Hynds Inspection Chamber

Technical Guide D4.4

The Hynds Inspection Chamber consists of precast concrete and iron components manufactured to offer a durable, high performance system with a range of design options available.

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 off the shelf at branches throughout NZ
- Standard and TW strength options available

Approvals/Standards

- Manufactured to AS/NZS 4058, Precast Concrete Pipes
- NZS 3109, Concrete Construction

Quality

- ISO 9001:2015 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 Hynds Inspection Chamber consists of precast concrete and iron components manufactured to offer a durable, high performance system with a range of design options available.

Design Requirements

- Manholes are positioned for multiple connection sites, changes of gradient (drop manholes) or direction and location for access into a pipeline.
- When designing a Hynds manhole 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 manhole 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 conditions are available, the following factors can be used as a guide:
  - 600 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 risers

- Hynds Inspection Chamber risers are manufactured using high strength concrete and fabricated circular steel reinforcement to achieve a "standard" strength inspection chamber suitable for standard installations.
- The chamber includes nominal internal riser diameters from 600 to 900 mm.
- Refer to Table 3 for a range of standard sizes.

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.

Connections

- Pipe connections fitted into the riser wall are made onsite using striking or cutting tools.
- All Hynds Inspection Chamber risers are reinforced with fabricated steel cages which require removal with bolt cutters only after all holes are punched out.
- Entry and exit punch outs can be made wherever and to whatever size required, just before installation.
- Working from outside the flanged base, punch the smallest hole diameter possible *(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 manhole riser wall.
- Inspection chambers installed in regions prone to settlement should be fitted with pipe shorts prior to installing the connected pipeline.

FIG. 1 Manhole Connectors

TABLE 1 Manhole 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 Connectors please refer to our DR09 product datasheet or contact your local branch.*

Inspection Chamber Lids

- Hynds manufacture a large range of precast inspection chamber lids to suit all common council requirements.
- Standard strength 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.

Inspection Chambers Covers & Frames

- Standard covers and frames are manufactured from strong and durable cast iron, coated with a bituminous protective compound.
- Options include light-duty for non-vehicular use, heavy-duty for light traffic, and heavy non-rock type for carriageways.

Testing

- The pressure testing of installed Inspection Chamber components is normally required for foul sewers only.
- This test typically follows the requirements set out in NZS 4452, with water tests being the only accurate way to determine leakage rates.

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.
- Refer to Table 2 for lifting anchor options.

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:
   a. Transporting the element as close as practical to ground level (300mm recommended)
   b. Establishing and maintaining exclusion zones
   c. Transporting only precast concrete elements that are unlikely to topple if they were to hit the ground
   d. Inspecting lifting anchors both after transportation and before final lifting into place
3. Hynds uses both Reids and Ancon lifting anchors which are both designed to *(Haeussler)* specifications and as such are compatible with Reid, Deha or Ancon anchors, clutches, and recess formers of the same load range.

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).
- Prepare punch outs (see Connections section) and lower flange base unit into place.
- 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.

Joint Sealing

- Hynds Inspection Chambers allow sealing at the riser joints and the lid/riser joint.
- Sealing occurs between the female collar and male spigot end.
- Sealing compounds are available from Hynds Sales Branches for even application between the mating surfaces.
- Options include: two pot epoxy, preformed butyl mastic sealing strips and flexible adhesive sealant.

FIG. 2 Manhole riser and lid

TABLE 2 Inspection Chamber Range

Specifications	**Nominal Internal Diameter** (mm)	
	600	**900**
Internal Diameter (mm)	610	914
External Diameter (mm)	699	1029
Standard Wall Thickness (mm)	44.5	57.5
(*) Lifting Anchor Load Group	1.3	1.3

Note: *(*) The load group specifies the maximum lifting capacity or Working Load Limit (WLL) of the lifting clutch expressed in tonnes.*
For additional information please refer to Reid Concrete Lifting Systems Design Guide.

TABLE 3 Standard Riser Mass in Kg

Nominal Riser Height (mm)	**Nominal Internal Diameter** (mm)	
	600	**900**
300	71	137
600	142	273
900	213	409
1200	284	547
1500	355	684
1800	426	819
2100	497	-
2400	569	1092

Note: *Please refer to our D4.1 Hynds Manhole System product sheet for larger diameter risers.*