ACT Government

# TRENCHING FOR UNDERGROUND SERVICES 03A

MUNICIPAL INFRASTRUCTURE TECHNICAL SPECIFICATION

**03 - UNDERGROUND SERVICES**

Transport Canberra and City Services

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# 1 TRENCHING FOR UNDERGROUND SERVICES

## 1.1 General

### 1.1.1 Responsibilities

#### 1.1.1.1 General

Requirement: Provide trenching for underground services as documented.

Exclusions: The construction of open drains is not included within this specification, refer to *MITS 06A Concrete kerbs and open drains.*

#### 1.1.1.2 Precedence

Precedence: The technical requirements of, or any standard drawing provided by any Utility Authority , including 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

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 03B | Pipe drainage |
| MITS 03C | Precast box culverts |
| MITS 03D | Drainage structures |
| MITS 03E | Water supply reticulation |
| MITS 03F | Sewerage systems reticulation |
| MITS 03G | Service conduits |
| MITS 03H | Road openings and restorations |
| MITS 03I | Subsurface drainage |
| 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 1141 | Methods for sampling and testing aggregates |
| AS 1141.11.1 | Particle size distribution – Sieving method |
| AS 1289 | Methods of testing soils for engineering purposes |
| AS 1289.3.2.1 | Soil classification tests – Determination of the plastic limit of a soil - Standard method |
| AS 1289.3.3.1 | Soil classification tests – Calculation of the plasticity index of a soil |
| AS 1289.4.2.1 | Soil chemical tests – Determination of the sulfate content of a natural soil and the sulfate content of the groundwater – Normal method |
| AS 1289 4.3.1 | Soil chemical tests – Determination of the pH value of a soil – Electrometric method |
| AS 1289 4.4.1 | Soil chemical tests – Determination of the electrical resistivity of a soil – Method for sands and granular materials |
| AS 1289.5.4.1 | Soil compaction and density tests – Compaction control test – Dry density ratio, moisture variation and moisture ratio |
| AS 1289.5.7.1 | Soil compaction and density tests – Compaction control test – Hilf density ratio and Hilf moisture variation (Rapid method) |
| AS/NZS 2566 | Buried flexible pipelines |
| AS/NZS 2566.1 | Structural design - Commentary |
| AS/NZS 2566.2 | Installation |
| AS 3600 | Concrete structures |
| AS/NZS 3725 | Design for installation of buried concrete pipes |
| AS/NZS 3725 | Supp 1: Loads on buried concrete pipes – Commentary (Supplement to AS/NZS 3725) |
| AS 3735 | Concrete structures retaining liquids |

**Icon Water**

Water Supply and Sewerage Standards

#### 1.1.3.2 Other publications

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

**Institute of Public Works Engineering Australia (IPWEA)**

IPWEA (NSW) Specification for the supply of recycled materials for pavements, earthworks and drainage (Greenspec)

**Safe Work Australia**

Excavation Code of Practice

#### 1.1.3.3 TCCS Reference Documents

Reference document 7 Operational acceptance submissions

Reference document 8 WAE quality records

Reference document 9 Final acceptance submissions

## 1.1.4 Interpretation

#### 1.1.4.1 Abbreviations

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

**DN:** Nominal diameter of the pipe.

**TCCS:** Territory and Municipal Services, ACT Government, and its successors.

#### 1.1.4.2 Definitions

General: For the purpose of this Specification, the definitions of terms used to define the components of the road reserve are in conformance with *AS 1348, Glossary of Austroads Terms* and *AGRD03*, the definitions given below also apply:

**Inadequate foundation material:** Material beneath or adjacent to the proposed drainage structures which the Authorised Person deems to be of insufficient strength to support the structure and loads on the structure, or material whose characteristics the Authorised Person deems would adversely affect the performance or construction of the drainage structure.

**Standard Compaction:** Compaction determined by *AS 1289.5.7.1.*

## 1.1.5 Hold points and witness points

### 1.1.5.1 Notice

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

**Table 3A-1 Hold point table**

| Item | Clause title | Requirement | Notice for inspection | Release by |
|---|---|---|---|---|
| **Materials** | | | | |
| **3A.1** | Bedding, support and backfill material - General | Proposed use of any recycled material must be approved. | 10 working days prior to ordering | Authorised Person |
| **Execution** | | | | |
| **3A.2** | Site Establishment – Set out of trenches | Submit survey set-out of trenches for approval | 1 working days prior to proceeding | Authorised Person |
| **3A.3** | Excavation - Shoring | Submit documentation of the proposed method of trench support | 3 working days prior to excavation of trenches | Authorised Person |
| **3A.4** | Excavation for drainage systems - Foundation | Confirm soil type with design | 1 working day | Authorised Person |
| **3A.5** | Excavation for drainage systems - Foundation | Inspect any area of the foundation including the sides of the trenches that may contain unsuitable material. | 1 working day | Authorised Person |

**Table 3A-2 Witness point table**

| Item | Clause title | Requirement | Notice for inspection |
|---|---|---|---|
| **Materials** | | | |
| **3A.1** | General – Certificate of Conformity | Certification verifying conformity with the specification | 1 working day prior to arrival onsite |
| **Execution** | | | |
| **3A.3** | Site Establishment – Construction Traffic | Submit certification and verification of protection measures | 3 working days |
| **3A.4** | Bedding and backfilling - Backfilling | Do not backfill against in situ concrete structures within 14 days of concrete placement in accordance with structural design | 2 working days |

# 1.2 Materials

## 1.2.1 General

### 1.2.1.1 Certificate of conformity

Verification: Provide certificates of conformance to the specification for all pipes, culverts, precast concrete units, access covers, road grates or frames and all materials and components.

Certification: Identify the item and record the inspection and test records that verify conformity.

This is a **WITNESS POINT**.

Recycled material: To MITS 03L Road opening and restorations. Submit to Authorised Person for approval any recycled material proposed.

This is a **HOLD POINT**.

### 1.2.1.2 Removal of Redundant Stormwater Structures

Excavate, break out and remove and dispose of redundant stormwater structures as identified on design plans. Make good, backfill and compact the void to subgrade level.

## 1.2.2 Bedding, support and backfill for stormwater

### 1.2.2.1 Bed and haunch zones

Material for bed and haunch zones: Select fill to conform to the following:

- Particle size distribution: To the Grading limits for bed and haunch zones table.
- Plasticity index: To *AS 1289.3.2.1* and *AS 1289.3.3.1* with a maximum of 6.

**Table 3A-3 Grading limits for bed and haunch zones (stormwater) table**

| Test Method | Property<br>Material passing AS sieve | Requirement<br>% by mass |
|---|---|---|
| ***AS 1141.11.1*** | 19.0 mm | 100 |
| | 2.36 mm | 50 to 100 |
| | 0.60 mm | 20 to 90 |
| | 0.30 mm | 10 to 60 |
| | 0.15 mm | 0 to 25 |
| | 0.075 mm | 0 to 10 |

### 1.2.2.2 Side and overlay zones

Fill material: Select fill material for side and overlay zones of pipes, box culverts and adjacent to other drainage structures to conform to the following:

- Maximum dimension: 50mm.
- Particle size distribution: To the **Grading limits for side and overlay zones (stormwater) table**
- Plasticity index: Between 2 and 12 to *AS 1289.3.2.1* and *AS 1289.3.3.1.*

**Table 3A-4 Grading limits for side and overlay zones (stormwater) table**

| Test Method | Property<br>Material passing AS sieve | Requirement<br>% by mass |
|---|---|---|
| ***AS 1141.11.1*** | 75.0 mm | 100 |
| | 9.5 mm | 50 to 100 |
| | 2.36 mm | 30 to 100 |
| | 0.60 mm | 15 to 50 |
| | 0.075 mm | 0 to 25 |

#### 1.2.2.3 Material adjacent to weepholes

Requirement: Conform to the following:

- Clean, graded, hard and durable stone or river gravel.
- Nominal particle sizes between 10 and 50mm.
- Maximum particle dimension < 50mm.
- Minimum particle dimension < 5% by mass passing the 9.5mm AS sieve.

#### 1.2.2.4 Flexible pipes

Embankment material: If using flexible pipes and the embankment method, provide embankment material to *AS/NZS 2566.1 clause 3.3* or *AS/NZS 2566.2 Appendix G.*

# 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.*

### 1.3.2.2 General

Clearing and grubbing: Clear, grub and dispose of debris along the alignment of underground services to *MITS 02A Clearing and grubbing.*

Open drains: Provide open drains, associated embankments and protective linings in conformance with *MITS 06A Concrete kerbs and open drains.*

### 1.3.2.3 Temporary drainage during construction

General: For each part of the drainage system, install the erosion and sedimentation control measures before commencing the excavation. Make adequate provision for runoff flows at drainage works under construction or at surrounding areas/structure.

Control of erosion and sedimentation: Conform to *MITS 00C Control of erosion and sedimentation*.

Trench drainage: Where trenches cannot be drained by gravity, provide pumping equipment to keep excavations dewatered. Do not drain to sewer.

Material and equipment: Locate material and equipment clear of watercourses or secure to prevent danger or damage in the event of large runoff flows.

Swales and buffer strips: Protect during construction or utilise the swale as a temporary runoff control measure. Provide geotextile with a shallow 50mm topsoil and instant turf laid perpendicular to the flow path.

Stabilisation of topsoil areas: Immediately following earthworks where required, stabilise the topsoil to *MITS 00C Control of erosion and sedimentation* for temporary stabilisation or *MITS 09 Landscape* for permanent stabilisation.

### 1.3.2.4 Set out of trenches

Requirement: Set out the service trenches and identify the following:

- The location, lengths and levels of service trenches and pits.
- The location and levels of any service crossings.

This is a **HOLD POINT**.

Changes by contractor: Submit for approval any proposed change to the set out of drainage structures, including but not limited to culvert/pipe location, length, invert levels, culvert strength, pipe class conditions of installation or cover to suit construction procedures, and provide proposed amended design in addition to the designed set-out.

#### 1.3.2.5 Excavation near underground services and trees

Utility service location and protection: To *MITS 00A General requirements.*

Protection of existing trees: To *MITS 02A Clearing and grubbing.*

#### 1.3.2.6 Construction traffic

Protection measures: If proposing to move heavy construction plant or vehicles over pipes or box culverts structures, provide verification and certification of protective measures.

This is a **WITNESS POINT.**

#### 1.3.2.7 Existing structures

Existing redundant drainage structures: Demolish, remove and recycle or legally dispose of existing redundant pipe culverts, head walls and pits as shown on the drawings. Redundant structures may be reused in the works if approved by the Authorised Person.

Backfill voids: Any voids created by removal of redundant structures shall be backfilled in accordance with this Specification and *MITS 03H Road opening and restorations.*

## 1.3.3 Excavation

#### 1.3.3.1 General

Topsoil: Remove and stockpile topsoil in conformance with *MITS 02A Clearing and grubbing* and *MITS 02B Bulk earthworks* before undertaking stormwater drainage excavation.

Open excavations: Open excavations and open ends of pipes are to be left in a safe and secure condition outside working hours. Minimise the length of open excavation ahead of service laying.

Barriers: Provide suitable barriers at least 900mm high for all accessible open excavations into which a person could fall more than 1.8m.

Use of explosives: To *MITS 02B Bulk earthworks.*

#### 1.3.3.2 Shoring

Requirement: Provide any shoring, sheet piling or other stabilisation of the sides of trench excavations necessary to conform to the *Scaffolding and Lift Act, ACT Scaffolding and Lifts Regulation* and *Safe Work Australia's Excavation Work Code of Practice*.

Trenching: All trenches greater than 2.5m long or 1.5m deep shall be adequately supported by one of the following methods:

- Shoring by shielding or other comparable means;
- Benching;
- Battering.

Details of the proposed trench support system shall be provided to the Authorised Person.

This is a **HOLD POINT**.

Risk Management: Where there is a risk of engulfment from a requirement for someone to enter the trench, the above control measures shall be implemented regardless of depth.

Geotechnical: Shoring, benching and battering may not be required if written advice is received from a geotechnical engineer that all sides of the trench are safe from collapse.

Shoring: Where shoring is required, ladders shall also be provided. Shoring shall be progressively placed as close as practical to the excavation equipment as excavation occurs. A Risk Assessment shall be used to determine whether any part of the trench may be left unsupported during mechanical excavation. Shoring shall be no more than 3.3m behind the face of excavation. Workers shall not work ahead of the shoring protection if it is being progressively installed.

Trench spoil: Excavated material shall be placed no closer than 0.5m from the edge of the trench and outside the area if influence for trench stability. Suitable spoil stockpile locations shall be based on the ground conditions and geotechnical advice.

Timber Shoring: No timbering shall be left in the backfilled trench within 1.2m of finished surface. The Contractor shall obtain the approval of the Authorised Person prior to backfilling any trench with timbering left in place.

#### 1.3.3.3 Trench excavation

Excavation level: Excavate trench or foundation for the works to the designed width and to the underside of the bedding or foundation. Do not disturb material below this level. Remove all loose material.

Requirements: Conform to the following requirements for trench excavation:

- Minimum cover requirements as documented.
- Maintain trench excavation in a stable condition.
- Minimise the length of the open trench at any one time.
- Align the trench centreline with the design pipeline centreline.

Trench width: Do not excavate > 500mm over the minimum trench width.

Widen for fittings: Widen the trench where necessary for the installation of fittings and structures.

Over excavation: If a trench is excavated to excess width or caves in due to inadequate support, or the surrounding nature of the ground is poor quality material, the Authorised person may direct the Contractor to install the conduit under embankment conditions, or require an alternative pipe materials, or both.

Embankment installation condition: To *AS 2566.2*. Before placement of bedding and laying pipes, place and compact embankment fill to a height above the top of the bed zone of at least 0.7 times the external diameter of the pipe and for a minimum lateral distance outside each trench wall of 2.5 times the external diameter of the pipe. Place earthworks to *MITS 02B Bulk earthworks.*

Trench installation condition: Complete the embankment to the underside of the selected material zone before starting the excavation.

Maximum trench depth: Excavate no more than 50mm below the bedding level or invert of the pipe, or as otherwise shown on the drawings.

#### 1.3.3.4 Stormwater pipes

Rock foundations: Excavate trenches to 75mm below the underside of the pipe barrel and socket or coupling, or as otherwise shown on the drawings.

Trench size for pipelines: Excavate the trench to *AS/NZS 3725* for concrete pipes, or *AS 2032* for UPVC pipes or *AS/NZS 2566* for flexible pipes. For pipes with sockets protruding beyond the barrel, chases shall be cut into the bed of the foundation such that each pipe is fully supported along the length of the barrel and the socket is not subject to point loading. The width of trenches for curved pipelines shall be adequate to allow correct jointing of rubber ring jointed pipes. Ensure a uniform fall to the discharging end of the pipeline.

Over excavation: If a trench is excavated to excess width or collapses due to inadequate shoring, or the surrounding nature of the ground is poor quality material, the Authorised Person may direct the Contractor to install the pipe under embankment conditions, or require a pipe of higher strength class, or both, without additional payment.

#### 1.3.3.5 Drainage structures other than pipes

Excavation: Provide clear width between the structure wall and the face of the excavation as the greater of the following:

- 300mm.
- 1/3 of the excavation face height.

#### 1.3.3.6 Water supply and sewer pipes

Water supply and sewer: Trench dimensions to *Icon Water Water Supply and Sewerage Standards*

#### 1.3.3.7 Utility trenches

Trench size: As shown on the drawings and the following:

- Minimum 300mm wide for single conduit installation.
- Minimum 600mm wide for shared trench installation.

Excavation level: Excavate trench to the designed level, provide a minimum grade of 0.5%.

### 1.3.4 Foundation

General: The foundation shall be assessed for conformity to select fill as defined in *AS 3725.*

This is a **HOLD 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 trench service. 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 and replace the material as per **Bedding and backfilling for Stormwater** and the **Bedding material compaction requirements (stormwater) table,** or to .the relevant specification:

- *MITS 03E Water supply reticulation*
- *MITS 03F Sewerage systems reticulation*
- *MITS 03G Service conduits*
- *MITS 03H Road openings and restorations*
- *MITS 03I Subsurface drainage*

#### 1.3.4.1 Stormwater pipes

Rock foundation: Compact the additional excavation with material conforming to the requirements for HS3 pipe support as per the **Pipe installation dimensions (stormwater) table**. Remove or cut back exposed boulders in trench bottoms.

Side zones of pipe trenches must have a density and stiffness not less than those of the adjacent compacted fill, to the height of 0.5D above the bottom of the pipe for a lateral distance D beyond the trench wall in accordance with *AS/NZS 3725 clause 9.2.3.1* for Type HS3 support.

## 1.3.5 Bedding and backfilling for Stormwater

#### 1.3.5.1 Pipe Bedding

Type: Provide bedding depths and compaction for concrete pipes to the **Pipe installation dimensions (stormwater) table.**

### Table 3A-5 Pipe installation dimensions (stormwater) table

| | | Pipe support type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | U | H1 | H2 | H3 | HS1 | HS2 | HS3 |
| **Dimension (minimum)** | **x** | 75 on rock<br>Nil on soil | 100 for D < 1500<br>150 for D > 1500 | | 0.25 D<br>but >100 | 100 for D < 1500<br>150 for D > 1500 | | |
| | **y** | - | 0.1D | 0.3D | 0.3D | 0.1D | 0.3D | 0.3D |
| | **z** | - | - | - | - | > 0.7D | | |

D = External diameter of pipe

Embedment geometry: To the **Embedment geometry (stormwater) table**.

**Table 3A-6 Embedment geometry (stormwater) table**

| Diameter of pipe | | Minimum values (mm) | | |
|---|---|---|---|---|
| | | Bedding | Side Support | Overlay |
| **>300** | **≤450** | 100 | 200 | 150 |
| **>450** | **≤900** | 150 | 300 | 150 |
| **>900** | **≤1500** | 150 | 350 | 200 |

Stormwater drainage minimum cover: Minimum cover over pipelines shall be 600mm from top of pipe to finished surface level. For pipelines under road pavements, the required cover shall be measured from top of pipe to pavement subgrade level. Where this is not possible, a higher class pipe shall be used.

#### 1.3.5.2 Backfilling

In situ concrete structures: Do not backfill against in situ concrete drainage structures within 14 days of concrete placement or in accordance with the structural design.

This is a **WITNESS POINT**.

Trench backfill material: Backfill the remainder of the trench to the underside of the subgrade, or selected material zone in conformance with this Specification.

Service ties: Leave service ties exposed in the trench until their positions have been recorded if required by the Contract.

Sequence: Commence backfilling and compaction at the pipe or wall to confine future backfill material. Backfill as soon as possible. Reinstate existing surface conditions or landscape to *MITS 09 Landscape* where required by the Drawings.

Dimension: Place backfill around the pipe or structure, equally balanced on both sides, to the minimum dimension shown on the drawings or as directed.

Tolerance: Check the shape of the culvert during backfilling to make sure that on completion of backfilling, the vertical and horizontal centreline dimensions of the pipe or structure do not vary from the manufacturer's specified dimensions by more than ± 2% for pipes.

Backfill under roads, paths and driveways: To *MITS 03H Road openings and restorations.*

Backfill adjacent to kerbs: To *MITS 06A Concrete kerbs and open drains.*

## 1.3.6 Compaction for Stormwater

### 1.3.6.1 Foundations, bedding and backfilling

Foundations, bedding (other than for pipe drainage) and backfilling: To the **Compaction table**, tested in conformance with *AS 1289.5.4.1* for standard compactive effort.

**Table 3A-7 Compaction (stormwater) table**

| Zone | Relative compaction (SDD) |
|---|---|
| Foundations or trench base: | |
| To a depth of 150 mm below foundation levels | 95% |
| Material replacing unsuitable material | 95% |
| **Bedding material** | 95% |
| Selected backfill and ordinary backfill material: | |
| Below 1.5 m of finished surface | 95% |
| Within 1.5 m of finished surface | 100% |
| **Backfill material within the selected material zone** | 100% |

Compaction layers thickness: Compact all material in layers not exceeding 150mm compacted thickness for the first 600mm depth, then maximum 300mm layer thickness to allow consistent compaction to the specified density before the next layer is commenced.

Moisture content range: At the time of compaction, adjust the moisture content of the material to permit attainment of the required compaction (within the range 60% to 95% of the optimum moisture content), as determined by *AS 1289.5.7.1* (standard compaction).

### 1.3.6.2 Compacting adjacent to culverts or drainage structures

Method: If compacting adjacent to culverts or drainage structures, adopt compaction methods which do not cause damage or misalignment.

Damage: Give notice and rectify any damage caused.

### 1.3.6.3 Additional requirements for compaction of stormwater pipe bedding

Protection of the pipe from construction damage: If required, adjust the layer thickness to avoid damaging the pipe e.g. for the first placed layer above the pipe crown in the overlay zone.

Bed and haunch zones compaction: Select fill material compaction to the appropriate pipe support requirements for concrete pipes in the **Bedding material compaction requirements (stormwater) table**.

**Table 3A-8 Bedding material compaction requirements (stormwater) table**

| Bedding material | | | Pipe support type | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Criteria** | Location | | U | H1 | H2 | H3 | HS1 | HS2 | HS3 |
| **Minimum Relative Compaction %** | **Bed and haunch zones** | | - | 50 | 60 | Concrete | 50 | 60 | 70 |
| ***AS1289.5.4.1*** **(Standard Compaction)** | **Side and overlay zones:** | **Cohesionless** | - | - | - | - | 50 | 60 | 70 |
| | | **Cohesive** | - | - | - | - | 85 | 90 | 95 |

Material directly under the pipe support: Place and shape the top 0.1Dmm of the bedding and haunch material directly under the pipe.

H3 pipe support including concrete bedding: Provide concrete grade N20 to AS 3600. Make sure pipe is suitably reinforced in conformance with *AS 3725* as standard elliptically reinforced pipe may not be adequate for H3 pipe support.

Cementitious stabilisation in the bedding and haunch zones: Provide cementitious stabilisation, if the impermeability of the natural ground and the slope of the drainage line are such that erosion of bedding material may occur.

## 1.3.7 Concrete work

### 1.3.7.1 General

Requirement: Supply and place normal class concrete, sprayed concrete, steel reinforcement, formwork and provide tolerances, construction joints, curing and protection to *MITS 10 Concrete works* and as shown on the drawings.

## 1.3.8 Finishing

Levels: Leave tops of trenches slightly rounded to shed water.

# 2 MEASUREMENT AND PAYMENT

## 2.1 Measurement

#### 2.1.1.1 General

Payments made to the Bill of Quantities: To *MITS 00A General requirements*, this Specification, the drawings and **Pay items.**

#### 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.
- Erosion and sedimentation control: To *MITS 00C Control of erosion and sedimentation.*
- Topsoil removal: To *MITS 02B Bulk earthworks.*
- Concrete work: To *MITS 10 Concrete works.*
- Sprayed concrete work: To *MITS 10 Concrete works.*
- Rock filled wire mattresses and gabions: To *MITS 06A Concrete kerbs and open drains.*
- Excavation and stone pitching of open drains: To *MITS 06A Concrete kerbs and open drains.*
- Miscellaneous minor concrete work: To *MITS 10 Concrete works.*
- Backfilling under roads, paths and driveways for exhumed pipes and structures: Extra over to *MITS 03H Road openings and restorations.*
- All costs associated with removal of water from excavations shall be included within respective excavation rates for stormwater pipes and drainage structures.
- All costs associated with excavation, bedding, support and backfill material for stormwater drainage, in accordance with this Specification: To *MITS 03B Pipe drainage, MITS 03C Precast box culverts* or *MITS 03D Drainage structures.*

## 2.2 Pay items

**Table 3A-9 Pay items table**

| Item No | Pay items | Unit of measurement | Schedule of rates scope |
|---|---|---|---|
| 3A.1 | 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. |
| 3A.2 | Removal of existing redundant structures | Number of structures removed | All activities associated with removal of structures including excavation of trenches in all types of material encountered including rock, non-mechanical excavation where specified, shoring, breaking out and making good, backfilling and compaction of the void to subgrade level.<br>This pay item shall also include pipe cutting, saw cutting, legal disposal of the redundant structure including fees, repairing or capping of pipes and branch connections including installation of sealing discs.<br>A separate pay item shall be included in the Contract for each structure to be removed. |
| 3A.3 | Exhume existing pipes | Linear metre of pipe removed measured at the centreline of the trench | All activities associated with removal of pipes including excavation of trenches in all types of material encountered including rock, non-mechanical excavation where specified, shoring, breaking out and making good, backfilling and compaction of the void to subgrade level.<br>This pay item shall also include pipe cutting, saw cutting, legal disposal of the redundant pipes including fees, repairing or capping of pipes and branch connections including installation of sealing discs.<br>A separate pay item shall be included in the Contract for each pipe material and diameter. |
| 3A.4 | Removal of unsuitable material from trenches | Bank $m^3$ measured in situ from the subgrade surface to the final excavated surface | This pay item refers only to unsuitable material in trenches as directed by the Authorised Person.<br>All activities associated with the excavation, loading of spoil onto trucks, haulage, disposal offsite, recycling or disposal fees and compliance with all regulatory requirements. |

ACT Government

Transport Canberra and City Services

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