



Network Access Pit Systems

STAKKAbox™ ULTIMA Connect

STAKKAbox™ ULTIMA Hybrid



STAKKAbox™ ULTIMA Connect

The Next Generation in Network Access Pit Systems

A modular scalable solution built on-site with easily connectable components.

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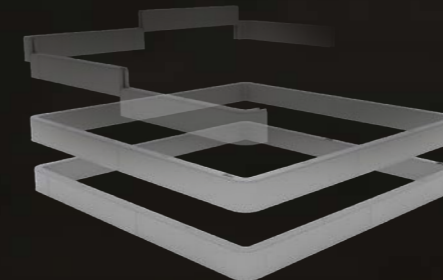
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Significantly reduce costs of in-situ construction through time savings

STAKKAbox™ ULTIMA Connect

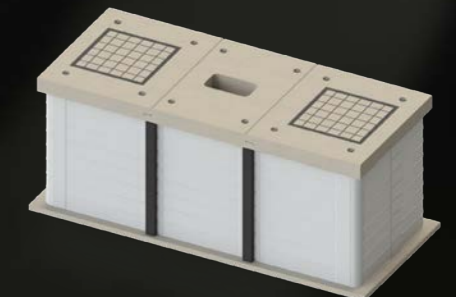
The modular scalable solution built on-site with easily connect-able components



The access pit system features a twinwall sectional design that is made up of GRP corner pieces ('hockey sticks') and sidewall lengths ('straights'). These parts are connected using a jointing peg to form a variety of clear opening sizes. With sidewall lengths being used in conjunction with corner pieces additional access pit sizes specified by the contractor can be made.

STAKKAbox™ ULTIMA Hybrid

A high strength stackable access pit solution for installations greater than two (2) metres long



Designed to provide increased strength capabilities, the ULTIMA Hybrid assembly includes highly-engineered CUBIS ULTIMA Beams, a precast concrete base and modular precast concrete encasements. Fully customisable to overcome the most complex of installation requirements.

How it Works

ULTIMA Connect is manufactured in 150mm deep sections that stack one on top of each other to reach desired depth. Each ring section is castellated to positively interlock with the unit above and below.

ULTIMA Connect Product Benefits:

Variability in Size

STAKKAbox™ offers a huge range of access pit dimensions thanks to the large number of sections sizes available and the variability offered by the ULTIMA Connect system.

Lightweight

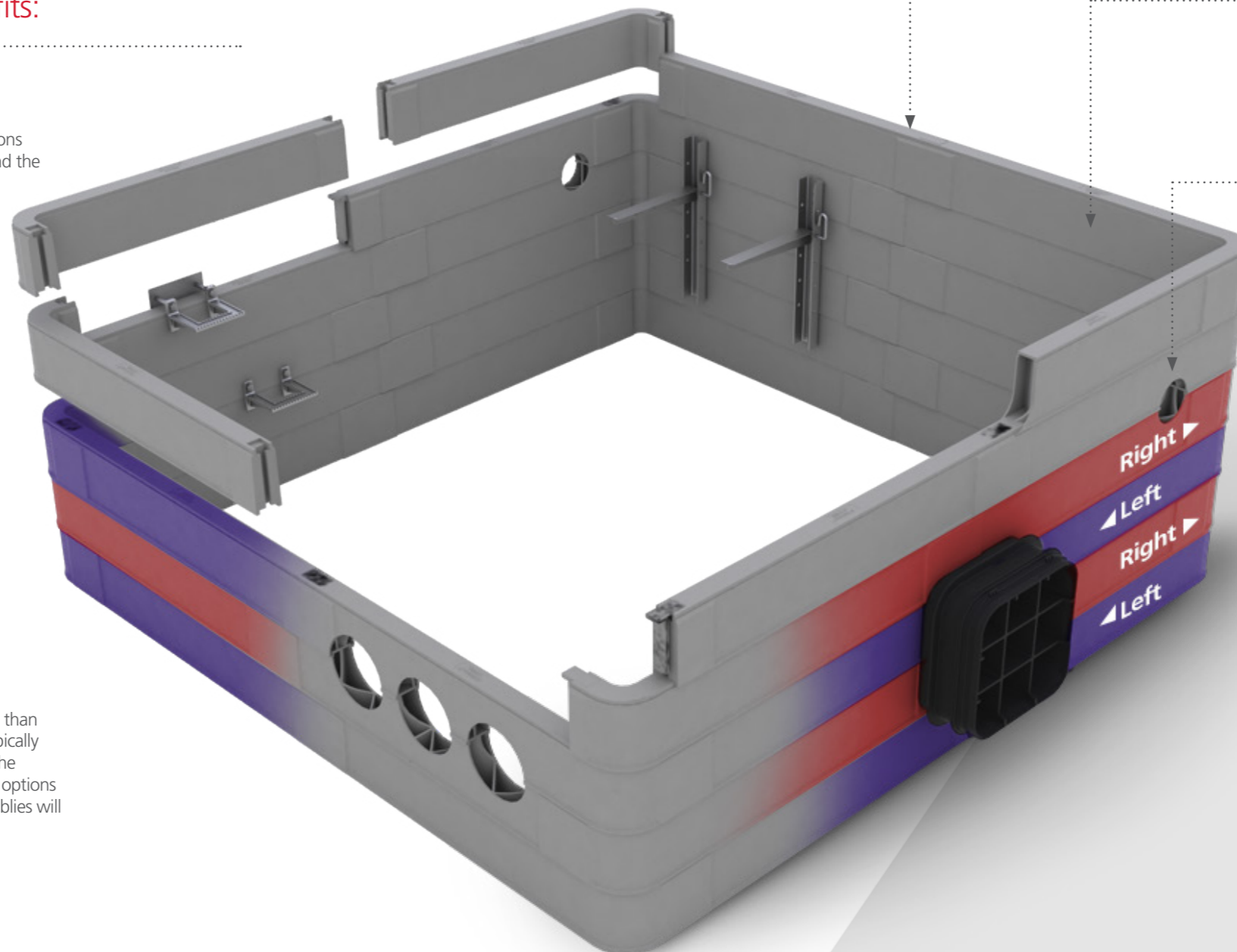
Due to the sectional twinwall design and the GRP material, most ULTIMA Connect 150mm deep sections fall under 25kg in weight, making it suitable for a single person lift under manual handling regulations.

Strong

ULTIMA Connect access pit systems can achieve unsupported 60 tonne vertical load test results. Side loads are comparable to that of traditional concrete access pit alternatives.

Fast and Easy to Install

STAKKAbox™ access pits are significantly faster to install than conventional alternatives, with complete installations typically taking up to one hour. This results in reduced costs for the installer. Please note, the precast access cover and floor options offered with the Ultima Connect & Ultima Hybrid assemblies will require lifting machinery for placement on access pits.



Twin Wall

Sections are twin walled and complete access pit systems feature horizontal and vertical ribs.

Chemical Resistance

GRP outperforms traditional construction methods for chemical resistance during its buried life, resulting in a product that offers longer installed life.

Smooth Outer Walls with Lip to 'Key In'

STAKKAbox™ access pits have smooth outer walls and an outer lip which keys into the backfill, restricting the pits ability to move in the case surrounding landscape is disturbed.

GRP material for long lasting toughness, durability and strength



Glass-reinforced polymer (GRP), is a composite material consisting of glass fibre and polyester resin.

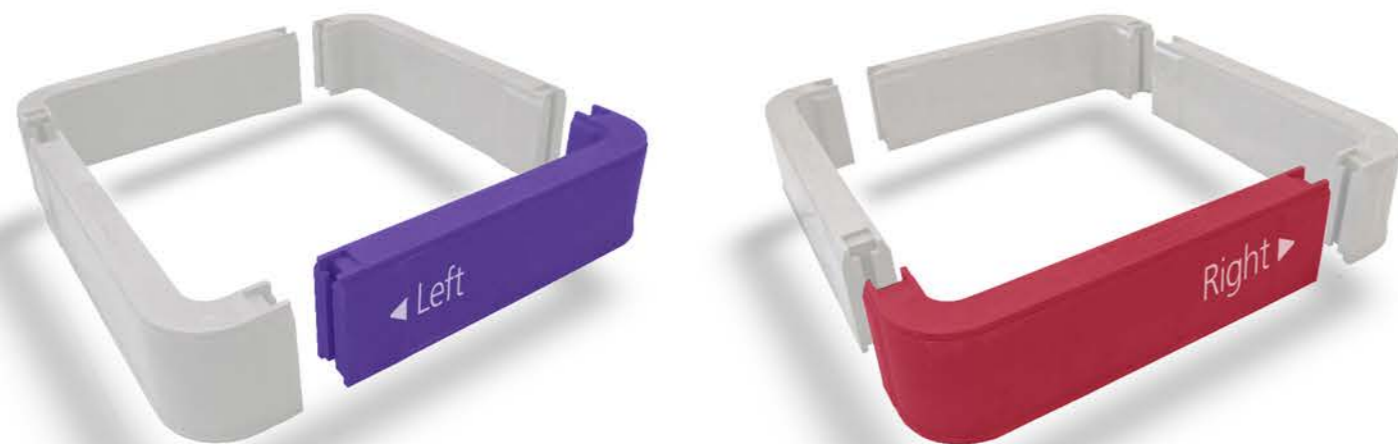
How it's Built

ULTIMA Connect corner pieces are manufactured in left and right 'handed' designs, which offer the ability to offset joints between sections in order to provide a brickworked design. This offers strong sidewall performance to the installed access pit.



When constructing an ULTIMA Connect access pit you must remember to start with a full ring section of either left or right corner pieces. You can then build up from this using alternative corner pieces per ring section, until the specified height of the access pit is reached.

Jointed Pegs are inserted at each intersection to securely connect each component



It is possible to differentiate between a left-handed and right handed corner piece when both parts are placed beside each other as the left-handed corner piece looks like an 'L'. The angle of the piece is also noted on the top of each Ultima section by either an 'L' (Left) or 'R' (Right).

Modular and Scalable

Below are all available sizes for the ULTIMA Connect system enabling rapid build of any access pit solution to suit project requirements.

Sidewalls



500mm

600mm

800mm

1000mm

Corner Sections



400mm

600mm

675mm

750mm



800mm

900mm



1000mm

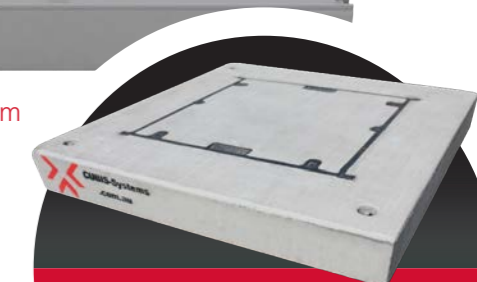
1200mm



1500mm



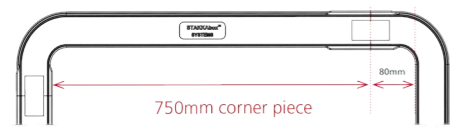
1900mm



Cubis access pits can be fitted with a range of custom access covers & encasements. Contact the Cubis Specialist team for more information.

Measuring an Access Pit

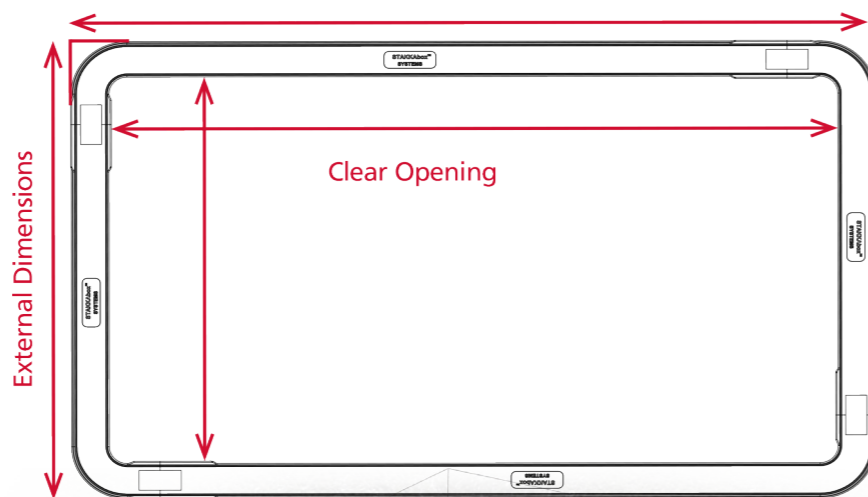
ULTIMA Connect access pit sections are measured by the measurements inside of the access pit. Attention should also be paid to the external dimensions when deciding whether the network access pit systems will fit into the area required. Internal measurements inside the pit (the clear opening).



The sizes in the below table demonstrate the most commonly requested ULTIMA pit sizes.

Sizes shown in the table are not exhaustive, please contact us for more information about the full sizing capabilities of the STAKKAbox™ system.

- Commonly requested ULTIMA Connect access pit sizes
- Commonly requested ULTIMA Hybrid access pit sizes
- Readily available access pit sizes



Internal Dimensions in mm	400	600										
400	■	600										
600	■	■	675									
675	■	■	■	750								
750	■	■	■	■	800							
800	■	■	■	■	■	900						
900	■	■	■	■	■	■	1000					
1000	■	■	■	■	■	■	■	1200				
1200	■	■	■	■	■	■	■	■	1300			
1300	■	■	■	■	■	■	■	■	1400			
1400	■	■	■	■	■	■	■	■	1500			
1500	■	■	■	■	■	■	■	■	1600			
1600	■	■	■	■	■	■	■	■	1800			
1800	■	■	■	■	■	■	■	■	1900			
1900	■	■	■	■	■	■	■	■	2000			
2000	■	■	■	■	■	■	■	■	2500			
2500	■	■	■	■	■	■	■	■	3000			
3000	■	■	■	■	■	■	■	■	3500			
3500	■	■	■	■	■	■	■	■	4000			
4000	■	■	■	■	■	■	■	■	4500			
4500	■	■	■	■	■	■	■	■	5000			
5000	■	■	■	■	■	■	■	■				

Rapid and Easy Installation

Step 1:

Arrange corner pieces and sidewalls to match the access pit clear opening dimensions. Ensure that the lip is on the outside of the access pit. The corner pieces should be all 'left' or all 'right' on each section and will alternate between the two as the access pit increases in depth.



Step 2:

Layout the first ring section of connect pieces to ensure you have the correct components



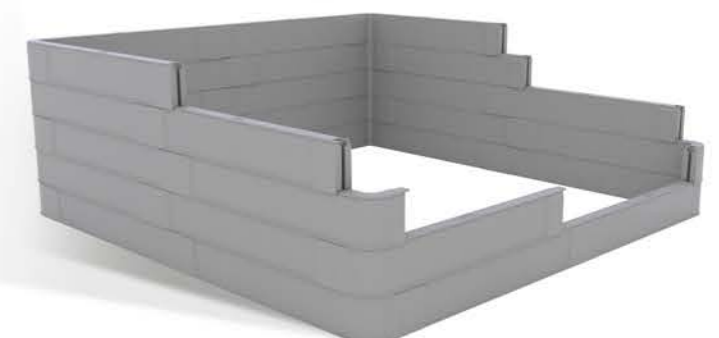
Step 3:

Now Connect the sections using the jointing peg, ensuring that the top of the peg is level with the top of the section.



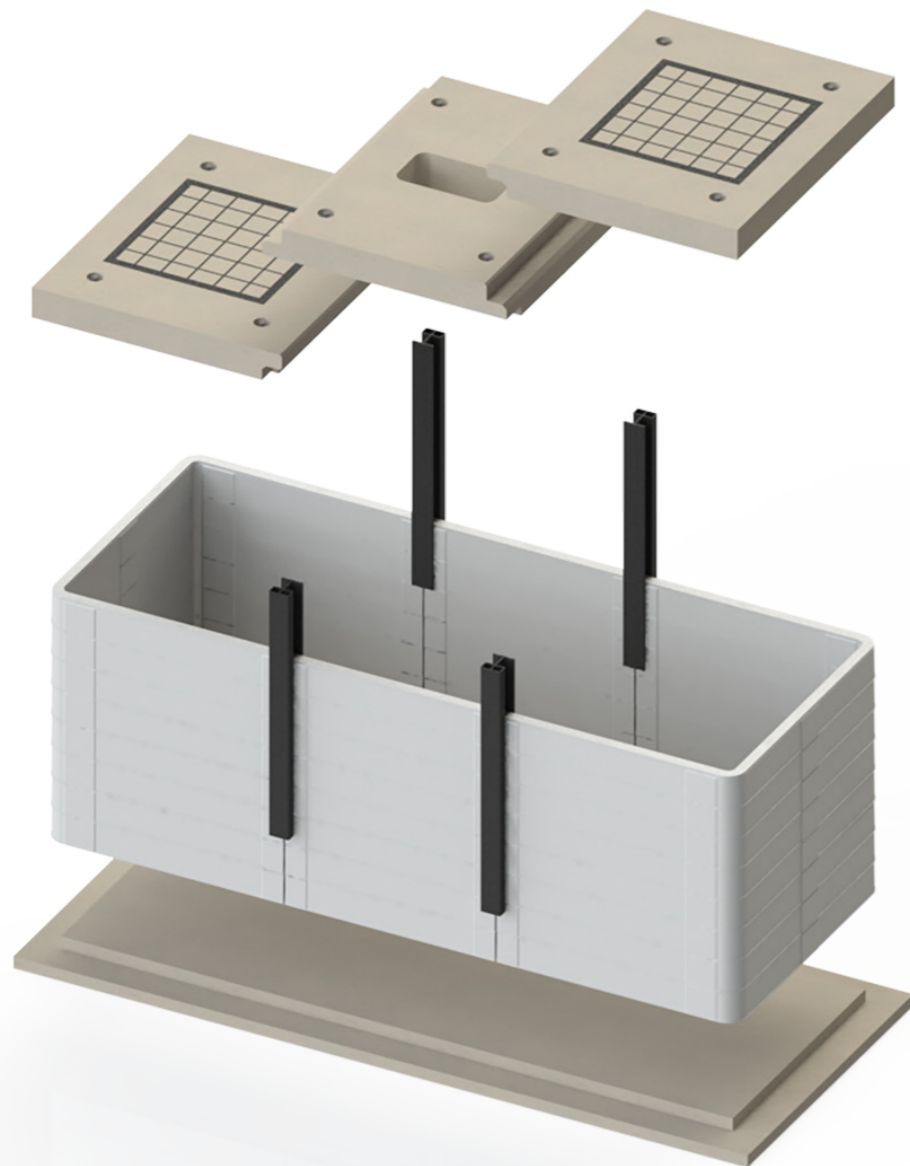
Step 4:

Build the next section on top, using the alternative corner pieces. This will provide a 'brick worked' access pit ensuring any joints are not in a vertical line.



Utilising the inherent benefits of the ULTIMA Connect system without compromising on installation flexibility.

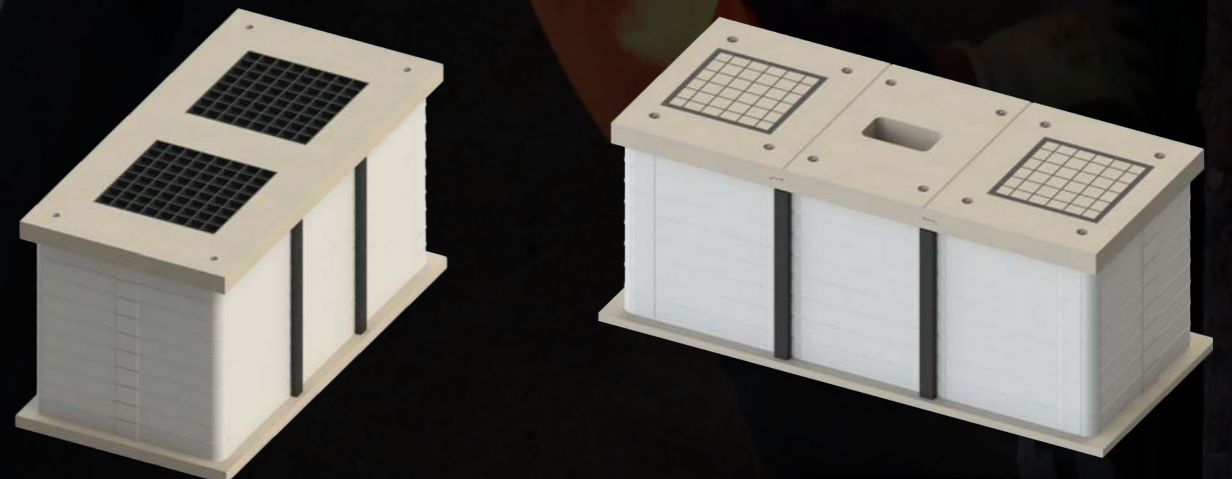
Cubis Systems latest innovation, the ULTIMA Hybrid pit system, features ULTIMA Beams developed specifically for large scale access pits two (2) meters and above. The ULTIMA Beams provide enhanced lateral strength capabilities and are manufactured to a variety of sizes with a maximum length of 2.2 meters.



Enhanced strength and installation capabilities

Specially engineered precast slab sections for the top and base complete the Hybrid assembly. The precast concrete encasement has been designed to replicate the modular structure of the Ultima Connect system providing ease of installation.

The entire Ultima Hybrid assembly acts as an exoskeleton, providing increased flexibility to overcome limitations of existing underground infrastructure networks with amplified strength capabilities for Australian projects.



Pit Accessories

Using Cubis network access pit systems accessories can help save even more time. Our access pit options & accessories range allows installers to simply place, connect up conduits or ducts, backfill and walk away.

1. ULTIMA Adjustable Ladder

Access pits deeper than 1200mm will usually require ladders for safe and simple access. We supply high quality adjustable ladders to suit custom STAKKAbox™ dimensions and customer requirements.

2. MULTIduct™ Systems

Cubis manufacture MULTIduct™, a multiple ducting system used for constructing under track or road crossings, bridge crossings and linear routes. The MULTIduct™ system offers various accessories to meet cabling requirements and fast interface options with ULTIMA access pits.

3. ULTIMA Beams

Specifically designed for large scale access pit systems measuring two (2) meters and above, Cubis can provide in-house design engineering support and ULTIMA Beams for a high-strength pit solution.

4. ULTIMA Pit Riser

The modular structure of the access pit system provides a fast and easy solution when additional height is required for an install. Simply add an extra ring of ULTIMA Connect for a 150mm riser.



5. Frame, Cover & Encasement Options

Cubis manufacture a range of covers, frames & encasements engineered to work in conjunction with its access pit products.

Cubis' standard range include galvanised mild steel (GMS) or cast iron covers in a precast concrete encasement. GMS non-slip and secure locking cover options are also available to meet project requirements.

6. Precast Concrete Base (custom available)

All precast concrete base slabs are manufactured using 40Mpa strength concrete and are fully steel mesh and bar reinforced. Cubis' in-house engineering team offer custom design capabilities to accommodate any pit size and load requirements.

Load Classification (AS 3996:2006)

Access covers and encasements for STAKKAbox™ ULTIMA Connect and Hybrid are designed by classes A, B, C & D according to load capacity set out in the table below. The table is an extract from AS 3996:2006.

The correct class for an access cover or encasement depends on the location of installation. Some examples are outlined in this table; however it is the responsibility of the designer to ensure the appropriate class is selected and/or specified. Specifics of the location should be taken into consideration when selecting the right cover or encasement. The speed of traffic, wheel pressure or positioning as well as the physical (turning area) should all be accessed.

Type	Class	Typical Use	Ultimate Limit State Design Load (kN)	Serviceability design loading (kN)	Nominal wheel loading (kg)
	A	Areas (including footways) accessibly only to pedestrians and cyclists and closed to other traffic (extra light duty)	10	6.7kN	330kg
	B	Areas (including footways and light tractor paths) accessibly only to vehicles (excluding commercial vehicles) or livestock (light duty)	80	53kN	2,670kg
	C	Malls and areas open to slow moving commercial vehicles (heavy duty)	150	100kN	5,000kg
	D	Carriageways of roads and areas open to commercial vehicles (heavy duty)	210	140kN	8,000kg

Notes:
 1) Nominal wheel loads are given as a guide only. Consideration should be given to the type, size and pneumatic pressure of the load applied. 2) Class B design loads exceed AS5100.2 requirements for footway loading. 3) Class D design loads exceed AS5100.2 requirements for a W80 wheel load. 4) Class C loads are based on an intermediate load. 5) The serviceability load is set at 2/3 of the ultimate limit state design load. 6) A force of 1kN approximately equal to 100kg.

EARTH



ELECTRICAL

Asset Identification

To assist with the efficient identification of underground services, Cubis offer standard and custom solutions for labelling, pulling/hauling eyes, unistrut, pit lifters, etc.

Industry Experts

STAKKAbox™ ULTIMA Connect: an innovative and sustainable access chamber solution

The Canberra Light Rail Project, Capital Metro, marks the exciting transformation of the public transport system connecting Australia's Capital Territory (ACT). The overall project, including all future zones, will span over 20 years and be the largest infrastructure spend in the history of the ACT, estimated to reach £515 million in total construction value.

Stage One (1) of the project is well underway, estimated to take two-years and includes the design and construction of a 12km light rail route spanning between the fast-growing northern corridor of Gungahlin to the City Centre. The first Light Rail Vehicle arrived in March 2018, with a total of 14 Light Rail Vehicles (LRV) each commuting 207 people across the 13-stop route. The light rail system is earmarked to drive growth within the region, increase tourism, alleviate road congestion, all whilst invigorating local businesses and the greater community.

To ensure the roll-out of the 21st Century service is completed as intended, Cubis were approached by Canberra Metro Construction to provide an innovative and sustainable solution for associated underground network access infrastructure. As the global leader of highly-engineered composite access chambers and cover systems, Cubis' in-house design team developed the STAKKAbox™ ULTIMA Connect to meet the specific needs of the project.

A highly accelerated project schedule was required to ensure successful completion of works in preparation for Stage Two. The 8 mile construction site was divided into three zones, Northern, Southern and Depot, each overseen by a dedicated project management team. The site comprised of both inner city and suburban locations, resulting in a diverse range of installation environments and associated construction requirements.

Dimensional constraints varied between project stages due to the Light Rail design. Access chambers accommodated multiple electrical (LV & HV) and communications cables vital to the successful delivery of the Light Rail network. Due to the high security and load capacities demanded by the project, guaranteeing complete safety, during and after installation, as well as ongoing asset protection was of utmost importance.

Traditional chamber options could not meet all project requirements and therefore Cubis were approached due to their long proven history of providing high quality and specialised network access solutions.

Cubis' in-house project management and engineering departments worked closely with Canberra Metro Construction providing technical advice to overcome the extensive project HV service footprint constraints. With a highly accelerated schedule and facing dimensional restrictions, particularly between the track slabs, Cubis utilised the inherent benefits of the ULTIMA Connect system and custom engineered the STAKKAbox™ ULTIMA Connect.

The entire ULTIMA Connect assembly acted as an exoskeleton, consisting of an in-situ concrete base, the ULTIMA Connect chamber system, ULTIMA beams and a three-part precast concrete encasement replicating the modular structure of Cubis' STAKKAbox™ range.

The innovative design of the ULTIMA beams were engineered to deliver amplified lateral strength capabilities particularly for large access chambers measuring two (2) meters and above. All ULTIMA Connect components were flat packed for delivery, therefore reducing freight and unloading costs. The lightweight ULTIMA sections were rapidly installed on-site, enabling two (2) or more large custom chambers to be fully assembled including all connections and backfill within one day by a small work crew. Modifications to the chambers which accommodated the HV electrical ducting were easily completed using standard battery powered tools.

Some of the major project outcomes included simplicity and ease of installation, custom access chamber systems with Class D load capabilities, secure asset protection, minimal traffic management and no specialist builders, backfills or heavy lifting machinery required. This resulted in a minimal labour intensive build, significantly reduced costs and the highest standard of health and safety compliance.

Undeniably, the STAKKAbox™ ULTIMA Connect chamber system has set a new standard for the ultimate high strength underground network access solution industry-wide.

It is one of the best innovative products which we have seen and I think we will be using more of this in Australia... Cubis STAKKAbox™ is the ultimate solution.

Kesh Prabhu, Project Engineer for Canberra Metro Construction



CUBIS SYSTEMS SOLUTION

Product: STAKKAbox™ ULTIMA Connect

Load Rating: Class D

Internal Dimensions (mm): Cubis provided three standardised chamber sizes;

(1) 3000L x 1500W x 1500D

(2) 5000L x 1500L x 1500D

(3) 3000L x 1500W x 2000D

Multiple additional custom Connect solutions were provided for the Depot site.

Access Cover: Modular three (3) and five (5) part precast concrete encasements

*In addition to the ULTIMA Connect, a number of Cubis precast concrete SCEC chamber and cover assemblies, including the C5, C2, 911 and 1500, were installed to protect the Light Rail communications network.

Installation Guides

STAKKAbox™ ULTIMA Connect



STAKKAbox™ ULTIMA Hybrid



Alternatively, you can view or download a copy of the installation guides via the Cubis Resources page on our website.

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Driven by Innovation

Cubis Systems is Australia's leading manufacturer and supplier of network access pits and cable protection solutions used in the construction of infrastructure networks for Rail, Telecoms, Water, Defence, Construction and Power markets.

Cubis has developed an innovative approach in an old-fashioned industry. This has been achieved by developing quality products which replace traditional construction materials, like bricks and concrete, with lightweight plastics incorporating intelligent design features. These can then be installed faster and ultimately save our customers both time & money.

Cubis manufactures its preformed network access pit systems STAKKAbox™, cable protection system RAILduct™, MULTIduct™ multiple duct system and various AX-S™ access covers at its manufacturing sites throughout the UK and Ireland. These products are exported to more than 25 countries throughout the world. With additional manufacturing facilities located throughout Australia, Cubis provides customised, highly-engineered underground access solutions including their robust precast concrete and MONObox™ access pit systems, developed in partnership with leading Authorities and Asset Owners.

At Cubis we pride ourselves on delivering technical customer support, new innovation, product quality and the highest levels of customer satisfaction.

www.cubis-systems.com.au

