

Municipal Infrastructure Technical Specification 031

Subsurface Drainage

Edition 1 Revision 1
September 2026

ACT Government

Machinery of Government changes: On 1 July 2025, administrative arrangements were made to establish the City and Environment Directorate (CED). As of the date of publication of this document, the transition from Transport Canberra and City Services (TCCS) to CED, including updates to internal organisational structure, are yet to be finalised. References in this document to the organisation TCCS are to mean CED.

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Endorsed by	Dr Jonathon Dragos	Senior Engineering Director, Technical Services Unit, Infrastructure Planning
Approved by	Tim Rampton	Executive Branch Manager, Roads ACT

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Revision register

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1/0	–	First release	Ken Marshall	July 2019
1/1	All	Template update and accessibility	Tim Rampton	September 2026
	All	Cross reference links updated		
	–	Acknowledgement of Country added		
	All	General amendments to align with layout and structure of Municipal Infrastructure Technical Specifications documents, that are non-technical in nature		
	1.1.2	Referenced documents updated		
	1.1.3	Minor update to guidance on proprietary products		
	1.1.4	Abbreviations and definitions updated		

Edition/Revision number	Clause number	Description of revision	Authorised by	Date
	1.2.3.2	Type A filter material replaced with TfNSW filter materials and selection, use and testing requirements added		
	1.2.3.3	Type B filter material replaced with TfNSW R44 drainage layer material for drainage mats		
	1.2.3.4	Type C filter material selection requirements updated for drainage mats		
	1.2.3.5	Type D filter material selection requirements updated for drainage mats		
	1.2.4.1	Geotextile filter fabric grab strength test method updated to *AS 3706.2, Method B*		
	1.3.2.3	Cross references updated for removal and replacement of unsuitable material		
	2.2	Pay items updated for trench drain and drainage mat filter materials		

Acknowledgement of Country

City and Environment Directorate (CED) acknowledges that Aboriginal people are the Traditional Owners of Australia. We acknowledge and pay respect to the Ngunnawal people as the custodians of the land and waters that we live and thrive on today and recognise any other people or families with connection to the lands of the ACT and region.

CED acknowledges that Canberra's cultural and natural heritage was maintained by the Traditional Custodians for many generations before colonial settlement on Australian soil. Aboriginal people's management of the land preserved the natural balance of local plants and animals. This knowledge of the environment in which we live is critical to the protection and restoration of our land today.

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1 Subsurface drainage

1.1 General

1.1.1 Cross references

General: The following documents are related to this Specification. The latest version of the documents is to be adopted.

1.1.1.1 ACT Legislation

Road Transport (General) Act (ACT)
Public Roads Act (ACT)
Scaffolding and Lifts Act (ACT)
Scaffolding and Lifts Regulation (ACT)
Work Health and Safety Act (ACT)

1.1.1.2 Technical Specifications

Requirement: The following Technical Specifications must be conformed to:

MITS 00 Preliminaries
MITS 01 Traffic Management
MITS 02 Earthworks
MITS 03 Underground Services
MITS 04 Flexible Pavements
MITS 06 Concrete Kerbs, Open Drains and Paving Works
MITS 08 Incidental Works
MITS 09 Landscape
MITS 10 Concrete for General Works
MITS 16 Stormwater

The full list of Technical Specifications can be accessed via the TCCS website.

1.1.1.3 Design Standards

General: The full list of Design Standards can be accessed via the TCCS website.

1.1.1.4 TCCS Reference Documents

General: The following TCCS Reference Documents are related to this Specification:

Reference Document 4	Landscape Management and Protection Plans
Reference Document 6	Requirements for Design Acceptance Submissions
Reference Document 6A	Requirements for Design Acceptance Submissions for Infill Developments
Reference Document 7	Requirements for Operational Acceptance Submission for Hard Public Infrastructure Works
Reference Document 8	Requirements for Works as Executed Records

Reference Document 9	Requirements for Final Acceptance Submission for Hard Landscape Assets and Civil Works
Reference Document 10	Requirements for Soft Landscape Consolidation and Handover
Reference Document 11	Drafting Requirements for Ref 11 Summary Drawings

The full list of TCCS Reference Documents can be accessed via the TCCS website.

1.1.2 Referenced documents[1]

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

1.1.2.1 Australian Standards

AS 1141	Methods for sampling and testing aggregates (Set)
AS 1141.11.1	Methods for sampling and testing aggregates: Method 11.1: Particle size distribution – Sieving method
AS 1141.22	Methods for sampling and testing aggregates: Method 22: Wet/dry strength variation
AS 1289	Methods of testing soils for engineering purposes (Set)
AS 1289.5.4.1	Methods of testing soils for engineering purposes: Method 5.4.1: Soil compaction and density tests – Compaction control test – Dry density ratio, moisture variation and moisture ratio
AS 1289.5.5.1	Methods of testing soils for engineering purposes: Method 5.5.1: Soil compaction and density tests – Determination of the minimum and maximum dry density of a cohesionless material – Standard method
AS 1289.5.6.1	Methods of testing soils for engineering purposes: Method 5.6.1: Soil compaction and density tests – Compaction control test – Density index method for a cohesionless material
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS 2439	Perforated plastics drainage and effluent pipe and fittings (Set)
AS 2439.1	Perforated plastics drainage and effluent pipe and fittings: Part 1: Perforated drainage pipe and associated fittings
AS 2758	Aggregates and rock for engineering purposes (Set)
AS 2758.1	Aggregates and rock for engineering purposes: Part 1: Concrete aggregates
AS 3705	Geotextiles – Identification, marking and general data
AS 3706	Geotextiles – Methods of test (Set)
AS 3706.2	Geotextiles – Methods of test: Method 2: Determination of tensile properties – Wide strip and grab method
AS 3706.3	Geotextiles – Methods of test: Method 3: Determination of tearing strength – Trapezoidal method
AS 3706.4	Geotextiles – Methods of test: Method 4: Determination of burst strength – California bearing ratio (CBR) – Plunger method
AS 3706.9	Geotextiles – Methods of test: Method 9: Determination of permittivity, permeability and flow rate

[1] Not all the documents are specifically referenced in the body of this Specification. However, they may be relied upon depending on the nature of the Works.

1.1.2.2 TfNSW Test Methods

TfNSW T201	Particle distribution of aggregates (by washing)
TfNSW T203	Particle distribution of aggregates finer than 75 µm (by washing)
TfNSW T215	Wet/dry strength variation
TfNSW T223	Determination of the point load strength of rock specimens
TfNSW T280	Determination of maximum particle dimension of road construction materials by direct measurement

1.1.2.3 Other publications

Austroads

AGPT	Guide to Pavement Technology (Set)
AGPT04G	Guide to Pavement Technology Part 4G: Geotextiles and Geogrids
AGPT10	Guide to Pavement Technology Part 10: Subsurface Drainage
AGRD03	Guide to Road Design Part 3: Geometric Design
AP-C87	Austroads Glossary of Terms

1.1.3 Standards

1.1.3.1 General

Standard: To *AGPT10.*

Proprietary products: Email CED.RoadStandards@act.gov.au for advice on proprietary products.

1.1.4 Interpretation

1.1.4.1 Abbreviations

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

ACT	Australian Capital Territory
AS	Australian Standard
CED	City and Environment Directorate
FRC	Fibre Reinforced Concrete
MIS	Municipal Infrastructure Standard
MITS	Municipal Infrastructure Technical Specification
NATA	National Association of Testing Authorities
NZS	New Zealand Standard
PAP	Principal's Authorised Person
TCCS	Transport Canberra and City Services, ACT Government, and its successors (including City and Environment Directorate)
uPVC	Unplasticised Polyvinyl Chloride

1.1.4.2 Definitions

General: For the purposes of this Specification, the definitions of terms used to define the components of the road reserve are in conformance with *AP-C87* and *AGRD03*. The definitions given below also apply:

Authorised Person: The Authorised Person is the person or body responsible for administering the Works Contract and has the same meaning as Contract Administrator, Principal's representative, Principal's Authorised Person (PAP), Superintendent or equivalent. The powers, duties and authorities of the Authorised Person are covered in the Contract.

Contract: The agreement between the Principal and the Contractor.

Contractor: The person bound to execute the work under the Contract.

Principal: Principal has the same meaning as Owner, Client and Proprietor and is the party to whom the Contractor is legally bound to construct the Works. The primary obligation of the Principal is to make payments to the Contractor.

Subsurface drainage: Includes subsoil drains, foundation drains and drainage mats.

Works: The scope of works to be executed by the Contractor in accordance with the Contract.

1.1.5 Hold points and Witness points

1.1.5.1 Notice

General: Give written notice to the Authorised Person for Hold points and Witness points in accordance with **Table 3I-1** and **Table 3I-2** respectively.

Table 3I-1 Hold points

Item	Clause title	Requirement	Notice of inspection	Release by
Materials				
HP3I.1	1.2.1.1 – Subsurface drainage pipes – General	Submit compliance certificates	5 working days before ordering	Authorised Person
HP3I.2	1.2.2.1 – Other types of subsurface drainage pipes – Alternatives	Submit details of proposed alternative pipes and evidence of conformity for approval	5 working days before ordering	Authorised Person
HP3I.3	1.2.4.1 – Geotextile – Properties	NATA compliance certificates, sample and manufacturer's instructions	5 working days before ordering	Authorised Person

Table 3I-2 Witness points

Item	Clause title	Requirement	Notice of inspection
Execution			
WP3I.1	1.3.2.3 – Site Establishment – Excavation	Unsuitable material removal and disposal to *MITS 02B Bulk Earthworks*	Progressive
WP3I.2	1.3.2.3 – Site Establishment – Excavation	Spoil site stockpile locations to *MITS 02B Bulk Earthworks*	Prior to placement

1.2 Materials

1.2.1 Subsurface drainage pipes

1.2.1.1 General

Approval: Before providing pipes, submit compliance certificate and test results determined from *AS 2439.1* as evidence that the pipes, including connections to structures, conform to the requirements of this Specification.

This is a **HOLD POINT (HP3I.1)**.

1.2.1.2 Corrugated circular plastic pipe and fittings

Pipe: Conform to the following:

(a) Standard: To *AS 2439.1*.

(b) Class: 1000, 100 mm diameter as shown on the drawings.

(c) Type: Slotted, except where shown otherwise on the drawings.

Fittings: Provide joints, couplings, elbows, tees and caps as follows:

(d) To *AS 2439.1*.

(e) To the manufacturer's recommendations.

1.2.1.3 Solid walled uPVC subsoil pipes

General: Provide subsoil pipes without slots and otherwise complying to this Specification for connection to flushing points.

1.2.2 Other types of subsurface drainage pipes

1.2.2.1 Alternatives

Approval: Perforated or slotted pipes of other materials including uPVC (unplasticised polyvinyl chloride) and fibre reinforced concrete (FRC) may be accepted as an alternative subject to compliance with this Specification. Submit full details of the type of pipe, certification from the manufacturer of its suitability and quality for use in each particular application. Address the crushing strength, flexural strength, jointing system and slotting details.

This is a **HOLD POINT (HP3I.2)**.

1.2.3 Filter material

1.2.3.1 General

Quality: Clean, hard, tough, durable particles.

Where subsoil drains are laid in or adjacent to planted areas: Ensure the PH of the filter material is within the range 6–7.

1.2.3.2 Type TfNSW filter material (F5 to F20)

Classification: Type TfNSW filter material is designated as defined sub-types as follows:

- Type TfNSW F20 filter material with nominal aggregate size of 20 mm
- Type TfNSW F14 filter material with nominal aggregate size of 14 mm
- Type TfNSW F10 filter material with nominal aggregate size of 10 mm
- Type TfNSW F7 filter material with nominal aggregate size of 7 mm
- Type TfNSW F5 filter material with nominal aggregate size of 5 mm.

Source: Crushed rock or granular material.

Use in subsoil trench drains: The following are the requirements for the selection of Type TfNSW filter material in subsoil trench drains:

(a) Type TfNSW F20 filter material and Type TfNSW F14 filter material are the default filter material types which can be adopted for all subsoil trench drains.

(b) Type TfNSW F10 filter material can only be adopted if the gradient of the subsoil trench drain is greater than 1%.

(c) Type TfNSW F7 filter material and Type TfNSW F5 filter material can only be adopted if the gradient of the subsoil trench drain is greater than 3%.*

* It is a requirement that all subsoil drains include a perforated drainage pipe enclosed in a seamless tubular filter fabric. If the tubular filter fabric is omitted from the design as a departure from specifications, then F5 or F7 filter material is not to be adopted.

Use in foundation trench drains: Permitted, as specified on the drawings or as agreed by the Authorised Person.

Requirements: Type TfNSW filter material must comply with the following:

(d) The particle size requirements of **Table 3I-3**. Determine the particle size distribution by *TfNSW Test Method T201*.

(e) The wet strength of the material must not be less than 100 kN. Determine the wet strength of the material by *TfNSW Test Method T215*. The fraction to be tested must be the proportion not passing the sieve specified in **Table 3I-3**.

(f) The wet/dry strength variation of the material must not exceed 35%. Determine the wet/dry strength variation of the material by *TfNSW Test Method T215*. The fraction to be tested must be the proportion not passing the sieve specified in **Table 3I-3**.

(g) When tested in accordance with *TfNSW Test Method T203*, the percentage of material passing the 75 µm sieve must not exceed 2% by mass.

Table 3I-3 Type TfNSW filter material particle size requirements

Grade	Nominal aggregate size[1] (mm)	Maximum coefficient of uniformity (D_{60}/D_{10})[2]	Particle size for wet strength testing not passive sieve (mm)
F20	20	1.3	13.2
F14	14	1.6	9.5
F10	10	1.9	6.7
F7	7	2.2	4.75
F5	5	2.5	2.36

[1] The nominal aggregate size is the designation of an aggregate which gives an indication of the largest aggregate size present. It is expressed as the next whole number above the largest sieve size on which aggregate may be retained.

[2] D_{60} is the particle size interpolated from a log-linear plot of the *TfNSW Test Method T201* sieve analysis, where exactly 60% of the sample is finer than the interpolated size. Similarly, D_{10} represents the particle size which 10% of the sample passes.

1.2.3.3 Type TfNSW R44 drainage layer material

Material properties: Type TfNSW R44 drainage layer material must conform to the properties specified in **Table 3I-4**. Do not use steel furnace slag aggregates in the drainage layer.

Selection of filter material in drainage mats: The filter material for use in drainage mats shall be as specified in the drawings and selected by the designer based on the requirements of the project. Where the drawings do not specify a filter material type, seek advice from the designer or geotechnical engineer.

Use in drainage mats: Type TfNSW R44 drainage layer material is permitted for use in Type A and Type B drainage mats, to *MITS 03K Drainage Mats*, if specified by the designer in the drawings or if specified by a geotechnical engineer.

Table 3I-4 Type TfNSW R44 drainage layer material requirements

Material property	Requirements	Test method
Maximum particle dimension	125 mm	Inspection, *TfNSW T280* if required
Percentage passing:		
19.0 mm AS sieve	0–15%	*TfNSW T201*
1.18 mm AS sieve	0–5%	*TfNSW T201*
75 µm AS sieve	< 0.5%[1]	*TfNSW T201*
Point Load Strength Index $I_{s(50)}$:		
Point Load Strength Index $I_{s(50)}$ of +19.0 mm fraction	min 3 MPa	*TfNSW T223*
Percentage of +19.0 mm fraction with $I_{s(50)}$ less than 3 MPa	max 10%	*TfNSW T223*
Wet/dry strength variation	max 35%	*TfNSW T215*

[1] Test only where directed.

1.2.3.4 Type C filter material

Source: Crushed rock.

Grading: To **Table 3I-5**.

Selection of filter material in drainage mats: The filter material for use in drainage mats shall be as specified in the drawings and selected by the designer based on the requirements of the project. Where the drawings do not specify a filter material type, seek advice from the designer or geotechnical engineer.

Use in drainage mats: Type C filter material is permitted for use in Type A drainage mats, to *MITS 03K Drainage Mats*, if specified by the designer in the drawings or if specified by a geotechnical engineer.

Table 3I-5 Type C filter material

Test method	Property	Requirement
AS 1141.11.1	Maximum particle size	37.5 mm
	Maximum passing the 9.5 mm AS sieve	5% by mass
	Maximum (D_{90}:D_{10})[1]	3
AS 1141.22	Minimum wet strength	100 kN
	Maximum 10% fines wet/dry variation	30%

[1] The D_{90} value is determined by sieving the material using 75 mm, 53 mm, 37.5 mm, 26.5 mm, 19 mm, 13.2 mm and 9.5 mm AS sieves, as appropriate, and then plotting the results on a graph of AS sieve size vs percentage passing. The plotted points to be joined by straight lines and the D_{90} value determined as the theoretical sieve size corresponding to 90% passing.

D_{10} denotes the theoretical size of a sieve through which 10% of the material would pass and is to be determined from the same graph used to determine the D_{90} value.

1.2.3.5 Type D filter material

Source: Uncrushed river gravel.

Description: Rounded aggregate to *AS 2758.1, Appendix B, Table B1.*

Grading: To **Table 3I-6**.

Selection of filter material in drainage mats: The filter material for use in drainage mats shall be as specified in the drawings and selected by the designer based on the requirements of the project. Where the drawings do not specify a filter material type, seek advice from the designer or geotechnical engineer.

Use in drainage mats: Type D filter material is permitted for use in Type A and Type B drainage mats, to *MITS 03K Drainage Mats*, if specified by the designer in the drawings or if specified by a geotechnical engineer.

Table 3I-6 Type D filter material

Test method	Property	Requirement
AS 1141.11.1	Maximum particle size	75 mm
	Maximum passing the 9.5 mm AS sieve	5% by mass
	Maximum (D_{90}:D_{10})	3
AS 1141.22	Minimum wet strength	100 kN
	Maximum 10% fines wet/dry variation	30%

1.2.3.6 Type E filter material

General: Type E filter material shall be used in subsoil drains within planting beds and playground softfall areas where nominated on the drawings.

Requirement: Where subsoil drains are laid in or adjacent to planted areas, ensure the pH of the filter material is within the range 6–7.

Source: Clean washed drainage sand.

Grading: To **Table 3I-7**.

Table 3I-7 Type E filter material

Test method	Property Material passing AS sieve	Requirement % by mass
AS 1141.11.1	9.5 mm	100
	4.75 mm	98 to 100
	2.36 mm	70 to 100
	1.18 mm	30 to 78
	600 µm	2 to 15
	300 µm	0 to 4
	150 µm	0 to 1

1.2.3.7 No fines concrete

Use: Where specified on the drawings.

Material properties: Conform to the following:

(a) Aggregate to cement ratio: Between 6:1 and 8:1 by mass.

(b) Water to cement ratio: 0.35 to 0.45 by mass.

(c) Shape: Minimum 98% by mass of aggregate with one fractured face.

Grading: To **Table 3I-8**.

Table 3I-8 No fines concrete filter material

Test method	Property Material passing AS sieve	Requirement % by mass
AS 1141.11.1	26.5 mm 19.0 mm 9.5 mm	100 95 to 100 0 to 5

1.2.4 Geotextile

1.2.4.1 Properties

Type: As shown on the drawings.

Geotextile materials for curtain drains: Polyester, polypropylene or polyethylene.

Minimum material properties: Filter fabric shall be a non-woven type with the following properties:

(a) Elongation: ≥ 30% to *AS 3706.4*

(b) Grab Strength: > 500 N to *AS 3706.2, Method B*

(c) Tear Strength: > 180 N to *AS 3706.3*

(d) Filtration: To *AGPT04G, Table 4.1* flow rate ≥ 50 litres/m^2/second and permittivity ≥ 0.5/second to *AS 3706.9*

Submit: For approval the proposed geotextile material and NATA (National Association of Testing Authorities) certificates of compliance. Submit a sample of the fabric, the manufacturer information and installation instructions.

This is a **HOLD POINT (HP3I.3)**.

Classification: Properties, functions, design and construction requirements to *AGPT04G*.

Specification: Material type and minimum mass requirements as shown on the drawings.

Quality: Free of any flaws, stabilised against UV radiation, rot proof, chemically stable, low water absorbency. Filaments must resist delamination and maintain their relative dimensional stability.

Robustness and strength: Conform to the following:

(e) Classifications for robustness and strength cited in *AGPT04G*.

(f) Select material based on tests and subgrade conditions for the relevant location/function.

(g) Rate of water flow: Under 100 mm constant head determined using the perpendicular flow test to conform to *AS 3706.9.*

1.2.4.2 Storage

Storage: Under protective cover or wrapped with a waterproof, opaque UV protective sheeting to avoid any damage prior to installation. Store to conform to manufacturer's recommendations.

Damage: Must not be stored directly on the ground or in any manner that may adversely affect the material by heat, dirt or damage.

Label: Make sure the geotextile material is clearly labelled showing manufacturer, type and batch number.

1.2.4.3 Seamless tubular filter fabric

Material: Either polypropylene or polyester seamless knitted tubular filter fabric.

Arrangement: Enclose slotted pipe 100 mm diameter.

Properties: Free of imperfections in weave or yarn, abrasion resistance and weave stability qualities such that it does not form holes, ladder, de-weave, tear or unravel more than 5 mm from a cut end.

Representative large opening size: Between 200 µm and 500 µm.

Damaged filter fabric: Remove and replace filter fabric that is torn, excessively stretched or otherwise damaged during transportation, storage, fitting of the fabric or pipe laying.

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 00 Preliminaries*.

1.3.2.2 General

Excavation: Conform to *MITS 03A Trenching for Underground Services* and *MITS 02B Bulk Earthworks*.

1.3.2.3 Excavation

Over-excavation: If the trench is excavated below the documented level, backfill the trench to the documented level with non-porous subgrade material compacted to a relative compaction of at least 95% Standard Compaction as determined by *AS 1289.5.4.1*.

Unsuitable material: Notify the Authorised Person of any unsuitable material and seek a direction for removal. Dispose of the unsuitable material as approved or directed, in accordance with *MITS 02B Bulk Earthworks*. Replace unsuitable material to this Specification, *MITS 03J Subsoil and Foundation Drains* and *MITS 03A Trenching for Underground Services*.

This is a **WITNESS POINT (WP3I.1 and WP3I.2)**.

1.3.2.4 Backfilling

Backfill: To *MITS 03J Subsoil and Foundation Drains* or *MITS 03K Drainage Mats*. Stockpile and handle filter material to prevent contamination.

Compaction: Compact cohesionless material to a Density Index of 70% determined by *AS 1289.5.6.1.*

1.3.3 Outlet structures

1.3.3.1 Discharge

Subsurface drainage pipes: Connect discharge into sumps or to outlet structures. The outlet of the subsurface drain shall not be lower than the highest obvert of other pipes at the point of connection.

(a) Where discharge is to the surface or an open drain, construct a drainage outlet in accordance with *ACTSD-0302*, unless otherwise shown on the drawings.

(b) Where discharge is to drainage structures, provide 100 mm diameter uPVC pipe sleeving through the penetration.

Outlet intervals: 150 m maximum.

Rodent proofing: Secure outlets, including those discharging into sumps, with galvanised wire netting.

1.3.3.2 Outlet pipe

Type: Provide unslotted outlet pipes from subsurface drains.

Levels: Ensure no point in an outlet pipe is higher than the pipe at the end of the curtain drain.

Concrete for outlet structures: Concrete to conform to *MITS 10 Concrete for General Works*.

1.4 Completion

1.4.1 Submissions

Work as Executed Records: To *MITS 00B Quality Construction*.

2 Measurement and payment

2.1 Measurement

2.1.1 General

Payments made to the Bill of Quantities: To *MITS 00A General Requirements*, this Specification, the drawings and **Clause 2.2**.

2.1.2 Methodology

The following methodology will be applied for measurement and payment:

(a) Allow for all work, materials, testing and quality assurance requirements in each Pay item.

(b) Temporary erosion and sedimentation control measures: To *MITS 00C Control of Erosion and Sedimentation*.

(c) Removal of unsuitable material: To conform to *MITS 03A Trenching for Underground Services*.

(d) Subsoil drains: To *MITS 03J Subsoil and Foundation Drains*.

(e) Drainage mats: To *MITS 03K Drainage Mats*.

(f) Subsurface drainage for ponds, wetlands and bioretention systems: To *MITS 16 Stormwater*.

(g) Endwall outlet structures: Paid under this Specification.

(h) Concrete work for outlet structures: Paid under this Specification and not *MITS 10 Concrete for General Works*.

2.2 Pay items

Table 3I-9 Pay items

Item No	Pay items	Unit of measurement	Schedule of rates scope
3I.1	Filter material for trench drains (Type TfNSW filter material and Type E)	Linear metre of subsoil pipe installed measured along the centreline	All activities extra over subsoil drains associated with supply, placement and compaction of filtration and capping materials
3I.2	Filter material for Type A and Type B drainage mats (Type TfNSW R44 drainage layer material, Type C, and Type D)	m^2 of drainage blanket constructed	All activities extra over drainage mats associated with supply, placement and compaction of filtration material
3I.3	No fines concrete capping for trench drains	Linear metre of subsoil pipe installed measured along the centreline	All activities extra over subsoil drains associated with supply and placement of no fines concrete, including formwork

Item No	Pay items	Unit of measurement	Schedule of rates scope
3I.4	Endwall outlet structures for subsurface drainage pipes	Number	All activities associated with the construction of outlet structures for subsurface drainage pipe, including excavation in all types of material encountered, including rock, supply and installation of outlets, concrete formwork, supply, placement, curing and finish of in situ concrete, vermin protection, connection to subsurface drainage and backfill
3I.5	Outlet to stormwater structures	Number	All activities associated with the construction of the outlet connection to stormwater structures, including excavation in all types of material encountered, including rock, connection to stormwater structures and subsurface drainage, vermin protection, backfilling and making good of all works