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<tr>
<th>Publication Number:</th>
<th>MITS 03F Edition 1 Revision 0</th>
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<tr>
<td>Supersedes:</td>
<td>Standard Specification for Urban Infrastructure Works Section 03 Edition 1 Revision 0 September 2002</td>
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<tr>
<td>Endorsed By:</td>
<td>Karl Cloos Director, Infrastructure Planning</td>
</tr>
<tr>
<td>Approved By:</td>
<td>Ken Marshall Executive Branch Manager, Roads ACT</td>
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</tbody>
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**Document Information**

<table>
<thead>
<tr>
<th>Document</th>
<th>Key Information</th>
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<tr>
<td>Document Title</td>
<td>MITS 03F Sewerage systems reticulation</td>
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<td>1361 Sewerage systems – reticulation (Construction)</td>
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**Revision Register**

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<th>Description of Revision</th>
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<th>Date</th>
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</table>
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 sewer 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.
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

<table>
<thead>
<tr>
<th>Item</th>
<th>Clause title</th>
<th>Requirement</th>
<th>Notice for inspection</th>
<th>Release by</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3F.1</td>
<td>General - Authorised products and materials</td>
<td>Submit for certification of conformance for all products and materials or approval for alternative products and materials</td>
<td>2 weeks before ordering</td>
<td>Authorised Person</td>
</tr>
</tbody>
</table>

Execution

<table>
<thead>
<tr>
<th>Item</th>
<th>Clause title</th>
<th>Requirement</th>
<th>Notice for inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>3F.2</td>
<td>Excavation for sewerage systems - Foundation</td>
<td>Identify any unsuitable material and proposed actions</td>
<td>1 working day prior to preparation of foundations</td>
</tr>
</tbody>
</table>

Table 3F-2 Witness point table

<table>
<thead>
<tr>
<th>Item</th>
<th>Clause title</th>
<th>Requirement</th>
<th>Notice for inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3F.1</td>
<td>General - Conformance with manufacturer’s recommendations</td>
<td>Inspect material and products at time of delivery</td>
<td>2 working days</td>
</tr>
</tbody>
</table>

Execution

<table>
<thead>
<tr>
<th>Item</th>
<th>Clause title</th>
<th>Requirement</th>
<th>Notice for inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>3F.2</td>
<td>Excavation for sewerage systems - Foundation</td>
<td>Confirm soil type with design</td>
<td>1 working day</td>
</tr>
<tr>
<td>3F.3</td>
<td>Excavation for sewerage systems - Foundation</td>
<td>Additional excavation and backfill if rock encountered at foundation level.</td>
<td>1 working day</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Item No</th>
<th>Pay items</th>
<th>Unit of measurement</th>
<th>Schedule of rates scope</th>
</tr>
</thead>
</table>
| 3F.1    | Sewer pipes      | Linear metre of pipe installed measured at the centreline of the trench Measured from centre of sewer structure | 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. This pay item shall also include pipe cutting, connection to existing and/or new pipes and making good pipes damaged during the works. Separate pay items shall be included in the Contract for each pipe material, class of pipe, pipe diameter and the following depth ranges:  
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  
For example;  
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...  
If a depth range is not specified, it is assumed that the rate includes excavation and backfill in all depth ranges. |
| 3F.2    | Sewer pipe fittings | Number                                                      | 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. A separate pay item shall be included in the Contract for each pipe fitting type. For example;  
3F.2.1 100x150 Slope junction  
3F.2.2 100x225 Slope junction  
3F.2.3 100x30 Degree bend  
Etc... |
<table>
<thead>
<tr>
<th>Item No</th>
<th>Pay items</th>
<th>Unit of measurement</th>
<th>Schedule of rates scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>3F.3</td>
<td>Flexible joints</td>
<td>Number of flexible jointing arrangements installed at the interface with each structure</td>
<td>All activities extra over Sewer pipes associated with the construction of flexible joints at sewer manholes, trench stops, scour stops and other rigid structures. A separate pay item shall be included in the Contract for each size of pipe. For example; 3F.3.1 150 Flexible joints 3F.3.2 225 Flexible joints Etc...</td>
</tr>
<tr>
<td>3F.4</td>
<td>Sewer main dead ends</td>
<td>Number</td>
<td>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. 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. A separate pay item shall be included in the Contract for each size of sewer pipe. For example; 3F.4.1 150 Sewer main dead end 3F.4.2 225 Sewer main dead end Etc...</td>
</tr>
<tr>
<td>3F.5</td>
<td>Sewer main sealing discs</td>
<td>Number</td>
<td>All activities associated with the construction of sealing discs on sewer mains including supply and installation. A separate pay item shall be included in the Contract for each size of sewer pipe. For example; 3F.5.1 150 Sewer main sealing disc 3F.5.2 225 Sewer main sealing disc Etc...</td>
</tr>
<tr>
<td>3F.6</td>
<td>Sewer tie dead ends</td>
<td>Number</td>
<td>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. A separate pay item shall be included in the Contract for each size of sewer tie. 3F.6.1 100 Sewer tie end cap 3F.6.2 150 Sewer tie end cap</td>
</tr>
<tr>
<td>Item No</td>
<td>Pay items</td>
<td>Unit of measurement</td>
<td>Schedule of rates scope</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------</td>
<td>---------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3F.7</td>
<td>Scour stops</td>
<td>Number</td>
<td>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. A separate pay item shall be included in the Contract for each scour stop pipe diameter. For example; 3F.7.1 150 Scour stop 3F.7.2 225 Scour stop Etc...</td>
</tr>
<tr>
<td>3F.8</td>
<td>Trench stops</td>
<td>Number</td>
<td>All activities associated with the construction of trench stops on sewer pipes including supply, placement, and finish of filter pipe, sandbags and compressible membrane. A separate pay item shall be included in the Contract for each trench stop pipe diameter. For example; 3F.8.1 150 Trench stop 3F.8.2 225 Trench stop Etc...</td>
</tr>
<tr>
<td>3F.9</td>
<td>Connect to existing sewer</td>
<td>Each connection</td>
<td>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. A separate pay item shall be included in the Contract for each pipe diameter and structure type. For example; 3F.9.1 150 connection to existing manhole 3F.9.2 300 connection to existing manhole Etc...</td>
</tr>
<tr>
<td>3F.10</td>
<td>BVR</td>
<td>Number</td>
<td>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. This pay item shall include backfilling and compaction around the structure.</td>
</tr>
<tr>
<td>3F.11</td>
<td>BVR &gt; 0.45m</td>
<td>Cumulative depth in metres measured as additional depth per BVR to nearest 100mm</td>
<td>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.</td>
</tr>
<tr>
<td>Item No</td>
<td>Pay items</td>
<td>Unit of measurement</td>
<td>Schedule of rates scope</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>---------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>3F.12</td>
<td>Sewer RP</td>
<td>Number</td>
<td>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. This pay item shall include backfilling and compaction around the structure.</td>
</tr>
<tr>
<td>3F.13</td>
<td>Sewer MS</td>
<td>Number</td>
<td>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. This pay item shall include backfilling and compaction around the structure. A separate pay item shall be included in the Contract for each structure.</td>
</tr>
<tr>
<td>3F.14</td>
<td>Sewer RP &amp; MS Class D covers</td>
<td>Number</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 3F.15   | Pipe and Trench Protection | m³ of placed concrete | 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. A separate pay item shall be included in the Contract for each trench protection type.  
  3F.15.1 Concrete bedding.  
  3F.15.2 Concrete encasing |
<table>
<thead>
<tr>
<th>Item No</th>
<th>Pay items</th>
<th>Unit of measurement</th>
<th>Schedule of rates scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>3F.16</td>
<td>Sewer MH</td>
<td>Number</td>
<td>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. 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 maintenance hole size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3F.16.1 1050 SMH&lt;br&gt;3F.16.2 1200 SMH&lt;br&gt;3F.16.3 1500 SMH</td>
</tr>
<tr>
<td>3F.17</td>
<td>Sewer MH</td>
<td>Cumulative depth in metres measured as additional depth per MH to nearest 100mm</td>
<td>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.</td>
</tr>
<tr>
<td>&gt;1.45m</td>
<td></td>
<td></td>
<td>3F.17.1 1500 SMH&lt;br&gt;3F.17.2 1600 SMH&lt;br&gt;3F.17.3 1750 SMH</td>
</tr>
<tr>
<td>3F.18</td>
<td>Class D access covers</td>
<td>Number</td>
<td>All activities extra over Sewer MH associated with construction of Class D access covers for sewer maintenance holes.</td>
</tr>
<tr>
<td>3F.19</td>
<td>VD</td>
<td>Number</td>
<td>All activities extra over Sewer MH associated with construction of vertical drops in sewer maintenance holes. A separate pay item shall be included in the Contract for each drop pipe diameter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3F.19.1 150 Drop pipe&lt;br&gt;3F.19.2 225 Drop pipe&lt;br&gt;3F.19.3 300 Drop pipe</td>
</tr>
<tr>
<td>3F.20</td>
<td>VD &gt;Min Drop</td>
<td>Cumulative depth in metres measured as additional depth per VD to nearest 100mm</td>
<td>All activities extra over VD associated with construction of vertical drops in sewer maintenance holes greater than the minimum drop height. A separate pay item shall be included in the Contract for each drop pipe diameter.</td>
</tr>
<tr>
<td>&gt;0.45m</td>
<td></td>
<td></td>
<td>3F.20.1 150 Drop pipe &gt; 0.45m&lt;br&gt;3F.20.2 225 Drop pipe &gt; 0.56m&lt;br&gt;3F.20.3 300 Drop pipe &gt; 0.68m</td>
</tr>
<tr>
<td>3F.21</td>
<td>Ladders</td>
<td>Number</td>
<td>All activities extra over Sewer MH associated with supply and installation of ladders for sewer maintenance holes. A separate pay item shall be included in the Contractor for each SMH.</td>
</tr>
<tr>
<td>Item No</td>
<td>Pay items</td>
<td>Unit of measurement</td>
<td>Schedule of rates scope</td>
</tr>
<tr>
<td>---------</td>
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<td>---------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>3F.22</td>
<td>Landings</td>
<td>Number</td>
<td>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.</td>
</tr>
<tr>
<td>3F.23</td>
<td>Special chambered MH</td>
<td>Number</td>
<td>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...</td>
</tr>
<tr>
<td>3F.24</td>
<td>Contractor works on existing sewer</td>
<td>Lump sum</td>
<td>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...</td>
</tr>
<tr>
<td>3F.25</td>
<td>Works by the Sewer Authority</td>
<td>Provisional sum</td>
<td>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.</td>
</tr>
<tr>
<td>3F.26</td>
<td>CCTV Camera</td>
<td>Per linear metre of pipe filmed.</td>
<td>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.</td>
</tr>
<tr>
<td>3F.27</td>
<td>Vacuum testing</td>
<td>Number</td>
<td>This Pay Item shall include all costs associated with carrying out vacuum testing of sewer maintenance holes in accordance with Authority requirements.</td>
</tr>
</tbody>
</table>