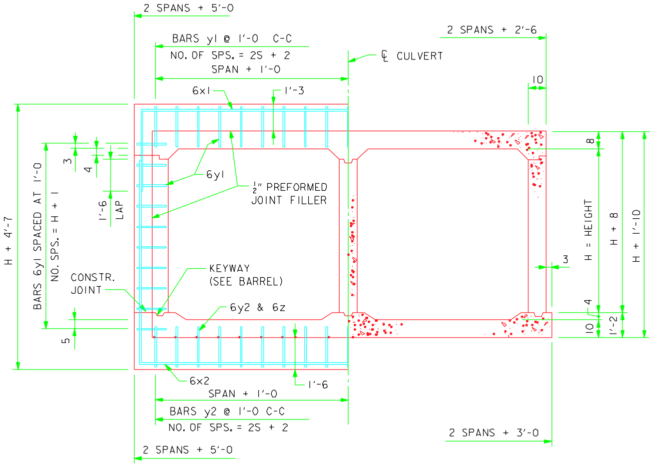
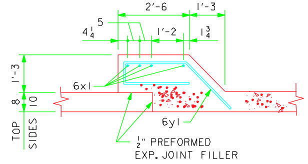
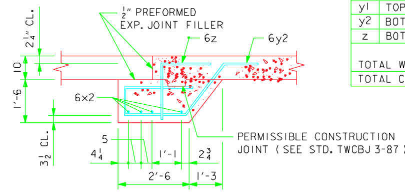


JOINT DETAIL
SECTION THRU BARREL



TOP & SIDES - BARS y1



BOTTOM BARS - y2 & z

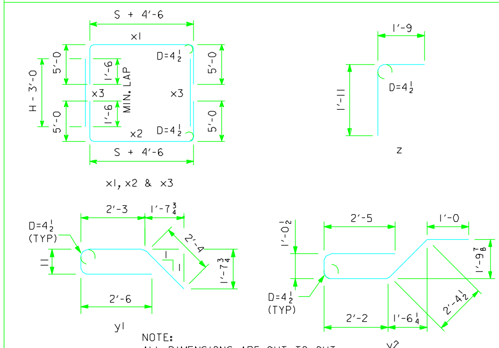
ESTIMATE OF QUANTITIES - ONE JOINT - 10' SPAN

BILL OF REINFORCING STEEL			10' x 6'				10' x 8'				10' x 10'				10' x 12'			
MARK	LOCATION	SHAPE	SIZE	NO.	LENGTH	LIN. FT.	SIZE	NO.	LENGTH	LIN. FT.	SIZE	NO.	LENGTH	LIN. FT.	SIZE	NO.	LENGTH	LIN. FT.
x1	SLAB AND WALLS		6	4	34'-6	138.0	6	4	34'-6	138.0	6	4	34'-6	138.0	6	4	34'-6	138.0
x2	FLOOR AND WALLS		6	4	34'-6	138.0	6	4	34'-6	138.0	6	4	34'-6	138.0	6	4	34'-6	138.0
x3	WALLS		6	8	3'-0	24.0	6	8	5'-0	40.0	6	8	7'-0	56.0	6	8	9'-0	72.0
y1	TOP AND SIDES		6	39	8'-0	312.0	6	43	8'-0	344.0	6	47	8'-0	376.0	6	51	8'-0	408.0
y2	BOTTOM		6	23	9'-0	207.0	6	23	9'-0	207.0	6	23	9'-0	207.0	6	23	9'-0	207.0
z	BOTTOM & FLOOR		6	23	3'-8	84.3	6	23	3'-8	84.3	6	23	3'-8	84.3	6	23	3'-8	84.3
					LENGTH	903.3			LENGTH	951.3			LENGTH	999.3			LENGTH	1047.3
TOTAL WEIGHT					1357 lbs.				1429 lbs.				1501 lbs.				1573 lbs.	
TOTAL CONCRETE					10.3 cu. yds.				10.8 cu. yds.				11.4 cu. yds.				12.0 cu. yds.	

ESTIMATE OF QUANTITIES - ONE JOINT - 12' SPAN

BILL OF REINFORCING STEEL			12' x 6'				12' x 8'				12' x 10'				12' x 12'			
MARK	LOCATION	SHAPE	SIZE	NO.	LENGTH	LIN. FT.	SIZE	NO.	LENGTH	LIN. FT.	SIZE	NO.	LENGTH	LIN. FT.	SIZE	NO.	LENGTH	LIN. FT.
x1	SLAB AND WALLS		6	4	38'-6	154.0	6	4	38'-6	154.0	6	4	38'-6	154.0	6	4	38'-6	154.0
x2	FLOOR AND WALLS		6	4	38'-6	154.0	6	4	38'-6	154.0	6	4	38'-6	154.0	6	4	38'-6	154.0
x3	WALLS		6	8	3'-0	24.0	6	8	5'-0	40.0	6	8	7'-0	56.0	6	8	9'-0	72.0
y1	TOP AND SIDES		6	43	8'-0	344.0	6	47	8'-0	376.0	6	51	8'-0	408.0	6	55	8'-0	440.0
y2	BOTTOM		6	27	9'-0	243.0	6	27	9'-0	243.0	6	27	9'-0	243.0	6	27	9'-0	243.0
z	BOTTOM & FLOOR		6	27	3'-8	99.0	6	27	3'-8	99.0	6	27	3'-8	99.0	6	27	3'-8	99.0
					LENGTH	1018.0			LENGTH	1066.0			LENGTH	1114.0			LENGTH	1162.0
TOTAL WEIGHT					1529 lbs.				1601 lbs.				1673 lbs.				1745 lbs.	
TOTAL CONCRETE					11.5 cu. yds.				12.1 cu. yds.				12.7 cu. yds.				13.3 cu. yds.	

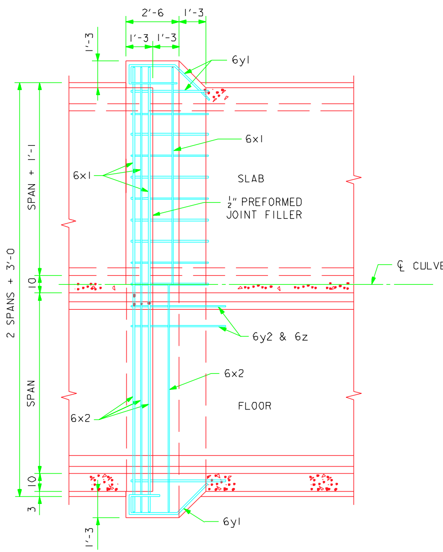
BENT BAR DETAILS



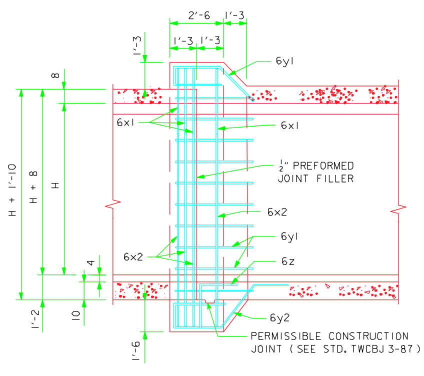
NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

CONCRETE PLACEMENT

SIZE	FOOTING	WALLS	SLAB
10' X 6'	4.727	1.640	3.883
10' X 8'	4.727	2.218	3.883
10' X 10'	4.727	2.797	3.883
10' X 12'	4.727	3.376	3.883
12' X 6'	5.422	1.640	4.461
12' X 8'	5.422	2.218	4.461
12' X 10'	5.422	2.797	4.461
12' X 12'	5.422	3.376	4.461



PLAN VIEW



LONGITUDINAL SECTION

NOTES:

1. DIMENSIONS AND QUANTITIES SHOWN BASED ON SLAB THICKNESS OF 8", WALL = 10", AND FLOOR = 10".
2. CHANGE LENGTHS OF BARS x1, x2, z, AND ADJUST REINFORCING STEEL AND CONCRETE QUANTITIES ACCORDINGLY FOR SLAB, WALL, AND FLOOR THICKNESSES OTHER THAN SHOWN.
3. ALL BAR LENGTHS ARE ESTIMATED WITH A 2" CLEARANCE FROM CONCRETE EDGE TO OUTSIDE OF BAR, EXCEPT AS NOTED.
4. MATERIAL AND CONSTRUCTION TO BE IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS OF I.D.O.T.
5. SEE DRAWING TWRCB-GI-87 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.
6. BARS x1 AND x2 MAY BE FURNISHED IN TWO EQUAL LENGTHS ADDING 24 DIAMETERS TO THE OVERALL LENGTH FOR LAP. THE ABOVE IS TO BE PERFORMED AT NO ADDITIONAL COST TO THE CONTRACTING AUTHORITY.
7. BARREL FLOOR BARS m1 ARE TO BE SHORTENED 6" AT BELL JOINTS.

LATEST REVISION DATE : 04-02

APPROVED BY :

STANDARD DESIGN

CULVERT BELL JOINTS

FOR
TWIN REINFORCED CONCRETE BOX CULVERTS

10' AND 12' SPANS

HIGHWAY DIVISION
IOWA DEPARTMENT OF TRANSPORTATION

JULY , 1987

TWCBJ 2-87

REVISED: 8/89: NOTE #7 ADDED.
REVISED: 12/96 : NOTE CORRECTED.
REVISED 05-01 - ADDED 2¼" CL. DIMENSION TO BOTTOM BARS y2 AND z.

REVISED 04-02 - ADDED PERMISSIBLE CULVERT BELL JOINT.
TWCBJ2.SOI