Muswellbrook Shire Council

CONSTRUCTION SPECIFICATION

AUS-SPEC (Cot 09)

1152 Road Openings and Restorations (Utilities)

Version 01

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
0	No amendment has been made	all	Nil		14 June 2012

Contents

1152 ROAD OPENINGS AND RESTORATIONS (UTILITIES)

1 GENERAL

1.1 RESPONSIBILITIES

Application

General: The worksection applies to Work under Contract where the Principal to the Contract is the relevant Utility Authority for the works under execution. The Utility Authority may be a Local Council for Council initiated utility works.

Objectives

General: Provide clearing, excavation, backfilling and restoration activities associated with the installation of public utility services within public road reserves or other reserves under the control of Local Government Authorities all in conformance with the objectives of the Streets Opening Conference Information Bulletin on Codes and Practices and the Model Agreement for Local Councils and Utility/Service Providers. This worksection excludes the installation activities of the relevant utility services.

Performance

Requirements: Provide the works as specified and/or as shown on the Drawings, as directed/approved by the Superintendent and conform with the relevant Utility Authority.

Quality: Requirements for quality control and testing are given in **Quality assurance** and *0161 Quality (Construction).*

Selections: As documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0152 Schedule of rates – supply projects.*
- *0161 Quality (Construction) or 0167 Integrated management.*
- *0179 General requirements (Construction).*
- *0257 Landscape – roadways and street trees.*
- *1101 Control of traffic.*
- *1132 Mass concrete subbase.*
- *1133 Plain and reinforced concrete base.*
- *1134 Steel fibre reinforced concrete base.*
- *1135 Continuously reinforced concrete base.*
- *1141 Flexible pavements.*
- *1142 Bituminous cold mix.*
- *1143 Sprayed bituminous surfacing.*
- *1144 Asphaltic concrete (Roadways).*
- *1145 Segmental paving.*
- *1191 Pavement markings.*
- *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 – Soil compaction and density tests
AS 1289.5.1.1-2003	Determination of the dry density/moisture content relation of a soil using standard compactive effort

AS 1289.5.2.1-2003	Determination of the dry density/moisture content relation of a soil using modified compactive effort
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	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
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 - Roads and traffic engineering
AS 1742	Manual of uniform traffic control devices
AS 1742.3-2009	Traffic control for works on roads
AS 4000-1997	General conditions of contract
AS/NZS ISO 9000: 2006	Quality management systems - Fundamentals and vocabulary
SAA HB 90.3-2000	The Construction Industry – Guide to ISO 9001:2000

Other publications

Austroads

AP-C87/08 2008 Glossary of Austroads Terms

Commonwealth Department of Housing and Regional Development

Australian Model Code for Residential Development. (AMCORD). A national resource document for residential development—1995:

Street Openings Conference

Guide to codes and practices for street openings, 2009

The Utility Authorities' Specifications

NSW SOC 1999 The Model Agreement for Local Councils and Utility/Service Providers

NSW Work Cover

Work near underground assets guide – 2007

WorkSafe Victoria

Guide for undertaking work near underground assets - 2004

Main roads Western Australia

Utility providers Code of Practice for Western Australia

1.4 STANDARDS

General

Standards: To the State Road Authorities, Work cover and Utility Authority's specifications.

1.5 INTERPRETATIONS

Abbreviations

General: For the purposes of this worksection the abbreviations given below apply.

- AADT: Annual average daily traffic.
- CRO: Council's restoration officer.
- EMP: Environment Management Plan.
- GAT: Glossary of Austroad Terms.
- GPR: Ground penetrating radar.
- HP: HOLD POINT.
- RTA: Roads and Traffic Authority.
- TGS: Traffic Guidance Scheme.
- TPO: Council's tree preservation officer.
- WAE: Work-as-executed.
- WP: WITNESS POINT.

Definitions

General: For the purposes of this worksection the definitions given below apply. The text in brackets is additional to the referenced definitions, as follows:

- AS 1348.1
  - Base (Base course): One or more layers of material usually constituting the uppermost structural element of a pavement and on which the surfacing may be placed.
  - Carriageway: That portion of a road or bridge devoted particularly to the use of vehicles, inclusive of shoulders and auxiliary lanes (and inclusive of medians, traffic facilities and heavy duty driveways).
  - Clearing: The removal of vegetation or other obstacles at or above ground.
  - Footpath: The paved section of a pathway (or verge).
  - Pathway: A public way reserved for the movement of pedestrians and of manually propelled vehicles (AMCORD verge).
  - Pavement: That portion of a carriageway placed above the subgrade for the support of, and to form a running surface for, vehicular traffic (including the subbase and base course).
  - Shoulder: The portion of the carriageway beyond the traffic lanes and contiguous and flush with the surface of the pavement.
  - Subbase (Subbase course): The material laid on the subgrade below the base either for the purpose of making up additional pavement thickness required over the subgrade, or to prevent intrusion of the subgrade into the base, or to provide a working surface on which the remainder of the pavement can be constructed. (The subbase course is often a different quality material to the base course.)
  - Subgrade: The trimmed or prepared portion of the formation on which the pavement is constructed. (Subgrade level is the level immediately below the pavement.)
  - Wearing Course (Surface): The part of the pavement upon which the traffic travels.
- AMCORD.
- SAA HB 90.3:
  - Hold Point (HP): A defined position in the construction/manufacturing stages of the Contract beyond which work is not to proceed without mandatory verification and acceptance by the Superintendent, or other person approved by the Superintendent.
  - Witness Point (WP): A nominated position in the manufacture/construction stages of the Contract where the option of attendance may be exercised by the Superintendent, after notification of the requirement.
  - Verge: That part of the road reserve between the carriageway and the road reserve boundary.
- AS/NZS ISO 9000:
  - Quality Check Lists (Contractor's Checklist): Forms completed during the manufacture/construction process verifying key steps, and records required for the Quality Register. Check lists apply to each identified lot of work.
- AS 4000:
  - Contractor: Means the person bound to carry out and complete work under the Contract. (A Contractor may be internal or external to the Utility Authority).
  - Principal: Means the Principal stated in the Annexure to the General Conditions of Contract. (The Utility Authority or Service Provider for whom the service installation and restoration work is being conducted.)
  - Superintendent: Means the person stated in the Annexure to the 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, includes a Superintendent's Representative an individual appointed in writing by the Superintendent.
- Other:
  - Ancillary road elements: Road elements including kerb and gutter, drainage pits, drainage lines, subsoil drainage lines, pavement markings, street furniture (i.e. signs, bins, road safety barriers, etc.)
  - Carriageway Concrete Pavements: Reinforced concrete pavements. Does not include roller compacted concrete bases and subbases.

. Council: The Local Government Authority for the area where the work is being performed.
. Protected Species: Plants identified by Council or other relevant authorities as protected species.
. Roads Authority: A person or body that is, by or under Roads Act 1993, declared to be a roads authority and in relation to a particular public road means the roads authority for that road (Road Act 1993).
. Selected material zone: The top part of the upper zone of formation in which material of a specified higher quality is required as shown on drawings and schedules or as directed.
. Utility Authority: Refer to Principal.

1.6 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)
- Quality Plan
- 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.

1.7 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
Planning and programming - Environmental Control measures	Submit an EMP for approval	2 weeks before construction	Superintendent
Provision for traffic			
- **Safety**	Submit a TGS for approval	2 weeks before works affecting traffic	Superintendent
- **Major roads**	Submit the TGS for formal approval of RTA, Council, Police	2 weeks before work affecting relevant roads	Superintendent
- **Local road closure**	Submit the TGS for approval of Council	2 weeks before road closures	Superintendent
Major roads – Utility Services	Approval for utilities within roads unable to be trenched	2 weeks before commencing works	Superintendent
Existing Utility services - marking	Provide details of affected services	7 days before excavation	Superintendent
Set out - Preparation	Submit the set out line for approval	7 days before commencing clearing	Superintendent and CRO
Surface treatment removal – Small plants, shrubs and trees.	Inspection of suitability of replanting small plants, shrubs and trees.	3 days before removal	Superintendent and Councils TPO
Excavation			
- **Trench**	Submit excavated level for approval	1 day before next relevant activity.	Superintendent
- **Location of services**	Provide details of requirements and approval of public utilities	7 days before commencing excavation	Superintendent

	removed		
- **Contaminated or hazardous material**	Notify event and submit disposal proposal	1 hour within finding	Superintendent
Existing trees – Protection during works	Inspection of all trees with councils TPO	7 days before clearing	Superintendent
Trench backfill			
- **Backfill**	Submit details of material	7 days before providing material	Superintendent
- **Water table**	Submit proposal to protect subgrade and respond to Superintendent directions.	7 days before next relevant activity	Superintendent
Restoration Preparation – Paved restoration	Inspect and setout extent of works	3 days before proceeding with pavement	Superintendent
Final carriageway restoration – Subbase and base	Submit evidence of settlement and identify cause	3 days before final restoration	Superintendent
Final pathways and driveways restoration			
- **Materials and tolerances**	Submit suitability of temporary materials	3 days before proceeding with pavement	Superintendent
- **Decorative segmental pavers on concrete base**	Submit alternative pavers	3 days before ordering	Superintendent and CRO
Completion - Clean up	Present the cleaned up restoration works for approval	3 days before programmed inspection	

Summary of WITNESS POINTS – On-site activities

Clause/subclause	Requirement	Notice for inspection
Provision for Traffic		
- **TGS**	Emergency works – application of TGS.	2 hours before proceeding
- **Access to properties adjacent to the works**	Provide report on liaison with affected owners/occupiers to the Superintendent	1 working day before restricting access
Set out		
- **Preparation**	Set out marked legible to satisfy Superintendent	Progressive
- **Pathways and driveways**	Locations for trenchless conduit installation as directed	Progressive
- **Carriageways**	Obtain protection or relocation requirements for Permanent/State Survey Marks for appropriate Authority	7 days prior to affecting survey marks
Surface treatment removal		
- **Concrete and asphalt pavements**	Removal of concrete and asphalt, disposal or stockpile as directed.	3 days before works commencing
- **Pavers and dimension stones**	Submit locations for stacking components	3 days prior to stacking

- **Decorative pavers**	Replacement pavers and protection of adjacent areas	24 hours prior to removing pavers
- **Grass**	If grass is considered unsuitable by the Superintendent remove and dispose	5 days before commencing works
Surface treatment removal - House storm water pipes	Notify damage to pipes and proposal for reinstatement to Superintendent	1 hour after damage
Excavation		
- **Topsoil**	Obtain Superintendent direction for top-soil disposal	3 days prior to removing top soil
Protection of trees		
- **Work near trees**	Restrictions on work near trees involving CTPO	Progressive
- **Tree roots**	Obtain approval for root work involving CTPO	Progressive
Trench backfill – backfill under footpaths and carriageways	Submit details of proposed material	3 days before providing material
Compaction – Relative compaction	Adjust the moisture content of the material to achieve specified compaction	Progressive
Compaction of trench backfill	Procedures, conformity with compaction criteria and testing frequency to be provided to Superintendent	Progressive
Restoration Preparation		
- **Carriageway pavements and pathways**	Restore pavements and pathways to agreed original condition with Superintendent and CRO	Prior to commencement of works
- **Temporary pavement – carriageways**	Submit proposals for temporary restoration including materials	3 days prior to commencing works
Restoration preparation – temporary footpaths and driveways	Provide access each day or as directed by the Superintendent	Progressive
Final carriageway restoration - asphaltic concrete wearing surfaces	Conform to relevant Road Authority – provide proposals	3 days prior to placing
Final pathways and driveways restoration –		
- **Materials and tolerances**	Exceptions to level tolerances to be resolved by Superintendent	Progressive
- **Pavement markings and street furniture**	Final locations subject to Superintendent's direction	7 days prior to locating
- **Concrete footpaths and driveways including textured and patterned**	Preformed jointing material to be approved	3 days prior to ordering
- **Segmental pavers on sand bed**	Replacement of pavers and pattern around features to be approved	7 days prior to proceeding
Verge plants, shrubs and trees – replanting	Replaced trees to be agreed with CTPO and Superintendent	7 days prior to importing trees and/or replanting

2 PRE-CONSTRUCTION PLANNING

2.1 THE WORKS GENERALLY

Planning

Check list: Conform with the Flow diagram 1 in *Guides to codes and practices for street openings* or Equivalent guide in States other than NSW.

Programming

Utility services: Liaise 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: Conform to the following:

- Obtain a Road opening permit from the appropriate Roads Authority unless specifically exempted.
- Provide planning resources to allocate plant and personnel for the contract period.
- Plan for the disposal of spoil and waste.
- Program the work to meet the constraints of **HOLD POINTS**, **WITNESS POINTS**.

Environmental control measures

Requirement: Implement an Environment Management Plan containing erosion and sedimentation control measures, and noise and dust control measures, as required by the relevant Environmental legislation and in accordance with the requirements of the relevant Statutory Authorities. This is a **HOLD POINT**.

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 accordance with *1101 Control of traffic*. This is a **HOLD POINT**.

Emergency works: Obtain and implement a Traffic Guidance Scheme, pre-approved by the Superintendent. This is a **WITNESS POINT**.

Access

Impact of the works: Consult with the affected property owners and/or occupiers to minimise the impact of the Works on the property owners' operation including impacts of the Works and the Traffic Guidance Scheme on businesses and around commercial areas. Provide a report on this liaison to Superintendent. This is a **WITNESS POINT**.

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.

Emergency works: Provide notice as soon as possible upon commencement of such works.

Major roads

Approval: Obtain formal approval of the Traffic Guidance Scheme from the State road authorities, council and police for works located on state roads, regional roads, and in the proximity to certain traffic control devices as determined by the Superintendent. This is a **HOLD POINT**.

Local road closures

Full road closures on local roads: Obtain prior approval of its Traffic Guidance Scheme from Council. This is a **HOLD POINT**.

Emergency works: Obtain and implement commencement of the Contract, a Traffic Guidance Scheme pre-approved by the Superintendent. This is a **WITNESS POINT**.

2.3 MAJOR ROADS

Utility services

Approval: Do not install utility services by open trenching methods in carriageway concrete pavements, full depth asphalt carriageways or regional roads with more than 10,000 AADT, without prior approval. This is a **HOLD POINT**.

Alternative: Install utility services under these carriageway pavements in conformance with *1392 Trenchless conduit installation* or the relevant Utility Authority's Specification as directed.

Maintenance: If maintenance of the Utility Authority's services requires the use of open trenching methods in these carriageway pavements, proceed only with approval.

Restoration: To **Final restoration of carriageway subbase and base (flexible)** or the relevant road authority's requirements.

2.4 QUALITY ASSURANCE

Quality plan

QA accreditation: Provide evidence of approved QA accreditation as required by the Contract, and of an approved Quality Plan for the Works.

Quality plan: Incorporate all checklists, inspections, testing and documentation as required in **Annexure C**, and as necessary to ensure that the Works conform to the Contract Documents.

Hold and witness points

Quality plan: Incorporate **HOLD** and **WITNESS POINTS** into the checklists.

Hold point sign-off: By the approved Contractor's Representative and the Superintendent.

Notice for the Superintendent: To the **Summary of HOLD POINTS** and the **Summary of WITNESS POINTS**.

Notice for Council officers: If the Superintendent instructs the Contractor that inspection is required at certain Hold Points or Witness Points by Council Officers, the Contractor is to give 24 hours notice to Council.

Hold Point approval by Contractor's inspector

Sign-off: If allowed by the Quality Plan, the Superintendent may allow the Contractor's nominated inspector to sign off certain Hold Points. This will be determined by the Contractor's performance in relation to the requirements of the Quality Plan and the Contract.

Testing

Frequencies: Conduct testing to the frequencies in **Annexure C**. All work represented by failed tests is to be retested and where necessary rectified.

Auditing

Co-operation: The Superintendent may audit the Contractor's Quality Assurance system as required. Fully co-operate in providing all information required by the Superintendent.

No additional payment

Costs: The provisions for quality assurance are deemed to be included in the rates generally in conformance with this worksection and there will be no additional payment for compliance with the specified Quality Assurance requirements.

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, collecting enquiries and passing them on to affiliated utilities to assist in locating underground pipe and cables (initial response possible within two working days with responses from utilities some time later). See www.dialbeforeyoudig.com.au.

Locations: Obtain locations of water, sewer, stormwater, gas, electricity and telephone services.

Utility Authorities: In addition to the' Dial before you dig' responses, the contact names listed in 0179 *General Requirements (Construction)* to verify the location of services. This is a **HOLD POINT**.

3.2 SET OUT

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.

Timing: Prior to the commencement of any surface clearing work, submit the set out line to the Superintendent for approval. 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.

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: Locate the set out line as determined by Council's Restoration Officer in conjunction with the Contractor's surveyor and the Superintendent.
- Driveways: If directed that driveways are not to be disturbed, install the utility services under driveways in conformance with *1392 Trenchless conduit installation*. If trenchless installation methods are not practicable, Locate and obtain approval for the set out line to enable an aesthetically acceptable restoration of the pavement. This is a **WITNESS 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.

Concrete pavements: Seek the advice and approval of the appropriate road authority/and or professional engineer for the location of trench set out lines. Refer also to the *Guides to codes and practices for street openings.* This is a **WITNESS POINT**.

Survey marks

Authority requirements: Before commencing trench or surface work within the vicinity of Permanent or State Survey Marks, refer to the Land Information Centre of the Department of Land and Water Conservation or other appropriate Authority responsible for survey records, for protection or relocation requirements.

3.3 ADDITIONAL RESTORATION WORK

Restoration

Removal and restoration: The relevant Council may request removal and restoration to footpaths and/or carriageway pavements, adjacent to the Works, in addition to the removal and restoration requirements of the scope of this worksection.

Identify: Such additional work will be identified and defined by Council's Restoration Officer at the **Set out** of the Contract.

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

Approval: Do not proceed with additional work without the prior approval of the Superintendent.

3.4 MATERIALS DISPOSAL, RECYCLING TO EXCAVATION

Disposal

Spoil: Legally dispose of all spoil and waste material to an appropriate recycling facility, disposal site or a legal waste management centre. Pay the costs of disposal, including loading, haulage and any tipping fees.

3.5 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 directed by the Superintendent. This is a **WITNESS POINT**.

Concrete edging: Break out, remove and legally dispose of off-site or stockpile in conformance with **Materials disposal**. This is a **WITNESS POINT**.

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

Decorative pavers

Utility services option: Do not disturb pavement consisting of decorative pavers laid on a mortar bed and a concrete base unless Trenchless Conduit Installation is impractical.

Removal: If it is necessary to disturb these surfaces, carefully remove pavers for reuse, and stack and secure against theft, or damage. Remove mortar bedding mix.

Sawcutting: Do not sawcut pavers unless evidence is provided that replacement pavers, of the same type, size, colour and decoration, are available.

Concrete subbase: Saw cut along the trench set out lines and remove. If using percussion equipment for removal of the pavement, ensure that adjacent areas of paving are not disturbed. This is a **WITNESS POINT**.

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 and water as directed during the storage period.

Disposal: If the grass is considered unsuitable for reuse by the Superintendent, remove and legally dispose of off-site. This is a **WITNESS POINT**.

Small plants, shrubs and trees

Inspection: The CTPO will identify small plants, shrubs and trees and/or protected or heritage listed species between the set out lines which are suitable for replanting. This is a **HOLD POINT**.

Storage: Take up identified 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: Repair or replace damaged pipes to the same diameter and in a sound matter to the satisfaction of the Superintendent if caused by the Contractor's activities. This is a **WITNESS POINT**.

Costs of rectification works: Borne by the Contractor.

Street furniture

Storage: Remove and store street furniture and signage that is installed between the trench set out lines or is likely to interfere with or be damaged by the Works.

3.6 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. If on-site stockpiling is impracticable, stockpile the topsoil off-site, or legally dispose off-site, as directed.

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 as shown on the drawings.

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

Excavation level: Excavate trench or foundation excavation to the planned level of the bottom of the documented bedding or foundation or as directed. This is a **HOLD POINT**.

Location of services

Existing underground services: Locate by exploratory excavation or by ground penetrating radar (GPR) prior to the principal trench excavation. Refer to NSW WorkCover guide *Work near underground assets*.

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

Approval by other public utility authorities: Where other public utilities exist in the vicinity of the Works, before starting excavation, either:

- Obtain the approval of the relevant authority for the method of excavation, or
- Incorporate the requirements of the relevant utility in the proposed work methods.

Provide proof of approval and/or conformity with the requirements of the relevant authority to the Superintendent. If there are any retired services seek approval before removing by providing 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 dispose legally all components of retired services. Backfill the resulting excavation in conformance with **Trench backfill**.

Stockpiles

Excavated material: Segregate the earth and rock material and stockpile, at sites nominated by the Superintendent, for reuse in backfilling operations.

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 at the bottom of the trench or at foundation level which is deemed unsuitable by the Superintendent. 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.

Contaminated or hazardous material

Procedure: If hazardous material is encountered, notify the Superintendent and dispose of the material to the requirements of the relevant Statutory Authorities. This is a **HOLD POINT**.

3.7 EXISTING TREES

Protection during works

Existing trees: Existing trees are legally protected by Council's Tree Preservation Order. Inspection and marking of all trees to be preserved in conformance with the Superintendent and Councils TPO. This is a **HOLD POINT**.

Protection: 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.

Aware: Be aware of the restrictions on work near trees and if required seek direction from Councils TPO. This is a **WITNESS POINT**.

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 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 permitted duration for open excavations will be directed by the Superintendent and Councils TPO at the time of inspection of the plants and trees. This is a **WITNESS POINT**.

3.8 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.

Geotextile: Install a geotextile sheet on any coarse overlay material to prevent piping of fines.

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. Material to be free of tree stumps, roots and any vegetative matter capable of being compacted in conformance with **Compaction**. This is a **HOLD POINT**.

Water table

Seepage zones: If sand/cement backfill is used, ensure that any natural seepage zones are not cut off by the impervious sand/cement material. Provide a pervious drainage layer or suitable subsoil drainage to preserve natural seepage.

Water in pervious material: If sand, crushed rock or similar pervious materials are used for trench backfill and bedding in a clay subgrade, there is a risk that seepage water will be trapped in the pervious material and then saturate the adjacent clay subgrade, and weaken it. If these circumstances occur, install subsoil drainage for the bedding and backfill, or provide an impervious layer of material between any possible sources of seepage and the pervious backfill material. These conditions are shown on the drawings.

Water table: If excavation is required below the natural water table and the permanent exclusion of water from subgrade is not possible in the opinion of the superintendent then submit proposals to protect the subgrade against weakening or obtain directions from the Superintendent to vary the excavation requirements. This is a **HOLD POINT**.

Selected material zone

Backfill material: Free from stones larger than 100 mm with the fraction passing a 19 mm AS sieve having a 4 day soaked CBR value not less than that of the adjacent selected material zone in conformance with AS 1289.6.1.2.

Verge and landscape areas

Material: Provide backfill material to pass 75 mm sieve and not containing any organic or deleterious material or reactive clay. Place topsoil in landscape areas on the subgrade to the same thickness as the surrounding topsoil.

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 level: Do not place backfill material above the original ground surface around tree trunks or over the root zone.

Watering: Immediately after backfilling, thoroughly water the tree root zone.

Footpaths, carriageways and heavy duty driveways

Extent: To subgrade level.

Materials: One of the following:

- Sand (do not use if the bedding/overlay is coarse aggregate).
- Fine crushed rock/recycled concrete in conformance with *1141 Flexible pavements*.
- Selected backfill material with an equivalent 4 day soaked CBR value to AS 1289.6.1.2, and a maximum particle size of 75 mm and not containing any organic or deleterious material or reactive clay.
- Under footpaths provide 25:1 sand/cement mix (compaction testing is not required).
- Under carriageways provide 14:1 sand/cement mix (compaction testing is not required).

Submission of relevant material is a **WITNESS POINT**.

3.9 COMPACTION

Relative compaction

Requirements: To the **Compaction table** when tested in conformance with AS 1289.5.4.1 for modified compactive effort.

Non-cohesive materials: Tested to AS 1289.5.6.1.

Sand/cement backfill material: No compaction testing is required.

Compaction table

Zone	Relative Compaction	Density Index (for Non-Cohesive Materials)	Moisture Content (percent of optimum moisture content)
Bedding and Overlay Zones	To Utility Authority's Specification	To Utility Authority's Specification	To Utility Authority's Specification
Backfill in verge and landscape areas	90% Standard	70	Between 60% and 100%
Backfill to subgrade level under footpaths and carriageways	98% standard 95% modified	80	Between 60% and 100%

Layers: Compact all material in layers not exceeding 150 mm compacted thickness unless it can be demonstrated to the Superintendent's satisfaction by suitable testing that the specified compaction can be achieved with the thicker layers.

Moisture content: At the time of compaction, adjust the moisture content of the material to attain the specified compaction at a moisture content which, unless otherwise approved 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: Arrange for compaction testing in conformance with AS 1289.5.7.1 on the completed backfill and submit the results of such tests within 2 weeks of the tests being performed. Undertake compaction tests at a minimum frequency of 1/second layer/50 m^2 of backfill surface area. This is a **WITNESS POINT.**

Precautions: When compacting adjacent to utility services, adopt compaction methods which will not cause damage or misalignment to any utility service.

Testing frequency: Compaction tests to be undertaken at the frequencies shown in **Annexure C** or as directed.

3.10 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**.

Safety: Provide all temporary and final restorations in carriageways and pathways of sufficient quality to ensure the safety of the site for pedestrian and vehicular traffic.

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. If any other utility service surface box requires adjustment or replacement before restoration, liaise with other utility authorities.

Paved restoration

Procedure: Set out the areas for paved restoration and arrange an inspection with the Superintendent for direction on any additional works that may be required. This is a **HOLD POINT**.

Requirements: Backfill and restoration to the **Annexure A** table.

Temporary carriageways

Subbase and base: After backfilling to subgrade level, install the subbase and base material in conformance with the final restoration of the wearing surface (course) unless otherwise agreed by the Superintendent.

Temporary restoration: If the carriageway will be re-opened to traffic prior to final restoration, provide temporary restoration. Monitor and maintain temporary restorations in a safe condition until the final restoration is completed.

Materials: Either:

- Bituminous cold mix to *1142 Bituminous cold mix*, 40-50 mm thickness, on the final subbase and base material unless otherwise agreed by the Superintendent.
- Steel plating, over the trench, of sufficient thickness to support traffic loadings and suitably secured with pins and bituminous cold mix. This is a **WITNESS POINT**.

Steel plating: If used, provide advance warning signs to AS 1742.3.

Temporary footpaths and driveways

Subbase and base: After backfilling to subgrade level install the subbase and base material in conformance with final restoration of the wearing surface (course) unless otherwise approved.

Temporary restoration: If the footpath or driveway will be re-opened to pedestrian traffic prior to final restoration, provide temporary restoration. Monitor and maintain temporary restorations in a safe condition until the final restoration is completed.

Access: Liaise with property owners regarding access and ensure that pedestrian and vehicular access is provided to all properties at the end of each day's work unless otherwise approved. This is a **WITNESS POINT**.

Temporary restoration materials:

- Bituminous cold mix, in conformance with *1142 Bituminous cold mix,* 20–40 mm thickness, or other approved material. Make a smooth and evenly graded connection with adjoining pavements such that the temporary restoration does not present a trip hazard for pedestrians.
- Sheeting or steel plating, over the trench, of sufficient thickness to support traffic loadings and suitably secured with pins and bituminous cold mix. Ensure that steel plating does not cause a trip hazard for pedestrians by matching the level of the steel plating to the adjacent surface with bituminous cold mix.

Temporary pavement removal

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

Temporary base material: If approved, 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

base and subbase (including the compaction and testing requirements) and has not been disturbed or contaminated during removal of the temporary surface.

Asphaltic material: Remove and dispose of off-site.

3.11 FINAL CARRIAGEWAY RESTORATION

Subbase and base

Settlement of temporary pavement: If the temporary restoration shows signs of settlement, before proceeding with the final restoration, identify the cause of the settlement and rectify to the satisfaction of the Superintendent. This is a **HOLD POINT**.

Material: Crushed rock or recycled concrete in conformance with *1141 Flexible pavements.*

Layers and depths: Match the existing pavement. If the existing pavement includes cement stabilised crushed rock or a lean mix concrete subbase, restore the pavement using materials and layer depths to match the existing pavement.

Compaction: Uniformly compact each 150mm layer of the subbase and base courses over the full area and depth within the trench to a relative compaction either as follows:

- 98% when tested in conformance with AS 1289.5.2.1 (Maximum Modified Dry Density)
- 102 % when tested in conformance with AS 1289.5.1.1 (Maximum Standard Dry Density).

Precautions for underlying utility services: Adopt compaction methods which will not cause damage or misalignment to underlying and adjacent utility services or adjacent structures.

Tests: Undertake compaction testing in conformance with this clause, and with the approved Quality Plan.

Program

Timing: Undertake final restoration as soon as practicable and within the time specified in the Contract.

Flexible pavements generally

Tack coat: Provide a waterproof surface for application of final material with the bituminous surfacing tack coat for asphalt or seal coat for sprayed bituminous seals.

Construction details: Conform to the following:

- Existing wearing course: Remove and dispose of off-site, material extending between 100 mm and 400 mm beyond the perimeter of any trench excavation as approved.
- Asphalt placed as restoration: Similarly, extend in plan to cover the area of previous wearing course.
- 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.

Defects: Seal any joints which appear between the existing and new asphalt during the defects maintenance period with an approved joint sealant.

Asphaltic concrete wearing surfaces

Material generally: Asphaltic concrete supplied and placed in conformance with *1144 Asphaltic concrete (Roadways).*

Material for Regional and State roads: Supply and place asphaltic concrete in conformance with the requirements of the relevant Road Authority. This is a **WITNESS POINT**.

Thickness and aggregate size: Match the existing wearing surface.

Bituminous spray seal surfaces

Material generally: Match existing surfaces in conformance with *1143 Sprayed bituminous surfacing.*

Thickness and aggregate size: Match the existing pavement.

Asphaltic concrete underlay: Restore the pavement in asphaltic concrete matching the total thickness of the existing pavements.

Small openings: Restore using asphaltic concrete (AS20) minimum thickness 50 mm, supplied and placed in conformance with *1144 Asphaltic concrete (Roadways).*

Concrete carriageways

Concrete carriageways: To *1132 Mass concrete subbase, 1133 Plain and reinforced concrete base*, *1134 Steel fibre reinforced concrete base* or *1135 Continuously reinforced concrete base*, as appropriate.

Surface tolerance

Surface tolerance: Maximum ± 5 mm surface deviation from a 3 m straightedge seven to ten days after completion, so that an impact is not transmitted to traffic passing over the restoration.

Pavement markings

Pavement markings: Reinstate pavement markings to match existing pavement markings and in conformance with *1191 Pavement markings*.

3.12 FINAL PATHWAYS AND DRIVEWAYS RESTORATION

Materials and tolerances

Timing: Undertake final restoration as soon as practicable and within the time specified in the Contract.

Matching finishes: Restore pathways, and other public areas, with materials consistent with the existing surface before commencement of the Works, or as directed in consultation with the Council.

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

Temporary base material: If approved, the temporary base material may remain in place and be incorporated into the final pavement if it conforms with 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. This is a **HOLD POINT**.

Surface tolerance: Match the levels existing before the surface was disturbed and make a smooth junction with the adjacent existing surfaces, covers and features.

Lippage: 5 mm maximum variation between the level of the restored surface and the adjacent surface, covers and features. If the levels of existing surfaces, covers, or features do not allow the specified level tolerance to be achieved, the restoration to be at the Superintendent's direction. This is a **WITNESS POINT**.

Pavement markings and street furniture

Pavement markings: Reinstate pavement markings to match existing pavement markings and to *1191 Pavement markings.*

Street furniture: Remove and store street furniture. Reinstate at locations matching the original location unless directed otherwise by the Superintendent. This is a **WITNESS POINT**.

Subbase and base

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

Supply and installation: To *1141 Flexible pavements*.

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^2 of restoration surface area.

Flexible subbase/base

Material: Fine crushed rock or recycled concrete to *1191 Pavement markings.*

Thickness: Match the existing subbase (minimum 50 mm thickness for footpaths and light duty driveways and 150 mm thickness for medium and heavy duty driveways).

Compaction: To 92 per cent relative compaction when tested to AS 1289.5.2.1 (Maximum Modified Dry Density) or 95% relative compaction when tested to AS 1289.5.1.1 (Maximum Standard Dry Density).

Rigid base

Concrete base: Reinstate the base using 20 MPa concrete to match the thickness of the existing base.

Testing: Undertake compaction testing in conformance with this clause, Quality Assurance and the Contractor's approved Quality Plan.

Precautions for adjacent utility services: Adopt compaction methods which will not cause damage or misalignment to underlying and adjacent utility services or adjacent structures.

Concrete footpaths and driveways including textured and patterned

Minimum width of restorations: Conform to section 7.7 of the Streets Opening Conference Information Bulletin.

Surface finish: Restore concrete footpaths and driveways to match the same surface finish and pattern as the original surface.

Concrete footpaths: Construct concrete footpaths using 20 MPa concrete to the same thickness (with a minimum of 75 mm), as the adjoining footpaths.

Light duty driveways: Construct light duty driveways serving single residential dwellings as follows:

- Concrete: 25 MPa concrete to the same thickness (with a minimum of 100 mm) as the original driveway.
- Reinforcing: If the existing driveway contains reinforcing, provide F62 Steel Fabric with 40 mm top cover.

Medium/heavy duty driveways: Construct medium duty driveways serving multiple residential dwellings and light commercial developments and heavy duty driveways as follows:

- Concrete: 25 MPa concrete to the same thickness as the original driveway (minimum of 150 mm)
- Reinforcing: F72 Steel Fabric with 50 mm top cover.

Expansion joints: In concrete footpaths, provide 15 mm thick preformed jointing material of bituminous fibreboard, or equivalent as approved in line with joints in existing concrete and at full width transverse joints with existing concrete. This is a **WITNESS POINT**.

Control joints: Form control joints strictly in line with the control joints in existing concrete.

Treatment at poles: 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)*.

Thickness: Match the adjoining footpath.

Finish: Compact to a smooth even surface.

Segmental pavers on sand bed

Materials and installation: To *1145 Segmental paving*.

Pavers: Match existing with existing pavers. Relay existing pavers to match the pattern and surface levels of the existing paving.

Cut or damaged pavers: Replace with new pavers of the same material, type, size and colour as the existing pavers unless otherwise authorised by the Superintendent.

Paving around trees: Match the paving pattern at tree surrounds, service boxes and poles, to similar existing features in the immediate area or as directed. This is a **WITNESS POINT**.

Decorative segmental paving on concrete base

Application: The restoration of pathways or driveways with a natural stone, concrete or masonry paver surface or other surface products laid on a mortar bed and concrete base.

Concrete base: Reconstruct the concrete base as follows:

- Concrete: 25 MPa concrete with thickness to match the existing concrete.
- Reinforcing: Match existing. If the concrete base is reinforced, tie the reinforcement to the existing reinforcing, either by exposing the reinforcing either side of the restoration to allow a minimum 300 mm lap, or by installing tie bars drilled and grouted into the existing concrete.
- Tie bars: 600 mm long Y12 reinforcing bars installed at 1000 mm centres by drilling 200 mm deep 16 mm diameter holes at mid-slab depth and grout tie bars into holes using a 1 cement:1 sand grout mix unless otherwise directed by the Superintendent.
- Unreinforced concrete base: Roughen the sawn face to allow formation of a keyed joint.

Jointing: If transverse or longitudinal joints have been disturbed as a result of the Works, reinstate them to match the existing joints.

Damaged or sawcut pavers: Remove any pavers adjacent to the trench which have been damaged during the Works. Remove sawcut pavers back to the nearest existing joint.

Mortar bed: Match the material and thickness to the existing mortar bed.

Existing pavers: If existing pavers are to be relaid, replace cut or damaged pavers with new pavers of the same material, type, size, colour and decoration as the existing pavers. Liaise with Council's Restoration Officer for details related to the supply of pavers. If existing pavers cannot be sourced, supply an approved alternative in consultation with Council's Restoration officer. This is a **HOLD POINT**.

Laying: Match existing surface levels, jointing pattern, gap width and infill material.

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 matching the original location unless directed otherwise in consultation with the relevant Council Officer responsible for road restorations, 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.

Unsuitable plants: Replace any plants which are not suitable for replanting with plants of the same species and size, or as agreed by the Superintendent in consultation with the Council Tree Preservation Officer or other appropriately authorised Council Officer. This is a **WITNESS POINT**.

Staking and watering: Stake as necessary and water and maintain in to *0257 Landscape – roadways and street trees* as necessary to ensure suitable re-establishment.

Replacement: Replace shrubs and trees which fail to re-establish and maintain in conformance with *0257 Landscape – roadways and street trees.*

3.13 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 off-site all formwork, rubbish and residue construction materials, including material left at stockpiles.

Approval: Present the cleaned up restoration works for formal approval of the completion of the restoration works. This action is a **HOLD POINT**.

Work-as-executed drawings

Requirement: Supply the Superintendent with fully marked-up Work-as-Executed Drawings for the whole of the Contract in conformance with the Utility Authorities' Specification.

4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

General

Payment to the schedule of Rates: To *0152 Schedule of rates – projects*, this worksection, the drawings and Pay items **1152.1 to 1152.16** inclusive.

Lump Sum prices: Not acceptable.

Unpriced items: If any item, for which a quantity of work is listed in the Schedule of Rates, has not been priced by the Contractor it is to be understood that due allowance has been made in the prices of other items for the cost of the activity which has not been priced.

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 this worksection.
- Segmental paving works: In conformance with this worksection and not *1145 Segmental paving*.
- Trenchless installation of utility services under driveways: In conformance with *1392 Trenchless conduit installation.*

4.2 PAY ITEMS

Pay items	Unit of measurement	Schedule rate scope

Pay items	Unit of measurement	Schedule rate scope
1152.1 Sawcut existing pavement/footpath - 1152.1(1) Bituminous carriageway pavement - 1152.1(2) Bituminous footpath - 1152.1(3) Concrete footpath, including textured or patterned concrete.	Linear metre measured along the actual line of cut.	Give separate rates for sawcuts in each type of material. All costs associated with the sawcutting operations including hire of plant and provision of water.
1152.2 Remove existing pavement/footpath	m² of pavement removed. Width and length as shown on the drawings or as directed by the Superintendent.	This includes both bituminous and concrete material and concrete base from segmental paving where applicable. All costs associated with breaking out, removing, transporting off-site, disposal and any tipping fees applicable.
1152.3 Segmental pavers (including decorative segmental pavers) - 1152.3(1) Take up and stack existing pavers—Carriageway - 1152.3(2) Take up and stack existing pavers—Footpath - 1152.3(3) Lay existing pavers—Carriageway - 1152.3(4) Lay existing pavers—Footpath - 1152.3(5) Supply and lay new pavers—Carriageway - 1152.3(6) Supply and lay new pavers—Footpath	m² of surface of segmental pavers (or decorative segmental pavers) taken up or laid. Width and length as shown on the drawings or as directed by the Superintendent.	Separate rates to be given for taking up existing, laying existing and supply and lay new pavers for carriageways or footpaths as appropriate. For items 1152.3(1) and 1152.3(2), all costs associated with taking up and stacking pavers on pallets at locations as agreed. Concrete base, where applicable, shall be removed under Pay Item 1152(2). For items 1152.3(3) and 1152.3(4), all costs associated with the laying and compaction of subbase, including concrete base where applicable, and existing segmental pavers, bedding sand and joint filling sand, mortar bed where applicable, including any cutting of units, concrete edging, joints overlying concrete pavement joints, and concrete surrounds or aprons around surface penetrations. For items 1152.3(5) and 1152.3(6), all costs associated with laying and compaction of subbase, including concrete base where applicable, and supply, laying and compaction of segmental pavers, bedding sand and joint filling sand, mortar bed where applicable, including any cutting of units, concrete edging, joints overlying concrete pavement joints, and surrounds or aprons around surface penetrations.

Pay items	Unit of measurement	Schedule rate scope
1152.4 Remove existing edge strips	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.
1152.5 Grass turf - 1152.5(1) Take up and store existing turf. - 1152.5(2) Lay existing turf. - 1152.5(3) Supply and lay new turf.	m^2 of surface of grass turf taken up or laid. Width and length as shown on the drawings or as directed by the Superintendent.	Separate rates to be given for taking up existing, laying existing and supply and lay new turf. For item 1152.5(1), all costs associated with cutting, taking up and storing turf. Grass unsuitable for reuse to be removed under Pay Item 1152.5(2). For item 1152.5(2), all costs associated with the topsoil bedding, rolling, laying of existing turf and topdressing. For item 1152.5(3), all costs associated with the topsoil bedding, rolling, supply and laying of new turf and topdressing.
1152.6 Verge plants, shrubs and trees - 1152.6(1) Take up and store existing. - 1152.6(2) Plant existing. - 1152.6(3) Plant new. - 1152.6(4) Disposal of unsuitable.	Each plant, shrub or tree taken up or planted (excludes Pay Item 1152.6(4)).	Separate rates to be given for taking up existing, replanting existing and supply and plant new plants, shrubs or trees. For item 1152.6(1), all costs associated with taking up, storing and watering. For Item 1152.6(2), all costs associated with topsoil placement, preparatory work, planting, staking and subsequent care of each plant. For Item 1152.6(3) all costs associated with topsoil placement, preparatory work, supply and planting, staking and subsequent care of each new plant. For Pay Item 1152.6(4) the cubic metre of unsuitable plants, shrubs and trees. For Item 1152.6(4) all costs associated with transporting off-site, disposal and any tipping fees applicable.
1152.7 Stockpiling of topsoil	m^3 as bank volume calculated from the width and length shown on the drawings or directed by the Superintendent, by the depth of topsoil.	All costs associated with stripping topsoil, carting and placing into stockpile. For topsoil to be disposed of off-site apply Pay Item 1152.8(2).
1152.8 Trench excavation - 1152.8(1) To stockpile - 1152.8(2) Disposal off-site (including unsuitable material)	m^3 as bank volume of excavation calculated as follows: Width—as specified for the particular utility service installation. Depth—average actual depth from topsoil stripped ground	Separate rates to be given for excavation to stockpile and disposal off-site. The schedule rate to be an average rate to cover all types of material encountered during excavation. Separate rates not

Pay items	Unit of measurement	Schedule rate scope
	surface to underside of specified bedding. Length—actual excavation length, centre to centre of pits.	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. Protection of trees and treatment to cut tree roots. For item 1152.8(1), all costs associated with carting and placing into stockpile. For item 1152.8(2), all costs associated with transporting off-site, disposal and any tipping fees applicable.
1152.9 Trench backfill - 1152.9(1) From stockpiled material. - 1152.9(2) From imported material. - 1152.9(3) 25:1 sand/cement mix. - 1152.9(4) 14:1 sand/cement mix.	m³ measured as backfill compacted volume in place in the trench calculated 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 (including supply and installation of geotextile where appropriate), compaction, testing and treatment around tree roots. For item 1152.1, all costs associated with loading and carting from stockpile. For items 1152.2, 1152.3 and 1153.4 all costs associated with supply and delivery of imported material, including material for a selected material zone where specified.
1152.10 Temporary pavement—Carriageway and footpath	m² of trench area restored with temporary pavement calculated by multiplying the 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 and all activities and material necessary for maintenance of the temporary pavement in a safe condition until the permanent restoration is executed.
1152.11 Temporary steel plating	m² of trench area plus adequate allowance for support on both sides of the trench calculated by multiplying 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 and all activities and materials necessary for maintenance of the plating until permanent restoration is executed.
1152.12 Flexible subbase	m² of trench calculated by multiplying the trench width by the length.	All costs associated with the removal of temporary pavement, supply, delivery, spreading and compaction.
1152.13 Flexible base	m² of trench calculated by multiplying 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.
1152.14 Carriageway wearing surface (course)	m² of new surface area in conformance with this	All costs associated with the removal of temporary pavement

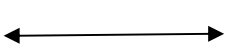
Pay items	Unit of measurement	Schedule rate scope
- 1152.14(1) Asphaltic concrete. - 1152.14(2) Sprayed bituminous surfacing. - 1152.14(3) Concrete.	Worksection calculated from the trench width +200 mm (or up to 800 mm as agreed) by the length.	or existing pavement to the new perimeter, supply, delivery, spreading, compaction and provision of pavement markings as appropriate. For item 1152.14(3) All costs associated with the forming, compaction of foundations, supply, delivery and compaction of mass concrete subbase, supply, delivery, placing, finishing and curing concrete base. Where shown on the Drawings or as directed by the Superintendent this pay item to include the supply and placement of reinforcing steel and the provision of pavement markings as appropriate.
1152.15 Footpaths and driveways - 1152.15(1) Asphalt/sprayed bituminous seal. - 1152.15(2) Plain concrete. - 1152.15(3) Textured/patterned concrete.	m² of paved surface, including driveways. Width and length as shown on the drawings or as directed by the Superintendent.	Separate rates to be given for each thickness of footpath or driveway. For item 1152.15(1), all costs associated with the forming, compaction of foundations, supply, delivery and compaction of subbase and bituminous material. For items 1152.15(2) and 1152.15(3) 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. Where shown on the Drawings or as directed by the Superintendent this pay item to include the supply and placement of reinforcing steel.
1152.16 Cleanup	m² of carriageway and/or footway surface or other surface as applicable. Width and length as 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 TYPICAL FINAL RESTORATION IN FOOTPATH

Reinstatement Width ←→ Finished Surface Level	**Zone**	**Zone thickness**	**Material**	**Compaction Requirement**
	Wearing Surface (Course)	75 mm min concrete Asphalt—match existing Segmental paving on sand bed—match existing Segmental decorative paving on concrete base—match existing	As specified in Final restoration of pathways and driveways	
Sub-grade Level	Subbase/ Base Course	Match existing thickness (minimum 50 mm) Segmental decorative paving on concrete base—subbase only required if existing	As specified in Final restoration of pathways and driveways	92% MMDD or 95% MSDD
	Subgrade	Varies	As specified in Trench backfill	90% MSDD or Density Index 70
	Bedding Zone	As per Utility Authority's Specification	As per Utility Authority's Specification	As per Utility Authority's Specification

6 ANNEXURE B - TYPICAL FINAL RESTORATION IN CARRIAGEWAY OR HEAVY DUTY DRIVEWAY

Reinstatement Width  Finished surface level	**Backfill zone**	**Backfill zone thickness**	**Backfill material**	**Compaction requirement**
Base level	Wearing Surface (Course)	Match existing	Match existing	
Subbase level	Base Course	Match existing	As specified in Final restoration of carriageway subbase and base (flexible)	98% MMDD or 102% MSDD
Subgrade level	Subbase course	Match existing	As specified in Final restoration of carriageway subbase and base (flexible)	
	Subgrade	Varies	As specified in Trench backfill	98% MSDD or 95% MMDD Density Index 80
	Bedding Zone	As per Utility Authority's Specification	As per Utility Authority's Specification	As per Utility Authority's Specification

7 ANNEXURE C - MINIMUM TESTING FREQUENCY

Activity	**Key quality verification requirements**	**Minimum test frequency**	**Test method**
Trench backfill under carriageways and footpaths, materials supply	Material properties as specified in this Specification	1 per contract or source of supply for each type of material used or suppliers test certificates. Minimum 1 per 500 m^3 or as required by the relevant AUS-SPEC Pavement Specification.	As specified
Trench backfill under carriageways and footpaths, placement	Compaction	1 per 2 layers per 100 lineal metres of trench or per 20 road openings for openings of less than 10 m^2 plan area whichever results in the most frequent testing.	AS 1289.5.1.1 AS 1289.5.2.1 AS 1289.5.6.1
Subbase and base materials supply	Material properties as specified	Suppliers test certificates in conformance with the relevant AUS-SPEC Pavement Specification.	As specified
Subbase and base placement	Compaction	1 per pavement layer, per 100 lineal metres of trench or per 20 road openings for openings of less than 10 m^2 plan area whichever results in the most frequent testing.	AS 1289.5.1.1 AS 1289.5.2.1
Wearing surface materials	Material properties as specified in the relevant AUS-SPEC Pavement Specification	Supplier test certificates in conformance with the relevant AUS-SPEC Pavement Specification.	As specified
Wearing surface placement	Testing as specified in the relevant AUS-SPEC Pavement Specification	Check evenness of restored surface in accordance with **Final restoration of carriageway wearing surface (course)**	As specified