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1. Purpose[1]

This Technical Note has been prepared to provide direction to Unitywater personnel and Unitywater design consultants, Contractors and private certifiers on the use of the different standard types of maintenance holes in RIGSS and NuSewers systems within the Unitywater service area.

2. Scope

This Technical Note defines the different standard types of Maintenance Holes and the applied limits for each type within RIGSS and NuSewers systems.

Table 7.3A “Minimum MH Diameters” of the SEQ Sewer Code allows the use of X type Maintenance Holes in NuSewer systems under certain circumstances. SEQ Sewer Code Standard Drawings SEQ-SEW-1301-14 to SEQ-SEW-1301-25 are related to the X Type Maintenance Hole design details, however they do not permit use by Unitywater. Future revisions of this set of drawings will permit the use of X Type Maintenance Holes in the NuSewer system within the Unitywater service area.

This Technical Note does not cover all the requirements for Maintenance Holes – its purpose is to clarify Unitywater’s position for the appropriate usage of each of them. For the complete design and construction requirements refer to SEQ edition Version 2.1-September 2021 of WSAA Gravity Sewerage Code of Australia WSA-02 2014-3.1 and SEQ Sewerage standard drawings.

3. Maintenance holes requirements

3.1 General requirements

Concrete for MH construction shall be special class to WSA PS-358 with requirement of calcareous aggregates and shall comply with Unitywater’s requirements in Pr9903 - Specification for Building and Structural Works Section 4.4 Special Class Concrete S40. MH construction details shall be shown on the Design Drawings.

Precast and Plastic Maintenance Holes must be selected from Unitywater’s approved for use - on the latest SEQ Civil IPAM list. When selecting, consider the comments on the list including product specifications, the size range and Unitywater status and notes on each product.

All standard Maintenance Holes have their depth limitation and greater depth requires design input.

In water charged ground or where bolt-down covers are required as per clause 7.9.1 of the SEQ sewerage gravity code including Q100 flooding and surcharge areas, use only full cast-in-situ MH.

All proposed maintenance structures must meet the SEQ code requirements in relation to design life also considering the safety of the structure during the construction phase, the operation and decommissioning if and when that may occur.

3.1.1 Large falls at MHs:

- Unitywater requires using the internal drops.
- No internal drops shall be used in 900 internal diameter MHs.
- The maximum number of internal drop pipes shall be determined in accordance with SEQ gravity sewerage code table 5.13 and clause 7.6.8.
- MH shall have a minimum 750 mm diameter working area clear of any internal obstruction.

3.1.2 Internal corrosion protection:

Unitywater permits only PE lining systems.

1. MHs that meet any one or more of the following conditions shall be provided with PE lining system:
2. The MH is a receiving MH for a sewer rising main or within 100 metres of such a receiving MH.
3. The MH is the inlet MH immediately upstream of a sewage pumping station.
4. The MH has an internal diameter of 1500 mm or more.
5. The MH exceeds 4 metres depth to the invert of its outlet sewer.
6. The outflow sewer from the MH has a diameter greater than 300 mm.
7. The MH is servicing an industrial area.
8. Where an assessment of corrosion or odour has indicated protection is required.

3.1.3 Ladders:

Unitywater does not require ladders or step irons to be included within the Maintenance Holes. Ingress and egress from structures will require the use of Davit arms and Harnesses as appropriate.

In the next revision of the SEQ Sewer Code, the relevant SEQ Code drawings will be modified to add note reflecting this requirement for Unitywater.

3.1.4 Safety Chains:

Unitywater does not require Safety Chains to be included within the Maintenance Holes. Ingress and egress from structures will require the use of Davit arms and Harnesses as appropriate.

In the next revision of the SEQ Sewer Code, the relevant SEQ Code drawings will be modified to add note reflecting this requirement for Unitywater.

3.2 MHs in RIGSS systems

RIGSS systems (Reduced Infiltration Gravity Sewerage Systems) are a type of Smart Sewer that comprises rubber-ring jointed PVC pipes (RIGSS might be used to refer to other RRJ pipes joining systems) with a combination of Maintenance Shafts, Maintenance Chambers, Maintenance Holes, in-line bends and reinforced house connections that is a permitted option for Unitywater's gravity sewerage networks.

Table 1: Maintenance holes for RIGSS systems

Nominal Sewer Size (mm)	MH type	MH Internal Diameter (mm)	References/Comments
Up to 225	Cast-in-situ	1050-1200	• SEQ-SEW-1307-1. • Wall thickness 150mm for Up to 3 m depth MHs. • Wall thickness 225mm for Up to 6 m depth MHs.
	Pre-cast (Types P1, P2 & P3)	1050 or 1200	• SEQ-SEW-1300-1 • Use Straight Back Taper or Conversion Slab only. • Maximum depth 4 m without internal lining.
	Plastic	1000 or 1050	Check SEQ Civil IPAM list for limitations.
300 to 600	Cast-in-situ	1500	• SEQ-SEW-1307-1. • Wall thickness 225mm. • Maximum depth 6 m.
	Pre-cast	By Design	By Design
600 to 675	Cast-in-situ (Type-Y)	1500-1800	• SEQ-SEW-1309 set. • Maximum depth 6 m. • Require design input by RPEQ for traffic loads, structural design and native soil conditions, refer notes 3 and 6 on SEQ-SEW-1309-1 Rev. C.
	Pre-cast (Type-Y)	1500	• SEQ-SEW-1309 set. • Maximum Horizontal Deflection at Chamber 35˚. • Maximum depth 6 m. • Require design input by RPEQ for traffic loads, structural design and native soil conditions, refer notes 3 and 6 on SEQ-SEW-1309-1 Rev. C.
675 to 750	Cast-in-situ (Type-Y)	1800	• SEQ-SEW-1309 set. • Maximum depth 6 m. • Require design input by RPEQ for traffic loads, structural design and native soil conditions, refer notes 3 and 6 on SEQ-SEW-1309-1 Rev. C.
750 to 900	Cast-in-situ	1800	By Design
Larger than 900	Cast-in-situ	By Design	By Design
	Pre-cast	By Design	By Design

3.3 MHs in NuSewers systems

NuSewers systems is a type of Smart Sewer that comprises fully welded polyethylene (PE) pipes, fittings, maintenance shafts, Maintenance Chambers and Maintenance Holes that is a permitted option for Unitywater's gravity sewerage networks.

Table 2: Maintenance holes for NuSewers systems

PE100 Sewer DN Size (mm)	MH type	MH Internal Diameter (mm)	References/Comments
Up to 250	Cast-in-situ (G type)	900	• SEQ-SEW-1301-2 to SEQ-SEW-1301-5. • Where there is no internal drop and/or Depth ≤ 3 m.
	Cast-in-situ (F type)	1200	• SEQ-SEW-1301-8 to SEQ-SEW-1301-12. • Where there is an internal drop and/or Depth > 3 m and up to 4.25 m.
	Plastic	1050	Only fully welded maintenance Holes. Check SEQ Civil IPAM list for limitations.
250 to 315	Cast-in-situ (F Type)	1200	• SEQ-SEW-1301-8 to SEQ-SEW-1301-12. • Maximum depth 4.25 m.
≥ 315	Cast-in-situ (X Type)	1200	• SEQ-SEW-1301-14 to SEQ-SEW-1301-25. • Type X to be used for deep sewer > 4.25 m.

3.4 Special MHs

Special Maintenance Holes are Subject to specific approval by Unitywater.

Table 3: Special maintenance holes

Nominal Sewer Size (mm)	MH type	MH Internal Diameter (mm)	References/Comments
DN1200 and Larger	GRP (Type Z1)	1200	• Use is Subject to specific approval. • Manufacturer to submit workshop drawings for approval prior to manufacture. • Refer SEQ-SEW-1310-1.
Tunnel Jacking Shaft	Cast-in-situ (Type Z2)	By Design	• Use is Subject to specific approval. • Refer SEQ-SEW-1311-1.
Tunnel Receival Shaft	Cast-in-situ (Type Z3)	By Design	• Use is Subject to specific approval. • Refer SEQ-SEW-1312-1.

4. Definitions

Table 4: Definitions, abbreviations and acronyms

Term	Meaning
MH	Maintenance Hole
MH depth	Maintenance Hole depth shall be taken as the distance from the top of the MH access cover/frame to the invert level of the MH outlet.
RIGSS	Reduced Infiltration Gravity Sewerage Systems
SEQ IPAM list	South East Queensland Infrastructure Products and Materials approved list

5. References and resources

Table 5: References and resources

Source	Reference
External	WSA 02 WSAA Gravity Sewerage Code of Australia - SEQ Edition - Version 2.1 (September 2021). (SEQ Sewer Code) Gravity Sewerage Maintenance Holes Standard Drawings SEQ-SEW-1300 set, SEQ-SEW-1301 set, SEQ-SEW-1307-1, SEQ-SEW-1309 set, SEQ-SEW-1310-1, SEQ-SEW-1311-1 and SEQ-SEW-1312-1
Internal	N/A