Hyspec Manhole System

(South Island only)

Technical Guide D4.1

The Hyspec Manhole System consists of precast concrete and iron components designed to offer proven manhole performance giving the installer flexibility onsite.

Applications

- Stormwater manholes
- Drop manholes
- Pipeline junctions
- Pipeline direction changes
- Catchment inlet structures
- Off-take risers
- Caisson chambers

Product Attributes

- Proven performance
- Different wall thicknesses available
- Lid and cover options to suit various load requirements

Approvals/Standards

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

Sustainability

- Available in Hynds LC® low carbon concrete
- Verifiable carbon footprint data available
- Customisable for climate-resilient infrastructure

Quality/Environment/Health & Safety

ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018

The Hyspec Manhole System consists of precast concrete and iron components designed to offer proven manhole performance giving the installer flexibility onsite.

Understanding our range

Our range is now organised to reflect what products are part of our everyday range & what products require specific design and manufacture.

Standard Range

Our Standard Range products cover majority of the everyday applications and are generally stocked.

MTO (made to order)

Our MTO products are made specifically for the customer's order and will not be held in stock.

Custom

Our Custom Range products are designed and manufactured specifically for a one-off application. Customers will be required to check drawings before manufacturing can commence.

Introduction

The system includes a range of manhole diameters and riser heights, various concrete lid options, ductile and cast iron access covers, step types, galvanised landing platforms, joint sealants, clamps and manhole base options. Flanged base and riser sections are steel reinforced so there is no need for preformed holes or knockouts – making alignment very easy and flexible. Entry and exit cut outs can be made wherever and to whatever size required, just before installation.

Manufacture

The Hyspec® Manhole System is manufactured using the spun and wetcast method. Manhole risers 1050 – 1800mm diameter are manufactured using the centrifugal spinning method and flanged bases are wet cast in high specification steel moulds. Manholes risers larger than 1800mm diameter are typically wetcast. High strength concrete and increased cover to reinforcing steel are used for enhanced durability. Manholes are cured inside steel moulds in controlled conditions. This eliminates relaxation stresses within the uncured manholes and ensures the integrity and durability of the manhole structure.

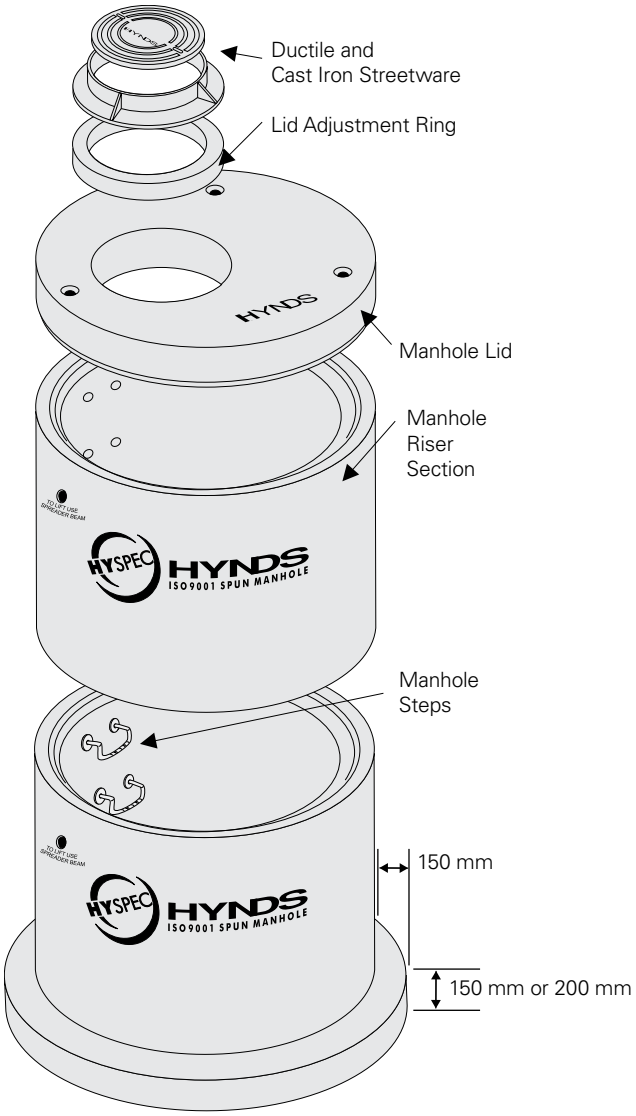


FIG. 1 Schematic elevation of Hynds Manhole System.

Design Specifications & Requirements

When designing a Hyspec® Manhole System consideration should be given to the diameter, height, riser and lid strengths, connections, installation and accessory options. The Local Council Authority should be contacted to determine regional requirements for manhole construction. If no conditions are available, then the following factors may be used (as a guide only):

- Minimum manhole diameter of 1050 mm.
- Single entry/single exit manholes typically have a diameter 1.6–2.0 times the diameter of the larger pipe connecting into it. See Connections for more information on manhole penetrations.

Manhole Lid

Hyspec® Manhole Lids are designed and manufactured in accordance with NZS 3109, Concrete Construction and the NZ Bridge Design Manual. Hynds manufacture a wide range of precast concrete manhole lids to suit manholes from 1050 mm Ø to 3200 mm Ø that are designed for the following specific load ratings:

5kN	Pedestrian (1050 Ø only)
LD20	Lightly Trafficked Areas
HD60	Roads where specific bridge rating design is not required
HN-HO-72	Bridge Manual loading. Majority of residential and secondary roads.

The lids vary in thickness from 100 mm to 225 mm depending on the manhole size and load rating. All lids are clearly marked with their item code which will designate their design loading.

Depending on the local authority requirements, your local Hynds Pipe Systems branch should have the common sizes with the standard lid openings of 535 mm Ø and 605 mm Ø available ex stock. For these lid opening sizes, the distance from the inside wall of a standard Manhole Riser to the lid opening edge is approximately 100 mm.

Custom design manhole lids, and lids with cast–in covers, grates and frames are also available to order.

Note: *Refer to Table 1 for a full list of Manhole Lids*

Manhole Riser

Hyspec® Manhole Risers are manufactured to AS/NZS 4058 using high strength concrete and fabricated circular steel reinforcement to achieve a "Standard" strength manhole suitable for most installations. For manholes with high axial load requirements, or where extra wall thickness is required for durability purposes, a thicker wall option is available.

Thick walled risers will have a 25 mm internal sacrificial layer to provide the thicker wall and will include a standard 200 mm thick base to accommodate for the load of the thicker wall. Where a manhole is subjected to high horizontal loads on one side, such as those arising from extreme wheel loads, a higher strength manhole may be required.

For more details on loads for precast concrete manhole chambers, download the "Guidance Note for loads on Circular Precast Concrete Manholes and Access Chambers" from the Concrete Pipe Association of Australasia's website.

Note: *For a full list of Hyspec® Manhole Risers see Table 2.*

Manhole Base

Hynds Pipe Systems manufacture riser sections cast into flanged bases to form a single precast unit, these bases are manufactured to NZS 3109. Standard flanged bases usually rely on site benching to ensure watertightness between the riser section and the flanged/internal base.

Where watertightness is critical such as deep manholes, sewer manholes and sewer pump stations, special flanged/internal bases incorporating a hydrophilic waterstop are available on request.

Note: *Refer to D4.2 Hyseal Sealed Manhole System Technical Guide for further details.*

1050mm diameter risers are available with monolithic bases (riser and base cast as a one-piece unit) in the South Island. This type of base construction ensure watertightness between the riser and flanged base therefore there is no need for additional hydrophilic waterstops. These flanged bases are only available in 1050mm diameter and in heights 600, 900 and 1200mm.

Note: *For a full list of flanged and bases see Table 3 and 4.*

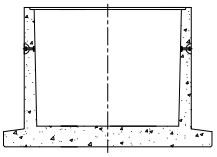


FIG. 2 Drawing of the base

Manhole Steps

Manhole steps for the Hyspec® Manhole System can be used for accessing the manhole system. These steps are set at 300 mm intervals within the riser sections, with the first step placed 150 mm down from the top of the riser.

Hyspec® Manhole Risers use the standard galvanised and stainless steel steps. The galvanised step is used for typical Stormwater and can be used in some Wastewater applications. The stainless steel step is used for typical Wastewater applications and other aggressive environments. These steps are installed through preformed holes through the riser wall and the nuts tightened from the

outside to compress rubber pads between washers.

TABLE 1 Manhole Step Codes to fit Hyspec® risers

Nominal Internal Diameter	Galv. bolt through step	Stainless steel bolt through step
1050	STEPGS	STEPSS
1200	STEPGS	STEPSS
1400	STEPGS	STEPSS
1500	STEPGS	STEPSS
1800	STEPGS	STEPSS
2050	STEPGS	STEPSS
2300	STEPGSL	STEPSSL
2550	STEPGSL	STEPSSL
3000	STEPGSL	STEPSSL
3200	STEPGSL	STEPSSL

Manhole Scruffy Domes, Grills and Landing Platforms

Fixed galvanised steel ladders complete with lift-up sections

are available for pump stations or manhole off-takes. Hynds galvanised landing platforms are designed for bolting to the internal riser wall and are recommended for positioning every 3 – 5 metres of depth (depending upon service procedures and fall arrest requirements). Hynds galvanised grills and scruffy domes are designed for bolting on top of the riser to prevent unauthorised entry.

Manhole Covers and Frames

Standard manhole 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. Types include LD (Light Duty) for pedestrian and domestic vehicle use, HD (Heavy Duty) for light commercial up to 7 Tonne wheel load, Extra Heavy Duty for Industrial and Carriageway use.

Note: *For the full range of access safety grilles, covers and frames please contact your local Hynds Branch.*

FIG. 4 Light Duty Cast Iron Manhole Cover and Frame 540 mm

FIG. 5 Heavy Duty Ductile Iron Maestro 600 mm Class D 400 kN

Connections

Pipe connections fitted into the riser wall are made onsite using striking or cutting tools. All Hynds Manhole Risers are reinforced with fabricated steel cages which require removal with bolt cutters only after all holes are cut out.

Working from outside the flanged base, punch the smallest possible hole diameter *(pipe O.D. + 50 mm*).

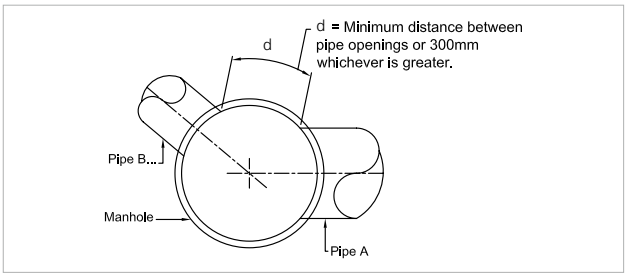


FIG. 3 Manhole/Pipe selection and minimum distance between pipes

1. Manhole and pipe selection
   - Maximum opening or pipe O.D. = 0.65 x MH I.D.
2. Minimum distance between pipes *(d)*
   - When equal sized pipes:
     - 300 mm or d = 0.75 x pipe O.D. (whichever is greater)
     - Example:
       Ø1050 pipe O.D.= 1218 mm;
       d = 0.75 x 1218 mm = 914 mm
     - Therefore the required minimum distance in the horizontal plane between pipes is the max between 914 mm and 300 mm; i.e. 914 mm.
   - When un–equal sized pipes:
     - 300 mm or d = 0.65 x largest pipe O.D. (whichever is greater)

- Example:
  Ø675 pipe O.D.= 779 mm and Ø1050 pipe O.D.= 1218 mm; d = 0.65 x 1218 mm = 792 mm
- Therefore the required minimum distance in the horizontal plane between pipes is the max between 792 mm and 300 mm; i.e. 792 mm.

FIG. 6 Manhole Connectors

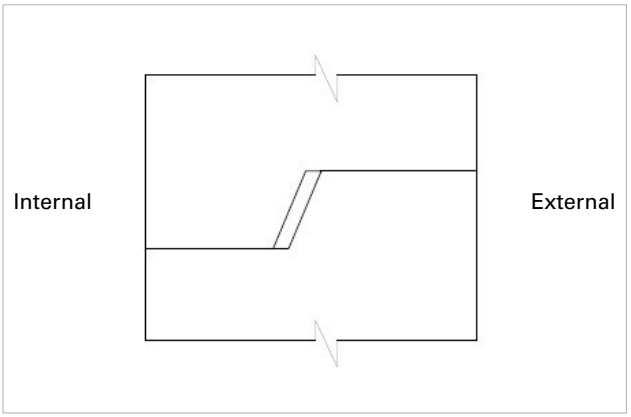
For connection of rigid pipe materials (vitrified clay and spun concrete) epoxy or cement mortar should be used.

For connection of PVC pipe materials, Hynds Pipe Systems supply purpose made manhole connectors in 100 mm 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 then held together with a patented heat shrink process to ensure that the connectors cannot come apart when being installed. The clay pipe short is epoxied to the concrete manhole riser wall.

Manhole structures installed in regions prone to settlement should be fitted with pipe shorts prior to installing the connected pipeline. Manhole shorts are not recommended for pipes above 675 mm internal diameter.

Joint Profile

Hyspec® manholes risers and lids are manufactured with the Mastic/ Epoxy Mortar Joint.



Concrete manhole risers and lids can be joined using the standard mastic sealant or using epoxy mortar. This joint has been proven and used for Gravity Stormwater and Gravity Wastewater applications. Sealing compounds are available from Hynds Pipe Systems Branches for even application between the mating surfaces.

1. 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.
2. Black Butyl Mastic Manhole Sealant – Hynds *(MSR)*. This has 'memory' and provides a more flexible 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.
3. 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 off-takes.

As an extra assistance in preventing water infiltration a barrier material such as Aquawrap can be used to cover the external part of the joint. Refer to D10.16 Aquawrap Technical Guide.

Testing

The pressure testing of installed manhole 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.

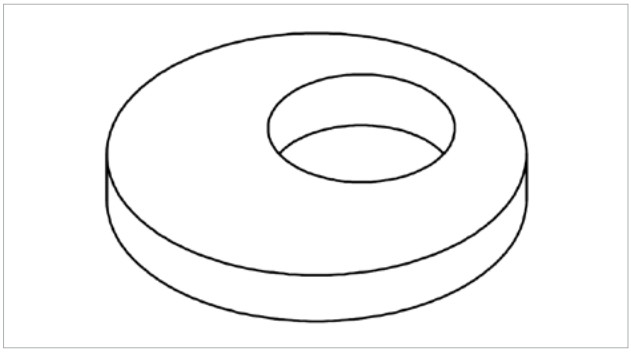


TABLE 2 **Hyspec® Concrete Lid Geometry**

Lid Diameter (mm)	**Opening Type**	**Thickness** (mm)	**Loading**	**Lifting Clutch Size (Tonne)**	**Weight of Lid** (kg)	**Hynds Product Code**	**Standard/ MTO**
WETCAST							
1050	Ø535 Hole Offset	100	5kPa	1.3	227	LD10100P5	MTO
	Ø535 Hole Offset	150	HD60	1.3	345	LD10150HD5	Standard
	Ø535 Hole Offset	200	HN-HO-72	1.3	454	LD10200HN5	Standard
	Ø600 Hole Offset	100	5kPa	1.3	210	LD10100P6	MTO
	Ø600 Hole Offset	150	HD60	1.3	323	LD10150HD6	Standard
	Ø600 Hole Offset	200	HN-HO-72	1.3	423	LD10200HN6	Standard
	Ø535 Hole Centre	100	5kPa	1.3	227	LD10100P5HC	MTO
	Ø535 Hole Centre	150	HD60	1.3	345	LD10150HD5HC	MTO
	Ø535 Hole Centre	200	HN-HO-72	1.3	454	LD10200HN5HC	MTO
	Ø600 Hole Centre	100	5kPa	1.3	210	LD10100P6HC	MTO
	Ø600 Hole Centre	150	HD60	1.3	323	LD10150HD6HC	MTO
	Ø600 Hole Centre	200	HN-HO-72	1.3	423	LD10200HN6HC	MTO
	Closed	100	5kPa	1.3	285	LD10100PCL	MTO
	Closed	150	HD60	1.3	424	LD10150HDCL	MTO
	Closed	200	HN-HO-72	1.3	566	LD10200HNCL	MTO
1200	Ø535 Hole Offset	150	HD60	1.3	462	LD12150HD5	Standard
	Ø535 Hole Offset	200	HN-HO-72	1.3	609	LD12200HN5	Standard
	Ø600 Hole Offset	150	HD60	1.3	439	LD12150HD6	Standard
	Ø600 Hole Offset	200	HN-HO-72	1.3	579	LD12200HN6	Standard
	Ø535 Hole Centre	150	HD60	1.3	462	LD12150HD5HC	MTO
	Ø535 Hole Centre	200	HN-HO-72	1.3	609	LD12200HN5HC	MTO
	Ø600 Hole Centre	150	HD60	1.3	439	LD12150HD6HC	MTO
	Ø600 Hole Centre	200	HN-HO-72	1.3	589	LD12200HN6HC	MTO
	Closed	150	HD60	1.3	546	LD12150HDCL	MTO
	Closed	200	HN-HO-72	1.3	720	LD12200HNCL	MTO
1400	Ø535 Hole Offset	150	HD60	1.3	614	LD14150HD5	Standard
	Ø535 Hole Offset	200	HN-HO-72	1.3	809	LD14200HN5	Standard
	Ø600 Hole Offset	150	HD60	1.3	591	LD14150HD6	Standard
	Ø600 Hole Offset	200	HN-HO-72	1.3	779	LD14200HN6	Standard
	Ø535 Hole Centre	200	HN-HO-72	1.3	809	LD14200HN5HC	MTO
	Ø600 Hole Centre	200	HN-HO-72	1.3	779	LD14200HN6HC	MTO
	Closed	200	HN-HO-72	1.3	921	LD14200HNCL	MTO

TABLE 2 **Hyspec® Concrete Lid Geometry**

Lid Diameter (mm)	**Opening Type**	**Thickness** (mm)	**Loading**	**Lifting Clutch Size (Tonne)**	**Weight of Lid** (kg)	**Hynds Product Code**	**Standard/ MTO**
1500	Ø535 Hole Offset	150	HD60	1.3	763	LD15150HD5	Standard
	Ø535 Hole Offset	200	HN-HO-72	1.3	1000	LD15200HN5	Standard
	Ø600 Hole Offset	150	HD60	1.3	740	LD15150HD6	Standard
	Ø600 Hole Offset	200	HN-HO-72	1.3	976	LD15200HN6	Standard
	Ø535 Hole Centre	200	HN-HO-72	1.3	1000	LD15200HN5HC	MTO
	Ø600 Hole Centre	200	HN-HO-72	1.3	976	LD15200HN6HC	MTO
	Closed	200	HN-HO-72	1.3	1112	LD15200HNCL	MTO
1800	Ø600 Hole Offset	150	HD60	1.3	1110	LD18150HD6	Standard
	Ø600 Hole Offset	200	HN-HO-72	1.3	1462	LD18200HN6	Closed
	Ø710 Hole Offset	200	HN-HO-72	1.3	1406	LD18200HN7	MTO
	Ø600 Hole Centre	200	HN-HO-72	1.3	1462	LD18200HN6HC	MTO
	Closed	200	HN-HO-72	1.3	1604	LD18200HNCL	MTO
2050	Ø600 Hole Offset	225	HN-HO-72	1.3	2071	LD20225HN6	Standard
	Ø600 Hole Offset	200	HD60	1.3	1829	LD20200HD6	MTO
	Ø710 Hole Offset	225	HN-HO-72	1.3	2008	LD20225HN7	MTO
	Ø600 Hole Centre	225	HN-HO-72	1.3	2071	LD20225HN6HC	MTO
	Closed	225	HN-HO-72	1.3	2230	LD20225HNCL	MTO
2300	Ø600 Hole Offset	225	HN-HO-72	1.3	2820	LD23225HN6	Standard
	Ø600 Hole Offset	200	HD60	1.3	2495	LD23200HD6	MTO
	Ø710 Hole Offset	225	HN-HO-72	1.3	2754	LD23225HN7	MTO
	Ø600 Hole Centre	225	HN-HO-72	1.3	2820	LD23225HN6HC	MTO
	Closed	225	HN-HO-72	1.3	2976	LD23225HNCL	MTO
2550	Ø600 Hole Offset	225	HN-HO-72	1.3	3480	LD25225HN6	Standard
	Ø600 Hole Offset	200	HD60	1.3	3069	LD25200HD6	MTO
	Ø710 Hole Offset	225	HN-HO-72	1.3	3430	LD25225HN7	MTO
	Ø600 Hole Centre	225	HN-HO-72	1.3	3480	LD25225HN6HC	MTO
	Closed	225	HN-HO-72	1.3	3636	LD25225HNCL	MTO
3000	Ø600 Hole Offset	225	HN-HO-72	2.5	4770	LD30225HN6	Standard
	Ø600 Hole Offset	200	HD60	2.5	4220	LD30200HD6	MTO
	Ø710 Hole Offset	225	HN-HO-72	2.5	4704	LD30225HN7	MTO
	Ø600 Hole Centre	225	HN-HO-72	2.5	4770	LD30225HN6HC	MTO
	Closed	225	HN-HO-72	2.5	4926	LD30225HNCL	MTO
3200	Ø600 Hole Offset	225	HN-HO-72	2.5	5426	LD32225HN6	Standard
	Ø600 Hole Offset	200	HD60	2.5	4836	LD32200HD6	MTO
	Ø710 Hole Offset	225	HN-HO-72	2.5	5363	LD32225HN7	MTO
	Ø600 Hole Centre	225	HN-HO-72	2.5	5426	LD32225HN6HC	MTO
	Closed	225	HN-HO-72	2.5	5585	LD32225HNCL	MTO

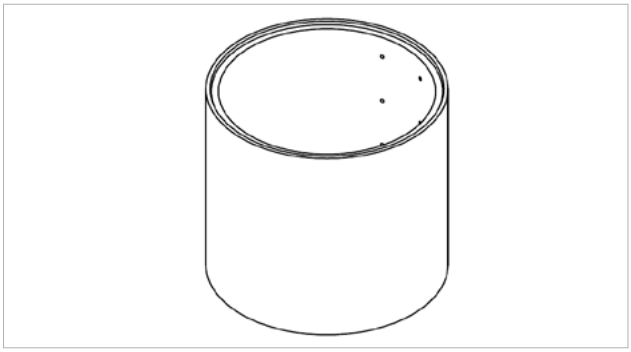


TABLE 3 **Hyspec® Riser Geometry**

Nominal Diameter (mm)	**Nominal Height** (mm)	**Internal Diameter** (mm)	**External Diameter** (mm)	**Internal Height** (mm)	**Standard Wall Thickness** (mm)	**Lifting Clutch Size** (tonne)	**Weight of Riser** (kg)	**Hynds Product Code**	**Standard/ MTO**
SPUN									
1050	150	1066	1194	150	64	1.3	88	R10500150	Standard
	300	1066	1194	300	64	1.3	176	R10500300	Standard
	450	1066	1194	450	64	1.3	261	R10500450	Standard
	600	1066	1194	600	64	1.3	349	R10500600	Standard
	900	1066	1194	900	64	1.3	525	R10500900	Standard
	1200	1066	1194	1200	64	1.3	700	R10501200	Standard
	1500	1066	1194	1500	64	1.3	874	R10501500	Standard
	1800	1066	1194	1800	64	1.3	1050	R10501800	Standard
	2100	1066	1194	2100	64	1.3	1225	R10502100	Standard
	2400	1066	1194	2400	64	1.3	1399	*R10502400	Standard
1200	300	1207	1347	300	70	2.5	218	R12000300	Standard
	450	1207	1347	450	70	2.5	327	R12000450	Standard
	600	1207	1347	600	70	2.5	436	R12000600	Standard
	900	1207	1347	900	70	2.5	654	R12000900	Standard
	1200	1207	1347	1200	70	2.5	872	R12001200	Standard
	1500	1207	1347	1500	70	2.5	1091	R12001500	Standard
	1800	1207	1347	1800	70	2.5	1309	R12001800	Standard
	2100	1207	1347	2100	70	2.5	1527	R12002100	Standard
	2400	1207	1347	2400	70	2.5	1745	R12002400	Standard
1400	300	1372	1524	300	76	2.5	270	R14000300	Standard
	450	1372	1524	450	76	2.5	405	R14000450	Standard
	600	1372	1524	600	76	2.5	540	R14000600	Standard
	900	1372	1524	900	76	2.5	810	R14000900	Standard
	1200	1372	1524	1200	76	2.5	1080	R14001200	Standard
	1500	1372	1524	1500	76	2.5	1350	R14001500	Standard
	1800	1372	1524	1800	76	2.5	1620	R14001800	Standard
	2100	1372	1524	2100	76	2.5	1890	R14002100	Standard
	2400	1372	1524	2400	76	2.5	2160	R14002400	Standard
1500	300	1524	1677	300	77	2.5	303	R15000300	Standard
	450	1524	1677	450	77	2.5	454	R15000450	Standard
	600	1524	1677	600	77	2.5	604	R15000600	Standard
	900	1524	1677	900	77	2.5	909	R15000900	Standard
	1200	1524	1677	1200	77	2.5	1212	R15001200	Standard
	1500	1524	1677	1500	77	2.5	1515	R15001500	Standard
	1800	1524	1677	1800	77	2.5	1818	R15001800	Standard
	2100	1524	1677	2100	77	2.5	2121	R15002100	Standard
	2400	1524	1677	2400	77	2.5	2121	R15002400	Standard

TABLE 3 **Hyspec® Riser Geometry**

Nominal Diameter (mm)	**Nominal Height** (mm)	**Internal Diameter** (mm)	**External Diameter** (mm)	**Internal Height** (mm)	**Standard Wall Thickness** (mm)	**Lifting Clutch Size** (tonne)	**Weight of Riser** (kg)	**Hynds Product Code**	**Standard/ MTO**
1800	300	1829	2007	300	89	5	418	R18000300	Standard
	450	1829	2007	450	89	5	628	R18000450	Standard
	600	1829	2007	600	89	5	837	R18000600	Standard
	900	1829	2007	900	89	5	1255	R18000900	Standard
	1200	1829	2007	1200	89	5	1673	R18001200	Standard
	1500	1829	2007	1500	89	5	2092	R18001500	Standard
	1800	1829	2007	1800	89	5	2510	R18001800	Standard
	2100	1829	2007	2100	89	5	3003	R18002100	Standard
	2400	1829	2007	2400	89	5	3427	R18002400	Standard
2050	300	2032	2236	300	102	5	522	R20500300	MTO
	450	2032	2236	450	102	5	785	R20500450	MTO
	600	2032	2236	600	102	5	1047	R20500600	MTO
	900	2032	2236	900	102	5	1569	R20500900	MTO
	1200	2032	2236	1200	102	5	2091	R20501200	MTO
	1500	2032	2236	1500	102	5	2616	R20501500	MTO
	1800	2032	2236	1800	102	5	3139	R20501800	MTO
	2100	2032	2236	2100	102	5	3661	R20502100	MTO
	2400	2032	2236	2400	102	5	4186	R20502400	MTO
2300	500	2300	2580	500	140	10	1368	R23000.5	MTO
	700	2300	2580	700	140	10	1915	R23000.7	MTO
	1200	2300	2580	1200	140	10	3284	R23001.2	MTO
	1900	2300	2580	1900	140	10	5199	R23001.9	MTO
	2400	2300	2580	2400	140	10	6567	R23002.4	MTO
2550	400	2550	2850	400	150	10	1296	R25500.4	MTO
	500	2550	2850	500	150	10	1620	R25500.5	MTO
	900	2550	2850	900	150	10	2916	R25500.9	MTO
	1500	2550	2850	1500	150	10	4859	R25501.5	MTO
	1900	2550	2850	1900	150	10	6155	R25501.9	MTO
	2000	2550	2850	2000	150	10	6479	R25502.0	MTO
	2400	2550	2850	2400	150	10	7775	R25502.4	MTO
3000 (NI)	600	3008	3308	600	150	10	2300	R30000.6NI	MTO
	900	3008	3308	900	150	10	3450	R30000.9NI	MTO
	1500	3008	3308	1500	150	10	5750	R30001.5NI	MTO
	1800	3008	3308	1800	150	10	6900	R30001.8NI	MTO
	2400	3008	3308	2400	150	10	9018	R30002.4NI	MTO
3000 (SI)	1000	3008	3308	1000	150	10	3832	R30001.0	MTO
3200	1000	3200	3520	1000	160	10	4339	R32001.0	MTO

Notes:

- *Thick wall and Extra thick wall versions may be available, please contact your nearest Hynds Pipe Systems Branch.*
- *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 Safe Lifting & Propping of Precast/ Tiltup Concrete Panels & Precast Guide.*
- *Standard 1050 x 2400 Risers in the South Island have 2.5tonne lifting anchors.*
- *NI – only available in North Island*
- *SI – only available in South Island*

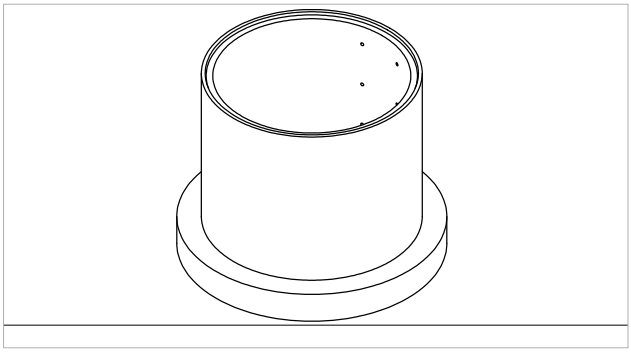


TABLE 4 **Hyspec® Flange Base Geometry**

Nominal Diameter (mm)	**Nominal Height** (mm)	**Internal Diameter** (mm)	**External Diameter** (mm)	**Internal Height** (mm)	**External Height** (mm)	**Wall Thick-ness** (mm)	**Base Thick-ness** (mm)	**Lifting Clutch Size** (Tonne)	**Weight of FB & Riser** (kg)	**Hynds Product Code**	**Standard/ MTO**
SPUN + WETCAST											
1050	600	1066	1186	500	650	64	150	1.3	1020	FB10500600	Standard
	600	1066	1210	544	709	72	150	2.5	1050	*FB10500600PC	Standard
	900	1066	1186	800	950	64	150	1.3	1197	FB10500900	Standard
	900	1066	1210	844	1009	72	150	2.5	1300	*FB10500900PC	Standard
	1200	1066	1186	1100	1250	64	150	1.3	1373	FB10501200	Standard
	1200	1066	1210	1144	1309	72	150	2.5	1500	*FB10501200PC	Standard
	1500	1066	1186	1400	1550	64	150	1.3	1545	FB10501500	Standard
	1800	1066	1186	1700	1850	64	150	1.3	1720	FB10501800	Standard
	2100	1066	1186	2000	2150	64	150	1.3	1896	FB10502100	Standard
	2400	1066	1186	2300	2450	64	150	1.3	2070	*FB10502400	Standard
1200	600	1207	1347	500	650	70	150	2.5	1251	FB12000600	Standard
	900	1207	1347	800	950	70	150	2.5	1469	FB12000900	Standard
	1200	1207	1347	1100	1250	70	150	2.5	1687	FB12001200	Standard
	1500	1207	1347	1400	1550	70	150	2.5	1906	FB12001500	Standard
	1800	1207	1347	1700	1850	70	150	2.5	2124	FB12001800	Standard
	2100	1207	1347	2000	2150	70	150	2.5	2342	FB12002100	Standard
	2400	1207	1347	2300	2450	70	150	2.5	2560	FB12002400	Standard
1400	600	1372	1524	500	650	76	150	2.5	1530	FB14000600	Standard
	900	1372	1524	800	950	76	150	2.5	1800	FB14000900	Standard
	1200	1372	1524	1100	1250	76	150	2.5	2070	FB14001200	Standard
	1500	1372	1524	1400	1550	76	150	2.5	2340	FB14001500	Standard
	1800	1372	1524	1700	1850	76	150	2.5	2610	FB14001800	Standard
	2100	1372	1524	2000	2150	76	150	2.5	2880	FB14002100	Standard
	2400	1372	1524	2300	2450	76	150	2.5	3150	FB14002400	Standard
1500	600	1524	1677	500	650	77	150	2.5	1763	FB15000600	Standard
	900	1524	1677	800	950	77	150	2.5	2066	FB15000900	Standard
	1200	1524	1677	1100	1250	77	150	2.5	2369	FB15001200	Standard
	1500	1524	1677	1400	1550	77	150	2.5	2672	FB15001500	Standard
	1800	1524	1677	1700	1850	77	150	2.5	2975	FB15001800	Standard
	2100	1524	1677	2000	2150	77	150	2.5	3278	FB15002100	Standard
	2400	1524	1677	2300	2450	77	150	2.5	3581	FB15002400	Standard

TABLE 4 **Hyspec® Flange Base Geometry**

Nominal Diameter (mm)	Nominal Height (mm)	Internal Diameter (mm)	External Diameter (mm)	Internal Height (mm)	External Height (mm)	Wall Thick-ness (mm)	Base Thick-ness (mm)	Lifting Clutch Size (Tonne)	Weight of FB & Riser (kg)	Hynds Product Code	Standard/ MTO
1800	600	1829	2007	500	650	89	150	5	2439	FB18000600	Standard
	900	1829	2007	800	950	89	150	5	2868	FB18000900	Standard
	1200	1829	2007	1100	1250	89	150	5	3297	FB18001200	Standard
	1500	1829	2007	1400	1550	89	150	5	3726	FB18001500	Standard
	1800	1829	2007	1700	1850	89	150	5	4155	FB18001800	Standard
	2100	1829	2007	2000	2150	89	150	5	4584	FB18002100	Standard
	2400	1829	2007	2300	2450	89	150	5	5008	FB18002400	Standard
2050	600	2032	2236	450	650	102	200	5	2985	FB20000600	MTO
	900	2032	2236	750	950	102	200	5	3507	FB20000900	MTO
	1200	2032	2236	1050	1250	102	200	5	4029	FB20001200	MTO
	1500	2032	2236	1350	1550	102	200	5	4554	FB20001500	MTO
	1800	2032	2236	1650	1850	102	200	5	5077	FB20001800	MTO
	2100	2032	2236	1950	2150	102	200	5	5599	FB20002100	MTO
	2400	2032	2236	2250	2450	102	200	5	6124	FB20002400	MTO
2300	500	2300	2580	350	550	140	200	10	4718	FB23000.5200	MTO
	700	2300	2580	550	750	140	200	10	5265	FB23000.7200	MTO
	1200	2300	2580	1050	1250	140	200	10	8002	FB23001.2200	MTO
	1900	2300	2580	1750	1950	140	200	10	8549	FB23001.9200	MTO
	2400	2300	2580	2250	2450	140	200	10	9917	FB23002.4200	MTO
2550	400	2550	2850	250	450	150	200	10	5345	FB25500.4200	MTO
	500	2550	2850	350	550	150	200	10	5671	FB25500.5200	MTO
	900	2550	2850	750	950	150	200	10	5965	FB25500.9200	MTO
	1500	2550	2850	1350	1550	150	200	10	8908	FB25501.5200	MTO
	1900	2550	2850	1750	1950	150	200	10	10204	FB25501.9200	MTO
	2000	2550	2850	1850	2050	150	200	10	10528	FB25502.0200	MTO
	2400	2550	2850	2250	2450	150	200	10	11824	FB25502.4200	MTO
3000 (NI)	600	3008	3308	450	650	150	200	10	6319	FB30000600NI	MTO
	900	3008	3308	750	950	150	200	10	8856	FB30000.9200NI	MTO
	1500	3008	3308	1350	1550	150	200	10	11156	FB30001.5200NI	MTO
	1800	3008	3308	1650	1850	150	200	10	12306	FB30001.8200NI	MTO
	2400	3008	3308	2250	2450	150	200	10	14603	FB30002.4200NI	MTO
3000 (SI)	1000	3008	3308	850	1050	150	200	10	9112	FB30001000.200	MTO
3200 (NI)	1000	3200	3520	850	1050	160	200	10	10270	FN32001000.200	MTO

Notes:

- *Thick wall and Extra thick wall versions may be available, please contact your nearest Hynds Pipe Systems Branch.*
- *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 Safe Lifting & Propping of Precast/ Tiltup Concrete Panels & Precast Guide.*
- *Standard 1050 x 2400 Flanged bases in the North Island have 2.5 tonne lifting anchors.*
- *NI – only available in North Island*
- *SI – only available in South Island*

Lifting & Handling

Hynds manufacture concrete manholes in convenient lengths to allow efficient delivery and off-loading on site.

Appropriate lifting equipment and methods must be used to ensure that individual anchors are not overloaded.

Note: Lifting anchors are designed for lifting the riser, flanged base and lid using an excavator arm or similar. They are not designed for dynamic loads arising from transportation over uneven ground while the load is suspended.

Hynds precast concrete manholes are delivered with lifting anchors cast into the concrete walls.

All Hyspec Manhole Systems incorporate lifting anchors for safe lifting and must be used with the correct lifting clutch.

Hynds Pipe Systems has designed and manufactured Hyspec Manhole Systems 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 manholes:

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 manhole systems 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.

Note: *Anchors are cast into set positions to accept a static vertical lifting force without dynamic forces. Use a spreader beam and appropriate lifting equipment to avoid overstressing a particular anchor, ensure that all anchors are securely held to provide an even vertical load passing through each point.*

Effective Rigging and Sling Angles

How lifting clutches work:

- The lifting clutch is attached to the lifting anchor by lowering the clutch slot over the anchor and rotating the clutch tab until it rests on the concrete surface.
- The tab is located on the side that will be uppermost when lifting.
- When the load is raised the anchor takes the full load in tension.
- As the load rotates or is lifted with the anchor in shear, the clutch comes into contact with the concrete.
- This transfers the lifting force into the concrete and the anchor prevents the clutch slipping out of the recess.
- Appropriate clutches for anchor sizes should always be used.

The larger the sling angle the higher the load on the chains. For example at an included angle of 170° the load on each sling is six times the weight of the actual load being lifted. Do not put more than the recommended safe working load on equipment. Hynds concrete manholes are fitted with lifting inserts, thus providing a safety factor which is well over the industry standard of three, when slung in the correct manner. However, care still needs to be taken when lifting the Hynds concrete manholes, especially over uneven surfaces as shock loading may exceed the designed safety factor.

Please note: *An insert with a nominal clutch size rating stamped on the head does not necessarily have the same safe working load limit because of the various insert lengths available.*

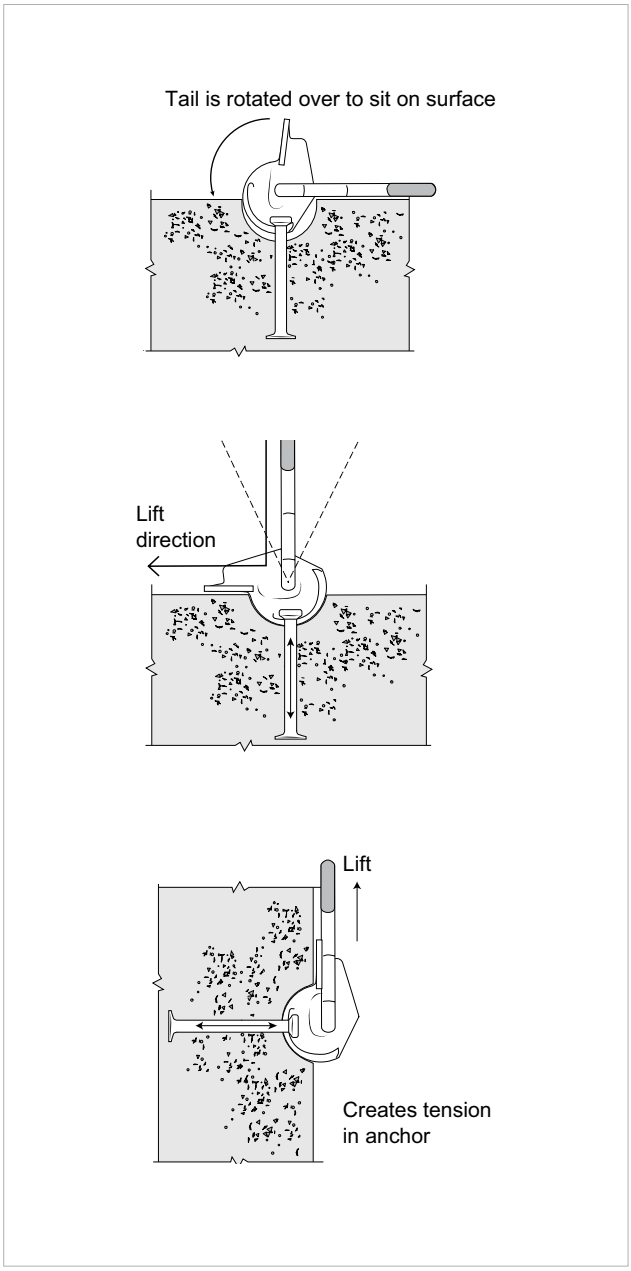
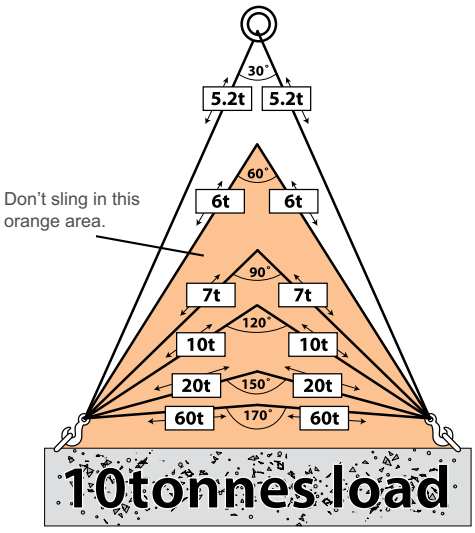


FIG. 8 Lifting anchors Clutch Operation



Note: Always aim to make sling length greater than the distance between two anchors.

FIG. 7 Sling Angles

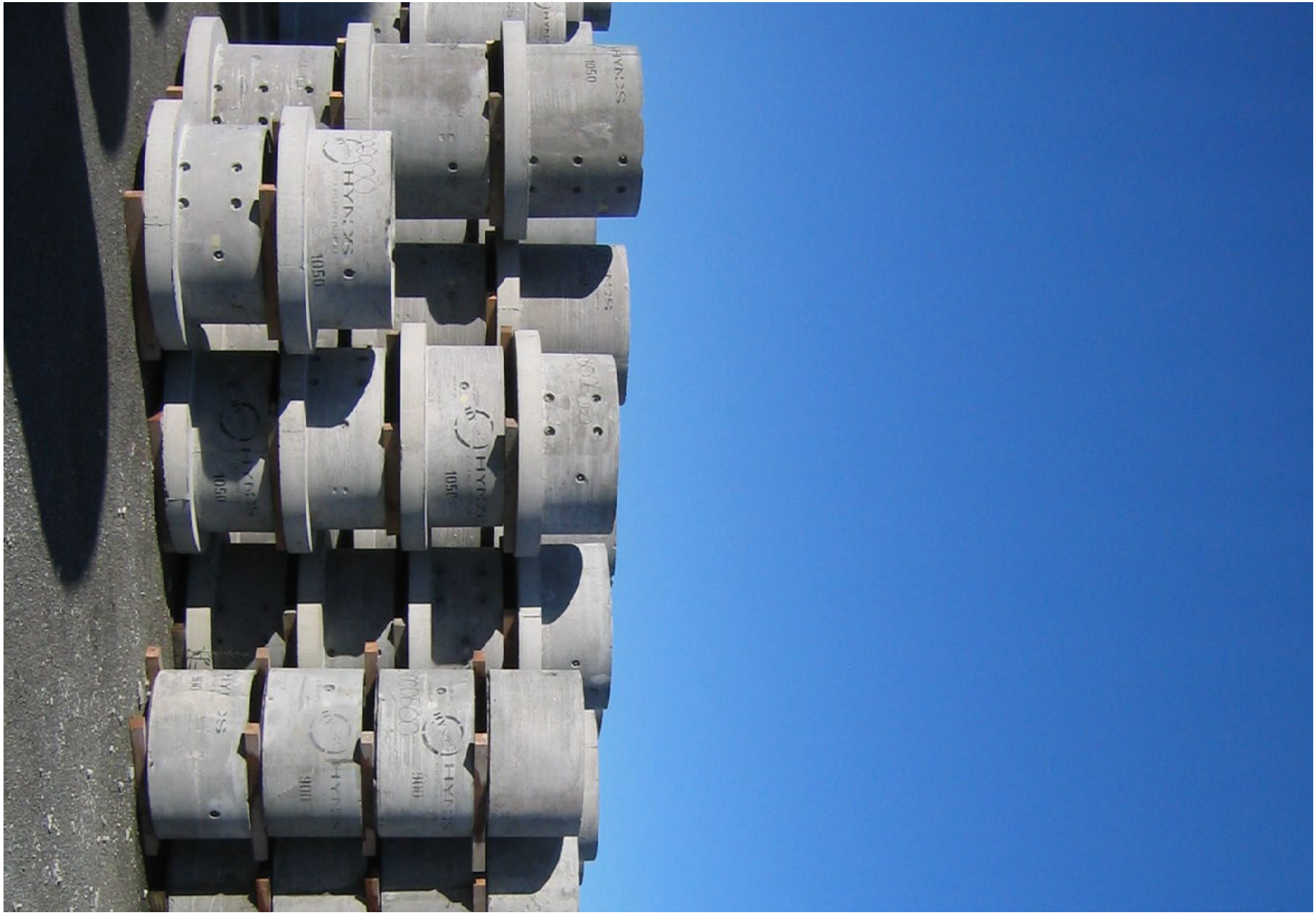
Manhole Installation

Manholes are installed using modern excavation equipment and techniques. Manholes are generally installed prior to the pipelines connecting into them. The manhole foundation should be prepared with compacted hardfill to prevent excessive settlement. A manhole structure may be constructed as follows:

1. Consider site specific health and safety requirements *(check flanged/internal base does not contain water or any other items, which may increase the weight of the unit)*.
2. Fix steps into riser components.
3. Prepare holes for connections *(see connections)* and lower flange base unit into place using a spreader beam and appropriate lifting equipment.
4. Place appropriate joint seal continuously around the joint circumference *(collar end)*.
5. Place the next riser section *(using a spreader beam and appropriate lifting equipment)*.
6. Make and seal pipeline connections.
7. Bench invert as required.
8. Place and seal the manhole lid.
9. Place and mortar seal lid adjustment rings to required level.
10. Position access frame and cover.

Also refer to:

- *D4.2 Hynds Hyseal Sealed Manhole System*
- *D4.6 Hynds Hyseal Manhole Connecting Seals*
- *D4.7 Caliber Safety Grille*
- *D4.12 Large Hinged Manhole Covers*
- *D4.17 Accio 600 mm Clear Opening Manhole Cover and Frame*
- *D4.23 Impact Safety Grille*
- *D5.14 Scruffy Domes*
- *D10.2 Hybond Two Epoxy Mortar*
- *D10.1 Lifting Equipment*
- *D10.16 Aquawrap*


HYNOX
1050
HYNOX
1050
HYNOX
1050
HYNOX
900
HYNOX
900


HYNDS
HYNDS
> DRAINAGE > WATERMAIN > ENVIRONMENTAL > RURAL


HYNDS

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