CADDENS HILL
Sports Precinct
LANDSCAPE CONSTRUCTION CERTIFICATE PACKAGE
ISSUE A

LANDSCAPE TECHNICAL SPECIFICATION

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For

Legacy Property

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LANDSCAPE WORKS

Appendices

Scope of Work

Extent

Caddens Hill Sports Precinct includes:

- Construction of concrete paths to park space as indicated in drawings,
- Construction of all concrete landings as indicated on plans,
- Construction of concrete steps and ramps as indicated on plans,
- Installation of pre-manufactured tactile studs and non-slip tread grips as per manufacturers specification
- Construction of all concrete unit pavers as detailed and indicated on plans,
- Construction of all subsoil drainage within planting areas as indicated on plans,
- Construction of all treepits including those using stratacells with the paved areas as indicated on plans,
- Construction of all sandstone log walls and in-situ concrete retaining walls and terraces and feature wall,
- Set out of all landscape components shown on set out plans,
- Grading to mass planting and turf areas,
- Soil improvement works as per SESL report and landscape specification (Earthworks & Soil Amelioration Works Section),
- Installation of all site furniture, (bin, benches, bike hoops) as per manufacturers specifications,
- Installation of all concrete and timber edging as detailed,
- Application of approved anti-graffiti coating to all in-situ concrete retaining walls and sandstone log walls, including stair wing walls,
- Planting, including all mulching, turf, mass planting of all trees and plants at sizes shown in plant schedules,
- Supply and Installation of feature bespoke bridge structures as detailed
- Supply and Installation of playground equipment and wetpour softfall surfacing as indicated on plans and specification
- Construction of sports field equipment (half basketball court, cricket pitch and nets), associated fencing and surfacing, to manufacturers detail and as indicated on plans

Note that the Principal reserves the right to delete certain component works within the scope of this contract.

Associated Work

The following works are to be carried out by other Contractors:

- All services; Refer to Service Engineers Specifications
- All roadworks; Refer to Civil Engineers Specifications
- Kerb, pram ramps and guttering;
- All street lighting;
- Oval Sports field

Work shown for information but not included:

- Road layouts and all associated civil works.
- Lot boundaries
- Substation
- GPT and maintenance access to GPT and to basin
- Basin D

Alternative to proprietary products:

General: An alternative product having properties equal to or better than those specified, may be offered for review. The Superintendent may in their absolute discretion approve or reject the alternative proposed. No claim shall arise from any rejection thereto.

Variation: Unless otherwise agreed, alternatives shall not be grounds for any claims for a variation or additional cost or time. When offering an alternative for review, provide all available technical information, together with any other relevant information as may be requested by the Superintendent. If so requested, the Contractor shall obtain and submit reports on relevant tests by an independent testing authority.

Alterations: The Contractor shall state whether the use of the alternative proposed will require alterations or modifications to any other part of the Works. If the alternative is accepted, carry out any such alteration without extra charge.

1. GENERAL

1.1 General

Precedence

Requirements of individual technical sections of the specification override conflicting requirements in this section.

1.2 Relevant documentation by others

This specification document is to be read in conjunction with:

1. Civil Engineering Construction Certificate Package Drawings by J. WYNDHAM PRINCE
2. Penrith DCP 2014
3. Penrith Council DA Approval for Caddens Hill Sports Precinct - **DA17/0479**
4. Structural Engineering documentations required
5. The Soil Sciences Report and recommendations for amelioration by SESL
6. Planning for Bush Fire Protection 2006 by RFS

1.3 Referenced Documents

Current editions

General: Use referenced documents which are editions, with amendments, current one month before the closing date for tenders, except where other editions or amendments are required by statutory authorities.
Site copies: One

Contractual relationships

Responsibilities and duties of the principal, contractor and contract administrator are not altered by requirements in referenced documents.

The Table below shows the list of relevant landscape drawings:

SCHEDULE OF DRAWINGS

COVER SHEET	L000
GENERAL NOTES PLAN	L101 - L104
GRADING AND LEVELS	L301 - L304
MATERIAL SCHEDULE	L400
SURFACE FINISHES AND FURNITURE	L401 - L404
PLANTING PLANS	
PLANTING SCHEDULE	L600
TREE PLANTING PLANS	L601 - L604
SHRUB PLANTING PLANS	L651 - L654
HARDSCAPE DETAILS	
HARDSCAPE DETAILS - PAVING	L901
HARDSCAPE DETAILS - PLAY AREA	L902
HARDSCAPE DETAILS - WALLS	L910 -L912
HARDSCAPE DETAILS - STAIRS	L920 -L923
HARDSCAPE DETAILS - STRUCTURES	L930 -L931
HARDSCAPE DETAILS - FURNITURE	L932 -L933
SOFTSCAPE DETAILS	L950 - L951

1.4 Interpretation

General

Unless the context otherwise requires, the following definitions apply:

- Supply: "Supply", "furnish" and similar expressions mean "supply only".
- Provide: "Provide" and similar expressions mean "supply and install".
- Approved: "Approved", "reviewed", "directed", "rejected", "endorsed" and similar expressions mean "approved (reviewed, directed, rejected, endorsed) in writing by the Contract Administrator".
- Superintendent: Person appointed in writing be 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.
- Give notice: "Give notice", "submit", "advise", "inform" and similar expressions mean "give notice (submit, advise, inform) in writing to the contract administrator".
- Obtain: "Obtain", "seek" and similar expressions mean "obtain (seek) in writing from the Contract Administrator".
- Proprietary: "Proprietary" mean identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Samples: Includes samples, prototypes and sample panels.

Maintenance period

- 12 Months for all Hardscape Areas from the date of PC
- 12 Months for all Softscape areas from the date of PC

Note: There will be an inspection at PC between the superintendent, landscape architect, contractor and Campbelltown Council. The maintenance period will start at the completion of *landscape* PC.

Watering

Watering to all softscape will be required by the contractor as part of this contract 'as and when' required to ensure plant establishment and longevity until handover. Plant deaths as a result of insufficient water will be at the contractors' expense.

1.5 Contract Documents
General

Diagrammatic layouts:
Layouts of built elements are diagrammatic only, except where figured dimensions are provided or calculable. Before commencing work, obtain measurements and other necessary information.

Levels:
Contractor to confirm all existing survey levels prior to commencement and alert the CA of engineers between proposed and existing grades. Spot levels take precedence over contour lines and ground profile lines.

1.6 Design

Space requirements
Check space requirements for all services easements indicated diagrammatically in the contract documents and submit a report on consequent variations to the design. Landscape Contractor to contact either the Superintendent or landscape architect once an issue has been highlighted.

2. QUALITY

2.1 Inspection

Notice
Witness points: If notice of inspection is to be given in respect of parts of the works, advise if and when those parts are to be concealed.

Hold points: If notice of inspection is to be given in respect of parts of the works, do not conceal those parts without approval.

Minimum notice for inspections to be made: two working days (48 hours).

2.2 Tests

Notice
General: Give sufficient notice so that designated tests may be witnessed.

Hold points: Do not carry out designated tests without approval.

Minimum notice for tests to be witnessed:

- 2 working days for site tests; and
- 5 working days for local pre-delivery tests.

Reports
General: Submit copies of test reports, including certificates for type tests, showing the observations and results of tests and compliance or non-compliance with requirements.

Number of copies of test certificates: Three

Endorsement
If tests are to be carried out on parts of the works, do not conceal those parts and do not commence further work on those parts until the tests have been satisfactorily completed and compliance verified.

2.3 Samples

Timing
Delays: Coordinate submissions of related samples. Do not cause delays by making late submissions or submitting inadequate samples.

Quantity
General: Submit a sample of each designated item and 2 copies of supporting documentation.

The contractor is to ensure that their price includes for the following samples as a minimum. There may be more samples required throughout the construction period.

- Typical construction and expansion joints to walls and pavements (photo acceptable).
- Inspection of anti-graffiti coating product once applied to a section of walling.

Identification
Identify the Project, Contractor, Subcontractor or Supplier, Manufacturer, applicable product and options, as appropriate and include pertinent contract document references. Include service connection requirements and product certification. Identify non-compliances with project requirements, and characteristics, which may be detrimental to successful performance of the completed work.

Approval
General: Do not commence work affected by samples until the samples have been approved. Submit further samples as necessary.

Retention
Keep approved samples in good condition on site, until practical completion.

Incorporation
Incorporate in the works samples, which have been approved for incorporation. Do not incorporate other samples.

Criteria
Match approved samples throughout the works.

2.4 Contractor's Submissions:

Timing
General: Submit documents in a timely manner, to suit the construction program. Advise if any of the documents are to be returned.

Delays: Coordinate submissions of related items. Do not cause delays by making late or inadequate submissions.

Quantity

Bound documents:	2 copies.
Documents up to and including A3:	2 copies
Standard contract drawing size:	A1

Identification
Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include pertinent contract document references. Identify non-compliances with project requirements, and characteristics, which may be detrimental to successful performance of the completed work.

Endorsement
Witness points: Give notice before commencing work affected by contractor's submissions, unless the submissions have been endorsed as satisfactory.

Hold points: Do not commence work affected by contractor's submissions until, if appropriate, the submissions have been endorsed as satisfactory,

Errors: If a document contains errors, submit a new or amended document as appropriate, indicating changes since the previous submission.

Design
General: If part or all of an installation is to be designed by the contractor, submit documents showing the layout and details of the installation.

Variation documents: If it is proposed to change the installation from that shown on the contract documents, or if statutory authorities require changes, submit variation documents showing the proposed changes.

Shop drawings
General: Submit dimensioned drawings showing details of the fabrication and installation of equipment.

Diagrammatic layouts: Coordinate work shown diagrammatically in the contract documents, and submit dimensioned set-out drawings.

Authorities
Correspondence: Submit copies of correspondence and notes of meetings with authorities.
Authorities' approvals: Submit documents showing approval of the authorities whose requirements apply to the work.

Samples
If it is intended to incorporate samples into the works, submit proposals.

3 MATERIALS AND COMPONENTS

3.1 General
Sources policy

Manufacturers' or suppliers' recommendations
General: Select, if no selection is given, and transport, deliver, store, handle, protect, finish, adjust, prepare for use, and use manufactured items in accordance with the current written recommendations and instructions of the manufacturer or supplier.

Instructions: Submit the recommendations and instructions, and advise of conflicts with other requirements.

Project modifications: Advise of activities that supplement, or are contrary to, manufacturers or suppliers' written recommendations and instructions.

Product certification: If products must comply with product certification schemes, use them in accordance with the certification requirements.

Sealed containers
If materials or products are supplied by the manufacturer in closed or sealed containers or packages, bring the materials or products to point of use in the original containers or packages.

Consistency
For the whole quantity of each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

4 COMPLETION

4.1 General - Samples
Remove unincorporated samples on completion.

Contractor's submissions
Within 2 weeks after practical completion, submit three (3) copies of designated documents.

4.2 Record Drawings - General
Submit record drawings, in paper and electronic format. Show the "as installed" locations of all built elements, including pathways and walls where applicable.

Format
Use the same borders and title block as the contract drawings.

4.3 Performance & Evaluation Reports - General
To be conducted by suitably qualified professionals as specified in the contract package

Contents - general
Include the following:

- Landscape Performance Evaluation

Include the following;

1. Time period of report and climatic conditions during that time
2. Qualifications and experience of contractors. Required in the first report only, unless there are changes after the first report.
3. Soil certification by a NATA registered soils laboratory (if required) for imported soil for similarity, weed free and contaminant free status.
4. Provide Certification of Completion and/or Compliance for all works and operations in the VMP and WP (both at practical completion and maintenance) by independent persons suitably experienced and qualified in such certification. Ecological Australia are engaged by PLACE Design Group.
5. Document proof of topsoiling under all areas of disturbance, including under any mulch.
6. Mulch to be certified that it is weed and contaminant free
7. Other issues such as vandalism, theft, changes of ownership etc.
8. Photographic record of the works/vegetations progress during the reporting period.

Timing & Quantity
Final copies: Submit 3 sets of final volumes at practical completion stage. Incorporate feedback from review and from training of principal's staff, including preparation and insertion of additional data.

Revisions: Submit 3 sets of amendments for insertion at the end of the maintenance period incorporating feedback from the maintenance period, within 2 weeks after completion.

Statutory authorities' requirements
Installation and continued monitoring to be approved by the relevant state authority, Department of Water & Energy (DWE)

4.5 Training - Operation
Immediately after practical completion, explain and demonstrate to the principal's staff the purpose, function and operation of the installations.

4.6 Maintenance - General
General: During the maintenance period, carry out periodic inspections and maintenance work as recommended by manufacturers of supplied equipment, and promptly rectify faults. The contractor is responsible for the safety of their team at all times and is to carry out their own risk assessment processes. The contractor is to alert the Landscape Architect or superintendent if any issues.

Emergencies: Attend emergency calls promptly.

SITE PREPARATION

1. GENERAL

1.1 Cross References - General

Refer to the: - *General requirements* section,

Related sections

Refer to the following sections:

- *Earthworks & Soil Amelioration* section

2. QUALITY

2.1 Inspection - Witness points

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

- Erosion control measures installed
- at 75% completion of shaping & fine grading
- at 25% completion of amending the existing topsoil
- at 75% completion of spreading the imported topsoil

2.2 Contractor's Submissions - Materials

Submit details (and samples - mulch) of materials proposed, including the following:

- Top soil amendments in line with the SESL requirements
- Mulch

3 SITE MANAGEMENT

3.1 Removal of Topsoil

General

Extent: Remove the topsoil layer of the natural ground containing substantial organic matter, over the areas to be excavated or regraded, and areas to be occupied by structures, pavements, embankments and the like and other areas designated to have topsoil removed.

Depth to be removed: To base of root zone, refer to *Geotechnical Report and also the soils report by SESL relating to soil depth and existing soil condition*.

Topsoil Stockpiles

Site topsoil approved for re-use and imported topsoil, are to be stockpiled at designated locations as shown on plan or approved other location, where necessary. Refer to Protection, Staging & Monitoring Plans – Information on stockpiling of topsoil will be provided in line with the engineers staging (within the overall stage 1 boundary) and the contractor will need to provide for a management plan / methodology around soil processes for landscape usage. It is intended to use as much site won topsoil as possible within stage 5 however topsoil may need to be brought to site as needed and stockpiled separately.

Establish stockpiles to sizes, as directed, to heights not exceeding 1.5 m. Provide adequate drainage and erosion protection. Do not burn off or remove plant growth which may occur during storage. Do not allow traffic on stockpiles. If a stockpile is to remain for more than four weeks, sow with temporary grass. Protect the topsoil stockpiles from contamination by excavated material, weeds, and building debris.

3.2 Stormwater Services

N/A - By Civil Contractor. Contractor to alert the landscape architect or superintendent if there are any potential conflicts between stormwater pipes and proposed landscape works, in particular, subsoil drainage to the landscape areas.

3.3 Environmental Protection

N/A - By Civil Contractor and as per approvals

4 SITE CLEARING

4.1 Site Clearing

Extent

General: Clear only the following site areas:

- Areas to be occupied by works such as; paving, excavation, regrading and landscaping.

- Other areas designated to be cleared.
  Contractor's site areas: If not included within the areas specified above, clear generally only to the extent necessary for the performance of the works.

Clearing operations

Removal: Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble.

Grubbing: Grub out stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade, embankments or paving, or 300 mm below finished surface in unpaved areas.

Old works: Remove old works, including slabs, foundations, paving, drains and manholes found on the surface.

Recycled Brick – to be re-used as part of the landscape works. Recycled bricks to be generally cleaned and stockpiled for re-use.

Existing grass: Remove grass to a depth just sufficient to include the root zone.

4.2 Spoil

Dispose off site in an approved manner

5 COMPLETION

5.1 Completion - Temporary works

- Environmental Protection: Remove structures including those to stormwater pits, ramps etc.

1 GENERAL

1.1 CROSS REFERENCES

General
Refer to the General requirements section.

Scope
All earthworks associated with the external landscape works shown on the drawings.

1.2 INTERPRETATION

Bulk Earthwork refer to Engineers Specification

2 QUALITY

2.1 INSPECTION

Refer to Section 4.0 for schedule of inspection and testing requirements.

Witness points
Give sufficient notice so that inspection may be made of the following:

- Base completed to contract levels.
- Subgrade before placing sub-base, base, working base, filter fabric or membrane, as applicable
- Stockpiled topsoil before spreading.

Hold points

- Subgrade test result approval prior to placing sub-base, base, working base, as applicable.
- Soil amelioration requirements as specified in Section 4.1
- Items to be measured as listed in Records of measurement.

2.2 TESTS
Refer to the Test Schedule and other requirements in Section 4.3 of this specification chapter.

2.3 SAMPLES

General
Submit samples of the following:

- Each type of filter fabric
- Each type of soil mix specified in section 4.0.

3 PLACING AND COMPACTION

3.1 FILL – To be completed by Civil Contractor

4 SPECIAL SITE WON AMELIORATED SOILMIX TYPES FOR USE IN LANDSCAPING WORKS

NOTE: Where the Contractor is required to achieve the specified soil depths, and insufficient depth of soil has previously been placed, the Contractor will be required to achieve the required depths and profiles using the site stockpiled material in accordance with the drawings and specification.

4.0 Topsoil stripping completed by civil contractor

It is intended that all existing suitable soil for reuse in landscaped areas will be initially stripped and stockpiled by the civil contractor and reviewed by the landscape contractor. Final spreading and all amelioration works to the topsoil will be by the landscape contractor.

Note: the landscape contractor will be responsible for all/any potential issues arising from incorrect amelioration or plant deaths as a result.

4.1 STANDARD SPEC FOR IMPORTED SOIL MIXES

SOIL MIX TYPE A – Applies only to Turf Areas - Min. 150mm depth of soil

Topsoil Preparation and amelioration requirements:

- Stripping of soil to a depth of 250 – 300mm available topsoil, (cease when clay is encountered)
- Screening to 15mm of around 50% of all recovered topsoil
- NPK Fertiliser 50g/m^2
- Organic Matter
- Gypsum applied at 250g/m^2
- Work organic matter, fertilizer and lime together thoroughly
- Cultivate through to 150mm depth avoiding compaction to appropriately treated sub-grade

Note:

Following spreading and prior to turfing apply a turf starter fertiliser equal to Patons Landscape Blend at 500g \ m3. Follow up application should be made 4 – 6 weeks after turfing at the same rate.

Where existing topsoil or material has been placed and the area, it will be the responsibility of the landscape Contractor to remove and replace existing topsoil to achieve the required soil profile.

Note that other areas, including landscape mounding, where bulk fill will need to be placed, the landscape Contractor shall be responsible for shaping the mounding to base levels and then preparing and installing soil mix Type A.

SOIL MIX TYPE B – Applies only to Tree Pits & Mass Planting Areas

Soil mix type B - Mass Planting to 300mm depth for mass planting areas.

Topsoil Preparation and amelioration requirements:

- NPK Fertiliser
- Lime at 2.5kg/m3
- Composted soil conditioner worked in with gypsum and fertilisers (complying with AS 4454) at 25% by volume (3 parts soil plus 1 part compost by volume).
- Organic Matter
- Gypsum to 150g/m^2
- 75g/m^2 of 10:5:5:5 NPKS or 75g/m^2 10:3:5 Native Plant Food for native plantings
- Work organic matter, fertiliser and lime together thoroughly
- Apply to 300mm depth to appropriately treated sub grade. (see conditions below)

Note:

Following spreading and prior to planting, apply a suitable fertiliser as recommended by the supplier of the soil. Follow up application should be made 4 – 6 weeks after planting in line with the manufacturers instructions

Where existing topsoil or material has been placed and the area, it will be the responsibility of the landscape Contractor to remove and replace existing topsoil to achieve the required garden bed soil profile.

Note that other areas, including landscape mounding, where bulk fill will need to be placed (Responsibility of the civil contractor) the landscape Contractor shall be responsible for shaping the mounding to base levels and then preparing and installing soil mix Type B.

4.1A STANDARD SPEC FOR SITE WON AMELIORATED SOIL

Note:

Site topsoil will be stripped to stockpile by civil contractor. Stockpiled soil will be tested either insitu or in the stockpile by the SESL representative and an appropriate amelioration regime determined. The contractor is to follow the final report recommendations by SESL.

Once Bulk levels have been achieved to all areas (by Civil Contractor), the stockpiled topsoil shall be spread over the turf and garden bed areas to 150mm depth (Turf) and /or 300mm depth (planted beds) and treated as required prior to planting)

4.2 IMPORTED SOILMIX TYPE D1 and D2 FOR TREE PITS

SOIL MIX TYPE D1:

"**A Horizon Backfill".** Where excavating into clay to accommodate a rootball it is imperative that organically enriched topsoil not be used.

Use - loamy sand soil of less than 2% organic matter complying with AS 4419. DO NOT back fill with organically enriched soil.

- 1 Parts by volume site topsoil
- 2 Parts by volume clean non calcareous sand (quartz sand) complying with the following particle size grading.

Sieve Size (mm)	% passing by mass
9.5	100
4.75	90 to 100
2.36	60 to 100
1.18	30 to 80
0.600	15 to 60
0.300	5 to 40
0.150	0 to 15
0.075	0 to 5

Use this to minus 300mm from finish ground surface ensuring all gaps and voids around the new rootball are filled.

SOILMIX TYPE D2:

"**A Horizon Backfill".** Where excavating into clay to accommodate a rootball it is imperative that organically enriched topsoil not be used.

Use - a washed coarse sand, with uniform particle size, 0.50mm to 1.50 mm. Particle shape is to be round to sub-round. Placed to depth of 150mm to be base of the excavated tree pit**.**

4.3 Sampling Procedure

The Contractor will be responsible for ensuring that all nominated soil mixes comply with the of soil mix characteristics. The Contractor will further be responsible for providing periodic sampling and testing to prove ongoing compliance and for implementing any necessary amelioration to correct any non-conformance.

The following sampling procedure has been included as a guide:

a) Remove and discard the surface material to a depth of 150mm. If necessary, use a shield to prevent loose particles form moving into the sampling area. Samples are best collected from approximately 1 metre up vertically from the base.

b) Remove sufficient material, using a scoop or shovel, from each location to constitute the sample increment (refer to sample increment table that follows), taking care to avoid spillage and to avoid contamination from the ground.

c) Sampling should produce significantly more material than is required for testing. The total volume of the sample must then be mixed and reduced to quantities appropriate for testing (i.e. approximately 2kg for standard soil testing).

d) The process of dividing the composite sample must be done carefully to ensure that sub-samples are uniform and representative. Conduct sample division using a standard coning and quartering method:
- All grab samples are placed on a plastic sheet and thoroughly mixed;
- After mixing, the corners of the sheet are lifted simultaneously, thus causing the sample to mound in the center of the sheet;
- The sample is divided into quarters, and two opposing quarters are removed and discarded. This process is repeated until the sample is approximately twice as large as needed;
- The last two quarters removed should be set aside for storage (library samples) and not discarded.

e) The two (2) identical samples should be placed in clean bags or containers and clearly labeled with the following information:

- Date of sampling;
- Type of material;
- Location of stockpile;
- Amount of material represented; and,
- Name of sampling operator.

The sample for testing should then be forwarded to the laboratory for testing for compliance with the specification and the library sample set-aside in a safe place for future reference if required.

Proper sampling technique avoids taking samples from the following:

- Areas of a stockpile where unusual materials are present;
- The very start or end of an operation, which may not be typical of the material being processed or its operating parameters. That is, the final material on a stockpile may come from either the bottom of the stockpile, clean up around processing equipment, or scraping the processed stockpile area. So, it may contain atypical particle sizes or contaminant levels; or,
- Situations where gravity or crosswinds may cause size grading (particle segregation).

4.4 Testing Frequency

Material should only be supplied for installation from certified stockpiles that have been tested and shown to conform to the requirements of the specification. Certified stockpiles should be created for each material type and should be clearly sign posted identifying the material.

Once a stockpile has been tested and certified, further material should not be added to the stockpile.

4.5 Test Schedule

Quantity (m^3)	0 to 25	25 to 50	50 to 100	100 to 250	250 to 500	500 to 1,000	1,000 to 3,000	>5,000

No. of tests	3	4	5	6	7	8	9	Min. 6 per 1,000m^3

5 COMPLETION

Records
Certified records of measurement: Submit a certified copy of the agreed records of measurement.

SUBSOIL DRAINAGE

1 GENERAL

1.1 Cross references

General
Refer to the *General requirements* section.

1.2 Standard

Stormwater drainage
General: To AS 3500.3.

1.3 Interpretation

Definition
Pipe surround: Includes pipe overlay, pipe side support, side zone and haunch zone.

2 QUALITY

2.1 Inspection

Witness points
Give sufficient notice so that inspection may be made at the following stages:

- Excavated surfaces.

Hold points As above

2.2 Samples

General
Submit samples of the following:

- Each type of imported pipe bedding material.
- Each type of filter material.

3 EXECUTION

3.1 Subsoil drains

General
Provide perforated PVC subsoil drains to intercept groundwater seepage and prevent water build-up behind walls and pavements. Connect subsoil drains to surface drains or to the stormwater drainage system as applicable. Refer to General Notes, Grading & Drainage plans

Pipe depth
Provide the following minimum clear depths, measured to the crown of the pipe, where the pipe passes below the following elements:

- 100 mm below formation level of the pavement, kerb or channel.
- 100 mm below the average gradient of the bottom of footings.
- 450 mm below the finished surface of unpaved ground.

Jointing
At junctions of subsoil pipes provide tees, couplings or adaptors to AS 2439.1.

Trench width
Minimum 300 mm, unless shown otherwise on the drawings.

Pipe underlay
General: Grade the trench floor evenly to the gradient of the pipeline. If the trench floor is rock, correct any irregularities with compacted bedding material. Bed piping on a continuous underlay of bedding material, at least 100 mm thick after compaction. Lay the pipe with one line of perforations at the bottom.

Chases: If necessary, form chases to prevent projections such as sockets and flanges from bearing on the trench bottom or underlay.

Pipe surrounds
General: Place the material in the pipe surround in layers ≤ 200 mm loose thickness, and compact without damaging or displacing the piping.

Depth of overlay:

- To the underside of the bases of overlying structures such as pavements, slabs and channels.
- To within 150 mm of the finished surface of unpaved or landscaped areas.
- As shown on the drawings.

Filter fabric
General: Provide polymeric fabric formed from plastic yarn composed of at least 85% by weight propylene, ethylene, amide or vinyledenechloride, and containing stabilisers or inhibitors which provide resistance to deterioration due to ultraviolet light.

Marking: To AS 3705.

Protection: Provide heavy-duty protective covering. Store clear of the ground and out of direct sunlight. During installation do not expose the filter fabric to sunlight for more than 14 days.

Filter socks
Provide polyester permeable socks capable of retaining particles of 0.25 mm size. Securely fit or join the sock at each joint.

Backfilling: Backfill material to be free draining coarse aggregate, free of fines or debris.

Flushing Points: Refer to Engineer's External Siteworks and Stormwater Specification.

Tolerances: Pipelines shall be within 50mm of design line and level and shall fall towards the outlet at all points. Subsoil drains to be installed at minimum grade of 1% unless otherwise specified.

EXTERNAL WALLING1 GENERAL

1.1 Cross References
General
Refer to the *General requirements* section.

Planting: Including plant and other materials, planting works and planning establishment.

Building works associated with landscaping:

Refer to the related sections: OUTDOOR FURNITURE / STRUCTURES

EXTERNAL WALLING

EARTHWORK / SOIL AMELIORATION

PAVING

SUB SOIL DRAINAGE

Refer to the consultants' sections: SITE LIGHTING

IRRIGATION

1.2 Scope of Works
External works as outlined on the drawings will include the supply and installation by the Landscape Contractor of the following, including, but not limited to:

- placement of cast in situ concrete paths within park
- all stairs and ramps including tactile indicators and handrails
- construction of all sandstone log retaining walls and insitu concrete retaining walls and terraces
- Insitu concrete free-standing seat walls
- Installation of stratacells and structural soil (or equivalent) for treepits under paving, as per details
- soil improvement works
- installation of all park furniture, (bin, bike rack, seating)
- installation of all structures, (bridge structure)
- installation of play equipment and rubber softfall to manufacturers specification
- installation of river rocks and boulders to base of swale as indicated on details and plans
- fine grading
- topsoiling

- drainage cell installation including waterproofing to retaining walls and filter fabric
- planting & mulching as per details
- turfing
- Maintenance
- Application of anti graffiti coating to all visible sandstone blocks and walls exposed surfaces

1.3 Standards

Soils

General: To AS 4419 (Int).

1.4 Approved Suppliers and Subcontractors

Requirement: Refer to *PARTICULAR CONDITIONS OF CONTRACT* or use approved subcontractors and suppliers for the landscaping works, and for the supply of materials, including soil, plants, seeds and mulch.

1.5 Ordering

Requirement: Within 14 days of the date of acceptance of tender, furnish proof of ordering the required materials, and advise immediately if any supply difficulties are encountered. For purposes of clarity, this refers to the acceptance of the tender for the head contract, NOT the landscape sub-contract. No extension of time will be granted if any material or product is not available because of late ordering.

1.6 Interpretation Definitions

Site rock: Rocks approved for salvage.

Site topsoil: Soil excavated from the site, which has the following characteristics:

- Contains organic matter.
- Supports plant life.
- Free from unwanted matter.

Unwanted matter (in topsoil):

- Stones over 25 mm diameter.
- Clay lumps.
- Weeds and tree roots.
- Sticks and rubbish.
- Material toxic to plants.

Imported topsoil:

- Fine: Clay loam, fine sandy loam, sandy clay loam, silty loam, loam.
- Medium: Sandy loam, fine sandy loam.
- Coarse: Sand, loamy sand.

Topsoil mixture: Topsoil and compost or other additives, thoroughly mixed before placing.

2 QUALITY

2.1 Inspection

Witness points

Give sufficient notice so that inspection may be made at the following stages:

- Setting out completed.
- Subgrades cultivated or prepared for placing topsoil.
- Topsoil spread before planting
- Grassing bed prepared before turfing, seeding, or temporary grassing.
- Plant holes excavated and prepared before planting for stock in excess of 100L size.
- Structural soil prior to slab pour and planting.
- Plant material set out before planting.
- Planting, staking, and tying completed.
- Grassing or turfing completed.
- Completion of planting establishment work.

2.2 Samples

General

General: Submit test results for each material, to indicate source and content.

Plant materials

Quantity: Submit one plant sample for each 100 of each species or variety, in the condition in which it is proposed to supply that plant to the site.

Samples schedule

Item	Quantity
One species of each type scheduled less than 25L in size	Min. One, or one for each 100 specified.
Organic mulch	5Kg of each type scheduled
Inorganic mulch	5Kg of each type scheduled

Note: Plants to be available for destructive inspection

2.3 Tests

Soil Tests/ Sampling: As recommended in AS 4419 (Int)

Provide proof, in the form of certificates from NATA registered laboratories, that the following materials comply with the specification:

- Topsoil mix Type 'A'
- Topsoil mix Type 'B'

2.4 Contractor's Submissions

Suppliers

Submit statements from suppliers of plants and other materials, giving the following, where applicable:

- Particulars of the supplier's experience in the required type of work.
- Production capacity for material of the required type, sizes and quantity.
- Lead times for delivery of the material to the site.

Materials
Supplier's data: Submit supplier's data including:

- certificate identifying seed species, purity, age and germination viability,
- submit a 5kg sample of mulch, which demonstrates the quality, organic content, value
- material source of supply

Compost: Submit a certificate of proof of compost pH value.

Execution

Program: Submit a work program in the form of a bar chart for the landscape works.

Planting machine: If a planting machine is to be used as an alternative to hand planting, submit a proposal.

Maintenance program: Submit a proposed planting period maintenance program.

Spraying: Submit proposal.

3 SITE AND SOIL

3.1 Preparation

Weed eradication
Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Manual: Regularly remove, by hand, rubbish and weed growth throughout grassed, planted and mulched areas. Remove weed growth from an area 750 mm diameter around the base of the trees in grassed areas. Continue eradication throughout the course of the works and during the planting establishment period.

Vegetative spoil
Remove vegetative spoil from site. Do not burn.

Earth mounds

Place clean filling in layers approximately 150 mm thick compacted to 85% of the dry density ratio of the surrounding soil as determined by AS 1289.5.4.1. Minimise slumping and further internal packing down. Construct changes in grade over a minimum width of 500 mm to smooth, gradual and rounded profiles.

Embankments
Place erosion control mesh to all embankments as shown on plan and details and to all areas which exceed 1:3. Erosion control mesh shall be equal to 'Jute Mesh' as supplied by Total Erosion & Pollution Control ph: 02 9524 0155

Site rock: Stockpile for future placement and accessibility for lifting. Dispose of other rock off site.

3.2 Reinstatement

Requirement: Refer to clause 3.8 in *Site Preparation section* and to Engineer's *External Siteworks and Stormwater Specification Section 3.7*

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

3.3 Subsoil

Ripping

General: Rip parallel to the final contours wherever possible. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

- Compacted subsoil: 300 mm.
- Heavily compacted clay subsoil: 450 mm.
- Ripline planting areas: 150mm

Planting beds

Excavated: Excavate to bring the subsoil to the design levels allowing for the thickness of topsoil. Shape the subsoil to fall to subsoil drains where applicable. Break up the subsoil to a further depth of 150mm.

Unexcavated: Remove weeds, roots, builder's rubbish and other debris. Bring the planting bed to 75mm below finished design levels.

Cultivation

Minimum depth: 300mm.

Cultivation depths (mm):

- Grassed areas: 150mm
- Planting areas: 300mm

Services and roots: Do not disturb services or tree roots, if necessary cultivate these areas by hand.

Cultivation: Thoroughly mix in materials required to be incorporated into the subsoil. Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 25mm, clods of earth exceeding 50mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

Filter fabric and drainage aggregate

Allow for Sarlon Polyweave "f" filter fabric or similar and max. 150mm deep 18mm aggregate to areas shown on the drawings which are to have gravel drainage layer in lawn or mass planted areas or tree pits in streetscape.

Additives

General: Apply additives after ripping or cultivation and incorporate into the upper 150 mm

layer of the subsoil.

Gypsum: Incorporate at the rate of 0.25 kg/m^2.

3.4 Topsoil Definitions

Amended Existing Site Topsoil: Soil excavated from the site which:

- contains organic matter
- supports plant life
- is free from unwanted matter such as stones over 25mm diameter, clay lumps, sticks and rubbish and clumps, and material toxic to plants
- is approved for reuse on site as topsoil.

Topsoil mixture: Topsoil and compost or other additives, thoroughly mixed before placing.

Topsoil schedule

Location	Type
Trees in planting on grade	Topsoil mix Type 'B' to Tree Pits and to achieve finished levels (300 mm depth)
Turf on grade	Topsoil mix Type 'A' (150 mm depth)
Mass planting on grade	Topsoil mix Type 'B' (300 mm depth)

Source:
Topsoil 'Type A' as suitable refined existing topsoil from site for all turfed areas
Topsoil 'Type B' as a suitable refined existing topsoil from site for all planted areas

Additives: Topsoil raised to the standard of the appropriate soil type. The use of additives may be used subject to compliance with the relevant test criteria.

Topsoil mix Type 'A' – organic topsoil mix for any depths ≤ 150mm depth below surface as scheduled.

Mix A is refined and ameliorated topsoil existing on site identified as being mainly extracted from Area 1 and with limited availability from Area 3 as per the Soil Conditions Report by Sydney Environmental and Soil Laboratory (See Appendix F)

Until stripping and stockpiling of the available site top soil is re tested to define the exact amelioration required, refer to the Top Soil Improvement clause of Appendix F of this specification.

Topsoil mix Type 'B' – organic soil mix for any depths >300mm below surface eg mass planting or backfilling pits for trees to surface level.

Mix B is refined and ameliorated topsoil existing on site identified as a 'being mainly extracted from Area 1 and with limited availability from Area 3 as per the Soil Conditions Report by Sydney Environmental and Soil Laboratory (See Appendix F)

Until stripping and stockpiling of the available site top soil is re tested to define the exact amelioration required, refer to the Top Soil Improvement clause of Appendix F of this specification

B Horizon Backfill 'D1' – inorganic loamy sand soil mix comprising of less than 2% organic matter for any depths >300mm below surface eg backfilling pits for trees to 300mm below surface level.

B Horizon Backfill Type 'D2' is a washed coarse sand, with uniform particle size, 0.50mm to 1.50 mm. Particle shape is to be round to sub-round. Placed to depth of 150mm to be base of the excavated tree pit.

The chemistry and physical properties of mix Type 'D1' are as follows:

Property	Amount
Hydraulic conductivity (permeability)	1200 mm/hr
Moisture Retention capacity	15%
Cation exchange	Very low
% clay and silt fines	Low

Mix testing: All mixes are to be submitted for testing and approval prior to installation. Approximately 5 litres of each mix type is required to be tested for chemical and physical compliance with the specification. Soil suppliers must also supply a list of the components used in each mix and their proportions as well as rates of any chemical additives.

Placing topsoil
General: Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances to permit the following:

- Required finished levels and contours may be achieved after light compaction.
- Grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.
- In planted areas, topsoil is required to finish 75mm below the adjacent hard surfaces such as kerbs, raised planter boxes and paths.
- In planter tubs, topsoil is required to finish 50 mm below the top of the planter tub to allow for 50 mm inorganic mulch.

Contamination: Where diesel oil, cement or other phytotoxic material has been spilt on the subsoil or topsoil, excavate the contaminated soil, dispose of it off the site, and replace it with site soil or imported topsoil to restore design levels.

Spreading: On steep batters, if using a chain drag, ensure there is no danger of batter disturbance.

Finishing: Feather edges into adjoining undisturbed ground.

Consolidation
Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface, which has the following characteristics:

- Finished to design levels.
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding, to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

Topsoil depths
Spread topsoil to the following typical depths:

- Excavated and raised planting areas: If using organic mulch or gravel mulch - 300 mm (Refer to details on drawings)

- Excavated tree pits: Refer to details on drawings.

- Irrigated grassed areas generally: 150 mm. (Refer to details on drawings)

Surplus topsoil
General: Surplus topsoil to be disposed of off site.

3.5 Fertiliser

Requirement: Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, N:P:K ratio, recommended uses and application rates.

Fertiliser schedule

Location	N:P:K ratio	Application rate	Proprietary item
Garden beds		50 g/m^3	Dynamic Lifter planting mix
Irrigated lawns		60 g/m^3	Osmocote Slow Release or approved equivalent

4 GRASS

4.1 Turfing

Turf
Obtain turf from a specialist grower of cultivated turf. Provide turf of even thickness, free from weeds and other foreign matter.

Supply
Deliver the turf within 24 hours of cutting, and lay it within 36 hours of cutting. Prevent it from drying out between cutting and laying.

Fertilising
Mix the fertiliser thoroughly into the topsoil before placing the turf. Apply lawn fertiliser at the completion of the first and last mowings, and at other times as required to maintain healthy grass cover.

Laying
General: Lay the turf in the following manner:

- In stretcher pattern with the joints staggered and close butted.

- Parallel with the long sides of level areas, and with contours on slopes.

- To finish flush, after tamping, with adjacent finished surfaces of ground, paving edging, or grass seeded areas.

Strip turf laying: Close butt all edges. Apply a layer of top dressing to all turf. Finish with an even surface.

Tamping
Lightly tamp to an even surface immediately after laying. Do not use a roller.

Pegging
On steep slopes peg the turf to prevent downslope movement. Remove the pegs when the turf is established.

Watering
Water immediately after laying until the topsoil is moistened to its full depth. Continue watering to maintain moisture to this depth. Keep the grass in a healthy condition.

Mowing
Mow to maintain the grass height within the required range. Carry out the last mowing within 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

Turfing schedule

Botanical Species	Variety	Turf roll size (mm)	Location	Mowing height (mm)	Supplier)
Kikuyu	TBA	As provided	Refer dwgs	30	J&B Buffalo Turf Supplies or Similar

(For further technical information refer to Appendix G)

Maintenance
Refer to Section 6.2 – Establishment of Grassed Areas.

5 PLANTS

5.1 Planting

Plants
General: Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage.
- Vigorous well established, free from disease and pests, of good form consistent with the species or variety.
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Trees: Provide trees, which, unless required to be multi-stemmed, have a single leading shoot.

Replacement: Replace damaged or failed plants with plants of the same type and size.

Plant containers
General: Supply plants in weed-free containers of the required size.

Open root stock: If trees are to be supplied as open rooted stock, ensure this is appropriate to the species, variety, size and time of year for planting.

Potting-on: Do not carry out potting-on.

Plant schedule
Refer to Planting Plans and schedules.

Labelling
Label at least one plant of each species or variety in a batch with a durable, readable tag. Do not use nursery tags for this purpose. Remove all such nursery tags from site.

Storage
Deliver plant material to the site on a day to day basis, and plant immediately after delivery.

Individual plantings in grassed areas
Excavate a hole to twice the diameter of the root ball and at least 100 mm deeper than the root ball. Break up the base of the hole to a further depth of 100 mm, and loosen compacted sides

of the hole to prevent confinement of root growth.

Locations
If it appears necessary to vary plant locations and spacing to avoid service lines, or to cover the area uniformly, or for other reasons, give notice.

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

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

Placing
Remove the plant from the container with minimum disturbance to the root ball, ensure that the root ball is moist and place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant root ball level with the finished surface of the surrounding soil.

Fertilising
Pellets: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

Refer to Fertiliser Schedule.

Backfilling
Backfill with approved topsoil mixture. Lightly tamp and water to eliminate air pockets. Ensure that topsoil is not placed over the top of the root ball, so that the plant stem remains the same height above ground as it was in the container.

Watering basins for plants in grass
Except in irrigated grassed areas and normally moist areas, construct a watering basin around the base of each individual plant, consisting of a raised ring of soil capable of holding at least 10 L. Refer to detai

5.2 Planting Advanced Plant Stock

Objective: At the date of practical completion, all trees and palms shall be healthy, in correct position, of at least the size specified, structurally stable and free of visible stakes, ties, guys, wires and the like. The contractor shall be responsible for achieving this objective.

Notice: Give sufficient notice before delivery of advanced plant stock.

Advanced stock: The Contractor is to liase and coordinate with the supplier of advanced trees, including possible long term storage, acclimatisation of tree to local conditions, preparation for and timing of delivery to site.

Conditions: Select a time for planting having regard to the appropriate season, time of actual operation, root ball diameter and depth, lifting methods, weather conditions and the like.

Lifting: Two days before planting of each specimen, thoroughly irrigate it to the full depth of the root ball. Minimise the cutting of roots. Cut roots with sharp tools. Do not fracture the ball of soil around the root system, but maintain it in firm condition during planting by wrapping in appropriate open weave material (eg hessian), securely tied.

Placing: Excavate a hole 1.5 times the pot size. Remove the plant from its container with minimum disturbance to the root ball, ensure that the root ball is moist and place it in the centre of the hole and vertical with the top of the rootball level with the finished surface of the surrounding soil.

Planting: Avoid disturbance to the root ball and plant. Remove the root ball wrapping and ties by cutting.

Maintenance: Refer to 6.3 – Establishment of Planting Works.

5.3 Mulching

General: Provide mulch, which is free of deleterious and extraneous matter such as soil, weeds and sticks.

Standard: To AS 4454.

Organic mulches: Horticultural Grade Fines, free from stones.

Mulch material: Organic mulches shall be free of pests, diseases, toxins and weeds and equal to Horticulture Grade Pine Bark Fines.

Placing mulch
General: Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread and roll mulch so that after settling, or after rolling, it is smooth and evenly graded between design surface levels sloped towards the base of plant stems in plantation beds, and not closer to the stem than 50 mm in the case of gravel mulches.

In mass planted areas: Place after the preparation of the planting bed but before planting and other work.

Application: Place mulch clear of plant stems, and rake to an even surface flush with the surrounding finished levels.

Extent: To surrounds of plants planted in riplines and grass areas, provide mulch to 750 mm diameter.

Depths: Spread organic to a depth of 100 mm, and gravel mulch to a depth of 75 mm, with the exception of gravel mulch to planter tubs to a depth of 50 mm.

Mulching schedule

Mulch key	Location	Mulch type	Depth	Stabilisation method
Horticultural Grade Fines Mulch	Planting areas		100 mm	

5.4 Spraying

Notice
Immediately give notice of evidence of insect attack or disease amongst plant material.

Spraying: Where required, spray with insecticide, fungicide or both.

5.5 Stakes and Ties (for all planting as itemised below)

Stakes
General: Use hardwood, straight, free from knots or twists pointed at one end.

Installation: Drive stakes into the ground for at least a third of their length, avoiding damage to the root system.

Stake sizes:

- For plants ≥ 2.5 m high: Three 50 x 50 x 2400 mm stakes per plant.

- For plants 1 - 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.

- For plants < 1 m high: One 38 x 38 x 1200 mm stake per plant.

Ties
General: Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant.

Tie types:

- For plants ≥ 2.5 m high: 50 mm jute tie installed twice, doubled around the stake and stem in a secure manner.

- For plants < 2.5 m high: 50 mm jute ties stapled to the stake.

5.5 Tree Surgery

Notice
Give sufficient notice before commencing tree surgery.

Qualifications
Employ suitably qualified persons to carry out tree surgery work in a safe and progressive manner.

Pruning
General: Comply with the recommendations of AS 4373.

Operations
Remove dead and decayed wood or limbs that have been broken. Make cuts into live wood. If the trees show signs of deterioration after the work has been done, carry out a program of feeding or soil amelioration such as soil aeration, irrigation or incorporation of organic material. Continue this program until the end of the planting establishment period.

Precautions
Avoid damage to trees being treated or to nearby trees and surroundings. Do not use trees as anchors for winching operations or bracing. Provide bracing as necessary before cutting to prevent uncontrolled breakages and damage to surroundings.

Dressing
Prevent incursion of rot or disease after cutting.

Root pruning
Do not unduly disturb the remaining root system.

6 COMPLETION

6.1 Planting Establishment

Period
Commencement: The planting establishment period commences at the date of **builder** being issued with occupation certificate.

Required period: 52 weeks

Existing planting and grass
Where existing grass or planting is within the landscape contract area, maintain it as for the corresponding classifications of new grass or planting.

Recurrent works
Throughout the planting establishment period, carry out maintenance work including, watering, mowing, weeding, rubbish removal, fertilising, pest and disease control, reseeding, returfing,

staking and tying, replanting, cultivating, pruning, hedge clipping, aerating, reinstatement of mulch, renovating, top dressing, and keeping the site neat and tidy.

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.

6.2 Establishment of Grassed Areas

Generally: Establishment turfed areas as outlined below commencing at completion of turfing.

Protection: Ensure protection of grassed areas to all vulnerable points and prevent traffic and damage until practical completion and to the end of defects liability. Any damage to be made good by the Contractor at his/her expense.

Replacement of grass: Replace all damaged, dying or dead grass. Damage under this heading shall mean such damage that, in the opinion of the Managing Contractor will lead to the death of the grass.

Fertilising: Apply an approved 'complete' lawn fertiliser at completion of the first and last mowings, and at other times as necessary to maintain healthy grass cover. Apply fertiliser at the rate and by the method recommended by the manufacturer and to the approval f the Managing Contractor.

Water grass areas as required to maintain them in a continuing health condition and in a state of active growth.

Mow grass to 40 mm height when grass has grown to 50 mm height, subsequently as necessary to encourage good grass growth, and to 25 mm height during the last week of the establishment period, or to the satisfaction of the Managing Contractor. Remove grass clippings from site.

Maintenance: maintain the turfed areas until the attainment of a dense continuous sward of healthy and evenly green grass over the whole area. Lift failed turf and relay with new turf. Where levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

Top dressing: When the turf is established, mow, remove cuttings and lightly top dress to a depth of 10 mm. Rub the dressing well into the joints and correct any unevenness in the turf surface.

Weeding: Keep the grass area free from noxious weeds. A selective weedicide spray may be approved by the Managing Contractor for use against broad-leafed weeds. Supply details of chemical analysis and manufacturer's literature when applying for approval. Weedicide to be applied strictly in accordance with the manufacturer's recommendations.

Trim grass against mowing edges and kerbs.

6.3 Establishment of Planting Works

Water each plant as necessary from the date of planting until the Managing Contractor is satisfied that it has become established, and thereafter until the end of the plant establishment period and as often as necessary to maintain continuing healthy growth.

Protection: Ensure protection of planted areas to all vulnerable points and prevent traffic and damage until Practical Completion and to the end of Defects Liability. Any damage to be made good by the Contractor at his/her expense.

Replacement of plants: Replace, at no extra cost, any plant which dies from natural causes whatsoever up until Practical Completion and the end of the Plant Establishment period. Plant replacements shall be of the same size and species as nominated in the planting schedules (See Drawings).

Weed beds and remove rubbish at bi-weekly intervals and as necessary to leave in a clean tidy state up until Practical Completion and through to the end of the plant Establishment Period.

Specified level: Make good any specified levels by lifting mulch, removing or adding topsoil mix, and replacing mulch to the required level.

Prune only those trees planted as part of the work under the contract to remove broken, bruised or dead branches, to maintain shape, for health reasons, or as directed. Obtain approval before pruning and comply with the recommendations of AS 4373. Apply an approved fungicidal wound dressing to cut surfaces in accordance with the manufacturer's recommendations.

6.4 Completion

Product warranty
Submit the supplier's written statement certifying that plants are true to the required species and type, and are free from diseases, pests and weeds.

Maintenance manual
Submit recommendations for maintenance of plants.

Cleaning
Stakes and ties: Remove those no longer required at the end of the planting establishment period.

Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

1 GENERAL

1.1 Cross references

General
Refer to the *General requirements* section.

Related sections
Refer to the related sections:

Refer to the consultants' sections:
Refer to Engineer's drawings and masonry notes for retaining walls and wall specification.

2 QUALITY

2.1 Inspection

Witness points
Give sufficient notice so that inspection may be made of:

- set out before placing sandstone blocks.
- Set-out of formwork for concrete wall footings

Hold points >Completion of Set-out

3 EXECUTION

3.1 Construction generally

Set out
Set out the fence and wall lines and mark the positions of posts.

Excavation
Excavate post holes and footings so that they have vertical sides and a firm base.

Line and level
Erect walls vertically. Set heights to follow the contours of ground plane.

Concrete footings
In ground: Place mass concrete around posts and finish with a weathered top falling 25 mm from the post to ground level.

4 WALL TYPES

4.1 WALL TYPE 1: Concrete wall

Dimensions
Width 150mm.
Refer to plans and drawings for wall length, widths and heights.

Description and finish:
Off form concrete wall, Class 2 finish. Colour 'Off White', as per Landscape details.

Installation: To Landscape details for Wall type 1,

Anti – Graffiti
All exposed faces of concrete walls will be treated with an approved anti graffiti sealant.

4.2 WALL TYPE 2: Sandstone Block Walls

Dimensions
Refer to plans and drawings for wall length, widths and heights. Standard sandstone "Stacking Block' size is L 2.0 x W 0.5 x H 0.5m

Type
Sandstone 'Stacking Block' freestanding and retaining walls.

Footings

In ground: Compacted granular foundation and geo-fabric membrane on compacted sub bases approved by civil engineers. Refer to details.

Construction
The sandstone linear feature wall shall be constructed according to details. Stacking Block to be laid so that the split-face of each block is consistent to any visible faces of the walls.

Anti – Graffiti

All exposed faces of sandstone blade walls will be treated with an approved anti graffiti sealant.

Approved Supplier for Sandstone Stacking Blocks:

Gosford Quarries

(p) 02 9810 7555 (f) 02-9810 1669

4.3 NATURAL SANDSTONE - STONEWORK

GENERALLY: Natural stone shall be of uniform quality, texture and strength, sound and free from defects (including vents, cracks, fissures, foreign material and the like) liable to affect its strength, appearance, durability, or proper functioning under the intended conditions of use, and subject to approval in accordance with the requirements of the Contract.

4.4 SANDSTONE - STONEWORK

REFERENCE: Colour of sandstone - Stonework. The design principle is that the sandstone should be even coloured buff sandstone with limited striations.

REQUIREMENT: Sandstone shall be new and of a hard and durable quality free from sand balls, excessive tea leaf, quartz pebbles, fissures, sealed joints, hard ball, shale inclusions or any other defect and without clearly defined, easily split bedding planes.

It shall be sawn from the lower lifts of an approved source with accurately sawn beds with joints to be diamond sawn squarely and accurately to permit fixing without voids at the joints.

All sandstone shall be new and completely free from sand balls, clay balls, hard ball, quartz pebble, fissures, healed joints, dry beds, mica beds, manganese, black line, shale inclusion or any other defects.

QUALITY: The Supplier must nominate the location in the quarry from which the stone to be used would be taken. Stone to be used in the works is to be quarried from a single approved source of stone.

The stone shall be from the approved source. It shall be extracted from the quarry by either channelling, drilling and wedging, or wire cutting.

Stone tested must have received an hypothetical durability rating of "A" or "B" as defined by the Amdel testing criteria.

Copies of recent test reports identifying the quarry source and location with complete details of these tests are to accompany each tender.

Generally all stone selected should have a proven durability for its intended use. Where the slightest doubt exists as to the performance of any block of stone in its nominated position, it will be rejected.

All stone shall be free of any defects liable to affect durability or structural soundness for its intended use. Reasonable variations natural to the source in colour and texture shall be acceptable within a range of samples requested, for approval by the Superintendent.
The use of any staining, bleaching or chemical oxidising agent is unacceptable to the Superintendent.

Selection standards are as follows:

(1) The degree of concentration of tea leaf will be subject to the approval of samples to be submitted by the Contractor. The amount of tea leaf acceptable will depend on the intended location of a block of stone (e.g. only light depositions will be acceptable in public areas at ground level etc.)

(ii) Shale inclusions in finished moulded stone shall be restricted to a single occurrence in the occasional stone. Acceptance will be subject to the final location of the stone and the size of the inclusion.

(iii) Stone with sharp lines or with thick (5 mm or more) distinctly marked lines shall not be accepted. Stone with faint indistinct markings, which are indefinable as lines may be acceptable.

The Superintendent will only inspect stone in its worked condition in order to check the compliance of that stone with standards as specified. The Contractor shall accept liability for all stone up to its worked condition with regard to defects, etc. as herein specified.

All worked stone shall be inspected in the mason's yard on site immediately prior to installation on the building works. Stone found unacceptable for its specific purpose shall be rejected.

Prior to delivery, each worked stone is to be inspected by the Superintendent and if any stone has not oxidised evenly and naturally to the required standard the stone will be rejected.

4.5 SUPPLY OF STONE - STONEWORK

Prior to commencement and throughout progress of the contract the Contractor shall stockpile on premises within the Sydney/Gosford region, sufficient processed material to prevent any delays to the programmed work which could occur because of rejection of stone or delays in the transportation of stone.

The Contractor shall nominate this proposed location and will be required to provide access to this location for inspection of stone by the Superintendent or his representative at any time within working hours during the progress of the Contract.

All stone is to be carefully packed and a stropped with arrises protected against damage during handling and transport. Stone received in a damaged condition will be rejected.

4.6 SURFACE FINISHES TO SANDSTONE - STONEWORK

Sandstone shall have a split-face, rough hewn or sawn finish as detailed.

4.7 REJECTED STONE - STONEWORK

Any stone rejected on site is to be removed by the Supplier or his agent within forty eight hours of rejection.

4.8 PROLONGATION - STONEWORK

Delays to the Contract caused by the rejection of stone, delay in delivery of stone or by failure to remove rejected stone from the site shall be the responsibility of the Contractor and any resultant prolongation costs incurred to the Contract shall be born by the Contractor.

4.9 ANTI GRAFITTI COATINGS

All exposed faces to sandstone blade walls and concrete terrace walls are to have approved anti graffiti coating applied.

Anti graffiti coating to be applied as per manufacturers instructions.

Due to high porosity of sandstone and concrete surfaces, the contractor will be responsible for application of two coats of an approved stone sealant/primer, before application of anti graffiti coating is to occur. Primers shall have little to no impact on surface finish of the stonework and be of a matte finish.

An area for sampling and testing should be set aside for approval.

4.10 ANTI GRAFITTI - Products

All exposed faces to sandstone blade walls and concrete terrace walls are to be sealed with undercoat primer (approved by anti graffiti manufacturer) and treated using the following product.

Applied as per manufacturers instruction.

1. GENERAL

1.1 Cross References

General

Refer to the *General Requirements* section.

1.2 Interpretation

Definitions

Unit segmental paving: Paving surfaces of exposed aggregate concrete, and recycled brick paving made with concrete segmented paving units to MA 20.

Density ratio: Percentage of the maximum density at optimum moisture content as determined by AS 1289.5.2.1.

Substrate: The building element to which the tiles are to be bedded.

Bonding slurry: The interface layer between substrate and paving units.

Underlay: An intermediate layer (eg. render, screed or sheeting) applied to the substrate to provide a suitable surface for tile bedding.

Separation layer: A membrane laid on the substrate beneath the bedded finish to prevent the two elements from adhering to each other.

Jointing material: A grout, applied to full depth of paving slab.

2. QUALITY

2.1 Inspection

Witness points

Give sufficient notice so that inspection may be made at completion of:

- substrate preparation;
- trial set-out for concrete unit paving;
- expansion joints before sealing and grouting;

2.2 Samples

Finishes

General: Submit samples of the paving finishes, showing the full range of texture and colour of the material.

Sample panels

General: Prepare sample panels of concrete paving finishes, including samples of expansion joint details and trim.

Concrete unit paving pattern: Prepare a trial setout for each area.
Concrete: Prepare a trial sample panel.

Rubber softfall pattern: Prepare a trial setout for each area.

Sample panels schedule

Paving finish (as scheduled on drawings	Sample panel size (mm)	Number panels	Location
Type P1	1500 x 1500	One	As directed
Type P2	1500 x 1500	One	As directed
Type P3	1500 x 1500	One	To include at least 2 colours
Type P4	1500 x 1500	One	As directed

2.3 Submissions

Execution
Grouting: Submit proposals for grouting methods and materials.

Concrete Unit pattern: If it appears that minor variations to joint widths will obviate cutting, submit proposals.

3 MATERIALS AND COMPONENTS

3.1 Insitu Concrete base
General: Provide minimum 20 MPa compacted reinforced insitu concrete slab.

3.2 Bonding Slurry
General: Provide bonding slurry as an interface layer between the insitu concrete base and bedding mortar, and between the bedding mortar and concrete segmental concrete pavers.

Mix proportions 1 part fine, washed sand to 6 parts Portland type GP Cement AS 3972 (1991), by volume with sufficient water to form a slurry of workable consistency.

Mortar Bed
General: To AS 3700.
Provide sand/cement mortar mix of minimum 25mm and maximum 40mm thickness, with no air voids to support pavers as detailed.

Mix proportions to AS CA27:
3 parts blended, washed sand, concrete aggregates AS 2758 {part 1 (1985), to 1 part Portland type GP Cement AS 3972 (1991), to 1 part water / elasticiser mix.

3.3 Elasticiser
General: An approved mortar additive to improve workability, elasticity, adhesion and strength.

3.4 Water
Provide clean water, free from contaminants and deleterious material including soluble salts.

3.5 Jointing Material: Grouting Mix
General: Provide non-shrink cementitious grout to joints of greater than 4mm in width. Grout to finish below surface of pavers.

Application: Grouting mix to be dry-bagged, proprietary brand, fine aggregate / cement / admixtures type, with high flow and shrinkage properties, non-staining during application and of a compressive strength in excess of 20 MPa.

Mixing: in accordance with manufacturer's specification.

3.6 Components
Concrete pavement reinforcement
Welded wire fabric: To AS 1304
Bar: To AS 1302

4.0 EXECUTION

4.1 General

Subgrade

General: Remove topsoil containing grass roots. Fill and compact as necessary. Ensure strength and stiffness is similar throughout, including soft spots and service trenches. If necessary, loosen the subgrade to a depth of 200 mm and adjust the moisture content before compaction.

Level tolerance: + 0, -25 mm.

Clay fill: Moisture condition near long term equilibrium moisture condition.

Cohesive subgrade soils:

- Minimum dry density ratio (standard compaction) to AS 1289.5.4.1: 100%

Cohesionless subgrade soils:

- Minimum dry density index to AS 1289.5.6.1: 80%

Substrate Preparation

Cleaning substrates

If the paving is to be bonded to the substrate, remove oils, greases, retarders and loose material and leave the surface clean and dust-free.

Subbase

Minimum dry density ratio: 98% to AS 1289.5.2.1

Thickness tolerance: + unspecified, -5 mm.

Level tolerance: ± 25 mm.

Basecourse

Placing: Spread and compact the basecourse. Adjust the moisture content to facilitate compaction.

Minimum dry density ratio: 98% to AS 1289.5.2.1

Thickness tolerance: + unspecified, -5 mm.

Level tolerance: Generally –0, + 25 mm, but at existing structures –0, +10 mm. Over 3m length of design profile, . ±10mm.

Drainage

Finished surface crossfalls: Between 1% and 2.5%.

Ponding: Grade pavements to even falls so as to drain to drainage outlets without ponding.

Surface run-off: Provide channels and drains to discharge points.

Poorly drained sites, use one of the following methods:

- Stabilise subgrade to pavement courses.
- Provide subsurface drains or pervious granular material, slotted or pervious pipes, or both, under or beside the pavement.

At walls: Set finished level of pavements below, weep holes and drainage openings.

4.2 Falls and Levels

Grading

Ponding: Grade paving to even falls to drain away from buildings to drainage outlets without ponding.

Falls: Minimum fall for drainage 1:150 or as shown on the drawings.

Finished level

Maintain the same finished level across junctions between different finishes.

Tolerances

Pavement thickness: + 3 mm, - 0.

Surface level: ± 25 mm from the specified level, ± 10 mm from a 3 m straight edge in areas of uniform grade.

Maximum deviations:

- Across junctions between adjacent paving surfaces: 2 mm.
- Across junctions between adjacent paving unit surfaces: 2 mm.

4.3 Concrete Pavements *(Refer to section 6.2 for base to paved pavements)*

Standard

General: To AS 3600.

Subgrade

Preparation for placing: Moisten the subgrade to ensure a firm, uniformly moist surface at the time of placing. Remove loose material and debris from the surface. Do not operate construction equipment on the prepared surface.

Subbase

Minimum 75 mm thick.

Reinforcement

Slab reinforcement: Required for irregular panels, and rectangular panels with length : width ratio greater than 1.3:1. Lap fabric so that the outermost transverse wires of one sheet overlap the 2 outermost wires of the other.

Trimming reinforcement: Required where slab surrounds another structure, and at re-entrant corners, except where isolation joints are provided.

- Type: At least one Y12 bar, 600 mm min, length

Position: Locate in top half of slab, 30 mm min. cover. Support on bar chains at 1m centres.

Control joints: Stop reinforcement 50 mm clear of control joints.

Concrete grade

Foot and bicycle traffic:	N20
Light traffic:	N20

Slab thickness

Light traffic:	100 - 125mm

Control / contraction joints

Spacing (maximum):

-	Unreinforced slabs:	2m
-	Light traffic:	F52 reinforcing fabric: 3m F62 reinforcing fabric: 6m

Depth: Full depth where constructed using formwork. ¼ to 1/3 slab thickness where constructed by scoring the plastic concrete, using proprietary crack-inducing device, or sawing set concrete.

Width: 3mm
Design tool off arises to 6mm radius.

Placing
General: Provide formwork for sides and stop ends.

Temperature limits: The temperature of the concrete when placed in forms must be in the range 10 - 32ºC. Do not place concrete when the shaded air temperature is less than 4ºC.

Hot weather placing: If placing concrete in hot weather, avoid premature stiffening of the mix and reduce water absorption and evaporation losses. If the air temperature exceeds 32ºC, place and compact the concrete as quickly as possible and then cover it with an impervious membrane or hessian kept wet.

Isolation / expansion joints
Location: Where slab wider than 1.5m abuts rigid structures, at path intersections, over structural joints. Maximum 6 m spacing as shown on plans.

Design: Permit free movement of slab, and exclude foreign matter. Do not tool off joint arises abutting the seal.

- Joint filler: 10 mm thick 2 part polyurethane joint filler. Colour to match pavement.
- Joint depth: Full thickness of slab.

Access holes and pits at pavement edges: Thicken the slab 50 mm for 100 mm from the rigid structure (tapering 300 mm), and reinforce the panel(s) containing the rigid structure with F62 fabric.

Other joints
Connolly key joints: Formed and sealed.

Tied joints: Formed or sawn joints reinforced with tie bars.

Construction joints: Locate to coincide with control or isolation joints.

Finishes
Exposed aggregate finish: Steel trowel to a smooth surface. After final set use clean water and brushes to remove the surface film of mortar until the aggregate is uniformly exposed without cutting of the matrix.

Surface texture: 5-10 mm diameter crushed rock exposed aggregate. To be a mix of white, light grey and dark grey

Finished pavement surface: Uniform in appearance and free from depressions in which water can lie, with a texture depth of 2 – 2.5mm.

Tolerance
Level: Over 3m length of design profile, ± 6mm

4.4 Tactile Indicators and non-slip strip

Tactile indicators shall be Stainless Steel with black colour polyurethane insert to have 40% colour contrast with paving material .To be fixed to pavement material as per manufacturer's recommendation and to conform to AS 1428.4 2002

Non –slip strip - The ecoglo® G3070 15.5mm wide silicon carbide coated aluminium strip or similar to be approved.

4.5 Edging (E1) Concrete edging

General: Set edges flush with adjoining surfaces to define planting, rubberise surface, grass areas or both.

Curving: Where the concrete edge is to be curved, create a smooth uniform curve as per the plan with no kinks. Set-out concrete edging for approval beforehand.

Location: As shown on drawings.
Size (mm): 150mm wide
Installation: Refer to Detail Drawings.

Timber Edging (E2)

General: Set edges flush with adjoining surfaces to define planting, grass areas or both. Fix using hardwood pegs two per fixing. Drive pegs into ground at 1200mm centres on planting side of the edging and both sides of joints between sections, with peg tops 15mm below the top of the edging.

Curving: Where the timber edge is to be curved, space the pegs to hold it to a uniform curve.

Location: As shown on drawings.
Material: Hardwood timber edging with hardwood timber fixing
Installation: Hardwood timber pegs. Refer to Detail Drawings.

4.6 Setting Out

General:

Joint widths: Set out brick pavers to give uniform joint widths 5-7mm.

Joint alignment: Set out pavers with joints accurately aligned in both directions to a tolerance of + 4mm in 2 m from the design alignment.

4.7 Falls and Levels

General: Grade all paving to even and correct falls as required. Make level junctions with walls.

Fall general: 1:150 minimum.

Deviation: Maximum deviation of the finished floor level between points of contact under a 2m straight edge laid in any direction on an area of uniform grade to be 1:300 or 3mm, whichever is the lesser.

5 JUNCTIONS

5.1 Control Joints

Movement joints

General: Provide movement joints over structural joints in the base (isolation, contraction, and expansion) right through the paving and bed to the substrate. Fill joints with a compressible material to match existing.

Abutment with building or against other fixtures or service pits

Where paving more than 1.5 m wide abuts the wall of a building provide a strip of 10 mm thick bitumen impregnated fibreboard between the paving and fixtures.

5.2 Execution

5.2.1 Joints

Seal control joints with an approved only grey elastometic sealant equal to Sikaflex 1A, Thioflex 600 or Dow Corning 790 silicone.

5.2.2 Jointing Material

General: Joint fillers and sealers shall be as shown on the drawings. In the absence of a specific detail, seal joints using a closed cell polyethylene backing rod and a two-part polysulphide sealant.

5.2.3 Grouting

Prior to commencing grouting and after inspection of the insitu concrete bedding slab (reinforced to vehicular pavements as shown on drawings), seal the face of the clean out holes to prevent loss of grout. The grout pour height shall not exceed 48 times the width of the cores or 3500mm, whichever is least.

5.2.4 Cleaning Down

On completion of paving, clean down with water and stiff brushes and remove all mortar projections, splashes and irregularities. Make good around any services penetrating the paving and make good any faults.

5.3 Paving Finish Junctions

Location: Where changes of paving finish occur, locate the junction in a manner compatible with existing work.

5.4 Grouted and Caulked Joints

Grouted joints

General: Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the surface with a clean cloth.

Epoxy grouted joints: Ensure that tiles edge surfaces are free of extraneous matter such as cement films or wax, before grouting.

6 PAVING

6.1 Base Course

For pedestrian areas only, as shown on drawings.

Preparation

Prepare the subgrade by grading to accommodate the thickness of the base course and paving. If necessary, loosen the ground to a depth of 200 mm and adjust the moisture content before compaction. Compact the ground to the required density.

Base course material

General: Crushed rock consisting of hard, dense, durable particles free from deleterious material, of nominal size 25 mm, uniformly graded, with not more than 10% passing a 0.075 mm sieve.

Maximum thickness (mm): 150 mm

Placing
Spread and compact the base course to the required thickness and 95% maximum modified dry density. Adjust the moisture content as needed to facilitate compaction.

Required density:
Minimum density ratio:
- Subgrade and base: Refer to Structural Engineers Drawings

Cohesive subgrade soils:
- Minimum dry density ratio (standard compaction) to AS 1289.5.4.1: 1:100

Cohesionless subgrade soils:
- Minimum density index to AS 1289.5.6.1: 80%

Base:
- Minimum dry density ratio (standard compaction) to AS 1289.5.4.1: 100%

Subbase:
- 90% of modifies maximum dry density.

Density test requirements: Refer to Structural Engineers Specification

6.2 Concrete Base

General: Reinforced concrete slab minimum 125 mm with F62 mesh placed centrally (min 20 MPa).

Preparation:
General: Trim the ground to accommodate the thickness of concrete and compact to a firm, even surface. Provide formwork for sides and stop ends.

Concrete placing
Preparation for placing: Moisten the subgrade to ensure a firm, uniform moist surface at the time of placing. Remove loose material and debris from the surface. Do not operate construction equipment on the prepared surface.

Temperature limits: The temperature of the concrete when placed in the forms must be in the range 10 - 32°C. Do not place concrete when the shaded air temperature is less than 4°C.

Hot weather placing: If placing concrete in hot weather, avoid premature stiffening of the mix and reduce water absorption and evaporation losses. If the air temperature exceeds 32°C, place and compact the concrete as quickly as possible and then cover it with an impervious membrane or hessian kept wet.

Joints:
Isolation joints: are required where pavement meets other construction ie. walls, slabs.

Longitudinal joints: at 5m spacings along the long direction of the paving.

Transerve joints: are perpendicular for longitudinal joints at 12m spacings, maximum.

Finish:
Exposed aggregate finish -steel trowel to a smooth surface. After final set use clean water and brushes to remove the surface film of mortar until the aggregate is uniformly exposed without undercutting the matrix.

Tolerance:
- 6 mm maximum deviation using a 3 m straight edge.

Finished surface:
Provide a surface uniform in appearance and free from depressions in which water can lie, with a texture depth of 2 - 2.5 mm.

6.3 Paving

6.3.1 Paving 'Type P1'

Location:	Pedestrian pavement as shown on drawings
Size (mm):	100mm thick
Colour:	Off white
Finish:	Light Broom / trowelled
Joints:	10mm Expansion joints & 3mm sawn control joints
Installation:	Poured in situ

6.3.2 Paving 'Type P1A'

Location:	Light maintenance vehicular pavement as shown on drawings
Size (mm):	125mm thick
Colour:	Off white
Finish:	Light Broom / trowelled
Joints:	10mm Expansion joints & 3mm sawn control joints
Installation:	Poured in situ

6.3.3 Paving 'Type P2'

Location:	Pedestrian and light vehicular pavement as shown on drawings,
Material:	Concrete Units
Colour:	Riverina and Zurich as shown on drawings
Joints:	5-7mm joints cement mortar

6.3.4 Paving 'Type 3'

Location:	Pedestrian pavement as shown on drawings,
Material:	TPV rubberised surface
Depth (mm):	15-20mm to manufacturers specification
TPV Colour:	'Red Earth', 'Cashew', 'Tangerine' & 'Cream'
Installation:	Wet pour to manufacturer's recommendations as per plan and details

6.3.5 Paving 'Type 4'

Location:	Artificial Turf to Cricket Net,
Material:	Synthetic Turf
Installation:	To manufacturer's recommendations as per layout and detail

6.4 Falls, Levels and Jointing

Lay all paving to even and correct falls as required and as shown on the drawings with no ponding and away from buildings and towards drainage outlets. Jointing at interface of rigid pavements and fixed objects (kerbs, sumps, and buildings) to be flexible sealant.

6.5 General

All paver shapes shall be true in shape with intersecting faces subtending at 90 degrees.
All pavers intersecting at a radius are to be cut at prescribed radius to alleviate faceting.

Grading:
Grade pavers to avoid abrupt changes in level and provide a smooth surface to prevent water ponding.

Units: Deviation between the surface of each paver and its surrounding surface shall not be greater than 4mm. Refer to construction details.

6.6 Laying Concrete Paving Units - Rigid Pavement Application

6.6.1 Bonding Slurry Mixing

Mixing to be performed either by hand, using equipment, which is clean and free of deleterious material. Alternatively, mix using a cement mixer to achieve a smooth, homogenous consistency, free of lumps.

The volume of slurry mix made, at any one time, must not exceed the amount required to lay the pavers within 45-60 minutes, from initial mixing time.

6.6.2 Mortar Bed Mixing

Mortar bed mix, as specified, to be performed using a cement mixer free of deleterious material. Mix by continuously adding aggregates to water/elasticiser mix to ensure a homogenous consistency, free of lumps. The consistency should be such that it may be loosely shaped into a cricket ball and remain whole when released, leaving the hand moist but not wet.

All components to be measured by means of calibrated containers.

The volume of the mortar bed mix made, at any one time, must not exceed the amount required to lay the pavers within 45-60 minutes, from initial mixing time.

6.6.3 Grout Preparation

Mixing shall be in accordance with the manufacturers specifications.

6.6.4 Installation

Ensure concrete base is free of deleterious material.
Prepare mortar mix, slurry mix and dampen concrete base with clean water.
Apply 1 mm thick layer of slurry mix, using a hand broom. Apply prepared mortar mix and loosely screed so that the thickness of combined bed and paver is 5 mm higher than desired finish levels.

Bed down dry paver, gently tap into position using a rubber mallet to within a level of approximately 2 mm higher than desired finish levels.

Remove paver, fill voids with additional mortar then loosen bed with criss-cross hand trowel through bed. Apply an even, light covering of dry cement at rate of 4 cups per square metre, dampen by misting with water. Apply a 1 mm layer coating of slurry mix to underside of paver, using a stiff brush. Bed down paver using a rubber mallet.

Trowel fill voids with mortar at the front edge and front corners of paver, discarding excess mortar.

On completion of the paved area, cover with hessian sheets and spray with water mist. Allow to remain moist for a minimum of 12 hours.

To Superintendent or Engineer's satisfaction, place wooden board or similar paver over areas subject to pedestrian traffic during first 12 hours of curing.

Grouting:
After 12 hours curing, joints are to be grouted. Remove residual material, prior to commencing joint filling operation. Prepare grout mix. Dampen joints, apply grout mix ensuring full penetration for thickness of paving slab. Light tamp down trowel edge into grouting mix. Use a rubber squeegee to spread out until filled flush with the top of pavers.
Remove excess grout with trowel.

Completion: Wipe pavers clean using damp sponge. Remove all excess grout and cement.

6.6.5 Expansion Joints and Sealants

Joints in concrete pavement slabs shall be carried through stonework and shall confirm to architectural details.

Expansion joints shall be installed where stonework abuts restraining surfaces such as kerbs and corners using a 10mm thick impregnated fibroboard joint filler cut to required depth, placed against restraining surface prior to placement of stonework. The joint filler shall have a bond breaker placed on the top edge, allowing grouting to be placed over it during the grouting process with a tooled joint formed for application of the sealant.

Where control joints occur under stonework the stone shall be sawn full depth exactly 24 hours after laying to allow the control joint to be projected through the stone ready for sealant.

Sealant to all joints shall be Sikaflex-11FC. Selected colour by the Superintendent placed in accordance with the manufacturers recommendations.

6.7 In situ Concrete Paving

Concrete
Standard: To AS 1379

Thickness
Foot traffic: 100mm minimum

Reinforcement
F62 mesh with min 40 mm cover

Preparation
General: Trim the ground to accommodate the thickness of concrete and compact to a firm, even surface. Provide formwork for sides and stop ends.

Concrete placing
Preparation for placing: Moisten the subgrade to ensure a firm, uniform moist surface at the time of placing. Remove loose material and debris from the surface.

Temperature limits: The temperature of the concrete when placed in the forms must be in the range 10 - 32°C. Do not place concrete when the shaded air temperature is less than 4°C.

Hot weather placing: If placing concrete in hot weather, avoid premature stiffening of the mix and reduce water absorption and evaporation losses. Of the air temperature exceeds 32°C, place and compact the concrete as quickly as possible and then cover it with an impervious membrane or hessian kept wet.

Joints
Control joints: Form tooled joints at 750mm-2000mm spacing, to replicate the existing tooled pattern.

Expansion joints: Cast in joint filler at maximum 6m spacing. Locate at junctions with fixed structures such as buildings and manholes, at path intersections, and at intervals not exceeding 15 m elsewhere. Do not tool off joint arrises abutting the seal.

Joint filler: 10 mm thick bitumen impregnated fibreboard.

Contraction joints: Weakened plane joints 3 mm wide extending at least one quarter the depth of the section, at spacing approximately equal to the paving width but not exceeding 2 m. Tool off arises to 6 mm radius.

Connolly key joints: Formed joints and sealed.

Finishing

Lightly Exposed aggregate finish: Steel trowel to a smooth surface. After final set use clean water and brushed to remove the surface film of mortar until the aggregate is uniformly exposed without under cutting of the matrix.

Tolerance: 6 mm deviation using a 3 m straight edge.

Finished pavement surface: Provide a surface uniform in appearance and free from depressions in which water can lie, with a texture depth of 2 - 2.5 mm.

6.8 Rubber wetpour softfall (P3)

Location:	To play areas.
Material:	TPV rubberised surface
Depth (mm):	15-20mm to manufacturers specification
TPV Colours:	'Red Earth', 'Cashew', Cocoa Bean & 'Cream'

Colour 1 'Cashew' = 70% Beige TPV RH30
= 20% Brown TPV RH32
= 10% Cream TPV RH31

Colour 2 ' Red Earth' = 70% Standard Red TPV RH01
= 30% Bright Red TPV RH02

Colour 3 'Cream' = 70% Beige TPV RH30
= 25% Cream TPV RH31
= 5% Light Grey TPV RH61

Colour 4 'Tangerine' = 20% Bright Red TPV RH02
= 70% Orange TPV RH50
= 10% Beige TPV RH30

Installation: Wet poured rubber surface and softfall zones to manufacturer's recommendations and as per layout on plans and details

7. COMPLETION

7.1 Cleaning

Leave paving clean on completion. Clean paved surfaces using an appropriate cleaning agent.

7.2 Spare tiles/ pavers

General: Supply spare matching pavers and accessories of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

OUTDOOR FURNITURE AND STRUCTURES

1. GENERAL

1.1 Cross References

General

Refer to the *General requirements* section.

2. QUALITY

2.1 Inspection

Witness points

Give sufficient notice so that inspection may be made at the following stages:

- Furniture items delivered to site before installation.
- Building locations or substrates prepared to receive furniture before the furniture is installed

2.2 Contractor's Submissions

Subcontractors

Submit names and contact details of proposed suppliers and installers.

Installation

Submit the manufacturer's standard drawings and details showing methods of constructions, assembly and fixing, with dimensions and tolerances.

3. NOMINATED FURNITURE ITEMS

3.1 The work specified in this section includes the supply and installation of new items.

Criteria for Rejection:

In general all furniture items supplied shall be consistent and regular in size and form, free of warps, chips, cracks, metal crazing or discolouration, and shall be completely free of defects or surface/structural damage.

The furniture items shall be supplied in accordance with this specification and be subject to conforming to the relevant details including specified component types and dimensional details.

All furniture items supplied which do not satisfy any of the requirements set out herein shall be deemed subject to rejection upon delivery to site by the Superintendent.

Materials Handling and Packaging:

The responsibility for adequate packaging and protection throughout the transport period to site including off loading shall be the responsibility of the supplier.

It is recommended that in order to avoid damage during transport the furniture items be packaged using sufficient polystyrene foam and timber planks so as to avoid contact between items during transit. All finished timber and metalwork should be protected using heat-bonded plastic, air bubble plastic or approved equivalent.

Supplier may wish to nominate alternative systems for materials handling which may vary from those supplied.

The supplier shall furnish the contractor with his preferred system for materials handling and in cases be held accountable for its performance.

3.2 Installation

Footings/Foundation:

All concrete footings are to have troweled finished top set "on flat" using spirit levels irrespective of adjacent surface pavement grades and crossfalls. Similarly all cast in fixings are to be set vertical and plumb perpendicular on top of footing. Allowances are to be made for varying footing set-down depths for bench and seat footings where local surface pavement crossfalls induce a variance in leg heights.

Fixings:
In accordance with AS 1720.1 the contractor is to provide all footings and ancillary items sufficient to carry out the fixing of site furniture as called for on the drawings.

Ensure all furniture items and signs are set plumb and legs, posts vertical using spirit levels and the like irrespective of adjacent surface pavement grades and crossfalls.

Where surface pavement grades result in uneven leg heights on seats and benches the specified height of furniture items above finished grades will be with respect to the "high" side of seat/bench.

Therefore, the specified height above pavements for seats/benches is to be regarded as the maximum at any one point as noted on the drawings.

Handling and Repair:
The contractor shall be responsible for ensuring safe handling of all furniture items from the time of acceptance upon delivery through the installation period and subsequent protection of furniture items through to handover.

The contractor shall be required to make good any damage to site furniture timber, metal and paint finished components which occurs post delivery and during or after the installation process.

Approvals:
The contractor shall check all setout dimensions on site and seek the Superintendent's approval for all furniture positions to commencement of the footing excavation.

Cleaning, Protection and Refurbishment:
Keep the works clean as they proceed. Protect finished furniture installations from damage and restrict user access to fittings until such times as directed by the Superintendent.

3.3 Adjacent Works

The contractor shall be responsible for making good any damage to adjacent works, with emphasis on paving, steel structures, walling and precast units which occur as a result of the furniture installation process.

3.4 Furniture Types

3.4.1 Seat (B1)

Manufacturer & model:	'Classic Plaza Seat' with armrest and backrest by Street Furniture
Colour and Finish:	Aluminium battens and painted galvernised steel frame
Size:	L 1750 x D 625 x H 420 mm

3.4.2 Bench (B2)

Manufacturer & model:	'Classic Plaza Bench' by Street Furniture
Colour and Finish:	Aluminium battens and painted galvernised steel frame
Size:	L 1750 x D 625 x H 420 mm

3.4.2 Rubbish Bin (BIN)

Manufacturer & Model:	'Frame' Bin Enclosure – 240L by Street Furniture Australia
Size, Colour and Finish:	240L 695 x 760 x 1380mm, stainless steel frame

3.4.3 Bike Hoop (BK)

Manufacturer & Model:	Town & Park BR-BHSN
Size, Colour and Finish:	845 x 980mm Hooped Stainless Steel – Refer details

3.4.4 Tree Grate

Manufacturer & Model:	By contractor
Size, Colour and Finish:	8mm Powder coated galvernise steel colour: black 1500 x 1500mm

TREE SUPPLY

1 GENERAL

1.1 Cross References

General

Refer to the *General requirements* section.

1.2 Interpretation

Definitions

Calliper: Measured at 300 mm above ground.

Size index: Product of height (m) x calliper (mm).

Small trees: Trees grown in containers < 20 L (other than tubestock), and balled and burlapped or RCB grown trees of size index < 35.

Other than tubestock or small trees: Trees grown in containers 20 L, and balled and burlapped or RCB grown trees of size index 35.

2 QUALITY

2.1 Inspection

Witness points and hold points

Give sufficient notice so that trees may be inspected before shipment.

Partial sampling

Method: Expose a small section of the rootball, by washing, sufficient to permit inspection of root development from the stem to the outer extremity. After inspection, carefully replace soil.

Rates: Inspect root systems using partial sampling at the following rates:

- 20 trees (or less): 1 tree sampled.
- 21 - 50 trees: 2 trees sampled.
- 51 (or more) trees: 4%.

2.2 Tests

Rootball occupancy test

Procedure: Shake or handle unsupported rootball.

Acceptance criterion: > 90% of soil volume remains intact.

Small trees rootball: shoot ratio test

Procedure: Hold stem at 80% of height above ground, deflect 30° from vertical, side to side.

Acceptance criterion: Container or rootball remains flat on the ground.

2.3 Contractor's Submissions

Reports

Forward order contracts: Submit regular reports in writing to the contract administrator. Include checks against specification requirements, and current photographs.

- Inspection frequency: 3 months.
- Report frequency: 3 months.

Materials

Substitution: If non-complying trees are proposed, submit proposal. Submit a copy of the approval of substitution with the non-complying trees.

Execution

Holding methods: Submit proposed methods for holding trees beyond specified dates so that trees will continue to comply.

3 TREES

3.1 Above Ground

True to type

Type: Supply trees which are true to type.

Health and vigour

Health: Supply trees with foliage size, texture and colour consistent with that shown in healthy specimens of the species.

Vigour: Supply trees with extension growth consistent with that shown in vigorous specimens of the species.

Freedom from pests and disease

Foliage: Restrict attack by pests and disease to < 10% of the foliage, such that potential for long term success of the trees is not affected.

Balance of crown

Maximum variation in crown bulk on opposite sides of stem axis: - 20%.

Uniformity of growth

Longest internode: Maximum 1.2 x shortest internode.

Stem taper

Support:

Small trees less than 20 L:

- Supply trees which are self-supporting unstaked.

Trees > 20 L, supply trees:

- Supply trees whose tree calliper at 300 mm above ground exceed callipers at 1000 mm above ground by 20%.

Pruning history
General: Comply with the recommendations of AS 4373.

Pruning wounds: Confine fresh pruning wounds to < 25% of the clean stem height.

Wound diameter: < 50% of stem diameter immediately above point of pruning.

Pruning location: Clean cut at branch collar.

Stem / branch / bark ridge: Convex (outwardly pointing) at junctions between co-dominant stems, and stems and branches.

Apical dominance
Apical bud: If appropriate for the species, supply trees which have a defined central leader and intact apical bud.

Indication of north
Trees grown in 100L containers or above indicate northerly aspect in the nursery using a permanent peg embedded in the rootball 150 mm north of the centre of the stem.

3.2 Below Ground

Root division
Root systems: Fibrous with repeated and sequential division, complying with the **Root division table**.

Root direction
Roots growing out or down: > 90% of roots within rootball at every stage of development.

Sampling
Partial sampling: To take place prior to delivery. Wash away a section of rootball sufficient to inspect root development from the stem to outer extremities of the rootball in one section.

0 – 20 trees	1 tree sampled
21 – 50 trees	2 trees sampled
51+ trees	4 % of order

Root division table

Tree sizes		Root division
Container volume (L)	**Size index (balled and burlapped or RCB grown trees)**	
< 20	< 35	Major divisions at maximum 50 mm intervals
≥ 20, < 100	≥ 35, < 130	Major division by 15 L container, or 250 mm diameter x 300 mm deep rootball, and at maximum 100 mm intervals beyond this size
≥ 100, < 200	≥ 130, < 230	Major division by 75 L container, or 450 mm diameter x 450 mm deep rootball, and at maximum 100 mm intervals beyond this size
≥ 200	≥ 230	Major division by 150L container, or 650 mm diameter x 450 mm deep rootball, and at maximum 100 mm intervals beyond this size.

3.3 Balance

Rootball: shoot ratio (tubestock and small trees)
Tubestock height above soil level: 2 x height of tube ± 25%.

Rootball: shoot ratio (other than tubestock or small trees)
Rootball: shoot ratio equations:

- Container grown trees: Size index = CF x Container volume (L)(± 10%).
- Balled and burlapped or RCB grown trees:

  Rootball volume (L) (±10%) = Size index/CF.

CF values table

Container grown trees		Balled and burlapped or RCB grown trees	
Container volume (L)	**CF**	**Size index**	**CF**
≥ 20, < 60	1.5	≥ 35, < 90	1.8
≥ 60, < 100	1.3	≥ 90, < 130	1.56
≥ 100, < 150	1.21	≥ 130, < 180	1.45
≥ 150, < 200	1.14	≥ 180, < 230	1.37
≥ 120, < 300	1.07	≥ 230, < 320	1.28
≥ 300, < 600	0.97	≥ 320, < 580	1.16
≥ 600, < 1000	0.93	≥ 580, < 930	1.12
≥ 1000	0.9	≥ 930	1.08

3.4 Schedules

Plant schedule

Refer to Planting Plans.

3.5 Delivery schedule

To be advised – Refer to Plant Procurement Document (Relates to phasing within stage 1) by PLACE Design Group

APPENDIX A

Furniture & Play Equipment Suppliers and Manufacturers

Approved Suppliers:

Bike Hoops

Stoddart Town & Park Furniture
Unit 6 ,13 Boundary Rd, Northmead NSW 2152

(02) 9907 6422

www.stoddart.com.au/architectural-products/street-furniture.html/

Rubbish Bin, Seat, Bench

Street Furniture Australia

N6 Regents Park Estate, 391 Park Road
Regents Park NSW 2143

P: 02 8774 8888 M: 0412 488 101

www.streetfurniture.com

Play Equipment

Play By Design

114 Christie St,
St Leonards
NSW 2065

+61 2 9436 4400

www.playbydesign.com.au

Stratacells

City Green

827 Pacific Highwau
North Sydney
NSW 2067

+61 2 4918 5515
02 6578 8250

www.citygreen.com

APPENDIX B

Caddens Hill
DEVELOPER MAINTENANCE PROGRAM - HARDSCAPE

Client Legacy Property

Project Name: Caddens Hill

Precinct Name: Caddens Hill Sports Precinct

Works Description: Maintenance of hard landscape areas

Maintenance Period: 12 months

TASK DESCRIPTION:	0-9 MONTHS FREQUENCY	9-12 MONTHS FREQUENCY
Concrete Pavements to Sports Precinct		
Visual inspection of all pavements for damage and cracks	*Fortnightly*	*Monthly*
Visual inspection of all pavements for efflorescence (salt deposits)	*Fortnightly*	*Monthly*
Visual inspection of all pavements for colour consistancy and stains	*Fortnightly*	*Monthly*
Clean in accordance with manufacturers recommendations	*As required*	*As required*
Leaf and debris clearance with blower	*Monthly*	*2 Months*
Concrete steps to Sports Precinct		
Visual inspection of step treads and risers for damage, chips and cracks	*Fortnightly*	*Monthly*
Visual inspection of all landings, treads and risers for efflorescence (salt deposits)	*Fortnightly*	*Monthly*
Visual inspection of all pavement surfaces for colour consistancy and stains	*Fortnightly*	*Monthly*
Check all joints and fixing on steel handrail and clean surfaces as required	*Fortnightly*	*Monthly*
Check all tactile pavers are secure and eplace if required	*Fortnightly*	*Monthly*
Clean all surfaces as required	*As required*	*As required*
Leaf and debris clearance with blower	*Monthly*	*2 Months*
Bridge Structure to Sports Precinct		
Visual inspection of all posts, mesh grating and balustrades	*Fortnightly*	*Monthly*
Check all fixtures, screws and bolts and replace as required	*Fortnightly*	*Monthly*
Visual inspection of all surfaces for colour consistancy and stains	*Fortnightly*	*Monthly*
Clean mesh grating and posts as required	*Fortnightly*	*Monthly*
Visual inspection for grafitti and removal if required	*As required*	*As required*
Walls to Sports Precinct		
Visual inspection of all sandstone log / concrete walls for damage and cracks	*Fortnightly*	*Monthly*
Check / Repair all mortar joints as required if failure / damage has occurred	*Fortnightly*	*Monthly*
Remove any weed growth in between sandstone logs	*Fortnightly*	*Monthly*
Visual inspection for staining and removal of all stains	*As required*	*As required*
Visual inspection for grafitti and removal if required	*As required*	*As required*
Visual Inspection of all anti skate studs and replace as required	*As required*	*As required*
Adventure Play Area to Sports Precinct		
Visual inspection of all slides, swings and ropes - To manufacturers instructions	*Fortnightly*	*Monthly*
Visual inspection of all softfall and mounded softfall - To manufacturers instructions	*Fortnightly*	*Monthly*
Visual inspection of all timber step walling and terraced stone walling to periphery	*Fortnightly*	*Monthly*
Cleaning of all play equipment as required	*As required*	*As required*
Visual inspection for grafitti and removal if required	*As required*	*As required*
Visual Inspection of all anti skate studs and replace as required	*As required*	*As required*
Mulch to all Garden Bed Areas to Sports Precinct		
Remove litter & debris from mulch areas	*Fortnightly*	*Monthly*
Remove weed growth in mulch areas	*Fortnightly*	*Monthly*
Rake over surface to re-level	*3 Months*	*6 Months*
Top up mulch levels	*Annually*	*Annually*
Urgent works		
Report any theft damage or vandalism	*Weekly*	*Fortnightly*

ADDITIONAL WORKS / COMMENTS:

Caddens Hill
DEVELOPER MAINTENANCE PROGRAM - SOFTSCAPE

Client Legacy Property

Project Name: Caddens Hill

Precinct Name: Caddens Hill Sports Precinct

Works Description: Maintenance of soft landscape areas

Maintenance Period: 12 months

SOFTSCAPE AREAS:

TASK DESCRIPTION:	0-9 MONTHS FREQUENCY:	9-12 MONTHS FREQUENCY:
Trees to Sports Precinct		
Visual inspection of all park trees	*Fortnightly in summer/Monthly in Winter*	*Monthly in summer/Once in Winter*
Manually inspect water levels to trees	*Fortnightly in summer/Monthly in Winter*	*Monthly in summer/Once in Winter*
Inspect damage to trees	*Fortnightly in summer/Monthly in Winter*	*Monthly in summer/Once in Winter*
Replace any taping to trees	*Fortnightly in summer/Monthly in Winter*	*Monthly in summer/Once in Winter*
Prune dead or damaged branches	*Fortnightly in summer/Monthly in Winter*	*Monthly in summer/Once in Winter*
Check for and report pests & diseases	*Fortnightly*	*Monthly*
Replace failed or damaged trees	*Fortnightly/As required*	*Monthly/As required*
Spray in accordance with manufacturers recommendations	*As required*	*As required*
Adjust &/or replace stakes & ties where necessary	*As required*	*As required*
Monitor and apply fertiliser to turf areas	*6 month intervals - Autumn/Spring*	*Yearly*
Turf to the Sports Precinct		
Mow all turf areas to maintain height between 30-40mm	*Weekly in Summer/Monthly in Winter*	*Fortnightly in Summer/2 months in Winter*
Trim edges of all turf areas	*Weekly in Summer/Monthly in Winter*	*Fortnightly in Summer/2 months in Winter*
Remove clippings from site	*Weekly in Summer/Monthly in Winter*	*Fortnightly in Summer/2 months in Winter*
Remove litter & debris from turf areas	*Weekly in Summer/Monthly in Winter*	*Fortnightly in Summer/2 months in Winter*
Check for and report pests & diseases	*Fortnightly*	*Monthly*
Spray in accordance with manufacturers recommendations	*As required*	*As required*
Monitor and apply fertiliser to turf areas	*6 month intervals - Autumn/Spring*	*Yearly*
Mulch to the Sports Precinct		
Remove litter & debris from mulch	*Fortnightly*	*Monthly*
Remove weed growth in mulch areas	*Fortnightly*	*Monthly*
Top up mulch as required	*Annually*	*Annually*
Plants to the Sports Precinct		
Check for and report pests & diseases	*Fortnightly*	*Monthly*
Spray in accordance with manufacturers recommendations	*Fortnightly*	*Monthly*
Prune damaged or dead branches	*Fortnightly*	*Monthly*
Remove weed growth in plant areas	*Fortnightly*	*Monthly*
Replace failed or damaged plants	*Fortnightly/As required*	*Monthly/As required*
Adjust &/or replace stakes & ties where necessary	*Fortnightly/As required*	*Monthly/As required*
General watering		
Irrigation by hydrant or water cart as required to maintain health	Weekly first 6 months/Fortnightly there after	Monthly

ADDITIONAL WORKS / COMMENTS:

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Site Foreman

APPENDIX C

Landscape Applications

Anti Graffiti Coating

Nanokote Pty Ltd

6 – 8 England Street
Dandenong
Victoria 3175

P: 03 9768 3277 F: 03 9768 3986

www.nanokote.com.au

APPENDIX D

Turf Suppliers

Oz Breed Turf
Phone: *02* ***4577 2977***
email: info@ozbreed.com.au
http://ozbreed.com.au/
Gate 6 – Cornwallis Road Windsor N.S.W 2756
P: 1800 802 908 F: 02 8915 1382

www.windsorturf.com.au

BENEDICT SAND & GRAVEL
11 Narabang Way, Austlink Park
Belrose NSW 2085
Phone: (02) 9986 3500
Fax: (02) 9986 3555

http://www.benedict.com.au

Australian Native Landscapes
317 Mona Vale Road
Terrey Hills NSW 2084
Phone: 02 9450 1444 Fax: 02 9450 2428

Roadhttp://anlscape.com.au