ACO Sport®

Drainage Elements for Athletic Venues

Site Installation Manual

GETTING STARTED

Polymer concrete products are made from sand and gravel held together by polymer resin. Polymer concrete products provide a strong and robust solution if correctly installed. This booklet offers basic installation guidance BUT local ground and site conditions may vary and engineering advice may be required.

Contents

Polymer concrete products should be handled with care, as they can be damaged by impact from other products or machinery.

Typical equipment necessary for installation may include:

- Excavating equipment
- String-line and laser level
- Measuring tools
- Masonry drill, grinder and/or saw
- Rubber mallet
- Concrete - 4,000 psi recommended compressive strength
- Gloves, respirator and eye protection

Working with ACO Sport products on site

Detailed section drawings of typical installations are available for every product in a number of common surfaces. Dimensions and details vary depending upon the location and intended use. Installers should review the most appropriate drawing before starting installation.

Section drawings are available online at **www.acoswm.com/sport** or call (888) 490-9552.

If using multiple systems within a drainage run (e.g. System 2000 in 'D' areas and System 4000 in straights), allow for different elevations if necessary.

Health & Safety Precautions

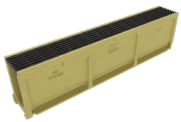
When handling polymer concrete products, gloves are recommended to avoid abrasive injury. If cutting, grinding or drilling, suitable eye protection and respirator should be worn.

Metal grates may have sharp edges and should be handled with gloves. Eye protection and a respirator should be worn if cutting or grinding. Flammable items should be removed from the vicinity as sparks may be generated.

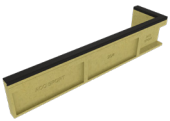
MSDS sheets are available on request.

System 2000

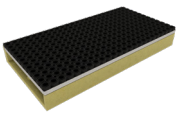
System 3000



System 4000



System 7100



System 7200

1.1 Site Preparations

Identify the necessary site tolerances required; generally running tracks that comply with IAAF or ASBA guidelines have extremely tight tolerances - often 0.125" (3 mm) track flatness maximum.

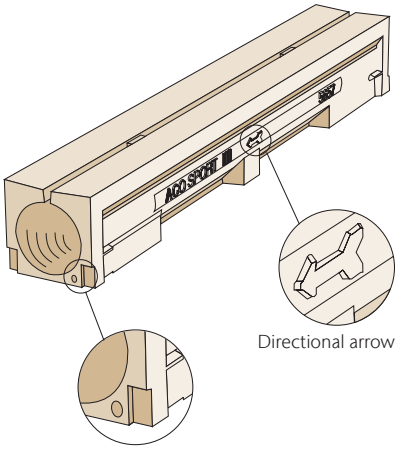
Measure area where products are to be installed. Position stakes/markers and levels to help identify location and height of finished surface. Locate and identify drainage connections.

1.2 Channel Identification

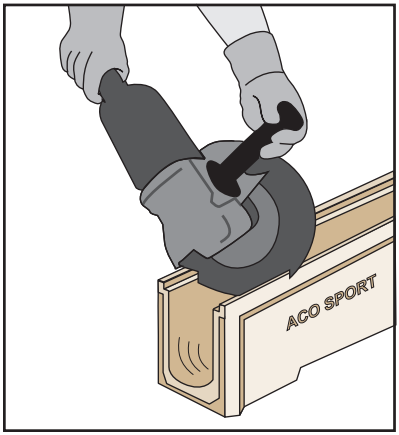
Channels have markings on the sides; e.g., part number. Systems that offer both straight and radius channels (Systems 2000 and 3000) also have an 'S' (straight) or 'R' (radius) to aid site identification. Radius channels also have a small dimple on the end to allow easy identification.

Radius channels only have a subtle visual radius. Arrows on channel help installation direction identification. When standing inside the radius looking outward at the trench system, arrows on the sides of channels should all point **CLOCKWISE** - this confirms the radius channels are correctly positioned.

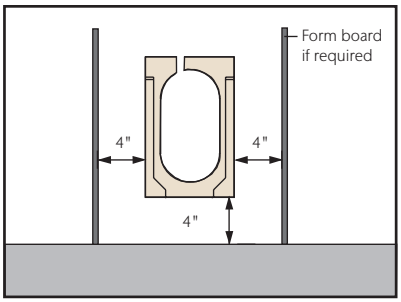
All channels are supplied in meter lengths (39.37") but can easily be cut to length using a cut-off saw with diamond blade.



Dimple on radius channels



1.3 Excavation



Once product locations are identified, excavate trench to accommodate a minimum of 4" (100 mm) on either side and beneath products. If using sloping System 4000 - allow for the increasing depth due to slope (approx. 1/10" per ft). Catch basins also require 4" (100 mm) of concrete support. Less than 4" (100 mm) of concrete may result in failed installation.

Reinforcement is not generally required in concrete surround, but consult engineering advice if in doubt.

Areas where emergency vehicles may cross the trench drain may require a larger concrete surround.

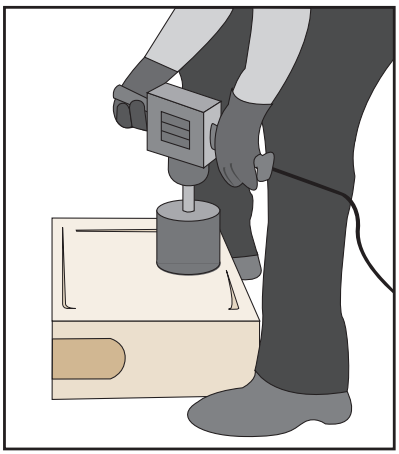
1.4 Pipe Connections

Identify products that connect to drainage pipes. To remove the 'Drill-out';

1. Mark area to be removed.
2. Remove drill-out.
Core Drill
- Using diamond core drill of required size, remove channel/catch basin wall to fit pipe.

Stitch Drill
- Using a hammer and nail punch or 1/4" concrete drill bit, pierce every dimple around the drill-out.
- From inside of channel, carefully tap out the inside of the perforated area.

3. Smooth edges with grinder, if necessary.
4. Connect pipe and seal connection.



Note: Do **NOT** attempt to remove in-fill area by hammering directly on the polymer concrete as severe cracking can occur and render the piece useless.

1.5 Laying of Channels

Start with outlet point. If installing drain around running track, pick one catch basin as the starting point. Ensure string-line and laser are set at required channel height - this may vary from finished surface height depending upon System and type of surface used.

Generally, installation is a two part process; First, position channel at the required height and alignment. Second, pour supporting concrete. Two common methods of positioning channels in place are;

1. Patty Method

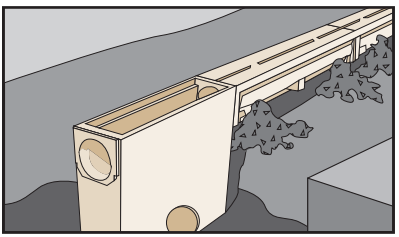
a) Set catch basin (or outlet channel) on a minimum 4" (100 mm) bed of concrete to required height. Connect outlet pipe and seal around joint.

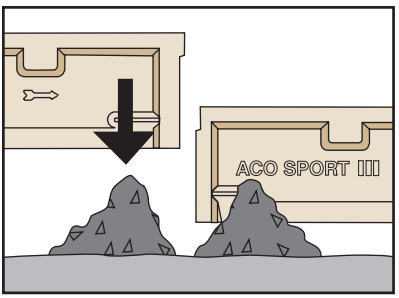
b) Using a stiff/dry mix concrete, create 'patties' at intervals to support channels. Allow two patties per channel and space such that no concrete material is directly at the joint. This prevents gaps between channels due to debris.

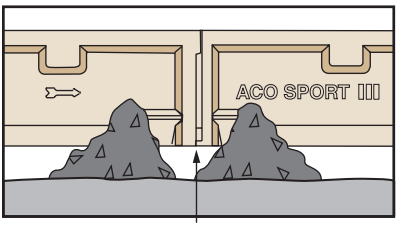
c) Lower channel vertically onto 'patties' and position to correct height and alignment ensuring 'tight' connection to previous channel.

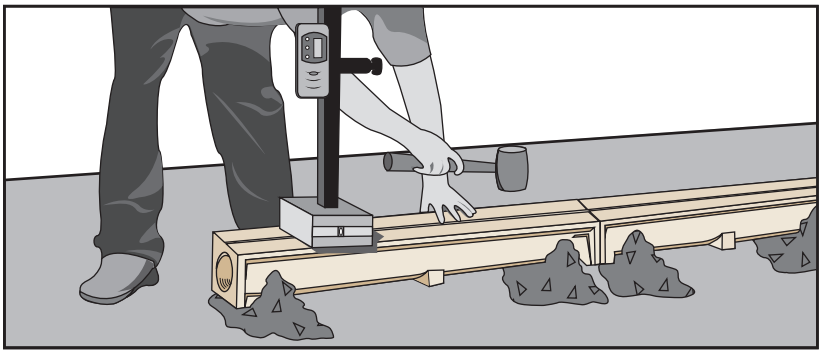
d) 'Patty' should cover the concrete 'keys' on side of channel - this prevents channel movement, or floating, during concrete pour. Add concrete if necessary.

e) Continue to lay channels until the next catch basin is reached and start again from step 'a'.









Position channel using laser level or string line.

2. Brick Method

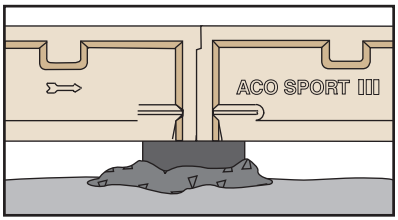
a) Set catch basin (or outlet channel) on a minimum 4" (100 mm) bed of concrete to required height. Connect outlet pipe and seal around joint.

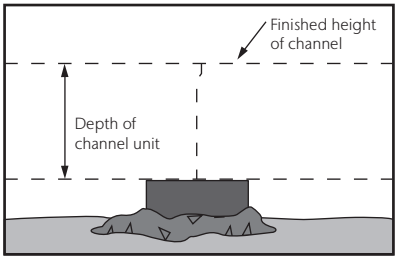
b) Set brick supports, one per meter (39.37"). Channel ends are cast with flat areas on the underside to ensure a consistent surface to maintain the correct level. Brick support is created by placing a concrete brick onto a mound of concrete (generally 1-2 shovels). Height of the brick can be calculated by subtracting the height of the channel from the required finished channel elevation.

c) Lower channel vertically onto brick - center channel joint on brick. Use shims to adjust to height required.

d) Add concrete along side of channel, to cover the concrete 'keys' - this prevents channel movement, or floating, during concrete pour.

e) Continue to lay channels until the next catch basin is reached and start again from step 'a'.





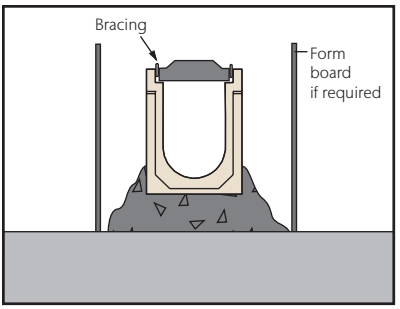
1.6 Pouring Concrete

Once concrete 'patties' or brick supports have set (approx. 4-6 hours) the concrete haunch can be poured.

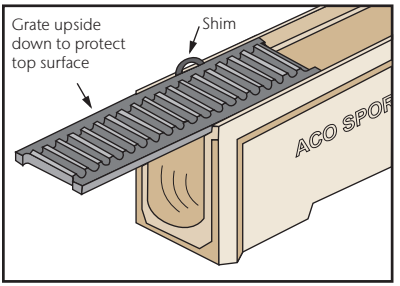
Channel Bracing - open channels
Systems 4000 must be braced to prevent channel walls deflecting inward from concrete pressure.

System 4000 can be braced by installing the grates with penny washers, pushed down the side (this allows grates to be easily removed afterward). Grates should overlap channel joints to help prevent movement. Grates can be covered or wrapped to protect from concrete splash.

Channel Bracing - slotted channels
System 2000 and 3000 are monolithic and require no bracing. Protective plastic or tape should be used to protect the top surface from concrete splash.



System 4000 Bracing



Concrete Pour

Concrete should have compressive strength of minimum 3,000 psi. To minimize cracking of concrete surround, crack control joints can be cut at intervals, frequency to be determined by engineer.

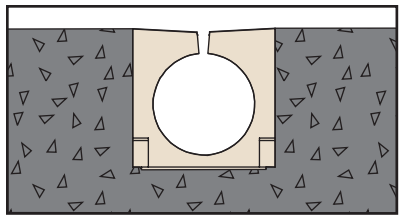
Alternatively, “fiber” reinforcing can be used to minimize surface cracking of the concrete surround. Typically 4,000 psi mix with fiber reinforcement is recommended.

Concrete should be poured evenly and carefully to avoid dislodging channels. If vibration is required, a wand type vibrator can be used.

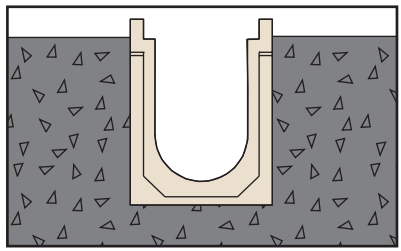
Concrete should be poured to height required. This may vary depending upon product and surface type required. The finished surface should be troweled level and smooth.

Allow concrete to set before removing grates, or bracing, if used.

Protect area from machinery and heavy traffic until finished surface is applied.



Concrete flush with product to allow overlay of track surface



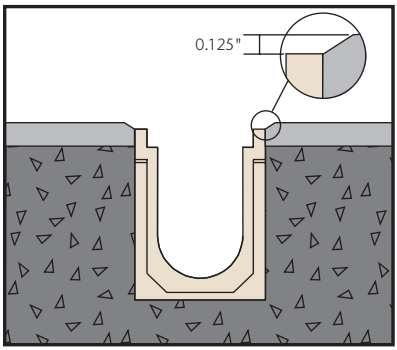
Concrete below product to allow track material to butt up to channel edge - non-porous surfacing

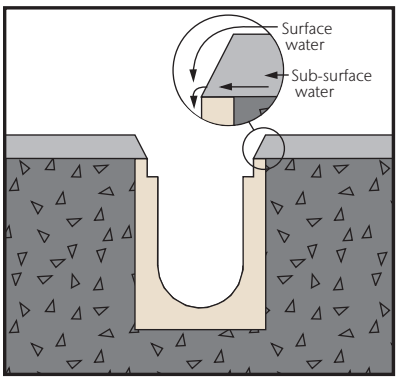
1.7 Final Surface

Once concrete surround is sufficiently cured, track surfacing material can be applied. If surface material is 'glued' to the surface of the drain, light grinding may be required to prepare surface and ensure good adhesion.

Finished surface should be level or up to 0.125" (3 mm) higher than the top of the channel. This ensures effective drainage and avoids a trip hazard. Porous surfacing must allow entire surface thickness to drain into channel.

Channel systems should be 'flushed', trash buckets/catch basins emptied before use to remove debris. This prevents construction debris from blocking underground pipe work, and ensures the system is ready for use.





Detail to allow drainage from porous surfacing

2.1 Anchoring to a Nailer

In-fill turf can be installed up to any ACO Sport trench drain or elastic curb and held in place by attaching to a nailer (wooden nailers must be treated to prevent deterioration). Alternatively, turf can be glued or nailed directly to concrete.

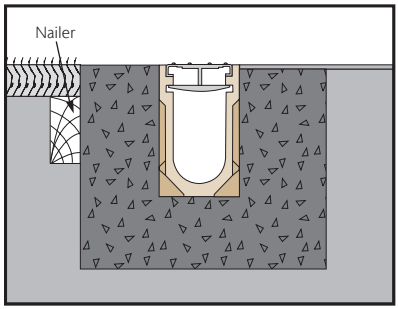
2.2 Product Install

1. Trench drains

An open grated system is recommended to enable full access to remove loose in-fill particles if required.

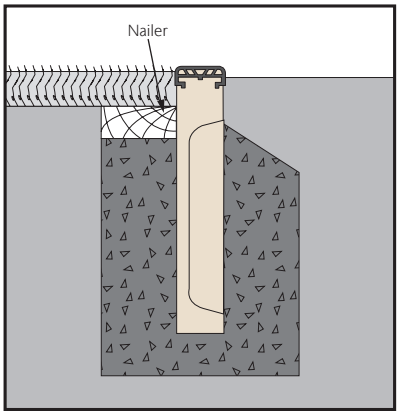
Install drain (details on pages 4-10), incorporate nailer along the length of the trench run, outside the 4" concrete collar as the grate edge requires concrete support. Install turf, pull tight towards the channel and fix to the nailer at strategic intervals. Check turf is tight and straight. Finish nailing at required intervals.

Cover grates when adding in-fill material to the turf to prevent large quantities entering the drain.



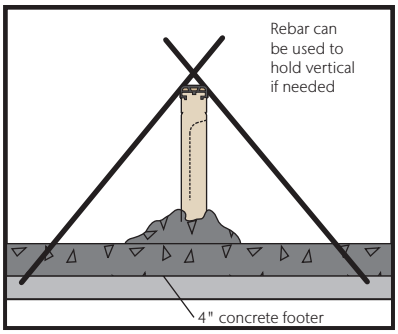
2. Elastic curbs

Commonly used at the transition from turf to track material at the 'D' area. Install as detailed on page 12, incorporate nailer directly against the curb, on top of 4" concrete haunch, allowing sufficient depth for turf. Install turf, pull tight towards the curb and fix to the nailer at strategic intervals. Check turf is consistently tight and straight. Finish nailing at required intervals.



3.1 Excavation

Mark out with stakes, excavate to accommodate a minimum of 4” (100 mm) on either side and beneath the curbs.



3.2 Laying Curbs

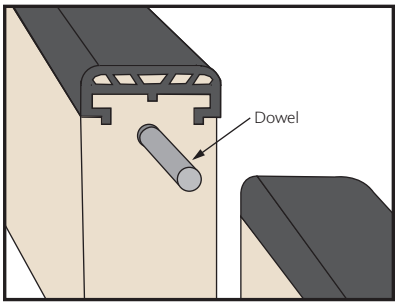
Set string-line or laser level at required height so that curb will be level with, or slightly above, finished surface.

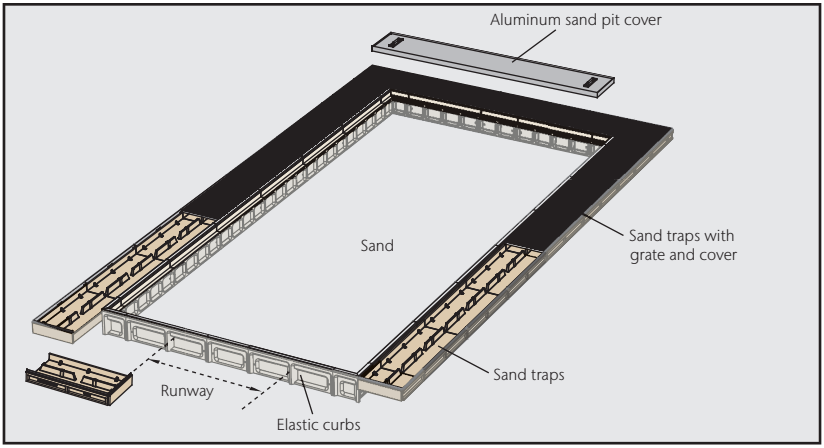
Pour a 4" (100 mm) footer where curb is to be positioned. Allow to set.

Start with a corner unit. Set curb on 2" (50 mm) base of stiff/dry mix concrete. Add concrete haunch around the foot of curb, checking that it is level.

Ensure end is free of concrete and use alignment dowels to connect next curb. Take care not to disturb previous unit. Continue to check curbs are level and add concrete haunch around base.

Curbs can be cut to length if required.



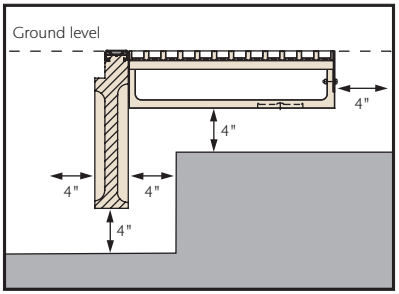


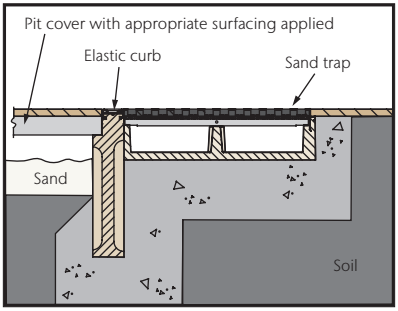
4.1 Excavation

Mark out with stakes, excavate area large enough to accommodate entire jump pit and minimum of 4" (100 mm) concrete around the outside edges of the system.

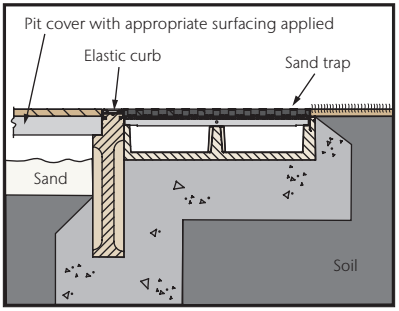
Excavation needs to be deep enough to allow a minimum of 4" (100 mm) beneath the curbs and sand trap (if used).

System installation starts with the curb units, then sand traps and finally the covers.



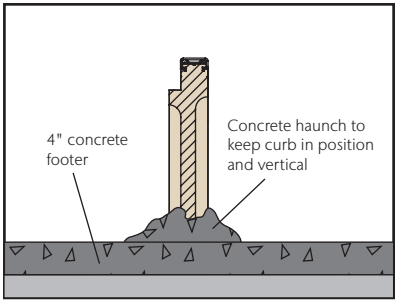


Installation in synthetic surface



Natural grass installation

4.2 Laying Curbs

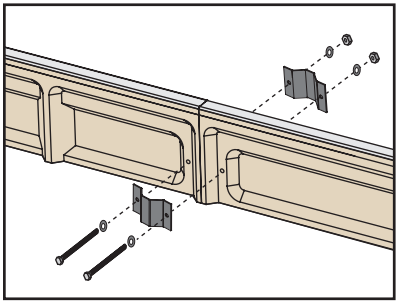


If installing both elastic curbs and sand traps, curbs must be installed first.

Set out pit position at appropriate site location with markers. Check diagonal dimensions to ensure pit is square. Use string-line or laser level at required height so that curb will be level with, or slightly above, finished surface.

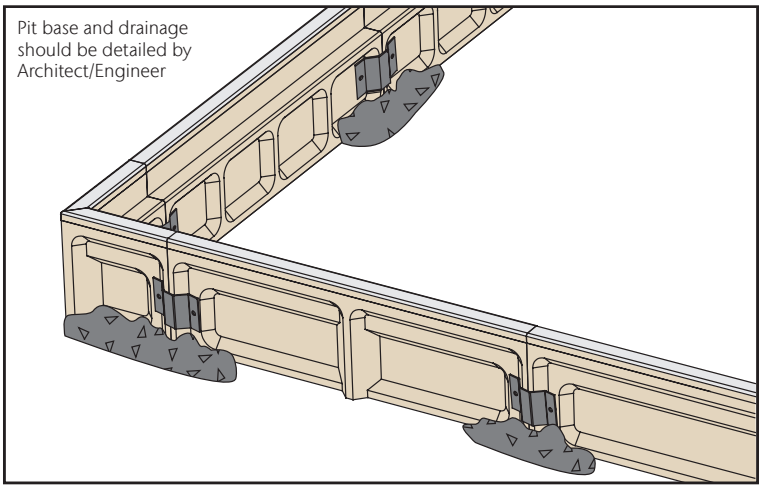
Pour a 4" (100 mm) footer where curb is to be positioned. Allow to set.

Start with a corner unit. Set curb on 2" (50 mm) base of stiff/dry mix concrete. Add concrete haunch around the foot of curb, checking that it is level. Ensure end is free of concrete and use alignment clamps to connect next curb.



Alignments clamps help ensure the jump pit remains square and within size tolerance to ensure covers and sand traps (if used) also fit.

Take care not to disturb previous unit. Continue to check curbs are level and add concrete haunch around base. Work around pit until pit is complete - check diagonally to ensure square.



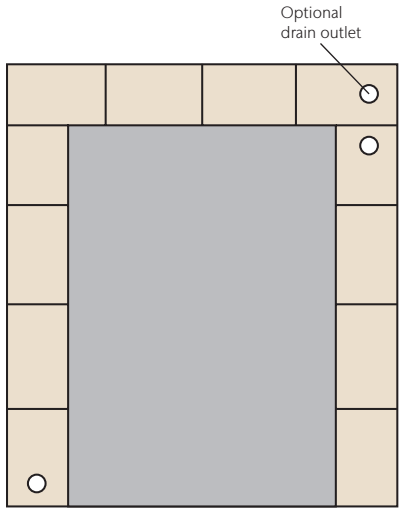
4.3 Installing Sand Traps

Site preparation
Can be installed as part of the jump pit system or individually to size required.

If installing with elastic curbs, first allow concrete footing around curbs to set approx. 24 - 48 hours.

Set string-line, or laser level, at required height.

Drainage outlet connection (optional)
ACO recommends one per side.
Each sand trap unit has an optional 4" diameter (100 mm) drill-out for pipe connection to enable rainwater to drain away. Select units for pipe connection. Lay necessary pipe work. Filter fabric, or similar, should be used to prevent sand from entering pipe system.



Laying sand traps
If using “kit” solution, check appropriate length unit and position in vicinity to installation.

Start at outlet/corner units. Set unit on 4" (100 mm) concrete base, add concrete patties along outside edge to hold in place and prevent floating during final concrete pour.

Continue laying sand traps. Take care not to disturb previous unit. Ensure they remain level. Fit end caps at open ends, use concrete patty to hold in place.

Sand traps can be cut to length, if required, with a concrete disc cutter.

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