

2. Installation

Once an appropriate location for a cable enclosure is determined and the conduit installed, preparations can be made for digging. Investigate whether other underground services exist.

In Australia, ACO recommends contacting **'Dial Before You Dig'** on 1100 or visiting their website at www.1100.com.au.

Designers and contractors must observe the regulations and codes of practice legislated by the electrical safety act and refer to ACO's standard installation drawings on pg 84.

Adverse ground conditions may require an increase in these dimensions and/or the addition of reinforcement. If in doubt, engineering advice should be sought.



a. Cable Pits

The following is a basic methodology for installing cable pits. If a degree of weather proofing is required, visit www.acoaus.com.au/cablemate for specific details.

1. Before installation, mark all conduit entries on pit walls.
2. Using holesaw of required size, cut out conduit entries. (See accessories pg 43).
3. Excavate greater than overall dimensions of the pit (refer to ACO's excavation guide for minimum dimensions - pg 82).
4. Remove all loose material from excavation. Level and compact base. ACO recommends compaction to 95% RDD (Relative Dry Density).
5. Install pit on a stiff wet concrete base with a minimum depth of 50mm. Higher load classes will require more concrete. A minimum concrete strength of 25MPa is recommended.

If using standard lids, ensure top of pit is level with the finished pavement level. If access covers are used, top of the pit must be set down beneath pavement. See standard installation drawings on pg 84.

6. Connect conduit to the pit, flush with inside wall so clear working area of the enclosure is not impeded. Conduits must have sharp edges removed from their internal surfaces.

If a bellmouth conduit fitting is required for drawing operations (pg 12), an appropriate sized hole should be cut and the bellmouth fitting is then epoxy glued onto the pit. The outside of pit should be reinforced around the bellmouth to ensure bellmouth/pit joint is not damaged when the cable is pulled.

ACO does not recommend the use of bellmouths for plastic pits.

7. For multiple conduit entries, ACO recommends a concrete haunch around all pipes to preserve pit rigidity. Minimum of 100mm concrete encasing is recommended around pipes and 200mm measured out from the pit wall (pg 20).
8. Seal pit and pipe connection with a proprietary sealant to prevent ingress of moisture and silt into pit during service.
9. Place lid into the rebate of pit before backfilling.

For Class A applications, backfill using sand or clean fill and lightly compact at 300mm increments. Note, if using plastic pits, do not over compact as this can lead to pit walls deforming.

For Class B applications, a concrete collar (at least) is required for paved, concreted and asphalted pavements with a minimum width and depth of 150mm. A minimum concrete strength of 25MPa is recommended.

For applications defined as Class C and above, concrete is required to encase all of the pit and access cover. In these instances, plastic pits are not recommended.

The visible/trafficable surface of the cement concrete surround (or pavement if asphalted to the edge of the pit/duct) must be finished flush with the pit/cover edge.

For installation illustrations for cable pit systems see pg 84 or for full installation details visit www.acoaus.com.au/cablemate

Supporting Information

2. Installation cont'd.

Access Cover Systems

If an access cover is used, it must be installed directly above the pit (pg 84)

- i. Form the rebate to size (to support the frame)
- ii. Position the access cover in rebate
- iii. Check the unit is level and does not rock
- iv. Pour & vibrate the concrete around the access cover and in the cover (if a concrete filled recessed cover is used)
- v. Level and finish concrete, lay pavers or pavement materials. **Urbanfil®/Pavermate®** covers are to be filled with concrete to a minimum depth of 45mm as concrete is integral to the strength of these covers. ACO does not recommend tiles deeper than 25mm in **Urbanfil®** covers and pavers more than 40mm deep in **Pavermate®** covers.
Recessed pan depths;
 - **Urbanfil®** - 85mm,
 - **Pavermate®** - 135mm,
 - **Rhinocast®** - either 12mm or 40mm dependent on steel edging height.
 Refer to notes beneath parts list table
- vi. Allow concrete to cure before removing cover – early removal may cause twisting of the frame

ACO sells a wide range of lifting keys dependent on the lid or cover type. Refer to accessories on pg 43.

For full installation details visit www.acoaus.com.au/cablemate

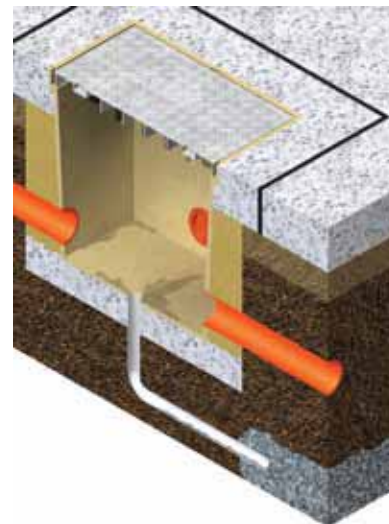
Pit Drainage

Conduits are generally installed with slope allowing water to drain into cable pits which are positioned at sag points along a cable route. Cable pits are generally not supplied with waterproof covers. To minimise the amount of standing water in the enclosure and in the conduits, a drainage point should be connected from the base of the pit to a suitable soakaway. All ACO cable pits are supplied with either a preformed hole (plastic pits) or a drillout hole in the base of polymer concrete pits. Holes are typically 25mm diameter or similar.

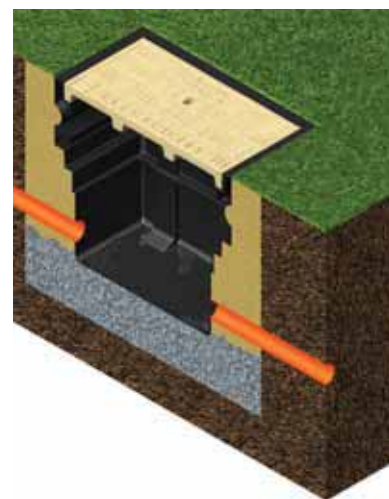
In some applications, telecommunication carriers may require up to a 300mm clearance below the lowest conduit entry for drainage purposes.

For landscaped applications, where only foot traffic is anticipated, it is recommended that at least 150mm of a gravel base is laid at the bottom of the pit. ACO recommends compaction no less than 60% RDD. The gravel acts as a drain and will help prevent the enclosure from sinking.

Conduits entering buildings should be installed to stop liquid from draining into the building. The simplest method is to make the exit end of the conduit (inside the building) higher than the external entry, while still applying sealing around the penetration of the building and within the pit wall.



Pit drainage with soakaway.



Landscape pit drainage.

b. Surface Cable Ducting

Ducting channels are installed in a continuous trench run, and are usually fully encased in concrete.

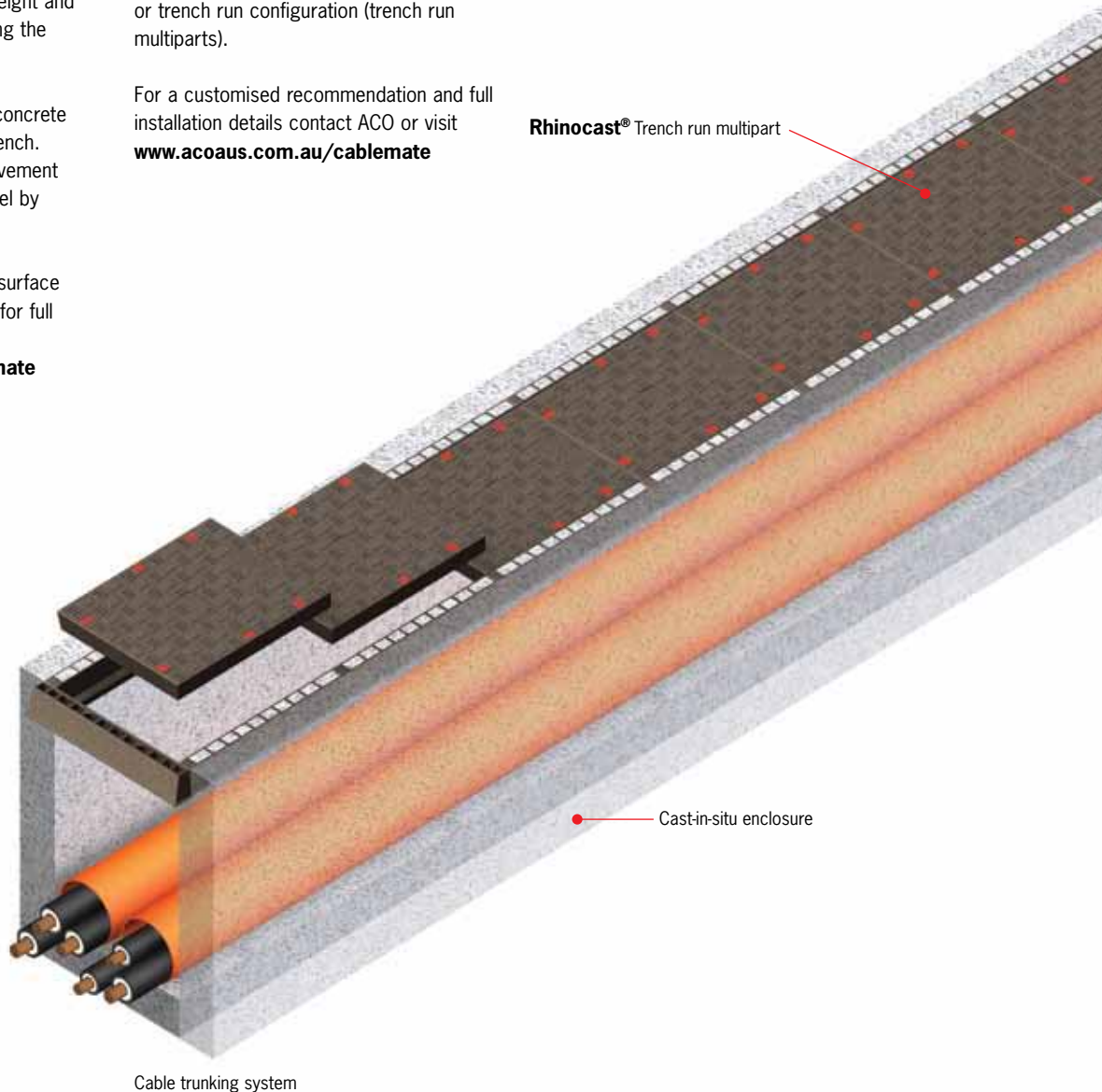
1. Excavate greater than the overall dimensions of the ducting channel (refer to ACO's excavation guide for minimum dimensions - pg 83).
2. Lay out ducting channels near the trench.
3. Ducting channels need to be supported at the correct height and held securely in place during the concrete pour.
4. To finish installation, pour concrete evenly either side of the trench. The top of the adjacent pavement should be above the lid level by approximately 3mm.

For installation illustrations for surface ducting systems see pg 84 or for full installation details visit www.acoaus.com.au/cablemate

c. Access Holes & Trunking Systems

Maintenance holes and cable trunking systems are usually fabricated on site or supplied as precast reinforced structures. ACO's access covers are designed to be installed above them in a multipart or trench run configuration (trench run multipart).

For a customised recommendation and full installation details contact ACO or visit www.acoaus.com.au/cablemate



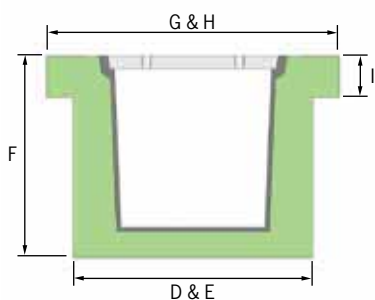
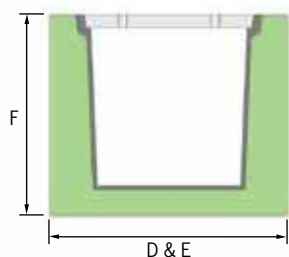
Cable trunking system

Supporting Information

3. Excavation Guide

Dimensions shown indicate minimum material to be excavated. (To be read in conjunction with pg 84/85).

Cable Pit & Lid Systems



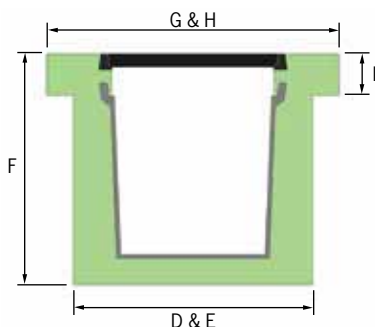
Class A & B (without collar)

Class A & B (with collar)

Polymer Concrete Pits ¹	Class A & B (without collar)			Class A & B (with collar)		
	D	E	F	G	H	I ²
Type 33	540	540	540	640	640	150
Type 45	710	710	700	810	810	150
Type 66	870	870	720	970	970	150
Type 66H	870	870	1020	970	970	150
Type 99	1210	1210	680	1310	1310	150
Type 52	710	420	540	810	520	150
Type 63	850	500	840	950	600	150
Type 95	1180	720	690	1280	820	150
Type 96	1200	900	720	1300	1000	150
Type 8	1600	780	1000	1700	880	150
Plastic Pits ¹	D	E	F	G	H	I ²
Type 1	720	440	500	820	540	150
Type 2	860	490	680	960	590	150
Type 3	770	540	630	870	640	150
Type 4	920	610	900	1020	710	150
Type 5	920	670	740	1020	770	150
Type 6	1580	770	770	1680	870	150
Type 7	1220	770	1250	1320	870	150
Type 8	1580	770	990	1680	870	150
Type 9	2240	770	990	2340	870	150
Type 43	630	630	710	730	730	150
Type 53	740	500	560	840	600	150
Type 55	760	760	610	860	860	150
Type 77	910	910	760	1010	1010	150

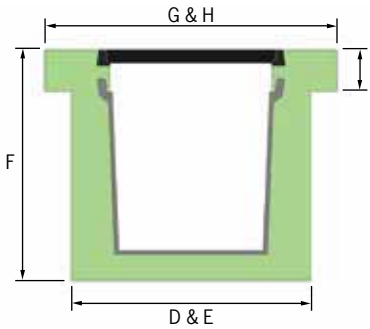
Class A & B (with collar)

Cable Pit with Access Cover Systems



Polymer Concrete Pits ¹	Class A & B (with collar)			Class A & B (with collar)		
	D	E	F	G	H	I ²
Type 33	540	540	540	900	860	150
Type 45	710	710	700	900	880	150
Type 66	870	870	720	1050	1030	150
Type 66H	870	870	1020	1050	1030	150
Type 99	1210	1210	680	1350	1330	150
Type 52	710	420	540	900	860	150
Type 63	850	500	840	1050	860	150
Type 95	1180	720	690	1350	880	150
Type 96	1200	900	720	1350	1030	150
Type 8	1600	780	1000	1750	900	150
Plastic Pits ¹	D	E	F	G	H	I ²
Type 1	720	440	500	900	860	150
Type 2	860	490	680	1050	860	150
Type 3	770	540	630	1030	860	150
Type 4	920	610	900	1080	860	150
Type 5	920	670	740	1080	860	150
Type 6	1580	770	770	1750	900	150
Type 7	1220	770	1250	1600	1050	150
Type 8	1580	770	990	1750	900	150
Type 9	2240	770	990	2320	900	150
Type 55	760	760	610	1050	1030	150
Type 77	910	910	760	1200	1180	150

Cable Pit with Access Cover Systems



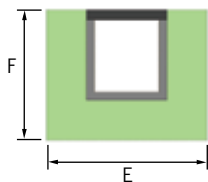
Class C & D (with collar)

Polymer Concrete Pits ¹	D	E	F	G	H	I ²
Type 33	640	640	590	970	970	200
Type 45	810	810	750	970	970	200
Type 66	970	970	770	1120	1120	200
Type 66H	970	970	1070	1120	1120	200
Type 99	1310	1310	730	1490	1420	200
Type 52	810	520	590	970	970	200
Type 63	950	600	890	1120	970	200
Type 95	1280	820	740	1420	970	200
Type 96	1300	1000	770	1420	1120	200
Type 8	1700	880	1050	1790	970	200

Class E, F & G (with collar)

Polymer Concrete Pits ¹	D	E	F	G	H	I ²
Type 33	740	740	640	1090	1090	250
Type 45	910	910	800	1090	1090	250
Type 66	1070	1070	820	1240	1240	250
Type 66H	1070	1070	1120	1240	1240	250
Type 99	1410	1410	780	1630	1540	250
Type 52	910	620	640	1090	1090	250
Type 63	1050	700	940	1240	1090	250
Type 95	1380	920	790	1540	1090	250
Type 96	1400	1100	820	1540	1240	250
Type 8	1800	980	1100	1930	1240	250

Surface Cable Ducting



Class A & B Class C & D Class E, F & G

Ducts	E	F	E	F	E	F
CD1215	330	280	n/a	n/a	n/a	n/a
CD2127	410	390	n/a	n/a	n/a	n/a
CD3015	530	280	n/a	n/a	n/a	n/a
CS010	360	300	460	350	560	400
CS030	360	420	460	470	560	520
CS2000	460	390	560	440	660	490
CS2020	460	490	560	540	660	590
CS3000	560	500	660	550	760	600
CS3020	560	620	660	670	760	720

Note:

- If risers are used, add the following to the depth
 Type 43, 52, 53, 63 - riser not available
 Type 55 - 150 mm
 Type 1, 2, 77 (plastic riser) - 200 mm
 Type 7, 8, 9 - 400 mm
 Type 77 (polymer concrete riser) and all other pits - 300 mm
- If access covers are installed adjacent to pavers, increase excavation depth (I) by the depth of the paver and mortar. (See pg 84/85).

CUTTING PIPE ENTRIES USING A HOLESAW

– INSTRUCTIONS



Recommended Drill Requirements

Holesaws up to 80mm in diameter

- 18V cordless drill - (minimum)
- 600W power drill - (minimum)

Holesaws above 80mm in diameter

- 800W to 1500W power drill

If using a SDS Plus drill, ensure you have purchased the correct arbour. (Figure 1)



Figure 1

1. Firstly mark out the location for the required penetration.
2. Pre-drill a 12mm pilot hole using a masonry drill bit. (Figure 2)
3. Assemble the components for the holesaw. The pilot drill is a taper lock style and only requires to be knocked into the arbour to secure it. Use the provided drift key to remove the pilot drill when required.
4. **Turn OFF hammer function.** Only drilling action is required. The use of the hammer setting will “blow out” the polymer concrete being cut, and damage the holesaw.
5. Start off drilling by keeping the drill level and use the speed of the drill to do the cutting. Avoid using excess pressure, let the diamonds do the cutting. (Figure 3)



Figure 2



Figure 3

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6. Once the hole is around 1/3 deep to aid dust clearance and therefore increase the speed of cut, make small circular motions with the drill. This allows dust to escape easier and can aid in the elimination of jamming the bit in the hole. (Figure 4)



Figure 4

7. The holesaw range has been designed to drill polymer concrete dry. However it is necessary to cool the diamond cutting edge of the holesaw on a regular basis. For every 1.5 to 2 minutes of drilling, rinse and cool the holesaw in a shallow container of water. This will extend the life of the holesaw; keep the holesaw cutting at a faster rate and will stop the diamonds from 'glazing', which simply means they stop biting into the polymer concrete. Remember to shake off excess water before resuming to drill. (Figure 5)



Figure 5

8. Depending on the size of the holesaw used, penetrations should take between 45 seconds and 3 minutes. This also depends on the wattage and rpm's of the drill being used. Rpm's should be started on a slower speed to begin with, building up as you go. The speed can be always be increased as required. (Figure 6)

9. If the holesaws performance starts to slow over time, it may be that new diamonds need to be exposed and some of the alloy encasing those diamonds needs to be removed. To do this, drill a hole into some waste sandstone, limestone or concrete with sand added to the hole. Use water to irrigate as you drill. These materials are very abrasive and will wear away the old fatigued diamonds and alloy and expose new diamond cutting surfaces. 1 to 4 minutes should be ample time to refresh a holesaw.



Figure 6

ACO offers a range of holesaws to facilitate this operation, refer to page 43 in the ACO Cablemate brochure.

For pit installation details, refer to page 79 in the ACO Cablemate brochure.



Figure 7

Technical Bulletin



CUTTING & JOINING PIPE ENTRIES

– INSTRUCTIONS

1. Mark all pipe entries on the pit and/or riser walls or use the preformed standard pipe entry guides/plastic inserts on the pit walls as a guide (Figure 1 & 2).
2. If multiple pipe entry is required, refer to the relevant regulatory authority for minimum cable separation spacings. ACO recommends a minimum of 50mm between penetrations to avoid local cracking.
3. Using a diamond tip holesaw of required size, remove the pit wall to fit the pipe (Figure 3). ACO offers a range of holesaws to facilitate this operation, refer to page 43 in the ACO Cablemate brochure.
4. A small diameter masonry grinder may be used to enlarge the opening for pipes entering the pit at an angle.
5. For multiple pipe entries, ACO recommends a concrete haunch around the all the pipes to preserve pit rigidity. Minimum of 100mm concrete encasing is recommended around the pipes and 200mm measured out from the pit wall. Concrete to be fully compacted and of grade 25MPa*. (Figure 4)
6. Install the pit and pipe. Cut the pipe flush with the inside wall of the pit so that the clear working area of the pit is not impeded.
7. Seal connection with a proprietary cementitious sealing compound to prevent ingress of moisture into the pit during service.

For pit installation details, refer to page 79 in the ACO Cablemate brochure.

* Adverse ground conditions may require an increase in these dimensions and/or the addition of reinforcement. If in doubt, engineering advice should be sought.

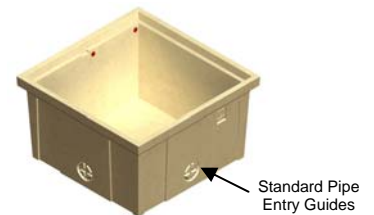


Figure 1

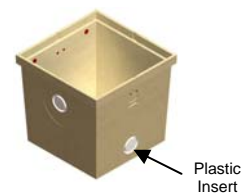


Figure 2



Figure 3

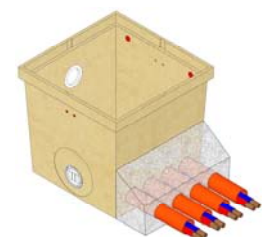


Figure 4

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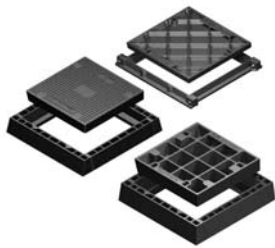
ACO Polycrete Pty Ltd
134-140 Old Bathurst Road
Emu Plains NSW 2750
Telephone (02) 4747 4000
Facsimile (02) 4747 4040
Email: technical@acoaus.com.au

RHINOCAST – DUCTILE IRON ACCESS COVERS

– INSTALLATION GUIDE

ACO ACCESS 

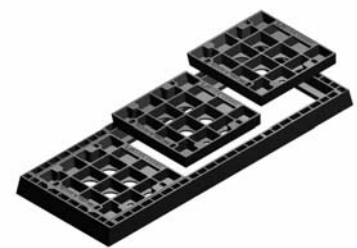
Installation of Single, 2 and 3 Part Cover Systems



Single Part Covers



2 Part Cover



3 Part Cover

Identification and Preparation

1. Form the access pit and rebate to the size required. See Figures 5, 6 & 7 for the recommended rebate dimensions for the required load class.
2. Remove all the dust caps and locking bolts from the covers and remove the covers from the frame using the appropriate Rhinocast lifting key. See Figures 8, 9 & 10 for the different Rhinocast lifting key options.
3. For 2 part or 3 part covers, mark the frame & covers at the lifting end to ensure that covers are reinstalled in the same position. The marks on the frame should line up with the lifting key holes.
4. Position the frame in the rebate and ensure that the lifting end of the frame is not obstructed by a wall, bollard etc.; otherwise cover removal will be restricted after installation. The frame must not protrude into the pit opening.
5. Pack under the corner of the frame joints to raise the level of the frame to the finished floor level. Ensure the packing does not protrude into the pit opening. For 2 and 3 part cover systems, pack under the additional frame joints to prevent the frame from sagging.
6. Set up the internal formwork to ensure that the frame will be fully supported after the concrete pour. For Class D and Class G covers block out the holes in the cover with metal sheeting.
7. Thoroughly clean the seat areas of the covers and frame. It is important that these surfaces are dirt and dust free.
8. Using the marks on the frame and covers (Step 3), place the covers back into the frame ensuring that the top edges of the frame and cover are level with each other. Check the covers for any diagonal rocking movement and adjust the packing under the frame where required. It is critical that the covers are properly seated in the frame and are not obstructed by any internal formwork.
9. Check that the top level edges of the covers and frame are level over the entire perimeter of the access cover. If the covers are not level, the covers and frame seats may not be dirt and dust free (Step 7) and/or the frame is damaged.
10. Replace all the dust caps in the covers.

Note: For Class D to Class G installations reinforcing may be required in the rebate under the frame. The reinforcement should be installed to the engineer's details.

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ACO Polycrete Pty Ltd
134-140 Old Bathurst Road
Emu Plains NSW 2750
Telephone (02) 4747 4000
Facsimile (02) 4747 4060
Email: technical@acoaus.com.au

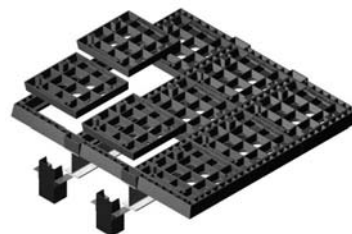
Concrete Pour

11. Simultaneously fill the rebate gap, cellular frames and recessed covers with concrete as specified in Table 1.
12. Tap the covers and frame to ensure that the concrete is well compacted and the frame is fully supported. Ensure all cavities and pockets are completely filled with concrete.
13. Screed off the excess concrete and finish the surface as required. The edges of the cover and frame should be visible.
14. Concrete must be allowed to cure for at least 24 hours before removing the covers from the frame. Early removal of the covers may cause twisting of the frame and damage to the supporting concrete. This may prevent covers from fitting back into the frame.
15. After the concrete has cured, remove the covers and strip the internal formwork.
16. Clean the seat area of the covers and frame. It is important that these surfaces are dirt and dust free.
17. Liberally apply sealing grease to the seat area of the covers and frame. This should be done periodically to assist in the maintenance procedure.
18. Using the marks on the frame and covers, place the covers back into the frame.
19. Tap down on the keyholes with a rubber mallet until the top of the covers are level with the top of the frame.
20. Replace all the locking bolts and dust caps in the covers.

Installation of Multi-part Cover Systems

Identification and Preparation

1. Using ACO's Multipart Cover Rebate Detail provided (example shown in Figure 1), form the access pit and rebate. Ensure that the pit clear opening, beam pockets and pit wall rebates are consistent with the detail. The numbering system on the drawing represents the position and order of installation of the covers. The frames and beams are numbered to help locate the covers, see Figures 2 & 3.



Multi-part Cover

2. The frame is delivered in sections. Ensure the end frame (containing the beam locating boxes) components mate with the side frame components.
3. Set the end frames so that the beam locating boxes are positioned with the corresponding beam pocket/s in the slab. Ensure all the undercut frames are installed at one end and the drawcut frames are installed at the opposite end, see Figure 11. Pack under the corner of the frame joints to raise the level of the frame to the finished floor level. Leave a clearance of 50mm between the concrete beam pocket/s and the beam locating boxes.

4. Place the side frames into position and bolt (finger tight) to the end frames. Ensure that the frames are level and square. Check carefully along the frames and across the diagonals. Surveying equipment is recommended. Ensure the frames and packing pieces do not protrude into the clear opening of the pit.

5. Lower the beams into the corresponding boxes.
6. Set up the internal formwork to ensure that the frame will be fully supported after the concrete pour. For Class D and Class G covers block out the holes in the cover with metal sheeting.

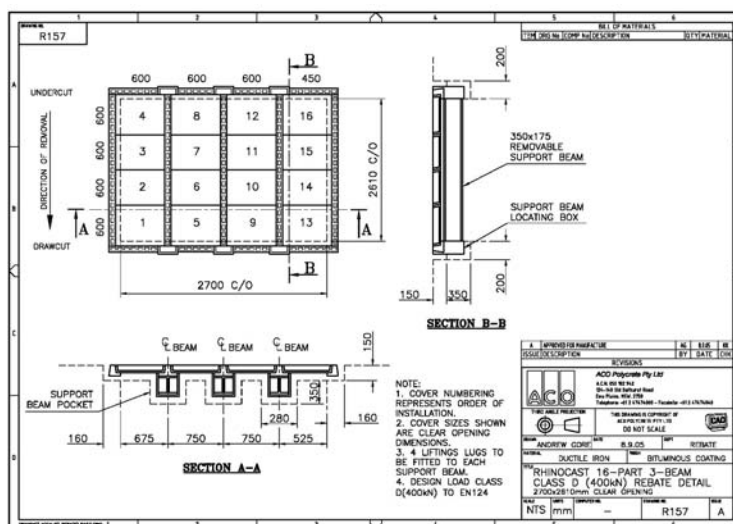


Figure 1 – Multi-part Cover Rebate Detail

7. Place the covers into the frame according to the numbering system (Step 1), ensuring that the top edges of the frame and covers are level with each other. Check the covers for any diagonal rocking movement and adjust the packing under the frame where required. It is critical that the covers are properly seated in the frame and are not obstructed by any internal formwork.
8. Check that the top edges of the covers and frame are level over the entire perimeter of the multi-part system.
9. Remove covers to access the (finger tight) bolts and tighten with a wrench. Repeat steps 7–9.
10. Replace all the dust caps in the covers.

Concrete Pour

Follow concrete pour procedure for single, 2 and 3 part cover systems.



Figure 2 – Frame Sections & Beams are Numbered



Figure 3 – Multi-part System Setup

Key Installation Requirements

Clear Opening

The clear opening is the unobstructed opening inside the frame, see Figure 4. The clear opening of the frame must be equal to or larger than the clear opening of the pit.

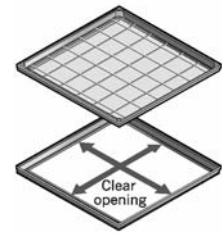


Figure 4 – Clear Opening

Dimensions

Dimensions are given as width (W) by length (L). Refer to ACO Access brochure for the complete dimensions of all the Rhinocast covers available.

Rebate Dimensions

To support the anticipated loads, the rebate must be cast according to Figures 5, 6 & 7. For covers with decorative edging add the height of the edging to the recommended rebate depths. The dimensions shown are the recommended minimum amount of concrete required to fully support the frame. Reinforcing may be required in the rebate under the frame. The reinforcement should be installed to the engineer's details.

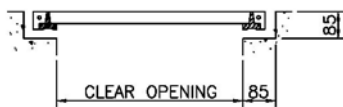


Figure 5 – Class B Rebate

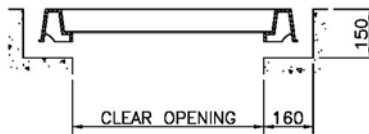


Figure 6 – Class D Rebate

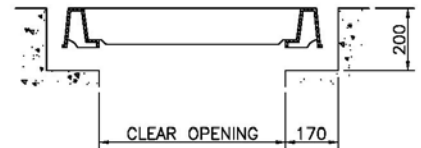


Figure 7 – Class G Rebate

Concrete Specification	
•	Minimum compressive strength of 32 MPa at 28 days
•	Minimum cement content of 400 kg/m ³
•	Aggregate size: 10-13mm

Table 1 – Concrete Specification

Load Class

Select the correct Rhinocast ductile iron access cover to suit the required load class and application, refer to pages 6-9 in the ACO Access brochure for further details.

Covers & Frames

Covers and frames are a matching pair and should never be mixed with other covers and frames as the seal may be compromised.

Rhinocast Lifting Keys

It is important that the appropriate Rhinocast lifting key is used, see Figure 8, 9 & 10. To remove a Rhinocast cover, insert the key and rotate clockwise a quarter turn and lock into position. Position the jacking screw over the frame and screw down using a shifting spanner to break the seal.



Figure 8 – Short Handle Lifter
Part No. 84653

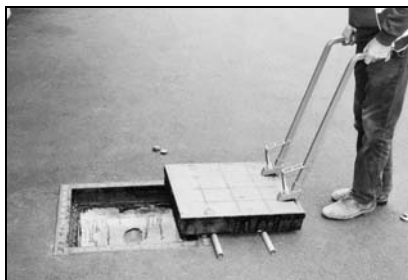


Figure 9 – Long Handle Lifter
Part No. 84851



Figure 10 – Mechanical Lifter
Part No. 84972 / 84965

For Road Traffic

The lifting end/drawcut edge of the cover, see Figure 11, should face the orientation of traffic flow to prevent the cover lifting, see Figure 12.

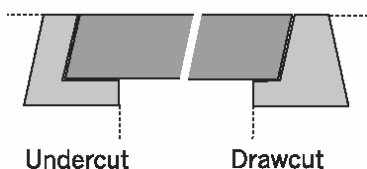


Figure 11 – Undercut & Drawcut Edge

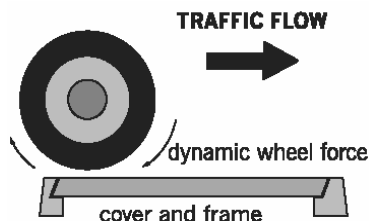


Figure 12 – Road Cover Orientation

Decorative Edging

A strip of stainless steel or brass can be fixed to the edge of the cover and frame to deepen the cover's rebate to accommodate tiles or pavers, see Figure 13.

For these applications, keyhole bosses will also have extensions to match the height and material finish of the decorative edge. The top of the decorative edge corresponds with the finished floor level of the cover. Ensure that the rebate has been formed with an allowance for the relevant height extensions (refer to Figures 5, 6 & 7 for standard rebate dimensions).

Tiles or pavers should be fully restrained and bonded to the concrete bed. An epoxy mortar is recommended.

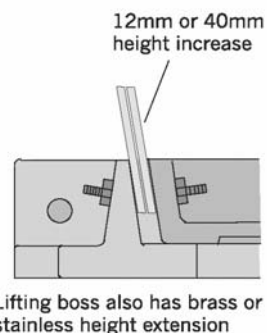


Figure 13 – Decorative Edging

Site Support

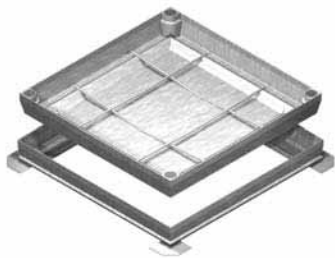
Dependent on the location of the installation, ACO can provide supervisory support if requested.

URBANFIL – GALVANISED STEEL ACCESS COVERS

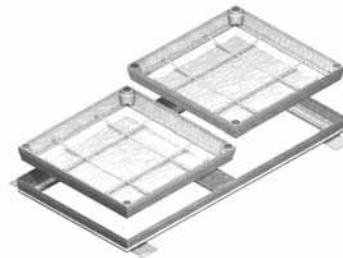
– INSTALLATION GUIDE

ACO ACCESS 

Installation of Single Part Covers and Trench Run Systems



Single Part Cover



2 Part Cover

Identification and Preparation

1. Form the access pit and rebate to the size required. See Figures 7, 8 & 9 for the recommended rebate dimensions for the required class load.
2. Remove all the dust caps and locking bolts from the covers and remove the covers from the frame.
3. Position the frame centrally over the clear opening in the rebate. The frame must not protrude into the pit opening.
4. Pack under the corners of the frame to raise the level of the frame to the finished floor level. Ensure the packing does not protrude into the pit opening. For trench run systems, pack under the additional frame joints to prevent the frame from sagging.
5. Set up the internal formwork to ensure that the frame will be fully supported after the concrete pour.
6. Thoroughly clean the seat areas of the covers and frame. It is important that these surfaces are dirt and dust free.
7. Place the covers back into the frame ensuring that the top edges of the frame and cover are level with each other. Check the covers for any diagonal rocking movement and adjust the packing under the frame where required. It is critical that the covers are properly seated in the frame and are not obstructed by any internal formwork.
8. Insert the plastic spacing pieces, one at the centre of each side between the cover and the frame at the top surface level. This is to ensure that clearance is maintained during the concrete pour.
9. Replace all the locking bolts and dust caps in the covers.
10. Check that the top level edges of the covers and frame are level over the entire perimeter of the access cover. If the covers are not level, the covers and frame seats may not be dirt and dust free (Step 6) and/or the frame is damaged.
11. Prior to the concrete pour, place clear sticky tape over the gap between the cover and frame and the locking recesses to prevent concrete from falling into the gap.

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ACO Polycrete Pty Ltd
134-140 Old Bathurst Road
Emu Plains NSW 2750
Telephone (02) 4747 4000
Facsimile (02) 4747 4060
Email: technical@acoaus.com.au

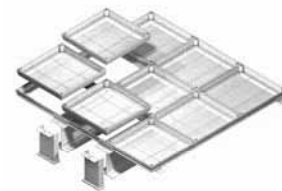
Concrete Pour

12. Fill the rebate gap with concrete as specified in Table 1, to a depth to accommodate the installation of the floor finish such as tiles or pavers and mortar at a later time. Tap the cover/frame to ensure that the concrete is well compacted. Ensure all cavities and pockets are completely filled with concrete. Allow to set before infilling covers. Take precautions to protect the exposed unit.
13. Fill the cover to a depth to accommodate the installation of the floor finish such as tiles or pavers and mortar at a later time. The cover must be filled with a minimum concrete depth of 45mm and must cover all the reinforcement. Tap the cover/frame to ensure that the concrete is well compacted.
14. The plastic spacing pieces should be removed soon after filling and before concrete hardens.
15. Concrete must be allowed to cure for at least 24 hours before removing the covers from the frame. Early removal of the covers may cause twisting of the frame and damage to the supporting concrete. This may prevent covers from fitting back into the frame.
16. After the concrete has cured, remove the covers and strip the internal formwork.
17. Clean the seat area of the covers and frame. It is important that these surfaces are dirt and dust free.
18. Replace the cover and all the locking bolts and dust caps. Care must be taken to ensure that the exposed frame and cover edges are protected against damage.
19. Infill cover with tiles/pavers or other floor finishes. The finished level of the floor finish must be flush with the top of the cover and frame.

Installation of Multi-part Cover Systems

Identification and Preparation

1. Using ACO's Multipart Cover Rebate Detail provided (example shown in Figure 1), form the access pit and rebate. Ensure that the pit clear opening, beam pockets and pit wall rebates are consistent with the detail. The numbering system on the drawing represents the position and order of installation of the covers. The frames and beams are numbered to help locate the covers.
2. The frame is delivered in sections. Ensure the end frame (containing the beam locating boxes) components mate with the side frame components.
3. Set the end frames so that the beam locating boxes are positioned with the corresponding beam pocket/s in the slab. Pack under the beam locating boxes and the corner of the frame joints to raise the level of the frame to the finished floor level.
4. Place the side frames into position and bolt (finger tight) to the end frames. Ensure that the frames are level and square. Check carefully along the frames and across the diagonals. Surveying equipment is recommended. The frame and packing must not protrude into the pit opening.
5. Lower the beams into the corresponding boxes. Set up the internal formwork to ensure that the frame will be fully supported after the concrete pour.
6. Place the removable cross bars into position. Remove all the dust caps and locking bolts from the covers.
7. Place the covers into the frame according to the numbering system (Step 1), ensuring that the top edges of the frame and covers are level with each other. Check the covers for any diagonal rocking movement and adjust the packing under the frame where required. It is critical that the covers are properly seated in the frame and are not obstructed by any internal formwork.
8. Insert the plastic spacing pieces, one at the centre of each side, between the covers and between the cover and frames at the top surface level. This is to ensure that clearance is maintained during the concrete pour.
9. Check that the top edges of the covers and frame are level over the entire perimeter of the multi-part system.
10. Tighten the (finger tight) bolts joining the frames with a wrench. Replace all the locking bolts and dust caps in the covers.
11. Prior to the concrete pour, place clear sticky tape over the gap between the cover and frame and the locking recesses to prevent concrete from falling into the gap.



Multi-part Cover

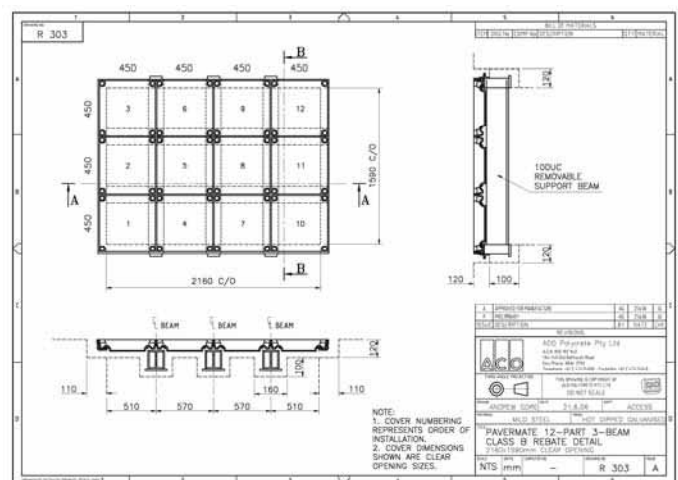


Figure 1 – Multi-part Cover Rebate Detail



Figure 2 – Frame & Beam

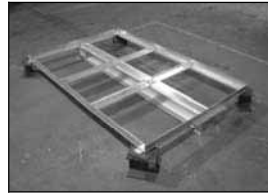


Figure 3 – Cross Bars

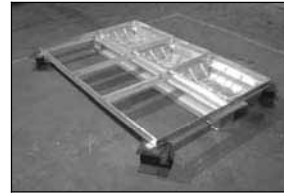


Figure 4 – Cover & Frame

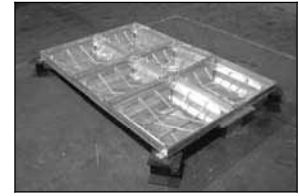


Figure 5 – Covers Assembled

Concrete Pour

Follow concrete pour procedure for single part covers and trench run systems.

Key Installation Requirements

Clear Opening

The clear opening is the unobstructed opening inside the frame, see Figure 6. The clear opening of the frame must be equal to or larger than the clear opening of the pit.

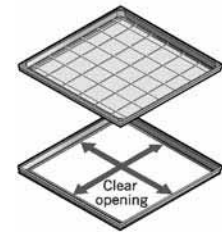


Figure 6 – Clear Opening

Dimensions

Dimensions are given as width (W) by length (L). Refer to ACO Access brochure for the complete dimensions of all the Urbanfil and Pavermate covers available.

Rebate Dimensions

To support the anticipated loads, the rebate must be cast according to Figures 7, 8 & 9. ACO's standard installation recommendations can be downloaded from ACO's website: http://www.acoaus.com.au/install_drawings_access.htm

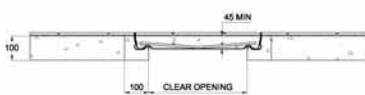


Figure 7 – Class A Rebate

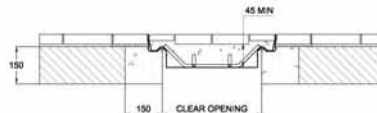


Figure 8 – Class B Rebate



Figure 9 – Class C Rebate

<p>Concrete Specification</p> <ul style="list-style-type: none"> • Minimum compressive strength of 32 MPa at 28 days • Minimum cement content of 400 kg/m³
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Table 1 – Concrete Specification

Load Class

Select the correct Urbanfil galvanised steel access cover to suit the required load class and application, refer to pages 6-9 in the ACO Access brochure for further details.

Covers & Frames

Covers and frames are a matching pair and should never be mixed with other covers and frames as the seal may be compromised.

Urbanfil Lifting Keys

It is important that the Urbanfil lifting key and locking (14mm allen) key are used, see Figure 10 and 11. To remove an Urbanfil cover, remove the locking bolts using the locking key from each corner and insert two short handle lifting keys in adjacent corners and rotate clockwise a quarter turn. Then lift both lifting keys and slide the cover out. Note square covers will fit diagonally through the frame so care should be taken not to drop the cover through the clear opening.



Figure 10 – Short Handle Lifter
Part No. 84306



Figure 11 – Locking (14mm Allen) Key
Part No. 84313

Decorative Edging

A strip of brass can be fixed to the edge of the cover and frame for an attractive finish, see Figure 12.

For these applications, keyhole bosses will also have extensions to match the decorative edge. The top of the decorative edge corresponds with the finished floor level of the cover.

Infill Materials

For Urbanfil covers, a maximum tile depth of 25mm is recommended.
For Pavermate covers, a maximum paver depth of 40mm is recommended.

Tiles or pavers positioned on the cover and in the first course outside the frame must be fully restrained and bonded to the concrete bed.
An epoxy mortar is recommended.

Site Support

Dependent on the location of the installation, ACO can provide supervisory support if requested.

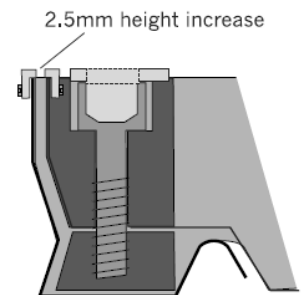


Figure 12 – Decorative Edging