



Maximum Wall Height for Push Walls For Waste Transfer Stations & Recycling Storage Bunkers



Design

The table below shows the maximum wall height for each precast panel type for a variety of waste & recycled products. The density of the stored material/product, the internal angle of shear resistance of the material and the anticipated storage level will determine the type of panel that is most suitable for the application. Panels are designed to Class 2 BS8110.

BLOCK TYPE	DENSITY	ANGLE	PROFILE	WALL PANEL THICKNESS		
				145mm <i>Code: VD145</i>	180mm <i>Code: VD180</i>	280mm <i>Code: VD280</i>
General Waste	1000 kg/m ³	30°	Level Fill	3.8m	4.2m	5.6m
			Surcharged	2.9m	3.2m	4.2m
Top Soil	1340 kg/m ³	35°	Level Fill	3.7m	4.1m	5.4m
			Surcharged	2.7m	3.0m	4.0m
Broken Brick	1570 kg/m ³	35°	Level Fill	3.5m	3.9m	5.1m
			Surcharged	2.6m	2.9m	3.8m
Compacted Paper	420 kg/m ³	30°	Level Fill	5.1m	5.7m	7.4m
			Surcharged	3.8m	4.3m	5.7m
Organic Waste	500 kg/m ³	25°	Level Fill	4.5m	5.0m	6.6m
			Surcharged	3.5m	3.9m	5.2m
Broken Tarmac	2260 kg/m ³	30°	Level Fill	2.9m	3.2m	4.2m
			Surcharged	2.2m	2.4m	3.2m



Maximum Wall Height for Bunkers and Retaining Walls

BLOCK TYPE	DENSITY	ANGLE	PROFILE	WALL PANEL THICKNESS		
				145mm <i>Code: VD145</i>	180mm <i>Code: VD180</i>	280mm <i>Code: VD280</i>
Grain	780 kg/m ³	28°	Level Fill	4.0m	4.5m	5.9m
			Surcharged	3.1m	3.5m	4.6m
Soya Beans	750 kg/m ³	30°	Level Fill	4.2m	4.7m	6.1m
			Surcharged	3.2m	3.5m	4.7m
Rice	770 kg/m ³	30°	Level Fill	4.1m	4.6m	6.1m
			Surcharged	3.1m	3.5m	4.6m
Fertilizer	1000 kg/m ³	30°	Level Fill	3.8m	4.2m	5.6m
			Surcharged	2.9m	3.2m	4.2m
Wood Chip	300 kg/m ³	30°	Level Fill	6.0m	6.0m	8.0m +
			Surcharged	4.9m	5.5m	7.3m
Road Salt	1300 kg/m ³	30°	Level Fill	3.5m	3.9m	5.1m
			Surcharged	2.6m	2.9m	3.9m
Aggregate	1900 kg/m ³	30°	Level Fill	3.0m	3.4m	4.5m
			Surcharged	2.3m	2.6m	3.4m
Coal	910 kg/m ³	30°	Level Fill	3.9m	4.4m	5.7m
			Surcharged	3.0m	3.3m	4.4m



Design

The table below gives the maximum retaining wall height by panel type and/or thickness for a variety of stored products based on the density of the material, the internal angle of shear resistance of the material and the anticipated storage profile. Values for bulk density & angle of repose are taken from standard figures. Panels are designed to Class 2 BS8110.



Maximum Wall Height for Earth Retaining Walls

BLOCK TYPE	DENSITY	ANGLE	PROFILE	WALL PANEL THICKNESS		
				145mm <i>Code: VD145</i>	180mm <i>Code: VD180</i>	280mm <i>Code: VD280</i>
Earth	1800 kg/m ³	30°	Level Fill	3.1m	3.6m	4.7m
			Surcharged	2.4m	2.7m	3.6m
Top Soil	1340 kg/m ³	35°	Level Fill	3.7m	4.1m	5.4m
			Surcharged	2.7m	3.0m	4.0m
Sand / Crushed rock	1900 kg/m ³	30°	Level Fill	3.0m	3.4m	4.5m
			Surcharged	2.3m	2.6m	3.4m
Earth + 10kN surcharge load	1800 kg/m ³	30°	Level Fill	2.9m	3.2m	4.4m



Design

The table below gives the maximum retaining wall height by panel type and/or thickness for a variety of stored products based on the density of the material, the internal angle of shear resistance of the material and the anticipated storage profile. Panels are designed to Class 2 BS8110.



Agricultural Storage Walls

Maximum Wall Height for Grain, Sugar Beet, Potato And Onions Agricultural Storage Walls

BLOCK TYPE	DENSITY	ANGLE	PROFILE	WALL PANEL THICKNESS		
				145mm <i>Code: VD145</i>	180mm <i>Code: VD180</i>	280mm <i>Code: VD280</i>
Grain	780 kg/m ³	28°	Level Fill	4.7m	5.2m	6.1m
			Surcharged	3.6m	4.0m	5.3m
Grain & Stirrers	780 kg/m ³	30°	Level Fill	3.5m	3.8m	5.0m
Sugar Beet	900 kg/m ³	35°	Surcharged	3.6m	4.0m	5.3m
Potatoes/Onions	700 kg/m ³	35°	Level Fill	3.9m	4.3m	5.7m



Design

Assuming Grain Loads as described in BS5502 part 22

Panels are designed to Class 2 BS8110.

All panels are double loading, this means that product can be stored on both sides or one side only (either side).



Agricultural Storage Walls Maximum Wall Height for Silage Clamps

		WALL PANEL THICKNESS			
		145mm	180mm	280mm	
MATERIAL	WEIGHT	Code: VD145	Code: VD180	Code: VD280	Code: VDX280
Silage	8T Tractor	3.0m	3.8m	4.4m	5.2m
Silage	10T Tractor	2.8m	3.6m	4.2m	5.0m



Design

Maximum Silage Storage Height for Vertical Cantilever Panels with Standard reinforcing details.

Silage loading to BS5502 part 22
Panels are designed to Class 2 BS8110.

- Settled height no higher than top of wall
- Maximum moisture content 80%
- Effluent drain at base of wall
- No impact between compacting vehicle and wall



Agricultural Storage Walls Maximum Wall Height for Slurry and Manure Storage

MATERIAL	STORAGE LEVEL	WALL PANEL THICKNESS			
		145mm Code: VD145	180mm Code: VD180	280mm Code: VD280 Code: VDX280	
Slurry including 300mm Freeboard		3.0m*	3.4m*	4.0m*	4.5m*
Farmyard Manure (FYM)	Level Fill	2.7m	3.0m	4.0m	4.5m
Earth Backfill	Level Fill	3.1m	3.6m	4.7m	5.3m
Earth Backfill	Slope Up	2.4m	2.7m	3.6m	4.0m

* Storage height of slurry 300mm lower.



Design

These values based on the following FYM - Level Fill, bulk density of 1100kg/m³.

* Storage height of slurry 300mm lower.

Please Note:

The bulk density of FYM varies considerably – please consult ACP office for more information.