DEVELOPMENT CONTROL PLAN NO. 80

Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District
# Contents

Introduction ................................................................................................................................. 1

Streetscape Character .............................................................................................. 3

Paving Principles .................................................................................................................. 4

Paving Requirements ........................................................................................................ 6
1. Introduction ....................................................................................................................... 6
2. Generally .............................................................................................................................. 6
3. Protection of Materials ................................................................................................. 6
4. Clay Pavers ........................................................................................................................... 7
5. Paving Characteristics ................................................................................................. 8
6. Concrete Paving Tiles ................................................................................................. 10
7. Concrete .............................................................................................................................. 13
8. Mortar ................................................................................................................................... 13
9. Jointing Sand ..................................................................................................................... 14
10. Sand Colour .................................................................................................................... 14
11. Construction ..................................................................................................................... 14

Street Tree Principles .............................................................................................. 18

Planting Requirements for Street Trees ........................................................................... 20
1. Introduction ...................................................................................................................... 20
2. General ................................................................................................................................ 20
3. Earthworks .......................................................................................................................... 27
4. Plant Materials ................................................................................................................ 36
5. Planting Works ................................................................................................................ 38
6. Plant Establishment ........................................................................................................ 47

Appendix .................................................................................................................. 51

DCP No.80 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District
Planning Services Division Shoalhaven City Council
File 96/2678
1.1 Name of this Plan

The name of this plan is Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District.

- Section 72 of the Environmental Planning and Assessment Act

G A Napper
GENERAL MANAGER

1.2 Land to Which This Plan Applies

The plan generally applies to the area bounded by Osborne Street, Princes Highway and Plunkett Street - see diagram below.
1.3 Purpose of This Plan

To provide clear guidelines on types of pavers and street trees while at the same time giving more detail construction methods to achieve quality streetscape.

1.4 Relationship to the Environmental Plan

This plan is subject to the provisions of city of Shoalhaven Local Environmental Plan 1985 as amended. Generally all streetscape recommendations apply to the area within the road reserve.

1.5 Relationship to Other Development Control Plans, Codes and Policies

Persons considering development in the area covered by this plan should refer to the relevant Council DCPs, codes and policies. Consultation with the Planning Services Division may be made for more detailed advice. The relevant documents to consult are:

- Car Parking Code
- Minimum Building Code
- Landscape Guidelines
- Subdivision Code
- Nowra CBD Strategy
- Medium Density Housing - DCP No.71
- Design Guidelines for Accessible Living
- Dual Occupancy Guidelines - DCP No.57
- Disability Discrimination Act
- Accessible Living - A Checklist of Development Requirements
- Requirement for the Submission of Landscape Plans
The character of Nowra is made up of generally two major factors. The first is the physical environment i.e. the surrounding landscape, topography, water features, tree cover, buildings, spaces, views, fences, signs, footpaths, colours and textures. The second is people and the way they lived in the past and their interaction with the existing environment, and the way they wish to live in the future.

Any new contribution to the character of a street should be influenced by these factors and follow some general principles:

1. Improve the quality of the street scape environment for public use by building upon the existing character and in inter-relationships between physical elements and people.

2. Inject vitality and interest into the Town Centre.

The remainder of this report deals with ways of achieving the desired streetscape character through:

(a) Paving Principles - these principles outline the desired footpaving character in highly trafficable areas (where full width paving is required), historic precincts and areas with low volumes of traffic (where only a narrow footpath and grass is necessary).

(b) Paving Requirements - this section recommends actual materials and construction methods required to maintain a quality pavement which is both safe and aesthetically pleasing.

(c) Street Tree Principles - these principles highlight important streetscape areas within the CBD and suggest ways of achieving the desired character.

(d) Planting Requirements for street Trees - shows actual trees to be used and planting methods recommended to achieve the desired character.
Paving Principles

Careful selection of surface materials can bring about interest and elegance to a town centre, as well as unifying its appearance. Paving design can reflect geometry, formality or informality of the environment. They can be patterned or plain and be of high detail, colour and texture to emphasise focal points.

Important paving principles in the Nowra Town Centre are:

- Enhance and unify the town centre through quality paving.
- Construct a safe, durable and strong pavement surface in all areas of the town centre especially the main axis Kinghorne/Junction Streets where there is a high volume of pedestrian traffic. The construction of a sound concrete base on which to lay pavers is important for longevity.
- Create interesting entry points into the CBD.
- Reinforce a unique and unifying paver for historic precincts.
- Maintain a variety of road reserve treatments such as part width paving, footpath between grass and full length paving ie on outskirts of CBD L part width for low pedestrian volumes.
- Ease of getting to services under the ground.
- Maintain a quality of detail.
- Simple patterns providing interest through earthen colours which relate to buildings.
- Use pavers to demonstrate change of use zones ie parking versus road, parking versus seating areas.
- Apply the principles of common trenching for underground services.
- Ensure level grades, crossfalls and transitions over kerbs follow Disabled Access Guidelines.
- Ensure colours and texture can assist the visually impaired.
1. Introduction

The following Paving requirements apply to areas within the Nowra CBD and other significant streets. The general principles (ie structural make up under pavers) may be used throughout other towns and villages in the Shoalhaven. Detail paving diagrams should be referred to when constructing pavement works.

The Nowra paving treatment diagram indicates adopted pavers for significant streets. Generally, streets outside this inner zone should be constructed in concrete. Final selection of pavers should always be referred to the nominated representative of the Shoalhaven City Council for approval.

Applicants should refer to any Development Control Plans affecting the land to determine whether special design requirements apply. Council retains the right to vary guidelines:

(a) In the event of suggested types of paving being discontinued by manufacturers (or having not performed to specification), pavers of similar texture, colour and dimension may be acceptable.

(b) In the light of major changes to frontage development or development control plans.

As a condition of development, each applicant will be required to meet the full cost of streetscape improvements.

2. Generally

All materials shall be new and of the best quality. Samples of bricks and paving tiles shall be submitted with the required test certificates to the nominated Council site representative and approved prior to placing orders.

3. Protection of Materials

Adequate storage and protection for materials shall be provided so as to preserve their quality and fitness for the works.
4. **Clay Pavers (see Paving Treatment Plan)**

(a) “Bulli Rustic Mottle Blue” pavers shall be purchased from Bulli Tile and Brick Pty Ltd, Quilky Place, Bulli.

(b) Nubrik pavers shall be “Traditional Pink” in colour.

(c) Bowral pavers shall be “London Chestnut Brown”.

(d) PGH “pompeii” pavers shall be used where shown on paving treatment diagram.

(e) Nominal paver size shall be 230 x 110 x 50mm generally for pedestrian traffic and 230 x 110 x 75mm for driveways and service areas.

5. **Paving Characteristics**

(a) Abrasion Characteristics. When tested in accordance with CMAA Specification MA 20 Minimum Index 4 or when tested in accordance with the procedures and standards of the Council of the City of South Sydney, the degree of wear shall not exceed 3mm.

(b) Pitting Characteristics. Nil.

(c) Resistance to chemical, ground water and salt attack. Exposure Grade (minimum 40 cycles before failure).

(d) Efflorescence. Nil.

(e) Moisture Absorption. Maximum 9%

(f) Comprehensive Strength. Average 45 MPA when tested in accordance to BDRI Specification BC.
NOWRA C.B.D.

Paving Pattern
Main Paving - Bulli Rustic Mottle Blue.
Plan View.

Section
Paving Pattern

Cement/Sand brushed into joints.
Pebblecrete header (concrete paving tile)
Bulli header course
35mm thick bed of weak sand/cement mortar mix.
Polythene sheet
Concrete slab 75mm

Typical detail for driveway.

DCP No.80 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District
Planning Services Division Shoalhaven City Council
File 96/2678

13
g) Tensile Strength. Characteristic of 5.0 MPA clauses 6.4 (1984) when tested in accordance with AS 1225.

(h) Polished Friction Value (PFV), when tested in accordance with the standards of the Council of the City of South Sydney Testing Laboratory or AS 1141.42 (1984) shall be PFV 50. Prior to delivery obtain from the brick manufacturer a certificate from a NATA testing authority confirming the above characteristics.

The certificate shall be for tests carried out within the previous twelve months and shall include a statement that the bricks delivered to the site are similar in all respects to the samples.

(i) Pavers shall be machine made, sound, with straight arises, free from distortion and other defects.

(j) Prior to delivery, obtain from the tile manufacturer a certificate from an NATA testing authority confirming the above characteristics. The certificate shall be for tests carried out within the previous twelve months and shall include a statement that the tiles delivered to site are similar in all respects to the samples. Submit tile for sample and approval.

6. Concrete Paving Tiles

**NOTE:** Concrete paving tiles and Pebblecrete shall mean the same type of paver.

**Generally**

Tiles shall be machine made, sound straight sided with squared angles (in plan) free from distortion. Cement shall conform with AS 1315 (1982). Aggregates shall comply with the requirements of clause 4 of AS 1141 (1974). Tiles shall possess the following physical characteristics:

(a) Nominal tile size shall be either 300 x 600 x 35mm or 300 x 300 x 35mm as shown on the drawings.
Paving Pattern
Main Paver-Pebblecrete (Concrete Paving Tile)
Plan View

Section

Pram Ramp
Detail

DCP No.80 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District
Planning Services Division Shoalhaven City Council
File 96/2678
(b) Colour - Tiles shall comprise four parts of 6mm bluestone to one part 8mm Sydney Pink granite mixed into common cement and black oxide to produce the desired colour. Colour shall be consistent throughout the works.

(c) Resistance to chemical, ground water and salt attack exposure grade (minimum 40 cycles before failure).

(d) Efflorescence - Nil.

(e) Strength of Concrete Mix - the concrete mix used to produce the tiles shall have a minimum of twenty-eight day compressive strength of 45 mpa and a cement water ratio in the range of 0.40 to 0.45.

(f) Moisture Absorption - maximum 8%.

(g) Reinforcement - tiles for use in vehicular areas shall be reinforced with F41 steel mesh.

(h) Polished Friction Value (PFV) when tested in accordance with the standards of the Council of the City of South Sydney Testing Laboratory or AS 1141.42 (1984) shall be PFV 50.

(I) Finish - ground (medium) and honed (medium).

(j) Selected vehicular areas shown on the drawings - grooved at 45 degrees to the tile edge to a finished depth of 4mm and to a pitch of 15mm.

(k) Abrasion and wear - when tested in accordance with the procedures and standards of the Council of the City of South Sydney, the degree of wear shall not exceed 3mm.

(l) Consolidation and compression - tiles shall be mechanically vibrated and compressed with a minimum force of 140 tonnes by a mechanical press capable of exerting a total force of 200 tonnes.

(m) Concrete paving tile may be obtained from Pebblecrete. (Company name - Pebblecrete In-Situ Pty Ltd, 238 Woodpark Road, Smithfield).
7. Concrete

Cement
The cement shall be type A ordinary Portland cement complying with AS1215 (1982).

Water
Water shall be potable (tap water).

Admixtures
Admixtures shall not be used unless approved by the Shoalhaven City Council and then only in the quantities directed.

Aggregates
Aggregates shall consist of clean, hard tough, durable rocks or grains and shall comply with the requirements of AS 1465 Dense Natural Aggregates for Concrete. Clean sand to approval. Maximum size of aggregates shall be 20mm.

8. Mortar

Cement
a.b.s (Australian Building Standard)

Water
a.b.s (Australian Building Standard)

Admixture
a.b.s (Australian Building Standard)

Sand
Brickies sand or equal to ensure workability. Submit a 2.5kg sample for approval.
9. **Jointing Sand**

Dry jointing sand to be brushed into brick paving joints.

Jointing sand - range of grading

<table>
<thead>
<tr>
<th>Sieve size</th>
<th>Percent passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.36 mm</td>
<td>100</td>
</tr>
<tr>
<td>1.18 mm</td>
<td>90-100</td>
</tr>
<tr>
<td>600 microns</td>
<td>60-90</td>
</tr>
<tr>
<td>300 microns</td>
<td>30-60</td>
</tr>
<tr>
<td>150 microns</td>
<td>15-30</td>
</tr>
<tr>
<td>75 microns</td>
<td>5-10</td>
</tr>
</tbody>
</table>

10. **Sand Colour**

To suit brick paving.
Submit 2.5kg sample for approval

11. **Construction**

11.1 **Earthworks**

**Excavated Levels**
The area of footpath is to be cut to appropriate levels to obtain finished surface of paving and to allow surface drainage to kerb and gutter

**Top Soil**
Top soil and grass is to be stockpiled for future use.

**Excavation for Paving**
(a) Working area shall be kept to a minimum to allow pedestrian access between times of actual construction.
(b) Excavation shall be kept to a minimum width especially to retain existing grassed areas adjacent to the paving.

(c) Working areas shall be adequately drained during the period of excavation.

(d) All excavations shall be approved before proceeding with further work.

(e) Warning and protective devices to protect the travelling and pedestrian public shall comply with AS 1742. Details to be submitted to Council for approval.

(f) Soil and water management controls to be in place prior to commencement of work.

**11.2 Concrete Slab**

(a) Concrete slab shall be free draining and shall be a minimum longitudinal grade of 3% and a minimum crossfall of 2%.

(b) The concrete slab shall have a minimum compressive strength of 15 MPA and a minimum thickness of 75 mm.

(c) Concrete slab shall be approved before proceeding with further work.

**11.3 Laying Pavers**

(a) Pavers shall be laid on mortar being in the proportions of 1:4 cement sand a.b.s with an average compressive strength of 28 days of 2.8 MPA.

(b) Mortar to be laid to a depth of 20 mm ensuring uniform thickness. Mortars shall be used within 90 minutes of the initial adding of water.

(c) The paving pattern is butt jointed herringbone with a trim of soldier course unless otherwise specified in the drawings.
(d) Paving joints shall be filled with jointing sand so that joints are completely filled and pavers adequately interlocked.

e) Cut pavers as necessary to maintain the required patterning ensuring neat accurate and clean edges.

(f) Grade pavings to even and correct falls as shown on the drawings. Relay without extra charge if the falls are incorrect. Where falls are not required, lay level. Unless otherwise specified, maintain finished paving levels without step or break at changes of paving finish.

(g) The deviation between the surfaces of adjacent paving areas shall not exceed 1 millimetre.

(h) The finished level of the brick paving at the kerbside shall match that of the surface level of the concrete kerb.

(I) Mitre all corners of the soldier course where there is a change in direction.

(j) Minimum width of a cut paver shall be 70 millimetres.

(k) Gaps between pavers shall not exceed 2 millimetres.

(l) Boards over the pavement shall be used for foot and barrow traffic to prevent disturbance of the paver prior to curing.

### 11.4 Surface Covers

(a) Selected Trench Covers.

Fill selected trench covers with cement/aggregate mix a.b.s. Colour to match adjacent pavers. Ground and hone to match adjacent surfaces as shown on drawings.
(b) Existing Service Pit Covers: Paving

If encountered, existing service pit covers shall be replaced with a recessed lid to Council standard specification - see diagram in Appendix 1-1d. Paving bricks are to be cut if necessary to fit neatly up against the frames. Stormwater pits where shown shall have recessed frames filled with sliced paving bricks to match surrounding paving.

11.5 Clean Pavers

Following completion of works, clean bricks according to nominated brick supplier’s written recommendations. Ensure jointing sand is not removed, replace and make good any loss.
Street Tree Principles

Trees in Nowra perform a variety of functions. They give the area a sense of identity, soften the impact of car parks or bulky buildings, provide summer shade, winter sun (through the use of deciduous species) and colour change through the seasons. Some trees absorb toxic gases and catch dust and dirt. Trees are a living element and give a human scale to the built environment.

Important street tree principles in the Nowra CBD area:

- Retention of significant existing trees and the infill planting adjacent to these.
- To provide a unique character to the Nowra town centre.
- Provide both major and minor gateways to the town which give a sense of arrival.
- Reinforce the character of the Shoalhaven River.
- Frame views where applicable ie rural views east of Junction Street and northern views towards the Cambewarra Escarpment.
- Maintain the boulevard concept from Council to CBD by a “tunnel” effect.
- Reinforce native and exotic planting where applicable ie existing native Spotted Gums near the river and along Harry Sawkins Park.
- Define regional roads ie Princes Highway by bold tree planting.
- Reinforce the CBD ring road to define the CBD high volume area.
- Use trees as a traffic slowing device (together with other streetscape elements).
- Use innovative tree planting techniques in footpath zones to ensure a quality urban landscape.

Caution:

Where common trenching is not practical, accurate survey data of existing services should be obtained to ensure that any large trees do not adversely affect underground and overhead services (see details for appropriate planting techniques, Tree Pit in Paving Nowra CBD.)
STREET TREE PRINCIPLES

Note: Tree planting should be a principle in all car parks.
1. Introduction

The following Planting Specification applies to areas within the Nowra CBD and other significant streets. General principles of the specification may be used throughout other towns and villages in the Shoalhaven. Detail planting diagrams should be referred to when constructing planting holes.

The Nowra street trees diagram indicates adopted tree species for significant streets. Final tree species, selection, size etc should always be referred to Council’s representative.

Applicants should always refer to any development control plans affecting the land to determine whether special design requirements apply.

Council retains the right to vary the guidelines:

(a) In the event of suggested types of tree species becoming unavailable or new tree species being added to the list of acceptable species.

(b) In the light of major changes to frontage development or development control plans.

As a condition of development, each applicant will be required to meet the full cost of streetscape improvement.

2. General

The term applicant shall mean the persons being signatory to the development and/or building application and may include contractors and subcontractors acting on behalf of applicant.

2.1 Scope of Works

(a) Outline Description
The applicant shall be responsible for the work and materials associated with landscape works, including soil treatment, cultivation, planting and plant maintenance during the consolidation period of all works.
NOTE:
NO LARGE TREES SHOULD BE PLANTED UNDER OVERHEAD POWER LINES UNTIL THE LINES HAVE BEEN BUNDLE-CABLED OR RE-LOCATED UNDERGROUND.

STREET TREES

NOTE: ALL TREE SYMBOLS ARE TO BE READ AS BEING IN THE ROAD RESERVE (NOT ON PRIVATE PROPERTY). ALL TREES ARE FOR INFILL OR REPLACEMENT PLANTING.

- CAMELIA
- WINTER BERRY
- JACARANDA (DARK PINK)
- GUM DANDY
- CAMELIA
- ROSEWOOD
- MIMOSA
- CLUSTERS OF (PINK)
- FIZZ PALM
- GUM DANDY
- MYRTLE
- LOCALICALI
- EUCALYPTUS

INTERPLANT EXOTIC SPECIES AMONGST EUCALYPTUS NICHOLLI

INTERPLANT EXOTIC SPECIES AMONGST EUCALYPTUS NICHOLLI

DCP No. 80 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District
Planning Services Division Shoalhaven City Council
File 96/2678
(b) Planting works include:
- excavation/fill to required levels and disposal of surplus material
- sub-grade preparation
- sub base preparation
- incorporation of add mixtures
- topsoil
- unloading of plant stock upon delivery
- protection and maintenance of plant stock following delivery
- location and excavation of planting holes
- supply and installation of fertiliser
- supply and installation of mulches
- fertilising following establishment

The supply and installation of landscape media to planter beds and associated works including:
- supply and installation of sub-surface drainage
- supply and installation of plant growing media
- supply and installation of fertiliser
- supply and installation of mulch

The maintenance of all landscape works for a consolidation period of 52 weeks, including:
- watering
- fertilising
- pruning
- weeding and rubbish removal
- insect and disease control
- mulch reinstatement
- replacement of failed and non-developing plants

The recording of maintenance log book.

2.2 Protection of Works

The applicant shall be liable for all damage caused by work undertaken within the road reserve to buildings, structures, paved surfaces, planters of plants within public areas. All such damage shall be repaired at the applicant’s expense.
The applicant shall take all necessary precautions (e.g., barricades, notices, etc.) to protect the works under this contract from damage by others. Should damage of works by others result from inadequate protection of works, the applicant shall be liable for the making good of these works.

All damages within public areas shall be immediately reported to Council’s site representative and an on-site meeting with the applicant shall be arranged to ascertain the extent of damage and the measures required to repair the works.

The applicant shall ensure that landscaping does not compromise safe sight distances at:

- intersections
- opposite large traffic generating developments
- where there is heavy pedestrian traffic
- adjacent to loading zones, taxi ranks, pedestrian crossings
- where turning traffic enters or leaves a facility

**Safety**

In addition to the requirements of the Occupational Health and Safety Act, 1983, and all associated Acts which require employers to ensure the health, safety, and welfare of employees, the following conditions shall apply:

(a) The applicant shall maintain access for authorised site personnel. Areas of work under construction shall be protected by temporary barriers incorporating signs and lights. The works shall be maintained in a neat and tidy condition to minimise accidents. Similar safety precautions shall be carried out as in Paving Requirements 9.1 (a), (c), (d), (e) and (f).

(b) Reports - the applicant shall promptly advise Council’s site representative of any accidents involving personal injury within public areas.

Give such information as may be required by Council’s site representative and, if requested, furnish a written report in the form directed.

**Reports**

As outlined in detail in the main body of the specification, the following reports are to be submitted by the applicant to Council’s site representative:

Report accidents - immediately they occur.
2.3 Standards

Wherever reference is made to Standards Association of Australia (SAA), Standard Specifications (AS), Codes (ASC) or Interim Codes (SAA Int) the requirements of the editions and amendments to them current at the date of tendering shall apply to the relevant materials or operations and be deemed to be incorporated in this specification.

Standard Specifications or Codes of the British Standards Institute (BSI), or the American Society for Testing and Materials (ASTM) are referenced only when a relevant SAA publication does not exist. Current edition shall apply as above specified.

In the case of a conflict between the referenced Standard Specification or Code and this specification, the more stringent provisions shall apply.

The applicant, if requested, shall furnish a certificate from the manufacturer that the materials or products delivered to the project meet the requirements of the relevant Standard. However, such certification shall not relieve the applicant of the responsibility to comply with added requirements of this specification.

Any other Standard Code of Specification mentioned in the body or in the preface or referenced Standards, shall be considered as part of this specification.

Materials or operations not covered by referenced Standard Codes and Specifications shall conform to the appropriate Australian Standard, or if no such Standard exists they shall conform to the Standards laid down by the ASTM.

Referenced documents: The following standards are referred to in this Section:

- AS 1141  Methods for sampling and testing aggregate
- AS 1289  Methods of testing soils for engineering purposes

2.4 Samples

The applicant shall supply samples of materials when requested by Council’s site representative and after approval all subsequent work shall conform to the quality indicated by the samples.
Requirements: Submit representative samples of the plants and other materials and products specified in the **SAMPLES SCHEDULE**.

Plant Samples: Submit each plant sample in the condition in which it is proposed to supply it to the site.

Rejection: Replace, at no additional cost, plant samples rejected as unsuitable for use, including samples rendered unsuitable by the process of examination (eg for root condition). Samples not rejected may be included in plant material for use in the works.

**SAMPLES SCHEDULE**

Requirement: Submit the following samples:

Minimum specimen size minimum period item: and/or quantity: for consideration:

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
<th>Period before installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imported sub base</td>
<td>5kg</td>
<td>5 working days</td>
</tr>
<tr>
<td>Imported topsoil</td>
<td>5kg</td>
<td>5 working days</td>
</tr>
<tr>
<td>Compost</td>
<td>5kg</td>
<td>5 working days</td>
</tr>
<tr>
<td>Mulch</td>
<td>5kg</td>
<td>5 working days</td>
</tr>
</tbody>
</table>

Plant materials (trees, shrubs and perennials). Each species as scheduled on Drawings: 5 working days before installation.

**2.5 Inspection**

Notice: Give not less than 48 hours notice to Council’s site representative so that inspection may be made of the following, as applicable:

- plant materials available at the source of supply
- plant materials delivered to the site
- clearing completed
- sub-grades cultivated and/or prepared prior to placing topsoil
- topsoil placing prior to planting
- tree holes excavated and prepared for planting
- plant material set out before planting
- plants placed and ready for backfilling
- planting, staking and tying completed
- upon completion of maintenance work
- upon completion of defects liability work
Periodic Inspections: Council’s site representative may make regular periodic inspections at the beginning of each month during the establishment period and the defects liability period.

2.6 Applicant to be Informed

By own inquiries, the applicant is to be informed of the physical, contractual and programming limitations that must be respected in accessing the site for site storage, landscape installation and the completing of plant establishment and defects liability activities. Enquiries will need to be made to Council’s site representative and relevant construction and service authorities. The applicant should also visit the site to be satisfied of the full implications of the described works.

2.7 Protection

Trees to be Retained: Protect existing tree(s) designated to be retained as shown on the drawings. Protection shall include but not be limited to fencing, keeping soil around base of trees free from all machinery, tools, rubbish, excavated material concrete and petroleum products.

Marking: Mark trees to be retained with a 100 x 50mm zincaneal tag, painted yellow and lettered to read "RETAIN" in 40mm high lettering. Secure the tag to the tree with a loose galvanised steel wire band around the battens specified hereafter. Maintain the signs in place and in a legible state for the duration of the contract. At the end of the contract Council’s site representative will check and remove the tags and give approval for the contractor to proceed.

Temporary Tree Enclosures: Protect trees liable to damage with suitable temporary guards for the duration of the work under the contract and remove at practical completion.

Ground Near Trees: Do not remove topsoil from within the drip line of trees to be retained unless otherwise directed by Council’s site representative. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged. Open up excavations under tree canopies for as short a period as possible. Do not place spoil from excavations against tree trunks even for short periods.
Where it is necessary to cut the roots, use a chain saw or similar means such that the cutting does not unduly disturb or cut the remaining root system. Immediately after cutting, backfill with imported topsoil a.b.s. Place the backfill in 150mm layers and firm, removing voids. Do not backfill around the tree trunk above the original ground level.

Immediately after backfilling, thoroughly water the whole root zone. Drench the backfilled area with an approved plant hormone equal to Formula 20\textsuperscript{th}. Apply at manufacturers recommended rate.

Loosen soil which has become compacted around trees using a hollow tine cultivator.

**Repair:** Should any tree be damaged during the work and Council’s site representative consider repair work should be attempted, the work shall be performed by a tree surgeon approved by Council’s site representative at no cost to Council. If repair work is attempted and fails or is impracticable, remove the tree and root system and provide, plant and establish a replacement tree of the same species at no cost to Council.

### 2.8 Final Cleaning Up

On completion of the works, a final inspection shall be made by Council’s site representative to ensure all the work is satisfactory.

The site shall be left in a clean and tidy appearance.

### 3. Earthworks

#### 3.1 Generally

The section comprises the demolition, excavation, disposal of surplus excavated material, the supply and compaction of filling material to required levels and the preparation necessary to the areas and in all plant beds areas to the correct shape and level prior to the installation of plant material.
Liaison with Council should be made for all works within Council’s road reserve prior to commencement.

It will be the applicants responsibility to check and ensure that existing underground and overhead services are not affected. Any alterations required will be at the applicants expense.

(a) Definitions
"Materials as found" shall include all material encountered in the excavation which cannot be removed until broken up by explosives or mechanical means such as rippers, jackhammers or percussion drills.
"Sub Grade". The existing ground below the excavations.

"Sub Base". Selected filling spread and compacted over the sub-grade to make up levels to the underside of the base as shown on the drawings.

Materials unsuitable for sub-grade shall include rubbish and contaminated soil.

(b) Setting out
Before using the survey marks provided in accordance with the contract, the contractor shall be satisfied that they are the marks shown on the drawings, that they have not been disturbed and that their levels, if shown on the drawings, agree with the levels of one or more existing features on the site.

(c) Inspection
Give Council’s site representative at least one working day’s notice when the following are ready for inspection:
- excavation completed to contract levels
- sub-grade filling completed to contract levels
- sub-base completed to contract levels

(d) Testing
Obtain the tests specified below from an approved NATA testing authority:
- Compaction: Test the soil in accordance with AS 1289 for compliance with the criteria stated for consolidation, as late specified.

- Fill: Before imported fill is delivered to the site or before using fill from the site, sample in accordance with AS 1141 and test in accordance with AS 1141 and AS 1289 for compliance with the criteria as later specified.
If test show non-compliance obtain further samples and re-test. Do not proceed with relevant work until tests show compliance.

The contractor shall bear the cost of test and repeat tests specified above. However, the cost of other tests required by Council’s site representative shall be borne by Council’s site representative.

Allow for provision of samples and carrying out tests and submitting results to Council’s site representative.

(e) Existing services
Where services or obstructions not shown on the drawings are discovered prior to and during the work under the contract, notify Council’s site representative immediately.

Do not excavate by machine within one metre of existing underground services without prior approval.

(f) De-watering
Allow for keeping excavations free from rain and percolating water by pumping or otherwise.

(g) Bad ground
Should unsuitable material be encountered within the prescribed depths of excavation or soft, wet and unstable areas develop during excavation, obtain instructions from Council’s site representative before carrying out additional excavations. Backfill and compact to the correct levels as directed by Council’s site representative.

If the contractor has not caused or contributed to the above conditions and if their occurrence could not have been reasonably anticipated at the date of the contractor’s tender, the additional work shall constitute a variation to the work under the contract.

(h) Disposal of spoil
Except as otherwise directed, remove from the site all debris and "bad ground" resulting from Hardworks construction and excavation. Dump material as directed by site superintendent.
(i) **Supporting excavations**

SIDES: Support sides of excavations as necessary to ensure safe working.

ADDITIONAL SUPPORT: If in the opinion of Council’s site representative any support provided is insufficient Council’s site representative may order the provision of additional support. No such instructions shall relieve the contractor of sole responsibility for the sufficient support of the excavations.

VOIDS: Guard against the formation of voids outside sheeting or sheet piling if used. Should any voids form, fill and compact them to a dry density similar to that of the surrounding material.

REMOVAL: Remove temporary supports progressively as backfilling proceeds, unless otherwise instructed.

### 3.2 Sub-Base Preparation

(a) **Filling**

Provide filling free from perishable matter, imported on to the site from an approved source unless the specified filling type can be provided from spoil recovered from the excavations.

Subsoil filter: Coarse sand or crushed stone graded to the following table:

<table>
<thead>
<tr>
<th>SIEVE APERTURE (mm)</th>
<th>PERCENTAGE PASSING (by mass)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fine Filter</td>
</tr>
<tr>
<td>26.5</td>
<td></td>
</tr>
<tr>
<td>19.0</td>
<td></td>
</tr>
<tr>
<td>9.5</td>
<td>100</td>
</tr>
<tr>
<td>4.75</td>
<td>80-100</td>
</tr>
<tr>
<td>2.36</td>
<td>65-95</td>
</tr>
<tr>
<td>1.18</td>
<td>10-30</td>
</tr>
<tr>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>0.30</td>
<td>7-16</td>
</tr>
<tr>
<td>0.15</td>
<td>0-4</td>
</tr>
</tbody>
</table>
3.3 Cultivation

Cultivate sub-grade/sub base in areas to receive planting using chisel plough to achieve suitable ripping of sub-grade without destruction of soil structure. Set chisel plough types a maximum of 500mm apart. Rip to a depth of 100mm for planting bed areas and 200mm for tree planting in pavements.

Prior to cultivation spread lime on this area at 500g/m². Work the lime into the sub-grade with close deep ripping. Cultivate at appropriate soil moisture content, generally 40-60% of field capacity.

Do not trim the surface following cultivation. Leave surface rough to allow better "integration" between cultivated sub-grade and improved site soil abs.

3.4 Tree Pit Excavation

GENERAL: All tree pits in pavement only shall be excavated to achieve a minimum volume of 6m³.

LOCATIONS: Locations may vary minimally from positions shown on drawings to allow for underground services. Final positions shall be approved by Council’s site representative prior to excavations.

The applicant shall excavate the pits to avoid all major service lines and in such a way that no proposed or existing footing will be undermined. The applicant may excavate in any direction to achieve the desired pit volume. However, the pits shall not exceed 1,555mm depth at any point. Rip base and sides of tree pits to 200mm depth. Any damage to statutory suppliers, underground plant shall be attended to immediately at the contractor’s expense.

3.5 Topsoil

(a) Placing topsoil

CULTIVATION: Cultivation of the ground surface in preparation for placing topsoil is specified in Cultivation (3.3 above).

PLACING: Place topsoil of the types specified in Topsoil (3.5(b) page 32) in the locations and to the depth shown on the drawings. Spread and grade evenly.
COMPACTION: Lightly compact topsoil so that the finished surface is smooth, free from lumps of soil, at the required levels, ready for cultivation and planting. Allow for the thickness of mulch where specified. Prevent excess compaction by constructional plant.

FINISHING: Finish topsoil flush with abutting kerbs, mower strips and paved surfaces unless otherwise specified or shown. Feather edges into adjoining undisturbed ground.

(b) Topsoil mixtures

PLANTING BEDS:

A suitable topsoil mixture for planting beds would be:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>River Sand</td>
<td>1/3</td>
<td></td>
</tr>
<tr>
<td>Humus material</td>
<td>1/3</td>
<td></td>
</tr>
</tbody>
</table>

The humus material should not be too rich (avoid manures, mushroom compost and the like). Composted sawdusts and fine bark, composted sewage sludge, coffee grounds, composted leaf chip or mixtures of any of these would be suitable.

TREE PITS IN PAVEMENT: See diagrams on pages 34 and 35.

A suitable mix of various topsoils for tree pits in pavement would be the following:

TYPE A SOIL MIX: 8 parts sandy loam and 2 parts washed coarse river sand with pH in the range of 5.5 to 7.0 and salt content (measured over dry) 0.1% maximum -shall only be lightly compacted by foot in 150mm layers.

TYPE B SOIL MIX: Soil to be 7 parts friable sandy loam and 3 parts peat moss and have a pH value within the range of 5.5 -7.0 and with no more than 0.1% salt content (measured oven dry).

TYPE C SOIL MIX: (Drainage base of tree pits) 15-20mm diameter graded blue metal aggregate free from dust.
(c) Topsoil spreading

GENERALLY: As specified in "Placing Topsoil" (3.5 (a) page 31)

Mass planted beds: Back fill mass planted beds with topsoil mixture. Progressively consolidate topsoil mixture to avoid later subsidence and thoroughly water to prevent voids. Rake over lightly to attain finished profiles. Finish the surface of the topsoil at a level which is to be at the same level as adjacent finished levels.
DCP No.80 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District

Planning Services Division Shoalhaven City Council

File No. 96/2678
DCP No.80 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District

Planning Services Division Shoalhaven City Council

File 96/2678
4. Plant Materials

4.1 Compost

DESCRIPTION: Well rotted compost or manure, with a neutral pH value, or other approved material, free from harmful chemicals, grass and weed growth. Provide a certificate of proof of compost pH on request.

4.2 Fertiliser

Deliver fertiliser to the site in sealed bags, branded with type and manufacturer. Use the following fertiliser types in areas as described.

PLANTING BEDS

<table>
<thead>
<tr>
<th>Rates of Application</th>
<th>Fertiliser Type</th>
<th>Fertiliser Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topdress 50g/m²</td>
<td>Osmocote</td>
<td>N:P:K 19:2.6:10</td>
</tr>
<tr>
<td>Topdress 100g/m²</td>
<td>Osmocote</td>
<td>N:P:K 17:4.3:8.2</td>
</tr>
</tbody>
</table>

TREE PLANTING

Langley Tree Tablets as available from:

Langley Chemicals Pty Ltd
89 Chandos Street, St Leonards NSW 2065

B.P.K. ratio = 20:4.4:8.2
Application rate: 5 No. 10g tablets per tree

4.3 Mulch

Hardwood Mulch: To be used in and around trees in paving, trees in planter beds and planter beds generally, unless otherwise shown on drawings.
Hardwood mulch shall be tree loppings, smaller branches and leaf matter from Eucalypts which have been processed through a mechanical chipper. Mulch shall range in size from 28-32mm.

Mulch shall be free from soil, sea weed growth and other green material (not above specified) or deleterious matter.

INSTALLATION:

Planting bed areas: Install 75mm mulch to the completed planting works. Bring mulch to the finished levels as indicated on the drawings. Dish around plant bases. Do not cover foliage with mulch.

Following installation of hardwood chip mulch broad cast 50g/m² of Urea over finished surface.

4.4 Plants

GENERALLY: Plants shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease and insect pests, with large healthy root systems and no evidence of having been restricted or damaged. Trees shall have a single leading shoot.

TREE SIZE: All new trees shall be of advanced size with minimum caliper size of 50mm and height of 3 metres generally. The applicant must ensure that the selected tree species and final size is approved by Council’s site representative.

SUBSTITUTIONS: Make no substitutions unless approved in writing. Substitutions will not be approved if the applicant has not complied with the specification.

LABELLING: Label at least one plant of each species or variety in a batch with a durable, readable tag.

REPLACEMENTS: Order sufficient quantities to allow for plant failures. Replace with plants of the same specified type, quality and size, any plants which fail or are damaged during the work under the contract.
WARRANTY: Furnish a warranty from the supplier attesting that the plants are true to the specified species and type and free from diseases, pests, weeds and the like.

STORAGE: Wherever possible, plants shall be planted immediately after delivery to the site. If this is not possible, keep them in good condition by appropriate storage methods, or as may be directed. Prevent theft, drying out or damage from any cause including frost, wind, sun, vermin, animals and the like. Provide an on-site nursery for holding plant stock on site for more than 48 hours, of sufficient size, with provision for watering.

4.5 Plant Containers

Sizes: Supply plants in weed-free containers of the sizes specified in the Plant Schedule, as shown on the drawings.

5. Planting Works

5.1 Generally

The installation of plant stock will be carried out to conform with the building program. The applicant shall inform him/herself and take into account all activities by others that may be detrimental to the plants in determining his own timing. The applicant must ensure the necessary measures are taken to protect the plants.

5.2 Excavating for Planting

MASS PLANTING AREAS: Excavate a hole for each plant large enough to provide not less than 100 mm all round the root system of the plant, or as shown on the drawings.

TREES IN PAVEMENT: Excavation for trees in pavement shall be as specified in Tree Pit Excavation (3.5(b) page 32) and as shown on the drawings on pages 34 & 35.
5.3 Planting

LOCATIONS: Do not vary the plant locations from those shown on the drawings unless otherwise directed. If it appears necessary to vary the locations and spacings to avoid service lines, or to cover the area uniformly, or for similar reasons, apply for directions.

PLANTING CONDITIONS: Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. Suspend excavation in other than sandy soils when the soil is wet, or during frost periods.

FERTILISING: Specified in Fertiliser (4.2 page 36).

WATERING: Thoroughly water the plants before planting begins, immediately after planting and thereafter as required to maintain growth rates free of stress.

DEPTH OF PLANTING: When the plant is in its final position in its hole or bed the top soil level of the plant root ball shall be 100mm + or - 50mm below the finished surface of the soil surrounding the hole or bed. Test the depth by measuring the sides of containers. If backfilling is required to correct the depth, use topsoil mixture as specified in Topsoil (3.5(b) page 32).

PLACING: When the hole or bed appears to be of correct size, and not before, remove the plant from the container with minimum disturbance to the root ball and place it in its final position in the centre of the hole and plumb.

BACKFILLING: Backfill with topsoil mixture as specified in Topsoil (3.5(b) page 32). Firm against root ball and water to eliminate air pockets.

WATERING BASINS: Construct a watering basin around the base of each individually planted tree in planting beds consisting of a raised ring of soil capable of holding a minimum of 10L.

PLANTING MACHINE: If a planting machine is to be used as an alternative to hand planting, submit the proposed method for approval.
5.4 Backfilling of Tree Pits

REFERENCE: Soil Mixes (3.5 (b) page 32)

No backfilling shall take place when, in the opinion of Council’s site representative, weather conditions are unfavourable for such an operation.

Soil mix shall be placed and lightly compacted by treading in, in layers not exceeding 300mm depth.

5.5 Tree Planting

SET OUT: All trees shall be set out by the applicant in accordance with the drawings and planting plans. On arrival the trees shall be planted without delay and set out as follows:

(a) TREES IN PAVEMENT: The top of the root ball level shall be 100 mm (+/-50 mm) below finished ground level.

(b) TREES IN PLANTING BEDS: The top of the root ball level shall be set at finished surface level (+/-50mm) and/or as shown on drawings.

(c) PLAN POSITIONS: In all cases plan positions shall be as detailed on the drawings and shall be within +/-75mm (in any direction) of the intended position.

UNLOADING: Before unloading, the depth and diameter of each root ball shall be measured, so any adjustments to the hole can be made.

LIFTING: The method of lifting is to be such that the root ball can be wrapped, lifted and transported without damage to the roots. Care shall be taken to avoid damage by stripping bark or breaking of branches or fronds.

WATERING IN: Tree pits shall be thoroughly watered after planting.
5.6 Root Ball Irrigation System

COMPONENTS: The root ball irrigation system applies only to new pavement trees and shall consist of an 8 mm diameter perforated PVC flexible pipe connected to a cast iron surface box with lid.

PIPE: 80mm diameter x 5,000mm length. Agroflex CL400 polythene range as manufactured by "Drossbach Australia" or similar approved.

SURFACE BOX: "Stop Tap Box No. 712" with the word "TREE" in raised letters as available from Gatic (Australia) Pty Limited or similar, telephone (02) 439 7788. Contact -Glen Bowman.

INSTALLATION PROCEDURE: The irrigation system applies only to new tree planting in pavements and shall be partially installed prior to construction of concrete tile/and or brick pavement and tree grate and surround in order to avoid disturbance to these works.

The method of installation shall be as follows:

(a) The upper portion of the irrigation pipe shall be mortared into the cast iron surface box with an approved epoxy mortar. The top of the surface box shall be set level with the finished surface level of the proposed paving. The box shall be set in the position to dimension shown on drawings.

(b) The pipe shall be capped securely with PVC cap to fit and securely taped and placed in the tree pit and buried to await planting of trees.

(c) During the planting the pipe shall be held back from pit temporarily until tree has been installed.

(d) After planting, the soil mix shall be carefully excavated around the root ball to a depth of 500mm below finished surface levels.

(e) Pipe shall be covered with soil mix and adequately compacted ensuring pipe and fittings are not displaced.

(f) The applicant shall dispose of all surplus materials off site.
5.7 Mulch Spreading

GENERALLY: Spread mulches evenly to the depths shown on the drawings and rake smooth surround finished levels. Grade the finished surface evenly between design surface levels. Do not place mulch against stems of plants.

5.8 Spraying

REPORTING: Report any evidence of insect attack or disease amongst plant material immediately it is noted.
SPRAYING: If so directed, spray with an insecticide and/or fungicide approved prior to use in accordance with manufacturer's recommendations and to comply with statutory requirements.

5.9 Tree Grate Frames

Tree grate frames shall be fabricated from cast iron as supplied by Gatic (Australia) Pty Ltd and shall be set flush with the surrounding paving. The frame shall be complete with all necessary brackets, bolts and anchors.

The frame shall be installed prior to planting the tree.

5.10 Tree Grates - See Diagram

Tree grates shall be fabricated from cast iron, as supplied by Gatic (Australia) Pty Ltd and shall be:

(a) 1,489 mm diameter semi-circular tree grate in four sections Product Code 851 for tree plantings in footpaths of Berry Street, Kinghorne Street, Junction Street, Nowra Lane and O'Keefe Avenue.

(b) 1,489 mm combination of one section circular tree grate, Product Code 850 and three sections square (circular pattern) grate, Product Code 855 for tree plantings at entrance to the Post Office and entrance to the Uniting Church, as shown on drawings.

(c) 1,489 mm combination of two sections semi circular tree grate, Product Code 851 and two sections square (circular pattern) tree grate, Product Code 855, for tree plantings in car parking areas as shown on drawings.
(d) 1,489mm diameter circular tree grate in four sections Product Code 850 for tree plantings in Junction Court, where shown on documentation drawings.

(e) For areas where design is incomplete ie Kinghorne Street, Junction Street etc the above Gatic grates shall be used in combination or as single Product Code elements ie 850, 851, 855.

When grates are installed around existing trees, the rings shall be cut as required to allow the tree trunk adequate room growth.

Tree grates shall be supplied to all areas with full width paving. See tree pit in paving detail.

5.11 Tree Guards

Tree guards shall be used in areas as shown in diagram Allocation of tree Grates and Guards.

The permanent tree guard shall be constructed by Shoalhaven City Council or Street Furniture Australia, Tree Guard TG1 or similar approved. The tree guards shall be 600 mm diameter with 14 posts, supplied in halves bolted together for ease of installation. The tree guards shall comprise mild steel posts fitted through and welded to top and bottom rings. Finished in hot dipped galvanising and polyester powder coat to a colour approved by Council’s site representative. Tree guards shall be supplied to all areas with tree grates.

5.12 Stakes and Ties (Where Specified)

STAKES: Durable hardwood, straight, free from knots or twists, pointed at one end.
DRIVING: Driving stakes 1,100mm into the ground on the opposite sides of the tree, either before the plant is placed, or in such a manner as to avoid damage to the root system.
SIZES: For 75L: 50 x 50 x 2,400mm.
TIES: 50mm hessian webbing or other approved material. Fix ties securely to stakes in a figure of eight pattern, with the first tie 300mm above ground. Other ties, where necessary, to stabilise the plant or as directed.
ROOT GUARDS: Root guards shall be used for all trees in the streetscape. These should be placed surrounding the root ball in the planting hole.
STANDARD DESIGNS AND PRODUCT CODES

REMOVABLE GRILLES
Tree grilles consist of a number of cast iron sections bolted together. Grilles are seated on frames and can be secured to the frames with stainless steel screws.

<table>
<thead>
<tr>
<th>TREE GRILLE TYPE</th>
<th>PRODUCT CODE</th>
<th>OVERALL SIZE (mm)</th>
<th>CENTRE HOLE SIZE (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIRCULAR</td>
<td>649</td>
<td>1189 dia.</td>
<td>381 dia.</td>
</tr>
<tr>
<td>CIRCULAR</td>
<td>650</td>
<td>1489 dia.</td>
<td>381 dia. capable of opening up to 724 dia.</td>
</tr>
<tr>
<td>SEMI-CIRCULAR</td>
<td>651</td>
<td>1400 dia.</td>
<td>301 dia. capable of opening up to 724 dia.</td>
</tr>
<tr>
<td>SQUARE (Diagonal Pattern)</td>
<td>652</td>
<td>1218 x 1218</td>
<td>381 dia.</td>
</tr>
<tr>
<td>OCTAGONAL (Tangential Pattern)</td>
<td>653</td>
<td>1422 across faces</td>
<td>457 across faces</td>
</tr>
</tbody>
</table>

FRAMES
Frames consist of cast iron or galvanized mild steel angle sections. Frame sections are bolted together and permanently grouted into tree pit openings.

LOADING CAPACITY
Tree grilles are designed to carry foot traffic.
TREEGUARDS
A number of decorative styles now exist in the Street Furniture Australia range of products. The sturdy construction of the feature treeguard TG1 (see brochure) is the basis for a variety of styles denoted by the finishing of the posts with chamfers, castings or bends.

The tree guards are available in two sizes, 600mm dia. illustrated above with 14 posts and 800mm dia. with 18 posts. Supplied in halves, bolted together for ease of installation, with a total of four extended posts for below ground fixing.

The tree guards comprise mild steel posts fitted through and welded to top and bottom rings. Finished in hot-dipped galvanising and either polyester powder coat or enamel paint. NOTE: The tree guards can be manufactured to suit the diameter and fixing requirements of any tree grate.
6. Plant Establishment

6.1 Generally

All planting maintenance activities shall be carried out according to the highest standard of accepted current horticultural practice and undertaken by qualified horticulturists.

6.2 Planting Establishment Period

The plant establishment period shall be 52 weeks from the date of practical completion of the works.

PRACTICAL COMPLETION OF PLANTING: Practical completion of the planting works shall include but not be limited to the replacement of plants which have failed or been damaged or stolen during the work under the contract.

6.3 Maintenance Program

Prior to practical completion of planting furnish a proposed planting maintenance program and amend it as required until approved. Comply with the approved program.

6.4 Maintenance Log Book

Keep a log book recording when and what maintenance work has been done and what materials, including toxic materials, have been used. Make the log book available for inspection on request.

6.5 Planting Establishment

RECURRENT WORKS: Throughout the establishment period continue to carry out recurrent works of a maintenance nature specified elsewhere in this section, including but not limited to watering, weeding, fertilising, pest and disease control, staking and tying, plant replacement cultivating, pruning, hedge clipping, aerating, renovating, keeping the site neat and tidy and the like.
MULCHED SURFACES: Maintain in a clean and tidy condition and reinstate the mulch as necessary.

WATERING: Water as required to maintain the best possible conditions and growth rates of the plant material.

**Pavement trees:**

PAVEMENT TREES: Water pavement trees as necessary or as required by Council’s site representative with clean unpolluted water at a rate which ensures the water is absorbed into the tree pit and does not overflow onto the surrounding areas. Water shall be applied into the tree irrigation pipe only and shall not exceed 200 litres per tree per watering visit.

TREE GUARDS AND TIES: Adjust and/or replace as required.

WEEDING: Weeding shall be executed at regular intervals during the maintenance period. A weed may be defined as a plant out of place. Any new or strange plant that occurs shall be removed immediately. Remove weeds as they appear using hand methods only, when removing weeds the full portion of the plant should be removed.

FERTILISING: Re-apply 3-4 month slow release fertilisers. A.b.s. 3 months after their logged date of installation at the rate of 100 g/m³.

PEST AND DISEASE CONTROL: Insecticide and/or fungicide spraying, if considered necessary by Council’s site representative, shall be carried out at the contractor’s expense. The contractor shall report any incidence of insect attack or evidence of disease amongst plant material. The contractor must advise Council’s site representative of the type of chemical he intends using and gain approval before such work is carried out.

If insecticide and/or fungicides spraying is approved by Council’s site representative it shall be carried out at all times nominated and as recommended by the manufacturer within the limits of State Statutes.

STAKING AND TYING: Adjust and/or replace as required. Remove at the end of the planting establishment period if directed.
Plant replacement:

PRUNING: Pruning shall be carried out as deemed necessary by Council’s site representative. Pruning may be required for one or more of the following reasons:

. to keep the shrub or climber within reasonable bounds
. to improve the shape, flowering and fruiting of the species concerned
. to rejuvenate the plant by removing diseased or dead materials, thus permitting full development and healthy growth

Trees

The pruning of trees will primarily be undertaken to develop leading branches and improve the shape of the crown. This will be undertaken before dominant growth of unwanted branches are established so as to avoid permanent pruning scars.

A saw will be used to make a clean straight cut and shall be dipped in disinfectant prior to use and before work on subsequent plants.

Avoid tearing of bark. Undercut branch 200mm away from final cut. Make final cut from collar (beneath branch) to the point where the branch joins trunk (on the upper side of the branch).

If shoots proliferate from the wounds or along the stem after pruning these should be removed.

Shrubs

The pruning of ornamental flowering shrubs should be as outlined below and as directed by Council’s site representative.

When pruning shrubs it is important to make neat, clean cuts at 45° to the stem so the water runs away from the centre where it would create rot in the stem. Cutting to an outward facing eye is desirable as that means the new growth will come from the "eye" or "leaf axil" or "bud" to the outside of the plant rather than to the inside and thereby cause congestion of the centre. Trimming can be done at times of active growth following flowering in order to create a particular shape required.
Remove dead foliage and spent flower heads.

In thick wood above 20mm diameter, a saw should be used rather than secateurs in order to make a clean straight cut. Avoid tearing of bark. Undercut branch 200mm away from final cut. Make final cut from collar (beneath branch) to the point where the branch joins trunk (on the upper side of the branch).

Secateurs or saws should be dipped in disinfectant before being used on other plants.

**Climbers and Ground Covers**

The principles stated for shrubs are applicable to the woody climbers and ground covers. In most cases pruning to shorten the longer canes or remove dead or weak wood is all that is necessary.

**Perennials**

Perennials will require little pruning other than removal of dead and "browned" foliage and spent flower heads.

RUBBISH: Remove all rubbish and litter from tree surrounds, planting beds and raised planter beds.
<table>
<thead>
<tr>
<th>Town</th>
<th>Major Pedestrian Path</th>
<th>Major Driveway &amp; Service Area</th>
<th>Major Tree Species</th>
<th>Tree Grates</th>
<th>Tree Guards</th>
<th>Tree Surround</th>
<th>Seats</th>
<th>Bins</th>
<th>Lights</th>
<th>Bollards</th>
<th>Signage</th>
<th>Steps</th>
<th>Walks &amp; Change of Level</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berry</td>
<td>See DCP No. 49 and details for Broughton Court</td>
<td>Buli Rustic Mottle Blue</td>
<td>Robinia pseudoacacia</td>
<td>Na</td>
<td>No</td>
<td>See separate detail for Berry Streetscape</td>
<td>Street Furniture Australia</td>
<td>Bega (flush)</td>
<td>Timber</td>
<td>Community sign in Broughton Court</td>
<td>Similar to tree surrounds in Broughton Court</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kangaroo Valley</td>
<td>See Heritage Study, Draft DCP underway</td>
<td>PGH Black and Tan</td>
<td>Eucalyptus, PGH Black &amp; Tan in stretcher bond longside to kerb with header edge.</td>
<td>No</td>
<td>No</td>
<td>Hexagonal PGH header flush with ground level</td>
<td>Community sign near Post Office</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycleway</td>
<td>Sandstone coloured concrete</td>
<td>Main Street</td>
<td>Pinus patula &amp; Cinnamomum Camphora Liquid Ambers Crab Apple</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bomaderry</td>
<td>See DCP No. 64</td>
<td>Zucca</td>
<td>Cottonwood White Cedars Illawarra Flame London Planes</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nowra</td>
<td>Jindabyne and Kinghorn Streets See detail street scape plans</td>
<td>Pebblecrete tile and Bull Rustic Mottle Blue</td>
<td>Flandersia articulata and Sophora japonica</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Street Furniture Australia</td>
<td>Street Furniture Australia</td>
<td>SCC Workshop</td>
<td>Community sign at Junction Court</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moss Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plunkett Street</td>
<td></td>
<td></td>
<td>Rawarra Flame Jacarandas</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoalhaven Heads</td>
<td>DCP No. 14 (under review)</td>
<td>Concrete with brick header course</td>
<td>Cephalis discoides and Eucalyptus ficifolia in main street</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culburra</td>
<td>See DCP No. 30</td>
<td></td>
<td>Eucalyptus ficifolia Washingtonia See DCP</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(See Guidelines for Urban Streetscape)
<table>
<thead>
<tr>
<th>Town</th>
<th>Major Street Paving Areas</th>
<th>Major Trees</th>
<th>Street Furniture</th>
<th>Paving</th>
<th>Tree Surround</th>
<th>Seats</th>
<th>Signage</th>
<th>Steps</th>
<th>Wires At Ceiling</th>
<th>Services</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greewell Point</td>
<td>Naval Parade Gully and Glade Gully</td>
<td>Secondary St.</td>
<td>Pool, Bathymetric Survey, Timber, Stone, Block Wall</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Underground electricity</td>
<td></td>
</tr>
</tbody>
</table>

Note: For Ewoll Bay, Sosse's Inlet, and Sesdax Inlet, refer to DCP No. 50 Streetscape Guidelines for Paving and Tree Planting in the Nowra Central Business District.
<table>
<thead>
<tr>
<th>Town</th>
<th>Major Pedestrian Paver</th>
<th>Major Driveway Paver for Service Areas</th>
<th>Major Tree Species</th>
<th>Tree Guards Yes/No</th>
<th>Tree Guards Yes/No</th>
<th>Tree Surround</th>
<th>Seats</th>
<th>Bins</th>
<th>Lights</th>
<th>Bollards</th>
<th>Signage</th>
<th>Steps</th>
<th>Walls &amp; Change of Level</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cudmirrah</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berrara</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milton</td>
<td>PGH Black and Tan</td>
<td>PGH Black and Tan</td>
<td>Magnolia soulariaina</td>
<td>No</td>
<td>Yes</td>
<td>See detail</td>
<td>Street Furniture Australia</td>
<td>Street Furniture Australia</td>
<td>Street Furniture Australia</td>
<td>IED is underground</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See DCP No. 26 and Detail Street Scope Plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulladulla</td>
<td>London Harvest Teck - main paver, London Chestnut - header course</td>
<td>Brush Box and Gladiolus in main street</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Double Eulonoe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Ulladulla</td>
<td></td>
<td>Eucalyptus leucadylon and selected native species</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burrill Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bawley Point/Kiddo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Access Covers and Frames

Polycrete-Broadsteel covers and frames are available in three loading categories, however, reduced loadings are given for Medium and Heavy Duty multi-part units due to the fact that end support for cover elements is not present when covers butt together.

Similarly, if tiles in excess of 12mm thickness are laid within the cover surface, this may marginally reduce quoted loadings in the Medium and Heavy Duty designs.

<table>
<thead>
<tr>
<th>LOADING</th>
<th>TYPE OF UNIT</th>
<th>TYPE OF TRAFFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT DUTY</td>
<td>Open Mesh Base</td>
<td>Pedestrian</td>
</tr>
<tr>
<td>Australian Standard</td>
<td>Single Cover</td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>Two Part Cover</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Three Part Cover</td>
<td></td>
</tr>
<tr>
<td>MEDIUM DUTY</td>
<td>Solid Base</td>
<td>Low-speed vehicles with wheel loading of 5,000 kg maximum.</td>
</tr>
<tr>
<td>Australian Standard</td>
<td>Single Cover</td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>Two Part Cover</td>
<td>Low-speed vehicles with wheel loading of 2,000 kg maximum.</td>
</tr>
<tr>
<td></td>
<td>Three Part Cover</td>
<td></td>
</tr>
<tr>
<td>HEAVY DUTY</td>
<td>Solid Base</td>
<td>Low-speed vehicles with wheel loading of 10,000 kg maximum.</td>
</tr>
<tr>
<td>Australian Standard</td>
<td>Single Cover</td>
<td></td>
</tr>
<tr>
<td>Class C</td>
<td>Two Part Cover</td>
<td>Low-speed vehicles with wheel loading of 5,000 kg maximum.</td>
</tr>
<tr>
<td></td>
<td>Three Part Cover</td>
<td></td>
</tr>
<tr>
<td>Class D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wheel loadings are in respect of four wheeled vehicles that are fitted with pneumatic tyres.

All loadings relate to covers filled to the top with Grade 25 “Mpa” mix concrete.
LIGHT DUTY
(PEDESTRIAN TRAFFIC)

LOADING
Pedestrian-when cover filled with Grade 25
*MPa* mix concrete (EN 124 A15, DIN 1229 A15)

LIST
Single Unit 7345, 7349 Series
Two Part Unit 2345, 2349 Series
Three Part Unit 3345, 3349 Series

SPECIFICATION
POLYCRETE-BROADSTEL
Light Duty recessed open mesh access
cover and frame.
Galvanised to AS 1650/1980.

FEATURES
Cover recessed for filling on site so that
surrounding floor finish can be maintained
with minimum interruption.
Slide out design facilitates easy cover
removal.

Supplied with plastic spacer clips to control
cover/frame gap to a minimum during back-
titting.
Can be supplied with rubber seal and locking
bolts to provide resistance to the escape of
gas at atmospheric pressure.

On multiple units the application of a
suitable caulking compound by the
installer to the centre bar joints increases
resistance.

Brass trim can be fitted to cover and frame
visible edges for special high quality finish.
This increases stated over frame dimension
by 5mm and overall depth by 2.5mm and
rebate sizes should be adjusted accordingly.

Covers and frames can be manufactured in
Grade 316 stainless steel if required.

Lifting bosses on sealed and locking versions
are fitted with plastic caps to mask keyholes
during installation and for long term
protection.

Covers can be fitted with special security
bolts if required.

Non standard sizes can be manufactured.

Notes for fixing-see page 21.

LIFTING KEY: Product No. 9756A

LOCKING KEY: Product No. 9758C
(sealed and locking units only)

See inside back cover for fixing instructions.
MEDIUM DUTY

LOADING
Single units 2-5 SMWL when cover filled with
Grade 25 "Nora" mix concrete (EN 124 B25
DIN 1229 B25)
Multi Part Units 2-1 SMWL when filled as
above.

LIST
Single Unit 7367, 7369 Series
Two Part Unit 2367, 2369 Series
Three Part Unit 3367, 3369 Series

SPECIFICATION
POLYCRETE - BROADSTEEL Medium Duty
recessed solid bottom access cover and
frame.
Galvanised to AS 1650/1980.

FEATURES
Cover recessed for filling on site so that
surrounding floor finish can be maintained
with minimum interruption.
Slide out design facilitates easy cover
removal.
Supplied with plastic spacer clips to control
cover/frame gap to a minimum during back-
filling.
Can be supplied with rubber seal and locking
bolts to provide resistance to the escape of
gas at atmospheric pressure.
On multiple units the application of a
suitable caulking compound to the centre
bar joints increases resistance.
Brass trim can be fitted to cover and frame
visible edges for special high quality finish.
This increases stated over frame dimensions
by 5mm and overall depth by 2.5mm and
rebate sizes should be increased accordingly.
Covers and frames can be manufactured in
Grade 316 stainless steel if required.
Lifting bosses on sealed and locking versions
are fitted with plastic caps to mask keyholes
during installation and for long term
protection.
Covers can be fitted with special security
bolts if required.
Non standard sizes can be manufactured.
Notes for fixing; see page 21.

LIFTING KEY: Product No. 9758A

LOCKING KEY: Product No. 9758C
(sealed and locking units only)
HEAVY DUTY

LOADING
Single units - 10t SMWL when cover filled
with Grade 25 "Mop" mix concrete
(EN 124, C250, DIN 1229 C250)
Multi Part Units - 5t SMWL when filled as
above. (EN 124 C250, DIN 1229 C250)

LIST
Single Unit 7377, 7379 Series
Two Part Unit 2377, 2379 Series
Three Part Unit 3277, 3379 Series

SPECIFICATION
POLYCRETÉ-BROADSTEL Heavy Duty
recessed solid bottom access cover and
frame.
Galvanised to AS 1650/1980.

FEATURES
Cover recessed for filling on site so that
surrounding floor finish can be maintained
with minimum interruption.
Slide out design facilitates easy cover
removal.

Supplied with plastic spacer clips to control
cover/frame gap to a minimum during back
filling.

Can be supplied with rubber seal and locking
bolts to provide resistance to the escape of
gas at atmospheric pressure.

On multiple units the application of a
suitable caulking compound to the centre
bar joints increases resistance.

Brass trim can be fitted to cover and frame
visible edges for special high quality finish.
This increases stated over frame dimensions
by 5mm and overall depth by 2.5mm and
rebate sizes should be adjusted accordingly.

Covers and frames can be manufactured in
Grade 316 stainless steel if required.
Lifting bosses on sealed and locking versions
are fitted with plastic caps to mask keyholes
during installation and for long term
protection.

Covers can be fitted with special security
bolts if required.
Non standard sizes can be manufactured.

Notes for fixing - see page 21.

LIFTING KEY: Product No. 9758B
LOCKING KEY: Product No. 9758C
(sealed and locking units only)

See inside back cover for fixing instructions.
MULTIPLE

LOADING
List 7367 SP and 7369 SP: 2t SMWL when covers filled with Grade 26 "MPa" mix concrete.
List 7377 SP and 7379 SP: 5t SMWL when cover filled as above.

PRODUCT No.: 7367 SP, 7369 SP, 7377 SP, 7379 SP.

SPECIFICATION
POLYCRETE-BROADSTEL recessed, solid bottom multiple access cover and frame.
Galvanised to AS 1650/1980.

FEATURES
Removable support beams incorporating frame centre bearers provide uninterrupted access to chamber.
Clear openings marginally reduced by projecting beam chairs.
Covers recessed for filling in site so that surrounding floor finish can be maintained with minimum interruption.
Sliding design facilitates easy cover removal.
Covers can be supplied with rubber seal and locking bolts.
Brass trim can be fitted to cover and frame visible edges for special high quality finish.
This increases overlapped frame dimensions by 5mm and overall depth by 2.5mm and rebate sizes should be adjusted accordingly.
Lifting bores on sealed and locking versions fitted with plastic cap to mask keyholes during installation and for long term protection.
Covers can be fitted with special security bolts if required.
Flexibility of design enables units to be supplied in accordance with customer's precise requirements as regards clear opening size.
Covers and frames can be manufactured in Grade 316 stainless steel.
Frame depth 69.5mm. Minimum rebate size 100mm wide x 75mm deep.

LIFTING KEY (Medium) Product No. 9758A
LOCKING KEY: Product No. 9758C
(sealed and locking covers only)

LIFTING KEY (Heavy) Product No. 9758B
LOCKING KEY: Product No. 9758C
(sealed and locking covers only)