1	1		W+4'-1"	W+4'-1"
WL9	#5	1	1	1	1	1	1		W+3'-11"	W+3'-11"
WL10	#5	1	1	1	1	1	1		W+3'-9 1/2"	W+3'-9 1/2"
WL11	#5	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WL12	#5	1	1	1	1	1	1		W+3'-6"	W+3'-6"
WL13	#5	1	1	1	1	1	1		W+3'-4"	W+3'-4"
WL14	#5	1	1	1	1	1	1		W+3'-2"	W+3'-2"
WL15	#5	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
WL16	#5	1	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WL17	#5	1	1	1	1	1	1		W+2'-9"	W+2'-9"
WL18	#5	1	1	1	1	1	1		W+2'-7"	W+2'-7"
WL19	#5	1	1	1	1	1	1		W+2'-5"	W+2'-5"
WL20	#5	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
WL21	#5	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WL22	#5	1	1	1	1	1	1		W+2'-0"	W+2'-0"
WL23	#5	1	1	1	1	1	1		W+1'-10"	W+1'-10"
WL24	#5	1	1	1	1	1	1		W+1'-8 1/2"	W+1'-8 1/2"
WL25	#5	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"
WL26	#5	1	1	1	1	1	1	1'-6"	W+2'-4 1/2"	W+3'-10 1/2"
WL27	#5	1	1	1	1	1	1	1'-6"	W+2'-2 1/2"	W+3'-8 1/2"
WL28	#5	1	1	1	1	1	1	1'-6"	W+2'-1"	W+3'-7"
WL29	#5	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
WL30	#5	1	1	1	1	1	1	1'-6"	W+1'-9 1/2"	W+3'-3 1/2"
WL31	#5	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
WL32	#5	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
WL33	#5	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
WL34	#5	1	1	1	1	1	1	1'-6"	W+1'-2"	W+2'-8"
WL35	#5	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
WL36	#5	1	1	1	1	1	1	1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WL37	#5	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
WL38	#5	1	1	1	1	1	1	1'-6"	W+0'-7"	W+2'-1"
WL39	#5	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DWL	#5	25	25	25	25	25	25	1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1	1		W+5'-1"	W+5'-1"
RS2	#4	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RS3	#4	1	1	1	1	1	1		W+4'-6"	W+4'-6"
RS4	#4	1	1	1	1	1	1		W+4'-2 1/2"	W+4'-2 1/2"
RS5	#4	1	1	1	1	1	1		W+3'-11"	W+3'-11"
RS6	#4	1	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
RS7	#4	1	1	1	1	1	1		W+3'-4"	W+3'-4"
RS8	#4	1	1	1	1	1	1		W+3'-0 1/2"	W+3'-0 1/2"
RS9	#4	1	1	1	1	1	1		W+2'-8 1/2"	W+2'-8 1/2"
RS10	#4	1	1	1	1	1	1		W+2'-5"	W+2'-5"
RS11	#4	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RS12	#4	1	1	1	1	1	1		W+1'-10"	W+1'-10"
RS13	#4	1	1	1	1	1	1		W+1'-6 1/2"	W+1'-6 1/2"

HEIGHT = 6 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 6'	8'	10'	12'	14'	16'	DIM. X	DIM. Y	LENGTH
RS14	#4	1	1	1	1	1	1		W+1'-3"	W+1'-3"
RS15	#4	1	1	1	1	1	1	1'-6"	W+1'-11"	W+3'-5"
RS16	#4	1	1	1	1	1	1	1'-6"	W+1'-7 1/2"	W+3'-1 1/2"
RS17	#4	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RS18	#4	1	1	1	1	1	1	1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
RS19	#4	1	1	1	1	1	1	1'-6"	W+0'-9"	W+2'-3"
RS20	#4	1	1	1	1	1	1	1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	14	14	14	14	14	14	1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
RL2	#4	1	1	1	1	1	1		W+4'-11 1/2"	W+4'-11 1/2"
RL3	#4	1	1	1	1	1	1		W+4'-9 1/2"	W+4'-9 1/2"
RL4	#4	1	1	1	1	1	1		W+4'-7"	W+4'-7"
RL5	#4	1	1	1	1	1	1		W+4'-5"	W+4'-5"
RL6	#4	1	1	1	1	1	1		W+4'-3"	W+4'-3"
RL7	#4	1	1	1	1	1	1		W+4'-1"	W+4'-1"
RL8	#4	1	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
RL9	#4	1	1	1	1	1	1		W+3'-8 1/2"	W+3'-8 1/2"
RL10	#4	1	1	1	1	1	1		W+3'-6 1/2"	W+3'-6 1/2"
RL11	#4	1	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
RL12	#4	1	1	1	1	1	1		W+3'-2"	W+3'-2"
RL13	#4	1	1	1	1	1	1		W+3'-0"	W+3'-0"
RL14	#4	1	1	1	1	1	1		W+2'-10"	W+2'-10"
RL15	#4	1	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
RL16	#4	1	1	1	1	1	1		W+2'-5 1/2"	W+2'-5 1/2"
RL17	#4	1	1	1	1	1	1		W+2'-3 1/2"	W+2'-3 1/2"
RL18	#4	1	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
RL19	#4	1	1	1	1	1	1		W+1'-11"	W+1'-11"
RL20	#4	1	1	1	1	1	1		W+1'-9"	W+1'-9"
RL21	#4	1	1	1	1	1	1		W+1'-7"	W+1'-7"
RL22	#4	1	1	1	1	1	1		W+1'-5"	W+1'-5"
RL23	#4	1	1	1	1	1	1		W+1'-2 1/2"	W+1'-2 1/2"
RL24	#4	1	1	1	1	1	1	1'-6"	W+2'-0 1/2"	W+3'-6 1/2"
RL25	#4	1	1	1	1	1	1	1'-6"	W+1'-10 1/2"	W+3'-4 1/2"
RL26	#4	1	1	1	1	1	1	1'-6"	W+1'-8"	W+3'-2"
RL27	#4	1	1	1	1	1	1	1'-6"	W+1'-6"	W+3'-0"
RL28	#4	1	1	1	1	1	1	1'-6"	W+1'-4"	W+2'-10"
RL29	#4	1	1	1	1	1	1	1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RL30	#4	1	1	1	1	1	1	1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL31	#4	1	1	1	1	1	1	1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RL32	#4	1	1	1	1	1	1	1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
RL33	#4	1	1	1	1	1	1	1'-6"	W+0'-5"	W+1'-11"
DRL	#4	23	23	23	23	23	23	1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2	2			4'-8"
YS2	#4	2	2	2	2	2	2			7'-11"
YS3	#4	2	2	2	2	2	2			11'-2"
YS4	#4	2	2	2	2	2	2			14'-5"
YS5	#4	2	2	2	2	2	2			17'-8"
YS6	#4	4	4	4	4	4	6			18'-4"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-6-3W-45

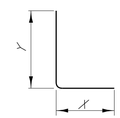
SHEET NUMBER 7216

REVISIONS | BY | DATE

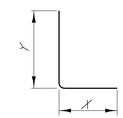
DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 6 FT.												
BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB												
BAR	SIZE	NO. REQUIRED								DIM. X	DIM. Y	LENGTH
		SPAN										
		6'	8'	10'	12'	14'	16'					
YL1	#4	2	2	2	2	2	2					8'-1"
YL2	#4	2	2	2	2	2	2					13'-7"
YL3	#4	2	2	2	2	2	2					19'-1"
YL4	#4	2	2	2	2	2	2					24'-7"
YL5	#4	2	2	2	2	2	2					30'-1 ½"
YL6	#4	4	4	4	4	4	6					31'-4"
FS	#4	2	2	2	2	2	2					19'-2 ½"
FL	#4	2	2	2	2	2	2					31'-10"
N	#4	24	30	35	41	47	53			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	21	27	32	38	44	49			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4	4					1.414(2S+V2)+1'-6 ½"
OS	#7	8	8	8	8	8	9			3'-4"	3'-4"	6'-8"
OL	#7	8	8	8	8	8	9			3'-4"	3'-4"	6'-8"
OSS	#4	1	1	1	1	1	1					6'-0"+T1
OSL	#4	1	1	1	1	1	1					6'-0"+T1

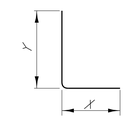
BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	5			6'-1"
DS	#4	1			6'-0"+T1
J1	#5	1		W1+5'-1 ½"	W1+5'-1 ½"
J2	#5	1		W1+4'-8"	W1+4'-8"
J3	#5	1		W1+4'-2"	W1+4'-2"
J4	#5	1		W1+3'-8"	W1+3'-8"
J5	#5	1		W1+3'-2 ½"	W1+3'-2 ½"
J6	#5	1		W1+2'-8 ½"	W1+2'-8 ½"
J7	#5	1	1'-0"	W1+2'-11 ½"	W1+3'-11 ½"
J8	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J9	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J10	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J11	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J12	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	6	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
FD	#4	1			11'-11"



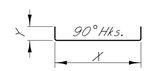
BARS DRS/DRL - #4



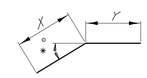
BARS DWS/DWL/DJ - #5



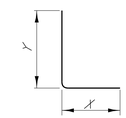
BARS RSn/RLn - #4



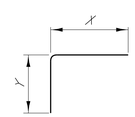
BARS N - #4



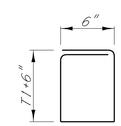
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

BY	REVISIONS	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 6 FT.

SPANS 12-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-6-3W-45

SHEET NUMBER
7217

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																		
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rt"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN 8'	10'	12'	14'	16'
8'-0"	7'-4"	23'-10 3/16"	40'-4 3/4"	0'-5 1/8"	1'-1 1/16"	22'-0"	0'-11"	0'-11"	4'-0"	2'-3"	0'-6"	15'-0"	49'-6 5/16"+1.414V2	54'-2 3/16"+1.414V2	59'-10 1/16"+1.414V2	65'-5 15/16"+1.414V2	71'-1 13/16"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
128	8x8	5'-0"	9"	9"	9"	9"	1'-9"	39.2110	4773.389	2.0976	279.268	1.4062	84.335	4.4074	1058.215
		10'-0"	9"	10 1/2"	9"	9"	1'-9"	39.3399	4773.389	2.0976	279.268	1.4062	84.335	4.4259	1061.898
		15'-0"	11"	1'-0 1/2"	9"	9"	1'-11"	39.8797	4804.294	2.0976	279.380	1.4062	84.335	4.4753	1071.719
		20'-0"	1'-0"	1'-1 1/2"	9"	9"	2'-0"	40.1494	4819.744	2.0976	279.435	1.4062	84.335	4.5000	1076.629
		25'-0"	1'-2"	1'-3 1/2"	9 1/2"	9"	2'-2"	40.6313	4850.649	2.0976	279.547	1.4120	84.502	4.5617	1088.122
		30'-0"	1'-3 1/2"	1'-5"	10 1/2"	9"	2'-3 1/2"	41.1027	4873.826	2.0976	279.630	1.4237	84.836	4.6235	1098.834
160	10x8	5'-0"	9"	10 1/2"	9"	9"	1'-9"	42.0258	4985.395	2.0976	279.268	1.6856	101.258	5.0185	1209.906
		10'-0"	10 1/2"	1'-0 1/2"	9"	9"	1'-10 1/2"	42.5084	5009.575	2.0976	279.352	1.6856	101.258	5.0617	1219.716
		15'-0"	1'-1"	1'-3"	9"	9"	2'-1"	43.2265	5049.873	2.0976	279.491	1.6856	101.258	5.1235	1233.730
		20'-0"	1'-4"	1'-5 1/2"	9"	9"	2'-4"	44.0365	5089.232	2.0976	279.658	1.6856	101.258	5.1914	1249.146
		25'-0"	1'-0"	1'-0 1/2"	9 1/2"	9"	2'-0"	42.7849	5033.755	2.0976	279.435	1.6914	101.425	5.0926	1225.593
		30'-0"	1'-1 1/2"	1'-2"	11"	9"	2'-1 1/2"	43.2211	5057.934	2.0976	279.519	1.7089	101.926	5.1667	1239.020
192	12x8	5'-0"	10 1/2"	11 1/2"	9"	9"	1'-10 1/2"	45.1082	5219.717	2.0976	279.352	1.9649	118.180	5.6420	1365.790
		10'-0"	1'-0"	1'-1"	9"	9"	2'-0"	45.5663	5244.731	2.0976	279.435	1.9649	118.180	5.6790	1375.242
		15'-0"	1'-3"	1'-5 1/2"	9"	9"	2'-3"	46.6608	5294.760	2.0976	279.602	1.9649	118.180	5.7716	1398.871
		20'-0"	1'-1"	1'-1"	9 1/2"	9 1/2"	2'-1"	45.7785	5262.408	2.1572	279.491	1.9737	118.403	5.7099	1380.511
		25'-0"	1'-2"	1'-2 1/2"	9 1/2"	9"	2'-2"	46.1161	5278.086	2.0976	279.547	1.9737	118.347	5.7346	1387.941
		30'-0"	1'-3"	1'-4"	11 1/2"	9"	2'-3"	46.4921	5294.760	2.0976	279.602	1.9940	118.960	5.8148	1402.509
224	14x8	5'-0"	1'-0"	1'-0 1/2"	9"	9"	2'-0"	48.2258	5458.547	2.0976	279.435	2.2443	133.544	6.2654	1523.413
		10'-0"	1'-1 1/2"	1'-3"	9"	9"	2'-1 1/2"	48.8473	5484.563	2.0976	279.519	2.2443	133.544	6.3148	1537.406
		15'-0"	1'-1"	1'-1"	9"	9"	2'-1"	48.4786	5475.889	2.0976	279.491	2.2443	133.544	6.2840	1528.660
		20'-0"	1'-3"	1'-3"	11"	9"	2'-3"	49.1311	5510.580	2.0976	279.602	2.2676	134.157	6.3827	1549.345
		25'-0"	1'-4"	1'-5"	11 1/2"	9"	2'-4"	49.5987	5527.923	2.0976	279.658	2.2734	134.324	6.4321	1561.512
		30'-0"	1'-5"	1'-6 1/2"	1'-0"	9"	2'-5"	49.9981	5545.271	2.0976	279.714	2.2792	134.491	6.4753	1571.930
256	16x8	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	2'-1"	51.2872	5804.221	2.0976	279.491	2.5295	152.137	6.8951	1682.524
		10'-0"	1'-3 1/2"	1'-5"	10"	9"	2'-3 1/2"	52.2970	5849.257	2.0976	279.630	2.5353	152.304	6.9815	1707.272
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	2'-2 1/2"	51.7245	5831.240	2.0976	279.575	2.5469	152.638	6.9630	1697.157
		20'-0"	1'-5"	1'-5"	1'-0"	9"	2'-5"	52.5853	5876.275	2.0976	279.714	2.5585	152.916	7.0494	1719.732
		25'-0"	1'-7"	1'-7"	1'-1"	9"	2'-7"	53.2794	5912.296	2.0976	279.825	2.5702	153.250	7.1235	1738.461
		30'-0"	1'-8"	1'-9"	1'-2"	10"	2'-8"	53.8547	5932.678	2.2171	279.881	2.5876	153.751	7.1975	1754.235

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 605 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 1 OF 3

WORKING NUMBER 1WD-8-3W-45

SHEET NUMBER 7218

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.414(2S+V2)+5'-3 ½"
T2	#4	1	1	1	1	1					1.414(2S+V2)+8'-11"
T3	#4	1	1	1	1	1					1.414(2S+V2)+10'-8"
T4	#4	1	1	1	1	1					1.414(2S+V2)+11'-9"
T5	#4	1	1	1	1	1					1.414(2S+V2)+12'-9 ½"
T6	#4	1	1	1	1	1					1.414(2S+V2)+13'-10"
T7	#4	1	1	1	1	1					1.414(2S+V2)+14'-11"
T8	#4	1	1	1	1	1					1.414(2S+V2)+15'-11 ½"
T9	#4	1	1	1	1	1					1.414(2S+V2)+17'-0"
T10	#4	1	1	1	1	1					1.414(2S+V2)+18'-1"
T11	#4	1	1	1	1	1					1.414(2S+V2)+19'-1 ½"
T12	#4	1	1	1	1	1					1.414(2S+V2)+20'-2 ½"
T13	#4	1	1	1	1	1					1.414(2S+V2)+21'-3"
T14	#4	1	1	1	1	1					1.414(2S+V2)+22'-3 ½"
T15	#4	1	1	1	1	1					1.414(2S+V2)+23'-4 ½"
T16	#4	1	1	1	1	1					1.414(2S+V2)+24'-5"
T17	#4	1	1	1	1	1					1.414(2S+V2)+25'-5 ½"
T18	#4	1	1	1	1	1					1.414(2S+V2)+26'-6 ½"
T19	#4	1	1	1	1	1					1.414(2S+V2)+27'-7"
T20	#4	1	1	1	1	1					1.414(2S+V2)+28'-8"
T21	#4	1	1	1	1	1					1.414(2S+V2)+29'-8 ½"
T22	#4	1	1	1	1	1					1.414(2S+V2)+29'-3"
T23	#4	3	3	3	3	3					1.414(2S+V2)+25'-2 ½"
V1	#4	20	24	28	32	36			30'-7 ½"	1'-8"	32'-3 ½"
VL1	#4	1	1	1	1	1			28'-11"	1'-8"	30'-7"
VL2	#4	1	1	1	1	1			25'-3"	1'-8"	26'-11"
VL3	#4	1	1	1	1	1			21'-6 ½"	1'-8"	22'-2 ½"
VL4	#4	1	1	1	1	1			17'-10"	1'-8"	19'-6"
VL5	#4	1	1	1	1	1			14'-1 ½"	1'-8"	15'-9 ½"
VL6	#4	1	1	1	1	1			10'-5"		10'-5"
VL7	#4	1	1	1	1	1			5'-9"		5'-9"
VS1	#4	1	1	1	1	1			30'-7 ½"	1'-8"	32'-3 ½"
VS2	#4	1	1	1	1	1			30'-0"	1'-8"	31'-8"
VS3	#4	1	1	1	1	1			29'-4"	1'-8"	31'-0"
VS4	#4	1	1	1	1	1			27'-11 ½"	1'-8"	29'-7 ½"
VS5	#4	1	1	1	1	1			24'-2 ½"	1'-8"	25'-10 ½"
VS6	#4	1	1	1	1	1			20'-5 ½"	1'-8"	22'-1 ½"
VS7	#4	1	1	1	1	1			16'-8 ½"	1'-8"	18'-4 ½"
VS8	#4	1	1	1	1	1			12'-11 ½"	1'-8"	14'-7 ½"
VS9	#4	1	1	1	1	1			9'-2 ½"	1'-8"	10'-10 ½"
VS10	#4	1	1	1	1	1			5'-5 ½"		5'-5 ½"
VS11	#4	1	1	1	1	1			1'-8 ½"		1'-8 ½"
FTL1	#5	1	1	1	1	1					1'-3"
FTL2	#5	1	1	1	1	1					1'-8"
FTL3	#5	1	1	1	1	1					2'-1"
FTL4	#5	1	1	1	1	1					2'-6 ½"
FTL5	#5	1	1	1	1	1					2'-11 ½"
FTL6	#5	1	1	1	1	1					3'-4 ½"
FTL7	#5	1	1	1	1	1					3'-9 ½"
FTL8	#5	1	1	1	1	1					4'-3"
FTL9	#5	50	50	50	50	50					6'-10"
FTL10	#5	1	1	1	1	1					6'-8"
FTL11	#5	1	1	1	1	1					6'-3"
FTL12	#5	1	1	1	1	1					5'-10"
FTL13	#5	1	1	1	1	1					5'-5"
FTL14	#5	1	1	1	1	1					4'-11 ½"
FTL15	#5	1	1	1	1	1					4'-6 ½"
FTL16	#5	1	1	1	1	1					4'-1 ½"
FTL17	#5	1	1	1	1	1					3'-8 ½"
FTL18	#5	1	1	1	1	1					3'-3 ½"
FTL19	#5	1	1	1	1	1					2'-10"
FTL20	#5	2	2	2	2	2					2'-10"
FLL	#4	8	8	8	8	8					39'-9 ½"
FTS1	#5	1	1	1	1	1					2'-11 ½"
FTS2	#5	1	1	1	1	1					4'-4 ½"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
FTS3	#5	1	1	1	1	1					5'-9"
FTS4	#5	34	34	34	34	34					6'-10"
FTS5	#5	1	1	1	1	1					3'-3 ½"
FTS6	#5	1	1	1	1	1					1'-11"
FLS	#4	8	8	8	8	8					23'-6"
WS1	#5	1	1	1	1	1				W+6'-8"	W+6'-8"
WS2	#5	1	1	1	1	1				W+6'-6"	W+6'-6"
WS3	#5	1	1	1	1	1				W+6'-3 ½"	W+6'-3 ½"
WS4	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WS5	#5	1	1	1	1	1				W+5'-10 ½"	W+5'-10 ½"
WS6	#5	1	1	1	1	1				W+5'-8"	W+5'-8"
WS7	#5	1	1	1	1	1				W+5'-6"	W+5'-6"
WS8	#5	1	1	1	1	1				W+5'-3 ½"	W+5'-3 ½"
WS9	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WS10	#5	1	1	1	1	1				W+4'-10 ½"	W+4'-10 ½"
WS11	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WS12	#5	1	1	1	1	1				W+4'-5 ½"	W+4'-5 ½"
WS13	#5	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
WS14	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WS15	#5	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
WS16	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WS17	#5	1	1	1	1	1				W+3'-5 ½"	W+3'-5 ½"
WS18	#5	1	1	1	1	1				W+3'-3 ½"	W+3'-3 ½"
WS19	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WS20	#5	1	1	1	1	1				W+2'-10 ½"	W+2'-10 ½"
WS21	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WS22	#5	1	1	1	1	1				W+2'-5 ½"	W+2'-5 ½"
WS23	#5	1	1	1	1	1				W+2'-3"	W+2'-3"
WS24	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WS25	#5	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
WS26	#5	1	1	1	1	1				W+1'-8"	W+1'-8"
WS27	#5	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WS28	#5	1	1	1	1	1				W+1'-3"	W+1'-3"
WS29	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WS30	#5	1	1	1	1	1			1'-6"	W+1'-10"	W+3'-4"
WS31	#5	1	1	1	1	1			1'-6"	W+1'-8"	W+3'-2"
WS32	#5	1	1	1	1	1			1'-6"	W+1'-5 ½"	W+2'-11 ½"
WS33	#5	1	1	1	1	1			1'-6"	W+1'-3"	W+2'-9"
WS34	#5	1	1	1	1	1			1'-6"	W+1'-0 ½"	W+2'-6 ½"
WS35	#5	1	1	1	1	1			1'-6"	W+0'-10"	W+2'-4"
WS36	#5	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
WS37	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	29	29	29	29	29			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WL2	#5	1	1	1	1	1				W+6'-7"	W+6'-7"
WL3	#5	1	1	1	1	1				W+6'-5 ½"	W+6'-5 ½"
WL4	#5	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
WL5	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL6	#5	1	1	1	1	1				W+6'-1 ½"	W+6'-1 ½"
WL7	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL8	#5	1	1	1	1	1				W+5'-10 ½"	W+5'-10 ½"
WL9	#5	1	1	1	1	1				W+5'-9"	W+5'-9"
WL10	#5	1	1	1	1	1				W+5'-7 ½"	W+5'-7 ½"
WL11	#5	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
WL12	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL13	#5	1	1	1	1	1				W+5'-3 ½"	W+5'-3 ½"
WL14	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WL15	#5	1	1	1	1	1				W+5'-0 ½"	W+5'-0 ½"
WL16	#5	1	1	1	1	1				W+4'-11"	W+4'-11"
WL17	#5	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
WL18	#5	1	1	1	1	1				W+4'-8 ½"	W+4'-8 ½"
WL19	#5	1	1	1	1	1				W+4'-7"	W+4'-7"
WL20	#5	1	1	1	1	1				W+4'-5 ½"	W+4'-5 ½"
WL21	#5	1	1	1	1	1				W+4'-4"	W+4'-4"
WL22	#5	1	1	1	1	1				W+4'-2 ½"	W+4'-2 ½"

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
WL23	#5	1	1	1	1	1				W+4'-1"	W+4'-1"
WL24	#5	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
WL25	#5	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
WL26	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WL27	#5	1	1	1	1	1				W+3'-7 ½"	W+3'-7 ½"
WL28	#5	1	1	1	1	1				W+3'-6"	W+3'-6"
WL29	#5	1	1	1	1	1				W+3'-4 ½"	W+3'-4 ½"
WL30	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WL31	#5	1	1	1	1	1				W+3'-1 ½"	W+3'-1 ½"
WL32	#5	1	1	1	1	1				W+3'-0"	W+3'-0"
WL33	#5	1	1	1	1	1				W+2'-11"	W+2'-11"
WL34	#5	1	1	1	1	1				W+2'-9 ½"	W+2'-9 ½"
WL35	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL36	#5	1	1	1	1	1				W+2'-6 ½"	W+2'-6 ½"
WL37	#5	1	1	1	1	1				W+2'-5"	W+2'-5"
WL38	#5	1	1	1	1	1				W+2'-3 ½"	W+2'-3 ½"
WL39	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WL40	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL41	#5	1	1	1	1	1				W+1'-11 ½"	W+1'-11 ½"
WL42	#5	1	1	1	1	1				W+1'-10"	W+1'-10"
WL43	#5	1	1	1	1	1				W+1'-8 ½"	W+1'-8 ½"
WL44	#5	1	1	1	1	1				W+1'-7"	W+1'-7"
WL45	#5	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WL46	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL47	#5	1	1	1	1	1				W+1'-3"	W+1'-3"
WL48	#5	1	1	1	1	1				W+1'-1 ½"	W+1'-1 ½"
WL49	#5	1	1	1	1	1			1'-6"	W+2'-0"	W+3'-6"
WL50	#5	1	1	1	1	1			1'-6"	W+1'-10 ½"	W+3'-4 ½"
WL51	#5	1	1	1	1	1			1'-6"	W+1'-9"	W+3'-3"
WL52	#5	1	1	1	1	1			1'-6"	W+1'-7 ½"	W+3'-1 ½"
WL53	#5	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
WL54	#5	1	1	1	1	1			1'-6"	W+1'-4 ½"	W+2'-10 ½"
WL55	#5	1	1	1	1	1			1'-6"	W+1'-3"	W+2'-9"
WL56	#5	1	1	1	1	1			1'-6"	W+1'-2"	W+2'-8"
WL57	#5	1	1	1	1	1			1'-6"	W+1'-0 ½"	W+2'-6 ½"
WL58	#5	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WL59	#5	1	1	1	1	1			1'-6"	W+0'-9 ½"	W+2'-3 ½"
WL60	#5	1	1	1	1	1			1'-6"	W+0'-8"	W+2'-2"
WL61	#5	1	1	1	1	1			1'-6"	W+0'-6 ½"	W+2'-0 ½"
WL62	#5	1	1	1	1	1			1'-6"	W+0'-5"	W+1'-11"
DWL	#5	48	48	48	48	48			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+6'-8"	W+6'-8"
RS2	#4	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
RS3	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RS4	#4	1	1	1	1	1				W+5'-9 ½"	W+5'-9 ½"
RS5	#4	1	1	1	1	1				W+5'-6"	W+5'-6"
RS6	#4	1	1	1	1	1				W+5'-2"	W+5'-2"
RS7	#4	1	1	1	1	1				W+4'-10 ½"	W+4'-10 ½"
RS8	#4	1	1	1	1	1				W+4'-7"	W+4'-7"
RS9	#4	1	1	1	1	1				W+4'-3 ½"	W+4'-3 ½"
RS10	#4	1	1	1	1	1				W+3'-11 ½"	W+3'-11 ½"
RS11	#4	1	1	1	1	1				W+3'-8"	W+3'-8"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 2 OF 3

WORKING NUMBER IWD-8-3W-45

SHEET NUMBER 7219

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
RS12	#4	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
RS13	#4	1	1	1	1	1				W+3'-1"	W+3'-1"
RS14	#4	1	1	1	1	1				W+2'-9"	W+2'-9"
RS15	#4	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
RS16	#4	1	1	1	1	1				W+2'-2"	W+2'-2"
RS17	#4	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RS18	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RS19	#4	1	1	1	1	1				W+1'-3"	W+1'-3"
RS20	#4	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
RS21	#4	1	1	1	1	1			1'-6"	W+1'-8"	W+3'-2"
RS22	#4	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
RS23	#4	1	1	1	1	1			1'-6"	W+1'-0 1/2"	W+2'-6 1/2"
RS24	#4	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
RS25	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	20	20	20	20	20			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
RL2	#4	1	1	1	1	1				W+6'-6 1/2"	W+6'-6 1/2"
RL3	#4	1	1	1	1	1				W+6'-4 1/2"	W+6'-4 1/2"
RL4	#4	1	1	1	1	1				W+6'-2"	W+6'-2"
RL5	#4	1	1	1	1	1				W+6'-0"	W+6'-0"
RL6	#4	1	1	1	1	1				W+5'-10"	W+5'-10"
RL7	#4	1	1	1	1	1				W+5'-8"	W+5'-8"
RL8	#4	1	1	1	1	1				W+5'-5 1/2"	W+5'-5 1/2"
RL9	#4	1	1	1	1	1				W+5'-3 1/2"	W+5'-3 1/2"
RL10	#4	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
RL11	#4	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
RL12	#4	1	1	1	1	1				W+4'-9"	W+4'-9"
RL13	#4	1	1	1	1	1				W+4'-7"	W+4'-7"
RL14	#4	1	1	1	1	1				W+4'-5"	W+4'-5"
RL15	#4	1	1	1	1	1				W+4'-3"	W+4'-3"
RL16	#4	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
RL17	#4	1	1	1	1	1				W+3'-10 1/2"	W+3'-10 1/2"
RL18	#4	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
RL19	#4	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"
RL20	#4	1	1	1	1	1				W+3'-4"	W+3'-4"
RL21	#4	1	1	1	1	1				W+3'-2"	W+3'-2"
RL22	#4	1	1	1	1	1				W+3'-0"	W+3'-0"
RL23	#4	1	1	1	1	1				W+2'-10"	W+2'-10"
RL24	#4	1	1	1	1	1				W+2'-7 1/2"	W+2'-7 1/2"
RL25	#4	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
RL26	#4	1	1	1	1	1				W+2'-3 1/2"	W+2'-3 1/2"
RL27	#4	1	1	1	1	1				W+2'-1"	W+2'-1"
RL28	#4	1	1	1	1	1				W+1'-11"	W+1'-11"
RL29	#4	1	1	1	1	1				W+1'-9"	W+1'-9"
RL30	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RL31	#4	1	1	1	1	1				W+1'-4 1/2"	W+1'-4 1/2"
RL32	#4	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
RL33	#4	1	1	1	1	1				W+1'-0 1/2"	W+1'-0 1/2"
RL34	#4	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
RL35	#4	1	1	1	1	1				W+0'-8"	W+0'-8"
RL36	#4	1	1	1	1	1			1'-6"	W+1'-6"	W+3'-0"
RL37	#4	1	1	1	1	1			1'-6"	W+1'-4"	W+2'-10"
RL38	#4	1	1	1	1	1			1'-6"	W+1'-1 1/2"	W+2'-7 1/2"
RL39	#4	1	1	1	1	1			1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
RL40	#4	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
RL41	#4	1	1	1	1	1			1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
RL42	#4	1	1	1	1	1			1'-6"	W+0'-5"	W+1'-11"
DRL	#4	35	35	35	35	35			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					4'-8"
YS2	#4	2	2	2	2	2					7'-11"
YS3	#4	2	2	2	2	2					11'-2"
YS4	#4	2	2	2	2	2					14'-5"
YS5	#4	2	2	2	2	2					17'-8"
YS6	#4	2	2	2	2	2					20'-11"
YS7	#4	6	6	6	6	8					23'-6"

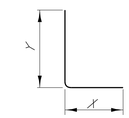
HEIGHT = 8 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

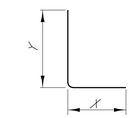
BAR	SIZE	NO. REQUIRED SPAN 8'	10'	12'	14'	16'			DIM. X	DIM. Y	LENGTH
YL1	#4	2	2	2	2	2					8'-1"
YL2	#4	2	2	2	2	2					13'-7"
YL3	#4	2	2	2	2	2					19'-1"
YL4	#4	2	2	2	2	2					24'-7"
YL5	#4	2	2	2	2	2					30'-1 1/2"
YL6	#4	2	2	2	2	2					35'-7 1/2"
YL7	#4	6	6	6	6	8					40'-0 1/2"
FS	#4	2	2	2	2	2					24'-7"
FL	#4	2	2	2	2	2					40'-8 1/2"
N	#4	30	36	42	47	54			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	27	33	38	44	50			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.414(2S+V2)+1'-11"
OS	#7	10	10	10	10	11			3'-6 1/2"	3'-6 1/2"	7'-1"
OL	#7	10	10	10	10	11			3'-6 1/2"	3'-6 1/2"	7'-1"
OSS	#4	1	1	1	1	1					8'-0"+T1
OSL	#4	1	1	1	1	1					8'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

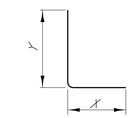
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	7			6'-2"
DS	#4	1			8'-0"+T1
J1	#5	1		W1+7'-1 1/2"	W1+7'-1 1/2"
J2	#5	1		W1+6'-8"	W1+6'-8"
J3	#5	1		W1+6'-2"	W1+6'-2"
J4	#5	1		W1+5'-8"	W1+5'-8"
J5	#5	1		W1+5'-2"	W1+5'-2"
J6	#5	1		W1+4'-8 1/2"	W1+4'-8 1/2"
J7	#5	1		W1+4'-2 1/2"	W1+4'-2 1/2"
J8	#5	1		W1+3'-8 1/2"	W1+3'-8 1/2"
J9	#5	1		W1+3'-2 1/2"	W1+3'-2 1/2"
J10	#5	1		W1+2'-9"	W1+2'-9"
J11	#5	1	1'-0"	W1+3'-0"	W1+4'-0"
J12	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J13	#5	1	1'-0"	W1+2'-0"	W1+3'-0"
J14	#5	1	1'-0"	W1+1'-6 1/2"	W1+2'-6 1/2"
J15	#5	1	1'-0"	W1+1'-0 1/2"	W1+2'-0 1/2"
J16	#5	1	1'-0"	W1+0'-6 1/2"	W1+1'-6 1/2"
DJ	#5	10	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			14'-3 1/2"
FD	#4	1			16'-5"



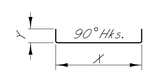
BARS DRS/DRL - #4



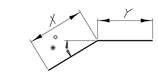
BARS DWS/DWL/DJ - #5



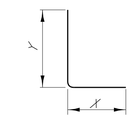
BARS RSn/RLn - #4



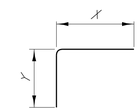
BARS N - #4



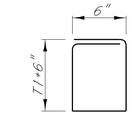
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

DATE	REVISIONS				BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 8 FT.

SPANS 16-32 FT.

SHT. 3 OF 3

WORKING NUMBER
IWD-8-3W-45

SHEET NUMBER
7220

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"R1"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													10'	12'	14'	16'	18'
10'-0"	8'-4"	27'-1 7/16"	45'-10 13/16"	0'-5 5/8"	1'-2 1/4"	25'-0"	0'-11"	1'-0"	4'-0"	2'-9"	0'-6"	19'-0"	57'-7 5/16"+1.414V2	63'-3 3/16"+1.414V2	68'-11 1/16"+1.414V2	74'-6 15/16"+1.414V2	80'-2 7/8"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet. Total brush deflector quantities include brushwalls and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"							ESTIMATED QUANTITIES							
								TOTAL HEADWALL		BRUSH DEFLECTOR		1 AUX. SLAB "W"		1 SQUARE COLLAR	
		Cover	T1	T2	V1	V2	W	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.	CONC. cu. yd.	REINF. STEEL lbs.
200	10x10	5'-0"	9"	10 1/2"	9"	9"	2'-9"	55.0519	7160.605	3.1061	401.817	1.6856	101.258	5.3148	1283.649
		10'-0"	10"	1'-0 1/2"	9"	9"	2'-10"	55.4856	7181.427	3.1061	401.872	1.6856	101.258	5.3519	1292.058
		15'-0"	1'-1"	1'-2 1/2"	10"	9"	3'-1"	56.3782	7243.899	3.1061	402.039	1.6972	101.592	5.4383	1309.765
		20'-0"	1'-3 1/2"	1'-5"	11 1/2"	9"	3'-3 1/2"	57.2165	7295.962	3.1061	402.179	1.7147	102.037	5.5370	1329.320
		25'-0"	1'-1"	1'-2"	1'-0 1/2"	9"	3'-1"	56.3338	7243.899	3.1061	402.039	1.7263	102.371	5.4938	1317.598
		30'-0"	1'-2 1/2"	1'-3 1/2"	1'-2"	9"	3'-2 1/2"	56.8424	7275.135	3.1061	402.123	1.7438	102.816	5.5679	1331.546
240	12x10	5'-0"	10 1/2"	1'-0"	9"	9"	2'-10 1/2"	58.5744	7443.565	3.1061	401.900	1.9649	118.180	5.9444	1441.109
		10'-0"	1'-0"	1'-2"	9"	9"	3'-0"	59.1571	7475.636	3.1061	401.984	1.9649	118.180	5.9877	1452.136
		15'-0"	1'-2 1/2"	1'-5"	10"	9"	3'-2 1/2"	60.0933	7529.086	3.1061	402.123	1.9766	118.514	6.0802	1473.157
		20'-0"	1'-2"	1'-2"	11 1/2"	9"	3'-2"	59.6200	7518.400	3.1061	402.095	1.9940	118.960	6.0741	1467.670
		25'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	3'-3"	60.0365	7539.778	3.1061	402.151	2.0057	119.294	6.1296	1479.240
		30'-0"	1'-4 1/2"	1'-5"	1'-2"	9"	3'-4 1/2"	60.5738	7571.849	3.1061	402.234	2.0231	119.739	6.2037	1494.232
280	14x10	5'-0"	1'-0"	1'-0 1/2"	9"	9"	3'-0"	62.0115	7731.091	3.1061	401.984	2.2443	135.103	6.5617	1597.156
		10'-0"	1'-2"	1'-3"	9"	9"	3'-2"	62.8119	7775.190	3.1061	402.095	2.2443	135.103	6.6173	1612.898
		15'-0"	1'-1"	1'-1"	10"	9"	3'-1"	62.3099	7753.137	3.1061	402.039	2.2559	135.381	6.6049	1606.097
		20'-0"	1'-3 1/2"	1'-3 1/2"	11 1/2"	9"	3'-3 1/2"	63.2334	7808.263	3.1061	402.179	2.2734	135.882	6.7037	1629.128
		25'-0"	1'-5 1/2"	1'-5 1/2"	1'-1 1/2"	9"	3'-5 1/2"	63.9829	7852.356	3.1061	402.290	2.2967	136.495	6.8025	1650.508
		30'-0"	1'-6 1/2"	1'-7"	1'-2"	9"	3'-6 1/2"	64.4289	7874.409	3.1061	402.346	2.3025	136.662	6.8457	1661.100
320	16x10	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-1"	65.4307	8135.931	3.1061	402.039	2.5295	152.137	7.1914	1756.441
		10'-0"	1'-3 1/2"	1'-4 1/2"	10"	9"	3'-3 1/2"	66.4704	8192.727	3.1061	402.179	2.5353	152.304	7.2716	1779.440
		15'-0"	1'-2 1/2"	1'-2 1/2"	11"	9"	3'-2 1/2"	65.9332	8170.006	3.1061	402.123	2.5469	152.638	7.2593	1771.596
		20'-0"	1'-5 1/2"	1'-5 1/2"	1'-0"	9"	3'-5 1/2"	67.0949	8238.156	3.1061	402.290	2.5585	152.916	7.3580	1798.364
		25'-0"	1'-7 1/2"	1'-7 1/2"	1'-2"	9"	3'-7 1/2"	67.8854	8283.592	3.1061	402.401	2.5818	153.584	7.4568	1821.135
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	3'-9"	68.8405	8326.462	3.6538	402.485	2.6109	154.364	7.5679	1842.884
360	18x10	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-2 1/2"	69.0014	8427.158	3.1061	402.123	2.8204	169.394	7.8395	1921.060
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	3'-5 1/2"	70.2981	8497.312	3.1061	402.290	2.8263	169.561	7.9321	1950.165
		15'-0"	1'-4 1/2"	1'-4 1/2"	1'-0"	9"	3'-4 1/2"	69.8138	8473.930	3.1061	402.234	2.8379	169.839	7.9259	1943.374
		20'-0"	1'-7"	1'-7"	1'-1"	9"	3'-7"	70.8309	8532.389	3.1061	402.373	2.8495	170.173	8.0123	1968.035
		25'-0"	1'-8"	1'-9"	1'-2"	9"	3'-8"	71.4233	8555.779	3.1061	402.429	2.8612	170.507	8.0741	1984.309
		30'-0"	1'-10 1/2"	2'-0"	1'-3 1/2"	1'-0"	3'-10 1/2"	72.7510	8623.117	3.6538	402.568	2.8961	171.453	8.2160	2015.586

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 1 OF 4

WORKING NUMBER IWD-10-3W-45

SHEET NUMBER 7221

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1					1.414(2S+V2)+6'-4 ½"
T2	#4	1	1	1	1	1					1.414(2S+V2)+9'-4 ½"
T3	#4	1	1	1	1	1					1.414(2S+V2)+12'-0 ½"
T4	#4	1	1	1	1	1					1.414(2S+V2)+12'-11"
T5	#4	1	1	1	1	1					1.414(2S+V2)+13'-9 ½"
T6	#4	1	1	1	1	1					1.414(2S+V2)+14'-8"
T7	#4	1	1	1	1	1					1.414(2S+V2)+15'-7"
T8	#4	1	1	1	1	1					1.414(2S+V2)+16'-5 ½"
T9	#4	1	1	1	1	1					1.414(2S+V2)+17'-4"
T10	#4	1	1	1	1	1					1.414(2S+V2)+18'-2 ½"
T11	#4	1	1	1	1	1					1.414(2S+V2)+19'-1"
T12	#4	1	1	1	1	1					1.414(2S+V2)+20'-0"
T13	#4	1	1	1	1	1					1.414(2S+V2)+20'-10 ½"
T14	#4	1	1	1	1	1					1.414(2S+V2)+21'-9"
T15	#4	1	1	1	1	1					1.414(2S+V2)+22'-7 ½"
T16	#4	1	1	1	1	1					1.414(2S+V2)+23'-6"
T17	#4	1	1	1	1	1					1.414(2S+V2)+24'-4 ½"
T18	#4	1	1	1	1	1					1.414(2S+V2)+25'-3 ½"
T19	#4	1	1	1	1	1					1.414(2S+V2)+26'-2"
T20	#4	1	1	1	1	1					1.414(2S+V2)+27'-0 ½"
T21	#4	1	1	1	1	1					1.414(2S+V2)+27'-11"
T22	#4	1	1	1	1	1					1.414(2S+V2)+28'-9 ½"
T23	#4	1	1	1	1	1					1.414(2S+V2)+29'-8 ½"
T24	#4	1	1	1	1	1					1.414(2S+V2)+30'-7"
T25	#4	1	1	1	1	1					1.414(2S+V2)+31-5 ½"
T26	#4	1	1	1	1	1					1.414(2S+V2)+32'-4"
T27	#4	1	1	1	1	1					1.414(2S+V2)+33'-2 ½"
T28	#4	1	1	1	1	1					1.414(2S+V2)+34'-1"
T29	#4	1	1	1	1	1					1.414(2S+V2)+34'-0"
T30	#4	1	1	1	1	1					1.414(2S+V2)+33'-1"
T31	#4	3	3	3	3	3					1.414(2S+V2)+28'-8"
V1	#4	25	29	33	37	41			34'-10 ½"	1'-8"	36'-6 ½"
VL1	#4	1	1	1	1	1			32'-2"	1'-8"	33'-10"
VL2	#4	1	1	1	1	1			28'-5 ½"	1'-8"	30'-1 ½"
VL3	#4	1	1	1	1	1			24'-9 ½"	1'-8"	26'-5 ½"
VL4	#4	1	1	1	1	1			21'-1"	1'-8"	22'-9"
VL5	#4	1	1	1	1	1			17'-4 ½"	1'-8"	19'-0 ½"
VL6	#4	1	1	1	1	1			13'-8"	1'-8"	15'-4"
VL7	#4	1	1	1	1	1			9'-3 ½"		9'-3 ½"
VL8	#4	1	1	1	1	1			4'-4 ½"		4'-4 ½"
VS1	#4	1	1	1	1	1			34'-10 ½"	1'-8"	36'-6 ½"
VS2	#4	1	1	1	1	1			34'-2 ½"	1'-8"	35'-10 ½"
VS3	#4	1	1	1	1	1			33'-7"	1'-8"	35'-3"
VS4	#4	1	1	1	1	1			32'-11 ½"	1'-8"	34'-7 ½"
VS5	#4	1	1	1	1	1			30'-1 ½"	1'-8"	31'-9 ½"
VS6	#4	1	1	1	1	1			26'-4 ½"	1'-8"	28'-0 ½"
VS7	#4	1	1	1	1	1			22'-7 ½"	1'-8"	24'-3 ½"
VS8	#4	1	1	1	1	1			18'-10 ½"	1'-8"	20'-6 ½"
VS9	#4	1	1	1	1	1			15'-2"	1'-8"	16'-10"
VS10	#4	1	1	1	1	1			11'-5"	1'-8"	13'-1"
VS11	#4	1	1	1	1	1			7'-8"		7'-8"
VS12	#4	1	1	1	1	1			3'-11"		3'-11"
FTL1	#5	1	1	1	1	1					1'-2 ½"
FTL2	#5	1	1	1	1	1					1'-6 ½"
FTL3	#5	1	1	1	1	1					1'-10"
FTL4	#5	1	1	1	1	1					2'-2"
FTL5	#5	1	1	1	1	1					2'-6"
FTL6	#5	1	1	1	1	1					2'-10"
FTL7	#5	1	1	1	1	1					3'-1 ½"
FTL8	#5	1	1	1	1	1					3'-5 ½"
FTL9	#5	1	1	1	1	1					3'-9 ½"
FTL10	#5	1	1	1	1	1					4'-1"
FTL11	#5	1	1	1	1	1					4'-5"
FTL12	#5	77	77	77	77	77					7'-5"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
FTL13	#5	1	1	1	1	1					7'-4"
FTL14	#5	1	1	1	1	1					7'-0"
FTL15	#5	1	1	1	1	1					6'-8"
FTL16	#5	1	1	1	1	1					6'-4"
FTL17	#5	1	1	1	1	1					6'-0 ½"
FTL18	#5	1	1	1	1	1					5'-8 ½"
FTL19	#5	1	1	1	1	1					5'-4 ½"
FTL20	#5	1	1	1	1	1					5'-1"
FTL21	#5	1	1	1	1	1					4'-9"
FTL22	#5	1	1	1	1	1					4'-5"
FTL23	#5	1	1	1	1	1					4'-1"
FTL24	#5	1	1	1	1	1					3'-9 ½"
FTL25	#5	1	1	1	1	1					3'-5 ½"
FTL26	#5	3	3	3	3	3					3'-5"
FLL	#4	9	9	9	9	9					45'-3 ½"
FTS1	#5	1	1	1	1	1					3'-6 ½"
FTS2	#5	1	1	1	1	1					4'-7 ½"
FTS3	#5	1	1	1	1	1					5'-8"
FTS4	#5	1	1	1	1	1					6'-9"
FTS5	#5	51	51	51	51	51					7'-5"
FTS6	#5	1	1	1	1	1					3'-9"
FTS7	#5	1	1	1	1	1					2'-8"
FTS8	#5	1	1	1	1	1					1'-7 ½"
FLS	#4	9	9	9	9	9					26'-9 ½"
WS1	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WS2	#5	1	1	1	1	1				W+7'-6 ½"	W+7'-6 ½"
WS3	#5	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
WS4	#5	1	1	1	1	1				W+7'-3"	W+7'-3"
WS5	#5	1	1	1	1	1				W+7'-1"	W+7'-1"
WS6	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WS7	#5	1	1	1	1	1				W+6'-9 ½"	W+6'-9 ½"
WS8	#5	1	1	1	1	1				W+6'-7 ½"	W+6'-7 ½"
WS9	#5	1	1	1	1	1				W+6'-5 ½"	W+6'-5 ½"
WS10	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WS11	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WS12	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WS13	#5	1	1	1	1	1				W+5'-10 ½"	W+5'-10 ½"
WS14	#5	1	1	1	1	1				W+5'-8 ½"	W+5'-8 ½"
WS15	#5	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
WS16	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WS17	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WS18	#5	1	1	1	1	1				W+5'-1"	W+5'-1"
WS19	#5	1	1	1	1	1				W+4'-11 ½"	W+4'-11 ½"
WS20	#5	1	1	1	1	1				W+4'-9 ½"	W+4'-9 ½"
WS21	#5	1	1	1	1	1				W+4'-7 ½"	W+4'-7 ½"
WS22	#5	1	1	1	1	1				W+4'-6"	W+4'-6"
WS23	#5	1	1	1	1	1				W+4'-4"	W+4'-4"
WS24	#5	1	1	1	1	1				W+4'-2"	W+4'-2"
WS25	#5	1	1	1	1	1				W+4'-0 ½"	W+4'-0 ½"
WS26	#5	1	1	1	1	1				W+3'-10 ½"	W+3'-10 ½"
WS27	#5	1	1	1	1	1				W+3'-8 ½"	W+3'-8 ½"
WS28	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WS29	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WS30	#5	1	1	1	1	1				W+3'-3"	W+3'-3"
WS31	#5	1	1	1	1	1				W+3'-1 ½"	W+3'-1 ½"
WS32	#5	1	1	1	1	1				W+2'-11 ½"	W+2'-11 ½"
WS33	#5	1	1	1	1	1				W+2'-9 ½"	W+2'-9 ½"
WS34	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WS35	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WS36	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WS37	#5	1	1	1	1	1				W+2'-2 ½"	W+2'-2 ½"
WS38	#5	1	1	1	1	1				W+2'-0 ½"	W+2'-0 ½"
WS39	#5	1	1	1	1	1				W+1'-10 ½"	W+1'-10 ½"
WS40	#5	1	1	1	1	1				W+1'-9"	W+1'-9"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WS41	#5	1	1	1	1	1				W+1'-7"	W+1'-7"
WS42	#5	1	1	1	1	1				W+1'-5 ½"	W+1'-5 ½"
WS43	#5	1	1	1	1	1				W+1'-3 ½"	W+1'-3 ½"
WS44	#5	1	1	1	1	1				W+1'-1 ½"	W+1'-1 ½"
WS45	#5	1	1	1	1	1				W+1'-0"	W+1'-0"
WS46	#5	1	1	1	1	1				W+0'-10"	W+0'-10"
WS47	#5	1	1	1	1	1				W+0'-8"	W+0'-8"
WS48	#5	1	1	1	1	1				W+0'-6 ½"	W+0'-6 ½"
WS49	#5	1	1	1	1	1				W+0'-4 ½"	W+0'-4 ½"
WS50	#5	1	1	1	1	1				W+0'-2 ½"	W+0'-2 ½"
WS51	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WS52	#5	1	1	1	1	1			1'-6"	W+0'-11"	W+2'-5"
WS53	#5	1	1	1	1	1			1'-6"	W+0'-9"	W+2'-3"
WS54	#5	1	1	1	1	1			1'-6"	W+0'-7"	W+2'-1"
WS55	#5	1	1	1	1	1			1'-6"	W+0'-5 ½"	W+1'-11 ½"
DWS	#5	51	51	51	51	51			1'-6"	2'-9"	4'-3"
WL1	#5	1	1	1	1	1				W+7'-8 ½"	W+7'-8 ½"
WL2	#5	1	1	1	1	1				W+7'-7 ½"	W+7'-7 ½"
WL3	#5	1	1	1	1	1				W+7'-6 ½"	W+7'-6 ½"
WL4	#5	1	1	1	1	1				W+7'-5 ½"	W+7'-5 ½"
WL5	#5	1	1	1	1	1				W+7'-4 ½"	W+7'-4 ½"
WL6	#5	1	1	1	1	1				W+7'-3"	W+7'-3"
WL7	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WL8	#5	1	1	1	1	1				W+7'-1"	W+7'-1"
WL9	#5	1	1	1	1	1				W+7'-0"	W+7'-0"
WL10	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WL11	#5	1	1	1	1	1				W+6'-10"	W+6'-10"
WL12	#5	1	1	1	1	1				W+6'-8 ½"	W+6'-8 ½"
WL13	#5	1	1	1	1	1				W+6'-7 ½"	W+6'-7 ½"
WL14	#5	1	1	1	1	1				W+6'-6 ½"	W+6'-6 ½"
WL15	#5	1	1	1	1	1				W+6'-5 ½"	W+6'-5 ½"
WL16	#5	1	1	1	1	1				W+6'-4 ½"	W+6'-4 ½"
WL17	#5	1	1	1	1	1				W+6'-3 ½"	W+6'-3 ½"
WL18	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WL19	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WL20	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL21	#5	1	1	1	1	1				W+5'-11"	W+5'-11"
WL22	#5	1	1	1	1	1				W+5'-10"	W+5'-10"
WL23	#5	1	1	1	1	1				W+5'-9"	W+5'-9"
WL24	#5	1	1	1	1	1				W+5'-8"	W+5'-8"
WL25	#5	1	1	1	1	1				W+5'-6 ½"	W+5'-6 ½"
WL26	#5	1	1	1	1	1				W+5'-5 ½"	W+5'-5 ½"
WL27	#5	1	1	1	1	1				W+5'-4 ½"	W+5'-4 ½"
WL28	#5	1	1	1	1	1				W+5'-3 ½"	W+5'-3 ½"
WL29	#5	1	1	1	1	1				W+5'-2 ½"	W+5'-2 ½"
WL30	#5	1	1	1	1	1				W+5'-1 ½"	W+5'-1 ½"
WL31	#5	1	1	1	1	1				W+5'-0"	W+5'-0"
WL32	#5	1	1	1	1	1				W+4'-11"	W+4'-11"
WL33	#5	1	1	1	1	1				W+4'-10"	W+4'-10"
WL34	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WL35	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WL36	#5	1	1	1	1	1				W+4'-7"	W+4'-7"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 2 OF 4

WORKING NUMBER IWD-10-3W-45

SHEET NUMBER 7222

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
WL37	#5	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
WL38	#5	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
WL39	#5	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
WL40	#5	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
WL41	#5	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
WL42	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WL43	#5	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
WL44	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL45	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WL46	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL47	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WL48	#5	1	1	1	1	1				W+3'-6"	W+3'-6"
WL49	#5	1	1	1	1	1				W+3'-5"	W+3'-5"
WL50	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
WL51	#5	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WL52	#5	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
WL53	#5	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
WL54	#5	1	1	1	1	1				W+2'-11 1/2"	W+2'-11 1/2"
WL55	#5	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
WL56	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WL57	#5	1	1	1	1	1				W+2'-8"	W+2'-8"
WL58	#5	1	1	1	1	1				W+2'-7"	W+2'-7"
WL59	#5	1	1	1	1	1				W+2'-6"	W+2'-6"
WL60	#5	1	1	1	1	1				W+2'-5"	W+2'-5"
WL61	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WL62	#5	1	1	1	1	1				W+2'-3"	W+2'-3"
WL63	#5	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
WL64	#5	1	1	1	1	1				W+2'-0 1/2"	W+2'-0 1/2"
WL65	#5	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
WL66	#5	1	1	1	1	1				W-1'-10 1/2"	W-1'-10 1/2"
WL67	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WL68	#5	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
WL69	#5	1	1	1	1	1				W+1'-7"	W+1'-7"
WL70	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL71	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WL72	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL73	#5	1	1	1	1	1				W+1'-3"	W+1'-3"
WL74	#5	1	1	1	1	1				W+1'-2"	W+1'-2"
WL75	#5	1	1	1	1	1				W+1'-0 1/2"	W+1'-0 1/2"
WL76	#5	1	1	1	1	1				W+0'-11"	W+0'-11"
WL77	#5	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
WL78	#5	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
WL79	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WL80	#5	1	1	1	1	1				W+0'-7 1/2"	W+0'-7 1/2"
WL81	#5	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
WL82	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL83	#5	1	1	1	1	1				W+0'-4"	W+0'-4"
WL84	#5	1	1	1	1	1				W+0'-3"	W+0'-3"
WL85	#5	1	1	1	1	1				W+0'-2"	W+0'-2"
WL86	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WL87	#5	1	1	1	1	1			1'-6"	W+0'-11 1/2"	W+2'-5 1/2"
WL88	#5	1	1	1	1	1			1'-6"	W+0'-10 1/2"	W+2'-4 1/2"
WL89	#5	1	1	1	1	1			1'-6"	W+0'-9 1/2"	W+2'-3 1/2"
WL90	#5	1	1	1	1	1			1'-6"	W+0'-8 1/2"	W+2'-2 1/2"
WL91	#5	1	1	1	1	1			1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
WL92	#5	1	1	1	1	1			1'-6"	W+0'-6 1/2"	W+2'-0 1/2"
WL93	#5	1	1	1	1	1			1'-6"	W+0'-5"	W+1'-11"
DWL	#5	86	86	86	86	86			1'-6"	2'-9"	4'-3"
RS1	#4	1	1	1	1	1				W+7'-8"	W+7'-8"
RS2	#4	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
RS3	#4	1	1	1	1	1				W+7'-1"	W+7'-1"
RS4	#4	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
RS5	#4	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
RS6	#4	1	1	1	1	1				W+6'-2"	W+6'-2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RS7	#4	1	1	1	1	1				W+5'-10 1/2"	W+5'-10 1/2"
RS8	#4	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
RS9	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RS10	#4	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
RS11	#4	1	1	1	1	1				W+4'-7 1/2"	W+4'-7 1/2"
RS12	#4	1	1	1	1	1				W+4'-4"	W+4'-4"
RS13	#4	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
RS14	#4	1	1	1	1	1				W+3'-8 1/2"	W+3'-8 1/2"
RS15	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS16	#4	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
RS17	#4	1	1	1	1	1				W+2'-9 1/2"	W+2'-9 1/2"
RS18	#4	1	1	1	1	1				W+2'-6"	W+2'-6"
RS19	#4	1	1	1	1	1				W+2'-2 1/2"	W+2'-2 1/2"
RS20	#4	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
RS21	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RS22	#4	1	1	1	1	1				W+1'-3 1/2"	W+1'-3 1/2"
RS23	#4	1	1	1	1	1				W+1'-0"	W+1'-0"
RS24	#4	1	1	1	1	1				W+0'-8"	W+0'-8"
RS25	#4	1	1	1	1	1				W+0'-4 1/2"	W+0'-4 1/2"
RS26	#4	1	1	1	1	1				W+0'-1"	W+0'-1"
RS27	#4	1	1	1	1	1				W-0'-3"	W-0'-3"
RS28	#4	1	1	1	1	1			1'-6"	W+0'-5 1/2"	W+1'-11 1/2"
DRS	#4	27	27	27	27	27			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
RL2	#4	1	1	1	1	1				W+7'-6 1/2"	W+7'-6 1/2"
RL3	#4	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
RL4	#4	1	1	1	1	1				W+7'-2"	W+7'-2"
RL5	#4	1	1	1	1	1				W+7'-0"	W+7'-0"
RL6	#4	1	1	1	1	1				W+6'-10"	W+6'-10"
RL7	#4	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
RL8	#4	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
RL9	#4	1	1	1	1	1				W+6'-3 1/2"	W+6'-3 1/2"
RL10	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RL11	#4	1	1	1	1	1				W+5'-11"	W+5'-11"
RL12	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RL13	#4	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
RL14	#4	1	1	1	1	1				W+5'-4 1/2"	W+5'-4 1/2"
RL15	#4	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
RL16	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RL17	#4	1	1	1	1	1				W+4'-10"	W+4'-10"
RL18	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RL19	#4	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
RL20	#4	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
RL21	#4	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
RL22	#4	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
RL23	#4	1	1	1	1	1				W+3'-9"	W+3'-9"
RL24	#4	1	1	1	1	1				W+3'-7"	W+3'-7"
RL25	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RL26	#4	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
RL27	#4	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
RL28	#4	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
RL29	#4	1	1	1	1	1				W+2'-8"	W+2'-8"
RL30	#4	1	1	1	1	1				W+2'-6"	W+2'-6"
RL31	#4	1	1	1	1	1				W+2'-4"	W+2'-4"
RL32	#4	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
RL33	#4	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
RL34	#4	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
RL35	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RL36	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RL37	#4	1	1	1	1	1				W+1'-3"	W+1'-3"
RL38	#4	1	1	1	1	1				W+1'-0 1/2"	W+1'-0 1/2"
RL39	#4	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
RL40	#4	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
RL41	#4	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"

HEIGHT = 10 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 10'	12'	14'	16'	18'			DIM. X	DIM. Y	LENGTH
RL42	#4	1	1	1	1	1				W+0'-4"	W+0'-4"
RL43	#4	1	1	1	1	1				W+0'-2"	W+0'-2"
RL44	#4	1	1	1	1	1				W+0'-0"	W+0'-0"
RL45	#4	1	1	1	1	1				W-0'-2 1/2"	W-0'-2 1/2"
RL46	#4	1	1	1	1	1			1'-6"	W+0'-7 1/2"	W+2'-1 1/2"
RL47	#4	1	1	1	1	1			1'-6"	W+0'-5"	W+1'-11"
DRL	#4	45	45	45	45	45			1'-6"	2'-5"	3'-11"
YS1	#4	2	2	2	2	2					4'-8"
YS2	#4	2	2	2	2	2					7'-11"
YS3	#4	2	2	2	2	2					11'-2"
YS4	#4	2	2	2	2	2					14'-5 1/2"
YS5	#4	2	2	2	2	2					17'-8 1/2"
YS6	#4	2	2	2	2	2					20'-11 1/2"
YS7	#4	2	2	2	2	2					24'-2 1/2"
YS8	#4	8	8	8	10	10					26'-9 1/2"
YL1	#4	2	2	2	2	2					8'-1"
YL2	#4	2	2	2	2	2					13'-7"
YL3	#4	2	2	2	2	2					19'-1"
YL4	#4	2	2	2	2	2					24'-7"
YL5	#4	2	2	2	2	2					30'-1 1/2"
YL6	#4	2	2	2	2	2					36'-7 1/2"
YL7	#4	8	8	8	8	8					41'-1 1/2"
YL8	#4	8	8	8	10	10					45'-7"
FS	#4	2	2	2	2	2					28'-0 1/2"
FL	#4	2	2	2	2	2					46'-4"
N	#4	36	42	48	54	60			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	33	38	44	50	55			0'-6"	T1+6"	2T1+2'-6"
L	#4	4	4	4	4	4					1.414(2S+V2)+2'-2"
OS	#7	12	12	12	13	13			3'-8"	3'-8"	7'-4"
OL	#7	12	12	12	13	13			3'-8"	3'-8"	7'-4"
OSS	#4	1	1	1	1	1					10'-0"+T1
OSL	#4	1	1	1	1	1					10'-0"+T1

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 10 FT.

SPANS 20-36 FT.

SHT. 3 OF 4

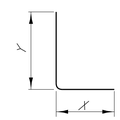
WORKING NUMBER
IWD-10-3W-45

SHEET NUMBER
7223

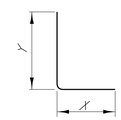
REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

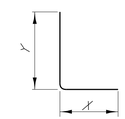
BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR					
BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	9			6'-4"
DS	#4	1			10'-0"+T1
J1	#5	1		W1+9'-1 ½"	W1+9'-1 ½"
J2	#5	1		W1+8'-8"	W1+8'-8"
J3	#5	1		W1+8'-2"	W1+8'-2"
J4	#5	1		W1+7'-8"	W1+7'-8"
J5	#5	1		W1+7'-2"	W1+7'-2"
J6	#5	1		W1+6'-8"	W1+6'-8"
J7	#5	1		W1+6'-2 ½"	W1+6'-2 ½"
J8	#5	1		W1+5'-8 ½"	W1+5'-8 ½"
J9	#5	1		W1+5'-2 ½"	W1+5'-2 ½"
J10	#5	1		W1+4'-8 ½"	W1+4'-8 ½"
J11	#5	1		W1+4'-2 ½"	W1+4'-2 ½"
J12	#5	1		W1+3'-9"	W1+3'-9"
J13	#5	1		W1+3'-3"	W1+3'-3"
J14	#5	1		W1+2'-9"	W1+2'-9"
J15	#5	1		W1+2'-3"	W1+2'-3"
J16	#5	1	1'-0"	W1+2'-6"	W1+3'-6"
J17	#5	1	1'-0"	W1+2'-0 ½"	W1+3'-0 ½"
J18	#5	1	1'-0"	W1+1'-6 ½"	W1+2'-6 ½"
J19	#5	1	1'-0"	W1+1'-0 ½"	W1+2'-0 ½"
J20	#5	1	1'-0"	W1+0'-6 ½"	W1+1'-6 ½"
DJ	#5	15	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 ½"
YD2	#5	1			4'-3 ½"
YD3	#5	1			6'-3 ½"
YD4	#5	1			8'-3 ½"
YD5	#5	1			10'-3 ½"
YD6	#5	1			12'-3 ½"
YD7	#5	1			14'-3 ½"
YD8	#5	1			16'-3 ½"
YD9	#5	1			18'-3 ½"
FD	#4	1			20'-10 ½"



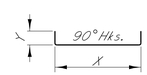
BARS DRS/DRL - #4



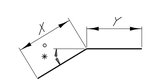
BARS DWS/DWL/DJ - #5



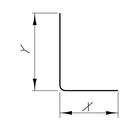
BARS RSn/RLn - #4



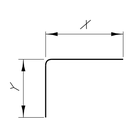
BARS N - #4



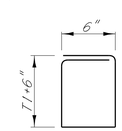
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

		BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS
		REVISIONS	HEIGHT 10 FT. SHT. 4 OF 4 SPANS 20-36 FT.
		DATE	DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E. DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015 DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE. DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

WORKING NUMBER
IWD-10-3W-45

SHEET NUMBER
7224

HEADWALL DIMENSIONS																	
CULVERT HEIGHT "H"	"J"	"LW1"	"LW2"	"R1"	"R2"	"Z"	"Rd"	"Rw"	"Rl"	"Rh"	"W1"	"BDL"	"Y" CLEAR SPAN				
													12'	14'	16'	18'	20'
12'-0"	9'-7"	31'-2 5/8"	52'-9 7/16"	0'-6 1/16"	1'-3 7/16"	28'-9"	11"	1'-1"	5'-0"	3'-0"	0'-6"	23'-0"	67'-6"+1.414V2	73'-1 1/8"+1.414V2	78'-9 3/4"+1.414V2	84'-5 5/8"+1.414V2	90'-1 1/2"+1.414V2

NOTE: Total headwall quantities include wingwalls, apron, wingwall footings and parapet.
Total brush deflector quantities include brushwall and brushwall footing.

AREA OF OPENING sq. ft.	SIZE OF CULVERT ft. x ft. "S"x"H"	Cover	T1	T2	V1	V2	W	ESTIMATED QUANTITIES: TOTAL HEADWALL CONC. cu. yd.	TOTAL HEADWALL REINF. STEEL lbs.	BRUSH DEFLECTOR CONC. cu. yd.	BRUSH DEFLECTOR REINF. STEEL lbs.	1 AUX. SLAB "W" CONC. cu. yd.	1 AUX. SLAB "W" REINF. STEEL lbs.	1 SQUARE COLLAR CONC. cu. yd.	1 SQUARE COLLAR REINF. STEEL lbs.
288	12x12	5'-0"	10 1/2"	11 1/2"	9"	9"	3'-7 1/2"	76.9381	10858.354	4.2998	536.883	1.9649	118.180	6.2346	1513.277
		10'-0"	1'-0"	1'-2"	10 1/2"	9"	3'-9"	77.6678	10898.681	4.2998	536.967	1.9824	118.626	6.3210	1531.941
		15'-0"	1'-2 1/2"	1'-5"	1'-0 1/2"	9"	3'-11 1/2"	78.7523	10965.891	4.2998	537.106	2.0057	119.294	6.4383	1557.351
		20'-0"	1'-0"	1'-1"	10"	9"	3'-9"	77.5455	10898.681	4.2998	536.967	1.9766	118.514	6.2963	1526.770
		25'-0"	1'-1"	1'-1 1/2"	10 1/2"	9"	3'-10"	77.8908	10925.564	4.2998	537.022	1.9824	118.626	6.3272	1533.516
		30'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	78.2977	10952.452	4.2998	537.078	1.9882	118.793	6.3642	1541.837
336	14x12	5'-0"	1'-0"	1'-1"	9"	9"	3'-9"	81.0095	11216.037	4.2998	536.967	2.2443	133.544	6.8642	1672.649
		10'-0"	1'-1 1/2"	1'-4"	10 1/2"	9"	3'-10 1/2"	81.8540	11257.199	4.2998	537.050	2.2617	133.990	6.9568	1694.452
		15'-0"	1'-0 1/2"	1'-1 1/2"	1'-0 1/2"	9"	3'-9 1/2"	81.2282	11229.759	4.2998	536.994	2.2850	134.658	6.9630	1690.291
		20'-0"	1'-2"	1'-2 1/2"	11"	9"	3'-11"	81.7895	11270.921	4.2998	537.078	2.2676	134.157	6.9568	1692.975
		25'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	82.2867	11298.361	4.2998	537.134	2.2792	134.491	7.0123	1705.761
		30'-0"	1'-4"	1'-4 1/2"	1'-0"	9"	4'-1"	82.6405	11325.800	4.2998	537.189	2.2792	134.491	7.0309	1711.008
384	16x12	5'-0"	1'-1"	1'-1 1/2"	9 1/2"	9"	3'-10"	84.8375	11564.951	4.2998	537.022	2.5295	152.137	7.4877	1830.358
		10'-0"	1'-3 1/2"	1'-4 1/2"	10 1/2"	9"	4'-0 1/2"	86.0180	11635.229	4.2998	537.161	2.5411	152.471	7.5802	1855.551
		15'-0"	1'-2"	1'-2 1/2"	1'-0 1/2"	9"	3'-11"	85.2864	11593.065	4.2998	537.078	2.5644	153.083	7.5864	1850.173
		20'-0"	1'-3 1/2"	1'-4"	1'-0"	9"	4'-0 1/2"	85.9468	11635.229	4.2998	537.161	2.5585	152.916	7.6111	1859.690
		25'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	86.8368	11689.222	5.0674	537.245	2.5876	153.751	7.7099	1877.941
		30'-0"	1'-6"	1'-7"	1'-1 1/2"	1'-0"	4'-3"	87.3641	11717.329	5.0674	537.301	2.5935	153.863	7.7531	1889.576
432	18x12	5'-0"	1'-2 1/2"	1'-2 1/2"	10 1/2"	9"	3'-11 1/2"	88.9134	11929.564	4.2998	537.106	2.8204	169.394	8.1358	1995.325
		10'-0"	1'-5 1/2"	1'-6"	11"	9"	4'-2 1/2"	90.3759	12015.896	4.2998	537.273	2.8263	169.561	8.2284	2024.603
		15'-0"	1'-3"	1'-3 1/2"	1'-0 1/2"	9"	4'-0"	89.2377	11943.955	4.2998	537.134	2.8437	170.006	8.2037	2009.697
		20'-0"	1'-5"	1'-5 1/2"	1'-1"	1'-0"	4'-2"	90.3811	12013.230	5.0674	537.245	2.8670	170.618	8.3025	2031.164
		25'-0"	1'-6 1/2"	1'-7 1/2"	1'-2"	1'-0"	4'-3 1/2"	91.1699	12056.396	5.0674	537.328	2.8786	170.952	8.3704	2049.882
		30'-0"	1'-9"	1'-10"	1'-3"	1'-0"	4'-6"	92.3364	12128.337	5.0674	537.468	2.8903	171.286	8.4568	2074.891
480	20x12	5'-0"	1'-3 1/2"	1'-3 1/2"	11"	9"	4'-0 1/2"	92.8826	12281.408	4.2998	537.161	3.1056	184.869	8.7654	2157.739
		10'-0"	1'-3"	1'-4"	1'-0"	9"	4'-0"	92.8409	12266.682	4.2998	537.134	3.1172	185.203	8.7901	2161.780
		15'-0"	1'-4 1/2"	1'-5"	1'-1"	1'-0"	4'-1 1/2"	93.6862	12322.652	5.0674	537.217	3.1463	185.982	8.8827	2179.846
		20'-0"	1'-6 1/2"	1'-7"	1'-2"	1'-0"	4'-3 1/2"	94.6512	12381.546	5.0674	537.328	3.1580	186.316	8.9568	2202.052
		25'-0"	1'-10"	1'-10"	1'-3"	1'-0"	4'-7"	96.2430	12484.599	5.0674	537.523	3.1696	186.595	9.0617	2235.611

GENERAL NOTES:

Specifications: Mississippi Standard Specifications For Road And Bridge Construction, 2004.
All concrete shall be Class "B".
Concrete surfaces shall be finished in accordance with Sub-Section 804.03.19.6.2
Expansion joint material shall be bituminous fiber type unless otherwise noted.
All exposed corners shall be chamfered 3/4".
Reinforcing steel shall be placed 2" clear minimum from the surface of the concrete unless otherwise noted, and all reinforcing shall be adequately supported from the forms.
All bars shall be accurately spaced and securely wired at each intersection before placing concrete.
Bar bending details shall be in accordance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315R-94).
Reinforcement order lists and required placing plans shall be furnished in accordance with Section 805 of the Mississippi Standard Specifications. Partial submittals are not acceptable.
Reinforcing steel shall be ASTM A615, Grade 60, unless otherwise noted.
Horizontal construction joints shall be placed only at the locations shown, and the concrete shall be allowed to set a minimum period of two hours before continuing the pour.
Auxiliary slabs "W" and vertical construction joints at the wings shall be placed in all culverts regardless of length.
The quantities shown will be used as a basis for final payment unless this drawing is modified.

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

REVISIONS | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 1 OF 4

WORKING NUMBER IWD-12-3W-45

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015
DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

SHEET NUMBER 7225

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
T1	#4	1	1	1	1	1			1.414(2S+V2)+6'-11"
T2	#4	1	1	1	1	1			1.414(2S+V2)+9'-4 1/2"
T3	#4	1	1	1	1	1			1.414(2S+V2)+11'-9 1/2"
T4	#4	1	1	1	1	1			1.414(2S+V2)+13'-4"
T5	#4	1	1	1	1	1			1.414(2S+V2)+14'-0 1/2"
T6	#4	1	1	1	1	1			1.414(2S+V2)+14'-9"
T7	#4	1	1	1	1	1			1.414(2S+V2)+15'-5 1/2"
T8	#4	1	1	1	1	1			1.414(2S+V2)+16'-2"
T9	#4	1	1	1	1	1			1.414(2S+V2)+16'-10 1/2"
T10	#4	1	1	1	1	1			1.414(2S+V2)+17'-7"
T11	#4	1	1	1	1	1			1.414(2S+V2)+18'-3 1/2"
T12	#4	1	1	1	1	1			1.414(2S+V2)+19'-0"
T13	#4	1	1	1	1	1			1.414(2S+V2)+19'-8 1/2"
T14	#4	1	1	1	1	1			1.414(2S+V2)+20'-5"
T15	#4	1	1	1	1	1			1.414(2S+V2)+21'-1 1/2"
T16	#4	1	1	1	1	1			1.414(2S+V2)+21'-10"
T17	#4	1	1	1	1	1			1.414(2S+V2)+22'-6 1/2"
T18	#4	1	1	1	1	1			1.414(2S+V2)+23'-3"
T19	#4	1	1	1	1	1			1.414(2S+V2)+23'-11 1/2"
T20	#4	1	1	1	1	1			1.414(2S+V2)+24'-8"
T21	#4	1	1	1	1	1			1.414(2S+V2)+25'-4 1/2"
T22	#4	1	1	1	1	1			1.414(2S+V2)+26'-1"
T23	#4	1	1	1	1	1			1.414(2S+V2)+26'-9 1/2"
T24	#4	1	1	1	1	1			1.414(2S+V2)+27'-6"
T25	#4	1	1	1	1	1			1.414(2S+V2)+28'-3"
T26	#4	1	1	1	1	1			1.414(2S+V2)+28'-11 1/2"
T27	#4	1	1	1	1	1			1.414(2S+V2)+29'-8"
T28	#4	1	1	1	1	1			1.414(2S+V2)+30'-4 1/2"
T29	#4	1	1	1	1	1			1.414(2S+V2)+31'-1"
T30	#4	1	1	1	1	1			1.414(2S+V2)+31'-9 1/2"
T31	#4	1	1	1	1	1			1.414(2S+V2)+32'-6"
T32	#4	1	1	1	1	1			1.414(2S+V2)+33'-2 1/2"
T33	#4	1	1	1	1	1			1.414(2S+V2)+33'-11"
T34	#4	1	1	1	1	1			1.414(2S+V2)+34'-7 1/2"
T35	#4	1	1	1	1	1			1.414(2S+V2)+35'-4"
T36	#4	1	1	1	1	1			1.414(2S+V2)+36'-0 1/2"
T37	#4	1	1	1	1	1			1.414(2S+V2)+36'-9"
T38	#4	1	1	1	1	1			1.414(2S+V2)+37'-5 1/2"
T39	#4	1	1	1	1	1			1.414(2S+V2)+38'-2"
T40	#4	1	1	1	1	1			1.414(2S+V2)+38'-10 1/2"
T41	#4	1	1	1	1	1			1.414(2S+V2)+38'-10 1/2"
T42	#4	1	1	1	1	1			1.414(2S+V2)+38'-2"
T43	#4	1	1	1	1	1			1.414(2S+V2)+37'-5"
T44	#4	3	3	3	3	3			1.414(2S+V2)+32'-10 1/2"
V1	#4	29	33	37	41	45	40'-2"	1'-8"	41'-10"
VL1	#4	1	1	1	1	1	39'-0"	1'-8"	40'-8"
VL2	#4	1	1	1	1	1	35'-3 1/2"	1'-8"	36'-11 1/2"
VL3	#4	1	1	1	1	1	31'-7"	1'-8"	33'-3"
VL4	#4	1	1	1	1	1	27'-10 1/2"	1'-8"	29'-6 1/2"
VL5	#4	1	1	1	1	1	24'-2"	1'-8"	25'-10"
VL6	#4	1	1	1	1	1	20'-5 1/2"	1'-8"	22'-1 1/2"
VL7	#4	1	1	1	1	1	16'-9"	1'-8"	18'-5"
VL8	#4	1	1	1	1	1	13'-0"		13'-0"
VL9	#4	1	1	1	1	1	8'-1"		8'-1"
VL10	#4	1	1	1	1	1	3'-2"		3'-2"
VS1	#4	1	1	1	1	1	40'-2"	1'-8"	41'-10"
VS2	#4	1	1	1	1	1	39'-6 1/2"	1'-8"	41'-2 1/2"
VS3	#4	1	1	1	1	1	38'-10 1/2"	1'-8"	40'-6 1/2"
VS4	#4	1	1	1	1	1	38'-3"	1'-8"	39'-11"
VS5	#4	1	1	1	1	1	36'-5"	1'-8"	38'-1"
VS6	#4	1	1	1	1	1	32'-8"	1'-8"	34'-4"
VS7	#4	1	1	1	1	1	28'-11"	1'-8"	30'-7"
VS8	#4	1	1	1	1	1	25'-2"	1'-8"	26'-10"
VS9	#4	1	1	1	1	1	21'-5"	1'-8"	23'-11"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
VS10	#4	1	1	1	1	1	17'-8"	1'-8"	19'-4"
VS11	#4	1	1	1	1	1	13'-11"	1'-8"	15'-7"
VS12	#4	1	1	1	1	1	10'-2"	1'-8"	11'-10"
VS13	#4	1	1	1	1	1	6'-5"		6'-5"
VS14	#4	1	1	1	1	1	2'-8 1/2"		2'-8 1/2"
FTL1	#5	1	1	1	1	1			1'-3"
FTL2	#5	1	1	1	1	1			1'-6"
FTL3	#5	1	1	1	1	1			1'-9 1/2"
FTL4	#5	1	1	1	1	1			2'-0 1/2"
FTL5	#5	1	1	1	1	1			2'-3 1/2"
FTL6	#5	1	1	1	1	1			2'-7"
FTL7	#5	1	1	1	1	1			2'-10"
FTL8	#5	1	1	1	1	1			3'-1 1/2"
FTL9	#5	1	1	1	1	1			3'-4 1/2"
FTL10	#5	1	1	1	1	1			3'-8"
FTL11	#5	1	1	1	1	1			3'-11"
FTL12	#5	1	1	1	1	1			4'-2 1/2"
FTL13	#5	1	1	1	1	1			4'-5 1/2"
FTL14	#5	1	1	1	1	1			4'-9"
FTL15	#5	1	1	1	1	1			5'-0"
FTL16	#5	1	1	1	1	1			5'-3 1/2"
FTL17	#5	1	1	1	1	1			5'-6 1/2"
FTL18	#5	104	104	104	104	104			8'-9"
FTL19	#5	1	1	1	1	1			8'-8 1/2"
FTL20	#5	1	1	1	1	1			8'-5"
FTL21	#5	1	1	1	1	1			8'-2"
FTL22	#5	1	1	1	1	1			7'-10 1/2"
FTL23	#5	1	1	1	1	1			7'-7 1/2"
FTL24	#5	1	1	1	1	1			7'-4"
FTL25	#5	1	1	1	1	1			7'-1"
FTL26	#5	1	1	1	1	1			6'-9 1/2"
FTL27	#5	1	1	1	1	1			6'-6 1/2"
FTL28	#5	1	1	1	1	1			6'-3"
FTL29	#5	1	1	1	1	1			6'-0"
FTL30	#5	1	1	1	1	1			5'-8 1/2"
FTL31	#5	1	1	1	1	1			5'-5 1/2"
FTL32	#5	1	1	1	1	1			5'-2"
FTL33	#5	1	1	1	1	1			4'-11"
FTL34	#5	1	1	1	1	1			4'-7 1/2"
FTL35	#5	1	1	1	1	1			4'-4 1/2"
FTL36	#5	1	1	1	1	1			4'-1"
FTL37	#5	1	1	1	1	1			3'-10"
FTL38	#5	4	4	4	4	4			3'-9"
FLL	#4	10	10	10	10	10			52'-2"
FTS1	#5	1	1	1	1	1			3'-10 1/2"
FTS2	#5	1	1	1	1	1			4'-9"
FTS3	#5	1	1	1	1	1			5'-7 1/2"
FTS4	#5	1	1	1	1	1			6'-6 1/2"
FTS5	#5	1	1	1	1	1			7'-5"
FTS6	#5	1	1	1	1	1			8'-3 1/2"
FTS7	#5	70	70	70	70	70			8'-9"
FTS8	#5	1	1	1	1	1			5'-0"
FTS9	#5	1	1	1	1	1			4'-1 1/2"
FTS10	#5	1	1	1	1	1			3'-3"
FTS11	#5	1	1	1	1	1			2'-4"
FTS12	#5	1	1	1	1	1			1'-5 1/2"
FLS	#4	10	10	10	10	10			30'-10 1/2"
WS1	#5	1	1	1	1	1		W+8'-11"	W+8'-11"
WS2	#5	1	1	1	1	1		W+8'-9 1/2"	W+8'-9 1/2"
WS3	#5	1	1	1	1	1		W+8'-8"	W+8'-8"
WS4	#5	1	1	1	1	1		W+8'-6 1/2"	W+8'-6 1/2"
WS5	#5	1	1	1	1	1		W+8'-5"	W+8'-5"
WS6	#5	1	1	1	1	1		W+8'-3 1/2"	W+8'-3 1/2"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'	DIM. X	DIM. Y	LENGTH
WS7	#5	1	1	1	1	1		W+8'-2"	W+8'-2"
WS8	#5	1	1	1	1	1		W+8'-0 1/2"	W+8'-0 1/2"
WS9	#5	1	1	1	1	1		W+7'-11"	W+7'-11"
WS10	#5	1	1	1	1	1		W+7'-9 1/2"	W+7'-9 1/2"
WS11	#5	1	1	1	1	1		W+7'-8"	W+7'-8"
WS12	#5	1	1	1	1	1		W+7'-6 1/2"	W+7'-6 1/2"
WS13	#5	1	1	1	1	1		W+7'-5"	W+7'-5"
WS14	#5	1	1	1	1	1		W+7'-3 1/2"	W+7'-3 1/2"
WS15	#5	1	1	1	1	1		W+7'-2"	W+7'-2"
WS16	#5	1	1	1	1	1		W+7'-0 1/2"	W+7'-0 1/2"
WS17	#5	1	1	1	1	1		W+6'-11"	W+6'-11"
WS18	#5	1	1	1	1	1		W+6'-9 1/2"	W+6'-9 1/2"
WS19	#5	1	1	1	1	1		W+6'-8"	W+6'-8"
WS20	#5	1	1	1	1	1		W+6'-6 1/2"	W+6'-6 1/2"
WS21	#5	1	1	1	1	1		W+6'-5"	W+6'-5"
WS22	#5	1	1	1	1	1		W+6'-3 1/2"	W+6'-3 1/2"
WS23	#5	1	1	1	1	1		W+6'-2"	W+6'-2"
WS24	#5	1	1	1	1	1		W+6'-0 1/2"	W+6'-0 1/2"
WS25	#5	1	1	1	1	1		W+5'-11"	W+5'-11"
WS26	#5	1	1	1	1	1		W+5'-9 1/2"	W+5'-9 1/2"
WS27	#5	1	1	1	1	1		W+5'-8"	W+5'-8"
WS28	#5	1	1	1	1	1		W+5'-6 1/2"	W+5'-6 1/2"
WS29	#5	1	1	1	1	1		W+5'-5"	W+5'-5"
WS30	#5	1	1	1	1	1		W+5'-3 1/2"	W+5'-3 1/2"
WS31	#5	1	1	1	1	1		W+5'-1 1/2"	W+5'-1 1/2"
WS32	#5	1	1	1	1	1		W+5'-0"	W+5'-0"
WS33	#5	1	1	1	1	1		W+4'-10 1/2"	W+4'-10 1/2"
WS34	#5	1	1	1	1	1		W+4'-9"	W+4'-9"
WS35	#5	1	1	1	1	1		W+4'-7 1/2"	W+4'-7 1/2"
WS36	#5	1	1	1	1	1		W+4'-6"	W+4'-6"
WS37	#5	1	1	1	1	1		W+4'-4 1/2"	W+4'-4 1/2"
WS38	#5	1	1	1	1	1		W+4'-3"	W+4'-3"
WS39	#5	1	1	1	1	1		W+4'-1 1/2"	W+4'-1 1/2"
WS40	#5	1	1	1	1	1		W+4'-0"	W+4'-0"
WS41	#5	1	1	1	1	1		W+3'-10 1/2"	W+3'-10 1/2"
WS42	#5	1	1	1	1	1		W+3'-9"	W+3'-9"
WS43	#5	1	1	1	1	1		W+3'-7 1/2"	W+3'-7 1/2"
WS44	#5	1	1	1	1	1		W+3'-6"	W+3'-6"
WS45	#5	1	1	1	1	1		W+3'-4 1/2"	W+3'-4 1/2"
WS46	#5	1	1	1	1	1		W+3'-3"	W+3'-3"
WS47	#5	1	1	1	1	1		W+3'-1 1/2"	W+3'-1 1/2"
WS48	#5	1	1	1	1	1		W+3'-0"	W+3'-0"
WS49	#5	1	1	1	1	1		W+2'-10 1/2"	W+2'-10 1/2"
WS50	#5	1	1	1	1	1		W+2'-9"	W+2'-9"
WS51	#5	1	1	1	1	1		W+2'-7 1/2"	W+2'-7 1/2"
WS52	#5	1	1	1	1	1		W+2'-6"	W+2'-6"
WS53	#5	1	1	1	1	1		W+2'-4 1/2"	W+2'-4 1/2"
WS54	#5	1	1	1	1	1		W+2'-3"	W+2'-3"
WS55	#5	1	1	1	1	1		W+2'-1 1/2"	W+2'-1 1/2"
WS56	#5	1	1	1	1	1		W+2'-0"	W+2'-0"
WS57	#5	1	1	1	1	1		W+1'-10 1/2"	W+1'-10 1/2"
WS58	#5	1	1	1	1	1		W+1'-9"	W+1'-9"

DEPARTMENT OF TRANSPORTATION MDOT MISSISSIPPI

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 2 OF 4

WORKING NUMBER IWD-12-3W-45

SHEET NUMBER 7226

DESIGNER William K. McBeath, P.E. CHECKER B. Keith Carr P.E.
DETAILER Wesley Phillips, E.I. ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WS59	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WS60	#5	1	1	1	1	1				W+1'-5 1/2"	W+1'-5 1/2"
WS61	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WS62	#5	1	1	1	1	1				W+1'-2 1/2"	W+1'-2 1/2"
WS63	#5	1	1	1	1	1				W+1'-1"	W+1'-1"
WS64	#5	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
WS65	#5	1	1	1	1	1				W+0'-10"	W+0'-10"
WS66	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WS67	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WS68	#5	1	1	1	1	1				W+0'-5 1/2"	W+0'-5 1/2"
WS69	#5	1	1	1	1	1				W+0'-4"	W+0'-4"
WS70	#5	1	1	1	1	1				W+0'-2 1/2"	W+0'-2 1/2"
WS71	#5	1	1	1	1	1				W+0'-1"	W+0'-1"
WS72	#5	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
WS73	#5	1	1	1	1	1				W-0'-2"	W-0'-2"
WS74	#5	1	1	1	1	1				W-0'-3 1/2"	W-0'-3 1/2"
WS75	#5	1	1	1	1	1				W-0'-5"	W-0'-5"
WS76	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWS	#5	76	76	76	76	76			1'-6"	2'-10"	4'-4"
WL1	#5	1	1	1	1	1				W+8'-11 1/2"	W+8'-11 1/2"
WL2	#5	1	1	1	1	1				W+8'-10 1/2"	W+8'-10 1/2"
WL3	#5	1	1	1	1	1				W+8'-10"	W+8'-10"
WL4	#5	1	1	1	1	1				W+8'-9"	W+8'-9"
WL5	#5	1	1	1	1	1				W+8'-8"	W+8'-8"
WL6	#5	1	1	1	1	1				W+8'-7"	W+8'-7"
WL7	#5	1	1	1	1	1				W+8'-6"	W+8'-6"
WL8	#5	1	1	1	1	1				W+8'-5"	W+8'-5"
WL9	#5	1	1	1	1	1				W+8'-4 1/2"	W+8'-4 1/2"
WL10	#5	1	1	1	1	1				W+8'-3 1/2"	W+8'-3 1/2"
WL11	#5	1	1	1	1	1				W+8'-2 1/2"	W+8'-2 1/2"
WL12	#5	1	1	1	1	1				W+8'-1 1/2"	W+8'-1 1/2"
WL13	#5	1	1	1	1	1				W+8'-0 1/2"	W+8'-0 1/2"
WL14	#5	1	1	1	1	1				W+8'-0"	W+8'-0"
WL15	#5	1	1	1	1	1				W+7'-11"	W+7'-11"
WL16	#5	1	1	1	1	1				W+7'-10"	W+7'-10"
WL17	#5	1	1	1	1	1				W+7'-9"	W+7'-9"
WL18	#5	1	1	1	1	1				W+7'-8"	W+7'-8"
WL19	#5	1	1	1	1	1				W+7'-7 1/2"	W+7'-7 1/2"
WL20	#5	1	1	1	1	1				W+7'-6 1/2"	W+7'-6 1/2"
WL21	#5	1	1	1	1	1				W+7'-5 1/2"	W+7'-5 1/2"
WL22	#5	1	1	1	1	1				W+7'-4 1/2"	W+7'-4 1/2"
WL23	#5	1	1	1	1	1				W+7'-3 1/2"	W+7'-3 1/2"
WL24	#5	1	1	1	1	1				W+7'-2 1/2"	W+7'-2 1/2"
WL25	#5	1	1	1	1	1				W+7'-2"	W+7'-2"
WL26	#5	1	1	1	1	1				W+7'-1"	W+7'-1"
WL27	#5	1	1	1	1	1				W+7'-0"	W+7'-0"
WL28	#5	1	1	1	1	1				W+6'-11"	W+6'-11"
WL29	#5	1	1	1	1	1				W+6'-10"	W+6'-10"
WL30	#5	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
WL31	#5	1	1	1	1	1				W+6'-8 1/2"	W+6'-8 1/2"
WL32	#5	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
WL33	#5	1	1	1	1	1				W+6'-6 1/2"	W+6'-6 1/2"
WL34	#5	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
WL35	#5	1	1	1	1	1				W+6'-5"	W+6'-5"
WL36	#5	1	1	1	1	1				W+6'-4"	W+6'-4"
WL37	#5	1	1	1	1	1				W+6'-3"	W+6'-3"
WL38	#5	1	1	1	1	1				W+6'-2"	W+6'-2"
WL39	#5	1	1	1	1	1				W+6'-1"	W+6'-1"
WL40	#5	1	1	1	1	1				W+6'-0"	W+6'-0"
WL41	#5	1	1	1	1	1				W+5'-11 1/2"	W+5'-11 1/2"
WL42	#5	1	1	1	1	1				W+5'-10 1/2"	W+5'-10 1/2"
WL43	#5	1	1	1	1	1				W+5'-9 1/2"	W+5'-9 1/2"
WL44	#5	1	1	1	1	1				W+5'-8 1/2"	W+5'-8 1/2"
WL45	#5	1	1	1	1	1				W+5'-7 1/2"	W+5'-7 1/2"
WL46	#5	1	1	1	1	1				W+5'-7"	W+5'-7"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL47	#5	1	1	1	1	1				W+5'-6"	W+5'-6"
WL48	#5	1	1	1	1	1				W+5'-5"	W+5'-5"
WL49	#5	1	1	1	1	1				W+5'-4"	W+5'-4"
WL50	#5	1	1	1	1	1				W+5'-3"	W+5'-3"
WL51	#5	1	1	1	1	1				W+5'-2"	W+5'-2"
WL52	#5	1	1	1	1	1				W+5'-1 1/2"	W+5'-1 1/2"
WL53	#5	1	1	1	1	1				W+5'-0 1/2"	W+5'-0 1/2"
WL54	#5	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
WL55	#5	1	1	1	1	1				W+4'-10 1/2"	W+4'-10 1/2"
WL56	#5	1	1	1	1	1				W+4'-9 1/2"	W+4'-9 1/2"
WL57	#5	1	1	1	1	1				W+4'-9"	W+4'-9"
WL58	#5	1	1	1	1	1				W+4'-8"	W+4'-8"
WL59	#5	1	1	1	1	1				W+4'-7"	W+4'-7"
WL60	#5	1	1	1	1	1				W+4'-6"	W+4'-6"
WL61	#5	1	1	1	1	1				W+4'-5"	W+4'-5"
WL62	#5	1	1	1	1	1				W+4'-4 1/2"	W+4'-4 1/2"
WL63	#5	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
WL64	#5	1	1	1	1	1				W+4'-2 1/2"	W+4'-2 1/2"
WL65	#5	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
WL66	#5	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
WL67	#5	1	1	1	1	1				W+3'-11 1/2"	W+3'-11 1/2"
WL68	#5	1	1	1	1	1				W+3'-11"	W+3'-11"
WL69	#5	1	1	1	1	1				W+3'-10"	W+3'-10"
WL70	#5	1	1	1	1	1				W+3'-9"	W+3'-9"
WL71	#5	1	1	1	1	1				W+3'-8"	W+3'-8"
WL72	#5	1	1	1	1	1				W+3'-7"	W+3'-7"
WL73	#5	1	1	1	1	1				W+3'-6 1/2"	W+3'-6 1/2"
WL74	#5	1	1	1	1	1				W+3'-5 1/2"	W+3'-5 1/2"
WL75	#5	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
WL76	#5	1	1	1	1	1				W+3'-3 1/2"	W+3'-3 1/2"
WL77	#5	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
WL78	#5	1	1	1	1	1				W+3'-2"	W+3'-2"
WL79	#5	1	1	1	1	1				W+3'-1"	W+3'-1"
WL80	#5	1	1	1	1	1				W+3'-0"	W+3'-0"
WL81	#5	1	1	1	1	1				W+2'-11"	W+2'-11"
WL82	#5	1	1	1	1	1				W+2'-10"	W+2'-10"
WL83	#5	1	1	1	1	1				W+2'-9"	W+2'-9"
WL84	#5	1	1	1	1	1				W+2'-8 1/2"	W+2'-8 1/2"
WL85	#5	1	1	1	1	1				W+2'-7 1/2"	W+2'-7 1/2"
WL86	#5	1	1	1	1	1				W+2'-6 1/2"	W+2'-6 1/2"
WL87	#5	1	1	1	1	1				W+2'-5 1/2"	W+2'-5 1/2"
WL88	#5	1	1	1	1	1				W+2'-4 1/2"	W+2'-4 1/2"
WL89	#5	1	1	1	1	1				W+2'-4"	W+2'-4"
WL90	#5	1	1	1	1	1				W+2'-3"	W+2'-3"
WL91	#5	1	1	1	1	1				W+2'-2"	W+2'-2"
WL92	#5	1	1	1	1	1				W+2'-1"	W+2'-1"
WL93	#5	1	1	1	1	1				W+2'-0"	W+2'-0"
WL94	#5	1	1	1	1	1				W+1'-11"	W+1'-11"
WL95	#5	1	1	1	1	1				W+1'-10 1/2"	W+1'-10 1/2"
WL96	#5	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
WL97	#5	1	1	1	1	1				W+1'-8 1/2"	W+1'-8 1/2"
WL98	#5	1	1	1	1	1				W+1'-7 1/2"	W+1'-7 1/2"
WL99	#5	1	1	1	1	1				W+1'-6 1/2"	W+1'-6 1/2"
WL100	#5	1	1	1	1	1				W+1'-6"	W+1'-6"
WL101	#5	1	1	1	1	1				W+1'-5"	W+1'-5"
WL102	#5	1	1	1	1	1				W+1'-4"	W+1'-4"
WL103	#5	1	1	1	1	1				W+1.25	W+1.25
WL104	#5	1	1	1	1	1				W+1'-2"	W+1'-2"
WL105	#5	1	1	1	1	1				W+1'-1 1/2"	W+1'-1 1/2"
WL106	#5	1	1	1	1	1				W+1'-0 1/2"	W+1'-0 1/2"
WL107	#5	1	1	1	1	1				W+0'-11 1/2"	W+0'-11 1/2"
WL108	#5	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
WL109	#5	1	1	1	1	1				W+0'-9 1/2"	W+0'-9 1/2"
WL110	#5	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
WL111	#5	1	1	1	1	1				W+0'-8"	W+0'-8"

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
WL112	#5	1	1	1	1	1				W+0'-7"	W+0'-7"
WL113	#5	1	1	1	1	1				W+0'-6"	W+0'-6"
WL114	#5	1	1	1	1	1				W+0'-5"	W+0'-5"
WL115	#5	1	1	1	1	1				W+0'-4"	W+0'-4"
WL116	#5	1	1	1	1	1				W+0'-3 1/2"	W+0'-3 1/2"
WL117	#5	1	1	1	1	1				W+0'-2 1/2"	W+0'-2 1/2"
WL118	#5	1	1	1	1	1				W+0'-1 1/2"	W+0'-1 1/2"
WL119	#5	1	1	1	1	1				W+0'-0 1/2"	W+0'-0 1/2"
WL120	#5	1	1	1	1	1				W-0'-0 1/2"	W-0'-0 1/2"
WL121	#5	1	1	1	1	1				W-0'-1"	W-0'-1"
WL122	#5	1	1	1	1	1				W-0'-2"	W-0'-2"
WL123	#5	1	1	1	1	1				W-0'-3"	W-0'-3"
WL124	#5	1	1	1	1	1				W-0'-4"	W-0'-4"
WL125	#5	1	1	1	1	1				W-0'-5"	W-0'-5"
WL126	#5	1	1	1	1	1				W-0'-6"	W-0'-6"
WL127	#5	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DWL	#5	100	100	100	100	100			1'-6"	2'-6"	4'-3"
RS1	#4	1	1	1	1	1				W+8'-11"	W+8'-11"
RS2	#4	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
RS3	#4	1	1	1	1	1				W+8'-4"	W+8'-4"
RS4	#4	1	1	1	1	1				W+8'-0"	W+8'-0"
RS5	#4	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
RS6	#4	1	1	1	1	1				W+7'-5"	W+7'-5"
RS7	#4	1	1	1	1	1				W+7'-1"	W+7'-1"
RS8	#4	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
RS9	#4	1	1	1	1	1				W+6'-6"	W+6'-6"
RS10	#4	1	1	1	1	1				W+6'-2"	W+6'-2"
RS11	#4	1	1	1	1	1				W+5'-10 1/2"	W+5'-10 1/2"
RS12	#4	1	1	1	1	1				W+5'-7"	W+5'-7"
RS13	#4	1	1	1	1	1				W+5'-3"	W+5'-3"
RS14	#4	1	1	1	1	1				W+4'-11 1/2"	W+4'-11 1/2"
RS15	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RS16	#4	1	1	1	1	1				W+4'-4"	W+4'-4"
RS17	#4	1	1	1	1	1				W+4'-0 1/2"	W+4'-0 1/2"
RS18	#4	1	1	1	1	1				W+3'-9"	W+3'-9"
RS19	#4	1	1	1	1	1				W+3'-5"	W+3'-5"
RS20	#4	1	1	1	1	1				W+3'-1 1/2"	W+3'-1 1/2"
RS21	#4	1	1	1	1	1				W+2'-10"	W+2'-10"
RS22	#4	1	1	1	1	1				W+2'-6"	W+2'-6"
RS23	#4	1	1	1	1	1				W+2'-2 1/2"	W+2'-2 1/2"
RS24	#4	1	1	1	1	1				W+1'-11"	W+1'-11"
RS25	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RS26	#4	1	1	1	1	1				W+1'-3 1/2"	W+1'-3 1/2"
RS27	#4	1	1	1	1	1				W+1'-0"	W+1'-0"
RS28	#4	1	1	1	1	1				W+0'-8"	W+0'-8"
RS29	#4	1	1	1	1	1				W+0'-4 1/2"	W+0'-4 1/2"
RS30	#4	1	1	1	1	1				W+0'-1"	W+0'-1"
RS31	#4	1	1	1	1	1				W-0'-3"	W-0'-3"
RS32	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRS	#4	32	32	32	32	32			1'-6"	2'-5"	3'-11"
RL1	#4	1	1	1	1	1				W+8'-11 1/2"	W+8'-11 1/2"
RL2	#4	1	1	1	1	1				W+8'-9 1/2"	W+8'-9 1/2"

DATE	REVISIONS	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR
BASIC CULVERT DRAWING
DOUBLE CELL
45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 3 OF 4

WORKING NUMBER
IWD-12-3W-45

SHEET NUMBER
7227

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.

HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
RL3	#4	1	1	1	1	1				W+8'-7 1/2"	W+8'-7 1/2"
RL4	#4	1	1	1	1	1				W+8'-5"	W+8'-5"
RL5	#4	1	1	1	1	1				W+8'-3"	W+8'-3"
RL6	#4	1	1	1	1	1				W+8'-1"	W+8'-1"
RL7	#4	1	1	1	1	1				W+7'-10 1/2"	W+7'-10 1/2"
RL8	#4	1	1	1	1	1				W+7'-8 1/2"	W+7'-8 1/2"
RL9	#4	1	1	1	1	1				W+7'-6 1/2"	W+7'-6 1/2"
RL10	#4	1	1	1	1	1				W+7'-4"	W+7'-4"
RL11	#4	1	1	1	1	1				W+7'-2"	W+7'-2"
RL12	#4	1	1	1	1	1				W+7'-0"	W+7'-0"
RL13	#4	1	1	1	1	1				W+6'-9 1/2"	W+6'-9 1/2"
RL14	#4	1	1	1	1	1				W+6'-7 1/2"	W+6'-7 1/2"
RL15	#4	1	1	1	1	1				W+6'-5 1/2"	W+6'-5 1/2"
RL16	#4	1	1	1	1	1				W+6'-3"	W+6'-3"
RL17	#4	1	1	1	1	1				W+6'-1"	W+6'-1"
RL18	#4	1	1	1	1	1				W+5'-11"	W+5'-11"
RL19	#4	1	1	1	1	1				W+5'-9"	W+5'-9"
RL20	#4	1	1	1	1	1				W+5'-6 1/2"	W+5'-6 1/2"
RL21	#4	1	1	1	1	1				W+5'-4 1/2"	W+5'-4 1/2"
RL22	#4	1	1	1	1	1				W+5'-2 1/2"	W+5'-2 1/2"
RL23	#4	1	1	1	1	1				W+5'-0"	W+5'-0"
RL24	#4	1	1	1	1	1				W+4'-10"	W+4'-10"
RL25	#4	1	1	1	1	1				W+4'-8"	W+4'-8"
RL26	#4	1	1	1	1	1				W+4'-5 1/2"	W+4'-5 1/2"
RL27	#4	1	1	1	1	1				W+4'-3 1/2"	W+4'-3 1/2"
RL28	#4	1	1	1	1	1				W+4'-1 1/2"	W+4'-1 1/2"
RL29	#4	1	1	1	1	1				W+3'-11"	W+3'-11"
RL30	#4	1	1	1	1	1				W+3'-9"	W+3'-9"
RL31	#4	1	1	1	1	1				W+3'-7"	W+3'-7"
RL32	#4	1	1	1	1	1				W+3'-4 1/2"	W+3'-4 1/2"
RL33	#4	1	1	1	1	1				W+3'-2 1/2"	W+3'-2 1/2"
RL34	#4	1	1	1	1	1				W+3'-0 1/2"	W+3'-0 1/2"
RL35	#4	1	1	1	1	1				W+2'-10 1/2"	W+2'-10 1/2"
RL36	#4	1	1	1	1	1				W+2'-8"	W+2'-8"
RL37	#4	1	1	1	1	1				W+2'-6"	W+2'-6"
RL38	#4	1	1	1	1	1				W+2'-4"	W+2'-4"
RL39	#4	1	1	1	1	1				W+2'-1 1/2"	W+2'-1 1/2"
RL40	#4	1	1	1	1	1				W+1'-11 1/2"	W+1'-11 1/2"
RL41	#4	1	1	1	1	1				W+1'-9 1/2"	W+1'-9 1/2"
RL42	#4	1	1	1	1	1				W+1'-7"	W+1'-7"
RL43	#4	1	1	1	1	1				W+1'-5"	W+1'-5"
RL44	#4	1	1	1	1	1				W+1'-3"	W+1'-3"
RL45	#4	1	1	1	1	1				W+1'-0 1/2"	W+1'-0 1/2"
RL46	#4	1	1	1	1	1				W+0'-10 1/2"	W+0'-10 1/2"
RL47	#4	1	1	1	1	1				W+0'-8 1/2"	W+0'-8 1/2"
RL48	#4	1	1	1	1	1				W+0'-6 1/2"	W+0'-6 1/2"
RL49	#4	1	1	1	1	1				W+0'-4"	W+0'-4"
RL50	#4	1	1	1	1	1				W+0'-2"	W+0'-2"
RL51	#4	1	1	1	1	1				W+0'-0"	W+0'-0"
RL52	#4	1	1	1	1	1				W-0'-2 1/2"	W-0'-2 1/2"
RL53	#4	1	1	1	1	1				W-0'-4 1/2"	W-0'-4 1/2"
RL54	#4	1	1	1	1	1				W-0'-6 1/2"	W-0'-6 1/2"
DRL	#4	54	54	54	54	54			1'-6"	2'-6"	4'-0"
YS1	#4	2	2	2	2	2					4'-1 1/2"
YS2	#4	2	2	2	2	2					6'-10"
YS3	#4	2	2	2	2	2					9'-7"
YS4	#4	2	2	2	2	2					12'-3 1/2"
YS5	#4	2	2	2	2	2					15'-0"

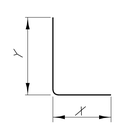
HEIGHT = 12 FT.

BAR LISTS FOR WINGS, FOOTING, PARAPET, APRON & AUXILIARY SLAB

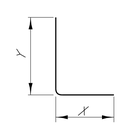
BAR	SIZE	NO. REQUIRED SPAN 12'	14'	16'	18'	20'			DIM. X	DIM. Y	LENGTH
YS6	#4	2	2	2	2	2					17'-8 1/2"
YS7	#4	2	2	2	2	2					20'-5"
YS8	#4	2	2	2	2	2					23'-1 1/2"
YS9	#4	2	2	2	2	2					25'-10 1/2"
YS10	#4	2	2	2	2	2					28'-7"
YS11	#4	12	12	12	12	12					30'-10 1/2"
YL1	#4	2	2	2	2	2					7'-2"
YL2	#4	2	2	2	2	2					11'-9"
YL3	#4	2	2	2	2	2					16'-4"
YL4	#4	2	2	2	2	2					20'-11"
YL5	#4	2	2	2	2	2					25'-6"
YL6	#4	2	2	2	2	2					30'-1 1/2"
YL7	#4	2	2	2	2	2					34'-8 1/2"
YL8	#4	2	2	2	2	2					39'-3 1/2"
YL9	#4	2	2	2	2	2					43'-10 1/2"
YL10	#4	2	2	2	2	2					48'-5 1/2"
YL11	#4	12	12	12	12	12					52'-5 1/2"
FS	#4	2	2	2	2	2					32'-3 1/2"
FL	#4	2	2	2	2	2					53'-3 1/2"
N	#4	42	47	54	60	65			1'-8"	0'-4"	2'-4"
M	#4	2	2	2	2	2					1.414(2S+2V1+V2)+2'-4"
K	#4	39	44	50	56	61			0'-8"	T1+6"	2T1+3'-0"
L	#4	4	4	4	4	4					1.414(2S+V2)+2'-4 1/2"
OS	#7	17	17	17	17	17			3'-9"	3'-9"	7'-6"
OL	#7	17	17	17	17	17			3'-9"	3'-9"	7'-6"
OSS	#4	1	1	1	1	1					12'-0"+T1
OSL	#4	1	1	1	1	1					12'-0"+T1

BAR LISTS FOR UPSTREAM BRUSH DEFLECTOR

BAR	SIZE	NO. REQ'D	DIM. X	DIM. Y	LENGTH
D	#7	11			6'-4"
DS	#4	1			12'-0"+T1
J1	#5	1		W1+11'-1 1/2"	W1+11'-1 1/2"
J2	#5	1		W1+10'-7 1/2"	W1+10'-7 1/2"
J3	#5	1		W1+10'-2"	W1+10'-2"
J4	#5	1		W1+9'-8"	W1+9'-8"
J5	#5	1		W1+9'-2"	W1+9'-2"
J6	#5	1		W1+8'-8"	W1+8'-8"
J7	#5	1		W1+8'-2"	W1+8'-2"
J8	#5	1		W1+7'-8 1/2"	W1+7'-8 1/2"
J9	#5	1		W1+7'-2 1/2"	W1+7'-2 1/2"
J10	#5	1		W1+6'-8 1/2"	W1+6'-8 1/2"
J11	#5	1		W1+6'-2 1/2"	W1+6'-2 1/2"
J12	#5	1		W1+5'-8 1/2"	W1+5'-8 1/2"
J13	#5	1		W1+5'-2 1/2"	W1+5'-2 1/2"
J14	#5	1		W1+4'-9"	W1+4'-9"
J15	#5	1		W1+4'-3"	W1+4'-3"
J16	#5	1		W1+3'-9"	W1+3'-9"
J17	#5	1		W1+3'-3"	W1+3'-3"
J18	#5	1		W1+2'-9"	W1+2'-9"
J19	#5	1		W1+2'-3"	W1+2'-3"
J20	#5	1	1'-0"	W1+2'-6 1/2"	W1+3'-6 1/2"
J21	#5	1	1'-0"	W1+2'-0 1/2"	W1+3'-0 1/2"
J22	#5	1	1'-0"	W1+1'-6 1/2"	W1+2'-6 1/2"
J23	#5	1	1'-0"	W1+1'-0 1/2"	W1+2'-0 1/2"
J24	#5	1	1'-0"	W1+0'-6 1/2"	W1+1'-6 1/2"
DJ	#5	19	1'-0"	2'-6"	3'-6"
YD1	#5	1			2'-3 1/2"
YD2	#5	1			4'-3 1/2"
YD3	#5	1			6'-3 1/2"
YD4	#5	1			8'-3 1/2"
YD5	#5	1			10'-3 1/2"
YD6	#5	1			12'-3 1/2"
YD7	#5	1			14'-3 1/2"
YD8	#5	1			16'-3 1/2"
YD9	#5	1			18'-3 1/2"
YD10	#5	1			20'-3 1/2"
YD11	#5	1			22'-3 1/2"
FD	#4	1			25'-4"



BARS DRS/DRL - #4



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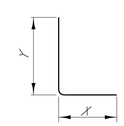

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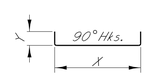

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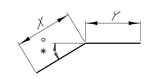
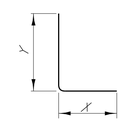
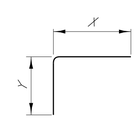


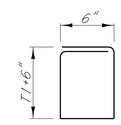
DOWELS OS/OL - #7
* See plan of apron



BARS WSn/WLn/Jn - #5



BARS V1/VLn/VSn - #4



BARS K - #4

BAR BENDING DETAILS

Dimensions are out to out

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

WINGS WITH 3:1 SLOPE FOR BASIC CULVERT DRAWING DOUBLE CELL 45° SKEW DETAILS

HEIGHT 12 FT.

SPANS 24-40 FT.

SHT. 4 OF 4

WORKING NUMBER IWD-12-3W-45

SHEET NUMBER 7228

REVISIONS | BY | DATE

DESIGNER William K. McBeath, P.E.
DETAILER Wesley Phillips, E.I.
CHECKER B. Keith Carr P.E.
ISSUE DATE 01/01/2015

DIRECTOR OF STRUCTURES, STATE BRIDGE ENGINEER - JUSTIN WALKER PE.
DEP. DIR. OF STRUCTURES, ASST. STATE BRIDGE ENGINEER - SCOTT WESTERFIELD PE.