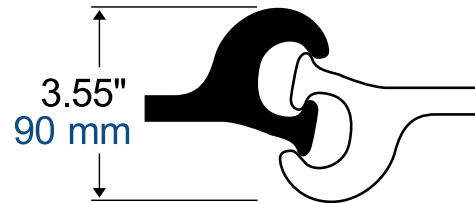
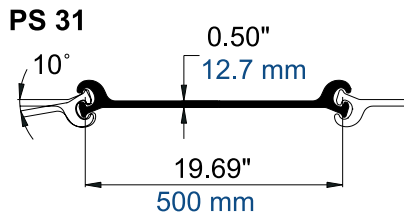
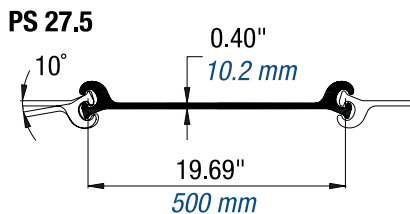




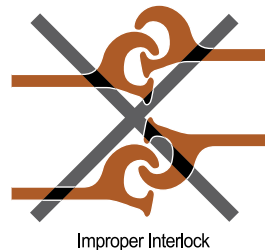
PS (FLAT SHEET) PILING PROPERTIES



Minimum Grade 60 Standard					Per Single Section						Per Unit of Wall			
Section	Nominal Width	Depth (Height)	Wall Depth (Height)	Web Thickness	Area	Weight	Moment of Inertia	Section Modulus	Total Surface Area	Nominal Coating Area*	Area	Weight	Moment of Inertia	Section Modulus
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. ² (cm ²)	lbs/ft (kg/m)	in. ⁴ (cm ⁴)	in. ³ (cm ³)	ft ² /ft (m ² /m)	ft ² /ft (m ² /m)	in. ² /ft (cm ² /m)	lbs/ft ² (kg/m ²)	in. ⁴ /ft (cm ⁴ /m)	in. ³ /ft (cm ³ /m)
PS 27.5	19.69	2.83	3.55	0.40	13.26	45.1	5.0	3.2	4.50	3.64	8.08	27.5	3.0	1.9
	500	72	90	10.2	85.5	67.1	207	52	1.37	1.11	171.0	134.2	414	103
PS 31	19.69	2.83	3.55	0.50	14.96	50.9	5.0	3.2	4.50	3.64	9.11	31.0	3.0	1.9
	500	72	90	12.7	96.5	75.7	207	52	1.37	1.11	192.9	151.4	414	103

*Both sides of sheet; excludes interior of interlock.

All listed dimensions are nominal. Due to rolling practices, variations in web thickness is common. Permitted variations for such dimensions are not addressed.



Grade	Minimum Interlock Strength ⁽¹⁾	Minimum Swing ⁽²⁾
A328	16 kips/in. (2,800 kN/m)	10 degrees
A572-50	20 kips/in. (3,500 kN/m)	10 degrees
A572-60	24 kips/in. (4,200 kN/m)	10 degrees

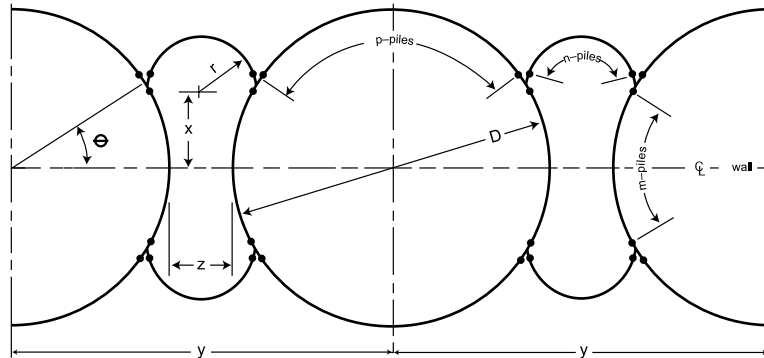
Higher interlock strengths are available; obtainable swing may be reduced in interlock strengths above 24 kips/in (4,200 kN/m).

- (1) These minimum ultimate interlock strengths assume proper interlocking of sheets. To verify the strength of PS Sheet Piling, consider both yielding of the web and failure of the interlock.
- (2) Swing reduces 1.5 degrees for each 10 feet (3 meters) in length over 70 feet (21 meters).

As a general rule, Gerdau advises against interlocking PS sections with other producers' section(s). Gerdau PS 27.5 and PS 31 can be interlocked together. PS and Z-Piling sections should not be interlocked together.



PS FLAT SHEET PILING 30° EXTRUDED WYE LAYOUT



Θ is measured to the center of the 30° connection

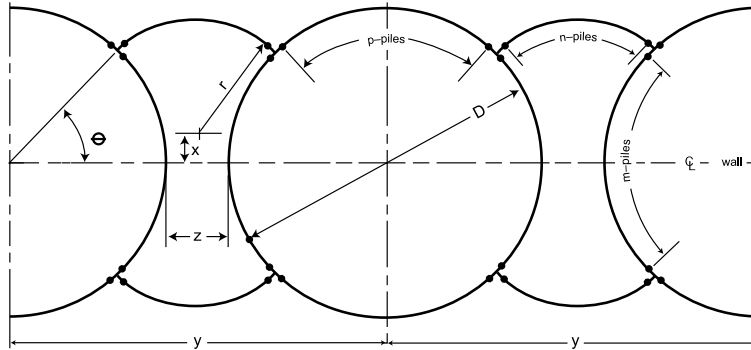
Number of Piles in Cell†	D ft (m)	z ft (m)	y ft (m)	r ft (m)	X ft (m)	Θ deg	Number of Piles			Area		Average Width ft (m)	Layout Number (see Website)
							m	n	p	Within Circle sg ft (sw m)	Between Circles sg ft (sg m)		
78	39.07	12.88	51.96	9.1	9.88	31.8	13	17	24	1199	549	33.6	2
	11.91	3.93	15.84	2.77	3.01					111.4	51.0	10.2	
84	42.21	12.47	54.61	9.1	10.66	31.6	14	17	26	1399	566	35.9	1
	12.87	3.80	16.65	2.77	3.25					130.0	52.6	10.9	
90	45.34	14.14	59.48	10.15	11.45	31.5	15	19	30	1615	692	38.8	2
	13.82	4.31	18.13	3.09	3.49					150.0	64.3	11.8	
96	48.48	13.72	62.19	10.15	12.23	31.4	16	19	30	1846	711	41.1	1
	14.78	4.18	18.96	3.09	3.73					171.5	66.1	12.5	
102	51.61	15.39	67	3.41	13.01	30.2	17	21	32	2092	853	44	2
	15.73	4.69	20.42	0	3.97					194.4	79.2	13.4	
108	54.74	14.97	69.71	11.2	13.8	31.3	18	21	34	2354	873	46.3	1
	16.68	4.56	21.25	3.41	4.21					218.7	81.1	14.1	
114	57.88	16.64	74.51	12.24	14.58	31.2	19	23	36	2631	1029	49.1	2
	17.64	5.07	22.71	3.73	4.44					244.4	95.6	15.0	
120	61.01	16.22	77.23	12.24	15.36	31.1	20	23	38	2923	1051	51.5	1
	18.60	4.94	23.54	3.73	4.68					271.6	97.6	15.7	
126	64.14	17.89	82.03	13.28	16.15	31.1	21	25	40	3232	1222	54.3	2
	19.55	5.45	25.00	4.05	4.92					300.3	113.5	16.6	
132	67.28	19.56	86.83	14.33	16.93	31	22	27	42	3555	1406	57.1	1
	20.51	5.96	26.47	4.37	5.16					330.3	130.6	17.4	
138	70.41	19.14	89.55	14.33	17.71	31	23	27	44	3894	1432	59.5	2
	21.46	5.83	27.29	4.37	5.40					361.8	133.0	18.1	
144	73.55	20.81	94.35	15.37	18.5	31	24	29	46	4248	1631	62.3	1
	22.42	6.34	28.76	4.68	5.64					394.7	151.5	19.0	
150	76.68	20.39	97.07	15.37	19.28	30.9	25	29	48	4618	1657	64.6	2
	23.37	6.21	29.59	4.68	5.88					429.0	153.9	19.7	
156	79.81	22.06	101.87	16.42	20.06	30.9	26	31	50	5003	1871	67.5	1
	24.33	6.72	31.05	5.00	6.11					464.8	173.8	20.6	

†Includes 4 extruded 30° Wye connectors

All dimensions given are nominal.

PS (FLAT SHEET) PILING

PS FLAT SHEET PILING 90° EXTRUDED TEE LAYOUT



Θ is measured to the center of the 90° connection

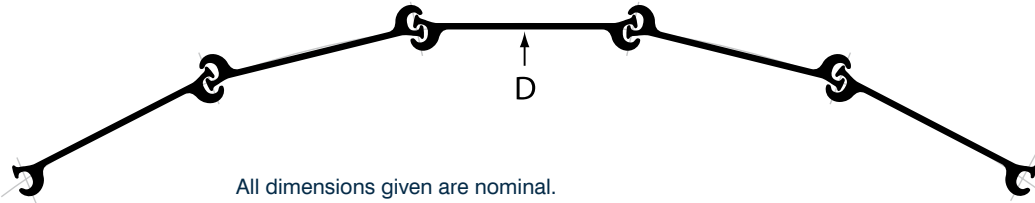
Number of Piles in Cell†	D ft (m)	z ft (m)	y ft (m)	r ft (m)	X ft (m)	Θ deg	Number of Piles			Area		Average Width ft (m)	Layout Number (see Website)
							m	n	p	Within Circle sg ft (sw m)	Between Circles sg ft (sg m)		
44	21.20	7.53	28.73	9.72	0.68	45.3	10	9	10	353	197	19.2	4
	6.46	2.30	8.76	2.96	0.21					32.8	18.3	5.9	
48	23.29	6.84	30.13	9.67	1.45	45.2	11	9	11	426	203	20.9	6
	7.10	2.08	9.18	2.95	0.44					39.6	18.9	6.4	
52	25.38	6.31	31.69	9.73	2.15	45.2	12	9	12	506	210	22.6	4
	7.74	1.92	9.66	2.97	0.66					47.0	19.5	6.9	
56	27.47	5.62	33.09	9.68	2.92	45.2	13	9	13	593	213	24.3	6
	8.37	1.71	10.09	2.95	0.89					55.1	19.8	7.4	
60	29.56	5.09	34.64	9.73	3.62	45.2	14	9	14	686	218	26.1	4
	9.01	1.55	10.56	2.97	1.10					63.7	20.3	8.0	
64	31.65	5.95	37.60	10.76	3.58	45	15	10	15	787	264	27.9	3
	9.65	1.81	11.46	3.28	1.09					73.1	24.5	8.5	
68	33.73	5.42	9.15	10.82	4.28	45	16	10	16	894	269	29.7	5
	10.28	1.65	11.93	3.30	1.30					83.1	25.0	9.1	
72	35.82	4.73	40.55	10.76	5.05	45.2	17	10	17	1008	269	31.5	3
	10.92	1.44	12.36	3.28	1.54					93.6	25.0	9.6	
76	37.91	5.59	43.51	11.83	5.09	45.1	18	11	18	1129	324	33.4	4
	11.55	1.70	13.26	3.61	1.55					104.9	30.1	10.2	
80	40.00	4.91	44.91	11.77	5.87	45.1	19	11	19	1257	323	35.2	6
	12.19	1.50	13.69	3.59	1.79					116.8	30.0	10.7	
84	42.09	5.92	8.02	12.91	5.76	45	20	12	20	1391	386	37.0	5
	12.83	1.80	14.64	3.93	1.76					129.2	35.9	11.3	
88	44.18	5.24	49.42	12.85	6.53	45	21	12	21	1533	384	38.8	3
	13.47	1.60	15.06	3.92	1.99					142.4	35.7	11.8	
92	46.27	6.10	49.42	13.92	6.57	45.1	22	13	22	1681	450	40.7	4
	14.10	1.86	15.06	4.24	2.00					156.2	41.8	12.4	
96	48.36	5.42	3.77	13.86	7.34	45.1	23	13	23	1837	448	42.5	6
	14.74	1.65	16.39	4.22	2.24					170.7	41.6	13.0	
100	50.45	4.88	55.33	13.92	8.04	45.1	24	13	24	1999	451	44.3	4
	15.38	1.49	16.86	4.24	2.45					185.7	41.9	13.5	
104	52.54	5.74	58.28	14.94	8.01	45	25	14	25	2168	445	46.1	3
	16.01	1.75	17.76	4.55	2.44					201.4	41.3	14.1	
108	54.63	6.61	61.24	16.01	8.05	45.1	26	15	26	2344	596	48.0	4
	16.65	2.01	18.67	4.88	2.45					217.8	55.4	14.6	
112	56.72	5.92	62.64	15.95	8.82	45.1	27	15	27	2526	592	49.8	6
	17.29	1.80	19.09	4.86	2.69					234.7	55.0	15.2	
116	58.80	5.39	64.19	15.95	9.52	45.1	28	15	28	2716	595	51.6	4
	17.92	1.64	19.57	4.86	2.90					252.3	55.3	15.7	
120	60.89	6.25	67.14	17.03	9.49	45	29	16	29	2912	674	53.4	3
	18.56	1.91	20.46	5.19	2.89					270.5	62.6	16.3	
124	62.98	5.71	68.7	17.08	10.19	45	30	16	30	3116	677	55.2	5
	19.20	1.74	20.94	5.21	3.11					289.5	62.9	16.8	
128	65.07	5.03	70.1	17.03	10.96	45	31	16	31	3326	670	57.0	3
	19.83	1.53	21.37	5.19	3.34					309.0	62.2	17.4	

†Includes 4 extruded 90° Tee connectors

All dimensions given are nominal.

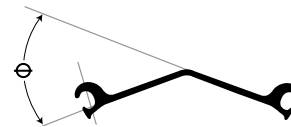
PS (FLAT SHEET) PILING

DIAMETERS AND AREAS OF CIRCULAR CELLS USING PS 27.5 AND PS 31



All dimensions given are nominal.

Number of Pieces	PS 27.5 & PS 31		Requires Swing degrees	Theoretical Bend degrees \ominus	Suggested Bend degrees \ominus
	D ft	Area ft ²			
12	21.20	7.53	28.73	9.72	0.68
14	7.31	42	25.7	15.7	25.0
16	8.36	55	22.5	12.5	20.0
18	9.40	69	20.0	10.0	15.0
20	10.45	86	18.0	8.0	15.0
22	11.49	104	16.4	6.4	15.0
24	12.53	123	15.0	5.0	10.0
26	13.58	145	13.8	3.6	10.0
28	14.62	168	12.9	2.9	10.0
30	15.67	193	12.0	2.0	10.0
32	16.71	219	11.3	1.3	10.0
34	17.76	248	10.6	0.6	10.0
36	18.80	278	10.0		
38	19.85	309	9.5		
40	20.89	343	9.0		
42	21.94	378	8.6		
44	22.98	415	8.2		
46	24.03	453	7.8		
48	25.07	494	7.5		
50	26.11	536	7.2		
52	27.16	579	6.9		
54	28.20	625	6.7		
56	29.25	672	6.4		
58	30.29	721	6.2		
60	31.34	771	6.0		
62	32.38	824	5.8		
64	33.43	878	5.6		
66	34.47	933	5.5		
68	35.52	999	5.3		
70	36.56	1050	5.1		
72	37.61	1111	5.0		
74	38.65	1173	4.9		
76	39.69	1238	4.7		
78	40.74	1304	4.6		
80	41.78	1371	4.5		
82	42.38	1441	4.4		
84	43.87	1512	4.3		
86	44.92	1585	4.2		
88	45.96	1659	4.1		
90	47.01	1736	4.0		
92	48.05	1813	3.9		
94	49.10	1893	3.8		
96	50.14	1975	3.8		
98	51.18	2057	3.7		
100	52.23	2143	3.6		



Small cells constructed with bent web piles must have half of the piles bent with the fingers inside and half with the fingers outside.

PS 27.5 and PS 31 when properly swing up to 10 degrees (in either direction) for lengths up to 70 feet (21 meters). The ability to obtain a full 10 degrees swing decreases with length because of the difficulty in handling the longer pieces. For lengths over 70 feet (21 meters), it is necessary to anticipate a reduction in obtainable swing of 1.5 degrees for each 10 feet (3 meters) increase in length.

SETTING AND DRIVING TIPS FOR PS FLAT SHEETS:

Although setting and driving techniques vary with the individual contractor and site conditions, several basic principles can generally be applied. It should be realized that the lack of good setting and driving practice can result in job delays and an unsatisfactory structure. The following suggestions are offered to help avoid problems at the site:

Handling of PS sections: These sections have very little modulus (beam strength) and are, therefore, very susceptible to handling damage. It is important that great care be taken when transporting or lifting these sections. When sheets exceed 70 feet (21 meters) in length, they should be lifted at two or more points.

Have an adequate steel template: Longer sheeting lengths will require a two or three tier template with tiers spaced 15 feet (4.5 meters) or more apart. For example, a contractor should consider at least a two-tier template when installing 70 foot (21 meters) or longer sheets as this will facilitate setting and driving and result in a superior product. As with Z-Piling, it is important that each sheet be plumbed and secured when set.

The diameter of the template is predicated on the contractor's experience and method of setting circular cells. It is important that the template diameter be less than the theoretical inside clear cell diameter to easily close the cell. Wood blocking may be utilized to adjust the template to ensure the proper setting width. Upon filling, the finished cell will expand to meet or exceed published values. When a cell with long lengths is being constructed, it may be advisable to stiffen the starter sheet by reinforcing it full length with a structural shape.

Site conditions such as swift water or hard driving may require more sheets to be reinforced.

Splicing: When it is necessary to splice PS sections, the splice point on adjacent sheets should be staggered by several feet.

Mark the driving template for each pile or pair of piles: This allows for wall adjustments to be made during the setting phase, ensuring that the sheets are located properly for cell closure.

Ensure that the sheets are properly interlocked when set: Improper interlocks become the "weak links" and result in job delays and/or failures. A closed cell must have an even number of sections (including connectors) to avoid an improper interlock. Set all sheets in the cell before driving any of the sheets, other than nominal pinning of the starter sheet(s).

"Shake out" several sheets at any closure point: Following good practice as noted above should ideally result in the last sheet sliding smoothly down into the remaining gap. Although the first sheet is set plumb and the next to last sheet is plumb, the chances that the remaining gap is uniform (19.69 inches or 500 mm) the full length is improbable. Picking up and dropping, or "shaking out," several sheets near the closure point until the sheets run smoothly will minimize the chance of driving sheets out of interlock.

Drive piles in pairs: Once sheet piles are threaded and set, it is more economical to drive two at a time. Some experts suggest that the energy needed to drive a pair may be only 50% more than that required to drive a single pile.

Drive piles in stages and work around the entire cell by alternating sheets (pairs): This allows the piles to be guided by those previously driven and lessens the chance of driving sheets out of interlock. The distance a pile, or pair of piles, should be driven at any one time will be governed by the driving conditions. In the first pass around the cell, every other pair is driven perhaps 4 feet (1.2 meters). In the second pass around the cell, the un-driven pairs are driven 8 feet (2.4 meters), 4 feet (1.2 meters) restrained by the adjacent pairs and then 4 feet (1.2 meters) into virgin soil. This procedure is continued until the cell is driven to design tip elevation. A good practice to keep the cell plumb is to reverse the direction of driving for each pass around the cell.