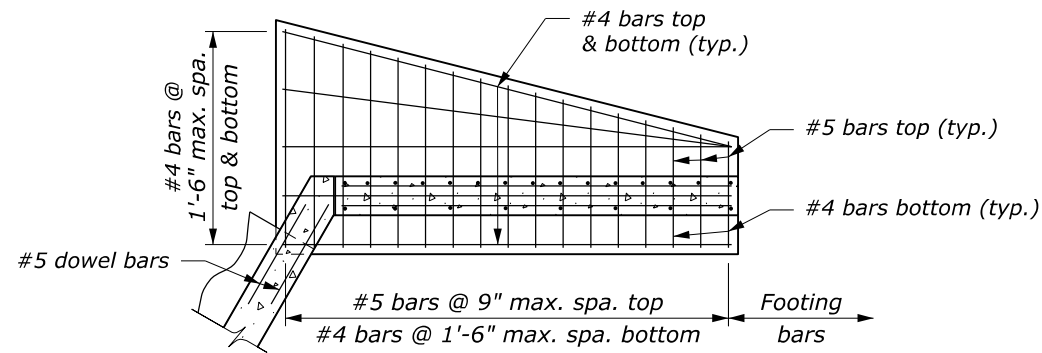
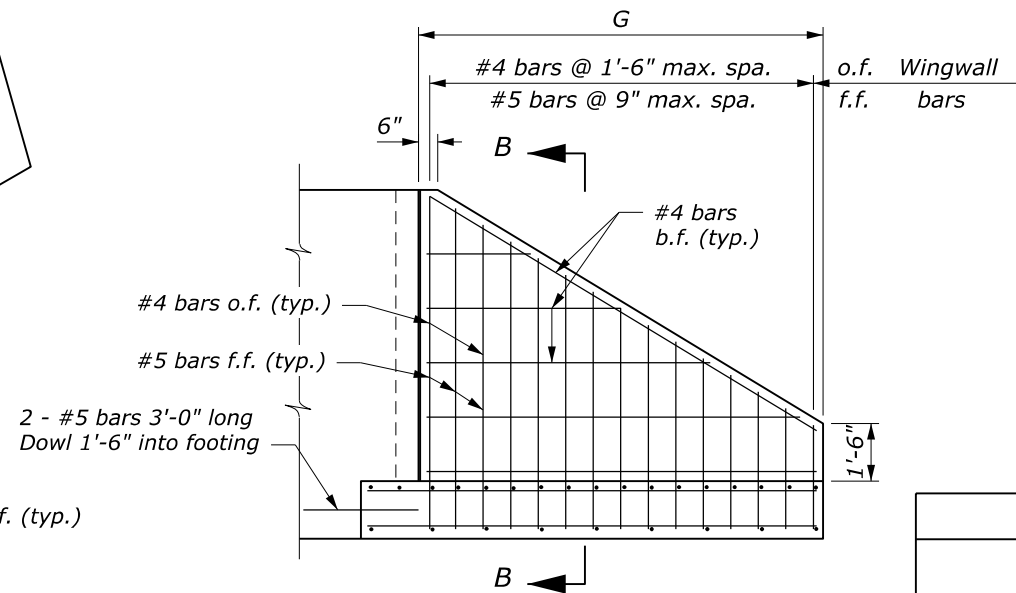


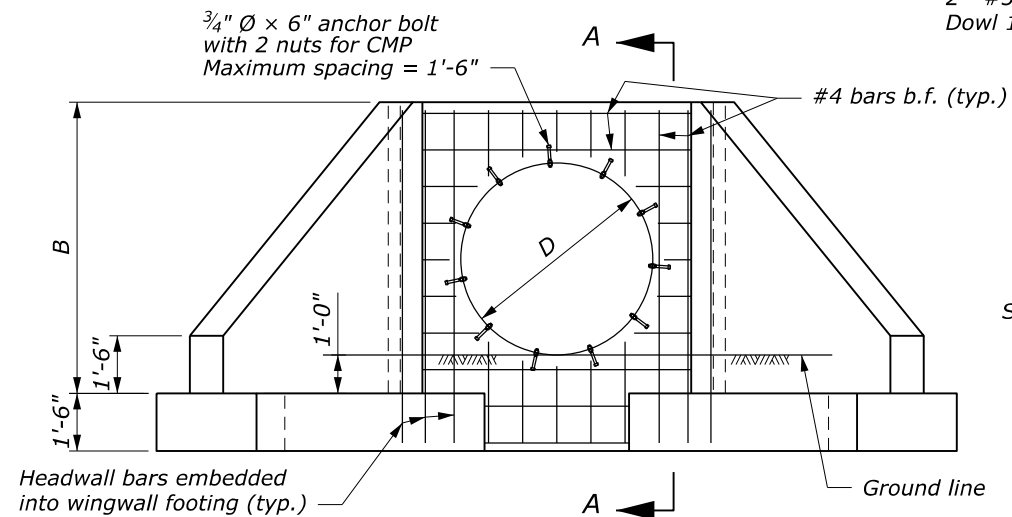
PLAN



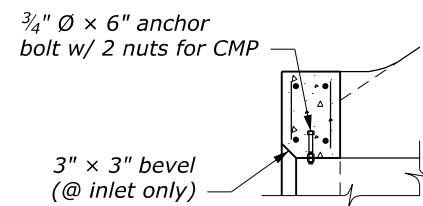
WINGWALL PLAN



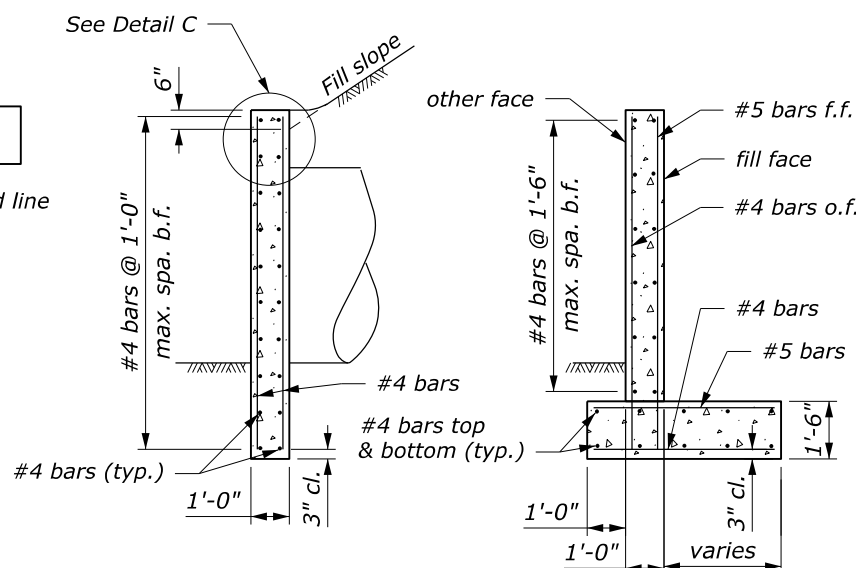
WINGWALL ELEVATION



FRONT ELEVATION
(Showing headwall reinforcement)



DETAIL C
(For Metal Pipes)



SECTION A-A

SECTION B-B

		DIMENSIONS AND QUANTITIES							
		Diameter of Pipe Culvert (D)							
Slope	Face	42"	48"	54"	60"	66"	72"	78"	84"
		1V:1.5H fill slope	A	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"
B	5'-11 1/2"		6'-5 1/2"	6'-11 1/2"	7'-5 1/2"	7'-11 1/2"	8'-5 1/2"	8'-11 1/2"	9'-5 1/2"
C	6'-7 3/4"		7'-1 3/4"	7'-7 3/4"	8'-1 3/4"	8'-7 3/4"	9'-1 3/4"	9'-7 3/4"	10'-1 3/4"
E	3'-10 1/2"		4'-3 3/4"	4'-9"	5'-2 1/4"	5'-7 1/4"	6'-0 3/4"	6'-5 3/4"	6'-11"
F	6'-8 3/4"		7'-5 3/4"	8'-2 1/2"	8'-11 3/4"	9'-8 1/2"	10'-5 3/4"	11'-2 3/4"	12'-0"
G	7'-9"		8'-7 1/2"	9'-6"	10'-4 1/2"	11'-2 3/4"	12'-1 1/4"	12'-11 1/2"	13'-10 1/4"
Conc. (CUYD)			8.0	9.0	10.1	11.1	12.2	13.4	14.5
Steel (LB)		651	738	818	878	977	1040	1152	1249
1V:2H fill slope	A	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"
	B	5'-11 1/2"	6'-5 1/2"	6'-11 1/2"	7'-5 1/2"	7'-11 1/2"	8'-5 1/2"	8'-11 1/2"	9'-5 1/2"
	C	6'-7 3/4"	7'-1 3/4"	7'-7 3/4"	8'-1 3/4"	8'-7 3/4"	9'-1 3/4"	9'-7 3/4"	10'-1 3/4"
	E	5'-2"	5'-9"	6'-3 3/4"	6'-11"	7'-5 3/4"	8'-0 3/4"	8'-7 3/4"	9'-2 3/4"
	F	8'-11 1/2"	9'-11 3/4"	10'-11 1/2"	11'-11 3/4"	12'-11 1/2"	13'-11 3/4"	14'-11 1/2"	15'-11 3/4"
	G	10'-4"	11'-6 1/4"	12'-7 3/4"	13'-10"	14'-11 1/2"	16'-1 3/4"	17'-3 3/4"	18'-5 1/2"
	Conc. (CUYD)		10.0	11.3	12.6	14.0	15.4	16.9	18.3
Steel (LB)		798	911	1001	1104	1206	1315	1417	1554

Abbreviations:
 f.f. = Fill face
 o.f. = Other face
 b.f. = Both faces

NO SCALE

NOTE:

1. This drawing applies for normal crossings and skews up to 15°.
2. Prepare foundation according to Section 209. Place headwall/wingwalls on 6 inches of foundation fill.
3. On shallow fill where headwall is 2 feet or less below shoulder line, construct the headwall parallel to line and grade of the shoulder.
4. Do not allow top of wingwall to project above fill slope, ditch slope or shoulder.
5. Chamfer all exposed edges 3/4 inch and finish all exposed surfaces with a Class 1 ordinary surface finish. Provide joint filler conforming to AASHTO M 213.
6. Bell end of concrete pipe may replace bevel at inlet headwall.
7. Quantities shown in table are for one headwall and two wingwalls and are based on CMP. Concrete and steel quantities shown will be used as basis for final payment for headwall/wingwalls constructed according to this drawing.
8. Reinforcing steel clearance is 2 inches unless shown otherwise.
9. Provide anchor bolts conforming to ASTM A307. Galvanize bolts and nuts according to ASTM A153.

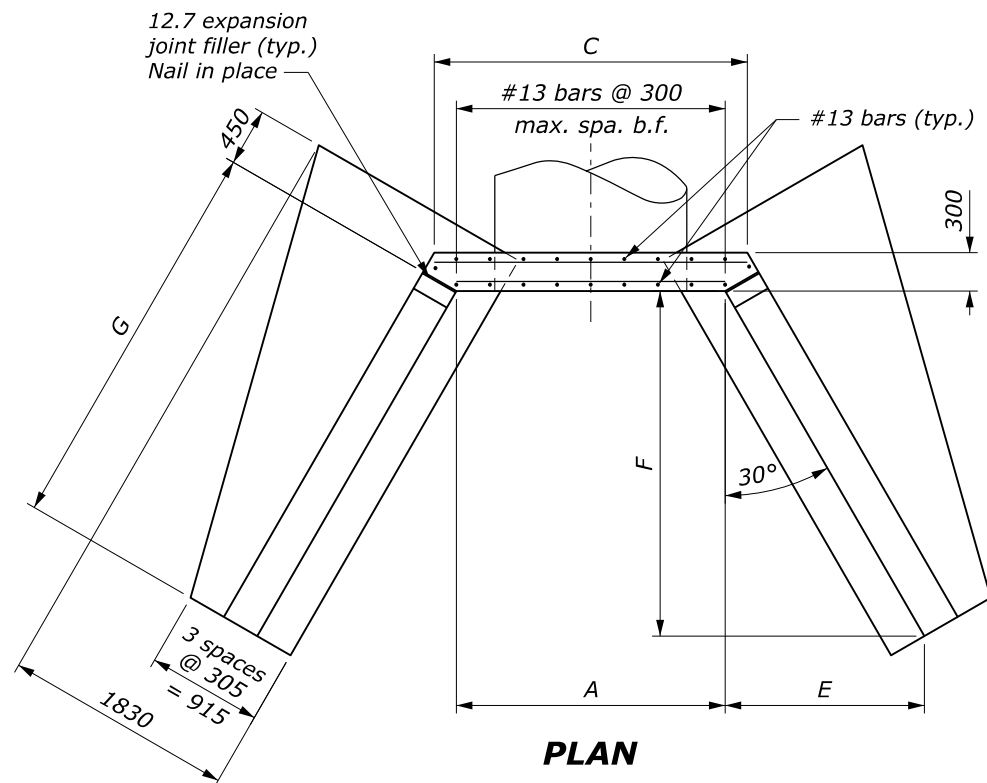
U.S. DEPARTMENT OF TRANSPORTATION, FHWA
 OFFICE OF FEDERAL LANDS HIGHWAY

**CONCRETE HEADWALL/WINGWALL
 FOR SINGLE NORMAL
 42" TO 84" PIPE CULVERT**

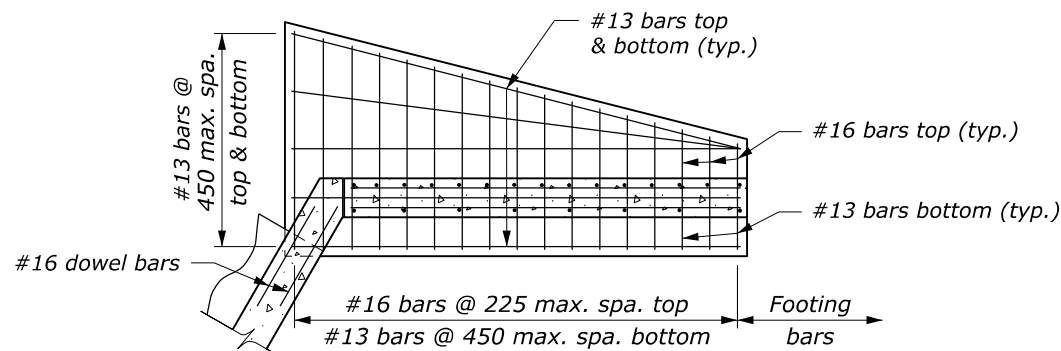
FLH STANDARD
601-5

SPECIFICATION
 FP-24, FP-14

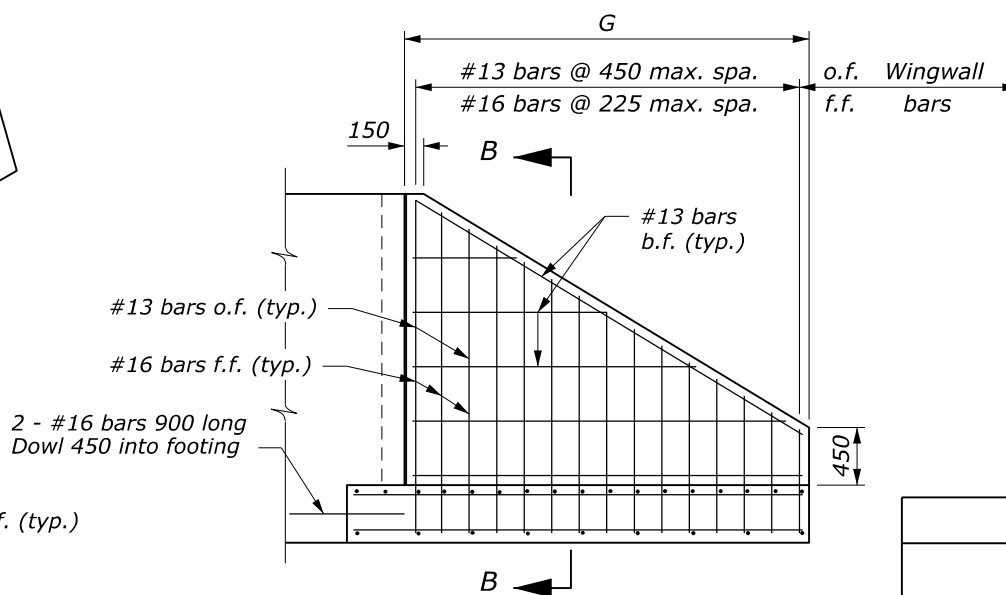
APPROVED FOR USE
 2/2024



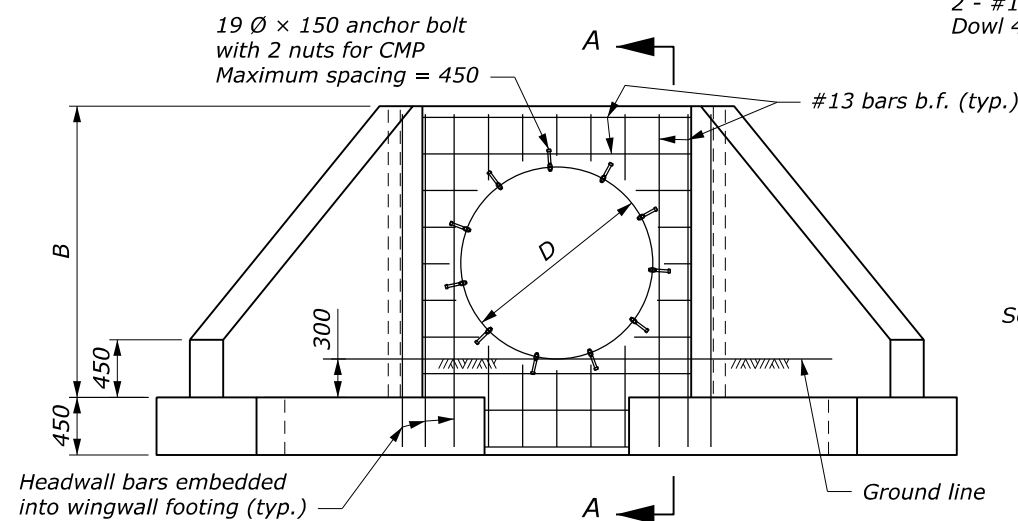
PLAN



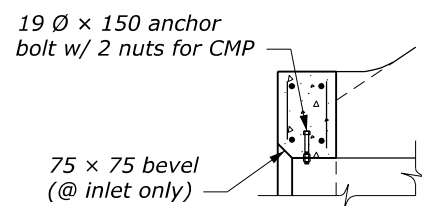
WINGWALL PLAN



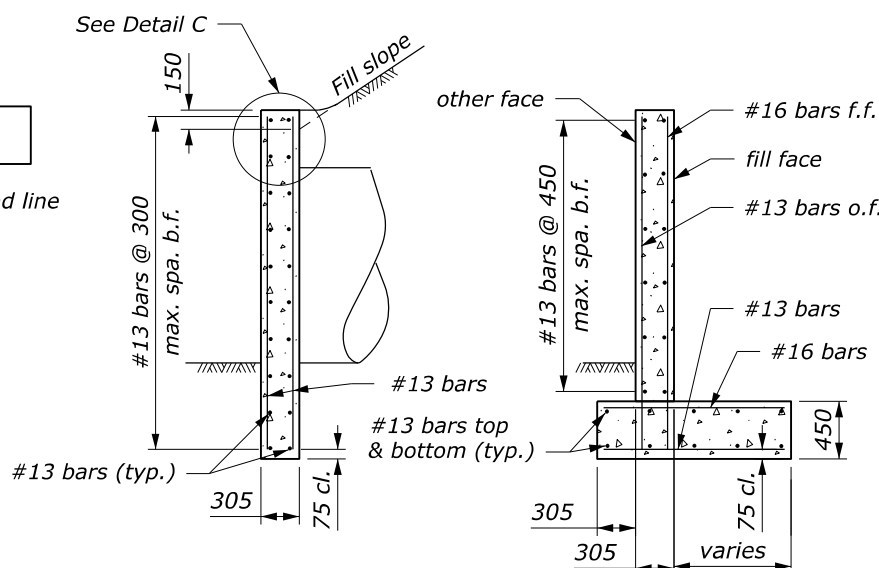
WINGWALL ELEVATION



FRONT ELEVATION
(Showing headwall reinforcement)



DETAIL C
(For Metal Pipes)



SECTION A-A

SECTION B-B

		DIMENSIONS AND QUANTITIES							
		Diameter of Pipe Culvert (D)							
1V:1.5H fill slope		1050	1200	1350	1500	1650	1800	1950	2100
	A	1675	1830	1980	2135	2285	2440	2590	2745
	B	1815	1970	2120	2275	2425	2580	2730	2885
	C	2025	2180	2330	2485	2635	2790	2940	3095
	E	1180	1315	1450	1580	1710	1845	1975	2110
	F	2050	2280	2505	2735	2960	3195	3420	3655
	G	2365	2630	2895	3160	3420	3690	3950	4220
Conc. (m ³)		6.1	6.9	7.7	8.5	9.4	10.2	11.1	12.1
Steel (kg)		295	334	371	398	443	471	522	567
1V:2H fill slope		1050	1200	1350	1500	1650	1800	1950	2100
	A	1675	1830	1980	2135	2285	2440	2590	2745
	B	1815	1970	2120	2275	2425	2580	2730	2885
	C	2025	2180	2330	2485	2635	2790	2940	3095
	E	1575	1755	1925	2110	2280	2460	2635	2815
	F	2730	3040	3340	3650	3950	4260	4560	4870
	G	3150	3510	3855	4215	4560	4920	5265	5625
Conc. (m ³)		7.7	8.6	9.6	10.7	11.8	12.9	14.0	15.2
Steel (kg)		362	413	454	501	547	596	642	705

Abbreviations:
f.f. = Fill face
o.f. = Other face
b.f. = Both faces

This drawing contains **Metric** units of measure.
Dimensions without units are millimeters.

U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY	FLH STANDARD M601-5
CONCRETE HEADWALL/WINGWALL FOR SINGLE NORMAL 1050 TO 2100 PIPE CULVERT	SPECIFICATION FP-24, FP-14
	APPROVED FOR USE 2/2024

NO SCALE

- NOTE:**
- This drawing applies for normal crossings and skews up to 15°.
 - Prepare foundation according to Section 209. Place headwall/wingwalls on 150 mm of foundation fill.
 - On shallow fill where headwall is 600 mm or less below shoulder line, construct the headwall parallel to line and grade of the shoulder.
 - Do not allow top of wingwall to project above fill slope, ditch slope or shoulder.
 - Chamfer all exposed edges 20 mm and finish all exposed surfaces with a Class 1 ordinary surface finish. Provide joint filler conforming to AASHTO M 213.
 - Bell end of concrete pipe may replace bevel at inlet headwall.
 - Quantities shown in table are for one headwall and two wingwalls and are based on CMP. Concrete and steel quantities shown will be used as basis for final payment for headwall/wingwalls constructed according to this drawing.
 - Reinforcing steel clearance is 50 mm unless shown otherwise.
 - Provide anchor bolts conforming to ASTM A307. Galvanize bolts and nuts according to ASTM A153.