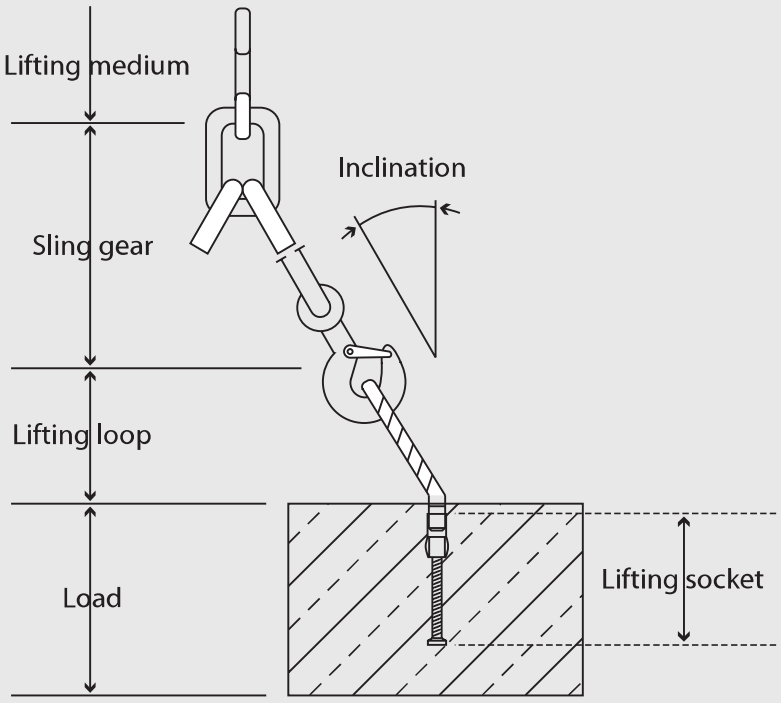
THREADED LIFTING SOCKET SYSTEM

These sockets are available in both high grade zinc plated and 316 grade stainless steel. They are used to lift and transport most kinds of precast units. They range from 500kg up to 12.5T. Additional reinforcement must be added through the hole in order to transfer the forces into the concrete.

HOW IT WORKS

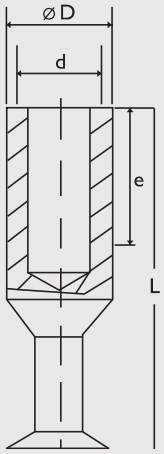
The Socket is attached to the formwork by means of either a plastic nailing plate or a magnetic nailing plate. This allows it to remain in position during the pour and after the concrete has reach the required strength, the nailing plate is removed revealing the exposed socket. When moving the unit the lifting loop or swivel eye is screwed into the exposed socket hole allowing for a safe lift. It must be remembered that the angle of lift will reduce the safe working load.



COMPONENTS

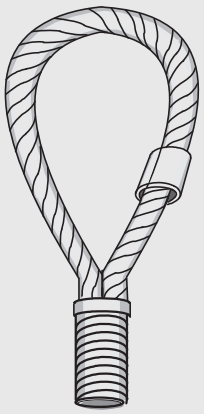
THE LIFTING SOCKETS

There are a wide range of sockets available to suit different precast unit types, based on depth of the unit, reinforcement need and thickness of the unit. Each type of socket is available in varying sizes allowing for different loads



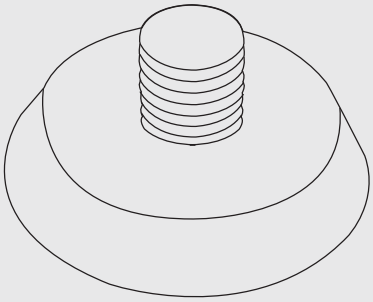
THE LIFTING LOOP

The Lifting Loops and Swivel Eyes come in varying sizes and can only be used with the corresponding socket size. All lifting devices come complete with a metal tag an individual identification number and certificate of conformity.



THE NAILING PLATE

The reusable nailing plate comes in varying sizes which correspond to the lifting loop and Socket. Each load group is a different colour for ease of identification. We also supply a large nailing plate for use with Swivel eyes.



During the precast process there are two occasions when the sockets are put under the most stress, the first one is at demoulding and the second is when the units are transported to site. We need to ensure that the sockets are capable of withstanding the forces when they are at there highest point.

The selection of the lifting sockets is determined by the following criteria.

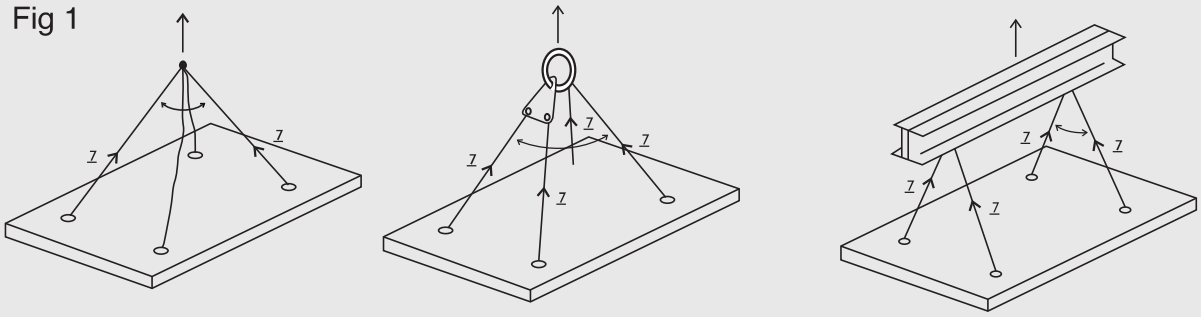
1. Weight of the unit.

In general a concrete strength 25N/mm³ is used to calculate the weight of the concrete unit, for our calculation it is determined as W.

2. Number of anchors being used.

This depends very much on the lifting method and the spread of the load among the anchor points. As can be seen in the following diagram, if the sockets are not positioned properly only two sockets will bear the load. The sockets should be placed symmetrically to the centre of gravity to ensure all the sockets are ultilised. This combined with the correct sling arrangement will ensure even load on the sockets. The centre of gravity is always below the crane hook.

Fig 1



3. Adhesion to the mould.

There are adhesion forces which are present depending on the formwork used.
The following is a guide to the values attached to the various formwork types.

FORMWORK TYPE	ADHESION FACTOR AF
OILED STEEL FORMWORK	1 KN/m2
VARNISHED TIMBER FORMWORK	2 KN/m2
ROUGH TIMBER FORMWORK	3 KN/m2

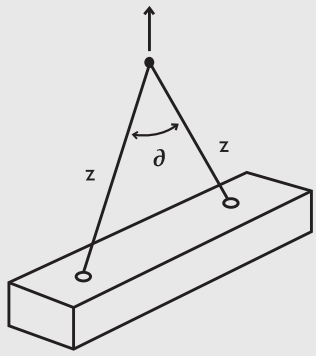
Adhesion to the mould will be minimised by removing as much of the formwork as possible before lifting.

In certain instances the type of product being produced can also affect demoulding forces.
These are summarised as follows:

INCREASED FORMWORK ADHESION	
DOUBLE T SLABS	2 x W
RIPPED SLABS	3 x W
COFFERED UNITS	4 x W

The value of adhesion to the mould is calculated by multiplying the area of concrete in contact with the formwork (A), and the adhesion factor (af).

4. Spread or splay angle factors



ANGLE AT ∂	af
15	1.01
30	1.04
45	1.08
60	1.16
75	1.26
90	1.41
105	1.64
120	2.0

If the sling used forms a triangle then the angle created at ∂ causes increased forces as it increases.

5. Sling type

If a four legged sling is being used. It must be assumed that two anchors alone are bearing the weight.

Fig 3

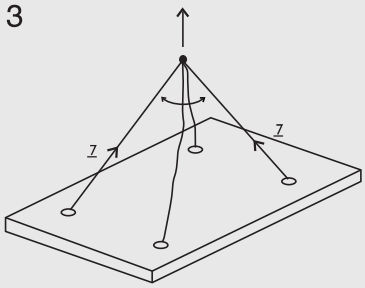


Fig 4

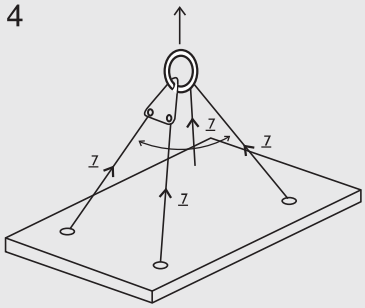
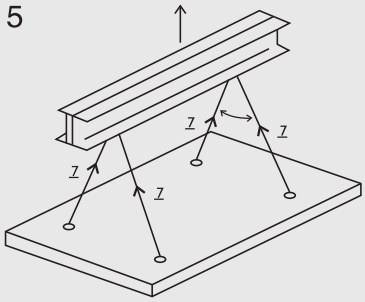


Fig 5



As can be seen in fig 3 not all anchors always carry equal weight. The situation can be rectified by adapting the sling as shown in fig 4 or using a spreader system as shown in figure 5.

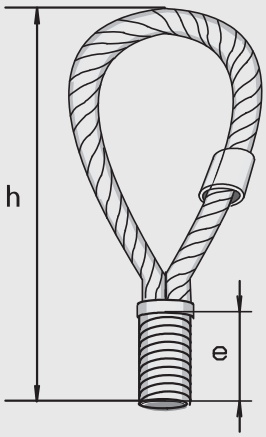
6. Dynamic loads

When the precast units are moved there are dynamic factors at work and these affect the load on the anchors.

LIFTING VARIABLE	IMPACT FACTOR IF
STATIONARY CRANE WITH SPEED BELOW 90M/MIN	1
STATIONARY CRANE WITH SPEED GREATER THAN 90M/MIN	1.3
MOBILE CRANE ON EVEN GROUND	1.75
MOBILE CRANE ON UNEVEN GROUND	2

LIFTING LOOPS

Manufactured in Europe our lifting loops are a combination of a high grade steel wire swaged onto a steel ferule. These loops prove to be an economical and reliable lifting device. Our Loops are compatible with both Rd and Metric sockets and are supplied with a EU certificate of conformity.



PRODUCT CODE	THREAD	LOOP DIAMETER Ø d mm	SWL Kg	e mm	h mm
SSLL12	M/Rd12	6	500	22	155
SSLL16	M/Rd16	8	1200	27	155
SSLL20	M/Rd20	10	2000	35	215
SSLL24	M/Rd24	12	2500	37	255
SSLL30	M/Rd30	16	4000	50	300
SSLL36	M/Rd36	18	6300	65	340
SSLL42	M/Rd42	20	8000	70	425
SSLL52	M/Rd52	26	12500	80	480

All our loops come with metal identification tags, each one is individually marked.

All loops are reusable but must be changed under the following circumstances

1. If the thread is damaged or bent.
2. If the steel wire is damaged or frayed.
3. If there are any signs of corrosion.

The above safe working loads are based on an axial lift. The loads decrease as the angle of lift increases.

REDUCTION IN SAFE WORKING LOAD FOR ANGLED LIFTS

ANGLE °	% LIFT REDUCTION
5-15	10
25-30	15
30-35	20
35-40	25
40-45	30

Angle of lift ß should not normally be more than 30°

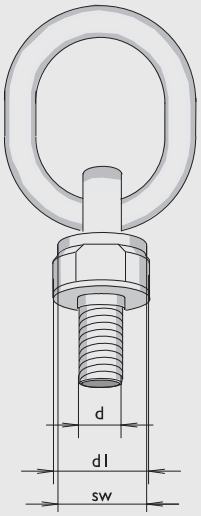
Loops are not designed for pitching and turning and the angle of the lift should not exceed 45°. If lifts over 45° are required, swivel eyes are combination loops should be used.

PRE INSTALLATION CHECKLIST

Please ensure

* That the socket and the loop are compatible.
* That the loop is completely free from defects
* That the loop is clearly marked with a unique identification number.
* That the loop is accompanied by a valid test certificate.
* Always insure the thread is well greased and free from any foreign matter. The loop must be fully threaded into the socket. There is an allowance of one thread turn in order to align the loop to the lifting hook.

SWIVEL EYES



Used with the threaded socket system, swivel eyes are more versatile than lifting loops in that they are used for pitching and turning precast units as well as transporting as normal. They are usually used in high movement areas where loops would prove uneconomical due to high levels of wear and tear.

Each Swivel eye is marked with a unique serial number which corresponds with the accompanying test certificate, it will also state the safe working load. The eyes are compatable with both Rd and metric threads.

Our swivel eyes are manufactured in Germany under most modern techniques out of high alloyed steel.

Characteristics:

- compact and easy construction
- low space needed
- fast installation
- no aligning, the pick up link can be turned in the right position

Installation tips:

- the surface has to be flat
- tighten by hand with spanner FDIN 695, 894
- minimum thread depth

  - steel 1,00 x d
  - cast iron 1,25 x d
  - aluminium 2,00 x d
  - observe the accident prevention regulation VGB 9a 42

SWIVEL EYES

PRODUCT CODE	SWL Kg	THREAD M/Rd mm	OUTER DIAMETER d1/mm	KEY WIDTH sw mm
SSLE10	300	10	36	30
SSLE12	500	12	36	30
SSLE16	1250	16	36	30
SSLE20	2000	20	50	30
SSLE24	2500	24	57	46
SSLE30	4000	30	66	46
SSLE36	6300	36	80	65
SSLE42	8000	42	80	80
SSLE52	12500	52	80	80

Pre installation check list

Please ensure

* That the Swivel eye is free of any defects.
* That the socket and the swivel eye are compatible.
* That the loop is clearly marked with a unique identification number.
* That the loop is accompanied by a valid test certificate.
* Always insure the thread is well greased and free from any foreign matter.
* The Swivel eye must be fully threaded into the socket until it is flush with the concrete.
* The Swivel eye should then be tightened with a FDIN 685, 894