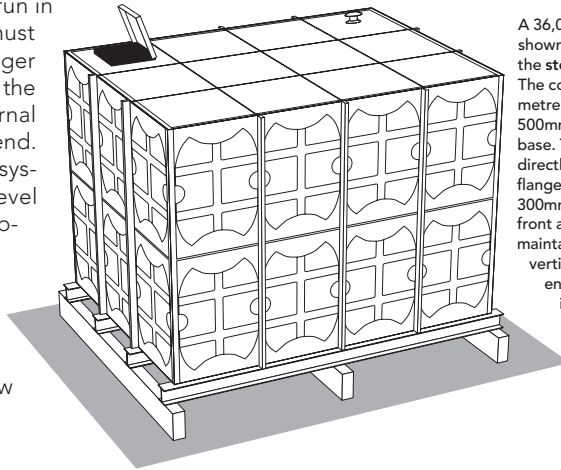


EFB EXTERNALLY FLANGED BASE (EFB) SECTIONAL TANK ACCESS AND SUPPORT REQUIREMENTS

OVERVIEW

Brimar GRP Externally Flanged Base (EFB) Sectional Tanks are designed to be installed in situations where there is sufficient access to the base and sides of the installation to allow interconnection of the panels from outside the tank. A clearance space of a minimum of 500mm is required on all sides and the base support system must be constructed to allow the installer an access space of 500mm to the flanges of the base panels from below. Consequently the tank cannot be sited on a solid slab but instead must be raised on piers (or a combination of piers and RSJs) which directly support the flanges which join the tank panels together.

The supports require to run in one direction only and must be at least 300mm longer than the overall length of the tank to support the external vertical flanges on each end. The final base support system must be flat and level and strong enough to support the weight of the tank when full. The manway requires a desired minimum clearance of 750mm from the top of the tank to allow reasonable access.



A 36,000 litre EFB tank shown mounted using the **steel support system**. The concrete piers, at 2 metre centres, give 500mm access to the base. The four RSJs are directly beneath the flange joints and are 300mm longer (150mm front and rear) to maintain support to the vertical flanges at each end of the tank. This is one of the recommended methods of tank support structure suitable for EFB tanks.

METHODS OF SUPPORT

The most commonly recommended methods of support for Brimar EFB tanks are **steel support** and **pier support**, the design and construction being the responsibility of the contractor. Both methods are equally suitable as long as they are constructed to within the required tolerances (see BASE SUPPORT TOLERANCES below), however the **steel support** method may be less demanding for site engineering staff to build.

When constructing a **pier support** system, the concrete or blockwork piers must be built to a high degree of accuracy. The individual piers must be flat and level. They must also be level with one another in all directions and must be precisely spaced to ensure support of the tank's flanges. The piers must be tapered to 100mm at the top to allow access to the flanges.

EFB EXTERNALLY FLANGED BASE (EFB) SECTIONAL TANK ACCESS AND SUPPORT REQUIREMENTS

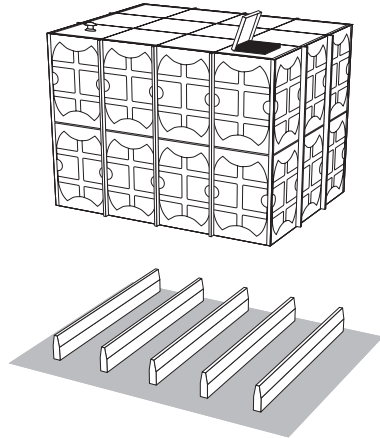
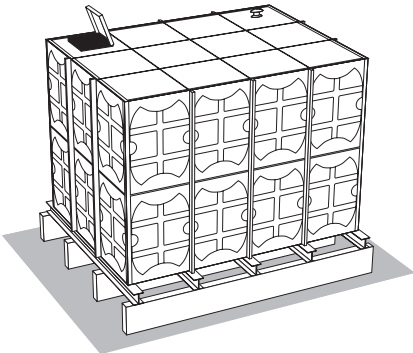
METHODS OF SUPPORT continued

Steel support systems also use concrete or blockwork piers to give the necessary 500mm clearance space to the tank base. The major difference is that steel RSJs are loosely placed on top of and at right angles to the piers. It is these RSJs which directly support the tank. The advantage is that the piers do not need to be built to such strict accuracy. Any minor inaccuracies in level can be overcome by the insertion of shims between the piers and the RSJs. In addition, the steels can be quickly and accurately spaced to support precisely the base flanges.

The disadvantage of this method is that it may marginally increase the overall height of the completed structure. If this does not present a problem then it is the **steel support** method that Brimar recommends.

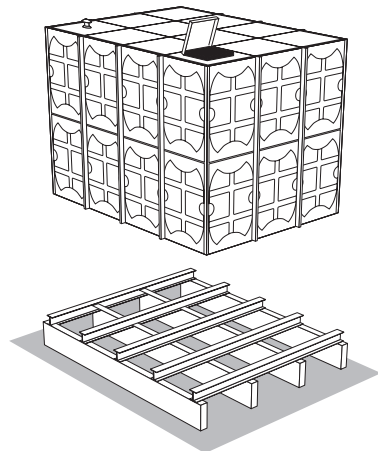
Note:

Before constructing a **steel support** system please consult the guidance information in **"GUIDELINES FOR SIZING STEEL BEARERS"** later in this section.



Above: pier support system showing tops tapering from 200mm (minimum) at the base to 100mm at the tops. The taper is required to allow access to the flanges.

Below Left & Right: steel support system. Note that RSJs are 300mm longer than the tank dimension to provide support for side flanges.



EFB EXTERNALLY FLANGED BASE (EFB) SECTIONAL TANK ACCESS AND SUPPORT REQUIREMENTS

BASE SUPPORT TOLERANCES AND DIMENSIONS (METRIC TANKS)

The base structures for EFB tanks must be flat and level to the following tolerances:

- 2mm in any metre.
- 6mm in any 6 metres.
- Maximum beam deflection - 1:500.

Supports are required in one direction only.

Pier or RSJ supports to be spaced at 1000mm centres and should be provided to support both end flanges as well as intermediate flanges (e.g. a 3 metre tank requires four piers or RSJs).

Pier supports used in conjunction with the **steel support** system may be positioned at greater than 1 metre centres i.e. 1.5 metres, 2 metres, 3 metres or 4 metres provided that the RSJ supports are positioned to support each panel joint line directly (in one direction only) and that the beam deflection on any given span is limited to a maximum of 1:500.

The supports must be a minimum of 300mm longer than the nominal dimension of the tank.

BASE SUPPORT TOLERANCES AND DIMENSIONS (IMPERIAL TANKS)

The base structures for EFB tanks must be flat and level to the following tolerances:

- 2mm in any metre.
- 6mm in any 6 metres.
- Maximum beam deflection - 1:500.

Supports are required in one direction only.

Pier or RSJ supports to be spaced at 1220mm centres for tanks up to 1830mm high and 610mm centres for tanks of 2440mm high and

above. Supports should be provided for both end flanges as well as intermediate flanges (e.g. a 3660mm x 1830mm tank requires four piers or RSJs).

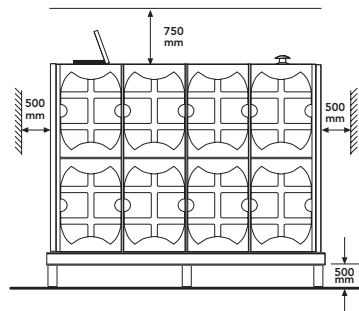
Pier supports used in conjunction with the **steel support** system may be positioned at greater than 1220mm centres i.e. 1830mm, 2440mm or 3660mm provided that the RSJ supports are positioned to support each panel joint line directly (in one direction only) and that the beam deflection on any given span is limited to a maximum of 1:500.

The supports must be a minimum of 300mm longer than the nominal dimension of the tank.

CLEARANCE/ACCESS REQUIREMENTS

All EFB tanks require a minimum of 500mm clearance around all sides and to the base of the tank. (Where a steel support system is being used, the depth of the RSJs does not constitute part of the base clearance).

A clearance space of 750mm is desired for the manway at the top of the tank to obtain reasonable access. However with the adoption of a special "lift off" manway design, this clearance space can be reduced to 500mm.

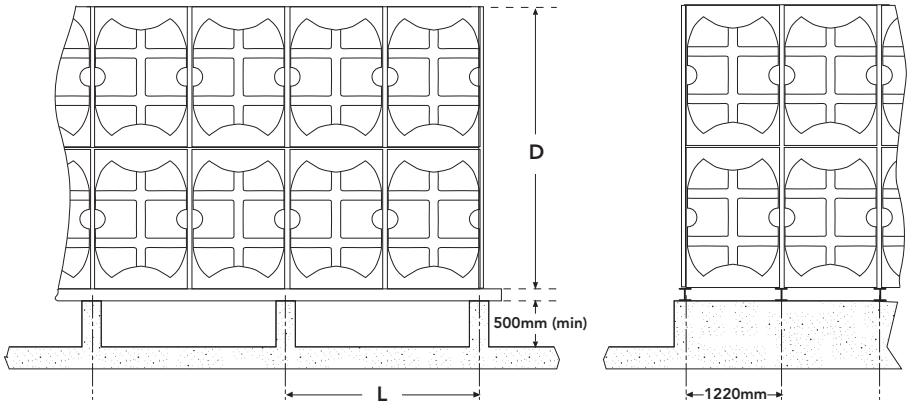



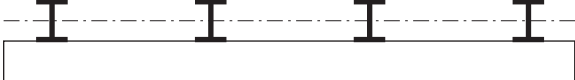
EFB

IMPERIAL

DETERMINATION OF APPROPRIATE BEAM SECTIONS FOR VARIOUS WATER DEPTHS AT VARIOUS SUPPORT CENTRES FOR EFB TANKS

SUGGESTED STEEL BEAM SUPPORTS FOR TANKS SUPPORTED AT 1 METRE CENTRES (ONE DIRECTION ONLY) AT VARIOUS SPANNING DISTANCES FOR TANKS OF VARIOUS DEPTHS.



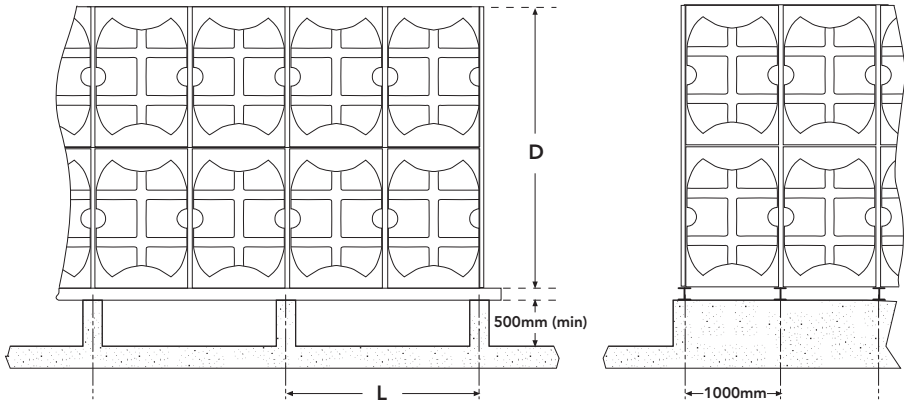
TANK DEPTH 'D'	SPANNING DISTANCE 'L'				
	1.22 metres	1.83 metres	2.44 metres	3.05 metres	3.66 metres
1.22 metres	102 x 51 x 10.42	127 x 76 x 13	178 x 102 x 19	254 x 102 x 22	305 x 102 x 26
1.83 metres	102 x 51 x 10.42	152 x 89 x 18	203 x 102 x 23	254 x 102 x 22	305 x 102 x 28
2.44 metres	127 x 64 x 14.90	178 x 102 x 19	254 x 102 x 22	305 x 102 x 26	356 x 127 x 33
3.05 metres	127 x 64 x 14.90	178 x 102 x 19	254 x 102 x 22	305 x 102 x 28	356 x 127 x 39
3.66 metres	127 x 64 x 14.90	178 x 102 x 19	254 x 102 x 28	305 x 102 x 33	406 x 140 x 39
Steel Beams to BS4360 - 43A	CHANNEL		'U' BEAM		
					


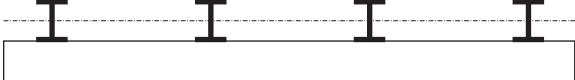
Recommendation would be to consider piers at 2.44 metre centres

EFB METRIC

DETERMINATION OF APPROPRIATE BEAM SECTIONS FOR VARIOUS WATER DEPTHS AT VARIOUS SUPPORT CENTRES FOR EFB TANKS

SUGGESTED STEEL BEAM SUPPORTS FOR TANKS SUPPORTED AT 1 METRE CENTRES (ONE DIRECTION ONLY) AT VARIOUS SPANNING DISTANCES FOR TANKS OF VARIOUS DEPTHS.



TANK DEPTH 'D'	SPANNING DISTANCE 'L'				
	1 metre	1.5 metres	2 metres	3 metres	4 metres
1 metre	76 x 38 x 6.69	127 x 76 x 13	127 x 76 x 13	178 x 102 x 19	254 x 102 x 25
1.5 metres	76 x 38 x 6.69	127 x 76 x 13	152 x 89 x 18	203 x 102 x 23	305 x 102 x 28
2 metres	76 x 51 x 9.34	127 x 76 x 13	152 x 89 x 18	254 x 102 x 22	305 x 102 x 37
2.5 metres	102 x 51 x 10.42	127 x 76 x 13	178 x 102 x 19	254 x 102 x 25	356 x 127 x 39
3 metres	102 x 51 x 10.42	152 x 89 x 18	178 x 102 x 19	254 x 102 x 28	356 x 127 x 39
3.5 metres	102 x 51 x 10.42	152 x 89 x 18	178 x 102 x 19	305 x 102 x 28	406 x 140 x 39
4 metres	102 x 51 x 10.42	152 x 89 x 18	203 x 102 x 23	305 x 102 x 28	406 x 140 x 46
Steel Beams to BS4360 - 43A	CHANNEL	'U' BEAM			
					

Recommendation would be to consider piers at 2 metre centres