ABGAL Liners & Covers

Liner Order Form No.4
3D Laser Markouts

Please read the conditions marked with a ★ and fill out all details and tick boxes where applicable.

QUOTE # ..... PRICE $ ..... DATE Required: .....

Your Name: ..... PH: .....

Your Client: ..... Order No: .....

Pool Wall Height: ..... mm or ☐ use 1 panel Width of 1120mm

A to B Measurement: ..... mm Pool Length: ..... mm

Last Point Before B: ..... Pool Width: ..... mm

T/port Co: ..... ☐ P/up Perimeter: ..... mm

All fixing extrusions are in 3m lengths, list quantity of lengths required

Above Water: Retainer EXTRET ..... Capping EXTCAP .....

T-Lock is not available with this style of liner

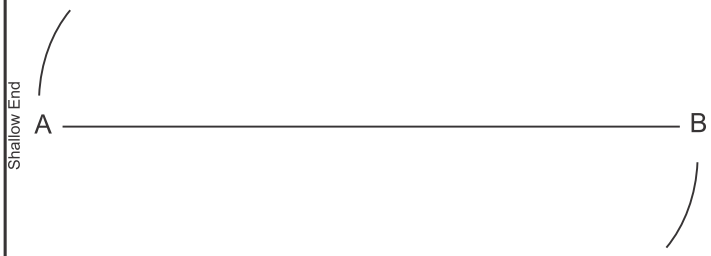
Below Water: W/line Male EXTWL3M ..... W/line Female EXTWL3F .....

Colour Tick ✓

Dark Blue	
Light Blue	
Grenada	
Pacific	
Antique	
Caribbean	
Maldive	
Coral Sand	
Reef Pebble	
Bahama	
Casblanca	
Costa Rica	
Mosaic Tile	
Maui	

NUMBERS ARE TAKEN AS CLOCKWISE FROM A

★ Pool Brand _____ Model _____
(if known)



Vertical wall seam usually starts at A

Check Point or Dish Base Dimensions ☐ Yes, Dish Liner

Refer to instructions Diagram 5 for measuring details

★ These measurements are used to check the accuracy of the point measurements and can also be used for a dish. However, a dish is not common in pools with shaped walls.

Distance from Base Points:		Tight	Loose
Point No.____	Point No.____		
Point No.____	Point No.____		
Point No.____	Point No.____		
Point No.____	Point No.____		
Point No.____	Point No.____		
Point No.____	Point No.____		
Point No.____	Point No.____		
Point No.____	Point No.____		

A dished base liner will be supplied and charged for if the YES box has been ticked, or the loose measurement is more than 8% longer than the tight measurement.

Please supply one pool liner as per these specifications and conditions:

Signed ..... **Date** .....

Additional Notes .....

.....

All liners are custom made and non-returnable. This form is to order liners for pools measured using ABGAL's 3D Laser Measuring System.

Need more info?

There is more detailed information on the other side of this sheet. Refer to the Markout instruction sheet for details on the correct distance between markout points. There is a chart in the sheets indicating the distance between points based on the shape and radius of the pool section being measured. There is also a variety of instructional videos available though Measure Wizard, which is accessed via abgal.com.au Thanks.

Data Reference Details

Instrument Height: _____

Prism Height: _____

Reference Angle: _____

Number of Points: _____

Starting Point No's:		Finishing Point No's:	
TOP	_____	TOP	_____
BAS	_____	BAS	_____
VER	_____	VER	_____
ST1	_____	ST1	_____
ST2	_____	ST2	_____
ST3	_____	ST3	_____
ST4	_____	ST4	_____

Notes: _____

Additional diagram:

Return to
us@abgal.com.au
or Fax 1800 808 786

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PO Box 1566 Browns Plains Business Centre Qld 4118 | www.abgal.com.au
Australia's largest manufacturer of premium liners & covers... Since 1976!

Measuring a Pool Using the 3D Laser System

Equipment needed:

- ☑ Total Station (electronic measuring device)
- ☑ Data recorder (if not built into the Total Station)
- ☑ Tripod
- ☑ Small hand-held prism
- ☑ Builders crayon (Red or Blue is best)
- ☑ Tape measure
- ☑ ABGAL Liner Markout Sheet No.4
- ☑ Piece of flexible plastic to use as a straight edge (E.g. length of female Waterline extrusion or Capping).

When hiring the Total Station, make sure it has been set up for angle and height measuring. This equipment is sensitive and should be handled with care. Check whether there is insurance on the hired equipment - if it is not covered, I would advise making arrangements for your own insurance coverage in the event of accidental damage. Check that the batteries for the Total Station and Data recorder are fully charged before you travel to the pool site.

At the Pool Site:

Once on site, the first step is to mark the measuring point positions around the pool. To save set-up time, have one person mark the points of the pool while the other person sets up the Total Station. There are different models of Total Stations and you should ask for "set-up" instructions of the particular model when you collect it .

Remember, more is better when measuring a swimming pool. It's important to take enough data points to ensure a proper fit of the pool liner. Using the sample pool diagrams on the following pages, start marking the pool. Mark the points around the top of the pool first and space the points according to the pool shape. This means that the points can be spaced about 1200mm apart on straight sections, closer together on curves and spaced about 100 — 150mm apart on corners. Use the point spacing reference chart in this manual as a guide for the required distance between the points.

When you have finished marking the top of the pool, use the flexible straight edge to draw a line around the base of the pool about 1/3 of the way down the cove. (See the diagrams in this manual for the exact position, as this depends on the radius of the cove.)

Mark the base points with the crayon, making sure each base point aligns with each top point. You can insert extra base points in between those that align with the top points, as the base curves are usually a smaller radius than the top points. Using the diagrams on the following pages, draw vertical lines between a top point and a base point. These lines must be vertical as seams will be placed following these lines. A rectangular pool will require vertical lines in each corner. A freeform or kidney shaped pool usually has vertical lines spaced at 2 — 3 meter intervals around the pool and always where the curve changes direction.

Base of the Pool:

If the base of the pool liner is made flat you do not need to take points across the base of the pool. However, if the base has a large dish, or has been shaped with an unusual profile, it is necessary to take points across the base of the pool. The points are taken in straight lines across the base. To position these, use the flexible straight edge and mark the points, spacing them according to the shape of the floor. In other words, if the floor has a dish, the points across the floor will be spaced at 300mm from the edge of the base, increased to a maximum of 1200mm apart in the centre of the pool then reduced in distance until the last point is 300mm away from the base line on the other side of the pool. (See the diagram showing this spacing for more details.)

Steps:

There are 2 ways of dealing with steps in a pool. The first is where the liner does not cover the steps. The steps are tiled and the liner is sealed off around them. This is the preferred method as the issue of enough weight-of-water to hold the liner in place on the steps does not have to be addressed. If the pool has steps that are not being covered by the pool liner, remember to offset the height of the top edge of the bottom step to match the wall height of the pool. This means that you have an imaginary line at the top of the pool, in line with the edge of the bottom step. To do this, measure the height between the imaginary line and the edge of the bottom step then enter that height as the offset prism height.

If the liner is being fitted over the steps, you need to address how the liner steps are going to stay in place, particularly the top step. Decide if additional methods of holding the liner in place are required. If the liner is not properly held in place by the weight of water, it could result in wear on the liner against the pool surface underneath, as well as wrinkling of the liner if it moves. The liner can be held in place using an adhesive or using a fixing extrusion.

To mark the points of the steps, start with the top step and place the points no more than 300mm apart on the straight edges and 50mm apart in the corners. If there is a small vertical radius at the steps, mark the points in the centre of the radius. (See the step diagrams to show you the normal point position and spacing.) After you have marked the perimeter of the top step, continue the points down the vertical sides of the step riser then continue to mark the perimeter points of the next step and so on.

Setting up the Total Station:

The best position for the tripod is in the shallow end of the pool. Ensure that the tripod height is low enough so you can sight all the areas of the pool, especially those closest to the tripod. Set the tripod up and adjust the legs so that the top of the tripod is fairly level. Mark the tips of the tripod's feet on the floor of the pool then make a small indentation into the pool surface so the tips cannot easily move. If the tripod is bumped and moves, it can then be easily repositioned with the indentations. Try to keep the top face of the tripod close to level as you adjust the legs.

Attach the Total Station to the top of the tripod so it is centrally positioned. Rotate the Total Station until the level indicator is parallel with two of the thumb wheel adjusting screws. Adjust one of the screws until the bubble in the level is exactly in the centre between the lines. Rotate the Total Station by 90 degrees and adjust the other thumb wheel until the bubble is centered exactly. Rotate the Total Station again and check that the bubble always remains exactly centred.

You are now ready to “zero” the Total Station. To do this, rotate it vertically 360 degrees. Move the centre section (the part containing the eyepiece) up and down to zero it.

Sight the centre point of the Total Station through the side viewfinder. (The centre point is that point which is directly below the centre of the tripod, on the pool floor.) Mark that point on the base of the pool with a crayon. Now, measure the height of the instrument from the crayon mark to the line on the side of the Total Station. Write this height down as you will have to enter this "Instrument Height" before you start measuring the pool.

Now pick a position on the side of the house, near the pool, to use as a reference for the position of the instrument. This might be the corner of the house near the pool or some other fixed point. Focus the instrument on the point and set the Total Station zero starting point using the menu-driven commands. Write the bearing or angle of this point (it should be zero) on the markout sheet. DO NOT MEASURE TO THIS POINT, just write it down. This reference point can be used to re-home the instrument should the battery fail or you have to stop measuring due to bad weather.

Start measuring:

It's now time to start measuring. Using the menu commands again, enter the job name (E.g. Smith), the instrument height, prism height (which will be 0 if you're using a hand held prism or, if you're using a staff, it will be the height from the centre of the prism to the base point of the staff) and starting point number, which will be 100.

First Point and Alpha Codes:

Place the prism on the first point so that it's facing the instrument and measure the point. After the point has been recorded, you will hear the instrument "beep" and you then enter the "Alpha Code" as TOP. The alpha code tells what part of the pool the point belongs to and it is always only a 3 digit code. You only need to enter these codes when you start with your first point and then only when you change to a different set of points. (i.e. Change the alpha code from TOP to BAS when you have just measured your first BASe point.) These are the only alpha codes to use: TOP (Top of pool), BAS (Base line of pool), VER (Vertical Wall points between the Top and Base), ST1 (Step number 1) , ST2 (Step number 2), ST3 (Step number 3), ST4 (Step number 4) and FLO (Floor points when needed). Only use the codes that are appropriate for the pool you are measuring. Some simple shaped pools without steps will only have the 3 basic alpha codes: TOP, BAS & VER.

After entering the alpha code, the instrument is ready to measure the next point. Have your assistant move the prism to the next point and repeat the process of measuring. You'll see that the alpha code has defaulted to the next point so you don't have to enter it again for each point. When you have finished the TOP points, move the prism to the first BASe point and measure it. Before selecting the next point, enter the new alpha code BAS then select the next point. Continue measuring the BASe, remembering to change the alpha code when you have measured the first point of the VERtical Wall and the first point of each Step. If you accidently measure the same point twice, don't worry too much, just write the "duplicate point number" down on the markout sheet in the Notes section. We will delete the duplicate point when we receive the data file.

It's a good habit to check the position of the instrument with the target on the house at least once during the measuring. Simply sight the target and compare the angle with the angle you have recorded on your ABGAL markout sheet. This will reassure you that the instrument is still in its original position and confirm the integrity of the data you are collecting. A quick check now can save the pain of remeasuring points later. If the instrument has moved, reposition it and remeasure the whole pool, noting on the markout sheet the new point number you re-started at.

Check Point Measurements:

After the whole pool has been measured, we need some check point measurements taken with a tape measure to use for double-checking purposes when the data is imported into our ABGAL software program. Measure the length of the pool from the A point to a point at the other end of the pool. Take 2 or 3 measurements across the pool between base points and list them on the markout sheet in the "Check Points" section.

Check List: Before finishing, have you...

- ☑ Measured all the points marked?
- ☑ Checked the position of the instrument with the "House Target"?
- ☑ Taken a check measurement of the length of the pool?
- ☑ Taken 2 — 3 check point measurements across the width of the pool?

Data Format:

The data is then downloaded from the measuring instrument. This can be done in a few different formats. The format ABGAL needs is an "ASCII" file in **X,Y,Z** coordinates. (Below is a sample file to show your instrument supplier or surveyor.) Please supply us with the data via email to laser@abgal.com.au The liner can only be made to the data supplied, if the data is not in this format, the liner will not fit correctly and ABGAL will not be responsible for any costs incurred to rectify the liner.

Point	-X-	-Y-	-Z-	Code
1001	1.93584	-0.85772	1.154	TOP
1002	1.83632	-0.36836	1.156	TOP
1003	1.56772	-2.28022	1.158	TOP
1004	1.47326	-2.96108	1.160	TOP
continued...				
1242	-0.53366	-2.91554	0.191	BAS
1243	-0.61825	-2.93582	0.208	BAS
1244	-0.70027	-2.95670	0.240	BAS
1245	-0.76727	-2.87586	0.201	BAS
continued...				
1283	-9.02796	-1.14001	-0.962	VER
1284	-8.91735	-1.09412	-1.117	VER
1285	-9.35615	-1.57818	-0.536	VER
1286	-9.26068	-1.51202	-0.174	VER
continued...				
1358	1.41151	-3.20985	0.968	ST1
1359	1.37518	-3.29945	0.969	ST1
1360	1.28123	-3.38982	0.972	ST1
1361	1.19887	-3.42610	0.972	ST1
1362	-0.30193	-3.91823	0.981	ST1

Please fill out all other relevant details on the ABGAL Markout Sheet, like “Quote Number”, “Liner Colour”, “Date Required” etc ... For more information on measuring, a detailed guide to using ABGAL Markout (Inground Liner Manual) is available.