Landscape Construction – Stage 45 Public Open Space

TENDER NO: 01/2026

Tender close:

3:00pm (WST), Wednesday 25th March 2026

Tender to be lodged online at:

https://tenders.net/dtp/catalina-regional-council/

Tenders received after the time specified for closing will not be accepted

CATALINA Regional Council

Contents

Background 3
Supporting Documents 4
Submission Requirements 4
Assessment Process 4
Selection Criteria 4
Management and Reporting Structure 6
Terms of Engagement 7
General Conditions of Tendering 7
Enquiries 7
Annexure A – Tender Form 8
Annexure B - General Conditions 10
Annexure C - Estate Master Plan 14
Annexure D – Catalina Green Stage 45 POS Landscape and Irrigation Works – Technical Specification 15
Annexure E – Catalina Green Stage 45 POS Landscape and Irrigation Works Drawings (Issued for Tender) 16

Background

The Catalina Regional Council (CRC) is developing Catalina Estate in the suburbs of Clarkson and Mindarie within Perth's north coast corridor. The CRC is comprised of the Town of Cambridge, City of Joondalup, City of Perth, City of Stirling, Town of Victoria Park, City of Vincent and City of Wanneroo. These member Councils have a joint holding in the Project. Satterley Property Group (Satterley) acts as project manager and exclusive selling agent on behalf of the CRC.

The vision of the CRC and in turn Catalina can be summarised as:

"To create a sustainable urban community offering diverse housing choice, social connectivity and employment opportunities."

Catalina is positioned in the Perth northern corridor, leveraging on its unique urban infill position, located close to existing community facilities in retail/shopping, health, education and transport. At completion Catalina will comprise around 2,400 lots, with approximately 1,400 homes completed to date. It is anticipated that development of the Estate will be complete in early 2027.

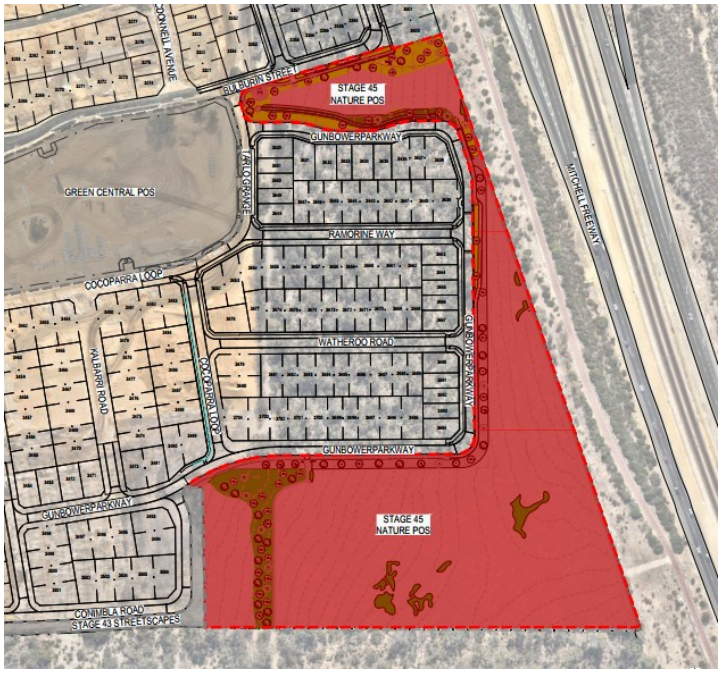
Catalina comprises three precincts being:

- Catalina Beach located west of Marmion Avenue in Mindarie;
- Catalina Central located between Marmion Avenue and Connolly Drive in Clarkson;
- Catalina Green located between Connolly Drive and the Mitchell Freeway in Clarkson.

Further details of Catalina and its features can be found on the Project website:
https://satterley.com.au/catalina

Scope of Services

The CRC is seeking to appoint a landscape construction contractor to undertake the construction of a new park to be constructed in Stage 45 of Catalina Green in accordance with the specifications and drawings appended to this document.



Supporting Documents

The following information is appended to this Tender to assist in the preparation of a submission:

- Tender Form (Annexure A).
- General Conditions of Tendering (Annexure B).
- Estate Master Plan (Annexure C).
- Stage 45 Nature POS Specifications (Annexure D).
- Stage 45 Nature POS Drawings (Annexure E).

Submission Requirements

Tenderers shall provide a written submission that includes:

- The Tender Form provided under Annexure A, including responses to the Compliance Criteria.
- Statements that individually address the Selection Criteria set out below.
- Completed pricing schedules (as contained in the Stage 45 Nature POS Specifications - Annexure D pages 7 to 15).

Tenders must be submitted no later than the time and date on the cover page of the Tender Document online at:

https://tenders.net/dtp/catalina-regional-council/

Tenders received after the time specified for closing will not be accepted.

Assessment Process

At the close of the Tender period, all Tender submissions received will be recorded by the CRC office.

An Evaluation Panel will be appointed to undertake the evaluation of all received Tender submissions against the requirements of the selection criteria contained in this Tender Document.

Upon completion of its evaluation, the Evaluation Panel will make a recommendation to the CRC in respect to the award of the Tender.

Selection Criteria

Tenderers are required in their submissions to address a series of compliance and qualitative selection criteria as set out below:

Compliance Criteria

Tenderers are required to complete Part 4 of Appendix A – Tender Form and provide additional information as requested. A failure to respond to the compliance criteria or certain responses to them may result in the exclusion of a Tender submission from further consideration.

Qualitative Criteria

Tender submissions must provide written statements to address each of the following selection criteria individually:

1. Tender Price - 60%

Tenderers must complete the fee schedules contained in the Stage 45 Nature POS Specifications - Annexure D (pages 7 to 15) as requested to cover all the components in the Scope of Works.

Tenderers shall include all costs and disbursements of the Tenderer and nominated Subcontractors, and the tendered price shall be deemed to include:

(a) Labour, machines, and materials:
(b) Fees and levies including B.C.I.T.F.;
(c) Fees as indicated in the price schedule;
(d) Profit and attendance;
(e) Insurance costs;
(f) All kinds of surcharges;
(g) Mobilisation, demobilisation, and establishment charges:
(h) All State and Commonwealth duties, taxes, and charges (excluding GST); and
(i) Any other necessary costs to complete the Contract.

GST shall not be included in the pricing.

2. Demonstrated Track Record and Experience - 15%

Using the form provided in the Stage 45 Nature POS Specifications - Annexure D (page 16), Tenderers are required to list the Project name and approximate landscape construction value and approximate timing of completion of four (minimum) recent landscape works built by the Tenderer under their current management structure over the last two years. Only include individual Contracts over $500,000 in landscape construction works. Tenderers may supplement the information provided on the form with photographs, project summary sheets and the like.

Tenderers should also provide:

- Details of the background of the company and services it has provided to similar projects to Catalina Estate.

- A demonstration of strong results achieved in landscape construction, particularly with sites that are environmentally sensitive or involve retention of substantial areas of native vegetation.

- The names and contact numbers of a minimum of two referees that can vouch for the company's past performance. Written references in this respect may also be provided.

- Where any subcontractors are proposed, the following details:
  - Portion of the Works to be subcontracted.
  - Name and address of the subcontractor.
  - Similar projects that the subcontractor has undertaken.

3. Methodology and Capacity - 15%

Tenderers should detail:

- The general methodology that will be applied in undertaking the scope of works, including descriptions of cost efficiencies and processes and strategies to be utilised to ensure work completed is of adequate quality, within budget and on time.

- Details of organisational structure and the key personnel who will be responsible for administrating and carrying out the Works/Services described.

- The resources to be applied to the scope of works (such as, crew type and number of personnel in each crew inclusive of their level of qualifications and a full list of the plant and equipment relevant to the Works described.

- How the scope of works will be managed and resources will be utilised.

4. Safety, Environmental and Organisational Management - 10%

Tenderers should provide:

- Details of the Project Management system to be employed, citing where appropriate examples of previous contracts of a similar nature to the scope of works. In support, provide details on how it is intended to project manage the Works described.

- Details of the processes and strategies will be utilised to ensure that the physical work undertaken in provision of the scope of works is of adequate quality.

- OSH policy and management plan details (manual or system) and evidence of a commitment to safety, adequate safety training of the Contractor's personnel, with details of the Contractor's personnel dedicated to OSH responsibilities.

- Examples of any processes currently in place relating to safety, such as Job Safety Analysis sheets, induction forms, workplace inspections and training. Provide actual samples from previous Contracts that are relevant to the Works described. Note: References to client names are to be deleted.

- Environmental policy and management system together with a general review of how environmental issues will be managed as well as details of experience and understanding of environmental issues on previous similar projects.

Management and Reporting Structure

The successful Tenderer will be appointed directly by the CRC but will report to Satterley Property Group as project managers on behalf of the CRC. The CRC has appointed Landscape Architects, Emerge Associates to assist Satterley and act as Superintendent to oversee the performance of the successful Contractor.

The CRC operates under the *Local Government Act 1995*. Further information on the CRC, its structure and policies can be found on the CRC website www.Catalina.wa.gov.au.

Terms of Engagement

The successful tenderer will be offered a contract based on AS 2024-1992 to complete the scope of works.

The CRC reserves the right, at its absolute discretion, to terminate the contract at any time should the company not be able to meet acceptable performance standards.

General Conditions of Tendering

This Tender is subject to the General Conditions of Tendering detailed in Annexure B.

Enquiries

Additional information with respect to the consultancy and the requirements of the tender can be obtained by contacting:

Contact:	Zac Fried, Principal Landscape Architect, Emerge Associates
Email:	Zac.Fried@emergeassociates.com.au

Annexure A – Tender Form

Tender Number: 01/2026 **Date:**

Tenderers must ensure that they fully and completely disclose all relevant information in completing this form. Terms used in this form have the same meaning as given in the Tender Document, unless the context otherwise requires:

1. IDENTITY OF THE PROPONENT ENTITY

_____

Name of Organisation(s) ACN /ABN

_____

Business Address

_____

Postal Address

2. CONTACT DETAILS

_____

Name of Contact Person

_____

Position

_____

Telephone

_____

Email

3. COMPANY DIRECTORS

Please list the names of all Company Directors:

_____

_____

_____

_____

4. COMPLIANCE CRITERIA

Please complete the following questions by ticking either yes or no. If relevant, please supply the requested information in the space provided or by appending it to your submission.

Compliance Criteria	Met?
The Tenderer is to confirm it currently has the required insurances (professional indemnity (minimum $5M) and public and products liability (minimum $10M)) or, if successful, is willing to obtain the required insurances, prior to executing a contract with the CRC. If no, please provide details:	❑ Yes ❑ No
The Tenderer is to confirm there are no instances of any material event, litigation, insolvency, breeches of law, offence or other matters involving the Tenderer or its Directors over the past 5 years. If yes, please provide details:	❑ Yes ❑ No
The Tenderer agrees to be bound by the terms and conditions set out in Annexure B – General Conditions. If no, please provide details:	❑ Yes ❑ No
The Tenderer agrees to the General Conditions of Contract. If no, please provide a listing of departures by clause, the reason for the departure, and proposed alternate wording for the clause in question:	❑ Yes ❑ No
The Tenderer is to confirm whether it is acting as an agent or trustee for another person or persons. If yes, please provide details:	❑ Yes ❑ No
The Tenderer is to confirm whether it is acting jointly or in association with another person or persons. If yes, please provide details:	❑ Yes ❑ No
The Tenderer is to confirm whether it or any of the specified personnel have any actual, potential or perceived conflict of interest in relation to the performance of the contract. If yes, please provide details:	❑ Yes ❑ No

5. AGREEMENT TO TERMS AND CONDITIONS

By completing and signing this Tender Form, the Tenderer confirms that it:

a) has read and understood Tender No. 01/2026 including noting and accounting for any Addenda:
b) agrees to be bound by the terms and conditions set out in the Tender Document; and
c) acknowledges the Selection Criteria and Annexures A – E, contained within the Tender Document.

Signed by Director of entity Tendering:

……

Name: ..... Date: .....

Complete and submit this form with your Tender submission.

Annexure B - General Conditions

1. Definitions and Interpretations

The interpretations contained in the General Conditions of Contract are applicable to the Tender Document.

In addition, the following definitions of terms used in this document will apply unless the context otherwise dictates so.

"General Conditions of Contract"	means Australian Standard – general conditions of contract for engagement of contractors (AS2124-1992) together with General Conditions of Tendering and Form of Tender (AS 2125—1992), Form of Formal Instrument of Agreement (AS 2127—1992) as amended by the Principal and Conditions as detailed in the Annexure Part B.
"CRC"	means the Catalina Regional Council.
"Sub-Contractor"	means a sub-contractor contracted to the Tenderer to provide goods or services to contribute to the Project.
"Tender"	means a valid written offer submitted by a Tenderer following the invitation of the CRC.
"Tenderer"	means any party submitting a Tender.
"Tender Document"	includes those documents referred to in Clause 2.

2. Tender Document

This Tender Document shall comprise:

(a) CRC Tender Document 01/2026:
(b) Annexures A-E:
(c) These General Conditions of Tendering.

The above listed items shall not be altered in any way including the Council's format or wording. Tender submissions with alterations may not be considered for evaluation.

3. Documents to be submitted with Tender

Tenderers should be aware that Tender Submissions may be publicly available.

In accordance with these General Conditions of Tendering the following document shall be completed, signed and submitted with the Tender:

Tender Form (Annexure A).

4. Tender Assessment

Tenders will be assessed on their compliance with the Tender Document and Tender submission addressing the assessment criteria including price submitted.

5. Site Inspection

Tenderers are encouraged to visit the site to be familiar with the Catalina Estate location and context. Tenderers will not have access to areas of the site under construction.

6. Lodgement of Tender

Tenders must be submitted no later than the time and date on the cover page of the Tender Document online at:

https://tenders.net/dtp/catalina-regional-council/

A Tender may be rejected without consideration of its merits in the event that:

(a) The Tenderer does not submit a Tender Form which has been completed and signed together with all required schedules and supporting documentation; or

(b) The Tenderer fails to comply with any other requirement of the Tender Document.

Hard copy, facsimile, electronic mail (email) and oral Tenders shall not be admitted for consideration.

A Tender not submitted on the CRC's online portal by the time and date of Tender opening will be considered a late Tender.

A late Tender shall not be considered for evaluation.

The CRC accepts no responsibility whatsoever for submitted Tenders failing to be submitted by the time and date of closing.

7. Acceptance of Tenders

The CRC has the right to accept or reject any Tender and to not accept any Tenders at all.

Tenders will be judged by the CRC as best suited to the interests of the CRC.

No Tender shall be deemed to have been accepted until the Tenderer has been notified of such acceptance in writing by or on behalf of the CRC.

8. Disclosure of Contract Information

(a) Tenderers should be aware that Tenders may be publicly available.

(b) Documents and other information relevant to the outcome of this Tender process may be disclosed when required by law under the *Freedom of Information Act (WA) 1992* or under a court order:

(c) The CRC shall not provide content or comment for use by suppliers to promote their work, products or services by using association with the Council's projects or image:

(d) Section 17, Part 4 of the *Local Government (Functions and General) Regulations 1996* (the "Regulations") requires that the Council maintain a Tender Register which must include, amongst other detail, the name of each Tenderer whose Tender has been opened and the amount of consideration or a summary of the consideration amount.

By submitting a Tender, the Tenderer acknowledges and agrees to the "Regulations" requirements as outlined above.

9. Alternative Tenders

All alternative Tenders shall be accompanied by a conforming Tender.

Tenders submitted as alternative Tenders or made subject to conditions other than the General Conditions of Contract shall be clearly marked by the Tenderer as an “Alternative Tender”. The CRC may decline to accept any alternative Tender.

10. Expiry or Withdrawal of Tenders

A Tender shall constitute an offer and shall remain open for acceptance for ninety (90) days from the date of closing of Tenders. The CRC and Tenderers may agree to extend this period by agreement in writing.

Tenders shall not be withdrawn after the date and time for the closing of Tenders without the consent of the CRC.

11. Tenderers to Inform Themselves

By submitting a Tender, a Tenderer shall be deemed to have:

(a) Examined carefully and to have acquired actual knowledge of the contents of this Tender Document;

(b) Examined all information relevant to the risks, contingencies, and other circumstances which have an effect on its proposal, and which is obtainable by the making of reasonable enquiries:

(c) Satisfied itself as to the correctness and sufficiency of its proposal and the arrangements stipulated by it;

(d) Made itself aware of the site location, conditions, traffic, and other conditions;

(e) Made itself aware of any statutory or legal requirements necessary to implement the proposal; and

(f) Satisfied itself that it, its suppliers, and its contractors are fully aware of any applicable provisions of the *Occupational Safety and Health Act 1984* and *Occupational Safety and Health Regulations 1996* and be able to comply with these.

12. Alterations

The Tenderer shall not alter or add to the Tender Form or other required documents unless required by these General Conditions of Tendering.

It is the responsibility of Tenderers to refer to the CRC website (www.catalina.wa.gov.au) and its tendering portal (https://tenders.net/dtp/catalina-regional-council/) in order to access any addenda which the CRC may make to the Tender Document, where matters of significance make it necessary.

Tenderers must sign the Tender Form provided under Annexure A, acknowledging that addenda have been noted and accounted for.

13. Canvassing of Councilors and Council Staff

If a Tenderer, whether personally or by any agent, canvasses any of the CRC's Councillors or staff with a view to influencing the acceptance of any Tender made by it or any other Tenderer, then regardless of such canvassing having any influence on the acceptance of such Tender, the CRC may at its discretion omit the Tender from consideration.

14. Tender Opening

All Tenders will be opened in the CRC's offices, following the advertised closing time. No discussions, including disclosure of submitted Tender pricing, will be entered into between Tenderers and the CRC's officers present or otherwise concerning the Tenders submitted.

15. Clarification of Tenders

A Tenderer may be requested to clarify a Tender in any respect before final consideration provided that no variation to the Tender sum is offered.

16. Copyright

Copyright in all documents provided by the CRC for the purposes of Tendering remains with the CRC except those documents comprising Australian Standards. No Tenderer shall use all or any part of any such copyright property except for the purpose of this Tender. Property of the logos of the CRC lies with the CRC.

Annexure C - Estate Master Plan

Catalina

MASTERPLAN

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All dimensions and areas are subject to survey. The particulars of this plan are intended to be indicative only and may not accurately depict the final form of the development. Plan subject to approval.
The Masterplan is subject to change. REF:-96641sa-348f DATE: 26/04/2023 COPYRIGHT. Satterley Property Group Pty Ltd Level 3, 27-31 Troode Street, West Perth WA 6005 ABN 38 009 054 979.

W: www.catalinaestate.com.au T: 9368 9068

TAMALA PARK REGIONAL COUNCIL
Building a sustainable community

SATTERLEY

Annexure D – Catalina Green Stage 45 POS Landscape and Irrigation Works – Technical Specification

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PRINCIPAL
CATALINA REGIONAL COUNCIL

PROJECT
CATALINA GREEN,
CLARKSON, WA

SPECIFICATION AND CONTRACT DOCUMENT FOR

CATALINA GREEN STAGE 45 POS LANDSCAPE & IRRIGATION WORKS

CONTRACT NUMBER
CAT-67

DATE
FEBRUARY 2026

TABLE OF CONTENTS

1.1	SCHEDULE OF SUB-CONTRACTOR'S AND MAJOR SUPPLIERS:	7
1.2	SCHEDULE OF DAY WORKS LABOUR RATES:	9
1.3	SCHEDULE OF PLANT HIRE RATES:	11
1.4	LANDSCAPE CONSTRUCTION:	13
1.5	SCHEDULE OF TENDERER'S EXPERIENCE	16

SECTION B PRELIMINARIES.....17

2 PRELIMINARIES 18

2.1	GENERALLY	18
2.2	CONTRACT DOCUMENTS	18
2.3	CO-OPERATION	18
2.4	CASH FLOW SCHEDULE	18
2.5	DEFECTS LIABILITY PERIOD	18
2.6	NOTIFICATION OF VARIATIONS	18
2.7	STAGING AND CONSTRUCTION PROGRAMMES	18
2.8	HOLD POINTS	18
2.9	EXTENSION OF TIME	19
2.10	LIQUIDATED DAMAGES	19
2.11	WORKING HOURS AND DAYS	19
2.12	MEETINGS	19
2.13	SITE AND PUBLIC SECURITY	19
2.14	CONTRACTOR'S SITE FACILITIES	20
2.15	SANITATION ON WORKS SITE	20
2.16	SITE SIGNBOARDS	20
2.17	ADVERTISING	20
2.18	CONTOURS AND LEVELS	20
2.19	STRUCTURAL DESIGN BY CONTRACTOR	20
2.20	STRUCTURAL DESIGN BY PRINCIPAL	21
2.21	SHOP DRAWINGS	21
2.22	TEMPORARY WORKS	21
2.23	BUILDING LICENCE/PERMIT APPLICATION	21
2.24	AS-CONSTRUCTED SURVEY	21
2.25	EXISTING SERVICES	21
2.26	PLANT AND EQUIPMENT	22
2.27	GUARANTEES AND WARRANTIES	22
2.28	PROTECTION OF PEOPLE AND PROPERTY	22
2.29	SAFETY PLAN	22
2.30	THE SITE – CIVIL PROTECTION/ADJACENT WORKS	23
2.31	ADVISORY NOTICES	23
2.32	PROCEDURE FOLLOWING DUST RELATED COMPLAINT	23
2.33	DILAPIDATION SURVEYS	23
2.34	TRAFFIC MANAGEMENT	23
2.35	POLLUTION AND ENVIRONMENT	24
2.36	DUST AND WIND BLOWN SAND	25
2.37	CHEMICAL INFORMATION	26
2.38	CLEAN-UP OF POLLUTION	26
2.39	INCLEMENT WEATHER	26
2.40	LOCAL AUTHORITY REQUIREMENTS	26
2.41	INDUSTRIAL AWARDS, DISPUTES AND PAYMENTS	26

SECTION C TECHNICAL SPECIFICATIONS 28

3 GENERALLY 29

3.1	LOCATION OF WORKS AND ACCESS	29
3.2	DESCRIPTION OF WORKS	29
3.3	WORKS BY OTHERS	29
3.4	NOMINATED SUB-CONTRACTOR'S / SUPPLIERS	29
3.5	MATERIALS SUPPLIED BY PRINCIPAL	30
3.6	STRUCTURAL DESIGN	31
3.7	AS CONSTRUCTED SURVEY AND DRAWINGS	31
3.8	STAGING AND PROGRAMME	31
3.9	PROCUREMENT	31
3.10	LIMITATIONS ON ACCESS	31
3.11	TRAFFIC MANAGEMENT	31

4 SITEWORKS, SETOUT AND EARTHWORKS 32

4.1	GENERAL	32
4.2	STANDARDS	32
4.3	TEMPORARY PROTECTIVE FENCE	32
4.4	DUST, NOISE, VIBRATION AND OTHER ENVIRONMENTAL CONTROLS	32
4.5	WORK NEAR EXISTING TREES	32
4.6	RETENTION OF EXISTING VEGETATION	33
4.7	CLEARING AROUND EXISTING TREES TO BE RETAINED	33
4.8	VEGETATION REMOVAL	33
4.9	WEED ERADICATION	34
4.10	STAGING OF VEGETATION REMOVAL	34
4.11	SETTING OUT OF WORKS AND INSPECTION	34
4.12	PROTECTION OF SURVEY STATIONS	34
4.13	PROJECT SURVEYOR	35
4.14	LEVELS AND ALIGNMENT	35
4.15	CLEARING	35
4.16	DISPOSAL OF MATERIAL	35
4.17	BULK EARTHWORKS	35
4.18	FINAL MINOR TRIM	36
4.19	EARTHWORKS - GENERALLY	36
4.20	NOTICE	36
4.21	SITE ACCEPTANCE	36
4.22	ROCK EXCAVATION	36
4.23	STRIPPING AND STOCKPILING TOPSOIL	36
4.24	EXCAVATION	36
4.25	SUBGRADE PREPARATION	37
4.26	FILLING AND RESPREADING	37
4.27	GEOTECHNICAL TESTING	38
4.28	DISPOSAL OF APPROVED SURPLUS SPOIL ON SITE	38
4.29	DISPOSAL OF SPOIL AND RUBBISH OFFSITE	38
4.30	MINOR GRADING AND TRIMMING	39
4.31	MATCHING UP	39
4.32	FINAL PRESENTATION	39
4.33	AS CONSTRUCTED SURVEY OF EARTHWORKS	39
5	**TIMBER AND COMPOSITE MATERIALS**	**40**
5.1	GENERAL	40
5.2	STANDARDS	40
5.3	TIMBER	40
5.4	PRESERVATIVE TREATMENT	40
5.5	TERMITE PREVENTION	40
5.6	TREATMENT OF CUT ENDS	41
5.7	TIMBER FIXINGS	41
5.8	FINISHING: OIL	41
5.9	WOOD PLASTIC COMPOSITE(WPC), FIBRE REINFORCED PLASTIC (FRP), GLASS FIBRE REINFORCED PLASTIC(GRP)	41
6	**METALWORK**	**43**
6.1	GENERAL	43
6.2	STANDARDS	43
6.3	SHOP DRAWINGS	44
6.4	SITE MEASUREMENTS	44
6.5	MATERIALS	44
6.6	DISSIMILAR METALS (GALVANIC POTENTIAL)	44
6.7	FABRICATION	45
6.8	WELDING	45
6.9	FASTENINGS	46
6.10	BOLTS	46
6.11	COLD FORMED STEELWORK	46
6.12	GALVANISING	46
6.13	REPAIR TO DAMAGED FINISHES	47
6.14	PROTECTIVE TREATMENT	47
6.15	PAINT PREPARATION	48
6.16	PAINTING METHODS	48
6.17	SITE PAINTING	49
6.18	TESTING	49
6.19	INSTALLATION OF HANDRAILS/BALUSTRADES	49
6.20	ERECTION	49
6.21	SECURITY DURING ERECTION	49
6.22	HOLLOW SECTION CONSTRUCTION	49
6.23	INSPECTION AND TESTING	49
6.24	TEMPORARY WORKS	50

6.25	ERECTION TOLERANCES	50
6.26	GROUTING	50
6.27	SITE MODIFICATIONS	50
7	**CRUSHED STONE/AGGREGATE HARDSTAND**	**51**
7.1	GENERAL	51
7.2	STANDARDS	51
7.3	MATERIALS	51
7.4	SAMPLES	51
7.5	CRUSHED STONE/AGGREGATE HARDSTAND	51
7.6	POROUS RESIN BOUND AGGREGATE PAVING	52
7.7	COMPLETION	53
7.8	TESTING	53
7.9	ACCEPTANCE CRITERIA FOR HARDSTAND	53
8	**LIMESTONE AND RECONSTITUTED BLOCKWORK**	**55**
8.1	GENERAL	55
8.2	STANDARDS	55
8.3	BLOCKS	55
8.4	MORTARS	55
8.5	WORKMANSHIP	56
8.6	COURSING AND BOND	56
8.7	JOINTS	56
8.8	SAMPLES	56
8.9	FOOTINGS TO LIMESTONE WALLS AND PIERS	56
8.10	REINFORCEMENT TO LIMESTONE WALLS, PIERS AND FOOTINGS	56
8.11	CLEANING	57
8.12	PROTECTION OF FINISHED WORK	57
8.13	GRAFFITI PROTECTION	57
8.14	DAMP COURSE	57
9	**INSITU CONCRETE**	**58**
9.1	GENERAL	58
9.2	STANDARDS	58
9.3	INSITU CONCRETE FOOTINGS	58
9.4	INSITU CONCRETE PAVING(FLATWORK) - STANDARD	60
9.5	INSITU CONCRETE PAVING (FLATWORK) – EXPOSED/WASHED AGGREGATE	62
9.6	INSITU CONCRETE MOWING KERBS	63
10	**STREET FURNITURE**	**64**
10.1	STREET FURNITURE	64
10.2	BENCH SEATING	64
10.3	RUBBISH BINS	64
11	**MISCELLANEOUS WORKS**	**65**
11.1	GRAFFITI COATING	65
11.2	SIGNAGE AND GRAPHICS	65
11.3	CHAIN MESH/LINK FENCING	65
11.4	PAINTING	66
12	**SOFT LANDSCAPE WORKS**	**68**
12.1	GENERAL	68
12.2	LANDSCAPE DESIGN OBJECTIVES	68
12.3	STANDARDS	68
12.4	ACCEPTANCE OF EARTHWORKS	68
12.5	FINAL MINOR TRIM	68
12.6	SOIL TESTING	68
12.7	SOIL CONDITIONER	68
12.8	PLANT SUPPLY	72
12.9	PLANTING GENERALLY	72
12.10	DEPTH OF PLANTING	73
12.11	PLANT PLACEMENT	73
12.12	MULCHING	74
12.13	EXISTING TREES TO BE RETAINED	77
12.14	ARBORIST REPORT	77
12.15	CLEARING AROUND EXISTING TREES	77
12.16	TREE AND STUMP REMOVAL	77

13 PROJECT CONSOLIDATION 78

13.1 GENERAL 78
13.2 STANDARDS 78
13.3 GENERAL 78
13.4 CONSOLIDATION PROGRAMME AND LOG BOOK 78
13.5 PLACING OF WORKS ON CONSOLIDATION 78
13.6 EXTENT OF CONSOLIDATION 78
13.7 CONSOLIDATION OF REVEGETATION, REHABILITATION AND NATURAL AREA 78
13.8 MAINTENANCE OPERATIONS 79
13.9 PUMPS, BORES AND ELECTRICS 79
13.10 IRRIGATION 79
13.11 BORE METER READINGS 80
13.12 CARE OF WORK AND REINSTATEMENT OF DAMAGE 80
13.13 HANDOVER 80

SECTION E APPENDICES 81

14 BULK EARTHWORKS 82

14.1 GENERAL 82
14.2 STANDARDS 82
14.3 TEMPORARY PROTECTIVE FENCE 82
14.4 DUST, NOISE, VIBRATION AND OTHER ENVIRONMENTAL CONTROLS 82
14.5 DILAPIDATION SURVEYS 82
14.6 CLEARING 82
14.7 WORK NEAR EXISTING TREES 83
14.8 RETENTION OF EXISTING VEGETATION 83
14.9 CLEARING AROUND EXISTING TREES TO BE RETAINED 84
14.10 VEGETATION REMOVAL 84
14.11 WEED ERADICATION 84
14.12 STAGING OF VEGETATION REMOVAL 84
14.13 DISPOSAL OF MATERIAL 84
14.14 EARTHWORKS - GENERALLY 84
14.15 NOTICE 84
14.16 EXCAVATION 85
14.17 ROCK EXCAVATION 85
14.18 PROTECTION OF SERVICES AND ADJACENT WORKS 85
14.19 STRIPPING AND STOCKPILING OF TOPSOIL 85
14.20 DISPOSAL OF APPROVED SURPLUS SPOIL ON SITE 85
14.21 MINOR GRADING TO POND BATTERS 85
14.22 SETTING OUT OF WORKS AND INSPECTION 85
14.23 DISPOSAL OF SPOIL AND RUBBISH OFFSITE 86
14.24 SUBGRADE PREPARATION 86
14.25 CLEAN FILL 86
14.26 PLACEMENT, BACKFILLING AND COMPACTION 87
14.27 TESTING AND COMPACTION 87
14.28 COMPLETION AND SITE PRESENTATION. 88
14.29 AS CONSTRUCTED SURVEY OF EARTHWORKS 88

15 CONSERVATION AREA MANAGEMENT PLAN 89

1.1 SCHEDULE OF SUB-CONTRACTOR'S AND MAJOR SUPPLIERS:

Tenderers are to list the name and address of each Sub-Contractor they propose to engage to carry out any works under the Contract. The tenderer shall note that the selection of sub contractors is considered a critical aspect for the successful completion of the works and is weighted accordingly in the assessment of the tenders. No alteration to the approved selection of Sub Contractors shall be made without prior approval from the Superintendent.

ITEM OF WORK

NAME

ADDRESS

RECENT WORKS (provide details of project, items of work, and sub contract value and time completed of works recently completed by the subcontractor)

ITEM OF WORK

NAME

ADDRESS

RECENT WORKS (provide details of project, items of work, and sub contract value and time completed of works recently completed by the subcontractor)

ITEM OF WORK

NAME

ADDRESS

RECENT WORKS (provide details of project, items of work, and sub contract value and time completed of works recently completed by the subcontractor)

ITEM OF WORK

NAME

ADDRESS

RECENT WORKS (provide details of project, items of work, and sub contract value and time completed of works recently completed by the subcontractor)

ITEM OF WORK

NAME

ADDRESS

RECENT WORKS (provide details of project, items of work, and sub contract value and time completed of works recently completed by the subcontractor)

Tenderer's Name (entity):

Telephone No.: .

Signature of Authorised Officer:

Name In Block Letters:

1.2 SCHEDULE OF DAY WORKS LABOUR RATES:

Tenderers shall list below the hourly rates payable for various occupational groups, which may be employed on site:

	OCCUPATION	**RATE PER HOUR (excluding GST)**
1.	**Project Manager**	
2.	**Site Manager / Foreman**	
3.	**Site Supervisor**	
4.	**Leading Hand**	
5.	**Horticulturalist / Arboriculturalist**	
6.	**Landscape Apprentice**	
7.	**Labourer – Horticultural**	
8.	**Labourer – Skilled**	
9.	**Labourer – Unskilled**	
10.	**Paver – Tradesperson**	
11.	**Paver – Labourer / Installer**	
12.	**Electrical - Licensed**	
13.	**Electrical - Apprentice**	
14.	**Plumber - Licensed**	
15.	**Plumber - Tradesman**	

- Other Trades/Classifications (as identified by the Tenderer)

16.		
17.		
18.		
19.		

Tenderer's Name (entity):

Telephone No.: .

Signature of Authorised Officer:

Name In Block Letters:

1.3 SCHEDULE OF PLANT HIRE RATES:

Tenderers shall list the hourly rates for the hire of all types of construction equipment used on site for clearing, earthworks, excavation, compaction, laying of pipes, grading of surfaces, watering, etc.

The rates shall include allowances for an experienced operator, fuel, consumable stores, maintenance, overheads and profit.

TYPE OF PLANT/EQUIPMENT	RATE PER HOUR (excluding GST)
1. 8 Wheel Truck (10 CuM)	
2. 6 Wheel Truck (10 Cu M)	
3. Loader (Medium size)	
4. Roller (Up to 10 tonne)	
5. Truck Hiab	
6. Water Cart (1800L)	
7. Water Cart (900 L)	
8. Mini Excavator (Up to 7 tonne)	
9. Skid-Steer Loader (Bobcat)	
10. Plate Compactor	
11. Stump Grinder	
12. Other Plant and Equipment (as identified by the Tenderer)	
▪	
▪	
▪	
▪	
▪	

Tenderer's Name (entity):

Telephone No.: .

Signature of Authorised Officer:

Name In Block Letters:

1.4 LANDSCAPE CONSTRUCTION:
PROJECT: CATALINA GREEN, WA
DESCRIPTION: STAGE 45 POS
CONTRACT NO: CAT-67

This is a Lump Sum Tender and the price so Tendered shall be compensation for the complete works as described by the Specification and Drawings. This Tender includes for the provision of all materials, plant and labour (unless specifically noted otherwise) and the complete and proper construction of all works as described by the Specification and Drawings and shall include but not be limited to, the securing, manufacture or fabrication of all parts, and their transportation, installation, erection, maintenance and replacement of defective parts all to the entire satisfaction of the Superintendent.
The Schedule below shall be completed with quantities and rates to allow for assessment of Tenders and the valuing of variations under the Contract.
Tenderers shall include a schedule of prices so submitted that when added together represent a lump sum for the comparison of Tenders. The individual items shall be used for the calculation of progress payments.
This schedule and the descriptions and scope of the items obtained therein shall be read as part of the Specification.
GST shall NOT be included in the rate shown for each item.

ITEM	*DESCRIPTION*	*QTY*	*UNIT*	*RATE*	*AMOUNT*
1.0	**PRELIMINARIES**				
1.1	GENERAL PRELIMINARIES	Item			
1.2	PRODUCTION OF REQUIRED SHOP DWGS	Item			
1.3	PROVISION OF SAMPLES, TEST RESULTS, AUTHORITY APPROVALS	Item			
1.4	PRODUCTION OF QA AND PROJECT DOCUMENTATION	Item			
1.5	PRODUCTION OF AS CONSTRUCTED DWGS INCLUDING SURVEY	Item			
2.0	**OHS COMPLIANCE** The tenderer shall complete the following schedule allowing for all costs to ensure the information is retained onsite and available to the principal and superintendent at any time.				
2.1	CONTRACT WORKS INSURANCES (with Principal noted as jointly insured)	Item			
2.2	PROVISION FOR SITE SHED AND FACILITIES (for the duration of the project)	Item			
2.3	SITE FENCING (supply for the duration of the project and removal)	Item			
2.4	TEMPORARY PROTECTIVE/SAFETY FENCING	Item			
2.5	PREPARATION AND IMPLEMENTATION OF A TRAFFIC MANAGEMENT PLAN	Item			
2.6	PREPARATION AND PROVISION OF A CONTRACT WORKS SAFETY MANAGEMENT PLAN	Item.			
2.7	PREPARATION OF A RISK ASSESSMENT PLAN	Item			
2.8	CONTRACTOR & SUB CONTRACTOR INDUCTIONS & TRAINING	Item			
2.9	INDEPENDENT SAFETY AUDIT (PER PRINCIPAL'S REQUIREMENTS)	Item			
2.10	PREPARATION, UPDATING AND PROVISION OF RISK REGISTER (for duration of the project, provide at site meetings)	Item			
2.11	COMPLETION OF PRINCIPAL'S 'CONTRACTORS MONTHLY WHSE REPORT'	Item			
2.12	TOOLBOX MEETINGS (undertaken weekly for the duration of the project)	Item			
2.13	UNDERTAKING AND PROVISION OF SWMS DOCUMENTATION	Item			
2.14	UNDERTAKING AND PROVISION OF JSA DOCUMENTATION	Item			
2.15	INSPECTION, TESTING AND REPORTING FOR PLANT AND EQUIPMENT	Item			
2.16	COMPLIANCE WITH CAMP – (refer section 3.3, 3.4, 3.8, 3.9)	Item			
2.17	MONITORING REPORT – 1x MONITORING REPORT POST IMPLEMENTATION (against CAMP compliance criteria table 3-1)	Item			
3.0	**SITE WORKS**				
3.1	REMOVAL OF DEMOLITION WASTE AND DISPOSAL OFFSITE	Item			
3.2	DUST SUPPRESSION AND WATER CARTS	Item			
3.3	SERVICES/UTILITIES LOCATION AND IDENTIFICATION	Item			
3.4	SITEWORKS & SET OUT		sq m		
3.5	ROCK EXCAVATION	Item	P.Sum	$10,000	$10,000

ITEM	*DESCRIPTION*	*QTY*	*UNIT*	*RATE*	*AMOUNT*
3.6	WEED/UNDERGROWTH ERADICATION – PRIOR TO WORKS COMMENCING		sq m		
3.7	WEED/UNDERGROWTH ERADICATION – AT COMPLETION OF PLANTING		sq m		
3.8	TREE SURGERY	Item	P.Sum	$15,000	$10,000
3.9	FENCING/BARRIERS TO PROTECT EXISTING TREES	Item			
3.10	SUPPLEMENTARY WATERING TO EXISTING TREES	Item			
4.0	**EARTHWORKS AND GRADING**				
4.1	BULK EARTHWORKS (refinement of civil, dispose of excess within 500m of site)	5	days		
4.2	FINAL MINOR TRIM (+/- 100mm)		sq m		
5.0	**PAVING**				
5.1	CONCRETE FOOTPATH (natural grey)		sq m		
5.2	TRAFFICABLE CONCRETE FOOTPATH (natural grey)		sq m		
5.3	TRAFFICABLE CONCRETE FOOTPATH (exposed aggregate)		sq m		
5.4	CONCRETE CULVERT CROSSING (inc headwalls)		item		
5.5	CRUSHED LIMESTONE PATH		sq m		
5.6	REPLACE EXISTING SECTION OF KERB WITH MOUNTABLE KERB FOR MAITNENANCE ACCESS		item		
6.0	**SITE FURNITURE**				
6.1	CITY OF WANNEROO PARK SIGN		item		
6.2	CONSERVATION FENCING		Lin m		
6.3	PEDESTRIAN GATES		each		
6.4	MAINTENANCE GATES		each		
6.5	FIXED BOLLARDS		each		
6.6	RUBBISH BIN		each		
6.7	FLORA & FAUNA EDUCATIONAL SIGNAGE		each		
6.8	STAR PICKETS TO DBCA BOUNDARY AT 10m SPACINGS (with white caps)		each		
6.9	DBCA PROPERTY BOUNDARY SIGNAGE (allow for 30cm x 30cm aluminium sign)		each		
7.0	**SOFT LANDSCAPE WORKS**				
	TREE PLANTING (Complete inc supply, install and staked/guyed as specified)				
7.1	- 200 litre		Rate only		
7.2	- 100 litre		each		
7.3	- 45 litre		Rate only		
7.4	- 15 litre		Rate only		
	SHRUB PLANTING (Complete inc supply, install as specified)				
7.5	- 140mm		Rate only		
7.6	- Tubestock		each		
7.7	SOIL CONDITIONER (Gardens 75mm)		sq m		
7.8	SOIL CONDITIONER (Trees)		sq m		
7.9	MULCHING (Imported - Supply and Install)		sq m		
7.10	TREE GUARDS – to all tubes		each		
7.11	REMOVAL OF TREE GUARDS – after 12 months		each		
8.0	**IRRIGATION**				
8.1	MANUAL WATERING TO ALL TREES AND TUBESTOCK – twice a week during consolidation		item		

ITEM	*DESCRIPTION*	*QTY*	*UNIT*	*RATE*	*AMOUNT*
9.0	**INSPECTION/CERTIFICATION**				
9.1	STRUCTURAL ENGINEER inspection No1 by Sub-Consultant		each		
17.7	ARBORIST REPORT(at PC)		each		
18.0	**CONSOLIDATION (13 weeks)**		wks		
21.0	**ANY OTHER ITEMS NOT INCLUDED ABOVE (list below)**				
22.0	**TOTAL PRICE TENDERED (excluding GST)**				
23.0	**GST (10%)**				
24.0	**GRAND TOTAL – LANDSCAPE CONSTRUCTION**				

Tenderer's Name (entity):

Telephone No.: .

Signature of Authorised Officer:

Name In Block Letters:

1.5 SCHEDULE OF TENDERER'S EXPERIENCE

Tenderers are to list the Project name and approximate landscape construction value and approximate timing of completion of four (4) (minimum) recent landscape works built by the Tenderer under their current management structure over the last two (2) years. Only include individual Contracts of a similar scope of works.

1. PROJECT _____

- EST LANDSCAPE VALUE (excl GST) _____
- TIME OF COMPLETION _____

2. PROJECT _____

- EST LANDSCAPE VALUE (excl GST) _____
- TIME OF COMPLETION _____

3. PROJECT _____

- EST LANDSCAPE VALUE (excl GST) _____
- TIME OF COMPLETION _____

4. PROJECT _____

- EST LANDSCAPE VALUE (excl GST) _____
- TIME OF COMPLETION _____

5. PROJECT _____

- EST LANDSCAPE VALUE (excl GST) _____
- TIME OF COMPLETION _____

6. PROJECT _____

- EST LANDSCAPE VALUE (excl GST) _____
- TIME OF COMPLETION _____
-
-
-
-
-

Tenderer's Name (entity): _____

Telephone No.: . _____

Signature of Authorised Officer: _____

Name In Block Letters: _____

SECTION B

PRELIMINARIES

2.1 GENERALLY

The Conditions of Contract shall be the [Amended] General Conditions of Contract (AS 2124—1992) together with General Conditions of Tendering and Form of Tender (AS 2125—1992), Form of Formal Instrument of Agreement (AS 2127—1992) as amended by the Principal and Conditions as detailed in the Annexure Part B

2.2 CONTRACT DOCUMENTS

Further to Clause 8 of the General Conditions of Contract, the work shall be performed in accordance with the following documents:

- Any Special Conditions of Contract as agreed upon before a formal agreement is executed
- The General Conditions of Contract
- The Drawings
- The Specifications

If there is any conflict between the Contract Documents then:

- The provisions of the Special Conditions shall be paramount
- The provisions of the Drawings shall take precedence over the Specification
- The provisions of the Specification shall take precedence over the General Conditions of Contract

2.3 CO-OPERATION

Further to Clause 27 of the General Conditions of Contract, the Contractor shall make all reasonable effort to perform the Work under the Contract in such a manner as to enable its Work to be performed without hindrance to others. No claim will be considered arising out of such other work or interference there from.

2.4 CASH FLOW SCHEDULE

Further to Clauses 33 and 42 of the General Conditions of Contract, upon request the Contractor shall submit a cash flow schedule, in conjunction with the construction programme, setting out the value of work to be completed in each monthly period of the Contract.

2.5 DEFECTS LIABILITY PERIOD

Further to Clause 37 of the General Conditions of Contract, the Contractor shall note that the Contract has a Defects Liability Period as noted in the General Conditions of Contract, the period of the defects liability being stated in the Annexure Part A to the General Conditions of Contract.

2.6 NOTIFICATION OF VARIATIONS

Further to Clause 40 of the General Conditions of Contract, the Contractor shall notify the Superintendent verbally within 24 hours of any item he believes to be a variation to the Contract and provide written confirmation within 48 hours. The Contractor shall within 3 days provide full details including costings and extension of time he believes are warranted by the variation. Within 3 days of receipt of these details the Superintendent shall provide the Contractor with its assessment of the variation claim.

Variation claims which are not detailed as stated in this clause will not be assessed and there will be no basis for further claim.

2.7 STAGING AND CONSTRUCTION PROGRAMMES

Further to Clause 33.2 of the General Conditions of Contract and within three (3) days after the Date of Acceptance of Tender, the Contractor shall forward to the Superintendent a detailed Staging Programme setting out the order and stages in which the construction work will be carried out.

The Contractor shall submit to the Superintendent within seven (7) days after acceptance of Tender, a detailed Construction Programme outlining all works. Each of the nominated and approved Sub-Contractor's must be in full agreement with the programme. The programme shall be signed off by all nominated Sub-Contractor's prior to submission to the Superintendent.

2.8 HOLD POINTS

The Contractor's attention is drawn to the below key hold points that will require approval before the contractor proceeds with the next stage of construction. The contractor is to show the below key hold points on the project programme and hold points requiring inspection are to be aligned where possible with scheduled project site meetings. Where photos can be provided, these may, at the sole discretion of the Superintendent be accepted in instances where site inspections are not practical. The contractor shall provide a minimum of 2 days' notice of the requirement for an inspection. Any delay to programme as a result of organising inspections will not be accepted.

All hold points will require sign-off by Superintendent or their representative, any works completed beyond nominated hold points without approval will risk being rejected, with removal and demolition at the contractors expense.

PROJECT PRELIMINARIES
Including but not limited to:

- Dilapidation Report
- SMP, EMP and Risk Register
- Traffic Management Plan
- Site Office, Fencing and Access
- Dial-before-you-dig

SET-OUT
Including but not limited to:

- Existing Tree Protection
- Completion of site survey
- Paving set out
- Furniture and Equipment set out

EARTHWORKS
Including but not limited to:
- Completion of earthworks

WALLS, STEPS AND PAVING
Including but not limited to:
- Sample panel of paving

FURNITURE
Including but not limited to:
- Pre-pour inspection of footings

SOFT WORKS
Including but not limited to:
- Final greenstock report including nursery source
- Photos of any substitutes
- Photos of all tree stock
- Soil conditioner sample
- Mulch sample
- Completion of soil preparation (turf and planting)
- Completion of planting prior to mulching

2.9 EXTENSION OF TIME

Further to Clause 35.5 of the General Conditions of Contract, a claim for extension of time arising from a work variation requested by the Superintendent will be solely assessed on the effect that the variation has on the critical path of the works programme.

A claim for extension of time arising from inclement weather conditions will be assessed on the effect rather than the occurrence.

Where such a claim is based on wet weather, only those wet days in excess of the average monthly number of wet days will be assessed on effect on the critical path of the works programme. The monthly average shall be as determined by the Bureau of Meteorology for the locality of the Works. To determine the average wet days a wet day shall be defined as a calendar day with at at least 10 mm of precipitation. Refer to Bureau of Meteorology Mean Number of days of rain ≥ 10 mm.

For the purpose of determining a claim for an extension of time a wet day shall be a day having rainfall equal to or in excess of 10mm as recorded by the Bureau of Meteorology for that locality.

2.10 LIQUIDATED DAMAGES

Further to Clause 35.6 of the General Conditions of Contract, Should the completion times nominated in the Contract be extended, the Principal will be subjected to additional costs including Consultancy fees for construction supervision and Contract administration, delayed sales, etc.

The amount for liquidated damages nominated in Annexure Part A has been based on the assessment of these costs and may be applied by the Principal in accordance with the provisions of the General Conditions of Contract.

Liquidated damages specified in Part A of the Annexure to the Australian Standard General Conditions of Contract will apply.

2.11 WORKING HOURS AND DAYS

Further to Clause 32 of the General Conditions of Contract, the Contractor may work between the hours of 7.00 a.m. to 6.00 p.m. Mondays to Fridays and 7.00 a.m. to 4.00 p.m. Saturdays with no work being permitted on Sundays. Under special circumstances and subject to the approval of the local authority and the Superintendent, the working hours may be increased.

The Contractor shall notify the Superintendent of its work start and finish times and working days prior to commencement of the Works on the Site.

2.12 MEETINGS

Further to Clause 33 of the General Conditions of Contract, the Superintendent shall call Site Progress Meetings as necessary. The Superintendent shall chair the Site Progress Meetings and record and distribute the Minutes.

The meetings may include the Contractor, the Superintendent, the Principal or its representative, Consultants and others required from time to time and the Contractor shall allow in the Contract Sum for attending such Site Progress Meetings and shall arrange to diligently carry out the progress of the Works as discussed or arranged at such meetings. The Contractor shall provide progress reports and Programme updates at these meetings or as otherwise called for by the Superintendent, in a format acceptable to the Superintendent.

2.13 SITE AND PUBLIC SECURITY

Further to Clause 15 of the General Conditions of Contract, the Contractor shall monitor and control wherever practicable, the access of all persons to the Site.

The Contractor shall ensure that no persons, including friends and relatives (particularly children) of employees and the representatives or organisations unrelated to the Contract, enter the Site without the express permission of the Contractor.

The Contractor is advised that residents / families currently live adjacent to the site, as such particular care and attention to the prevention of vandalism, theft and public injury is required. It is recommended that the site be rendered as secure as possible to prevent vandalism, damage or injury.

If, in the opinion of the Superintendent at any period of the contract and during all non-working hours maximum security cannot be maintained, the Contractor shall employ an approved static guard security service on the site.

The Contractor shall provide a temporary safety fence as required by the Work Health and Safety Act 2020 (the "Act") and the accompanying regulations (the "Regulations"). The Contractor shall also comply with any amendments that may be made to the Act and Regulations from time to time.

The Contractor shall allow in its Tender for vandalism and interference or disruption to work which may be caused by any person or personal either employs or not employed by the Contractor during the course of the contract.

2.14 CONTRACTOR'S SITE FACILITIES

Further to Clause 27 of the General Conditions of Contract, the Contractor may provide and maintain on the Site, facilities for its staff, workers and Sub-Contractor's including all necessary offices, stores, workshops, sheds, toilets and other facilities that are required. The standard and position of any such facilities and extent of clearing shall be subject to the approval of the Superintendent.

Buildings shall be of sound construction with good quality materials used throughout. The location, adequacy and general appearance of all buildings shall be approved by the Superintendent prior to their installation. The Contractor's attention is drawn to various requirements of the Specification of the storage of materials such as cement and steel reinforcement. The Contractor shall provide facilities satisfactory to the Superintendent for the storage of such materials.

All buildings and facilities used by the Contractor shall be cleared away and removed by it at no cost to the Principal on completion of the Works and the Site shall be left in a clean and tidy condition.

An access road to this area shall be constructed by the Contractor as required and maintained in a dust-free condition throughout the duration of the Contract. Upon completion of the Works this access shall be removed and the ground restored to its original shape and level to the satisfaction of the Superintendent.

Areas set aside for the location of these facilities shall be away from significant stands of vegetation. To prevent the soil around tree roots being compacted, vehicles and equipment shall not be driven or parked under trees.

Storage sites for oil and other contaminant materials and plant maintenance areas shall be confined to specially designed areas within the Site in case of spillage. These areas shall be approved by the Superintendent and shall ensure that any spillages are confined. Adequate quantities of suitable material to counteract spillages shall be kept on hand.

2.15 SANITATION ON WORKS SITE

Further to Clause 27 of the General Conditions of Contract, approved temporary toilet facilities may be provided by the Contractor and maintained in a clean, tidy and hygienic state. All traces of the facilities shall be removed and the ground surface disinfected on Practical Completion of the Works.

2.16 SITE SIGNBOARDS

Further to Clause 27 of the General Conditions of Contract, within seven (7) days of commencing work on the site the Contractor shall erect or cause to be erected a project signboard and an information signboard in a location approved by the Superintendent. The Contractor shall maintain these signboards in good condition during the currency of the Contract.

2.17 ADVERTISING

Further to Clause 8 of the General Conditions of Contract, the Contractor shall not exhibit or permit to be exhibited any advertisement on the Site or any land to which it has access under the Contract, without the written permission of the Superintendent.

2.18 CONTOURS AND LEVELS

Further to Clause 28 of the General Conditions of Contract, contours and levels provided on the Drawings to show existing levels shall be deemed to be the level used in preparation of the Tender.

If it can be shown on the date of possession of the site by the Contractor, or within 48 hours of that date, that the existing levels differ from the levels shown on the Drawings by an amount which would change the quantity of any of the work to be executed under the Contract by more than 10% of the quantity calculated from the levels shown on the Drawings, the Contract sum shall be adjusted accordingly. Any other adjustment will be at the contractor's cost.

2.19 STRUCTURAL DESIGN BY CONTRACTOR

For Items scheduled in Section C:GENERALLY, it is the Contractor's responsibility to have all elements requiring structural design i.e. footings, walls and all structures detailed by a qualified, practicing Structural Engineer.

The Contractor shall ensure that Council Approvals and Building Licences/Permits have been received for all works prior to construction unless otherwise authorised.

The Drawings supplied at Tender are for Tender and for design guidance only as indicated on the plans. The Contractor shall submit final details to the Superintendent first in draft and then followed in the form of structurally certified documentation and shop Drawings. Approval from the Superintendent is to be granted prior to submission by the Contractor to Council for approval and construction.

2.20 STRUCTURAL DESIGN BY PRINCIPAL

For Items scheduled in Section C:GENERALLY, all elements requiring structural design i.e. footings, walls and all structures shall be detailed by a qualified, practicing Structural Engineer engaged by the Principal. Any additional drawings that are required under the Contract specifically to assist in the method of construction ie for the purposes of erecting, propping or lifting components and the like remain solely the responsibility of the Contractor (refer Clause 7.22 Temporary Works).

The Contractor is entitled to review the Drawings and amend details to improve the efficiency of construction however all revised structural elements are to be then certified by a qualified, practicing structural engineer engaged by the Contractor. Revised and certified details are to be submitted to the Superintendent for approval.

The Contractor shall ensure that Council Approvals and Building Licences/Permits have been received for all works prior to construction unless otherwise authorised.

2.21 SHOP DRAWINGS

All fabrication details are to be submitted by the Contractor to the Superintendent for approval as Shop Drawings prior to the commencement of fabrication. Submitted Drawings are to be in AutoCAD 2013 format and laid out using standard international Drawing protocols. Submit shop Drawings in a timely manner, allowing a minimum of 14 days for examination prior to return.

Shop drawings will be reviewed for general conformance with design concept only. Comments on "examined" shop Drawings will apply to general principles of design only. Examination of the Drawings by the Superintendent or Consulting Engineers will in no way relieve the Contractor's responsibility for any errors, omissions or necessity of furnishing such workmanship or materials as may be required for the completion of these works in accordance with the Contract documents. The design drawings, the specification and all relevant Standards shall all have priority over the examined shop drawing.

2.22 TEMPORARY WORKS

The Contractor is wholly responsible and liable for the design and construction of all temporary works in relation to the Works.

When requested by the Superintendent, the Contractor shall forthwith supply full details of any proposed temporary works.

The submission of calculations or details shall not in any way limit the liability of the Contractor nor be seen as an admission of liability on the part of the Principal or the Superintendent.

2.23 BUILDING LICENCE/PERMIT APPLICATION

The Contractor shall submit to the Local Government Authority all Building Licence/Permit Applications as required, inclusive of all fees, charges, and structural advice for approval where required. On each occasion the Contractor shall allow for the engagement of an independent building certifier/building surveyor to certify the Works and submit a 'Certified' BA1application in accordance with the requirements of the Local Government Authority. All fees, charges and costs associated with each submission and the cost of engaging the certifier/ building surveyor are to be met by the Contractor.

The Contractor shall confirm the presence or receipt of approved Structural Drawings within the Contract or by the Superintendent prior to commencing works.

A copy of all building licence/permits, applications and approvals shall be provided to the Superintendent as they are lodged, processed and approved. The Contractor shall ensure they have access to or are knowledgeable of the status of and /or have copies of all approvals, structural designs and building applications at all times.

2.24 AS-CONSTRUCTED SURVEY

Further to Clause 8.4 of the General Conditions of Contract, the Contractor shall, at appropriate stages of the Works make access to the Works available to a Surveyor engaged by the Contractor to provide 'As Constructed' surveys and prepare Drawings for submission to the relevant authorities. Refer to Section C: GENERALLY for detailed requirements.

2.25 EXISTING SERVICES

Further to Clause 28 of the General Conditions of Contract, prior to commencing the Works on the Site, the Contractor shall obtain a full set of Civil Earthworks and Roadworks and Services Drawings and familiarise themselves with the scope of the works potentially impacting upon the works under this Contract. The Contractor shall make inquiries of all Service Authorities via 'Dial before you Dig' and determine the location of all services including upon adjacent sites. Furthermore, the Contractor shall engage an authorised Service Locator to attend site and determine the depth of each service. These locations and depths shall be clearly shown on the Site and on existing service Drawings and prominently displayed in the Contractor's site office. The Contractor's workforce shall be made aware of the locations of all services and the need for protection. Services shown on the landscape plans are indicative only.

The Contractor shall take all precautions necessary to prevent damage to existing fencing, drainage structures, telephone and power lines, water mains and services and/or other improvement during the performance of the Works. Any damage caused by the Contractor shall be made good by the Contractor at the expense of the Contractor or the Superintendent shall arrange for such damage to be made good by others and for the costs involved to be deducted from payments due to the Contractor. The Contractor shall establish what services or improvements exist or are under construction at the Site of the Works.

Any damage caused by the Contractor to any existing services shall be notified immediately to the Superintendent and to the Service Authorities or persons concerned.

Negligence by the Contractor in managing and supervising the protection of services shall be sufficient cause for the Superintendent to direct the Contractor to remove relevant persons from the Site or from any activity connected with the Works, in accordance with Clause 26 of the General Conditions.

2.26 PLANT AND EQUIPMENT

Further to Clause 33 of the General Conditions of Contract, if at any time during the progress of the works, plant or equipment appear to the Superintendent to be insufficient, inefficient or inappropriate to secure the quality of work required, or the proper rates of progress, the Superintendent may order the Contractor to increase their efficiency, improve their character, augment their number, or to substitute plant or equipment as the case may be. And the Contractor must conform to such orders.

Failure by the Superintendent to demand such variations or additions shall not relive the Contractor of its obligations to secure the quality of the work and the rate of progress necessary to complete the work within the time required by the Contract and to the requirement of the Contract.

2.27 GUARANTEES AND WARRANTIES

Further to Clause 30 of the General Conditions of Contract, the Contractor shall obtain guarantees as specified in the Contract The Contractor shall provide warranties for the works except where this is not reasonably possible and where he has so notified the Superintendent in writing before the work of the relevant Sub-Contractor has been processed.

The Contractor shall ensure that the Principal shall have the benefit of the guarantees including any guarantees specified in the Contract that are to be obtained by Sub-Contractors of the Contractor. As soon as possible after Practical Completion and before the issue of the Final Certificate the Contractor shall produce such specified warranties or equivalent warranties to be effectively transferred or issued directly in favour of the Principal so that thereafter the warrantors shall be directly responsible to the Principal.

Unless otherwise specified, guarantee periods shall begin on the Date of Practical Completion.

2.28 PROTECTION OF PEOPLE AND PROPERTY

Further to Clause 15 of the General Conditions of Contract, the Contractor shall:

- at its own cost provide all things and take all measures necessary to protect people and property on or adjacent to the Site;
- prevent nuisance and unreasonable noise and disturbance.
- ensure the safety of all traffic on the Site and
- be responsible for any injury, accident or damage arising from the failure of the Contractor to take precautions or perform its obligations under Clause 15 of the General Conditions of Contract.

Without limiting the generality of the Contractor's obligations, they include the provision of barricades, guards, fencing, temporary roads, footpaths, warning signs, lighting, watching traffic flagging, safety helmets and clothing, removal of obstructions and protection of services.

If the Contractor or the employees or agents of the Contractor damage property, including but not limited to public utilities and services and property on or adjacent to the Site, the Contractor shall promptly make good the damage and pay any compensation which the law requires the Contractor to pay.

If the Contractor fails to comply with an obligation under this Clause, the Principal may, in addition to any other remedy, arrange for others to perform the obligation on the Contractor's behalf and the cost incurred by the Principal shall be a debt due from the Contractor to the Principal.

2.29 SAFETY PLAN

Further to Clause 15 of the General Conditions of Contract, the Contractor shall comply with the Work Health and Safety Act 2020 (the "Act") and the accompanying regulations (the "Regulations"). The Contractor shall also comply with any amendments that may be made to the Act and Regulations from time to time.

The Contractor shall be solely responsible for ensuring that wherever practicable, its employees and those of its Sub-Contractors are not exposed to hazards. The Contractor shall ensure that all employees are suitably trained and qualified to carry out the Work under the Contract, and that all work permits have been obtained before the commencement of work. The Contractor shall at all times use proper and safe plant and equipment and to ensure that all employees using the equipment are adequately trained, instructed and supervised in the safe operation of the equipment.

The Contractor shall within 2 weeks of the Date of Possession of Site submit to the Superintendent a Safety Plan in accordance with the Act and Regulations noted above. This shall cover but is not limited to:

- Training, Operation and Requirements of employees operating on site
- Training, Operation and Requirements of Sub-Contractor's operating on site
- Training, Operation and Requirements of Plant and Machinery operating on site
- Reporting procedures
- Risk management
- Liaison and co-ordination of Safety procedures with other Contractor's on Site
- Protocols for dealing with service providers and Government Agencies
- Emergency Response Procedures

The Contractor shall submit a report once a fortnight (as a minimum) on all safety matters to the Superintendent.

The Principal has the right to conduct safety and health audits. Safety and health audits may also be applied to Sub-Contractor's, where applicable. The Superintendent and the Principal's Safety and Health Officer shall be entitled to inspect all registers, reports and certificates required by statute to be kept by the Contractor in respect of safety and health matters applicable to the Contract. A copy of all accident reports or reports of dangerous occurrences occurring in relation to the Contract shall be provided to the Superintendent and the Principal's Safety and Health Co-ordinator as soon as practicable.

Prior to the commencement date, the Contractor shall provide to the Superintendent and the Principal's Safety and Health Co-ordinator, details of all hazardous substances to be brought on site to be used for the purpose of the execution of the work under the Contract.

The Superintendent has the right to suspend the carrying out of the whole or part of the Works under the Contract if in the opinion of Superintendent; the Contractor fails to provide for the protection or safety of any person or property.

The Contractor shall note that at certain times during the construction their work may involve construction within a site under the contractual possession of another Contractor (Main Contractor). It is a requirement of this Contract that all personnel complete a safety induction in accordance with the Safety Plan of the Main Contractor prior to commencing works. The Contractor shall ensure all of their personnel including Sub-Contractor's and delivery personnel are inducted to the site prior to entering.

The Contractor shall liaise with the Main Contractor and co-ordinate their own works and personnel in order to minimise conflict and maximise safety and efficiency of operation.

2.30 THE SITE – CIVIL PROTECTION/ADJACENT WORKS

Further to Clause 27 of the General Conditions of Contract, access onto and around the Site shall be as approved by the Superintendent.

Further to Clause 15, 16 and 17 of the General Conditions of Contract, the Contractor shall provide, erect and maintain barricades, guards, fencing, temporary roadways, footpaths, signs and lighting. It shall provide and maintain all watching and traffic flagging lawfully required by any public or other authority or necessary for the protection of the Works or of other property or for the safety and convenience of the public and others and shall remove same when no longer required.

The Contractor shall avoid obstruction or damage to roadways and footpaths, drains and water courses and public utilities and other services on or adjacent to the Site which are visible, or the location of which can be ascertained by the Contractor from the appropriate authority or from the Contract.

Further to Clause 28 of the General Conditions of Contract, where the Works include extensions of or are adjacent to existing works, the Contractor shall be responsible for making the proper junction between the sections of work and for making good any damage to the adjacent or existing works. The Contractor shall ensure that the adjacent or existing works conform in level and location with those shown on the Drawings before commencing any work on the Site.

The Contractor shall remove any obstruction immediately and make good any damage at its own cost; in default of which the Principal may employ and pay others to execute the work and recover the cost as a debt due to the Principal from the Contractor under the Contract.

The Contractor shall avoid interference with or damage to property on or adjacent to the Site and shall provide temporary protection and shall repair and reinstate all damage caused thereto by it either directly or indirectly.

The Contractor shall prevent nuisance to the owners, tenants or occupiers or properties adjacent to the Site and the public generally.

The Contractor shall be responsible at its own cost for all footpath and other deposits or bonds required by statutory authorities.

2.31 ADVISORY NOTICES

In accordance with EPA and Local Government requirements based on the classification of the site the Contractor shall issue Advisory Notices to adjoining land occupiers, the local authority and the EPA at least 48 hours before site works commence. The notice shall include details for the contractor, consulting engineer, Contract period and site classification. The notices shall be in a format approved by the Superintendent prior to issue.

2.32 PROCEDURE FOLLOWING DUST RELATED COMPLAINT

Following receipt of a dust related complaint by either the Contractor or Superintendent, assessment and procedure to be followed shall be in accordance with Appendix 3 of the EPA Guidelines. If it is the Superintendent's opinion that wind borne material has been deposited outside the site as a consequence of the Contractors failure to undertake adequate control measures the Superintendent may direct the Contractor to remove this material within 24 hours at the Contractors expense. The Contractor shall pay for the rectification of damage resulting from the wind borne material.

2.33 DILAPIDATION SURVEYS

Dilapidation surveys will be conducted on existing buildings in the vicinity of the works by a third party qualified assessor, appointed by the Contractor. The surveys will be conducted prior to works commencing on site. Reports from the dilapidation surveys will be issued to the Principal and property owner prior to the commencement of works in the relevant area.

The extent of the dilapidation surveys will be agreed by the Principal and the Contractor's Representative, however, direction will be provided by the Superintendent in order to help identify the properties at risk of potential damage.

Following the dilapidation surveys, a risk assessment will be conducted for all the buildings surveyed. Where the assessed risk of damage to the building is high, monitoring of vibration will be put in place prior to works commencing, and, protective measures installed to preserve the building.

2.34 TRAFFIC MANAGEMENT

Further to Clause 15 of the General Conditions of Contract, the Contractor shall submit full details of proposed traffic management measures to the Superintendent as part of its Safety Management Plan. Management procedures are to be in accordance with the relevant Australian Standards and adhere to Commonwealth, State and Local Government regulations, policy and/or guidelines.

The Contractor shall construct the Works with the least possible interference to public traffic. Public roads and driveways shall remain open at all times for the safe movement of traffic. In addition, the Contractor shall maintain the existing road as necessary for this purpose.

Where the amount of dust raised by the traffic or by construction works causes a hazard to public traffic, then the Contractor shall take action, such as watering, to eliminate the hazard. In dry conditions, watering shall be undertaken a minimum of four times per day. The cost for such action shall be included under the lump sum cost for the Contract.

The Contractor's plant and equipment shall not cross over existing roads during construction operations without prior approval of the Superintendent as to the proposed methods of traffic control including flagmen.

The Contractor shall not direct public traffic onto the completed Works from the existing road or sidetracks without obtaining prior written approval from the Superintendent.

Further to Clause 15 of the General Conditions of Contract, the Contractor shall supply signs, cones, lights and any other necessary equipment and erect and maintain same in good condition in accordance with local authority requirements the relevant Australian Standards or as instructed by the Superintendent. Maintenance of signs includes washing to ensure night visibility.

Works such as trenches or spoil heaps and other hazards shall be individually signed and barricaded at all times and equipped with warning lamps at night notwithstanding that the area in question may not be open to traffic at the time. All sections being widened or excavated shall have, at all times, the edge of the widening or excavation clearly indicated by delineators and steady amber lights.

2.35 POLLUTION AND ENVIRONMENT

Operations

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contractor shall conduct its operations in a manner that will minimise damage to the environment on the Site and minimise pollution on the Site and the Contractor shall comply with the requirements from time to time of all Acts (including Codes and Laws) of Parliament (whether State or Federal) and with the lawful requirements of public, municipal and other authorities, including the Environmental Protection Authority, in any way regarding pollution.

Noise and Vibration

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contractor shall at all times take adequate measures to control noise and vibration on site. The Contractor shall comply with all statutory requirements relating to control of noise and vibration levels on site and take all necessary precautions to minimise nuisance from noise and vibration and ensure that all Sub-Contractor's observe similar care.

The Contractor shall be responsible for carrying out all monitoring in accordance with local government requirements and associated costs on the instructions of the Superintendent.

The Contractor shall arrange its operations and shall provide silencing and or damping equipment to its plant, at its own expense, to whatever extent is necessary to satisfy the requirements of the Local Authority Health Department in relation to the sound and vibration level arising from the Contractor's operations near the boundaries of existing occupied properties.

Soil Erosion

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contractor shall take all proper precautions to prevent soil erosion from any land used or occupied by the Contractor in the execution of work under the contract.

Stockpiles

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the height of stockpiles shall be kept to less than 3 metres high. Stockpiles include topsoil material and trench excavation. As with all other disturbed ground, stockpiles shall be kept wet down. The Contractor may wish to give consideration to the use of temporary stabilisation measures at the Contractor's expense.

No Discharge

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, no rubbish, litter, waste, oil, bilge water or other pollutants shall be discharged or allowed to escape from the Contractor's equipment or from its Sub-Contractor's' equipment. The Contractor shall take all reasonable measures including instructing its employees and its Sub-Contractor's in such matters and shall ensure that its employees observe and perform the requirements of this Clause. All debris, spoil, rubbish or materials shall be suitably contained and covered in vehicles during transportation to or from the site to prevent spillage or contamination of adjoining and other areas of property. The Contractor shall maintain vehicles, wheels and tracks in a suitable clean condition to prevent transfer of mud onto adjacent streets or other areas. All site refuse (including foodstuffs) shall be handled and disposed of in accordance with the requirements of relevant statutes and to the approval of the Superintendent.

Smoking on Construction Sites

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contractor shall at all times ensure that all workmen and visitors on the construction site comply with the following policy on smoking. In respect of construction sites, smoking is prohibited:

- In site offices, lunchrooms or enclosed toilet facilities; and
- Inside existing premises that are designated 'no smoking' areas.

Fire Control

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contactor shall comply with all the conditions of the Bush Fires Act 1954 (as amended).

Flora and Fauna

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contractor is to note that it is an offence under the Wildlife Conservation Act 1950 to remove or disturb Rare and Declared Flora or Fauna populations unless written permission is obtained from the Minister for the Department of Environment and Conservation.

Aboriginal Sites

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, should the presence of a site of possible significance be discovered, the Contractor shall notify the Superintendent and the Department of Indigenous Affairs and immediately cease work within the area. The Contractor is to note that it is an offence under the WA Aboriginal Heritage Act 2021 to interfere with any Aboriginal site unless written permission is obtained from the Minister for Indigenous Affairs.

2.36 DUST AND WIND BLOWN SAND

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, the Contractor shall take all necessary measures to prevent dust and sand from being lifted by wind and carried onto land outside the site of the works.

The site shall be assessed in accordance with the EPA Guidelines and the risk of dust nuisance rated accordingly. Provisions including contingency arrangements for each classification are given in the EPA Dust Control Guidelines and it shall be the Contractor's responsibility to be aware of the required provisions and be capable of implementing both the provisions and contingency arrangements as directed by the Superintendent.

The Contractor shall accept responsibility for preventing aeolian movement of sand, dust or soil from within the site of the works and shall indemnify the Principal against any claims which may arise as a result of aeolian movement of sand, dust or soil from within the site of the works however valid those claims may be. The Contractor shall arrange its operations so that existing vegetation and topsoil are preserved in all areas except those on which fill is to be placed on or in which excavation is to take place or those areas which are defined in this Specification as areas for occupation or access.

Any over-clearing shall be reinstated by the Contractor with vegetation of similar species and maturity, at its expense. All access tracks and other disturbed areas shall be regularly watered to prevent wind erosion. The Contractor shall on request, within 24 hours, remove from public roads and other land outside the Site sand or dust wherever the Superintendent considers the sand or dust originated from the site of the works.

Where a resident has made a complaint of dust nuisance, the Contractor shall contact the affected party within two (2) hours of being notified of the complaint. The Contractor shall forward a report to the Superintendent within the subsequent two (2) hours detailing:

- The nature of the complaint
- The Contractor's assessment of the complaint
- The Contractor's proposed course of action

In the event that complaints are received from neighbouring properties in respect to airborne dust, the Superintendent shall determine whether the Contractor is and has been taking appropriate action, and further determine whether the Contractor shall immediately initiate any or all of the following at the request of the Superintendent.

Sand and Dust from External Sources

Where dust and sand is being deposited or may be deposited on the area of the Works (the Site) from external sources the Contractor shall immediately notify the Superintendent so as to enable mitigation measures to be enacted. The Contractor shall be responsible for investigating the source of external dust and sand which shall be verified by the Superintendent. The Contractor shall take all reasonable measures to prevent dust and sand from being lifted by wind and carried onto the Site from sources outside the site of the works. The Contractor's responsibility shall be limited to the erection of wind fencing to the Site Boundary and the physical removal of any deposited material within or on the Site or collected adjacent to the Contractor's wind fencing.

Wind Fencing

Further to Clause 15,16,17 and 39 of the General Conditions of Contract and following the identification of a threat of windblown dust or sand, wind fencing (1200 high) shall be erected at the Contractor's cost prior to the commencement of any further works and shall be maintained for the duration of the construction and consolidation period that follows. Suitable material such as hessian cloth/shade cloth shall be affixed to the fencing along its full length and height. Structural adequacy of the fence shall be the responsibility of the Contractor.

The Contractor at no cost to the Principal shall immediately repair any damage that occurs to the wind fencing.

The Contractor shall also allow for removing any sand that accumulates at the foot of the wind fencing, placing it within the site as directed by the Superintendent. These actions may need to be undertaken on a regular basis. The Contractor shall remove and dispose of wind fencing at the completion of the project.

Stabilisation

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, when instructed by the Superintendent, the Contractor shall carry out stabilisation of disturbed areas within the Works area within 48 hours.

Suspension of the Works

Further to Clause 15,16,17,34 and 39 of the General Conditions of Contract, in the event that extreme weather conditions make the control of wind-blown sand difficult, the Contractor shall immediately notify the Superintendent. The Superintendent shall determine whether the Contractor is and has been taking appropriate action, and further determine whether earth working operations should be suspended.

Where such action for suspension does not mean loss of greater than 4 hours per day, the costs shall be borne by the Contractor. The Contractor may claim the cost of equipment stand down beyond 4 hours per day. The duration of the suspension shall be ended immediately upon the Superintendent's instruction.

Failure to Comply

Further to Clause 34 of the General Conditions of Contract, where the Superintendent at its sole discretion determines the Contractor has not been taking appropriate action or work as required under the Contract to minimise dust nuisance and the Contractor further fails to initiate actions or work as requested by the Superintendent within 24 hours including additional work as requested by the Superintendent shall entitle the Superintendent without any further notification to the Contractor to arrange for the work or initiate actions. The cost of

such work or actions including time required by the Superintendent in organising the work or actions shall be deducted from the Contract Sum.

Water Carts

Further to Clause 15,16,17 and 39 of the General Conditions of Contract, sufficient water carts and adequate volumes of water shall be allowed for in the Tender Sum and used during the Contract to keep all disturbed areas wet and shall be available for a minimum of 10 hours per day, including Saturdays & Sundays. The water carts shall be able to traverse all areas of the site, and be of not less than 10,000 litres capacity per 5 hectares of disturbed site and shall be fitted with a pump and automated spray to damp down disturbed areas and stockpiles. Non disturbed areas within the site boundary that are the source of windblown sand are also to be watered down. Where adequate water carts have not been provided and operated at the request of the Superintendent within 4 hours an amount of $1,000.00 including GST shall be deducted from the Contract Sum per day of non-compliance to the Superintendent's direction. The method of refilling shall be such that at least 1 water cart is in operation at all times. At least one water cart is to remain full at the end of each day so that it may be immediately used the following morning.

2.37 CHEMICAL INFORMATION

Further to Clause 29 of the General Conditions of Contract, the use of chemicals specified or required during the currency of this contract shall comply with the Work Health and Safety Act 2020 (the "Act") and the accompanying regulations (the "Regulations"). The Contractor shall also comply with any amendments that may be made to the Act and Regulations from time to time, concerning information on chemical substances.

The Contractor shall ensure manufacturers, importers and suppliers of chemical substances for use on the works, are responsible for providing information on those substances to be used, refer to section 23(3) of the Act. Copies of all information supplied shall be kept on site. The Contractor is responsible for passing on information supplied by manufacturers, importers and suppliers of chemical substances to workers on site, refer to section 19(1)(B) of the Act.

2.38 CLEAN-UP OF POLLUTION

Further to Clause 38 of the General Conditions of Contract, the Contractor shall as soon as practical and at its own expense clean up any pollution caused by it or its Sub-Contractor's in the course of performing the work under the Contract.

2.39 INCLEMENT WEATHER

Further to Clause 16 of the General Conditions of Contract, the Contractor shall, at its own expense, provide all plant, materials and labour necessary to protect the works from damage from inclement weather (Inclement weather shall be defined as that which is wet or with temperature in excess of 37.5 degrees centigrade. A wet day shall be a day having rainfall equal to or in excess of 5mm as recorded by the Bureau of Meteorology for that locality.

Only those wet days in excess of the average monthly number of wet days will be assessed on effect on the critical path of the works programme. The monthly average shall be as determined by the Bureau of Meteorology for the locality of the Works.

Low points or excavations where water may collect shall be kept thoroughly drained by mechanical or gravitational means. Drains or water courses utilised for this purpose shall be maintained to the satisfaction of the Superintendent.

The Contractor shall prevent, in so far as reasonably possible, any materials entering any gully, manhole or pipe, and shall remove from the drainage system any materials from any source which may be deposited in the drainage system by any agency up to the date of Practical Completion.

2.40 LOCAL AUTHORITY REQUIREMENTS

Further to Clause 14 of the General Conditions of Contract, all work shall meet the requirements of the Local Authority and other relevant authorities who will inspect the Works from time to time to ascertain whether the standard of work meets their respective requirements.

Local Authority is:
City of Wanneroo
23 Dundebar Rd, Waneroo WA
Ph: 9405 5000

2.41 INDUSTRIAL AWARDS, DISPUTES AND PAYMENTS

Further to Clause 14 of the General Conditions of Contract, notwithstanding anything herein mentioned to the contrary:

- With respect to all work done in Western Australia under the Contract, the Contractor shall observe, perform and comply in all material respects with all relevant industrial agreements and orders to competent Courts or Industrial Tribunals applicable to the work to be done under the Contract.
-
- Failure by the Contractor to comply with sub-clause (i) hereof shall entitle the Principal by notice in writing to the Contractor to forthwith terminate the Contract but without prejudice to any other rights or remedies of the Principal.

Disputes

The Contractor shall resolve any industrial disputes that may arise during the course of construction for any reason, with no additional cost being borne by the Principal. For the purposes of Clause 35.5 of the General Conditions, only industrial actions encompassing the state-wide operations of the affected industry shall be considered.

Payments

The Contractor shall allow for any site allowance payments and this amount, if any, shall be included in the Contract Lump Sum.

The Contractor shall make payment of the required levy to the Building and Construction Industry Training Fund. Payment shall be made prior to the commencement of any construction work, and evidence of payment provided to the Superintendent. The Contractor shall be

responsible for any penalty charges, which may be incurred due to late payment. These payments shall be included in the Contract Lump Sum.

SECTION C TECHNICAL SPECIFICATIONS

3.1 LOCATION OF WORKS AND ACCESS

The works area is located at Catalina Green, Clarkson The site shall be accessed off Bulburin Street and Conimbla Road. Refer to landscape plans for site access details. Limit all direct access from major roads where possible.

The Contractor shall advise the names and contact phone numbers (mobile) of all workers and Sub-Contractor's working on site for the duration of the works.

All site delivery areas shall be as approved by the Superintendent prior to use and construction. The Contractor shall conform to all relevant Traffic Management standards and practices as specified and/or relevant Australian Standards.

Deliveries, access and transport shall be confined to standard working hours.

3.2 DESCRIPTION OF WORKS

The works shall include the provision of all materials, labour, equipment and cartage as necessary for the due and proper completion of the Works comprising, but not limited to, the following:

- Earthworks and clearance
- Interpretive signage
- Concrete paving
- Soilworks and final grading
- Soft landscaping
- Furniture
- Complete aftercare and maintenance of all landscape works (including conservation) throughout the 13 week consolidation period.

3.3 WORKS BY OTHERS

The Works shall be undertaken in conjunction with works carried out by others as part of the project particularly, but not limited to:

- Civil engineering and services
- Bulk earthworks
- Road construction
- Street lighting installation

The Tenderer for the Contract shall be deemed to have taken into account this coordination role in its Lump Sum price. The Contractor shall cooperate with others and allow free access by others as required or ordered by the Superintendent to enable those other works to be completed.

All edge finishes, backfill, final adjustment to finished level of aeration network and topping up of sand cover to liner will be the responsibility of the Contractor. Allowance shall be made for co-ordination of these works with the Civil Contractor undertaking the liner works.

In the instance where structures to be constructed under the landscape contract require penetrations of the liner, the Contractor shall allow for the early installation of footings, sleeves etc. using approved detailing to allow the Civil Contractor to complete a watertight seal. The Contractor shall submit shop Drawings of such items for approval to the Superintendent prior to commencing fabrication.

3.4 NOMINATED SUB-CONTRACTOR'S / SUPPLIERS

Further to Clause 10 of the General Conditions of Contract, the Principal has nominated the following Sub-Contractor's / Suppliers. The Contractor shall liaise with each Sub-Contractor / Supplier for all coordination of their works relative to other works taking place.

ITEM NO.	ITEM DESCRIPTION	NOMINATED SUB-CONTRACTOR / SUPPLIER
Nil	Nil	Include name and all contact details

Before selecting Sub-Contractor's from the above list the Tenderer must carry out their own assessment and satisfy themselves that the subcontract companies selected have all the necessary abilities to complete the work including technical, management and financial ability.

Failure to raise concerns with the nominated sub-contractor and a provide a suitable alternative during the tender process deems contractor acceptance of the nominated sub-contractor, placing full responsibility for the co-ordination, installation, timeframes,

workmanship, standards and quality on the head contractor. Following the tender process, if no concerns are raised, the nominated sub-contractors are no longer considered nominated.

3.5 MATERIALS SUPPLIED BY PRINCIPAL

Further to Clause 18 of the General Conditions of Contract, the Principal shall supply the following materials. The Contractor shall liaise with the Superintendent and the Supplier for all coordination of works relative to the supply of the materials listed.

ITEM NO.	ITEM DESCRIPTION	DETAILS OF LOCATION/DELIVERY
Nil	Nil	Include name and all contact details

3.6 STRUCTURAL DESIGN

All elements requiring structural design, i.e., footings, walls and all structures, shall be detailed and certified by a qualified, practicing Structural Engineer engaged by the Contractor.

3.7 AS CONSTRUCTED SURVEY AND DRAWINGS

In addition to the requirement for irrigation, electrical and similar "As Constructed" drawings as specified in the relevant sections of this document, the Contractor shall engage a licensed surveyor to undertake "As Constructed" surveys in accordance with the requirements of the current version of "A-Spec Digital Data Specification - Consultant/Developer Specifications for the Delivery of Digital Data to Local Government and Authorities" as applicable to the state of Western Australia and comprising the following:

- D-Spec - Stormwater Drainage Specification
- R-Spec – Road Specification
- O-Spec – Open Space Specification
- B-Spec – Buildings Specification
- T-Spec – Telecommunications Specification

Where landscaped areas are to be handed over to the Local Authority, the "As Constructed" survey shall record all information strictly in accordance with the current revision of the "O-Spec" standard for Open Space together with relevant sections of D-Spec and R-Spec, as applicable.

In addition to the standard requirements the OSpec ascon data for all landscaped areas shall include compaction testing for pavement layers to paths, access tracks, play surfaces, etc. Testing to be carried out by a NATA accredited organisation.

In order to comply with the requirements of "O-Spec", the surveyor engaged by the Contractor shall be responsible for provision of all services as itemised in the section titled: "Western Australia – Responsibility of the Developer", as applicable to a surveyor engaged by the Developer.

Copies of the above-mentioned specifications can be obtained from the A-Spec website: www.dspec.com.au

3.8 STAGING AND PROGRAMME

The Contractor's attention is drawn to the requirement to implement the works in stages. Allow for all limitations on access and mobilisations necessary to complete the works in accordance with the staged programme.

3.9 PROCUREMENT

Within the first week following award the Contractor shall provide a procurement register for all materials, furniture and equipment. This is to be updated fortnightly and provided to the Superintendent for review.

It is the Contractor's responsibility to ensure all material is ordered within the first week following award unless instructed otherwsie. If the Contractor fails to order within this time period, any costs required to ensure delivery on schedule so as not to delay the Practical Completion (air freight, express freight) are at the Contractor's expense. Failing this, the Contractor will be required to maintain the works for the period of time in which the equipment is delayed in addition to the Consolidation Period at no cost to the Contract.

In the event that this delay pushes the PC into a period where an LGA does not accept handover, the cost for the additional maintenance incurred to this period will be at the cost of the contractor. For example, certain LGA's do not accept handover during summer months, if the PC is scheduled before this period and then delayed, the cost of maintenance will be the responsibility of the contractor until the period where the LGA will accept handover.

3.10 LIMITATIONS ON ACCESS

The Contractor's attention is drawn to Works by Others and the limitations on access available.

3.11 TRAFFIC MANAGEMENT

The Contractor shall establish, implement and manage a Contract specific Traffic Management Plan (TMP) complying with the Contract, the Main Roads Western Australia (MRWA)'s Code of Practice Traffic Management for Works on Roads, Australian Standard AS 1742.3 - 2009, The Contractor shall comply with the Work Health and Safety Act 2020 (the "Act") and the accompanying regulations (the "Regulations"). The Contractor shall also comply with any amendments that may be made to the Act and Regulations from time to time.

The Contractor shall include for all costs associated with the preparation and implementation of the TMP, as required to implement the Landscape Works.

4.1 GENERAL

Scope of Works

This Specification covers all works included but not limited to:

- Mobilisation and site establishment
- Site setout
- General site clearance
- Earthworks, trimming and fine grading
- Works around existing trees
- Cutting and filling earthworks
- Removal of plant and equipment upon completion of works
- Supervision, inspection and testing

4.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated, or is not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS 1289 Methods of Testing Soils for Engineering Purposes
- AS1726 Geotechnical Site Investigations
- AS3798 Guidelines on Earthworks for Commercial and Residential Developments
- WA GOV Work, Health and Safety Act 2020
- AS 2436- Guide to Noise Control of Construction Maintenance and Demolition Sites".

4.3 TEMPORARY PROTECTIVE FENCE

Within five (5) working days of the Date of Possession of the site, the Contractor shall erect temporary protective fencing to the perimeter of all Public Open Space areas and to any other areas to be landscaped (verges, drainage basins and the like) that might be vulnerable to damage as described below.

The temporary fencing shall comply with the requirements of applicable Safety Plans and shall be sufficiently robust and secure to prevent the following activities occurring within the protected area for the duration of the Contract:

- creation and use of informal vehicle access routes
- vehicle parking.
- storage of plant, equipment and materials
- dumping of waste; and
- any other activities that are likely to be detrimental to the health of existing trees to be retained and/or might cause damage to undisturbed areas.

The temporary fencing shall be located to protect the whole of the Public Open Space/verge/basin areas on alignments to the approval of the Superintendent.

The Contractor shall be responsible for maintaining the fence as an effective barrier at all times throughout the Contract.

4.4 DUST, NOISE, VIBRATION AND OTHER ENVIRONMENTAL CONTROLS

Refer to PRELIMINARIES.

4.5 WORK NEAR EXISTING TREES

Protection

Protect trees specified or shown to be retained from damage by site works. Take necessary precautions as described below.

Harmful Materials

Do not store or otherwise place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks, even for short periods. Prevent wind-blown materials such as cement form harming trees and plants.

Damage

Prevent damage to tree bark. Do not attach stays, guys and the like to trees.

Work under trees

Do not add or remove topsoil within the drip line of trees. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged. Open up excavations under tree canopies for as short a period as possible.
It is critical for the survival of the existing trees that the health of the soil ecology be considered and therefore protection of the surrounding ground area is to take equal priority as the protection of the canopy.

Roots
Do not cut tree roots exceeding 50mm diameter unless approved by the Superintendent. Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, apply a bituminous fungicidal sealant to the cut surface to prevent the incursion of rot or disease.

Backfilling
Do not backfill around tree trunks to a height greater than 100mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Compacted Ground
Avoid compaction of the ground under trees. The parking of plant and storage of equipment under trees to be retained is not permitted.

Australian Standards
All works associated with the protection of existing trees shall comply with Australian Standard;
AS 4970 – Protection of trees on development sites

4.6 RETENTION OF EXISTING VEGETATION

Protection of existing vegetation
The Contractor shall note that great importance is placed on retention of any natural or significant vegetation in its current state, and thus the Contractor shall limit the movement of plant and equipment and stockpiling of materials to within the limit of the works to be cleared.

The amounts payable for significant damage (as determined by the Superintendent) or unauthorised clearing are as follows:

Type of Existing Vegetation	Penalty
Heritage tree (listed by State Heritage Office or Local Authority as having heritage value)	Cost of comparable replacement
Significant tree (8.0m and greater in either total height or canopy diameter)	Cost of comparable replacement
Medium tree (4.0 – 8.0m in total height)	Cost of comparable replacement (estimated to be $10,000 each)
Minor tree (1.0m – 4.0m in total height)	Cost of comparable replacement (estimated to be $1,000 each)
Shrubs	Cost of comparable replacement (estimated to be $20/square metre)
Existing Bushland	Cost of comparable replacement (estimated to be $100/square metre)
Existing Turf	Cost of comparable replacement (estimated to be $100/square metre)

For the purposes of this Specification a tree is all trees with a 200mm diameter trunk and greater, and one metre or greater in total height.

Contractor's should note that if clearing works extend beyond the prescribed limits without the written authorisation of the Superintendent, these costs will apply and be borne solely by the Contractor by reduction in monies payable under the Contract.

If the Contractor believes that for construction purposes, additional movement areas are required in the form of haul roads and/or access roads, they shall submit details of the proposed location and extent of these roads to the Superintendent for approval prior to their construction.

In addition to paying the costs of comparable replacements as specified above, the Contractor shall undertake to co-ordinate, manage and achieve any and all necessary approvals in relation to protecting and /or the rectification of damage to the satisfaction of the Superintendent, Local Authority and relevant agencies.

Trees to be transplanted by others
There are two existing trees nominated to be retained for transplantation purposes (transplantation works by others), within the Forward Works area.

These two trees (Tree 197 and Tree 189), as highlighted on the Tree Retention Plan C040 shall be protected by the Contractor by a Tree Protection Zone, as nominated in AS 4970.

4.7 CLEARING AROUND EXISTING TREES TO BE RETAINED

The Contractor shall undertake to remove all understorey vegetation from in between closely located existing trees to be retained as noted on the Drawings. In difficult to access areas between groups of existing trees, removal of grass, weeds and other deleterious material shall occur by hand or mechanical means as appropriate.

Note: No damage to trees to be retained is to be caused either above or below ground.

Arborist
When there is no option but to work in the immediate vicinity of existing trees that are to be retained, the Contractor is to organise for a qualified Arborist to be on site to oversee these works.

The Contractor is to engage, at the Contractor's expense, a qualified, experienced and reputable Arborist to oversee the demolition works in close proximity to any particular tree to be retained. The Arborist is to be contacted a minimum 3 weeks prior to the demolition works commencing to ensure appropriate scheduling of works.

4.8 VEGETATION REMOVAL

The Contractor shall note that trees to be removed and/or retained shall be tagged on site as follows. The Principal, Contractor and Superintendent shall agree to either;

- Tag trees to be retained, OR
- Tag trees to be removed, whichever is the lesser.

The Contractor shall not remove any trees or vegetation without seeking absolute clarity from the Superintendent in writing as to which option above has implemented.

All tree removal shall comply with the relevant Australian Standards and accepted industry standards, particularly but not limited to safety, adjoining property, insurance and pedestrian and traffic control. The Contractor shall be liable for any and all costs associated with damage or injury resulting from tree removal.

Grub out stumps and roots over 75mm diameter to a minimum depth of 500mm below Sub-grade in paved areas or below finished surface in unpaved areas. Backfill grub holes with suitable spoil from excavations compacted in layers to the density of the surrounding undisturbed soil.

All debris together with fallen timber shall be loaded, hauled and disposed of in a tip in compliance with statutory requirements or may if instructed be dumped as directed by the Superintendent.

4.9 WEED ERADICATION

All weed growth shall be eliminated throughout the landscape areas prior to commencement of any soil preparation or planting or grassing works. Weed eradication shall be undertaken by use of an approved non-residual herbicide such as "Roundup" or equivalent. Apply such herbicide only on windless days strictly in accordance with the manufacturer's written directions and any relevant health and safety regulations. The Contractor shall comply with the Work Health and Safety Act 2020 (the "Act") and the accompanying regulations (the "Regulations"). The Contractor shall also comply with any amendments that may be made to the Act and Regulations from time to time.

Following the application of the herbicide, the treated areas shall be left undisturbed for a minimum of seven (7) days 'ingestion' period prior to undertaking any further work in such areas.

4.10 STAGING OF VEGETATION REMOVAL

At the Superintendent's discretion the removal of vegetation may be staged in order to temporarily retain shade, screening, habitat, buffers and the like until future construction works occur.

The Contractor shall not remove any vegetation until instruction from the Superintendent in writing is provided as to the extent of staged clearing.

4.11 SETTING OUT OF WORKS AND INSPECTION

The Contractor shall be responsible for setting out the works from the points given on the Drawings and for constructing the works to the required line and level.

The Contractor will provide:

- White painted timber stakes to define the position of trees, paths, paving, garden beds and other construction elements as specified and or on the Drawings
- Bench marks for reduction of levels (if required)
- Stakes to define lot boundaries

Setting out shall be approved by the Superintendent prior to the commencement of construction.
Permanent survey pegs that have been damaged or moved during construction shall be reinstated by a Licensed Surveyor nominated or approved by the Superintendent and the cost of such work shall be paid for in full by the Contractor.

Should survey pegs or marks be in the line of construction operations, the Contractor shall advise the Superintendent prior to commencing work to enable their temporary removal or relocation of the works. Co-ordination shall include necessary approvals from Main Roads Department, Council, Service Authorities, other Contractor's and the like.

Due to the nature of landscape construction works, minor changes in the layout of the works may be instigated by the Superintendent on site.

The Contractor shall allow in their price for changes in the setout of the works. A variation to the contract shall only be issued where any changes results in a change in the Bill of Quantities.

The Contractor shall check horizontal and vertical values of all established or identified benchmarks, reference marks and boundary and location pegs and compare them with the values and measurements given on the Contract drawings and with other information and data such as pre-cal plans that may be made available by the Superintendent to the Contractor from time to time. In case the values given differ from the values established in the field, the work shall not proceed until the Superintendent's approval has been given. Copies of the recorded survey and setting out information shall be made available to the Superintendent. For the avoidance of doubt, the responsibility for set-out is the responsibility of the Contractor at all times.

4.12 PROTECTION OF SURVEY STATIONS

Survey stations and bench marks shall be preserved and adequately protected from disturbance for the duration of the Contract by the Contractor.

Any disturbance of a survey station or bench mark shall be reported to the Superintendent without delay. The Contractor shall not attempt to reinstate the station or mark without an instruction from the Superintendent and shall accept full liability for damage, however caused.

4.13 PROJECT SURVEYOR

The Principal, through the Project Surveyor, will arrange for the following survey information to be provided:-

- A copy of the pre-calculation plan, marked up to show the pegs placed and bench mark level information;
- An electronic data set, for set-out by the Contractor.
- Access to accurate datum in the form of an on site survey reference point on which to calculate relative levels for the setout of the works.

It shall be the Contractor's responsibility to re-establish, recover or transfer any of the above survey pegs which will be, or are, disturbed in the course of construction.

The Contractor shall give the Project Surveyor 48 hours notice of when information is to be provided to the Contractor.

4.14 LEVELS AND ALIGNMENT

All levels shown on the Drawings refer to Australian Height Datum (AHD). Existing surface levels refer to the surface at the time of survey. All vertical control for the work shall be established from the temporary bench marks provided by the Project Surveyor. It shall be the Contractor's responsibility to set out accurately all work according to the Drawings or figured dimensions thereon.

Pipe and RCB drains, End Treatments, Access Chambers, Open Drains and all Earthworks shall be set out in accordance with the alignments and levels shown on the working drawings. Setting out tolerances are:

- Horizontal ± 0.020 m Vertical ± 0.005 m.

The concept of the works and the alignments (both vertical and horizontal) shown on the drawings shall not be altered in any way without the prior approval of the Superintendent.

4.15 CLEARING

Unless otherwise specified or directed, remove all trees, logs, stumps, boulders, roots and scrub within the limits of the Works. Prior to commencement of clearing seek approval from the Superintendent to commence clearance operations and to further define the boundaries of areas to be cleared.

Within areas to be cleared demolish and dispose of existing fences, structures and slabs detailed to be removed. Grass and topsoil shall not be removed as part of this initial clearing. All standing trees shall remain unless directed otherwise by the Superintendent. Give seven (7) days notice of intention to clear any section of the works so that the Superintendent may determine the trees and plants not already detailed within the limits of clearing which are to be preserved.

Grub out stumps and roots to a minimum depth of 500mm below Sub-grade in paved areas or below finished surface in unpaved areas. Backfill grub holes with suitable spoil from excavations compacted in layers to the density of the surrounding undisturbed soil. All equipment used for clearing shall be fitted with rakes/tines or similar equipment so that as little soil as possible is disturbed and added to the vegetation stockpiles. No material from clearing is to be pushed beyond the limit of the site.

Cleared vegetation shall be mulched and stockpiled at an agreed site. Spoil from grubbing out; unsuitable material, uncontrolled fill and rubbish etc shall be removed from site to an approved Local Authority tipping site at the Contractors expense.

Clearing and grubbing shall extend over the areas of the site shown by the limit of earthworks on the drawings. Limits of clearing are defined as lines one metre outside the intersection of excavation or embankment slopes with the natural surface or the outside limits of slope rounding together with any other limits detailed.

Existing access tracks, storage, laydown and borrow areas, or similar shall be kept in a condition to be agreed with the Superintendent. Access tracks locations are to be agreed with the Superintendent prior to construction.

4.16 DISPOSAL OF MATERIAL

Unless otherwise permitted or directed, all debris resulting from clearing operations together with all lying and fallen timber and rubbish shall be removed from the site. All cleared material removed from the site shall, unless required by the Contractor for other purposes, be loaded, hauled, dumped and disposed of in a tip in compliance with statutory requirements.

The Superintendent may permit the disposal of boulders, concrete fragments and other non-combustible materials by burial within the POS reserves outside paved areas. When buried, the tops of boulders, etc. shall be not less than 800mm below finished surface.

The Superintendent may direct that boulders greater than 0.03 cubic metres in volume be stockpiled on site.

4.17 BULK EARTHWORKS

Definition: **"Bulk Earthworks**" is defined as being all operations including clearing, grubbing, stripping and stockpiling topsoil, excavation, backfilling and compaction to achieve the 'bulk' levels which shall be within a tolerance of +/- 100mm from finished design level allowing for a "**Final Minor Trim**" to bring the levels to with +/- 10mm of design levels.

Bulk Earthworks to achieve the existing contours as indicated on the Drawings is the responsibility of others. If Bulk earthworks have been completed prior to this tender it is the Tenderer's responsibility to inspect the site and assess the adequacy of the material used under the bulk earthworks operations. All costs are to be included in this tender for the working of the pre-existing material. Any concerns as to the sufficiency of the bulk material to meet the requirements of the landscape intent including its capacity to perform as growing and/or drainage media shall be raised at the time of Tender.

4.18 FINAL MINOR TRIM

Definition: "**Bulk Earthworks"** is defined as being all operations including clearing, grubbing, stripping and stockpiling topsoil, excavation, backfilling and compaction to achieve the 'bulk' levels which shall be within a tolerance of +/- 100mm from finished design level allowing for a "**Final Minor Trim**" to bring the levels to with +/- 10mm of design levels. Minor trim shall include cultivating the top 250-300mm of the surface of the pre existing material using a ripper or chisel plough. Cultivating shall occur to all areas proposed to be planted or grassed to ensure high permeability and aeration of topsoil to encourage root growth. The final soil finish shall be a well aerated, friable topsoil that is free from rock, rubble, vegetative matter and debris. The soil shall be lightly compacted only. This operation is to be combined with soil conditioner/additive application if specified.

4.19 EARTHWORKS - GENERALLY

The Contractor's responsibility under this Contract shall extend to all works necessary to transform the existing levels as shown on the Drawings to those shown as proposed levels on the Drawings. The Contractor shall complete the earthworks to this specification and adhere to the tolerances as set out herein and as depicted in the drawings.

4.20 NOTICE

If the following are encountered, give notice immediately and obtain instructions before carrying out any further work in the affected area:

- Bad ground - Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities, faults or fissures, contaminated ground and ground which is or becomes soft, wet or unstable.
- Rock - refer to the clause below entitled 'Rock Excavation'
- Suspected Aboriginal or other artefacts
- Underground springs or watercourses,
- Unknown underground tanks/structures.

4.21 SITE ACCEPTANCE

It is the contractors responsibility following possession of site to undertake a thorough analysis of site and advise immediately of any of the following that may impact works:

- Other uses or operations
- Stormwater
- Debris
- Underlying rock
- waterways
- UXO
- Livestock

This must be undertaken within the first 2-weeks of possession and if no concerns are raised within this period then it is deemed the contractor has accepted the site and all it's conditions, variations as a result of these items will not be considered beyond this 2-week period.

4.22 ROCK EXCAVATION

Rock excavation is classed as any excavation material that cannot be undertaken by a hydraulic excavator (Caterpillar 330B or equivalent in good condition) fitted with a rock bucket at a rate of three cubic metres per hour. The excavator shall be capable of exerting a minimum breakout force of 180kN at the bottom of the excavation with a 600 mm wide bucket fitted with rock teeth. Excavation in all other classes of material shall be termed common excavation. Material which can be loosened with a pick, frozen materials, soft laminated shale and hardpan, which for convenience or economy is loosened by drilling, blasting, wedging or the use of pneumatic tools, removal of concrete pavement and retaining walls, shall not be classified as rock excavation

Rock excavation shall be undertaken as an approved variation to the Contract at the rate specified by the Contractor in the Schedule of prices.

Rock excavation is a provisional quantity and payment for rock excavation shall only be made where the extent has been determined by the Contractor and Superintendent and an approved variation issued. The remaining dollar balance of any variations issued shall remain with the Principal to be expended if and as approved.

4.23 STRIPPING AND STOCKPILING TOPSOIL

After the completion of clearing operations all topsoil shall be stripped. Strip topsoil within the limits of earthworks area to provide for later re-use as specified. Ensure that all topsoil is removed from any areas to be covered by paving or structures. Also strip topsoil within the limits of clearing for underground services beyond the limits of earthworks. Unless otherwise directed, the depth of stripping shall be to 150mm or to the bottom of the grass root zone, whichever is greater. Grass shall be stripped together with topsoil. Avoid contamination by any other material.

Stockpile topsoil on or near the site for later re-use as specified. A designated stockpile site will be made available by the Principal.

Topsoil is to be separated from all other spoil material. Stockpiles are to not exceed 3.0m in height. If to remain unused for more than four (4) weeks, topsoil stockpiles shall be sown with a fast growing, non-invasive seed or have an application of Dustex or similar to prevent wind erosion.

4.24 EXCAVATION

Excavate to conform to the lines grades, cross-sections and dimensions shown on the Drawings. Excavate over the site to give correct levels and profiles as the basis for construction, paving, filling and landscaping.

The Superintendent may order the removal of any soft spots, debris or organic material exposed when excavated areas have been trimmed to finished formation levels. Remove all rocks and boulders which protrude above finished surfaces of Sub-grades. Make allowance for compaction or settlement.

Separate the best granular materials from excavations for use in the upper layers of fill Sub-grades.

No explosives are to be used at any time.

4.25 SUBGRADE PREPARATION

Following Clearing and Grubbing and prior to the placement of bulk earthworks fill, the contractor shall identify areas that require additional compacting ie for walls, paths and structures and shall proof roll/compact the existing surface to the satisfaction of the Superintendent. The in-situ sub-grade shall be adequately watered and consolidated with a power drum roller of 8 to 10 tonne. The roller shall run over the sub-grade till the soil is evenly and densely consolidated and behaves as elastic mass. The roller shall pass a minimum of but not limiting to 5 runs on the sub-grade. For smaller areas use a compactor capable of achieving an equivalent result to the approval of the Superintendent.

Unless otherwise stated the affected areas shall achieve a minimum compaction of 8 blows per 300mm layer to a depth of 450mm (ie. 150mm to 450mm). All other areas (softscape areas) are to be lightly compacted to the approval of the Superintendent.

The approved subgrade preparation shall be surveyed by the Contractor's licensed surveyor, and shall be independently spot checked by the Principal's surveyor. This survey data shall be use as a base in determining/checking the quantity of Forward Earthworks.

The contractor shall notify and allow the Superintendent adequate time to inspect, review the Contractor's compaction test sheets, and confirm sub-grade has been compacted to the requirements stated in this technical specification and geotechnical report.

4.26 FILLING AND RESPREADING

Generally

Before filling commences, the Superintendent may order the removal of any soft spots, debris or organic material exposed when the nominal depth of topsoil has been stripped in areas where natural surface is within 1m below finished levels. This additional stripping may extend to a depth of 300mm below the general depth of stripping. Grade all stripped surfaces to prevent accumulation of water.

Materials

Material to be used for fill shall consist of materials approved by the Superintendent, free from timber, stumps and weeds, or other perishable matter, and shall be obtained generally from the excavation.

Unless otherwise specified or directed, the materials used for filling shall be obtained from cut from site. Filling shall be free from logs, stumps, weeds and other perishable matter. The best available material, i.e. the most granular and least plastic, shall be used in the upper layers of construction. Material used in the top 150mm below Sub-grades shall be free of particles larger than 75mm. Material used in the top 600mm below Sub-grades shall be free of particles larger than 150mm.

Rocky materials not exceeding 600mm maximum dimension may be used in embankments. Suitable fine materials shall be placed with the rock to fill the interstices and produce a dense compact embankment.

The Superintendent may permit the disposal of rocks larger than 600m by burial in banks, mounds, or other areas at least 800mm below finished surface.

Any material imported to be used as suitable fill shall satisfy the following criteria:

- The sand shall be clean, cohesion-less, free draining and free of all silty, organic or any other deleterious inclusions
- Having greater than 80% material passing 19mm sieve
- Containing no greater than 4% by weight of soil fractions finer than 0.075mm
- Having plasticity index equal to 0% (i.e. no plastic)
- The ratio of the maximum density shall be greater than 1.20 the maximum and minimum densities shall be determined in accordance with test AS1289.5.5.1.

The Contractor shall provide classification and compaction test results on representative samples of the proposed material from a NATA registered testing authority for approval by the Superintendent prior to the importation of this material to site.

The Superintendent may direct that material unsuitable for embankments be used elsewhere on site or run to spoil. If this should result in a deficiency of material available for filling, then additional materials shall be obtained as directed at the Contractor's expense.

Placement, Backfilling and Compaction

Place and compact fill to conform to the lines, grades, cross-sections and dimensions shown on the Drawings. Allow for the thickness of materials, which will be placed in subsequent operations.

Filling shall be carried up in horizontal layers, extending the full width of the works. Fill thickness shall not be more than 300mm, loose measurements, provided that if the Contractor can demonstrate that its equipment is capable of compacting a thicker layer to comply with this Specification, the Superintendent may nominate an increased maximum thickness of layer.

If fill is to be placed on a surface which slopes more than 1:4, bench the surface to form a key for the fill. As each layer of fill is placed, cut the existing ground surface progressively to form a series of horizontal steps at least 1 metre in width. Recompact excavated material as part of the filling.

The bedding, overlay and back-filling of all pipe work trenches shall be accomplished with material previously excavated from the site trenches, provided it is free from rock and other hard objects, in accordance with AS-2032 “Installation of uPVC Pipe Systems”.

If the material excavated from the site trenches is unsuitable or insufficient to accomplish the bedding and back-filling operation to the satisfaction of Superintendent, then the Contractor shall import clean sand fill for this purpose, at its expense.

The Contractor shall provide all necessary equipment for the backfilling of trenches, compacting and levelling. Excessive subsidence of trenches during the Defects Liability period shall be the responsibility of the Contractor to rectify at its own expense.

All surplus soil excavation, including rocks removed from backfill material, shall be removed from the site by the Contractor at its expense.

Prior to the commencement of compaction the Contractor shall confirm with the Superintendent the areas and the degree of compaction. Unless otherwise stated all areas that the drawings indicate will be supporting hardscape ie walls, footings, paving and structures shall be compacted to no less than 95% of the modified maximum dry density when tested in accordance with Australian Standards. All other areas (softscape areas) are to be lightly compacted to the approval of the Superintendent.

Bulk Earthworks shall be trimmed to a neat and even finish to a tolerance of ± 100 mm of the design level allowing for a final minor trim to bring the levels to with +/- 10mm of design levels.

4.27 GEOTECHNICAL TESTING

Geotechnical Verifications

The Contractor shall be responsible for engaging a geotechnical consultant to undertake pre and post geotechnical inspections, to verify the earthworks, compaction, and achievement of a final site classification. This shall include but not be limited to the following:

- Conduct full site investigation to understand existing geotechnical conditions, soil strata, potential for underlying rock or subterranean structures.
- Inspect topsoil and vegetation stripping and assess whether sufficient topsoil has been removed, subsurface conditions are adequate, and level of compaction has been achieved.
- Inspect ongoing earthworks in accordance with AS3798
- Undertake post earthwork verification testing to assess the level of compaction achieved across the site
- Provide a report detailing the earthworks verification studies, including site classification to AS2870- 1996

Quality Control Test on Import Fill Material

The contractor shall obtain 3 (three) Particle Size Distribution Samples and provide test certificates, for every 15,000BCM of imported fill.

Compaction Testing

The Contractor shall be responsible for the compaction testing of the earthworks. The Contractor shall undertake all compaction testing required to demonstrate that the Works have been undertaken in accordance with the requirements of this specification and in accordance with the requirements of AS 3798-1996.

Testing shall be with a Perth Sand Penetrometer in accordance with Australian Standards. The Contractor shall record the equipment used, date, time, results and location (in plan and level) of all compaction tests conducted on site. If the Contractor uses its own penetrometer, a calibration certificate showing the mass, drop height and tip diameter shall be provided. The cost of all penetrometer testing shall be included in the tender rates for preparation and earthworks.

Should difficulty arise in achieving the specified Perth penetrometer blow count the Superintendent may direct that in-situ density testing be performed to confirm the correlation between blow count and density and ensure that a density index of at least 70 % is being achieved in accordance with AS 1289 Method 5.6.1.

On a weekly basis, the Contractor shall record the progress of compacted earthworks. The location of quality control tests shall be referenced on a drawing. The records of all compaction tests shall be submitted to the Superintendent. It should be expected that the Superintendent will be auditing the Contractor's lift compaction tests on a weekly basis.

The Contractor shall notify and allow the Superintendent adequate time to inspect, and test, to confirm that the final Classification is in accordance with AS2870-1996.

4.28 DISPOSAL OF APPROVED SURPLUS SPOIL ON SITE

Unless otherwise specified, dispose of approved surplus material from excavations where directed on site by:

- Uniform widening of embankments, or
- Uniform flattening of fill batters, or
- Uniform filling of selected areas.

If not already cleared, dumping sites shall be cleared and grubbed to the extent necessary before any additional material is deposited. Strip topsoil as specified and set aside for later re-spreading over the dumped spoil. Selling of unused surplus spoil may be examined as approved by the Superintendent with proceeds to be paid to the Principal in full.

4.29 DISPOSAL OF SPOIL AND RUBBISH OFFSITE

Remove from the site any approved surplus excavated material or building rubbish, vegetative refuse and the like and dispose of in the correct manner at an approved rubbish tip at the Contractor’s expense inclusive of all charges and fees.

4.30 MINOR GRADING AND TRIMMING

Bulk Earthworks shall be trimmed to a neat and even finish to a tolerance of ± 100 mm of the design level allowing for a final minor trim to bring the levels to with +/- 10mm of design levels.

Undertake minor levelling and grading to all earth worked areas after completion of major earthworks to suit final grades indicated on the plan to the Superintendent's approval.

4.31 MATCHING UP

The Contractor shall ensure that all levels neatly tie in and match up with existing work in adjoining areas to the satisfaction of the Superintendent. This shall include work associated with roads, pathways and paving carried out previously to the areas covered by this Contract.

4.32 FINAL PRESENTATION

Contractor shall, ensure that all sand, silt and debris is cleared from the site immediately following completion of the earthworks. The Contractor shall remain responsible for maintaining these works free of sand, silt and debris until the date of Practical Completion. Presentation of the completed works is of paramount importance and as such the site shall be presented in a neat and tidy condition.

At completion, the earth worked areas shall be cleared of all refuse, rubble and the like and neatly graded prior to hydro mulching.

Full attention to detail is expected of the Contractor and as such the Contractor shall make allowance for final trim (hand work if necessary) to remove all wheel ruts from machinery, the raking of sicks, stones, removal of temporary level stakes etc. to present a neat and tidy appearance prior to hydro mulching.

The requirements of this clause shall also extend to existing roads used for access and storm water drains which are directly affected by the works under the Contract.

4.33 AS CONSTRUCTED SURVEY OF EARTHWORKS

The Contractor shall appoint a registered surveyor to carry out 'as constructed' survey of the earthworks to ensure the levels specified on the Drawings have been achieved by the Contractor. Both the proof rolled in-situ surface as well as the final compacted surface level shall be surveyed by the Contractor. The proof rolled in-situ surface shall be surveyed at a grid spacing not exceeding 5m x 5m. The surveying of „as- constructed" levels shall not relieve the contractor of its obligation to implement its own quality control procedure during construction to ensure that the required level and accuracy requirements stated on the drawings and specifications are met.

5.1 GENERAL

Scope of Works

Supply, fabricate (where applicable) and install the following as scheduled and detailed on the Drawings:

- Treestakes
- Conservation fencing
- Bollards as detailed on the Drawings

5.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS 4785 Timber – Softwood
- AS 2271- Plywood and Blockboard for Exterior Use.
- AS 1604 Preservative Treatment for Sawn Timber
- AS 1608 Preservative Treated Farm Fencing Timber
- AS 3660.1 Termite management – New Building work
- AS 3660.2 Termite management – In and around existing buildings and structures - Guidelines
- AS 1684 SAA Timber Framing Code
- AS 1650 Hot dipped Galvanised Coatings on Ferrous Articles
- AS 1214 Hot dipped Galvanised Coatings on Threaded Fasteners
- AS 1111 1980 ISO metric hexagon commercial bolts and screws
- AS 1112 1980 ISO metric hexagon nuts
- AS 1237 1973 Flat metal washers for general engineering purposes
- AS 1252 1983 High-strength steel bolts for structural engineering
- AS 3566.1-2002 (R2015) Self-drilling screws for the building and construction industries

5.3 TIMBER

Supply timber of the types, sizes and finishes as indicated on the Drawings.

All timber shall be first class, free of splits or warps.

- Timber for conservation fencing shall be as follows:
- Posts – 150mm diameter x 2.2m long CCA treated pine
- Toprail – 100mm diameter CCA treated pine
- Bollards – 125mm diameter CCA treated pine

5.4 PRESERVATIVE TREATMENT

All radiata pine is to be dried, pressure treated with LOSP or 'Tanalith' preservative and then re-dried prior to installation on site.

Pressure treatment of pine with preservative is to be carried out in accordance with AS 1604 - 1993 to Hazard Level 5 (H5) and timber shall be clearly stamped to indicate that specified Hazard Level of treatment has been achieved.

When requested by the Superintendent, the Contractor shall supply Certificates, Warranties and the like to confirm the type and level of pressure treatment applied to the timber delivered to the site.

Where the degree of shaping, routing, bevelling and the like indicated on the Drawings as being required as part of the fabrication of timber items is likely to reduce the effectiveness of the preservative treatment then these works shall be carried out prior to preservative treatment.

5.5 TERMITE PREVENTION

All natural logs and timber structures shall be treated with termite protection measures which comply with the Building Regulations and the relevant Standard (AS 3660.1)

Termite protection shall provide a continuous barrier that prevents termites from entering the building or structure undetected. The critical areas for termite entry, including the external perimeter, construction joints and plumbing penetrations, shall be protected and treated by a termite management system. The system installation shall conform to the manufacturer's guidelines.

A manufacturer's warranty for a minimum of fifty (50) years shall be provided. The warranty shall be renewable on an annual basis, base on annual inspection by the system installation organisation. Such a warranty shall provide for timber replacement should a system breach occur.

A certificate permanently fixed to the building or structure in a prominent location shall indicate the following:

- Method of protection.
- Date of installation.
- Life expectancy of any termiticide and the required re-injection date.
- Installer's or manufacturer's recommendations for the scope and frequency of future inspections for termite activity, not greater than 12 months.

Sheet material acting as a termite barrier within the structure shall be constructed of termite-resistant materials, such that termites are unable to pass through them. The maximum aperture size of a perforated sheet material barrier shall be sufficiently small as to deny access to foraging termite species of the region. Combinations of materials likely to cause electrolytic reaction shall not be used, e.g. stainless steel mesh shall not be used in contact with mild steel reinforcement.

Minor structures, as agreed with the Superintendent shall be either raised clear of the ground through the use of galvanised steel stirrups in concrete footings or primed and treated with a bitumen based waterproofing agent and termite/anti fungal treatment to the area in contact with soil and or mulch. All measures shall be approved by the Superintendent prior to installation.

5.6 TREATMENT OF CUT ENDS

All cut ends, drill holes and the like which expose timber must be coated with Cabot's Jarrah Deck & Exterior Oil Based Timber Stain or equivalent and approved. All natural logs and timber structures shall be timber that is sufficiently dried so as not to split or fracture within the Defects Liability Period. Split timber elements will be replaced at the Contractor's cost or upon approval of the Superintendent filled with a flexible grout/mastic/filler or similar to provide a smooth, splinter free and robust finish.

5.7 TIMBER FIXINGS

All bolts, nails, screws and other timber fixings shall be stainless steel, zinc or hot dipped galvanised.

All hot dip galvanising shall conform to the requirements of AS 1650 - Galvanised Coatings and shall be clean, smooth and continuous, free from acid spots, cracks, laminations, runs and drips. The coating shall have a minimum thickness of 85 microns.

Galvanising of fasteners shall conform to the requirements of AS 1214 - Hot Dip Galvanised Coatings on Threaded Fasteners.
Fastenings i.e. chemical anchors, lugs, screws, rivets and the like shall be of approved type, appropriate to the work, capable of transmitting the loads and stresses imposed, and sufficient to ensure the rigidity of the assembly.

5.8 FINISHING: OIL

Unless otherwise noted on the drawings all timber shall to be treated with Cabot's Jarrah Deck & Exterior Oil Based Timber Stain as supplied by Permalux Pty Ltd, or equivalent and approved. Colour to be as directed by the Superintendent.

Prepare timber and apply stain strictly in accordance with Manufacturer's recommendations. All timber to be coated on all sides in a controlled environment prior to delivery to site. All cut ends, drill holes and the like which expose timber must be recoated with Cabot's Jarrah Deck & Exterior Oil Based Timber Stain or equivalent and approved.

Where the drawings do not specify the coating or treatment of the timber the Contractor shall seek the Superintendent's instruction as to whether timber is to be either painted or oiled.

5.9 WOOD PLASTIC COMPOSITE(WPC), FIBRE REINFORCED PLASTIC (FRP), GLASS FIBRE REINFORCED PLASTIC(GRP)

Standards

In the absence of Australian Standards for composite and recycled plastic materials the following European Standard or appropriate ASTM International standards shall be used for testing FRP and composite material whichever is the more conservative.

- EN 13706:2002 Reinforced Plastics Composites- Specifications for Pultruded Profiles
- ASTM D-7032-04: Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International.
- ASTM D-7031-04: Standard Guide for Evaluating Mechanical and Physical Properties of Wood-Plastic Composite Products, ASTM International
- ASTM D 570: Water Absorption of Plastics

The testing shall establish such values including but not limited to bending, compressive and tensile strengths, Young's modulus of elasticity, screw pullout capacities and thermal expansion coefficient. Tensile properties from tests can be obtained as per AS 1145:2001 Determination of tensile properties of plastic materials, which is based on ISO 527.

FRP grating

The acceptable deflection within FRP panels shall be dependent on the type of installation

Load capacity data for all panels shall be provided by the Contractor at shop drawing stage for verification by the Principals Structural Engineer.

Wood-Plastic Composite (WPC)

(WPC) Decking shall consist of recycled Linear Low Density Polyethylene (LLDPE) and recycled wood.

Physical and Mechanical Properties shall be at a minimum as follows:

Test	Test Method	Value
Flame spread	ASTM E 84	60
Thermal Expansion	ASTM D 1037	1.9 x 10-5 inch/inch/degree F
Moisture Absorption	ASTM D 1037	< 1%
Nail Withdrawal	ASTM D1761	163 lbs/in
Screw Withdrawal	ASTM D1761	558 lbs/in
Fungus Resistance	ASTM D1413	Rating - no decay
Termite Resistance	AWPAE1-72	Rating = 9.6

		Ultimate (Typical)Values *	Design Values
Compression Parallel	ASTM D198	1588 psi	540 psi
Compression Perpendicular	ASTM D143	1437 psi	540 psi
Bending Strength	ASTM D198	3280 psi	500 psi
Shear Strength	ASTM D143	1761 psi	360 psi
Modulus of Elasticity	ASTM D4761	495,000psi	200,000 psi
Modulus of Rupture	ASTM D4761	3800 psi	1800 psi

Material Data Sheets
Material Data sheets shall be provided for verification of but not limited to the following: surface style, load capacity, fire resistance, cross sectional profile.

Samples:
For each product specified, one sample representing actual product color, size, and finish shall be provided to the superintendent.

Colours/Textures
To be confirmed by Principal following presentation of samples.

Delivery, Storage, and Handling
Store products in weatherproof situation on a flat and level surface. Adjust support blocks accordingly.
When stacking bundles, supports should start at each end and be spaced at a maximum of 600mm centres. Supports should align vertically.
Keep material covered until time of installation.

Installation
Installation shall be in accordance with manufacturer's specification. Material shall be cut, drilled or routed on site using diamond or carbide tip cutting tips. All safety precautions shall be in place and a minimum of a P2 Dust mask when cutting together with a dust extraction unit.

Warranty
Provide manufacturer's warranty against rot, decay, splitting, checking, splintering, fungal damage, and termite damage for a period of 25 years for a residential installation and 10 years for a commercial installation.

6.1 GENERAL

Scope of Works

Supply, fabricate (where applicable) and install the following as scheduled and detailed on the Drawings:

- Galvanised mild steel fencing
- Interpretive Signage
- Street Furniture
- Play Equipment

6.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including, but not limited to, the following:

STEEL

- AS 1163 1991 Structural Steel Hollow Sections
- AS 1538 1988 Cold-formed Steel Structures Code
- AS 1554 SAA Structural Steel Welding
- AS 3678 1990 Structural Steel – hot rolled plates, floor plates and slabs
- AS 3679 Structural Steel
- AS 3679.1 Hot rolled bars and sections
- AS 3679.2 Welded sections
- AS 4100 1900 Steel structures
- AS 1170 SAA Loading Code
- AS 1170.1 1989 Dead and live loads and load combinations
- AS 1170.21989 Wind loads (amended 1993)
- AS 3623 1993 Domestic metal framing
- AS 1397 Steel sheet and strip—Hot-dipped zinc coated or aluminium/zinc coated
- AS 2728 Prepainted Sheet Steel
- AS 1445 Corrugated Sheet Steel

ELECTRODES

- AS 1553 Covered electrodes for welding
- AS 1553.1 1983 Low carbon manganese steels
- AS 1553.2 1987 Low carbon alloy steels
- AS 1553.3 1992 Corrosion-resisting electrodes

BOLTS, NUTS AND WASHERS

- AS 1111 1980 ISO metric hexagon commercial bolts and screws
- AS 1112 1980 ISO metric hexagon nuts
- AS 1237 1973 Flat metal washers for general engineering purposes
- AS 1252 1983 High-strength steel bolts for structural engineering
- AS 3566.1-2002 (R2015) Self-drilling screws for the building and construction industries

FABRICATION AND EXECUTION

- AS/NZS 1554 Structural Steel Welding
- AS 1796 1993 Certification of welders and welding supervisors
- AS 1562 Design and Installation of Metal Roofing

SURFACE PREPARATION

- AS 1627 Metal finishing – Preparation and pre-treatment of surfaces
- AS 1627.1 Preparation and pre-treatment of surfaces - Removal of oil, grease and related contamination.
- AS 1627.4 Preparation and pre-treatment of surfaces - Abrasive blast cleaning of steel.
- AS 1627.5 Preparation and pre-treatment of surfaces - Pickling
- AS 3884 1991 Etch primers for pre-treating metal surface

PROTECTIVE COATINGS

- AS 1214 1983 Hot-dip galvanised coatings on threaded fasteners (ISO metric coarse thread series)
- AS 4680:2006 Hot-dipped galvanised coatings on ferrous articles (ISO Standard, ISO 1461).
- AS 2105 1992 Inorganic zinc silicate paint
- AS 2312 1984 Guide to the protection of iron and steel against exterior atmospheric corrosion
- AS 3750 Paints for steel structures (applicable parts)
- AS 4534 Zinc and zinc/aluminium-alloy coatings on steel wire
- AS 4791 Hot-dip galvanised (zinc) coatings on ferrous open sections, applied by an in-line process
- AS 4792 Hot-dip galvanised (zinc) coatings on ferrous hollow sections, applied by a continuous or a specialised process.
- AS 2309 Durability of galvanised and electro galvanised zinc coatings for the protection of steel in structural applications – Atmospheric
- AS 2312 Guide to the protection of structural steel against atmospheric corrosion by the use of
- protective coatings
- AS 4312 Atmospheric corrosivity zones in Australia

RAINWATER GOODS

- AS 2179 Metal Rainwater goods
- AS 2180 Selection and Installation of Metal Rainwater goods

6.3 SHOP DRAWINGS

Submit artwork and shop Drawings for all works to the Superintendent for approval prior to commencing fabrication.
The Contractor shall prepare shop drawings at his own expense. Submit 2 copies of shop drawings for approval. Allow 14 days prior to fabrication for return of same. Dimensional accuracy and completeness of the drawings are the responsibility of the Contractor. The cost of any work which may have to be dismantled or altered as a result of inaccurate shop drawings shall be borne by the Contractor.

6.4 SITE MEASUREMENTS

The Contractor shall be responsible for obtaining and providing all necessary site measurements to ensure accurate and correct fabrication of steelwork.

6.5 MATERIALS

Materials Generally
All materials as specified hereunder are to comply with the appropriate Specifications of the Standards Association of Australia:

Stainless Steel
Stainless steel to BHP or similar approved 3mm grade 316 sheet or as noted on the Drawings with Electropolished finish as per AS 1449. Refer to finishes schedule below.

All other Materials shall be of the types, and hardness/strength and quality most suited to their particular application in this Contract.

Structural Steel
All structural steelwork shall be a minimum of Grade 250 in accordance with the Australian Standards. All structural hot rolled and welded sections shall be OneSteel Grade 300PLUS, complying with AS 3678 and AS 3679. All structural hollow sections shall be grade C250LO or grade C350LO, in accordance with AS 1163. Other types and grades of steel shall not be used unless otherwise approved by the Superintendent

All materials shall be new and of unused stock and free from splices for the full length between joints unless otherwise approved by the Superintendent.

Compliance
Mill Test Certificates shall be supplied for all steel used in the work. Alternatively, at the discretion of the Project Superintendent, Manufacturer's Certificates of Compliance confirming conformance to the relevant Standard may be accepted.

Substitution of Materials
No variations from the sizes, sections or grades of material shown on the design drawings shall be made unless otherwise approved by the superintendent.

Fixings
Unless otherwise specified, all bolts, nuts, washers and screws connecting materials shall be:

- Of at least equivalent strength
- Of at least equivalent anti-corrosive properties
- Compatible

For fixing metal components, use only stainless steel A4 grade, bolts, fasteners or stainless steel anchors.
The minimum bolt size for any anchor shall be 6mm diameter. Where washers are shown or required, they shall be of the same metal or coating as the bolt.

6.6 DISSIMILAR METALS (GALVANIC POTENTIAL)

Refer to AS 4036—2006. The Contractor shall ensure that dissimilar metals are assessed and isolated. If dissimilar metals are detailed on the Drawings the Contractor shall assess the galvanic potential and ensure that the shop drawings detail a suitable method of isolation. The proposed methodology must be approved by the Superintendent. If the Contractor believes a suitable isolation method is not achievable/practical they shall notify the Superintendent.

Preventative measures

- When connecting two pieces of the same material, use a fastener/bolt made of the same material.
- If the subjects being fastened are structural, use a fastener/bolt of appropriate strength. For example, when fastening aluminum and steel in a structural application, use a fastener made of carbon steel with suitable plating.
- Use the corrosion potential chart when selecting fastener/bolt material.
- If using the same metal is not possible, select combinations of metals close together on the galvanic potential chart.
- Avoid small active metal contact with large inactive metal content.

Isolation methods

- All dissimilar metals are to be isolated using a non-absorbent insulating plastic (nylon, neoprene or similar and approved) washer, gasket, sleeve or insert.
- The use of insulating tape is generally unacceptable and is only appropriate for light wear situations and the Superintendents approval must be sought prior to its use. Isolating tape shall be a polypropylene tape of 1.7 mils minimum thickness with a dielectric strength of 300-400 volts/mil.
- Paint or prime the two metals or selected pieces, even if they have protective coatings. This is especially helpful in joints, if kept in good repair. It is particularly important to coat the active metal.
- Avoid threaded fittings with materials far apart in the ranking of galvanic potential.
- Design (during the shop drawing phase) for the use of replaceable active metal components or make them thicker for longer life.
- Do not use caulk as an isolation method. Caulk in a joint between dissimilar metals can squeeze out and allow the two metals to contact.
- Consider using sacrificial anodes. The installation of yet a more active metal than the active metal in a joint will tend to corrode the most active metal and protect the less active metal.
- Use one-piece or welded construction versus bolting or riveting when possible.
- If the above measures are not applicable for a joint design, care must be taken to ensure that moisture is allowed to drain.
- Apply corrosion-inhibiting material (pastes, washers, compounds, etc.) under heads of screws or bolts inserted into dissimilar metal, even if they already have been treated.

6.7 FABRICATION

Generally

All fabrication shall comply with the requirements of AS 4100 - Steel Structures.

Fabrication shall be carried out by qualified and experienced tradesmen to produce finished steelwork components that accurately reflect the design intent as represented on the design drawings.

Fabricate and pre-assemble items in the workshop wherever practical. All members shall be stored and handled so as to reasonably protect the inherent and specified finishes.

The Contractor shall be responsible for checking all as-constructed dimensions of features having a bearing on the final form of fabricated steelwork and allowing for same in fabrication.

Edges and Surfaces

Keep clean, neat and free from burrs and indentations. Remove sharp edges without excessive radiusing.

Joints

Fit accurately with parallel faces and to a close tolerance .

Straightening and Forming

Any straightening of material or bending to produce curvilinear forms shown on the drawings shall be achieved by methods that will not diminish the material properties of the steel and shall be in accordance with approved procedures. Heating shall not induce steel temperatures in excess of 600°C.

Cutting

Steelwork shall be cut by sawing, shearing, machine, plasma or hand flame cutting methods except that:

- Ends of sections or edges of plates required to transmit full contract bearing (e.g. column end to base plate) shall be cold sawn or milled.
- Plates thicker than 16mm where edges are to be welded or galvanised shall not be sheared.

Any cutting operations shall produce clean, true lines and surface, complying with the requirements of AS 1554.1 for surfaces to be welded and AS 4100 for surfaces not to be welded.

Mitres shall be dressed smooth and neatly fitted. Re-entrant corners shall be notch-free and radiused at least 10mm.

Holing

Bolt holes shall not be made by gas cutting or by punching full size. Holes may be punched 3mm undersize and reamed to size.
Holes to be tapped shall be first drilled to the tapping size. Holes through tubular members shall be lined with pipe sleeves, seal-welded in place and ground flush.

Tube Bends

Form bends in tube without unduly deforming the true cross section.

6.8 WELDING

All welding shall be carried out in accordance with AS 1554 - Welding of Steel Structures.

After fabrication all weld splatter and slag shall be removed by suitable mechanical means and all sharp edges and rough welds rounded off.

All joints and connections between all elements to be fully welded unless otherwise approved.

Finish visible joints made by welding, brazing or soldering by grinding, buffing and the like methods appropriate to the class of work before painting, galvanising or the like further treatment.

6.9 FASTENINGS

Fastenings, including anchors, lugs, screw, rivets and the like shall be of approved type, appropriate to the work, capable of transmitting the loads and stresses imposed, and sufficient to ensure the rigidity of the assembly.

6.10 BOLTS

All bolts, washers and nuts shall comply with the relevant Australian Standards.
All structural bolting shall be hot-dip galvanised in accordance with AS 1214, unless otherwise noted on the drawings.

Mild Steel Bolts, Washers and Nuts
The use of 12mm mild steel bolts shall be confined to the fastening of cold-formed purlins and girts, and stair treads. Material for all bolts shall be at least Grade 4.6. The use of M16 bolts shall be confined to the fastening of handrail stanchions. Nuts for mild steel bolts shall be in accordance with AS 1112, Class 5, Normal Type, Flat washers and material of tapered washers shall comply with AS 1237. One flat washer per each assembly shall be provided, unless design drawings show otherwise. Tapered washers shall be provided where necessary.

High Strength Bolts, Washers and Nuts
All structural connections have a minimum of 2 No. M20 Grade 8.8 high strength bolts in accordance with AS 1252. Bolt sizes to be used for the works shall be limited to M20, M24 or M30 and all connections shall be designed as bearing type joints unless design drawings show otherwise.

One hardened washer per each assembly shall be provided when bolt tightening procedure is 8.8/S (“snug-tight” condition).

One hardened washer per each assembly shall be provided when the bolt tightening procedure is 8.8/TB (fully tensioned, bearing type) and 8.8/TF (fully tensioned, friction type) where the tensioning procedure is nominated as part turn method to AS 4100 cl. 15.2.5.2.

One hardened washer and one approved load indicating washer per each assembly shall be provided when the tightening procedures are 8.8/TB and 8.8/TF, where the tensioning procedure is nominated as ‘by use of a direct-tension indication device’ to AS 4100 cl. 15.2.5.3.

Where a bolt head or nut bears on a tapered flange it shall be provided with a washer of corresponding taper.
After tightening a bolt, at least one thread and not more than three threads shall project beyond the nut.

6.11 COLD FORMED STEELWORK

Cold formed members including purlins and girts shall comply with AS 1397.
Holes in purlins and girts shall be punched by the manufacturer to suit fixing to supports, laps, bridging and miscellaneous items such as fly bracing. Fasteners shall be minimum M12 bolts, grade 4.6, unless design drawings show otherwise.

6.12 GALVANISING

Complete welding, cutting, drilling and other fabrication before coating.

Unless otherwise stated on the Drawings, all steel items shall be hot dip galvanised. All hot dip galvanising shall conform to the requirements of AS 4680:2006 - Hot-dipped galvanised coatings on ferrous articles (as aligned with ISO Standard, ISO 1461).

Galvanised Coatings and shall be clean, smooth and continuous, free from acid spots, cracks, laminations, runs and drips. The thickness of the galvanised coating shall conform with Table 1 in AS 4680

Galvanising of fasteners shall conform to the requirements of AS 1214 - Hot Dip Galvanised Coatings on Threaded Fasteners.

Inspection
Inspection shall be carried out at the galvaniser’s works by the Contractor, or at some other place as agreed between Contractor and galvaniser.

Certificate
A certificate shall be provided stating that the galvanising complies with the requirements of AS/NZS 4680.

Transport and Storage
Galvanised components shall, wherever possible, be transported and stored under dry, well-ventilated conditions to prevent the formation of wet storage staining following the recommendations contained in AS 4680 Appendix F.

A passivation treatment after galvanising may be used to minimise the wet storage staining which may occur on articles unable to be stored in dry, well-ventilated conditions.

Any wet storage staining shall be removed by the galvaniser if formed prior to leaving the galvaniser’s plant, unless late pick-up or acceptance of delivery has necessitated the material being stored in unfavourable conditions. Provided the coating thickness complies with the requirements of AS 4680, no further remedial action is required to the stained areas.

Welding
Where galvanised steel is to be welded, adequate ventilation shall be provided. If adequate ventilation is not available, supplementary air circulation shall be provided. In confined spaces a respirator shall be used.

Grinding of edges prior to welding may be permitted to reduce zinc oxide fumes formed during welding and eliminate weld porosity which can sometimes occur.

All uncoated weld areas shall be reinstated – see Coating Reinstatement or Clause 8 of AS 4680.

Coating Reinstatement
Areas of significant surface that are uncoated shall, following approval by the Superintendent, be reinstated by following the recommendations contained in AS 4680 - Repair after Galvanising, or by other methods nominated by the Contractor and approved by the Superintendent. Similar repair methods shall be used for areas damaged by welding or flame cutting, or during handling, transport and erection.

The size of the area able to be repaired shall be relevant to the size of the object and the conditions of service but shall normally be in accordance with the provisions of AS 4680 - Repair after Galvanising.

Sweep (Brush) Blast Cleaning Of Galvanised Steel Prior To Painting
Refer AS 4680 Appendix I

All items to be powder coated are not to have chromate passive coating on surface.

6.13 REPAIR TO DAMAGED FINISHES

General
After erection and/or site welding make good any damage to shop finish.

Where damage has occurred, the damaged areas shall be thoroughly power wire brushed or ground back to bright metal, cleaned and degreased.

Immediately following surface preparation, apply two coats minimum 50 micron dry film thickness each coat of approved organic zinc rich epoxy in accordance with this specification and AS 2312.

Area to be treated such that there is minimum 50mm overlap with sound surface coating.

Immediately following surface treatment the selected paint shall be applied with a brush in two coats to give a minimum total dry film thickness of 100 microns.

Where colour matching is required an approved paint shall be applied over the treated area strictly in accordance with manufacturer instructions to achieve the required colour match. Unless noted otherwise, colour matching is required, and the Contractor shall arrange and pay for colour match trials as necessary.

Where colour matching is not required, surfaces treated with an organic zinc-rich paint shall be coated with an approved acrylic or polyurethane top coat applied over the fully cured surface.

Galvanised Surfaces
Where galvanised steel surfaces have been damaged on site or in transit due to welding or rough handling, corrosion protection must be restored in accordance with AS 4680 Appendix E “Renovation of Damaged or Uncoated Surfaces” and AS 2312.

Unless otherwise stated in AS4680**,** acceptable methods of protection reinstatement include the use of low-melting-point zinc alloy repair rods or by application of an approved zinc-rich paint.

If an approved zinc-rich paint is to be used, it shall be a single pack organic zinc rich paint, containing 90% zinc by weight in the dry film (Interzinc 315 or a similar approved) and shall conform to and be applied in accordance with AS 3750.9 “Organic Zinc Rich Primer” and the paint manufacturer’s written instructions.

Note that inorganic zinc rich paints are not considered suitable as touch-up coatings for galvanised products as the surface preparation requirements specific to uncoated steel will damage the galvanised coating adjacent to any area being repaired.

The damaged area to be painted shall be thoroughly power wire brushed or ground back to bright metal, be clean, dry and free from contaminants such as oil and grease. Area to be treated such that there is minimum 50mm overlap with sound galvanised coating.

Immediately following surface treatment the selected paint shall be applied with a brush in two coats to give a minimum total dry film thickness of 100 microns.

Where colour matching is required an approved paint shall be applied over the treated area strictly in accordance with manufacturer instructions to achieve the required colour match. Unless noted otherwise, colour matching is required, and the Contractor shall arrange and pay for colour match trials as necessary.

Where colour matching is not required, surfaces treated with an organic zinc-rich paint shall be coated with an approved acrylic or polyurethane top coat applied over the fully cured surface.

6.14 PROTECTIVE TREATMENT

Note: if the site is within 5 kms of coast or subject to strong wind/harsh conditions seek a specialist specification from Dulux or similar and attached as an appendix and cross reference here. Highly recommend doing this regardless of location.

Where proprietary specifications for protective treatment, painting and /or finishing have been provided and detailed they are to take precedence over these specifications.

Scope and Standards
The protective treatment is to be as noted in the steelwork notes set out on the structural drawings. This Specification defines the requirements for the supply and application of surface protection to structural steelwork in accordance with the current issue including amendments of the following Standards:-

- AS 1627 Metal Finishing – Preparation and Pre-treatment of Surfaces
- AS 3894 Site Testing of Protective Coatings
- AS 4848 Application Specifications for Coating Systems

For Galvanising refer to Clauses 11.12 of this Specification.

Surface Preparation
The Contractor shall ensure that the method and finish adopted is adequate to ensure adhesion of the selected paint system in the particular application conditions and service environment of the work.

Particular attention shall be paid in the vicinity of welds to ensure that all slag, flux residues, and spatter are completely removed.
Wherever the surface preparation leaves a bare metal surface, prime coat must be applied within 4 hours of completion of preparation.

Hand & Power Tool Cleaning
All weld spatter shall be removed and all burrs, sharp edges, gouge marks and rough welds shall be rounded or smoothed off. Unpainted surfaces shall be treated with power impact tools to obtain a Class 2 finish except that where the surface is inaccessible to power tools, hand tools shall be used.

Abrasive Blast Cleaning
All weld spatter shall be removed and all burrs, sharp edges, gouge marks and rough welds shall be rounded or smoothed off. Oil and grease shall be removed using solvent cleaning.

Steel surfaces shall be cleaned by dry abrasive blasting to achieve a Class 2.5 finish. The abrasive used shall be dry and free of salt or contaminants and be of sufficient hardness and angularity to produce the specified anchor pattern profile at the intended blast pressure. Blast products and dust shall be removed from surfaces on completion using compressed air or vacuum cleaning.

Sweep (brush) blast cleaning of galvanised steel prior to painting
Refer AS 4680 Appendix I

6.15 PAINT PREPARATION

Where proprietary specifications for protective treatment, painting and /or finishing have been provided and detailed they are to take precedence over these specifications.
Manufacturer's product data sheets and Material Safety Data Sheets for each material used shall be kept at the work site for the duration of the work. Where instructions are unclear or in conflict with this Specification then clarification shall be sought.
Should thinning of paint become necessary for any reason then only thinners recommended by the paint manufacturer shall be used. Supplies of compatible thinners shall be maintained in the paint shop and at the site.

Paint Finished Steelwork
The Contractor shall ensure that all external steelwork shall be prepared for paint finish.

Compatibility of Painting Systems
The Contractor shall ensure each paint coat is compatible with subsequent treatments and top coats.

Weather Conditions
Painting shall not commence or continue when rain is falling nor when fog or mist is present, nor when any condensation occurs on the surface to be painted. If appropriate data is available then no painting should be carried out when the relative humidity exceeds 85% nor when the surface temperature of the steelwork is less than 2°C above the dew point. In any case painting shall not commence or continue when the air temperature is less than 5°C, nor when the steel surface temperature is less than 2°C.

Painting shall not commence or continue when the steel temperature exceeds 50°C unless the paint is specifically formulated for application at high temperature. Appropriate measures shall be taken when painting in hot weather to avoid 'dry spray' and other film defects, and to ensure that the specified film thickness is achieved.

Painting in high winds shall be avoided, and shall be discontinued if excessive drift to adjacent surfaces, 'dry spray' film defects, or wind-blown dust contamination of the wet paint occurs.

6.16 PAINTING METHODS

Where proprietary specifications for protective treatment, painting and /or finishing have been provided and detailed they are to take precedence over these specifications.

Paint shall be applied uniformly without sags or runs. Welds, bolts, edges, crevices and other irregularities shall be thoroughly coated, using extra material if necessary to provide equivalent protection to that obtained on adjacent smooth surfaces at the specified dry film thickness.

Paint shall be applied by spray wherever practical. Airless spray is preferred and shall be used for high build coatings. Areas inaccessible for effective spray coating shall be coated by brushing before adjacent work is sprayed.

Paint shall be stirred and mixed strictly in accordance with manufacturers' instructions prior to and during application. Mixed paint which has exceeded the pot-life nominated by the manufacture shall be discarded and removed from the site.

Storage, handling and application of paint shall be carried out observing all safety precautions given in the manufacturer's instructions and in the appropriate government legislation and regulations. In particular adequate ventilation and appropriate fire precautions shall be provided.

Each coat shall be properly cured or dried before the succeeding coat is applied. Application of the succeeding coat shall not cause any lifting or other film irregularities in the undercoat. Minimum drying times and state of cure shall be those nominated by the manufacturer.

6.17 SITE PAINTING

Site painting shall be carried out in accordance with this Specification to achieve the same standards as for shop painting.

Previously applied paintwork damaged by site work shall be completely removed and all bare steel surfaces shall be cleaned using power tools, if possible, or otherwise by hand tools, to achieve a Class 2 finish as defined by AS 1627 Part 7. The edges of the affected area shall be feathered and painted areas which will be recoated shall be wet-sanded to provide an appropriate key.
All surfaces shall be cleaned between successive coats applied on site to remove all dust and other contaminants immediately prior to painting.

For touch-up work all coats shall be applied as specified, ensuring that the finished surface is uniformly matched to the adjacent untouched work.

Where the work includes repair of previously painted surfaces, all paint which has been damaged by heat, smoke, or mechanical impact shall be removed and the exposed surface prepared as specified above. The edges of the remaining paint film shall be feathered off and the area to be over-coated with fresh paint shall be wet sanded.

6.18 TESTING

Accurately calibrated testing instruments shall be provided and maintained by the Contractor, and used in accordance with methods and procedures outlined in AS 3894 as directed by the Superintendent. Tests shall be conducted to determine wet and dry film thicknesses, and to locate defects and discontinuities.

Any defects and discontinuities detected shall be rectified as directed by the Superintendent.

For each coat the average dry film thickness shall equal or exceed the specified value, and no more than 25% of readings shall be less than the specified value.

6.19 INSTALLATION OF HANDRAILS/BALUSTRADES

It is critical that the alignment of the handrails and balustrades forms a smooth profile along its length and reflects the design profiles in elevation. The Contractor shall take every care to ensure that a smooth profile is maintained after all site connections have been completed.

The finished railings shall be created to the tolerances set out below:

- Variation from true plan positions of post ± 5mm
- Variation of dimensions in elevation ± 3mm
- Variation of line of rails from specified vertical and horizontal profile ± 5mm

6.20 ERECTION

Protect finish during the erection procedures where steelwork is visible in the final structure. Grind welds and use an approved body filler to leave a smooth, neat and monolithic appearance to such steelwork. Repair blemishes to sections prior to surface preparation and protective treatment.

6.21 SECURITY DURING ERECTION

During the erection securely bolt or otherwise fasten and if necessary temporarily brace the steelwork to provide safely for all erection stresses and loading conditions. Allow for loads due to erection equipment or its operation.

6.22 HOLLOW SECTION CONSTRUCTION

Fully seal all hollow sections using nominal 3mm plates where necessary. Provide single rolled lengths of members between end connections, unless approval to make other joints is given. Dress such joints to make their appearance at the joint indistinguishable from the remainder of the member.

6.23 INSPECTION AND TESTING

Fabrication Inspection
During fabrication, the Contractor and Sub-Contractor(s) shall permit the Superintendent free access to the fabricators works at all reasonable times for the purpose of carrying out inspections and shall afford all necessary facilities for the carrying out of such inspections. Where steel has been checked and approved by the Superintendent at the works before being delivered to site, such approval shall not relieve the Contractor of his responsibility to provide correct fitting on site.

Inspection During Erection
The Contractor shall give the Superintendent 24 hours notice for inspections where the Superintendent's approval is required for commencement of any stage of the works.

All field bolting and field welding shall be inspected during erection. All field weld slag shall be removed prior to inspection.

Priming and painting in the vicinity of welds shall not be carried out over any field welding until they have inspected.

No concrete encasing of formwork installation shall be carried out until the Superintendent has inspected and approved the preparation of the steelwork to be encased.

No grouting may take place until the Superintendent has inspected and approved the preparation of both the steel and concrete.

6.24 TEMPORARY WORKS

The Contractor shall be responsible for the stability of partially erected structures and shall design and construct temporary works such as falsework, guys and bracing to ensure that no permanent structural members are overloaded during the construction phase.

Approval

The Contractor shall obtain approval in writing from the Superintendent before undertaking any welding, drilling, cutting or other modification to permanent steelwork to accommodate temporary works.

Rectification

The Contractor shall make full rectification to permanent steelwork, including restoration of protective coatings after removal of temporary works.

6.25 ERECTION TOLERANCES

Steelwork shall be erected to the lines and levels shown on the design drawings within the tolerances nominated in AS 4100.

Shims and Packers

Shims and packers shall be galvanised steel grade 250 unless shown otherwise on the drawings and shall be clean, flat and free from burrs or other imperfections. Packers shall be sized to cover as much of the area of the packed joint as possible. Packers may be notched to facilitate assembly but the number of plies shall be kept to a minimum. Packers and shims shall not be used in joints using high strength structural bolts unless they are shown on the design drawings. Packers and shims supplied with the steelwork shall be assembled in accordance with the relevant drawings. All shims and packers shall be assessed for galvanic potential and alternate materials used to avoid the use of dissimilar metals.

6.26 GROUTING

General

The grout type to be used is as shown on the design drawings and shall be either flowable non-shrink grout or dry pack mortar.
Spaces to be grouted shall be fully cleaned and free of rubbish, polystyrene formers, free water and any other deleterious substances immediately prior to placing grout.

Flowable Non-shrink Grout

"Masterflow 870" or approved equivalent packaged flowable non-shrink grout shall be mixed and placed in accordance with the manufacturer's instructions. Sand-cement grout incorporating site-mixed admixtures shall not be used in these applications. Grout shall be cured in accordance with the manufacturer's instructions.

Dry Pack Mortar Grout

Dry pack mortar grout shall be mixed with two parts cement to five parts sand and the minimum possible amount of water. The grout shall be rammed under the full area of the baseplate, either by ramming from opposite sides simultaneously or by ramming against a fixed form. The edges of the grout pad shall be neatly tapered at 45° from the edge of the baseplate to the concrete surface. Grout shall be moist-cured for at least seven days.

6.27 SITE MODIFICATIONS

No modification that may affect the structural integrity of the steelwork or the serviceability of the works shall be made without the prior written approval of the Superintendent, who may direct where additional strengthening or altered configurations of the proposed modification shall be made. Any field fabrication shall conform to the requirements this Specification. Procedures and methods of modification shall be subject to the Superintendent's approval.

Cutting

Site cutting shall be by mechanical means wherever practical. Where flame cutting is unavoidable, an allowance shall be left for grinding off ragged edges to ensure a smooth finish.

Holing

Boltholes shall be drilled, not flame-cut. Correction of mismatching holes may be achieved by reaming or by filling badly misaligned holes with weld metal, grinding flush and redrilling correctly.

Repositioning

Where welded fitments need to be repositioned, the existing weld shall be removed by chipping, grinding or gouging. When the fitment has been removed any undercut areas shall be filled with weld metal and the area shall be ground smooth. Fitments damaged during removal shall be replaced with new items. Fitments shall be replaced using the same fixing as shown in the detail drawings.

Finishing

Wherever remedial work has been carried out, burrs, slag and weld spatter shall be removed and the surface of the affected area shall be cleaned. The paintwork shall be made good in accordance with this Specification.

7.1 GENERAL

Scope of Works

Supply and install the following as detailed on the Drawings:

- Decomposed granite hardstand
- Crushed aggregate hardstand
- Porous resin bound paving

7.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS/NZS 3661.2:1994; Slip resistance of pedestrian surfaces - Guide to the reduction of slip hazards
- AS/NZS 4586:1999: Slip resistance classification of new pedestrian surface materials
- AS/NZS 4663:2002: Slip resistance measurement of existing pedestrian surfaces
- HB 197:1999: An introductory guide to the slip resistance of pedestrian surface materials
- AS 1141 - 1974 : Methods of Sampling and Testing Aggregates
- AS 1289 - 1977 : Methods of Testing Soils for Engineering Purposes

7.3 MATERIALS

The Contractor shall supply and install the following paving types or approved equivalent where indicated on the Drawings:

Decomposed Granite/Granitic Sand Pavement

Decomposed granite is to be a graded 0-3mm grit, which can be stabilised and compacted as a hard wearing pathway. Decomposed granite should be stabilised with cement at 5%, or 1 bag of off-white cement per tonne of decomposed granite for pedestrian use.

Compacted Crushed Limestone

Crushed Limestone (19mm) is to be blended with Soilbond A01 emulsion combined to full depth in accordance with manufacturers specification as available from:

- Soils Aint Soils

Lot 79 Ranford Rd Cnr Bannister Rd CANNING VALE WA 6155
Phone: 1300 808 000

All material shall be to Superintendent's approval.

7.4 SAMPLES

The Contractor shall allow to construct for approval, a sample of the works. This work shall be reviewed by the Superintendent, to ensure compliance with the Specification and Drawings. Once approved, the Contractor shall ensure that all materials and workmanship comply with the approved samples. The approved samples may be incorporated into the finished work.

7.5 CRUSHED STONE/AGGREGATE HARDSTAND

Sub-Grade Preparation

Excavate (box out) sub-grade and shape to the required dimensions and levels as indicated on the Drawings and to allow for the total hardstand thickness.

Prepare sub-grade to provide a consolidated, sound base, free of depressions, soft spots or any deleterious materials such as tree roots, organic matter, Contractor's rubble and the like.

Any section of sub-grade which, in the opinion of the Superintendent, is composed of unsuitable material or is composed of material which would bread down with ageing or weathering to such an extent that it would then fall outside the limits of the Specification shall be rejected. Any material thus rejected shall immediately be excavated and removed from site and replaced with conforming material.

Uniformly compact the sub-grade to 95% of the modified maximum dry density when tested in accordance with AS 1289 - 1977 Part E2.1 for the upper 250mm. Where the material is to be used as the infill to the tree surrounds do not over compact the area immediately around the tree.

Level and trim sub-grade finished surface to ensure that the completed hardstand surface does not deviate more than 10mm from the base of a 3.0m long straight edge placed in any direction on the finished surface.

Limestone Base Course

Crushed limestone shall be limestone obtained from an approved source and be crushed to comply with the grading in this Specification.

The crushed limestone shall be free from:

- Roots and other organic matter
- Sand, capstone and other deleterious material

The crushed limestone base shall comply with the following grading requirements:

AS Sieve Size	Passing (%)
75mm	100
19mm	50-75
2.36mm and less	30-50

Methods of sampling and testing of crushed limestone shall be in accordance with the following Australian Standards:

- AS 1141 : Methods of Sampling and testing Aggregates
- AS 1289 : Methods of Testing Soils for Engineering Purposes

The crushed limestone shall have resistance to abrasion, when determined in accordance with the Los Angeles Test to show a weight loss not exceeding sixty percent (60%) by weight.

The Calcium Carbonate content of the crushed limestone shall not be less than sixty percent (60%) by weight.

Notwithstanding this Specification, any sample, which in the opinion of the Superintendent, is composed of unsuitable material or is composed of material which would break down with ageing or weathering to such an extent that it would then fall outside the limits of the Specification shall be rejected.

The base course shall be compacted to 95% of the maximum dry density when tested in accordance with AS 1289-1977. Where the material is to be used as the infill to the tree surrounds do not over compact the area immediately around the tree.

The base course shall be graded and compacted to the required profiles and grades. The material shall be watered during grading and rolling to achieve the optimum water content for compaction. Generally, compaction shall be by means of rolling with an approved self-propelled roller.

The surface shall be tested by template to ensure accuracy and any irregularities greater than 10mm when tested with a straight edge 3m long shall be made good by addition or removal of material and further rolling until the specified cross section is obtained. A tolerance of levels of + 5mm will be permitted. The thickness of the base course shall not vary by more than 10% of the nominated layer thickness.

Placement
Once an appropriate base is established install crushed stone and/or stabilised material to the required depth as indicated on the Drawings.

The top course shall be carefully placed upon the subgrade and compacted to achieve a dense solid surface that is resistant to scuffing and scouring. The Contractor shall maintain the moisture content at the optimum level for placing and construction throughout the entire construction period. Any foreign matter such as rock and soil must be removed and re-established. It is important that the fully compacted depth of material is achieved, and the surface is even, fully compacted and free draining.

Do not over-water any stabilised material before compaction otherwise cement will rise to the surface causing a hard cement surface layer.

Compaction of Stabilised Material
After installation, the decomposed granite sand shall be immediately compacted and brought to level by not less than three passes of a vibrating plate compactor. If the granite is too dry, puffs of dust will blow out from beneath the vibrating plate compactor. If this occurs, lightly water before compacting again.

Compact the decomposed granite to required levels adding more to lower areas. Establish a level surface with a recommended cross fall of at least 5% as indicated on the Drawings. (Do not allow water to pond on surface). Follow compaction process while lightly watering with spray nozzle until water slowly soaks into the granite. Surface broom off any excess water and cement fines. Use water spray to clean off granite surface. Protect area and leave surface for 24-48 hours to dry.

7.6 POROUS RESIN BOUND AGGREGATE PAVING

Sub-Grade Preparation
Excavate (box out) sub-grade and shape to the required dimensions and levels as indicated on the Drawings and to allow for the total hardstand thickness.

Prepare sub-grade to provide a consolidated, sound base, free of depressions, soft spots or any deleterious materials such as tree roots, organic matter, Contractor's rubble and the like.

Any section of sub-grade which, in the opinion of the Superintendent, is composed of unsuitable material or is composed of material which would bread down with ageing or weathering to such an extent that it would then fall outside the limits of the Specification shall be rejected. Any material thus rejected shall immediately be excavated and removed from site and replaced with conforming material.

Uniformly compact the sub-grade to 95% of the modified maximum dry density when tested in accordance with AS 1289 - 1977 Part E2.1 for the upper 250mm. Where material is to be used as the infill to the tree surrounds do not over compact the area immediately around the tree.

Level and trim sub-grade finished surface to ensure that the completed hardstand surface does not deviate more than 10mm from the base of a 3.0m long straight edge placed in any direction on the finished surface.

Gravel Base Course
Washed blue metal gravel (5mm) shall be

Methods of sampling and testing of gravel shall be in accordance with the following Australian Standards:

- AS 1141 - 1974 : Methods of Sampling and Testing Aggregates
- AS 1289 - 1977 : Methods of Testing Soils for Engineering Purposes

Notwithstanding this Specification, any sample, which in the opinion of the Superintendent, is composed of unsuitable material or is composed of material which would break down with ageing or weathering to such an extent that it would then fall outside the limits of the Specification shall be rejected.

The base course shall be laid to 70mm thickness and compacted to 95% of the maximum dry density when tested in accordance with AS 1289-1977. Where the material is to be used as the infill to the tree surrounds do not over compact the area immediately around the tree. Seek Superintendent's guidance in this regard.

The base course shall be graded and compacted to the required profiles and grades. The material shall be watered during grading and rolling to achieve the optimum water content for compaction. Generally, compaction shall be by means of rolling with an approved self-propelled roller.

The surface shall be tested by template to ensure accuracy and any irregularities greater than 10mm when tested with a straight edge 3m long shall be made good by addition or removal of material and further rolling until the specified cross section is obtained. A tolerance of levels of + 5mm will be permitted. The thickness of the base course shall not vary by more than 10% of the nominated layer thickness.

Placement
Once an appropriate base is established install resin bound aggregate to 30mm depth or as indicated on the Drawings.

The top course shall be carefully placed upon the subgrade and compacted to achieve a dense solid surface. Any foreign matter such as rock and soil must be removed and re-established. It is important that the fully compacted depth of material is achieved, and the surface is even, fully compacted and free draining.

Establish a level surface with a recommended cross fall of at least 2% as indicated on the Drawings. (Don't allow water to pond on surface). Protect area and leave surface for 24-48 hours to dry.

7.7 COMPLETION

Miscellaneous Work
Do all cutting and forming of holes for services to be installed by other trades, secure any membranes where shown to be concealed under cappings or paving and all other labours required to complete the work.

Protection
Protect work from staining, erosion and damage, use sheeting or other screening as necessary until Practical Completion.

Protect adjoining surfaces during installation. Finished surfaces in the vicinity of work being carried out shall be protected from staining and impact and all necessary precautions are to be taken to ensure that protection is provided and maintained.

Cleaning
On completion and following approval by the Superintendent of the work, all stone/surfaces shall be raked/brushed cleaned by approved means to give a uniform surface free from all foreign matter.

Clean away and remove from the site all rubbish and unwanted materials and leave the area of the works clean and tidy.

7.8 TESTING

The Superintendent reserves the right to take samples of any materials at any time for test or analysis.

Should the results indicate that the requirements of this Specification have not been complied with, action will be taken under the Contract regarding replacement, re-performance or compensation.

The costs of all failing tests or analysis will in all circumstances be paid by the Contractor.

7.9 ACCEPTANCE CRITERIA FOR HARDSTAND

Initial Acceptance
Initial acceptance and confirmation of Practical Completion will not be approved until the following criteria are satisfied:

- The finished works shall conform to the construction tolerances and be free draining at all times. The applicable finished surface tolerance is a maximum deviation from the bottom of a 3m straight edge shall be 10mm.
- The colour of the pavement will be uniform
- The surface texture is to be uniform throughout.
- Where hardstand is constructed against a kerb and/or edge restraint, the top of the hardstand shall be constructed to finish 10 mm below the lip of the adjacent edge.

Performance in Maintenance Period

Prior to the expiration of the Maintenance Period the pavement shall be examined to ensure that the requirements for initial acceptance are still met, together with the following:

- The surface and subgrade should be stable and such as not to be eroded under normal conditions.
- Resin bound material shall be of uniform appearance across the project and have retained the original surface tolerances +/- 5% of the tolerance as approved at Practical Completion.

8.1 GENERAL

Scope of Works

- Construct reconstituted limestone retaining/walls as detailed on the Drawings

8.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS/NZS 4455:1997: Masonry units and segmental pavers
- AS/NZS 4456:1997: Masonry units and segmental pavers - Methods of test
- AS 3700-2001: Masonry structures
- AS/NZS 4517:1998: Abrasive products - Segmented saws for machining of stone and masonry cutting - Dimensions of
- steel blades
- BS EN2370:1999: Natural stone test methods. Determination of resistance to salt crystallization
- BS EN12371:2001: Natural stone test methods. Determination of frost resistance
- BS EN12372:1999: Natural stone test methods. Determination of flexural strength under concentrated load
- BS EN12407:2000: Natural stone test methods. Petrographic examination
- BS EN13161:2001: Natural stone test methods. Determination of flexural strength under constant moment
- BS EN13364:2002: Natural stone test methods. Determination of the breaking load at dowel hole
- BS EN13755:2002: Natural stone test methods. Determination of water absorption at atmospheric pressure
- BS EN13919:2002: Natural stone test methods. Determination of resistance to ageing by SO2 action in the presence of
- humidity
- BS EN1925:1999: Natural stone test methods. Determination of water absorption coefficient by capillarity
- BS EN1926:1999: Natural stone test methods. Determination of compressive strength
- BS EN1936:1999: Natural stone test methods. Determination of real density and apparent density and of total and open
- porosity
- BS EN771-6:2001: Specification for masonry units. Natural stone masonry units
- BS EN772-11:2000: Methods of test for masonry units. Determination of water absorption of aggregate concrete,
- manufactured stone and natural stone masonry units due to capillary action and the initial rate of water absorption of clay
- masonry units
- BS EN772-20:2000: Methods of test for masonry units. Determination of flatness of faces of aggregate concrete,
- manufactured stone and natural stone masonry units
- BS EN772-4:1998: Methods of test for masonry units. Determination of real and bulk density and of total and open
- porosity for natural stone masonry units

8.3 BLOCKS

Stone shall be sound, free from stakes, crakes, vents, pockets, veins, fissures and other like defects.

Limestone shall have a density not less than 1600 kg/m3.

Except where otherwise indicated on the Drawings, all limestone shall be tungsten cut to the sizes indicated on the Drawings and palletised for delivery to site.

Stone shall be stored on site clear of the ground on pallets and the stacks shall be covered with a waterproof cover to prevent wetting.

Blocks to be as follows or as notated on the Drawings:

- Faceblocks and edging to be 'Blokstone' 350X350x500mm reconstituted limestone available from Brikmakers 1300 360 344 or approved equivalent.

- Rear and Supporting Blocks not visible to be grey reconstituted limestone blocks.

The Contractor shall ensure that the nominated blocks meet with the structural requirements of the Specification and the appropriate Australian Standard.

8.4 MORTARS

General

Mortar shall comply with AS 3700 - 1988 and be used within 30 minutes of initial adding of water.

Materials for Mortar:

- Fine aggregate shall be sand
- Water shall be clean and of drinking quality, and
- Colouring pigments shall be metallic oxides insoluble in water.

Do not use admixtures unless specified. When specified, use admixtures strictly in accordance with the manufacturer's recommendations. When coloured mortar is specified, mix colouring pigments with cement and use fine aggregate compatible with the colour required.

Mix mortar as follows:

- Measure parts in mixes by volume in calibrated devices
- Thoroughly mix any colouring pigments with the cement before adding other ingredients, and
- Mechanically mix mortar to an even colour and consistency.

Mix mortar in the proportions as follows:

- 1 part ordinary Portland cement
- 1 part lime putty, and
- 6 parts fine aggregate.

Coloured Mortar
Mortar in face stonework shall match the colour of the specified reconstituted limestone blocks to the approval of the Superintendent.

8.5 WORKMANSHIP

All stone work shall be carried out by tradespersons experienced in limestone work.

Provide all accessories and perform all operations necessary for the proper execution of first class masonry work, including selecting, cutting, dressing, carving, bedding, setting, fixing, pointing, grouting, caulking and the like.

Build in where indicated and as necessary, all reinforcements, ties and the like.

Cut openings, chases, mortices and the like for other services and fixings. Well wet down stone which is to be laid or grouted in cement mortar.

Use non-staining softwood wedges or lead or plastic buttons for positioning stones.

Set work out, plumb, level and properly bonded, with no part rising more than 1000mm above adjacent unfinished work.

Corners and other advanced work shall be raked.

Re-lay in fresh mortar any stonework which has been moved or jarred after initial laying.

Construct all exposed areas of walls/piers to face work standard.

8.6 COURSING AND BOND

Stonework shall be to face sizes and pattern shown on Drawings and shall consist of carefully cut and dressed stone with even joints.

Stone shall be selected on site to ensure that only clean, square edges are visible in top course and facework.

All edges shall be kept true and straight, with jointing running horizontally and vertically and finished to dimensions indicated.

8.7 JOINTS

Form joints uniformly in facework, filled solidly with mortar, rolled to a smooth finish and finished with clean, straight edges against the stone.

Do NOT fill minor chips or hollows in stone of facework with mortar.

- Joint thicknesses shall be 20mm

8.8 SAMPLES

Erect samples of limestone work as follows and obtain the Superintendent's approval prior to proceeding. All limestone work shall match the standard of the approved sample:

- 2 m^2 wall showing capping and bond pattern

8.9 FOOTINGS TO LIMESTONE WALLS AND PIERS

Compaction of Sub-Grade
All wall foundations to be compacted to 95% of the modified maximum dry density when tested in accordance with AS 1289-1977 Part E2.1 for the upper 250mm.

Ducts and Conduits
Provide ducts and conduits as necessary through walls to accommodate the requirements of the irrigation system and any other services.

8.10 REINFORCEMENT TO LIMESTONE WALLS, PIERS AND FOOTINGS

Provide reinforcement to piers and footings as indicated on the Drawings and as specified.

8.11 CLEANING

Upon completion, clean down all new work and adjoining surfaces where necessary, by appropriate methods, which shall be subject to the Superintendent's approval.

8.12 PROTECTION OF FINISHED WORK

Clean off mortar drippings and the like as soon as they occur. Protect all finished stonework from staining or damage. Use sheeting or casing where necessary.

Do not use hardwoods in contact with stone.

Stained or damaged stonework shall be replaced, not repaired, unless otherwise permitted by the Superintendent. Similarly protect adjoining surfaces during masonry work.

8.13 GRAFFITI PROTECTION

Supply and apply a graffiti protection system to all walls and signs and structures in accordance with manufacturer's recommendations as follows:

- All limestone walls, and cappings

Refer to miscellaneous Specification for product details.

8.14 DAMP COURSE

The damp course shall consist of an approved spray-on bitumen-based waterproofing compound such as Pabco 'Pabkote 3' or other similar approved. The Contractor shall apply the waterproofing compound to all surfaces of limestone works in planter boxes and to the rear face of all retaining walls where proposed to be in contact with soil, to the manufacturer's Specifications.

Protect adjoining surfaces during application of the waterproofing compound. Finished surfaces in the vicinity of work being carried out shall be protected from staining and all necessary precautions are to be taken to ensure that protection is provided and maintained.

On site application of the waterproofing compound can be carried out only after the Contractor has taken every precaution to ensure that there is no danger of overspray damaging property or passing traffic.

Application shall not take place when weather conditions are unsuitable such as in high winds or rain.

Application shall occur subsequent to the installation of irrigation lines and all other services.

9.1 GENERAL

Scope of Works

Supply and install the following as detailed on the Drawings:

- Construct concrete footing to structures as detailed on the Drawings
- Construct concrete footpaths as detailed on the Drawings

9.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS 3972: Specification and Methods of Test for Portland Cement
- AS 1316: Masonry Cement
- AS 2758.1: Concrete Aggregate
- AS 1672: Building Limes
- AS A123: Mortar for Masonry Construction
- AS 3600: Concrete Structures
- AS 3700: SAA Masonry Code.
- AS 1170: SAA Loading Code
- AS 1881, Part 5: Methods of Testing Hardened Concrete for other than Strength
- AS 1478: Chemical Admixtures for Concrete
- AS 1012: Methods for Testing Concrete
- AS 3799: Liquid Membrane-Forming compounds for curing Concrete
- AS 1379: The Specification and Manufacture of Concrete
- AS 1141: Methods of Sampling and Testing Aggregates
- AS 1289: Methods of Testing Soils for Engineering Purposes

9.3 INSITU CONCRETE FOOTINGS

Concrete

The concrete shall conform to AS 3600 - 1988 and shall be a mixture of cement, fine aggregate, coarse aggregate and water proportioned so that the amount of fine aggregate shall be the minimum that combined with the cement will produce only sufficient mortar to fill the voids in the coarse aggregate and leave a slight excess for finishing and that the 28 day cylinder strength of the concrete shall equal or exceed 25 MPa if not detailed otherwise in the Drawings. The cement content of any mix shall not be less than 270 Kg/m3. No additives shall be used in the concrete, unless otherwise approved by the Superintendent. The slump shall not exceed 70mm or be less than 30mm. The maximum size of aggregate shall be 20mm.

Cement

All cement used shall be Portland Cement in accordance with AS 3972 and obtained from an approved manufacturer. Cement shall be delivered to the site fresh and in sealed bags and there stored in a weatherproof shed until such time that it is to be used. Any bag showing sign of deterioration or setting is to be rejected.

Aggregate

Fine aggregate shall be well graded, clean, sharp and free from clay and organic impurities in accordance with AS 1141 - 1974 and AS 2758.1 - 1985.

Coarse aggregate shall be crushed granite or diorite clear and free from all impurities and dust in accordance with AS 1141 - 1974 and AS 2785.1 - 1985.

Water

Potable water shall be used in the concrete mix. The water shall be clean and free of any deleterious matter before use in the mix.

The quantity of water used in the concrete shall be kept to the minimum necessary to ensure adequate workability of the concrete. Under no circumstances may the water/cement ratio exceed 0.60.

Sand

Sand for mortar will be crushed stone or natural sand free from all deleterious substances and have a uniform grading. Sand for bedding or backfilling shall be clean sand free from roots, clay or any deleterious matter.

Steel

Steel reinforcing fabric and steel reinforcing bars for concrete shall comply with the requirements of AS 1302 - 1982, AS 1303 - 1984 and AS 1304 - 1984 and be free from loose rust or matter likely to impair the bond with concrete.

Compaction of Sub-Grade

Uniformly compact sub-grade to 95% of the modified maximum dry density when tested in accordance with AS 1289 - 1977 Part E2.1 for the upper 250mm.

Mixing and Placing
Concrete shall be mixed in an approved mechanical batch mixer. The aggregate and cement shall be first mixed dry, then after the addition of water (the quantity of which shall be carefully measured to ensure uniformity consistency of batches), the contents shall be mixed until there is uniformity in colour and consistency, but in no case shall the mixing continue for less than two minutes after the addition of water.

The concrete may be mixed in an approved central plant and transported on to the site in a pre-mixed condition in specially constructed conveyances, or centrally batched and mixed in transit by specially constructed transit mixers. Production and delivery of the concrete shall be in accordance with the requirements of AS 1379 - 1973.

A plastic surface of concrete shall be maintained until the completion of placing of that part of the work.

Each batch of concrete shall be placed and compacted within 30 minutes of the concrete being discharged from the mixer, or delivered to the site in a transit mixer and discharged there from. The methods of handling and placing shall prevent segregation and/or loss of ingredients and shall avoid re-handling. The concrete shall not be dropped by more than 1 metre. Open troughs and chutes where used shall be made of metal or lined with metal. Barrows and buckets shall be of metal. The concrete shall NOT be thrown from shovels.

During and immediately after placing, the concrete shall be thoroughly compacted by mechanical vibration or if necessary by hand in positions agreed by the Superintendent around the reinforcement and shall be properly spaded against the forms to ensure a good surface free from honeycombing. The concrete shall not be subjected to any disturbance after being worked into place. Concreting shall be carried on continuously between joints. The position of all construction joints shall be subject to prior approval of the Superintendent. Newly placed concrete shall be adequately shielded from harmful effects of sun, rain and frost.

Curing
All concrete shall be kept continuously damp for at least 7 days or until thoroughly cured. In hot, dry or windy conditions, the exposed concrete shall be covered and sealed with a PVC membrane, or similar approved material, such that adequate moisture is retained for proper curing.

Finishing
All exposed surfaces of concrete shall be finished smooth and dense. All honeycombed portions shall be cut out and made good to the satisfaction of the Superintendent immediately after the formwork has been struck. All projecting imperfections shall be rubbed down flush with carborundum stone or other approved means and resulting grit and dust thoroughly washed off with clean water. Then as a separate operation a 1-1/2:1 approved sand and Portland Cement mixture shall be worked into the pores over the whole surface with a fine carborundum float in such a manner that no material is left on the concrete face than is necessary to fill the pores completely, so that a uniformly smooth and dense surface is presented.

Formwork
The design and construction of the forms shall be the responsibility of the Contractor. The forms shall be removable without injury to the concrete. The forms shall be made either of approved timber, free from loose knots and other defects, or metal in which all bolt and rivet heads are countersunk in faces in contact with the concrete, or other approved material.

The forms shall be built true to line, and braced in a substantial and unyielding manner to maintain position and shape. Joints in forms shall be either horizontal or vertical and the forms and joints shall be mortar tight. Re-entrant angles shall be chamfered and corners filleted, the bevel in each case having equal angles and sides of 25mm, if not shown otherwise in the Drawings.

The contact face of timber formwork used for exposed concrete surfaces shall be made of either dressed timber or undressed timber lined with an approved waterproof lining not liable to warp, so that exposed concrete surfaces on stripping shall be smooth and even and true to the dimensions and slopes given in the Drawings.

Forms shall be provided for all vertical surfaces of concrete to be placed in earth excavation.

Dimensions affecting the construction of other parts of the work shall be checked carefully, after the erection of forms and before the placing of concrete. The oil, grease or soap used on forms to prevent adhesion of mortar shall be such that no discolouration of the surface of concrete will result. The oil, grease or soap shall be spread uniformly in a thin film and any surplus shall be removed prior to the placing of concrete.

No concrete shall be placed until the forms have been approved by the Superintendent. The approval of the Superintendent does not relieve the Contractor from its responsibility to provide adequate and dimensionally correct formwork at the required location, level and alignment. If, after the concrete has been placed, the forms show any signs of bulging or sagging, the affected part of the concrete shall be removed. The forms shall be reconstructed rigidly to the satisfaction of the Superintendent and the removed part of the work shall be reconstructed to the requirements of this Specification at the earliest opportunity. All this work shall be completed at no cost to the Principal.

Reinforcement
The reinforcement shall be built up exactly as shown on the detail Drawings and supported in position so as to give the correct cover. Bars and stirrups shall be wired firmly together at all points of intersections and the ends of all wires turned inwards away from the shuttering. Fabric must be waved up over supports exactly as shown on the Drawings. The use of a fabric bender is recommended.

The reinforcement shall be accurately bent cold to the shapes shown on the working Drawings and all bends shall conform to the special details supplied.

The Contractor shall provide at the Contractor's own expense all supports of timber or other material, pre-cast motor spacing blocks, tying wire and other materials. Fabric reinforcement shall be supplied in flat sheets. Any fabric which has been taken from a roll will not be allowed to be used on the works.

Testing
The consistency of concrete shall be determined by the slump test in accordance with AS 1012.3 - 1983. The Contractor shall provide the necessary equipment and conduct the test whenever requested by the Superintendent.

The method of sampling fresh concrete for testing is to be carried out in accordance with AS 1012.1 - 1981.

The Contractor shall provide four (4) standard moulds for the making of strength test cylinders in accordance with methods prescribed in AS 1012.8 - 1986. Cylinders shall be made when required by the Superintendent and shall be tested after curing and maturing in accordance with AS 1012.9 - 1986, AS 1012.10 - 1985 and AS 1012.11 - 1985, as appropriate.

The testing shall be allowed for within the Contract Sum, except that the cost of all tests failing to reach the required strength shall be borne by the Contractor.

9.4 INSITU CONCRETE PAVING(FLATWORK) - STANDARD

Earthworks and Subgrade Preparation
Carry out earthworks and preparation to allow for levels to be achieved to finished grades as specified. Unless otherwise permitted, excavated material shall not be deposited on existing grass areas. Remove all topsoil containing roots, grass or organic material. Ensure all service trenches are uniformly backfilled and compacted with the surrounding material. All isolated hollows and soft spots are to be filled to finished level by compacting in layers of no more than 100mm in depth. All subgrade is to be uniformly compacted to the required strength using a plate compactor or vibrating drum roller. Compaction shall be to 95% modified maximum dry density. 100mm thick rises of low volume change material ie. limestone road base or approved equivalent shall be used if existing site soil is inadequate to achieve the required strength.

Sub-Base Preparation
Sub-Base shall be clean yellow fill sand. It shall be placed and compacted to a minimum depth of 50mm and to 90% modified maximum dry density.

Colour
Concrete shall be standard grey or approved equivalent.

Samples by Contractor
The Contractor shall supply and lay a sample panel of each concrete colour each 1.5 x 2.0 metres. All samples shall be reproducible at the price submitted with Tender. The Superintendent shall select one of the sample panels for use to areas as shown on the plans. The samples panels shall be protected from damage to enable comparison following completion of the works. The Contractor shall be responsible for maintaining the quality and colour approved in the samples across all relevant works.

Form work
Form work shall be of steel or suitable dressed seasoned timber planks, free of warps, bends of kinks.

Set out of form work to be approved prior to pouring. The Superintendent must approve the path setout and form work prior to pouring of concrete, give adequate notice (24 hours min) for inspection and approval prior to pouring.

Forms shall be staked with no less than 3 stakes and not more than 1.5m apart to prevent unspecified warps and bends. Forms shall be in one piece for the concrete pavement thickness specified. Control joints should be straight, even and true.

Concrete
The concrete shall conform to AS 3600 - 1988 and shall be a mixture of cement, fine aggregate, coarse aggregate and water proportioned so that the amount of fine aggregate shall be the minimum that combined with the cement will produce only sufficient mortar to fill the voids in the coarse aggregate and leave a slight excess for finishing.

Concrete shall be grade N32 have a maximum aggregate size of 14mm and include quarry dust.

The cement content of any mix shall not be less than 270 Kg/m3. No additives shall be used in the concrete, unless otherwise approved by the Superintendent. The slump shall not exceed 70mm or be less than 30mm.

Cement
All cement used shall be Portland Cement in accordance with AS 3972 and obtained from an approved manufacturer.

Aggregate
Fine aggregate shall be well graded, clean, sharp and free from clay and organic impurities in accordance with AS 1141 - 1974 and AS 2758.1 - 1985.

Coarse aggregate shall be crushed granite or diorite clear and free from all impurities and dust in accordance with AS 1141 - 1974 and AS 2785.1 - 1985.

Water
Potable water shall be used in the concrete mix. The water shall be clean and free of any deleterious matter before use in the mix.

The quantity of water used in the concrete shall be kept to the minimum necessary to ensure adequate workability of the concrete. Under no circumstances may the water/cement ratio exceed 0.60.

Steel

Steel reinforcing fabric and steel reinforcing bars for concrete shall comply with the requirements of AS 1302 - 1982, AS 1303 - 1984 and AS 1304 - 1984 and be free from loose rust or matter likely to impair the bond with concrete.

Placement
Lay concrete at widths shown on Drawings and to 100mm depth unless otherwise indicated and finish with a steel hand trowel.

Joints in Paving
The Contractor shall prepare a construction joint location plan detailing the location of all expansion, control and contraction joints. This drawing shall be submitted to the Superintendent allowing for sufficient time for any amendments and approval without causing delay to the Contract. The drawing shall clearly indicate the extent of all paving and any relevant features that occur within the paving, including but not limited to interface with built form, walls, ramps, drainage pits, pram ramps, bollards, man holes, lights, street furniture, artwork etc.

All constructed joints shall conform with this plan once approved.

Unless specifically detailed do not install any joints across junctions in paths. Provide an expansion joint at the leading edge of each and every path emanating from a junction.

Should the Drawings show any joints at centres other than that Specified below, the Contractor shall be deemed to have allowed in the Contract Sum for joints to be constructed at the closer of the two centres.

In general jointing shall be as follows;

Expansion and Isolation Joints
Provide 10mm wide expansion joints in paving evenly spaced at intervals not exceeding 6 metres apart. Expansion joints in pathways (no wider than 2.5m) are required every 50m along a straight, unhindered path or at the start of a deviation of a curve in the path. Expansion joints are also to be installed along all edges where the slab abuts either a structure, pier, post, paved surface or similar.

All expansion joints are to be dowel joints consisting of galvanised steel reinforcing dowel cast central to the depth of the slab. Unless otherwise indicated on the drawings the dowels shall be R10x450mm length placed at 450mm centres. One end of each dowel to be wrapped in Denso tape or approved equivalent.

Set into each expansion joint a backing of 10mm diameter closed cell polyethylene strip (Ableflex or similar approved). Set strip back sufficient distance so that sealing compound will finish flush with paving.

Seal expansion joints with a polysulphide or polyurethane based sealing compound. Depth of sealing compound shall not exceed the width of the joint. Colour of sealing compound shall blend with colour of concrete. Seek approval from the Superintendent prior to installation of seal.

Where polysulphide sealing compounds are used, coat surfaces of concrete in contact with sealing compound with a sealer recommended by the sealing compound manufacturer.

Control and Contraction Joints
Provide control joints in paving evenly spaced at intervals not 1.5 times the width of the path. For example, a path 2m wide should have spacings no more than 3m. Spacings may be increased when laying on sand with the approval of the Superintendent.

Control joints shall be formed from a recycled PVC joint strip approximately 3mm thick such as Lock Joint or similar and approved. The joint shall be finished with a silicone co-polymer, polyurethane sealant and installed in accordance with the manufacturer's specification and the Superintendent's approval. Seek approval for the sealant strip colour from the Superintendent prior to installation.

Expansion Membrane Where Paving Abuts Fixed Items
Install a 10mm thick expansion membrane such as Ableflex or approved equivalent against any adjoining constructed or other fixed elements such as walls, drains, footings to walls, man-holes, furniture, posts and/or other fixed items such as large rocks, etc.

The membrane should be to the full depth of the slab and installed directly onto the base-course or sub-grade. Secure the expansion membrane to the adjoining footing, wall, kerb and/or other fixed structure as specified above using an approved adhesive. Install in a neat and tidy fashion, in straight sections unless otherwise shown on the joint location drawings.

Select the height of the expansion membrane to match the full depth/thickness of the concrete including the detachable 10mm strip at the top. Once the concrete is cured and the detachable strip removed, install an approved, colour matched, flexible mastic to the full length of the expansion membrane.

Finishing
After placing and compaction, concrete shall be finished monolithically to a smooth, even surface by means of steel floats or other suitable equipment. Refer to Texture and exposed aggregate clauses below for specialised finishes where required.

On completion of steel floating and before initial set, the surfaces of concrete paths, driveways and minor paving shall be brushed to a "non-skid" texture. This shall be achieved by Drawing a moistened nylon broom lightly across the surface at right angles to the direction of the path or paving.

All concrete indicated as being textured, exposed aggregate or feature panels shall be finished to match approved samples.

Sealant

The Contractor shall allow to supply and install sealant to all concrete paving areas. The sealant shall be a commercially manufactured, clear, non yellowing, sealant designed to prevent staining from oils, grease and general dirt equal or equivalent as approved by the Superintendent to "Nu Pave" by Crommelin Chemicals or "Natural Finish" by Bondall.

Path Widths
The Contractor shall allow to supply and install footpaths to the dimensions as indicated on the plans.

9.5 INSITU CONCRETE PAVING (FLATWORK) – EXPOSED/WASHED AGGREGATE

Note: All Specification Clauses noted above for Standard Flatwork apply equally to Textured and Exposed Aggregate Concrete unless otherwise noted.

Concrete Mix

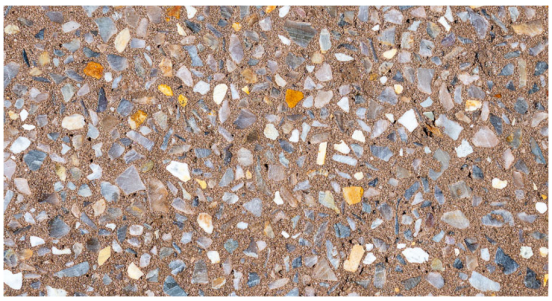
- Holcim 'Kangaroo Paw'

Holcim (Australia) Pty Ltd
Western Australia State Office
18 Brodie Hall Drive
Bentley WA 6102
Phone 08 9212 2000
Fax 08 9212 2001

Exposed Aggregate
All concrete shall be finished to match the colour and texture of the approved sample.

Samples by Contractor
The Contractor shall supply and lay a sample panel of each exposed aggregate type each 1.5 x 2.0 metres. All samples shall be reproducible at the price submitted at Tender. The Superintendent shall select one of the sample panels for use to areas as shown on the plans. The samples panels shall be protected from damage to enable comparison following completion of the works. The Contractor shall be responsible for maintaining the quality and colour approved in the samples across all relevant works.

The Contractor shall refer to the Holcim 'Best Practice Placement Guidelines' when installing all Holcim products. If an alternate method is proposed this must first be submitted to the Superintendent for approval prior to proceeding with the works.


indicative image of exposed aggregate concrete.

Placement
The concrete shall contain an integral mix of the specified aggregate to the entire depth of the slab. Concrete shall be placed, screeded and bull floated to the finished level ensuring an even cover of approximately 2mm of cement mortar to the aggregate at the surface.

Exposing Aggregates
Aggregates shall be exposed through the water wash-off technique. The slab shall be brushed and flushed with water soon after the concrete has stiffened. Aggregate exposure shall commence when the surface can bear the weight of the pavior without making surface impressions deeper than 2-3mm.

A medium-bristle broom together with a continuous water spray shall be used to wash away the surface cement matrix. The water spray is to be sized to avoid dislodging smaller aggregate particles. To avoid weakening the mortar and dislodging aggregate the surface shall not be broomed repeatedly. Re-trowelling of the surface may be necessary to tightly pack the aggregate particles for an improved finish and then the washing process repeated.

Smaller sections are to be hand worked with a sponge and brush where necessary.

If washing larger areas the Contractor shall ensure water runoff is not concentrated into defined areas and thereby removing additional mortar.

No aggregate is to be exposed more than one third of their individual depth. Aggregate shall be exposed uniformly across each slab and consistently over the entire project to match the approved samples.

Inconsistent or unevenly exposed panels will be rejected and are to be relaid at the Contractor's cost.

Finishing

All cement film is to be washed from the finished surface.

Details for the use of surface set retardants are to be submitted to the Superintendent at the time of sample panels being laid.

Following exposure of aggregates the surface shall be kept free of all traffic for a minimum of 7 days.

The surface shall be acid washed with a mix of 1 part hydrochloric acid to between 10-20 parts water to remove any remaining cement film. The surface shall first be thoroughly wetted to prevent acid soaking into the surface. The surface shall then be rinse with clean water to remove residual acid. If a curing compound has been used the use of acid shall be delayed until the curing compound has degraded.

All surfaces are to be sealed as noted under the Standard Flatwork Section.

9.6 INSITU CONCRETE MOWING KERBS

Setting out of the Works
Construct mowing kerbs to areas shown on Drawings or as determined on site by the Superintendent.

Materials
Concrete shall be minimum strength 15 MPA.

Colour
Concrete shall be standard grey concrete using cement to match footpaths.

Earthworks
Carry out earthworks and preparation of surfaces to achieve eve grades to the final approval of the Superintendent. Compact kerbing sub-base to 90% of modified maximum dry density.

Installation
Kerbing shall be constructed using machine formed extruded insitu concrete to have dimensions as indicated on the drawings. Kerbing is to be free from imperfections and irregularities in width and thickness and must be constructed in good straight line and/or smooth even radius curves, to the approval of the Superintendent.

Construct control joints at 3.0 metre maximum centres and at least one quarter of the depth of the kerb section.

Hand constructed mowing kerbs must be done using good quality framework capable of producing uniform, well finished kerbs in either straight and even lengths or smooth, even curves.

Top surface of all kerbing must finish flush with surrounding surfaces and/or ground level.

Finish all kerbing monolithically to a smooth, even surface by means of a steel trowel or other surface equipment.

Provide surface protection to kerbing as necessary to prevent cracking of the concrete due to temperature changes during curing periods. Make good to all poorly constructed and/or damaged lengths of kerb.

On Completion
Remove all excess concrete from site and backfill with soil flush with top of kerb.

10.1 STREET FURNITURE

The Contractor shall allow to supply and install the following furniture as nominated on the plans:

Street Furniture Australia
Address: Perth Office
DS Agency
184 Beechboro Road South
Bayswater WA 6053
Phone: 08 6143 6565
Sales Manager: Paul Quilty

10.2 BENCH SEATING

The Contractor shall allow to supply and install all bench seating as nominated on the Drawings. Benches shall be; Linea Seating Bench. Benches shall be securely fixed to a level 100mm thick reinforced concrete pad as specified and detailed, finished flush with adjoining levels to grade at 2% for drainage. Concrete pads shall be 2800mm x 1800mm unless otherwise noted on the Drawings.

10.3 RUBBISH BINS

The Contractor shall allow to supply and install rubbish bins as per the Drawings. Rubbish bins to be standard City of Wanneroo bin and post arrangement The Contractor shall note that the bind is to be installed on its own concrete pad as detailed. Bins are available from:

- GC Sales
  Paul Homes
  9248 3726
  www.gcsales.com.au

The Contractor shall allow for the supply and installation a 240lt “Wheelie Bin” or similar approved by the Superintendent. The installation of the ‘Wheelie Bin” must occur at the same time as the installation of the bin enclosure.

11.1 GRAFFITI COATING

General

The Contractor shall allow to supply and apply a non-sacrificial graffiti coating to all walls, signs and vertical surfaces unless otherwise specified or directed. Do not apply graffiti coating to any signage unless directed to do so on site, removal of graffiti coating applied to signage will be at the Contractor's expense. The Principal will not be liable for any costs associated with removal of graffiti during the Construction period.

Materials

Source graffiti coating from an approved supplier and ensure application rate and method meets the
Supplier's recommended standards. Anti graffiti coating shall be a two-part, clear waterbased acrylic coating such as Dulux APP Surfaceshield HD or similar approved by the Superintendent. Application shall be as per manufacture's recommendations for individual surface types.

Safety

All works and product handling shall be undertaken in strict accordance with the approved material safety data sheet and the manufacturer's Specification.

11.2 SIGNAGE AND GRAPHICS

General

The Contractor shall allow to supply and installation signage as part of the Landscape Contract. The Contractor's responsibility shall include all items required for the supply, fabrication, transport and installation. The Contractor shall also be responsible for the preparation of shop drawings for the final layout of the artwork. Any text, logo's and graphics shown on the drawings are indicative only. All fonts and graphics shall be provided as a digital file by the Principal and the Contractor shall submit a shop drawing to confirm sizing, layout and colours for approval prior to fabrication.

11.3 CHAIN MESH/LINK FENCING

Standards

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated, or is not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

The Australian Standard for chainlink security fencing is covered by AS1725-2010 - Parts 1-5

The Australian Standard for Chain-link Fabric Fencing and Gates (aka Chainwire) replaces AS1725-2003 – "Chain-link fabric security fences and gates"

AS1725-2010 expands on the main application areas of chain-link fabric fencing and gates, but ensures that the five (5) different sections, four (4) which are new, are consistent in both types and applications of materials and installation standards.
The revised standard and comprises of 5 parts:
AS1725.1 – 2010 Chain link fabric fencing – Security fencing & gates – General requirements
AS1725.2 – 2010 Chain link fabric fencing – Tennis court fencing – Commercial
AS1725.3 – 2010 Chain link fabric fencing – Tennis court fencing – Private/Residential
AS1725.4 – 2010 Chain link fabric fencing – Cricket net fencing enclosures
AS1725.5 – 2010 Chain link fabric fencing – Sports ground fencing – General requirements

Chain link fabric is to be –

- 1060mm Black PVC coated chain link mesh

Chain link fabric is to be finished with barbed top selvedge and knuckled bottom selvedge.

Support cables are to be 4mm diameter helicoil and to be the same coating quality as the chain link fabric.

All tie wires and clips to be 2mm and to be the same coating quality as the chain link fabric.

Every second chain link diamond on top rail and every second chain link diamond on bottom rail are to be individually secured using double wrapped tie wire. Continuous lacing is not acceptable.

Chain link fabric is to be placed on the outside of posts and strained taut and secured to each support cable, all rails, all posts and bracing rails with tie wires, except at the end posts and gateposts.

At the end posts and gateposts the every chain link diamond is to be individually secured using double wrapped tie wire to end posts, internal corner posts and gateposts.

The space between the bottom selvedge of the chain link fabric and the ground will be sufficiently small to clear the surface and maintain security.

11.4 PAINTING

Note: if the site is within 5 kms of coast or subject to strong wind/harsh conditions seek a specialist specification from Dulux or similar and attached as an appendix and cross reference here. Highly recommend doing this regardless of location. Insert Dulux Spec as an appendices and cross refer from here.

General
Where proprietary specifications for protective treatment, painting and /or finishing have been provided and detailed they are to take precedence over these specifications.

Standards
Follow the guidance given in AS/NZS 2311 and AS/NZS 2312.

Powder Coating
Aluminium surfaces: To AS 3715.
Steel or zinc coated surfaces: To AS 4506.

'Wet Paint' warning
Place notices conspicuously and do not remove them until the paint is dry.

Materials And Components
Premium Paints
Use only premium paints from approved manufacturers.

Paint Manufacturer
Prior to placing orders provide a list showing the brand of the paint proposed for use and the trade names of the paint types referred to by generic type and APAS specification number in the painting schedule.

Spray Painting - Hold point.
Do not apply by spray without approval.

Combinations
Do not combine paints from different manufacturers in a paint system.

Delivery
Deliver paints to the site in the manufacturers' labelled containers. Ensure containers are marked with the APAS (Australian Paint Approvals Scheme) specification number.

Inspection
Notice - Witness Point
Witness Point: Give sufficient notice so that each of the following stages may be inspected:

- substrate immediately prior to commencement of painting.
- Prior to application of final coat.

Painting - Substrate Preparation
Prepare new surfaces for painting in accordance with Section 3 of AS/NZS 2311.
For repainting of existing surfaces comply with Sections 7 and 8 of AS/NZS 2311. This includes cleaning down with sugar soap, treatment of mould growth, rubbing back existing painted surfaces with abrasive paper and patching and priming of damaged surfaces.

Order of work
Complete clear timber finishes before commencing opaque paint finishes in the same area.

Protection
Remove door furniture, switch plates, light fittings and other fixtures before starting to paint, and refix in position on completion of painting.

Restoration
Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition. Touch up damaged decorative paintwork or misses with the paint batch used in the original application.

Fillers
Provide a filler tinted to match the substrate if the finish is transparent.

Paint Application
Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Ensure each coat of paint or clear finish is uniform in colour, gloss, thickness and texture, and free of runs, sags, blisters, or other discontinuities.

Number of Coats
Apply additional coats if necessary at no extra cost to achieve the required total film thickness and satisfactory opacity.

Priming Before Fixing
Timber: Apply a first coat (two coats to end grain) to exposed roof trim, timber doors including tops and bottoms of doors, associated trims and glazing beads before fixing in position.
Steel: Apply a priming coat of zinc-rich organic binder to APAS - 2916.

Repair of Galvanising
If galvanised or zinc-coated surfaces have been cut or welded after galvanising, prime the affected area with a zinc-rich organic binder to APAS - 2916.

Paint System Description
If a system is referred to only by its final coat (for example by the manufacturer's brand name, the APAS specification code or the generic name) provide stains, primers, sealers and undercoats which are suitable for the substrate and are compatible with the finish coat and each other.

Painting Schedule
Refer to the Project Specific Requirements for painting, where applicable.

12.1 GENERAL

Scope of Works

This Specification covers the supply and installation of soft landscape materials including but not limited to:

- Soil mixes
- Soil conditioner
- Plant material
- Mulches

12.2 LANDSCAPE DESIGN OBJECTIVES

The Principal has invested significant funds to ensure the new works have been designed to achieve a high level of presentation and as such the Principal finds it essential that the quality and appearance of the new Works be installed and maintained to the highest standard.

The quality and presentation of the softscape works shall meet the highest standard and be in accordance with accepted horticultural best practice. If the Contractor has any concerns with the specification of items or any ambiguities in relation to best practice they shall raise this at the time of Tender.

During the course of the Works all softscape works shall be of continually high standards at all times, rubbish collection shall occur regularly and any defects with the landscape or irrigation works be rectified or reported as soon as possible.

12.3 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS 2303-2015: Tree Stock for Landscape Use
- AS 4454-1997: Composts, Soil Conditioners and Mulch
- AS 3743-1996: Potting Mixes
- AS 4454-2003: Standard mark pasteurised mulch
- AS 4454-2003: Standard mark composted soil conditioner
- AS 4419(int)-1996: Soils for Landscaping Use
- ARMCANZ guidelines for Biosolids Management(Draft) 1995

12.4 ACCEPTANCE OF EARTHWORKS

Where Bulk earthworks have been completed prior to this tender or is the responsibility of others it is the Tenderer's responsibility to inspect the site and assess the adequacy of the material used under the bulk earthworks operations. All costs are to be included in this tender for the working of the pre-existing material. Any concerns as to the sufficiency of the bulk material including its capacity to perform as growing or drainage media shall be raised at the time of Tender.

12.5 FINAL MINOR TRIM

Definition: "Bulk Earthworks" is defined as being all operations including clearing, grubbing, stripping and stockpiling topsoil, excavation, backfilling and compaction to achieve the 'bulk' levels which shall be within a tolerance of +/- 100mm from finished design level allowing for a "Final Minor Trim" to bring the levels to with +/- 10mm of design levels. Minor trim shall include cultivating the top 250-300mm of the surface of the pre-existing material using a ripper or chisel plough. Cultivating shall occur to all areas propose to be planted or grassed to ensure high permeability and aeration of topsoil to encourage root growth. The final soil finish shall be a well aerated friable topsoil that is free from rock, rubble, vegetative matter and debris. The soil shall be lightly compacted only. This operation is to be combined with soil conditioner application if specified.

12.6 SOIL TESTING

The Contractor shall conduct a series of soil tests in order to verify that the soils to be planted into are:
Suitable for the proposed use,
Suitable for the establishment and ongoing viability and healthy growth of the species specified in the Contract.
Report on the presence of any weed seeds or contaminants.
The above information shall be provide to the Superintendent including recommendations on any amelioration, weed eradication or contaminant removal required.

12.7 SOIL CONDITIONER

Soil conditioner shall generally consist of:

- 5 parts Composted Sawdust
- 5 parts Composted Treated Sewerage
- 10 parts Peat
- 30 parts Gin Gin Red Loam and
- 50 parts Screened Black Topsoil

Soil conditioner shall be free from pathogens and heavy metals and produced in accordance with AS 4454-2012.

'Metro Soil Conditioner' as supplied by Amazon Soils (Tel: 08 9302 1288), is acceptable. Alternatives must be submitted as a 5 Kg sample together with a current laboratory certification for approval by the Superintendent.

The Contractor shall supply and incorporate soil conditioner to all planted and grassed areas as follows:

Garden Beds

- Import and spread 75mm depth soil conditioner and thoroughly incorporate into top 300mm of existing soil

Tree Planting (5 to 1000 litre stock)

- Import soil conditioner and thoroughly incorporate with backfill to tree pit in the proportions 3 parts backfill to 1 part soil conditioner

Soil conditioner shall be incorporated using a rotary hoe except in raised planting beds and other areas with restricted access where the Contractor shall allow for hand digging.

The chemical composition shall be as follows unless otherwise approved by the Superintendent:

AMAZON

The Experts in Soils • Mulches • Composts

PRODUCT SPECIFICATION

STANDARD MARK COMPOSTED SOIL CONDITIONER
AUSTRALIAN STANDARD AS 4454-2003

Product Name: Metro Soil Conditioner — **Issue date: June 2008**
Product Code: SAM0650
Product Description: Composted organic material suitable for adding to soils as soil improver.

Characteristic & Unit		Requirement From AS 4454-2003	Typical Analysis
Description		Conforms	Yes
pH		5.0 to 7.5	6.5
Electrical Conductivity	dS/m	No limit	4.0
Phosphorus, soluble	mg/L	≤ 5 for P sensitive plants	15.0
Phosphorus, total	%	≤0.1 for P sensitive plants	0.65
Ammonium-N	mg/L	<200	190.0
Nitrate-N	mg/L	≥10	70
Ammonium-N plus nitrate-N	mg/L	>200	260
Nitrogen, total	%	≥0.6	1.6
Organic matter content	%	≥25	55 %
Boron B	mg/kg	< 200	20.0
Sodium Na	%	< 1	0.12
Wettability	Minutes	< 7	<1
Toxicity	mm	≥ 60	80
Particle size grading: Maximum size Tolerance	% mm % mass	 ≤16 ≤ 20 % retained by sieve	Soil conditioner
Total $CaCO_3$ equivalent	%	To be determined and stated if pH > 7.5	-
Chemical Contaminants (Includes Heavy Metals)		State guidelines for unrestricted use.	Passed C1 Grade
Organic Contaminants		State guidelines for unrestricted use.	Passed C1 Grade
Pathogens (Plant & Human Pathogens)		State guidelines for unrestricted use.	Passed P1 Grade
Moisture Content	%	Minimum 25	30 %
Contaminants Glass, metal and rigid plastics >2mm Plastics- light, flexible or film >5 mm Stones and lumps of clay ≥ 5 mm	%	 ≤ 0.5 ≤ 0.05 ≤ 5	 <0.5 <0.05 <5
Self Heating °C		≤ 40°C	<40

Note: Detailed typical analysis continued on next page

A. Richards Pty Ltd. Trading as Richgro Garden Products & Amazon Soils ABN 97 008 734 852

AMAZON SOILS	Typical Analysis continued	Page 2
STANDARD MARK COMPOSTED SOIL CONDITIONER AS 4454-2003 Product ID: Metro Soil Conditioner		Issue date: June 2008
Characteristic & Unit	**Requirement From AS 4454-2003**	**Typical Analysis**
Chemical Contaminants:	**Grade C1 Biosolids**	
Constituents	**Maximum allowable concentration in mg/kg dry solids**	**mg/kg**
Arsenic mg/kg	20	15
Cadmium mg/kg	3	0.3
Chromium Total mg/kg	100	20
Copper mg/kg	100	150
Mercury mg/kg	1	0.35
Nickel mg/kg	60	7
Lead mg/kg	150	12
Zinc mg/kg	200	160
Molybdenum mg/kg	4	<2
Selenium mg/kg	3	<2
Organic Contaminants :		
Organochlorine (OC) Pesticides		
Aldrin mg/kg	0.02	<0.01
BHC Total mg/kg	0.5	<0.01
Chlordane mg/kg	0.02	<0.01
DDD mg/kg	0.02	<0.01
DDE mg/kg	0.02	<0.01
DDT mg/kg	0.02	<0.01
Total DDT Analogs mg/kg	0.5	<0.01
Dieldrin mg/kg	0.02	<0.01
HCB mg/kg	0.02	<0.01
Heptachlor mg/kg	0.02	<0.01
Chlorpyrifos mg/kg	0.02	<0.02
Organophosphorus (OP) Pesticides		
Bromophos Ethyl mg/kg	N/A	<0.05
Ethion mg/kg	N/A	<0.05
Diazinon mg/kg	N/A	<0.1
Malathion mg/kg	N/A	<0.1
Fenitrothion mg/kg	N/A	<0.1
PCB Total mg/kg	0.3	<0.2
Pathogen Test :	**Grade P1 Biosolids**	
Phytophthora (plant pathogen)	N/A	Not detected
Pythium (plant pathogen)	N/A	Not detected
Salmonella sp. (human pathogen)	< 1 Salmonella per 50 g	Negative
Thermotolerant coliforms (human pathogen)	<100 MPN Thermot. cfu/mL	<10
Authorised by: Maria Sevo, Quality Manager		

A. Richards Pty Ltd. Trading as Richgro Garden Products & Amazon Soils ABN 97 008 734 852

12.8 PLANT SUPPLY

Trees, shrubs and plants

Trees, shrubs and plants shall be supplied by approved suppliers and be in accordance with the Plant Schedule and Drawings.

Within 14(fourteen) days of Contract award the Contractor shall source all plant stock as shown on the Drawings and schedules. All stock shall be sourced from NIASA accredited nurseries. The Contractor shall submit photos of all plant stock to the Superintendent for review immediately after sourcing stock and prior to delivery to site. All plant stock shall be suitably sized typical for the pot size selected in height, spread and calliper in accordance with the table below:

Pot Size	Height (mm)	Spread (mm)	Calliper (mm)
Tubestock	100	100	n/a
140mm	200	200	n/a
200mm (5 litre)	300	300	n/a
45 litre	1500	1000	30
100 litre	2000	1500	40
200 litre	3000	1800	50
500 litre	4000	2500	80
1000 litre	5000	3000	100
5000 litre	6000	3500	120

If any variance is evident between the selected stock and the above table which results in plant stock being smaller than specified the Contractor shall advise the Superintendent at the time of sourcing the stock. The Superintendent may either reject the stock or request a substitution for suitably sized stock (refer table above) or request a cost discount to the correct value of the reduced stock size.

Plant quality

Plants shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease, pathogens and insect pests, with large healthy root systems and no evidence of having been restricted or damaged. Trees shall be straight, have a single dominant leader and be uniform in growth and in the appearance of the crown. All trees are to be underpruned to the height agreed with the Superintendent and formatively pruned where required and as instructed by the Superintendent.

The Superintendent will reject any trees, shrubs or plants, which do not meet with its approval.

Should plant stock be installed and then be subsequently determined by the Superintendent to be undersized, unhealthy or of poor form at the Superintendent's sole determination and at the Contractors expense the Contractor shall either:

- Replace the stock with healthy, suitably sized and well formed stock (refer table above)
- Provide a cost discount to the correct value of any reduced stock sizes or quantity.

Hardening Off

All plants to be delivered to areas north of the 30th line of parallel south (latitude) are to be delivered to site at least 3 weeks prior to planting for a hardening off period. During this period they are to be enclosed in a nursery, protected from wind, pest and disease and vandalism. Sun protection may be required and then incrementally removed as the plants harden. Watering regime is also to be monitored to ensure plants are prepared for planting out.

Substitution

If, in selecting the trees, shrubs and plants as shown on the Drawings or as specified, the Contractor finds the best quality of trees, shrubs and plants available at the time vary in species and container sizes to those shown or specified, they shall notify the Superintendent. The Superintendent shall give the Contractor all necessary direction regarding the selection of plant species and container sizes and such.

Plant substitutions will be considered in most situations for plant stock performing an equivalent role to that proposed in the design. In some situations plant stock cannot be substituted based on approval conditions, site conditions or the like. In all instances should plant stock not be available as proposed by the documents the Superintendent is to be contacted within 14 days of Contract award to agree a course of action. The Contractor shall not substitute stock unless approved in writing. Substitutions will not be approved if the Contractor has not complied with the Specification.

12.9 PLANTING GENERALLY

Setting out the works

Where underground services, manholes, cable pits, fire hydrants, lamp standards, retaining walls, kerbing, roads, paving and other obstructions occur, plant trees, shrubs and plants clear of such service and obstructions and protect services and obstructions from damage by machines and equipment.

Plant labelling

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

Plant replacements

Order sufficient quantities to allow for plant failures, Replace with plants of the same specified type, quality and size, and plants which fail or are damaged during the work under the Contract.

Plant warranty

Furnish a warranty from the supplier attesting that they are true to the specified species and type, and free from diseases, pets, weeds and the like.

Plant storage on site

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

Planting generally
Remove trees, shrubs and plants from their containers in such a manner as to do as little disturbance as possible to the roots. Where necessary tease out root-balls before planting.

Place trees, shrubs and plants in holes in an up-right position and backfill level with top of root-ball. Compact soil by hand watering.

Mass planting areas
Excavate a hole for each plant large enough to provide not less than 150mm all around the root system of the plant, or as shown on the Drawings.

Individual planting in grassed areas
Excavate a hole 100mm deeper and 600mm wider than plant containers of 5 litre and over, or 450mm diameter x 300mm deep for pots, unless otherwise shown on the Drawings. Break up the base of the hole to a further depth of 100mm, and loosen compacted sides of the hole, as necessary to prevent confinement of root growth to the hole.

12.10 DEPTH OF PLANTING

When the plant is in its final position in its hole or bed the top soil level of the plant root-ball shall be level with the finished surface of the soil surrounding the hole or bed. Test the depth by measuring the sides of containers. If backfilling is required to correct the depth, use top-soil as specified.

12.11 PLANT PLACEMENT

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

Fertiliser tablets
Prior to backfilling all plants are to receive approved fertiliser tablets such as Agraform or similar and in accordance with manufacturer's instructions:

- 500 litre and larger pot size plants to have ten 10g tablets
- 200 and 100 litre pot size plants to have six 10g tablets
- 35 and 45 litre pot size plants to have four 10g tablets
- 15 litre and 200mm pot size plants to have two 10g tablets
- 130-150mm pot size plants to have one 10g tablet

Backfilling to plants
Backfill with topsoil or approved site soil mixture as specified. Lightly tamp down the mixture and water to eliminate air pockets.

Watering Basins
Construct a watering basin around the base of each individually planted tree or shrub of 200mm pot size and above, consisting of a raised ring of soil of minimum diameter of 1000mm capable of holding a minimum of 10 litres of water.

Staking and tying
Support each tree as nominated on the plans (and large shrubs where directed) with hardwood stakes of the number and dimensions nominated on the dwgs. Subject to peculiar or fluctuating site conditions additional stakes may be required; these shall be requested by the Contractor as a variation to be approved.

Locate stakes parallel to prevailing wind direction on site or adjoining roads as nominated. Do not pierce root ball.

All ties shall be approved flat plastic, rubber or hessian tree ties of minimum width of 10mm. Ties to be located as directed by the Superintendent in accordance with tree size. All ties shall be placed in a figure of eight around stake and stem allowing adequate support without constricting plant growth.

All broken ties shall be replaced quickly and adequately to prevent tree damage. The Contractor shall be responsible for replacing any damaged trees as a result of no/slow replacement of tree ties. Stakes to be painted black (2 coats).

Watering
At time of planting provide by hand watering a minimum of 5 litres of water to each tree, shrub and plant. Repeat watering to each tree, shrub and plant with 5 litres of water on each alternate day up to Practical Completion. Watering of plants by a reticulation system will not be accepted unless approved by the Superintendent.

The Contractor is responsible for watering all plant material on site during the Contract Period. The following rates are provided as a general guide only. The Contractor shall provide adequate water to keep plants vigorous, well established, hardened off, of good form consistent with species or variety. The Contractor shall be responsible for adjustments which may be required according to specific site conditions, extremes in weather and individual plant requirements:

- 200mm pots or smaller 5 litres per application
- 200mm pots – 15ltr bags 10 litres per application
- 15ltr bags – 45ltr bags 20 litres per application
- 100ltr trees 100 litres per application

- 200ltr trees 200 litres per application

Repeat watering to each tree, shrub and plant on each alternate day up to Practical Completion.

Watering of plants by a reticulation system will not be accepted unless approved by the Superintendent.

Note: Any diseased or dying plants are to be replaced at the Contractor's expense.

Cleaning up
On completion ensure that trees, shrubs and plants are in first class, presentable condition by removing dead, damaged and unhealthy branches and trimming where necessary to result in balanced growth typical of their normal form.

After inspection by the Superintendent and on Practical Completion, remove labels from plants.

Final Inspection
Give the Superintendent at least three (3) working days notice before completing each project so that he may inspect the work upon completion.

12.12 MULCHING

Supply and place 75mm deep mulch as specified to the extent of each watering basin, minimum diameter 1000mm and to all garden beds or as indicated on the Drawings.

Mulch shall be 'Sandgroper Mulch' as supplied by Amazon Soils (Tel: 08 9302 1288), or equivalent to the approval of the Superintendent. Mulch shall be a composted organic material free from pathogens, heavy metals, noxious weeds, seeds and fungus, insect pests and other deleterious material and produced in accordance with AS 4454-2003. The chemical composition shall be as follows unless otherwise approved by the Superintendent:

AMAZON

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PRODUCT SPECIFICATION

STANDARD MARK PASTEURIZED MULCH
AUSTRALIAN STANDARD AS 4454-2003

Issue date: 15/04/05

Product Name: Sandgroper Mulch
Product Code: SAM 1250
Product Description: Composted organic material suitable for placing on soil surfaces as mulch.

Characteristic & Unit		Requirement From AS 4454-2003	Typical Analysis
Description		Conforms	Yes
pH		5.0 to 7.5	7.3
Electrical Conductivity	dS/m	No limit	2.6
Phosphorus, soluble	mg/L	≤ 5 for P sensitive plants	5.5
Phosphorus, total	%	≤0.1 for P sensitive plants	0.10
Ammonium-N	mg/L	<200	<10
Nitrate-N	mg/L	≥10	<10
Ammonium-N plus nitrate-N	mg/L	No requirement	-
Nitrogen, total	%	≥0.6	0.48
Organic matter content	%	≥25	49 %
Boron B	mg/kg	< 200	6.0
Sodium Na	%	No requirement	-
Wettability	Minutes	< 7	<1
Toxicity	mm	No requirement	-
Particle size grading: Maximum size Tolerance	% mm % mass	 ≤16 ≥ 70 % retained by sieve	 70 % 30 %
Total $CaCO_3$ equivalent	%	To be determined and stated if pH > 7.5	
Chemical Contaminants (Includes Heavy Metals)		National guidelines for unrestricted use.	Passed A Grade
Organic Contaminants		National guidelines for unrestricted use.	Passed A Grade
Pathogens (Plant & Human Pathogens)		National guidelines for unrestricted use.	Passed A Grade
Moisture Content	%	No requirement	-
Contaminants Glass, metal and rigid plastics >2mm Plastics- light, flexible or film >5 mm Stones and lumps of clay ≥ 5 mm	%	 ≤ 0.5 ≤ 0.05 ≤ 5	 <0.5 <0.05 <5
Self Heating °C		No requirement	-

Note: Detailed typical analysis continued on next page

A. Richards Pty Ltd. Trading as Richgro Garden Products & Amazon Soils ABN 97 008 734 852

AMAZON SOILS	Typical Analysis continued	Page 2
STANDARD MARK PASTEURIZED MULCH AS 4454-2003 Product ID : Sandgroper Mulch		Issue date: 15/04/05
Characteristic & Unit	**Requirement From AS 4454-2003**	**Typical Analysis**
Chemical Contaminants:	**Grade A Biosolids**	
Constituents	**Maximum allowable concentration in mg/kg dry solids**	**mg/kg**
Arsenic mg/kg	20	12
Cadmium mg/kg	3	<0.1
Chromium Total mg/kg	400	7
Copper mg/kg	200	20
Mercury mg/kg	1	0.07
Nickel mg/kg	60	2
Lead mg/kg	200	3
Zinc mg/kg	250	22
Molybdenum mg/kg	4	2
Selenium mg/kg	3	<5
Organic Contaminants :		
Organochlorine (OC) Pesticides		
Aldrin mg/kg	0.2	<0.01
BHC Total mg/kg	1.0	<0.01
Chlordane mg/kg	0.2	<0.01
DDD mg/kg	0.2	<0.01
DDE mg/kg	0.2	<0.01
DDT mg/kg	0.2	<0.01
Total DDT Analogs mg/kg	1.0	<0.01
Dieldrin mg/kg	0.2	<0.01
HCB mg/kg	0.2	<0.01
Heptachlor mg/kg	0.2	<0.01
Lindane mg/kg	0.2	<0.01
Organophosphorus (OP) Pesticides		
Bromophos Ethyl mg/kg	N/A	<0.05
Ethion mg/kg	N/A	<0.05
Diazinon mg/kg	N/A	<0.1
Malathion mg/kg	N/A	<0.1
Fenitrothion mg/kg	N/A	<0.1
PCB Total mg/kg	1.0	<0.2
Pathogen Test :	**Grade A Biosolids**	
Phytophthora (plant pathogen)	N/A	Not detected
Pythium (plant pathogen)	N/A	Not detected
Salmonella sp. (human pathogen)	< 1 Salmonella per 50 g	Negative
Thermotolerant coliforms (human pathogen)	<100 MPN Thermotolerant cfu/mL	<10

Authorised by: Maria Sevo, QA Manager

A. Richards Pty Ltd. Trading as Richgro Garden Products & Amazon Soils ABN 97 008 734 852

A sample of the mulch will be required for approval by the Superintendent prior to commencement of works on site. Submit a 5kg sample for approval.

Minor garden bed preparation, including raking and removal of rubbish to produce an even and smooth surface, will be the responsibility of the Contractor.

The mulch will be consolidated, to produce smooth and even grades, finishing 10mm below surrounding hard surfaces.

12.13 EXISTING TREES TO BE RETAINED

A number of trees currently existing on site are to be retained and incorporated in the Works. The Contractor shall undertake care and maintenance of the existing trees on site that have been retained. This shall include

- Pruning for safety, structural stability and aesthetic purposes,
- Supplementary watering as required to ensure tree health is maintained during the construction and consolidation period
- Erection of fencing (for a diameter of 9m around each tree or to the limit of the canopy drip line) to limit pedestrian and vehicular access to the trees and subsequent compaction of the root ball.
- Safety audit and reporting by a qualified Arborist following pruning.

Pruning shall include the removal of all deadwood, diseased limbs, unsafe limbs and branches, any limbs or branches that impede views to feature items. All pruning and lopping shall occur to the Superintendent's approval or on site direction.

12.14 ARBORIST REPORT

The Contractor shall provide a comprehensive arborist's report at practical completion certifying the safety of the existing trees on site. The report shall be prepared by a certified practicing Arborist.

12.15 CLEARING AROUND EXISTING TREES

The Contractor shall undertake to remove all understorey vegetation from in between closely located existing trees to be retained. Most clearing will have occurred by the civil earthworks Contractor, however in difficult to access areas between groups of existing trees, removal of grass, weeds and other deleterious material shall occur by hand or mechanical means as appropriate.

Note: No damage to trees to be retained is to occur either above or below ground.

12.16 TREE AND STUMP REMOVAL

Remove all trees and stumps as indicated on plans and in the schedules.
Grub out stumps and roots over 75mm diameter to a minimum depth of 500mm below subgrade in paved areas or below finished surface in unpaved areas. Backfill grub holes with suitable spoil from excavations compacted in layers to the density of the surrounding undisturbed soil.

All debris together with fallen timber shall be loaded, hauled and disposed of in a tip in compliance with statutory requirements or may if instructed be dumped as directed by the Superintendent.

13.1 GENERAL

Scope of Works

This Specification covers the requirements for maintenance of the whole of the works immediately following Practical Completion and prior to handover to Maintenance.

13.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated as not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

13.3 GENERAL

Consolidation shall mean the continuing care and consolidation of the Contract areas by accepted horticultural practices, as well as rectifying any defects that become apparent in the works.

The Consolidation Period shall commence from the date of Practical Completion and be for a period of thirteen (13) weeks.

During the Consolidation Period damage to the works due to vandalism and theft shall be the responsibility of the Principal.

13.4 CONSOLIDATION PROGRAMME AND LOG BOOK

The Contractor shall supply a written consolidation programme to the Superintendent for approval and if required amend it until approved. The Contractor shall then comply with the approved programme.

The Contractor is also required to keep a log book recording when and what maintenance has occurred and what materials have been used. Make the consolidation log book available on request.

13.5 PLACING OF WORKS ON CONSOLIDATION

Give three (3) working days notice that the works are complete and are ready to be placed on consolidation. The Superintendent shall inspect the works and, if any defects or deficiencies are found, they shall be rectified within seven (7) days of notification.

13.6 EXTENT OF CONSOLIDATION

The consolidation programme shall include, but shall not be limited to, the following horticultural items where and as required:

- Report weekly to Superintendent
- Rubbish removal from all areas (including lakes and waterways)
- Review, inspection and monitoring of all bores
- Review, inspection and monitoring of all pumps and electrics
- Watering,
- Mowing
- Slashing and weeding
- Apply Herbicide
- Re-mulching
- Fertilising
- Re-planting
- Hedge / shrub Pruning
- Advanced Tree Maintenance
- Maintaining Site Neat and Tidy
- Sweeping/cleaning surfaces
- Cleaning of bbq's and surrounds and emptying garbage bins immediately following weekends or public holidays
- Removal and re-erection of shade sails for winter
- Removal of storm debris, bird droppings etc.
- Irrigation inspections

13.7 CONSOLIDATION OF REVEGETATION, REHABILITATION AND NATURAL AREA

The Consolidation programme for revegetation, rehabilitation and defined natural areas shall be limited to the following practices:

- Weeding of all general horticultural weeds for 13 weeks ,
- Weeding of all persistent and noxious weeds listed by the WA Dept of Agriculture and Food as Declared Plants including blackberry, Arum lily, Typha sp for a period of 13 weeks including an initial slashing operation followed immediately thereafter with spraying/ A follow up slashing and poisoning operation is to be allowed for at the end of the 13 week period.
- rubbish collection and removal for 13 weeks
- All planting shall be inspected after 3 weeks to ensure plant stock is of good form and healthy condition. Any defective stock is to be removed and replaced at the Contractors expense. Any replacement plants will be subjected to a further 3 week period and reassessed. Following the successful 3 week inspection any failures of the plant stock shall be at the Principal's risk.
- All care of the plant stock including watering for the initial 13 week period is at the Contractor's expense and thereafter it shall be the responsible of the Principal. Any plant stock that decline due to lack of water during the initial 3 week assessment period shall be replaced at the Contractor's expense.
- Damage due to theft, vandalism or vermin is at the Principal's risk.

13.8 MAINTENANCE OPERATIONS

Grass Areas
Grass areas shall be mown and maintained to present a high quality, healthy and vigorous grass sward appropriate to the area.

Trees and Shrubs
Trees and shrubs shall show signs of healthy vigorous growth. Trees shall be appropriately staked and, have a suitably sized watering basin intact and be weed free.

Weekly Report
Report in writing by 12 noon each Friday 1 x A4 summary of works complete as at that date.

Watering
Manual watering is required to all newly planted areas twice a week. Contractor will be required to provide evidence of this occurring.

Mowing
All areas of turf will be mown using cylinder mowers. Edging and line trimming of kerbs, paths and around trees and obstacles will be completed after each alternate mow. Special care will be taken to ensure the trees are not damaged by mowing operations. Clippings are to be collected and removed from site.

Slashing & Weeding
Maintain site and fence lines free of weeds and invasive plants.

Herbicide
Eliminate all weed growth to landscaped areas using approved non-residual herbicide such as “Roundup”.

Re-Mulching
At the end of consolidation period ‘top up’ mulching to all plants to conform to Specification.

Staking Maintenance
Supply and install replacement stakes as required each week.

Re-Planting
Supply and install replacement plants for unhealthy or damaged, or dead plants each week.
As part of a Monthly report, advise the Superintendent of the cost for the supply and installation of replacement plants for those damaged or stolen through acts of theft or vandalism.

During the Consolidation Period damage to the works due to vandalism and theft shall be the responsibility of the Principal.
All other plant replacement shall be at the Contractor’s expense.

Pruning
Prune all dead wood or foliage from plants as required each week and maintain hedge planting.

Maintaining Site
Maintain site free of rubbish, rocks, branches etc each week , with specific visits scheduled for Friday and Monday mornings to cater for heavy weekend use.

Theft and Vandal Damage
Report on and make good theft and vandal damage as instructed by the Superintendent.

13.9 PUMPS, BORES AND ELECTRICS

The Contractor shall undertake a minimum of one complete and thorough inspection of all bores, pumps and electrics during the course of the consolidation period. This inspection should occur immediately prior to handover to the annual maintenance period (at the close of the thirteen (13) week Consolidation Period).

The Contractor shall be required to prepare and submit to the Superintendent a complete report on the state all lake hydraulic, re-circulation and refilling systems, bores and irrigation systems and all electrics within these systems and its general operation. Any problems, issues or recommendations shall be made in writing as part of this report for rectification as required prior to handover to the annual maintenance period.

13.10 IRRIGATION

The Contractor shall undertake the full and complete operation of the irrigation system during the consolidation period in accordance with the systems design requirements. The Contractor shall supervise and authorise any and all works as may be urgently necessary to be undertaken by the selected Irrigation Contractor to ensure the full and continuous operation of the system and the watering of the landscape works.

Consolidation works shall include a complete operational review of the irrigation system prior to handover to the annual maintenance period. The Contractor shall issue a written report on the irrigation system operation to the Superintendent prior to the completion of the consolidation period. Any problems, issues or recommendations shall be made in writing as part of this report for rectification as required prior to handover to the annual maintenance period.

13.11 BORE METER READINGS

Monthly bore meter readings shall be taken by the contractor during the 13 week consolidation period and reported to superintendent. The Contractor shall each month check and report to the Superintendent the bore meter reading in accordance with the requirement of the Local government authority and the Department of Water. The Contractor shall provide a proposed watering regime for the period of the maintenance contract and relate this to the current Groundwater Licence. Each month the contractor shall provide the Superintendent with monthly meter readings and track the usage of water in relation to the approved watering regime.

13.12 CARE OF WORK AND REINSTATEMENT OF DAMAGE

The Contractor shall make themselves familiar and fully aware of their contractual obligations as outlined in Clause 16: Care of the Work and Reinstatement of Damage under the General Conditions of Contract (AS 2124-1992).

Sand and Dust from External Sources

Where dust and sand is being deposited or may be deposited on the area of the Works (the Site) from external sources the Contractor shall immediately notify the Superintendent so as to enable mitigation measures to be enacted. The Contractor shall be responsible for investigating the source of external dust and sand which shall be verified by the Superintendent. The Contractor shall take all reasonable measures to prevent dust and sand from being lifted by wind and carried onto the Site from sources outside the site of the works. The Contractor's responsibility shall be limited to the erection of wind fencing to the Site Boundary and the physical removal of any deposited material within or on the Site or collected adjacent to the Contractor's wind fencing.

13.13 HANDOVER

Reference is made to the General Conditions of Contract, definition of Practical Completion.

Give the Superintendent five (5) working days notice that the works are complete and that the works are ready for Principal handover or for the subsequent commencement of the Maintenance Contract/Period.

SECTION E

APPENDICES

14.1 GENERAL

Scope of Works

This Specification covers all works included but not limited to:

- Mobilisation and Demobilisation
- Site Setout
- General Site Clearance
- Earthworks, Trimming and Fine grading
- Sourcing of fill and transportation to site.
- Works around Existing Trees
- Placement and compaction of fill
- Supervision, inspection and testing

14.2 STANDARDS

All equipment, materials and workmanship supplied by the Contractor for incorporation into the Works shall comply with the respective Australian Standard applicable which is current as at the date of close of Tenders.

Where an Australian Standard is nominated in this documentation, it is provided as a guide to the Contractor for the selection of appropriate materials and/or work practices which are required by the Principal. Where a nominated Standard or Interim Standard has been revised, amended and/or designated, or is not current as at the date of close of Tenders, the applicable Standard shall be the Australian Standard which is current as at the date of close of Tenders.

Materials and workmanship shall conform to the current Australian Standards, where such Standard exists, including the following:

- AS1726 Geotechnical Site Investigations
- AS1289 Methods of Testing Soils for Engineering Purposes
- AS3798 Guidelines on Earthworks for Commercial and Residential Developments

14.3 TEMPORARY PROTECTIVE FENCE

Within five (5) working days of the Date of Possession of the site, the Contractor shall erect temporary protective fencing to the perimeter of all Public Open Space areas and to any other areas to be landscaped (verges, drainage basins and the like) that might be vulnerable to damage as described below.

The temporary fencing shall comply with the requirements of applicable Safety Plans and shall be sufficiently robust and secure to prevent the following activities occurring within the protected area for the duration of the Contract:

- creation and use of informal vehicle access routes;
- vehicle parking;
- storage of plant, equipment and materials;
- dumping of waste; and
- any other activities that are likely to be detrimental to the health of existing trees to be retained and/or might cause damage to undisturbed areas.

The temporary fencing shall be located to protect the whole of the Public Open Space/verge/basin areas on alignments to the approval of the Superintendent.

The Contractor shall be responsible for maintaining the fence as an effective barrier at all times throughout the Contract.

14.4 DUST, NOISE, VIBRATION AND OTHER ENVIRONMENTAL CONTROLS

Refer to Section B PRELIMINARIES.

14.5 DILAPIDATION SURVEYS

Refer to Section B PRELIMINARIES

14.6 CLEARING

Unless otherwise specified or directed, remove all trees, logs, stumps, boulders, roots and scrub within the limits of the Works. Prior to commencement of clearing seek approval from the Superintendent to commence clearance operations and to further define the boundaries of areas to be cleared.

Within areas to be cleared demolish and dispose of existing fences, structures and slabs detailed to be removed. Grass and topsoil shall not be removed as part of this initial clearing. All standing trees shall remain unless directed otherwise by the Superintendent. Give seven (7) days' notice of intention to clear any section of the works so that the Superintendent may determine the trees and plants not already detailed within the limits of clearing which are to be preserved.

Grub out stumps and roots to a minimum depth of 500mm below Sub-grade in paved areas or below finished surface in unpaved areas. Backfill grub holes with suitable spoil from excavations compacted in layers to the density of the surrounding undisturbed soil. All equipment used for clearing shall be fitted with rakes/tines or similar equipment so that as little soil as possible is disturbed and added to the vegetation stockpiles. No material from clearing is to be pushed beyond the limit of the site.

Cleared vegetation shall be mulched and stockpiled at an agreed site. Spoil from grubbing out; unsuitable material, uncontrolled fill and rubbish etc shall be removed from site to an approved Local Authority tipping site at the Contractors expense.

Clearing and grubbing shall extend over the areas of the site shown by the limit of earthworks on the drawings. Limits of clearing are defined as lines one metre outside the intersection of excavation or embankment slopes with the natural surface or the outside limits of slope rounding together with any other limits detailed.

Existing access tracks, storage, laydown and borrow areas, or similar shall be kept in a condition to be agreed with the Superintendent. Access tracks locations are to be agreed with the Superintendent prior to construction.

14.7 WORK NEAR EXISTING TREES

Protection

Protect trees specified or shown to be retained from damage by site works. Take necessary precautions as described below.

Harmful Materials

Do not store or otherwise place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks, even for short periods. Prevent wind-blown materials such as cement form harming trees and plants.

Damage

Prevent damage to tree bark. Do not attach stays, guys and the like to trees.

Work under trees

Do not add or remove topsoil within the drip line of trees. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged. Open up excavations under tree canopies for as short a period as possible.

Roots

Do not cut tree roots exceeding 50mm diameter unless approved by the Superintendent. Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, apply a bituminous fungicidal sealant to the cut surface to prevent the incursion of rot or disease.

Backfilling

Do not backfill around tree trunks to a height greater than 300mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Compacted Ground

Avoid compaction of the ground under trees. The parking of plant and storage of equipment under trees to be retained is not permitted.

Australian Standards

All works associated with the protection of existing trees shall comply with Australian Standard;
AS 4970 – Protection of trees on development sites

14.8 RETENTION OF EXISTING VEGETATION

Protection of existing vegetation

The Contractor shall note that great importance is placed on retention of any natural or significant vegetation in its current state, and thus the Contractor shall limit the movement of plant and equipment and stockpiling of materials to within the limit of the works to be cleared.

The penalties for significant damage (as determined by the Superintendent) or unauthorised clearing are as follows:

Type of Existing Vegetation	Penalty
Heritage tree (listed by State Heritage Office or Local Authority as having heritage value)	Cost of comparable replacement
Significant tree (8.0m and greater in either total height or canopy diameter)	$20,000 or the cost of replacement, whichever is the greater value
Medium tree (4.0 – 8.0m in total height)	$10,000 each
Minor tree (1.0m – 4.0m in total height)	$1,000
Shrubs	$20/square metre
Existing Bushland	$100/square metre
Existing Turf	$100/square metre

For the purposes of this Specification a tree is all trees with a 200mm diameter trunk and greater, and one metre or greater in total height.

Contractor's should note that if clearing works extend beyond the prescribed limits without the written authorisation of the Superintendent, these costs will apply and be borne solely by the Contractor by reduction in monies payable under the Contract.

If the Contractor believes that for construction purposes, additional movement areas are required in the form of haul roads and/or access roads, they shall submit details of the proposed location and extent of these roads to the Superintendent for approval prior to their construction.

In addition to the above penalties the Contractor shall undertake to co-ordinate, manage and achieve any and all necessary approvals in relation to protecting and /or the rectification of damage to the satisfaction of the Superintendent, Local Authority and relevant agencies.

14.9 CLEARING AROUND EXISTING TREES TO BE RETAINED

The Contractor shall undertake to remove all understorey vegetation from in between closely located existing trees to be retained as noted on the Drawings. In difficult to access areas between groups of existing trees, removal of grass, weeds and other deleterious material shall occur by hand or mechanical means as appropriate.

Note: No damage to trees to be retained is to be caused either above or below ground.

Arborist

When there is no option but to work in the immediate vicinity of existing trees that are to be retained, the Contractor is to organise for a qualified Arborist to be on site to oversee these works.

The Contractor is to engage, at the Contractor's expense, a qualified, experienced and reputable Arborist to oversee the demolition works in close proximity to any particular tree to be retained. The Arborist is to be contacted a minimum 3 weeks prior to the demolition works commencing to ensure appropriate scheduling of works.

14.10 VEGETATION REMOVAL

The Contractor shall note that trees to be removed and/or retained shall be tagged on site as follows. The Principal, Contractor and Superintendent shall agree to either;

- Tag trees to be retained, OR
- Tag trees to be removed, whichever is the lesser.

The Contractor shall not remove any trees or vegetation without seeking absolute clarity from the Superintendent in writing as to which option above has implemented.

All tree removal shall comply with the relevant Australian Standards and accepted industry standards, particularly but not limited to safety, adjoining property, insurance and pedestrian and traffic control. The Contractor shall be liable for any and all costs associated with damage or injury resulting from tree removal.

Grub out stumps and roots over 75mm diameter to a minimum depth of 500mm below Sub-grade in paved areas or below finished surface in unpaved areas. Backfill grub holes with suitable spoil from excavations compacted in layers to the density of the surrounding undisturbed soil.

All debris together with fallen timber shall be loaded, hauled and disposed of in a tip in compliance with statutory requirements or may if instructed be dumped as directed by the Superintendent.

14.11 WEED ERADICATION

All weed growth shall be eliminated throughout the landscape areas prior to commencement of any soil preparation or planting or grassing works. Weed eradication shall be undertaken by use of an approved non-residual herbicide such as "Roundup" or equivalent. Apply such herbicide only on windless days strictly in accordance with the manufacturer's written directions and any relevant health regulations. The Contractor shall comply with the Work Health and Safety Act 2020 (the "Act") and the accompanying regulations (the "Regulations"). The Contractor shall also comply with any amendments that may be made to the Act and Regulations from time to time.

Following the application of the herbicide, the treated areas shall be left undisturbed for a minimum of seven (7) days 'ingestion' period prior to undertaking any further work in such areas.

14.12 STAGING OF VEGETATION REMOVAL

At the Superintendent's discretion the removal of vegetation may be staged in order to temporarily retain shade, screening, habitat, buffers and the like until future construction works occur.

The Contractor shall not remove any vegetation until instruction from the Superintendent in writing is provided as to the extent of staged clearing.

14.13 DISPOSAL OF MATERIAL

Unless otherwise permitted or directed, all debris resulting from clearing operations together with all lying and fallen timber and rubbish shall be removed from the site. All cleared material removed from the site shall, unless required by the Contractor for other purposes, be loaded, hauled, dumped and disposed of in a tip in compliance with statutory requirements.

The Superintendent may permit the disposal of boulders, concrete fragments and other incombustible materials by burial within the POS reserves outside paved areas. When buried, the tops of boulders, etc. shall be not less than 500mm below finished surface.

The Superintendent may direct that boulders greater than 0.03 cubic metres in volume be stockpiled on site.

14.14 EARTHWORKS - GENERALLY

The Contractor's responsibility under this Contract shall extend to all works necessary to transform the existing levels as shown on the Drawings to those shown as proposed levels on the Drawings. The Contractor shall complete the earthworks to this specification and adhere to the tolerances as set out herein and as depicted in the drawings.

14.15 NOTICE

If the following are encountered, give notice immediately and obtain instructions before carrying out any further work in the affected area:

- Bad ground - Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities,

faults or fissures, contaminated ground and ground which is or becomes soft, wet or unstable.
- Rock - refer to the clause below entitled 'Rock Excavation'
- Suspected Aboriginal or other artefacts
- Underground springs or watercourses,
- Unknown underground tanks/structures.

14.16 EXCAVATION

Excavate to conform to the lines grades, cross-sections and dimensions shown on the Drawings. Allow for depth required for construction of footings, access during construction and the like. Make allowance for compaction or settlement. The Superintendent may order the removal of any soft spots, debris or organic material exposed when excavated areas have been trimmed to finished formation levels. Remove all rocks and boulders which protrude above finished surfaces of Sub-grades.

Separate the best granular materials from excavations for use in the upper layers of fill Sub-grades.

14.17 ROCK EXCAVATION

Rock excavation is classed as any excavation material that cannot be undertaken by a hydraulic excavator (Caterpillar 330B or equivalent in good condition) fitted with a rock bucket at a rate of three cubic metres per hour. The excavator shall be capable of exerting a minimum breakout force of 180kN at the bottom of the excavation with a 600 mm wide bucket fitted with rock teeth. Excavation in all other classes of material shall be termed common excavation. Material which can be loosened with a pick, frozen materials, soft laminated shale and hardpan, which for convenience or economy is loosened by drilling, blasting, wedging or the use of pneumatic tools, removal of concrete pavement and retaining walls, shall not be classified as rock excavation

Rock excavation shall be undertaken as an approved variation to the Contract at the rate specified by the Contractor in the Schedule of prices.

Rock excavation is a provisional quantity and payment for rock excavation shall only be made where the extent has been determined by the Contractor and Superintendent and an approved variation issued. The remaining dollar balance of any variations issued shall remain with the Principal to be expended if and as approved.

14.18 PROTECTION OF SERVICES AND ADJACENT WORKS

The Contractor shall locate all utility services within the Works area prior to commencing construction.

The Contractor shall be responsible for the protection of all services and shall meet all costs associated with any repairs necessary to the satisfaction of the relevant Statutory Authority.

The Contractor shall take all precaution against damage to adjacent structures including roads, paths, drains etc. Should damage occur it shall be reinstated by the Contractor at his own cost. All repairs shall be to the satisfaction of the Superintendent.

Where excavations are to be undertaken in the vicinity of existing services they shall be supported in a manner approved by the Superintendent and the relevant Utility Authority until backfilling of the adjacent excavation has been satisfactorily completed. The cost of supporting such services shall be deemed to be included in the Lump Sum Price.

14.19 STRIPPING AND STOCKPILING OF TOPSOIL

Prior to the commencement of earthworks, strip sufficient topsoil within the limits of earthworks to provide for later re-use as specified. Ensure that all topsoil is removed from any areas to be covered by paving or structures. Also strip topsoil within the limits of clearing for underground services beyond the limits of earthworks. Unless otherwise directed, the depth of stripping shall be to the bottom of the grass root zone. Grass shall be stripped together with topsoil. Avoid contamination by any other material.

Topsoil shall be screened and stockpiled separately from vegetative matter, mulched vegetation and the like. Stockpile topsoil on or near the site for later re-use as specified. Location of all stockpiles to be agreed with the Superintendent. Topsoil stockpiles shall not exceed 3m in height. If to remain unused for more than four (4) weeks, topsoil stockpiles shall be sown with a fast growing, non-invasive seed with good soil retention capacity.

14.20 DISPOSAL OF APPROVED SURPLUS SPOIL ON SITE

Unless otherwise specified, dispose of approved surplus material from excavations where directed on site by:

- Uniform widening of embankments, or
- Uniform flattening of fill batters, or
- Uniform filling of selected areas.

If not already cleared, dumping sites shall be cleared and grubbed to the extent necessary before any material is deposited. Strip topsoil as specified and set aside for later re-spreading over the dumped spoil. Selling of unused surplus spoil may be examined as approved by the Superintendent with proceeds to be paid to the Principal in full.

14.21 MINOR GRADING TO POND BATTERS

The Contractor shall undertake minor grading to pond batters indicated on the plans to produce a gently sloping area and tying in neatly with the general contours of the adjacent land. Graded areas shall be free of humps and depressions greater than 50mm from the general grade. Cut and fill humps and depressions by hand or mechanically as necessary incorporating approved site spoil or imported fill as approved and available under the contract.

14.22 SETTING OUT OF WORKS AND INSPECTION

The responsibility for set-out is the responsibility of the Contractor at all times.

The Principal, through the Project Surveyor, will arrange for the following survey information to be provided:-

- An annotated copy of the pre-calculation plan, indicating the pegs placed and bench mark level information;
- An electronic data set of the above.

The Contractor shall give the Project Surveyor a minimum of 48 hours notice of when information is required to be provided to the Contractor.

The Contractor shall check horizontal and vertical values of all established or identified benchmarks, pegs and the like and compare them with the values and measurements provided within the Contract and advise the Superintendent of any discrepancy immediately as this becomes known. In the case of a discrepancy being identified affected works shall not proceed until the Superintendent's provides direction. Copies of the recorded survey and setting out information shall be made available to the Superintendent on site when so requested.

The Contractor shall be responsible for setting out the works from the points given on the Drawings and for constructing the works to the required line and level. All levels shown on the Drawings refer to Australian Height Datum (AHD). Existing surface levels refer to the surface at the time of survey. All vertical control for the work shall be established from the temporary bench marks provided by the Project Surveyor

The Contractor shall provide:

- White painted timber stakes to define the position of trees, paths, paving, garden beds and other construction elements as specified and or on the Drawings
- Bench marks for reduction of levels (if required)
- Stakes to define lot boundaries

Setting out shall be approved by the Superintendent prior to the commencement of construction.

Setting out tolerances are:

Horizontal ± 0.020 m
Vertical ± 0.005 m.

Permanent survey pegs that have been damaged or moved during construction shall be reinstated by a Licensed Surveyor nominated or approved by the Superintendent and the cost of such work shall be paid for in full by the Contractor. It shall be the Contractor's responsibility to re-establish, recover or transfer any of the above survey pegs which will be, or are, disturbed in the course of construction.

Due to the nature of landscape construction works, minor changes in the layout of the works may be instigated by the Superintendent on site.

The Contractor shall allow in their price for changes in the setout of the works. A variation to the contract shall only be issued where any changes results in a change in the Bill of Quantities.

Contours and levels provided on the Drawings to show existing levels shall be deemed to be the levels used in preparation of the Tender.

If it can be shown on the date of Possession of Site by the Contractor, or within 48 hours of that date, that the existing levels differ from the levels shown on the Drawings by an amount which would change the quantity of any of the work to be executed under the Contract by more than 10% of the quantity calculated from the levels shown on the Drawings, the Contract sum shall be adjusted accordingly.

14.23 DISPOSAL OF SPOIL AND RUBBISH OFFSITE

Remove from the site any approved surplus excavated material or building rubbish, vegetative refuse and the like and dispose of in the correct manner at an approved rubbish tip at the Contractor's expense inclusive of all charges and fees.

14.24 SUBGRADE PREPARATION

Following Clearing and Grubbing and prior to the placement of bulk earthworks fill, the contractor shall identify areas that require additional compacting ie for walls, paths and structures and shall proof roll/compact the existing surface to the satisfaction of the Superintendent. The in-situ sub-grade shall be adequately watered and consolidated with a power drum roller of 8 to 10 tonne. The roller shall run over the sub-grade till the soil is evenly and densely consolidated and behaves as elastic mass. The roller shall pass a minimum of but not limiting to 5 runs on the sub-grade. For smaller areas use a compactor capable of achieving an equivalent result to the approval of the Superintendent.

Unless otherwise stated the affected areas shall achieve a minimum compaction of 8 blows per 300mm layer to a depth of 450mm (ie. 150mm to 450mm). All other areas (softscape areas) are to be lightly compacted to the approval of the Superintendent.

The approved subgrade preparation shall be surveyed by the Contractor's licensed surveyor, and shall be independently spot checked by the Principal's surveyor. This survey data shall be use as a base in determining/checking the quantity of Forward Earthworks.

The contractor shall notify and allow the Superintendent adequate time to inspect, review the Contractor's compaction test sheets, and confirm sub-grade has been compacted to the requirements stated in this technical specification and geotechnical report.

14.25 CLEAN FILL

Material to be used for fill shall consist of materials approved by the Superintendent, free from timber, stumps and weeds, or other perishable matter, and shall be obtained generally from the excavation.

Any material imported to be used as suitable fill shall satisfy the following criteria:

- The sand shall be clean, cohesion-less, free draining and free of all silty, organic or any other deleterious inclusions
- Having greater than 80% material passing 19mm sieve
- Containing no greater than 4% by weight of soil fractions finer than 0.075mm
- Having plasticity index equal to 0% (i.e. no plastic)
- The ratio of the maximum density shall be greater than 1.20 the maximum and minimum densities shall be determined in accordance with test AS1289.5.5.1.

The Contractor shall provide classification and compaction test results on representative samples of the proposed material from a NATA registered testing authority for approval by the Superintendent prior to the importation of this material to site.

14.26 PLACEMENT, BACKFILLING AND COMPACTION

Generally

Place and compact filling to conform to the lines, grades, cross-sections and dimensions shown on the Drawings. Allow for the thickness of materials, which will be placed in subsequent operations.

Before filling commences, the Superintendent may order the removal of any soft spots, debris or organic material exposed when the nominal depth of topsoil has been stripped in areas where natural surface is within 1m below finished levels. This additional stripping may extend to a depth of 300mm below the general depth of stripping. Grade all stripped surfaces to prevent accumulation of water.

Where fill is to be constructed on hillsides or against existing fills, slopes which are steeper than 1:3 shall be benched and roughened to allow placement of filling in layers and to prevent slip failures at the interface.

Materials

Unless otherwise specified or directed, the materials used for filling shall be obtained from cut from site. Filling shall be free from logs, stumps, weeds and other perishable matter. The best available material, i.e. the most granular and least plastic, shall be used in the upper layers of road embankments. Material used in the top 150mm below Sub-grades shall be free of particles larger than 75mm. Material used in the top 600mm below Sub-grades shall be free of particles larger than 150mm.

Rocky materials not exceeding 600mm maximum dimension may be used in embankments. Suitable fine materials shall be placed with the rock to fill the interstices and produce a dense compact embankment.

The Superintendent may permit the disposal of rocks larger than 600m by burial in banks, mounds, or other areas at least 300mm below finished surface. Alternatively, large rocks may be secondary blasted to suitable size at no additional cost and incorporated in fills.

The Superintendent may direct that material unsuitable for embankments be used elsewhere on site or run to spoil. If this should result in a deficiency of material available for filling, then additional materials shall be obtained as directed.

Filling

All fill material shall be placed in horizontal layers no greater than 300 mm thick extending the full width of the works and compacted to a Perth Sand Penetrometer test (AS 1289 Method 6.3.3) result of not less than 8 blows for the 300 mm interval 150 mm to 450 mm, 10 blows for the 300 mm interval 450 mm to 750 mm, and 11 blows for 750 mm to 1,050 mm, and deeper. Place and compact fill to the designated dimensions, levels, grades, and cross sections so that the surface is always self draining.

When filling at structures place and compact fill in layers simultaneously on both sides of structures, culverts and pipelines to avoid differential loading. Where necessary to achieve the required density or moisture content, adjust the moisture content of the fill before compaction.

Earthworks shall be trimmed to a neat and even finish to a tolerance of ± 50 mm of the design level.

The bedding, overlay and back-filling of all pipe work trenches shall be accomplished with material previously excavated from the site trenches, provided it is free from rock and other hard objects, in accordance with AS-2032 “Installation of uPVC Pipe Systems”.

If the material excavated from the site trenches is unsuitable or insufficient to accomplish the bedding and back-filling operation to the satisfaction of Superintendent, then the Contractor shall import clean sand fill for this purpose, at its expense.

The Contractor shall provide all necessary equipment for the backfilling of trenches, compacting and levelling. Excessive subsidence of trenches during the Defects Liability period shall be the responsibility of the Contractor to rectify at its own expense.

All surplus soil excavation, including rocks removed from backfill material, shall be removed from the site by the Contractor at its expense.

Prior to the commencement of compaction the Contractor shall confirm with the Superintendent the areas and the degree of compaction. Unless otherwise stated all areas that the drawings indicate will be supporting hardscape ie walls, footings, paving and structures shall be compacted to no less than 95% of the modified maximum dry density when tested in accordance with Australian Standards. All other areas (softscape areas) are to be lightly compacted to the approval of the Superintendent.

Bulk Earthworks shall be trimmed to a neat and even finish to a tolerance of ± 100 mm of the design level allowing for a final minor trim to bring the levels to with +/- 10mm of design levels.

14.27 TESTING AND COMPACTION

Quality Control Test on Import Fill Material

The contractor shall obtain 3 (three) Particle Size Distribution Samples and provide test certificates, for every 15,000BCM of imported fill.

Compaction Testing

The Contractor shall be responsible for the compaction testing of the earthworks and testing shall be with a Perth Sand Penetrometer. The Contractor shall record the equipment used, date, time, results and location (in plan and level) of all tests conducted on site. The cost of all penetrometer testing shall be included in the rates for foundation preparation and earthworks.

During the process importation and compaction of fill material, the contractor shall provide compaction test sheets to the Superintendent on weekly bases, confirming lifts have been compacted to the requirements stated in this technical specification. The contractor shall also provide Calibration Certificates.

The contractor shall notify and allow the superintendent adequate time to inspect, and test, to confirm that the final site Classification is in accordance with AS2870-1996. The Contractor shall provide a report detailing the earthworks verification studies.

Should difficulty arise in achieving the specified Perth penetrometer blow count the Superintendent may direct that in-situ density testing be performed to confirm the correlation between blow count and density and ensure that a density index of at least 70 % is being achieved in accordance with AS 1289 Method 5.6.1.

14.28 COMPLETION AND SITE PRESENTATION.

The Contractor shall ensure that all levels neatly tie in and match up with existing work in adjoining areas to the satisfaction of the Superintendent. This shall include work associated with roads, pathways and paving carried out previously to the areas covered by this Contract.

Following completion of the works the Contractor shall clear all excess sand, silt and debris from the site. The Contractor shall remain responsible for maintaining these works free of sand, silt and debris until the completion of the Landscape Consolidation Period. The site shall be presented in a neat and tidy condition, .clear of all refuse, rubble and the like and neatly graded prior to hydromulching.

The highest quality presentation of the completed works is paramount and the Contractor shall make full allowance for the following within the Contract:-

- Remove refuse, builders debris, spillage etc
- Remove track and wheel ruts,
- Remove excess stockpiles
- Sweep all streets and hardscape, paths etc.
- Hand rake to remove all sticks, stones etc.

The requirements of this clause shall also extend to existing roads, existing roads used for access, and storm water drains which are directly affected by the works under the contract.

14.29 AS CONSTRUCTED SURVEY OF EARTHWORKS

The Contractor shall appoint a registered surveyor to carry out 'as constructed' survey of the earthworks to ensure the levels specified on the Drawings have been achieved by the Contractor. Both the proof rolled in-situ surface as well as the final compacted surface level shall be surveyed by the Contractor. The proof rolled in-situ surface shall be surveyed at a grid spacing not exceeding 5m x 5m. The surveying of ‘as- constructed’ levels shall not relieve the Contractor of its obligation to implement its own quality control procedure during construction to ensure that the required level and accuracy requirements stated on the drawings and specifications are met.

COTERRA
ENVIRONMENT

Conservation Area Management Plan

Catalina Green Stage 45 POS

REV 3 March 2025

CALIBRE | COMMITMENT | COLLABORATION

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Contents

1 Introduction 5
1.1 Background 5
1.2 Environmental Approvals and Compliance 5
1.2.1 EPBC Referral 5
1.2.2 Subdivision Approval 5
1.3 Purpose of Report 5
1.4 Objectives 6
2 Existing Environment 8
2.1 Climate 8
2.2 Topography and Geology 8
2.3 Hydrology 9
2.3.1 Groundwater 9
2.3.2 Surface Water 9
2.4 Flora and Vegetation 9
2.4.1 Regionally Mapped Vegetation 9
2.4.2 Flora and Vegetation 9
2.5 Fauna and Habitat 10
2.6 Heritage 11
3 Conservation Area Management 12
3.1 Vegetation Retention 12
3.2 Rehabilitation and Revegetation 13
3.2.1 Weed control 15
3.3 Waste and Rubbish 16
3.4 Fauna Management 16
3.5 Bushfire Management 17
3.6 Access Management 18
3.6.1 Pedestrian Access 18
3.6.2 Vehicle Access 18
3.7 Public Education and Signage 18
3.8 Pest and Disease management 19
3.9 Dust Management 20
4 Implementation Strategy 21
5 References 25

Tables

Table 1-1: WAPC 200312 Environmental Conditions 6
Table 3-1: Completion Criteria 15
Table 4-1: Conservation Area Management Plan Implementation Table 21

Plates

Plate 2-1: Average Rainfall and Temperature 8
Plate 2-2: Example Vegetation within Conservation POS 10
Plate 2-3: Example Vegetation within Conservation POS 10

Figures

Figure 1 Site Location
Figure 2 EPBC Approval Black Cockatoo Retention and Loss Areas

Appendices

Appendix 1 EPBC Approval
Appendix 2 Subdivision Approval
Appendix 3 Landscape Concept Plan (Emerge, 2024)
Appendix 4 Native Vertebrate Fauna Management Plan (Terrestrial Ecosystems, 2022)

1 Introduction

1.1 Background

The Catalina Residential Development (Catalina) comprises a 180 hectare (ha) parcel of land, across former Lot 9504 Marmion Avenue, Clarkson (Figure 1). Catalina is located approximately 34 kilometres (km) north of the Perth Central Business District and is dissected along a north-south axis by Marmion Avenue in the west and Connolly Drive in the east, dividing the estate into three precincts; central (Catalina Central), western (Catalina Beach) and eastern (Catalina Green). The Catalina development comprises current and future residential land uses, including housing, mixed/commercial, a school precinct, Public Open Space (POS) and conservation areas. Construction within the Catalina Central and Catalina Beach has now been largely completed, with the final stages of Catalina Green scheduled to progress over the coming two years.

1.2 Environmental Approvals and Compliance

1.2.1 EPBC Referral

The project was referred and assessed under the *Environment Protection and Biodiversity Conservation* Act *1999* (EPBC Act) and was approved with conditions on 10 August 2011, with approval conditions relating to listed threatened species and communities (EPBC Ref: 2010/5785; Appendix 1). Several variations to the approval have been sought and granted since the approval date.

The EPBC approval requires that across the entire development, a maximum of 72.5 ha of the identified black cockatoo foraging habitat can be removed, with permitted locations for removal and retention specified within the approval. The conservation area described in this report is part of the required retention area and there is proposed to be no clearing of native vegetation within this area that is potential foraging or breeding habitat for Carnaby's Black Cockatoo (Figure 2).

Condition 5 of the EPBC approval requires the preparation and implementation of a Clearing and Revegetation Management Plan. The most recent version of this plan (Version 4) is dated December 2018 (Ecological Australia, 2018).

The entirety of the Catalina development must comply with the Conditions set out in the EPBC approval.

1.2.2 Subdivision Approval

Subdivision approval was issued by the Western Australian Planning Commission (WAPC) on 17 September 2024 for Stages 44 to 47 of the Catalina Green precinct (WAPC 200312; Appendix 2).

1.3 Purpose of Report

This Conservation Area Management Plan (CAMP) has been prepared primarily in support of the following Condition of the Subdivision Approval issued by the WAPC, 2024:

> *9. Prior to the commencement of subdivisional works for land south of the 13 metre wide road reserve as annotated on the attached plan dated 20 August 2024, a Conservation Area Management Plan is to be prepared in consultation with the Department of Biodiversity, Conservation and Attraction and to the satisfaction of the Local Government to address the management of the Conservation Public Open Space and interface with the Neerabup National Park and Bush Forever 323 and satisfactory arrangements being made for the implementation of the approved plan. (City of Wanneroo)*

Further to the above Condition 9, this CAMP also addresses Conditions 10 to 14 as a part of the management strategies for the Stage 44 to 47 of the development (the site). Further details are outlined below (Table 1-1). Consultation has been undertaken between Coterra Environment, Catalina Regional Council, the City of

Wanneroo (CoW) and the Department of Biodiversity, Conservation and Attractions (DBCA) regarding the scope of this CAMP and the Condition 13 requirements.

Table 1-1: WAPC 200312 Environmental Conditions

Condition No.	Condition wording	Relevant Section/s of CAMP
10	Satisfactory arrangements being made for the implementation of the approved Native Vertebrate Fauna Management Plan for the Catalina area (Terrestrial Ecosystem March 2022) plan. (City of Wanneroo)	Section 3.4
11	Satisfactory arrangements being made for the implementation of the approved Clearing and Revegetation Management Plan – Catalina Development (Ecological Australia). (City of Wanneroo).	Section 3.1
12	Measures being taken to ensure no vegetation within Neerabup National Park or Bush Forever Site 323 is removed or disturbed during subdivisional works, including any secondary impacts from works to provide service infrastructure and drainage to implement the approved plan of subdivision. (DBCA)	Section 3.1
13	Fences restricting access to Neerabup National Park and Bush Forever Site 323 are to be constructed on the western and northern boundaries of proposed Lot 185 and the northern boundary of the Conservation Public Open Space, to protect the adjacent national park and Bush Forever site, to the specifications of and in consultation with the Department of Biodiversity, Conservation and Attractions. (DBCA)	Section 3.1
14	Prior to the commencement of subdivisional works, measures being undertaken to identify any vegetation on the site worthy of retention, including any potential habitat or foraging trees for threatened fauna species, and protection measures implemented to ensure such vegetation is not impacted by subdivisional works. (City of Wanneroo)	Section 3.1

1.4 Objectives

The Objectives of this CAMP are to:

1. Ensure no impacts to the Bush Forever (BF) Sites 323 and 383 occur as a result of the subdivision of Stage 44 to 47, in compliance with the DBCA and City of Wanneroo's requirements for the development
2. Define environmental management arrangements for the Conservation POS and adjacent northern POS, which have been developed in conjunction with those outlined in the Environmental Management Plan for the greater Catalina Area (Syrinx, 2011), in pursuit of the following objectives:
    a. Ensure protection of the conservation values in adjacent areas
    b. Prevent further fragmentation and damage of the remnant bushland
    c. Connect and protect remnant vegetation
    d. Ensure endangered fauna habitats (namely Carnaby's Black Cockatoo) are not impacted by bushland fragmentation
    e. Ensure no adverse effect on biodiversity due to introduction and spread of weed populations
    f. Ensure feral fauna do not impact on biodiversity values on site
    g. Ensure feral animals do not impact on Carnaby's Black Cockatoo habitat

h. Prevent loss of biodiversity through inappropriate fire regimes

i. Protect biodiversity (flora and fauna) via provision of appropriate infrastructure, public access and facilities to conservation areas

j. Promote and preserve biodiversity through community awareness

k. Prevent loss of biodiversity through illegal disposal of rubbish

l. Ensure no adverse effect on biodiversity due to altered hydrology

m. Ensure *Phytophthora cinnamomi* is not introduced to or spread from the site.

2 Existing Environment

2.1 Climate

The site experiences warm, dry summers and cool, wet winters. Temperatures range (as observed at the Swanbourne weather station, approximately 30 km south of the site) from a mean maximum of 30.5°Celcius (°C) in February, to a mean minimum temperature of 10.0°C in July (BoM, 2024; Plate 2-1).

Annual mean rainfall is 728.7 millimetres (mm), with the highest rainfall period falling in June to August, and lowest rainfall period from December to February (Plate 2-1).

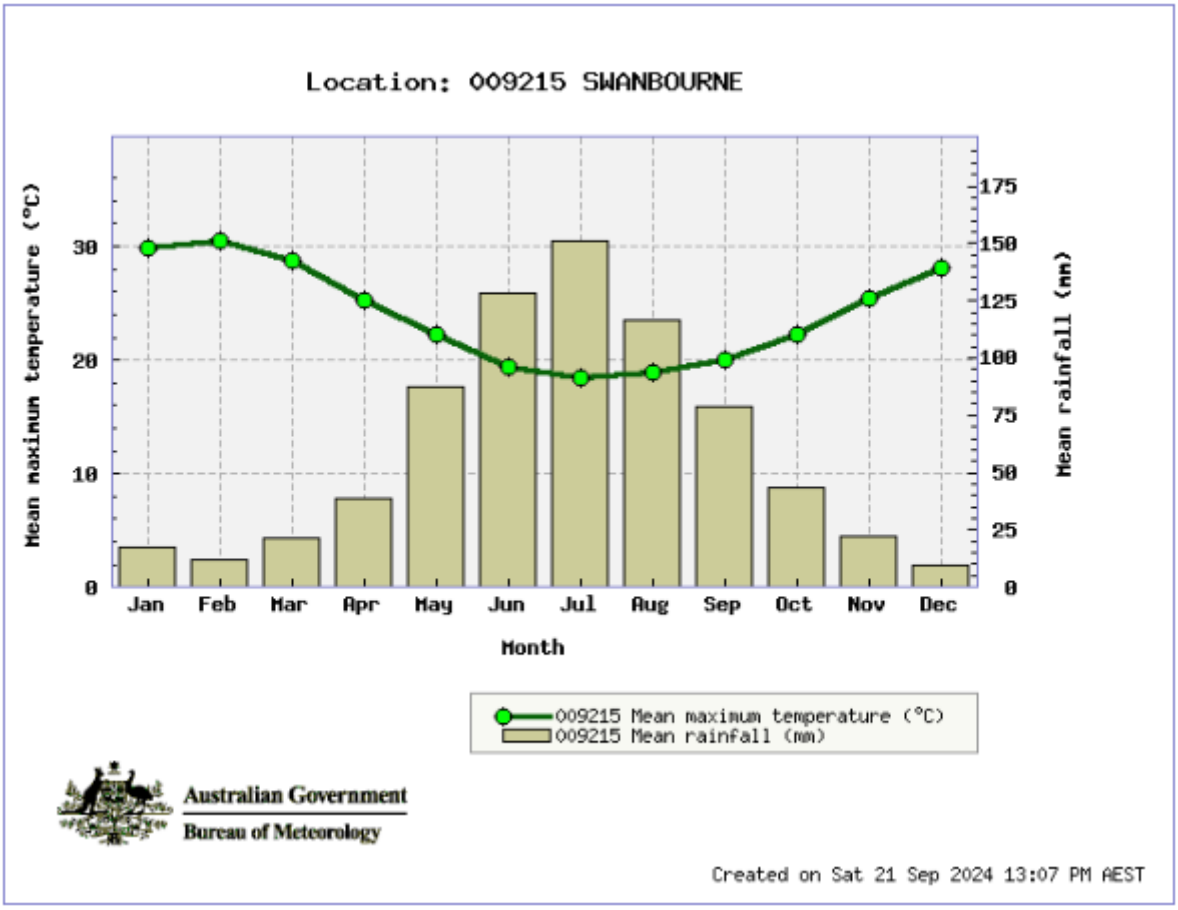

Plate 2-1: Average Rainfall and Temperature

Source: BoM, 2024

2.2 Topography and Geology

Soils within the site form part of the Spearwood System, comprising Sand Dunes and Plains, Yellow Deep Sands, Pale Deep Sands and Yellow/brown Shallow Sands. The soils in this area are not mapped as being at risk of Acid Sulphate Soils (MNG, 2024).

Topographic elevations within the Conservation POS range from 12 to 24 metres Australian Height Datum (mAHD) with elevation sloping toward the west (MNG, 2024).

2.3 Hydrology

2.3.1 Groundwater

Regional mapping indicates that the water table lies at approximately 1 mAHD at the site (DWER, 2024). Groundwater flows in a westerly direction, toward the coast.

2.3.2 Surface Water

The site does not contain any wetland or surface water features. The closest wetland is located over 2 kilometres (km) north-west of the Conservation POS, being Neerabup Lake (UFI 8091) (MNG, 2024).

2.4 Flora and Vegetation

2.4.1 Regionally Mapped Vegetation

Pre-European vegetation within the site is mapped as part of the Spearwood 998 Association, described as 'Jarrah, marri and wandoo; *Eucalyptus marginata, Corymbia calophylla, E. wandoo'* (Landgate, 2024).

The vegetation within the site forms part of the Cottesloe Complex – Central and south, described as 'Mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops' (Heddle, et. al 1980).

To the immediate south of the site are Bush Forever Sites No 383 and 323 which form part of Neerabup National Park.

2.4.2 Flora and Vegetation

Syrinx Environmental (Syrinx) undertook a flora and vegetation and targeted Declared Rare and Priority Flora survey of the Catalina Estate (Syrinx, 2009; 2010). General findings of these surveys in relation to the site include (Syrinx, 2009; 2010):

- Vegetation was in 'Good' condition
- Vegetation type is described as:
  - *Eucalyptus gomphocephala* and *Eucalyptus marginata* Woodland over *Banksia attenuata* Low Open Woodland over *Xanthorrhoea preissii / X. brunonis, Hakea lissocarpha* Shrubland over *Hibbertia hypericoides, Gompholobium tomentosum* Low Shrubland over mixed Very Open Grassland / mixed Very Open Herbland / *Mesomelaena pseudostygia* Open Sedgeland Good condition
- No Declared Rare or Priority flora were recorded
- Weed presence throughout the Catalina Estate was high.

Although the vegetation survey is 14 years old, the vegetation worthy of retention was determined through the Federal and State environmental assessments of the overall development as described in Section 1.2. For the purposes of this CAMP is the surveys used in those environmental assessments is considered as an appropriate baseline for determining species and vegetation communities present in the site and it is therefore not proposed to undertake additional flora and vegetation surveys at this time. Coterra Environment undertook a site inspection on 12 September 2024 and confirmed that the remaining vegetation is representative of the vegetation types mapped in 2010 (Plate 2-2; Plate 2-3). Remnant vegetation condition appeared to be mostly 'Good' condition, with some 'Completely Degraded' and 'Degraded' vegetation with weed encroachment evident adjacent to the western firebreaks within the Conservation POS. These degraded areas are mapped on the Overall Concept Plan in Appendix 3 which identifies the need for infill

planting at this location. Some household rubbish dumping was particularly prevalent this part of the site due to the current uncontrolled vehicular access along the firebreak.

Plate 2-2: Example Vegetation within Conservation POS

Plate 2-3: Example Vegetation within Conservation POS

Source: Coterra Environment (12 September 2024)

2.5 Fauna and Habitat

Syrinx undertook a Level 1 fauna assessment in 2009 to assess the Catalina Estate's value for fauna and fauna habitat. A total of 29 vertebrate species were recorded, comprising (Syrinx, 2009):

- 23 bird species
  - *Elanus axillaris* (Black-shouldered Kite)
  - *Lophoictinia isura* (Square-tailed Kite)
  - *Haliastur sphenurus* (Whistling Kite)
  - *Falco cenchroides* (Nankeen Kestrel)
  - *Streptopelia senegalensis* (Laughing Turtle-Dove)
  - *Phaps chalcoptera* (Common bronzewing)
  - *Ocyphaps lophotes* (Crested pigeon)
  - *Cacatua roseicapilla* (Galah)
  - *Barnadus zonarius* (Australian Ringneck)
  - *Dacelo novaeguineae* (Laughing kookaburra)
  - *Malurus leucopteris* (White-winged Fairy Wren)
  - *Pardalotus striatus* (Striated pardalote)

    - *Smicrornis brevirostris* (Weebill)
    - *Acanthiza Chrysorrhoa* (Yellow-rumped Thornbill)
    - *Anthochaera carunculata* (red wattlebird)
    - *Lichenostomus virescens* (Singing honeyeater)
    - *Rhipidura fuliginosa* (Grey Fantail)
    - *Coracina novaehollandiae* (Black-faced Cuckoo Shrike)
    - *Artamus cinereus* (Black-faced woodswallow)
    - *Cracticus torquatus* (Grey Butcherbird)
    - *Gymnorhina tibicen* (Australian magpie)
    - *Corvus coronoides* (Australian raven)
    - *Anthus novaeseelandiae* (Richard's pipit)
    - *Zosterops lateralis* (Silvereye)
- 3 reptile species
    - *Pogona minor* (Western Bearded Dragon)
    - *Varanus gouldii* (Gould's monitor)
    - *Pseudonaja affinis* (Dugite)
- 1 native mammal
    - *Macropus fuliginosus* (Western Grey Kangaroo)
- 2 introduced mammal species
    - *Vulpes vulpes* (Fox)
    - *Oryctolagus cuniculus* (rabbit).

No priority or threatened fauna were recorded, however potential habitat for the Carnaby's Black Cockatoo (*Zanda latirostris*) and Graceful Sunmoth (*Synemon gratiosa*; now delisted under the EPBC Act) was recorded. During an additional survey undertaken in 2010, Syrinx recorded flocks of Carnaby's Black Cockatoo foraging within the Catalina Estate. Subsequent mapping was produced outlining the areas of Carnaby's Black Cockatoo habitat within the Catalina Estate, and this was used as a baseline for the approval issued under the EPBC Act (Syrinx, 2011).

More recently Terrestrial Ecosystems prepared a Native Vertebrate Fauna Management Plan for the Catalina development area (Terrestrial Ecosystems, 2022). That plan is provided in Appendix 4 and provides a comprehensive list of vertebrate fauna previously recorded in the vicinity of the project area (Section 2, pages 5-7).

2.6 Heritage

The site does not contain any known heritage places under either the Aboriginal Heritage Act (1972) or as identified by the Department of Planning, Lands and Heritage (DPLH).

All contractors should be aware of obligations should any unexpected heritage finds arise during works.

3 Conservation Area Management

3.1 Vegetation Retention

The retention of native vegetation known to be foraging habitat for Black Cockatoos is regulated by the EPBC Act approval for the Catalina site. The areas of black cockatoo habitat identified in the EPBC approval is shown in Figure 2 , with 14.41 ha of habitat to be retained across the whole of the Catalina development.

Subsequent to the EPBC approval, a Clearing and Revegetation Management Plan was prepared for the site (Eco Logical, 2018; Condition 11 of WAPC 200312). As such, the vegetation retention management actions relevant to the site from that plan include:

- No clearing of the area identified as retention of Black Cockatoo habitat under the EPBC Act approval must be undertaken (Figure 2). This area forms the majority of the Conservation POS area. Whilst no potential foraging or breeding habitat for Black Cockatoos is proposed to be cleared in the Conservation POS area, some understorey species may be cleared for the proposed limestone pathway. The pathway location will be marked out and determined 'on site' to ensure the route with minimal understorey clearing is achieved.
- Additional remnant vegetation areas and significant existing trees will be retained within the Northern POS located adjacent to Bulburn Street as shown in Appendix 3
- Clearing areas boundaries will be clearly demarcated with flagging tape by the surveyor followed by the installation of temporary fencing to be installed along the clearing boundary of the Conservation and Northern POS areas prior to the commencement of clearing. This will ensure no encroachment by machinery or materials into the vegetation or trees to be retained
- The temporary fencing will remain in place until the permanent conservation fencing is due to be installed
- Clearing contractors will undertake a site walkover to indicate which areas of vegetation and significant trees are marked for retention
- Seed collection (if required) is to be undertaken in the adjacent clearing area and incorporated into revegetation actions
- Clearing will be undertaken in the direction toward retained vegetation and Neerabup National Park to allow fauna to move into adjacent bushland.

As discussed with the DBCA (J Clinton, *pers comm*), the boundary between the Conservation POS area and the abutting Bush Forever (BF) Site 323 and 383 will be pegged/boundary marked with star pickets to distinguish boundary lines prior to any clearing works commencing in the adjacent development area. The marking will allow unrestricted fauna movement between the Conservation POS and BF Sites, reducing the potential for population isolation. Permanent fencing is not proposed along this alignment to maintain full connectivity between the conservation bushland and adjacent Bush Forever area (Condition 12 and 13 of WAPC 200312).

Vegetation clearing will only occur in the demarcated areas, subject to the EPBC Act Approval for the Catalina development, ensuring retention of vegetation identified as Carnaby's Black Cockatoo foraging habitat and significant trees as outlined in the EPBC approval (Condition 14 of WAPC 200312).

Retaining walls, batters and/or fencing (depending on detailed engineering design) are proposed at the interface of BF Site 323 and Catalina residential development, to the west of the Conservation POS area, as part of the Stage 43 streetscape works. The engineering design will ensure that no clearing occurs within the Conservation POS.

3.2 Rehabilitation and Revegetation

The *Clearing and Revegetation Management Plan* (CRMP) prepared for Catalina (Eco Logical Australia, 2018) only proposed revegetation within the two Biodiversity Conservation Areas in the central cell and Site 1 in the southeast of the central cell. The conservation POS in Stage 45 was only required to be retained, not rehabilitated. As such there was no EPBC requirements to do any revegetation within this Conservation POS area.

Notwithstanding that there are no requirements for rehabilitation for this area, revegetation works are proposed in the Degraded to Completely Degraded area of the Conservation POS to improve vegetation condition in those areas (Refer to Overall Concept Plan in Appendix 3). These works are consistent with the CRMP and will include:

- Infill planting is proposed to the west of the existing western firebreak in the Conservation POS which will involve:
  - An on-ground assessment will be undertaken to determine the extent of rehabilitation works that can be achieved without disturbing current vegetation or restricting required firebreak width (i.e. 3 m to address City of Wanneroo Annual Fire Notice requirements)
  - Species will incorporate foraging plants for Black Cockatoos, as outlined in the Clearing and Revegetation Management Plan (Eco Logical, 2018)
- Planting of low/shrub native vegetation between the Conservation POS area and concrete pathway surrounding the POS to aid in buffering impacts to vegetation within the Conservation POS (see 'Detail Concept Plan Two' in Appendix 3)
- Revegetation will be setback 500mm back from the development interface boundary delineation (fencing or otherwise determined delineation – subject to refinement as part of landscape approvals) to preserve the asset and provide a 'walkable' firebreak given a full firebreak not being provided at the perimeter.
- Installation of trees between the Conservation POS area and residential area to enhance the ecological value of the site and reduce pedestrian digression from concrete pathways (see 'Proposed Trees' in Appendix 3)
- The separation of the POS areas and residential development via hardstand delineation and planted native vegetation will also provide a buffer between residential areas and remnant vegetation. This will assist with reduction of potential indirect impacts such as exotic vegetation (weed) encroachment into the conservation area.
- Undertake seed and cutting collection from the clearing footprint area and surrounds, remaining as close as possible to areas to be rehabilitated.
- Propagation of selected seeds at an accredited nursery
- Targeted spraying will be conducted by a suitably qualified contractor, experienced in weed identification and control. Spraying will occur in the summer or autumn, prior to seed being set and will be conducted prior to revegetation commencing in the following winter
- Undertake planting of tubestock
- Installation of tree guards as required
- Tree guard removal will occur within one season following planting
- Vegetation and weed monitoring undertaken annually in Spring for two years within rehabilitation areas with photographic monitoring points established
- One weed control event to be undertaken prior to seed set in spring/summer after planting

- Any infill planting works will be undertaken during the appropriate season for the species (i.e., winter) to allow optimum success rates of establishment.

Revegetation species proposed to be included are:

- *Acacia cochlearis*
- *Acacia saligna**
- *Allocasuarina fraseriana**
- *Allocasuarina humilis**
- *Banksia attenuata**
- *Banksia grandis**
- *Banksia ilicifolia**
- *Banksia menziesii**
- *Banksia nivea*
- *Bossiaea eriocarpa*
- *Burchardia congesta*
- *Caladenia flava*
- *Conostephium preissii*
- *Conostylus aculeata*
- *Conostylus setigera subsp. Setigera*
- *Crassula colorata*
- *Daucus glochidiatus*
- *Desmocladus flexuosus*
- *Dianella revoluta*
- *Drosera menziesii subsp. Penicillaris*
- *Drosera pallida*
- *Eryngium pinnatifidum*
- *Eucalyptus gomphocephala**
- *Eucalyptus marginata**
- *Gompholobium tomentosum*
- *Haemodorum laxum*
- *Hakea lissocarpha**
- *Hardenbergia comptoniana*
- *Hibbertia hypercoides*
- *Hibbertia racemosa*
- *Isotoma hypocrateriformis*
- *Isotropis cuneifolia subsp. Cuneifolia*
- *Kennedia prostrata*
- *Lagenophora huegelii*
- *Lepidosperma sp. Darling Range Heath*
- *Leptoceras menziesii*
- *Leptosperma sp. coastal dunes*
- *Leucopogon parviflorus*
- *Macrozamia riedlei*
- *Mesomelaena pseudostygia*
- *Olearia axillaris*
- *Petrophile linearis*
- *Petrophile macrostachya*
- *Phyllanthus calycinus*
- *Podolepis lessonii*
- *Podotheca angustifolia*
- *Ptilotus drummondii*
- *Ptilotus manglesii*
- *Quinetia urvillei*
- *Schoenus curvifolia*
- *Schoenus latitans*
- *Sowerbaea laxiflora*
- *Spyridium globulosum*
- *Stirlingia latifolia*
- *Stylidium neurophyllum Wege ms*
- *Stylidium piliferum*
- *Thysanotus patersonii*

- *Drosera erythrorhiza*
- *Drosera macrantha*
- *Drosera macrantha subsp. Macrantha*
- *Leucopogon propinquum*
- *Lomandra sp.*
- *Lyginia imberbis*
- *Xanthorrhoea brunonis*
- *Xanthorrhoea preissii**

**Note: Black Cockatoo foraging species*

The success of the rehabilitation program will be determined by comparing the monitoring results to the completion criteria provided in Table 3-1. The average density of plants is consistent with that outlined within the CRMP.

Table 3-1: Completion Criteria

Completion Criteria	Performance Target
Average density of plant species to be installed (if not already meeting this density)	Installation of: • 3 ground storey/low shrubs per m^2 OR • 2 tall shrubs/small trees (e.g. Banksia) per m^2 OR • 1 overstorey trees (tuarts, marri etc) per $5m^2$
Plant diversity (% of planted species surviving)	70%
Ground/ canopy coverage (% of area)	80%
Weed coverage	<10% No Declared plants or Weeds of National Significance

A short monitoring report will be prepared and submitted to the CoW annually for two years following planting, outlining the progress against completion criteria and the rehabilitation success.

Where completion criteria are not met, contingency actions will be undertaken. Contingency actions may include:

- Infill planting or seeding
- Additional weed control
- Erosion control measures

3.2.1 Weed control

Weed control works will target significant weed species and will be appropriate to the identified species (i.e., through spot spraying, or manual control measures). The following will be undertaken in the revegetation areas:

- Targeted weed spraying will be conducted by a suitably qualified contractor in the summer or autumn prior to revegetation commencing in the following winter
- Vegetation and weed monitoring undertaken annually in Spring for two years within rehabilitation areas with photographic monitoring points established
- One weed control event to be undertaken prior to seed set in spring/summer after planting.

Weed control will also occur throughout the broader POS area, as required, via spot spraying or manual removal, occurring at the appropriate time (i.e., before seeds set, and likely in line with the revegetation area management timing).

3.3 Waste and Rubbish

During construction general waste skip bins will be available for all on-site works through the construction program to contain any waste generated. Waste generation within the Catalina development is generally low, with the overall development achieving the Urban Development Industry Australia EnviroDevelopment Waste Leaf through the waste recycling program implemented throughout the development. Minimal waste is generated by civil contractors as only materials required are brought to site or are generally otherwise repurposed off site.

Consistent with previous Environmental Management Plans prepared for other stages of the Catalina development, the following will be undertaken with regard to waste:

- Areas where wastes are stored shall be part of site inspections undertaken weekly to ensure visual amenity is maintained and potential environmental impacts are controlled
- Where possible, green waste and brush generated from clearing works will be re-used within the pedestrian accessway landscaping around the perimeter of the POS areas.

The details of the proposed rubbish bins within the POS would be provided to the City of Wanneroo as part of the landscape plan detailed design and approvals process. The landscape concept plan in Appendix 3 shows a rubbish bin being located at the entrance to the Conservation POS.

Weekly inspections will be undertaken of the Conservation POS and development area interface with Bush Forever site 323 and Neerabup National Park for displaced rubbish, to facilitate rubbish removal, if present. The inspection should include all areas at least 20 m from the development interface. In addition, observations of any illegally dumped rubbish, including white goods, within the site will be removed and remedied during construction works. No dust curtains are considered to be needed given this proposed active management of waste.

3.4 Fauna Management

Fauna management for the adjacent development areas will be undertaken in line with the approved *Native Vertebrate Fauna Management Plan – Catalina Development Area* (Terrestrial Ecosystems, 2022) as outlined in Appendix 4. The approved management actions of the Stage 45 area in accordance with this Fauna Management Plan include:

- Five nights of pre-clearing trapping - baited wire cage traps targeting Quenda and other trappable fauna will be deployed across the site in suitable habitat for a minimum period of five nights within two weeks of the commencement of vegetation clearing. Traps will remain open each day. Daily trap checking will be completed within four hours of sunrise to minimise heat stress on nocturnal captured fauna.
- Tree inspections pre-clearing and during clearing works - Trees will be inspected during the trapping program from ground level to determine whether they contain suitable hollow(s) or active nest(s). The on-site zoologist will decide whether tree hollows should be inspected prior to vegetation clearing, and whether any captured fauna, eggs and/or chicks should be relocated, euthanised or given to a wildlife carer, based on the potential for the animal surviving and subsequently being released as well as if the species captured is a feral species.
- Active foraging for individuals during clearing - Active foraging and searching will be undertaken by the contracting zoologist for reptiles prior to vegetation clearing and where appropriate concurrent with any trapping program that is undertaken.
- Active kangaroo management is not proposed, but will be utilised if required. Clearing will occur towards the direction of the Neerabup National Park and Bush Forever site so that if there are any kangaroos in the clearing area they will be encouraged to move towards these large conservation areas. Where it is not possible or feasible for kangaroos to naturally move into adjacent areas, then

the contracting zoologist will use the best-practise methods for kangaroo management as determined by published research and advice from experienced zoologists who regularly undertake these management programs.

All captured small native vertebrate fauna will be released into the adjacent retained bush areas, with larger or more mobile fauna being relocated to off-site areas, under the judgement of the on-site zoologist. The above proposed fauna works have been awarded to Terrestrial Ecosystems who will operate in accordance with the Native Vertebrate Fauna Management Plan (Condition 10 of WAPC 200312).

No fencing restricting fauna movement is proposed. This strategy has been implemented under the guidance of Terrestrial Ecosystems who have been the primary consultant to date regarding fauna relocation works. The use of fauna restricting fences will be determined by the on-site zoologist at the time of fauna management, however it is not proposed at this stage.

Feral animals are a declared pest under State and Federal legislation (*Biosecurity and Agriculture Management Act 2007* and associated Regulations 2013). Possible feral animals resident within the site and the adjoining conservation areas to the south include foxes, rabbits and cats. The Conservation POS and other POS area in Stage 45 totals an area of 4.23ha. The directly adjoining conservation areas to the south including Neerabup National Park and Bush Forever Site no. 323 total 89.45ha. As such the Catalina POS represents less than 5% of the potential habitat for feral animals in this location. Due to the ability of fauna to move between the site and adjacent National Park and BF site, any proposed feral fauna management in the Catalina POS would not make a significant enough impact on overall feral fauna populations to warrant undertaking. Similar management actions would need to occur at the same time within the greater conservation area by the DBCA to have any significant impact on feral animal populations.

Feral fauna control has also been considered in the context of public usage of the POS and 1080 baiting or foot traps in this area is not considered appropriate due to risk to domestic animals. The calicivirus is the best form of control for rabbits as it does not affect domestic pets which may enter the area (i.e., cats or dogs) and this method of control is commonly used within the City of Wanneroo. Future residents should ensure any pet rabbits are immunised against this virus and are appropriately housed to minimise risk (i.e., outdoor rabbits enclosures should be insect proof).

Tree guards will be installed, if revegetation is disturbed as a result of undesired herbivory. Should herbivory continue despite use of tree guards, the installation of animal-proof fencing (exclusion fencing) may be utilised, comprising (MRWA, 2024):

- Kangaroo exclusion - Fences shall be 1800mm high and buried into ground to at least 500 mm deep at an angle; and/or
- Rabbit exclusion–50mm width wire apertures up to 900 mm are recommended and buried into ground to at least 350mm.

As indicated by the DBCA (J. Clinton, pers. comm. 5 Mar 2025), the DBCA currently do not undertake any feral fauna control in the adjacent BF sites, and as such DBCA has noted that feral fauna management within the POS in isolation is unlikely to achieve a significant outcome.

3.5 Bushfire Management

Existing firebreaks located within the Conservation POS area are to be maintained to the satisfaction of the City of Wanneroo. As such, the following will apply (CoW, 2024):

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year
- If it is not possible to install the firebreak adjacent to the external boundary of the property due to naturally occurring obstacles, it is acceptable to install the firebreak around the obstacle. If this

requires the firebreak to be greater than 5 metres away from the external boundary, a firebreak variation is required.

- Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to ensure vehicles can drive along the firebreaks without being impeded by tree branches.

The Conservation POS area has an existing firebreak along the western and eastern boundaries which will be maintained to the above specifications. As agreed between the City of Wanneroo and the DBCA there is to be no firebreak installed on the southern boundary of the Conservation POS to negate the need for clearing of significant Black Cockatoo habitat required to be retained under Condition 3d of the EPBC approval for the Catalina development.

A 3 m wide maintenance access is provided on the eastern firebreak exiting into the proposed development to enable DBCA or DFES to exit out of the National Park when conducting a prescribed burn or fire response.

In addition, the development will also comply with the requirements of the approved Bushfire Management Plan (Strategen, 2018) as referred to in Condition 23 of WAPC 200312.

3.6 Access Management

3.6.1 Pedestrian Access

Formal pedestrian access around the perimeter of the two POS areas are proposed to be facilitated through the installation of concrete pathways at 2.5 m width. Pedestrian access into the Conservation POS area will be facilitated through a singular limestone pathway, with pathway alignment and gate access locations to be refined as part of the detailed design and landscape approvals process to avoid the need for any removal of any vegetation that is potential foraging or breeding habitat for black cockatoos. Indicative path locations are shown in Appendix 3.

Pedestrian access will also be facilitated through the northern POS area, which will be landscaped and connected to the Conservation POS area (Appendix 3). Due to the northern POS area being outside the required EPBC retention areas, development of this area has greater flexibility regarding clearing extent and will be able to facilitate accessibility considerations. As such this POS contains two concrete pathways of 1.5 m width.

The interface of the future north-south running road and the Conservation POS (refer 'Road 159' in Appendix 3) will be delineated with a retaining wall (two courses in height) that is situated within the road does not encroach into the Conservation POS area (or EPBC boundary). The remainder of this interface will be the subject of low-level battering and some revegetation, located within the road reserve, and delineated via fencing.

3.6.2 Vehicle Access

Prohibitive fencing/ walls will encompass the entirety of the Conservation POS and the majority of the Northern POS area, and unauthorised vehicle access will be restricted by two maintenance gates within the Conservation POS. The Conservation POS area will maintain one northern access maintenance gate and one southern access maintenance gate to allow for maintenance of the existing firebreak around the site (Appendix 3). The maintenance gates also serve as emergency vehicle and DBCA access into the Conservation POS, Neerabup National Park and Bush Forever Site no. 323 to the south of the site.

Any vehicles requiring entry to the site during installation of infrastructure within the POS will be restricted to the existing fire break and surrounding cleared areas only.

3.7 Public Education and Signage

Interpretive signage providing information regarding the ecological value and management requirements of the conservation area and adjacent Bush Forever areas will be installed at four strategic locations along the

limestone access paths within the Conservation POS areas. Indicative locations are provided in Appendix 3, with precise locations to be provided during the detailed design and approvals process at later stages, in consultation with the City and DBCA.

Items proposed to be included in the signage include:

- Conservation significance of the reserve and connectivity to the larger Bush Forever area
- Information regarding local conservation significant flora and fauna species (including Carnaby's Black Cockatoo)
- Requests for users to only access the Conservation POS via the limestone pathways to prevent damage to adjacent vegetation
- Directional signage showing path connection within the area
- Reminders to keep the area clean of rubbish, pet excreta and to keep dogs on leashes.

Example interpretive signage is provided in Appendix 3. The details, location and wording of the proposed signage would be provided to the City of Wanneroo and DBCA as part of the landscape plan detailed design and approvals process.

3.8 Pest and Disease management

Although not noted to be present within the site, in order to prevent any possible spread of dieback (*Phytophthora cinnamomi*) into the Conservation POS area the following management measures will be undertaken:

- All machinery, tools and contractor footwear entering the site is to be clean upon entry to the site
- Construction works entry points are to be minimised to only those necessary
- If soil is required to be imported into the site it will be sourced from a certified dieback free source
- All tubestock will be sourced from certified dieback free sources
- All site workers will be made aware of the potential spread of dieback and the requirement to keep machinery and vehicles entering the site free of and soils or adhered vegetated matter
- Informal pathways will be installed in areas where no potential foraging or breeding habitat for Carnaby's Black Cockatoos is present within the Conservation POS area. It is noted that where limestone is used for these access paths, the natural pH of this material is a natural suppressant of dieback
- All mulch produced as a result of the clearing will be restricted to use outside of the Conservation POS area, or adjacent areas (i.e., landscaped verge, northern POS) to avoid the potential spread of dieback.

Recently the Perth metropolitan region has experienced an invasion of the Polyphagous shot-hole borer (PSHB; *Euwallacea fornicatus*), a beetle native to Southeast Asia which attacks plants by tunnelling into trunks, stems and branches causing structural damage, as well as facilitating the growth of *Fusarium* fungus, which restricts absorption of water and nutrients within the tree. The DPIRD has established a quarantine area, of which Catalina Estate currently sits within the 'Zone B' area where fewer to no infested plants have been recorded, and maintains a buffer between infested areas and the rest of Western Australia (DPIRD, 2024). In order to maintain this zone, the following will apply to the site:

- Revegetation plants will only be sourced from within 'Zone B', so as to not risk introduction of the PSHB
- Untreated or unseasoned wood will not be moved outside of the quarantine area (Zone A and Zone B) unless chipped to pieces that are 2.5 cm or less in diameter

- Plant materials, including living plants, that are greater than 2 cm in diameter must not be moved outside of the quarantine area
- Wood, plant materials or living plants can be moved into Zone A
- Any machinery used to handle green waste must be cleaned prior to leaving the quarantine area.

3.9 Dust Management

Dust from the construction site will be managed in accordance with the contractor's standard procedures which may include:

- Plan earthmoving works so that they are completed just prior to the time they are needed.
- Observing weather conditions and do not commence or continue earthworks if conditions are unsuitable e.g. under conditions of strong winds
- Pre-watering areas to be disturbed if required
- Regular use of the water cart over disturbed areas and vehicular access tracks if required
- Watering sprays on stockpiles and materials to be loaded and during loading if required
- Hydromulch or a similar binding material to be used in completed earthwork areas where little or no further vehicle or pedestrian traffic is likely.

Dust curtains are therefore not considered necessary with these management measures in place.

4 Implementation Strategy

The implementation strategy of the Conservation Area management Plan is provided in Table 4-1.

Table 4-1: Conservation Area Management Plan Implementation Table

Management Issue	Strategy	Timing	Responsibility
1. Vegetation Retention	• No clearing of the area identified as retention of Black Cockatoo habitat under the EPBC Act approval must be undertaken. This area forms the majority of the Conservation POS area with the detailed engineering design proposing to contain all fencing and retaining walls/batters outside of this area. Some additional vegetation is being retained in the Northern POS. • Clearing areas boundaries will be clearly demarcated with flagging tape by the surveyor followed by temporary fencing to be installed along the clearing boundary of the Conservation and Northern POS areas prior to the commencement of clearing. This will ensure no encroachment by machinery or materials into the vegetation or trees to be retained • The temporary fencing will remain in place until the permanent conservation fencing is due to be installed • Clearing contractors will undertake a site walkover to indicate which areas of vegetation and significant trees are marked for retention • Detailed location, design and installation of any infrastructure (i.e., pathways and pedestrian access gates) to avoid disturbance or removal of potential foraging or breeding habitat for Black Cockatoos, and minimise clearing and disturbance to the understorey species.	Prior to and during adjacent area clearing and construction works.	Catalina Regional Council Emerge Landscape Architects All contractors accessing the site
2. Rehabilitation	Infill planting is proposed to the west of the existing western firebreak in the Conservation POS which will involve: • An on-ground assessment undertaken prior to revegetation works will be used to determine the extent of rehabilitation works that can be achieved without disturbing current vegetation or restricting required firebreak • Species planted will incorporate foraging plants for Black Cockatoos • Revegetation will be setback 500 mm back from the proposed boundary delineator to preserve the asset and provide a ‘walkable’ firebreak given a full	Post-construction of POS infrastructure and ongoing maintenance as needed.	Catalina Regional Council Emerge Landscape architects

Management Issue	Strategy	Timing	Responsibility
	firebreak is not being provided at the perimeter of the Conservation POS and external pathway interface. • The separation of the POS areas and residential development via hardstand delineation and planted vegetation • Undertake seed and cutting collection from the clearing footprint area and surrounds, remaining as close as possible to areas to be rehabilitated. • Propagation of selected seeds at an accredited nursery • Targeted weed spraying will be conducted by a suitably qualified contractor in the summer or autumn prior to revegetation commencing in the following winter. • Undertake planting of tubestock • Installation of tree guards as required • Vegetation and weed monitoring undertaken annually in Spring for two years within rehabilitation areas with photographic monitoring points established • One weed control event to be undertaken prior to seed set in spring/summer after planting • The success of the rehabilitation program will be determined by comparing the monitoring results to the completion criteria provided in Section 3.2 • Preparation of a short monitoring report and submission to the CoW annually for two years following planting, outlining the progress against completion criteria and the rehabilitation success • Where completion criteria are not met, contingency actions will be undertaken Planting of low/shrub native vegetation between the Conservation POS area and concrete pathway surrounding the POS to aid in buffering impacts to vegetation will also occur, however does not form part of the Rehabilitation works and falls into the 'landscaping' works.		
3. Rubbish Control	• Install strategic rubbish bins within Conservation POS at locations to be approved by the City of Wanneroo • Remove any illegally dumped rubbish presently within the Conservation POS area • Weekly inspections will be undertaken of the Conservation POS and development area interface with Bush Forever site 323 and Neerabup National	During and post construction.	Catalina Regional Council Emerge Landscape Architects All construction workers accessing the site

Management Issue	Strategy	Timing	Responsibility
	Park for displaced rubbish, to facilitate rubbish removal, if present. The inspection should include all areas at least 20 m from the development interface. • Provide sufficient general waste disposal skip bins during construction • Construction teams are required to adhere to the Catalina Estate recycling program		
4. Fauna Management	• Fauna management will align with the approved Native Vertebrate Fauna Management Plan (Terrestrial Ecosystems, 2022).	During and post construction.	Catalina Regional Council Terrestrial Ecosystems (or alternative consultant)
5. Bushfire Management	• Maintain the existing firebreaks located around the perimeter of the POS area to address the City of Wanneroo firebreak requirements • Installation of maintenance gates to allow maintenance and emergency access into Neerabup National Park and Bush Forever Site no. 323. A 3 m wide maintenance access is provided on the eastern firebreak exiting into the proposed development to enable DBCA or DFES to exit out of the National Park when conducting a prescribed burn or fire response.	During Construction until handover of POS areas.	Catalina Regional Council Following handover of the POS area post-construction fire break maintenance will be the responsibility of the City of Wanneroo.
6. Access Management	• Determine location of access paths through Conservation POS area to ensure no potential foraging or breeding habitat for black cockatoos will be impacted as a result of the pathway installation • Install strategic access maintenance and pedestrian gates along the development and Conservation POS interface	Prior to any POS infrastructure installation works commencing, with approval to be provided by City of Wanneroo.	Catalina Regional Council
7. Public Education and Signage	• Install interpretive signage.	Post construction.	Catalina Regional Council, in consultation with the City of Wanneroo and DBCA.
8. Pest and Disease Management	• Minimise construction entry points to the conservation area where required • Ensure all vehicles tools and contractor footwear are clean upon entry to the Conservation and Northern POS • All site workers will be made aware of the potential spread of dieback and the requirement to keep machinery, footwear and vehicles entering the site free of and soils or adhered vegetated matter	During construction.	Catalina Regional Council/ on-site Contractors.

Management Issue	Strategy	Timing	Responsibility
	• All mulch produced as a result of the clearing will be restricted to use outside of the Conservation POS area, or adjacent areas (i.e., landscaped verge, northern POS) to avoid the potential spread of dieback. • Revegetation plants will only be sourced from within 'Zone B', so as to not risk introduction of the PSHB • Untreated or unseasoned wood will not be moved outside of the quarantine area (Zone A and Zone B) unless chipped to pieces that are 2.5 cm or less in diameter • Plant materials, including living plants, that are greater than 2 cm in diameter must not be moved outside of the quarantine area • Wood, plant materials or living plants can be moved into Zone A • Any machinery used to handle green waste must be cleaned prior to leaving the quarantine area.		
9. Dust Management	• Plan earthmoving works so that they are completed just prior to the time they are needed • Observe weather conditions and do not commence or continue earthworks if conditions are unsuitable e.g. under conditions of strong winds • Pre-water areas to be disturbed if required • Regular use of the water cart over disturbed areas and vehicular access tracks if required • Watering sprays on stockpiles and materials to be loaded and during loading if required • Hydromulch or similar binding material to be used in completed earthwork areas where little or no further vehicle or pedestrian traffic is likely.	During and post construction	Catalina Regional Council Emerge Landscape Architects All contractors accessing the site

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Figures

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LEGEND
- Catalina Estate Boundary
- Biodiversity Conservation Area
- Conservation P.O.S.
- SPP 2.8 Bush Forever Area
- Major Road
- Railway

N

0 62.5 125 250 375 500 m

Scale: 1:10,000 @ A3
GDA 1994 MGA Zone 50

CLARKSON
Neerabup Rd
Anchorage Dr
MINDARIE
BCA NORTH
BCA SOUTH
POS
383
NEERABUP
Connolly Dr
Marmion Av
Mitchell Fwy
323
383
323
TAMALA PARK
322

Source: Cadastre - Landgate
Bush Forever - DPLH
Orthophoto - NearMaps, 15.06.24

ENVIRONMAPS | t: 0406 590 006
Environmental Mapping Solutions | www.environmaps.com.au

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COTERRA ENVIRONMENT

Job: SATCAT36
Doc: 001
Date: 26/09/2024
Ph: (08) 9381 5513
Fax: (08) 9381 5514
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Satterley Property Group
CONSERVATION AREA MANAGEMENT PLAN
STAGE 45 CONSERVATION AREA POS

SITE LOCATION

Figure 1

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Neerabup Rd

Connolly Dr

Mitchell Fwy

CONSERVATION P.O.S.

LEGEND

- Catalina Estate Boundary
- Cadastre
- Subject to Engineering Design. Refer Section 3.1
- Conservation P.O.S.

Carnaby's Black Cockatoo Habitat

- Loss (72.44 ha)
- Retention (14.41 ha)

N

0 25 50 100 150 200 m

Scale: 1:3,500 @ A3
GDA 1994 MGA Zone 50

Source: Cadastre - Landgate
CBC Habitat - Ecological
Orthophoto - NearMaps, 15.06.24

ENVIRONMAPS | t: 0406 590 006
Environmental Mapping Solutions | www.environmaps.com.au

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Satterley Property Group
CONSERVATION AREA MANAGEMENT PLAN
STAGE 45 CONSERVATION AREA POS

EPBC BLACK COCKATOO CLEARING AND RETENTION AREAS

Figure 2

C:\GIS\Jobs\CoTerra\SATCAT36 - 45 Conservation Area POS, CAMP\Figures\SATCAT36_F02 EPBC Black Cockatoo Clearing and Retention Areas_241212.mxd

Appendix 1 EPBC Approval

Australian Government
Department of the Environment and Energy

CONSOLIDATED APPROVAL NOTICE

Catalina residential development, Marmion Avenue, Clarkson, WA (EPBC 2010/5785)

The attached notice (Attachment A) is provided to consolidate the approval conditions for the above project, approved on 10 August 2011. The approval conditions were subject to variation at various times during the post approval phase. These decisions are publicly available on the Department's website at http://epbcnotices.environment.gov.au/referralslist/

The publication of this notice does not alter the dates of: effect for the approval; the variations to conditions; the expiry date of the approval; or any other dates mentioned in conditions. The consolidated approval notice is for ease of reference only.

Name and position	Greg Manning Assistant Secretary Assessments (WA, SA, NT) and Post Approvals Branch
Date of Consolidated Approval Notice	1 / 12 / 2017

Attachment A

Australian Government
Department of the Environment and Energy

Catalina residential development, Marmion Avenue, Clarkson, WA (EPBC 2010/5785)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted	Tamala Park Regional Council
proponent's ABN	77 069 468 271
proposed action	Clearing of native vegetation on Lot 9504 and the construction of a residential development at 1700 Marmion Avenue, Clarkson, WA [See EPBC Act referral 2010/5785].

Approval

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approved

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 31 December 2036

Decision-maker

name and position	Barbara Jones Assistant Secretary Environment Assessment Branch
signature	**SIGNED**

date of decision	10 August 2011

Conditions attached to the approval

1. Within 30 days after the **commencement** of the action, the person taking the action must advise the **Department** in writing of the actual date of commencement.
2. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan required by this approval, and must make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department**'s website. The results of audits may also be publicised through the general media.
3. To protect habitat for **listed threatened species**, the person taking the action must ensure that:
   a) no more than 72.5 ha of **foraging habitat** and 11 ha of **potential breeding habitat** for Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) is **cleared**;
   b) no **clearing** of native vegetation is undertaken in the areas marked with the numbers '2' and '3' in Attachment A, except for maintenance of necessary management or **formalisation** of passive use pathways within the Northern and Southern Biodiversity Conservation Areas (BCAs). These areas are to be maintained as **natural bushland** as per the Northern and Southern Conservation Area Management Plans (CAMPs);
   c) all previously **cleared** or disturbed land in areas marked with the numbers '2' and '3' in Attachment A, and at least 50% of the previously cleared land in the area marked with number '1' in Attachment A are **revegetated**;
   d) no **clearing** of native vegetation that is potential foraging or breeding habitat for Carnaby's Black Cockatoo is undertaken within the areas marked in dark blue in Attachment B, except for maintenance or **formalisation** of necessary management or passive use pathways within the Northern and Southern Biodiversity Conservation Areas (BCAs). These areas are to be maintained as **natural bushland** per the Northern and Southern CAMPs;
   e) within 2 years of the **commencement** of the action, the areas marked with the numbers '2' and '3' in Attachment A must be protected in perpetuity under an irrevocable conservation covenant: and
   f) at least 50% of plantings of trees and shrubs in street-scaping and other public areas (excluding the areas described in condition 3.c) must consist of plant species known to be **primary feeding plants** for Carnaby's Black Cockatoo.
4. To offset the loss of habitat for Carnaby's Black Cockatoo, the person taking the action must:
   a) within 6 months after the commencement of the action, provide funds to the **DEC** for the acquisition of the offset as described on pages 6 - 8 of the Eco Logical Australia report Catalina Residential Development Assessment Documentation – Further Information dated March 2011, and the offset as described on page 3 of a letter by Tamala Park Regional Council dated 23 June 2011; or
   b) if the abovementioned offsets cannot be acquired, the person taking the action must provide details of an alternative offset package to the **Department**. Any alternative offset package must include one or more land parcels that contain a total of at least 420 ha of Carnaby's Black Cockatoo foraging habitat and 66 ha of

Carnaby's Black Cockatoo **potential breeding habitat**. If the **Department** considers that an alternative offset package does not provide sufficient Carnaby's Black Cockatoo habitat to compensate for the impacts of the action, then the person taking the action must provide details of further alternative offset package to the **Department**. Once the written approval of the **Department** has been obtained for an alternative offset package, the person taking the action must provide sufficient funds to **DEC** to acquire the land parcel(s) in the offset package within 6 months of the **Department**'s written approval.

5. The person taking the action must prepare and submit a *Clearing and Revegetation Management Plan* for the **Minister**'s approval to demonstrate how the impact of **clearing** of habitat for **listed threatened species** will be minimised. The plan must detail how:
   - on-site **revegetation** will be undertaken;
   - seed from native vegetation will be collected from the area contained within the red lines marked in Attachment C;
   - topsoil obtained from the **clearing** of native vegetation on the proposal site within the red lines marked in Attachment C will be used for **revegetation** on-site or stored and made available for the **DEC** or other conservation agencies for the purpose of **revegetation** elsewhere; and
   - the **DEC**, or other conservation agencies, have been consulted in the development of the plan to determine the optimal time for **clearing** and provision of seed or soil for **revegetation**.

   If the **Minister** approves the plan then the approved plan must be implemented
6. The person taking the action must not undertake any **clearing** in the area within the red lines marked in Attachment C unless:
   - the *Clearing and Revegetation Management Plan* described in condition 5 has been approved by the **Minister**; and
   - evidence has been provided to the **Department** confirming that the purchase(s) of the land parcels required for offsets under condition 4a or condition 4b has been completed.
7. Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published.
8. The person taking the action may choose to revise a Plan approved by the **Minister** under condition 5 without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the revised Plan would not be likely to have a new or increased impact. If the person taking the action makes this choice they must:
   a) notify the **Department** in writing that the approved Plan has been revised and provide the **Department** with an electronic copy of the revised Plan;
   b) implement the revised Plan from the date that the Plan is submitted to the Department; and
   c) for the life of this approval, maintain a record of the reasons the person taking the action considers that taking the action in accordance with the revised Plan would not be likely to have a **new or increased impact**.

   8A. The person taking the action may revoke their choice under condition 8 at any time by notice to the **Department**. If the person taking the action revokes the choice to implement a revised Plan, without approval under section 143A of the **EPBC Act**, the Plan approved by the **Minister** must be implemented.

8B. If the **Minister** gives a notice to the person taking the action that the **Minister** is satisfied that the taking of the action in accordance with the revised Plan would be likely to have a **new or increased impact**, then:

a) condition 8 does not apply, or ceases to apply, in relation to the revised Plan; and

c) the person taking the action must implement the Plan approved by the **Minister**.

To avoid any doubt, this condition does not affect any operation of conditions 8 and 8A in the period before the day the notice is given.

At the time of giving the notice the **Minister** may also notify that, for a specified period of time, condition 8 does not apply for one or more specified Plans required under the approval.

8C. Conditions 8, 8A and 8B are not intended to limit the operation of section 143A of the **EPBC Act** which allows the person taking the action to submit a revised Plan to the **Minister** for approval.

9. If the **Minister** believes that it is necessary or convenient for the better protection of listed threatened species to do so, the **Minister** may request that the person taking the action make specified revisions to the management plan specified in the conditions and submit the revised management plan for the **Minister**'s written approval. The person taking the action must comply with any such request. The revised approved management plan must be implemented. Unless the **Minister** has approved the revised management plan, then the person taking the action must continue to implement the management plan originally approved, as specified in the conditions.
10. Unless otherwise agreed to in writing by the **Minister**, the person taking the action must publish the management plan referred to in these conditions of approval on their website. The management plan must be published on the website within 30 calendar days of being approved.
11. If, at any time after 5 years from the date of this approval, the person taking the action has not **commenced** the action, then the person taking the action must not **commence** the action without the written agreement of the **Minister**.

Definitions

Clearing: The removal of vegetation.

Commencement of the action is the commencement of **construction**.

Construction includes **clearing** associated with the proposed action or the erection/building of any infrastructure, excluding fences and signage.

DEC: is the Western Australian Government's Department of Environment and Conservation (or equivalent agency).

The **Department**: The Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999*.

Diameter-at-breast-height is a measurement of tree diameter, which measures the diameter of the widest part of the tree at approximately 1.3m from the ground.

EPBC Act is the *Environment Protection and Biodiversity Conservation Act 1999*.

Foraging habitat for Carnaby's Black Cockatoo is any vegetation community that is known to provide foraging resources for Carnaby's Black Cockatoo.

Formalisation includes the mapping of tracks, potential signage and defining the specific geographic layout.

Listed Threatened Species: Species listed under the **EPBC Act** including Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*).

Minister: The Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

Natural bushland must have a tree canopy, an understorey and ground cover of native vegetation.

New or increased impact means a new or increased environmental impact or risk relating to any **Listed Threatened Species**, when compared to the likely impact under an management plan that has been approved by the **Minister** (as outlined in the Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017) available from http://www.environment.gov.au/epbc/publications/new-increased-impact-guidance.

Potential breeding habitat for Carnaby's Black Cockatoo includes any known tree of a species known to be used by Carnaby's Black Cockatoo for breeding that are greater than 500mm **diameter-at-breast-height**. In the project area Tuart (*Eucalyptus gomphocephala*) is a species known to be used for breeding by Carnaby's Black Cockatoo. In mapping and calculating areas, the **Department** considers potential breeding habitat to be any 0.5 ha patch of native vegetation that contains 3 or more trees that are greater than 500mm **diameter-at-breast-height**.

Preliminary documentation is the referral submitted to the **Department** 21 December 2010, including figures and attachments and the additional information provided to the Department on 28 March 2011 including figures and attachments.

Primary feeding plants for Carnaby's Black Cockatoo include: any *Banksia* sp., any plants identified in a web search of the Department of Biodiversity, Conservation and Attractions "Plants for Carnaby's Search Tool", or other plants approved in writing by the **Department**.

Revegetation is the removal of weeds and the establishment of native vegetation.

Attachment A

Attachment B

Attachment C

Appendix 2 Subdivision Approval

GOVERNMENT OF WESTERN AUSTRALIA

Western Australian Planning Commission

WAPC ref: 200312
Date: 17 September 2024
Enquiries: Jemma Douglas
6551 9036

Tamara Vreeken
Level 2, 896 Canning Highway
APPLECROSS 6153

Transmitted via email only to: tamara@nicheplanningstudio.com.au

Dear Tamara

APPROVAL OF APPLICATION WAPC REF: 200312

Thank you for your application to subdivide Lot 711 & 807 Neerabup Road and Lot 9046 Grampians Drive, Clarkson.

The Western Australian Planning Commission (WAPC) has approved application WAPC Ref: 200312 and, once the attached conditions of approval are fulfilled, is prepared to endorse a Deposited plan in accordance with the plan date-stamped 24 May 2024.

This decision is valid for four (4) years from the date of this letter. In order to implement this letter and have the new titles created, a request for the endorsement of a Deposited plan (Form 1C) must be submitted to the WAPC within the term of the approval, that is by the close of business on 17 September 2028 or this approval will no longer be valid.

The Form 1C and a schedule of fees can be found on Planning Online: https://planningonline.dplh.wa.gov.au.

CONDITION(S):

1. The plan of subdivision is to be modified in accordance with the attached plan dated 20 August 2024.

   (City of Wanneroo)

2. The landowner/applicant contributing towards development infrastructure provisions pursuant to the City of Wanneroo District Planning Scheme No.2.

   (City of Wanneroo)

3. Uniform fencing being constructed along the boundaries of Lots 1-23, 24, 25, 33, 34, 41, 42 and 87 in accordance with the plan dated 24 May 2024.

   (City of Wanneroo)

4. Engineering drawings and specifications are to be submitted, approved, and works undertaken in accordance with the approved engineering drawings, specifications and approved plan of subdivision, for grading and/or stabilisation of the site to ensure that:

a) lots can accommodate their intended use; and
b) finished ground levels at the boundaries of the lot(s) the subject of this approval match or otherwise coordinate with the existing and/or proposed finished ground levels of the land abutting.

(City of Wanneroo)

5. Prior to the commencement of subdivisional works, an urban water management plan is to be prepared and approved, in consultation with the Department of Water and Environmental Regulation, consistent with any approved Local Water Management Strategy.

(City of Wanneroo)

6. Engineering drawings and specifications are to be submitted and approved, and works undertaken in accordance with the approved engineering drawings and specifications and approved plan of subdivision, for the filling and/or draining of the land, including ensuring that stormwater is contained on-site, or appropriately treated and connected to the local drainage system. Engineering drawings and specifications are to be in accordance with an approved Urban Water Management Plan (UWMP) for the site, or where no UWMP exists, to the satisfaction of the Western Australian Planning Commission.

(City of Wanneroo)

7. Prior to the commencement of subdivisional works, the landowner/applicant is to provide a pre-works geotechnical report certifying that the land is physically capable of development or advising how the land is to be remediated and compacted to ensure it is capable of development; and In the event that remediation works are required, the landowner/applicant is to provide a post geotechnical report certifying that all subdivisional works have been carried out in accordance with the pre-works geotechnical report.

(City of Wanneroo)

8. Drainage easements and reserves as may be required by the local government for drainage infrastructure being shown on the diagram or plan of survey (deposited plan) as such, granted free of cost, and vested in that local government under Sections 152 and 167 of the Planning and Development Act 2005.

(City of Wanneroo)

9. Prior to the commencement of subdivision works for land south of the 13 metre wide road reserve as annotated on the attached plan dated 20 August 2024, a Conservation Area Management Plan is to be prepared in consultation with the Department of Biodiversity, Conservation and Attractions and to the satisfaction of the Local Government, to address the management of the Conservation Public Open Space and interface with the Neerabup National Park and Bushfire Forever 323 and satisfactory arrangements being made for the implementation of the approved plan.

(City of Wanneroo)

10. Satisfactory arrangements being made for the implementation of the approved Native Vertebrate Fauna Management Plan for the Catalina Area (Terrestrial Ecosystems March 2022) plan.

    (City of Wanneroo)

11. Satisfactory arrangements being made for the implementation of the approved Clearing and Revegetation Management Plan - Catalina Development (Ecological Australia).

    (City of Wanneroo)

12. Measures being taken to ensure no vegetation within Neerabup National Park or Bush Forever Site 323 is removed or disturbed during subdivisional works, including any secondary impacts from works to provide service infrastructure and drainage to implement the approved plan of subdivision.

    (Department of Biodiversity, Conservation and Attractions)

13. Fences restricting access to Neerabup National Park and Bush Forever Site 323 are to be constructed on the western and northern boundaries of proposed Lot 185 and the northern boundary of the Conservation Public Open Space, to protect the adjacent national park and Bush Forever site, to the specifications of and in consultation with the Department of Biodiversity, Conservation and Attractions.

    (Department of Biodiversity, Conservation and Attractions)

14. Prior to the commencement of subdivisional works, measures being undertaken to identify any vegetation on the site worthy of retention, including any potential habitat or foraging trees for threatened fauna species, and protection measures implemented to ensure such vegetation is not impacted by subdivisional works.

    (City of Wanneroo)

15. Local Development Plan(s) being prepared and approved for lots shown on the plan dated 20 August 2024 (attached) that address the following:
    a) Quiet house design;
    b) Dwelling orientation;
    c) Major openings from habitable rooms facing public open space; and
    d) Garage locations.

    (City of Wanneroo)

16. The landowner/applicant shall make arrangements to ensure that prospective purchasers of lots subject of a Local Development Plan are advised in writing that Local Development Plan provisions apply.

    (City of Wanneroo)

17. The proposed reserve(s) shown on the approved plan of subdivision being shown on the diagram or plan of survey (deposited plan) as reserve(s) for Recreation and Drainage and vested in the Crown under Section 152 of the Planning and Development

Act 2005, such land to be ceded free of cost and without any payment of compensation by the Crown.

(City of Wanneroo)

18. Arrangements being made for the proposed public open space (excluding the conservation public open space) to be developed by the landowner/applicant to a minimum standard and maintained for two summers through the implementation of an approved landscape plan providing for the development and maintenance of the proposed public open space in accordance with the requirements of Liveable Neighbourhoods and to the specifications of the local government.

(City of Wanneroo)

19. Engineering drawings and specifications are to be submitted, approved, and subdivisional works undertaken in accordance with the approved plan of subdivision, engineering drawings and specifications, to ensure that those lots not fronting an existing road are provided with frontage to a constructed road(s) connected by a constructed road(s) to the local road system and such road(s) are constructed and drained at the landowner/applicant's cost.

As an alternative, and subject to the agreement of the Local Government the Western Australian Planning Commission (WAPC) is prepared to accept the landowner/applicant paying to the local government the cost of such road works as estimated by the local government and the local government providing formal assurance to the WAPC confirming that the works will be completed within a reasonable period as agreed by the WAPC.

(City of Wanneroo)

20. Engineering drawings and specifications are to be submitted and approved, and subdivisional works undertaken for construction of roads in accordance with the approved plan of subdivision, engineering drawings and specifications to ensure that:
    (a) street lighting is installed on all new subdivisional roads to the standards of the relevant licensed service provider; and
    (b) roads that have been designed to connect with existing or proposed roads abutting the subject land are coordinated so the road reserve location and width connect seamlessly; and
    (c) temporary turning areas are provided to those subdivisional roads that are subject to future extension; and
    (d) embayment parking is provided within the subdivision.

(City of Wanneroo)

21. Engineering drawings and specifications are to be submitted, approved, and subdivisional works undertaken in accordance with the approved plan of subdivision, engineering drawings and specifications, for the provision of shared paths through and connecting to the application area to the satisfaction of the Western Australian Planning Commission. The approved shared paths are to be constructed by the landowner/applicant.

(City of Wanneroo)

22. All local streets within the subdivision being truncated in accordance with the Western Australian Planning Commission's Liveable Neighbourhoods policy.

(City of Wanneroo)

23. Information is to be provided to demonstrate that the measures contained in Section 6; Table 1 Catalina Stages 44-47 Implementation Schedule dated 21 August 2024 have been implemented during subdivisional works. This information should include a completed 'Certification by Bushfire Consultant' from the bushfire management plan.

(City of Wanneroo)

24. A notification, pursuant to Section 165 of the Planning and Development Act 2005, is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:

"*This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land*."

(City of Wanneroo)

25. A notification, pursuant to Section 165 of the Planning and Development Act 2005 is to be placed on the certificate(s) of title of the proposed lot(s) identified in accordance with the Herring Storer Acoustics Noise Assessment dated September 2024. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:
"*This lot is situated in the vicinity of a transport corridor and is currently affected, or may in the future be affected by transport noise. Additional planning and building requirements may apply to development on this land to achieve an acceptable level of noise reduction*."

(Western Australian Planning Commission)

26. Arrangements being made with a licensed water provider for the provision of a suitable water supply service to the lots(s) shown on the approved plan of subdivision.

(Water Corporation)

27. Arrangements being made with the Water Corporation for the provision of a sewerage service to each lot shown on the approved plan of subdivision.

(Water Corporation)

28. The provision of easements for existing or planned future water, sewerage and/or drainage infrastructure as may be required by Water Corporation being granted free of cost to that body.

(Water Corporation)

29. Arrangements being made with a licensed electricity network operator for the provision of an underground electricity distribution system that can supply electricity to each lot shown on the approved plan of subdivision.

(Western Power)

30. The transfer of land as a Crown reserve free of cost to Western Power for the provision of electricity supply infrastructure.

(Western Power)

ADVICE:

1. The residential density code plan date stamped 19 August 2024 (attached) has been approved by the Western Australian Planning Commission and shall now form part of the Tamala Park Local Structure Plan No.79. This plan supersedes any previous residential density code plans related to the subdivision area. Any variations to the density code plan require approval from the Western Australian Planning Commission.

2. Conditions 5 and 6 have been imposed in accordance with Better Urban Water Management Guidelines (WAPC 2008). Further guidance on the contents of urban water management plans is provided in 'Urban Water Management Plans: Guidelines for preparing and complying with subdivision conditions' (Published by the then Department of Water 2008)

3. With regard to Condition 17, the development is to include full earthworks, reticulation, grassing of key areas, and pathways that form part of the overall pedestrian and/or cycle network. Any lighting within the public open space shall comply with the dark sky principles and AS/NZS 4282:2019 - Control of the obtrusive effects of outdoor lighting. Smart lighting should also be installed to ensure that lighting infrastructure is capable of remote operation and/or timing.

4. In regard to Conditions 26 and 27, the landowner/applicant shall make arrangements with the Water Corporation for the provision of the necessary services. On receipt of a request from the landowner/ applicant, a Land Development Agreement under Section 83 of the Water Services Act 2012 will be prepared by the Water Corporation to document the specific requirements for the proposed subdivision.

5. Where the Water Corporation is the preferred services provider for the proposed subdivision for water, wastewater and/or drainage, the subdivider shall make satisfactory arrangements with the Water Corporation for the provision of the necessary services. Where required, the subdivider shall provide service connections, make financial arrangements, set aside land, grant easements, apply notices or other requirements, to protect existing and proposed Corporation assets to the satisfaction of the Water Corporation. When requested by the subdivider, a Land Development Agreement under section 83 of the Water Services Act 2012, will be prepared by the Water Corporation which will document the specific requirements for the proposed subdivision.

6. In regard to Condition 29, Western Power provides only one underground point of electricity supply per freehold lot.

7. The landowner/applicant is advised that the Department of Water and Environmental Regulation has prepared dust control guidelines for development sites, which, outline the procedures for the preparation of dust management plans. The dust management plans are generally approved, and their implementation overseen, by the Local Government. Further information on the guidelines can be obtained from the Department of Water and Environmental Regulation's website www.dwer.wa.gov.au under air quality publications.

8. In regard to Condition 19 and 20, the landowner/applicant is advised that the road reserves, including the constructed carriageways, laneways, truncations, footpaths/dual use paths and car embayments, are to be generally consistent with the approved plan of subdivision.

9. The landowner/applicant and the local government are advised to refer to the Institute of Public Works Engineering Australasia Local Government Guidelines for Subdivisional Development (current edition). The guidelines set out the minimum best practice requirements recommended for subdivision construction and granting clearance of engineering conditions imposed.

If further clarification is required, please review the attached information about your approval, or contact the planning officer listed at the top of this letter

Sam Boucher.

Ms Sam Boucher

WAPC Secretary
17 September 2024

APPLICATION DETAILS

Applicant	Tamara Vreeken Level 2, 896 Canning Highway APPLECROSS 6153
Owner	1. Town of Cambridge 2. Town of Victoria Park 3. City of Wanneroo 4. City of Vincent 5. City of Perth 6. City of Stirling 7. State of Western Australia 8. City of Joondalup 9. Tamala Park Regional Council
Application Receipt	22 May 2024
Lot Number	9046,807,711
Diagram / Plan	Plan 426633 / Diagram 426633, Plan 32406 / Diagram 32406, Plan 405360 / Diagram 405360
Location	
C/T Volume/Folio	4050/23,2541/660,LR3166/430
Street Address	Lot 711 & 807 Neerabup Road and Lot 9046 Grampians Drive, Clarkson
Local Government	Wanneroo, City of

What are conditions and how are they fulfilled?

Conditions and associated advice notes are an essential tool used by the WAPC to ensure compliance with its statutory responsibilities.

Condition(s) must be fulfilled before a request for endorsement of a deposited plan (Form 1C) can be lodged. This provides the basis to create the new land titles.

Each condition has a nominated clearing authority, noted at the end of each condition, and the landowner/applicant needs to liaise with that authority in order to fulfil the condition. Typically, conditions need to be addressed before any site works are commenced.

When the written advice of each clearing authority has been obtained, this advice is to be submitted to the WAPC with a Form 1C and a copy of the deposited plan (that has been lodged with Landgate). The Form 1C and schedule of fees are available on the WAPC website: https://planningonline.dplh.wa.gov.au

Can I request reconsideration/review of a condition or a decision?

There are two ways in which an applicant/owner may request reconsideration or review of a condition or a decision:

1. Seeking WAPC reconsideration - Sections 144 and 151(1) of the *Planning and Development Act 2005* provide for the landowner/applicant, within 28 days from the date of the decision, to make a written request to the WAPC to reconsider the decision, or conditions imposed. Such an application can be made via the Form 3A, which can be found, together with a schedule of fees, online from: https://planningonline.dplh.wa.gov.au

In seeking a reconsideration the applicant/landowner needs to provide new information or evidence that would warrant the WAPC making a different decision.

An application for reconsideration may be submitted to the WAPC prior to submission of an application for review of a decision through the State Administrative Tribunal.

2. Seeking a review by the State Administrative Tribunal – An applicant/landowner may also apply to the State Administrative Tribunal for review of a decision under Section 251 of the *Planning and Development Act 2005*.

An application should be lodged within 28 days of the date of the decision. Further details can be obtained at www.sat.justice.wa.gov.au

What if the clearing authority does not provide written confirmation?

The applicant/owner should make reasonable endeavour with the clearing authority to fulfil conditions. This may include the provision of supplementary information. If the clearing authority will not provide its written confirmation following reasonable endeavour, the applicant/owner should seek advice from the WAPC.

There is scope for the WAPC to clear conditions of subdivision through the Form 1C process; however, it is best to seek pre-lodgement advice so that the WAPC can advise if the clearing of

conditions would be a minor administrative matter, or whether it will require the WAPC to seek further advice or investigate the matter with the clearing authority.

Lodgement of deposited plans with the Western Australian Land Information Authority

The deposited plan is to be submitted to the Western Australian Land Information Authority (Landgate) for certification. Once certified, Landgate will forward it to the WAPC. A copy of the Deposited Plan should also be provided to the WAPC when the Form 1C is lodged.

Applying for new certificates of title

Once the WAPC has endorsed the Deposited Plan, then, under Section 146 the *Planning and Development Act 2005*, the landowner/applicant has two years to apply to Landgate for new certificates of title to be issued.

LEGEND

- Lot 711, 807 & 9046 Application Area (100.785ha)
- Existing Contours (1m interval)
- Footpath
- Dual Use Shared Path (2.5m)
- Existing Trees (retention subject to detailed engineering design)

Note: All Carriageways, Footpaths & Shared Paths Are Indicative Only And Subject To Engineering Design

RESIDENTIAL LOT SUMMARY

Lot Size	No. Lots	% Total Lots
180m² - 234m²	21	11.41%
235m² - 399m²	84	45.65%
400m² - 449m²	23	12.50%
450m² - 499m²	33	17.93%
500m² - 549m²	18	9.78%
550m² - 599m²	3	1.63%
700m² - 799m²	2	1.09%
Total Residential Lots	**184**	

Minimum Lot Size 180m²
Maximum Lot Size 750m²
Average Lot Size 380m²
Total Lot Area 7.0057ha

SUBJECT LAND SUMMARY

The proposed subdivision of Lot 711 on P405360, Lot 807 on P32406 & Lot 9046 on P426633 creates the following lot yield:

- 184 Residential Lots
- 5 Public Open Space & Drainage Lots
- 1 Conservation POS Lot
- 1 Other Lot
- 3 Balance Lots

DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE	FILE
20-Aug-2024	200312

Lot 711, 807 & 9046 SUBDIVISION PLAN

Catalina Estate, CATALINA REGIONAL COUNCIL

Aerial supplied by: Nearmap
Aerial Date Stamp:
Survey supplied by: MNG
Plan Number: NPS1059 - 001
Revision Number: B
Drawn By: JP
Client: CRC

0 25 50 75 100 125 150m

Scale: 1:2500@A3 | Date Issued: 19.08.2024 | ©Niche Planning Studio

DISCLAIMER:
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NICHE STUDIO

NEERABUP ROAD

GRAMPIANS DRIVE

BALANCE LOT 1
1.340ha
(20.006ha)

BALANCE LOT 2
0.920ha

P32406
807
1.800ha

BALANCE LOT 1
0.038ha
(20.006ha)

REFER TO PAGE 1
FOR DETAIL

DANDENONG PARADE

KURANDA ROAD

EXPEDITION DRIVE

CONNOLLY DRIVE

MITCHELL FREEWAY

P405360
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51.509ha

P426633
9046
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(47.476ha)

BALANCE LOT 1
18.628ha
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REFER TO PAGE 1
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185
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51.509ha

BALANCE LOT 3
41.275ha

9039

12520

3323

LEGEND

Lot 711, 807 & 9046 Application Area (100.785ha)

Refer To Main Plan For Subdivision Detail

Lot 711, 807 & 9046 BALANCE LOT DETAIL

Catalina Estate, CATALINA REGIONAL COUNCIL

Aerial supplied by:
Aerial Date Stamp:
Survey supplied by: MNG
Plan Number: NPS1059 - 001
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Client: CRC

0 60 120 180 240 300 360m

Scale: 1:6000 @A3 | Date Issued: 19.08.2024 | ©Niche Planning Studio

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NICHE STUDIO

Local Development Plan Advice Notations

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DATE	FILE
20-Aug-2024	200312

- Vehicle access and dwelling orientation
- Vehicle access and garage location
- Surveilence of POS
- Uniform fencing
- Quiet House Design Package A

Lot 711, 807 & 9046 SUBDIVISION PLAN

Catalina Estate, CATALINA REGIONAL COUNCIL

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0 25 50 75 100 125 150m

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DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE 20-Aug-2024 | FILE 200312

Refer to Condition 9

Lot 711, 807 & 9046 SUBDIVISION PLAN

Catalina Estate, CATALINA REGIONAL COUNCIL

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0 25 50 75 100 125 150m

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NICHE STUDIO

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Lot 711, 807 & 9046 Application Area (100.785ha)

Refer To Main Plan For Subdivision Detail

Lot 711, 807 & 9046 BALANCE LOT DETAIL

Catalina Estate, CATALINA REGIONAL COUNCIL

Aerial supplied by:
Aerial Date Stamp:
Survey supplied by: MNG
Plan Number: NPS1059 - 001
Revision Number: B
Drawn By: JP
Client: CRC

0 60 120 180 240 300 360m

Scale: 1:6000 @A3 | Date Issued: 19.08.2024 | ©Niche Planning Studio

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NICHE STUDIO

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DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE	FILE
24-May-2024	200312

Lot 711, 807 & 9046 SUBDIVISION PLAN

Catalina Estate, CATALINA REGIONAL COUNCIL

Aerial supplied by: Nearmap
Aerial Date Stamp:
Survey supplied by: MNG
Plan Number: NPS1059 - 001
Revision Number: A
Drawn By: JP
Client: CRC

0 25 50 75 100 125 150m

Scale: 1:2500@A3 | Date Issued: 07.05.2024 | ©Niche Planning Studio

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NICHE STUDIO

DEPARTMENT OF PLANNING, LANDS AND HERITAGE	
DATE	FILE
24-May-2024	200312

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Refer To Main Plan For Subdivision Detail

Lot 711, 807 & 9046 BALANCE LOT DETAIL

Catalina Estate, CATALINA REGIONAL COUNCIL

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Aerial Date Stamp:
Survey supplied by: MNG
Plan Number: NPS1059 - 001
Revision Number: A
Drawn By: JP
Client: CRC

0 60 120 180 240 300 360m

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Built Form is illustrative only and subject to Architectural Design and approval from an RAIA qualified architect. This plan has been prepared for illustrative purposes only and should not be used as a means to judge any properties value or yield potential.

NICHE STUDIO

LEGEND

- Lot 711, 807 & 9046 Application Area (100.785ha)
- Residential R30
- Residential R40
- Residential R60

DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE	FILE
19-Aug-2024	200312

NEERABUP ROAD
MAPLETON AVENUE
GRAMPIANS DRIVE
TAMBORINE ROAD
DANDENONG PARADE
AUBURN STREET
LAMINGTON LANE
CHESTERTON STREET
LITTABELLA ROAD
DORRIGO STREET
EREYONET WAY
EXPEDITION DRIVE
KURANDA ROAD
FUTURE GRAMPIANS DRIVE EXTENSION
MITCHELL FREEWAY

P426633 9046 47,438ha (47,476ha) BALANCE LOT 1 1,340ha (20,006ha)
P32406 807 1,800ha BALANCE LOT 2 0.920ha
P426633 9046 (0.038ha) (47,476ha) BALANCE LOT 1 (20,006ha)
P426633 9046 47,438ha (47,476ha) BALANCE LOT 1 18,628ha (20,006ha)
P426633 9046 47,438ha (47,476ha) 185 23,265ha
P405360 711 51.509ha BALANCE LOT 3 41.275ha

POS 1 317m²
POS 2 194m²
POS 3 257m²
POS 4 351m²

18m ROAD RESERVE (5.5/7/5.5)
16m ROAD RESERVE (5.5/7/5.5)
15m ROAD RESERVE (4.5/6/4.5)
13m ROAD RESERVE (4.5/6/2.5)
13m ROAD RESERVE (2.5/6/4.5)
20m ROAD RESERVE (4.5/6/9.5)

PUBLIC OPEN SPACE & DRAINAGE 5
5616m²

CONSERVATION POS
3.670ha

Approved Subdivision (WAPC REF: 163566)
Approved Subdivision (WAPC REF: 163749)

Lot 711, 807 & 9046 RESIDENTIAL DESIGN CODES

Catalina Estate, CATALINA REGIONAL COUNCIL

Aerial supplied by: Nearmap
Aerial Date Stamp:
Survey supplied by: MNG
Plan Number: NPS1059 - 002
Revision Number: B
Drawn By: JP
Client: CRC

0 25 50 75 100 125 150m

Scale: 1:2500@A3 | Date Issued: 19.08.2024 | ©Niche Planning Studio

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Appendix 3 Landscape Concept Plan (Emerge, 2024)

CATALINA STAGE 45 NATURE POS

OVERALL CONCEPT PLAN

DWG CAT-75-01
REV C
DATE 22.11.2024

0 10 20 30 40 50 m

SCALE 1 : 1000 @ A1

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emerge ASSOCIATES

CATALINA STAGE 45 NATURE POS

OVERALL TRACKS PLAN

DWG **CAT-75-02**
REV **C**
DATE **22.11.2024**
SCALE **1 : 1000 @ A1**
0 10 20 30 40 50 m

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CATALINA STAGE 45 NATURE POS

DETAIL CONCEPT PLAN ONE

DWG **CAT-75-03**
REV **C**
DATE **22.11.2024**

0 5 10 15 20 25 m

SCALE **1 : 500 @ A1**

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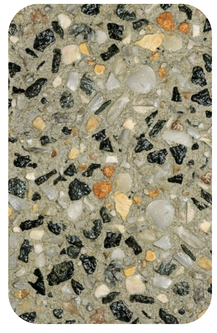
PEDESTRIAN GATE
MAINTENANCE GATE
FORMALISED EXISTING FIREBREAK TO BE RETAINED AND REVIEWED TO COMPLY WITH CITY OF WANNEROO CLEARANCE REQUIREMENTS
RUBBISH BIN
ROAD 159
INTERPRETIVE SIGNAGE
PRAM RAMP
INFORMAL CRUSHED LIMESTONE PATH
EXISTING CONSERVATION FENCE
MITCHELL FREEWAY
BOUNDARY SIGNAGE BETWEEN CoW & DBCA
ROAD 155
WORKS TO BE CONSTRUCTED SEPERATELY UNDER STAGE 43 STREETSCAPES
STAR PICKET BOUNDARY MARKERS BETWEEN CoW AND DBCA ZONES
MAINTENANCE GATE

LEGEND

- EXTENT OF WORKS
- CONCRETE PATH
- CRUSHED LIMESTONE PATH
- CONCRETE PRAM RAMP
- EXPOSED AGGREGATE HARDSTAND & PICNIC SETTING
- SEATING BENCH
- EXISTING VEGETATION TO BE PROTECTED
- PROPOSED PLANTING TO CPOS INTERFACE
- INFILL PLANTING TO EXISITING DEGRADED VEGETATION
- PROPOSED TREES
- SIGNIFICANT EXISTING TREES TO BE PROTECTED
- EXISTING FIREBREAK TO BE RETAINED
- PROPOSED CONSERVATION FENCING
- EXISTING CONSERVATION FENCING
- MAINTENANCE/ PEDESTRIAN GATE
- INTERPRETIVE SIGNAGE
- BOUNDARY SIGNAGE BETWEEN CoW & DBCA
- STAR PICKET BOUNDARY BETWEEN CoW & DBCA
- RUBBISH BIN

STREET FURNITURE AUSTRALIA
LINEA SEATING BENCH

HOLCIM EXPOSED AGGREGATE
WANDOO & JACARANDA



INTERPRETIVE SIGNAGE

CATALINA STAGE 45 NATURE POS

DETAIL CONCEPT PLAN TWO

DWG **CAT-75-04**
REV **C**
DATE **22.11.2024**
0 5 10 15 20 25 m
SCALE **1 : 500 @ A1**

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Appendix 4 Native Vertebrate Fauna Management Plan (Terrestrial Ecosystems, 2022)

Native Vertebrate Fauna Management Plan

Catalina Development Area

Prepared for: Satterley Property Group

Version 3. March, 2022

RECORD OF DISTRIBUTION

No. of copies	Report File Name	Report Status	Date	Prepared for:	Initials
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Electronic	2021-0136-001-GT V2.DOCX	DRAFT	17 November 2021	Satterley Property Group	ST
Electronic	2021-0136-001-GT V2.DOCX	FINAL	9 January 2022	Satterley Property Group	ST
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REPORT CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION 1

1.1 Background 1
1.2 City of Wanneroo's Local Planning Policy Framework 3.3 Fauna Management 2
1.3 Principles for vertebrate fauna management prior to and during vegetation clearing 2
1.4 Existing environment 3
1.4.1 Fauna habitats 3
1.5 Relevant legislation 4

2. POTENTIAL FAUNA IN THE PROJECT AREA 5

2.1 Potential impacts on native fauna 8
2.1.1 Killing or injuring animals during vegetation clearing 8
2.1.2 Loss of fauna habitat and habitat fragmentation 8
2.1.3 Predation by feral and domestic animals 8
2.1.4 Displacement of fauna into adjacent areas 8
2.2 Potential Impacts of specific taxa 8
2.2.1 Nesting birds and arboreal fauna 8
2.2.2 Quenda 9
2.2.3 Snakes 9
2.2.4 Western Grey Kangaroos 9
2.2.5 Other vertebrate fauna 10
2.2.6 Feral pest species 10

3. MANAGEMENT ACTIONS AND IMPLEMENTATION 11

3.1.1 Licenses 11
3.1.2 Quenda trapping program 11
3.1.3 Reptile and small mammal trapping program 11
3.1.4 Active foraging 12
3.1.5 Other non-endemic fauna 12
3.1.6 Searches for active bird nests and tree hollows 12
3.1.7 Bees 12
3.1.8 Vegetation clearing procedure and induction 13
3.1.9 During clearing 13
3.1.10 Injured fauna 13
3.1.11 Fencing 14
3.1.12 Reporting 14
3.1.13 Adaptive Management 14
3.2 Management action summary 15

4. REFERENCES 19

LIST OF TABLES

Table 1. Commonwealth and State legislation relevant to this management plan 4
Table 2. Vertebrate fauna previously recorded on the Swan Coastal Plain in the vicinity of the project area 5
Table 3. Management actions 16

LIST OF FIGURES

Figure 1. Bush Forever sites relative to the project area 1
Figure 2. Three broad project areas in the Catalina development 3
Figure 3. Catalina project area 21

EXECUTIVE SUMMARY

This vertebrate fauna management plan describes the project area, potential fauna in the project area, and the management strategies that will be implemented to avoid, minimise and mitigate potential impacts on the native vertebrate fauna associated with clearing the vegetation so that the remaining areas can be developed.

1. INTRODUCTION

1.1 BACKGROUND

Satterley Property Group (Satterley) has partially developed the Catalina subdivision development (Figure 3) and is proposing to continue with this staged development over the coming years.

Syrinx Environmental (2011) prepared an *Environmental Management Plan* for the Tamala Park Regional Council for a similar project area. This plan is now out-dated and was prepared when the area was on the northern fringe of the Perth Metropolitan Region. This Native Vertebrate Fauna Management Plan replaces the earlier requirements for vertebrate fauna management contained in the Environmental Management Plan for the remaining areas that will be cleared in stages.

The total project area is approximately 180ha, however, a large part of Catalina Central that adjoins Neerabup Road (Figure 3) has already been developed and has established housing. Recently, part of the western portion of Catalina Green was cleared for development. Similarly, there is an established housing estate along the western side of Marmion Ave in the Catalina Beach area. The area on the eastern side of Connolly Drive (i.e. Catalina Green), the sections of the southern part of Catalina Central and the western portion of Catalina Beach area have yet to be developed.

Bush Forever sites 322, 323 and 383 are immediately to the south of the project area (Figure 1).

Figure 1. Bush Forever sites relative to the project area

(Taken from Syrinx Environmental 2011)

1.2 CITY OF WANNEROO'S LOCAL PLANNING POLICY FRAMEWORK 3.3 FAUNA MANAGEMENT

The City of Wanneroo's Local Planning Policy Framework 3.3 Fauna Management (City of Wanneroo 2018) requires:

- Survey the fauna (type and number) contained on the site/property intended to be cleared and developed, and document appropriately;
- Obtain relevant specifications and permits for the relocation of fauna from the Department of Biodiversity Conservation and Attractions (DBCA);
- Undertake full relocation of the fauna in question to an area which will not be detrimentally impacted by the fauna, in accordance with necessary relocation permits;
- If the satisfactory relocation of the fauna is not possible, the advice of the DBCA on alternative options for management of the fauna is required;
- Obtain relevant specifications and permits for alternative fauna management options to relocation, from the DBCA;
- Install fauna proof fencing to the satisfaction of the DBCA and the City of Wanneroo prior to the disturbance of existing habitat. Fencing needs to encompass the entire perimeter of the land holding, or portion thereof, which is intended to be either disturbed or cleared, and needs to be in place for the duration of site works; and
- Undertake the approved alternative management option as advised by the DBCA for the fauna in question in accordance with the relevant specifications and permits.

1.3 PRINCIPLES FOR VERTEBRATE FAUNA MANAGEMENT PRIOR TO AND DURING VEGETATION CLEARING

Thompson and Thompson (2016) offered the following guidance for vertebrate fauna rescue programs for non-threatened species:

- In areas that support high habitat value (i.e. closely resembles the vegetation complex and quality that would have existed in the area prior to any disturbance, has connectivity with other habitats and is likely to contain a vertebrate fauna assemblage similar to undisturbed environments) a comprehensive fauna relocation program is recommended. This may include trapping, tree hollow inspections and fauna rescue personnel are deployed on site during vegetation clearing process;
- In areas that support a low-moderate habitat value (i.e. some indication of disturbance, may be partially fragmented or cleared, but generally retain many of the characteristics of the habitat if it had not been disturbed) then a moderately comprehensive fauna relocation program is recommended. This may include targeted trapping and fauna rescue personnel being deployed on-site during vegetation clearing process;
- In areas that support a highly degraded habitat limited intervention is required and the fauna relocation program may be concentrated on having fauna rescue personnel present when the trees are cleared but not grasses;
- In areas where the fauna habitat is considered rare or represents less than 10% of its original extent and is between a low and very high habitat quality, then a comprehensive trapping and relocation program is implemented, and fauna rescue personnel are deployed on-site; and
- In areas that support iconic species, or mammals and reptiles with a mass between 50-5,000g (critical mass range for mammals), then a targeted trapping and fauna rescue program should be implemented to capture and relocate these individuals.

In the absence of any other available guidance in the literature or provided by government agencies responsible for fauna management, these guidelines are the basis of what is provided in this plan.

1.4 EXISTING ENVIRONMENT

The Syrinx Environmental (2011) report indicated the Catalina project area was situated on Quindalup, Spearwood and Bassendean dune systems, and the project area was gently undulating.

The vegetation and flora of the area have been assessed and reviewed by multiple botanists (Alan Tingay and Associates 1999, Mattiske Consulting Pty Ltd 2000, Syrinx Environmental 2009a, d, c, b). Syrinx Environmental (2011) identified the following three vegetation communities in the project area:

- 26b Woodlands and mallees on limestone
- 28 Spearwood Banksia attenuata or Banksia attenuata – *Eucalyptus* woodlands; and
- 29b Acacia shrublands on taller dunes.

Vegetation condition was assessed as mostly degraded to completely degraded with some good to very good patches located at the western extent of the project area (Syrinx Environmental 2011).

1.4.1 Fauna habitats

Fauna habitats in the project area are highly variable, with the consequence, different fauna management strategies may be required for different development areas when the vegetation is cleared. There are three broadly identified areas (Figure 2):

- Catalina Beach;
- Catalina Central; and
- Catalina Green.

Figure 2. Three broad project areas in the Catalina development

A substantial portion of Catalina Central has already been developed, with the only remaining substantive parcel of native vegetation being the conservation area along the eastern side of Marmion Ave. Catalina Beach has mostly been cleared with residential development on the western side of Marmion Ave. The remaining areas have either been cleared or is partially degraded bushland. There is clear evidence in the aerial photography where machinery has swept the area for unexploded ordinance and in doing so have cleared pathways and significantly fragmented the vegetation. Catalina Green has been partially cleared and most of the remaining area is degraded having had vehicles create numerous tracks across this area over a period of many years.

The consequence of large areas being already developed, devoid of vegetation or ground cover and lower-level shrubs, and the highly fragmented habitat means fewer small mammals and reptiles are present than in areas of relatively undisturbed natural bushland. The different areas may require different management strategies, however, it is not practical to categorise areas based on subdivision areas (e.g. Catalina Beach, Catalina Central and Catalina Green), nor is it reasonable to subdivide the area into multiple fauna habitats and develop a specific plan for each area as the development strategy and staging approach is not known at this stage.

The consequence is that the zoologist(s) undertaking the fauna management program should make a judgement on the level of active management that will be required for each parcel of land planned for vegetation clearing and development. There are a few areas that may require pit-fall and funnel traps to be deployed, other areas will only require baited wire cage traps to be deployed (i.e. to target Quenda), other areas will only require an on-site zoologist to be present to catch and relocate fauna during the vegetation clearing program, and some areas will require no action at all.

Vertebrate fauna caught and relocated from the project area will be relocated into suitable nearby habitat or as otherwise nominated on the approved Regulation 28 licence. Given the Bush Forever sites 322, 323 and 383 are immediately to the south of the project area, then these are possible relocation sites.

1.5 RELEVANT LEGISLATION

The protection of fauna and their habitat is the subject of several Acts listed in Table 1.

Table 1. Commonwealth and State legislation relevant to this management plan

Legislation	Application
Environmental Protection Act 1986	State environmental impact assessment and Ministerial approval process
WA *Biodiversity and Conservation Act 2016*	State legislation that regulates and controls native fauna capture and relocation programs
WA *Biosecurity and Agricultural Management Act 2007*	State Act that controls the management of vertebrate pest fauna
Environment Protection and Biodiversity Conservation Act 1999	Federal process that assesses the conservation significance of fauna species and forms the framework for protection of significant species

2. POTENTIAL FAUNA IN THE PROJECT AREA

A search of Terrestrial Ecosystems fauna survey database provided a list of vertebrate species that had previously been recorded on the Swan Coastal Plain in the vicinity of the project area (Table 2). Many of these species are no longer present due to previous vegetation clearing and land development, and some are vagrants and would only be rarely recorded in the project area. Due to the small size of the project area, its generally degraded condition, and a lack of specific suitable habitat, many of the species listed in Table 2 will not be present.

Table 2. Vertebrate fauna previously recorded on the Swan Coastal Plain in the vicinity of the project area

Family	Species	Common name
Amphibians		
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog
	Limnodynastes dorsalis	Western Banjo Frog
Myobatrachidae	*Crinia georgiana*	Quacking Frog
	Crinia insignifera	Sin-bearing Froglet
	Myobatrachus gouldii	Turtle Frog
	Pseudophryne guentheri	Gunther's Toadlet
Pelodryadidae	*Litoria moorei*	Motorbike Frog
Reptiles		
Agamidae	*Ctenophorus adelaidensis*	Western Heath Dragon
	Pogona minor	Western Bearded Dragon
Diplodactylidae	*Diplodactylus polyophthalmus*	Spotted Sand Plain Gecko
	Oedura marmorata	Marbled Velvet Gecko
	Strophurus spinigerus	South-western Spiny-tailed Gecko
Elapidae	*Brachyurophis semifasciata*	Half-girdled Snake
	Demansia psammophis	Yellow-faced Whipsnake
	Echiopsis curta	Bardick
	Neelaps bimaculatus	Black-naped Burrowing Snake
	Suta gouldii	Gould's Snake
	Pseudonaja affinis	Dugite
	Pseudonaja mengdeni	Western Brown Snake
	Simoselaps bertholdi	Jan's Banded Snake
Gekkonidae	*Christinus marmoratus*	Marbled Gecko
	Hemidactylus frenatus	Asian House Gecko*
Pygopodidae	*Aprasia repens*	Southwest Sandplain Worm Lizard
	Delma concinna	Javelin Lizard
	Delma fraseri	Fraser's Delma
	Delma grayii	Side-barred Delma
	Lialis burtonis	Burton's Legless Lizard
	Pletholax gracilis	Keeled Legless Lizard
	Pygopus lepidopodus	Common Scaly-foot
Pythonidae	*Morelia spilota*	Carpet Python
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink
	Cryptoblepharus buchananii	Buchanan's Snake-eyed Skink
	Ctenotus australis	Western Limestone Ctenotus
	Ctenotus fallens	West-coast Laterite Ctenotus
	Cyclodomorphus celatus	Western Slender Bluetongue
	Egernia kingii	King's Skink
	Egernia napoleonis	Southwestern Crevice Skink
	Hemiergis quadrilineata	Two-toed Earless Skink
	Lerista distinguenda	South-western Orange-tailed Slider
	Lerista elegans	West Coast Four-toed Lerista
	Lerista lineopunctulata	Dotted-line Robust Slider
	Lerista praepedita	Blunt-tailed West-coast Slider
	Menetia greyii	Common Dwarf Skink
	Morethia lineoocellata	Pale-flecked Morethia
	Morethia obscura	Shrubland Pale-flecked Morethia

Family	Species	Common name
	Tiliqua occipitalis	Western Blue-tongued Lizard
	Tiliqua rugosa	Bobtail
Typhlopidae	*Anilios australis*	Austral Blind Snake
	Anilios pinguis	Rotund Blind Snake
Varanidae	*Varanus gouldii*	Gould's Goanna
	Varanus tristis	Black-headed Monitor
Chelidae	*Chelodina oblonga*	Oblong Turtle
Birds		
Casuariidae	*Dromaius novaehollandiae*	Emu
Anatidae	*Cygnus atratus*	Black Swan
	Tadorna tadornoides	Australian Shelduck
	Anas superciliosa	Pacific Black Duck
	Anas castanea	Chestnut Teal
Phasianidae	*Synoicus ypsilophorus*	Brown Quail
Columbidae	*Columba livia*	Rock Pigeon
	Streptopelia chinensis	Spotted Dove
	Streptopelia senegalensis	Laughing Dove
	Phaps chalcoptera	Common Bronzewing
	Phaps elegans	Brush Bronzewing
	Ocyphaps lophotes	Crested Pigeon
Cuculidae	*Chrysococcyx basalis*	Horsfield's Bronze-Cuckoo
	Chrysococcyx lucidus	Shining Bronze-Cuckoo
	Cacomantis pallidus	Pallid Cuckoo
	Cacomantis flabelliformis	Fan-tailed Cuckoo
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar
Podargidae	*Podargus strigoides*	Tawny Frogmouth
Rallidae	*Fulica atra*	Eurasian Coot
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull
Ardeidae	*Egretta novaehollandiae*	White-faced Heron
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis
	Threskiornis molucca	Australian White Ibis
	Threskiornis spinicollis	Straw-necked Ibis
	Platalea flavipes	Yellow-billed Spoonbill
Accipitridae	*Elanus axillaris*	Black-shouldered Kite
	Hieraaetus morphnoides	Little Eagle
	Accipiter fasciatus	Brown Goshawk
	Haliastur sphenurus	Whistling Kite
Tytonidae	*Tyto alba*	Barn Owl (Eastern)
Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo
Strigidae	*Ninox boobook*	Southern Boobook
	Ninox novaeseelandiae	Morepork
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra
	Todiramphus sanctus	Sacred Kingfisher
Meropidae	*Merops ornatus*	Rainbow Bee-eater
Falconidae	*Falco cenchroides*	Nankeen Kestrel
	Falco longipennis	Australian Hobby
	Falco berigora	Brown Falcon
	Falco peregrinus	Peregrine Falcon
Rhipiduridae	*Rhipidura fuliginosa*	New Zealand Fantail
Timaliidae	*Zosterops lateralis*	Silvereye
Cacatuidae	*Calyptorhynchus banksii*	Red-tailed Black-Cockatoo
	Calyptorhynchus latirostris	Carnaby's Black-Cockatoo
	Eolophus roseicapilla	Galah
	Cacatua sanguinea	Little Corella
Psittaculidae	*Neophema elegans*	Elegant Parrot
	Barnardius zonarius	Australian Ringneck
	Purpureicephalus spurius	Red-capped Parrot
	Glossopsitta porphyrocephala	Purple-crowned Lorikeet
	Trichoglossus haematodus	Coconut Lorikeet
Maluridae	*Malurus lamberti*	Variegated Fairywren
	Malurus splendens	Splendid Fairywren
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill
	Manorina flavigula	Yellow-throated Miner

Family	Species	Common name
	Anthochaera chrysoptera	Little Wattlebird
	Anthochaera lunulata	Western Wattlebird
	Anthochaera carunculata	Red Wattlebird
	Gavicalis virescens	Singing Honeyeater
	Epthianura albifrons	White-fronted Chat
	Lichmera indistincta	Brown Honeyeater
	Phylidonyris novaehollandiae	New Holland Honeyeater
	Phylidonyris niger	White-cheeked Honeyeater
	Melithreptus brevirostris	Brown-headed Honeyeater
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote
	Pardalotus striatus	Striated Pardalote
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren
	Acanthiza inornata	Western Thornbill
	Acanthiza apicalis	Inland Thornbill
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill
	Smicrornis brevirostris	Weebill
	Gerygone fusca	Western Gerygone
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike
	Lalage tricolor	White-winged Triller
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush
	Pachycephala pectoralis	Golden Whistler
	Pachycephala rufiventris	Rufous Whistler
Artamidae	*Artamus cinereus*	Black-faced Woodswallow
	Cracticus torquatus	Grey Butcherbird
	Cracticus nigrogularis	Pied Butcherbird
	Gymnorhina tibicen	Australian Magpie
	Strepera versicolor	Grey Currawong
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail
	Rhipidura albiscapa	Grey Fantail
Monarchidae	*Grallina cyanoleuca*	Magpie-lark
	Myiagra inquieta	Restless Flycatcher

Family	Species	Common name
Corvidae	*Corvus bennetti*	Little Crow
	Corvus coronoides	Australian Raven
Petroicidae	*Microeca fascinans*	Jacky Winter
	Petroica boodang	Scarlet Robin
	Petroica goodenovii	Red-capped Robin
	Eopsaltria griseogularis	Western Yellow Robin
	Eopsaltria georgiana	White-breasted Robin
Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler
Locustellidae	*Poodytes gramineus*	Little Grassbird
Hirundinidae	*Hirundo neoxena*	Welcome Swallow
	Petrochelidon ariel	Fairy Martin
	Petrochelidon nigricans	Tree Martin
	Cheramoeca leucosterna	White-backed Swallow
Zosteropidae	*Zosterops lateralis*	Silvereye
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird
Estrildidae	*Taeniopygia guttata*	Zebra Finch
Mammals		
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna
Canidae	*Vulpes vulpes*	Red Fox
Felidae	*Felis catus*	Cat
Molossidae	*Austronomus australis*	White-striped Freetail Bat
	Mormopterus sp. 4	South-western Free-tail Bat
Vespertilionidae	*Nyctophilus sp.*	Long-eared Bat Sp.
	Chalinolobus gouldii	Gould's Wattled Bat
	Nyctophilus geoffroyi	Lesser Long-eared Bat
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo
Phalangeridae	*Trichosurus vulpecula*	Common Brushtail Possum
Tarsipedidae	*Tarsipes rostratus*	Honey Possum
Leporidae	*Oryctolagus cuniculus*	Rabbit
Peramelidae	*Isoodon fusciventer*	Quenda
Muridae	*Mus musculus*	House Mouse
	Pseudomys albocinereus	Ash-grey Mouse
	Rattus fuscipes	Bush Rat

2.1 POTENTIAL IMPACTS ON NATIVE FAUNA

Vegetation clearing can directly impact native vertebrate fauna through several threatening processes, including:

- killing or injuring animals during the vegetation clearing program;
- loss of fauna habitat;
- habitat fragmentation; and
- increased access for feral predators.

2.1.1 Killing or injuring animals during vegetation clearing

It is inevitable that some vertebrate fauna will be lost or injured during the vegetation clearing process. This can be partially avoided or mitigated by undertaking trapping programs for some species prior to vegetation clearing and having a zoologist on-site to catch and relocate fauna when they are disturbed.

2.1.2 Loss of fauna habitat and habitat fragmentation

Loss of habitat can adversely affect fauna survival through fragmentation, which can isolate or restrict movement of fauna populations and individuals within vegetation remnants from the wider area. This is typically a long-term impact, and it mostly affects individuals that survive the vegetation clearing program or remain in small habitat fragments with insufficient conspecifics to maintain a viable population.

2.1.3 Predation by feral and domestic animals

Feral cats and foxes can adversely impact native species, particularly in remnant vegetation. Typically foxes and feral cats are generally not killed or injured during vegetation clearing programs but will visit sites that have been recently cleared in search of prey.

2.1.4 Displacement of fauna into adjacent areas

Vegetation clearing programs often encourage the movement of large snakes, mice and rats into adjacent areas, which in this case is similar bushland or residential housing.

An on-site zoologist will catch and relocate any fauna that are seen during the vegetation clearing program.

2.2 POTENTIAL IMPACTS OF SPECIFIC TAXA

2.2.1 Nesting birds and arboreal fauna

Trees with hollows could support active nests of parrots/owls and arboreal mammals such as the Common Brushtail Possum. As most birds likely to nest in tree hollows breed in spring, with the consequence that clearing the trees outside this period is unlikely to impact on these species. Where hollows are being used as nesting sites and those nests contain chicks, then where practical and feasible chicks will be rescued, and given to wildlife carers who will raise them and then released them when they are old enough.

Removal of chicks from nesting hollows often requires the use of an elevated work platform (EWP), which are easily bogged in the sand, so, ideally, EWPs are used to remove chicks when other heavy machinery is on-site and able to assist in moving the EWP around the site.

Where there are a substantive number of large trees with hollows that are likely to support active nests or arboreal mammals, then these hollows will be checked prior to vegetation clearing and animals removed and relocated. For all other areas and during the non-breeding periods, trees with hollows will be lowered to the ground and then the hollows will be checked and any chicks that have a good chance of being raised in care and being released will be given to a suitable wildlife carer and arboreal mammals will be relocated.

2.2.2 Quenda

Some sections of the project area potentially support a small population of Quenda. In these areas Quenda will be trapped and relocated prior to the vegetation clearing program. The judgement on the number of traps to be deployed in an area should be left to a suitably experienced and competent zoologist to determine based on evidence of fauna in the areas to be cleared. Traps will be left open for 24 hours as they will also catch Bobtails and Blue-tongue lizards which can be relocated. The duration of the trapping period will be a decision for the zoologist and be based on the estimated potential number of Quenda in the area, and the trapping success rate.

2.2.3 Snakes

The area may support a population of snakes, in particular Dugites (*Pseudonaja affinis*). Broadscale trapping programs targeting snakes are largely unsuccessful and are not recommended. Active management involving catching and relocating snakes during the vegetation clearing programs will however, be implemented to protect individual snakes and limit the potential of them moving into adjacent areas.

2.2.4 Western Grey Kangaroos

Various sections of the project area support a small population of Western Grey Kangaroos. These kangaroos will readily move out of an area once vegetation clearing commences when available habitat exists and there are no barrier fences. For some areas, there will not be suitable adjacent habitat, and in these cases the kangaroos will need to be actively managed.

Kangaroos that are occasionally present at Catalina Green are considered non-resident visitors as they are residing in the higher quality bushland to the south (i.e. Bush Forever site #383) and moving in and out of the area (Terrestrial Ecosystems 2022). It is unlikely that these kangaroos will be impacted by further development activity other than a slight reduction in their activity area. No active management is proposed for these kangaroos.

There is a small patch of vegetation in Catalina Central that may support a small number of Western Grey Kangaroos. These kangaroos are unable to move south or west because of a barrier fence, so these kangaroos will require active management.

Kangaroos in the Catalina Beach area can move south but are restricted from moving west into the coastal dunes because of a barrier fence along the walkway. No kangaroos were observed during sites works in early 2022, however, tracks indicate that they occasionally move through the area. If kangaroos are land locked active management will be required.

Any kangaroos in the Catalina Central area will move into the bushland on the western side that is adjacent to Marmion Ave. However, given this bushland's proximity to Marmion Ave, it is an inappropriate long-term location for a population of kangaroos, unless it is to be properly fenced, which is the City of Wanneroo's responsibility.

Given our significant experience in relocating kangaroos from urban bushland areas and development sites, the most humane approach is to dart-sedate and euthanase the animals on-site. It will only be feasible to

implement this program when the area occupied by kangaroos has been appreciably reduced. So, it may be necessary to erect temporary enclosures into which kangaroos will be herded before being darted.

Each area to be developed that contains kangaroos, will be appropriately managed to stop disturbed kangaroos moving onto the roads and into the residential areas. The developer is committed to maintaining these fences for the ongoing protection of kangaroos, to limit their movement across roadways and into residential areas.

The strategies implemented for kangaroo management will be done utilising methods backed by the scientific research and practical experience from practitioners who regularly undertake similar works.

2.2.5 Other vertebrate fauna

The project area is likely to support a depleted range of vertebrate fauna typically found in the sandy plain areas on the Swan Coastal Plain. It is inevitable that some of these will be lost during the vegetation clearing process.

A pit and funnel trapping program will be implemented in areas that the contracting zoologist considers likely to support a substantive fauna assemblage of small native mammals and reptiles (e.g. relatively undisturbed native bushland). The number of traps and period of trapping will be a judgement of the zoologist based on the guiding principles discussed in Section 1.3, an estimate of the fauna native assemblage, and the trapping success rate.

For most areas, a zoologist will be present on-site during the vegetation clearing programs to catch and relocate animals that flee from the vegetation clearing to reduce the number of animals that are lost. The commonly seen Bobtail (*Tiliqua rugosa*) and Western Bearded Dragon (*Pogona minor*) are examples of fauna regularly caught and relocated during similar activities. Black Rats (*Rattus rattus*) and House Mice (*Mus musculus*) are also often abundant in these locations and are regularly caught in trapping programs designed to catch Quenda. All Black Rats and House Mice caught in the project area will be humanely euthanased.

Where an area has very little ground cover or lower-level native vegetation, or is highly disturbed, the contracting zoologist may determine that no active management is required.

2.2.6 Feral pest species

Fox tracks were apparent at multiple locations in the project area. Foxes are able to move through the entire project area and in a westerly direction into the bushland in the dunes along the coast. It is also possible that the project area will support a small population of feral or unowned cats, as they are known to exist in the bushland on the coastal dunes. Land managers have an obligation under the *Biosecurity and Agriculture Management Act 2007* to control declared feral pest species on their properties. The fox is a declared pest species.

The overall responsibility for feral and pest management in the region lies with the City of Wanneroo. If there is a high density of foxes or feral cats the developer may choose to collaborate with the City in a management program.

3. MANAGEMENT ACTIONS AND IMPLEMENTATION

3.1.1 Licenses

The trapping program requires a Regulation 28 License to catch and relocate native vertebrate fauna.

M1 A Regulation 28 License (issued by DBCA) to take, catch and relocate native fauna will be applied for by the contracting zoologists and all obligations under the license will be fulfilled. The Regulation 28 licence may include the sedation and euthanasia of kangaroos, or the DBCA may require a separate licence.

3.1.2 Quenda trapping program

Prior to vegetation clearing the project area will be trapped targeting Quenda and some of the larger reptiles (e.g. Bobtails). Baited wire cage traps will be set typically for five days to catch Quenda and any other vertebrate that are in the traps. The number, location of traps and duration of the trapping program will be determined by the onsite zoologist.

Trapping will be concluded within two weeks of the commencement of vegetation clearing.

All cage traps in this relocation program will have a shade cloth cover and, where possible, be placed in the shade of a tree or shrub and all traps will remain open during the day as this will enhance the capture and relocation of diurnal vertebrate fauna (e.g. *Tiliqua rugosa*). Traps will be checked within four hours of sunrise.

Any other vertebrate fauna caught in the traps that are not an introduced species will be relocated. Introduced species (e.g. House Mouse, Black Rat, Rabbit, etc) will be humanely euthanased.

M2 If the zoologist considers Quenda are potentially present, then baited wire cage traps targeting Quenda and other trappable fauna will be deployed across the site in suitable habitat for a minimum period of five days within two weeks of the commencement of vegetation clearing. Traps will remain open each day. Daily trap checking will be completed within four hours of sunrise to minimise heat stress on nocturnal captured fauna.

3.1.3 Reptile and small mammal trapping program

In areas where there is substantive relatively undisturbed native vegetation, and the zoologist considers there is a potential to trap and relocate a reasonable quantity of native fauna, then a pit and funnel trapping program will be implemented. The number of pit and funnel traps used, and the period of trapping will be a judgement for the zoologist based on likely captures.

M3 If the zoologist considers a trapping program is required for small mammals and reptiles because of the presence of suitable vegetation and fauna assemblage, then a pit and funnel trapping program will be implemented. The number of traps and duration of trapping will be a judgement for the zoologist.

Kangaroos

In areas where it is not possible or feasible for kangaroos to naturally move into adjacent areas, then the contracting zoologist will use the best-practise methods for kangaroo management as determined by published research and advice from experienced zoologists who regularly undertake these management programs.

M4 Where it is not possible or feasible for kangaroos to naturally move into adjacent areas, then the contracting zoologist will use the best-practise methods for kangaroo management as determined by

published research and advice from experienced zoologists who regularly undertake these management programs.

3.1.4 Active foraging

The contracting zoologist will undertake an active foraging program prior to vegetation clearing to search for reptiles.

M5 Active foraging and searching will be undertaken by the contracting zoologist for reptiles prior to vegetation clearing and where appropriate concurrent with any trapping program that is undertaken.

3.1.5 Other non-endemic fauna

Any cats caught in the Quenda trapping program will be checked for domestication such as a microchip, ear tattoo or collar. If a domestic cat is caught, then the City's ranger will be contacted to come and collect the cat. If the ranger is unavailable the cat will be taken to the Shenton Park Cat Haven. Feral cats can be humanely euthanased by firearm. All non-endemic fauna (i.e. black rats and mice) will be euthanased.

M6 The City ranger will be contacted to collect domestic cats, but if this is not possible, they will be taken to the Shenton Park Cat Haven.

3.1.6 Searches for active bird nests and tree hollows

If the vegetation clearing is undertaken in spring, then it could impact on nesting birds. All trees will be inspected from ground level by a zoologist during the Quenda trapping program and prior to vegetation clearing to determine if any have active birds' nests. When there are a substantive number of large trees with hollows likely to support active nests or arboreal mammals, then they will be caught and relocated prior to vegetation clearing. Where practicable and when chicks have a good chance of being raised and subsequently being released into bushland, then they will be collected and given to a wildlife carer to raise. For all other areas and periods, trees will be lowered to the ground and any hollows inspected by the zoologist for chicks or arboreal mammals.

During vegetation clearing, all trees will be bumped or gently shaken by the machine operator to encourage birds and arboreal mammals to relocate prior to the tree being felled.

All tree inspections will be completed within two weeks of vegetation clearing commencing.

M7 Trees will be inspected during the trapping program from ground level to determine whether they contain suitable hollow(s) or active nest(s). The on-site zoologist will decide whether tree hollows should be inspected prior to vegetation clearing, and whether any captured fauna, eggs and/or chicks should be relocated, euthanased or given to a wildlife carer, based on the potential for the animal surviving and subsequently being released.

3.1.7 Bees

During the trapping program, the project area will be searched for active beehives. Where beehives are identified, and considered to cause a hazard, then a bee collector-exterminator will be contacted to remove or kill the bees.

M8 During the trapping program, the site will be searched for active beehives, and if located and they are likely to be a hazard, then a bee collector-exterminator will be contacted to remove the bees.

3.1.8 Vegetation clearing procedure and induction

The on-site zoologist will be present for vegetation clearing but not the grubbing and pushing of vegetation into piles.

Clearing works will be conducted in a direction that enables mobile vertebrate fauna to escape the clearing process and move into adjacent bushland.

The on-site zoologist will provide the vegetation clearing machine operator with a brief induction on procedures that will minimise the potential to injure vertebrate fauna. This induction will include:

- positive communications between the clearing operator and the on-site zoologist before fauna is salvaged near active machinery;
- all trees (dead or alive) will be 'bumped' with machinery first, then lowered if no fauna is spotted;
- all vegetation clearing will be undertaken in a direction that enables vertebrate fauna to escape into adjacent bushland; and
- fauna observed by the machine operator will be communicated to the on-site zoologist to salvage if they haven't already been observed by the zoologist.

There will be one zoologist for each machine operator clearing the vegetation.

M9 The on-site zoologist will work with each machine operator and provide the operator with a brief induction on procedures that will minimise the potential to injure vertebrate fauna.

3.1.9 During clearing

During vegetation clearing, a Terrestrial Ecosystems zoologist will be present on-site to catch and relocate vertebrate fauna that will survive or if injured or introduced species, then they will be humanely euthanased.

M10 In areas where the zoologist deems it appropriate, a qualified zoologist will be present to capture and relocate any fauna that are likely to be injured during the vegetation clearing. One zoologist will be available per machine that is undertaking vegetation clearing (but not grubbing and pushing the vegetation into piles).

3.1.10 Injured fauna

Large vertebrate fauna that are injured during the vegetation clearing process and that are assessed by the on-site zoologist as having a good chance of being satisfactorily rehabilitated will be given to a DBCA registered wildlife carer. The DBCA's Wild Care 24hr hotline number is (08) 9474 9055. Native Animal Rescue is a registered wildlife carer in Malaga and their contact details are 9249 3434 (170 Camboon Road, Malaga).

Fauna injured during the clearing process that have little possibility of being satisfactorily rehabilitated and released will be humanely euthanased.

M11 Injured fauna able to be successfully rehabilitated and subsequently released will be given to a registered wildlife carer.

M12 Injured fauna unlikely to be successfully rehabilitated and subsequently released will be humanely euthanased.

M13 The zoologist will determine if injured fauna are able to be treated, rehabilitated and released into bushland to subsequently survive. The zoologist will be responsible for taking injured fauna to an approved wildlife carer. If injured fauna are given to an approved wildlife carer, then the developer will

provide funds to the wildlife carer to cover the cost of treating and rehabilitating injured fauna. Animals that cannot be treated, rehabilitated, and released into bushland to subsequently survive will be humanely euthanased and this decision will be made by the on-site zoologist.

3.1.11 Fencing

All areas to be cleared of vegetation will be appropriately fenced to stop kangaroos moving onto roads and into residential areas prior to vegetation clearing commencing. It may be appropriate to allow time for kangaroos to naturally move back into adjacent bushland before the fence is erected and vegetation clearing is commenced. Fencing will be designed to limit kangaroo movement back into the development.

M14 All areas to have the vegetation cleared will be fenced to limit kangaroos moving into the area and across roads or into residential properties.

3.1.12 Reporting

Within 30 days of the conclusion of the vegetation clearing program, Terrestrial Ecosystems will provide a letter report detailing the relocation activities undertaken, the dates over which the relocation program operated, the number of each species relocated, the release locations and the details of any animals killed or injured (including disposal location) during that stage or clearing. This letter report will be satisfactory for submission to council.

A report will be provided to the DBCA within 30 days of the expiry date on the licence.

M15 Within 30 days of the conclusion of the vegetation clearing program a letter report outlining the vertebrate fauna caught and relocated will be prepared by the contracting zoologist and sent to its client. The developer can make this report available to the City of Wanneroo.

M16 In accordance with the Regulation 28 license a return will be lodged with DBCA.

3.1.13 Adaptive Management

As with all similar wildlife protection plans, unexpected fauna may be on-site, circumstances change quickly, or action is required to protect the welfare of fauna and for the construction contractors and on-site zoologist to comply with the *Animal Welfare Act 2002*.

Terrestrial Ecosystems staff and the construction contractors will take whatever action is necessary and appropriate to maintain the welfare of vertebrate fauna on-site. Such action(s) might require deviation from this plan.

3.2 MANAGEMENT ACTION SUMMARY

Table 3 outlines the management actions to be implemented. These actions aim to avoid or reduce impacts to fauna and fauna habitat during vegetation clearing and construction, and the life of the development. A fauna trapping, salvage and relocation program is necessary to mitigate and minimise the potential impact on vertebrates in the project area.

Table 3. Management actions

#	Management Actions	Performance Indicator	Timing	Responsibility
M1	A Regulation 28 License (issued by DBCA) to take, catch and relocate native fauna will be applied for by the contracting zoologists and all obligations under the license will be fulfilled. The Regulation 28 licence may include the sedation and euthanasia of kangaroos, or the DBCA may require a separate licence.	A Regulation 28 licence is obtained prior to and maintained for the duration of the fauna management program	Prior to fauna management program	Specialist zoological consultant – Terrestrial Ecosystems
M2	If the zoologist considers Quenda are potentially present, then baited wire cage traps targeting Quenda and other trappable fauna will be deployed across the site in suitable habitat for a minimum period of five days within two weeks of the commencement of vegetation clearing. Traps will remain open each day. Daily trap checking will be completed within four hours of sunrise to minimise heat stress on nocturnal captured fauna.	Impacts on Quenda are mitigated	The trapping program is to conclude within two weeks of vegetation clearing commencing	Specialist zoological consultant – Terrestrial Ecosystems
M3	If the zoologist considers a trapping program is required for small mammals and reptiles because of the presence of suitable vegetation and fauna assemblage, then a pit and funnel trapping program will be implemented. The number of traps and duration of trapping will be a judgement for the zoologist.	Impacts on small mammals and reptiles are mitigated	The trapping program is to conclude within two weeks of vegetation clearing commencing	Specialist zoological consultant – Terrestrial Ecosystems
M4	Where it is not possible or feasible for kangaroos to naturally move into adjacent areas, then the contracting zoologist will use the best-practise methods for kangaroo management as determined by published research and advice from experienced zoologists who regularly undertake these management programs.	Impacts on kangaroos are mitigated	The management program is to conclude within two months of vegetation clearing commencing	Specialist zoological consultant – Terrestrial Ecosystems

#	Management Actions	Performance Indicator	Timing	Responsibility
M5	Active foraging and searching will be undertaken by the contracting zoologist for reptiles prior to vegetation clearing and where appropriate concurrent with any trapping program that is undertaken.	Photographic records of active foraging and searching are provided in the close out report	Undertaken concurrent with the trapping program and within two weeks of the vegetation clearing commencing	Specialist zoological consultant – Terrestrial Ecosystems
M6	The City ranger will be contacted to collect domestic cats, but if this is not possible, they will be taken to the Shenton Park Cat Haven.	Animals are killed humanely	Prior to and during the vegetation clearing program	Specialist zoological consultant – Terrestrial Ecosystems
M7	Trees will be inspected during the trapping program from ground level to determine whether they contain suitable hollow(s) or active nest(s). The on-site zoologist will decide whether tree hollows should be inspected prior to vegetation clearing, and whether any captured fauna, eggs and/or chicks should be relocated, euthanased or given to a wildlife carer, based on the potential for the animal surviving and subsequently being released.	All trees are inspected from ground level and cleared of any live nesting birds or arboreal mammals	To be completed prior to vegetation clearing	Specialist zoological consultant – Terrestrial Ecosystems
M8	During the trapping program, the site will be searched for active beehives, and if located and they are likely to be a hazard, then a bee collector-exterminator will be contacted to remove the bees.	No beehives are found during the vegetation clearing program.	Inspections are undertaken during the trapping program to determine whether beehives are present.	Specialist zoological consultant – Terrestrial Ecosystems
M9	The on-site zoologist will work with each machine operator and provide the operator with a brief induction on procedures that will minimise the potential to injure vertebrate fauna.	Records of induction are kept and appended to the close out report	Prior to and during the vegetation clearing program.	Specialist zoological consultant – Terrestrial Ecosystems
M10	In areas where the zoologist deems it appropriate, a qualified zoologist will be present to capture and relocate any fauna that are likely to be injured during the vegetation clearing. One zoologist will be available per machine that is undertaking	Impacts on vertebrate fauna are mitigated	During vegetation clearing	Specialist zoological consultant – Terrestrial Ecosystems

#	Management Actions	Performance Indicator	Timing	Responsibility
	vegetation clearing (but not grubbing and pushing the vegetation into piles).			
M11	Injured fauna able to be successfully rehabilitated and subsequently released will be given to a registered wildlife carer.	No fauna are not left to suffer longer than necessary	During vegetation clearing	Specialist zoological consultant – Terrestrial Ecosystems
M12	Injured fauna unlikely to be successfully rehabilitated and subsequently released will be humanely euthanased.	No fauna are not left to suffer longer than necessary	During vegetation clearing	Specialist zoological consultant – Terrestrial Ecosystems
M13	The zoologist will determine if injured fauna are able to be treated, rehabilitated and released into bushland to subsequently survive. The zoologist will be responsible for taking injured fauna to an approved wildlife carer. If injured fauna are given to an approved wildlife carer, then the developer will provide funds to the wildlife carer to cover the cost of treating and rehabilitating injured fauna. Animals that cannot be treated, rehabilitated, and released into bushland to subsequently survive will be humanely euthanased and this decision will be made by the on-site zoologist.	Any injured fauna suitable for rehabilitation are taken to a wildlife carer. Injured fauna not suitable are euthanased by the on-site zoologist.	During vegetation clearing	Specialist zoological consultant – Terrestrial Ecosystems
M14	All areas to have the vegetation cleared will be fenced to limit kangaroos moving into the area and across roads or into residential properties.	No kangaroos are killed or injured due to vegetation clearing, other than those in an active management program	Prior to vegetation clearing	Specialist zoological consultant – Terrestrial Ecosystems
M15	Within 30 days of the conclusion of the vegetation clearing program a letter report outlining the vertebrate fauna caught and relocated will be prepared by the contracting zoologist. The developer can make this report available to the City of Wanneroo.	Close out report is provided within 30 days addressing each management action	Within 30 days of vegetation clearing concluding	Specialist zoological consultant – Terrestrial Ecosystems
M16	In accordance with the Regulation 28 license a return will be lodged with DBCA.	A licence return is submitted to the DBCA	Within 30 days of the expiry date	Specialist zoological consultant – Terrestrial Ecosystems

4. REFERENCES

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Terrestrial Ecosystems. 2022. Kangaroo assessment at Catalina Green. Perth.

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Figures

Native Vertebrate Fauna Management Plan
Catalina Development Area

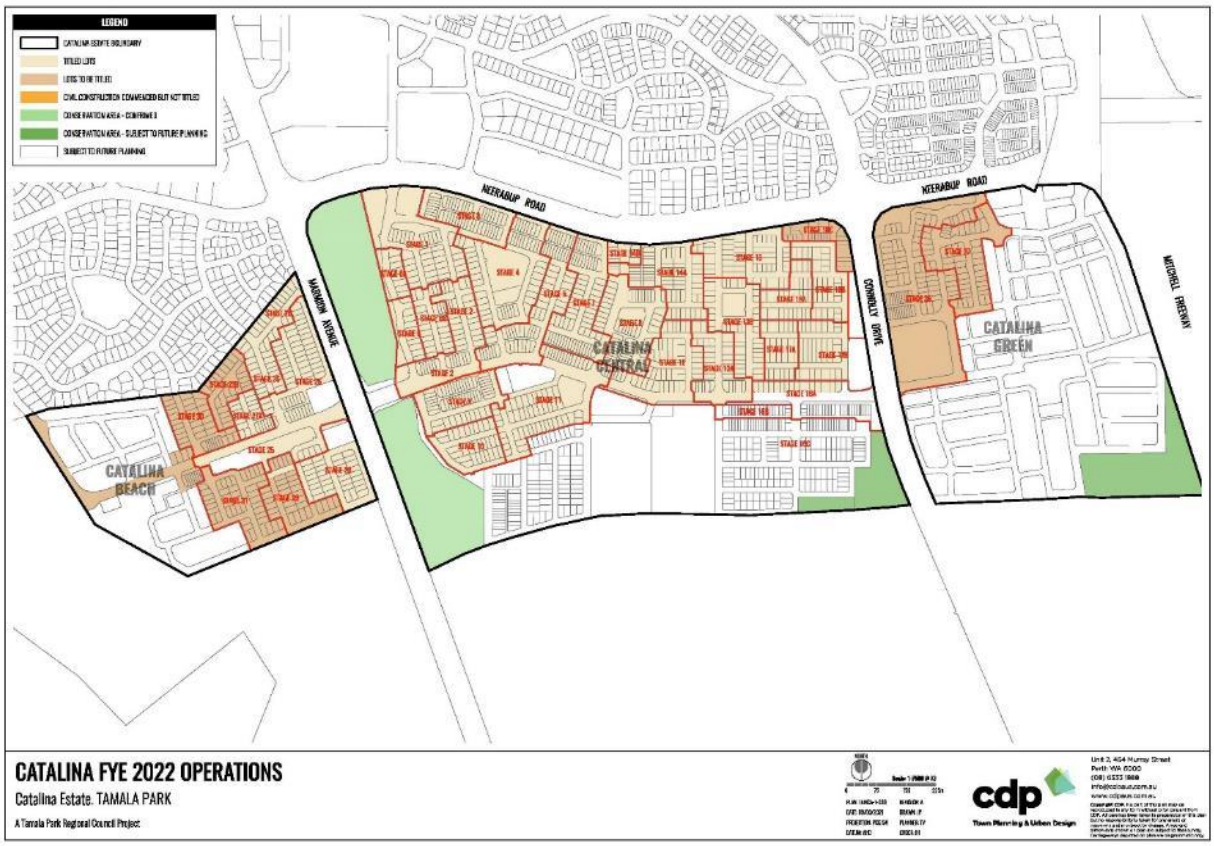

Figure 3. Catalina project area

DETECTION DOG

COTERRA
ENVIRONMENT

Level 1, 98 Colin Street
West Perth WA 6005

T (08) 9381 5513

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info@coterra.com.au

Annexure E – Catalina Green Stage 45 POS Landscape and Irrigation Works Drawings (Issued for Tender)

CATALINA

CLARKSON, W.A

STAGE 45 NATURE POS

LANDSCAPE CONTRACT: CAT75

LANDSCAPE & IRRIGATION WORKS

CLIENT: CATALINA REGIONAL COUNCIL

ISSUE FOR: ***TENDER***

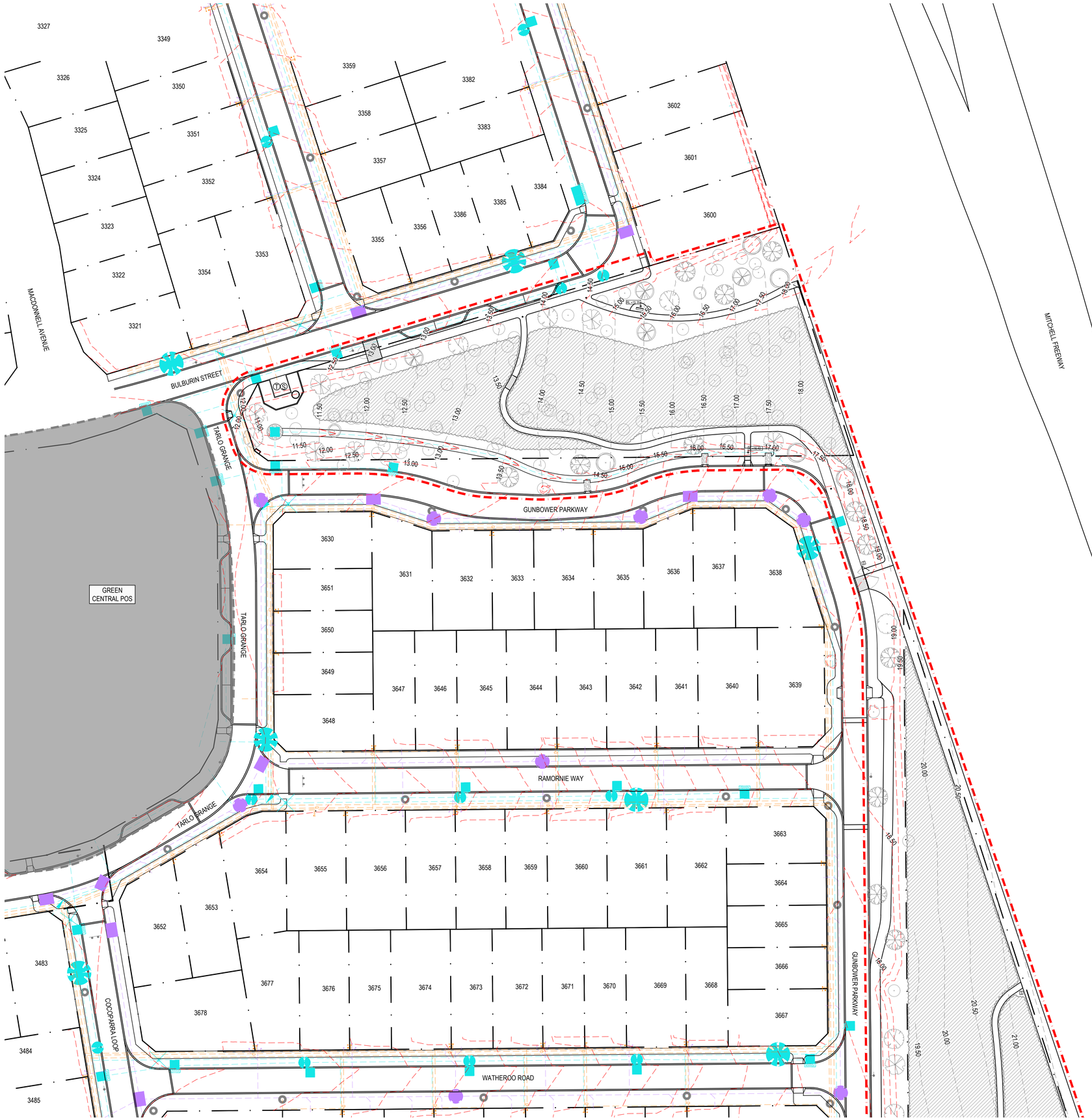
DATE: **FEBRUARY 2026**

Sheet List Table

Sheet Number	Sheet Title	Revision
CAT-75-000	COVERPAGE	D
CAT-75-301	GRADING PLAN 1 OF 2	D
CAT-75-302	GRADING PLAN 2 OF 2	D
CAT-75-401	HARDSCAPE PLAN 1 OF 2	D
CAT-75-402	HARDSCAPE PLAN 2 OF 2	D
CAT-75-501	PLANTING PLAN 1 OF 2	D
CAT-75-502	PLANTING PLAN 2 OF 2	D
CAT-75-901	DETAILS 1 OF 2	D
CAT-75-902	DETAILS 2 OF 2	D
CAT-75-980	NOTES	D

CATALINA Regional Council

emerge ASSOCIATES
Integrated Science & Design



LEGEND

- EXTENT OF WORKS
- 0.00 EXISTING CONTOURS
- 0.00 CIVIL PROPOSED CONTOURS
- 0.00 PROPOSED CONTOURS
- RL +00.00 SPOT LEVELS
- EXISTING VEGETATION TO BE RETAINED AND PROTECTED

WORKS BY OTHERS

- DRAINAGE
- SEWERAGE
- SERVICES

STANDARD NOTES

1. **SET OUT & DIMENSIONS.** THE CONTRACTOR SHALL SET OUT ALL PATHS, WALLS, HARD SURFACES AND ELEMENTS EITHER ON OR OFFSITE PRIOR TO CONSTRUCTION AND SHALL OBTAIN THE SUPERINTENDENTS SET OUT APPROVAL PRIOR TO WORKS COMMENCING. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE. CHECK ALL DRAWING SCALES IN CONJUNCTION WITH DRAWING SIZE.
2. **SERVICES & SITE ASSETS.** THE CONTRACTOR SHALL INVESTIGATE THE NATURE AND LOCATION OF ALL EXISTING SERVICES AND RETAINED SITE ASSETS AFFECTED BY THEIR WORKS. FAILURE TO TAKE DUE CARE SHALL NOT LIMIT THE CONTRACTORS LIABILITIES
3. **REFERENCE.** THE CONTRACTOR SHALL REFER TO ALL CONTRACT DOCUMENTS, THE SPECIFICATION AND DRAWINGS PRIOR TO AND DURING THE WORKS.
4. **DISCREPANCIES.** NOTIFY SUPERINTENDENT OF ANY SUSPECTED OR KNOWN DISCREPANCIES OR ERRORS PRIOR TO THE ORDERING OF AFFECTED MATERIALS AND OR CONSTRUCTION OF AFFECTED WORKS.
5. **RELEVANT STANDARDS.** THE CONTRACTOR SHALL UNDERTAKE ALL PRICING AND WORKS IN ACCORDANCE WITH CURRENT INDUSTRY BEST PRACTICE AND ALL RELEVANT AUSTRALIAN STANDARDS.
6. **SERVICE LOCATOR.** THE CONTRACTOR SHALL UNDERTAKE A DIAL BEFORE YOU DIG PROCESS PRIOR TO COMMENCING WORKS ON SITE. THE CONTRACTOR SHALL ENGAGE A SERVICE LOCATOR TO MAP THE SPECIFIC LOCATIONS AND DEPTH OF ALL SERVICES AND ADVISE ALL RELEVANT STAFF AND SUBCONTRACTORS IN WRITING PRIOR TO COMMENCING WORKS ON SITE.

REV	DATE	BY	ISSUE OR AMENDMENT
D	18.02.2026	JL	ISSUE FOR TENDER
C	03.12.2025	JL	REVISED FOR APPROVAL
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PROJECT
CATALINA
CLARKSON, W.A
STAGE OR PHASE
STAGE 45 NATURE POS
DRAWING TITLE
GRADING PLAN 1 OF 2
CLIENT
CATALINA REGIONAL COUNCIL

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LEGEND

- EXTENT OF WORKS
- 0.00 EXISTING CONTOURS
- 0.00 CIVIL PROPOSED CONTOURS
- 0.00 PROPOSED CONTOURS
- RL +00.00 SPOT LEVELS
- EXISTING VEGETATION TO BE RETAINED AND PROTECTED

WORKS BY OTHERS

- DRAINAGE
- SEWERAGE
- SERVICES

STANDARD NOTES

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PROJECT
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STAGE OR PHASE
STAGE 45 NATURE POS
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LEGEND

- EXTENT OF WORKS
- PROPOSED CONCRETE PATH NON-TRAFFICABLE & TRAFFICABLE — 16,13 901
- EXPOSED AGGREGATE HARDSTAND — 5 901
- CONCRETE PATH BY OTHERS
- PROPOSED PLANTING — 1-2 902
- EXISTING VEGETATION TO BE RETAINED AND PROTECTED
- CRUSHED LIMESTONE PATH — 6 901
- EXISTING FIREBREAK TO BE RETAINED
- BLUE METAL GRAVEL BY OTHERS
- CULVERT AT NATURAL STREAM CROSSING — 5 902
- MULCH ONLY — 4 902
- (S) INTERPRETIVE SIGNAGE — 8 901
- (B) RUBBISH BIN — 7 901
- FB DBCA & CoW BOUNDARY SIGNAGE
- MAINTENANCE & PEDESTRIAN GATE — 11-12 901
- EXISTING CONSERVATION FENCING
- PROPOSED CONSERVATION FENCING — 10 901
- STAR PICKETS WITH WHITE CAPS (PICKETS AT 10m SPACINGS)
- FIXED BOLLARD — 6 902
- PROPOSED TREES — 10 902
- EXISTING TREE TO BE RETAINED AND PROTECTED

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PROJECT
CATALINA
CLARKSON, W.A
STAGE OR PHASE
STAGE 45 NATURE POS
DRAWING TITLE
HARDSCAPE PLAN 1 OF 2
CLIENT
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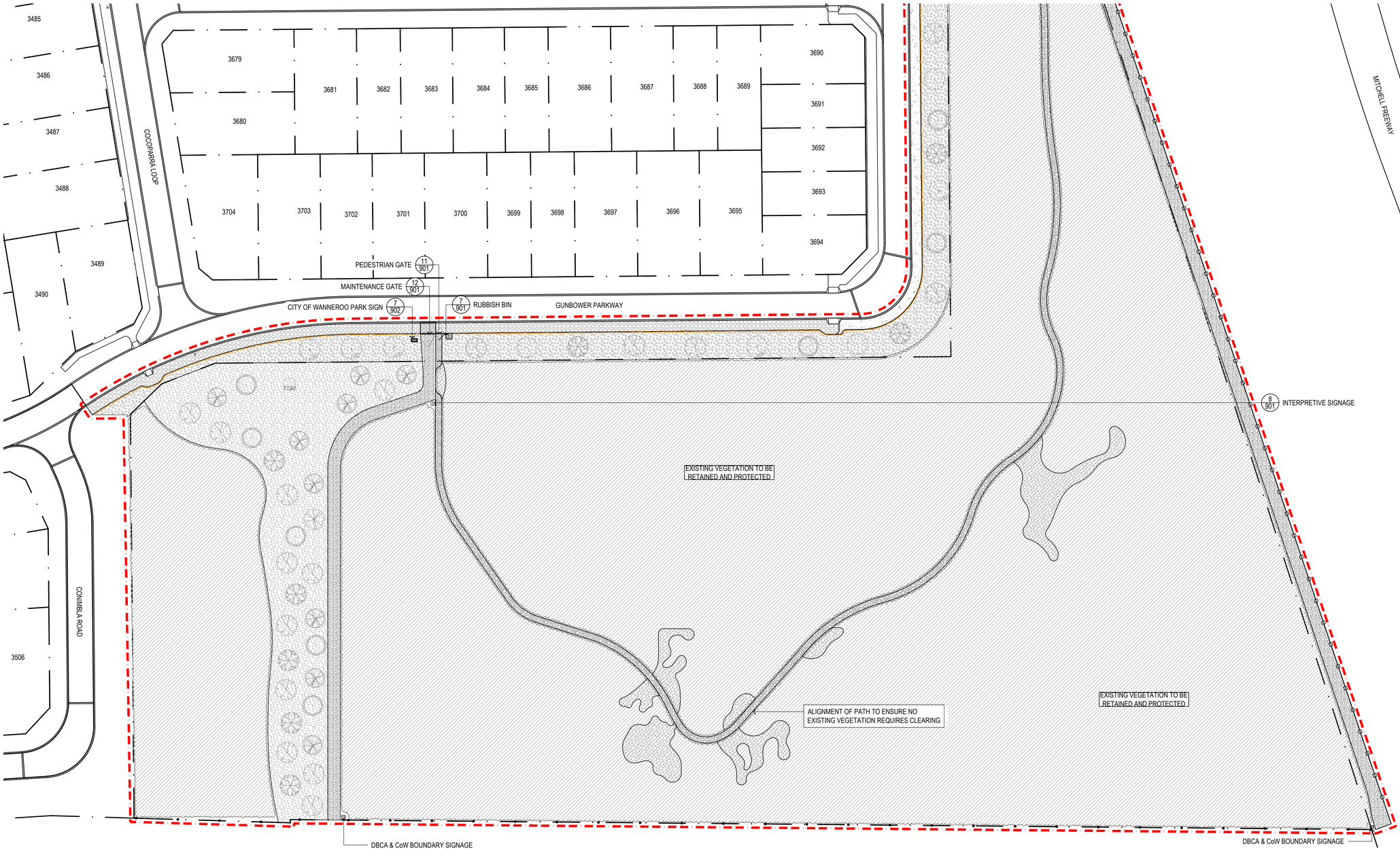

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PROJECT
CATALINA
CLARKSON, W.A
STAGE OR PHASE
STAGE 45 NATURE POS
DRAWING TITLE
HARDSCAPE PLAN 2 OF 2
CLIENT
CATALINA REGIONAL COUNCIL

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Tree List

Sym.	Key	Botanic Name	Common Name	Pot	Qty	Description
Alfr	Alfr	Allocasuarina fraseriana	Western Sheoak	100 Litre	11	Secondary
Baat	Baat	Banksia attenuata	Candlestick banksia	100 Litre	8	Primary
Bail	Bail	Banksia ilicifolia	Holly-Leaved Banksia	100 Litre	13	Primary
Bame	Bame	Banksia menzeisii	Firewood Banksia	100 Litre	13	Primary
Coca	Coca	Corymbia calophylla	Marri	100 Litre	4	Primary
Eugo	Eugo	Eucalyptus gomphocephala	Tuart	100 Litre	10	Secondary
Eutod	Eutod	Eucalyptus todtiana	Coastal Blackbutt	100 Litre	20	Secondary
Metr	Metr	Melaleuca trichophylla	Pretty Honey-Myrtle	100 Litre	5	Nil

Conservation Buffer

Key	Botanic Name	Common Name	Pot	Qty	Description
Acla	Acacia lasiocarpa	Wattle	Tube	209	Nil
Acro	Acacia rostelliffera	Summer-Scented Wattle	Tube	209	Nil
Acsa	Acacia saligna	Orange Wattle	Tube	209	Primary
Alhu	Allocasuarina humilis	Dwarf Sheoak	Tube	931	Nil
Bagr	Banksia grandis	Bull Banksia	Tube	931	Primary
Bail	Banksia ilicifolia	Holly-Leaved Banksia	Tube	931	Primary
Bame	Banksia menziesii	Firewood Banksia	Tube	931	Primary
Boer	Bossiaea eriocarpa	Common Brown Pea	Tube	931	Nil
Goto	Gompholobium tomentosum	Hairy Yellow Pea	Tube	931	Nil
Hali	Hakea lissocarpha	Honey Bush	Tube	931	Primary
Haco	Hardenbergia comptononia	Native Wisteria	Tube	931	Nil
Hihy	Hibbertia hypericoides	Yellow Buttercups	Tube	931	Nil
Hira	Hibbertia racemosa	Stalked Guinea Flower	Tube	931	Nil
Xapr	Xanthorrhoea preissii	Grass Tree	Tube	931	Primary

Infill Mix

Key	Botanic Name	Common Name	Pot	Qty	Description
Buco	Burchardia congesta	Milkmaids	Tube	962	Nil
Copr	Conostephium preissii	Preiss's Conostephium	Tube	962	Nil
Coca	Conostylis aculeata	Prickly Conostylis	Tube	962	Nil
Dire	Dianella revoluta	Blue Flax Lily	Tube	962	Nil
Eugo	Eucalyptus gomphocephala	Tuart	Tube	962	Nil
Goto	Gompholobium tometosum	Hairy Yellow Pea	Tube	962	Nil
Hala	Haemodorum laxum	Bloodroot	Tube	962	Nil
Kepr	Kennedia prostrata	Running Postman	Tube	962	Nil
Peli	Petrophile linearis	Pixie Mops	Tube	962	Nil
Phca	Phyllanthus calycinus	False Boronia	Tube	962	Nil
Spgl	Spyridium globulosum	Basket Bush	Tube	962	Nil
Xabr	Xanthorrhoea brunonis	Grasstree	Tube	962	Nil

Swale Batter

Key	Botanic Name	Common Name	Pot	Qty	Description
Atis	Atriplex isatidea	Coastal Saltbush	Tube	330	Nil
Bame	Banksia menziesii	Firewood Banksia	Tube	330	Primary
Caqu	Calothamnus quadrifidus 'Clean and Green'	One Sided Bottlebrush	Tube	330	Nil
Coac	Conostylis aculeata	Prickly Cottonhead	Tube	330	Nil
Hapr	Hakea prostrata	Harsh Hakea	Tube	330	Primary
Hepu	Hemiandra pungens	Snakebush	Tube	330	Nil
Jase	Jacksonia sericea	Waldjumi	Tube	330	Nil
Legl	Lepidosperma gladiatum	Coast-Sword Sedge	Tube	330	Nil
Lebr	Leucophyta brownii	Cushion Bush	Tube	330	Nil
Sccr	Scaevola crassifolia	Cushion Fan Flower	Tube	330	Nil

Swale Mix

Key	Botanic Name	Common Name	Pot	Qty	Description
Anfl	Anigozanthos flavidus	Tall Kangeroo Paw	Tube	220	Nil
Coac	Conostylis aculeata	Prickly conostylis	Tube	220	Nil
Hepu	Hemiandra pungens	Snakebush	Tube	220	Nil
Lelo	Lepidosperma longitudinale	Pithy Sword Sedge	Tube	220	Nil

PLANT AND TREE NUMBERS IN SCHEDULE ARE TO BE USED AS GUIDE ONLY. TENDERERS TO REFER LABELS ON PLANS FOR NUMBERS. PLANT NUMBERS AND SPECIES ARE SUBJECT TO AVAILABILITY.

LEGEND

- EXTENT OF WORKS
- LOW THREAT CONSERVATION BUFFER PLANTING (12-13 901)
- INFILL PLANTING (12-13 901)
- LOW THREAT SWALE BATTER PLANTING (12-13 901)
- SWALE PLANTING (12-13 901)
- PROPOSED TREES (14 901)
- EXISTING TREE TO BE RETAINED AND PROTECTED

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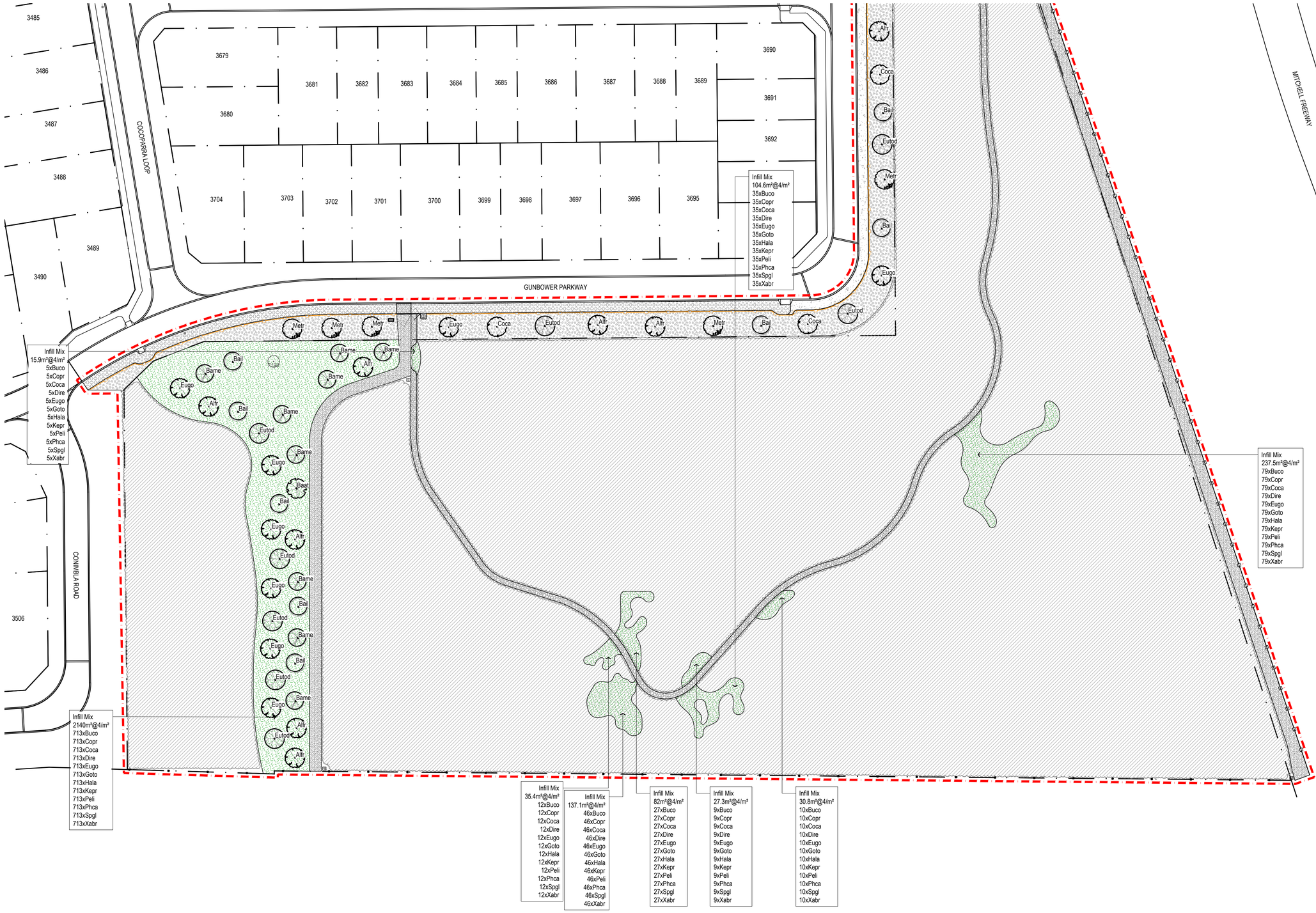

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- INFILL PLANTING — 12-13 301
- LOW THREAT SWALE BATTER PLANTING — 12-13 301
- SWALE PLANTING — 12-13 301
- PROPOSED TREES — 14 901
- EXISTING TREE TO BE RETAINED AND PROTECTED

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C	03.12.2025	JL	REVISED FOR APPROVAL
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PROJECT
CATALINA
CLARKSON, W.A
STAGE OR PHASE
STAGE 45 NATURE POS
DRAWING TITLE
PLANTING PLAN 2 OF 2
CLIENT
CATALINA REGIONAL COUNCIL

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DATE INITIALLY DRAWN	05.05.25		

SCALE 1: 500 @ A1 METRES
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DRAWING NUMBER CAT-75-502
REV D

PRELIMINARY
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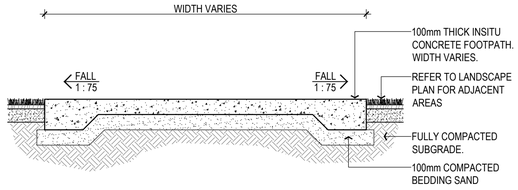
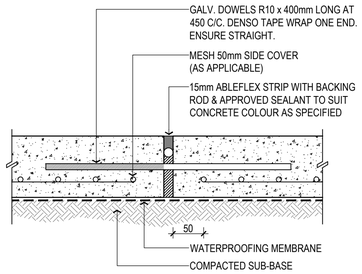
REF: U:\CURRENT PROJECTS\CATALINA, TAMALA PARK\C) DRAWINGS\JOB CODE\ AUTOCAD\JOB CODE\ LANDSCAPE\STAGE 45 NATURE POS\CAT-75-502 SHEET 2 OF 2 NATURE POS_DES.DWG



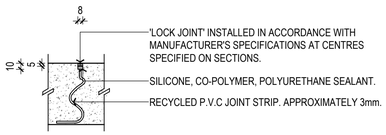
NOTES

1. FOUNDATION TO BE COMPACTED TO 95% MDD.
2. ALL CONCRETE FOOTPATH CONSTRUCTION TO BE A MIN 25MPa, 20mm AGGREGATE AND MAX SLUMP OF 80-100mm.
3. BEDDING - SAND (100mm MINIMUM).
4. EXPANSION JOINT EVERY 5.0M AS. SEE DETAIL 02/901
5. CONTRACTION JOINT EVERY 2.5M. SEE DETAIL 03/901
6. SURFACE TO BE BROOM FINISH, NON-SLIP, WITH SMOOTH EDGE APPROX 75mm WIDE AT EDGES AND JOINTS.
7. LONGITUDINAL GRADE SHOULD NOT EXCEED 1 IN 20.
8. WHERE LONGITUDINAL GRADE IS GREATER THAN 1 IN 14, LANDINGS WILL BE PROVIDED EVERY 6m.
9. VERTICAL CLEARANCES ALONG PATHS SHOULD BE A MINIMUM OF 2m.
10. WHERE STREET FURNITURE (POLES, BENCHES, RUBBISH BINS, POSTS, ETC) ARE LOCATED IN PATH, A MIN UNOBSTRUCTED WIDTH OF 1.2m MUST BE MAINTAINED.

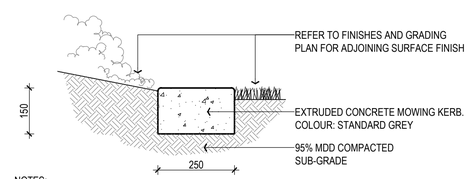
1 / 901 PROPOSED CONCRETE PATH
SECTION — SCALE 1:20



2 / 901 TYPICAL EXPANSION JOINT
SECTION — SCALE 1:5

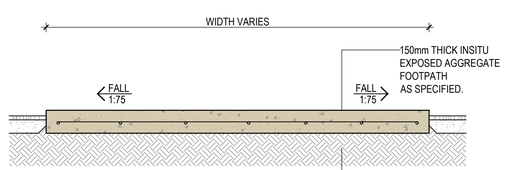


3 / 901 TYPICAL CONTRACTION JOINT
SECTION — SCALE 1:5



NOTES:
1. ALL CONCRETE TO BE 32MPa @ 28 DAYS
2. CONTRACTION JOINTS: RULED / STAMPED AT 2.0M INTERVALS
3. EXPANSION JOINTS: 6.0M INTERVALS TO LINE UP WITH FOOTPATH JOINTS.

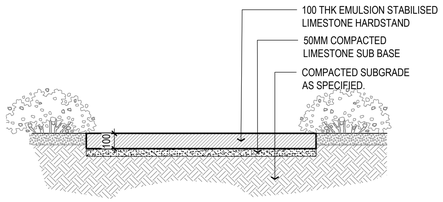
4 / 901 MOWING KERB
SECTION — SCALE 1:10



FINISH:
EXPOSED AGGREGATE BY HOLCIM

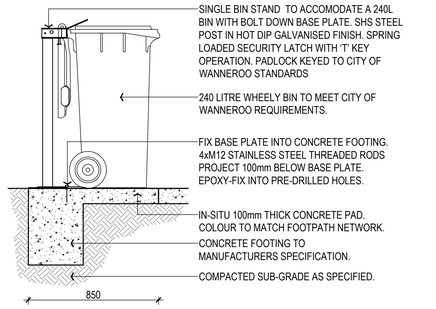
KANGEROO PAW

5 / 901 EXPOSED AGGREGATE HARDSTAND
SECTION — SCALE 1:20

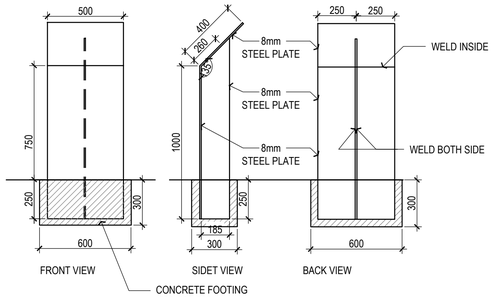


6 / 901 CRUSHED LIMESTONE PATH
SECTION — SCALE 1:20

CITY OF WANNEROO RECOMMENDED SUPPLIER:
GC SALES
Contact: Paul Homes -92483726
WEB http://www.gcsales.com.au/



7 / 901 RUBBISH BIN
SECTION — SCALE 1:20



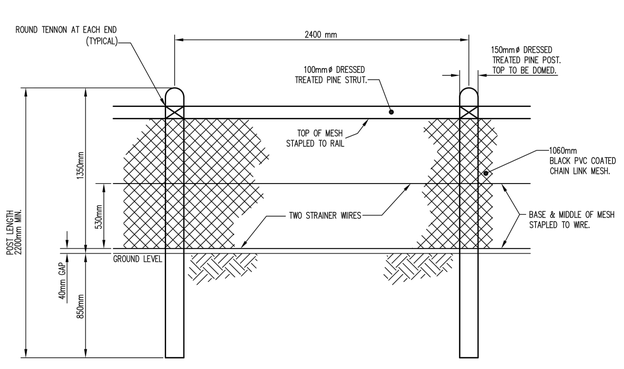
IMPORTANT NOTE:
1. ALL STEEL PLATE TO BE 8mm THICK.
2. PLATE TO BE PAINTED:
   GREEN (BUSHLAND AND WETLAND) PMS300 OR DULUX MISSLETOE
   OR
   BLUE (COASTAL FORESHORE) PMS300 OR DULUX BLAZE BLUE.
3. STRUCTURE TO BE COATED WITH APPROVED ANTI-GRAFFITI SURFACE/ COATING.
4. CONCRETE SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 20 MP AT 28 DAYS.

NOTE: TEXT TO BE PROVIDED BY THE CoW.

8 / 901 INTERPRETIVE SIGNAGE - CoW STANDARD
PLAN & ELEVATIONS — SCALE 1:20

PRODUCT NAME	LINEA SEATING BENCH
PRODUCT SUPPLIER	STREET FURNITURE AUSTRALIA
PRODUCT CODE	LIS10
PRODUCT FINISH	POWDER COATED ALUMINIUM
PRODUCT COLOUR	LEGS: MONUMENT, BATTENS: ALUMINIUM SPOTTED GUM
PRODUCT FIXING	AS PER MANUFACTURER'S SPECIFICATIONS

9 / 901 LINEA SEATING BENCH
IMAGE REFERENCE — NTS



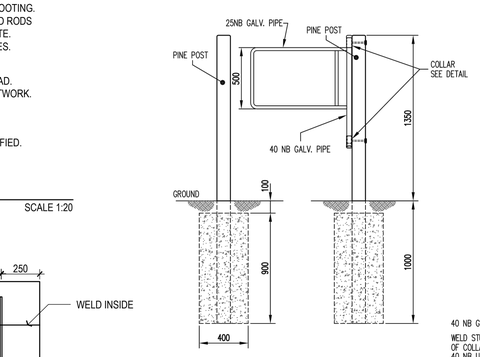
10 / 901 CONSERVATION FENCING
SECTION — SCALE 1:25

MATERIAL SPECIFICATIONS

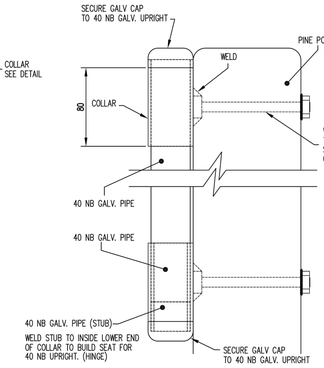
150-175mm x 2.2m CCA TREATED PINE LOG (FOR PINE UPRIGHTS).
1.57mm GALVANISED TIE WIRE.

NOTES

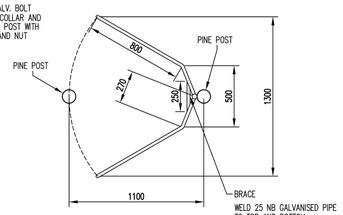
1. ALL ENDS, JOINS AND TIES TO BE FINISHED NEATLY WITH NO WIRE PROTRUSIONS.
2. WIRE TO BE WRAPPED AROUND PINE POSTS TWICE, THEN WOUND BACK AROUND WIRE THREE TIMES AND CUT OFF FLUSH.
3. FENCING WIRE TO BE FIXED TO OUTSIDE OF FENCE, EXCEPT WHERE PARK ADJOINS PRIVATE PROPERTY, WHERE IT SHOULD BE FIXED TO INSIDE OF FENCE
4. FENCE TO SMOOTHLY FOLLOW THE OVERALL CONTOURS OF THE LAND AS FOR BOLLARDS (NOT TO HAVE SUDDEN DIPS AND RISES).
5. REFER TO STANDARD DRAWING TS 01-09 FOR BOX STRAINER DETAIL.



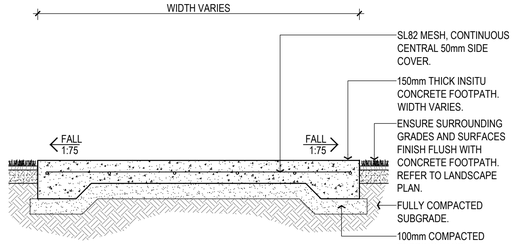
SIDE VIEW AND FOOTING DETAIL
SCALE: 1:20



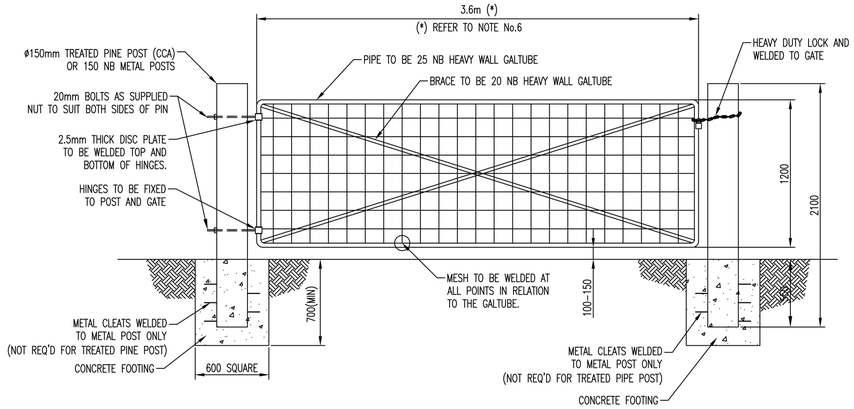
COLLAR DETAIL
SCALE: N.T.S.



TOP VIEW
SCALE: 1:20



13 / 901 REINFORCED CONCRETE PATH FOR MAINTENANCE VEHICLE ACCESS
SECTION — SCALE 1:20



RURAL FIELD GATE

NOTES:

1. ALL STEEL TO BE GALVANIZED.
2. ALL STEEL POSTS TO BE SECURELY CAPPED.
3. ALL WELDS TO BE POWER WIRE BRUSHED AND COLD GALVANIZED.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. MESH TO BE METRIC MESH 46G5 AND GALVANIZED FINISHED COMPLETE WITH FITTINGS.
6. A 3.9m GATE SHALL ONLY BE INSTALLED WHEN THE INTERNAL VEHICLE TRACK DOES NOT RUN PERPENDICULAR TO THE GATE LOCATION, ALL GATES WITH WIDTHS LARGER THAN 3.9M SHALL ONLY BE CONSIDERED IN EXCEPTIONAL CIRCUMSTANCES AND TECHNICAL SPECIFICATIONS WILL REQUIRE APPROVAL PRIOR TO INSTALLATION.
7. CONCRETE FOOTINGS TO BE GRADE N32 TO AS 1379
8. ALL GALVANISED STEEL TO MEET AS/NZS 4792 FOR HOT-DIP GALVANISED (ZINC) COATING ON FABRICATED FERROUS ARTICLES

11 / 901 PEDESTRIAN GATE
SECTION — SCALE 1:25

12 / 901 RURAL FARM GATE - CoW
SECTION — SCALE 1:25

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CLARKSON, W.A
STAGE OR PHASE
STAGE 45 NATURE POS
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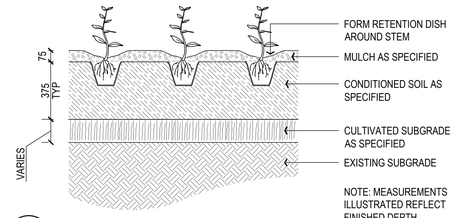
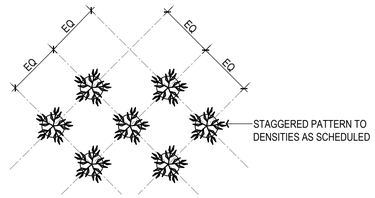
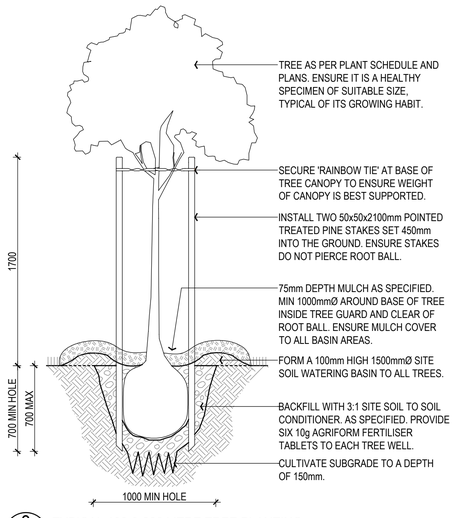


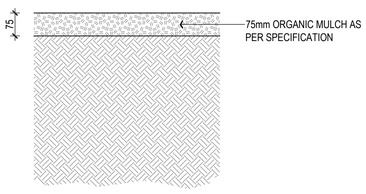
1 / 902 TUBESTOCK - 200mm POT PLANTING
SECTION — SCALE 1:20



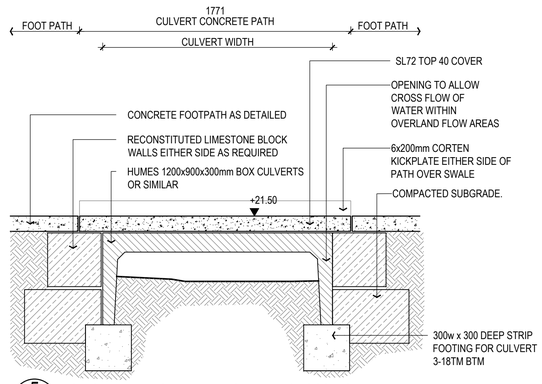
2 / 902 TYPICAL STAGGERED PLANTING PATTERN
PLAN — SCALE 1:20



3 / 902 TYPICAL 100 & 200 LITRE TREE PLANTING
SECTION — SCALE 1:25



4 / 902 MULCH ONLY
SECTION — SCALE 1:10



5 / 902 BOX CULVERT TO NATURAL STREAM CROSSING
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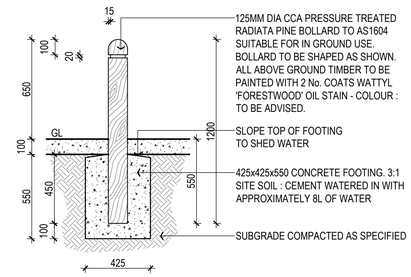
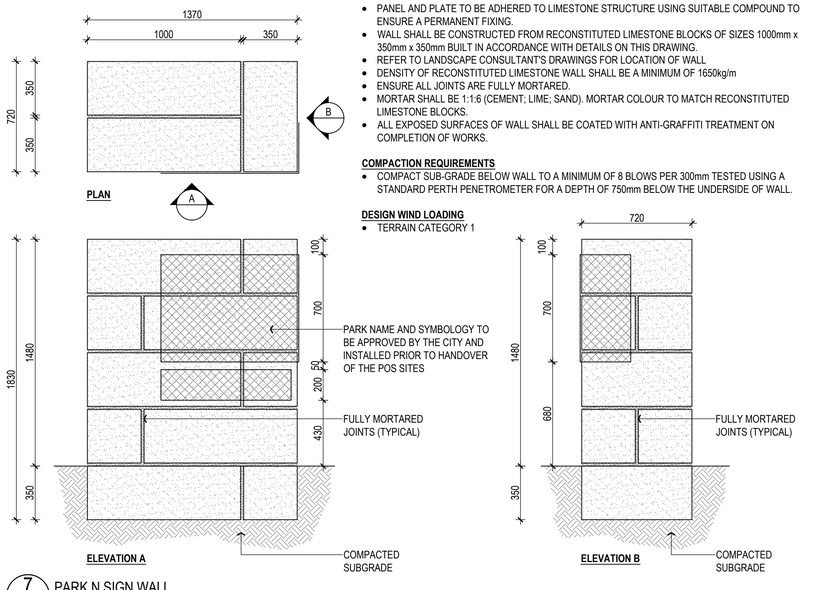


6 / 902 FIXED BOLLARD
SECTION — SCALE 1:20

NOTES:
- PANEL AND PLATE TO BE FABRICATED FROM 3mm ALUMINUM SHEETING.
- PANEL TO BE FOLDED PRIOR TO DELIVERY ON SITE.
- PANEL AND PLATE TO BE ADHERED TO LIMESTONE STRUCTURE USING SUITABLE COMPOUND TO ENSURE A PERMANENT FIXING.
- WALL SHALL BE CONSTRUCTED FROM RECONSTITUTED LIMESTONE BLOCKS OF SIZES 1000mm x 350mm x 350mm BUILT IN ACCORDANCE WITH DETAILS ON THIS DRAWING.
- REFER TO LANDSCAPE CONSULTANT'S DRAWINGS FOR LOCATION OF WALL.
- DENSITY OF RECONSTITUTED LIMESTONE WALL SHALL BE A MINIMUM OF 1650kg/m
- ENSURE ALL JOINTS ARE FULLY MORTARED.
- MORTAR SHALL BE 1:1:6 (CEMENT; LIME; SAND). MORTAR COLOUR TO MATCH RECONSTITUTED LIMESTONE BLOCKS.
- ALL EXPOSED SURFACES OF WALL SHALL BE COATED WITH ANTI-GRAFFITI TREATMENT ON COMPLETION OF WORKS.

COMPACTION REQUIREMENTS
- COMPACT SUB-GRADE BELOW WALL TO A MINIMUM OF 8 BLOWS PER 300mm TESTED USING A STANDARD PERTH PENETROMETER FOR A DEPTH OF 750mm BELOW THE UNDERSIDE OF WALL.

DESIGN WIND LOADING
- TERRAIN CATEGORY 1



7 / 902 PARK N SIGN WALL
PLAN & ELEVATIONS — SCALE 1:20

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PROJECT
CATALINA
CLARKSON, W.A
STAGE OR PHASE
STAGE 45 NATURE POS
DRAWING TITLE
DETAILS 2 OF 2
CLIENT
CATALINA REGIONAL COUNCIL

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DRAWN BY	JL	PRELIM DWG REVIEWED BY	ZF
DATE INITIALLY DRAWN	05.05.25		

SCALE: AS SHOWN

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REV: D

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REF: I:\CURRENT PROJECTS\CATALINA, T.MAILA PARK\CLI_DRAWINGS\JOB CODE\ JOB CODE_AUTOCAD\JOB CODE_LANDSCAPE\STAGE 45 NATURE POS\JOB CODE_STAGE 45 NATURE POS_DETAILING

GENERAL NOTES

1. These drawings are to be read in conjunction with all architectural and other consultants' drawings and specifications and with such other written instructions as may be issued. Any discrepancies shall be referred to the superintendent for clarification before proceeding with work.
2. All dimensions are in millimetres and those relevant to setting out (excludes finishes) and offsite work shall be verified by the contractor before construction and fabrication are commenced. The engineer's drawings shall not be scaled.
3. All levels and grid co-ordinates are in metres.
4. During construction the contractor shall be responsible for maintaining the structure in a stable condition and no part shall be over stressed under construction activities.
5. Workmanship and materials shall be in accordance with the current edition of the relevant SAA codes and the by-laws and ordinances of the relevant building authority, except where varied by the contract documents.

DESIGN CRITERIA

1. Dead, live, wind and earthquake loads to AS1170.
2. Design Wind Speed
   Region A
   Terrain Category 2.5
   Regional Gust Wind Speed = 45m/sec (ULTIMATE LIMIT STATE)
   Regional Gust Wind Speed = 37m/sec (SERVICE LIMIT STATE)
3. Earthquake
   kp = 1.0
   Hazard Factor Z = 0.09 (Perth)
4. Foundations
   Foundations designed for Class 'S' site with minimum 150kPa allowable bearing pressure.
5. Live Loads

Decking:	3kPa to AS1170.1
Balustrade:	C3 to AS1170.1
Roof construction load:	0.25kPa to AS1170.1
Retaining Wall Surcharge:	3kPa to AS1170.1

BUILDER NOTE - COMPLIANCE INSPECTIONS

1. As part of the building licence for this project, the builder may be required to have the structural engineer certify the completed structure has been built in accordance with the approved drawings & /or with any subsequent written instructions.
2. If WA Structural Consulting are to provide this certification, the builder must arrange for WA Structural Consulting to inspect each of the structural items at appropriate stages. These items and stages include, but are not limited to the following:,
   2.1. Concrete reinforcement, prior to pouring of concrete in:
      2.1.1. Footing Excavations
      2.1.2. Slabs on ground
      2.1.3. Suspended slabs and beams
      2.1.4. Concrete columns and walls
      2.1.5. Retaining walls
   2.2. Structural steelwork prior to any cladding being fixed.
   2.3. Concrete wall panel connections.
3. The builder must provide appropriate evidence that the specified concrete has been supplied for each concrete element.
4. The builder must provide evidence that the required levels of foundation compaction have been achieved.
5. Where a geotechnical engineer has made specific recommendations, evidence that these have been achieved must be provided.
6. Unless fees for our inspections and certifications have been previously negotiated with WA Structural Consulting by others, these fees will be the builder's responsibility. It is required that the builder negotiate these fees with the engineer at a tender stage.
7. If the builder requires the fabrication drawings to be checked & certified by the project engineer, the costs associated with this will be the builder's responsibility, unless these fees have been previously negotiated with WA Structural Consulting by others. This must be confirmed by the builder.

CONCRETE AND REINFORCEMENT

1. All concrete works shall be in accordance with AS3600.
   Concrete specification shall be U.N.O.:

	F'C (MPA)	MAX.AGG SIZE (mm)	SLUMP (mm)
• Location			
• Footings	25	20	65
• Slab on Ground	25	20	65
• In Situ Retaining Walls	32	20	60
• Precast	32	20	80
• Cavity Fill	15	10	100

   Cover to Reinforcement shall be:

	Bottom (mm)	Top (mm)	Sides (mm)
• Location			
• Footing	70	50	50
• Slab on Ground	50	40	50
• In Situ Retaining Walls	32	20	60
• Precast	50	40	40
• Cavity Fill	50	50	20 U.N.O

2. Reinforcement shall be supported on approved plastic or plastic tipped wire chairs and hold rigidly in position as follows:
   a. Bars up to N12 and fabric - 800mm centres
   b. Bars N16 and larger - 1200mm centres
   * Welding reinforcement is not permitted unless approved by engineer.
3. Construction joints shall be scabbled, cleaned and coated with a cement/water slurry immediately prior to placing concrete.
4. Concrete shall be compacted using mechanical vibrators.
5. Concrete shall be cured for a minimum of 7 days by flooding, keeping continuously moist, the application of an approved curing compound or by other means approved by the engineer.
6. No holes or chases other than those shown on the drawings shall be made unless approved by engineer. Pipework passing through footing beams shall be to the approval of the engineer and shall be wrapped with a compressible material of minimum 6mm thickness.
7. Formwork and stripping times shall comply with AS3610. Remove formwork only when concrete has attained its design (f'c) strength unless otherwise instructed by the structural engineer.
8. Control, expansion and contraction joints shall be constructed as detailed. Saw cut joints shall be made within 12 hours of concrete placement.
9. All mesh to conform with AS1304.
10. Reinforcement shall be in accordance with the following standards:
    R Indicates plain reinforcing bar R250N to AS/NZS4671
    L Indicates plain or deformed wire R500L or D500L to AS/NZS4671
    RL Indicates deformed rectangular mesh D500L to AS/NZS4671
    SL Indicates deformed square mesh D500L to AS/NZS4671
    N Indicates deformed bars D500N to AS/NZS4671
    S Indicates deformed bars D250N to AS/NZS4671
    TM Suffix indicates trench mesh using deformed bars D500L to AS/NZS4671
11. All galvanized items which are cast into concrete are to be passivated in a 0.2% sodium dichromate solution or equivalent.
12. All formwork shall be rigidly constructed of approved material. Formwork and supports shall be designed to withstand all possible load combinations during construction.

BAR DIAMETER (LARGEST)	LAP
12	600
16	800
20	1000
24	1200
28	1400
32	1600

Note: To be used U.N.O

14. Chemset Anchors U.N.O to be M16 HCR 8.8 rods with HILTI-HIT-HY-200 Adheisive minimum 150mm embedment. Installed in accordance with Manufacturers Specification and Installation Procedure.

FOUNDATIONS

1. Design is based on an allowable bearing pressure of 150kPa. It is the builder's responsibility to confirm the foundation type prior to commencing construction. Should the foundation type or bearing capacity not satisfy the above criteria the builder shall immediately contact engineer prior to construction proceeding.
2. Builder to grub out and remove all organic material and debris from the building platform.
3. Any soft areas shall be dug out and replaced with approved non-plastic fill.
4. All site preparation works shall be in accordance with site specific Geotechnical report and requirements.
5. Ensure a minimum of 8 blows per 300mm is achieved with a calibrated Perth Sand Penetrometer in accordance with AS1289.6.3.3
6. The building platform is to be shaped to ensure it drains to its perimeter and that such drainage is taken away from the platform area.
7. Footings at the lowest level must be the first footings constructed.
8. Located plumbing lines over top of footings and step footings.

MASONRY

1. All blockwork and brickwork shall be in accordance with AS3700
2. Concrete blocks shall be in accordance with AS2733
3. Reinforcement and concrete core filling shall comply with the notes on "concrete and reinforcement".
4. Mortar shall be classification M3 or M4 within 1km of open water or other severe corrosive environments. All mortar mix to AS3700.
5. Masonry units shall have a minimum compressive strength of 15MPa.
6. As follows:
   a. Bond beam reinforcement shall be continuous at intersecting walls and bars anchored and lapped to develop full tensile stress.
   b. Support reinforced brick lintels for 14 days minimum.
7. Cleanout blocks shall be provided at the base of all cores to be concrete filled. Alternatively the builder shall open such cores for cleaning by an approved method.
8. All cores to be concrete filled shall be cleaned out by hosing prior to final setting or mortar at all lifts or by rodding prior to concrete filling.
9. Retaining walls shall be fully core filled. Backfill to retaining walls shall not be carried out until 14 days after core filling.
10. Provide 10mm stack bonded control joints where shown. Control joint to consist of flexible masonry anchors every 3rd course. Brunswick type MFA 3/3. Apply flexible sealant over backing rod.
11. Cross walls shall be fully bonded for the full height of intersecting wall.
12. Horizontal chasing is not permitted without written approval from the engineer.
13. Lap wires 500mm at splices and around corners and COG 500mm into intersecting walls. 20mm cover to all wires.
14. All wires in external face of external leaf to be galvanised to AS/NZS4680.
15. Masonry ties are to be provided at no more than 600mm spacing in each direction, and max 300mm from top of wall, side of control joint or perimeter of opening.
16. Ties to be grade 316 stainless steel in corrosive environments.
17. Masonry abutting concrete footings to typically be isolated with 10mm Ableflex expansion foam or similar approved product UNO.

STRUCTURAL STEEL

1. All steelwork shall be in accordance with:
   AS4100 steel structures
   AS4600 cold formed steel structures
2. Fabricator to check all dimensions before cutting materials or manufacturing. fabrication to AS4100 UON. These drawing are to be read in conjunction with the project architectural and other consultants' drawings.
3. Unless noted otherwise all steel shall be:
   a. AS3678 grade 250 hot rolled plates
   b. AS3679.1 grade 300 hot rolled UB, PFC, TFC, TFB, EA, UA and FLATS
   c. AS3679.2 grade 300 WB and WC
   d. AS1163 grade 250 for circular hollow sections Ø165mm and less
   e. AS1163 grade 350 for circular hollow sections larger than Ø165mm and rectangular hollow sections.
   f. AS1397 500MPa for 1.2mm thick purlins and girts
   g. 450MPa for 1.6mm thick purlins and girts
   h. 450MPa for 1.0 thick CF Channels
   i. 450MPa for 1.6mm thick CF Channels
4. Galvanising shall be hot dipped to AS/NZS 4680
5. Bolts shall be galvanised and of sufficient length to exclude the thread from the shear plane. A suitable washer shall be used under all nuts, when tensioning is specified high strength bolts shall be fully tensioned with load indicating washers to the requirements of AS4100.
6. Bolt legend 4.6/S commercial grade 4.6 bolts snug tightened 8.8/S high strength grade 8.8 bolts snug tightened. 8.8/TB high strength grade 8.8 bolts tensioned bearing connection. 8.8/TF high strength grade 8.8 bolts tensioned friction connection.
7. Unless otherwise specified the following shall apply -
   a. Cleats, brackets, stiffeners etc. to be 10mm thick, ex-standard square edge flats U.N.O.
   b. Welding to be carried out in accordance with AS/NZS 1554. 1:1995 welding consumables to be E48XX or W50X U.N.O. all welds to be 6MM CFW SP category U.N.O CPBW to be SP category U.N.O.
   c. Inspection to be carried to AS/NZS 1554.1:1995. All GP/SP welds to be 100% visually scanned. SP welds allow for 25% visual examination U.N.O.
   d. 6mm end plates to all hollow sections (seal weld).
   e. Bolts to be G 8.8/S
   f. Bolt hole clearance 2mm
   g. Hold down bolt clearance 4mm
   h. Grout - a space for 40mm of 2:1 sand: cement mortar of damp earth consistency under all base plates.
   i. Connections - minimum of 2-M16 8.8/S bolts
   j. Bracing intersects on centrelines and centre of gravity for angles.
8. Fabricator shall allow for all cleats and other fixings required by the supervisor.
9. All column base plates shall be set on 20mm min. of 1:2 cement and sand grout.
10. Seal all open ends of pipes or RHS members. Grind off all visible welds and brand marks to neat appearance where specified.
11. See below:
   a. The contractor shall remain responsible at all times for providing all necessary temporary bracing and other supports during erection, to stabilise the partially constructed building.
   b. Particular attention must be paid to the buckling stability of beams and columns prior to the connection of purlins, girts, fly braces and other bracing elements.
   c. It is the responsibility of the builder to obtain proper technical advice wherever necessary to ensure the partially completed structure is safe from collapse.
12. Treatment:
   All steel connection plate and bolts to be hot dip galvanize (600 g/sqm)
   Holding down bolts - hot dip galvanize (600 g/sqm)
13. Bitumen paint all steelwork for 50mm above ground level / top of footing and 100mm into footing depth with Taubmans Interzone or equivalent

STRUCTURAL TIMBER

1. Structural timber shall comply with AS1720 timber structure code.
2. All timber to be seasoned F14, class 2, strength group SD5, joint group JD2 and treated with creosote to hazard class H4 unless noted otherwise.
3. All timber work to be in accordance with :
- AS1684 - SAA timber framing code.
- AS1720 - SAA timber structures code.
4. All timber and steel connections to be in accordance with AS1720.
5. Ensure no knots or gum veins in timber used.
6. Coat all timber in contact with ground with bitumen paint or similar approved.
7. All structural details to be confirmed, checked and site measured by builder prior to construction. Report any discrepancies to structural engineer.
8. Treatment :
- H1 - Interior use, above ground.
- H2 - Interior use, above ground, subject to termites.
- H3 - Exterior use, above ground, subject to periodic wetting.
- H4 - Exterior use, in ground, subject to severe wetting.
- H5 - Exterior use, in ground, with or in fresh water.
- H6 - Exposed to marine water.
9. Required bending stress:
- MGP10 fb = 16 MPa
- MGP12 fb = 28 MPa
- F14 fb = 36 MPa
- GL17 fb = 40 MPa
- LVL13 fb = 48 MPa
- LVL15 fb = 59 MPa
- LVL18 fb = 72 MPa
10. All bolted timber connections to be re-tightened at end of project prior to completion, ensure no splitting of timber occurs.
11. All proprietary systems (floor/wall/roofing) to be installed in strict accordance with manufacturer's specifications and details.
12. Bush Poles :
- All timber to AS1720.
- Minimum F11 grade CCA / H4 treated seasoned softwood. S6 strength group.
- Free from decay, shakes & fractures,resin pockets and surface damage.
- Heartwood not to exceed 50% of the diameter at each end or be within 35mm from the surface.
13. Bitumen paint all timber posts/columns for 50mm above ground level / top of footing and 100mm into footing depth with Taubmans Interzone or equivalent

LIMESTONE RETAINING WALL SPECIFICATION NOTES

1. Width 'b' at any height to be no less than half of retained height 'h'. step wall to suit
2. Walls to be built on compacted sand, compact ground under footing to resist 7 blows per 300mm of a standard 16mm dia penetrometer over a depth of 600mm.
3. These walls are applicable to well drained sandy soil conditions only.
4. Walls resisting clay soil pressures and/or hydrostatic pressures to be referred to the engineer.
5. All reconstituted limestone to be first grade quality & free from soft pockets.
6. Rubble shall not be used to fill voids.
7. Reconstituted limestone to have a dry density of at least 1600 kg/m3 and a crushing strength of at least 5mpa.
8. Mortar shall be classification M3 or M4 within 1km of open water or other severe corrosive environments. All mortar mix to AS3700. All mortar joints to be 20mm thick and fully mortared.
9. All topsoil, vegetation and deleterious matter shall be removed from the foundation area.
10. Vertical thickness of wall to be adequately bonded by building in header blocks - refer cross section
11. No backfilling until 7 days after walls have been built.
12. All backfilling shall be carried out using material which shall generally be sandy in nature and free from large pieces of rock to the extent that the material can be compacted using a vibrating plate compactor to meet the requirements of the specification.
13. Backfill shall not be dumped behind wall in a manner which will cause shock loading on the wall
14. Backfill shall be clean sand compacted in shallow (300) layers using light compacting equipment
15. In all cases the backfill material shall be selected such that once compacted, the standard of compaction can be measured using a standard perth penetrometer.
16. Compaction of the backfill material to the front and back of the wall to be compacted 95% modified max dry density.
17. Prior to practical completion the contractor shall provide written certification from a practising structural engineer that the wall construction & backfill compaction has been carried out in accordance with this drawing and the specification.
18. Construction Joints (CJ) shall be constructed within the retaining wall where noted below:
(i) at max. 10m centres along wall face
(ii) where the angle between faces of two walls exceeds 180 degrees, in which case the CJ is to be located on one side of the change in direction, at a distance away from the direction change equal to the base width of the wall.
19. Construction joints shall be 15mm wide and filled with expanded polyethylene (100mm deep) covered with a 25mm deep mastic of colour to match wall mortar. joints are to extend through wall and any fences, but need not extend through base course of limestone wall.
20. Select blocks to ensure intact faces only visible in facework.

ALUMINIUM

1. All Aluminium shall be in accordance with AS1664.
2. All Aluminium welding shall comply with AS1664.
3. Unless noted otherwise, all aluminium to be:
- Plates: Grade 5083 H116/h321 or 5083 H112 Aluminium
- SHS/RHS/CHS: Grade 6060-t5 aluminium
- Fixings: grade 316 stainless steel
- Welds: 5mm continuous fillet, category sp, filler allow to be grade 5186,5356 or 5556 aluminium
4. All fixings into Aluminium members to be stainless steel (SS316) or equivalent capacity aluminium fixings.
5. Provide nylon washers and packers for all and any connections between steel and aluminium.
6. Adequate protective coatings are to be applied to aluminum cast into concrete.

PRECAST CONCRETE

1. All precast units shown are for service conditions only. The contractor is responsible for all casting,lifting, transportation and propping requirements and must satisfy himself that they have been constructed to meet the design criteria noted. Any queries regarding precast concrete units shall be flagged during the tender process. If in doubt, ask.
2. Contractor to obtain Engineer's Design Certification for all elements of precast concrete work as required to the relevant Australian Standards (Lifting, bracing, propping as required).
3. Panels are to be securely propped until designed connections have been installed and are sufficiently restraining panels.
4. U.N.O all chemical anchors fixed into concrete panels to be galvanised HILTI-HAS-E-F rods with HILTI-HIT-HY-200 adhesive.
5. All grout used for panels shall be non shrink high strength grout to achieve min 40mpa compressive strength typ.
6. Precast concrete strength is for final position. Contractor to confirm required lifting strength in accordance with lifting engineers requirements. Shall be no less than 15 MPA.

HDPE DECKING AND BOARDS

1. All HDPE battens and other HDPE members to be supplied and installed in strict accordance with manufacturers specification.

STANDARD NOTES

1. **SET OUT & DIMENSIONS.** THE CONTRACTOR SHALL SET OUT ALL PATHS, WALLS, HARD SURFACES AND ELEMENTS EITHER ON OR OFFSITE PRIOR TO CONSTRUCTION AND SHALL OBTAIN THE SUPERINTENDENTS SET OUT APPROVAL PRIOR TO WORKS COMMENCING. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE. CHECK ALL DRAWING SCALES IN CONJUNCTION WITH DRAWING SIZE.
2. **SERVICES & SITE ASSETS.** THE CONTRACTOR SHALL INVESTIGATE THE NATURE AND LOCATION OF ALL EXISTING SERVICES AND RETAINED SITE ASSETS AFFECTED BY THEIR WORKS. FAILURE TO TAKE DUE CARE SHALL NOT LIMIT THE CONTRACTORS LIABILITIES.
3. **REFERENCE.** THE CONTRACTOR SHALL REFER TO ALL CONTRACT DOCUMENTS. THE SPECIFICATION AND DRAWINGS PRIOR TO AND DURING THE WORKS.
4. **DISCREPANCIES.** NOTIFY SUPERINTENDENT OF ANY SUSPECTED OR KNOWN DISCREPANCIES OR ERRORS PRIOR TO THE ORDERING OF AFFECTED MATERIALS AND OR CONSTRUCTION OF AFFECTED WORKS.
5. **RELEVANT STANDARDS.** THE CONTRACTOR SHALL UNDERTAKE ALL PRICING AND WORKS IN ACCORDANCE WITH CURRENT INDUSTRY BEST PRACTICE AND ALL RELEVANT AUSTRALIAN STANDARDS.
6. **SERVICE LOCATOR.** THE CONTRACTOR SHALL UNDERTAKE A DIAL BEFORE YOU DIG PROCESS PRIOR TO COMMENCING WORKS ON SITE. THE CONTRACTOR SHALL ENGAGE A SERVICE LOCATOR TO MAP THE SPECIFIC LOCATIONS AND DEPTH OF ALL SERVICES AND ADVISE ALL RELEVANT STAFF AND SUBCONTRACTORS IN WRITING PRIOR TO COMMENCING WORKS ON SITE.

REV	DATE	BY	ISSUE OR AMENDMENT
D	18.02.26	JL	ISSUE FOR TENDER
C	03.12.25	JL	REVISED FOR APPROVAL
B	05.11.25	JL	REVISED FOR APPROVAL
A	09.05.25	JL	ISSUE FOR APPROVAL

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SEE 'I:\CURRENT PROJECTS\CATALINA, TAMALA PARK\CLD\DRAWINGS\JOB CODE\ AUTOCAD\JOB CODE\ LANDSCAPE\STAGE 45\NATURE POS\CAT-75-980 NOTES.DWG' LAST EDITED BY 'JL' ON 18.02.26 AT 10:05:43