



SEWERAGE SYSTEMS RETICULATION 03F

MUNICIPAL
INFRASTRUCTURE
TECHNICAL
SPECIFICATION
03 - UNDERGROUND SERVICES

Transport Canberra and
City Services

July 2019



Publication Number:	MITS 03F Edition 1 Revision 0
---------------------	-------------------------------

Date of Effect:	July 2019
-----------------	-----------

Supersedes: Standard Specification for Urban Infrastructure Works Section 03
Edition 1 Revision 0 September 2002

Endorsed By:	Karl Cloos	Director, Infrastructure Planning
--------------	------------	-----------------------------------

Approved By: Ken Marshall Executive Branch Manager, Roads ACT

Document Information

Document	Key Information
----------	-----------------

Document Title MITS 03F Sewerage systems reticulation

Next review date	
------------------	--

Key words

AUS-SPEC Base Document	1361 Sewerage systems – reticulation (Construction)
------------------------	---

Revision Register

Edition/ Revision Number	Clause Number	Description of Revision	Authorised By	Date
--------------------------	---------------	-------------------------	---------------	------

1/0

--	--	--	--	--

CONTENTS

- 1 SEWERAGE SYSTEMS RETICULATION 4**
 - 1.1 General 4
 - 1.1.1 Responsibilities..... 4
 - 1.1.2 Cross references..... 4
 - 1.1.3 Referenced documents 5
 - 1.1.4 Standards 5
 - 1.1.5 Interpretation..... 5
 - 1.1.6 Hold points and witness points 6
 - 1.2 Materials 7
 - 1.2.1 General..... 7
 - 1.3 Execution 8
 - 1.3.1 Provision for traffic..... 8
 - 1.3.2 Site establishment..... 8
 - 1.3.3 Excavation 8
 - 1.3.4 Installation, embedment and backfill..... 9
 - 1.3.5 Maintenance holes, shafts and inspection shafts 9
 - 1.4 Completion 9
 - 1.4.1 Submissions..... 9
 - 1.4.2 Connections to existing sewers..... 9
- 2 MEASUREMENT AND PAYMENT 9**
 - 2.1 Measurement 9
 - 2.2 Pay items 10

LIST OF TABLES

- Table 3F- 1 Hold point table..... 6
- Table 3F- 2 Witness point table 6
- Table 3F- 3 Pay items table..... 10

1 SEWERAGE SYSTEMS RETICULATION

1.1 General

1.1.1 Responsibilities

Requirement: Provide sewerage reticulation works in the location, to the lines, levels, grades and using the materials as documented.

1.1.1.1 Performance:

Requirement: Conform to *ICON Water's Water Supply and Sewerage Standards*

1.1.1.2 Precedence:

Precedence: The technical requirements of, or any standard drawing provided by, Icon Water, used in conjunction with and in conflict with this Specification, take precedence.

1.1.2 Cross references

General: The following documents are related to this Specification.

1.1.2.1 ACT Legislation

Road Transport (General) Act

Public Roads Act

Scaffolding and Lifts Act

Scaffolding and Lifts Regulation

Water and Sewerage Act

Water and Sewerage Regulations

Work Health and Safety Act

1.1.2.2 Specifications

Requirement: Conform to the following:

MITS 00	Preliminaries
MITS 01	Traffic Management
MITS 02	Earthworks
MITS 04	Flexible pavement construction
MITS 06	Concrete kerbs, footpaths and minor works
MITS 08	Incidental works
MITS 09	Landscape
MITS 10	Concrete works

1.1.3 Referenced documents

1.1.3.1 Standards

General: The following documents are incorporated into this Specification by reference:

Australian standards

AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2566	Buried flexible pipelines
AS/NZS 2566.1	Structural Design
AS/NZS 2566.2	Installation
AS/NZS 3500	Plumbing and drainage
AS/NAS 3500.2	Sanitary plumbing and drainage

1.1.3.2 Other publications

Water Services Association of Australia (WSAA)

WSA 02	Gravity Sewerage Code of Australia
--------	------------------------------------

Plastic Industry Pipe Association of Australia Limited (PIPA)

POP102	Solvent cement welding of PVC-U pipe
--------	--------------------------------------

1.1.4 Standards

1.1.4.1 General

Standard: To *ICON Water's Water Supply and Sewerage Standards*

Buried flexible pipes design and installation: *AS/NZS 2566.1* and *AS/NZS 2566.2*.

PVC-U installation: To *AS/NZS 2032*.

Proprietary products: To *TCCS Products previously considered for use list*

1.1.5 Interpretation

1.1.5.1 Abbreviations

General: For the purposes of this Specification the following abbreviations apply:

BVR:	Buried Vertical Riser
DN:	Nominal diameter of the pipe.
DI:	Ductile iron.
DICL:	Ductile iron cement lined pipe.
IS:	Inspection shaft.
MH:	Maintenance hole.
MS:	Maintenance shaft.
NATA:	National Association of Testing Authority.

- PE:** Polyethylene.
- PIPA:** Plastic Industry Pipe Association of Australia Limited.
- PVC-U:** Polyvinyl chloride.
- TCCS:** Territory and Municipal Services, ACT Government, and its successors.
- VC:** Vitrified clay.
- VD:** Vertical drop.

1.1.6 Hold points and witness points

1.1.6.1 Notice

General: Give written notice to the Authorised Person so that inspections and submissions may be made to the **Hold point table** and the **Witness point table**:

Table 3F- 1 Hold point table

Item	Clause title	Requirement	Notice for inspection	Release by
Materials				
3F.1	General - Authorised products and materials	Submit for certification of conformance for all products and materials or approval for alternative products and materials	2 weeks before ordering	Authorised Person
Execution				
3F.2	Excavation for sewerage systems - Foundation	Identify any unsuitable material and proposed actions	1 working day prior to preparation of foundations	Authorised Person

Table 3F- 2 Witness point table

Item	Clause title	Requirement	Notice for inspection
Materials			
3F.1	General - Conformance with manufacturer's recommendations	Inspect material and products at time of delivery	2 working days
Execution			
3F.2	Excavation for sewerage systems - Foundation	Confirm soil type with design	1 working day
3F.3	Excavation for sewerage systems - Foundation	Additional excavation and backfill if rock encountered at foundation level.	1 working day

1.2 Materials

1.2.1 General

1.2.1.1 Authorised products and materials

Products and materials: Provide only products and materials authorised by ICON Water, the Drawings and this Specification. Submit for approval any alternative or not authorised products and materials.

This is a **HOLD POINT**.

Unauthorised material: Remove unauthorised or non-conforming materials from the site within 24 hours.

1.2.1.2 Conformance with manufacturer's recommendations

Requirement: Conform to the requirements of the manufacturer's recommendations for handling, transport and storage of materials and in a manner to prevent damage or deterioration or excessive distortion. Inspect all products and materials at the time of delivery and reject products and materials not in conformance with this specification and the manufacturer's recommendations.

This is a **WITNESS POINT**.

On site storage: Store pipe fittings, valves, seals and other components as follows:

- > Maintain protective crating or packaging until immediately before use.
- > Stack piping to avoid ovalisation.
- > Support all fittings and pipes off the ground.

Damaged or defective materials: Do not use damaged or defective materials, including coatings and linings, outside the manufacturer's recommended limits and the following:

- > Faded/discoloured plastics, plastic coated pipes, fittings and appurtenances.
- > PVC-U pipes and fittings scored deeper than 10% of wall thickness to a maximum of 1mm.
- > PE pipes and fittings scored deeper than 10% of wall thickness.
- > DI and steel pipes and fittings with damage to linings in excess of 20% of the lining thickness.
- > Plastics coated pipes, fittings and appurtenances with damage to coating in excess of 20% of the coating thickness.

1.3 Execution

1.3.1 Provision for traffic

1.3.1.1 General

Requirement: Conform to *MITS 01 Traffic Management*.

1.3.2 Site establishment

1.3.2.1 Survey

Requirement: Confirm site surface and benchmarks. Conform to *MITS 00A General requirements*.

1.3.3 Excavation

1.3.3.1 General

Excavation: Conform to *Icon Water's Water Supply and Sewerage Standards, MITS 03A Trenching for underground services* and *MITS 02B Bulk Earthworks*.

Bedding, support and backfill material: Unless otherwise documented, to *Icon Water's Water Supply and Sewerage Standards*.

Tolerances: Install water mains, in-line structures, property services and meters in conformance with *Icon Water's Water Supply and Sewerage Standards*.

1.3.3.2 Trenchless technology

Excavation: Conform to *Icon Water's Water Supply and Sewerage Standards*.

1.3.3.3 Foundation

Confirmation: Confirm surrounding soil type with design. Notify Authorised Person if not consistent with the design.

This is a **WITNESS POINT**.

Water ingress: If any material in the excavation has been damaged by water ingress, assess for suitability prior to proceeding. Water in trenches shall be lowered to the bottom of the trench during bedding, pipe laying and backfilling.

Notice: Give notice of any area of the foundation including the sides of the trenches that may contain material that is inadequate to support the proposed sewerage structure. Where soft material occurs, the Authorised Person may require the use of alternative bedding material.

This is a **HOLD POINT**.

Unsuitable trench and foundation material: Remove and dispose of inadequate trench and foundation material as directed by the Authorised Person to *MITS 03A Trenching for underground services* and replace the material to *ICON Water's Water Supply and Sewerage Standards* and Standard Drawings.

Rock foundation: Remove or cut back exposed boulders in trench bottoms.

This is a **WITNESS POINT**.

1.3.4 Installation, embedment and backfill

1.3.4.1 General

Bedding and pipe support: To *Icon Water's Water Supply and Sewerage Standards*.

Sanitary drains: Install sanitary drains to *AS/NZS 3500.2* and *PSS-1101*.

Minimum cover: To *Icon Water's Water Supply and Sewerage Standards*.

1.3.5 Maintenance holes, shafts and inspection shafts

1.3.5.1 General

General: To *Icon Water's Water Supply and Sewerage Standards*.

1.4 Completion

1.4.1 Submissions

Work as Executed Records: To *Icon Water's Water Supply and Sewerage Standards* and *MITS 00B Quality Requirements*.

1.4.2 Connections to existing sewers

Acceptance testing: Complete acceptance testing to the satisfaction of Icon Water before connection to existing sewers.

2 MEASUREMENT AND PAYMENT

2.1 Measurement

2.1.1.1 General

Payments made to the Schedule of Rates: To *MITS 00 Preliminaries*, this Specification, the Drawings and the **Pay Items table**.

2.1.1.2 Methodology

The following methodology will be applied for measurement and payment:

- > Allow for all work, materials, testing and quality assurance requirements in each Pay Item.
- > Excavation, bedding, support and backfill material for sewer pipes: Paid under this Specification.
- > Miscellaneous minor concrete work not included in the pay items in this Specification: Conform to *MITS 10 Concrete works*.
- > Backfill under roads, paths and driveways: Extra over to *MITS 03H Road openings and restorations*.
- > Disposal of surplus trench spoil: To *MITS 02B Bulk earthworks*.
- > Removal of existing sewer pipes and structures: To *MITS 03A Trenching for underground services*.
- > All costs associated with removal of water from excavations shall be included within respective excavation rates for sewer pipes.
- > No Additional payment will be made for excavation in rock, overbreak of trench due to ground conditions or over excavation of trenches.

2.2 Pay items

Table 3F- 3 Pay items table

Item No	Pay items	Unit of measurement	Schedule of rates scope
3F.1	Sewer pipes	Linear metre of pipe installed measured at the centreline of the trench Measured from centre of sewer structure	<p>All activities associated with construction of sewer pipes including excavation of trenches in all types of material encountered including rock, over excavation for bedding, shoring, additional excavation at structures, bedding, laying, jointing, including wrapping of DICL pipes or filter fabric if specified, joint deflections or curvature of the pipe, backfilling and compaction.</p> <p>This pay item shall also include pipe cutting, connection to existing and/or new pipes and making good pipes damaged during the works.</p> <p>Separate pay items shall be included in the Contract for each pipe material, class of pipe, pipe diameter and the following depth ranges:</p> <ul style="list-style-type: none"> 0 to 1.5m depth 1.5 to 3.0m depth 3.0 to 4.5m depth 4.5 to 6.0m depth greater than 6.0m depth <p>For example;</p> <ul style="list-style-type: none"> 3F.1.1 300 uPVC SN8: 0 to 1.5m depth 3F.1.2 300 uPVC SN8: 1.5 to 3.0m depth 3F.1.3 375 DICL: 3.0 to 4.5m depth Etc... <p>If a depth range is not specified, it is assumed that the rate includes excavation and backfill in all depth ranges.</p>
3F.2	Sewer pipe fittings	Number	<p>All activities associated with construction of sewer pipe fittings including supply, installation, jointing, compacting backfill around the connection and all work to the pipes in order to make the connection.</p> <p>A separate pay item shall be included in the Contract for each pipe fitting type. For example;</p> <ul style="list-style-type: none"> 3F.2.1 100x150 Slope junction 3F.2.2 100x225 Slope junction 3F.2.3 100x30 Degree bend Etc...

Item No	Pay items	Unit of measurement	Schedule of rates scope
3F.3	Flexible joints	Number of flexible jointing arrangements installed at the interface with each structure	<p>All activities extra over Sewer pipes associated with the construction of flexible joints at sewer manholes, trench stops, scour stops and other rigid structures.</p> <p>A separate pay item shall be included in the Contract for each size of pipe. For example;</p> <p>3F.3.1 150 Flexible joints</p> <p>3F.3.2 225 Flexible joints</p> <p>Etc...</p>
3F.4	Sewer main dead ends	Number	<p>All activities associated with the construction of dead ends for temporary and permanent dead ends on sewer mains including supply and installation of end cap.</p> <p>This pay item shall include over-excavation of pipe trench, supply and placement of formwork, concrete, filter pipe, compressible membrane and additional backfilling of pipe trench over that of a straight uninterrupted pipe length.</p> <p>A separate pay item shall be included in the Contract for each size of sewer pipe. For example;</p> <p>3F.4.1 150 Sewer main dead end</p> <p>3F.4.2 225 Sewer main dead end</p> <p>Etc...</p>
3F.5	Sewer main sealing discs	Number	<p>All activities associated with the construction of sealing discs on sewer mains including supply and installation.</p> <p>A separate pay item shall be included in the Contract for each size of sewer pipe. For example;</p> <p>3F.5.1 150 Sewer main sealing disc</p> <p>3F.5.2 225 Sewer main sealing disc</p> <p>Etc...</p>
3F.6	Sewer tie dead ends	Number	<p>All activities associated with the construction of dead ends on sewer ties including supply and installation of an end cap, clip, marker tape and marker stake.</p> <p>A separate pay item shall be included in the Contract for each size of sewer tie.</p> <p>3F.6.1 100 Sewer tie end cap</p> <p>3F.6.2 150 Sewer tie end cap</p>

Item No	Pay items	Unit of measurement	Schedule of rates scope
3F.7	Scour stops	Number	<p>All activities associated with the construction of scour stops on sewer pipes including over-excavation of pipe trench, concrete formwork, supply, placement, curing and finish of concrete, filter pipe, compressible membrane and additional backfilling of pipe trench over that of a straight uninterrupted pipe length.</p> <p>A separate pay item shall be included in the Contract for each scour stop pipe diameter. For example;</p> <p>3F.7.1 150 Scour stop 3F.7.2 225 Scour stop Etc...</p>
3F.8	Trench stops	Number	<p>All activities associated with the construction of trench stops on sewer pipes including supply, placement, and finish of filter pipe, sandbags and compressible membrane.</p> <p>A separate pay item shall be included in the Contract for each trench stop pipe diameter. For example;</p> <p>3F.8.1 150 Trench stop 3F.8.2 225 Trench stop Etc...</p>
3F.9	Connect to existing sewer structures	Each connection	<p>All activities associated with connection to existing sewer structures including excavation, breaking out structure wall for new pipe, jointing and making good the connection and modifications to structure geometry at the junction.</p> <p>A separate pay item shall be included in the Contract for each pipe diameter and structure type. For example;</p> <p>3F.9.1 150 connection to existing manhole 3F.9.2 300 connection to existing manhole Etc...</p>
3F.10	BVR	Number	<p>All activities associated with construction of Buried Vertical Risers including excavation in all types of material encountered including rock, over excavation for bedding, shoring, supply and placement of bedding, concrete, formwork, pipes, fittings, screw cap and marker, as detailed.</p> <p>This pay item shall include backfilling and compaction around the structure.</p>
3F.11	BVR > 0.45m	Cumulative depth in metres measured as additional depth per BVR to nearest 100mm	<p>All activities extra over BVR associated with construction of Buried Vertical Risers deeper than 0.45m measured from the sewer main invert to the finished surface level.</p>

Item No	Pay items	Unit of measurement	Schedule of rates scope
3F.12	Sewer RP	Number	<p>All activities associated with construction of rodding points on sewer mains including excavation in all types of material encountered including rock, over excavation for concrete bedding, shoring, supply and placement of concrete, formwork, pipework, fittings, Class B metal cover and surround.</p> <p>This pay item shall include backfilling and compaction around the structure.</p>
3F.13	Sewer MS	Number	<p>All activities associated with construction of sewer maintenance shafts on sewer mains including excavation in all types of material encountered including rock, over excavation for concrete bedding, shoring, supply and placement of bedding, concrete, formwork, pipes, fittings, maintenance shaft, 600 long outer socket, end cap, pipe adapters, Class B access cover and surround, as detailed.</p> <p>This pay item shall include backfilling and compaction around the structure.</p> <p>A separate pay item shall be included in the Contract for each structure.</p>
3F.14	Sewer RP & MS Class D covers	Number	<p>All activities extra over Sewer RP and Sewer MS associated with construction of Class D access cover, surround and bedding for sewer maintenance shafts and sewer rodding points.</p>
3F.15	Pipe and Trench Protection	m ³ of placed concrete	<p>All activities extra over Sewer pipes associated with construction of pipe and trench protection on sewer mains including over-excavation of pipe trench, concrete formwork, supply and placement of reinforcement, concrete (including type SR cement), dowelled joints at pipe sockets and additional backfilling of pipe trench over that of a straight uninterrupted pipe length.</p> <p>A separate pay item shall be included in the Contract for each trench protection type.</p> <p>3F.15.1 Concrete bedding.</p> <p>3F.15.2 Concrete encasing</p>

Item No	Pay items	Unit of measurement	Schedule of rates scope
3F.16	Sewer MH	Number	<p>All activities associated with construction of sewer maintenance holes including excavation in all types of material encountered including rock, over excavation for bedding, shoring, supply and placement of bedding, concrete, reinforcement, formwork, precast units, step irons, precast cone and Class B access cover.</p> <p>This pay item shall include benching, sealing, marking, backfilling and compaction around the structure.</p> <p>A separate pay item shall be included in the Contract for each maintenance hole size.</p> <p>3F.16.1 1050 SMH 3F.16.2 1200 SMH 3F.16.3 1500 SMH</p>
3F.17	Sewer MH >1.45m	Cumulative depth in metres measured as additional depth per MH to nearest 100mm	All activities extra over Sewer MH associated with construction of sewer maintenance holes deeper than 1.45m measured from the top of the cover to the underside of the base.
3F.18	Class D access covers	Number	All activities extra over Sewer MH associated with construction of Class D access covers for sewer maintenance holes.
3F.19	VD	Number	<p>All activities extra over Sewer MH associated with construction of vertical drops in sewer maintenance holes.</p> <p>A separate pay item shall be included in the Contract for each drop pipe diameter.</p> <p>3F.19.1 150 Drop pipe 3F.19.2 225 Drop pipe 3F.19.3 300 Drop pipe</p>
3F.20	VD >Min Drop	Cumulative depth in metres measured as additional depth per VD to nearest 100mm	<p>All activities extra over VD associated with construction of vertical drops in sewer maintenance holes greater than the minimum drop height.</p> <p>A separate pay item shall be included in the Contract for each drop pipe diameter.</p> <p>3F.20.1 150 Drop pipe > 0.45m 3F.20.2 225 Drop pipe > 0.56m 3F.20.3 300 Drop pipe > 0.68m</p>
3F.21	Ladders	Number	<p>All activities extra over Sewer MH associated with supply and installation of ladders for sewer maintenance holes.</p> <p>A separate pay item shall be included in the Contractor for each SMH.</p>

Item No	Pay items	Unit of measurement	Schedule of rates scope
3F.22	Landings	Number	All activities extra over Sewer MH associated with supply and installation of landings for sewer maintenance holes. A separate pay item shall be included in the Contractor for each SMH.
3F.23	Special chambered MH	Number	All activities associated with construction of special chambered sewer maintenance holes including excavation in all types of material encountered including rock, over excavation for bedding, shoring, supply and placement of bedding, concrete, reinforcement, formwork, step irons, access shaft, precast cone and Class D access cover. This pay item shall include benching, sealing, marking, backfilling and compaction around the structure. A separate pay item shall be included in the Contract for each special chambered manhole. For example; 3F.23.1 Special chambered MH 1/1 3F.23.2 Special chambered MH 1/2 Etc...
3F.24	Contractor works on existing sewer	Lump sum	All activities associated with works on existing sewers including liaison with the sewer authority, new connections, adjustments to existing infrastructure and disconnections. This pay item shall include excavation, exposing existing services, backfilling, compaction and provision of any items required by the Sewer Authority. A separate pay item shall be included in the Contract for each location. For example, 3F.24.1 Connection to existing MH 1/1 3F.24.2 Disconnection of existing stub 2/1-2/2 3F.24.3 Connection to existing sewer at new MH 3/1 Etc...
3F.25	Works by the Sewer Authority	Provisional sum	This pay item shall include fees charged by the Sewer Authority for works on existing live sewers including new connections, adjustments to existing infrastructure and disconnections.
3F.26	CCTV Camera	Per linear metre of pipe filmed.	This Pay Item shall include all costs associated with carrying out Closed Circuit Television Camera testing of stormwater pipe installed in accordance with Authority requirements.
3F.27	Vacuum testing	Number	This Pay Item shall include all costs associated with carrying out vacuum testing of sewer maintenance holes in accordance with Authority requirements.



Transport Canberra and
City Services

July 2019