In Ground Pool Installation Guide

General Information for Installing an In Ground Swimming Steel Wall Pool

Disclaimer: **This Installation Booklet is to be used ONLY as a basic guide and information on the installation of an inground steel wall vinyl liner swimming pool. There are multiple construction methods and techniques that can be used in the construction of an inground swimming pool. In addition, the construction of an inground swimming pool must comply with all local / state / and National Codes (such as the Virginia Baker Graeme Act). Before construction begins, you must verify all applicable building permits. Due to the various contingencies, and issues that can arise in the construction process, it is highly recommended that a local swimming pool professional install all swimming pools. It is highly recommended that all Residential Swimming pools be constructed without a diving board and slide; and users of the swimming pool be required to only enter a pool "feet first". ALL SAFETY SIGNAGE that is provide with all components and products from manufactures must be installed in accordance with the instruction provided by each manufacturer.**

In addition to the information in this booklet, the internet is another good source for further information regarding the construction of swimming pools, swimming pool safety, and swimming pool products and installation techniques, problems and solutions. You should also review the following web sites www.poolsafely.gov and www.apsp.org, for additional information.

General Information

Planning Stage:

- Refer to the local building codes. The codes will provide you with the easements, set backs and general requirements for positioning the pool and the size and shape that will best fit in your yard. Also, your local code enforcement may be able to help with plot plan and any obstructions that may be in yard
- Contact your local utilities companies in reference to underground utilities (Communication, gas, electric, etc.)
- Obtain proper permits, fencing requirements that are required
- Contract any professionals that may be needed, gas, electrical etc.

Pool Size and Shape:

- Try to optimize the yard space and bather loads to consider the size of pool. Remember that you will want a deck around pool
- Keep the pool within close proximity of the home if possible, for rest rooms, food etc.
- The sun is an important factor as well, the more the pool is in the sun the warmer the water
- Avoid trees near the pool.
- The closer the pool is to electrical service the less it cost to run the wires.

Terms:

- **Liner**, this is the waterproof membrane that is inside the pool and is the surface after it is filled(like the sheet rock inside a house)
- **Walls or Panels**, these are the structure of the pool, (like the 2x4 in a house)
- **Steps**, built into the structure that enable ingress and egress for the inside of the pool
- **Coping**, this is the top perimeter of the pool, it acts as both a trim for the deck and also to hold the liner in place
- **Main Drain**, This is a suction device that goes in the deep end of a pool and is used for circulate water to the pump. Check codes
- **Skimmer,** this is a device that circulates water from surface of the pool. Rule is 1 skimmer for 400 square feet.
- **Returns**, these are what bring water back to the pools via the pump. The water that is returned to the pool has been through the filter and heater.
- **Lights,** underwater lights come in different configuration check codes for proper lighting
- **Hand Rails,** used in conjunction with steps and ladders to aid in ingress and egress for the pool.
- **Pump,** used to circulate water from pool through filter and back to pools
- **Filter,** cleans the water using different types of media ,sand, DE or cartridge

Tools Needed:

-**Marking spray paint,** for layout
-**Wrenches**, for use during assembly of the wall system
-**Socket set**, for assembly of wall system
-**Screwdriver**, flat and Philips heads, for use in assembly of steps and plumbing fittings
-**Tape Measures**, two needed, a 25' and a 100' Used for layout, squaring the pool etc
-**Utility knife**, used to cut liner for assembly of plumbing fittings and steps
-**String Line**, used for layout, excavation and bottom layout, bright color helps
-**Drill with a variety of bits**, used to attach coping, drill return holes
- **3" whole saw**, used in drilling the return holes in panels
-**Wheelbarrow**, used to move dirt
-**Shovels**, both flat and round, trending, shaping etc.
- **Rakes**, used to shaping the pole interior
-**Transit**, for layout, excavation and leveling of the pool (rental)
-**Pick Axe**, for shaping the dig
-**Cement mixer**, paddle style for mixing pool base material
-**Hammers**, sledge and standard, for driving stakes
-**Tamper**, used to smooth the bottom material
-**Hacksaw** with metal blade, used to cut PVC pipe and aluminum coping
-**Trowels** (mags and finish), used to form base material (rental)
- **Carpenter square**, for layout
-**Large channel locks**, for tightening of plumbing fittings
-**Level**, 4' long for checking step level and set up
-**Shop vacuum**, for cleaning and seating liner (may need two)
-**Broom**, for cleaning and seating liner
-**Garden hose**, for the fill and mixing base material
-**"C" clamps**, large ones for step set up (can use welders clamps)
-**Duct Tape**, good quality for panel joints
- **Wood**, assorted 2x4, stakes for set up and pool layout
-**Nails**, to be used for setup
-**Temporary Fence,** used during the build process as a barrier to the build site

Excavation Equipment:

Excavator or Backhoe- Recommend and experienced excavator operator
Bobcat
Dump truck

Pool Layout and Location

Location:

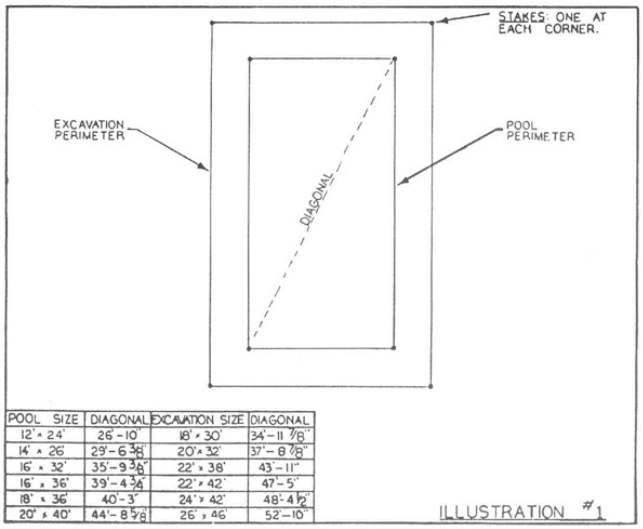
- Review the local building codes for setback, easements, variances and utilities (call utility companies)
- Look for flat, drainage away from pool is needed, a clear area this will reduce costs
- Have a wide access area for excavation equipment
- Look for sunny area, with no or limited trees
- Look at prevailing wind for skimmer and return locations
- Position pool to be near rest rooms
- Position pool to be close to electrical supply, will help reduce cost
- Make sure that pool will not be built on fill dirt

RECTANGLE POOL:

-When lying out pool please be advised that the excavation will have an "over dig", the over dig is typically 30" larger then the pool on each side, and will enable you to work on the back side of the pool with ample room. The over dig is an extension of the shelf. The shelf is what the panels rest. Note: the over dig may vary based on pool wall and brace combination Over dig is typically 24" to 36" greater the pool size

For example: a 14' x 28' rectangle pool will have an excavation of 16.5' x 26.5'
16' x 32' rectangle pool will have an excavation of 18.5' x 34.5'
18' x 36' rectangle pool will have an excavation of 20.5' x 38.5'

Note: Always square the dig layout.
If the pool has a step, take the position of the step and add extra excavation area for the steps.
Drive Stakes in ground to form the box, use a bright marker paint to show lines of pool on ground



POOL SIZE	DIAGONAL	EXCAVATION SIZE	DIAGONAL
12' x 24'	26'-10"	18' x 30'	34'-11 7/8"
14' x 28'	29'-6 3/8"	20' x 32'	37'-8 7/8"
16' x 32'	35'-9 3/8"	22' x 38'	43'-11"
16' x 36'	39'-4 3/8"	22' x 42'	47'-5"
18' x 36'	40'-3"	24' x 42'	48'-4 1/2"
20' x 40'	44'-8 5/8"	26' x 46'	52'-10"

Typical Layout

RADIUS POOLS AND OVALS:

-There are many ways to layout radius pools. One of the easiest is to form a box of the maximum length and width of the pool and place a stake at the four points.

-Using two long tape measures you can triangulate the center points of the radii. You must have large space to "swing "

-Then drive a stake at the radii center point and swing the arcs. You can initially use baking flour to mark ground so it may be easily changed prior to using the more permanent marker paint.

Note: Always check dimensions prior to starting excavation

STEPS:

- If the pools will to have a step, add area to the layout to allow for a step. Steps vary in size and shape. An 8'wide straight step, is typically 4' deep: you will need to over dig 24" around step, or 12' wide by 6' deep over dig

ELEVATION

Elevation is a very important part of the pool layout. The pool should be 6-12" higher then existing grade. You want any drainage away from pool, BUT, also not have drainage towards the house or other critical areas.

-The elevation of the pool will include the pool wall height and any copings that will be used on the pool. A 42" high pool wall with a 2 3/8" coping will have a height of 44 3/8" total height.

- When proper elevation is determined place string lines to the layout stakes. This will enable you to have a consistent reference point (benchmark) when using your laser level or transit

Note: You should reference an existing point on a house, deck or walk way to determine the elevation

EXCAVATION or the DIG

CALL BEFORE YOU DIG for utilities

Note: Your yard will become a building site at this point and you will have a big hole in the ground and piles of dirt in the yard.

-Confirm all dimensions that have been used for layout.

-Confirm that you have contacted all necessary companies for obstructions, utilities, as well as local building codes have been met prior to excavation.

-Review ALL manufacturer layouts and dig specifications

-Excavation will always be 2" deeper that manufactures layout sheets; the 2" is for installation of the pool base material.

IMPORTANT INFORMATION FROM ANSI/APSP CONCERING. HOPPER MINIMUMS.

Residential Inground Swimming Pools
Errata, 2011-09-15

Page	Error
4	The illustration for Figure 3 Minimum diving water envelope was displayed incorrectly. The corrected image is shown below.
14	The abbreviation for bromine, Br_2, is incorrectly shown with a superscript instead of a subscript (Br^2). The abbreviation should read: Br_2
A-4	Under Cyanuric Acid: "disease outbreaks have been reported" should be: "no disease outbreaks have been reported."

Figure 3 Minimum diving water envelope

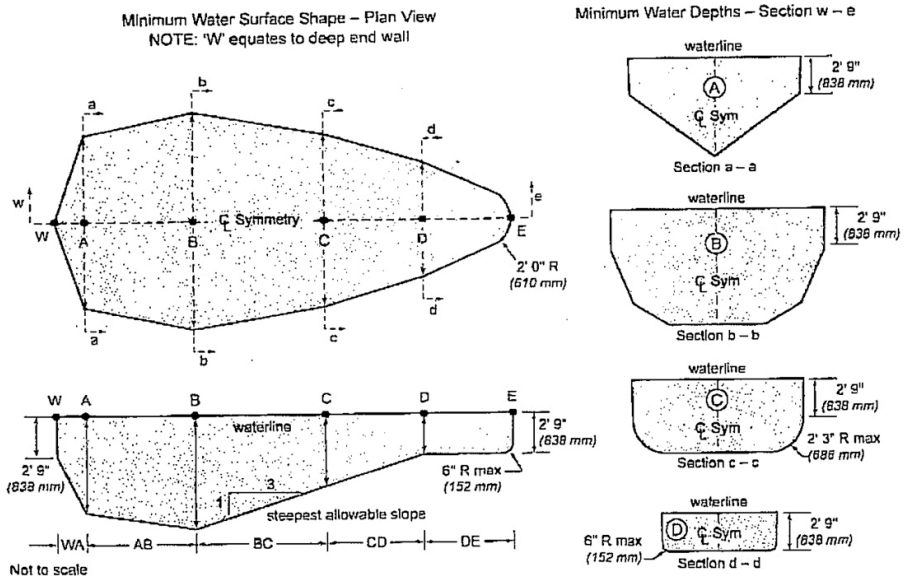


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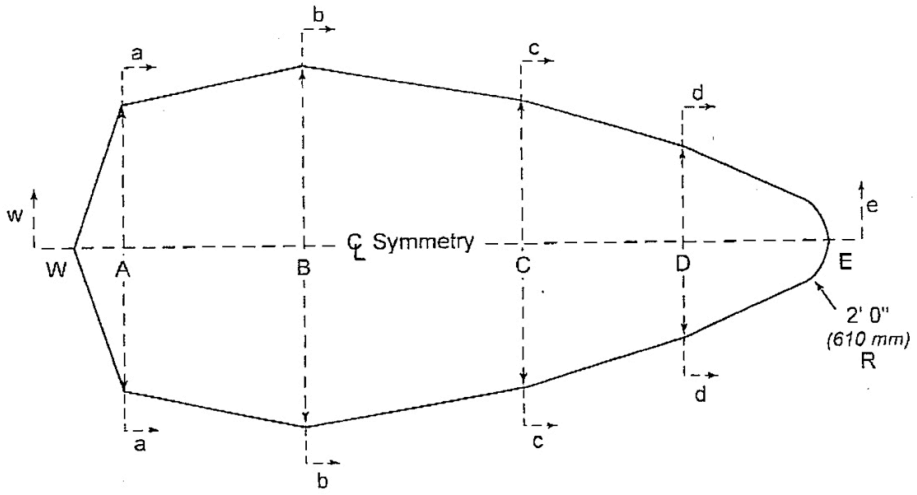
Figure 3 Minimum diving water envelope



Minimum Water Surface Shape – Plan View
NOTE: 'W' equates to deep end wall

Table 1. Minimum diving water envelope for swimming pools designated types I-V

Pool Types	Minimum Depths at Point				Minimum Widths at Point				Minimum Lengths between Points					
	A	B	C	D	A	B	C	D	WA	AB	BC	CD	DE	WE
0	Manufactured diving equipment is prohibited													
1	6' 0" (1.82 m)	7' 6" (2.29 m)	5' 0" (1.52 m)	2' 9" (838 mm)	10' 0" (3.05 m)	12' 0" (1.52 m)	10' 0" (3.05 m)	8' 0" (2.44 m)	1' 6" (457 mm)	7' 0" (2.13 m)	7' 6" (2.29 m)	Varies	6' 0" (1.82 m)	28' 9" (8.76 m)
2	6' 0" (1.82 m)	7' 6" (2.29 m)	5' 0" (1.52 m)	2' 9" (838 mm)	12' 0" (3.66 m)	15' 0" (4.57 m)	12' 0" (3.66 m)	8' 0" (2.44 m)	1' 6" (457 mm)	7' 0" (2.13 m)	7' 6" (2.29 m)	Varies	6' 0" (1.82 m)	28' 9" (8.76 m)
3	6' 10" (2.08 m)	8' 0" (2.44 m)	5' 0" (1.52 m)	2' 9" (838 mm)	12' 0" (3.66 m)	15' 0" (4.57 m)	12' 0" (3.66 m)	8' 0" (2.44 m)	2' 0" (610 mm)	7' 6" (2.29 m)	9' 0" (2.74 m)	Varies	6' 0" (1.82 m)	31' 3" (9.53 m)
4	7' 8" (2.34 m)	8' 6" (2.59 m)	5' 0" (1.52 m)	2' 9" (838 mm)	15' 0" (4.57 m)	18' 0" (5.49 m)	15' 0" (4.57 m)	9' 0" (2.74 m)	2' 6" (762 mm)	8' 0" (2.44 m)	10' 6" (3.20 m)	Varies	6' 0" (1.82 m)	33' 9" (10.3 m)
5	8' 6" (2.59 m)	9' 0" (2.74 m)	5' 0" (1.52 m)	2' 9" (838 mm)	15' 0" (4.57 m)	18' 0" (5.49 m)	15' 0" (4.57 m)	9' 0" (2.74 m)	3' 0" (914 mm)	9' 0" (2.74 m)	12' 0" (3.66 m)	Varies	6' 0" (1.82 m)	36' 9" (11.2 m)

NOTES

1. Minimum length between points CD may vary based upon water depth at point D and the slope between points C and D.
2. Drawings are not to scale.
3. Negative construction tolerances (see para. 5.1.1) shall not be applied to any of the dimensions shown in the Minimum Water Envelopes given in Table 1.
4. Pool types designate minimum water envelope sizes as specified by the diving board manufacturers.

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The SHELF

-The is the part of the excavation that you will place the panels and braces on and will also be the point at which the initial elevation is determined. The shelf is excavated the wall height and coping height from the string line or benchmark point.
Note: the shelf must be on undisturbed soil.
-Do not dig shelf deeper then needed
-The shelf point is also the excavation depth for shallow end; you will have 2" of base material.

EXCAVATION continued

There are many ways to excavate a pool and the excavation may vary on machinery, area and operator preference.

Note: It is best to have a few people to aid in the excavation. One person can assist operator with depth and shape of the pool dig. Also, use marker paint to high light slopes and transition lines for the operator. **The better the excavation the less work you have later!!**

SHALLOW END:

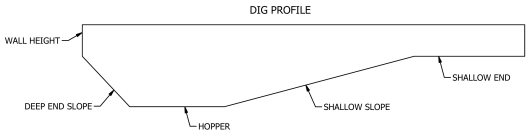
- Use the benchmark or the string line as a guide for the shallow end depth. The bottom of the dig will be the start of the shelf.
- When the shallow end is completed mark the transition line or line from shallow to deeper. Also, drive stakes at the transition point at the correct width of pool. These stakes will be later used to "string" the bottom for final dimensions.

HOPPER or DEEP END:

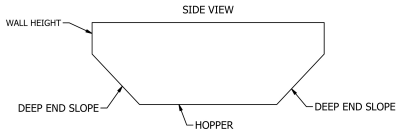
Note: The excavated depth will be two (2") deeper then the finished depth. You will have 2" of base material on excavated soil.

-Draw out the hopper or deep end area with marker paint; this will assist the excavator with the dig. Having someone in side the pool area working with the excavator would be a great help, BUT that person must be careful.
-A typical slope for a diving pool is 14' long. The length is measured from the shallow end transition line to the transition line at the beginning of the flat deep end.
NOTE: A pool that has a 14' slope become narrower as it is dug towards the bottom of the pool. For every 42" or 3'6" of slope length the slope becomes 12" or 1 foot more narrow.
In Example: a 16' wide pool will have a slope width of 16' at the shallow end transition line. If you measure down the slope 3' 6" that width of the slope will be 15' wide. At the

half way mark or 7’ down from the shallow end transition line, the width would be 14’etc.
-Mark the flat hopper bottom with marker paint, refers to the dig specifications provided by the liner manufacturer for this information. Have the operator dig the hopper.
- After the hopper is complete begin to excavate the sides and back slopes in accordance with the liner manufactures specs. The liner mfg specs will be two inches less then excavated specs.
-When pool is completely excavated, drive stakes at all transition points. These points will be shown in the picture below (
- The stakes will be used for two reasons, one, being the position of the walls during the wall assembly process. The stakes will also enable you to “string “the bottom of the pool for the base material installation.



Definitions and Example of the Pool’s Bottom Excavation



Refer to Actual Dig Specification For Pool Installation
Water in the Dig:

Ground water is not an unusual situation and can be overcome. You have a few options to solve the problem.
Here is a simple solution:
-Have the excavator operator dig the flat part of the hopper deeper. Typically 2’ is enough of an over dig
-Use pea gravel to bring the over dig to the rough grade (two inches below finished grade). Pea gravel does not have sharp edges.
-Place a “foot” valve with a 1 ½” line glued to foot valve to the area where the filter will be placed. See drawing below
-Hook this line to a pump and run the pump continuously until the liner has been installed and the pool is filling.
-When the pool is filled with water, you can cap this drainage line, BUT remember not to cap it permanently.

Panel Layout:

-Reference the wall manufactures drawing for the panel layout.
Note: The proper layout is important in that the skimmers and returns should be in the correct position in order to have proper circulation. The skimmer should be in line with the prevailing wind and the returns should be position so that movement of the debris on the surface is towards the skimmers. The skimmers, returns and lights are typically pre-cut. General rule of thumb-one skimmer per 400 square feet of surface area.

- Start at the step area. Place the step in the area in which the excavator dug the step area. Different manufactures use different types of support systems for the steps. **Have steps self supported at the point.**
-You can attach a panel to each side of the step with “c” clamps, do not permantly attach at this point.
-Install next panel to one of the panels temporally attached to step. Use the fasteners provided with the pool walls. (Different pool wall manufactures use different types of fasteners). Steel nuts and bolts, nylon nuts and bolts and wedges systems are the most common.
-Attach brace at each panel joint, as well as the joint between pool walls and step.
Note: do not drive any brace stakes at this point
- For radius pools, use the manufactures dig specifications to set up radius points, this will assist you in squaring the pool.

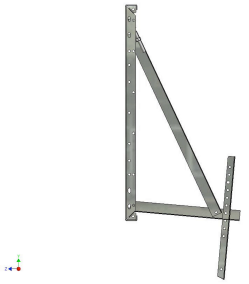
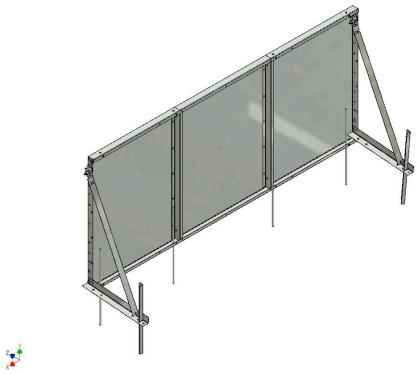


Figure 1 Typical Brace



Typical Braces with Steel Panel

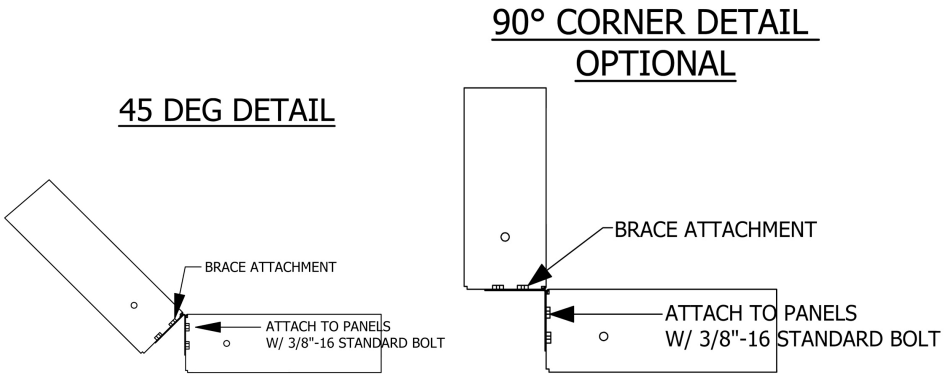
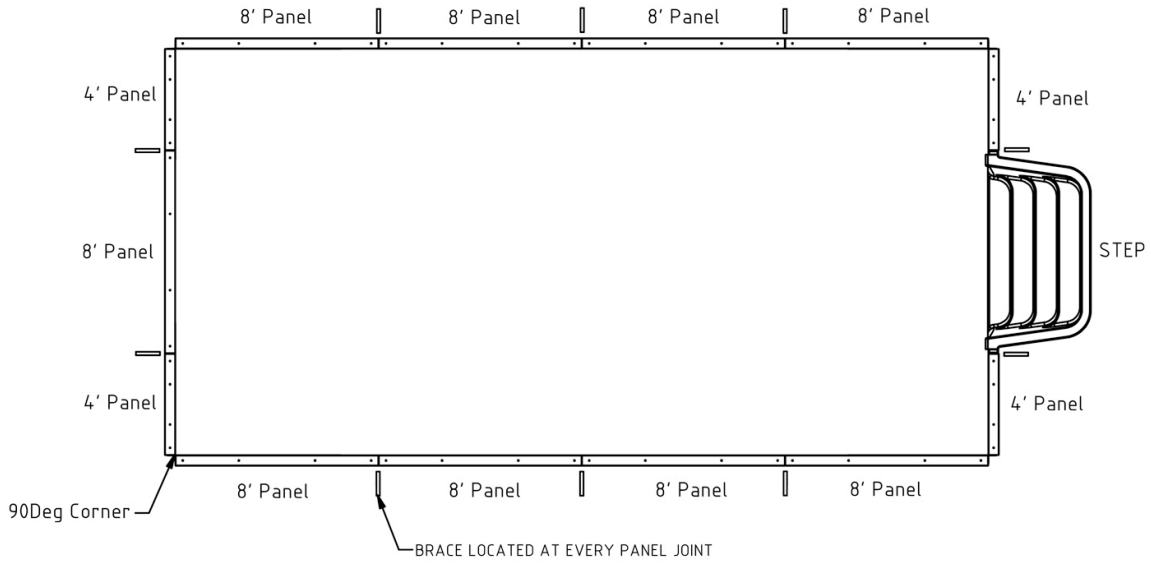


Figure 2 Typical Panel Layout w/ Step



Squaring the Pool

-When the panel is fastened together it is time to align the step and walls together.
-Assure that the face of the panels and the face of the step are flush.
Note: You will need to loosen the clamps holding the step to the panels.
-use a small piece of coping to on top of the panels next to the step to provide the correct height of the step and panel.
- When the correct height and the panels and steps are flush, re-clamp the steps to the panels.
-Visually **RECHECK** the step and panel positions.
-When you are satisfied with step and panel positions, you will be ready to permanently attach the step to the panels using nuts and bolts
-With the step and panels are tightly clamped together, drill 3/8" holes through the side flange of the panel and step.
Note: Be careful that you do not hit the screw blocks on the back side of the step. You may need to drill at an angle.
-Bolt the step to the panels
- Check the square of the pool; check the diagonals of the pool walls. These measurements should be provided from the panel manufacturer.
-Check the width at various points along the long walls
-check overall length of the pool.

Leveling the pool:

-Using the laser transit check the level around the pool.
-Determine the high point
-The high point will become you level benchmark

-At points that are lower, you can use patio blocks of various thicknesses as shims.
Note: Roof shingles can be used alone or in small layers in conjunction with the patio blocks to better fine tune the level.
-RECHECK level

Secure pool to ground

-When pool is level and squared, it is time to stake the pool wall with the brace stakes.
-Drive stakes into ground using a hammer; make sure that the stakes are driven straight into the ground
NOTE: Wear safety glasses when driving stakes
-Drive the 18" rebar into the holes on the bottom of the pool wall flange, the brace stakes and rebar will secure the walls from moving.
- Make sure to leave 4" to 6" of rebar exposed

Securing the step:
-Place a 2" x 6" piece of wood that is long then the step is wide in front of the step
-secure the wood in place by driving rebar if front of the step, this will keep the step from moving when the concrete collar is poured.

Installing Receptor Coping:

-Prior to installing coping run strings the length of all wall at the top of the panels (this will be used as proof that the walls are straight)
-Coping is used as a perimeter or edging of the pool and also to hold the liner in place
-Start with a corner piece, aligning the center of the coping to the center point of the panel
-secure the coping to the panel using the self taping screws provided with the coping at a maximum of 12" apart.
-next install straight coping butting the joints of the straight and radius coping
-The coping can have slight gaps between the butt joints, a coping clip will be provided to cover joints
Note: INSTALL ALL SAFETY LABELS TO THE COPING. LABELS ARE PROVIDE WITH COPING AND LINERS

“Stinging Bottom:

-After walls and plumbed, leveled and squared, you are ready to string the bottom for proper finished depth
-Drive stakes on the inside of the pool, the stakes should be at all corners where the walls meet the bottom, also at all corners of the hopper
-run strings along the wall lengths, across the width of the pool at the transition lines
-Also cross the strings in an “x” pattern across the shallow end, slopes and hopper pad.
-These strings should be at the FINISHED depth. By crossing the strings this will provide reference to how deep the base material will need to be laid over excavated dirt
Note: these strings need to be tight

RECHECK ALL MEASUREMENTS, level and plum of the pool walls

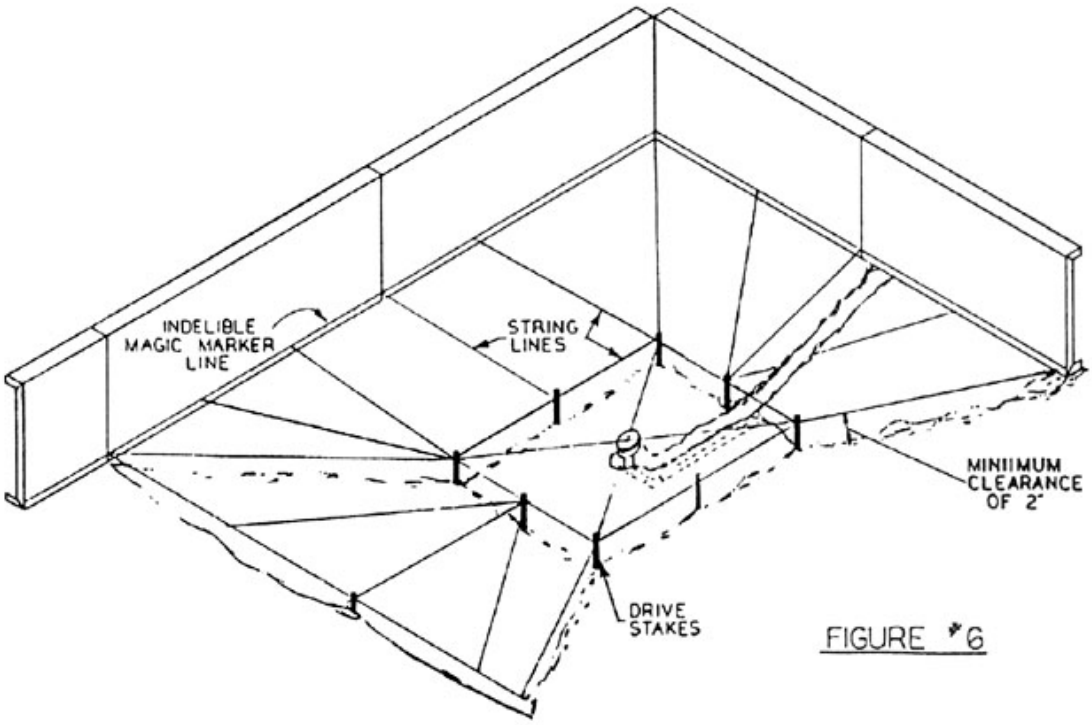


FIGURE #6

Rough Plumbing:

-At this point you want to install the plumbing fittings.

CHECK LOCAL AND STATE CODES FOR PROPER EQUIPMENT AND APPROVED FITTINGS

Main Drain(s): Optional

-
-The main drains will be placed in the center of the hopper pad. Dig a 1' wide by 18" deep hole for each main drain. **MAINDRAIN INSTALLATION MUST ADVHERE TO THE VIRGINIA GRAEME BAKER ACT of 2008 (see www.poolsafely.gov) for more information**
-Place drains into the hole making sure that the is at the finished grade with the compression ring installed
- Remove all gaskets, screws etc prior to placing drain(s) Put hardware is safe place
-Tape the surface of the drain(s) so that you do have any debris in the drain(s) bodies
-Determine where the filter pad will be set in relation to the drain(s) and dig a trench for the pipe that runs from the drain(s) to the filter. The trench should run the shortest distance from the drain(s) to the filter
Note: the drain(s) pipe will run **UNDER** the panels
-Glue the pipe to the drain(s) per manufacture's instructions
-Plug any non used hole in drain(s) bodies per manufacturer's instructions
-Level drain(s) bodies and fills holes around drains with concrete
-RECHECK level of drain(s) before concrete sets up
-Tape off surface of drains to keep debris from the drains when bottom is installed

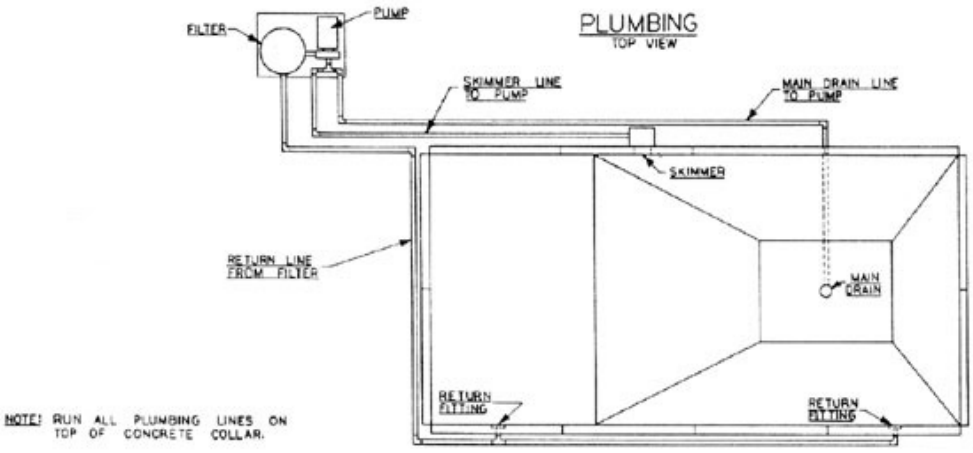
Return Fittings:

- Return fittings can be located on any section of the pool wall. The returns are designed to work with the skimmer to produce a proper flow pattern that adds the skimmer(s)
- A return fitting hole is a 3" hole that is 12" to 15" down from top of panel's top flange.
- Drill holes from back side of panel, out of the way of any ribbing in panel,
- After hole is drilled, slide the return fitting through the front side of panel with thread side first. Install nut snugly.
- Do not attach face plate at this time; you will do that after liner is installed.

SKIMMER(S)

- Typically the skimmer panels are pre cut.
- If so follow the skimmer manufacturers installation manual
- Different manufacturers use different skimmer configurations and gasket systems
- Tape off top of skimmer so that debris does not enter skimmer body

Figure 3 Typical Plumbing Schematic



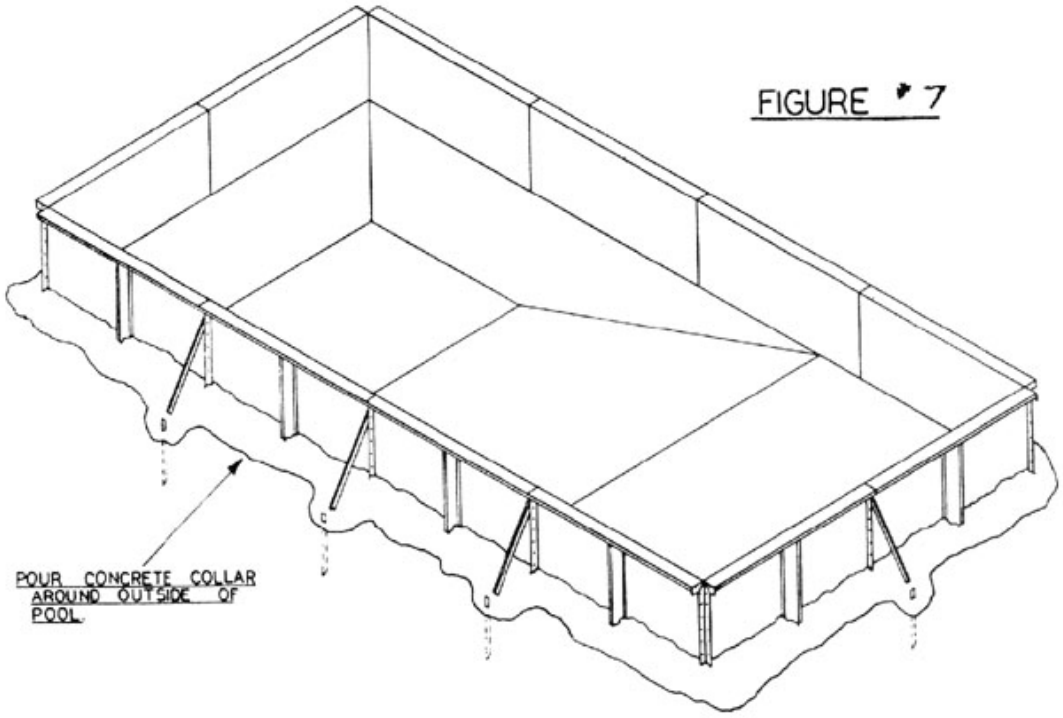
Pouring the perimeter collar (bond beam)

Note: check local building codes to confirm collar requirements

Rule of thumb: 1 yard of concrete per 12-14 linear feet of pool. A 16' x 32' rectangle would take 7-8 yards of concrete 6" to 8" think consistently

Note: make sure any plumbing that must be run under walls and marked and out way of concrete.

- The collar secures the wall structures position.
- **Make sure there are no opening or gaps under the step or panels**
- **Run sting lines on all straight panels to confirm they are flush with the string line.**
- Pour the concrete carefully and slowly around the perimeter to keep from moving the walls, have concrete slope away from pool walls
- After concrete has been poured and is still wet, recheck the panel's plum and wall alignment as compared to strings.
- Step area should have concrete to first tread



Prepping Bottom

- The rough excavation should be 2" below finished depth
- Your strings should be set up at finishished depth
- String the pool in sections based on liner manufacturers dimensions.
- Place rebar pins at shallow end break points, the pins should be butted up to the walls
- Locate the front and back sections of the deep end hopper by stretching pins width wise at proper length (on a 4' back slope you will place pins 4' from the back wall at bottom of wall)
- Continue doing this for both width and length of bottom measurements.
- **All dimensions are from top of panel and not top of coping**

Prepping Bottom Continued

- Find the finished pool bottom grade by using a plumb bob at all string intersection points in the deep end.
- Drive pins into each corner of the hopper at the point of which the plumb bob lands
- Attach string lines to the pins at the proper finished grade
- "x" the strings so confirm proper depth on all flat areas
- Do same in shallow end
- Clean all loose debris, rocks, sticks etc. form pool

Bottom Material

Note: there are varieties of materials to use for pool base, sand/cement, and vermiculite/cement-

- Sand/Cement 5/1 Ratio (Sand to cement)
- One ton of sand equals one cubic yard
- One ton (1 cubic yard) will cover 162 sqft of area
- Use Type II Portland cement
- Mason sand is best to use and cleanest

Formula for sand/cement mixture

- determine surface area of pool (length x width) a 16' x 32' pool is 512 sqft
- Multiply by 1.15 (512*1.15= 588.88 sqft) this is total area to be covered by the bottom mixture
- One cubic yard of sand will cover 162 sqft. So divide total area by 162 (588.88/162=3.63 cubic yards or 2000*3.63= 7270.00 pounds of sand)
- Divide pounds of sand by 5 (5 to 1 ratio) 7270/5=1454.00 pounds of cement
- Check on weight of Portland cement bags and divide pounds of cement by bag weight for total bags needed.

For vermiculite please review manufactures directions

Troweling the bottom material

-THE SMOOTHER THE BETTER
- NO rocks or pebbles
- Trowel from the deep end to wards the shallow end
-start on back slope
-Use string lines to confirm material thickness

Vinyl Liner Installation

Notes:
-Vinyl Liners should be stored in an area that temperatures are above 50 degree F. Also do not stack products on top of box; this will reduce permanent folds in the liner.

-Liner Preparation, Liner are best installed when temperatures are above 65 degrees F. The liner should be stored in an area above 70 degrees for at least 3 days (72 hours) prior to installation. The liner should be dropped in direct sunlight to enable the liner to seat properly.

Tools Needed For Vinyl Liner Installation:

-Minimum of two to four people, the larger the liner the more people will help with the install. A 16 x 32' liner wills way approximately 100 Lbs.

-Broom for cleaning the interior of the pool prior to dropping the liner. Also the broom can be used to help seat the liner by gently applying pressure to liner as pool is filling.

- Screwdrivers, Philips and Standard, the drivers are used to install the plumbing fittings and step gasket systems

- Razor knife, this will be used to cut the liner for the plumbing and step openings. Make sure it is sharp. Cuts are on INSIDE of gasket systems. BE CAREFUL

-Shop vacuum(s), this is used to help seat the liner. The vacuums will evacuate the air from the inside of the pool, and is used when filling pool with water. The larger the liner the more vacuums are needed

-Garden Hose, used to fill the pool, make sure the water is clean and does not have excessive minerals. There also may be options in your area to fill the pool, such as water delivery and or fire departments. Check with your neighbors as well.

-Duct Tape, buy a good quality tape. The tape is used to seal the panel joints.

-Waterproof caulk, this can be used to set gaskets on drains and skimmers.

- Sand bags make sure they are in plastic. This can be used to help seat liner against step.

Vinyl Liner Installation:

Guide Lines:

- Prior to dropping the liner, make sure the entire pool is clear of debris, used the broom and vacuums to clean the bottom. Also make sure the panels are clean as well.

-Duct Tape all wall joints

-Used caulk to set the gaskets

-Make sure the bead track is clean. The bead track is where the liner is help in place in the coping. The bead is the top portion of the liner.

-If there is a step please prep step area for install. It is a good idea to use plywood to lace on top of step an extra piece of coping to help hold liner in step area.

-Remove the liner from the box, do not use any sharp knives. Look at the instructions on the liner box to have liner positioned properly. Carefully unfold liner on the ground (make sure the area around liner is free on debris and snags). **Avoid dragging the liner on pool bottom.**

-With the people at various locations, snap the liner bead into the liner track in each shallow end corners. Liners typically have markings for the center of the corners and or markings for the transition lines. Continue snapping the bead into the track across the shallow end of the pool. Start snapping the liner in the long sides. When the liner is squared, continue snapping the liner into the track. Look at the liner and make sure the tiles look straight, (this is a sign of the liner being square)

-After liner bead is completely installed in track, adjust liner for square. You can grab the liner and gently pull it to square. Also, check positions of seams, the seams should be parallel to the walls and the bottom seams should be seats at the intersection of the wall and floor of pool. Use sand bags along the step wall**. Liners are designed to stretch**

- With liner in position, squared. Unsnap a small area of the liner bead, close to the transition line (the point that defines shallow from deep end), insert the vacuum hose

between liner and wall. If the vacuum hose is ribbed wrap it in a cloth (this will help with removal). Do not have the hose touch bottom of pool. Use duct tape to tape around hose so that all the area is sealed form air. You may need two vacuums for larger pools.
-Turn on vacuum(s). As the vacuums remove the trapped air from behind the liner will begin to stretch into place, adjust the liner by moving the excess materials on the floors toward the base of the walls. If you are unable to remove all wrinkles, turn off vacuum(s) and reposition liner. When repositioning is complete turn vacuum(s) back on.
- When liner is positioned correctly and is pulled down, with no wrinkles, the plumbing fittings should be visible. You may now install the main drain grates and gasket 9one gasket should be affixed to main drain body prior to liner install). With gasket attached to main drain ring, feel for screw holes in top of main drain under the liner. **Follow drain manufacture's instructions.** After main drain ring is in place and secured, **carefully cut the liner material from INSIDE the main drain ring.** Then install main drain cover.
-Using a garden hose in the deep end of the pool, start the water. **Do not use excessive water pressure during the initial filling process.**
- Continue to run vacuums until water is at 6" in shallow end, but not more then 12" deep in shallow end
-Continue to fill pool
-You will be ready to install step gasket system when there is about 6-8" of water in shallow end of pool. Install gasket screw with hand screw drivers only. DO NOT OVERTIGHTEN.
-When water is 12"-18" deep in shallow end, locate returns and skimmers and install the gaskets and faceplates according to manufacture's instructions. Cut and remove liner material from **INSIDE** faceplate areas.

Step Gasket System

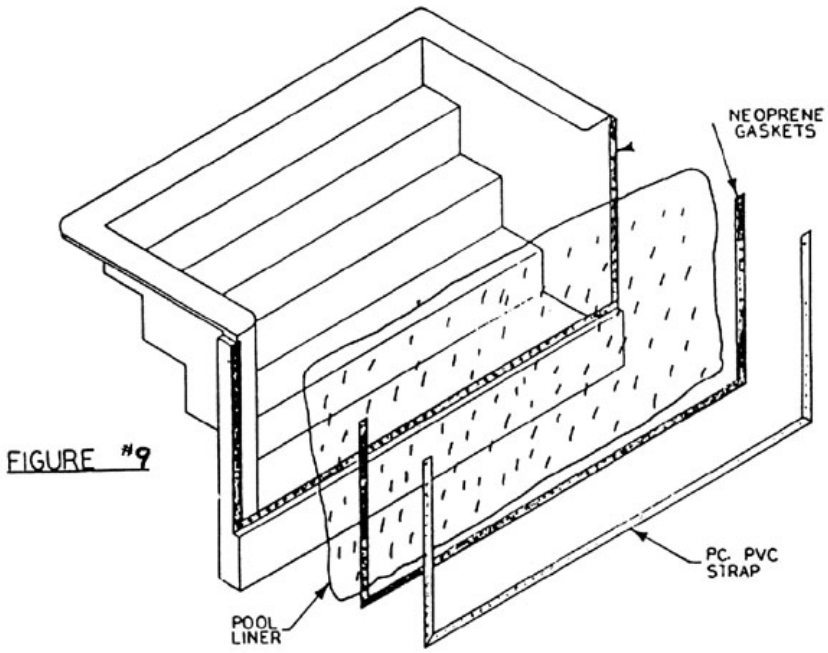


FIGURE #9

Backfilling pool dig area

-Note use non corrosive and non expandable back fill materials (sand, gravel etc.)
-Backfilling should be done slowly and evenly around pool
-Backfilling should be done at same time pool is filling to provide equal pressure on the walls
-Backfill should be brought to top of pool braces

IMPORTANT!!!!!!

Place all Warning signs and Warning stickers around the entire perimeter of the pool