



# ShawSpan

Installation Guide



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Table of Contents

1. General ..... 2

2. Handling and Transportation ..... 3

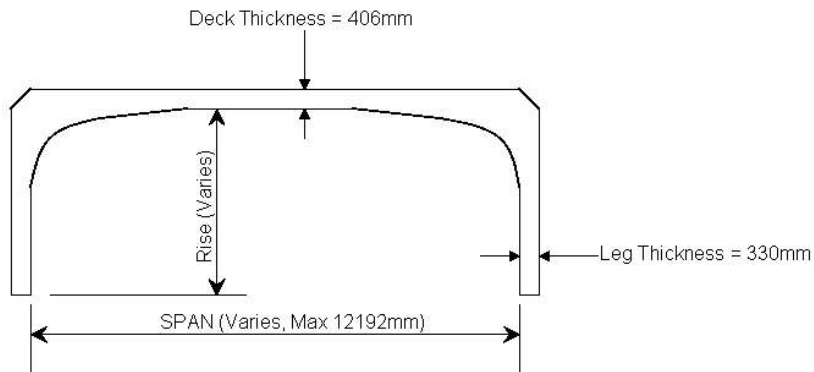
3. Construction and Installation..... 5

4. Specifications for Backfilling ..... 11

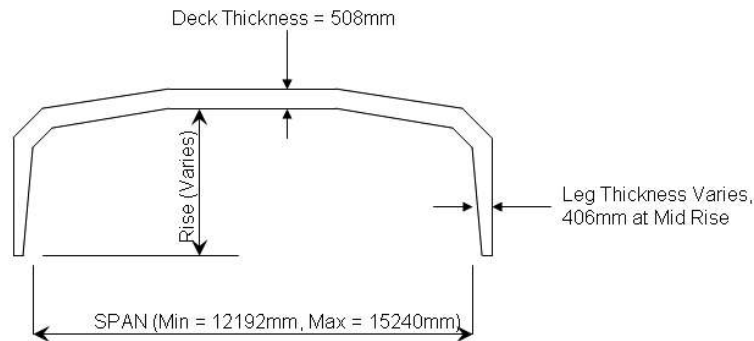
# I. General

ShawSpan units are high quality, low maintenance, pre-cast structures that can be used in a variety of applications. Each ShawSpan unit is a pre-cast reinforced concrete, rigid frame that uses the backfill material to increase the structures load handling characteristics. The horizontal top member of the frame functions as a deck to support soil, roadway and traffic loads across the clear span. The vertical legs retain the soil fill and provide the desired opening height or rise for the structure. Typically each leg is founded on the concrete strip footing that may be pre-cast or cast-in-place. A standard ShawSpan unit width is 1m and a Super ShawSpan unit width is 1.2m. Therefore, a 12m road width would be accommodated by placing twelve (12) standard ShawSpan's or ten (10) Super ShawSpan's side by side.

### Typical Standard ShawSpan Dimensions

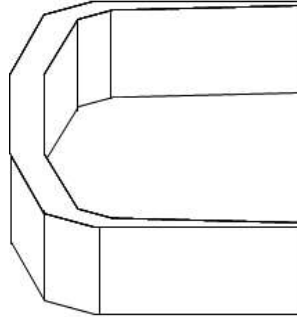


### Typical Super ShawSpan Dimensions

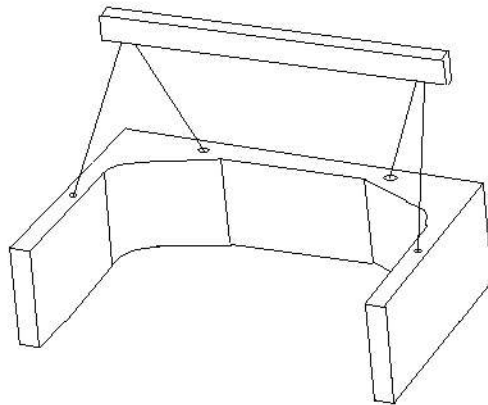


## 2. Handling and Transportation

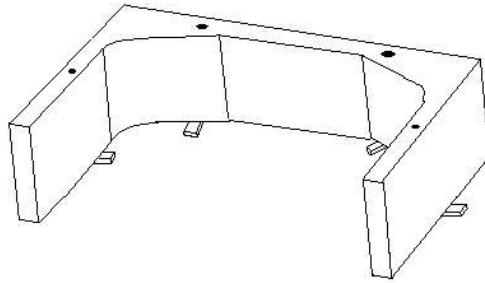
Care must be exercised when handling and moving ShawSpan units. ShawSpan units are designed to be cast, lifted, stored and transported on their side until they are to be placed in the field.



Spreader Beams are to be used for stripping from the Form, handling in the yard and loading onto the truck. The use of a spreader beam will prevent unwanted torsional and bending forces being exerted onto the unit. All ShawSpan units are to be only lifted by the cast-in lifting anchors that are shown on the accompanying shop drawings.

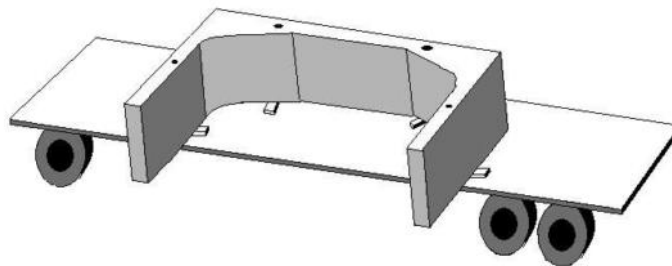


Storage of ShawSpan units shall occur on solid ground that will not settle under the unit's weight. The unit's shall be supported by wood dunnage directly below each lift anchor and shall maintain a minimum of 100mm between the bottom of the structure and the ground. If the ground can resist the structure's weight, two units may be stacked on top of each other providing that 50mm separation between each structure is maintained and the dunnage is located directly below the lift anchors.



ShawSpan elements are **not** to be shipped until the full 28 day concrete design strength has been reached.

ShawSpan units shall always be shipped on their side with the unit's centre of gravity in line with the vehicles (see project specific shop drawings). Dunnage shall be placed between the trailer deck and the ShawSpan to prevent damage to the unit. At a minimum, dunnage will be located under each lift anchor point and any other location that a tie-down strap is used. At no time shall the ShawSpan unit be allowed to deform when being tied down, the unit must be shimmed with the appropriate size piece of material to prevent deflection.

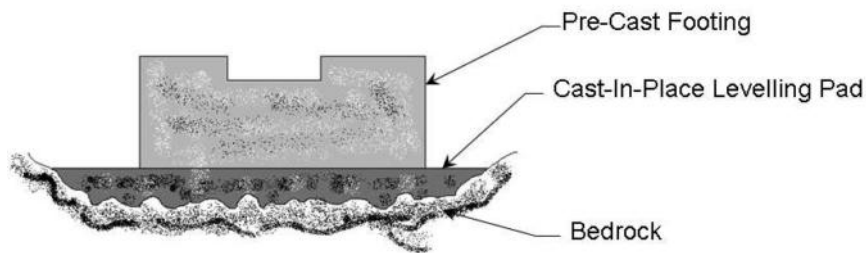


### 3. Construction and Installation

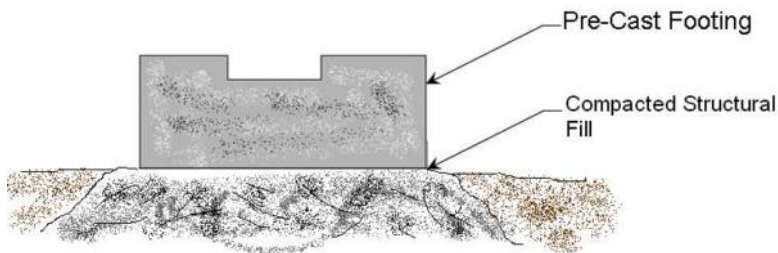
All footings whether pre-cast or cast in place shall be placed to within 3mm of the required dimensions.

If pre-cast footings are used, site preparation must be made prior to their installation. If the pre-cast footings are to be placed on bedrock a “leveling slab” of non reinforced, concrete shall be poured onto the bedrock, allowed to gain strength and then the pre-cast footing may be installed. The concrete shall have a minimum concrete strength of 20 MPa and between 5 to 7 percent air entrainment. If the pre-cast footing is to be placed on fill it must be placed on level, compacted structural fill that has the required design bearing capacity and all allowances for scour protection have been made.

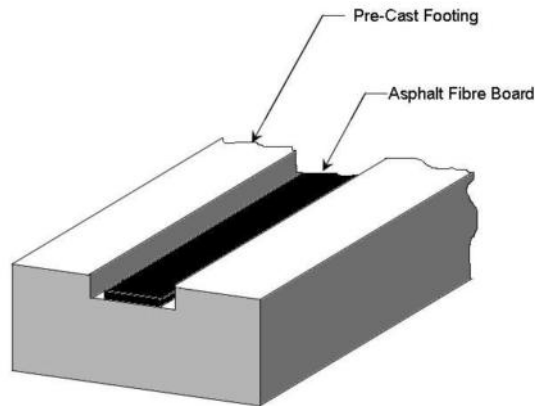
#### PRE-CAST FOOTING ON BEDROCK



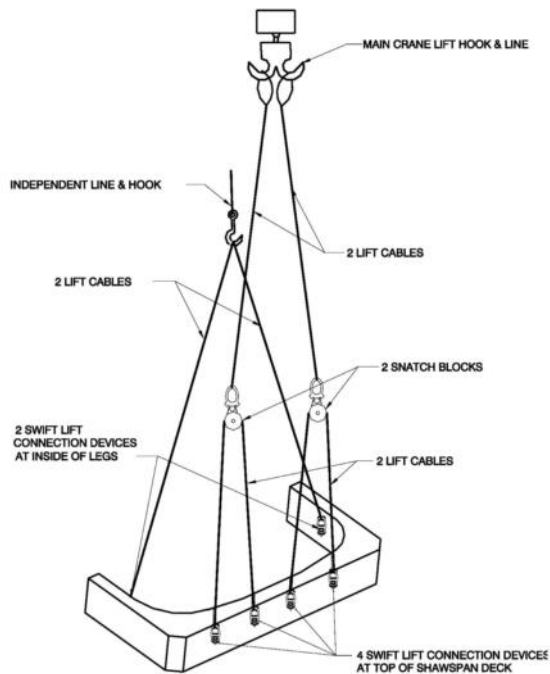
#### PRE-CAST FOOTING ON GRAVEL



The footing keyways shall be swept clean of loose gravel and a 200mm wide by 13mm thick piece of asphalt fibre board shall be placed in the bottom of the keyway. The fibre board will prevent spalling of the ShawSpan legs during installation.



To install the ShawSpan units, a two line crane rated for the correct capacity shall be used. (See Rigging Diagram) The crane rigging is attached to the lift anchors of the ShawSpan and lifted off the truck. At no time shall the ShawSpan units be lifted by any other means than by the lift anchors provided. Once the unit is free from the truck the Crane's second line is lowered rotating the ShawSpan into the upright position.





The first Shawspan unit is placed flush with the upstream edge of the footing and is centered in the footing keyway. It is critical that the first shawspan unit be placed perpendicular to the footing keyway otherwise the error will start to compound as the installation progresses.

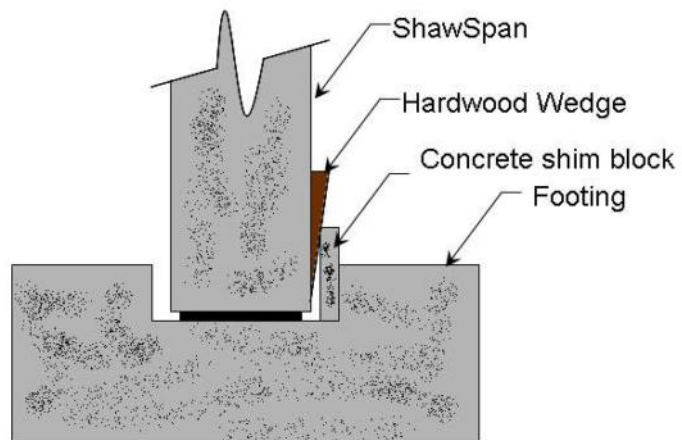
To prevent unwanted lateral spreading of the ShawSpan elements before backfilling commences, concrete blocks and hardwood wedges shall be placed between the ShawSpan leg and the Footing. Keyway before the next unit is installed.







Place additional units on the downstream side of the first. Ensure a 6 to 10mm gap is maintained between each ShawSpan and continue to block and shim each unit to prevent lateral spreading.

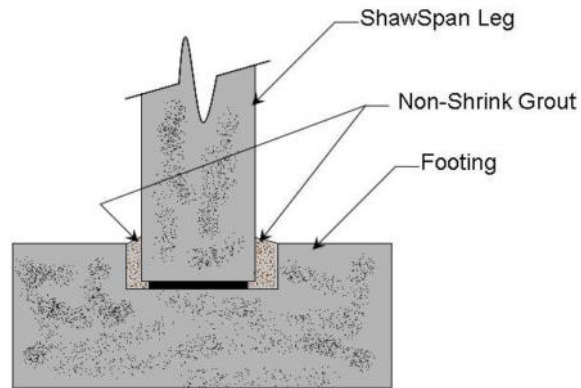




When all structures are in place, the units shall be joined together using the shear plates and weld slugs supplied. This task consists of inserting round steel rod between two ShawSpans at the shear plate location and fastening with two fillet welds (see supplied shop drawings for weld size and length).



Pour 35 MPa non-shrink grout, with an aggregate size no greater than 6mm, in the Footing Keyway. To fill all air voids ensure the grout is worked under the ShawSpan and is poured level with the top of the Footing on both the stream and land side of the leg. Do not begin to backfill the structure until the grout has reached 17.5 MPa.



To seal joints between ShawSpan units, apply primer and membrane as directed by the manufacturer.



## 4. Specifications for Backfilling

Backfilling operations shall not commence until the grout in the Footing Keyway has attained a minimum compressive strength of 17.5 MPa unless otherwise noted on the shop drawings.

Structural Backfill used in the leg supporting areas shall be of crushed and screened gravel or rock having the following Gradation Requirements when following ASTM C117 and C136 test methods:

<i>Sieve Size</i> <i>m</i>	<i>Per cent Passing</i>
112 000	100
40 000	60 - 85
5 000	25 - 50
315	5 - 15
80	2 - 7

Backfill against the structure shall be completed in layers no greater in depth than 300 mm and compacted to 95 % Standard Proctor. To prevent lateral deflection of the structure, the layers of fill against the ShawSpan legs must be placed on alternating sides. At no time shall there be a difference in opposite fill layers of more than 750mm. This operation is continued until the fill zone is at an elevation equal to the concrete deck of the ShawSpan unit.

