Pinnacle® Series Inspection Chamber

(North Island only)

Technical Guide D4.16

Manufactured at our state of the art world leading concrete manufacturing plant in Pokeno, the inspection chamber offers a durable and high performance system.

Applications

- Pipeline junctions
- Pipeline direction changes
- Soakholes
- Off-take risers

Product Attributes

- Total flexibility onsite
- Durable proven performance
- Complete range of diameters and riser heights available throughout NZ

Approvals/Standards

- Manufactured to AS/NZS 4058, Precast Concrete Pipes

Quality

- ISO 9001:2008 Quality Management Standard

We are the supply partner of choice for New Zealand's civil construction industry, specialising in water and infrastructure based solutions.

HYNDS PIPE SYSTEMS

The pinnacle Inspection Chamber range is our new range of concrete inspection chambers from our state-of-the-art, world leading concrete manufacturing site in Pokeno Auckland

Design Requirements

- Inspection Chamber are positioned for multiple connection sites, changes of gradient (drop Inspection Chamber) or direction and location for access into a pipeline.
- When designing a Hynds Inspection Chamber system, components such as diameter, height, connections and installation need to be considered.
- The Local Council Authority should be contacted to determine regional requirements for Inspection Chamber construction.
- Continuous pipelines that don't require changes in gradient or direction generally require Inspection Chambers to be positioned at a distance specified by the applicable local authority. Maximum recommended depth for placement is 1.5 metres subject to prior approval from local council authority.
- Where no council recommendations are available, the following factors can be used as a guide:
  - 450 mm minimum chamber diameter.
  - Single entry/exit inspection chambers typically have a diameter 1.6–2.0 times the diameter of the larger pipe connecting into it.
  - Multiple entry/single exit chambers are larger and dependent upon structural restrictions and flow limitations.

Chamber Bases

- Bases are available with or without an external flange.
- Flanged base and riser sections are steel reinforced so there is no need for preformed holes or knockouts – making alignment very easy and flexible.
- Refer to table 2 and 3 for full list of our Pinnacle® Inspection Chamber Base Range

Chamber risers

- Hynds Inspection Chamber risers are manufactured using high strength concrete and fabricated circular steel reinforcement to achieve a suitable strength for standard installations.
- The chamber includes nominal internal riser diameters from 450 to 900 mm.
- Refer to Table 4 for a range of standard sizes.

Joint Sealing

- Hynds Inspection Chambers allow sealing at the riser joints and the lid/riser joint.
- Pinnacle Inspection Chamber Risers & Bases incorporate a traditional "Mortar Joint".
- This joint profile is sealed with standard mastic sealant or epoxy mortar and which has been proven over time. The recommended products to be used for sealing this joint profile are:
  a. Grey Butyl Manhole Sealant – Hynds (SM9020). This product does not have a 'memory' and provides a flexible joint. It has a moderate amount of surface tack making it easier to pull the joint apart, if required.
  b. Black Butyl Mastic Manhole Sealant – Hynds (MSR). This has 'memory' and provides a more robust joint. It has a stronger bond to the concrete faces, making it more difficult to pull the joint apart. Hynds recommends this sealant for installations with high water tables.
  c. Epoxy Mortar – Hynds (Hybond). This is a two part epoxy mortar which will result in a rigid joint. It is commonly used for patching concrete as well as to joint concrete components such as in bends and offtakes.

Inspection Chamber Lids

- Hynds manufacture a large range of precast inspection chamber lids to suit all common council requirements.
- 5kPa and HD60 options are stocked at Hynds Sales Branches. Special strength concrete lids and inspection chambers lids with cast-in covers, grates and frames are also available.
- Refer to table 6 for Instection chamber lid range

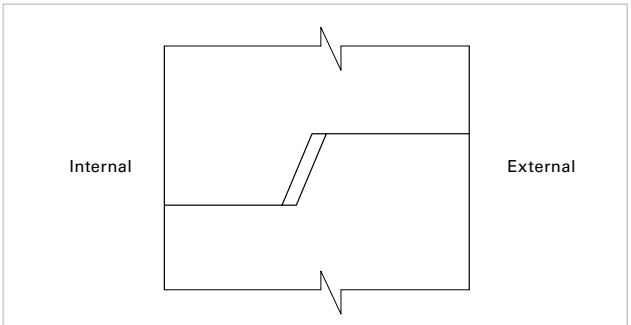

FIG. 1 Mortar Joint profile

Connections

- Pipe connections fitted into the riser wall are to be made onsite by coring
- Entry and exit punch outs can be made wherever they are required and should be made after the risers have been installed.
- Punch outs should be made as small as possible and above the flanged base. Hynds recommends coring to pipe O.D. + 50 mm.
- A minimum distance of 200 mm should separate all holes. At least 40% of the riser wall should remain in any horizontal plane after punching holes.
- For connection of rigid pipe materials (vitrified clay and spun concrete) epoxy or cement mortar should be used.
- For connection of PVC pipe materials, Hynds Pipe Systems supply purpose made manhole connectors in 100 and 150 mm diameters. These sealed units are made up of a BS EN 295 vitrified clay pipe short, coupled to a PVC short and held together with a patented heat shrink process to ensure the connectors cannot come apart when being installed. The clay pipe short is epoxied to the concrete inspection chamber riser wall.
- Inspection chambers installed in regions prone to settlement should be fitted with pipe shorts prior to installing the connected pipeline.

TABLE 1 Manhole/Inspection Chamber Starters

Product Code	Description
CON100H	MH Connector 100 mm PVC to Concrete M/Hole
CON150H	MH Connector 150 mm PVC to Concrete M/Hole

Note: *For more information about the Hynds Manhole/ Inspection Chamber Connectors please refer to our DR09 product datasheet or contact your local branch.*

FIG. 2 Manhole Connector for PVC pipe

Inspection Chambers Covers & Frames

- Standard Inspection Chamber covers and frames are manufactured from strong and durable cast and ductile iron. The cast iron cover and frame is coated with a bituminous protective compound, and the ductile iron cover and frame with a water based non toxic paint.
- Our Inspection Chamber cover and frames come in a range of diameters and load ratings. The load rating can range from 10kN to 900kN and are designated in classes. The rating of the cover and frame is not the same as the rating of the manhole lid.

Note: For the full range of access safety grilles, covers and frames please contact your local Hynds Branch or see the Hynds Streetware Catalogue on our website.

FIG. 3 Cast Iron Cover and Frame Ø540 mm rated to 80kN

FIG. 4 Ductile Iron Maestro Cover and Frame Ø600 mm rated to 400 kN

FIG. 5 Pinnacle® Inspection Chamber Flanged Base Diagram

TABLE 2 Flanged Bases

Nominal & Internal Diameter (mm)	Nominal Height (mm)	External Diameter (mm)	Internal Height (mm)	External Height (mm)	Wall Thickness (mm)	Base Thickness (mm)	Mass of Riser & Base (kg)	Swiftlift Lifting Clutch Size (Tonne)	Hynds Product Code	Standard/ MTO
600	600	689	500	650	44.5	150	440	1.3	ICF60060015M	Standard
	900		800	950			509		ICF60090015M	Standard
	1200		1100	1250			578		ICF60120015M	Standard
	1800		1700	1850			717		ICF60180015M	Standard
675	600	772	500	650	48.5	150	520	1.3	ICF67060015M	Standard
	900		800	950			604		ICF67090015M	Standard
	1200		1100	1250			689		ICF67120015M	Standard
900	600	1015	500	650	57.5	150	795	1.3	ICF90060015W	Standard
	900		800	950			928		ICF90090015W	Standard
	1200		1100	1250			1061		ICF90120015W	Standard

FIG. 6 Pinnacle® Inspection Chamber Internal Base Diagram

TABLE 3 Internal Bases

Nominal & Internal Diameter (mm)	Nominal Height (mm)	External Diameter (mm)	Internal Height (mm)	External Height (mm)	Wall Thickness (mm)	Base Thickness (mm)	Mass of Riser & Base (kg)	Swiftlift Lifting Clutch Size (Tonne)	Hynds Product Code	Standard/ MTO
600	600	689	500	665	44.5	150	272	1.3	ICI60060015M	Standard
	900		800	965			341		ICI60090015M	Standard
	1200		1100	1265			411		ICI60120015M	Standard
	1500		1400	1565			480		ICI60150015M	Standard
	1800		1700	1865			550		ICI60180015M	Standard
675	600	772	450	600	48.5	150	307	1.3	ICI67060015M	Standard
	900		750	900			391		ICI67090015M	Standard
	1200		1050	1200			476		ICI67120015M	Standard
900	600	1050	450	600	57.5	150	508	1.3	ICI90060015W	Standard
	900		750	900			641		ICI90090015W	Standard
	1200		1050	1200			774		ICI90120015W	Standard

FIG. 7 Pinnacle® Inspection Chamber Riser Diagram

TABLE 4 Standard Risers

Nominal & Internal Diameter (mm)	**Nominal Height** (mm)	**External Diameter (mm)**	**Internal Height (mm)**	**Standard Wall Thickness** (mm)	**Mass of Riser** (kg)	**Swiftlift Lifting Clutch Size (Tonne)**	**Hynds Product Code**	**Standard/ MTO**
450	600	527	600	38.5	91	No Swiftlift	ICR450600M	Standard
	900		900		138		ICR450900M	Standard
600	300	689	300	44.5	70	1.3	ICR600300M	Standard
	450		450		104		ICR600450M	Standard
	600		600		140		ICR600600M	Standard
	900		900		209		ICR600900M	Standard
	1200		1200		278		ICR601200M	Standard
	1800		1800		417		ICR601800M	Standard
675	300	772	300	48.5	85	1.3	ICR675300M	Standard
	450		450		126		ICR675450M	Standard
	600		600		170		ICR675600M	Standard
	900		900		254		ICR675900M	Standard
	1200		1200		339		ICR671200M	Standard
900	300	1015	300	57.5	132	1.3	ICR900300M	Standard
	600		600		265		ICR900600M	Standard
	900		900		398		ICR900900M	Standard
	1200		1200		531		ICR901200M	Standard

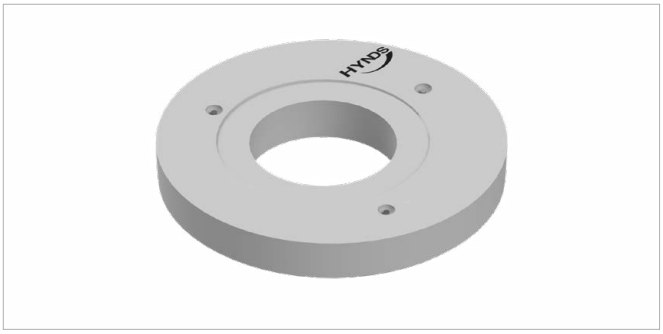

FIG. 9 Pinnacle® Inspection Chamber Concrete Lid Diagram

TABLE 6 Inspection Chamber Lids

Nominal Diameter (mm)	**Opening Type**	**Thickness (mm)**	**Loading**	**Mass of Lid** (kg)	**Swiftlift Lifting Clutch Size (Tonne)**	**Hynds Product Code**	**Standard/ MTO**
450	Closed	100	5kPa	76	1.3	ICL45100PCLW	Standard
600	Closed	100	5kPa	122	1.3	ICL60100PCLW	Standard
675	Closed	100	5kPa	149	1.3	ICL67100PCLW	Standard
900	Closed	100	5kPa	245	1.3	ICL90100PCLW	Standard
	Ø535 Hole Centre	150	5kPa	281		ICL90150LD5HCW	Standard
	Ø535 Hole Centre	200	HD60	374		ICL90200HD5HCW	Standard
	Ø605 Hole Centre	200	HD60	360		ICL90200HD6HCW	Standard

Note: *For more information about the Hynds Pinnacle Series Insepction Chamber please contact your local branch.*

Component Lifting

- Hynds precast concrete inspection chambers are delivered with lifting anchors cast into the concrete walls.
- Anchors are cast in set positions to accept a static vertical lifting force without dynamic forces.
- To avoid overstressing a particular anchor, ensure that all anchors are securely held to provide an even vertical load passing through each point.
- Use a lifting beam or spreader bar to avoid damage to the riser.

All Hynds Inspection Chambers incorporate Swiftlift lifting anchors for safe lifting and must be used with the correct lifting clutch.

Hynds Pipe Systems has designed and manufactured Hynds Inspection Chambers with a minimum dynamic factor of 1.2. This dynamic factor requires that all the following conditions are observed when lifting, moving or placing the chambers:

1. Lifting with mobile plant *(such as an excavator or similar)* where equipment is specifically exempt from the requirements of the PECPR Regulations 1999, subject to the conditions outlined in the New Zealand Gazette, No. 104, September 2015 and
2. Lifting, travelling and placing over rough or uneven ground where anchor failure is not anticipated to cause harm or injury, by adopting procedures such as:
   d. Transporting the element as close as practical to ground level (300mm recommended)
   e. Establishing and maintaining exclusion zones
   f. Transporting only precast concrete elements that are unlikely to topple if they were to hit the ground
   g. Inspecting lifting anchors both after transportation and before final lifting into place

Refer to "Safe work with precast concrete - Handling, transportation and erection of precast concrete elements" published by Worksafe New Zealand (October 2018)

Shock loads resulting from travelling with suspended inspection chambers over rough terrain and uneven ground may exceed design, dynamic and safety factors of the lifting systems. It is essential that care is taken during lifting and transporting as additional stresses could result in anchor failure.

Installation Guidelines

Hynds precast inspection chamber are installed using modern excavation equipment and techniques. Inspection chambers are generally installed prior to connecting the pipelines.

- The inspection chamber foundation should be prepared with compacted hardfill to prevent excessive settlement.
- Consider site specific health and safety requirements (check flanged/internal base units do not contain water or any other items which may increase the weight of the unit).
- Lower flange base unit into final installed location.
- Core penetrations as required for connections.
- Place appropriate joint sealing compound around the joint circumference (collar end).
- Place the next riser section and make and seal pipeline connections.
- Bench invert as required.
- Place and seal the inspection chamber lid.
- Place and mortar seal the lid adjustment rings to required level.
- Position cast iron frame and cover.

Branches Nationwide *Support Office & Technical Services 0800 93 7473*