

## DURA<sup>®</sup> WP70/20 Wall Panel

### Description

**DURA<sup>®</sup> WP70/20** Wall Panel is a thin wall panel manufactured using ultra-high performance ductile concrete (UHPdC). Each panel has a total height of 7 m and a total width of 2 m. The wall panel has multiple purposes such as it can be used in conjunction with **Dura<sup>®</sup> PFS Portal Frame System**, serve as thin wall panel against wind/rain/sunshine/dust/spy. Besides, the wall panel can be customized to serve as acoustic panel against noise; security panel against thief; protective panel against blast and impact loading; impermeable membrane against highly corrosive compound and fire.

### Features

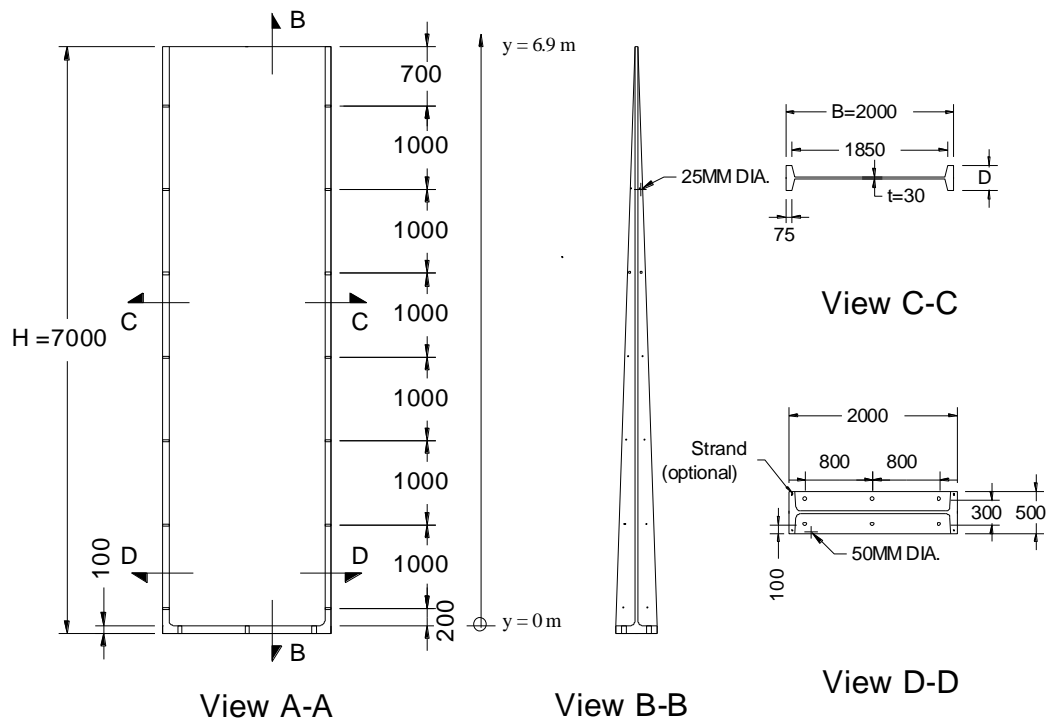
- **DURA<sup>®</sup> WP70/20** consists of thin wall panel of 30 mm in thickness, two ribbed beams as wide as 75 mm and a base pad of 100 mm in thickness.
- The UHPdC used for the **DURA<sup>®</sup> WP70/20** has compressive strength ranged between 130 to 150 MPa, and flexural strength of 20 MPa.
- **DURA<sup>®</sup> WP70/20** eliminates the use of conventional steel reinforcing bars and stirrups. All steel fibers used are made from high carbon steel wires with tensile strength of 2300 MPa.
- Special lifting anchors are provided to improve the safety margin during handling and installation.

### Advantages of DURA<sup>®</sup> WP70/20

- **DURA<sup>®</sup> WP70/20** is highly durable and impermeable. It is therefore suitable for use in extremely aggressive environments such as marine environments or chemically active plants.
- **DURA<sup>®</sup> WP70/20** is easy to install. Simple conventional drop-in anchors or pre-positioned bolts & nuts are used to connect the wall panel to the floors (except some grout may be needed for uneven floor base).
- No scaffolding, props or formwork are required over the entire installation, thus reducing construction site activities, improving safety margins and eliminating in-situ casting work.
- **DURA<sup>®</sup> WP70/20** is many times lighter than conventional R.C. wall system.
- **DURA<sup>®</sup> WP70/20** is guaranteed to be geometrically stable as they are steam-cured to minimized creep and long-term shrinkage.
- **DURA<sup>®</sup> WP70/20** is not only weather-proof, but can be also customized to fire-proof.
- **DURA<sup>®</sup> WP70/20** is aesthetically pleasing as its finish surface is smooth and colors of the wall are subjected to request.
- **DURA<sup>®</sup> WP70/20** is a durable structure that supports the "GREEN" visionary of sustainable development.



**DURA<sup>®</sup> WP70/20**



**Table 1: Technical Data for DURA<sup>®</sup> WP70/20.**

	Symbol	Unit	DURA <sup>®</sup> WP70/20
<b>Total Height of Wall</b>	H	m	7.0
<b>Total Width of Wall</b>	B	m	2.0
<b>Panel Thickness</b>	t	mm	30
<b>Self Weight of Wall</b>	W	kg / pc	2400
<b>Ribs Depth</b>	D	mm	135 ~ 500 [500 – 52.8986 y]
<b>Section Area</b> ↑	A <sub>g</sub>	x 10 <sup>3</sup> mm <sup>2</sup>	Min. 7.75; Max. 130.5 [0.15 D + 55.5]
<b>Neutral Axis</b> ↑	y <sub>top</sub>	mm	Min. 67.5; Max. 250 [0.5 D]
	y <sub>bot</sub>	mm	
<b>2<sup>nd</sup> Moment of Inertia</b> ↑	I <sub>xx</sub>	mm <sup>4</sup>	Min. 0.0349e9; Max. 1.5667e9 [4162500 + 12.5 D <sup>3</sup> ]
<b>Section Modulus</b> ↑	Z <sub>top</sub>	mm <sup>3</sup>	Min. 0.7331e6; Max. 6.5275e6 [277500 + 25 D <sup>2</sup> ]
	Z <sub>bot</sub>	mm <sup>3</sup>	
<b>Design Gust Wind Speed</b> *	V <sub>s</sub>	m/s (km/hr)	31 (112)
	V <sub>u</sub>	m/s (km/hr)	40 (144)
<b>Design Wind Pressures</b> *	p <sub>s</sub>	kPa	0.46 (SLS)
	p <sub>u</sub>	kPa	0.77 (ULS)
<b>Natural Frequency, 1<sup>st</sup></b>	f <sub>0,1</sub>	Hz	3.9

y is the distance along the ribbed beams (in meters) ↑ Analytical expression in term of D (in mm)

\* AS 1170.2 (1989) – Wind loads

## Construction Sequence



(a) Preparation of Drop-in Anchors on Floor.



(b) Lifting of Wall WP70/20.



(c) Over-turning of Wall.



(d) Lifting and Mounting of Wall.

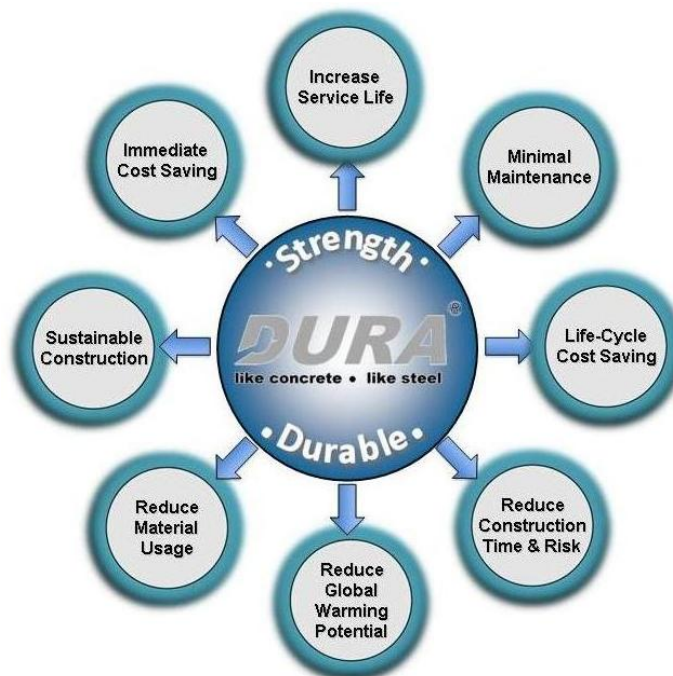
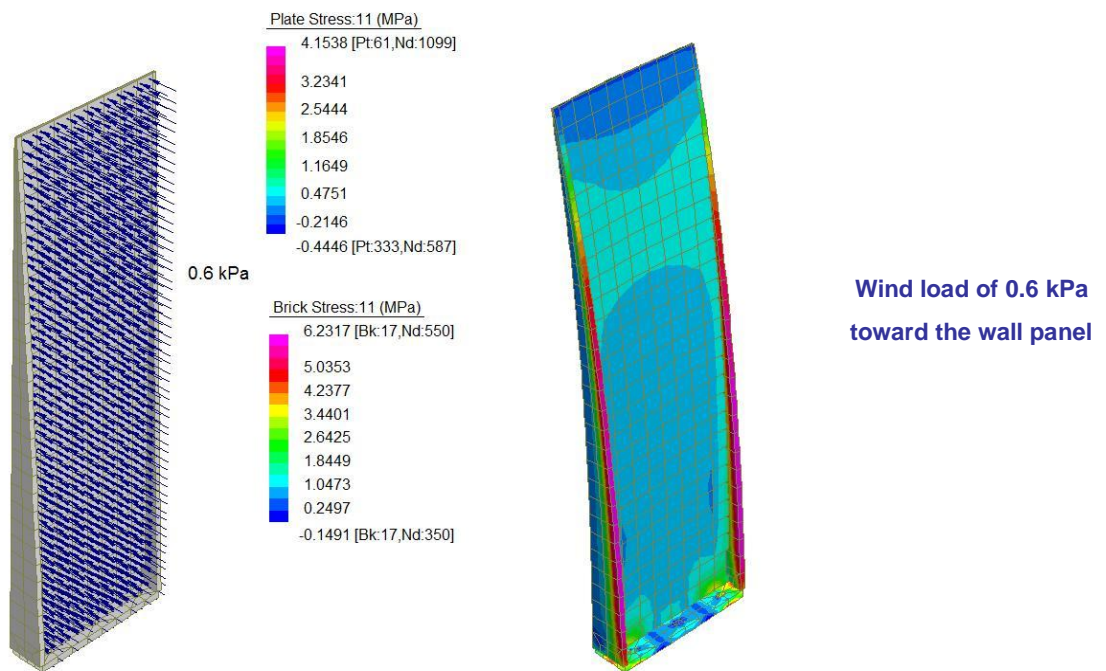


(e) Positioning and Tightening to Adjacent Wall.



(f) Completed Wall.

## Non-Linear Finite Element Modeling



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