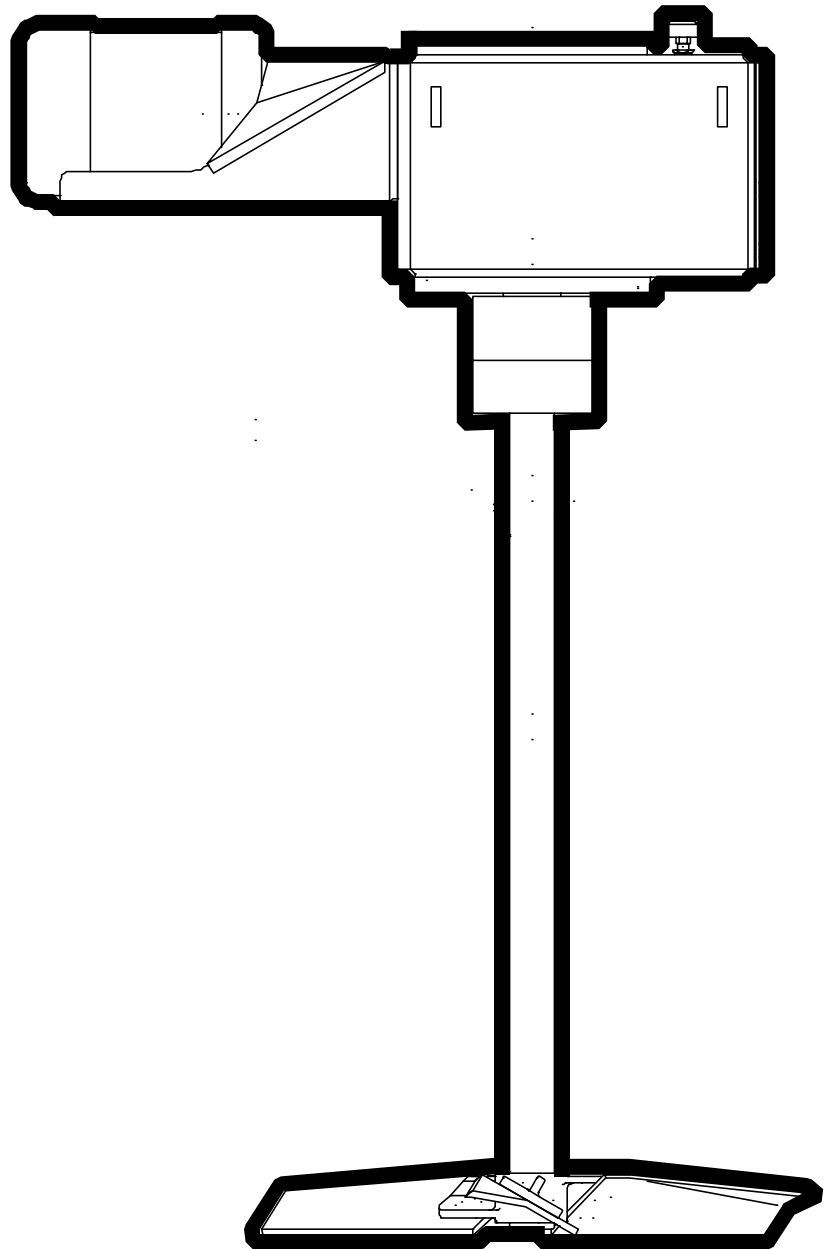


HTD/HTP Turbine Agitators Mounting Supplement



Reference IOM Manual 300

MOUNTING

HTD and HTP (open tank) style units usually mount separately from the tank on either a steel structure or a concrete slab over the tank. The steel structure for open tank mounting is typically constructed of two main support beams, with lateral and diagonal bracing, spanning the tank. See *Figure 1, page 2 (HTD)* or *Figure 2, page 3 (HTP)*. HTD style units may include an auxiliary shaft seal as an option. Refer to the agitator assembly drawing for minimum required mounting height to allow for servicing the seal.

The most frequent cause of mechanical difficulty with an agitator is improper mounting. The agitator extension shaft is designed to run in a true vertical position. *Do not angle or side mount. Do not mount on a surface which is not flat and horizontal.*

During operation of the agitator, the fluid motion in the vessel produced by the rotation of the turbine impeller can exert significant forces and moments on the agitator extension shaft. The forces and moments produced by the turbine rotating in a fluid are; torque, turbine thrust and turbine hydraulic (side) force. Torque implies an unchanging load, but the actual operating torque will show plus or minus 10 to 20 percent variability due to the turbulent conditions within the agitated fluid. Start up of the agitator with the turbine impacted in solids is beyond the scope of these recommendations. Hydraulic forces acting on the turbine generate moments, which act on the shaft and are transmitted to the agitator drive. Because of the random nature of the forces and the rotation of the shaft, the direction of these forces is constantly changing. A pitched blade or axial flow turbine normally pumps downward and generates an upward thrust. The thrust force is generally less than the weight of the unit. Upward pumping turbine thrust force will add to the unit weight. The net effect of the turbine thrust force is to offset or add to the unit weight, contributing to the variability of the support structure loading. The agitator has been designed to accommodate these forces, and as a result, the forces are transmitted directly to the mounting support. The support structure must be rigid enough to support the agitator weight and the live agitator reactions as a result of torque and bending moment. The structure should be sufficiently rigid that the agitator extension shaft will not move more than 1/32 inch per foot (2.6 mm per meter) of length due to deflection of the structure. Refer to the agitator assembly drawing for the support structure design loads.

Table 3, page 5, Recommended Beam Sizes, is keyed to model, a case size and tank diameter. Select the appropriate beam size for your application. Beams of equivalent section modulus and moment of inertia and/or modulus of elasticity can be used. See *Figure 1, page 2 (HTD)* or *Figure 2, page 3 (HTP)*. Refer to *Table 2, page 4* for mounting dimensions.

This information is intended as a guide and does not relieve the user of completely analyzing the entire mounting system.

THE AGITATOR SUPPORT IS TYPICALLY CONSTRUCTED OF TWO STEEL BEAMS (CLOSED AT BOTH ENDS) WITH LATERAL AND 45° BRACING BEAMS.

LATERAL AND BRACING BEAMS TO BE SAME SIZE AS MAIN SUPPORT BEAMS. SEE TABLE 3 FOR BEAM SIZE.

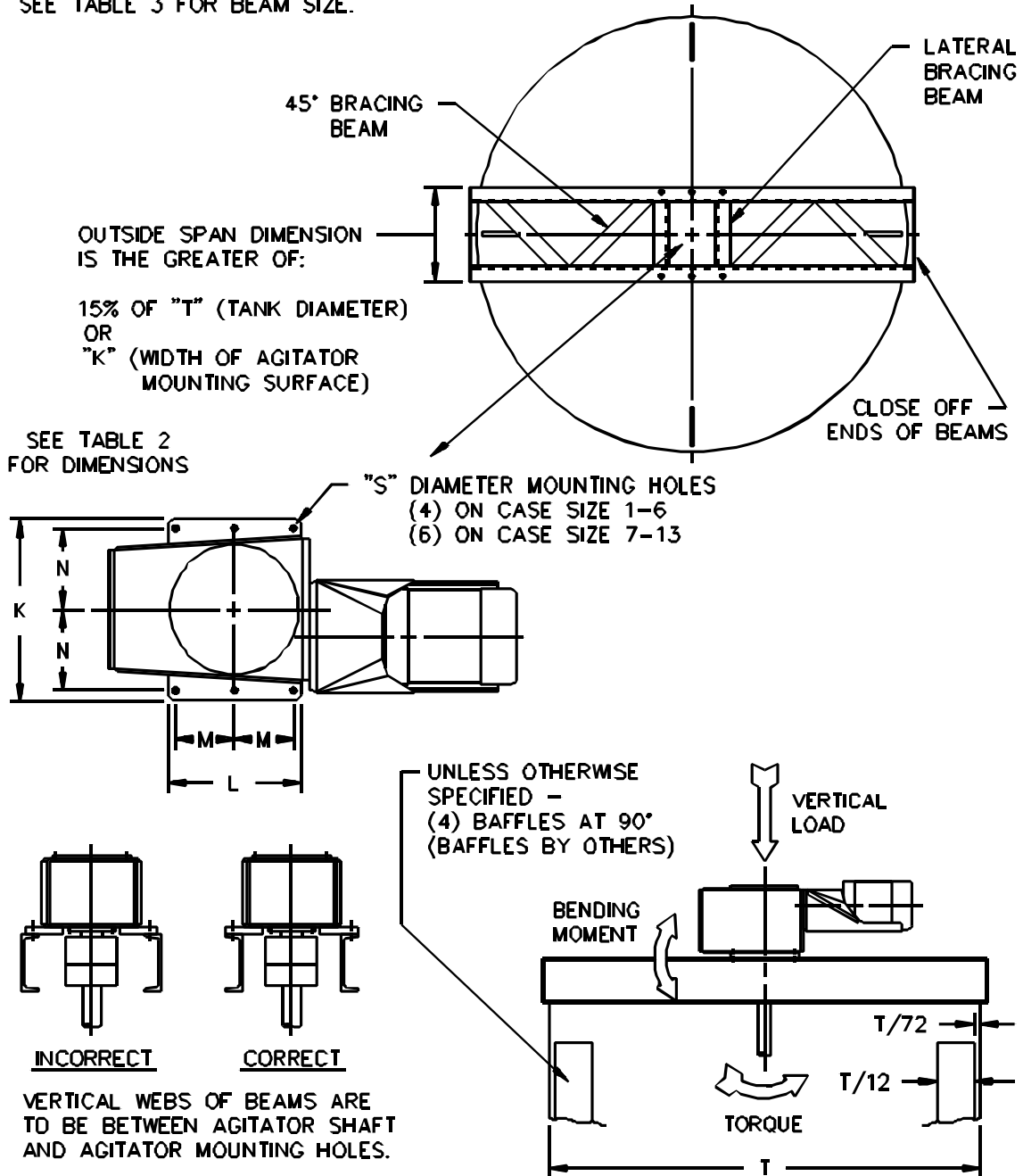


Figure 1: Open Tank Beam Mounting - HTD

THE AGITATOR SUPPORT IS TYPICALLY CONSTRUCTED OF TWO STEEL BEAMS (CLOSED AT BOTH ENDS) WITH LATERAL AND 45° BRACING BEAMS.

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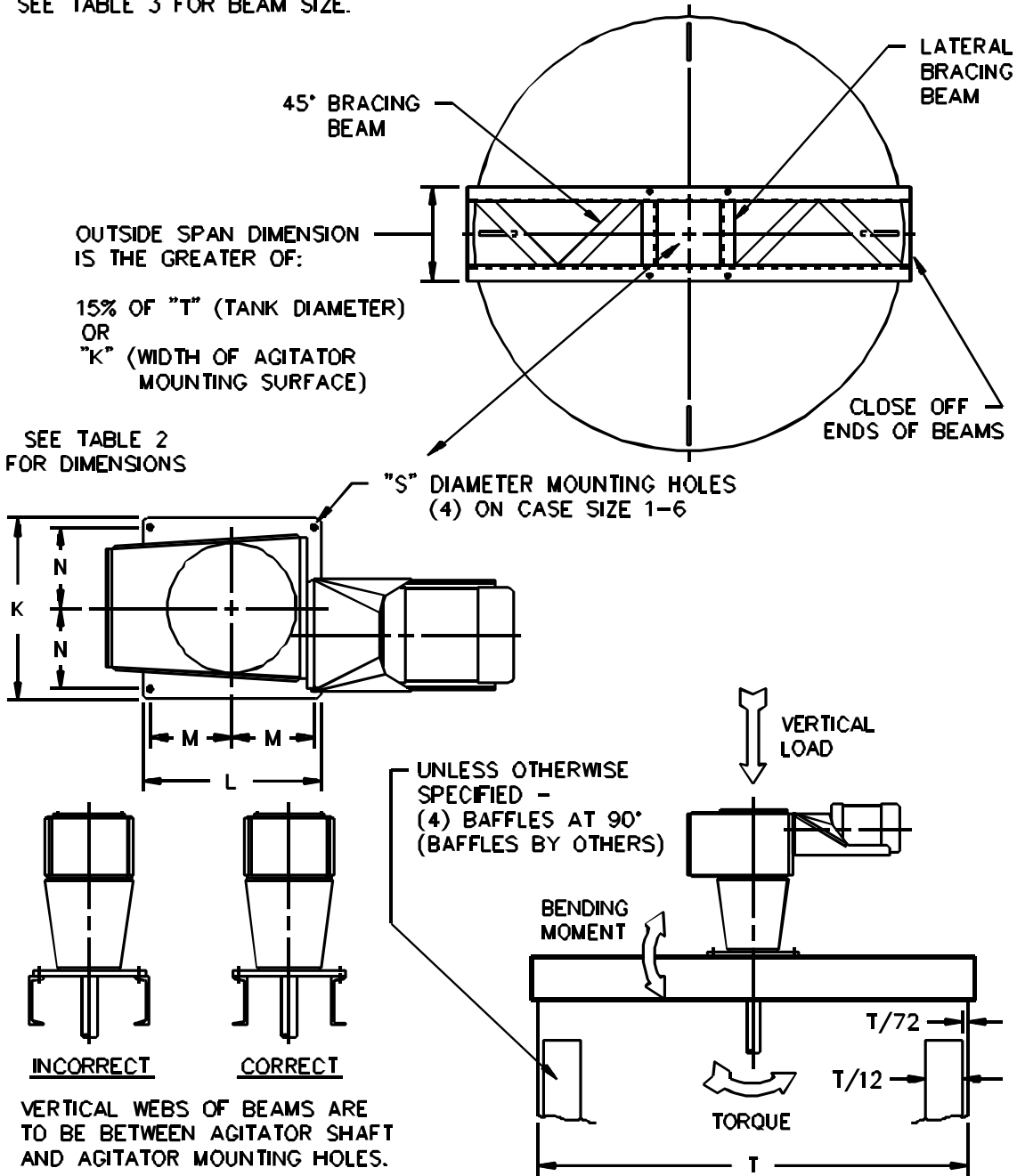


Figure 2: Open Tank Beam Mounting - HTP

TABLE 2 MOUNTING DIMENSIONS

CASE SIZE	Model HTD									
	K		L		M		N		S	
	in	mm	in	mm	in	mm	in	mm	in	mm
1	13.00	330.2	8.00	203.2	3.25	82.6	5.63	142.9	0.63	15.9
2	16.00	406.4	10.00	254.0	4.25	108.0	7.00	177.8	0.63	15.9
3	18.00	457.2	11.50	292.1	4.75	120.7	8.00	203.2	0.75	19.1
4	20.50	520.7	16.50	419.1	7.25	184.2	9.13	231.8	0.88	22.2
5	22.50	571.5	16.50	419.1	7.25	184.2	10.00	254.0	0.88	22.2
6	25.00	635.0	18.50	469.9	8.25	209.6	11.25	285.8	0.88	22.2
7	34.00	863.6	21.00	533.4	9.25	235.0	15.75	400.1	1.00	25.4
8	38.50	977.9	22.00	558.8	9.50	241.3	17.75	450.9	1.13	28.6
9	41.00	1041.4	26.00	660.4	11.50	292.1	19.00	482.6	1.13	28.6
10	45.00	1143.0	33.00	838.2	15.00	381.0	21.00	533.4	1.13	28.6
11	52.00	1320.8	39.00	990.6	17.75	450.9	24.25	616.0	1.38	34.9
12	57.00	1447.8	48.00	1219.2	22.25	565.2	26.75	679.5	1.63	41.3
13	68.00	1727.2	50.50	1282.7	23.00	584.2	32.25	819.2	1.63	41.3
CASE SIZE	Model HTP									
	K		L		M		N		S	
	in	mm	in	mm	in	mm	in	mm	in	mm
1	16.50	419.1	16.50	419.1	7.25	184.2	7.25	184.2	0.75	19.1
2	16.50	419.1	16.50	419.1	7.25	184.2	7.25	184.2	0.75	19.1
3	16.50	419.1	16.50	419.1	7.25	184.2	7.25	184.2	0.75	19.1
4	25.00	635.0	25.00	635.0	11.25	285.8	11.25	285.8	0.88	22.2
5	25.00	635.0	25.00	635.0	11.25	285.8	11.25	285.8	0.88	22.2
6	25.00	635.0	25.00	635.0	11.25	285.8	11.25	285.8	0.88	22.2

TABLE 3 RECOMMENDED BEAM SIZES

Case Size	Tank Diameter, Feet (Meters)				
	4 (1.22)	6 (1.83)	8 (2.44)	10 (3.05)	15 (4.57)
1	C4 x 5.4	C5 x 6.7	C6 x 8.2	C7 x 9.8	W12 x 14
2	C5 x 6.7	C6 x 8.2	C7 x 9.8	W8 x 10	W12 x 14
3	C6 x 8.2	C7 x 9.8	W8 x 10	W10 x 12	W12 x 19
4	---	C7 x 9.8	W8 x 10	W12 x 14	W14 x 22
5	---	W8 x 10	W10 x 12	W12 x 14	W16 x 26
6	---	W8 x 10	W10 x 12	W12 x 16	W16 x 31
7	---	---	W12 x 14	W14 x 22	W18 x 35
8	---	---	W12 x 16	W14 x 22	W18 x 40
9	---	---	---	W16 x 26	W21 x 44
10	---	---	---	W18 x 31	W24 x 55
11	---	---	---	---	W24 x 62
12	---	---	---	---	W24 x 76

Case Size	Tank Diameter, Feet (Meters)				
	20 (6.10)	25 (7.62)	30 (9.14)	40 (12.19)	50 (15.24)
1	W12 x 19	W16 x 26	W18 x 35	W24 x 55	W24 x 76
2	W14 x 22	W16 x 31	W18 x 40	W24 x 62	W27 x 84
3	W16 x 26	W18 x 40	W21 x 50	W27 x 84	W30 x 116
4	W18 x 35	W21 x 50	W24 x 62	W30 x 99	W36 x 135
5	W18 x 40	W24 x 55	W24 x 76	W30 x 116	W36 x 160
6	W21 x 44	W24 x 62	W27 x 84	W33 x 118	W36 x 194
7	W24 x 55	W27 x 84	W30 x 99	W36 x 160	W36 x 280
8	W24 x 62	W27 x 84	W30 x 116	W36 x 194	W36 x 280
9	W24 x 76	W30 x 99	W33 x 130	W36 x 260	*
10	W27 x 84	W33 x 118	W36 x 160	*	*
11	W30 x 99	W36 x 135	W36 x 194	*	*
12	W30 x 116	W36 x 160	W36 x 260	*	*
13	*	*	*	*	*

* Consult Chemineer

C = American Standard Channel

W = Wide Flange Beam

