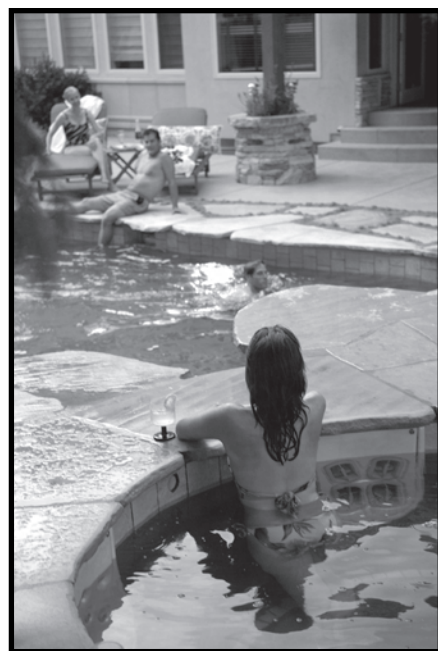


JetPak® System for Concrete Spas

Installation Guide

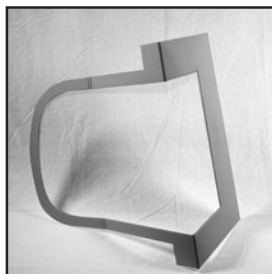


JetPak® System for Concrete Spas

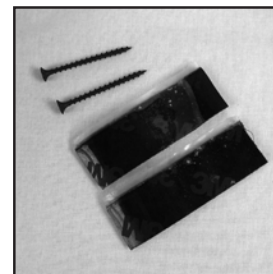
Parts List



JetPak (1)



JetPod Template (1)



Adjustment Screws & Velcro

#8 x 2" Long
Drywall Screws (2)
3" Velcro Strips (2)



Trim Ring (1)

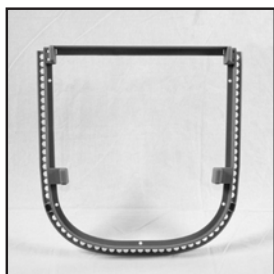


Union Elbow (1)

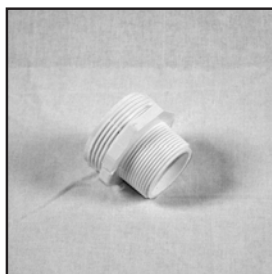


JetPak Attachment Hardware

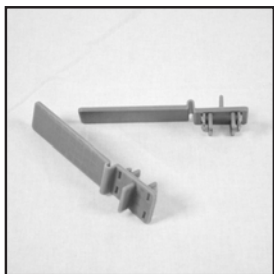
1/4 x 20 x 3/4" Flat Head Screws (2)
Finish Washers (2)
Retaining Washers (2)



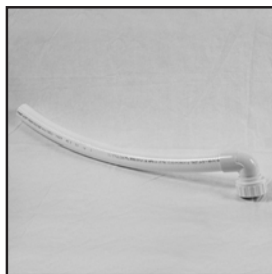
Plaster Ring (1)



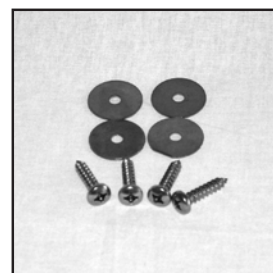
Union Tail Piece (1)



Upper Tabs (2)

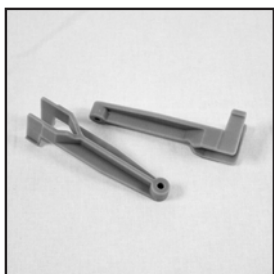


Adapter Pipe Assembly (1)

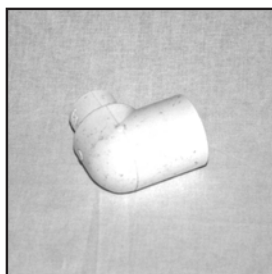


Trim Ring Attachment Hardware

#10 x 3/4" Pan Head Screws (4)
1/4 x 3/4" Flat Washers (4)



Lower Tabs (2)



Air Fitting (1)

JetPak® System for Concrete Spas

Installation Instructions

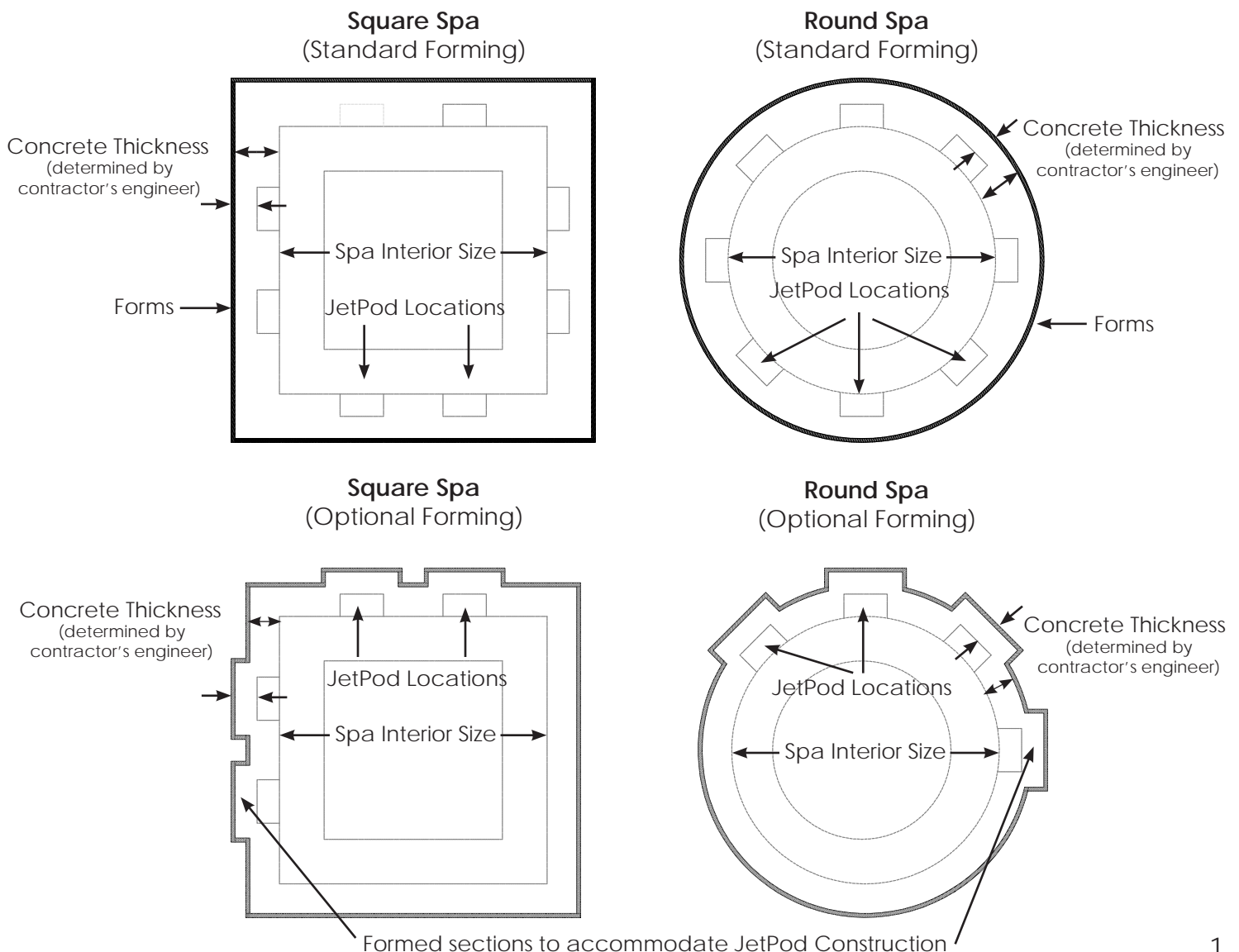
IMPORTANT: *It is the builder's responsibility to ensure the structural integrity of the spa by designing and constructing it utilizing adequate rebar reinforcement and concrete thickness. It is also the builder's responsibility to have the structure and plumbing of the spa engineered to meet the required specifications of the JetPak System as well as all local and national building and safety codes.*

Definition: JetPod™: The JetPod is a cavity that is built into the concrete spa wall to accommodate the JetPak plumbing (see Diagram 3).

I. Layout, Excavation and Forming

- A. Layout pool perimeter and set forms (see Diagram 1). Forms should be set to accommodate the construction of the JetPods (see Diagram 3 for finished dimensions). **Note 1:** Standard Forming should be used when building raised spas. **Important:** Concrete thickness and rebar requirements around JetPod may vary and must be determined by the pool contractor's engineer.

Diagram 1 - Set Forms



- B. Excavation (see Diagram 2). Excavation must accommodate the JetPod construction specifications provided by pool contractor's engineer (to see finished concrete JetPod dimensions see Diagram 3).

Diagram 2 - Excavation for JetPod

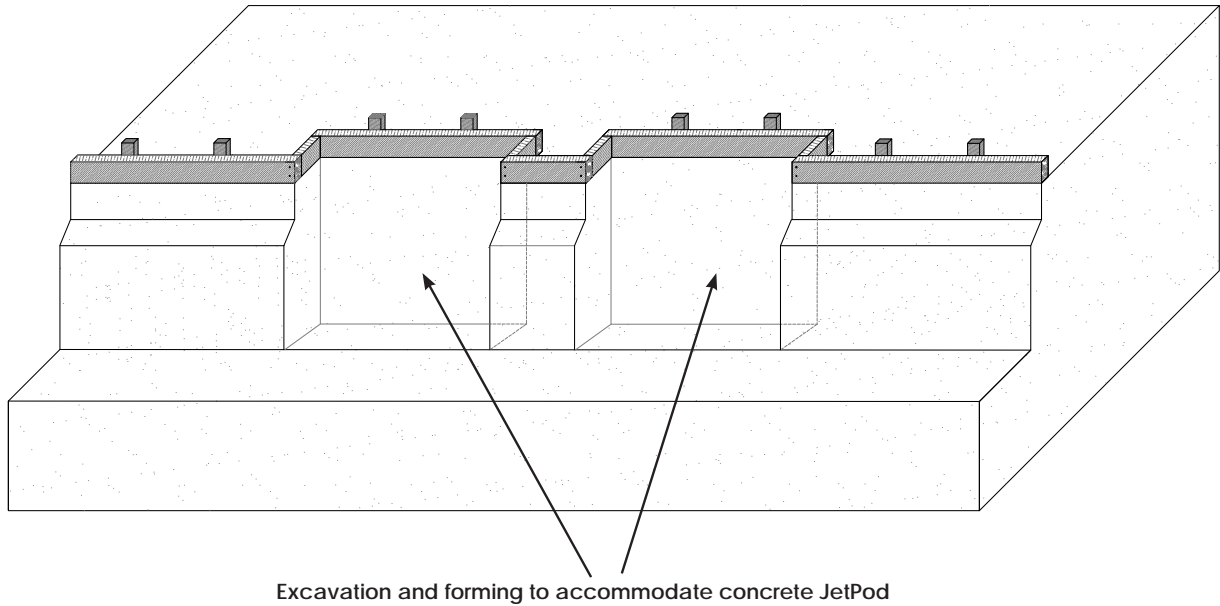
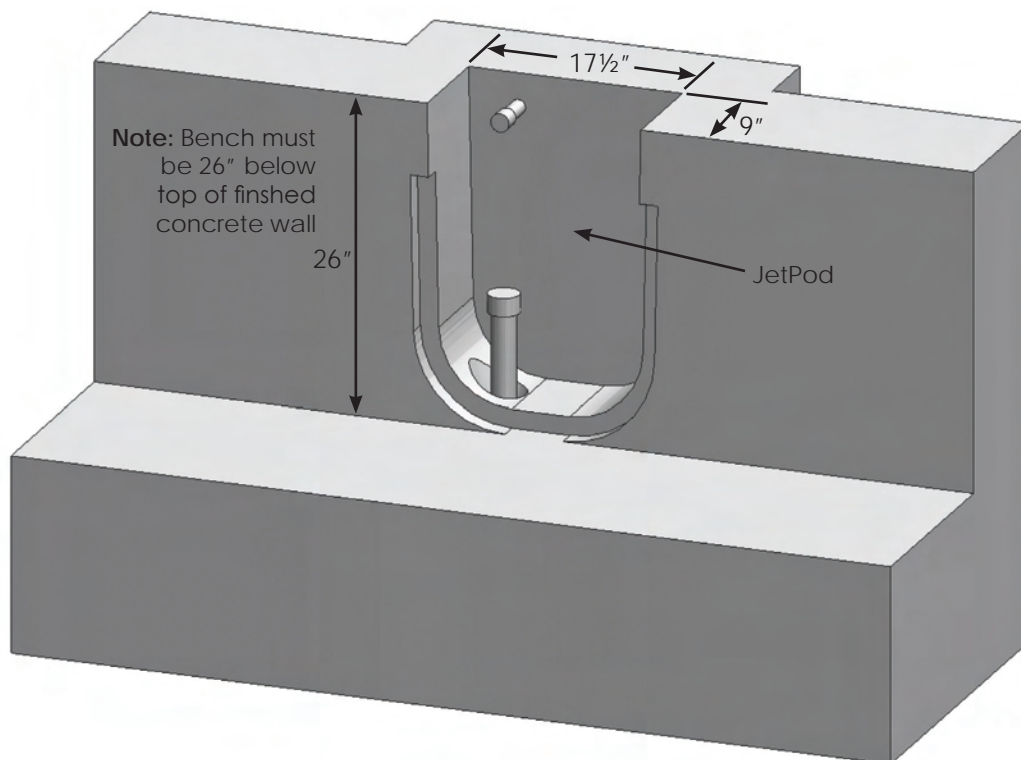


Diagram 3 - Concrete JetPod Finished Dimensions



II. Plumbing and Pump Sizing

Note 1: It is recommended that a licensed hydraulic engineer is used in the design of the plumbing and pump system that will power the JetPak Systems.

Note 2: Piping and pump sizing will vary depending on the hydraulic requirements that are unique to each job. To ensure that each JetPak performs properly, each JetPak has a factory-specified Gallons Per Minute (GPM) requirement at ft/hd (see Diagram 4). The builder is responsible to hydraulically engineer each spa project to ensure that each JetPak is supplied with the factory-specified GPM at the proper feet/head. (Recommendation: It is recommended to plumb the spa with an oversized Jet Return line to accommodate for future JetPak upgrades. A target of 100GPM per JetPak will allow for the maximum flow requirements of any future JetPak.)

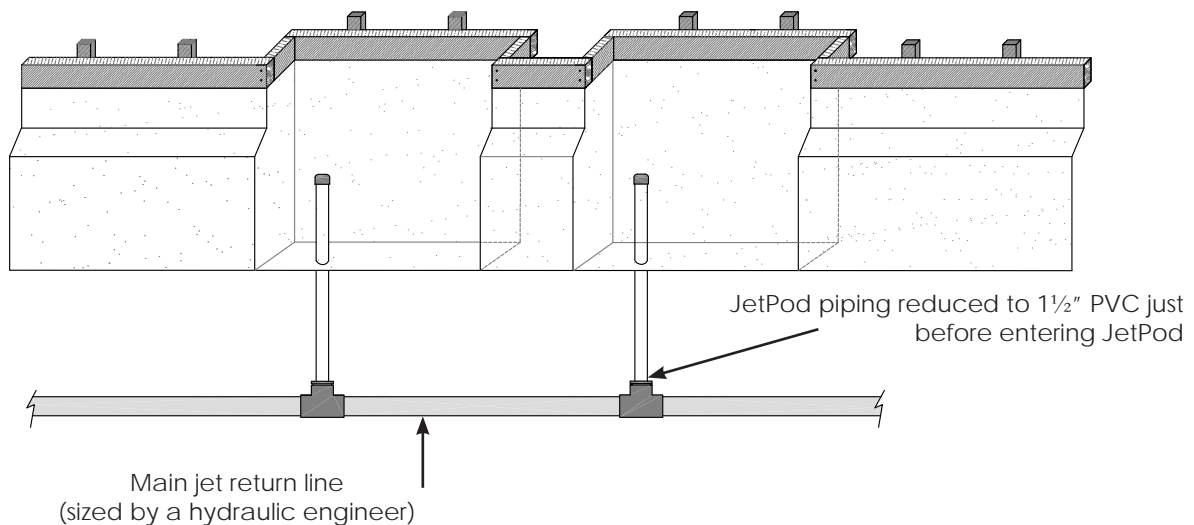
Note 3: Depending on flow rates, one or two JetPaks may be powered off a filter system. Additional JetPaks will require a separate booster pump.

Diagram 4 - JetPak Pump Selection Guide

See Appendix A on Pages 30 and 31 at the end of the guide for the JetPak Pump Selection Guide.

- A. The piping for each JetPod should tee off of the main jet return line and should be reduced to 1-1/2" PVC pipe just before entering into the JetPod (see Diagram 5a)

Diagram 5a - JetPod Plumbing

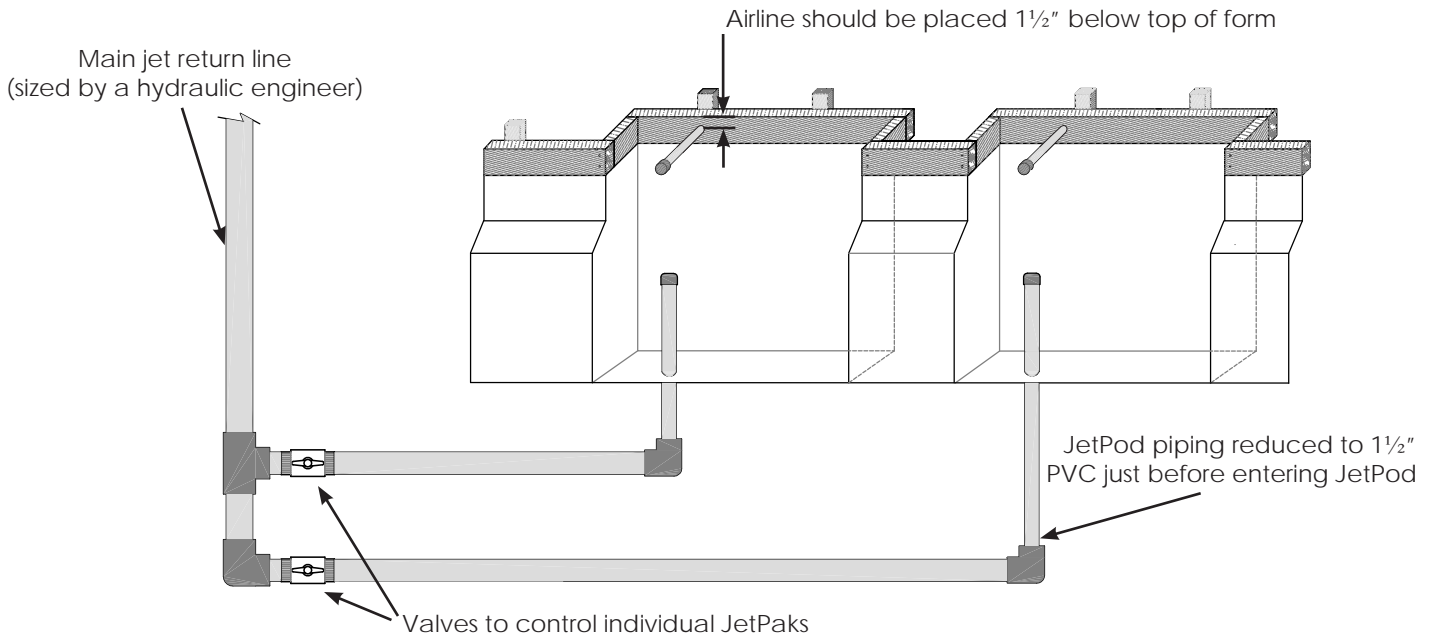


- B. The JetPod piping MUST be positioned to allow for 3" of clearance from the finished concrete JetPod walls to any side of the JetPod pipe. While facing the JetPod, the JetPod piping should be located in the lower left-hand section of the JetPod and should be capped and left extra long (see Diagram 6).
- C. All jet return piping should be pressure tested to ensure the system will not leak.

Alternate Plumbing Method

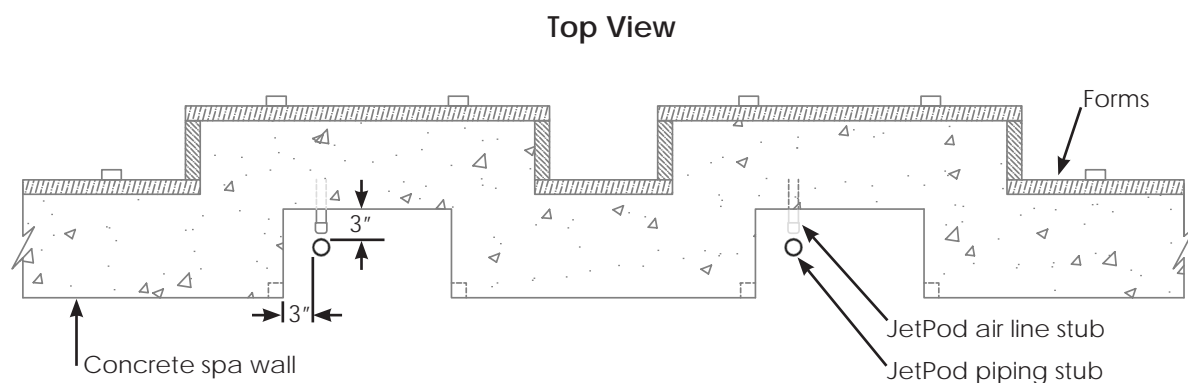
- A. For individual control of each JetPak, the piping to each JetPod should tee off of the main jet return line and be valved with a separate pipe to each JetPod location (see Diagram 5b – Alternate).

Diagram 5b - Alternate JetPod Plumbing



- B. The JetPod piping MUST be positioned to allow for 3" of clearance from the finished concrete JetPod walls to any side of the JetPod pipe. While facing the JetPod, the JetPod piping should be located in the lower left-hand section of the JetPod and should be capped and left extra long (see Diagram 6).
- C. All Jet Return piping should be pressure tested to ensure the system will not leak.

Diagram 6 - Pipe positioning inside JetPod



Important for Sections II and III

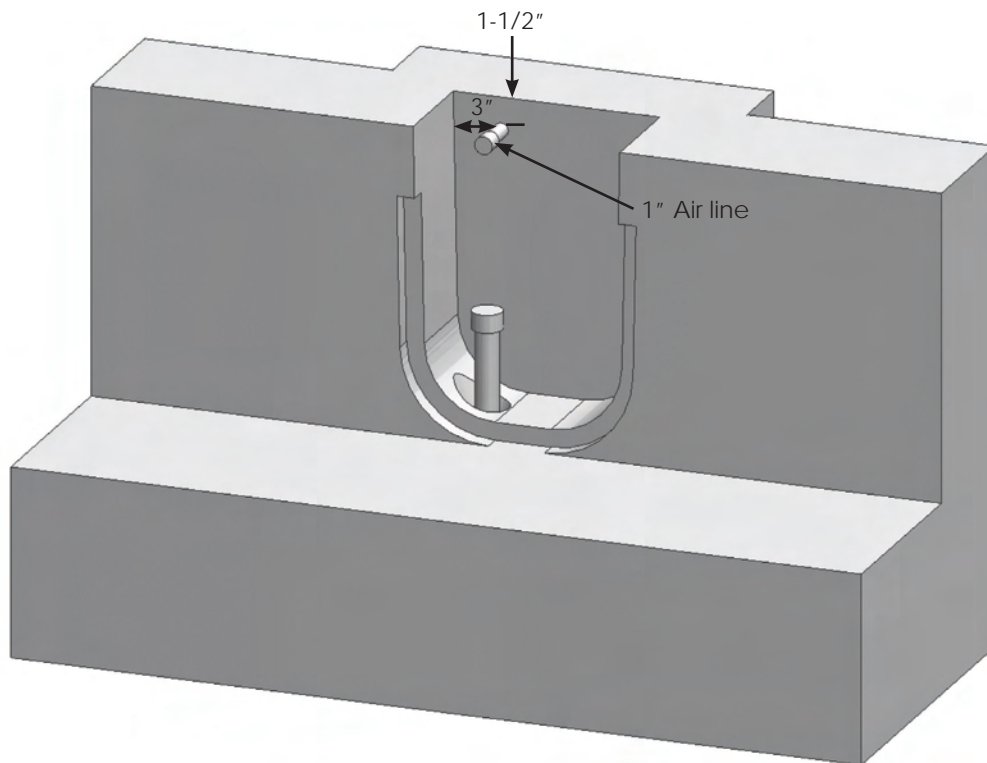
Note 1: The JetPod piping will move during the gunite/shotcrete phase and should be stabilized to ensure that proper positioning is maintained. The positioning should be checked and adjusted during the gunite/shotcrete process.

Note 2: Plumbing to accommodate JetPaks should meet all local and national standards.

III. Air Line

The JetPod Air Line should tee off of a standard spa air loop with 1" PVC piping and should stub into the JetPod. While facing the JetPod, the Air Line pipe should be located in the upper left-hand section of the JetPod and on the back wall of the JetPod. The Air Line pipe should be capped and left extra long (see Diagram 7). **Note: JetPaks do not require blowers.**

Diagram 7 - Airline pipe position inside JetPod



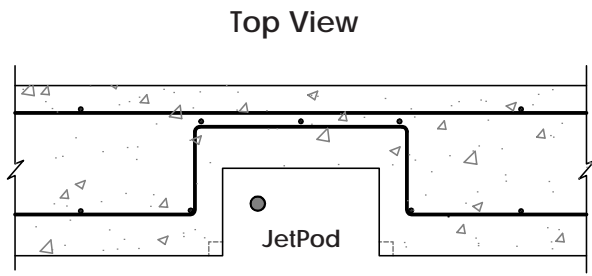
III. Important

Note 1: The Air Line will move during the gunite/shotcrete phase and should be stabilized to ensure that proper positioning is maintained. The positioning should be checked and adjusted during the gunite/shotcrete process.

IV. Rebar

Install rebar as per structural engineer's specifications (Bullfrog and/or Paramount do not provide engineering specifications). Ensure rebar structure in and around JetPod area will provide adequate structural integrity to spa and JetPod structure (see Diagram 8). Rebar should be set to allow adequate thickness of gunite/shotcrete material to achieve the finished interior dimensions of the JetPod (to see finished concrete JetPod dimensions see Diagram 3).

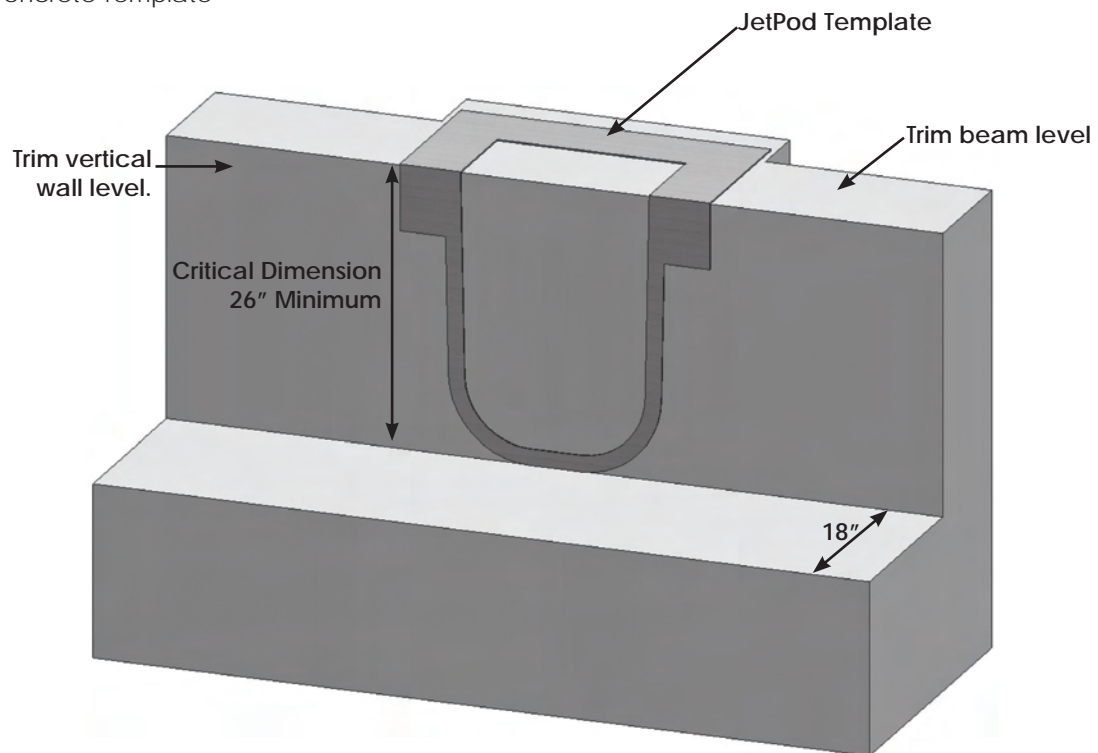
Diagram 8 - Rebar



V. Concrete

- A. Prior to gunite/shotcrete, mark the center location of each JetPod on the form.
- B. Apply gunite/shotcrete as normal.
- C. Prior to cutting out the JetPod, trim the spa beam and wall ensuring that the vertical wall is trimmed level. The bench height at the JetPod must be at least 26" below the top of the beam. **Note:** Bench depths greater than 26" below the top of the concrete wall may be desired for spa bathers that are taller than the average adult. **Note:** Refer to ANSI standards for maximum bench depths.
- D. Place the **JetPod Template** on the spa beam centered over the JetPod area (see Diagram 9). Adjust template to ensure that top of template is sitting level from side to side and front to back. **IMPORTANT:** The finished bench height at the JetPod must be at least 26" below the top of the concrete spa beam.

Diagram 9 - Concrete Template

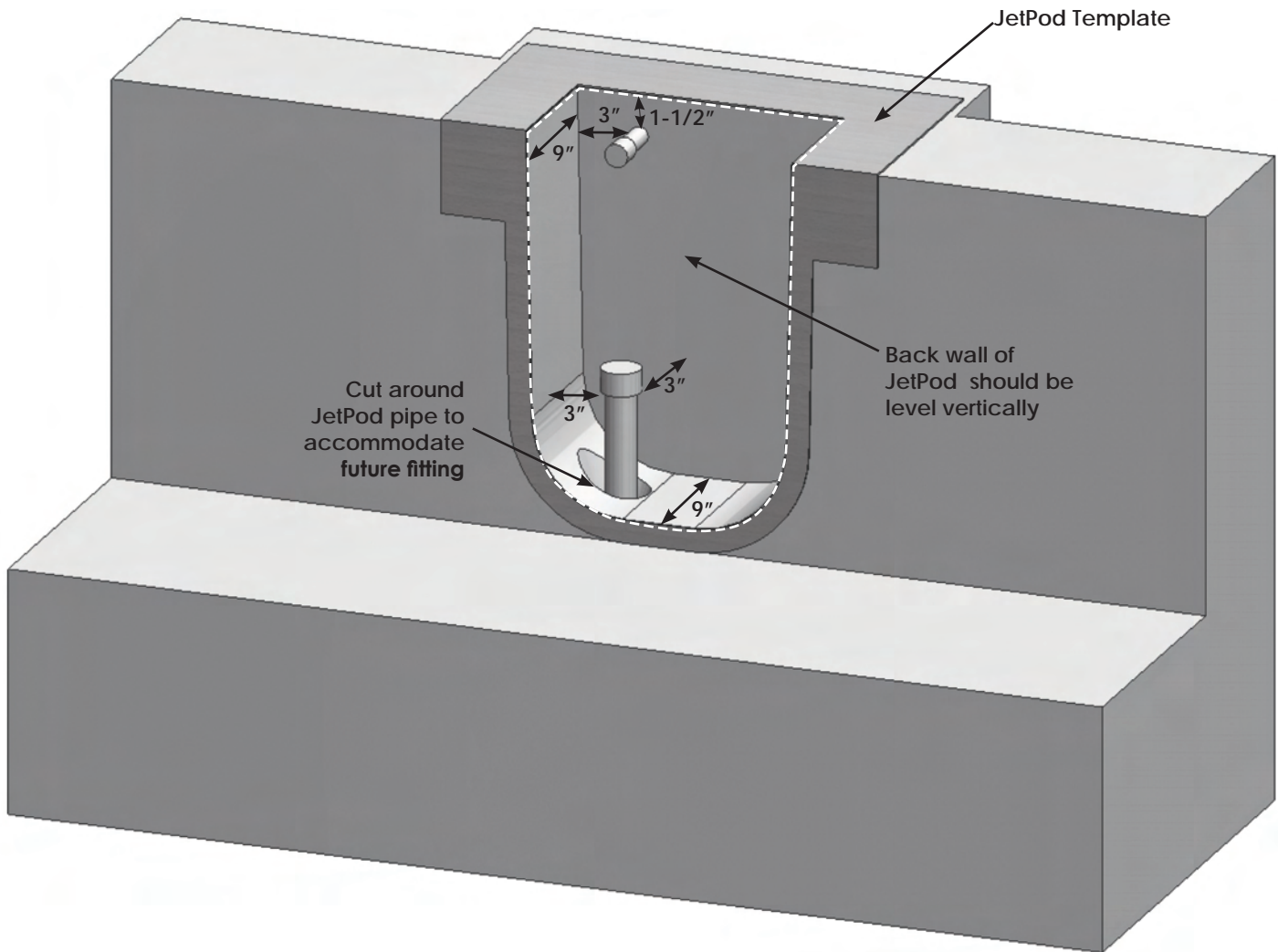


- E. While the concrete is still soft, use a cement trowel to carve out the inside of the JetPod following the inside edge of the template. The concrete JetPod must be consistently 9" deep from the face of the concrete wall. The back wall of the JetPod must be level vertically (see Diagram 10).

IMPORTANT: Check JetPod pipe and air line pipe positioning and adjust to meet the required dimensions shown in Diagram 10.

- F. Cut out around the base of the JetPod pipe to accommodate for future fitting (see Diagram 10).

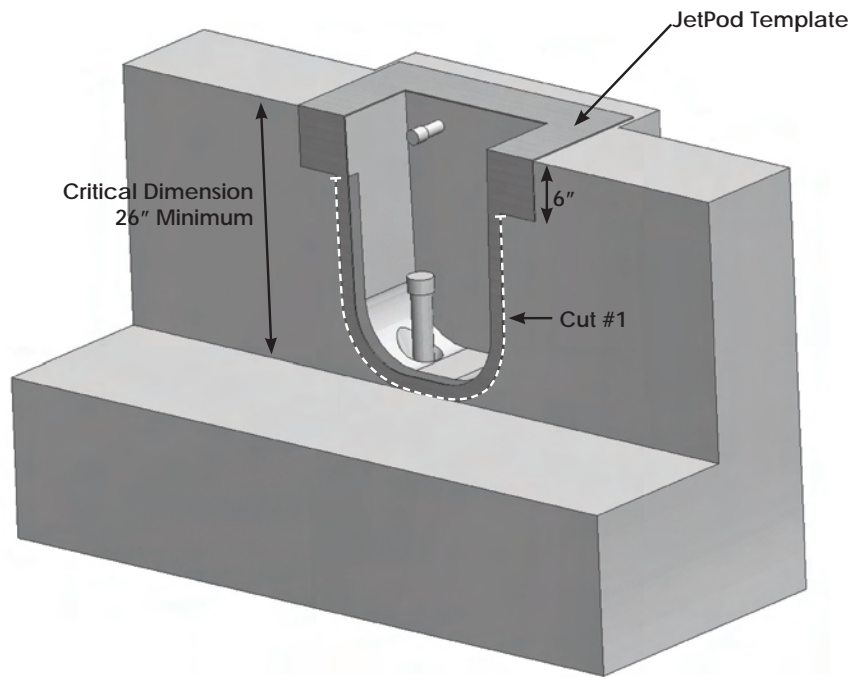
Diagram 10 - JetPod Template - Master Cut



G. Using a cement trowel, cut out Plaster Ring Notch as follows:

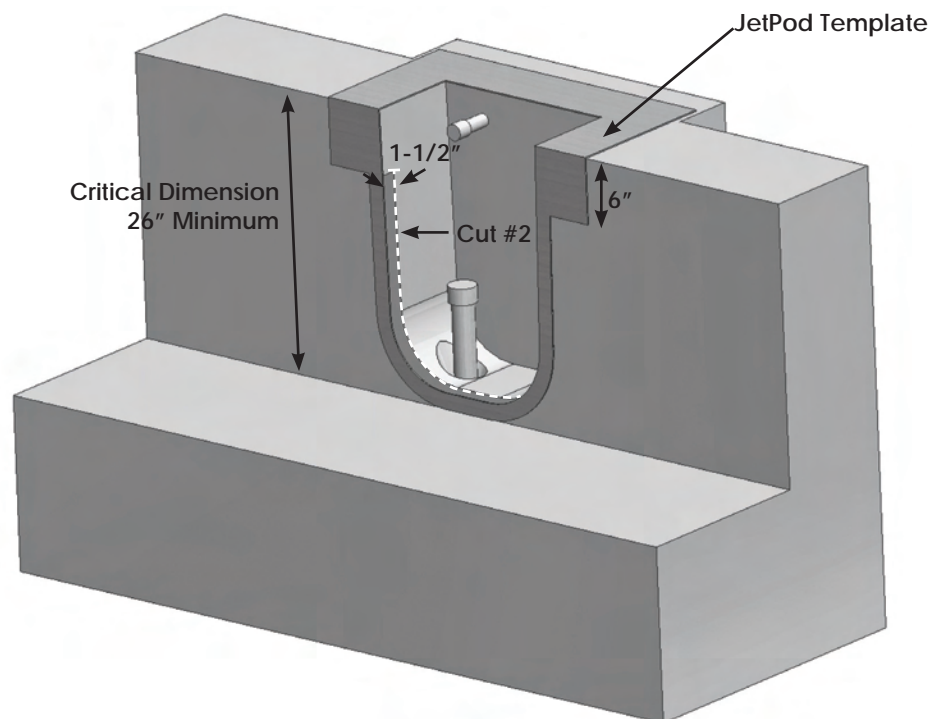
Cut #1: With the template in place, cut along the outside edge of the lower “U” shaped section of the template 1-1/2” deep and square with the face of the concrete wall (see Diagram 11). **Note:** The top of the Plaster Ring Notch must be 6” below the top of the beam.

Diagram 11 - JetPod Template - Notch Cut #1



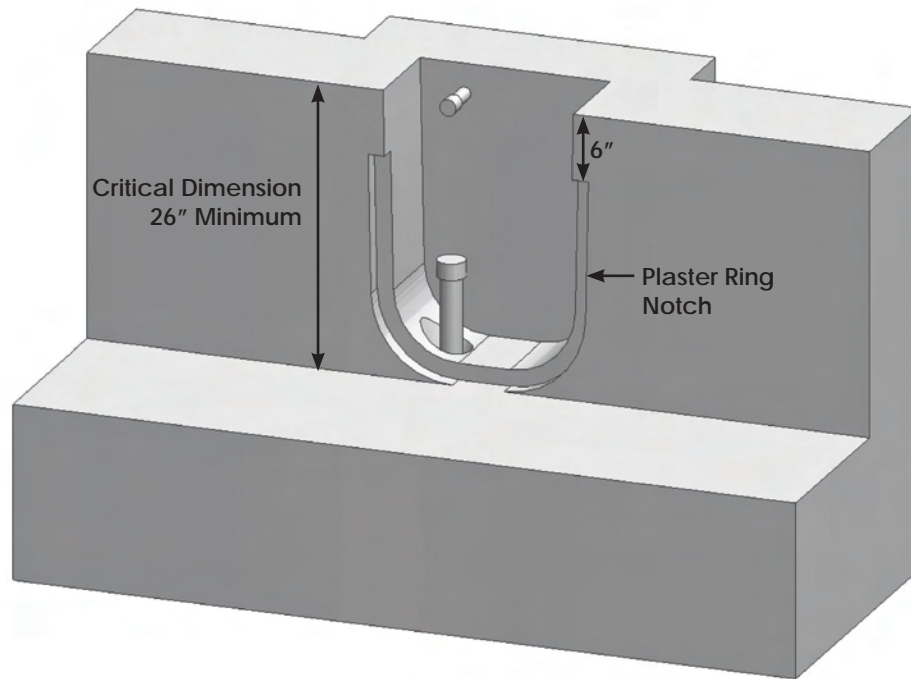
Cut #2: With the template in place, measure back from the face of the concrete wall 1-1/2” and cut into the concrete perpendicular to Cut #1, connecting Cut #2 and Cut #1 (see Diagram 12).

Diagram 12 - JetPod Template - Notch Cut #2



H. Remove template and cut away concrete to create the Plaster Ring notch (see Diagram 13).

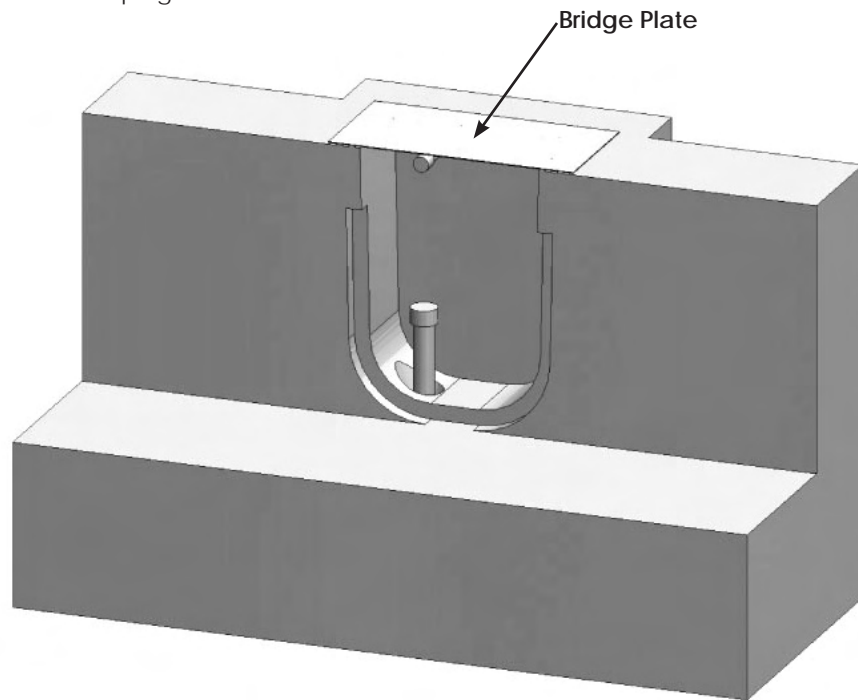
Diagram 13 - Plaster Ring Notch



VI. Coping, Deck and Tile

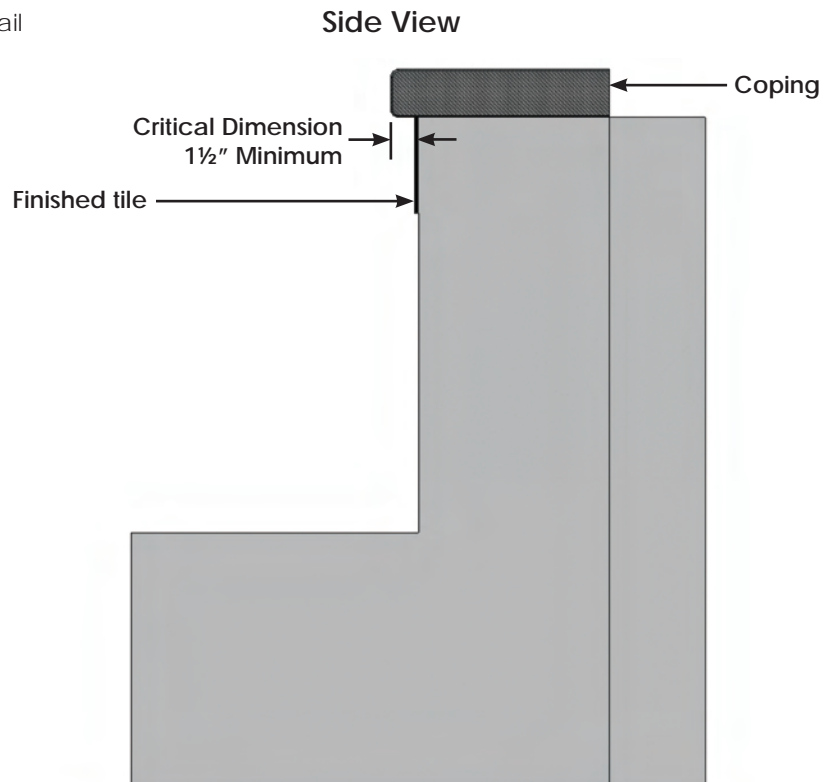
- A. Install coping as normal, bridging over the JetPod with a material that will structurally support the coping similar to bridging over a skimmer throat (see Diagram 14).

Diagram 14 - Bridge Plate for Coping



IMPORTANT: Coping must overhang finished tile by at least 1-1/2" (see Diagram 15).

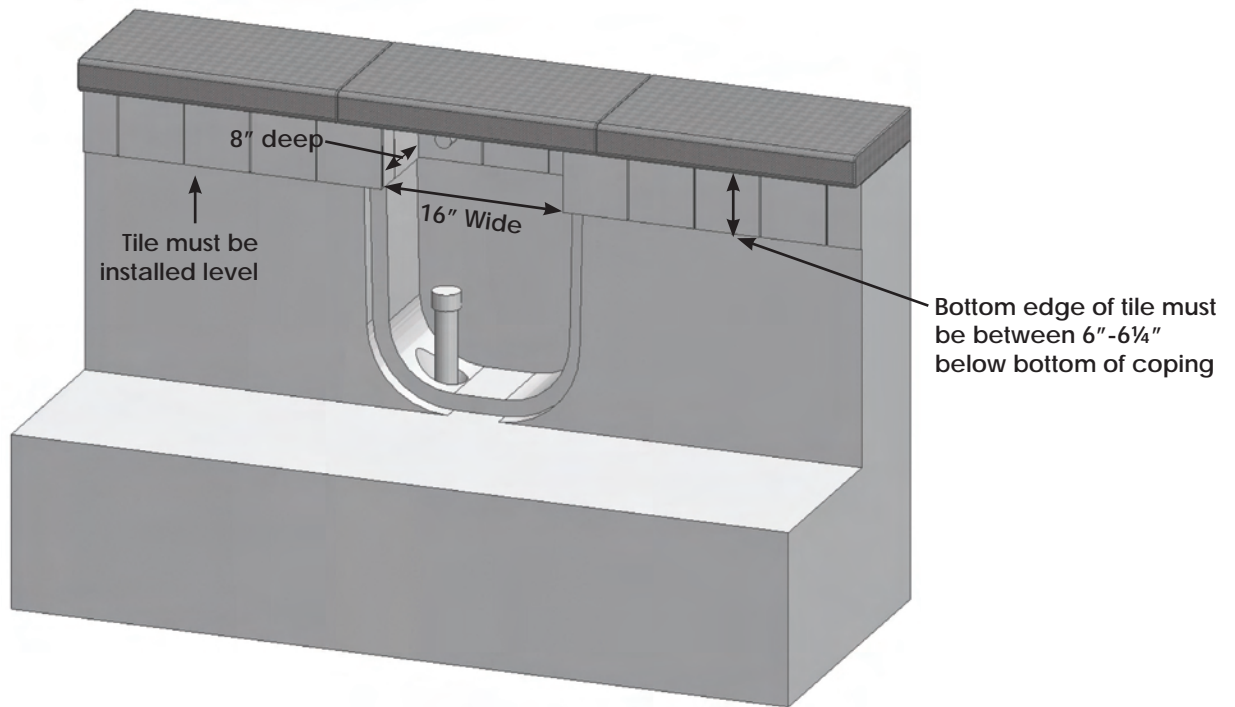
Diagram 15 - Coping Detail



Note: If using Stegmeier's Cantilevered Coping Forms, be sure to use Stegmeier's 1" extender to achieve the specified overhang.

- B. Install a 6" row of tile and ensure that the tile is set level. **IMPORTANT:** The finished dimensions of the JetPod after tile must be 16" wide and a minimum of 8" deep (see Diagram 16).

Diagram 16 - Tile Detail



Note 1: If the band of tile is greater than 6" in height then the tile will need to be reduced to 6" at each JetPod location (it is recommended to continue the 6" band of tile inside the JetPod).

Note 2: If the tile band is less than 6" in height (or if the spa does not have tile), special attention will be required to install the Plaster Ring ensuring that the top edge of the Plaster Ring is set 6" below the bottom of coping, the Plaster Ring is set level, and that the Plaster Edge is set out 1/2"- 5/8" from gunite surface to accommodate plaster finish.

VII. Plaster Ring Assembly

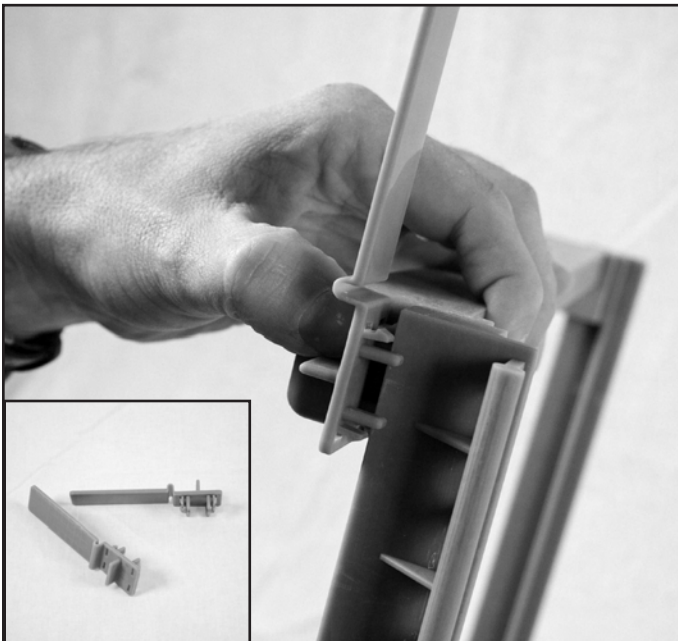
- A. Attach the two (2) **Lower Tabs** to the Plaster Ring by snapping each tab into the lower receivers and ensure the clips engage (see Diagram 17).

Diagram 17 - Plaster Ring - Lower Tabs



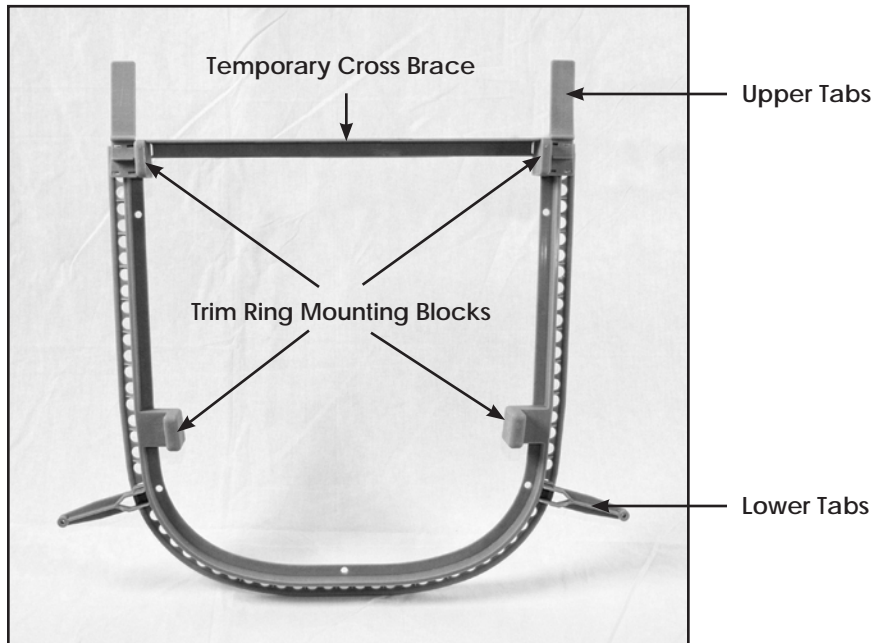
- B. Attach the two (2) **Upper Tabs** to the Plaster Ring by snapping each tab into the upper receivers and ensure the clips engage (see Diagram 18).

Diagram 18 - Plaster Ring - Upper Tabs



C. Completely Assembled Plaster Ring (see Diagram 19).

Diagram 19 - Assembled Plaster Ring



- D. Install velcro tape on Upper Tabs - Remove protective strip from one side of the velcro and attach it to one of the Upper Tabs on the side labeled "Tape". Repeat this step with the other Upper Tab (see Diagram 20). DO NOT attach velcro to Lower Tabs.

Diagram 20 - Velcro tape on Upper Tabs



VIII. Pre-Set Plaster Ring

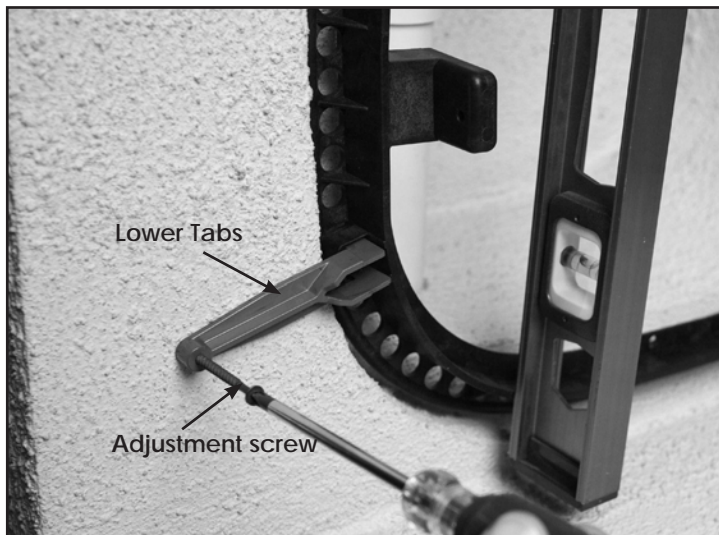
- A. Before installing Plaster Ring, clean all surfaces (tile, JetPod and Plaster Ring notch) thoroughly to remove all dirt and debris.
- B. Using the Upper Tabs, position the Plaster Ring so that it is centered on the JetPod and fits into the Plaster Ring notch. The top of the Plaster Ring should touch the bottom edge of the 6" tile band. Remove protective strip from the velcro and secure the Plaster Ring to the tile by pressing firmly on the Upper Tabs. **IMPORTANT:** Top of Plaster Ring must be between 6" - 6 1/4" below the bottom side of the coping (see Diagram 21).

Diagram 21 - Velcro Plaster Ring to Tile



- C. Lower Tabs – Using Adjustment Screws (#8 x 2") place screws in the end of each Lower Tab and tighten screws so that the screws are touching the concrete surface. (**Note:** Screws are not intended to fasten into the concrete and must be removed prior to finished plaster.) Once the Adjustment Screws are touching the concrete, and using a level, adjust each screw until the Plaster Ring is level vertically (see Diagram 22).

Diagram 22 - Adjust Lower Tabs



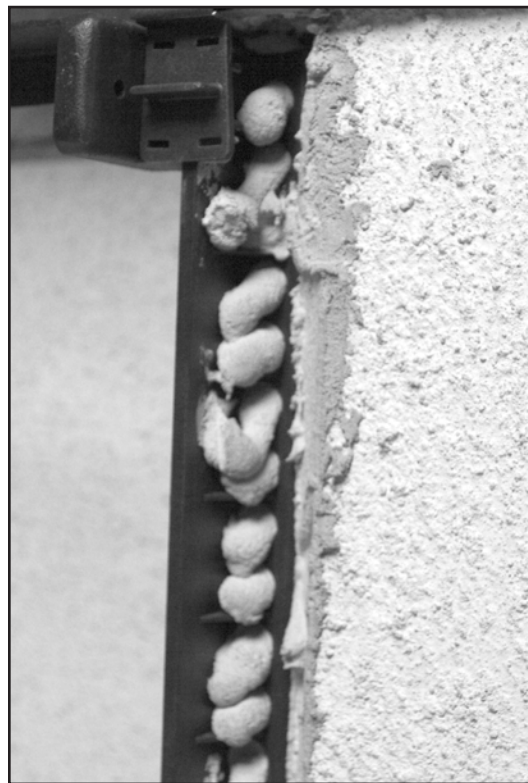
IX. Mud-Set Plaster Ring

- A. With the Plaster Ring in place and adjusted as described in the previous section, mix the setting mud using cement topping mix and a liquid polymer designed to be used when mixing grouts and mortars. (Note: All of these materials are available at your local hardware store). The finished mix should be free of lumps and should be the consistency of normal mortar.
- B. Remove the pre-set Plaster Ring by separating the Velcro strips attaching the Upper Tabs to the tile. Using a trowel, fill the Plaster Ring Notch $\frac{3}{4}$ full with the setting mud (see Diagram 23). While the mud is still workable, press the Plaster Ring into the mud, align it to the pre-set position. The mud should be thin enough to protrude through the holes in the Plaster Ring, but thick enough to hold the Plaster Ring in place (see Diagram 24).

Diagram 23 - Mud Plaster Ring Notch



Diagram 24 - Plaster Ring Mud Set



Note 1: The top edge of the Plaster Ring must be between 6" – 6 1/4" below the bottom side of the coping.

Note 2: Plaster Ring must be centered on the JetPod.

Note 3: Adjustment screws should be touching the concrete surface.

- C. Secure the Plaster Ring in the pre-set position by either placing a heavy object against the bottom of the Plaster Ring or by tying a piece of wire or string to the Plaster Ring and secure it to the JetPod pipe so that the Adjustment Screws are held firmly against the concrete (see Diagram 25). **IMPORTANT:** Do not allow the Plaster Ring to bend during this process.

Diagram 25 - Secure Plaster Ring



- D. Using a trowel, finish mud so that the mud is leveled $\frac{1}{2}$ " below the inside and outside plaster edges of the Plaster Ring (see Diagram 26).

Diagram 26 - Plaster Ring - Troweled Mud



- E. Once setting mud is hardened and Plaster Ring is secure, remove the cross brace by cutting at the attachments points (see Diagram 27).

Diagram 27 - Cross Brace Removal



Note: Do not remove Cross Brace, Upper Tabs or Lower Tabs until setting mud is hard.

Note: Do not remove or damage Trim Ring or Mounting Blocks.

- F. Using pliers, remove the Upper Tabs by gently twisting the tabs side to side while pulling away from the Plaster Ring (see Diagram 28).

Diagram 28 - Upper Tab Removal

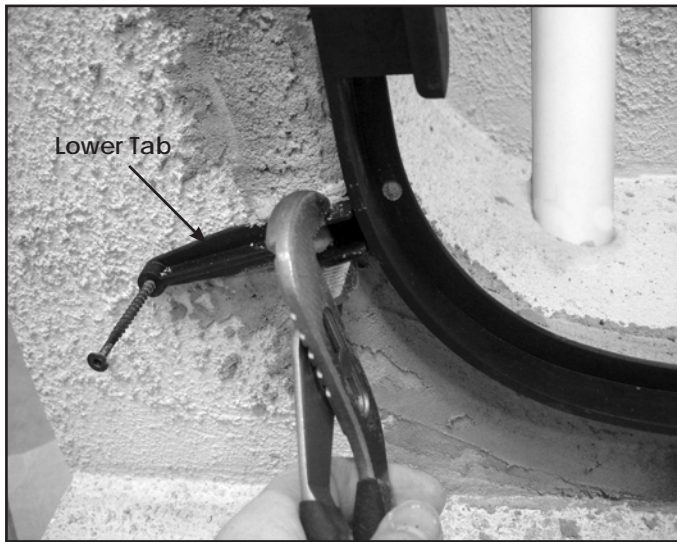


Upper Tab

Mounting Block

- G. Using pliers, remove the Lower Tabs by squeezing the tabs and gently pulling away from the Plaster Ring (see Diagram 29).

Diagram 29 - Lower Tab Removal



- H. Remove the heavy object or wire used to secure the Plaster Ring to the pre-set position.

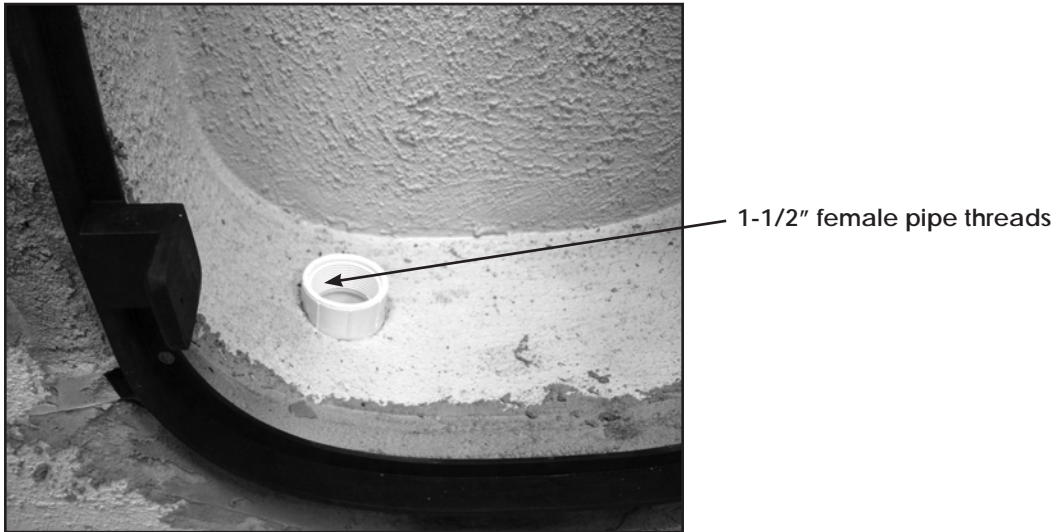
X. JetPod Piping

- A. Prior to plaster, cut JetPod piping and install a 1-1/2" PVC FIP finished fitting (see Diagram 30).

Note 1: Finished fitting is **not included**.

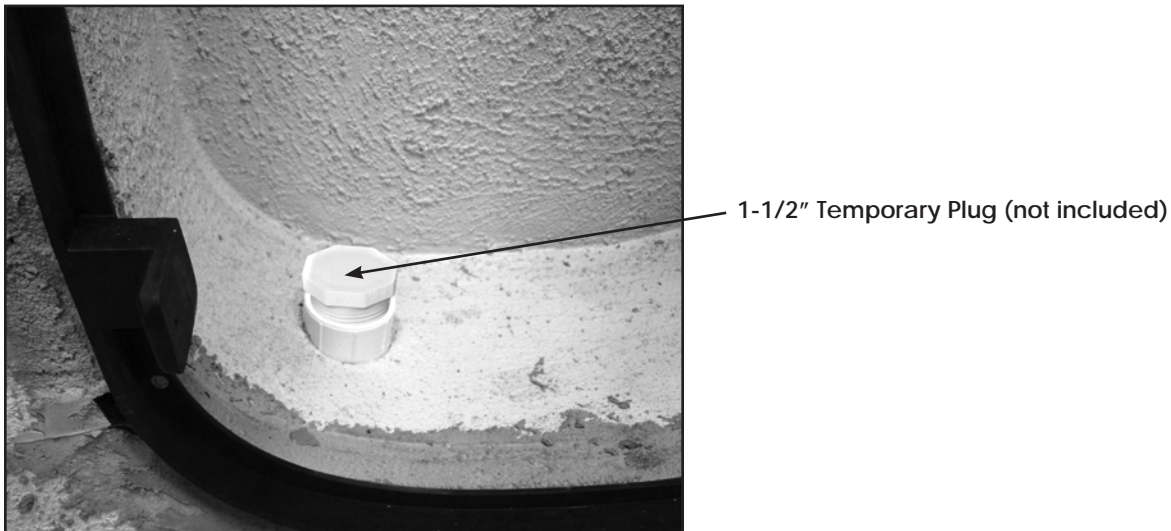
Note 2: Finished fitting must be female with standard pipe thread.

Diagram 30 - Install 1-1/2" Finished Fitting



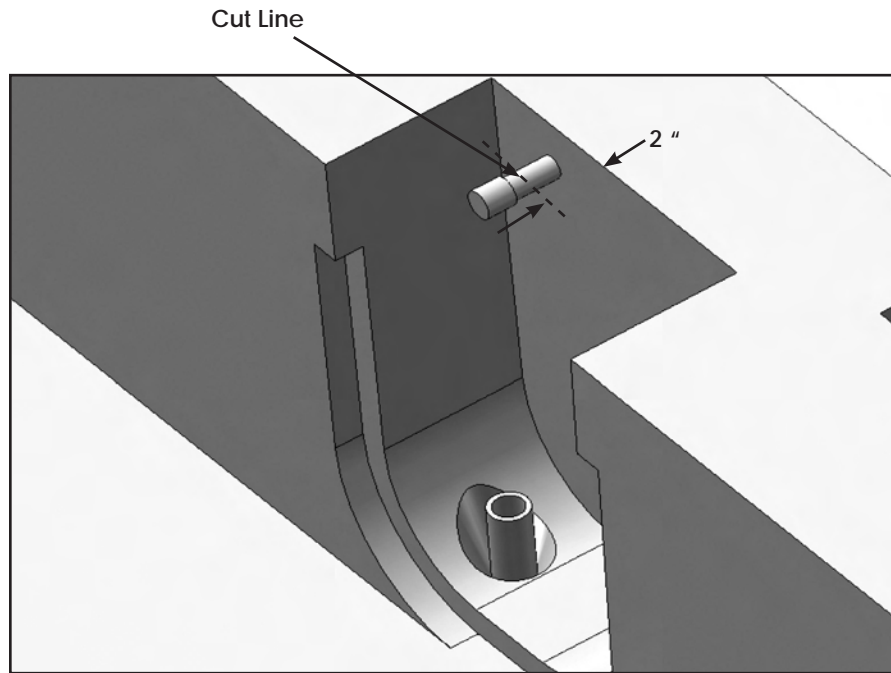
- B. Loosely thread in a temporary 1-1/2" plug to protect fitting during plastering process (see Diagram 31).

Diagram 31 - Temporary Plug



- C. Prior to plaster, cut Air Line pipe 2" out from concrete surface ($\frac{1}{2}$ " to accommodate plaster or tile thickness plus $1\frac{1}{2}$ " to accommodate Air Fitting) (see Diagram 32).

Diagram 32 - Air Line Final Cut



- D. Prior to plaster, tape off the end of the Air Line to prevent plaster from entering into pipe during the plaster process.

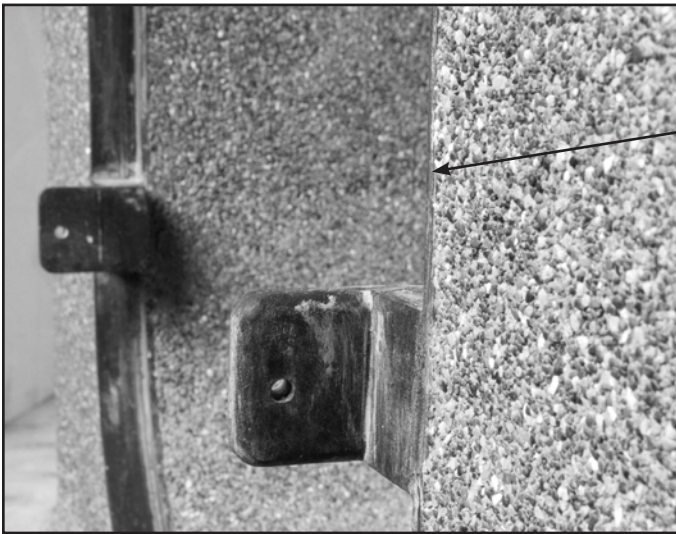
XI. Plaster/Pebble Finishing

- A. Apply plaster as normal, ensuring adequate coverage in and around JetPod. Ensure that plaster is finished tightly against both the inside and outside edges of the Plaster Ring and the pipe fitting.

IMPORTANT: Care should be taken to ensure plaster is finished smoothly and level along outside edge of Plaster Ring (see Diagram 33).

WARNING: If plaster is finished higher than the critical plaster edge the Trim Ring will not fit! (See Diagram 33)

Diagram 33 - Critical Plaster Edge



Critical Plaster Edge
(plaster must be flush with
Critical Plaster Edge)

XII. Trim Ring Installation

- A. Place the Trim Ring over the Plaster Ring lining up the slotted holes on the Trim Ring with the Mounting Tabs on the Plaster Ring (see Diagram 34).

Diagram 34 - Line up Trim Ring with Plaster Ring



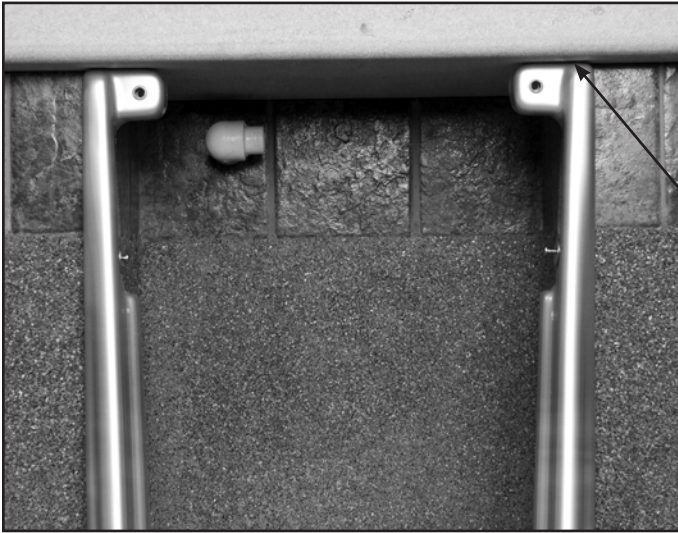
- B. Loosely secure the JetPak Trim Ring to the Plaster Ring Mounting Blocks using the four (4) stainless steel screws (#10 x $\frac{3}{4}$ " long) and flat washers (see Diagram 35).

Diagram 35 - Secure Trim Ring to Plaster Ring



- C. Prior to tightening the screws, slide the JetPak Trim Ring up against the bottom of the coping and tighten the screws firmly, but **DO NOT OVER TIGHTEN** (see Diagram 36).

Diagram 36 - Trim Ring Final Position

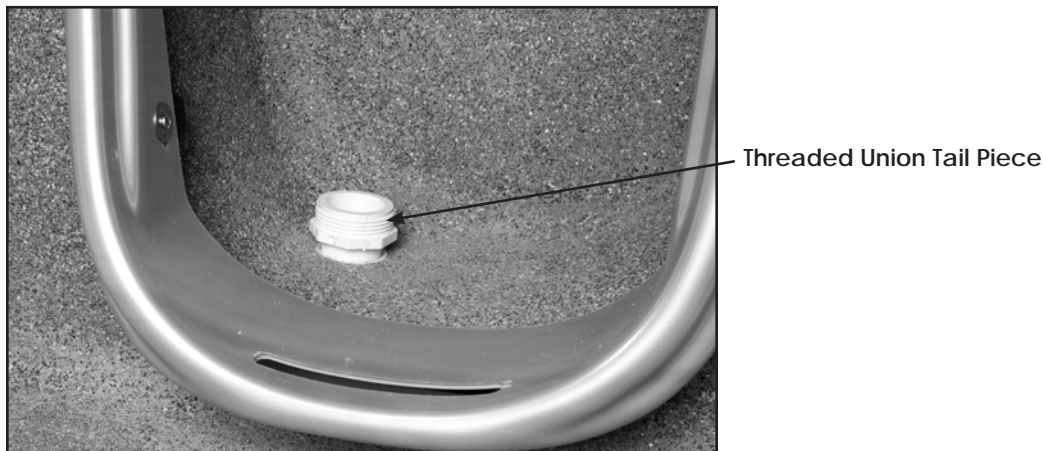


Slide the JetPak Trim Ring up against the bottom of the coping

XIII. Jet Piping:

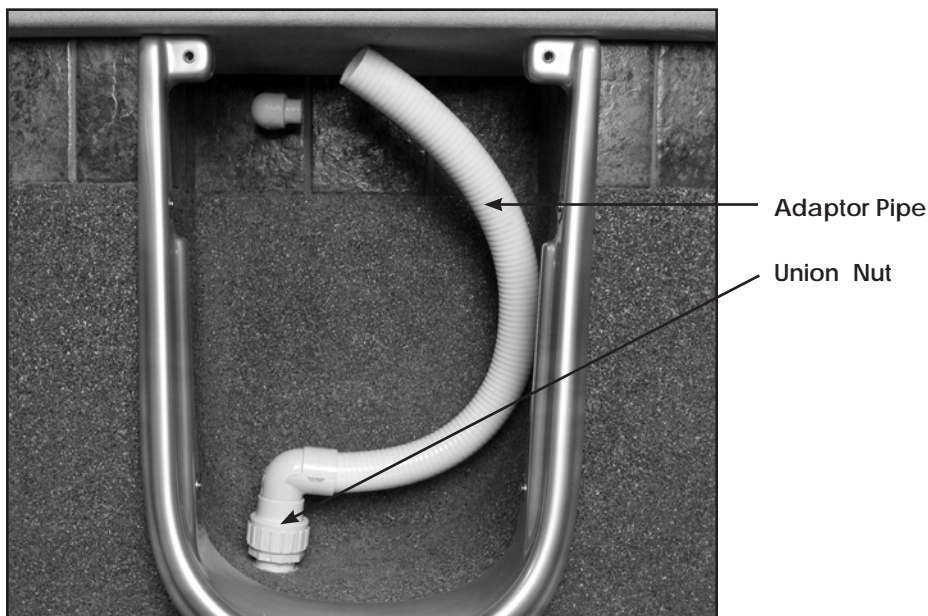
- A. Remove the loosely threaded plug from the PVC FIP adaptor fitting in the JetPod and install the threaded Union Tail Piece (see Diagram 37).
- B. Fill spa and start pump to blow lines clear of debris before attaching JetPak plumbing. **Important:** Failure to blow lines clear may result in JetPak jets becoming jammed with construction debris.

Diagram 37 - Union Tail Piece



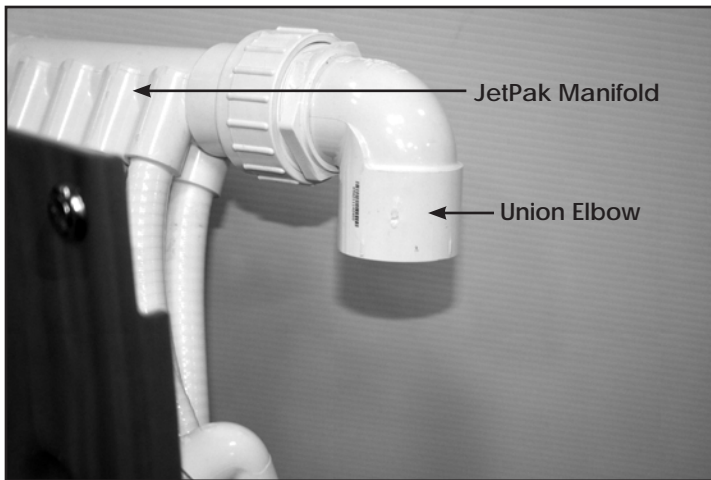
- C. Install Adaptor Pipe Assembly by threading the union nut of the Adaptor Pipe Assembly onto the installed Union Tail Piece with the flexible pipe directed upward and toward the right hand side of the JetPod (see Diagram 38).

Diagram 38 - Adapter Pipe Assembly



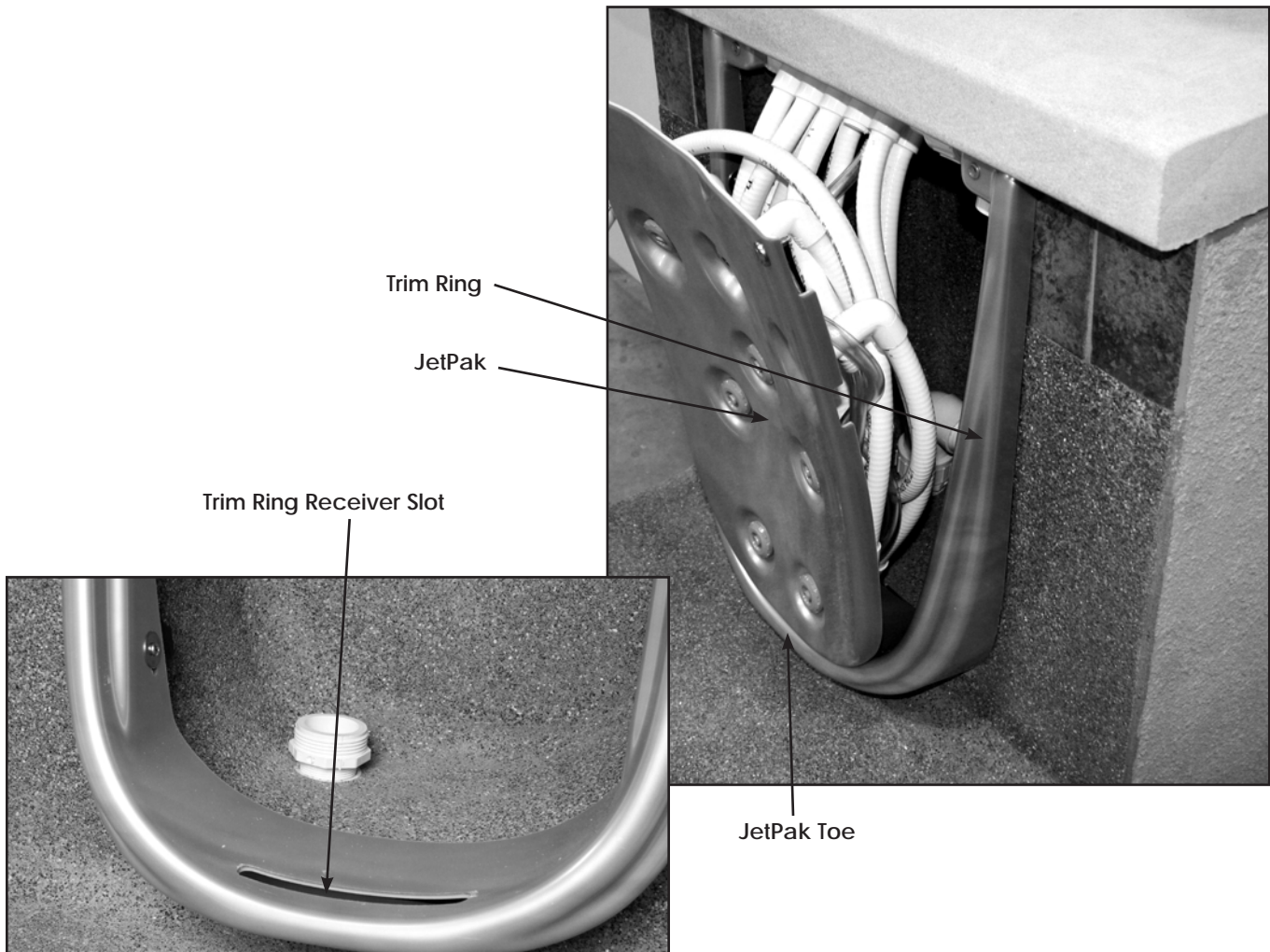
D. Attach the Union Elbow to the JetPak Manifold with the elbow directed down (see Diagram 39).

Diagram 39 - JetPak Manifold



E. Place the toe of the JetPak into the receiver slot in the Trim Ring with the top of the JetPak leaning out into the spa (see Diagram 40).

Diagram 40 - JetPak



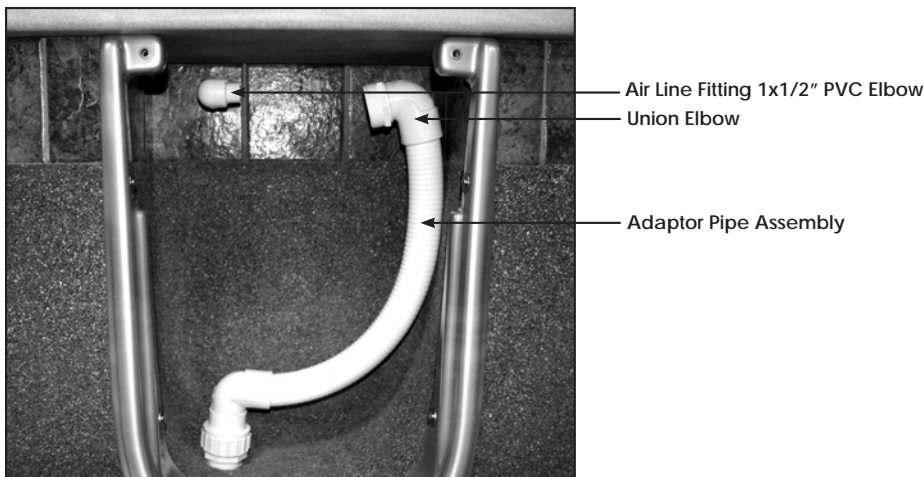
- F. With the JetPak leaning out into the spa, reach into the JetPod and pull the top of the Adaptor Pipe out toward the JetPak manifold, align pipe with the bottom of the Union Elbow and mark the Adaptor Pipe with an underwater marking pen (see Diagram 41).

Diagram 41 - Marking Adaptor Pipe



- G. Remove the JetPak from the Trim Ring and remove the Adaptor Pipe from the JetPod.
- H. Locate the mark on the Adaptor Pipe, **add 1-1/4"** to the mark, and cut the Adaptor Pipe to the finished length.
- I. Remove the Union Elbow from the JetPak manifold and using PVC glue (**WARNING: Do not use primer on flexible PVC pipe**), glue the Elbow Union onto the Adaptor Pipe, positioning the Elbow Union so that the natural curve of the flexible PVC pipe will easily connect to the JetPak Manifold when the Adaptor Pipe is installed in the JetPod (see Diagram 42).
- Note:** All PVC primer and glue used shall be designed for use in spas. When gluing PVC pipe and fittings make sure all pipe and fittings are clean and free of damage.
- J. Re-attach the Adaptor Pipe into the JetPod by hand tightening the Union Nut. Position the Adaptor Pipe with the natural curve of the flexible PVC pipe directed upward and toward the right side of the JetPod. (See Diagram 42). **Note:** Do not over tighten union connections.

Diagram 42 - Adaptor Pipe Assembly Complete



XIV. Air Line

- A. Install the 1" X 1/2" PVC elbow **without** PVC glue onto the air line stub in the JetPod. Position the elbow so that the 1/2" socket is directed toward the right side of the JetPod (see Diagram 42).

Note: If 1" X 1/2" PVC fitting is glued onto the airline stub, the JetPak will not be removable.

- B. Place the toe of the JetPak into the receiver slot in the Trim Ring with the top of the JetPak leaning out into the spa (see Diagram 40).
- C. With the JetPak leaning out into the spa, align the flexible 1/2" Air Line from the JetPak to the 1" X 1/2" PVC fitting on the Air Line stub and mark the 1/2" Air Line with an underwater marking pen.
- D. Remove the JetPak from the Trim Ring and locate the mark on the 1/2" Air Line connected to the JetPak, **add 1"** past the marking, and cut the 1/2" Air Line to the finished length.

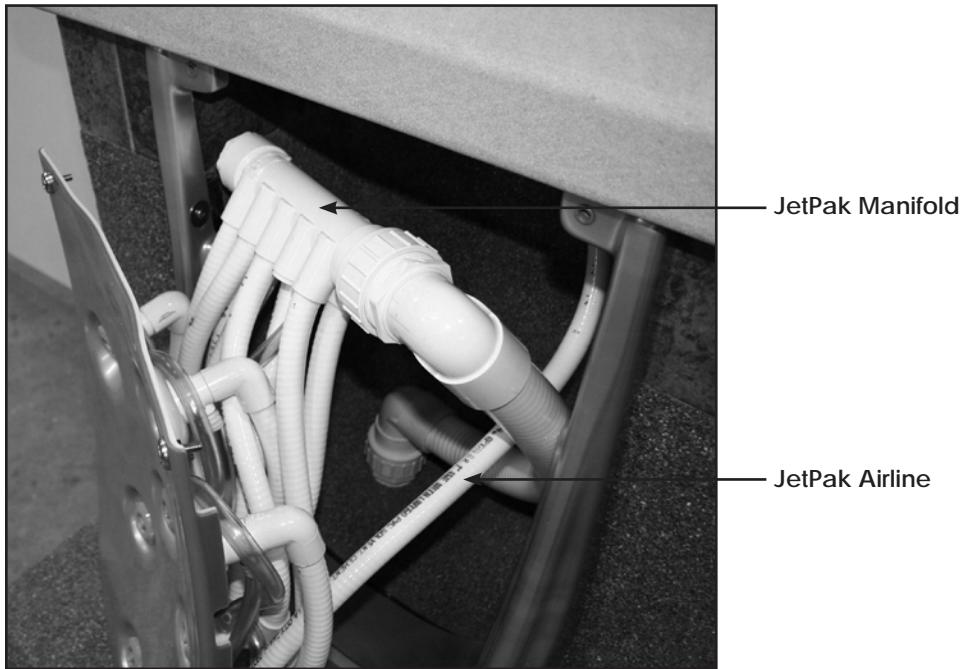
Note: The Air Line should have plenty of slack to make it easy to install and remove the JetPak.

- E. Using PVC glue (**WARNING:** Do not use primer on flexible PVC pipe), glue the 1" X 1/2" PVC elbow onto the 1/2" JetPak Air Line, positioning the elbow so that the natural curve of the flexible PVC pipe will easily connect to the Air Line stub.

XV. JetPak Install

- A. Attach the other end of the Adaptor Pipe to the JetPak Manifold by hand tightening the Union Nut (see Diagram 42). **Note:** Do not over tighten union connections.

Diagram 42 - Installation of JetPak



- B. Re-insert the bottom of the JetPak into the slotted pocket of the Trim Ring (see Diagram 40).
- C. Place the Flat Head Screws (1/4 x 20 x 3/4" long) with the Finished Washers into the holes at the top of the JetPaks.
- D. Install the Rubber Retaining Washers onto the Flat Head Screws on the back of the JetPak.
- E. Secure the JetPak by tightening the screws (see Diagram 43).

Note: Do not over tighten screws.

Diagram 43 - Finished JetPak Installation



JetPak Pump Selection Guide

JetPak with Dedicated Pump

	Qty per Pump	Total GPM	Approx. 50' Run HD Loss	Approx. 100' Run HD Loss	Pipe Size Suction	Pipe Size Pressure Trunk	Pipe Size Pressure Branch	Pentair Whisperflow Full Rated	Pentair Intelliflow Full Rated	Jandy Stealth Full Rated	Hayward Northstar Full Rated
Spinal'ssage	1	40	67.1	69.1	2"	2"	na	WFE-4 1.0 HP	na	1 HP SHPF 1.0 HP	SP4010NS 1.0 HP
	2	80	70.1	74.1	2-1/2"	2-1/2"	2"	WFE-8 2.0 HP	VS-3050	2 HP SHPF 2.0 HP	SP4020NS 2.0 HP
	3	120	69.1	73.1	3"	3"	2"	WFE-12 3.0 HP	VS-3050	3 HP SHPF 3.0 HP	SP4030NS 3.0 HP
Oscillator	1	60	65.2	71.2	2" (2-1/2")	2"	na	WFE-4 1.0 HP	na	1 HP SHPF 1.0 HP	SP4010NS 1.0 HP
	2	120	65.2	66.2	3"	3"	2"	WFE-12 3.0 HP	VS-3050	3 HP SHPF 3.0 HP	SP4030NS 3.0 HP
ClusterSpray	1	60	44.5	50.5	2" (2-1/2")	2"	na	WFE-4 1.0 HP	na	1 HP SHPF 1.0 HP	SP4010NS 1.0 HP
	2	120	41.5	45.5	3"	3"	2"	WFE-12 3.0 HP	VS-3050	3 HP SHPF 3.0 HP	SP4030NS 3.0 HP

JetPak with Filter/Heater/Chlorinator/etc

	Qty per Pump	Total GPM	Approx. 50' Run HD Loss	Approx. 100' Run HD Loss	Pipe Size Suction	Pipe Size Pressure Trunk	Pipe Size Pressure Branch	Pentair Whisperflow Full Rated	Pentair Intelliflow Full Rated	Jandy Stealth Full Rated	Hayward Northstar Full Rated
ClusterSpray	1	60	70.0	75.0	2" (2-1/2")	2"	na	WFE-8 2.0 HP	VS-3050	2 HP SHPF 2.0 HP	SP4020NS 2.0 HP

The ClusterSpray JetPak has the lowest pressure requirement and operates well at 60 GPM. This makes it ideal for use with a typical residential filtration system when connected with a standard spa/pool valving arrangement. The pump is upgraded to a 2 HP to compensate for the typical additional losses due to the filter, heater, chlorinator, valves, etc. A 25' allowance for filter system has been added. System requirements can vary greatly depending on the size of pool. If the pool requires more GPM output than the 2 hp pump system suggested here, other JetPak combinations are possible, but must be individually determined by a qualified designer.

Appendix A (continued)

JetPak GPM and Pressure Requirements Table

This table is to be used for custom JetPak installations. A qualified swimming pool hydraulic systems designer can determine pipe sizing and make pump selection using this table in conjunction with standard hydraulic sizing tools.

	GPM	PSI	HD/ft	Therapy Action
Spinal'ssage	30	15	34.5	Good
	40	27	62.1	Best
Oscillator	40	11	25.3	Fair
	50	18	41.4	Good
	60	24	55.2	Best
ClusterSpray	40	8	18.4	Fair
	50	11	25.3	Good
	60	15	34.5	Best

This table indicates the flow in gallons per minute required at the JetPak connector to provide the therapy action indicated for the various JetPak models. The pressure requirements shown must be added to the plumbing system loss when selecting a pump. **ADD FOR PLUMBING LOSSES. NO PIPING IS INCLUDED IN THE ABOVE TABLE.**

JetPak Combinations on One Pump

	Qty per Pump	Total GPM	Approx. 50' Run HD Loss	Approx. 100' Run HD Loss	Pipe Size Suction	Pipe Size Pressure Trunk	Pipe Size Pressure Branch	Pentair Whisperflow Full Rated	Pentair Intelliflow Full Rated	Jandy Stealth Full Rated	Hayward Northstar Full Rated
Oscillator	1	60									
Spinal'ssage	1	40									
		100	70	74	3"	3"	2"	WFE-12 3.0 HP	VS-3050	3 HP SHPF 3.0 HP	SP4030NS 3.0 HP
ClusterSpray	1	60									
Oscillator	1	60									
		120	64	69	3"	3"	2"	WFE-12 3.0 HP	VS-3050	3 HP SHPF 3.0 HP	SP4030NS 3.0 HP
ClusterSpray	1	60									
Spinal'ssage	1	40									
		100	70	74	3"	3"	2"	WFE-12 3.0 HP	VS-3050	3 HP SHPF 3.0 HP	SP4030NS 3.0 HP