Institute of
Public Works
Engineering Australasia

Tasmania Division

TASMANIAN MUNICIPAL STANDARD

SPECIFICATIONS

March 2020

TASMANIAN MUNICIPAL STANDARD SPECIFICATIONS

SPECIFICATIONS

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1 GENERAL

1.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjuction with the other Parts of this set of documents.

1.2 GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract must be Australian Standard General Conditions of Contract either AS 2124, AS 4000 or other General Conditions of Contract nominated by the Principal. All works must be carried out in accordanc with the General Conditions of Contract, this specification, the Drawings and to the satisfaction of the Superintendent.

1.3 INTERPRETATION OF DOCUMENTS

Clauses in this specification must take precedence over Clauses in the General Conditions of Contract and notes and details on the Drawings must take precedence over this specification.

1.4 AUSTRALIAN STANDARDS

Wherever reference to an Australian Standard is mentioned it must imply reference to the latest issue of the particular Australian Standard at the commencement of the Contract.

1.5 ENDORSED DRAWINGS

The Drawings referred to in this specification must be those endorsed by the Superintendent. The Drawings must not be varied without the written approval of the Superintendent.

The Standard Drawings referred to in this Specification must be those as issued by the IPWEA Tasmania Division/Local Government Association of Tasmania.

1.6 UNSPECIFIED CONTRACT WORKS

Any works or items indicated on the drawings or otherwise necessary to produce the purpose, intent or proper functioning of the work must form part of the Contract not-withstanding such works may not be directly specified in this specification or detailed on the drawing. All such works must be carried out in accordance with accepted practice or procedure and in accordance with any standards relating to such works or materials.

1.7 SUPERINTENDENT

In this specification the term “Superintendent” must mean the person stated in Annexure A of the relevant Australian Standard General Conditions of Contract as the Superintendent or other person from time to time appointed in writing by the Principal to be the Superintendent and notified as such in writing to the Contractor by the Principal and, so far as concerns the functions exercisable by a Superintendent’s Representative, include a Superintendent Representative. The Superintendent may appoint a representative to act as Clerk of Works and the Superintendent or their representative must have the right to inspect all stages of the work.

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1.8 CONTRACT MANAGEMENT PLAN

Prior to the commencement of work on site, the contractor must prepare a contract management plan as specified by State Growth General Specification G2 Contract Management Plan, July 2014. The contract management plan is to include but not be limited to:

a) Environmental management
b) Product quality
c) Traffic management
d) Public contact
e) WHS/Risk management
f) Emergency management.

1.9 NOTICE OF COMMENCEMENT OR RESUMPTION OF WORK

The Superintendent must be notified in writing on the approved form at least two (2) working days before the commencement, or resumption of work, where the work has ceased for six (6) or more working days.

1.10 HOURS OF WORK

No works of the Contract must proceed outside the hours of 7am to 5.30pm Monday to Friday or on public holidays without the prior approval of the Superintendent and such other Statutory Authorities as may be required. The Contractor must pay the costs of any additional inspections made necessary by work outside the times specified above.

1.11 CONSTRUCTION PROGRAMME

Prior to commencement of work on site the Contractor must provide the Superintendent with two (2) copies of the proposed construction program. This must be in an acceptable bar chart form showing planned weekly progress and must have provision for entering comparative actual progress. The Superintendent must be notified in writing of any changes to the program.

1.12 EXISTING SERVICES

The Contractor must not interfere with the Corporations Services without approval of the Superintendent. All damage caused to existing Council services by the Contractor must be repaired by the Corporation at the Contractor's expense unless otherwise approved by the Superintendent.

1.13 EXISTING ROADS

The Superintendent or their representative may direct the Contractor to refrain from depositing mud, clay, or other debris onto any local highway and that any such deposits be removed. Any damage to a local highway caused by the Contractor must be repaired in accordance with the Superintendent's requirements at the Contractor's cost. No material must be stored on any local highway without prior approval of the Superintendent.

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1.14 ACCESS

Access over abutting properties must not be permitted unless agreed to in writing by the owners and occupiers. Access to existing properties must be maintained at all times.

1.15 TRAFFIC CONTROL

The Contractor must be responsible for providing a safe work site for the public and site personnel in all conditions. Traffic Control must comply with the *Vehicle and Traffic Act 1999* (Tas), the Traffic (Road Rules) Regulations 2009 (Tas) as amended, Australian Standard AS 1742.3 Manual of Uniform Traffic Control Devices - Traffic Control Devices for Works on Roads and the Australian Standard Safety at Roadworks handbooks.

A traffic control plan must be established in accordance with the Department of State Growth General Specification G3 Traffic Management, March 2016 and adequate daily records of the plan maintained for the duration of the Contract.

1.16 WORKPLACE HEALTH AND SAFETY

The Contractor must at all times exercise all precautions and be responsible for the safety of their employees, the Superintendent, their staff and all other persons, and must comply with all statutory requirements, and with such directions as the Superintendent may give from time to time. Notwithstanding any directions or approvals given by the Superintendent, the Contractor must at all times be held responsible for the safety of all persons engaged on, or entering on to, the work site.

The Contractor must be responsible for ensuring that appropriate safety procedures are adopted when working in the vicinity of overhead power lines and underground power cables.

The following provisions are to be particularly observed by the Contractor:

a) Comply with all requirements of the Contract and all statutory requirements for Workplace Health and Safety.
b) Ensure that each of its Subcontractors and Consultants comply in like manner.
c) Whenever requested, demonstrate to the Principal by mutual inspection and/or documentation that the requirements of the Contract and statutory requirements for Workplace Health and Safety are being met.
d) All persons working on the site are to attend an induction prior to commencement. This applies to the Contractor, Subcontractors and their Employees.
e) The Contractor must promptly report to the Superintendent orally, and confirm in writing, all accidents involving death or serious injury to staff or workmen.
f) Reports of all accidents, involving loss of time of employees must be submitted by the Contractor, giving such information as the Superintendent will prescribe, and must comply with any relevant Australian Standards.
g) The Contractor must provide first aid facilities for their staff and workmen, the Superintendent and their staff and must be fully responsible for all necessary transport of injured personnel to hospital, or other appropriate accommodation, as and when required.

h) The Contractor must be responsible for the safety of passers-by and casual visitors to the site. When leaving the site unattended the Contractor must ensure the site is left in a safe condition.

1.17 ENVIRONMENTAL SYSTEMS PLANNING

The Contractor must:

a) Comply with all requirements of the Contract and statutory requirements for protection of the environment.
b) Ensure that each of its Subcontractors and Consultants comply in like manner.
c) Demonstrate to the Principal by mutual inspection and/or documentation whenever requested that requirements of the Contract and statutory requirements for the protection of the environment are being met.

The Contractor is responsible for and must at their own cost make good any damage to the environment caused by the execution of the works.

1.18 INSPECTIONS

The Contractor must give the Superintendent notice of all inspections in accordance with this specification. The Superintendent may require the Contractor to uncover any works that have not been inspected by the Superintendent.

1.19 EXPLOSIVES

No blasting must take place on site without the written approval of the Corporation
If approved blasting must be in accordance with all relevant Local and Statutory procedures

1.20 LOT PEGS

Lot Pegs must not be disturbed by the Contractor unless it is necessary to carry out the work of the Contract. If lot Pegs are disturbed by the Contractor they must be replaced, by a licensed Surveyor, as soon as possible. The Contractor must be responsible for the replacement of lot Pegs prior to the works being placed on maintenance.

1.21 SURVEY MARKS

State Permanent Marks must not be disturbed without the written permission of the Superintendent. The Superintendent must require the Contractor to pay the cost of re-establishing the State Permanent Marks if disturbed. Temporary bench marks must be established on site in accordance with the Drawings and must be maintained by the Contractor for the duration of the Contract.

1.22 AS CONSTRUCTED DRAWINGS

The Contractor must prepare and provide to the Superintendent “As Constructed Drawings” in accordance with the Superintendent's requirement for all works prior to being placed on maintenance unless otherwise approved by the Superintendent.

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1.23 MAINTENANCE

On completion of the work the Contractor must advise the Superintendent in writing that the works have been completed and arrange an inspection to certify that the works are completed. Subject to the approval of the Superintendent the works must be maintained for a period of twelve (12) months or as otherwise required by the Superintendent. At the end of the Maintenance period the Superintendent must advise the Superintendent in writing that the works are in a satisfactory state of repair and arrange a final inspection. Subject to the approval of the Superintendent the works may be taken over by Council.

1.24 SITE AMENITIES

The Contractor must provide and maintain sanitary accommodation and site office on the site for the use of their workmen. This temporary convenience must be of a standard approved by the Local Authorities and the Superintendent.

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PART 2 - EARTHWORKS

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PART 2 - EARTHWORKS

2 EARTHWORKS

2.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

2.2 SCOPE OF WORKS

This section includes clearing and grubbing of material from the site, excavation, filling and compaction necessary for the satisfactory construction of the works.

2.3 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 1289	Methods of Testing Soil for Engineering Purposes
AS 3704	Geotextiles - Glossary of Terms
AS 3705	Geotextiles - Identification marking and general data
AS 3706	Geotextiles - Methods of Test

Standard Drawings

TSD – R1 - Urban Road Typical Cross Section
TSD – R10 - Rural Road Typical Cross Section

2.4 MATERIALS

2.4.1 Filling Material

All materials used in filling must be free from all vegetation, organic matter or deleterious material and must be approved by the Superintendent and must be obtained from cuttings where possible.

2.4.2 Geotextile Fabric

Geotextile fabric must be non-woven type, thermally bonded, of weight 140g/m^2 or equivalent as approved by the Superintendent. References, identification and testing of geotextile fabric must comply with the requirements of the Australian Standards.

2.5 SET-OUT

The Contractor must be responsible for setting out alignment and levels from the Drawings and must establish sufficient set-out pegs to ensure smooth changes in both vertical and horizontal alignment. Bench marks, survey pegs, level pegs or supplementary reference marks must not be adjusted or moved without written approval of the Superintendent. The Contractor must transfer any pegs affected by the earthworks to side positions clear of operations and must note the extent of the movement in distance and level.

2.6 DRAINAGE

During the progress of the work the surface profile must be maintained in shape and condition to ensure free drainage at all times.

PART 2 - EARTHWORKS

2.7 CLEARING AND GRUBBING

Clearing must be carried out in advance of any earthwork operations and must include the removal of all foreign material and vegetation, except trees and plants required to be preserved. Clearing must be carried out from within the boundaries of areas affected by earthworks or other areas to be cleared as designated on the Drawings.

All stumps and roots must be grubbed to a depth of at least 300 mm below finished subgrade level under pavements and at least 150 mm below the finished surface level elsewhere. Grub holes must be backfilled and well compacted with approved material.

All foreign material and vegetation cleared except topsoil becomes the property of the Contractor. The Contractor's material must be removed from the site and may be burnt off subject to the *Fire Services Act 1979* and regulations and other statutory requirements. This includes permission from the Department of Primary Industries, Parks, Water and Environment relating to lighting of fires, and must give the occupiers of adjoining properties at least 24 hours notice before any burning off is commenced.

2.8 STRIPPING AND STOCKPILING OF TOPSOIL

All topsoil must be stripped from areas to be paved, excavated or filled and from other areas as shown on the Drawings. Topsoil must be stored in approved stockpiles for use in re-instatement of the work by the Contractor.

2.9 EXCAVATION

2.9.1 Extent of Work

Excavation must be taken out accurately to the lines, levels, grades and sections shown on the Drawings.

2.9.2 Disposal of Surplus Material

Where specified on the Drawings or where directed by the Superintendent, the Contractor must remove surplus material from the site. Where material is required to be stockpiled the locations must be as approved by the Superintendent.

2.10 FILLING

2.10.1 Unsound Foundations

Where in the opinion of the Superintendent the existing material is unsound, the material is to be removed and replaced with approved material and compacted to 95 per cent standard compaction as specified in AS 1289.

2.10.2 Benching

Where the cross slope of the natural surface is steeper than 1 vertical in 3 horizontal, the base of the entire embankment must be benched horizontally to sufficient width to allow the use of compaction equipment during the placement of fill material and to allow filling in horizontal layers across the whole width of the embankment.

Embankment construction must not start until the Superintendent has approved the benching of the embankment.

2.10.3 Placing and Compaction

The total width on which fill material is to be placed must be compacted to produce a minimum of 95 per cent standard compaction as specified in Australian Standard AS 1289. Filling must be carried up in horizontal layers, extending the full width of the embankment, in layers not exceeding 400 mm uncompacted. The fill must be placed to above finished surface level and then trimmed, graded and compacted to finished levels.

2.11 GEOTEXTILE SEPARATION LAYER

Geotextile fabric installed as a separation layer and complying with the requirements of Clause 2.3.2 must be placed over areas as shown on the Drawings or where directed by the Superintendent. All joints in geotextile fabric must have a 500 mm minimum overlap.

2.12 SUBGRADE

2.12.1 Preparation and Trimming

The subgrade must be finished true to alignment dimensions and levels, compacted, tested and approved by the Superintendent before any pavement material is placed. Trimming must extend for a sufficient width to include the kerb and channel and/or shoulders. The subgrade must be compacted to produce a minimum of 100 per cent standard compaction as specified in Australian Standard AS 1289.

2.12.2 Unsound Subgrade Material

Where the surface of the subgrade in cutting consists of material, which, in the opinion of the Superintendent is less than the design bearing capacity, the Contractor must excavate to a further depth and replace with an approved material to the satisfaction of the Superintendent.

2.13 ACCEPTANCE

2.13.1 Inspections

The following stages of the works must be inspected by the Superintendent:

a) prior to commencement of the work

b) set-out of the work

c) completion of clearing and grubbing prior to the stripping of topsoil

d) excavations and benching

e) prior to filling

f) preparation and trimming of subgrade

The Contractor must give twenty-four (24) hours notice for any of the above inspections. Work must not proceed unless each stage of the work has been inspected and passed by the Superintendent.

2.13.2 Tolerances

The finished profile of excavations and earthworks must be to the alignments and grades indicated on the Drawings and must be within a tolerance of +0 mm to -50 mm of design levels. The finished surface level of the subgrade must not deviate from a 3.0 metre straight edge laid in any direction by more than 30 mm.

2.13.3 Testing

The Contractor must arrange or carry out the following tests as required by the Superintendent:

a) Filling
Supply standard laboratory soil tests in accordance with AS 1289 for fill materials in the construction of the works.

b) Test Rolling (if required)
Upon completion of excavation to design levels the subgrade must be proof rolled in nominated areas, as directed, to determine the extent of any unstable ground. A pneumatic tyred roller, loaded truck or similar vehicle having a load per wheel in the range 1,300-2,200kg at a tyre pressure of approximately 350kPa may be used. Ground which moves under the action of the test equipment must be considered unstable. The cost of proof rolling must be included in the tendered price.

Unstable areas detected must be rectified by the Contractor using methods approved by the Superintendent.

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PART 3 - SUBSOIL DRAINS

PART 3 - SUBSOIL DRAINS

3 SUBSOIL DRAINS

3.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

3.2 SCOPE OF WORK

This section includes the requirements for the supply of materials, equipment, labour and services for the construction of subsoil drains.

3.3 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 2439.1 Perforated Drainage Pipe and Associated Fittings
AS 3704 Geosynthetics - Glossary of Terms
AS 3705 Geotextiles - Identification, marking and general data
AS 3706 Geotextiles - Methods of test

Standard Drawings

TSD – R12 – Subsoil Drains Construction Details
TSD – R13 – Subsoil Drains Pit Connection Type

3.4 MATERIAL

3.4.1 Pipes

The type, diameter and lengths of pipe used must be as shown on the Drawings. Subsoil drain pipe must comply with the relevant Australian Standard.

3.4.2 Filter Material

Filter material must consist of an angular, clean, hard and durable crushed rock with a uniformly sized particle size of 14 mm. The filter material must be free from lumps of clay or organic matter.

3.4.3 Geotextile Fabric

Geotextile fabric must be of non-woven type thermally bonded, minimum weight 100 g/m^2, or equivalent as approved by the Superintendent. References, identification and testing of geotextile fabric must comply with the requirements of the relevant Australian Standards.

3.4.4 Alternative Drain

Alternative drain types must not be installed unless otherwise approved by the Superintendent.

3.5 EXCAVATION

Trenches must be excavated and trimmed clean true to grade and alignment as shown on the Drawings, or directed by the Superintendent. Unless noted on the Drawings the trenches

must be constructed in accordance with the Standard Drawings to a grade not flatter than that of the carriageway, but having a minimum grade of 1 in 200 (0.5 per cent).

3.6 TRENCH LINING

Trenches must be lined with geotextile filter fabric as shown on the Standard Drawings. Where fabric requires jointing, fabric must overlap a minimum of 500 mm at transverse joints and the full trench width at the top.

3.7 LAYING AND JOINTING SUBSOIL DRAIN PIPE

Subsoil drains must be laid and bedded as detailed on the Drawings. Subsoil drain pipe must be jointed according to the manufacturer's recommendations.

3.8 BACKFILLING

The trench must be backfilled with filter material as described in Chapter 3.4.2 and in layers not exceeding 150 mm loose depth. Where trenches are not covered by pavement or other works, 100 mm of material matching the adjacent insitu material must be placed as surface layer.

3.9 OUTLETS

Outlets must be placed as shown on the Drawings. Outlets to discharge clear of embankments must be of sufficient slope to prevent silting. Where outlets will discharge into culverts, waterways, etc., the pipes must be positioned above flood level. Outlets for street drainage must discharge into stormwater pits at locations or intervals as shown on the Drawings.

Where subsoil drains discharge through concrete headwalls, pits, stone walls, etc., a neat entry is required, free of any obstruction. Any blockouts must be rendered after drain installation.

3.10 INSPECTIONS

The Contractor must give not less than twenty-four (24) hours notice of the commencement or completion of the undermentioned works, and must submit such works for inspection. The Contractor must not proceed with the next succeeding operation until specific approval has been given for the following:

a) Trench excavation.

b) Trench lining with filter fabric and laying of subsoil drain pipe.

c) Filter material backfill.

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PART 4 - STORMWATER RETICULATION

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PART 4 - STORMWATER RETICULATION

4 STORMWATER RETICULATION

4.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

4.2 SCOPE OF WORK

This section includes the supply of materials, equipment, labour and services necessary for the construction of stormwater reticulation.

4.3 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 3725 Design for Installation of Buried Concrete Pipes
AS 3600 Concrete Structures
AS 1726 Geotechnical Site Investigations
AS 2280 Ductile Iron Pipes and Fittings
AS 1477 PVC Pipes and Fittings for Pressure Applications
AS 1379 Specification and Supply of Concrete
AS 4058 Precast Concrete Pipes (pressure and non-pressure)
AS 1289 Methods of Testing Soils for Engineering Purposes
AS 1260 PVCU Pipes and Fittings for drain, waste and vent applications
AS 1254 PVCU Pipes and Fittings for Storm and Surface Water Applications
AS 1012 Methods of Testing Concrete
AS 2566 Burried Flexible Pipelines

Standard Drawings

TSD – SW01 – Pipe Installation Anchor Blocks
TSD – SW02 – Manholes 100 – 600 Dia. Pipes General Arrangements
TSD – SW03 – Manholes 100 – 600 Dia. Pipes Benching Details
TSD – SW04 – Side Entry Pits Grated and Frame Details
TSD – SW05 – Side Entry Pits (Sep)
TSD – SW06 – Side Entry Pits (Seps)
TSD – SW07 – Side Entry Pits Type 1
TSD – SW08 – Side Entry Pits Type 2
TSD – SW09 – Side Entry Pits Type 3
TSD – SW10 – Side Entry Pits Type 4
TSD – SW11 – Side Entry Pits Kerb Transitions
TSD – SW12 – Side Entry Pits Type 5
TSD – SW13 – Side Entry Pits Table Drain Pit Construction
TSD – SW14 – Stormwater (GVP)
TSD – SW15 – Stormwater (GP)
TSD – SW16 – Side Entry Pits Type 6
TSD – SW17 – Outlet Headwalls 300 – 600 Dia Pipes
TSD – SW18 – Outlet Headwalls 1050 – 1350 Dia Pipes
TSD – SW19 – Concrete Endwall Plain (300 – 450 Dia)
TSD – SW20 – Outlet Headwalls Grouted Stone (300 – 450 Dia)
TSD – SW21 – Inlet Headwalls Grated Inlet 300 – 900 Dia Pipes

TSD – SW22 – Inlet Headwalls Raised Grated Inlet (Square)
TSD – SW23 – Inlet Headwalls Raised Grated Inlet (Domed)
TSD – SW24 – Headwalls Inlet Grated and Fence Requirements
TSD – SW25 – Stormwater Property Connections to Mains
TSD – SW26 – Saddle Connection to Stormwater Drains
TSD – SW27 – Repairs/New Connection to Stormwater Drain
TSD – SW28 – Guidelines for Sediment Control
TSD – G01 – Trench Reinstatement Flexible Pavements

4.4 MATERIALS

4.4.1 Pipes and Fittings

Pipes and fittings must comply with the relevant Australian Standards. Type of pipes used in the Contract must be as shown on the Drawings unless otherwise approved by the Superintendent.

4.4.2 Storage and Handling

Materials must be stored and handled in such a manner necessary to prevent their damage and deterioration. The Contractor must employ adequate means to safely handle pipes, access chambers and other materials.

4.4.3 Bedding and Haunching

Pipe bedding and haunching material will depend on the type of pipe installed as shown in the Standard Drawings TSD – G01. It must be clean sand, gravel or crushed rock, free from organic matter and clay lumps and conform to the grading given in Table 4.4.1.

Pipe bedding material must also have a sand equivalent of at least 60.

Table 4.4.1 Grading of Fill

AS Sieve (mm)	Percentage Passing By Mass
9.5	100
2.36	25 - 100
0.425	0 - 60
0.075	0 - 10

Where referred to on the Standard Drawings alternative bedding material may be fine crushed rock in accordance with Section 4.4.4 c).

4.4.4 Backfill

a) Select Fill.
Must comply with the requirements of AS 3725, Section 4, generally being sands or gravels, or sand and gravel mixtures with fines of low plasticity obtained from excavation of the pipe trench or elsewhere, with a particle size not greater than 75 mm.

b) Ordinary Fill.
Must comply with the requirements of AS 3725, Section 4, being material

obtained from excavation of the pipe trench or elsewhere and containing not more than 20 per cent by mass of stones with a size between 75 mm and 150 mm and none larger than 150 mm.

c) Fine Crushed Rock
Must be material complying with the requirements of aggregate used for base course construction and in accordance with the Municipal Standards Specifications Part 6, Material and Pavement Construction.

4.4.5 Concrete

Concrete for pits, access chambers, headwalls and culverts must be of grade N25 unless otherwise shown on the Drawings.

4.4.6 Access chamber Sections

Precast access chamber risers, tapers and other precast units must be of a type approved by the Superintendent.

4.5 EXCAVATION

4.5.1 General

Prior to excavation the Contractor must note all existing surface features and locate all underground services.

4.5.2 Surface excavation

Surface material must be carefully stripped and set aside. Where the material is to be re-used it is to be stacked separately.

4.5.3 Trenching

Trenches must be excavated to the lines and levels shown on the Drawings with allowance being made for bedding. The dimensions of the trench must comply with the relevant Standard Drawing. The base of the excavated trench must be trimmed neat and uniform for its full length. Boulders, roots and any other hard objects in the bottom of the trench must be removed; soft areas in the bottom of the trench must be taken out and filled to grade level with approved bedding material and compacted.

The Contractor will maintain all trenches in a safe condition for protection of people and property. The Contractor is responsible for all necessary notifications required to Workplace Standards Tasmania and carrying out instructions of its officers.

4.5.4 Storage and disposal of material

Excavated material is to be stored in a safe manner and in a location approved by the Superintendent. No excavated material will be placed against any fence or wall without the written consent of the owner and the approval of the Superintendent. Material will be placed outside the zone of influence of the trench wall. Surplus material will be disposed of in locations approved by the Superintendent.

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PART 4 - STORMWATER RETICULATION

4.6 LOCATION OF PIPES, PITS, ACCESS CHAMBERS AND ENDWALLS

All pipes, pits, access chambers, and endwalls must be located as shown on the Drawings unless otherwise approved by the Superintendent.

4.7 CONNECTION TO EXISTING FACILITIES

Connections to existing pipes and access chambers will be undertaken by the Local Authority at the Contractors cost unless otherwise noted on the Drawings. The Contractor must be responsible for notifying the Superintendent of the requirements for the connection to the existing service fourteen (14) days prior to the need for that connection.

4.8 DEWATERING

During the progress of drainage works, the Contractor must provide for effective diversion and disposal of surface water and must be responsible for all damage to any portion of the works or surrounding properties due to inadequate drainage diversion or de-watering equipment.

4.9 PIPE LAYING, JOINTING AND BACKFILLING

4.9.1 Trench foundation

The trench foundation will be finished to the approval of the Superintendent prior to placing of the bedding material.

4.9.2 Bedding

Bedding must be compacted bedding material complying with Section 4.4.3 and placed in accordance with the relevant Standard Drawing. Compaction must be to 95% of Standard Compaction in accordance with AS 1289.

4.9.3 Laying

All pipes must be layed straight and must be free from dirt and foreign matter. All pipes must be in good condition and laid with manufacturing marks visible. All pipes must be bedded for the full length of their barrel. Laying must commence at the downstream end and proceed upstream with the socket ends of pipes placed upstream.

4.9.4 Jointing

Jointing of pipes must be in accordance with the manufacturers specifications.

4.9.5 Haunching

Haunching must be material complying with Section 4.4.3. placed in accordance with the relevant Standard Drawing. Material must be well tamped to the satisfaction of the Superintendent.

4.9.6 Backfilling

Backfilling material must be as shown on the relevant Standard Drawing and must be placed in layers not exceeding 150 mm thick when compacted. The degree of compaction must depend on the location of the trench.

For trenches clear of trafficked areas the layers must be compacted to a minimum density of 95 per cent standard compaction in accordance with AS 1289. For trenches under trafficked areas, the layers must be compacted to comply with the pavement requirements as shown in Table 4.9.1.

Table 4.9.1 Trenches Under Trafficked Areas

Pavement Layer	Characteristic Density in accordance with AS1289
Sub-grade	95% standard compaction
Sub-base	95% modified compaction
Base	98% modified compaction

The ground surface must be reinstated to its original condition or as shown on the Drawings and to the satisfaction of the Superintendent.

4.9.7 Cutting of pipes

Where pipes are cut the ends must be left neat and regular.

4.9.8 Property connections

Property connections must be laid and located as shown on the Drawings.

4.10 TRENCH REINSTATEMENT

Trench reinstatement in flexible pavement must be to TSD-G01.

Unless otherwise specified, reinstatement of surfaces other than flexible pavements must match the materials and standard of the original surface.

4.11 STRUCTURES

4.11.1 Access Chambers

Access chambers must be constructed of approved precast sections or grade N20 concrete.

Invert channels and benches must be constructed as shown on the Standard Drawing and may be formed of grade N20 Concrete finished with a 20 mm thick layer of 2:1 sand/cement mortar smoothed down with a steel tool. Alternatively channels may be formed by using half pipe sections embedded in concrete. The access chamber base must be constructed before access chamber wall construction proceeds.

The entrance and outlet are to be fully smoothed and shaped to allow free passage for flow and be clear of any obstructions or irregularities.

Stormwater access chambers must be free of infiltration. Flexible joints for all PVC lines entering the access chamber are required.

For cast in-situ access chambers, inside and outside shutters must be used. The walls must be 150 mm thick and have a smooth internal finish.

Where precast sections are used in access chambers, joints must be made with mortar or an approved glue.

Drop connections must be constructed as shown on the Standard Drawing and must be constructed as close as possible to the inside of the access chamber.

Unless otherwise directed by the Superintendent access chamber covers must be set flush with and have the same crossfall as the existing surfaces of the road, footway or finished ground levels.

Capped branch drain connection pipe or starter pipes must be built into access chambers as shown on the Drawings. Stormwater connections must not protrude inside the access chamber.

4.11.2 Stormwater and side entry pits

Stormwater pits and Side Entry pits must be approved precast sections or constructed of grade N20 concrete and in accordance with the Standard Drawings and of the type shown on the Drawings.

The pit base must be constructed before pit wall construction proceeds. Inside and outside shutters must be used at all times unless otherwise authorised by the Superintendent.

Invert channels and benches must be constructed as shown on the Standard Drawing and must be formed of grade N20 concrete finished with a 20 mm thick layer of 2:1 sand/cement mortar smoothed with a steel tool. The entrance and outlets must be smoothed and well shaped to allow free passage for flow and be clear of any obstructions and irregularities.

Allowance must be made for connection of subsoil drains as shown on the Standard Drawings.

4.11.3 Endwalls

Approved precast sections must be in accordance with the Standard Drawing and bedded on compacted bedding material complying with Section 4.4.3 as required for pipe.
In-situ endwalls must be constructed as shown on the Drawings. All concrete work must comply with Part 9 of this specification.

Where shown on the Drawings stone pitching of inlet and outlet channels must consist of approved quarry stone that must be dense, resistant to weathering, and of reasonably uniform size and appearance. Nominal stone size must be 200 mm or as specified by the designer to suit piope size and stormflow velocuty. The stone must be bedded on grade N25 concrete, to a minimum depth of 150 mm.

4.11.4 Anchor Blocks

Anchor blocks and cut off walls must be constructed as shown on the construction drawings.

SPECIFICATIONS

PART 4 - STORMWATER RETICULATION

4.12 INSPECTIONS

The Contractor must ensure that inspections, by the Superintendent, of the various stages of work are requested. The Superintendent may require the following inspections:

a) Inspection of the site prior to commencing work.

b) Completion of trench excavation prior to placement of bedding material.

c) Completion of pipe laying prior to any backfilling.

d) Stages of backfilling.

e) Completion of excavation for access chamber bases.

f) Completion of access chamber bases prior to rendering.

g) Completion of access chambers.

Twenty-four (24) hours notice is required for any of the above inspections. Work must not proceed unless each stage of work has been inspected and passed by the Superintendent.

4.13 TESTING

4.13.1 Cost of testing

All tests required by the Superintendent must be at the Contractors cost.

4.13.2 Testing of Bedding, Haunching and Backfill Material

The Superintendent may request a sample of bedding or backfill material to be taken and tested by a registered N.A.T.A. testing laboratory in order to determine whether the material complies with this specification. Any material, which is found not to comply with the requirements, must not be used for bedding or backfill.

4.13.3 Pipeline Inspection and Testing

a) Pipeline Inspection.
The pipelines must be visually inspected to ensure there are no obstructions in the barrel and to ensure that pipes are laid straight.

b) Sewer pipeline testing.
Completed sewer pipelines must be tested by the Contractor with an approved method (i.e. hydraulic or air).

For water testing, all openings in the length of sewer must be sealed with watertight plugs and the sewer then filled with water to give a hydrostatic head of two (2) metres on the highest point of the section under test. If any undue sweating at joints occurs or the pressure head drops, the drainage line is defective.

For air testing, all openings in the length of pipeline must be sealed with airtight plugs with provision to alter the atmospheric pressure within the drainage via a clear tube connected to a plug. The meniscus must be held at a constant level 100 mm below water surface level.

4.13.4 Access Chamber Testing

Access chamber leakage tests may be required by the Superintendent at the Contractors cost. The access chamber entries and outlets must be temporarily sealed and the access chamber filled with water. Any visible leakage or leakage which exceeds five litres in 24 hours will not be accepted.

4.13.5 Concrete Testing

Compressive strength and slump tests may be required at the Contractors cost. Tests must be carried out in accordance with AS 1012.

SPECIFICATIONS

PART 5 – WATER AND SEWER RETICULATION

SPECIFICATIONS

PART 5 – WATER AND SEWER RETICULATION

5 WATER AND SEWER RETICULATION

5.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

5.2 WATER AND SEWER RETICULATION

TasWater has responsibility for water and sewer infrastructure in Tasmania and any water and sewerage infrastructure reticulation or other works require their approval. All design, materials, installation and testing for water and sewer infrastructure must comply with TasWater's development standards which can be found at:

http://www.taswater.com.au/Development/Development-Standards.

Works other than water and sewer infrastructure, including backfill, excavation and reinstatement, must comply with these standards.

5.3 BACKFILL MATERIALS

a) Select Fill.
Must comply with the requirements of AS 3725, Section 4, generally being sands, gravels or sand and gravel mixtures, with fines of low plasticity obtained from excavation of the pipe trench or elsewhere with a particle size not greater than 75 mm.

b) Ordinary Fill.
Must comply with the requirements of AS 3725, Section 4, being material obtained from excavation of the pipe trench or elsewhere and containing not more than 20 per cent by mass of stones with a size between 75 mm and 150 mm and none larger than 150 mm.

c) Fine Crushed Rock
Must be material complying with the requirements of aggregate used for basecourse construction and in accordance with the Municipal Standards Specifications Part 6, Material and Pavement Construction.

5.4 EXCAVATION

5.4.1 General

Prior to excavation the Contractor must note all existing surface features and locate all underground services.

5.4.2 Surface excavation

Surface material must be carefully stripped and set aside. Where the material is to be re-used, it is to be stacked separately.

5.4.3 Trenching

Trenches must be excavated to the lines and levels shown on the Drawings with allowance being made for bedding. The dimensions of the trench must comply with the relevant Standard Drawing. The base of the excavated trench must be trimmed neat and uniform for its full length. Boulders, roots and any other hard objects in the bottom of the trench must be removed; soft areas in the bottom of the trench must be taken out and filled to grade level with approved bedding material and compacted.

The Contractor will maintain all trenches in a safe condition for protection of people and property. The Contractor must notify Workplace Standards Tasmania of any excavation over 1.5m deep and be responsible for carrying out the instructions of its officers.

5.4.4 Storage and disposal of material

Excavated material is to be stored in a safe manner and in a location approved by the Superintendent. No excavated material will be placed against any fence or wall without the written consent of the owner and the approval of the Superintendent. Material will be placed a minimum of 1.0 m clear of the edge of the trench. Surplus material will be disposed of in locations approved by the Superintendent.

5.5 DEWATERING

During the progress of drainage works, the Contractor must provide for effective diversion and disposal of surface water and must be responsible for all damage to any portion of the works or surrounding properties due to inadequate drainage diversion or de-watering equipment.

5.6 BACKFILLING

Backfilling material must be as shown on the relevant Standard Drawing and must be placed in layers not exceeding 150 mm thick when compacted. The degree of compaction must depend on the location of the trench.

For trenches, clear of trafficked areas, the layers must be compacted to a minimum density of 95 per cent standard compaction in accordance with AS 1289. For trenches under trafficked areas, the layers must be compacted to comply with the pavement requirements as shown in Table 5.6.1.

Table 5.6.1 Trenches Under Trafficked Areas

Pavement Layer	Characteristic Density in accordance with AS1289
Sub-grade	95% standard compaction
Sub-base	95% modified compaction
Base	98% modified compaction

The ground surface must be reinstated to its original condition or as shown on the Drawings and to the satisfaction of the Superintendent

5.7 TRENCH REINSTATEMENT

Trench reinstatement in flexible pavement must be to TSD-G01.

Unless otherwise specified, reinstatement of surfaces other than flexible pavements must match the materials and standard of the original surface.

5.8 ACCEPTANCE

5.8.1 Inspections

TasWater must inspect and approve the installation of TasWater Infrastructure.

TASMANIAN MUNICIPAL STANDARD SPECIFICATIONS

SPECIFICATIONS

PART 6 - MATERIAL AND PAVEMENT CONSTRUCTION

SPECIFICATIONS

PART 6 - MATERIAL AND PAVEMENT CONSTRUCTION

6 MATERIAL AND PAVEMENT CONSTRUCTION

6.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

6.2 SCOPE OF WORK

This section includes the supply of all materials, equipment, labour and services necessary for the construction of pavements.

6.3 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 1141	Methods of Sampling and Testing Aggregates
AS 1289	Methods of Testing Soil for Engineering Purposes
AS 1348.1	Road and Traffic Engineering - Glossary of Terms

Standard Drawings

TSD – R01 – Rural Roads Unsealed
TSD – R02 – Rural Roads Sealed
TSD – R06 – Urban Roads Typical Section & Pavement Widths

6.4 MATERIALS

6.4.1 General

Unless otherwise specified, all pavement material must be crushed aggregate produced from sound unweathered igneous rock and shoulder material must be natural gravel.

6.4.2 Source of Materials

The Contractor must identify the source of materials and may be required to provide N.A.T.A. endorsed certificates plus a 20 kg representative sample at least three (3) business days prior to use for approval by the Superintendent. Changes to the material source must require approval of the Superintendent.

6.4.3 Crushed Aggregate

a) Base Course Material
Base course material must be crushed aggregate with grading conforming with Table 6.4.1 with a Plasticity Index not greater than 6, a Liquid Limit not greater than 25 and a Los Angeles Abrasion Test value not greater than 35.

b) Sub-base Materials
Sub-base materials must be crushed aggregate with grading conforming to Table 6.4.1 with a Plasticity Index not greater than 12, a Liquid Limit not greater than 30 and a Los Angeles Abrasion Test value not greater than 35.

Table 6.4.1 Base Course Material Classification

Sieve Size (mm)	Class of Material	
	Sub-base Course	Base Course
53	100	
37.5	90 - 100	
26.5	80 - 87	100
19	-	93 - 100
9.5	47 - 62	64 - 85
4.75	32 - 48	44 - 64
2.36	22 - 38	32 - 47
0.425	8 - 11	13 - 22
0.075	3 - 11	3 - 11

6.4.4 Shoulder Material (where shown on drawings)

Shoulder material must be natural gravel with grading conforming to Table 6.4.2 a Plasticity Index of 10-15 and a Liquid Limit not greater than 35.

Table 6.4.2 Shoulder Material Classification

A.S. Sieve Size (mm)	Percentage Passing
37.5	100
26.5	85 - 100
19.0	75 - 100
9.50	64 - 100
4.75	45 - 90
2.36	30 - 73
0.425	16 - 39
0.075	9 - 22

6.4.5 Water

The water used must be clear, clean and free of deleterious substances.

6.4.6 Wet Mix

Wet mix must consist of a uniform blend of base course material and water to provide a uniform moisture content of 3 to 7 per cent. The actual water content must be as recommended by the Superintendent.

The aggregate and water must be mixed by a central mixing plant in a mixer approved by the Superintendent. Discharge from the mixer into delivery trucks must be done in a manner that avoids segregation.

6.5 CONSTRUCTION

6.5.1 Spreading of Materials

Materials must be spread uniformly and in layers not exceeding 150 mm loose depth in such a manner that avoids segregation.

6.5.2 Compaction of Materials

The sub-base material and shoulder material must be compacted to a minimum characteristic dry density ratio of 95 per cent of modified compaction at optimum moisture content.

The base course material must be compacted to a minimum characteristic dry density ratio of 98 per cent of modified compaction at optimum moisture content.

Compaction of each layer must commence immediately using a smooth wheeled roller of minimum static mass of 10 tonne or approved equivalent. Water must be added and must be thoroughly mixed to give the required moisture content through the depth of the layer. Material with excess moisture must be dried to the required moisture content.

Each pass of the compaction plant must be parallel with the centreline of the pavement. On sections having one-way crossfall, compaction must start at the lower edge and must progress towards the higher edge. On crowned sections, compaction must start at the outer edges and progress towards the crown. The method of compaction must allow for 300 mm minimum overlap between passes.

6.5.3 Construction Tolerances

Each pavement course, consisting of one or more layers of the same material, must be finished to a smooth and uniform surface and must conform to the levels, grades and shapes shown on the Drawings.

The finished surface of the sub-base must be within + 20 mm of the designated levels. When measured with a 3.0 metre straight edge laid in any direction on the surface, the deviation of the surface from the straight edge must not exceed 25 mm.

The finished surface of the base must be within + 10 mm of the designated levels. When measured with a 3.0 metre straight edge laid in any direction of the surface, the deviation of the surface from the straight edge must not exceed 15 mm.

Any departures in excess of the requirements for finished surface must be corrected by scarifying the layer concerned, removing excess or adding deficient pavement material, as required and recompacting the area to a uniform surface.

6.6 ACCEPTANCE

6.6.1 Inspection

The Contractor must be responsible for arranging inspection by the Superintendent of the various stages of the work. The following inspections may be required:

a) Inspection of the subgrade prior to commencing pavement construction.
b) Completion of each course of the pavement.

Twenty-four (24) hours notice is required for each inspection. Work must not proceed unless the superintendent passes each stage.

6.6.2 Testing

a) Materials Testing
The Superintendent may direct the Contractor to supply to the Superintendent copies of delivery dockets for all pavement material used. The Superintendent may direct the Contractor to test the materials supplied in accordance with this specification. The requested tests must be conducted by an approved N.A.T.A. accredited laboratory at a rate of three (3) tests from each 1,000 tonnes of material supplied or part thereof, as directed by the Superintendent.
The Contractor must meet cost of testing.

b) Pavement Testing
All pavement layers must be compacted so that they are capable of withstanding proof rolling.

Test rolling must be performed by a static weight roller of 8 to 10 tonnes mass, a single rear axle truck fitted with dual wheels and 9.00 x 20 tyres inflated to 550 kPa loaded to produce a rear axle mass of 8.2 tonne, or such other vehicle as may be approved by the Superintendent, traveling at 4 to 5 kph. The allowable deflection of the subgrade must not be more than is just visible to an observer standing still as the test vehicle passes.
Unstable areas detected by proof rolling must be rectified by the Contractor using methods approved by the Superintendent.

c) Compaction Testing
Unless otherwise specified, the compaction testing frequency and Characteristic Density calculations must comply with the "StateGrowth - VicRoads Specifications - 173 Examination and Testing of Materials and Work".

Density testing must be by nuclear density meter unless otherwise approved by the Superintendent.

The contractor must meet the cost of testing.

TASMANIAN MUNICIPAL STANDARD SPECIFICATIONS

SPECIFICATIONS

PART 7 - CONCRETE KERB AND CHANNEL

PART 7 - CONCRETE KERB AND CHANNEL

7 CONCRETE KERB AND CHANNEL

7.1 SCOPE OF WORK

This section includes the supply and delivery of materials, equipment, labour and services necessary for the construction of manually-placed or machine-placed insitu and pre-cast concrete kerb and channel.

7.2 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 3972 General Purpose and Blended Cements
AS 2758.1 Aggregates and Rock for Engineering Purposes – concrete aggregates
AS 2876 Concrete Kerb and Channels (Gutters) - Manually or Machine Placed

Standard Drawings

TSD – R14 – Concrete Kerbs and Channels Dimensions
TSD – R15 – Concrete Kerbs and Channels Construction Details
TSD – R16 – Concrete Kerbs and Channels Vehicular Crossings
TSD – R17 – Concrete Kerbs and Channels Grated Wedge Crossings
TSD – R18 – Concrete Kerbs and Channels Access Ramps

7.3 MATERIALS

7.3.1 Ready-Mixed Concrete

Concrete used in the construction of in-situ kerb and channel must be ready-mixed concrete manufactured and supplied by a concrete manufacturer in accordance with Municipal Standards Specifications Part 9, Constrtuction of Minor Concrete Structures.

Manually-placed concrete must be normal grade N20 concrete and must have the following properties:

a) Minimum strength 20 MPa
b) Maximum aggregate size 20 mm
c) Maximum slump 60 +/- 15 mm

Machine-placed concrete must be Class B and must have the following properties:

a) Minimum strength 20 MPa
b) Maximum aggregate size 12.5 mm
c) Maximum slump Nil (absolute maximum 12.5 mm)
d) Minimum cement content 280 kg/m^3

The concrete must be mixed with sufficient water to produce a consistency that maintains the design profile after extrusion. The combined aggregate grading must be arranged so that not more than 80 per cent passes the 6.7 mm. AS sieve.

7.3.2 Mortar

Mortar for finishing must consist of not less than one (1) part cement to three (3) parts of sand, or approved equivalent, by loose pour volume. The water quantity must be just sufficient to obtain thorough mixing and adequate workability.

a) Cement
Cement must be Type A Portland cement complying with AS 3972.

b) Sand
Sand must be composed of sharp tough grains, free of mica, clay or foreign matter and must be in accordance with AS 2758 Part 1.

c) Water
Water for use in mortar must be clean and free of all substances harmful to concrete and reinforcing steel.

d) Bedding
The bedding material must consist of sub-base material in accordance with Municipal Standards Specifications Part 6, Material and Pavement Construction.

7.4 PROFILES

The selection and position of the kerb and channel must be in accordance with the Drawings. Kerb and channel profiles must be in accordance with Standard Drawings or as otherwise shown on the Drawings.

7.5 PLACING

Construction must be in accordance with Municipal Standards Specifications Part 9, Construction of Minor Concrete Structures and the following clauses:

7.5.1 Base preparation

Base preparation may be constructed as one or all of the following:

a) New Pavement
All kerb and channel must be bedded on an extension of the road pavement, which must be equal in thickness to the depth of the pavement, but must not be less than 75 mm. The bedding must be placed and compacted in accordance with AS 2876. The bedding must be lightly watered and dowels for joints must be available on site and fixed in place where necessary.

b) Existing Pavement
The excavation for bedding for kerb and channel must be to the depth of the existing pavement and in any case must be to a minimum of 75 mm below the base of the kerb and channel. Excavation must extend 500 mm into the existing pavement from the face of kerb or invert of channels, and 150 mm behind the back of the kerb or channel.

The sides of the excavation must extend at an inclination of 45 degrees beyond these limits.

The bedding must be placed and prepared in accordance with Chapter 7.5.1 a).

c) Pre-cast kerbing
Where pre-cast kerb is to be installed on the top of the pavement, it must be swept clear of dust and loose stone prior to installation.

7.5.2 Pouring

Kerb and channel must be poured to the specified line, level and minimum grade as shown on the Drawings or as directed by the Superintendent.

Pouring of the kerb must generally be carried out using a self propelled kerb and channel paving machine designed to compact and extrude the final profile and capable of automatically adjusting the mould position while in operation.

Manually-placed concrete must be placed in bays of 3.0 metres in length.

7.5.3 Formwork

Templates of the finished shape and profile must be provided at 3.0 metre centres. Forms must be firmly held in place and capable of easy release and removal. End forms must be provided at the end of each pour.

7.5.4 Joints

Joints must be located as shown on the Drawings and must be formed in accordance with AS 2876.

Unless otherwise approved by the Superintendent, contraction or shrinkage control joints must be cut in machine layed kerb and channel at 3.0 metre centres using a template and the joints finished with a suitable grooving tool.

Insert R10 mild steel dowels into the back of the kerb at 1.0 metre centres in accordance with standard drawings SD 1006 where concrete footpath is to be laid adjacent to the kerb.

7.5.5 Surface Finish

All kerb and channel must be finished to a smooth steel trowel finish in accordance with AS 2876. Machine-placed kerb and channel must be rendered with a mortar in accordance with AS 2876.

7.5.6 Pre-cast Units

Pre-cast units must be installed by spiking through each unit or tags cast into it, using two (2) spikes of at least 10 mm diameter, driven at least 100 mm into the underlying pavement, or when approved by the Superintendent, by proprietary adhesive applied in accordance with the manufacturer's instructions.

7.6 PROTECTION AND CURING

7.6.1 Protection

Newly finished concrete surfaces must be protected from premature drying and damage by rain, frost or vandalism for a period of twenty-four (24) hours after pouring.

Sufficient signs, barricades and lights must be erected to protect the newly-laid work from traffic.

7.6.2 Curing

Concrete may be cured by covering with hessian kept wet for a period of not less than seven (7) days, or by other methods as approved by the Superintendent.

7.7 ACCEPTANCE

7.7.1 Inspections

Inspections, sampling and testing of the concrete may be carried out in accordance with AS 2876.

The Contractor must notify the Superintendent to allow inspection of the following stages of the work :

a) Preparation of the sub-grade;

b) Compaction of the base and set-out of the kerb and channel alignment prior to pouring;

c) Completion of the work.

The Superintendent may inspect the laying of the concrete and must reject any concrete that has not the correct property, texture, depth, shape or level.

7.7.2 Tolerances

Unless otherwise specifically permitted in writing by the Superintendent, the tolerances on the concrete mix and construction must be in accordance with AS 2876.

TASMANIAN MUNICIPAL STANDARD SPECIFICATIONS

SPECIFICATIONS

PART 8 - FOOTPATH CONSTRUCTION

SPECIFICATIONS

PART 8 - FOOTPATH CONSTRUCTION

8 FOOTPATH CONSTRUCTION

8.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

8.2 SCOPE OF WORK

This section includes the supply of materials, equipment, labour and services necessary for the construction of reinforced concrete footpaths.

8.3 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 4671 Steel Reinforcing Materials

Standard Drawings

TSD – R11 – Urban Roads Footpaths
TSD – R16 – Concrete Kerbs and Channels Vehicular Crossings
TSD – R18 – Concrete Kerbs and Channels Ramps

8.4 MATERIALS

8.4.1 Concrete Materials

All concrete materials must comply with the Municipal Standards Specifications Part 9, Construction of Minor Concrete Structures.

8.4.2 Bedding

Bedding material must comply with the Municipal Standards Specifications Part 6, Materials and Pavement Construction.

8.4.3 Steel Reinforcing Fabric

All steel reinforcing fabric must comply with the requirements of AS 4671.

8.5 CONSTRUCTION

8.5.1 Subgrade Formation

The subgrade must be formed in accordance with the Municipal Standards Specifications Part 2, Earthworks.

8.5.2 Bedding

Bedding material must be placed and compacted as shown on referenced Standard Drawings.

PART 8 - FOOTPATH CONSTRUCTION

8.5.3 Formwork

The construction, use and removal of all formwork must be in accordance with the Municipal Standards Specifications Part 9, Construction of Minor Concrete Structures.

8.5.4 Reinforcement

Steel reinforcing bars and fabric are to be placed as shown on TSD – R11. Bar chairs are to be provided to support all reinforcement at 1.0 metre maximum spacings.

8.5.5 Concrete Work

Concrete work must be in accordance with the referenced Standard Drawings and the Municipal Standards Specifications Part 9, Construction of Minor Concrete Structures. The surface finish must be a broomed non-slip finish.

8.6 ACCEPTANCE

8.6.1 Inspection

The Contractor must be responsible for arranging inspections by the Superintendent of the various stages of the work as follows:

a) Inspection of the site prior to commencement of the works.

b) Completion of the subgrade formation prior to construction of the bedding.

c) Completion of construction of the bedding prior to placement of reinforcement and formwork.

d) Completion of placement of reinforcement and formwork prior to pouring concrete.

e) Completion of the work.

Twenty-four (24) hours notice is required for any of the above inspections.
Work must not proceed unless the Superintendent passes each stage.

8.6.2 Testing

Testing of the subgrade formation, bedding material and concrete work must comply with the Municipal Standards Specifications Part 6, Materials and Pavement Construction and Part 9, Construction of Minor Concrete Structures.

8.6.3 Tolerances

a) The finished thickness of the concrete footpath must be as shown on the Drawings and must be within a tolerance of +5 mm to +0 mm. The finished crossfall of the footpath must not deviate by more than 5 mm from the design level change.

b) The finished width of the concrete footpath must be within a tolerance of +5 mm to -5 mm from the design width.

TASMANIAN MUNICIPAL STANDARD SPECIFICATIONS

SPECIFICATIONS

PART 9 - CONSTRUCTION OF MINOR CONCRETE STRUCTURES

SPECIFICATIONS

PART 9 - CONSTRUCTION OF MINOR CONCRETE STRUCTURES

9 CONSTRUCTION OF MINOR CONCRETE STRUCTURES

9.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

9.2 SCOPE OF WORK

This part includes the supply of materials, equipment, labour and services necessary for the construction of minor concrete structures including pits, manholes, anchor blocks, minor walls, footpaths, pavements and vehicular crossings.

9.3 STANDARDS

The following Australian Standards are referred to:

Australian Standards

AS 1012	Methods of Testing Concrete
AS 1141	Methods of Sampling and Testing Aggregates
AS 1379	Specification and Supply of Concrete
AS 1478.1	Chemical Admixtures concrete, mortar and grout – Admixtures for Concrete
AS 3610	Formwork for Concrete
AS 2758.1	Aggregates and rock for engineering purposes – Concrete aggregates
AS 3600	Concrete Structures
AS 3972	General Purpose and Blended Cements
AS 4671	Steel Reinforcing Materials

9.4 MATERIALS

Water must be free of all substances harmful to concrete and reinforcing steel. Cement must be Portland Cement Type A unless otherwise shown on the Drawings and bedding must be base course complying with the Municipal Standards Specifications Part 6, Materials and Pavement Construction.

9.5 CONCRETE MIX DESIGN

9.5.1 Design

Unless otherwise specified concrete must be normal grade and have the following properties:

a)	Minimum Strength	20 MPa
b)	Maximum Aggregate Size	20 mm
c)	Maximum Slump	80 mm

The use of chemical admixtures and fly ash must only be used with the prior direction or approval of the Superintendent.

9.6 CONCRETE MANUFACTURE

All concrete must be ready-mixed concrete from an approved batching plant.

PART 9 - CONSTRUCTION OF MINOR CONCRETE STRUCTURES

9.7 CONSTRUCTION

9.7.1 Foundation

Excavations and embankments must be formed and compacted to the lines, levels and grades shown on the Drawings or as directed by the Superintendent.

Organic and soft material forming part of the subgrade must be removed and replaced with suitable material compacted in layers not exceeding 150 mm. The bedding course must be spread and compacted to a depth as shown on the Drawings.

9.7.2 Formwork

Forms must be of approved material, rigid, securely braced and supported to produce mortar tight joints and smooth even surfaces. Interior surfaces of forms must be thoroughly cleaned and oiled before erection.

9.7.3 Reinforcement

Reinforcement must be placed in accordance with the reinforcement details as shown on the Drawings. Approved chairs, spacers and other supports must be used for the support of all reinforcement. Reinforcing steel fabric must be supported and held in position with approved supports spaced at 1.0 metre intervals in each direction.

Reinforcing bars must be placed in the positions indicated on the drawings and be adequately tied and chaired to prevent movement.

Cover must be as specified in the Drawings or as directed by the Superintendent.

9.7.4 Concrete Placement, Surface Curing and Finish

Concrete must not be placed until all formwork, reinforcement and surface preparation have been approved by the Superintendent.
Unless approval of the Superintendent, concrete must be placed in dry conditions and only in such quantities as are required for immediate use and must be placed before initial set has occurred.

Concrete must be placed to avoid segregation and in layers not exceeding 300 mm depth and must be thoroughly compacted during and immediately after placing by means of continuing tamping, spading or use of vibrators, as directed by the Superintendent. Under no circumstances must concrete be shaken, displaced or disturbed after the initial set of the concrete.

After placement of the concrete, exposed surfaces must be kept continuously wet for a minimum period for seven (7) days by covering with water saturated material. New surfaces must be protected from rain damage until hard set has occurred.

Except as otherwise directed, formwork must be removed after a period of not less than twenty-four (24) hours after concrete pouring. Formed concrete must have a smooth finish and be free from blowholes, voids and honeycomb. Top surfaces must be finished with a steel trowel and have tooled edges, with slabs having a broomed surface if required by the Superintendent.

PART 9 - CONSTRUCTION OF MINOR CONCRETE STRUCTURES

Any defective concrete must be repaired as directed within twenty-four (24) hours of formwork removal.

9.8 ACCEPTANCE

9.8.1 Inspection

The Superintendent may require the following inspections:

a) Formation or excavation prior to placement of bedding material.

b) Bedding construction prior to placement of reinforcement.

c) Placement of reinforcement and formwork prior to pouring of concrete.

d) Completion of work.

Twenty-four (24) hours notice is required for any of the above inspections.
Work must not proceed until each stage has been approved by the Superintendent.

9.8.2 Sampling and Testing

Sampling and testing of concrete must be as requested by the Superintendent. The making, handling, caring, storage, transportation and testing of the samples must be by a N.A.T.A. accredited testing laboratory approved by the Superintendent.

All testing of concrete must be carried out in accordance with AS 1012, Australian Standard Methods of Sampling and Testing.

9.8.3 Acceptance of Concrete

The Superintendent may reject concrete at the site of placement where:

a) The slump tests fail to meet the requirements of AS 1379, Clause 5.2.

b) More than one and a half hours, has elapsed after the introduction of the mixing water to the cement and aggregate.

SPECIFICATIONS

PART 10 - SEALING

10 SEALING

10.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

10.2 SEALING

Sealing is to be carried out in accordance with the Previous StateGrowth Construction Specifications – Section R51.

10.3 ACCEPTANCE

10.3.1 Inspections

The Superintendent must inspect and approve the sealing works.

SPECIFICATIONS

PART 11 - ASHPALT SEALING

11 ASPHALT SEALING

11.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

11.2 ASPHALT SEALING

Sealing is to be carried out in accordance with the Department of State Growth, Tasmania – Roadworks Specifications – Section R55.

11.3 ACCEPTANCE

11.3.1 Inspections

The Superintendent must inspect and approve the installation of all Asphalt Sealing.

TASMANIAN MUNICIPAL STANDARD SPECIFICATIONS

SPECIFICATIONS

PART 12 - SERVICE CONDUITS

SPECIFICATIONS

PART 12 - SERVICE CONDUITS

12 SERVICE CONDUITS

12.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

12.2 SCOPE OF WORK

This section covers the supply, excavation, backfilling and laying of service conduits. The Service Authority must supply and lay all cables and pits, including drainage facilities for pits.

12.3 STANDARDS

The following Australian Standards, Standard Drawings and Codes of Practice are referred to:

Australian Standards

AS 2053 Conduits and Fittings for Electrical Installations
AS 1289 Methods of Testing Soils for Engineering Purposes

Standard Drawings

TSD – G01 – Trench Reinstatement Flexible Pavements
TSD – G02 – Urban Roads Typical Service Locations

12.4 MATERIALS

12.4.1 Bedding and Haunching.

Pipe bedding and haunching material will depend on the type of pipe installed as shown in the Standard Drawings TSD – G01. It must be clean sand, gravel or crushed rock, free from organic matter and clay lumps and conform to the grading given in Table 12.4.1.

Pipe bedding material must also have a sand equivalent of at least 60.

Table 12.4.1 Bedding Material Classification

AS Sieve (mm)	Percentage Passing by Mass
9.5	100
2.36	25 - 100
0.425	0 - 60
0.075	0 - 10

Where referred to on the Standard Drawings alternative bedding material may be fine crushed rock in accordance with Chapter 12.6.4 c).

12.4.2 Conduits

Conduits supplied by the Contractor must be, unless otherwise shown on the Drawings, UPVC pipe of a class, size, and colour in accordance with the Service Authorities requirements.

12.5 LOCATION

Services must be located as shown on the Drawings. Unless otherwise stated, common trenching must be used in accordance with the requirements of the Superintendent and Service Authorities. Covers and clearances to services must be as shown on the Standard Drawings or as otherwise required by the Service Authority.

12.6 INSTALLATION

12.6.1 Excavation

Trenches must be excavated to the location and minimum dimensions shown on the Drawings. Excavation must be in accordance with Clause 12.5. Prior to excavation the Contractor must confirm the location of all other services.

Excavations in existing pavement areas must be made by first saw cutting the pavement surfacing.

12.6.2 Conduits

Conduits must be supplied and installed as shown on the Drawings. Where pipes are cut, the ends must be left neat and regular. Conduits must be fitted with 2 mm diameter galvanised draw wire and the ends plugged to prevent the entry of backfill.

12.6.3 Bedding and Haunching

Bedding and haunching must be placed as shown in the Standard Drawings and firmly compacted to the satisfaction of the Superintendent. Care must be taken to ensure that the conduit is fully and evenly supported by the bedding material.

Fine crushed rock bedding must be compacted to 95% of Standard Compaction in accordance with AS 1289.

Metallic detector tape must be installed above the pipe haunching.

12.6.4 Backfill

a) Outside pavement areas
Backfill free of rocks or stones larger than 50 mm, clay lumps larger than 150 mm, organic material or other deleterious matter, must be placed in uniform layers not exceeding 450 mm compacted thickness and watered and compacted to a minimum of 95 per cent of Standard Compaction.

b) New pavement areas
Backfill to the formation level must be sub-base material in accordance with the Municipal Standards Specifications Part 6, Material and Pavement Construction.

Backfill must be placed in uniform layers not exceeding 150 mm compacted thickness, and watered and compacted to a minimum of 95 per cent of Standard Compaction

c) Existing pavement areas
The pavement must be backfilled and reinstated to the satisfaction of the Superintendent using wet-mixed base course material in accordance with the Municipal Standards Specifications Part 6, Material and Pavement Construction. Backfill must be placed in uniform layers not exceeding 150 mm compacted thickness, and compacted to a minimum of 98 per cent of Modified Compaction. Excavations in existing pavements must be reinstated as soon as practicable and in all cases a minimum carriageway width of 4.0 metres must be maintained. No excavation must be permitted to remain open over night without the written approval of the Superintendent. Unless otherwise approved by the Superintendent, resurfacing of the pavement must be carried out by the Local Authority at the Contractor's expense.

12.6.5 Location Indicators

The location of roadway conduit crossings must be marked on kerbs using symbols approved by the Superintendent. Where there is no kerb, the conduit location must be marked using indicator posts in accordance with the requirements of the Superintendent.

12.7 TRENCH REINSTATEMENT

Trench reinstatement in flexible pavement must be to TSD-G01.

Unless otherwise specified, reinstatement of surfaces other than flexible pavements must match the materials and standard of the original surface.

12.8 ACCEPTANCE

The Superintendent must inspect and approve the installation of conduits prior to backfill.

SPECIFICATIONS

PART 13 - GUIDE POSTS AND ROAD SAFETY BARRIER SYSTEMS

13 GUIDE POSTS AND ROAD SAFETY BARRIER SYSTEMS

13.1 INTRODUCTION

This specification is a part of the IPWEA Tasmania Division's Municipal Standard Specifications and Standard Drawings and should be read in conjunction with the other Parts of this set of documents.

13.2 GUIDE POSTS AND DELINEATORS

Guide Posts and Delineators are to be in accordance with the StateGrowth VicRoads Specifications:

709 Guide Posts
710 Fixed Raised Pavement Markers
721 Pavement Markings

13.3 ROAD SAFETY BARRIER SYSTEMS

Road Safety Barrier Systems are to be in accordance with the StateGrowth VicRoads Specifications:

670 Steel Bridge Joints
671 Concrete and Combined Concrete and Steel Bridge Barriers
675 Cast Steel Barrier Railing Posts
711 Wire Rope Safety Barrier

13.4 ACCEPTANCE

13.4.1 Inspections

The Superintendent must inspect and approve the installation of all Guide Posts, Road Safety Barrier Systems and Delineators.