Installation

Guidelines to installing the ACO Sport range of products

ACO SPORT®

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.

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

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 - 3,000 psi minimum grade***
- ***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.

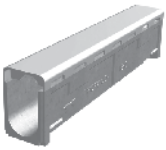
Section drawings are available on-line at **www.acousa.com/install_drawings_sport.htm** or call (800) 543-4764.

Health & Safety Precautions

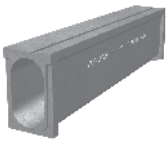
When handling polymer concrete products gloves are recommended to avoid abrasive injury. If cutting, grinding or drilling suitable eye protection and respirator should be worn.

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 - call (800) 543-4764 for additional information.



System 1000



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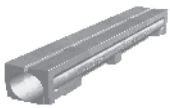
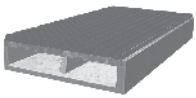


System 3000

System 4000

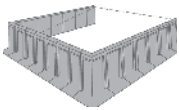
System 6000

System 7100



System 7200

System 8000



System 8000

System 9000

1.-i Site preparations

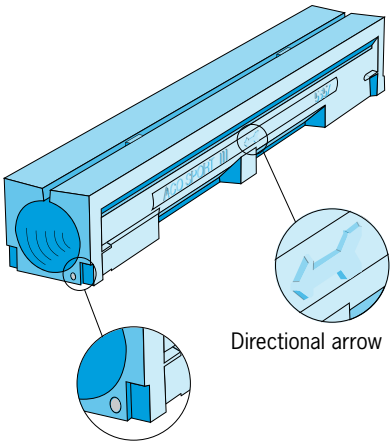
Identify the necessary site tolerances required; generally running tracks that comply with IAAF or ASBA guidelines have extremely tight tolerances - often 0.125" (3mm) track flatness maximum.

Measure area where products are to be installed. Peg-out markers and levels to help identify location and height of finished surface. Locate and identify drainage connections.

1.-ii Channel identification

Channels have markings on the sides; e.g., Part number. Systems that offer both straight and radius channels (Systems 1000, 2000 and 3000) also have an 'S' (straight) or 'R' (radius) to aid site identification. System 1000, 2000 and 3000 radius channels also have a small dimple on the end to allow easy identification when on the skid.

Radius channels only have a subtle visual radius. Arrows on channel help 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.



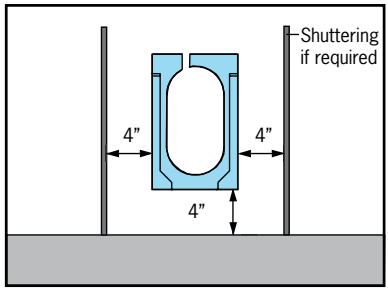
Directional arrow

Dimple on radius channels

1-iii Excavation

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

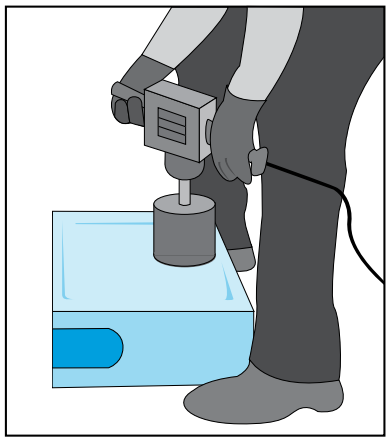
Reinforcement is not generally required in concrete surround, but consult engineering advice if in doubt.



1-iv Pipe Connections

Identify products that connect to drainage pipes. All catch basins have molded 'Drill-outs' for connection to underground piping; some have a choice of outlet positions and sizes. System 4000 sloping channels offer end or bottom outlets. To remove the 'Drill-out';

1. Mark area to be removed using permanent marker.
2. Use core-drill of required pipe diameter (4" or 6").
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-v Laying of Channels

Start with outlet point. If installing drain around running track pick one catch basin as the starting point. Ensure string-line or laser is 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

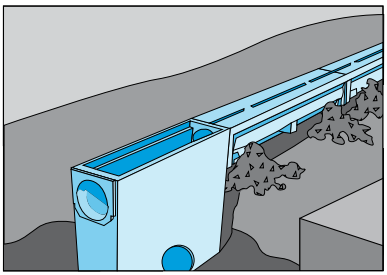
a) Set catch basin (or outlet channel) on a minimum 4" (100mm) bed of concrete to required height. Connect outlet pipe and seal around joint.

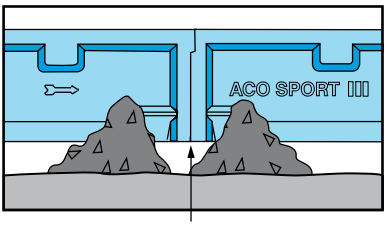
b) Using a stiff/dry mix concrete, create 'patties' at intervals to support channels. Allow two patties per channel and space such that no concrete material is directly at the joint. This prevents gaps between channels due to debris.

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

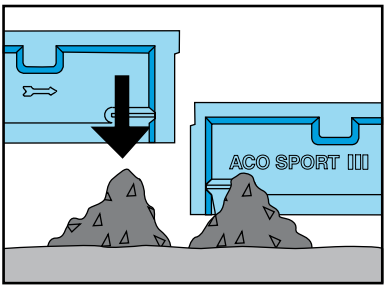
d) Add concrete along side of 'patty' to cover the concrete 'keys' on side of channel - this prevents channel movement, or floating, during concrete pour.

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





Avoid concrete/dirt at joint



2. Brick Method

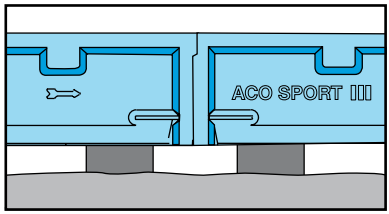
a) Set catch basin (or outlet channel) on a minimum 4" (100mm) bed of concrete to required height. Connect outlet pipe and seal around joint.

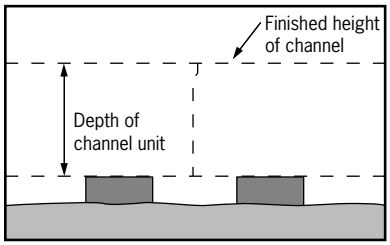
b) Set brick supports at one meter (39.37") intervals. Brick support is created by placing a concrete brick onto a mound of concrete (generally 1-2 shovels). Height of the brick can be calculated by subtracting the height of the channel from the required finished channel elevation.

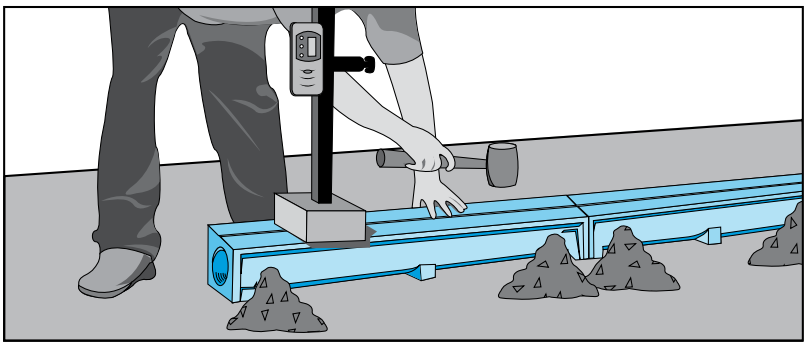
c) Lower channel vertically onto brick - channel joint should be between bricks. Use shims to adjust to exact height required.

d) Add concrete along side of channel, at the joint 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'.







Position channel using laser level or string line.

1-vi 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 1000, 4000 and 6000 must be braced to prevent channel walls deflecting inwards from concrete pressure.

System 4000 and 6000 can be braced by installing the grates with shims, pushed down the side (this allows grates to be easily removed afterwards). Grates should overlap channel joints to help prevent movement. Grates can be wrapped in plastic to protect from concrete splash.

Brace System 1000 using wooden blocks inserted into pre-formed slots.

Channel Bracing - slotted channels

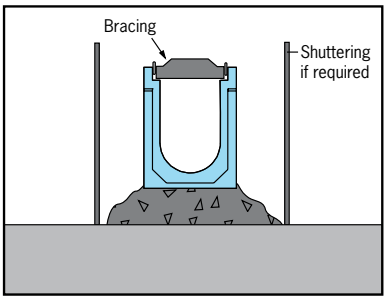
System 2000 and 3000 are monolithic and require no bracing. Protective plastic or tape should be used to protect the top surface from concrete splash.

Concrete Pour

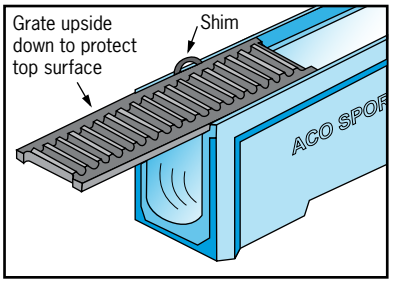
Concrete should have compressive strength of minimum 3,000 psi. To minimize cracking of concrete surround, crack control joints should be cut every 4-6 meters (14-20 feet).

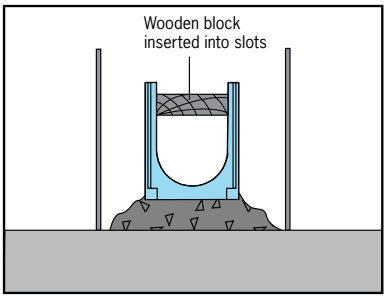
Alternatively "Fiber" reinforcing can be used to minimize surface cracking of the concrete surround. Typically 4,000 psi mix with fiber reinforcement is recommended.

Concrete should be poured evenly and carefully to avoid dislodging channels. A finger type vibrator should be used to ensure concrete distributes evenly underneath and around channels.



System 4000 Bracing



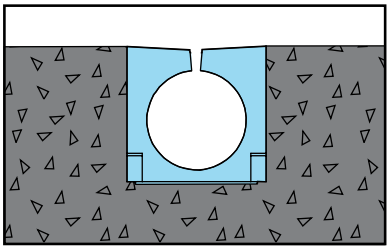


System 1000 Bracing

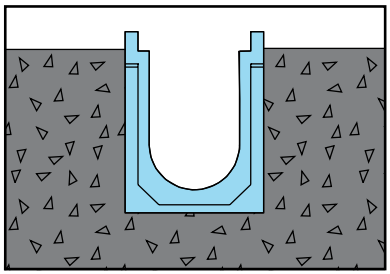
Concrete should be poured to height required. This may vary depending upon product and surface type required. The finished surface should be troweled level and smooth.

Allow recommended 24 hours curing time 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



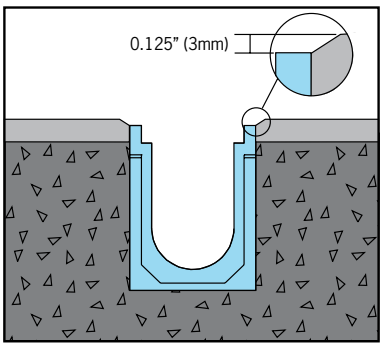
Concrete below product to allow track material to butt up to channel edge

1-vii 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" (3mm) higher than the top of the channel. This ensures effective drainage and avoids a trip hazard.

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



2-i Connection to Trench Drain

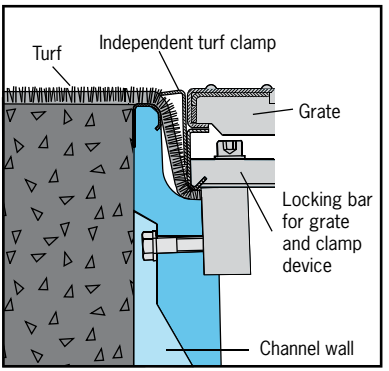
Water based artificial turf can be anchored directly into either System 6100 or 6500 channels.

Install channel exactly as any other ACO Sport open channel (pages 4-10) and allow surround to set.

2-ii System 6100

Install channel with clamp detail towards the turf - clamp detail locks turf into place and enables grate removal for maintenance without releasing the turf.

Install turf and pull tight towards the channel (approx. 2" overlap). Clamping bar has the grate locking bars attached. Position locking bars into recesses, pull turf tight and bolt bar down tight. Fit clamping bars at strategic intervals to ensure turf is flat and consistent. Finish installing clamping bar, fit grates.

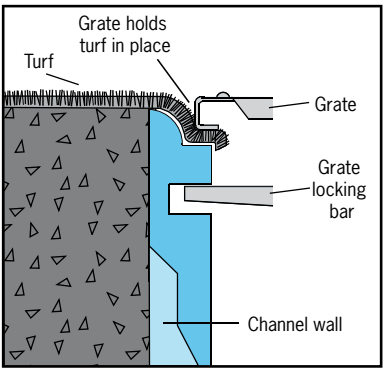


2-iii System 6500

Install channel with rounded grate support edge towards the turf - rounded edge allows turf to wrap into the trench drain without being damaged by a sharp corner.

Install turf and pull tight into the channel (a 2" overlap is ideal). Turf is locked into position by grates. Fit grates at strategic intervals to ensure turf is flat and consistent. Fit rest of grates.

Note: Do NOT over tighten bolts - this will deform grate and locking bar.



2-iv 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.

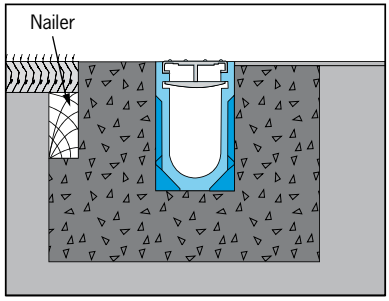
2-v Product Install

i) Trench drains

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

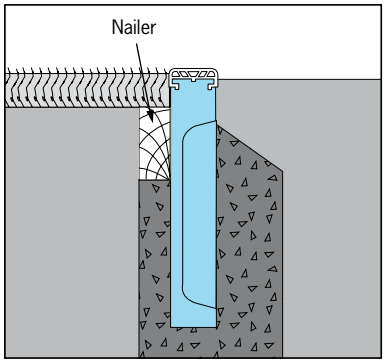
Install drain as detailed pages 4-10, incorporate wooden nailer along the length of the trench run, outside the 4" concrete collar as the grate edge requires concrete support. Install turf, pull tight towards the channel and nail into the wooden block at strategic intervals. Check turf is tight and straight. Finish nailing at required intervals.

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



i) Elastic curbs

Install as detailed in pages 12-13, incorporate wooden nailer directly against the curb, allowing sufficient depth for turf. Install turf, pull tight towards the curb and nail into the wooden block at strategic intervals. Check turf is consistently tight and straight. Finish nailing at required intervals.



3-i Excavation

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

3-ii Pipe Connections
(Sand trap)

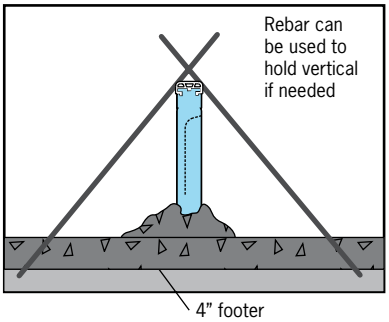
Each sand trap unit has an optional 4" (100mm) drill-out for pipe connection to enable rainwater to drain away. Select units for pipe connection, ACO recommends one per side. Lay necessary pipe work. Filter fabric, or similar, should be used to prevent sand from entering pipe system.

3-iii Laying Curbs/ Sand Traps

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

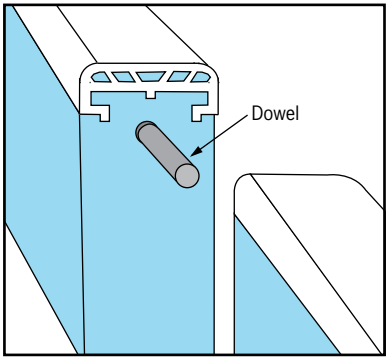
1. Elastic Curbs

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



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

Start with a corner unit. Set curb on 2" (50mm) 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.

2. Sand Traps

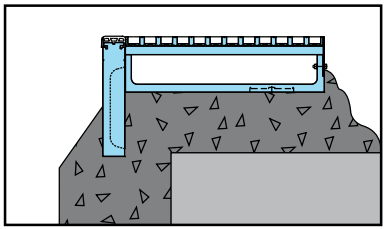
If installing with elastic curbs, first allow concrete footing around curbs to set approx. 4-6 hours.

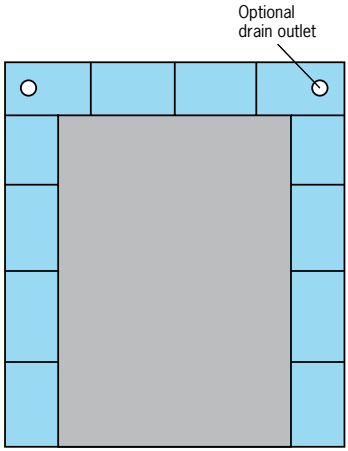
Set string-line, or laser level, at required height.

Start at outlet/corner units. Set unit on 4" (100mm) 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.





3-iv Pouring Concrete

Concrete should have compressive strength of minimum 3,000 psi.

Concrete should be poured carefully to avoid dislodging products. A finger type vibrator should be used to ensure even concrete distribution.

Once concrete base has set, approx. 4-6 hours, pour rest of concrete. Level concrete with curb/sand trap and finish per installation drawing.

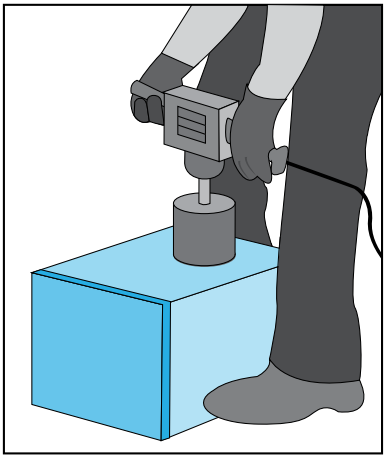
Use masking tape to protect rubber edge on curbs.

4-i Excavation

Identify area for communication box, if using in an area trafficked by vehicles a concrete encasement will be required. Otherwise compacted gravel and sand is sufficient.

Excavate area large enough to fit the communication box plus any encasement required. Depth should allow for a 6-8" gravel to provide drainage. If a solid concrete base is required a drainage outlet pipe should be installed.

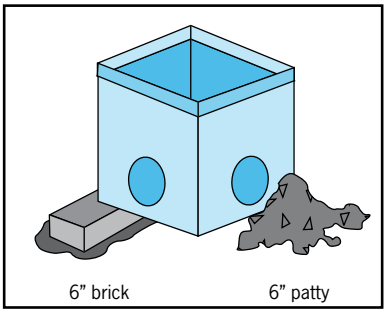
4-ii Cable Connections



Each communication box has a number of pre-formed drill-outs to act as guides to core-drill openings for allow cable conduits to enter the box. The unit has an open base to allow conduits to connect from below.

Inlet/outlet duct openings can be core-drilled anywhere in the side walls but allow 4" - 6" between openings to avoid compromising the structural integrity of the unit.

4-iii Setting Box



Fill base of excavation with gravel and compact down to avoid settling. Position unit onto gravel and check levels, a small amount of dry mix concrete can be used at the corners to hold the unit in place, if required.

If installing in trafficked area, set unit to grade on 6" high bricks or concrete patties. Allow to set (approx 4-6 hours).

4-iv Install conduit

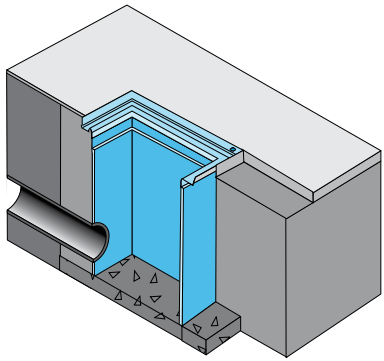
Once the communication box is set in place, conduits can be installed through prepared holes in side walls, seal if necessary.

4-v Back-fill

Non-trafficked applications; Back-fill around unit, if compacting take care not to move or damage the box, internal bracing is recommended.

Trafficked applications; Haunch around box and backfill around with concrete of 3,000 psi minimum strength. Finish concrete to required height to allow for surrounding surface finish.

Fill base with 6" gravel.



4-vi Final surface

ACO Sport Communication boxes are supplied with recessed lids to allow infill with matching track or field surfacing material up to 0.5" (13mm) thick.

Fill recessed lids at same time as laying surrounding surfacing.

5-i Excavation

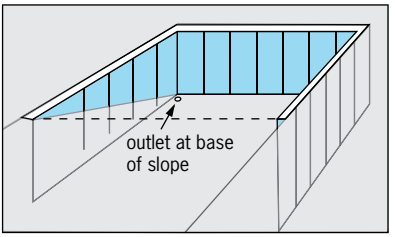
Identify area for water jump, measure and mark out area and levels with pegs. Finished water jump pit will have internal dimension of 12' (3.65m) wide by 11'-9.5" (3.60m) long and be 2'-5" (0.75m) deep (at deepest point).

Excavate area large enough for water jump pit. Allow 8-10" (200-250mm) extra for concrete surround.

Note: internal sloping base of pit is created on site by contractor after installation of jump pit walls is complete.

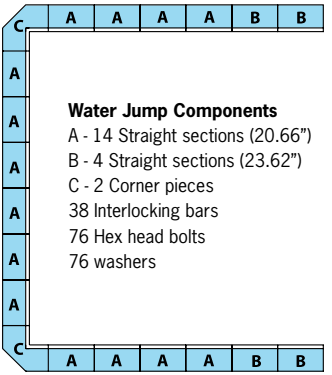
5-ii Pipe Connections

A drainage outlet enables easy maintenance, otherwise water must be pumped out. The outlet should be created at the deepest point in the concrete base and be fitted with a closing cap or valve. Allow suitable depth for the pipe to pass under the water jump components without affecting the strength of the concrete surround.



5-iii Laying Components

Set components out around excavated area, per the diagram. This ensures parts are close to where they will be required.



Water Jump Components
A - 14 Straight sections (20.66")
B - 4 Straight sections (23.62")
C - 2 Corner pieces
38 Interlocking bars
76 Hex head bolts
76 washers

Pour a 6" (150mm) concrete base/footer to fit the entire water jump. Footer should be approximately 32" below grade to allow for 2" (50mm) bedding concrete plus the height of components.

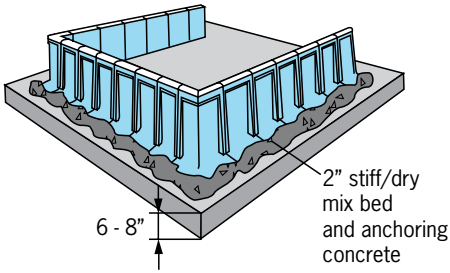
Set string-line and laser level at required grade.

Start with a corner section. Set on a stiff/dry concrete mix, tamp down to required height, haunch around the foot of the piece to prevent movement during concrete pour.

Lay next straight section, take care not to disturb previous unit. Check sections remain level and vertical. Bolt together using hardware supplied.

Continue to lay sections as above, continuously check units are level and vertical.

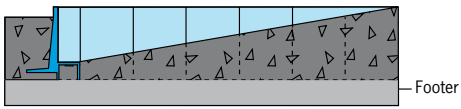
Allow concrete base to set, approx. 4-6 hours before continuing.



5-iv Pouring Concrete

Concrete should have compressive strength of minimum 3,000 psi. Alternatively "Fiber" reinforcing can be used to minimize surface cracking of the concrete surround. Typically 4,000 psi mix with fiber reinforcement is recommended.

Pour concrete haunch around outside of water jump, level concrete with height of asphalt base. Pour concrete and grade in internal surface of jump pit. This also provides bracing to jump pit walls.

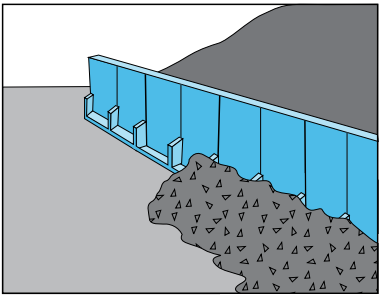


6-i Site preparations

Check ground conditions of area where bleachers are to be installed. Ground must be stable and engineering advice is recommended.

Ground should be prepared with an overall 6% slope. Stepped levels can be prepared.

ACO recommends a maximum of 20 standing elements or 10 seating elements.

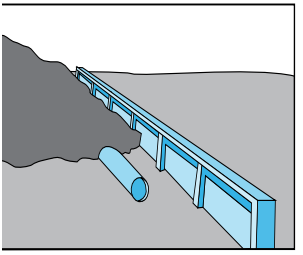


6-ii Laying Bleacher System Components

Front Plates

Position front plates on a 4" (100mm) concrete bed. Ensure sections are level and vertical. Haunch both sides with concrete to hold securely in place.

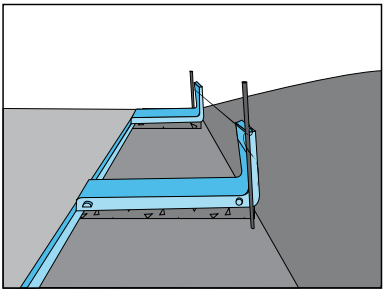
Lay a land drainage pipe behind front plates, along entire length, Backfill with fill to a level 4" (100mm) below top of front plate and compact.



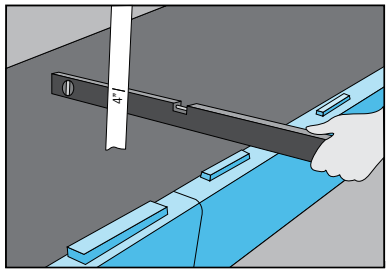
Seating/Standing Elements

Lay 4" (100mm) stiff mix concrete base, on top of drainage fill, so that it is level with top of front plates.

Position seating/standing elements onto concrete base. Ensure seating unit overlap joints of front plates. Check that elements have slight forward slope. This facilitates drainage and prevents ponding water.

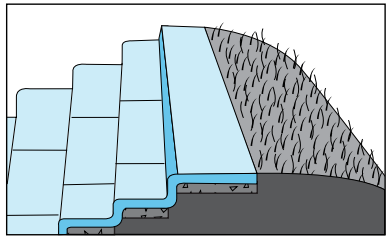


Before positioning next seating/standing element, backfill to a height 4" (100mm) below top of the previous element and compact.



Lay 4" (100mm) concrete base, on top of backfill, so that it is level with top of previous element.

Position next seating/standing elements onto concrete base, overlaying joints. Check elements are close to level - a slight forward slope.

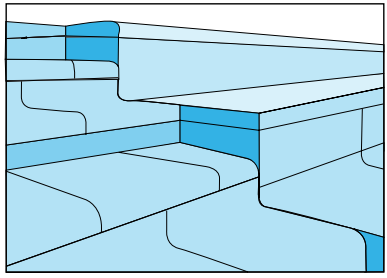


Continue until final seating/standing elements are installed.

Top Plates

Backfill final seating/standing elements to a height 4" (100mm) below top of the previous element and compact.

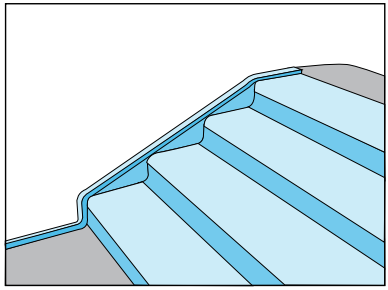
Lay 4" (100mm) concrete base, on top of backfill, so that it is level with top of final elements and position top plates.



Fill-in Plates

At junctions between seating and standing elements, open faces should be concrete rendered. Side fill-in plates can be attached using polymer concrete repair kit.

Outside ends should be rendered with concrete and fill-in plates attached using polymer concrete repair kit.



Expansion Joints

ACO recommends saw cutting expansion joints, approx. every 30 ft. (10m) and filling with flexible sealant. This allows expansion/contraction in large temperature variations.

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