



RETAINING WALL

DESCRIPTION

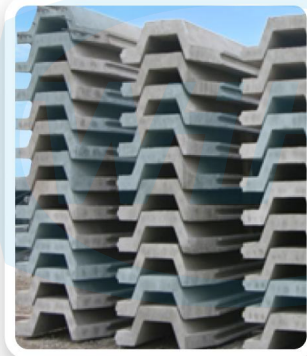
Retaining Wall Concrete products come in various types, such as Flat and Corrugated Sheet Piles, PC Walls, and Gravity Walls. These retaining wall concrete products are used as permanent retaining wall structures, such as quay walls, revetments, jetties, breakwaters, reclamation walls, levees, water control gates, building basements, bridge abutments, and more.

Initially, PC sheet piles were produced only in a flat (rectangular) shape. The product then evolved with a corrugated cross-section. The corrugated cross-section has better properties, resulting in longer products that can be used for retaining wall structures with higher freestanding capabilities.

PC Wall products are produced using the spinning method to create hollow square sections due to centrifugal force. These sections have high moment resistance, making them a substitute for conventional diaphragm wall structures. The product features grooves that are filled with grout to seal the joints between PC Walls, preventing water leakage.

Another product, the Gravity Wall, was developed as an alternative retaining wall structure that can be quickly assembled without using special tools. Gravity wall modules are arranged to utilize their own weight to withstand soil pressure. The preference for using concrete sheet piles is due to the convenience and low cost in construction/installation work.

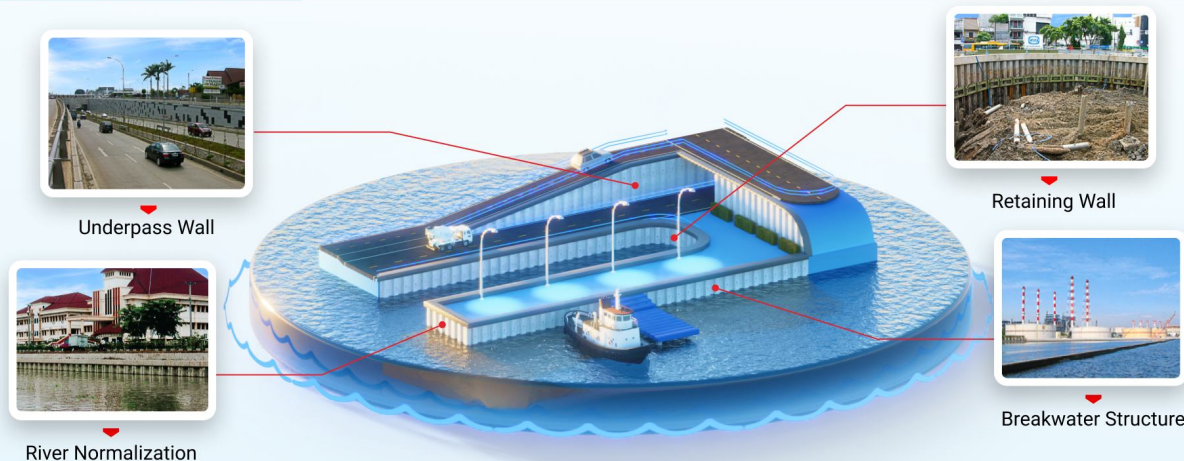
Types of Retaining Wall

<ul style="list-style-type: none"> ● Corrugated Sheet Piles 	<ul style="list-style-type: none"> ● Flat Sheet Piles <ul style="list-style-type: none"> • Prestressed Flat Sheet Piles • Reinforced Flat Sheet Piles 	<ul style="list-style-type: none"> ● PC Wall 	<ul style="list-style-type: none"> ● Gravity Wall 
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DESIGN REFERENCE

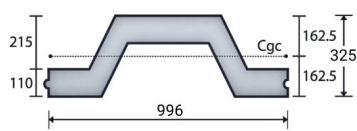
Design	SNI 6880	Structural Concrete Specification
	ACI 543R	Design, Manufactured and Installation
	JIS A 5325 - 1981	Prestressed Concrete Sheet Piles
	SNI 2847	Reinforced Concrete Sheet Piles
	SNI 2847	Indonesian Standard Code for Concrete
	SNI 9175	Specification for prestressed Concrete Corrugated Sheet Pile

PRODUCT APPLICATION

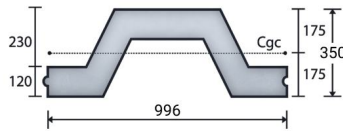


PRODUCT SHAPE

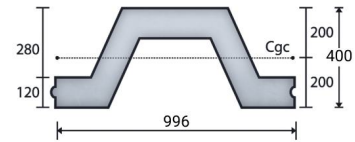
► Corrugated Prestressed Concrete Sheet Piles



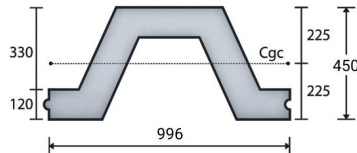
W-325



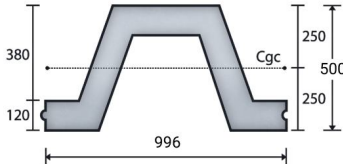
W-350



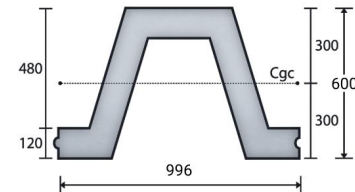
W-400



W-450



W-500



W-600

SPECIFICATION

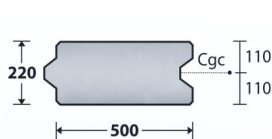
Concrete Compressive Strength $f_c' = 62,5$ MPa

Type	Thickness (mm)	Width (mm)	Cross Section (cm ²)	Section Inertia (cm ⁴)	Unit Weight (kg/m)	Class	Moment (kN.m)		Length (m)
							Crack	Break	
W-325	110	996	1.315	134.264	329	A	120	240	8 - 15
						B	130	260	8 - 16
W-350	120	996	1.468	169.432	368	A	160	320	9 - 17
						B	170	340	10 - 18
W-400	120	996	1.598	248.691	400	A	200	400	10 - 18
						B	230	460	11 - 20
W-450	120	996	1.825	353.363	459	A	270	540	11 - 20
						B	310	620	12 - 21
W-500	120	996	1.818	462.373	455	A	350	700	12 - 22
						B	400	800	13 - 24
W-600	120	996	2.078	765.907	520	A	500	1000	14 - 25
						B	590	1.180	15 - 27

Note : Length of Concrete Corrugated Sheet Piles may exceed usual standard whenever lifted in certain position

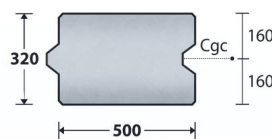
PRODUCT SHAPE

► Flat Concrete Sheet Piles



FPC/FRC-220

Area : 1.085 cm²
Inertia : 43.802 cm⁴



FPC/FRC-320

Area : 1.585 cm²
Inertia : 135.455 cm⁴

SPECIFICATION

Concrete Compressive Strength $f_c' = 42$ MPa

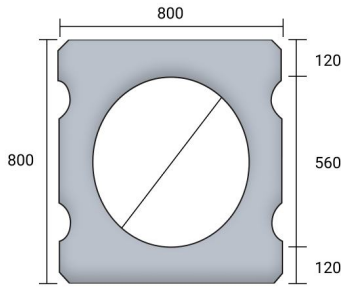
Type	Class	Moment (kN.m/0,5 m)		Length* (m)
		Crack	Break	
FPC-220	6S-A	33	54	4 - 9
	8S-A	38	67	4 - 10
	10S-A	42	78	4 - 10
	6S-B	44	82	4 - 11
	8S-B	51	96	4 - 11
	6S-C	53	99	4 - 12
	10S-B	58	106	4 - 12
	8S-C	62	113	4 - 13
FPC-320	6S-A	61	84	4 - 10
	8S-A	68	107	4 - 11
	10S-A	76	129	4 - 12
	6S-B	78	137	4 - 12
	12S-A	82	149	4 - 12
	14S-A	89	167	4 - 12
	8S-B	90	171	4 - 13
	6S-C	93	179	4 - 13
	16S-A	95	184	4 - 13
	10S-B	102	200	4 - 13
	8S-C	109	216	4 - 14
	12S-B	113	223	4 - 14
	14S-B	123	242	4 - 15
	10S-C	124	244	4 - 15
	16S-B	133	257	4 - 15

Type	Class	f_c'	Moment (kN.m/0,5 m)		Length* (m)
			Crack	Break	
FRC-220	A	28	31	39	4 - 7
	B	42	46	58	4 - 7
FRC-320	A	28	49	61	4 - 8
	B	42	73	91	4 - 9

Note :
A = PC Strand \varnothing 9,53 mm
B = PC Strand \varnothing 12,7 mm
C = PC Strand \varnothing 15,2 mm

PRODUCT SHAPE & SPECIFICATION

▶ PC Wall



PC Wall 800 x 800

Scale 1 ; 75

Concrete Compressive Strength $f_c' = 50 \text{ MPa}$

Type	Dimension (mm)	Cross Section (cm^2)	Section Inertia (cm^4)	Unit Weight (kg/m)	Class	Moment (kN.m)		Allowable Compression (ton)	Length (m)
						Crack	Ultimate		
PCW 800 Void $\varnothing 560$	800 x 800	3768	2834701	942	A	686	883	580	6 - 22
					B	834	1275	550	6 - 24
					C	981	1618	530	6 - 24
					D	1079	1961	515	6 - 24

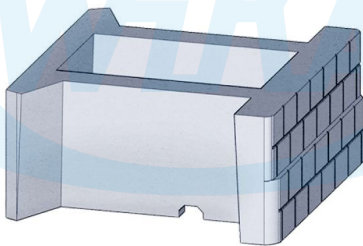
Note : Length of PC Wall may exceed usual standard whenever lifted in certain position

PRODUCT APPLICATION

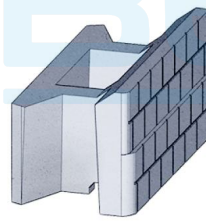


PRODUCT SHAPE

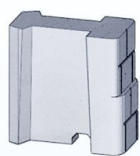
▶ Gravity Wall



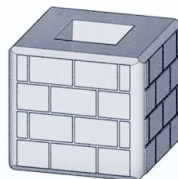
GW120.110, GW240.110,
GW240.160, GW240.220



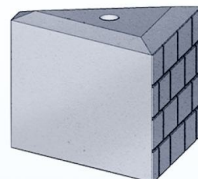
GWT120.110,
GWT240.110



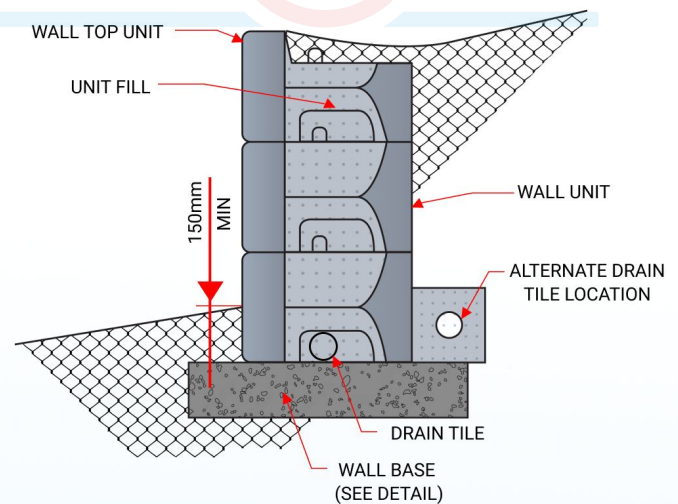
GW 60.110



GW 90°



GW 45°



SPECIFICATION

Concrete Compressive Strength $f_c' = 62,5 \text{ MPa}$

No	Modul Type	Dimension L x W x H (m)	Modul Weight (ton)
1	GW-45°	1,2 x 1,2 x 1,0	1.95
2	GW-90°	1,2 x 1,2 x 1,0	2.60
3	GW60.110	1,1 x 0,6 x 1,0	0.98
4	GW120.110	1,2 x 1,1 x 1,0	1.77
5	GW240.110	2,4 x 1,1 x 1,0	3.45
6	GW240.160	2,4 x 1,6 x 1,0	3.94
7	GW240.220	2,4 x 2,2 x 1,0	4.53
8	GWT120.110	1,2 x 1,1 x 1,0	1.53
9	GWT240.110	2,4 x 1,1 x 1,0	3.01

PRODUCT APPLICATION

