

**Alidrain® Prefabricated Vertical Drains for  
Consolidation Acceleration Applications**



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# Alidrain® Prefabricated Vertical Drains for Consolidation Acceleration Applications

## 1. General

This document is prepared to help ensure that the prefabricated vertical drain (PVD), once installed, will perform its intended design functions. To do so, the product must be identified, handled, stored and installed in such a way that its physical property values are not affected and the design conditions are ultimately met as intended. This document does not account for every possible construction scenario. This document contains information consistent with generally accepted practices of identifying, handling, storing and installing PVDs for most consolidation acceleration applications. Failure to follow these guidelines may result in the unnecessary failure of the PVD in an otherwise properly designed application.

## 2. Product and Application

Alidrain® PVD (see Figure 1) is comprised of a durable double sided ribbed polypropylene core wrapped around with a high-performance filter jacket. The filter jacket acts like a permeable membrane by allowing water to move through into the drain while retaining soil particles from entering and clogging the core. The product has an excellent flow discharge capacity even in the kinked form. It is installed normally in soft clays to provide a shorter path for more rapid excess pore water dissipation, thereby resulting in accelerated consolidation of soft clay layers and gain in shear strength. Typical applications include accelerated consolidation in the construction of embankment for road and railway and land reclamation projects.



Figure 1. Alidrain® PVD

## 3. Material Identification, Storage and Handling

The PVD shall be rolled on cores having strength sufficient to avoid collapse or other damage from normal use. Every packaging which consists of 10 rolls of PVD shall be wrapped with black plastic covering to protect the PVD product from damage during shipping, handling and to prevent the product from direct exposure to ultraviolet light. Each packaging shall be identified with a durable gummed label or the equivalent, clearly legible on the outside of the packaging wrapping. The label shall indicate the manufacturer's name, the style number and the roll number.

Upon delivery, check the packaging labels to verify that the correct product has been received. Inspect the PVD packaging to ensure it is free of any flaws or damage that might have occurred during shipping or handling. While unloading, and transferring the packaging of PVD from one location to another, care should be taken to prevent damage to the wrapping, core, label or the PVD itself.

If the PVD is to be stored for an extended period, the PVD packaging shall be located and placed in a manner that ensures the integrity of the wrapping, core and label as well as the physical properties of the PVD product. This can be accomplished by elevating the PVD packaging off the ground on pallets (see Figure 2). For safety purposes, the recommended maximum stacking is two packaging per pallet.

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Care should be taken to ensure that the PVD packages are adequately covered and protected from UV radiation, chemicals that are strong acids or strong bases, fire or flames including welding sparks, temperatures more than 60°C, and human or animal destruction.

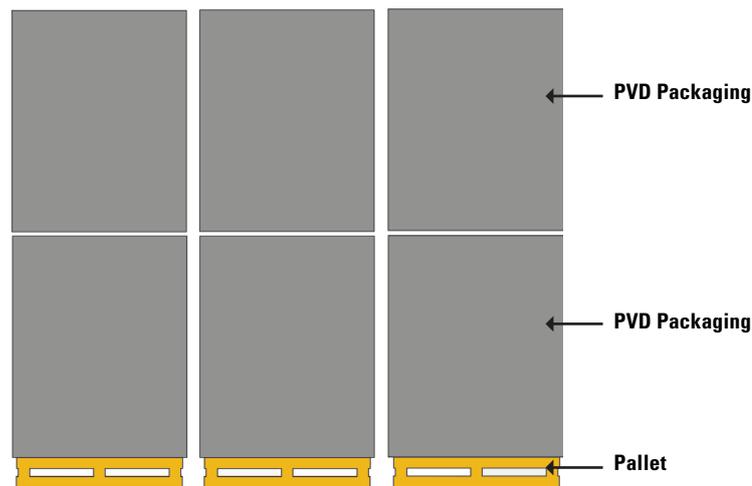


Figure 2. Recommended onsite storage of Alidrain® PVD

### 4. Preparation of Working Platform / Horizontal Drainage Layer

The working platform is formed to support PVD installation equipment. Besides that, the working platform also acts as a horizontal drainage layer to remove water draining out of the top end of installed PVDs. Therefore, the working platform typically consist of granular materials. A stabilization geotextile is usually placed on the subgrade before the granular material are placed to protect the integrity of the granular material. Excavate and grade the ground surface, including trenches for ponding water to drain out of the construction site, as per Engineer's design and drawings. The excavated material should be removed for disposal or stored well away from any sides trenches to prevent trench side instability. Trim any large roots or sharp objects protruding out that might puncture or tear the stabilization geotextile and refill any voids created if necessary (see Figure 3).



Figure 3. Construction of working platform / horizontal drainage layer

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### 5. Installation of PVD

Alidrain® PVDs are supplied generally in standard packaging of rolls with specific roll length and width. Before removing PVD packaging wrapping, verify the packaging identification. While removing the PVD packaging wrapping, inspect the product for damage or defects. Discard or repair any damage that occurs during storage, handling or installation as directed by the Engineer.

Before installing the PVDs, mark the alignment of individual PVD position with pegs. The installation grid has a triangular or square pattern spacing and which to use is decided as per Engineer's specification.

Mount the PVD roll on the side of the leader and feed the PVD through the tubular steel mandrel. At the base of the mandrel, the PVD is looped through an anchor plate (PVD shoe) (see Figure 4) which will be installed together into the compressible soft soil at a constant speed (see Figure 5). The anchor plate holds and retains the installed PVD in position at the required depth when the mandrel is extracted back up from the ground.



Figure 4. Alidrain® PVD anchor plate

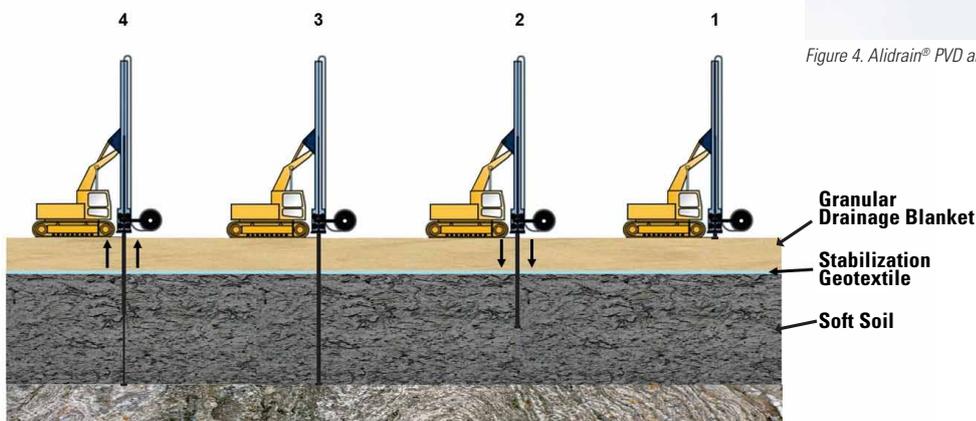


Figure 5. Installation of Alidrain® PVD

Retrieve the mandrel and install a new drain within 500 - 600mm or as per Engineer's specification from the original position if the mandrel hits an obstruction. Attempt two tries at most at installing the drain within the stated radius. If the drain still could not be installed, the drain location shall be abandoned and continue with the next drain location or as per Engineer's direction. Pre-auger method can also be used to loosen any obstruction before installing the drain.

The mandrel is withdrawn from the ground and the PVD is cut off with approximately 300mm or as per Engineer's specification left to protrude above the granular drainage blanket layer to complete the installation of single PVD. Repeat all the steps for the whole installation process.

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### 6. Jointing (Splicing) of PVD

Prepare the Stapling Plier and Galvanized Staplers. The size of the Galvanized Stapler is recommended to be a minimum of 12mm.

Pull the end of existing roll and new roll of PVD close to each other. Insert the end of the existing roll into the new roll of PVD. Ensure there is a minimum 300mm PVD (composite of core and filter jacket) overlapping length. Staple the PVD splice by using the Stapling Plier.

The method of splicing shall be carried out with 6 staples each on both left and right side of the overlapped PVD. In addition, apply another 3 staples at the center of the overlapped PVD (see Figure 6).

### 7. Backfilling and Compaction

Top up the granular drainage blanket first after finishing the installation of PVDs. Filter geotextile may be needed on top of granular drainage layer before general backfill is placed. Then, backfill with suitable material as per Engineer's specification. Place the suitable backfill material and compact at every 300mm thickness or otherwise instructed by the Engineer until the proposed platform level.

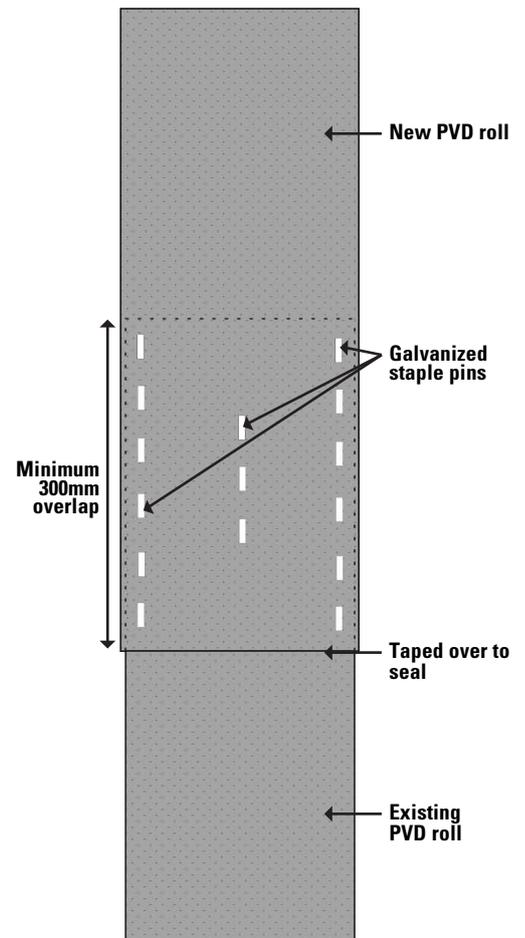


Figure 6. Recommended PVD jointing (splicing) methodology

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