

TELECOMMUNICATION CONTRACTORS INSTALLATION GUIDE

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HUMES PIPELINE SYSTEMS

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Section 1 Means of Compliance: Humes

Overview

Introduction This section covers the installation procedure to be followed during the installation of Humes Pipeline Systems prefabricated concrete manhole products. The procedure includes health and safety precautions for lifting and use of epoxy mortar.		llowed during the concrete manhole recautions for lifting
In this section	This section covers the following topics.	
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Document History		
Version	Date Updated	Change
1.0 DRAFT	November 1999	Conversion to Infomap97 template
2.0	January 2000	Note regarding removal of wall or end panel to accommodate cable/duct. Page 5 Clause 2.3 Step 3
3.0	February 2000	Inclusion of Rural Joint Chamber instructions
4.0	May 2010	Contacts updated clause 4.30

1	GENERAL
1.1	Lifting equipment required All panels are provided with foot anchors rated to 1.3 tonnes. Contractors must ensure that universal lifting eyes (otherwise known as "swiftlifts") and chains are rated for 1.3 tonne loads. Swiftlift anchors can be sourced directly from Reid Engineering, or from Humes Sales Centres nationwide.
1.2	Epoxy Mortar It is recommended that Epoxy mortar be used when installing Humes precast inspection chambers. This is placed between all panel joints to provide a permanent bond and seal.
1.2.1	Applications Humebond Epoxy Mortar is a two-part product that provides a high strength bond to precast concrete. For the installation of Humes inspection chambers, Humebond must be used on all joints in order to achieve a watertight seal.
1.2.2	Mixing Humebond must be mixed in accordance with the manufacture's instructions, these are provided with the product. It is important that the correct mix ratio is observed in order to maintain optimum cured properties. Do not use water in this process, as it will also affect the curing properties. As a guide 4 litres should be sufficient for a 1200 chamber; the average life after mixing is 30 minutes in summer and 1 hour in winter.
1.3	 Health & Safety Skin contact should be avoided. Safety glasses and clothing should be worn at all times while using uncured Humebond. Impervious rubber or plastic gloves are recommended. Skin should be thoroughly cleaned if exposure occurs by washing with soap and warm water. Adequate ventilation should be provided to the working area.

2 INSTALLATION PROCEDURE

2.1 Excavation

The following describes the recommended installation procedure for Humes precast inspection chambers.

Step	Action
1	Excavate the hole to the required depth. Allow sufficient depth
	for the finished product, complete with in-situ collar, and
	aluminium frame and lid.
2	Place a compacted, and level layer of hard fill in the bottom of
	hole; this should be a 20mm layer of sand on an 80mm
	compacted layer of approved AP20 hard fill.
3	A depth of 150mm for roadway applications and 100mm for
	footway applications is required. This may increase depending
	on ground conditions and surface levels. It is important that the
	hard fill is placed on a solid foundation after all soft spots have
	been removed. See fig. 1
	Comments of the second se
	Fig. 1
	Excavation of trench

Base Panel Installation

Lift in and position base slab using correct lifting equipment rated to 1.3 tonnes. It is important to ensure that the base slab is level. See fig. 2



Fig. 2 Base slab placement

If the surrounding surface is not level, any adjustments needed are done with the lid set and collar to accommodate for this variation.

2.3

2.2

Side Panel Placement

Follow the steps below to install the side and end panels of the manhole

Step	Action
1	Mix Humebond as per the manufacturers instructions.
2	Place Humebond on base slab where the first end panel is to be placed; this is to effect a sealed joint between the base and panel.

3	If the end panel is to go over existing cables and ducting, then a hole large enough to accommodate these should be cut out prior to placing the panel. See fig. 3. NOTE: the design of the side and end panels allows for the removal of 25% of the panel to accommodate cable/ducting providing that once the cable/ducting is in place the remaining hole is filled with Humebond. If an area that is greater than 25% needs to be removed then authority (in writing) to proceed must be obtained from Humes.
	Fig. 3
	Side & End Panel Placement With Cut Hole For Ducting
4	Lift in first end panel and locate using the end panel dowel pins so that these correspond with matching holes in the base panel.
5	Check that a full seal has been achieved with the Humebond between the end panel and the base slab. After panel has been suitably braced, remove lifting equipment.
6	Repeat the placement of Humebond on the base slab and the adjacent end panel where the side panel is to be positioned; this to effect a sealed joint between this and the first side panel.
7	Lift in first side panel and locate using the side panel dowel pins so that these correspond with matching holes in the base panel. See fig. 3
8	Check that a full seal has been achieved with the Humebond between the base, side panel and the adjacent end panel
9	Bolt end panel to side panel using bolt and receiver provided with the product
10	Remove Lifting equipment
11	Place Humebond on base slab and adjacent side wall to effect a sealed joint between them and the second end panel.
12	Lift in second end panel and locate using the end panel dowel pins so that these correspond with matching holes in the base panel. <u>Note:</u> Again, any holes needed to accommodate existing ducts should be pre-cut before positioning the panel.

13	Check that a full seal has been achieved with the Humebond
	between the end panel and the base slab, and the adjacent side
	panel.
14	Bolt end panel to side panel using bolt and receiver provided
	with the product. See fig. 4
	E A PA IL ALL
	Placement Of Second End Panel
15	Remove lifting equipment.
16	Place Humebond on base slab to effect a sealed joint between
	this and the second side panel.
17	Lift in second side panel and locate using the end panel dowel
	pins so that these correspond with matching holes in the base
	panel.
18	Check that a full seal has been achieved with the Humebond
	between the side panel and the base slab.
19	Bolt end panel to side panel using bolt and receiver provided
	with the product. See fig. 5
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	Fig. 5
20	Placement of second side panel
20	Remove lifting equipment.

Re-instatement around duct entry

Where panels have been cut for placement over new or existing ducts, these holes must be sealed in order for the chamber to be watertight.

Step	Action
1	Place Humebond between the plastic ducting to protect the cables and the concrete panel
2	cables and the concrete panel Smooth the epoxy to give a clean finish within the chamber. See fig. 6
	Fig. 6
	Humebond detail over ducting
3	Trim duct entry to flush with the manhole wall
4	Deburr sharp edges around ducts.

Roof Panels

2.5

If roof panels are fitted they must be sealed as per the panel walls.

Step	Action
1	If a roof panel is provided, place Humebond around the top of all
	side panels to effect a sealed joint between this and the wall
	panels.
2	Lift in roof panel and locate over box.
3	Check that a full seal has been achieved between roof panel and
	all side walls.
4	Remove lifting equipment.
	NOTE: All roadway pit roof panels are bolted to wall panels
	using bolts and receivers provided with the product

3 RURAL JOINT CHAMBER

3.1 Excavation

Refer to Section 2.1 steps 1-3 in respect to excavation and bedding requirements only.

3.2 Installation of Chamber

Place chamber into the excavated hole using the swiftlifts (2) provided. These are located on the external section of the chamber. Ensure correct lifting equipment is used rated to 1.3 tonnes.

3.3 Placing of Lid

Place the concrete lid onto chamber ensuring that it is centred correctly.

NOTE: If the contractor chooses to use timber, then this should be 150 x 50mm RS H5 laid over the chamber and trimmed to the required length. Timber will not be supplied by Humes with the Rural Joint Chamber. It is the responsibility of the contactor to ensure the timber meets the specifications set out above.

Where timber is used, it is recommended that the contractor fill the chamber with sand to provide additional support to the timber planks. This is not required when using a concrete lid.

3.4 Sealing Requirements

No sealing is required for the slot entry or lid.

4 NOTES

4.1	Completion of the chamber These instructions relate to the installation of the chamber. Completing the work to finished ground level, including the installation of an approved access lid and frame, do not form part of these instructions.
4.2	The Product All chambers are manufactured in accordance to Telecom specification revision 5, 23 March 1999. In addition to this, they are also manufactured in accordance to NZ Standards relating to precast concrete. Within these standards some cracking of the panels is acceptable, hairline cracks (0.2mm or less) do not effect the integrity of the product and can be repaired by the contractor using Humebond. Cracks that are greater than 0.2mm should be referred to the manufacturer for inspection and repair.
4.3	Humes Pipeline Systems Free phone: 0800 502 112 Sales and enquiries should be directed to Andrew Hofer Design and engineering enquiries should be directed to Engineering Services, Dave Edkins

Section 2

Overview					
Introduction	This section covers the procedure to be followed during the installation of manhole collars, for use in conjunction with the Humes prefabricated manhole.				
In this section	This section	n covers the follow	ng topics.		
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	Document History				
	Version	Date Updated	Change		
	1.0	January 2000	Conversion from paper to elect	tronic version.	

MANHOLE COLLAR BUILD INSTRUCTIONS

1 General

1.1 Surface levels	It is assumed that the road and footpath levels would have been considered at the initial design stage. Where there is any uncertainty regarding surface levels (i.e., unformed footpaths etc.) or possible future works, the Local authority - should be consulted prior to the construction of the manhole and the frame and covers.
1.2 Manhole and frame levels	In all installations, the manhole is to be installed level. The frame and lids are aligned and adjusted to conform to the surface crossfall (levels of surrounding area).

2 Positioning of Frame and Lids

2.1 Guideline

When installing frames and lids the following points that should be considered:

- Roadway frames are to have a minimum 300mm concrete surround (see figs. 1 &2).
 - Roadway frames are to be installed with a minimum 250mm allowance from the top of the manhole roof (or wall) to the ground, or crossfall level (see figs. 1&2).



- Footway frames are to have a minimum 200mm concrete surround (See figs. 3&4).
- Footway frames are to be installed with a minimum 200mm allowance from the top of the manhole roof (or wall) to the ground or crossfall level (see figs. 3&4)



- Where the neck construction is excessive (above 350mm) then extra reinforcing may be required. This is covered in section 4.2.3 Construction Modifications to manhole necks.
- The frame should be installed slightly proud (approx. 3mm) of the surrounding surface. This minimises water entry into the manhole via gaps between the frame and covers.
- Wherever possible, the installation should allow for the covers and centre beam to be placed parallel with the kerb.

2.2 Correct frame alignment The frames and lids are relatively simple to install. However, regardless of this simplicity, extreme care should be taken when handling and setting the frame as any misalignment cannot be rectified once the concrete is placed.

3 Installation Procedure

3.1

The following describes the recommended installation procedure for the aluminium footway frames and lids. The procedure for roadway coversets is very similar and requires only slight adjustments to the preparation and settings described in Section 2





Continued on next page









4.0 Manhole Throat Starter Bars and Re-inforcing

4.1	Starter bars or reinforcing bars are used to strengthen and form the concrete neck and coverset. Concrete kitset manholes are supplied with starter bars in the roof section or top of the walls. As built manholes should have provisions for the starter bars as one of its design features. Reasonable attempts should be made to fit or secure the starter bars through the holes in the coverset frame. In cases where this is not possible, then extra reinforcing for the neck construction may be required.			
4.2 Some common problems	The following outlines the more common problems and suggested remedial action:			
4.2.1 Short starterbars	Often starter bars are too short to facilitate through the coverset frame. This could be due to the starter bars being incorrectly positioned or the need for an extensive neck construction. Where the coverset frame is less than 300mm above the manhole top, bending the reinforcing bars to approximately 10mm below the frame is considered a suitable modification. See below			



Fig 19

If the starter bars are excessively short, then new starter bar will need to be installed into the existing structure. This is covered in section 4.2.2 on next page.

4.2.2 Broken Starter bars

ter Broken or excessively corroded bars, which may snap with moderate bending, should be replaced. The following procedure is recommended:

-					
Step	Action				
1	Align the coverset frame with the manhole opening and mark the frame				
	hole position for the starter bars.				
2	Diagram Drill 16mm holes in the manhole roof or wall for				
	approximately 3/4 depth of section.				
3	Clean out the holes with air blower or similar before filling with epoxy				
	mortar or putty compound.				
4	Measure and cut D 12 starter bar to suitable length, allowing for				
	insertion into holes construction and frame holes.				
5	Generally, epoxy mortar and putty compounds require 2 to 3 days				
	curing time, however most are workable after a gel-time period of				
	about lhr to 2 hrs.				
	Concepts Month (Current and)				
	Concrete Neck (Sutburk)				
	D12 starter bar				
	Coverset frame hole				
	T				
	Epoty montai				
	Manhole roof				
	\leftarrow				
	Pre-drilled 16mm				
	Fig 20				

4.2.3 Extensive neck construction is usually due to the manhole being at extra depth Extensive neck requiring a deeper entry throat.

construction Extra reinforcing tied onto the starter bars around the neck is recommended for coverset frames that are between 300m and 450m above the manhole top. See below







Where there is a requirement for a deeper entry throat (i.e., greater than 450mm), then further advice should be sought from a qualified expert.

4.2.4 If there is any doubt regarding the manhole neck and coverset construction, or Other Problems for manholes with a requirement not covered above, the issue should be referred to a suitably qualified expert for further advice

5.0 Striking The Form Work

Generally, formwork must not be removed until the concrete in strong enough to self-supporting and able to carry imposed loads.

The period which should lapse before the form work should be struck will vary form job to job and is largely dependent on a number of factors including the type of concrete used, the weather (temperature,) method of curing etc. The removal of formwork is specified in NZS 1900 Chapter 9.3A. However, for manhole construction using ordinary Portland cement, the formwork can generally be removed after 5-7 days.