

# BELOW-GRADE POOL INSTALLATION INSTRUCTIONS

BECAUSE THIS TYPE OF INSTALLATION IS PERMANENT AND MORE DIFFICULT THAN AN ABOVE-GROUND INSTALLATION, USE OF THESE INSTRUCTIONS IS LIMITED TO PROFESSIONAL INSTALLERS WITH THE REQUISITE SKILLS. *Hill Industries is in no way affiliated with any professional installer, and assumes no responsibility for installation errors.* Check with your local building department to see if any permits are required before beginning installation. These instructions cover preparation for installation without decking, concrete decking, or redwood decking on 48", 52" and 54" tall pools. **Carefully read all instructions before starting installation.** Failure to follow these instructions will void the pool warranty. If you are unsure about any aspect of the installation process, consult with Hill's Customer Service Department before beginning.

**COVING INSTALLATION: PREFORMED FOAM COVING IS NOT RECOMMENDED FOR THIS TYPE OF POOL INSTALLATION. IF THE WATER TABLE AROUND THE POOL RISES, IT CAN CAUSE THE FOAM COVING TO RELEASE AND RISE UP THE POOL WALL. AN EARTH COVE MADE FROM SCREENED DAMP EARTH IS RECOMMENDED. USE SCREENED DAMP EARTH TO FORM THE COVE AROUND THE INSIDE BASE OF THE POOL WALL. SHAPE AND COMPACT FIRMLY. REFER TO ASSEMBLY GUIDE INSTRUCTIONS FOR PROPER COVE DIMENSIONS.**

THE HIGH WATER TABLE AROUND THE POOL CAN ALSO CAUSE THE LINER TO FLOAT UP FROM THE POOL BOTTOM AS THE WATER TABLE RISES. NORMALLY WHEN THE WATER TABLE RECEDES THE LINER WILL GO BACK DOWN AND WILL MOST LIKELY HAVE A FEW WRINKLES. TO ELIMINATE THIS ISSUE, THE POOL WATER LEVEL MUST BE HIGHER THAN THE SURROUNDING WATER TABLE. THIS CAN BE ACCOMPLISHED BY MAKING SURE THE POOL WATER LEVEL IS AS HIGH AS POSSIBLE DURING THE RAINY SEASON. BY BEING AWARE AND KEEPING THE POOL WATER LEVEL UP, YOU CAN KEEP THE LINER IN THE PROPER POSITION.

Preparations for concrete deck or installation without decking both require backfilling (see instructions for PREPARATION FOR INSTALLATION WITHOUT DECKING OR CONCRETE DECK, FIG.S 1 & 2). Redwood deck preparation requires a sloping over-dig without backfilling if your soil characteristics allow this type of installation (see instructions in PREPARATION FOR REDWOOD DECK FIG. 3).

To avoid runoff from traveling to the pool wall and decking, the pool site should be located at the highest elevation in the yard with the surrounding landscape sloping away from the pool.

The typical plumbing installation shown in Fig. 4 is provided for reference only, and may not represent a plumbing solution for all pool sites and/or equipment. Equipment that may require special plumbing considerations are pool lights, fountains, and chlorinators. Always consult accessory owner's manuals before plumbing the pool.

## EXCAVATION

1. The perimeter excavation is sized according to the actual pool size, plus a 18 inch over-dig all around the pool. Locate the ground preparation dimensions pertaining to the clearance borders for your size pool found in the large fold out assembly guide packed with the pool parts. Excavate the pool area following those dimensions. If you decide to excavate an optional deep swim area, follow the instructions also found in that same assembly guide.
2. The depth of the excavation will vary depending on the height of the pool desired deck type. Use the dimensions shown in Fig.s 1, 2, or 3 to calculate the excavation depth for your pool height and deck choice.
3. After completing the excavation, the pool frame and wall must be installed according to instructions in the assembly guide packaged with your pool parts.

## SKIMMER AND RETURN FITTING INSTALLATION

Skimmer and return fitting installation must be completed prior to filling the pool with water and backfilling with slurry mix. DURING LINER AND SKIMMER INSTALLATION, DO NOT CUT OUT THE SKIMMER OPENING. If your skimmer is supplied with u-gaskets, discard the skimmer u-gasket and instead use the separate flat skimmer gaskets method, one gasket inside the wall, and one outside (available from your Doughboy dealer). It's recommended that you use a silicone lubricant on both sides of the two skimmer gaskets. **Do not remove the liner bordered within the skimmer faceplate at this time.**

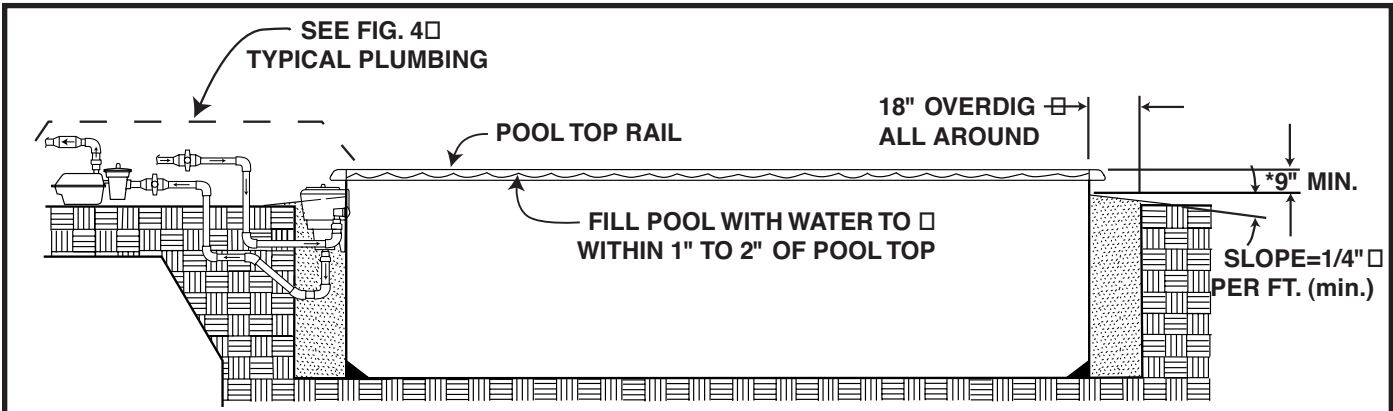
Install the return fitting and gasket. Trim the liner from the return opening and install the winterizing/shutoff disk provided with your skimmer. Double check the skimmer and return and make sure there are no leaks before backfilling with slurry.

## PLUMBING

To avoid possible hose collapse, you must hard plumb with PVC pipe and fittings from the skimmer and return fittings to your filtration equipment (see Fig. 4). If you use flexible PVC pipe, be sure that it is not kinked before covering with soil or backfill slurry. Install a check valve in the suction line between the pump and filter to prevent losing pump prime. Locate the check valve as close to the pump elevation as possible, and where it is accessible for maintenance.

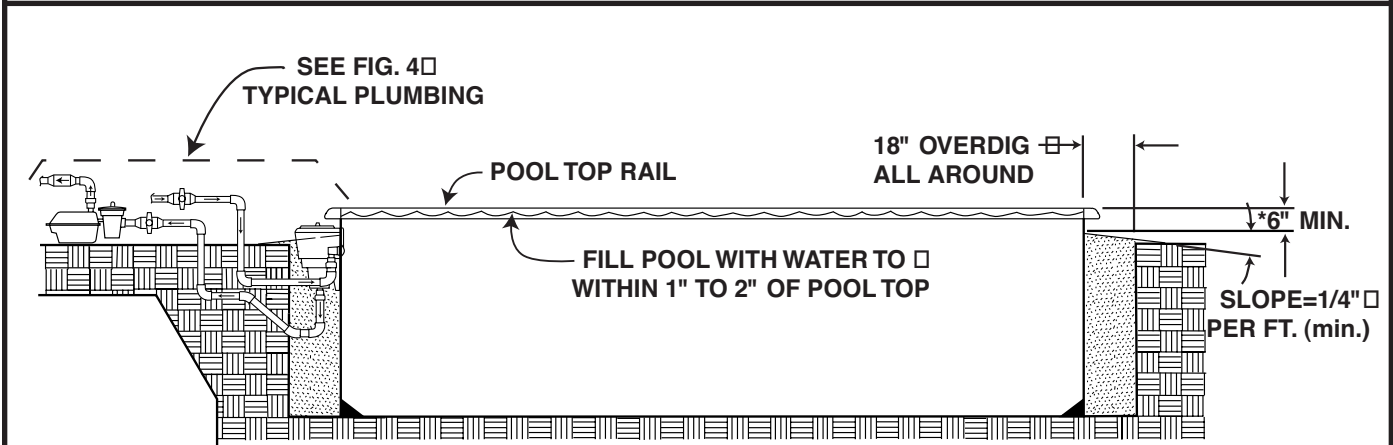
## FILL POOL

Fill the pool with water to within 1" to 2" of top of pool wall. **This procedure is absolutely necessary in order to resist the pressure exerted on the wall by the backfill slurry. Failure to fill the pool completely with water prior to backfilling could cause pool wall collapse.**

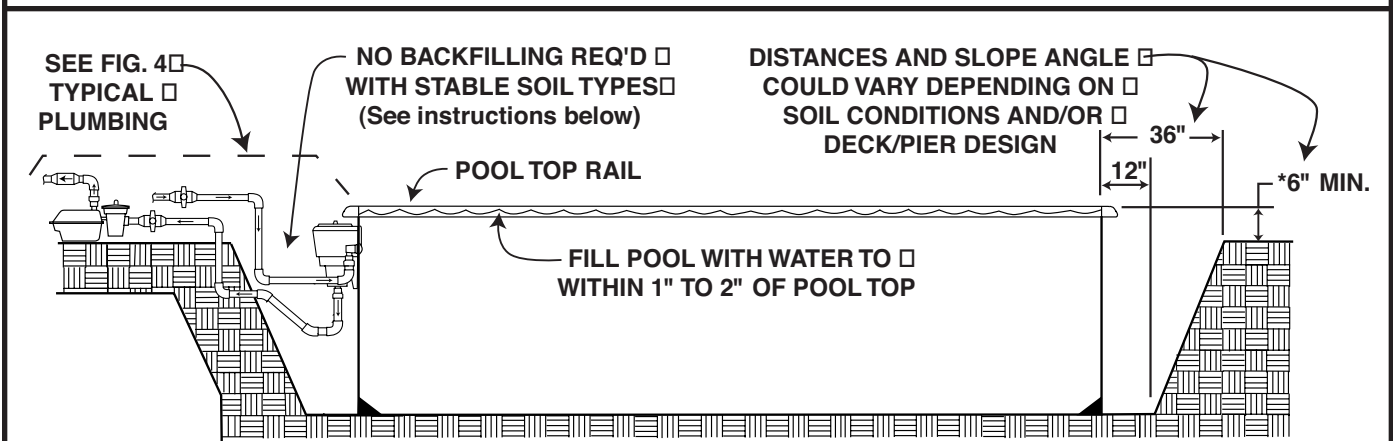


**FIG. 1 - PREPARATION FOR CONCRETE OR PAVER BLOCK DECK INSTALLATION**

\*Minimum grade to top rail distance must be maintained to allow for liner replacement.



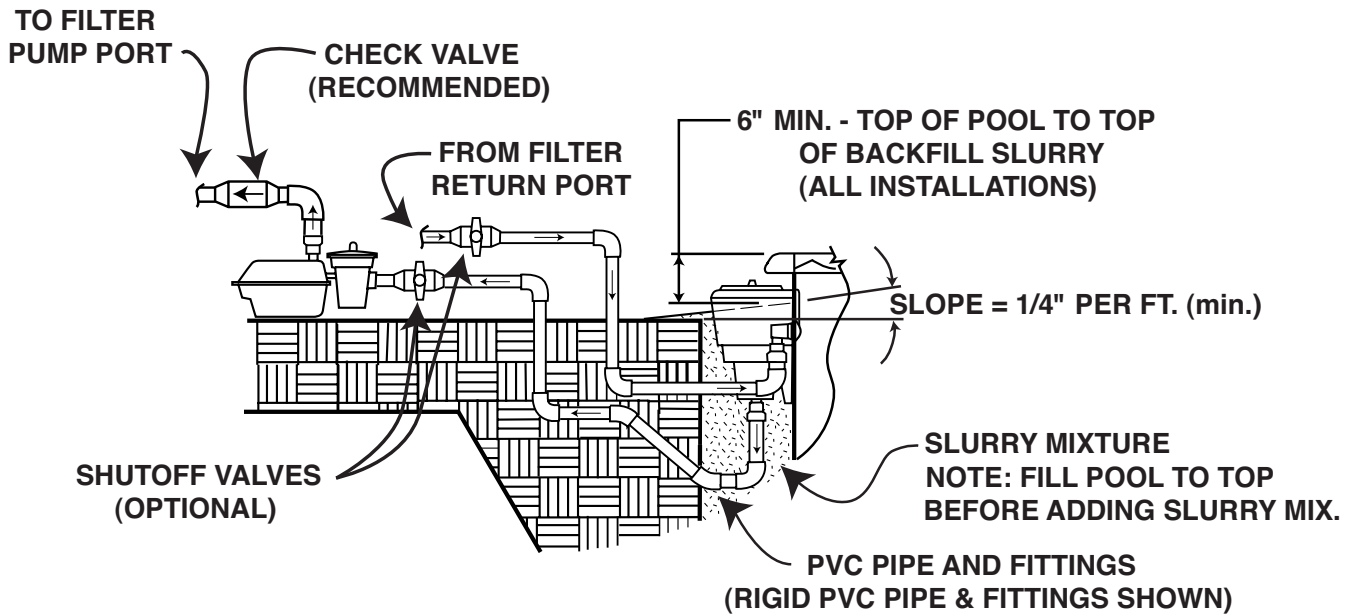
**FIG. 2 - PREPARATION FOR INSTALLATION WITHOUT DECKING**



**FIG. 3 - PREPARATION FOR REDWOOD DECK INSTALLATION**

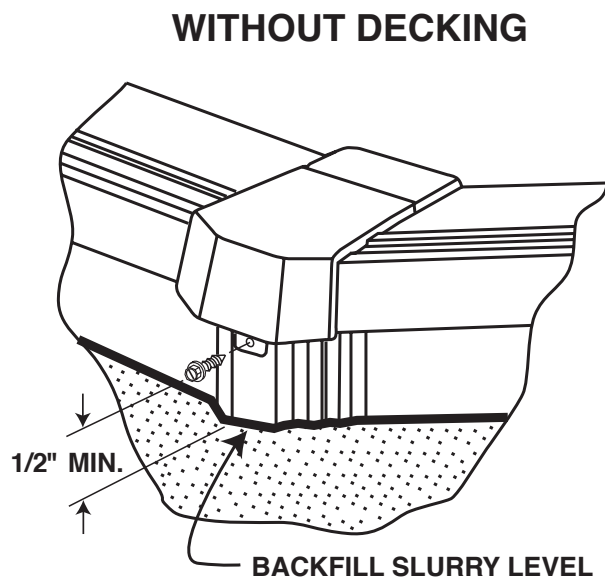
\*Minimum grade to top rail distance must be maintained to allow for liner replacement.

Slope over-dig away from pool to allow access for installation of concrete deck piers and supports. In cases where soil is composed of heavy clay, or impedes adequate drainage, installation of an automatic sump pump is recommended. **CAUTION: This type of installation is suitable only if the surrounding soil is firm enough to resist cave-in and/or excessive erosion. If there is any doubt about adequate soil stability, backfill with a slurry mix as shown in PREPARATION FOR INSTALLATION WITHOUT DECKING OR INSTALLATION FOR CONCRETE OR PAVER BLOCK DECK and install redwood decking over the slurry backfill.**

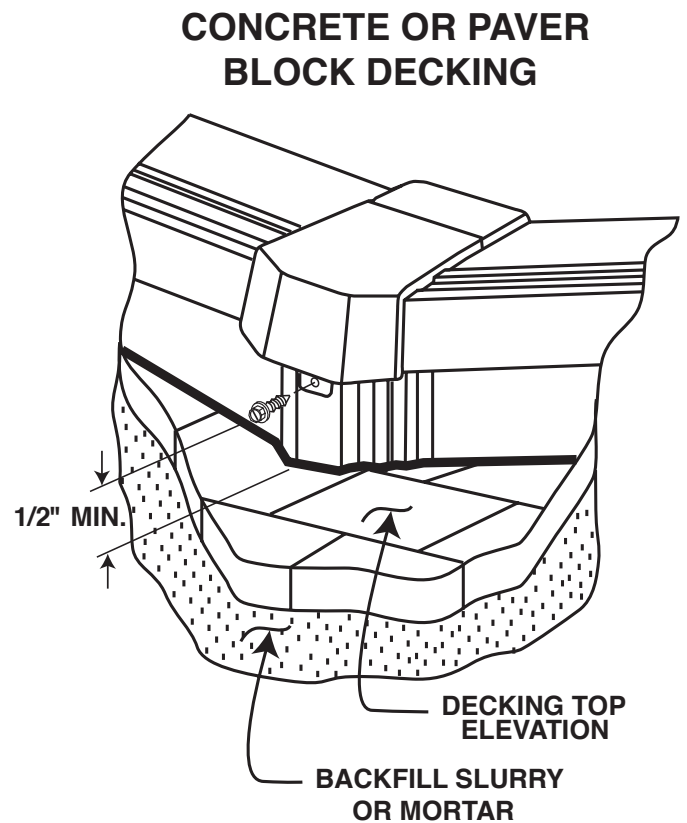


**FIG. 4 - TYPICAL PLUMBING INSTALLATION**

**FIG. 5 - DECK ELEVATION**



NOTE: KEEP BACKFILL SLURRY 1/2" MIN. BELOW LOWEST VERTICAL SCREW (7" FLARE FRAME SHOWN)

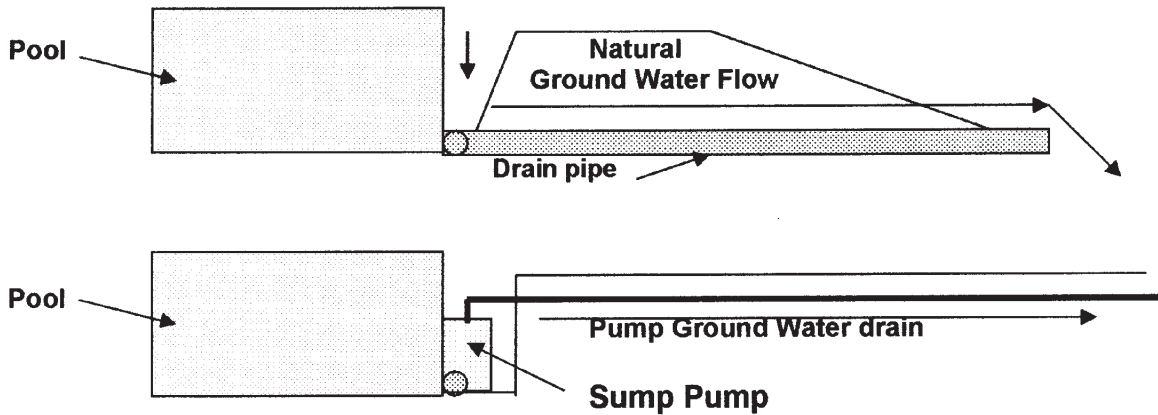


NOTE: KEEP DECK TOP ELEVATION 1/2" MIN. BELOW LOWEST VERTICAL SCREW (7" FLARE FRAME SHOWN)

## DRAINAGE

Ground water can be a serious problem for your pool if not allowed to drain properly. There are a number of ways to do this. It is recommended to install a perforated drainage pipe around the outside of the pool at the base. Run the pipe to an area away from the pool that will allow any ground water pressure to be naturally released away from the pool. If you can not drain naturally use an automatic sump pump that will drain into a storm drain or a downward grade away from the pool. The sump pump is an important component if there is no natural runoff.

To begin drain installation, create a base of about 2 inches of Pea gravel. Then set drainage pipe on Pea gravel. The pipe should be covered with a paper or cloth designed to allow water through but keep soil from clogging pipe. After setting the pipe and drainage cloth onto the Pea gravel then cover with Pea gravel approximately 2 to 4 inches then set the slurry mix.



## FORMS

It is recommended that you build forms around the skimmer and any above-ground pool lighting accessories prior to backfilling. An air space left around the skimmer and accessories will provide the easiest access for maintenance or plumbing repairs. If soil is composed of heavy clay, or a type that impedes adequate drainage, installation of an automatic sump pump at the bottom of the formed area is recommended. The pump will drain runoff and/or overflow water from the formed area away from the outside pool wall.

**CAUTION: Backfilling directly against the skimmer body will make it harder to access any future plumbing leaks or blockage. The installer should advise the pool owner of same and make sure the owner understands that Doughboy is in no way responsible for expenses related to locating or repairing leaks, cutting, chipping, and/or removing decking or backfill material.**

If after consultation with the pool owner, a decision is made to backfill directly against the skimmer body, keep the slurry a minimum of 5" below the top rail so that the skimmer body's top section can be removed for maintenance or repair or purchase an In-ground skimmer extension kit from your local dealer.

## BACKFILL SLURRY PREPARATION

### VERY IMPORTANT PLEASE READ CAREFULLY:

The installation of the slurry mix is a very critical step in the installation of a below grade pool. It is important to follow the instructions and review the illustrations noting that the slurry mix **MUST** be mixed thoroughly having **NO LOOSE** material against the pool wall. Also when toping off the slurry, make sure you go to the proper height and slope the slurry away from the pool. **THIS IS VERY IMPORTANT INFORMATION.**

1. Mix concrete and plaster sand (dry) and add water to produce a slurry that will harden to a compressive strength of 300-400 PSI.

The objective is to have the cavity area filled with a hardened mixture that can withstand outside ground forces during liner replacement, but can be broken away and removed if pool or plumbing repairs are necessary. There are two methods for preparing the slurry mix as follows:

**METHOD 1:** Prepare a dry mixture of Portland cement and plaster sand at a ratio of 325 lbs of cement per ton (2000 lbs) of dry mixture. Backfill the 18 inch wide cavity with 3 ft. of the dry mixture and jet with water to produce a slurry. Either apply several consecutive layers of dry mix and jet each layer with water, or fill the cavity with dry mix and use PVC pipe inserted into the mix at varied levels and locations to jet the mixture with water.

**METHOD 2:** Prepare a dry mixture of Portland cement, and plaster sand mixed with water to produce a dry slurry with a 3" slump (consult local concrete company for the slump) at a ratio of 325 lbs of cement per ton (2000 lbs) of dry mixture. Use a commercial cement pump to spread the slurry in the cavity if possible. Work around the pool, evenly applying the mixture in layers. **To avoid indenting the pool wall, be extremely careful not to direct the force of the slurry stream against the wall.** NOTE: Consult with your local concrete company to make sure their pumper can work with a mixture of this consistency.

**IMPORTANT CAUTION:** Regardless of the method of slurry preparation and application you use, **you must monitor the pool wall closely during the entire backfilling process to verify that the pool wall does not indent.** If a indent appears, stop backfilling immediately and have someone enter the pool to push out the indent. If you are unable to remove the indent, relieve pressure against the wall by removing backfill slurry from the affected area, and push out the indent. Carefully refill the area with slurry. **Continue to monitor the pool wall until the slurry mix is well set.**

**2. To eliminate the possibility of pool wall corrosion, pool overflow and runoff water must be directed away from the wall.**

Finish the setting slurry to a **1/4" per foot minimum slope** away from the pool wall as shown.

**3.** After the slurry mixture is completely set, lower the water level to the upper line on the skimmer faceplate and cut away the liner in the skimmer opening. Remove the winterizing/shutoff disk and install the directional eyeball.

## **DECKING MATERIALS**

Typical decking materials include concrete, paver blocks, and redwood. Before backfilling and plumbing the pool, be sure to give careful consideration to design and construction factors related to integrating the decking with the pool.

**Provisions must be made to allow the pool liner to be replaced when needed.** To replace the liner; pool top rails, vertical end caps, plastic coping, and stabilizer rails must be removed. **Concrete or paver block decking top elevations must be kept at a height 1/2" minimum below the lowest screw at the top of the vertical (see Fig. 5).** When installing redwood decking, it is strongly recommended that the deck design allows partial deck disassembly to permit access for liner replacement.

**IMPORTANT CAUTION:** Accumulations of loose material between the backfill slurry and pool wall can eventually push the wall inward. If extra material is added between the slurry and decking material to elevate the deck to the desired height, only use a mortar mix that will set up solidly.