



BLOCK & LINER POOL KIT

INSTALLATION MANUAL

www.plasticapools.com

Plastica



PERMISSIONS

The construction of a private open air swimming pool in the back garden of a domestic property in the U.K. does not usually require planning permission. However, if your property is listed, sited in an area of outstanding natural beauty or special scientific interest, or the pool is to have a permanent enclosure, then planning permission will certainly be required. The one exception to this rule is the air dome type of structure. We recommend that you contact your local authority in order to check the requirements of local legislation before proceeding with construction.

If the pool is to be enclosed or is to be used for commercial purposes then both planning permission and building regulation approval are required.

LOCATION OF POOL

Ideally the pool should be sited well away from trees to avoid leaf debris. Also bear in mind that hedges, trees, fences and walls may reduce the amount of sunlight reaching the pool area. A sheltered position from high winds is preferable. Other important points to consider are as follows:

1. Ensure that **NO** electrical cables, water pipes, gas pipes, sewage pipes, underground phone lines or other obstructions run under the proposed location of the pool, (watch out for overhead electric cables as well, you will be using a long metal pole to during cleaning of the pool).
2. The filter plant should be enclosed and sited as close to the pool as possible (3-5m preferably). This will protect it from the elements, help pump efficiency and reduce the cost of pipework. The filtration plant should be installed on a level base, ideally at water level (try to avoid installing your filtration plant more than 300mm (12") above water level), if this is not possible then no higher than the surrounding paving (this is to avoid difficulties when priming the pump).
3. Availability of water supply.
4. Availability of a suitable discharge point i.e. soakaway, storm drain or ditch for the disposal of waste water used in the backwashing of the filter. NOTE: local authorities do not normally permit the discharge of chemically treated water into their foul drains.
5. Proximity of changing facilities and toilets to the pool.
6. In the interests of safety, the access to the pool should be from the shallow end and we suggest that the pool area should be fenced off, to minimise the possibility of accidents occurring when the pool is unattended.
7. If the pool is to be heated, then the availability of an adequate oil, gas or electricity supply to the heating unit should be considered. Also the provision of an oil or gas tank if required. If a heat pump or electric heater is to be used, then the electrical supply should be checked to ensure it will accept the additional load.

A BRIEF DESCRIPTION OF THE CONSTRUCTION

After excavation to the required dimensions a 225mm (9") thick perimeter wall is constructed from 450mm x 220mm x 100mm dense concrete blocks to a height of 1.06m (3' 6", 9 courses laid on the flat) on top of a 375mm wide x 150mm deep (15" x 6") concrete foundation. The walls can then rendered in sand/cement to provide a smooth face against the liner and a plastic linerlock extrusion is fitted around the top, or if the quality of the block work and joints is smooth enough, just a polyethylene foam or felt underlay can be used instead of the render. The base of the excavation is screeded with a 50mm (2") layer of sand/cement to the specified profiles. A felt underlay is available as an optional extra for the floor of the pool. This disguises any slight imperfections in the screeding and is particularly useful to the DIY installer with little or no experience of screeding. It is especially important if you are planning to fit an underwater light, as this will highlight any imperfections in the screed, with a shadow behind.

CONTENTS OF A BLOCK AND LINER POOL KIT

Our kits include the specialist equipment and fittings:

Flow control fittings: Surface Skimmer(s) and Vacuum Point
Main Drains (two minimum), Return Inlets
Pipework
Pipe Adhesives
Valves
Plumbing fittings for location of plant up to 3m (10') from pool.
150mm (6") Radius Corner Formers

Also: High Rate Sand Filter
Pump
Linerlock
Tailored Liner
3 Tread Pool Ladder
Maintenance Kit
Water Test Kit
Thermometer
Chemical Starter Kit
225mm (9") Coping Stones

The kits DO NOT include any basic building materials such as concrete blocks, sand, cement, pea shingle or reinforcing rods for ring beams. All these materials are listed in Figure A and should be easily obtained locally at competitive prices.

On receipt of your Plastica Block and Liner Pool Kit check that the fittings are as listed on your component schedule. If there are any discrepancies please contact your supplier immediately as claims can only be accepted within seven days.

DATUM LEVEL

The Datum level is the top of the pool wall and is of crucial importance as it is probable that it will join on to an existing terrace or patio. Drive a peg into the ground close to the pool but away from the excavation hole (the datum peg), the top of this peg will be the top of the pool wall and the reference point for all measurements downwards. The finished height of the pool coping will be 63mm (2 1/2") above the Datum peg. This measurement represents the bed and the thickness of the coping and any paving. In order to accurately transfer the levels from the Datum level it is recommended that a Laser level be hired.

DIMENSIONS

Figures B, C and D (see pages 4 and 5) show the excavation sizes and depth dimensions for the pool range. A 375mm (15") overdig all around the pool is included to allow for the 225mm (9") pool wall and a 150mm (6") backfilling clearance. 50mm (2") is included for the sand/cement floor screed. No allowance is made for any extra digging necessary for the perimeter wall foundation or for any overdigging in the event of clay sub-soil conditions. A hopper configuration is not available for a 10' x 20' pool, it should be made as a constant depth or wedge configuration. See page 26 for dimensions if a wedge configuration is preferred.

MARKING OUT THE EXCAVATION

Once you have selected the correct dimensions from Figure B for your pool, drive in the corner pegs making sure the **diagonals are equal**.

Measure out the deep and shallow end dimensions and drive in additional pegs outside the proposed hole so that they can be referred to whilst the pool is being dug. Following the dimensions given in Figure B, drive in further pegs outside the excavation to indicate the pool wall dimensions. Connect all the pegs together with string and mark the lines on the ground using cement or lime. Figure C refers to the peg layout. If possible drive all the pegs in to the same depth as the datum peg so that a check can be made of all levels by measuring down from a line stretched between pegs.

Note: It is important that all the internal corners of the pool walls must form a rectangle with diagonals that are equal.

Figure A

Basic building materials (to be purchased locally).
Please note: the quantities shown here are only approximate.

Pool Size	Profile	Excavated Spoil cu. m.	Foundations (1 part cement to 8 parts 3/4" to dust in aggregate) Blocks to 4 parts			Concrete 18" x 9" x 4"	Mortar for block walls 1 part cement B.S. 1200 sand		Rendering 1 part cement to 4 parts B.S. 1200 sand		Floor Screed 1 part cement to 8 parts sand		Backfill Pea Shingle		Ring Beam 1 part cement to 8 parts 3/4" to dust all-in aggregate		12mm diameter reinforcing rod
			Ready Mix cu. m.	Mixed on site cu. m.	Cement Aggreg.		Cement	Sand	Cement	Sand	Cement	Sand	Cement	Aggreg.	Cement	Aggreg.	
10' x 20'	Constant Depth or Wedge	37	1.3	1.7	7 bags	420	10 bags	1.5	4 bags	1	6 bags	1.5	3.5	3 bags	0.7	150'	
12' x 24'	Wedge or Hopper	45	1.5	2.0	7 bags	450	11 bags	1.6	5 bags	1.0	8 bags	2.0	3.75	3 bags	0.8	180'	
14' x 28'	Wedge or Hopper	63	1.75	2.3	9 bags	525	13 bags	1.8	6 bags	1.2	11 bags	2.8	4.25	4 bags	1.0	200'	
14' x 30'	Wedge or Hopper	65	1.80	2.4	9 bags	540	13 bags	1.9	6 bags	1.3	12 bags	2.9	4.4	4 bags	1.0	210'	
15' x 30'	Wedge or Hopper	67	1.85	2.5	9 bags	550	13 bags	1.9	6 bags	1.3	12 bags	3.0	4.5	4 bags	1.0	220'	
16' x 32'	Wedge or Hopper	83	2.0	2.7	11 bags	600	14 bags	2.0	7 bags	1.4	13 bags	3.6	5	4 bags	1.1	230'	
18' x 36'	Wedge or Hopper	101	2.25	3.0	11 bags	675	15 bags	2.3	8 bags	1.6	16 bags	4.3	5.75	5 bags	1.2	250'	
16' x 38'	Wedge or Hopper	101	2.25	3.0	11 bags	675	15 bags	2.3	8 bags	1.6	16 bags	4.3	5.75	5 bags	1.2	250'	
40' x 20'	Wedge or Hopper	131	2.5	3.25	13 bags	750	17 bags	2.6	9 bags	1.7	21 bags	5.6	6.25	5 bags	1.3	280'	

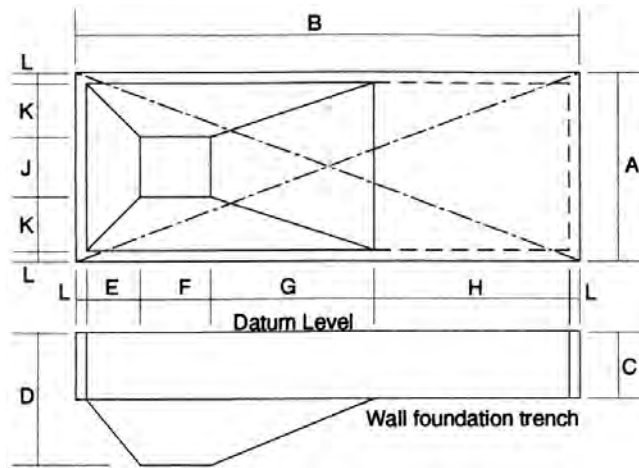
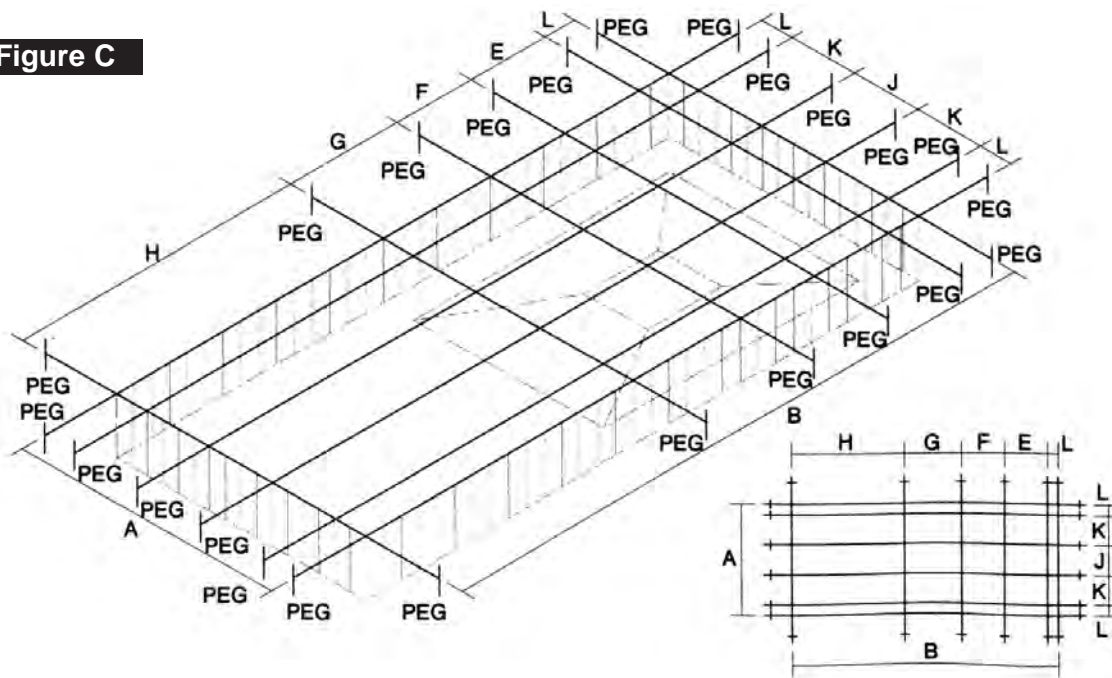


Figure B

Dimensions required for hopper excavation.

Pool Size	A	B	H	G	F	E	L	K	J	C Shallow End	D Deep End	Diagonals Equals	
10' X 20'	12'6"	22'6"	CONSTANT DEPTH								4'2"	N/A	25'9"
12' x 24'	14'6"	26'6"	9'3"	8'6"	4'6"	3'	1'3"	3'	6'	3'6"	6'2"	30'2½"	
14' x 28'	16'6"	30'6"	11'3"	9'	5'	4'	1'3"	4'	6'	3'6"	7'2"	34'8"	
14' x 30'	16'6"	32'6"	11'3"	11'	5'	4'	1'3"	5'	4'	3'6"	7'2"	36'5¼"	
30' x 15'	17'6"	32'6"	11'3"	11'	5'	4'	1'3"	4'	7'	3'6"	7'2"	36'5½"	
32' x 16'	18'6"	34'6"	9'3"	14'	6'	4'	1'3"	4'	8'	3'6"	8'2"	39'1¼"	
36' x 18'	20'6"	38'6"	11'3"	14'	8'	4'	1'3"	4'	10'	3'6"	8'2"	43'7½"	
38' x 16'	18'6"	40'6"	13'3"	14'	8'	4'	1'3"	4'	8'	3'6"	8'2"	44'6¼"	
40' x 20'	22'6"	42'6"	13'3"	14'	10'	4'	1'3"	4'	12'	3'6"	8'8"	48'1"	

Figure C



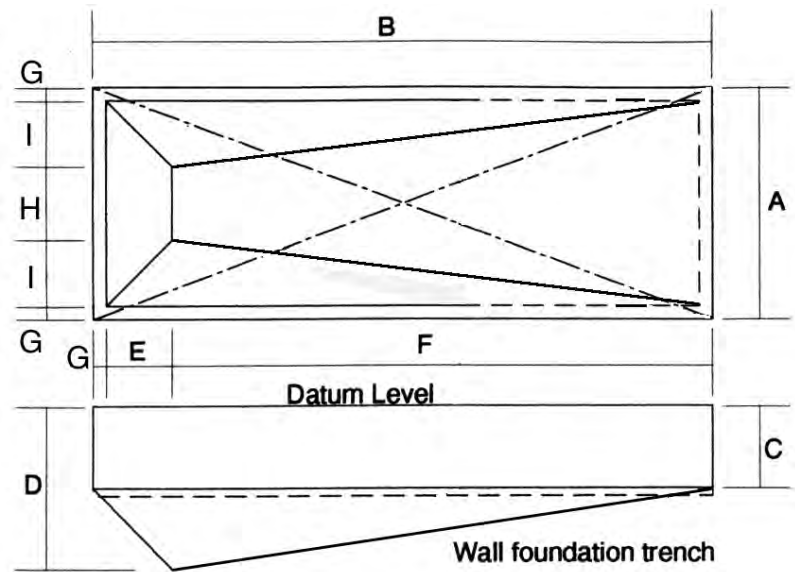
(See page 26 for wedge configuration dimensions)

WEDGE POOL DIMENSIONS

For a 10' x 20' pool it is necessary to install a constant depth pool rather than hopper. The dimensions given below are for the wedge configuration. If a wedge or constant depth configuration is chosen this MUST be stated when the liner is ordered.

EXCAVATION DIMENSIONS

Figure D



Pool Size	A	B	C	D	E	F	G	H	I
10x20	12'-6"	22'-6"	3'-6"	Constant Depth			1'-3"		
12x24	14'-6"	26'-6"	3'-6"	6'-2"	3'	22'-3"	1'-3"	6'	3'-0"
14x28	16'-6"	30'-6"	3'-6"	7'-2"	4'	25'-3"	1'-3"	6'	4'-0"
14x30	16'-6"	32'-6"	3'-6"	7'-2"	5'	27'-3"	1'-3"	4'	5'-0"
15x30	17'-6"	32'-6"	3'-6"	7'-2"	4'	27'-3"	1'-3"	7'	4'-0"
16x32	18'-6"	34'-6"	3'-6"	8'-2"	4'	29'-3"	1'-3"	8'	4'-0"
16x38	18'-6"	40'-6"	3'-6"	8'-2"	4'	35'-3"	1'-3"	8'	4'-0"
18x36	20'-6"	38'-6"	3'-6"	8'-2"	4'	33'-3"	1'-3"	10'	4'-0"
20x40	22'-6"	42'-6"	3'-6"	8'-2"	4'	37'-3"	1'-3"	12'	4'-0"

EXCAVATION

Digging a pool by hand is hard work and time consuming, hiring a mechanical excavator (e.g. a JCB or similar) will save time and much effort, but it must be remembered that a 2.5m (8') wide access is required. An experienced operator can dig a pool in a day, particularly if the soil is to be left on site. If the access is not available smaller, but slower machines can be hired but the job will then take longer. If you cannot make use of the soil from the excavation, provision must be made to cart this away and this will involve extra cost and time, possibly hiring one or even two dumper trucks (if the soil has to be carted more than 40'-50' from the hole to the truck). Calculations have to be made with regard to cost of hiring all equipment.

If the site is sloping or conditions are muddy, consider hiring a 4 wheel drive dumper. Don't forget to save the top soil to finish off the area, don't bury it and be left with poor soil for landscaping!

Take care not to overdig the pool floor, any hollows must be filled with a mixture of lean sand/cement (18:1) rather than any soil that had been removed. This will help to avoid settlement problems at a later date. It is recommended that the final dimensions of the pool are hand dug with a spade to ensure an accurate shape.

UNDER POOL DRAINAGE

It is advisable to consult your supplier to determine if site conditions require under pool drainage. In some cases a simple hydrostatic relief valve and collection tube connected to the main drain may be sufficient. However in some cases other methods may be required.

If your soil is chalk, gravel, sand, or shale, you will not need to lay drainage as the soil will allow water to drain free. If however your soil is clay, then drainage will have to be considered to prevent water building up beneath the liner. Ideally a channel for land drains should be dug from the lowest point in the pool excavation to another part of the garden. This can then have the drains laid in it and then backfilled with shingle, bearing in mind of course that this is really only suitable for areas where the land is sloping or close to an existing drainage ditch. If the site is fairly level then the following procedure may be adopted (see Figure E).

The lowest point of the excavation will need to have a 450mm (18") deep drainage sump dug out. A polythene sheet should then be laid over the base of the hole and concrete blocks placed around the perimeter of the sump to prevent the sides collapsing. From the centre of the sump run a 1.5" pipe up the sloping sides of the excavation. A collection tube, (a perforated section of pipe with one end open) should be fitted to the sump end of this pipe and the pit filled with clean rubble. Minimum size of the rubble to be 50mm (2") to prevent clogging of the collection pipe.

Lay an 8:1 lean sand/cement layer approximately 75mm (3") deep over all the sump area to bring the base level back to the required depth, as per the dimensions table.

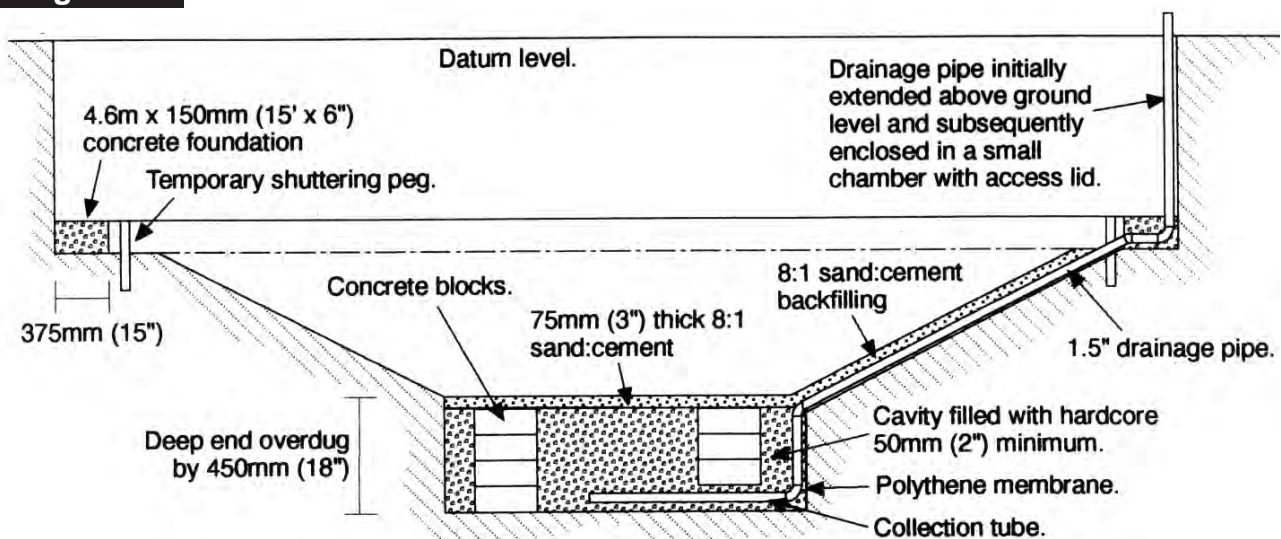
Note: The main drain suction fittings installation, as detailed later, should be carried out in conjunction with this 75mm (3") layer of lean sand/cement.

Extend the pipe from the sump under the pool wall foundation and extend it vertically upwards behind the pool wall. The pipe can be used during construction to remove any ground water build up by using an electrical diaphragm pump (this can be hired). Don't forget to pump any water well away from the site in order to prevent it reappearing in the excavation.

When the pool is completed the pipe can be enclosed in a small chamber, complete with access cover, and the pipe fitted with a temporary plug. This will mean that water from beneath the pool can be pumped out if the pool is drained or the liner replaced.

Alternatively, a sump chamber can be constructed outside the the pool excavation, but below the depth of the deep end. The chamber should be linked to the deep end of the pool with a beech or pea shingle filled channel. A 12" diameter pipe available from builders merchants provide a suitable wall construction, with an additional skimmer frame and lid giving access from the finished paving. A submersible pump with float switch can be lowered to the bottom of the pit. and if an electrical supply (via armoured cable) and a drainage pipe is provided, then the system can be left permanently in the ground.

Figure E



SLIDES (OPTIONAL EXTRA)

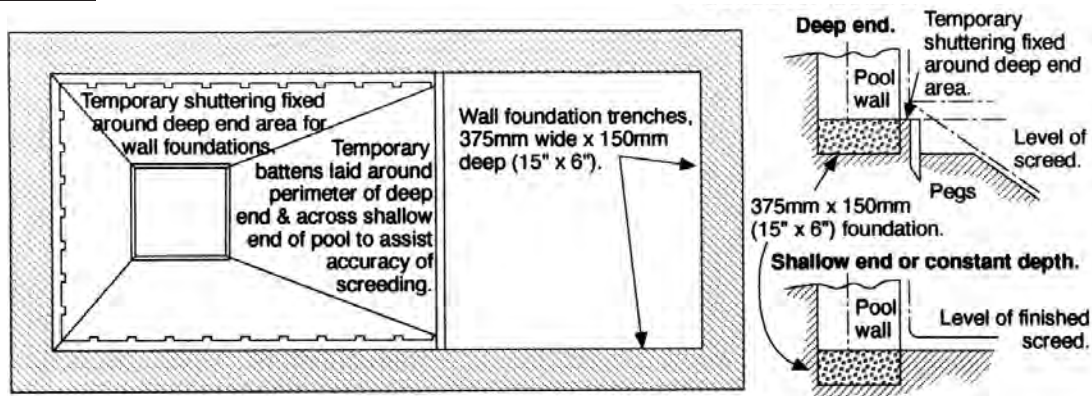
Curved or straight slides can be obtained, the minimum water depth required is 1.2m (4'). They are normally glass-fibre and reduce friction by the use of water jets. Again the fixing points can be concreted in or secured by deck anchors. Mains water is required for the jets on the slide.

POOL WALL FOUNDATIONS

The pool wall foundations should be 375mm (15") wide and 150mm (6") deep. At the deep end of the pool the foundations can be dug by excavator, as it is only necessary to reduce the levels around the basin perimeter by a further 150mm (6"). The foundations for the shallow end are best dug by hand. Due to the sloping sides of the basin temporary shuttering should be fixed around the perimeter of the basin to contain the concrete poured for the foundation. Boards of suitable size (e.g. scaffolding boards) should be positioned and secured by pegs. These pegs, driven into the basin slope, will provide the necessary shuttering, see Figure F. Reinforcement must be used if the foundations are constructed on unstable ground.

Before casting the foundation, the pipe from the main fitting at the base of the pool must run under the wall foundation, see Figure M, page 14. In order to establish the finished level of the concrete, steel pegs should be driven in around the foundation trench. This final level should be 1.05m (3' 6") below the Datum level. The foundation concrete mix should be one part cement : eight parts three quarters to dust, all in aggregate, and it should be laid and levelled in one operation to ensure consistency of the strength.

Figure F



WALL CONSTRUCTION

Hire in some scaffolding, one week should be sufficient. This temporary scaffolding will need to be erected in order to build and render the walls in the basin area. The walls will be 9 courses of 450mm x 225mm x 100mm (18" x 9" x 4") concrete blocks, laid flat on their side with each course bonded. Use 4:1 sand/cement making sure you use B.S. 1200 sand for the mortar mix. In order to make the mix more workable add a plasticiser.

When the first course of blocks are laid check the internal dimensions. These must be correct at this stage and the diagonals equal (see table below).

If you are installing an underwater light unit, this should go in at the third course. The pool return inlet fittings are installed on the fourth course of blocks.

Continue laying the blocks remembering to install the skimmer and optional vacuum point in the top two courses of blocks.

Pool Size	Diagonals (Equal)	Internal Dimensions	
		Length A	Width B
10' x 20'	22'5¾"	20'1"	10'1"
12' x 24'	26'11¼"	24'1"	12'1"
14' x 28'	31'5"	28'1"	14'1"
14' x 30'	33'2½"	30'1"	14'1"
15' x 30'	33'7¾"	30'1"	15'1"
16' x 32'	35'10¾"	32'1"	16'1"
18' x 36'	40'4¼"	36'1"	18'1"
16' x 38'	41'4"	38'1"	16'1"
20' x 40'	44'10"	40'1"	20'1"

POOL WALL FITTINGS

Look at the plumbing layout, figure G, for the location of the flow control fittings, these must be installed as the pool construction proceeds.

Joining Instructions for Flow Control Fittings

Storage and Handling

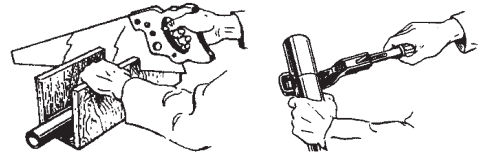
Pipe can be safely stored indoors or outdoors, but try to avoid direct exposure to sunlight for long periods, which can discolour the pipe although there is no loss of strength. Avoid dragging pipes over rough ground or careless handling in cold weather, when the material is more fragile.

Cutting

Pipes are best cut with a pipe cutter or a fine tooth tenon saw. If neither is available then a hacksaw can be used.

Above all, cut the pipe square.

Use a mitre block or guide if necessary. Better still, use a hand rotary cutting tool with blades for plastic pipes. A square cut is virtually guaranteed.

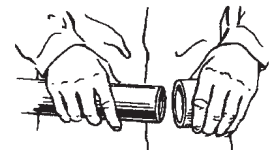


Deburring

Use a file, knife or deburring tool to remove swarf and then to put a small chamfer on the leading edge of the pipe.

Check Dry Fit

Insert the pipe into the fitting to check the tightness of the fit. A good interference fit is when resistance is felt about a third to one half the way in, and this will bond faster than a loose fit. If the fit is loose, apply two coats of solvent cement to ensure that the material is well jointed.



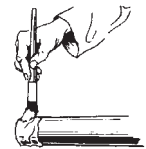
Clean All Surfaces

Cleanliness is very important. Clean all jointing surfaces with pipe cleaner using a small paint brush or a lint free cloth.

Assemble Joint

Use a natural bristle brush or applicator which is **about 1/2 the pipe diameter**. Flow on a generous coat of the solvent cement to the pipe, making sure that all the joint surface is well covered. Without delay, apply cement to the inside of the fitting, using outward strokes to keep excess cement from the root of the fitting. For sizes 3" and above, or if the fit was loose, apply a second coat to the pipe.

Immediately push together the pipe and fitting using a 1/4 turn twisting motion. The assembly must take place whilst the cement is still wet. Hold together for about 30 seconds until bonding takes place, then wipe away any excess with a brush or cloth.



Testing

Leave as long as possible before testing, and never use compressed air or gases.

Safety

When working with solvent cements, always follow the safety instructions on the can.

Work in well ventilated areas, and do not smoke. Dispose of unused cement with care.

10 Tips For Good Solvent Cement Joints

- 1 In cold weather, move materials indoors to adjust to ambient temperatures
- 2 Cut pipes square, de-burr and chamfer
- 3 Clean and dry all jointing surfaces
- 4 The joining surfaces must be softened and be made semifluid
- 5 Apply sufficient cement
- 6 Assemble while surfaces are still wet
- 7 Store cements away from cold or heat
- 8 Allow a longer cure time in cold conditions
- 9 Avoid "puddling" excess cement in sockets
- 10 Don't thin solvent cements, or leave the lid off the can during use.
If it becomes jelled, do not use

Threaded Connections

Wrap the male threads with PTFE tape, and apply a thin layer of silicone sealer. It is essential that there are no bare threads and that the tape is evenly wrapped. Screw the fittings together, and tighten slightly with wrench if required.

1. UNDERWATER LIGHT

If you intend to use underwater lighting, remember that although it makes the pool look very attractive, it also highlights any slight imperfections in the construction. Extra care must therefore be taken with finishing the surfaces, particularly the pool floor. A felt underlay is definitely recommended.

Ideally install underwater lights on the side of the pool closest to the areas where people will sit or view the pool. The light units will then not be visible and the overall effect will be one of a glow around the pool. The best location for the lights will therefore be on one of the longer sides, either centrally for one light or equidistant from the end wall for two units.

Follow these instructions in conjunction with Figure H.

- a. Take the underwater light from the box and remove the light unit, face plate and gaskets from the niche (storing them carefully, as they will not be required until the liner is installed). You should be left with the niche, flexible conduit and screw in gland and rubber ring.
- b. Install the niche into the wall at the third course of blocks making sure you cement it in securely. The unit must stand 12.5mm ($\frac{1}{2}$ ") proud of the wall to enable the rendering to be 12.5mm ($\frac{1}{2}$ ") thick.
- c. The conduit hole on the light unit should be at the very top of the unit. In order to make the threading of the light cable to the deck box as easy as possible, the flexible cable conduit must be laid with curves and not angles, see Figure H. The flexible conduit should then be attached to the niche by means of a watertight joint to the light unit. Connect the other end of the conduit to the deck box as in Figure H.
- d. Cooling for the light unit is provided by the water which surrounds it. In order to prevent water entering the deck box when the pool level rises too high the screw in gland and rubber ring should be fitted to seal the cable. Make sure you locate the terminal block well up in the deck box and keep the 'O' ring seal to the box clean and lightly greased with silicone grease. This seal prevents rain water etc. from entering.
- e. For wiring details see the section 'Electrical Services'.

2. RETURN INLETS

Having laid the fourth course of blocks, the inlet fittings which return the clean filtered water from the filter via the heater - if fitted - must be installed as follows:

- a. Remove the flange plate, gasket, eyeball housing and screws. These items again must be carefully stored for fitting during the liner installation.
- b. Cement the pre-plumbed inlet into position in the wall, making sure the chamfered front plate stands $\frac{1}{2}$ " proud of the wall to allow for the rendering, if you intend to render the pool walls. See Figure G & H.

3. SURFACE SKIMMER(S)

The surface skimmers have a dual role. Not only do they remove floating debris, oil based contaminants and insects from the water surface but by the addition of a "kornea", after removing the collar weir assembly, the suction cleaner hose whether manual or automatic can be connected and used to vacuum the bottom of the pool. In most pools one skimmer is adequate but if the pool is installed in a location where it will be susceptible to large amounts of wind borne debris, two may be needed, as will probably be the case when installing in large pools.

Always remember to consider the prevailing wind direction when siting the skimmer(s). It is preferable for the debris etc. to be blown towards the skimmer to ease its removal.

Ideally if the skimmer is to be used as the vacuuming point it should be located centrally in one of the longer sides of the pool. There is a case for installing a second skimmer if the wind blown debris is found to always arrive at the short end of the pool. Ask your supplier for advice about skimmers if you are unsure about the number to use or their location.

Figure G

Possible pool flow control fittings and pipework layout. Please consult your supplier for ideal positioning as most pools differ.

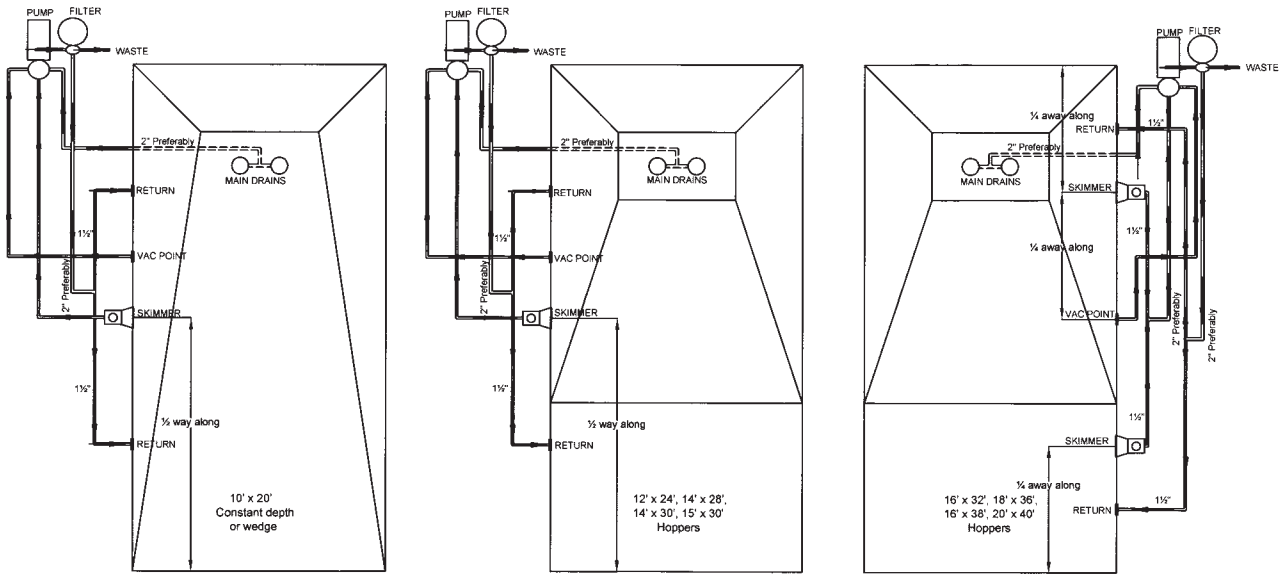
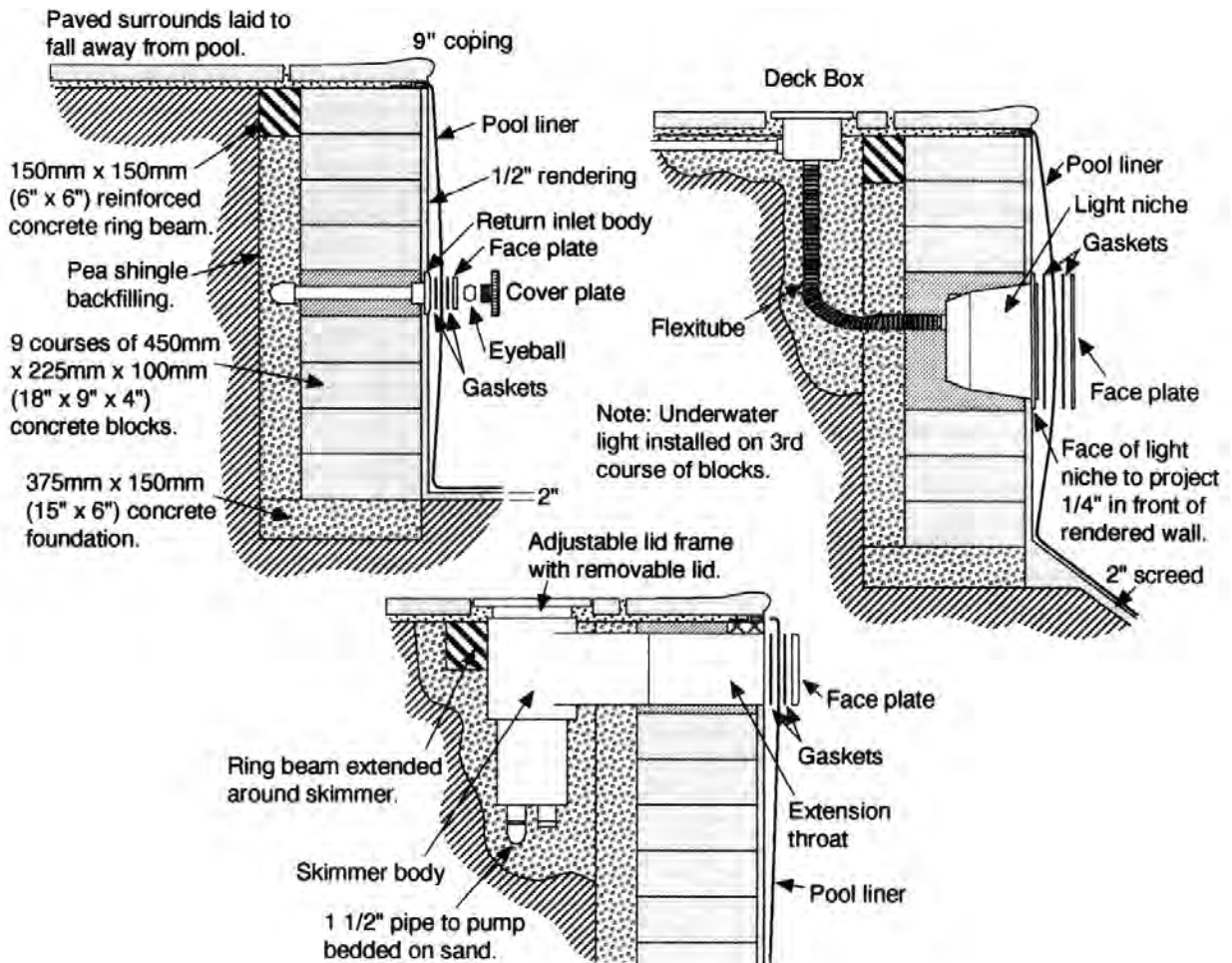


Figure H

Note: If installing a vacuum point, position just below the water line.



- a. The skimmer itself comes as one unit, ready for installation.
- b. Again remove and store the flangeplate, gasket, cover plate and screws, plus the collar weir and basket assembly until the liner is installed.
- c. The bottom of the skimmer body has a threaded outlet. Fit a threaded reducer and socket nipple ready to receive the suction pipeline back to the filter.
- d. Install the skimmer 25mm (1") down from the top of the pool wall on the seventh course of blocks. Make sure it is laid on a bed of cement with the front plate of the throat projecting 12.5mm (½") from the wall to again allow for the thickness of the rendering, if rendering the walls of the pool.
- e. Carefully level and securely cement the fitting into position (please note: it is advisable to support the main body behind the wall as well as placing a concrete block over the top of the throat to help to keep the fitting in position while the cement hardens).
- f. Fit short lengths of reinforcing rod across the top of the skimmer throat, and finish it with a strong sharp sand/cement mix, flush with the top of the wall, for subsequent fixing of the linerlock track. Newspaper should be inserted into the main skimmer body to prevent general debris from entering the pipeline while work is in progress.
- g. Take care to protect the skimmer body during backfilling, adequately supporting it to prevent movement which would damage the skimmer and its connections. Sand should be used around the skimmer body.

4. **VACUUM POINT**

This is a wall fitting. It must be installed 15" below the coping and allows connection of an automatic pool cleaner. It resembles a return inlet fitting but has a cover (removable) to stop debris entering the fitting when it is not being used.

ROMAN END STEPS (OPTIONAL EXTRA)

Roman End Steps can be installed in most pools. Depending on the choice of liner design, the pre-formed steps (white fibreglass) are finished with or without a tile band closely matching that of the liner. Figure J shows the design of the step unit which is semi-circular and provides safe and easy access to the shallow end of the pool. The treads of the steps are non-slip and give confidence to both children and elderly people.

RECTANGULAR STEPS

This design, see Figure K, can be fitted to the Shallow or Deep end of the pool and, although manufactured in the same way as the Roman End Steps, is smaller in size and rectangular in shape.

INSTALLATION OF WALK IN STEP UNITS

1. All the concrete foundations for the perimeter walls, including the step section, must be completed around the whole pool and at least the first layer of blocks must be laid across the step area.
2. The excavation for the step must be dug to a 45 degree slope with a sufficient clearance for subsequent backfilling with concrete.
3. The step unit should be placed in position, again with 12.5mm (½") protruding in front of the pool wall to allow for rendering, if rendering the pool walls. The flanges on both sides of the step unit, must have the block pool walls laid to butt tightly against them.
4. Drill a 12.5mm (½") diameter hole through the step flange (fibreglass) and pass a 300mm (12", approximately) length of reinforcing rod with a cranked end through this flange, this should be positioned and wired around a vertical section of reinforcing rod and bedded into each course of blocks.
5. Concrete should be carefully placed at each end of the step unit, once the blockwork has set to fully anchor the reinforcement. It may be necessary to chock up the back of the step unit to keep it level.
6. The mix to infill the gap beneath the steps should be 8:1 dry lean sand/cement.
7. Each step must be infilled one at a time using the mixture given in item 6 and carefully but firmly tamped down to remove all gaps and spaces. This will prevent the steps from moving and feel solid to the tread.

Figure J

Fibreglass Roman end steps.

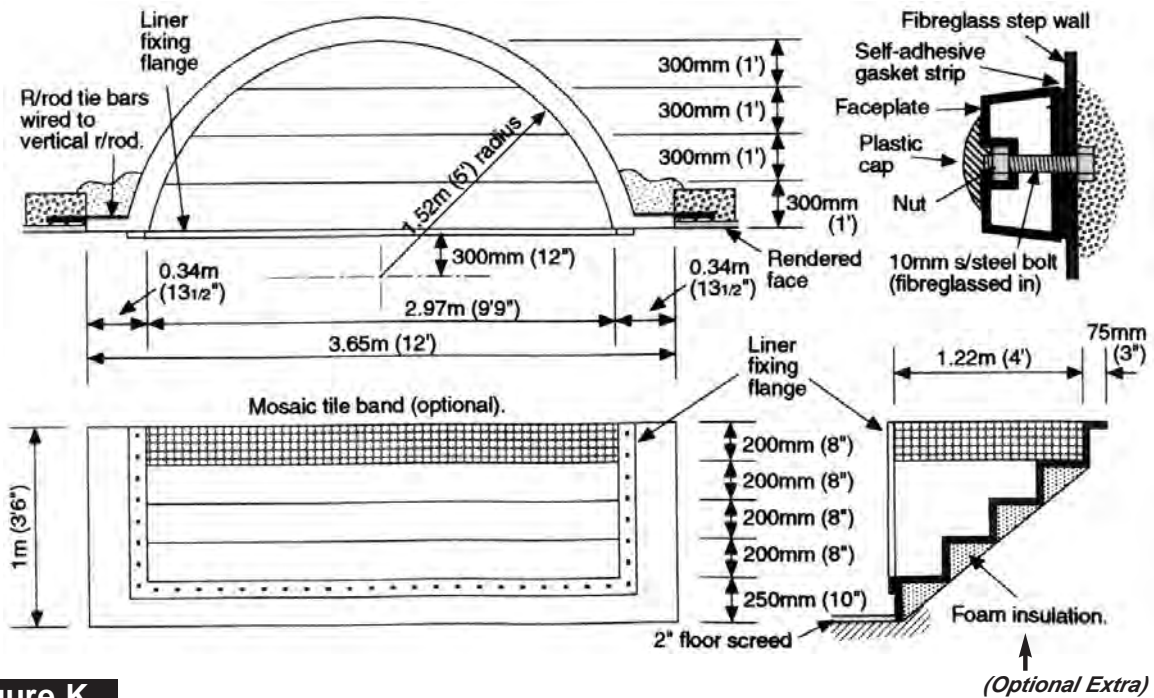
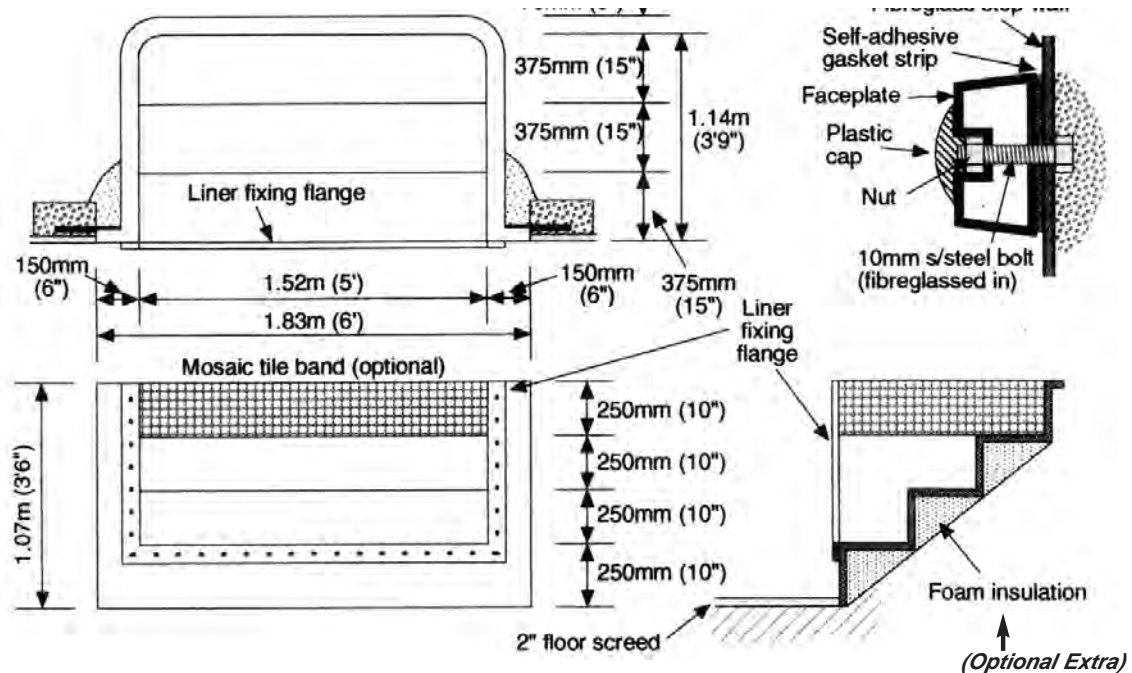


Figure K

Fibreglass Rectangular steps.



INTERNAL RENDERING

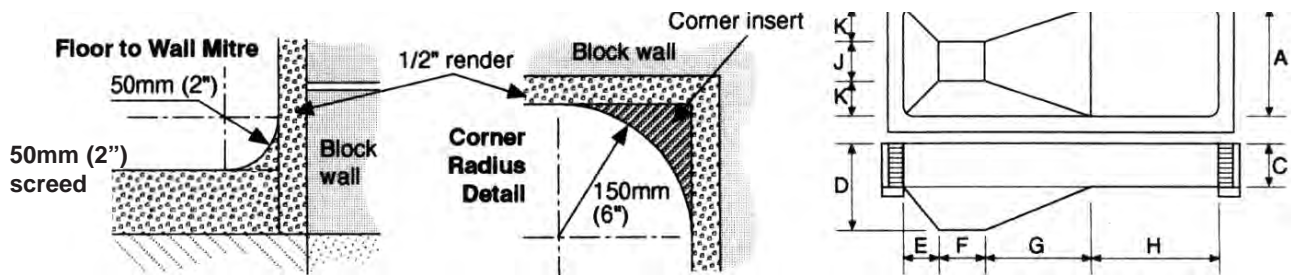
Note: Extra care must be taken to avoid damaging the underwater light or flow control fittings when rendering the pool. All faces and screw holes must be masked up with tape prior to commencement of the work.

The overall look of the pool as well as the life of the liner will be greatly improved if a smooth finish is obtained when the inside is rendered. If you do not feel confident in obtaining a good rendered finish it might be worth employing a craftsman to do this job. See Figure L for the finished dimensions.

You can leave out the render if you keep your block work joints neat enough. Just use the underlay on the walls.

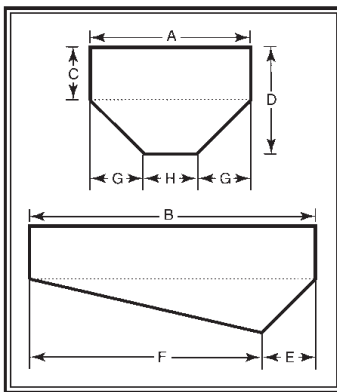
FINISHED SCREED DIMENSIONS (HOPPER)

Finished internal pool dimensions.



Pool Size	Profile	A	B	H	G	F	E	K	J	C Shallow End	D Deep End
10' x 20'	N.S.P.I. I	10'	20'	CONSTANT DEPTH						4'	N/A
12' x 24'	N.S.P.I. I	12'	24'	8'	8'6"	4'6"	3'	3'	6'	3'4"	6'
14' x 28'	N.S.P.I. I	14'	28'	10'	9'	5'	4'	4'	6'	3'4"	7'
14' x 30'	N.S.P.I. I	14'	30'	10'	11'	4'	5'	5'	4'	3'4"	7'
15' x 30'	N.S.P.I. I	15'	30'	10'	11'	5'	4'	4'	7'	3'4"	7'
16' x 32'	N.S.P.I. II	16'	32'	8'	14'	6'	4'	4'	8'	3'4"	8'
16' x 38'	N.S.P.I. II	16'	38'	12'	14'	8'	4'	4'	8'	3'4"	8'
18' x 36'	N.S.P.I. II	18'	36'	10'	14'	8'	4'	4'	10'	3'4"	8'
20' x 40'	N.S.P.I. II	20'	40'	12'	14'	10'	4'	4'	12'	3'4"	8'6"

FINISHED SCREED DIMENSIONS (WEDGE)



WEDGE

Size	A	B	C	D	E	F	G	H
10'x20'	10'	20'	3'4"	5'	1'6"	18'6"	1'6"	7'
12'x24'	12'	24'	3'4"	6'	3'	21'	3'	6'
14'x28'	14'	28'	3'4"	7'	4'	24'	4'	6'
14'x30'	14'	30'	3'4"	7'	5'	25'	5'	4'
15'x30'	15'	30'	3'4"	7'	4'	26'	4'	7'
16'x32'	16'	32'	3'4"	8'	4'	28'	4'	8'
16'x38'	16'	38'	3'4"	8'	4'	34'	4'	8'
18'x36'	18'	36'	3'4"	8'	4'	32'	4'	10'
20'x40'	20'	40'	3'4"	8'6"	4'	36'	4'	12'

PROCEDURE

- Using masonry nails attached to the top of the pool walls, fit temporary timber battens so that 12.5mm ($\frac{1}{2}$ ") stands proud of the wall. This will give a guideline to work to for the rendering, to ensure that a finished depth of 12.5mm ($\frac{1}{2}$ ") is achieved.
- A mix of 4:1 sand/cement is used. Particularly taking care that BS 1200 grade sand is available for this job.
- Using a wooden float lay up the rendering to the face of the battens and smooth off with a steel trowel. In order to correct any unevenness in the blockwork it is often advisable to apply a scratch coat first.
- When the rendering is completely dry, tape the corner inserts into position.

MAIN DRAIN SUCTION FITTINGS

The main drains are located in the centre of the deepest section of the pool and have two roles:-

1. Efficient filtration and even heat distribution will be obtained as water is drawn from the deepest section of the pool.
2. The pool can be drained by pumping the water out of the drains via the filtration plant, see Figures L and M.

Figure L

Main drain suction fittings.

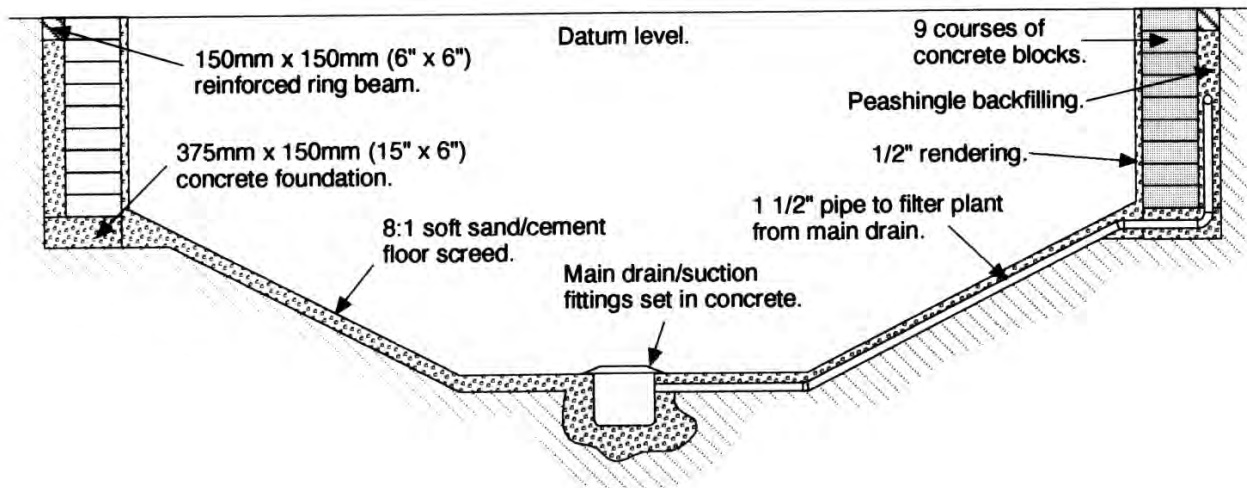
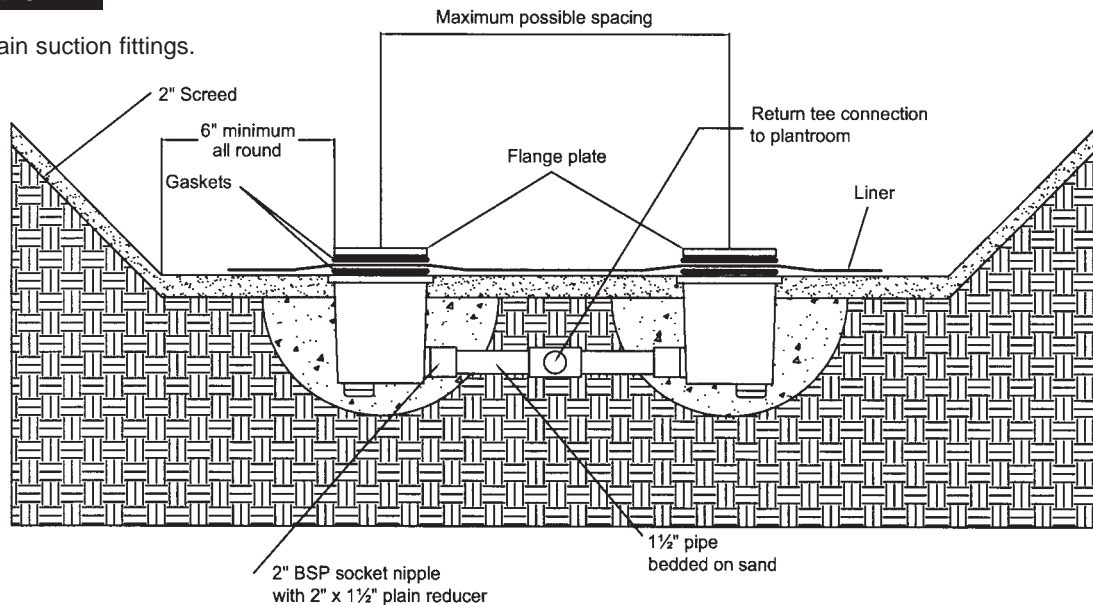


Figure M

Main drain suction fittings.



INSTALLATION

SPATA regulations now specify that a minimum of two bottom suction points (maindrains) should be installed in any swimming pool for safety reasons and these instructions reflect that requirement.

Check once again that the depth of the deep end of the floor is correct, allowing for the 50mm (2") screed which is to be applied after the fitting of the maindrains as follows:

1. Remove all flanges, gaskets, faceplates and fixing screws, storing in a safe place, with the exception of the protective disposable cover.

2. Use the 1½" threaded plugs and P.T.F.E. tape to seal the bottom outlets of the maindrains
3. Fit 2" x 1½" Threaded reducing bushes and 1-½" socket nipples to the side outlets of each drain and then connect the two drains together, inserting a tee centrally with the central outlet facing horizontally towards the suction pipe already installed in the pit. The minimum distance centre to centre between the maindrains should be 750mm (30"). Care must be taken however to ensure that a minimum distance of 150mm (6") is allowed between the outside edge of the drain flanges and the transition points between the flat and sloping sides of the pool floor. This will help avoid unsightly distortion of the liner.
4. After first removing the sealing plastic sheet, adjust length of the drain suction pipe already installed and connect to the maindrains via the tee.
5. Set the drains into their final positions and concrete in place, once more remembering to allow for the 50mm (2") floor screed which is to be applied later.
6. Backfill the suction pipework with sand.

FLOOR PREPARATION

1. Measure 1m (3' 4") down the walls from the top of the pool and mark a chalk line around the whole of the perimeter of the rendered walls. This will be the finished floor level.
2. Measure along the line and mark off the basin dimensions together with the shallow end line.
3. Fix 3 masonry nails on each long side and 2 on each short side at these points.
4. Attach string lines to these nails, from end to end and side to side, then pull taut.
5. With a plumb bob or straight edge and spirit level, transfer and thereby locate the four corners of the basin bottom. Identify each corner with a peg, driven into the ground to ensure that the top of the pegs are level with the finished basin floor.
6. Tie string to these pegs and to the masonry nails in the walls which will then indicate the finished sloping sides of the basin.
7. Attach temporary battens around the perimeter of the basin and across the shallow end of the pool to help obtain an accurate finished floor screed.

FLOOR SCREED

1. Use a 6:1 soft sand/cement mix for the floor screed. Note: It is vital that a soft, BS grade sand is used, on no account should sharp sand be used, unless a felt underlay is to be used, and then that sharp sand is preferable, as it will give a stronger screed.
2. Check all dimensions are to Figure K.
3. Make sure the sand is clean and does not contain stones. The consistency of the mix should be damp, but not wet.
4. Using a wooden float spread the screed mix down the sloping sides of the basin first. Checking with the string laid out across the area as you go.
5. Using a timber batten level off the screed and then use a trowel to give a smooth finish to the area. Continue in the same manner to level and smooth the basin bottom and work back up the slope to the shallow end of the pool.
6. At the angle between the walls and the floor form a small rounded cove at the shallow end. This will help to get a good fit for the liner.
7. Take out all pegs, battens and nails when the floor screed is finished and make good any disturbed areas.
8. Do not walk on the floor screed the next day unless absolutely necessary.
9. A point to note; the screed is porous enough to allow surface water to drain through.

BACKFILLING

1. Backfill the pool walls up to the 3rd course of blockwork, (immediately beneath the return inlet fittings). Clean pea shingle or small chippings must be used. This will ensure that consolidation occurs. TAKE CARE NOT TO DAMAGE PIPEWORK.
2. Connect the pipework to the two return inlet fittings using a 90° elbow on each pipetail. Then return to a 'T' piece centrally positioned between the two fittings to allow the flow to be equalised.
3. Extend a common line from this 'T' piece to the location of the filter, this can be in 2" pipe for increased flow.
4. Cut the pipeline from the main drain fitting to the required height and using a 90° elbow turn the pipe to run adjacent to, but not touching, the return line. Again this can be in 2" pipe for increased flow.
5. Extend the suction line from the bottom of the surface skimmer body in a similar manner.
6. In a similar way extend the suction line from the vacuum point, four lines should now run together from the filter location.
7. Lay the pipework on a 50mm (2") thick layer of sand, then cover it with another 50mm (2") layer to give a 'sandwich' effect. This will give the pipe protection.
8. Continue backfilling to 150mm (6") below the top of the wall.

PIPEWORK AND PLUMBING

The pump and filter can be positioned within 3m (10') of the pool and the kit contains sufficient pipework and fittings to achieve this. If however you wish to locate the filtration plant further away from the pool additional pipework and fittings can be obtained from your supplier.

1. Lay the pipelines from the pool to the filter plant well below the top water level of the pool.
2. If possible the plant should be installed so that the pump suction connection is at this same level. This will aid priming.
3. Dig a trench from the pool to the filter plant location and lay the 4 pipes approximately 225mm (9") apart on a sand base.
4. Cover the pipes with at least 50mm (2") of sand. Carefully backfill the trench.
5. If the filtration plant is installed above the water level, extend the pipelines below water level before rising vertically immediately before the pump.
6. Consult your supplier if you have to install the plant above or below the surround level.

CONCRETE RING BEAM

If the Winter is very cold and thick ice forms on the surface, the top 6" of the pool has to withstand considerable pressure. This area then becomes very vulnerable.

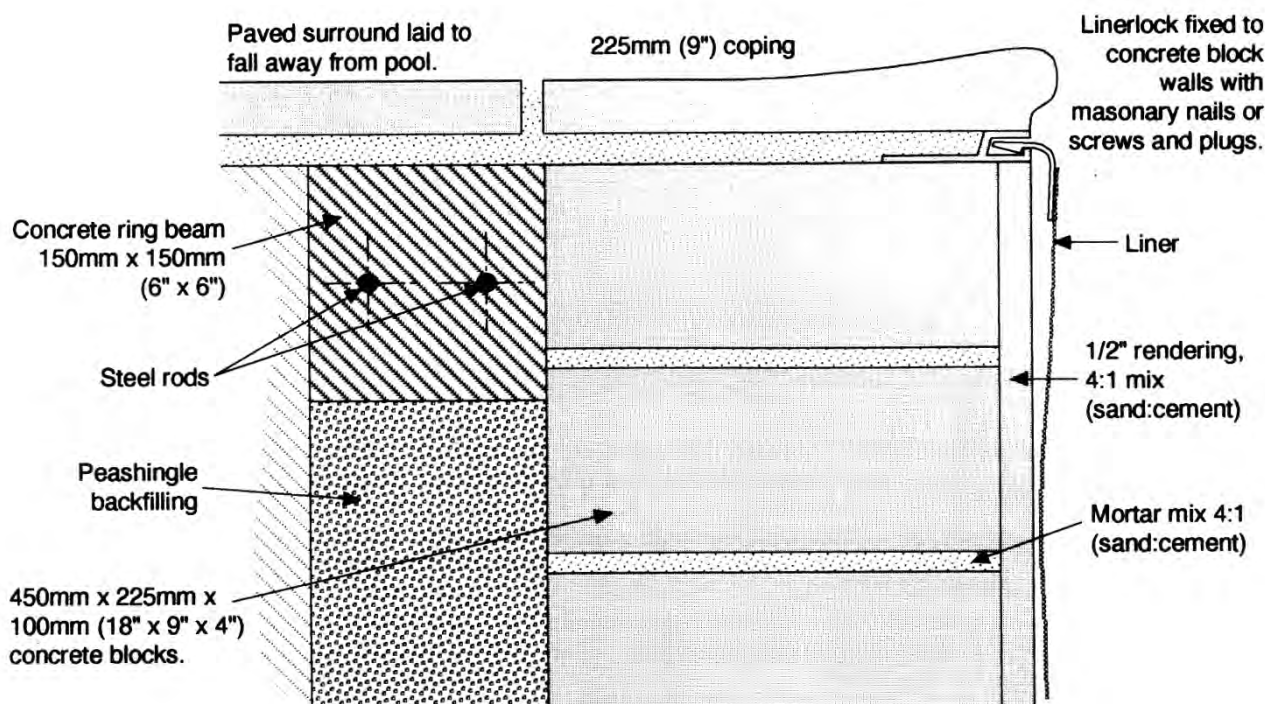
Provision must be made at this stage for the pool step fixings (and other deck fittings if applicable).

See page 20 - 22.

1. The solution to this is to strengthen this 'vulnerable area' with a concrete ring beam (see figure N), 150mm x 150mm (6" x 6") reinforced with two 12mm (½") diameter high tensile reinforcing rods.
2. The beam must be cast in a concrete mix of 1:8 cement/(¾") to dust all in aggregate, behind the top of the perimeter walls, extending around the skimmer body and Roman End or square walk-in steps.
3. Shuttering, made up of scaffolding boards or similar size planks, held in place by concrete blocks or pegs should be used whilst casting the beam.
4. If you are to install stainless steel steps, diving boards, a slide or other deck equipment, this is the stage at which to plan the foundations for these items. See later sections in this manual for details.

Figure N

Ring beam, coping and linerlock detail.



LINERLOCK

In order to make the pool look good it is essential that the top of the block wall is completely flat and level. Any undulations in the linerlock will be easily seen and annoying to the eye.

1. Scrape off any surplus protruding mortar around the perimeter of the top of the wall using a section of concrete block.
2. Fit the linerlock corner sections first. Make sure they are flush with the walls and set square.
3. Next fit the straight sections. Make sure they are also flush with the internal face of the finished pool wall.
4. Pre-drill through the flat section of the linerlock and fix to the top of the wall with plastic plugs and $\frac{3}{4}$ " No.8 stainless steel Round Head screws at 225mm (9") intervals or masonry nails as supplied.
5. If steps are installed the linerlock must extend over the fibreglass side reveals up to the liner edge of the faceplate.
6. Fix the linerlock to the top of the glass fibre reveals with Stainless Steel self tapping screws in these areas.
7. Fit a further section of linerlock across the top of temporary bulkhead panel as detailed later.

LINER PREPARATION

1. Closely examine the whole of the pool interior. Remove any stones, gravel and protruding pieces of cement and anything that might damage the liner.
2. If you are fitting a step unit make sure the temporary bulkhead panel is installed (see later in the manual) and taped prior to fitting the liner.
3. Make good any small defects in the floor screed or wall surfaces with a neat cement mix and lightly rub down all the area with carborundum paper.
4. Remove any masking tape from the pool fittings and carefully clean up the faces, paying particular attention to the screw holes. Any debris left on the fittings or holes could cause the plastic to crack when the unit is screwed up tightly.

5. Remove any plastic plugs and the newspaper from the main drain body.
6. Brush out the pool with a soft brush/broom and vacuum up the final dust and debris.

GASKETS

1. Carefully fit the self adhesive gaskets to the return inlets, vacuum point and underwater light assemblies.
2. Temporarily fit the gasket to the face of the main drain and surface skimmer/s with Bostik or similar clear adhesive.

LINER UNDERLAY (OPTIONAL)

In order to provide some degree of insulation/protection against abrasion between the liner and the floor and wall screed, a felt underlay can be fitted.

1. Cut the underlay to size and shape using a 'Stanley' knife or similar.
2. Butt the joints and tape up with the tape provided. Caution must be used with fixing tapes, colour may effect the liner over time, only use specially provided tape.

LINER INSTALLATION

1. Check that the pool is free of all dust and debris.
2. Choose a warm, sunny day, if possible. The liner is slightly smaller than the size of the pool to allow it to be stretched during installation and thereby give a crease free, wrinkle free, perfect fit.
3. Store the liner in a warm environment for 2/3 days prior to fitting in order to make it as pliable as possible.
4. Ensure that everyone who will be helping with the liner installation only enters the pool bare-foot. **YOU MUST AVOID PUNCTURING THE LINER.**
5. Take the liner out of its box and place it in the centre of the shallow end floor.
6. A label attached to the liner will indicate the position of the deep end. Make sure you have placed this label facing the deep end.
7. Unroll the liner down the length of the pool. Unfold it. The liner has a special beading welding to the top edge that clips into an aperture of the linerlock (already fixed to the top of the perimeter walls of the pool).
8. Make sure the corners of the liner are in the correct position for the pool corners at floor level.
9. Starting at one of the shallow end corners, push the liner into the corner with your foot and, keeping this pressure, lift the liner wall and feed the beading at the top into the linerlock until it is held into position.
10. Work around the entire pool in the same manner, locking the beading into the track as you go. Make sure the four corners are located correctly, sliding the liner along to make sure this is possible.
11. Make sure the deep end area is positioned as close as possible to the pool profile.

VACUUMING THE LINER INTO POSITION

The most effective way of positioning the liner is by drawing out the air trapped behind it and this can best be achieved by using an industrial wet and dry vacuum cleaner. These can be hired from a local hire shop and it successfully draws the liner back to the walls ensuring an exact fit. In order to get the best result it is advisable to take the following precautions:-

1. Using masking tape, seal the 4 open ends of the pipes connected to the skimmer, inlets, main drain and vac point.
2. Seal the joint between the rear edge of the linerlock and the top of the wall with a neat cement mix to reduce the possibility of air being drawn in between the linerlock and wall.
3. Approximately 450mm (18") from one of the deep end corners lift a small length of the liner beading out of the linerlock track and very carefully push the vacuum cleaner hose down behind the liner. Push the hose down to within 6" of the base of the wall.
4. Seal the gap around the hose with tape or wet towels and turn the vacuum cleaner on.
5. The liner will be sucked back to the walls and floor. Check that the corners are fitting correctly at this point. Also check that the floor seams align with the base of the wall.
6. There may be some tension at the base of the walls if the liner has not been sucked back fully, but this will correct itself when the pool is filled provided that the tension is equal all round.
7. If you have vertical creases from the floor seam to the top of the wall. Turn off the vacuum and slide the liner along the linerlock to remove the creases.
8. Switch on the vacuum cleaner and check that the liner is fitting properly.

Only proceed once you are satisfied with the fit of the liner. On no account, cut any fittings until the liner is correctly positioned or fill with water, which will stretch the liner material.

9. When you are satisfied fill the pool with 75mm (3") of water all over the deep end base.
10. Cut out the main drain fitting.

CUTTING OUT THE MAIN DRAINS

1. Take a Philips screwdriver, Stanley knife and bradawl down into the bottom of the pool. Also take the main drain flange plates, gaskets, grilles and screws with you.
2. Puncture each of the screw holes in the main drain face plates with a bradawl. The outline of the plates will be easily visible through the liner.
3. Locate the flange plates and gaskets on top of the liner and align the screw holes.
4. Fit the screws carefully, taking care to work on diagonally opposite screws in turn. This will allow the plates to be evenly screwed down.
5. Tighten all screws.
6. When secure, carefully cut out the liner held in the centre of the flange plates.
7. Fit the grilles with the screws provided.
8. Continue to fill the pool. Switch off the vacuum cleaner when the pool has filled to a level of 150mm (6") above the shallow end floor.
9. Remove the vacuum cleaner from behind the liner and replace the beading into the linerlock.

INSTALLATION OF THE LINER AROUND A ROMAN END OR RECTANGULAR STEPS (OPTIONAL EXTRAS)

Both of these types of steps incorporate a neoprene gasket and flange plate which seals the joint with the liner. Stainless steel bolts secure the flange plate into the shell of the step unit. (See figures J & K earlier).

1. Remove the flange plate, leaving the gasket in position.
2. Fit a temporary bulkhead (plywood or similar) across the opening into the steps. Fix this panel by fixing it to a scaffold board laid across the top of the steps and strutted back against the step risers.
3. Make sure this bulkhead is firmly anchored to take the weight of the rising water.
4. **CARE MUST BE TAKEN IN HANDLING THE STEPS.** The glass fibre surfaces of the steps are vulnerable to damage and care must be taken to protect them.
5. Seal the edges of the bulkhead panel against the base and two sides of the step unit with masking tape.
6. As a temporary measure fit a section of linerlock across the top of the bulkhead to take the liner. This section of liner will eventually be cut away.
7. Once the pool has filled to a level of 150mm (6") above the shallow end floor remove the liner bead from the track across the temporary bulkhead panel. The weight of the water will stretch the liner into the floor cove beneath the step unit.
8. The location of the flange bolts will now be evident as they will protrude through the liner.
9. Carefully pierce the liner at the top of each bolt projection with a sharp knife and this will allow the bolt to penetrate through the material.
10. Position the flange plate (with gasket) over the projecting bolts and screw the nuts in place, working first along the bottom of the flange.
11. Tighten all nuts using a box spanner. Fit the plastic caps to each nut.
12. Remove the temporary bulkhead panel.
13. Carefully cut out the section of liner that has been trapped.

CUTTING OUT THE UNDERWATER LIGHT FITTING (OPTIONAL EXTRA)

1. **DO NOT** cut out the underwater light fitting until the water level is immediately below the light. (See figure H earlier).
2. Locate the holes and pierce them with a bradawl.
3. Align the flange plate (with gasket) and tighten the screws. Make sure that you work in diagonally opposite pairs to evenly secure the fitting.
4. When secure carefully cut out the inner circle of liner.
5. Fit the internal lamp unit into the niche by passing the cable through the conduit up to the deck box, making sure that you leave any extra cable wound round the lamp unit to facilitate lifting the unit above the water line to change the bulb. **DO NOT SHORTEN THE CABLE IN ANY WAY.**
6. Secure the lamp unit in the niche, it is a push fit (four metal clamps on the back of the light unit connect with the four raised areas in the niche) and seal the cable entry by tightening the compression fitting at the base of the deck box.

CUTTING OUT THE RETURN INLET FITTINGS

1. DO NOT cut out the return inlet fittings until the water level is immediately below the fitting. If the liner is cut too soon, stretching may occur and unsightly creases form around the fitting. (See figure H earlier).
2. Locate the screw holes and pierce them with a bradawl.
3. Align the flange plate (with gasket) and tighten the screws. Making sure that you work in diagonally opposite pairs to evenly secure the fitting.
4. When secure, carefully cut out the inner circle of liner.
5. Screw the eyeball housing assembly into position.

CUTTING OUT THE VACUUM POINT (IF FITTED)

1. DO NOT cut out the vacuum fitting until the water level is immediately below the fitting. If the liner is cut too soon, stretching may occur and unsightly creases form around the fitting.
2. Locate the screw holes and pierce them with a bradawl.
3. Align the flange plate (with gasket) and tighten the screws. Make sure that you work in diagonally opposite pairs to evenly secure the fitting.
4. When secure, carefully cut out the inner circle of liner.
5. Screw the threaded cap in place.

CUTTING THE SURFACE SKIMMER FITTING

1. DO NOT cut out the surface skimmer fitting until the water level is immediately below the skimmer extension throat. If the liner is cut too soon, stretching may occur and unsightly creases form around the fitting. (See figure H earlier).
2. Locate the screw holes and pierce them with a bradawl.
3. Align the flange plate (with gasket) and tighten the screws. Making sure that you work in diagonally opposite pairs to evenly secure the fitting.
4. When secure, carefully cut out the inner rectangle of liner.
5. Snap the cover plate in position over the flange plate.
6. Remove the newspaper, clean out the skimmer body and fit the collar weir and basket assembly.
7. Finish filling the pool until the water level is up to half way up the skimmer mouth, this represents the normal water level.
8. For commissioning purposes top up the pool by an extra 1" of water.

LINER CORNERS

It is highly likely that some tension will be noticeable at the corners of the pool. This is perfectly normal.

COPINGS

The copings are 9" wide and have a bullnose front edge. The straight lengths are 2' long and the corners have a radius of 6". Additional copings are used on a Roman End or rectangular steps.

1. Remove all dust and dirt from the top of the pool block walls.
2. Apply a cement slurry to the top of the walls to act as a bonding agent. This slurry should be of a thick cream consistency and painted on both the copings and the blockwork prior to laying.
3. Spread a 6:1 sand and cement fillet on the top of the pool walls and make sure this is evenly spread and level. The finished layer should protrude marginally above the linerlock track.
4. Lay the four corner copings first. Each coping should overlap the linerlock by 9.5mm ($\frac{3}{8}$ ") to cover it up.
5. Stretch a taut string between each corner to ensure that the straight copings are all in line along the sides. Always work from the corners to the middle. Check that the front and back edges of the copings are level.
6. Take care to make sure the copings are all level. Some units may need more or less mortar due to the fact that they are not all uniform in depth when manufactured. Any copings that need cutting should be in the middle of each side or end, this will look more pleasing to the eye.
7. If any copings need cutting use a carborundum disc cutter, this, again, can be hired.
8. Leave 9.5mm ($\frac{3}{8}$ ") between copings for point. The mixture for pointing is one part silver sand to one part white cement, mixed to a putty consistency.
9. Trowel the mixture into the joints and remove any extra immediately with a damp sponge. Do not scratch any surplus off as this will damage the copings.
10. TAKE CARE NOT TO LET ANY DEBRIS FALL INTO THE POOL OR ONTO THE LINERLOCK

PAVING

The paving around the pool must be laid with a fall away from the rear edge of the perimeter coping to make sure surface water and any dirt or debris is not washed into the pool. The paving slabs are not supplied with the kit.

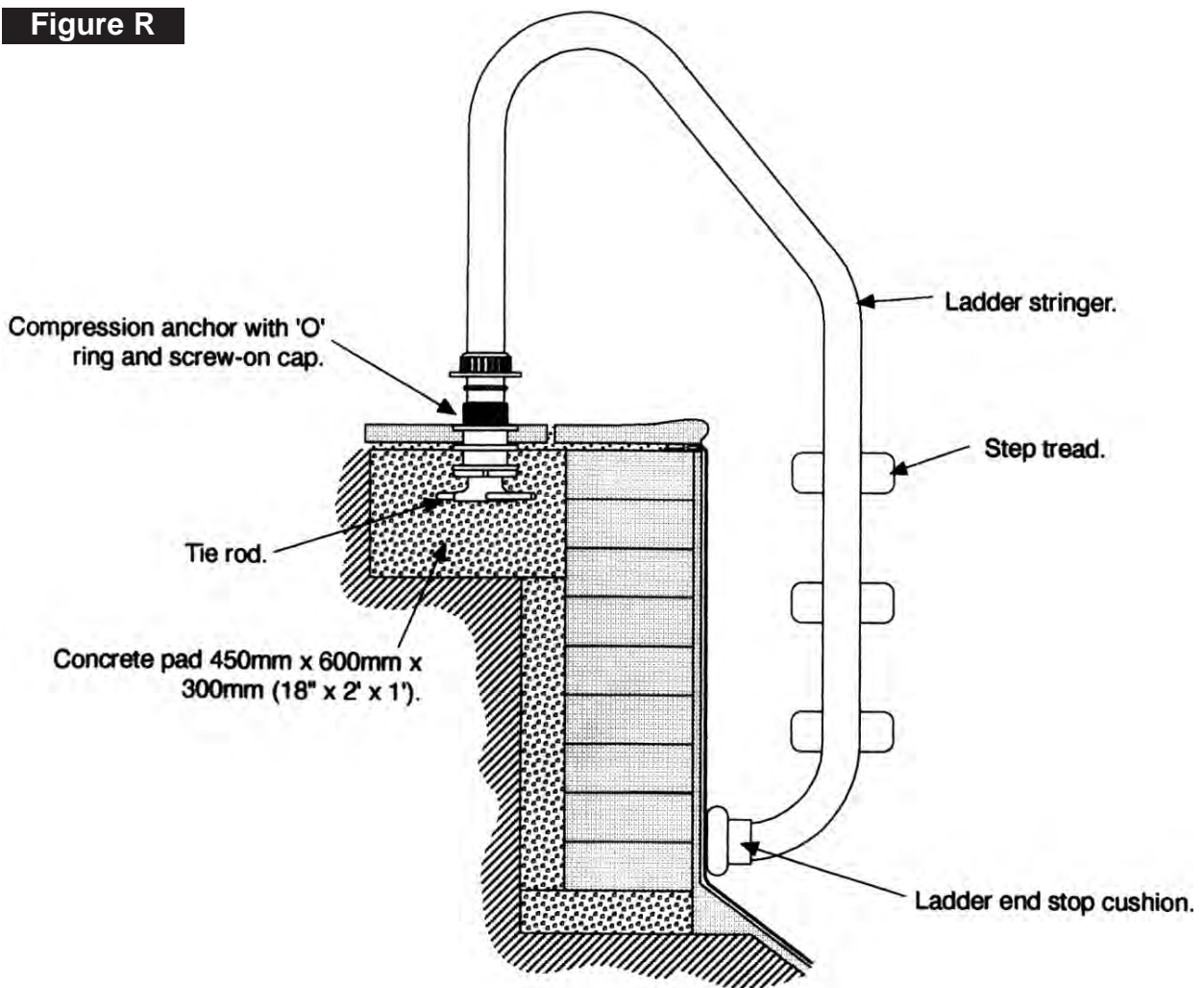
1. Lay a reinforced concrete base 150 mm (6") deep as a raft for any paving to be laid on.
2. A mixture of 1:5 semi dry cement and sand bedding mortar may be used.
3. Leave 12.5mm ($\frac{1}{2}$ ") between slabs for pointing and this should be done using a dry mortar mix well rammed in. The pointing should be slightly recessed to improve drainage as well as the appearance. Take care with any pointing, as you wish to achieve a sealed surface around the pool for water to drain off from.
4. Sponge off surplus cement to avoid damage to the paving slabs.
5. Fit the skimmer frame and lid assembly and install the stainless steel steps where required.
6. Consider the installation of a diving board and any other deck furniture at this stage and also make provision for the electrical services to the underwater light deck box.
7. Settlement may take place for a little while if the pool surrounds have had to be made up. In this case it is advisable to lay the slabs on sand so that they may be levelled again at a later date, then cemented into place.
8. Choose the paving slabs carefully. PAVED AREAS ARE SLIPPERY AND DANGEROUS WHEN WET. Look for textured slabs to minimise danger.

SKIMMER LID ASSEMBLY

The lid frame slips over the top of the skimmer body and allows for a certain amount of flexibility in vertical position. The lid must be set flush with the finished paving.

1. Securely bed the lid frame into position with sand and cement and then cut the paving slabs to fit.
2. Secure the lid.

Figure R



1. Assemble the steps.
2. Check the location of the steps and temporarily support them in their position, make sure the rubber pads firmly touch the side walls of the pool.
3. Fit the compression anchors to each rail and insert a short length of reinforcing rod between the anchors, through the bottom eyelets.
4. Cast the concrete slab using a mix of 1:8 cement $\frac{3}{4}$ " to dust, all in aggregate.
5. Texture the slab to match the surrounds or lay the slab to be at the ring beam level and cut one of the paving slabs to around the projecting anchors.
6. Do not remove the temporary framework holding the steps until the concrete has cured.
7. Do not use the steps for at least one week.

FILTRATION PLANT

The pressure sand filtration system is designed to give a filtration turnover of 8 hours or less and consists of a circulating pump, filter tank and multiport valve.

As with the deck equipment this plant should be installed on a concrete slab, cast 1:8 cement to $\frac{3}{4}$ " to dust all in aggregate mix. It should be located in a position such to achieve flooded suction lines as mentioned in the plumbing section. Consider drainage requirements if the base is below ground level as equipment could be damaged by accidental flooding or by groundwater seeping into the plant chamber. Heating requirements will also determine the size of the plant house as well as the layout. If oil or gas are to be used as fuel then flues and fresh air vents must be considered and the plant house suitably arranged. Seek advice from your supplier.

Don't forget to make the door to the plant house wide enough! This will mean equipment can be removed easily at a later date if required, without dismantling, and allow yourself enough room to carry out routine maintenance and general cleaning and servicing. This also means enough head room!!

The kit comes as standard with enough 1.5" pipe and fittings to allow installation of the equipment within about 3m of the pool side. You may need to purchase additional pipe and fittings if keeping the equipment further away.

You can increase the flow rate of your equipment by purchasing some larger 2" pipe and fittings. If you run a 2" suction line from the main drains, and skimmers if you have two (from the point they tee together), and form the suction manifold in 2" pipe and fittings, whilst installing a 2" return line, the filtration system will be capable of flowing more water, and therefore your equipment will work more efficiently, and keep your water clearer.

Figure S



1. Position the pump and filter tank, so that you can reach the drain plugs. Lightly grease the 'O' ring underneath the multiport valve with silicone grease and, making sure all debris is removed, fit the multiport valve assembly by screwing it home. Refer to the pump and filter instruction for further guidance.
2. Plumb in the three suction lines from the pool to the front of the pump, via ballvalves, and utilising a union, if not provided with the pump itself.
3. The valves allow flow adjustment as well as isolation of the lines.
4. Extend an 1½" pipe from the delivery connection on top of the pump and plumb this to the 'pump' connection on the multiport valve. Make sure a socket union is incorporated going into the multiport valve.
5. Extend the return line back to the pool (in 2" as far as the tee if possible) and connect to the 'return' line on the multiport valve. Again make sure a socket union is incorporated.
6. An isolating ball valve must be used on the return line if the filtration plant is installed below water level.
7. Extend the backwash line from the 'waste' connection on the multiport valve to a suitable discharge point.

Note: The socket unions which are fitted facilitate easy removal of a piece of equipment for maintenance or replacement.

When the filter tank is located in its final position the sand media can be introduced, refer to filter instructions.

1. Undo all the socket unions surrounding the multiport valve.
2. Remove the valve and put to one side.
3. Check the underdrain collector tubes at the bottom of the tank for tightness and pour water into the tank until the tubes are covered to a minimum depth of 15". This prevents damage to the tubes when the sand is added.
4. Using the special funnel provided, pour the sand into the tank. Make sure the funnel is correctly located and that the vertical centre pipe is held in place by the funnel's central hub.
5. Fill the tank two thirds full with sand and level off by hand.
6. Wash any sand off the top of the filter and valve fittings.
7. Lubricate the 'O' ring with silicone grease.
8. Carefully replace the multiport valve, its fixing clamp and its pipework.
9. Having made sure all the pipework lines up, reconnect the socket unions.

PRINCIPLES OF OPERATION

Pool water is drawn from the surface skimmer and the main drain assembly to the circulating pump. Large debris is trapped by the basket in the skimmer body and the strainer basket in the pump priming chamber, before the water enters the top of the filter tank via the multiport valve. The water then passes through the sand media leaving smaller debris as it travels through. The underdrain collector tubes have holes that allow water to escape, but these are not large enough for sand to escape. The filtered water then flows back through the multiport valve and re-enters the pool through the return inlet fittings. The valve on the vacuum point should remain closed unless the vacuum point is being used.

Any heating system must be installed after the filtration system. so that only filtered water passes through it.

Any chemical dosing system must be after any heater, and a non return valve should be fitted between the dosing system and any piece of equipment installed prior to it in the flow.

Eventually there will be a reduction in flow and increase in the pressure gauge reading, due to debris accumulating in the filter. The sand must then be backwashed by reversing the water flow and sending the water to waste. This can cause heating systems to shut down due to reduced flow. Always backwash the filter first if there is a heating problem, as this may cure the problem.

ELECTRICAL SERVICES AND CONNECTIONS

Strict standards are set out by SPATA (the Swimming Pool and Allied Trades Association) with regard to electrical services and connections for pool equipment. A qualified electrician must be employed to work to these guidelines.

In order to conform to current Electrical Regulations a 30 MILLIAMPER EARTH LEAKAGE CIRCUIT BREAKER MUST BE FITTED TO THE ELECTRICAL INSTALLATION OF ALL SWIMMING POOL EQUIPMENT AND ANCILLARY EXTERNAL FITTINGS TO GUARANTEE SAFETY AND CONFORM TO CURRENT ELECTRICAL REGULATIONS.

Refer to the instructions of each appliance for further guidance. If a gas appliance is installed this must be fitted and commissioned by a properly registered installer.

A thermal overload must be incorporated into the starter switch of the circulating pump to protect the motor.

<u>Size of Motor</u>	<u>Thermal Overload</u>
Up to 1 HP	4 - 8 amp
1 HP - 2 HP	7 - 17 amp

It is usual to install the underwater light transformer on the wall of the plant house. It is very important to use the correct size of 3 core PVC insulated steel wire armoured cable, connecting the transformer to the light unit by means of the deck box. 4mm cable can be used if the distance involved is less than 20m but if it is between 20m and 30m, 6mm can be used. There are various separate tapings on the transformer which overcome the different resistance of the cable. refer to the wiring instructions supplied with the light for full instructions.

Run a separate cable for each underwater light from the deck box to its respective transformer.

With the exception of millivolt gas heaters, which do not require a separate electrical supply, all heating systems must be interlocked electrically with the starter switch on the circulating pump to prevent the heater operating when the water is not circulating.

Remember to install a standard 13amp switched socket in the plant house if heaters are needed for frost protection in the Winter months. A light is also desirable should work need to be done after dark.

OPTIONAL EQUIPMENT

Your supplier will be pleased to provide information on the following equipment:

Pool Covers

There are many types of pool cover available, from simple solar covers that trap the sun's heat to fully automatic slatted covers. Using a pool cover will significantly reduce heating costs and chemical use. Winter debris covers are available to protect the pool while it is shut down over the winter.

Automatic Pool Cleaners

Most automatic pool cleaners operate from the vacuum point installed or via a skimmer fitted to a skimmer. They move around the pool removing dirt and debris not collected by the normal filtering process. Fully independent Electric Automatic Pool cleaners are available that will complement any pool.

Control Panel and Control System

Control panels and systems are optional but they do simplify and offer a safer electrical installation. They can combine the filter pump, heating, lighting and cleaning equipment controls into one unit. A time clock may be incorporated to operate some or all of the above equipment.

Chemical Dosing Systems

To save dosing chemicals by hand they can be added to the filtered pool water automatically as the need arises.

Having now installed your swimming pool refer to the Pool Care guide and handbook for maintenance instructions.

HAVE FUN !!

NOTES

SAFETY IN SWIMMING POOLS: Water Outlets from the Pool

Plastica Block & Liner swimming pool kits are designed for private domestic use only. When used with care your pool will be an enjoyable asset. In addition to usual safety precautions attention must be given to the following points.

1) The vacuum point is provided to enable efficient pool "hoovering", either manual or automatic. A high suction is achieved by the vacuum point and as such it can represent a hazard by entrapping hair, clothing or limbs. This hazard can be avoided by closing the vacuum point valve in the plant room and replacing the vacuum point cover after use. **Never use the pool with the vacuum line left open or cover removed.**

2) The bottom drains are used to draw water to the filtration plant in conjunction with the skimmer(s). To avoid excessive (possibly hazardous) flow rate through the drains **the pool must not be operated with only the drains' suction line open.**

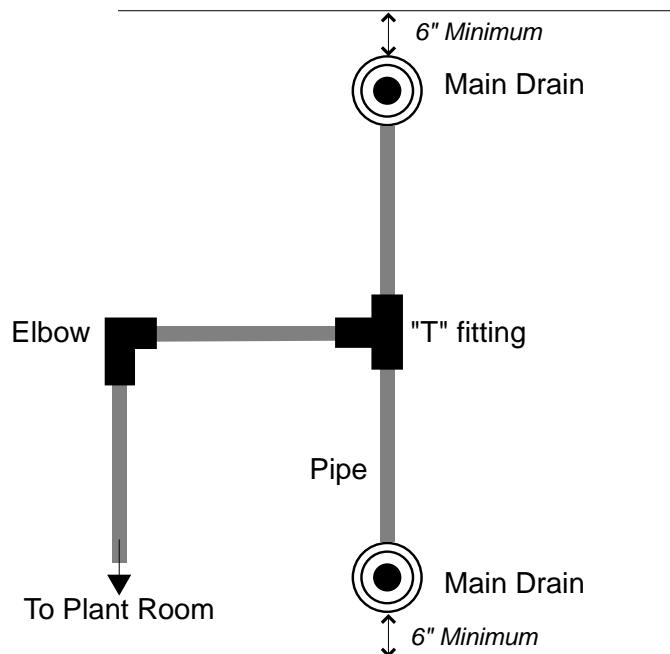
3) To avoid any possible entrapment hazard the drains should be periodically inspected. Make sure the grilles are in good condition: securely fixed with no cracks. **Never use the pool with missing or faulty grilles.**

4) Consider fitting an automatic suction breaking device that can protect against the suction trapping a person on the drains.

ADDITIONAL MAIN DRAIN

To reduce the flow rate through the bottom pool outlet, two main drains are supplied with each Plastica pool kit. Various standards recommend that the drains are situated as far apart from each other so as to make it as difficult as possible to cover both at the same time. For ease of construction and liner fitting the drains should not be installed any closer than 150mm (6") from where any reveal meets the base floor. Join the two drains together using pipe lengths and the opposite connections of a "T" fitting. Run the line to the plant room from the middle connection on the "T" fitting.

If in any doubt at all do not use the pool and consult a competent swimming pool engineer.



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Your local supplier is:

