

c:\pw-work\00147408\Std601-3.dgn [Std 601-3]
18 June 2024 10:49 AM

PROJECT	SHEET NUMBER

WINGWALLS FOR CONCRETE HEADWALLS

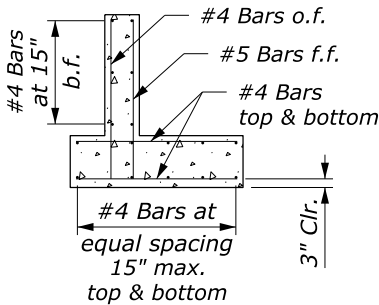
DIMENSIONS, REINFORCING STEEL AND CONCRETE TABLE OF QUANTITIES

D INCH	H FEET	0° WINGWALL SKEW			15° WINGWALL SKEW			30° WINGWALL SKEW			45° WINGWALL SKEW			60° WINGWALL SKEW		
		W FEET	CONC. CUYD	STEEL LB	W FEET	CONC. CUYD	STEEL LB	W FEET	CONC. CUYD	STEEL LB	W FEET	CONC. CUYD	STEEL LB	W FEET	CONC. CUYD	STEEL LB
48	5.00	6.00	2.81	178	6.00	2.78	178	6.00	2.76	178	6.00	2.74	178	6.00	2.73	178
54	5.25	6.00	2.86	180	6.00	2.82	180	6.00	2.80	180	6.00	2.78	180	6.75	3.06	202
60	5.50	6.25	2.90	181	6.00	2.86	181	6.00	2.84	181	6.00	2.82	181	7.50	3.39	224
66	5.75	7.00	2.94	183	6.00	2.90	183	6.00	2.87	183	6.00	2.85	183	8.25	3.74	241
72	6.00	7.50	2.98	185	6.00	2.94	185	6.00	2.91	185	6.50	3.09	202	9.00	4.09	263
78	6.25	8.25	3.02	186	6.00	2.98	186	6.00	2.95	186	7.00	3.34	213	9.75	4.45	285
84	6.50	8.75	3.06	188	6.00	3.02	188	6.25	3.09	197	7.50	3.59	232	10.50	4.81	311
90	6.75	9.50	3.11	190	6.00	3.06	190	6.50	3.24	207	8.00	3.84	246	11.25	5.18	329
96	7.00	10.00	3.15	191	6.25	3.21	200	7.00	3.49	218	8.50	4.10	260	12.00	5.56	350

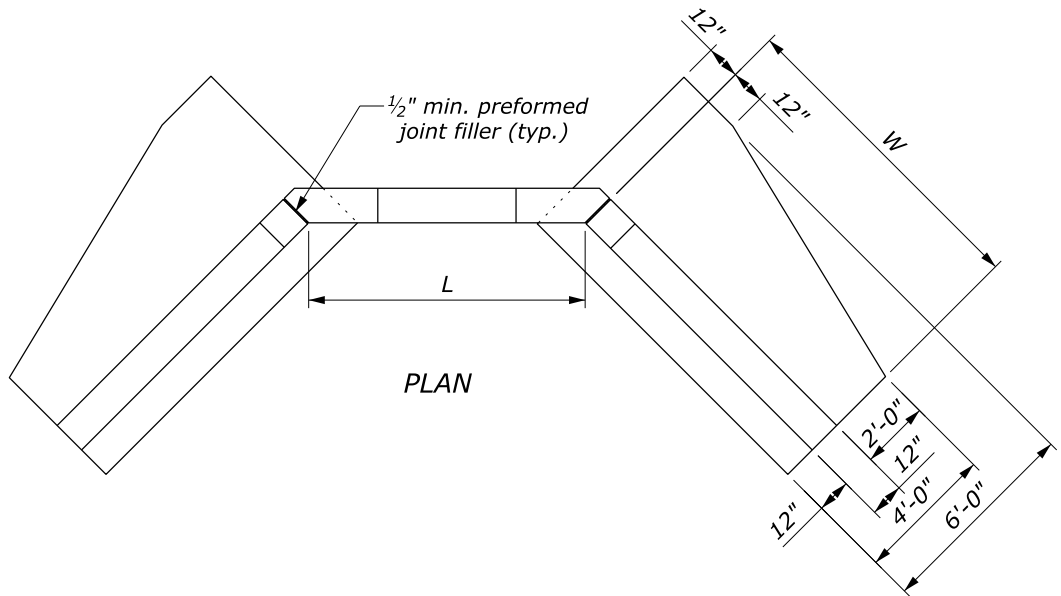
RECOMMENDED WINGWALL SKEWS				
WINGWALL	PIPE SKEW			
	0°	15°	30°	45°
①	45°	45°	60°	60°
②	45°	30°	15°	0°
③	45°	30°	15°	0°
④	45°	45°	60°	60°

NOTE:

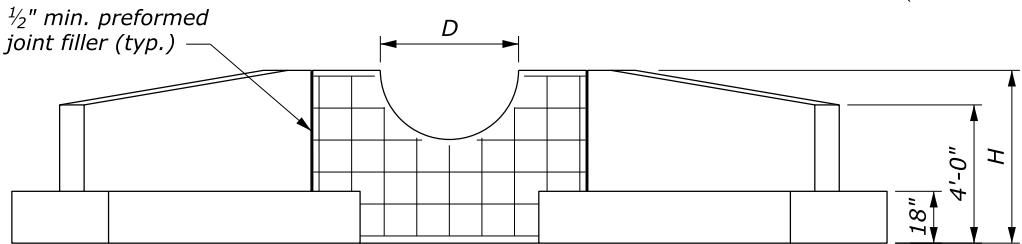
- Chamfer all exposed edges $\frac{3}{4}$ inch and finish all exposed surfaces with a Class 1 ordinary finish.
- Reinforcing steel clearance is 2 inches unless otherwise noted.
- For skew angles shown in table, the length W and quantities for wingwalls are computed for a 1V:1.5H side slope. For 1V:2H or 1V:2.5H slopes compute length W with the following equation:
 $W = D/2 \times \text{slope} \times \text{secant (wingwall skew angle)}$
Minimum W not less than 6 feet.
- Quantities shown in table are for one wingwall only. For lengths W not shown in table, approximate the quantities by multiplying the quantities for 0° skew and a given height H by the factor: $1 + [(W-6.0) \times 0.14]$.
- See Standards 601-1 and 601-2 for headwall and slope paving dimensions.
- Final quantities will be determined by using the tables on this drawing.
- Do not order materials until the length, skew angle, and slope bevel in the field have been approved.



SECTION A-A

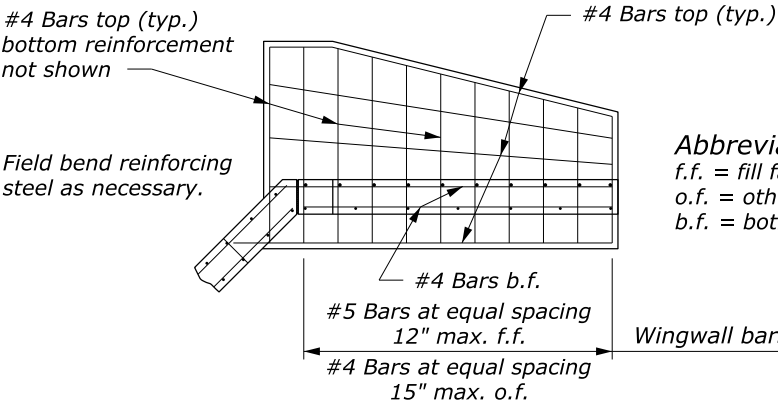


PLAN

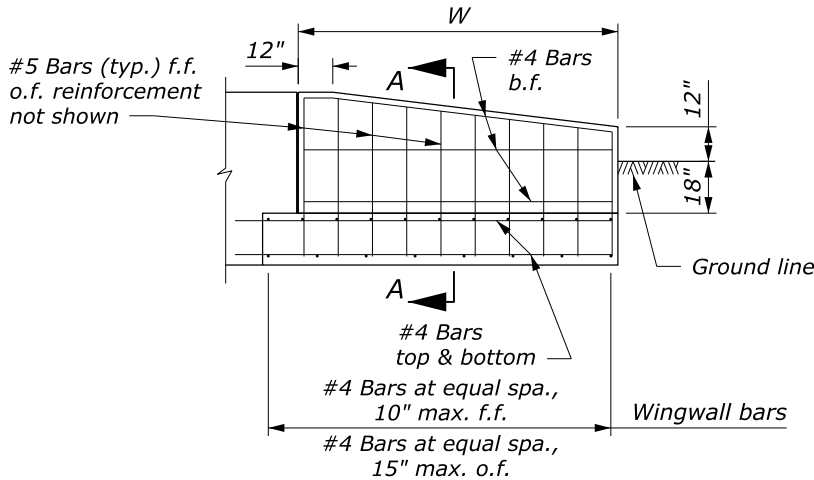


ELEVATION

HEADWALL AND WINGWALL



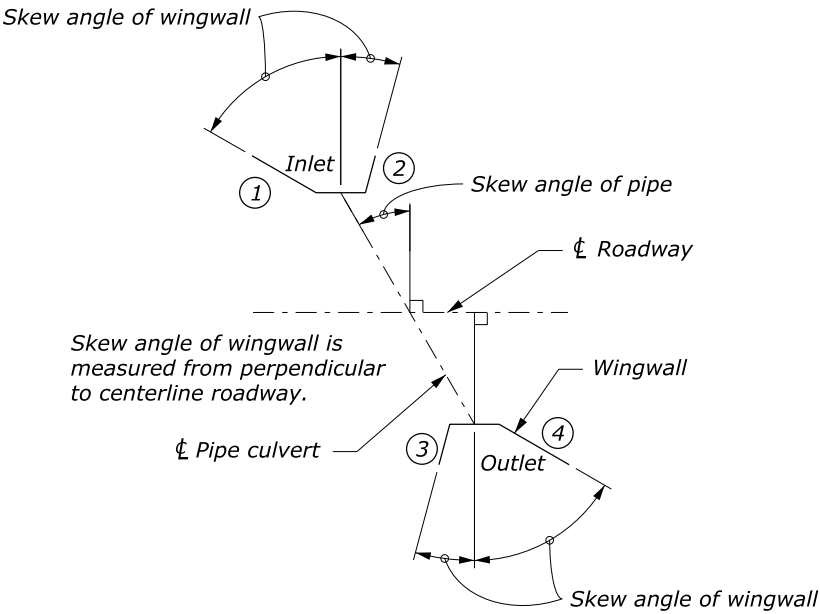
PLAN



ELEVATION

TYPICAL WINGWALL

Abbreviations:
f.f. = fill face
o.f. = other face
b.f. = both faces



WINGWALL LAYOUT

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY	FLH STANDARD 601-3
WINGWALLS FOR CONCRETE HEADWALLS	SPECIFICATION FP-24, FP-14 APPROVED FOR USE 2/2024

c:\pwwork\0147408\Std601-3.dgn [Std M601-3]
30 May 2024 10:28 AM

PROJECT	SHEET NUMBER

WINGWALLS FOR CONCRETE HEADWALLS

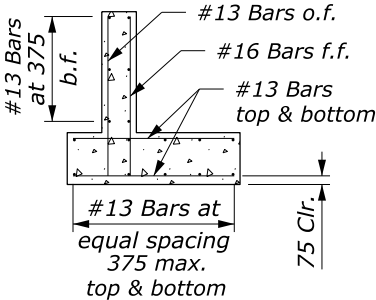
DIMENSIONS, REINFORCING STEEL AND CONCRETE TABLE OF QUANTITIES

D	H m	0° WINGWALL SKEW			15° WINGWALL SKEW			30° WINGWALL SKEW			45° WINGWALL SKEW			60° WINGWALL SKEW		
		W m	CONC. m3	STEEL kg	W m	CONC. m3	STEEL kg	W m	CONC. m3	STEEL kg	W m	CONC. m3	STEEL kg	W m	CONC. m3	STEEL kg
1200	1.500	1.8	2.05	80	1.8	2.03	80	1.8	2.01	80	1.8	2.00	80	1.8	1.99	80
1350	1.575	1.8	2.08	80	1.8	2.06	80	1.8	2.04	80	1.8	2.03	80	2.1	2.30	92
1500	1.650	1.8	2.11	81	1.8	2.09	81	1.8	2.07	81	1.8	2.05	81	2.3	2.52	101
1650	1.725	1.8	2.14	82	1.8	2.12	82	1.8	2.10	82	1.8	2.08	82	2.5	2.75	108
1800	1.800	1.8	2.17	82	1.8	2.15	82	1.8	2.12	82	2.0	2.30	92	2.7	2.98	117
1950	1.875	1.8	2.20	83	1.8	2.17	83	1.8	2.15	83	2.1	2.43	95	3.0	3.32	130
2100	1.950	1.8	2.23	84	1.8	2.20	84	1.9	2.28	88	2.3	2.66	104	3.2	3.56	140
2250	2.025	1.8	2.26	85	1.8	2.23	85	2.0	2.41	95	2.4	2.80	110	3.4	3.80	147
2400	2.100	1.8	2.30	85	1.9	2.36	90	2.1	2.54	97	2.6	3.04	117	3.6	4.05	156

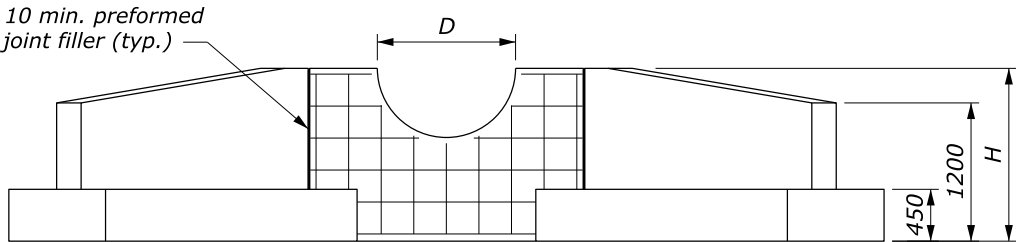
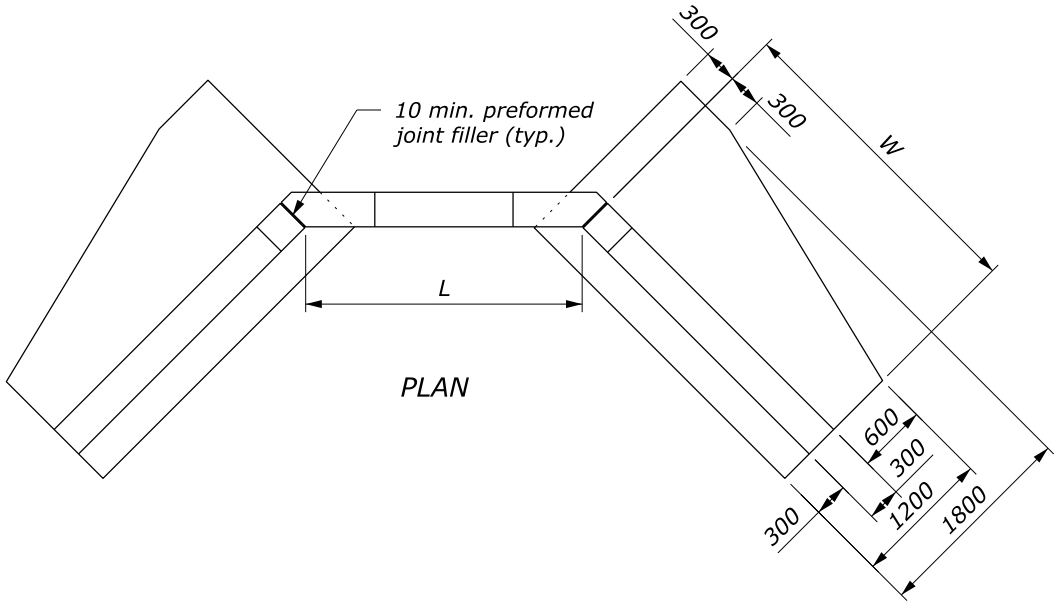
WINGWALL	PIPE SKEW			
	0°	15°	30°	45°
①	45°	45°	60°	60°
②	45°	30°	15°	0°
③	45°	30°	15°	0°
④	45°	45°	60°	60°

NOTE:

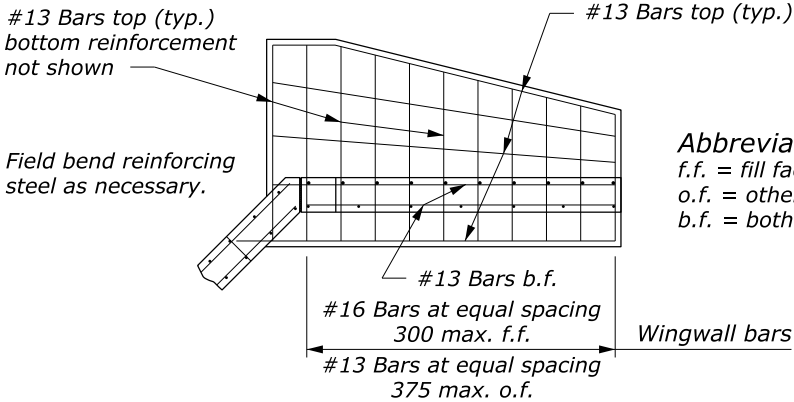
- Chamfer all exposed edges 20 mm and finish all exposed surfaces with a Class 1 ordinary finish.
- Reinforcing steel clearance is 50 mm unless otherwise noted.
- For skew angles shown in table, the length W and quantities for wingwalls are computed for a 1V:1.5H side slope. For 1V:2H or 1V:2.5H slopes compute length W with the following equation:
 $W = D/2 \times \text{slope} \times \text{secant (wingwall skew angle)}$
Minimum W not less than 1.8 meters.
- Quantities shown in table are for one wingwall only. For lengths W not shown in table, approximate the quantities by multiplying the quantities for 0° skew and a given height H by the factor: $1 + [(W-1.8) \times 0.46]$.
- See Standards M601-1 and M601-2 for headwall and slope paving dimensions.
- Final quantities will be determined by using the tables on this drawing.
- Do not order materials until the length, skew angle, and slope bevel in the field have been approved.



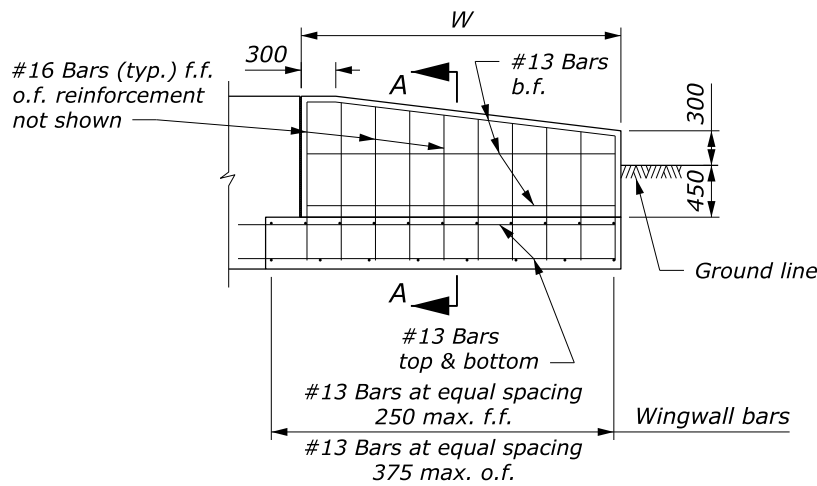
SECTION A-A



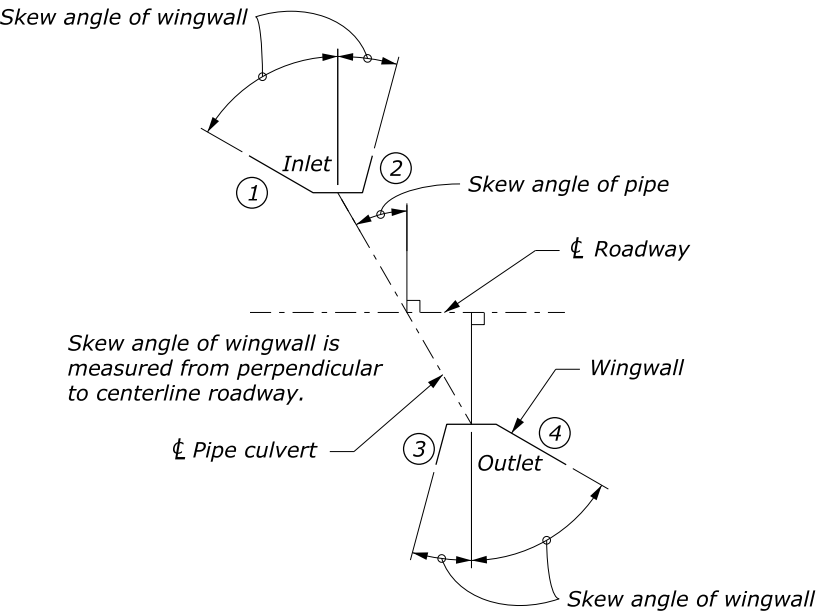
HEADWALL AND WINGWALL



Abbreviations:
f.f. = fill face
o.f. = other face
b.f. = both faces



TYPICAL WINGWALL



WINGWALL LAYOUT

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

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY	FLH STANDARD M601-3
WINGWALLS FOR CONCRETE HEADWALLS	SPECIFICATION FP-24, FP-14
	APPROVED FOR USE 2/2024