

<b>1151 ROAD OPENINGS AND RESTORATION</b>
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## 1 GENERAL

### 1.1 RESPONSIBILITIES

#### Objectives

General: Provide road opening and restoration works for installation of services within public road reserves comprising clearing, excavation, backfilling and restoration of surfaces. This worksection excludes the installation activities of the relevant public utility services.

#### Performance

Requirements: Provide the works as specified and/or as shown on the drawings and as directed/approved by the Superintendent. Conform to public utility services and Council requirements.  
Selections: As documented.

### 1.2 CROSS REFERENCES

#### Worksections

Requirement: Conform to the following:

- 0136 General requirements (Construction).
- 0152 Schedule of rates – supply projects.
- 0161 Quality (Construction) or 0167 Integrated management.
- 1101 Control of traffic.
- 1141 Flexible pavements.
- 1142 Bituminous cold mix.
- 1143 Sprayed bituminous surfacing.
- 1144 Asphaltic concrete (Roadways).
- 1145 Segmental paving.
- 1392 Trenchless conduit installation.

### 1.3 REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

#### Standards

AS 1289	Methods for testing soils for engineering purposes
AS 1289.5.4.1-2007	Soil compaction and density tests—Compaction control test—Dry density ratio, moisture variation and moisture ratio
AS 1289.5.6.1-1998	Soil compaction and density tests - Compaction control test - Density index method for a cohesionless material
AS 1289.5.7.1-2006	Soil compaction and density tests—Compaction control test—Hilf density ratio and Hilf moisture variation (rapid method)
AS 1289.6.1.2-1998	Soil strength and consolidation tests—Determination of the California Bearing Ratio of a soil—Standard laboratory method for an undisturbed specimen
AS 1348-2002	Glossary of terms—Road and traffic engineering
AS 1742	Manual of uniform traffic control devices
AS 1742.3-2009	Traffic control devices for works on roads

#### Other publications

*Street Openings Conference*

Guide to codes and practices for street openings, 2009

### 1.4 INTERPRETATIONS

#### Abbreviations

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

- CBR: California Bearing Ratio.
- CRO: Council's Restoration Officer.
- TGS: Traffic Guidance Scheme.
- CTPO: Council's Tree Preservation Officer.
- WAE: Work-as-executed (drawings).

**Definitions**

General: For the purposes of this worksection the following definitions apply in addition to those of AS 1348:

- Carriageway: That portion of a road or bridge devoted particularly to the use of vehicles, inclusive of shoulders and auxiliary lanes.
- Clearing: The removal of vegetation or other obstacles at or above ground.
- Footpath: The paved section of a pathway.
- Pathway: A public way reserved for the movement of pedestrians and of manually propelled vehicles.
- Pavement: That portion of a carriageway placed above the subgrade for the support of, and to form a running surface for, vehicular traffic.
- Selected material zone: The top part of the Upper zone of formation in which material of a specified higher quality is required.
- Shoulder: The portion of the carriageway beyond the traffic lanes and contiguous and flush with the surface of the pavement.
- Verge: That portion of the formation not covered by the carriageway or footpath.

**1.5 SUBMISSIONS**

**Acceptance criteria**

General: All submissions will be subject to the approval of the Superintendent.

**Documents**

Submit the following for approval:

- Drawings: W.A.E. drawings (certified).
- Calculations: Survey set-out data for trench excavations.
- Execution details: As documented. Refer to **HOLD POINTS, WITNESS POINTS.**

Materials: Select backfill, cement, bituminous/asphaltic pavement materials.

- Technical data: Compaction data on backfill.
- Type tests: [complete/delete]
- Type test results: [complete/delete]

**1.6 INSPECTION**

**Notice**

General: Give notice so that the inspection may be made of the following:

**Summary of HOLD POINTS**

Clause/subclause	Requirement	Notice for inspection	Release by
<b>Provision for traffic – Safety</b>	Submit a Traffic Guidance Scheme	2 weeks before construction	Superintendent
<b>Set out of works</b>			
<b>Pathways and driveways</b>	Install utility services by trenchless method	7 days before installation	Superintendent
<b>Set out inspection and approval</b>	Submit set out line	7 days before surface work	Superintendent and CRO
<b>Excavation</b>			
<b>Trench</b>	Submit proof of approval of method of excavation	7 days before excavation	Superintendent
<b>Location of services</b>	Written confirmation by	2 weeks before excavation	Superintendent

	appropriate authority that service is retired and inactive		
<b>Excavation level</b>	Excavated foundation level as planned or directed	3 days before approval of foundation	Superintendent
<b>Unsuitable material</b>	Removal of unsuitable foundation material	3 days before approval of foundation	Superintendent
<b>Trench backfill - Backfill</b>	Nominate backfill material for approval	7 days before backfill	Superintendent
<b>Restoration preparation - approval</b>	Present prepared areas prior to paving restoration	3 days before restoration	Superintendent and CRO
<b>Surface restoration</b>			
<b>Temporary pavement removal</b>	Approval to retain in place temporary base material 7 days before restoration of pavement		Superintendent
<b>Subbase and base</b>	Approval of source of material	7 days before restoration of pavement	Superintendent
<b>Pathways and paved public areas</b>	Approval to retain in place temporary subbase material	7 days before restoration	Superintendent
<b>Segmental paving units</b>	Approval of paving pattern near features	7 days before restoration	Superintendent and CRO
<b>Completion - Clean up</b>	Present cleaned up restoration works for approvals	As directed	Superintendent

**Summary of Witness Points – On site activities**

Clause/subclause	Requirement	Notice for inspection
<b>Surface treatment removal</b>		
<b>Concrete and asphalt pavements</b>	Removal and legally dispose	3 days before removal
<b>Segmental paving units</b>	Hand removal and stacking	24 hours before removal
<b>Segmental paving units</b>	Removal and legally dispose	3 days before removal
<b>Grass</b>	Unsuitable grass for assessment and removal to disposal	3 days before removal
<b>Small plants, shrubs and trees</b>	Suitable items for assessment and stores at nominated locations	7 days before removal
<b>House stormwater pipes</b>	Maintain/assess damage for repair/replacement	As directed
<b>Excavation</b>		
<b>Topsoil</b>	Suitability for reuse – assessment and stockpile	3 days before removal
<b>Stockpiles</b>	Stockpile at sites nominated by Superintendent	3 days before removal
<b>Existing trees</b>		
<b>Work near trees</b>	Duration of open excavation to be determined by Superintendent with conditions by CTPO	3 days before excavation
<b>Work near trees</b>	Avoid root damage conditions by CTPO	3 days before disturbing roots

<b>Trench backfill</b>		
<b>Backfill</b>	Source of backfill for trenches approved by Superintendent	7 days before importing material
<b>Trees</b>	Approval to place fill near trees	7 days before placing material
<b>Compaction – Relative compaction</b>	Approval to vary moisture content for material compaction	3 days before placing material
<b>Compaction – Relative compaction</b>	Submit test results on compacted backfill within 2 weeks of testing	As directed
<b>Restoration preparation</b>		
<b>Carriage pavements and pathways</b>	Condition determined by CRO and Superintendent As directed	
<b>Temporary carriageways</b>	Steel plating and warning signs for approval	As directed
<b>Surface restoration</b>		
<b>Pathways and paved public areas</b>	Restoration directed by the Superintendent	3 days before restoration
<b>Concrete footpaths</b>	Match thickness, finish and pattern to adjoining components or as directed by the Superintendent	7 days before formwork
<b>Verge plants, shrubs and trees</b>	Planting holes, replanting items, backfill and maintain as directed	As directed

## 2 PRE-CONSTRUCTION PLANNING

### 2.1 THE WORKS GENERALLY

#### Programming

Utility services: Liaise with and document the constraints on excavation imposed by the existing utility services.

Concrete pavements: Procedures to obtain approval for open trenching in carriageway concrete pavements.

Program:

- Provide planning resources to allocate plant and personnel for the contract period.
- Program the work to meet the constraints of **HOLD POINTS, WITNESS POINTS**.

### 2.2 PROVISION FOR TRAFFIC

#### Safety

Traffic obstruction: Construct the Works in a safe manner with the least possible obstruction to traffic, both vehicular and pedestrian.

Guidance scheme: Submit a Traffic Guidance Scheme and carry out all activities for controlling traffic, both vehicular and pedestrian, in conformance with *1101 Control of traffic*. This is a **HOLD POINT**.

#### Access

Properties adjacent to the works: Provide continuous safe, all weather vehicular and pedestrian access wherever possible.

Notice: Provide 48 hours to property owners whose access will be restricted.

### 3 EXECUTION

#### 3.1 EXISTING UTILITY SERVICES

##### Marking

General: Before commencing earthworks, locate and mark existing underground services in the areas which will be affected by the earthworks operations including clearing, excavating and trenching.

Contact: DIAL 1100 BEFORE YOU DIG is a free service, from anywhere in Australia, of locating underground pipe and cables (possible within two working days). See [www.dialbeforeyoudig.com.au](http://www.dialbeforeyoudig.com.au).

Locations: Obtain locations of water, sewer, stormwater, gas, electricity and telephone services. Utility Authorities: In addition contact names listed in *0179 General Requirements (Construction)* to verify the location of services.

#### 3.2 SET OUT OF WORKS

##### Preparation

Initial limits: Set out the limits of the proposed excavation for trenches, pits and chambers required for the utility service installation. Set out legibly in chalk or crayon for inspection by Council's Restoration Officer without permanently defacing any surface. This is a **WITNESS POINT**.

Adjusted limits: Adjust the set out to minimise or eliminate residual small portions of paving slabs. Make adjustments in conformance with **Pathways** and **Carriageways** and with respect to the existing paved surfaces and joint patterns.

##### Utility services under concrete pavements

Approval: Installation of utility services by open trenching methods in carriageway concrete pavements is not permitted without the prior approval of the Superintendent, or Council in the case where the Utility Authority is the Principal in the Contract. Install the utility services under carriageway concrete pavements in conformance with *1392 Trenchless conduit installation*.

##### Additional work adjacent to the works

Procedure: The Council may require removal and restoration of footpaths and/or carriageway pavements, adjacent to the Works, in addition to the removal and restoration requirements of this worksection. Such additional work is identified and defined by Council's Restoration Officer at the **Set out inspection and approval** hold point of the Contract.

Payment: In this case, payment for the additional removal and restoration activities is made as a Variation to the Contract at the schedule rates for the particular activities.

##### Pathways and driveways

Set out: Vary the set out line in conformance with the reinstatement requirements of the Street Opening Conference publication *Guide to codes and practices for street openings*.

Conform to codes and practices as follows:

- Bitumen and concrete paving: In conformance with the reinstatement provisions and sketches of the above guide.
- Segmental paving units: Ensure the set out line is at least one whole unit clear of both sides of the minimal alignment of the trench.
- Textured or patterned concrete set out line: As determined by Council's Restoration Officer in conjunction with the Contractor's surveyor and the Superintendent.
- Driveways: Where the Superintendent directs that driveways are not to be disturbed, install the utility services under driveways in conformance with *1392 Trenchless conduit installation*. This is a **HOLD POINT**.

##### Carriageways

Asphalt pavements: Set out the proposed trench at the minimum width for the depth of service and, wherever possible, at right angles to the road reserve boundary.

##### Survey marks

Authority requirements: Refer any trench or surface work proposed in the vicinity of Permanent or State Survey Marks to the Land Information Centre of the Department of Land and Water Conservation or other appropriate Authority responsible for survey records, prior to commencement or Work, to obtain protection or relocation requirements.

### **Set out inspection and approval**

Timing: Submit the set out line to the Superintendent for approval prior to the commencement of any surface clearing work. This action is a **HOLD POINT**.

Release: The Superintendent and Council's Restoration Officer will inspect and approve the set out, and define any additional removal and restoration work required by Council, prior to the release of the hold point.

## **3.3 SURFACE TREATMENT REMOVAL**

### **Concrete and asphalt pavements**

Method: Saw cut trench set out lines located on concrete or asphalt footpaths, and asphalt carriageway pavements for the full depths of the bound pavement layers except where the set out line is located along expansion joints.

Removal of concrete and asphalt: Break out concrete or asphalt footpath and carriageway pavement material between the trench set out lines, remove and legally dispose of off-site or stockpile at a site nominated by the Superintendent. This is a **WITNESS POINT**.

### **Segmental paving units**

Removal: Take up by hand segmental paving units both full and cut, between the trench set out lines, and neatly stack on wooden pallets at locations as directed by the Superintendent. This is a **WITNESS POINT**.

Concrete edging: Break out, remove and legally dispose of off-site or stockpile at a site nominated by the Superintendent. This is a **WITNESS POINT**.

Concrete subbase: If present, sawcut along the trench set out lines.

### **Dimensioned stone**

Kerb and gutter: Take up stone units within the set out lines and stack on wooden pallets at locations as directed by the Superintendent. This is a **WITNESS POINT**.

### **Grass**

Method: Neatly cut grass turf between trench set out lines into 300 mm squares. Take up and store the turf at locations as directed by the Superintendent and water as directed during the storage period. If the grass is considered by the Superintendent to be unsuitable for reuse, remove and legally dispose of it off-site. This is a **WITNESS POINT**.

### **Small plants, shrubs and trees**

Suitability for re-planting: As determined by the Superintendent.

Storage: Take up small plants, shrubs and trees, between the set out lines, and store at locations nominated by the Superintendent. Wrap the root ball in a hessian or plastic bag with drain holes and water as directed during the storage period.

Unsuitable vegetation: Remove and legally dispose of off-site other plants deemed unsuitable for replanting.

### **House stormwater pipes**

Gutter discharge: Maintain house stormwater pipes discharging into carriageway gutters at all times.

Damage: If caused by the Contractor's activities, repair or replace damaged pipes to the satisfaction of the Superintendent. This is a **WITNESS POINT**.

Costs of such rectification works: Borne by the Contractor.

## **3.4 EXCAVATION**

### **Topsoil**

Definition: Topsoil, which is considered by the Superintendent to be suitable for reuse in the restoration work

Topsoil: Strip, remove and stockpile at a site nominated by the Superintendent.

Timing: Before undertaking trench excavation. This is a **WITNESS POINT**.

### **Trench**

Dimensions: Excavate trenches to the standard widths and depths for the particular utility service installation or to dimensions shown on the drawings.

Stabilisation: Provide shoring, sheet piling or other stabilisation of the sides necessary in conformance with statutory requirements.

Approval by other public utility authorities: Where other public utilities exist in the vicinity of the Works, obtain the approval of the relevant authority to the method of excavation before commencing excavation. Provide proof of approval of the relevant authority to the Superintendent. This is a **HOLD POINT**.

#### **Location of services**

Existing underground services: Locate by exploratory excavation prior to the principal trench excavation.

Retired services: Before removal, provide confirmation in writing from the appropriate Authority that retired services are inactive. This is a **HOLD POINT**.

Removal of services: Excavate, remove off site and legally dispose of all retired services components. Backfill the resulting excavation in conformance with **Trench backfill**.

#### **Excavation level**

Trench or foundation excavation: To the planned level for the bottom of the specified bedding or foundation level or such other depth as directed by the Superintendent. This action is a **HOLD POINT**. The Superintendent's approval of the trench or foundation level is required prior to the release of the hold point.

#### **Stockpiles**

Excavated material: Segregate the earth and rock material and stockpile, at sites nominated by the Superintendent, for reuse in backfilling operations. This is a **WITNESS POINT**.

Locations: Do not stockpile excavated material against tree trunks, buildings, fences or obstruct the free flow of water along gutters where stockpiling is permitted along the line of the trench excavation.

Disposal: If stockpiling is not permitted legally, dispose of excavated material off-site.

#### **Unsuitable material**

Disposal: Remove any material from the bottom of the trench or at foundation level which is deemed unsuitable by the Superintendent and legally dispose of off-site and replace with backfill material in conformance with the requirements of this worksection.

Levels: Align the bottom of the excavated trench or foundation at the specified level and slope of the utility service. This is a **HOLD POINT**.

### **3.5 EXISTING TREES**

#### **Protection during works**

Existing trees: Protect from all damage during the works.

Harmful materials: Do not store, stockpile, dump or otherwise place under or near trees bulk materials and harmful materials including oil, waste concrete, clearings, boulders and the like. Prevent wind blown materials from harming trees and plants.

#### **Work near trees**

Damage: Prevent damage to tree bark. Do not attach stays and guys to trees.

Work under trees: Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees.

Hand methods: Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods or trenchless methods, to preserve root systems intact and undamaged.

Roots: Do not cut tree roots exceeding 50 mm diameter. If it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, water the tree and apply a liquid rooting hormone to stimulate the growth of new roots (e.g. Formula 20® or Hormone 20®). This is a **WITNESS POINT**.

Backfilling: Backfill to excavations around tree roots with a mixture consisting of three parts by volume of topsoil and one part of well rotted compost with a neutral pH value, free from weed growth and harmful materials. Place the backfill layers, each of 300 mm maximum depth, compacted to a dry density similar to that of the original or surrounding soil. Do not backfill around tree trunks to a height greater than 200 mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Compacted ground: Do not compact the ground or use skid-steel vehicles under the tree dripline. If compaction occurs, give notice and obtain instructions.

Compaction protection: Protect areas adjacent the tree dripline. Submit proposals for an elevated platform to suit the proposed earthworks machinery.

Watering: Water trees as necessary, including where roots are exposed at ambient temperature > 35°C.

Mulching: Spread 100 mm thick organic mulch to the whole of the area covered by the drip line of all protected trees.

Open excavations under tree canopies: The duration to be determined by the Superintendent at the time of the excavation and in conformance with the requirements of Council's Tree Preservation Officer. This is a **WITNESS POINT**.

### 3.6 TRENCH BACKFILL

#### Bedding, haunch, side and overlay zones

Installation: In conformance with the particular utility authority requirements.

Overlay zone thickness: Maximum of 300 mm immediately over the utility service.

Material: As nominated by the utility authority.

#### Backfill

Extent: Between the overlay zone and the top of subgrade.

Material: As determined by the Superintendent and may comprise the following:

- Approved stockpiled excavated material.
- Imported fill.
- 14 :1 moist washed river sand/cement mix or non-cohesive backfill material.

Nominate backfill material for approval of the Superintendent at least 7 days prior to commencement of work. This is a **HOLD POINT**.

Imported material: From a source approved by the Superintendent, free of tree stumps and roots and capable of being compacted in conformance with **Compaction**. This is a **WITNESS POINT**.

#### Selected material zone

Extent: The section of trench within the zone, if applicable.

Backfill material: Selected material free from stones larger than 100 mm maximum dimension and the fraction passing a 19 mm Australian Standard sieve to have a 4 day soaked CBR value, in conformance with AS 1289.6.1.2, not less than that of the adjacent selected material zone.

#### Trees

Backfill at trees generally: Backfill, for a minimum 300 mm thickness, around tree roots with a topsoil mixture approved by the Superintendent, placed and compacted in layers of 150 mm minimum depth to a dry density equal to that of the surrounding soil.

Backfill at trees in carriageway pavements: To the direction of the superintendent.

Backfill level: Do not place backfill material above the original ground surface around tree trunks or over the root zone. This is a **WITNESS POINT**.

Watering: Thoroughly water Immediately after backfilling the tree root zone.

### 3.7 COMPACTION

#### Relative compaction

Requirements: To the **Compaction table** when tested in conformance with AS 1289.5.4.1 for modified compactive effort or AS 1289.5.6.1 for density index for cohesionless material as applicable.

#### Compaction table

Layer	Relative compaction	Density index
Foundations or trench base to a depth of 150 mm below foundation levels	92%	70
Material replacing unsuitable material	92%	70
Bedding material	92%	70
Selected backfill and ordinary backfill material		70
– below 1.5 m of finished surface	92%	70
– within 1.5 m of finished surface	97%	80

Layer	Relative compaction	Density index
Backfill material within the selected material zone	97%	80

Layers: Compact all material in layers not exceeding 150 mm compacted thickness. Compact each layer to the relative compaction specified before the next layer is commenced.

Moisture content: At the time of compaction, adjust the moisture content of the material so as to permit the specified compaction to be attained at a moisture content which, unless otherwise approved by the Superintendent, is neither less than 60% nor more than 95% of the apparent optimum moisture content, as determined by AS 1289.5.7.1 (modified compaction). This is a **WITNESS POINT**.

Testing compaction: To AS 1289.5.7.1 compaction of completed backfill testing and submit the results. Test compaction at a minimum frequency of 1/every second layer/50m<sup>2</sup> of backfill surface area. This is a **WITNESS POINT**.

Precautions: If compacting adjacent to utility services, use compaction methods which do not cause damage or misalignment of any utility service.

### 3.8 RESTORATION PREPARATION

#### Carriageway pavements and pathways

Make good: Restore carriageway pavements and pathways in a continuous manner to the equivalent condition.

Equivalent condition: The condition equivalent to that existing at the commencement of the works as determined by Council's Restoration Officer and the Superintendent. This is a **WITNESS POINT**.

#### Structures

Levels: Set the levels of utility service surface pits, access chamber frames and lids and any other affected structures, so that carriageway pavements and footpaths can be restored to original levels. Liaise with other utility authorities if any other utility service surface box requires adjustment or replacement prior to restoration.

#### Approval

Before paving: Prior to the commencement of any paving restoration work, form up and prepare the areas for paved restoration and present the prepared areas to the Superintendent and Council's Restoration Officer for approval. This action is a **HOLD POINT**. And verify any additional restoration work required by Council, prior to the release of the hold point.

#### Temporary carriageways

Temporary restoration: If the planned date for final restoration exceeds 5 days provide temporary restoration and re open immediately after backfilling to subgrade level to the following alternatives:

- Bituminous cold mix, of a maximum thickness 50 mm, on a base of compacted crushed stone, gravel or other material approved by the Superintendent.
- Steel plating, over the trench, of sufficient thickness and bearing area outside the trench to support traffic loadings and suitably secured with pins or bituminous cold mix to the satisfaction of the Superintendent. Provide advance warning signs in conformance with AS 1742.3. This is a **WITNESS POINT**.

#### Temporary footpaths and driveways

Temporary restoration: If the planned date for final restoration exceeds 2 days provide temporary restoration and re open immediately after backfilling to subgrade level.

Material: Bituminous cold mix, of maximum thickness 50 mm, or other material approved by the Superintendent.

### 3.9 SURFACE RESTORATION

#### Temporary pavement removal

Temporary pavement material: Remove and dispose of off-site prior to final carriageway pavement restoration.

Temporary base material: If approved by the Superintendent, the temporary base material may remain in place and be incorporated into the final pavement if it complies with the requirements of this worksection for the subbase (including the requirements for compaction and testing) and has not been disturbed or contaminated during removal of the temporary surfacing.

In any case, remove and dispose the asphaltic material of off-site. This is a **HOLD POINT**.

### **Subbase and base**

Material: Provide crushed rock, DGS20 or DGB20 material, from a source approved by the Superintendent and configure in layers and depths as indicated in **Annexure A**.

Supply and installation: To *1141 Flexible pavements*. This is a **HOLD POINT**.

Compaction: Uniformly compact each layer of the subbase and base courses over the full area and depth within the trench to a relative compaction of 100 per cent when tested in conformance with AS 1289.5.4.1.

Tests: Undertake compaction tests at a minimum frequency of 1/ every second layer/50 m<sup>2</sup> of restoration surface area.

### **Carriageway bituminous wearing surface**

Materials and installation:

- To *1143 Sprayed bituminous surfacing* or *1144 Asphaltic concrete (Roadways)*, as applicable.
- To the requirements set out in Annexure A.
- To present a waterproof surface at application.

Surface tolerance: Departures from a 3.m straightedge less than  $\pm 5$  mm 7 to 10 days after completion, and the surface such that an impact is not transmitted to traffic passing over the restoration.

Construction details:

- Extend the bituminous surfacing and/or asphalt to a minimum dimension of 100 mm beyond the perimeter of any trench excavation.
- Make the joint between new and existing asphalt vertical and cut by diamond saw or milling machine.
- Treat the vertical face and subgrade surface of the old asphalt by bituminous tack coating.

Thickness tolerance: No variation more than +10 mm or less than -0 mm at any point from the specified layer thickness.

### **Pathways and paved public areas**

Materials generally: Consistent with the surface existing before commencement of the works, or as directed by the Superintendent. This is a **WITNESS POINT**.

Subbase: 150 mm crushed stone DGB20 compacted to 100 percent relative compaction in conformance with AS 1289.5.4.1. If approved by the Superintendent, the temporary material may remain in place and be incorporated into the final subbase. This is a **HOLD POINT**.

Lippage at patches: Match the surface level at any point along the patch's edge with the adjoining footpath surface within  $\pm 5$  mm.

### **Concrete footpaths**

General: Include textured and patterned concrete

Construction: Conform to the following:

- Material: 20 MPa concrete
- Surface finish and pattern: Match existing adjoining footpaths and driveways as appropriate or as directed by the Superintendent. This is a **WITNESS POINT**.
- Expansion joints: 15 mm thick preformed jointing material of bituminous fibreboard or equivalent approved by the Superintendent placed where new concrete abuts existing concrete and in line with joints in existing concrete.
- Control joints:
  - . Form control joints strictly in line with the control joints in existing concrete.

Around electricity supply poles: Terminate the concrete paving 200 mm from the pole and fill the resulting space with cold mix asphalt.

### **Asphalt footpaths**

Materials and installation: To *1144 Asphaltic concrete (Roadways)*, or *1142 Bituminous cold mix*, as nominated by Council's Restoration Officer.

Thickness: Match the adjoining footpath.

Finish: Compact to a smooth even surface.

### **Segmental paving units**

Materials and installation: To *1145 Segmental paving* and as follows:

- Laying: Re-lay to match the pattern and surface levels of the existing paving.
- Damaged paving units: Replace with new units, paving units which are unsuitable for relaying, as determined by the Superintendent, with new units of the same material, type, size and colour as the existing.

Tree surrounds, service boxes and poles: Match the pattern at similar existing features in the immediate area or be as directed by the Superintendent in consultation with Council's Restoration Officer. This is a **HOLD POINT**.

#### **Turfed verges**

Topsoil: 50 mm minimum thickness, placed on the subgrade prior to restoration of turfed verges.

Existing grass turf: Re-lay to conform with the original grassed surface.

Method: Hand butt turfs against each other in rows and topdress the seams with topsoil, rolled and watered to ensure direct and uniform contact with the topsoil.

Additional turf: If required complete the affected area with turf of the same species.

#### **Verge plants, shrubs and trees**

Topsoil: Match the surrounding thickness, placed on the subgrade prior to restoration of turfed verges.

Planting holes: Excavate, at locations determined by the Superintendent in consultation with Council's Restoration Officer, and spread the material evenly around each hole.

Plant material: Re-plant existing plants, shrubs and trees which are suitable for replanting as determined by the Superintendent. Backfill the planting hole with topsoil and compact by foot up to surface level.

Staking: Stake the shrubs and trees as directed by the Superintendent, and water and maintain for 2 months after the date of formal completion of the restoration works. These constitutes a **WITNESS POINT**.

### **3.10 COMPLETION**

#### **Clean up**

Extent: Clean up the areas affected by the Works and associated construction activities and restore to a condition equivalent to that existing at the commencement of the Works.

Rubbish: Remove and legally dispose of all formwork, rubbish and residue construction materials, off site including material left at stockpiles.

Approval: Present the cleaned up restoration works to the Superintendent for approval. This action is a **HOLD POINT**. The Superintendent's approval is required prior to the formal completion of the restoration works.

### **3.11 WORK-AS-EXECUTED DRAWINGS**

#### **Requirements**

Submission: Supply the Superintendent with fully marked-up work-as-executed drawings for the whole of the contract within 2 weeks of approval of the restoration works by the Superintendent. Prints of the contract drawings will be supplied by the Principal free of charge for this purpose.

Format: To 0179 General requirement (Construction).

## **4 MEASUREMENT AND PAYMENT**

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### **4.1 MEASUREMENT**

#### **General**

Schedule of Rates payment to the Contractor: To 0152 Schedule of rates – supply projects, this worksection, the drawings and Pay items **1151.1 to 1151.16** inclusive.

Lump Sum prices: Not acceptable.

Unpriced items: If any item, for which a quantity of work is listed in the Schedule of Rates, is not priced, make due allowance in the prices of other items for the cost of the activity.

#### **Methodology**

The following methodology will be applied for measurement and payment:

- Provision for traffic, both vehicular and pedestrian, is deemed to be included in the schedule rates generally in conformance with *1101 Control of traffic*.
- Segmental paving works are measured and paid in conformance with this worksection and not *1145 Segmental paving*.
- Trenchless installation of utility services under driveways is measured and paid in conformance with *1392 Trenchless conduit installation*.

**4.2 PAY ITEMS**

Pay items	Unit of measurement	Schedule rate scope
<p><b>1151.1 Sawcut existing pavement/footpath</b></p> <ul style="list-style-type: none"> <li>- 1151.1(1) Bituminous carriageway pavement</li> <li>- 1151.1(2) Bituminous footpath</li> <li>- 1151.1(3) Concrete footpath, including textured or patterned concrete.</li> </ul>	<p>Linear metre measured along the actual line of cut</p>	<p>All costs associated with the sawcutting operations including hire of plant and provision of water.</p>
<p><b>1151.2 Remove existing pavement/footpath</b></p> <ul style="list-style-type: none"> <li>- 1151.2(1) Removal to stockpile</li> <li>- 1151.2(2) Disposal off-site.</li> </ul>	<p>m<sup>2</sup> of pavement removed including both bituminous and concrete material and including concrete subbase from segmental paving where applicable. Width and length as shown on the drawings or as directed by the Superintendent.</p>	<p>For <b>1151.2(1)</b>, all costs associated with breaking out, removing, carting and placing into stockpile. For <b>1151.2(2)</b>, all costs associated with breaking out, removing, transporting off-site, disposal and any tipping fees applicable.</p>
<p><b>1151.3 Segmental paving units</b></p> <ul style="list-style-type: none"> <li>- 1151.3(1) Take up and stack existing units—Carriageway</li> <li>- 1151.3(2) Take up and stack existing units—Footpath</li> <li>- 1151.3(3) Lay existing units—Carriageway</li> <li>- 1151.3(4) Lay existing units—Footpath</li> <li>- 1151.3(5) Supply and lay new units—Carriageway</li> <li>- 1151.3(6) Supply and lay new units—Footpath</li> </ul>	<p>m<sup>2</sup> of surface of segmental paving units taken up or laid. Width and length as shown on the drawings or as directed by the Superintendent.</p>	<p>For items <b>1151.3(1)</b> and <b>1151.3(2)</b>, all costs associated with taking up and stacking units on pallets at locations as directed. Remove concrete subbase, where applicable, under <b>1151.2</b>. For items <b>1151.3(3)</b> and <b>1151.3(4)</b>, all costs associated with the laying and compaction of subbase, including concrete subbase where applicable, and existing segmental paving units, bedding sand and joint filling sand, including any cutting of units, concrete edging, joints overlying concrete pavement joints, and concrete surrounds or aprons around surface penetrations. For items <b>1151.3(5)</b> and <b>1151.3(6)</b>, all costs associated with the laying and compaction of subbase, including concrete subbase where applicable, and supply, laying and compaction of segmental paving units, bedding sand and joint filling sand, including any cutting of units, concrete edging, joints overlying concrete pavement joints, and</p>

Pay items	Unit of measurement	Schedule rate scope
		surrounds or aprons around surface penetrations.
<b>1151.4 Remove existing edge strips</b>	Linear metre measured along the length of the edge strip	All costs associated with breaking out, removing, transporting off-site, disposal and any tipping fees applicable.
<b>1151.5 Grass turf</b> - 1151.5(1) Take up and store existing turf - 1151.5(2) Lay existing turf - 1151.5(3) Supply and lay new turf	m <sup>2</sup> of surface of grass turf taken up or laid. Width and length as shown on the drawings or as directed by the Superintendent.	For item <b>1151.5(1)</b> , all costs associated with cutting, taking up and storing turf at locations as directed. For item <b>1151.5(2)</b> , all costs associated with the topsoil bedding, rolling, laying of existing turf and topdressing. For item <b>1151.5(3)</b> , all costs associated with the topsoil bedding, rolling, supply and laying of new turf and topdressing.
<b>1151.6 Verge plants, shrubs and trees</b> - 1151.6(1) Take up and store existing - 1151.6(2) Replant existing	Each plant, shrub or tree taken up or planted	For item <b>1151.6(1)</b> , all costs associated with taking up, storing and watering at locations as directed. For Item <b>1151.6(2)</b> , all costs associated with topsoil placement, preparatory work, planting, staking and subsequent care of each plant for 2 months after the date of formal completion of the restoration works.
<b>1151.7 Stockpiling of topsoil</b>	m <sup>3</sup> as bank volume. The area, derived from the width and length as shown on the drawings or as directed by the Superintendent, by the depth of topsoil directed to be removed by the Superintendent.	All costs associated with stripping topsoil, carting and placing into stockpile.
<b>1151.8 Trench excavation</b> 1151.8(1) Excavation to stockpile 1151.8(2) Excavation to disposal off-site	m <sup>3</sup> as bank volume of excavation. The width by the depth by the length defined as follows: - Width—as specified for the particular utility service installation. - Depth—average actual depth from topsoil stripped ground surface to underside of specified bedding. - Length—actual excavation length, centre to centre of pits.	The schedule rate to be an average rate to cover all types of material encountered during excavation. Separate rates not to be included for earth and rock. All costs associated with: - Excavation, including excavation and replacement of unsuitable material. - Replacement for over-excavation for any reason. - Excavation, removal and disposal of retired services, and backfilling of the resulting excavations. - Protection of trees and treatment to cut tree roots.

Pay items	Unit of measurement	Schedule rate scope
		Also for item <b>1151.8(1)</b> , all costs associated with carting and placing into stockpile. Also, for item <b>1151.8(1)</b> , all costs associated with transporting off-site, disposal and any tipping fees applicable.
<b>1151.9 Trench backfill</b> - 1151.9(1) From stockpiled material - 1151.9(2) From imported material	m <sup>3</sup> measured as backfill compacted volume in place in the trench. The width by the depth by the length defined as follows: - Width—average trench width - Depth—average actual depth from top of subgrade to top of bedding overlay material around the utility service. - Length—actual trench length, centre to centre of pits.	All costs associated with backfilling, compaction, testing and treatment around tree roots. Also for item <b>1151.9(1)</b> , all costs associated with loading and carting from stockpile. Also for item <b>1151.9(2)</b> , all costs associated with supply and delivery of imported material, including material for a selected material zone where specified.
<b>1151.10 Temporary pavement—Carriageway and footpath</b>	m <sup>2</sup> of trench area restored with temporary pavement. Trench width by the actual length of temporarily restored pavement.	All costs associated with the supply, delivery, placing and compaction of the base material and bituminous cold mix including all activities and material necessary for maintenance of the temporary pavement in a safe condition until the permanent restoration is executed.
<b>1151.11 Temporary steel plating</b>	m <sup>2</sup> of trench area. The trench width by the actual length of trench to be covered.	All costs associated with the hire, delivery, placement, securing and subsequent removal and return to depot of the steel plates of sufficient dimensions to provide support on both sides and ends of the trench and all activities and materials necessary for maintenance of the plating until permanent restoration is executed.
<b>1151.12 Subbase</b>	m <sup>2</sup> of trench. The trench width by the length.	All costs associated with the removal of temporary pavement, supply, delivery, spreading and compaction in conformance with <b>Annexure A</b> .
<b>1151.13 Base</b>	m <sup>2</sup> of trench. The trench width by the length.	All costs associated with the removal of temporary pavement where no subbase is required, supply, delivery, spreading and compaction in conformance with <b>Annexure A</b> .
<b>1151.14 Bituminous wearing surface</b>	m <sup>2</sup> of new surface area. The trench width +200 mm by the length.	All costs associated with the removal of temporary pavement or existing pavement to the new perimeter, supply, delivery,

Pay items	Unit of measurement	Schedule rate scope
		spreading and compaction in conformance with <b>Annexure A</b> .
<b>1151.15 Footpath</b> - 1151.15(1) Asphalt/sprayed bituminous seal - 1151.15(2) Plain concrete - 1151.15(3) Textured/patterned concrete	m <sup>2</sup> of paved surface, including driveways. The width and length as shown on the Drawings or as Directed by the Superintendent.	For item <b>1151.15(1)</b> , all costs associated with the forming, compaction of foundations, supply, delivery and compaction of subbase and bituminous material. For items <b>1151.15(2)</b> and <b>1151.15(3)</b> all costs associated with the forming, compaction of foundations, supply, delivery and compaction of subbase, supply delivery, placing, finishing and curing concrete, including texturing or patterned finish where applicable and placement of reinforcing steel where shown on the drawings or as directed by the Superintendent.
<b>1151.16 Cleanup</b>	m <sup>2</sup> of carriageway and/or footway surface or other surface as applicable. The lengths and widths shown on the Drawings or as directed by the Superintendent.	All costs associated with the cleaning up of the Work site, and transporting off-site and disposal of material including any tipping fees applicable.

**5 ANNEXURE A**

**5.1 RESTORATION REQUIREMENTS**

Description of Location: .....

Restoration pavement layers:

Wearing surface type                      Thickness (mm)                      (or nominal stone size)  
 Base layer type                              Thickness (mm)                      \_\_\_\_\_  
 Sub base layer type                        Thickness (mm)                      \_\_\_\_\_  
 Selected material                            Thickness (mm)                      \_\_\_\_\_

Special requirements (e.g. linemarking, traffic signs, advice to adjacent property owners etc.)

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