



Invitation to Tender (ITT)

Kroombit Creek Tributary Stabilisation

Release Date: 23 September 2024

Close Date: 4pm, Tuesday, 14 October 2024





Prepared By

Ben Reimers
Business Systems Leader

A handwritten signature in black ink, consisting of several fluid, connected strokes, positioned above a horizontal line.

Signature

23 Sep 2024
Date

Approval

This document is authorised for release once all signatures have been obtained.

In signing this approval, I agree that this and associated documents meet the Fitzroy Basin Association standards and procedures and have been checked against the Project Scope of Works.

Pamela Jeffery
Acting Chief Executive Officer

A handwritten signature in black ink, featuring a large, stylized initial 'P' followed by several loops, positioned above a horizontal line.

Signature

19 Sept 2024
Date

Contents

| | |
|--|----|
| Part 1: Tender Particulars..... | 5 |
| Part 2: Tender Conditions..... | 7 |
| 2.1 Definitions and Interpretation..... | 7 |
| 2.2 Overview of the ITT..... | 8 |
| 2.3 ITT requirements | 8 |
| 2.4 Preparing a Tender..... | 11 |
| 2.5 Submitting a Tender..... | 13 |
| 2.6 Evaluation | 14 |
| 2.7 General terms and conditions of this ITT | 15 |
| 2.8 Acknowledgement by Tenderers | 17 |
| Part 3: Evaluation of Tenders..... | 18 |
| 3.1 Evaluation Process..... | 18 |
| 3.2 Evaluation Criteria..... | 18 |
| Part 4: Scope of Works..... | 19 |
| 4.1 Introduction | 19 |
| 4.2 Inclusions | 19 |
| 4.3 Exclusions..... | 20 |
| 4.4 Project Execution Plan | 20 |
| 4.5 Geotechnical Report..... | 27 |
| 4.6 Detailed Design..... | 41 |
| 4.7 Contract Requirements | 57 |
| 4.8 Reference Specifications | 61 |
| 4.9 As-Constructed Data and Works Certification..... | 68 |
| 4.10 Quality Management..... | 68 |
| 4.11 Measurement and Payment..... | 70 |
| 4.12 Project Management Authority..... | 71 |
| 4.13 Expected Schedule and Timing..... | 71 |
| Part 5: Returnable Schedules | 73 |
| 5.1 Tender Checklist | 73 |
| 5.2 Schedule 1: Supplier Details Form..... | 74 |
| 5.3 Schedule 2: Insurances..... | 75 |
| 5.4 Schedule 3: Business Licences | 76 |
| 5.5 Schedule 4: Key Personnel | 77 |



| | |
|--|----|
| 5.6 Schedule 5: Non-price Assessment Requirements..... | 78 |
| 5.7 Schedule 6: Price Schedule..... | 79 |
| 5.8 Schedule 7: Contract Term Non-conformances | 80 |
| 5.9 Schedule 7: Tenderer’s Acknowledgement..... | 81 |
| Part 6: Draft Contract..... | 82 |

Part I: Tender Particulars

| # | Item | Details |
|-----|---------------------------|--|
| 1.1 | Program Name | Department of Environment and Science (DES) – Disaster Recovery Funding Arrangements: Environmental Recovery Program |
| 1.2 | Tender Description | <p>Fitzroy Basin Association (FBA) invites tenders to deliver ground works for the DES Environmental Recovery Program.</p> <p>Through this tender invitation, FBA seeks to engage a skilled construction firm to provide the services outlined in Schedule I –Scope of Works.</p> <p>The project involves stabilizing a section of a Kroombit Creek Tributary to combat erosion and enhance the stability of the surrounding area.</p> <p>The location of the site is in Thangool, Queensland (Lat/Long -24.43562, 150.59195).</p> <p>Works are anticipated to commence in July/August 2024 during the “dry season”.</p> |
| 1.3 | Invitation Documents | Part 1: Tender Particulars Part 2: Tender Conditions Part 3: Evaluation of Tenders Part 4: Scope of Works Part 5: Returnable Schedules Part 6: Draft Contract |
| 1.4 | Contact Details | Ben Reimers Business Systems Leader Tenders@fba.org.au |
| 1.5 | Mandatory Site Inspection | Wednesday 2 October, 2024 1pm |
| 1.6 | Clarifications Close | 4pm 10 October 2024 |
| 1.7 | Tender Close | 4pm 14 October 2024 15 Business Days from sending tender out. |
| 1.8 | Method of Lodgement | Electronic lodgement via email to Tenders@fba.org.au |
| 1.9 | Conforming Tender | <p>A Conforming Tender is a Tender which:</p> <ul style="list-style-type: none"> a) is lodged by the Tender Close date and time required in Section 1.7; b) is lodged in the manner required by Section 1.8; c) is signed by an authorised representative of the Tenderer; and d) includes all of the documents outlined in Part 5: Returnable Schedules. <p>FBA may, but is under no obligation to, consider or refuse to consider any Tender which:</p> |

| | | |
|-------------|------------------------|---|
| | | <ul style="list-style-type: none"> a) is lodged after the Tender Close date and time required in Section 1.7; b) is lodged in a manner other than as required in Section 1.8; c) does not strictly conform to the Invitation to Tender in any respect; d) includes assumptions, clarifications or exclusions; or e) is otherwise non-conformant with the requirements of the Invitation to Tender. |
| 1.10 | Tender Validity Period | A Tender shall remain valid and able to be accepted for 120 days from the Tender Close date and time. |

Part 2: Tender Conditions

2.1 Definitions and Interpretation

2.1.1 In this Invitation to Tender (ITT), unless the context otherwise requires, the following definitions apply:

- a. Agreement means the proposed form of agreement between Fitzroy Basin Association and the successful Tenderer (if any), as identified in Part 6: Draft Contract;
- b. Alternative Tender means a Tender proposal which is non-conforming to the requirements outlined in Part 4: Scope of Works that the Tenderer believes will achieve the same or better outcomes for FBA.
- c. Business Day means any day other than:
 - i. a Friday, Saturday or Sunday;
 - ii. a public holiday in Rockhampton, Queensland;
 - iii. 20 to 31 December inclusive; and
 - iv. 1 to 5 January inclusive.
- d. Conflict of Interest means any relationship or other interest between parties that may actually, potentially, or be perceived to compromise judgements, decisions, or actions;
- e. Contract means the Agreement, the Scope of Works and all Scope of Works attachments and specifications;
- f. Contract Work means anything which the successful Tenderer (if any) is or may be required to do under the Contract as described in the Scope of Works or as directed by FBA under and per the Contract;
- g. FBA means Fitzroy Basin Association Ltd. (ABN 30 802 469 401);
- h. Invitation to Tender (ITT) means the Invitation Documents specified in clause 1.3;
- i. Tender means the response to this ITT and the firm Tender to enter into the Contract submitted by a Tenderer to FBA;
- j. Tender Close means the date and time, as identified in clause 1.7, by which Tenderers are to lodge their Tenders, as varied by FBA per clause 1.9e;
- k. Site means the site on which the Contract Work is to be carried out, as specified in Part 4: Scope of Works;
- l. Validity Period means the period specified in clause 1.10, commencing from the Tender Close, for which the Tenderers' Tenders will be valid for acceptance by FBA as extended from time to time; and
- m. Work means the package of works that is the subject of this ITT as described in Part 4: Scope of Works.

2.1.2 The following rules apply unless the context requires otherwise:

- a. the singular includes the plural, and the converse also applies;
- b. a gender includes all genders;
- c. if a word or phrase is defined, its other grammatical forms have a corresponding meaning;
- d. if a party comprises more than one person, each of them is referred to separately, and each is bound severally, and any two or more of them are bound jointly;
- e. headings are for convenience only and shall not affect interpretation;
- f. a reference to writing includes any method of representing or reproducing words, figures, drawings or symbols in a visible and tangible form;
- g. a reference to conduct includes an omission, statement or undertaking, whether or not in writing;

- h. a reference to dollars and \$ is to Australian currency exclusive of GST;
- i. a reference to a person includes a corporation, trust, partnership, unincorporated body or other entity, whether or not it comprises a separate legal entity;
- j. all references to time are to Rockhampton, Queensland time;
- k. mentioning anything after includes, including, for example, or similar expressions, does not limit what else might be included;
- l. correspondence and documentation connected with this ITT will be in English; and
- m. in drawings and technical documentation, the English language, the metric system of measures, and the SI unit system should be used.

2.2 Overview of the ITT

Purpose of this Invitation to Tender

- 2.2.1 This document, which includes Parts 1 to 6 and all Schedules, seeks an Invitation to Tender (ITT).
- 2.2.2 This ITT is issued by Fitzroy Basin Association (FBA) who is seeking Tenders from parties interested in supplying the solution described in the Part 4: Scope of Works. The ITT is a contestable and competitive process. FBA is seeking Tenders from parties who can supply economic, efficient and effective goods, services, or works that represents the best value for money over the whole-of-life of a contract and that can be delivered in a timely manner.
- 2.2.3 The purpose of this ITT is to invite suitably qualified and experienced Tenderers to submit a Tender stating their interest and capability to deliver the goods, services or works described in the Part 4: Scope of Works.
- 2.2.4 This ITT sets out the process that each Tenderer must follow in preparing and submitting its Tender. It also details the process that FBA will use to evaluate Tenders.

2.3 ITT requirements

FBA's terms

- 2.3.1 This ITT, including all Schedules, sets out FBA's terms upon which Tenderers must submit Tenders. These terms are non-negotiable.
- 2.3.2 Any suitably qualified and experienced Tenderer may submit a Tender to this ITT.
- 2.3.3 Each Tenderer should carefully read this ITT to ensure that its Tender complies with FBA's terms. By submitting a Tender, the Tenderer accepts that it is bound, without reservation or variation, by the terms set out in this ITT.
- 2.3.4 FBA is not required to accept any Tender for evaluation that does not comply with these terms.

Indicative timeline

- 2.3.5 The indicative timeline for this ITT is stated in clauses 1.5, 1.6 and 1.7 of Part 1: Tender Particulars at the start of this document. Please note that these dates and times may be subject to change at the sole discretion of FBA. FBA will notify Tenderers of any changes to these dates or times by email to each Tenderer who has uplifted a copy of this ITT (to the email address provided by each Tenderer to FBA).



FBA's Contact Person

- 2.3.6 All enquiries regarding this ITT must be directed to FBA's contact person whose details are provided in clause 1.4 of Part 1: Tender Particulars. FBA requests that email be used for all communications in relation to this ITT.
- 2.3.7 Only the FBA contact person and/or any person authorised by the FBA contact person are authorised to communicate with Tenderers regarding any aspect of this ITT. Where a Tenderer has an existing contract with FBA then business as usual communication, for the purpose of that contract, will continue using the usual contacts. Tenderers must not use business as usual contacts to lobby FBA, solicit information, or discuss aspects of this ITT.
- 2.3.8 FBA will not be bound by any written or oral statement made by any person other than FBA's authorised contact person.
- 2.3.9 FBA may change FBA's contact person at any time. FBA will notify Tenderers of any such change by providing notice to each Tenderer who has uplifted a copy of this ITT.

FBA's obligations

- 2.3.10 FBA's obligations to any Tenderer (including as to any aspect of the Tender process):
- a. are limited to only those obligations expressly set out in this Invitation to Tender; and
 - b. exclude (to the maximum extent permitted by law) any obligations which may otherwise be implied or imposed on FBA under contract, at law, in equity, by statute or otherwise.

Tenderers' obligations

- 2.3.11 Each Tenderer will be considered to have:
- a. examined the ITT and any documents referenced in the ITT and any other information provided by FBA.
 - b. satisfied themselves as to the correctness and sufficiency of their Tender.

Ethics/Canvassing

- 2.3.12 Tenderers must not, in relation to any representative of FBA, directly or indirectly:
- a. approach, contact, lobby or solicit information concerning any aspect of this ITT, or
 - b. attempt to influence, or provide any form of personal inducement, reward or benefit.
- 2.3.13 A representative of FBA includes any employee, consultant, contractor or advisor engaged by FBA. Any Tenderer, who attempts to do anything prohibited by the above clause, may be disqualified from this ITT.
- 2.3.14 Every Tenderer must:
- a. prior to lodging any Tender, obtain or procure any approval, qualification, registration or licence required to be held by the Tenderer to enable it lawfully to lodge any Tender and carry out the Contract Work;
 - b. in preparing and lodging any Tender (including accessing the Site) comply with all applicable laws and legal requirements;
 - c. without limiting paragraph b):
 - i. not collude with, accept any commission from, Tender any commission to, or inflate its Tendered price for the benefit of, any other Tenderer;
 - ii. without limiting any other provision of this ITT, not disclose any part of its Tender to any other Tenderer;

- iii. not enter into any contract, arrangement or understanding with any other Tenderer or any trade, industry or other association to the effect that the Tenderer, if successful, will confer any benefit on any other person;
- iv. not enter any other improper or anticompetitive contract, arrangement or understanding with any other person in connection with the Tender or the Contract Work;
- v. immediately notify FBA, in writing, if at any time it becomes aware of any conflict of interest or any matter that may give rise to a conflict of interest and such notice shall include the steps the Tenderer intends to take to address such conflict of interest or matter;
- vi. address any conflict of interest, or any matter that may give rise to a conflict of interest, to FBA's satisfaction;
- vii. without limiting subparagraph (vi), sign any document (including any statutory declaration) required by FBA in respect of conflicts of interest; and
- viii. comply with FBA's probity and conflicts requirements, as notified in writing from time to time.

Access to Site

2.3.15 Every Tenderer must:

- a. if applicable, attend the Site at the time and date set out for the Scheduled Site Inspection identified in clause 1.5 for the purposes of carrying out such inspection or investigation of the Site as the Tenderer requires;
- b. not access the Site at any time without prior written arrangement of such, confirmed and agreed by FBA, unless it is a publicly accessible site; and
- c. comply with any conditions imposed by FBA in connection with the Tenderer's access to the Site.

No Associations warranties or representations

2.3.16 All information provided to date and provided by FBA in relation to this ITT, is released on the following basis:

- a. such information provides a background only;
- b. FBA makes no representation or warranty other than as expressly set out in this ITT document;
- c. Tenderers rely on all information provided by FBA at their own risk and must seek their own professional advice as appropriate; and
- d. the information may not form part of any subsequent contract documents other than as specified in this ITT.

2.3.17 Tenderers will be responsible for verifying the accuracy and adequacy of information supplied by or on behalf of FBA at their own cost. Should a Tenderer find any discrepancy, inconsistency, error or omission in this ITT, the Tenderer should notify the FBA contact person in writing as soon as reasonably practicable.

Errors and omissions

2.3.18 FBA is under no obligation to check any Tender for errors. Shortlisting of a Tender that contains errors will not invalidate that Tender.

2.3.19 FBA may provide subsequent correspondence if it is found that errors, omissions or further clarification of this document is required. Any subsequent correspondence will be provided (via email) to all Tenderers who have requested this ITT and provided with the ITT documents on the FBA website.

Confidentiality

- 2.3.20 FBA and each Tenderer will keep confidential all information provided by the other. No confidential information will be provided to a third party without the other's prior written consent (other than for the purpose of the preparing or evaluating the Tenderers' Tender).
- 2.3.21 Where a Tenderers' Tender contains information such as intellectual property that it considers should be held confidential the Tenderer must clearly identify the information and mark it confidential or commercially sensitive. The Tenderer may be asked by FBA to indicate the reason why such information should be held as confidential.
- 2.3.22 Tenderers acknowledge that FBA is subject to the Queensland Right to Information Act 2009 ("Act") and information provided by Tenderers may be required to be disclosed under that Act or under any other law or by any court.
- 2.3.23 No advertisement or other information relating to this ITT process or any contract that may arise out of it shall be published in any newspaper, magazine, journal or other advertising medium, or broadcast/dissemination by radio, television or other electronic media without the prior written approval of FBA.

2.4 Preparing a Tender

Clarification Period

- 2.4.1 Each Tenderer must satisfy itself as to the interpretation of the ITT and should, where there is any perceived ambiguity or uncertainty in the ITT documents, seek clarification from FBA's contact person.
- 2.4.2 During the period from the date the ITT is issued to the deadline for Tenderers' questions, stated in clause 1.6 of Part I: Tender Particulars, Tenderers may email FBA's contact person to request clarification of any matter regarding the ITT or to request additional information.
- 2.4.3 All such requests must be by email to FBA's contact person whose details are provided in clause 1.4 of Part I: Tender Particulars of the ITT. In sending the email the Tenderer should receive a receipt email to say that their request been received and read by FBA. Please allow a reasonable period of time for FBA to respond to a request. Requests will be dealt with during FBA's standard working days, Monday to Thursday, excluding days outlined in clause 2.1.1(c).
- 2.4.4 FBA may decide not to respond to any request received after the Clarification Period, although it reserves the right to do so.
- 2.4.5 FBA will issue any clarification or change to this ITT by way of notice by email. A copy of each amendment notice will be emailed to all known Tenderers receiving this ITT and included on the FBA website. All amendment notices will become part of this ITT.
- 2.4.6 FBA will not be bound by any statement, written or verbal made by any person other than FBA's contact person or a person authorised by FBA's contact person.
- 2.4.7 Tenderers may be asked by FBA's contact person to revise or clarify their Tender or provide additional information during the ITT process. These requests will require immediate action and must be responded to in writing within two (2) working days, or the time specified in the request. Otherwise, FBA reserves the right to mark down or not consider the original Tender.

Preparing a Tender

- 2.4.8 Tenders must follow the format set out in Part 5: Returnable Schedules. Tenderers must provide in their Tender all information requested, and in the format specified by FBA, including information stated in clause 1.3 of Part 1: Tender Particulars.
- 2.4.9 Tenderers should limit their Tenders to less than 30 pages, although more pages will not constitute a non-conforming proposal.
- 2.4.10 Failure to provide all information required by FBA will normally result in the Tenderers' Tender being rejected as non-conforming.

Joint Tenders

- 2.4.11 Tenderers may submit joint Tenders, so long as the requirements of this ITT are met. Any joint Tender must clearly:
- identify all of the parties;
 - nominate a single point of contact for joint Tenders;
 - outline the nature of the relationship between the parties for the purpose of the joint Tender;
 - confirmation that all parties are committed to the relationship and the joint Tender;
 - the specific parts of the Part 4: Scope of Works each party will be responsible for delivering;
 - the structures set up by the parties that support good governance and accountability and financial and contract management;
 - any perceived or actual conflicts of interest, and
 - be signed by all parties.

FBA's Consideration of Tenders

- 2.4.12 Subject to the terms of this ITT, FBA shall consider any Tender which complies with and is lodged in accordance with the Invitation Documents.
- 2.4.13 FBA may, in its discretion and without being under any obligation to do so, consider any non-conforming Tender.
- 2.4.14 FBA may consider Alternative Tenders at its sole discretion when accompanied by a Conforming Tender and all documentation outlined in Part 5: Returnable Schedules.
- 2.4.15 Any Alternative Tender should be clearly identified as an 'Alternative ITT Tender' and clearly outline the commercial advantage and value add Tendered to FBA.

Language

- 2.4.16 Responses must be in English.

Tender costs

- 2.4.17 Each Tenderer must meet all its own costs associated with the preparation and presentation and submission of its Tender including any negotiations, site visits or other matters in respect of its Tender.

Reliance on the Tenders

- 2.4.18 Each Tenderer must ensure that all information provided to FBA is complete and accurate. FBA may rely upon all information provided by a Tenderer in its Tender and in any correspondence or negotiations with FBA, or FBA's representatives.

Ownership of documents

- 2.4.19 All documents forming the Tenders will, when delivered to FBA, become the property of FBA. Tenders will not be returned to Tenderers at the end of the process.
- 2.4.20 Ownership of intellectual property rights does not pass to FBA when a Tender is delivered to FBA. However, the Tenderers grant to FBA a license to retain, use, disclose and copy information contained in the Tender for any purpose related to this ITT process [or any subsequent process] – this may include FBA's provision of information to state or commonwealth agencies.
- 2.4.21 All documents comprising this ITT, including all its parts, appendices, attachments, schedules, annexures, variations and addenda and other requirements, remain the property of FBA, but each Tenderer is permitted to use them for the purposes only of compiling its Tender.

2.5 Submitting a Tender

Submitting a Tender

- 2.5.1 Responses must be presented and submitted to FBA in the manner set out in clause 1.9 of Part 1: Tender Particulars.
- 2.5.2 Responses must be delivered by email to FBA by the deadline for Tenders (closing date and time) stated in clause 1.7 of Part 1: Tender Particulars.
- 2.5.3 Only Tenders lodged via the method outlined by clause 1.8 of Part 1: Tender Particulars will be accepted by FBA. A confirmation of receipt email will be sent.
- 2.5.4 By submitting a Tender each Tenderer warrants that all information provided by it to FBA, is complete and accurate in all material respects. Each Tenderer also warrants that the provision of that information, or its use by FBA, will not breach any third party intellectual property rights.

Non-conforming Tenders

- 2.5.5 Without limiting clause 1.9:
- a. a Tenderer must, in any non-conforming Tender, expressly state in detail the extent to which the Tender:
 - i. does not comply in any respect with the requirements of the Tender Documents or relies upon any assumptions;
 - ii. is for the carrying out and completion of the Contract Work on terms which differ from the terms of the Tender Documents (including the Contract); and
 - iii. will benefit or disadvantage FBA by the proposed non-conformity (including the effect on the Tendered price).
 - b. except to the extent expressly stated in the Tender, any Tender shall be deemed to be for the carrying out and completion of the Contract Work on the terms of the Tender Documents (including the Contract).

Alternative form of Tender

- 2.5.6 FBA will accept any alternative form of Tender outside of the Part 5: Returnable Schedules if accompanied by a conforming Tender and conforming aspects of Part 5: Returnable Schedules.



Late Responses

- 2.5.7 FBA does not intend to accept any Tender that it receives after the closing date other than in exceptional circumstances.

Conflict of Interest

- 2.5.8 Please detail any known conflict of interest you may have with FBA e.g. working for other government organisations, for media organisations, personal relationship with any FBA staff or consultants, business relationships with FBA staff or consultants other than providing services to FBA.

2.6 Evaluation

Evaluation

- 2.6.1 FBA will convene an evaluation team comprising members chosen for their relevant expertise and experience.
- 2.6.2 FBA will evaluate each Tender (including any information gathered from presentations, workshops or site visits) in accordance with the methodology set out in Evaluation of Tenders (Part 3).
- 2.6.3 FBA may direct the evaluation team to undertake due diligence relating to any Tender at any time during the evaluation process. FBA may, at its sole discretion, invite independent advisors to evaluate any Tender, or any aspect of any Tender.
- 2.6.4 Tenderers should note that, while FBA may conduct interviews, site visits and reference checks, it intends to base its evaluation primarily on the written Tender submitted in Tender to this ITT. Tenderers are therefore encouraged to submit their best Tender in the first instance.

Clarification

- 2.6.5 FBA may request clarification and additional information from any Tenderer about any aspect of their Tender. FBA is not required to request the same clarification or information from each Tenderer.
- 2.6.6 The Tenderer must provide the clarification or additional information in writing and within the reasonable time notified by FBA. The evaluation team will take such clarification or additional information into account in evaluating the Tender.
- 2.6.7 If a Tenderer fails to respond adequately or in a timely manner to any request for clarification or additional information, FBA reserves the right not to consider the original Tender or may mark down the Tender as a consequence due to a lack of clarity.

Collection of further information

- 2.6.8 Each Tenderer authorises FBA to collect any information (except commercially sensitive pricing information) from any relevant third parties (such as a referee, previous or existing client or any other third party) and to use that information as part of its evaluation of the Tenderer's Tender.
- 2.6.9 Each Tenderer must ensure that all referees provided in support of its Tender agree to provide a reference and are appropriately briefed on the Tender. To facilitate discussions between FBA and referees, each Tenderer waives any confidentiality obligations that would otherwise apply to information held by any referee.
- 2.6.10 FBA is not obliged to contact the Tenderers' referees.

Shortlisted Tenderers

- 2.6.11 Following the evaluation process, the evaluation team may shortlist preferred Tenderers. The preferred Tenderers will be notified and advised by FBA that they have been shortlisted. Such notification does not:
- a. constitute acceptance by FBA of any Tender;
 - b. imply or create any obligation on FBA to enter into negotiations with, or award a contract to any shortlisted party and
 - c. obligate FBA to proceed with any further procurement process in respect of the solution.
- 2.6.12 Each Tenderer that has not been shortlisted will be notified by FBA that its Tender has been unsuccessful.
- 2.6.13 FBA is not obliged to publicise the name of the shortlisted Tenderers, but it may do at its discretion.

Tender validity

- 2.6.14 As a minimum, Tenders shall remain valid, and capable of being accepted by FBA, for the Validity Period specified in clause 1.10.
- 2.6.15 The Validity Period can be extended with the relevant Tenderer's consent, which must not be unreasonably withheld or delayed (in which case, this ITT applies to the Validity Period as extended).
- 2.6.16 The Tenderer must not withdraw, change (including by way of addition or qualification) or otherwise do anything which affects its Tender before the expiration of the Validity Period.

2.7 General terms and conditions of this ITT

Status of ITT

- 2.7.1 Neither the ITT, nor the ITT process shall create any legal relationship between FBA and a Tenderer. Nothing in this ITT will be construed to create any binding contract (express or implied) between FBA and any Tenderer until a written contract is entered into with a successful Tenderer (if any). Any conduct or statement whether prior to or subsequent to the issuance of the ITT is not, and this ITT is not, and must not be deemed to be:
- a. a Tender to contract; or
 - b. a binding undertaking of any kind by FBA.
- 2.7.2 If there is any conflict, or inconsistency between the terms and conditions set out in this ITT and the terms contained in a Tenderer's Tender, the terms and conditions set out in this ITT shall prevail.

Acceptance of Tender

- 2.7.3 Notification (in writing or otherwise) from FBA to any Tenderer that it is a preferred, selected or successful Tenderer will not constitute an acceptance or rejection of any Tender and is not authorisation for that Tenderer to commence the Contract Work.
- 2.7.4 A Tender is not and will not be deemed to be accepted by FBA unless and until a Contract (in a form acceptable to FBA) is executed by both FBA and a Tenderer.
- 2.7.5 The successful Tenderer shall execute the Contract within ten (10) Business Days of the date that the Contract (in a form capable of execution) is emailed to that Tenderer by FBA.

- 2.7.6 Without affecting the successful Tenderer's obligations, until the Contract is signed by both the Tenderer and FBA, there shall not be a binding contract between the parties for the carrying out of the Work as outlined in the Scope of Works.

FBA's rights

- 2.7.7 In addition to any other term described in this ITT, FBA reserves the unrestricted rights, at any time to:
- a. amend, suspend or cancel this ITT;
 - b. vary the Tender Closing Date & Time and notify the Tenderers accordingly;
 - c. waive any irregularities or informalities in this ITT process;
 - d. delete, change or add to any requirement contained in the Part 4: Scope of Works prior to the closing date on the proviso that such changes are minor and Tenderers are notified by a notice provided for in this ITT;
 - e. reject all Tenders;
 - f. reject or accept any non-conformant Tender;
 - g. reject or accept any alternative Tender;
 - h. not proceed to evaluation of Tenders;
 - i. exclude any Tenderer from this ITT process where the Tenderer has breached a term or condition of this ITT;
 - j. liaise with any Tenderer to clarify a Tender, or negotiate with any shortlisted Tenderer without disclosing this to, or doing the same with, any other Tenderer;
 - k. seek clarification on any aspect of any Tender from any Tenderer to the exclusion of other Tenderers and seek further information from such Tenderer/s in respect of that clarification;
 - l. readvertise this ITT process;
 - m. shortlist Tenderers based on their Tender;
 - n. directly negotiate with any shortlisted Tenderer and enter into a final contract with a Tenderer without having to continue with any subsequent procurement process;
 - o. provide, or withhold from any Tenderer information in relation to any question arising in relation to this ITT. Information will only be withheld if it is deemed unnecessary or inappropriate to supply it at the time of the request and/or
 - p. deal separately with any divisible element/s of the Scope of Works (Part 4), or any Tender.

Conflict of Interest

- 2.7.8 Tenderers warrant that, except as notified to FBA under clause 2.5.8, at the time of submitting their Tender, no conflict of interest exists, or is likely to arise, which would affect the performance of their obligations of any contract that may be entered into with FBA arising out of this ITT.
- 2.7.9 In the event of a conflict of interest being identified FBA may, in its sole and absolute discretion, exclude the Tender from any further consideration.

Negotiations

- 2.7.10 Acceptance of a Tender may be subject to negotiations at the sole and absolute discretion of FBA. In any negotiation process, FBA may require the submission of any additional written documents or information that may be required for the purposes of the contract to be entered into under this ITT.
- 2.7.11 Without limiting its other rights under this ITT if, in the sole and absolute opinion of FBA, during final negotiations a Tenderer has retracted, or attempts to retract, representations under which material business, financial, technical and legal issues were resolved during negotiations, FBA may reject the

Tender, discontinue negotiations with that Tenderer, and exercise any other right FBA has under this ITT, at law or otherwise.

No Liability

- 2.7.12 This ITT process does not form a process contract. FBA, its officers, employees, agents or advisors will not be liable in contract or tort or in any other way for any direct or indirect damage, loss or cost incurred by any Tenderer or other person in respect of this ITT process.

Queensland law

- 2.7.13 The laws of Queensland shall govern this ITT and each Tenderer agrees to submit to the exclusive jurisdiction of the Queensland courts, including arbitration and mediation, in respect of any dispute concerning this ITT or the ITT process.

2.8 Acknowledgement by Tenderers

- 2.8.1 Every Tenderer accepts that the Tenderer:

- a. has not relied, and will not rely, upon any FBA-Supplied Information for any purpose (including determining whether or not to lodge a Tender, preparing its Tender, entering into the Contract or performing its obligations under the Contract);
- b. has been or will be provided with FBA-Supplied Information only for the Tenderer's convenience and FBA does not assume any responsibility or duty of care in respect of, give any warranty or guarantee or make any representations as to, FBA-Supplied Information (including its accuracy or adequacy);
- c. shall have no claim of any kind whatsoever and howsoever arising against FBA or any employee, agent or contractor of FBA (whether in contract, tort (including negligence), equity, under statute or otherwise) from or in connection with FBA-Supplied Information (including the provision of, or failure to provide any FBA-Supplied Information); and
- d. must satisfy itself as to and take into account any matter or thing disclosed by any FBA-Supplied Information relevant to the Tender and the carrying out of the Contract Work.

- 2.8.2 The Tenderer shall have no claim of any kind whatsoever and howsoever arising against FBA or any employee, agent or contractor of FBA (whether in contract, tort (including negligence), equity, under statute or otherwise) arising from or in connection with:

- a. any costs, expenses or other liabilities incurred by the Tenderer in preparing a Tender or otherwise in connection with the Tenderer's Tender (whether or not a Tender is lodged by the Tenderer or the Tenderer's Tender is accepted) including any costs, expenses, or other liabilities incurred by the Tenderer in providing any further information or in carrying out any further work at the request of FBA or any of its employees, agents or contractors;
- b. FBA or any of its employees, agents or contractors exercising in its absolute discretion, any discretion or right it has under this ITT or in connection with the Contract Work; and/or
- c. any of the matters or things relevant to the Contract Work in respect of which the Tenderer must satisfy itself under this ITT.

Part 3: Evaluation of Tenders

3.1 Evaluation Process

Evaluation panel

The objective in evaluating each Tender is to obtain the best value for money and not necessarily the lowest Tendered price. If FBA considers any Tender to be ambiguous, erroneous or incomplete, FBA may in its absolute discretion:

- a. consider, or refuse to consider, the Tender;
- b. request further information from the Tenderer; or
- c. request the Tenderer to amend its Tender.

Tenders will be evaluated by a panel of staff chosen for their relevant experience. Evaluation will take place against the Evaluation Criteria outlined in Section 3.2.

Tenderer debrief

Following the successful awarding of the ITT (if any) FBA will offer to debrief the Tenderers who have not been successful. The debrief will be conducted by teleconference or email as requested. The debrief will aim to:

- a. provide the reasons why a Tender was not successful;
- b. explain how the Tender performed against the evaluation criteria, i.e. the strengths and weaknesses of the Tender; and
- c. answer any relevant concerns or questions from the respective Tenderers.

Tenderers should keep in mind the terms of this ITT regarding confidentiality and privacy considerations when requesting information during the debrief. FBA will not provide any information that is comparative to the successful (or any other) Tender or any other commercial-in-confidence information.

3.2 Evaluation Criteria

| Criteria | Key Indicators | Weighting |
|--|---|-----------|
| Price | - Fixed and variable costs | 30% |
| Methodology | - Program of works - Subcontracts - Procedures used - Reporting and recording systems | 20% |
| Capacity | - Proven capacity to deliver similar scale works - Technical expertise and resources available - Ability to deliver in the proposed timeline or reasonably suggested timeline | 20% |
| Experience | - Demonstrated relevant experience - Meets quality standards | 15% |
| Management Systems | - WHS systems and procedures - Quality and project management - Environmental management | 10% |
| Environmental and Social Governance | - Locally based contractor - Environmental sustainability and social initiatives | 5% |

Part 4: Scope of Works

4.1 Introduction

FBA has an outstanding reputation locally, across Queensland and nationally for developing and delivering effective and efficient programs that work with local community, stakeholders, and investors to protect our region's natural assets. FBA is uniquely placed geographically, strategically, and operationally to deliver priority environmental and agricultural outcomes.

FBA is the organisation that can bridge the gap between knowledge and action, and bring projects that combine environmental awareness, increased profitability, and improved production to life.

We are the experts of our region. We translate complex information - explaining legislation, new technologies and changes in best practice in a way that becomes tangible, practical actions land managers and the community can do. We work with all parts of our community to implement evidence-based, accessible solutions that are relevant to our region.

FBA is proud to be one of Queensland's leading natural resource management organisations.

When it comes to the environment, landholders and our local community, FBA is well placed to lead and support projects that protect the future prosperity and resilience of our land and sea.

4.2 Inclusions

The scope includes, but is not limited to:

- Supplying and delivering materials (unless specified otherwise), equipment, labour, site office, supervision, and everything needed for groundworks, earthmoving, pile driving and revegetation activities.
- Contractor responsible for sourcing construction water, including related costs.
- Setting up the site, along with mobilization and demobilization.
- Confirming the line and level of services if identified in "Dial Before You Dig."
- Protecting existing services if necessary.
- Clearing the site, demolishing, removing, and reinstating existing structures like fences as needed to facilitate the work.
- Conducting all necessary excavation and backfilling according to the design for the execution of the works.
- Ensure that erosion and sediment control measures are implemented during construction activities according to best practices or as instructed by project management.
- Seeding cover crops (approved grasses by FBA/landholder) on disturbed areas as needed.
- Carrying out additional minor tasks that support the main project.
- Restoring disturbed areas' surfaces to a standard at least as good as before construction.
- Completing all work required to fulfill the contract per the detailed design drawings and referenced specifications.
- Providing "As-Constructed" drawings, including layout, as-constructed survey information, and elevation model (DEM, DTM, Imagery) before demobilization.
- Adherence to the project execution plan outlined below

4.3 Exclusions

The following items listed are excluded from the scope of works:

- Follow up revegetation activities (irrigation, planting & maintenance)

4.4 Project Execution Plan

The following comprehensive project execution plan meets FBA's requirements for the project:

General Project Costs

Wash-down machinery to meet biosecurity requirements

- Ensure all exterior surfaces, undercarriages, and attachments are adequately cleaned and free from soil, debris, and organic matter.
- Pay special attention to hard-to-reach areas where soil and contaminants may accumulate.(e.g. belly plates, centre hitches, interiors)
- Maintain detailed records of the wash-down activities, including dates, times, locations, a log of where the machine has been, and methods used.
- Ensure all relevant documentation is completed accurately and submitted to the FBA project management team.
- Complete Weed and Seed declaration form. Example included as attachment *Visitor – Weed and Seed Declaration Template.docx*.
- Any deviations from the agreed-upon scope of work must be approved by the project management team in writing.
- Non-compliance will result in the denial of site access for the equipment.

Mobilisation

- Install safety signage and barriers to demarcate work zones and ensure site safety.
- Implement comprehensive safety protocols and procedures to mitigate risks associated with excavation and earthmoving activities.
- Provide comprehensive training on equipment operation, safety procedures, and project-specific requirements.
- Implement a site induction process for all personnel to familiarize them with project objectives and safety protocols.
- Conduct regular safety inspections and toolbox talks to reinforce safe work practices among the workforce.
- Implement environmental protection measures to mitigate potential impacts on surrounding ecosystems and waterways.

Maintain Access Track to Site

- Conduct a site assessment to identify existing track conditions, drainage issues, and potential obstacles.
- Maintain the track alignment to achieve a uniform slope
- Suitable for access to the site by truck and dog trailers, as well as semitrailers.

Pre-Construction / Site Set Out Survey

- Coordinate with project stakeholders to establish survey control points and coordinate access to the site.
- Use survey data to set out zones and alignment.

- Coordinate with project stakeholders to ensure alignment with design specifications and regulatory requirements.
- Address any discrepancies promptly through data adjustment or re-surveying as necessary to maintain integrity.

Clear and Grub Design Footprint

- Obtain approval from FBA prior to clearing of vegetation
- All debris and vegetation, including trees, shrubs, roots, stumps, and other organic material, must be removed from the specified areas.
- The cleared material should be disposed of off-site or in designated on-site locations as per the project's requirements.
- Clearing and grubbing shall be conducted to a depth sufficient to remove all roots and vegetation that could affect the integrity of the bank reprofiling and rock chute construction.

Mulch Woody Vegetation on Top of Bank in Design Footprint

- Only trees and vegetation that directly interfere with the construction activities or are necessary for the project's execution should be removed.
- Trees that do not pose an obstruction to the work or are outside the immediate construction area must be preserved.

As Constructed Survey

- Conduct field surveys to accurately measure and document the locations, alignments, and elevations of constructed elements.
- Capture data on key features.
- Process survey data using specialized software to generate accurate as-constructed drawings, plans, and reports.
- Generate digital terrain models (DTMs) and orthomosaic maps to visualize and analyze the final earthworks conditions.
- Compile all survey data and documentation into a cohesive package for submission to the client and project archives.

Return Site to Original or Improved Condition & Demobilization

- Perform site cleanup activities to remove construction debris, waste materials, and temporary structures.
- Need rubbish bins onsite. No rubbish to be laying around at any time
- All oil spills to be managed by contractor in an environmentally responsible manner
- Restore disturbed areas to their original condition by regrading, seeding, and mulching as necessary.
- Address any environmental concerns or hazards resulting from construction activities.
- Complete any final inspections or walkthroughs to verify that all demobilization activities have been completed satisfactorily.
- Reinstate any fencing and signage to functional and pre-construction standards.
- Conduct a final site inspection to ensure all reinstatement work is complete.

Stabilisation Works

Earthworks

Stockpile Batter Topsoil

- Conduct a site assessment to identify suitable areas for topsoil excavation and stockpiling.
- Exercise care to avoid contamination or mixing of soil designated for topsoil with other materials during excavation.
- Segregate topsoil from large debris.
- Monitor the moisture content of the stockpiled topsoil to prevent excessive drying or saturation.
- Implement regular maintenance practices, such as turning or aerating the stockpile, to promote air circulation and prevent compaction. Additionally, avoid building up the topsoil mound too high to retain moisture and preserve organic activity within the soil.

Chute and Bank Reprofiling Cut

- Excavate material from the designated cut areas to the required depth and profile as shown in the design drawings.
- Implement appropriate stabilization measures such as benching, soil reinforcement, or erosion control to enhance the stability of the batter cut.
- Manage excavated materials in accordance with project requirements and environmental regulations.
- Stockpile or dispose of excess soil and debris responsibly, considering factors such as material quality and site constraints.

Chute, Bank Reprofiling and Existing Channel Fill

- Source suitable fill material from onsite excavation.
- Ensure that compaction is achieved through the normal movement and operation of machinery on-site. No additional compaction with rollers or specific density requirements is necessary. The goal is to achieve uniform compaction naturally as part of the construction activities. However, in areas where space is tight and standard machinery cannot easily access, suitable equipment capable of compacting in those confined spaces will be required to ensure proper compaction.
- Monitor fill slopes regularly and address any erosion or instability issues promptly to prevent potential safety hazards.

Bund Fill

- Clear the area of any obstructions, vegetation, and debris.
- Place the fill material in layers not exceeding 300mm in loose thickness.
- Use appropriate compaction equipment (compaction wheel, track rolling) to compact the fill material.
- Maintain moisture content in the fill material to facilitate effective compaction.
- Shape the bund wall to the specified profile and cross-section, ensuring smooth and even surfaces.

Rock Chute Grade Control Structures

Lay and Compact Granular Filter for Chutes

- Place the granular filter material.
- Compact the granular filter layer using the basic machinery already on-site, such as excavators or loaders, as part of standard construction activities.

Install Geofabric for Chutes

- Overlap adjacent geofabric sheets by at least 300mm (12 inches) or as specified in the design to ensure continuous coverage.
- Use utility knives or scissors to cut the geofabric to fit around obstacles and conform to the chute's profile.
- Secure the geofabric to the ground using staples, pins, or other approved anchoring methods at regular intervals (typically every 1 meter along overlaps and edges).
- Maintain tension in the geofabric during installation to avoid wrinkles and ensure full contact with the underlying surface.
- Repair any damaged sections of geofabric immediately by placing a new piece of geofabric over the damaged area, ensuring an overlap of at least 300mm on all sides.

Construct Rock Chutes

- Construct the rock chute in layers, placing larger rocks at the base and smaller rocks towards the top as specified in the design.
- Key in the larger rocks at the base into the underlying material to provide stability and prevent movement.
- Arrange the rocks to interlock tightly, minimizing voids and ensuring structural integrity.
- Shape and grade the rock chute to the specified profile, ensuring proper alignment and slope as per the design drawings.
- Secure the rock chute by placing additional rocks at the toe and sides to prevent undercutting and lateral movement.
- Compact and stabilize the entire structure to ensure durability and resistance to water flow and erosion.

Key Boulders into the Rock Chute

- Carefully select and position large boulders to ensure they fit tightly within the rock structure. Boulders should be placed so they interlock with surrounding rocks, enhancing the stability and integrity of the chute.
- Key the boulders into the underlying layers of the rock chute. This may involve partially embedding the boulders into the granular filter layer or the supporting rock base to ensure they are securely anchored.
- Orient the boulders in a manner that maximizes their stability. Place them with their largest and flattest sides facing downward to increase contact with the underlying layers and reduce the risk of movement.
- Ensure that each boulder is stable and does not rock or shift under pressure. Adjust surrounding materials as needed to create a solid base for each boulder.
- The goal is to create a continuous and cohesive structure where the large boulders work together with the surrounding rocks to create a more varied and natural flow environment.

Timber Installation

Install Rootball Logs, Piles and Attach Rootball Logs to Piles

- Excavate areas as necessary to prepare for pile driving and log placement.
- Position the rootball logs adjacent to the installed piles, aligning the rootball end with the desired placement direction.
- Position the piles at the specified locations, ensuring alignment with the design.

- Drive the piles into the ground using pile drivers or hydraulic hammers to the specified depth and inclination. Ensure piles are driven to a stable and secure depth to resist movement.
- Drill holes through the rootball logs and into the piles at specified attachment points.
- Securely attach the rootball logs to the piles using fasteners as per project drawings. Ensure that all fasteners are tight and secure to prevent movement.

Enhancement of Nearby Landforms

Use the leftover excavated material to enhance nearby landforms and improve landscape integration within a 1 km radius.

- Conduct a site survey to identify and mark suitable locations for material placement within a 1 km radius of the project site.
- Evaluate the potential impact on the environment and existing landforms.
- Place the material in layers not exceeding 300mm in loose thickness to facilitate compaction and stability.
- spread the material evenly across the designated areas, shaping it to enhance the natural landforms.
- Grade the placed material to achieve the desired profile, ensuring smooth transitions and natural contours.
- Implement necessary stabilization measures, such as the use of erosion control materials and techniques.
- Apply erosion control measures, such as mulch, to prevent soil erosion and promote stability.
- Implement a revegetation plan using suitable seeds, plants, or other vegetation to integrate the enhanced landforms into the surrounding landscape.

Landscaping with Spoil

- Strip the top 100mm layer of topsoil from designated areas using appropriate equipment.
- Handle stripped topsoil carefully to prevent contamination and preserve quality for later use.
- Identify low spots or areas requiring elevation adjustments based on site plans and specifications.
- Transport overburden material to fill identified low spots and achieve desired contours and elevations.
- Lightly compact filled areas to ensure stability and minimize settling.
- Evenly distribute stripped topsoil over filled areas to replace the removed layer.

Paddock Spoil Dumping

- Utilize equipment to strip and handle the top 100mm layer of topsoil from designated areas.
- Spread out dumped spoil material evenly over paddock areas to achieve desired land contours and elevations.
- Lightly compact the dumped spoil material to ensure stability and minimize settling over time.
- Evenly distribute stripped topsoil over the compacted spoil material to restore the top layer.
- Implement erosion control measures such as straw mulching or sediment barriers to prevent soil erosion and sediment runoff.

Revegetation Works

Spread and Incorporate Gypsum into Subsoil

- Ensure the subsoil is suitably moist for effective gypsum incorporation.
- Calibrate the spreader to ensure the accurate application rate of gypsum as specified.
- Spread the gypsum uniformly over the designated subsoil area using a broadcast spreader, drop spreader, or spinner spreader.
- Ensure complete coverage of the subsoil surface with gypsum, avoiding overlaps and gaps.
- Attach a disc harrow or rotary tiller to the tractor for incorporating the gypsum.

- Incorporate the gypsum into the subsoil to a depth of 100-200mm.
- Perform multiple passes with the incorporation equipment to ensure thorough mixing and uniform distribution of the gypsum.

Soil Ripping/Scarifying

- Use the selected equipment to rip/scarify the soil across the designated areas.
- Operate the equipment systematically, following predetermined patterns or grid layouts to ensure comprehensive coverage and uniform ripping depth.
- Adjust equipment settings or operating parameters as needed to maintain the desired ripping depth and effectiveness.
- It's only required if the ground is hard; otherwise, the ground will be sufficiently disturbed through work activities.

Subsoil surface watering in preparation for resspreading topsoil

- Utilise suitable watering equipment such as water trucks, sprinklers, or hoses with sprinkler attachments.
- Use the selected equipment to evenly distribute water over the subsoil surface across the designated areas.
- Control the rate of water application to avoid overwatering or creating waterlogged conditions in the subsoil.
- Monitor soil moisture levels and adjust watering rates as needed to maintain optimal soil conditions.

Respread Topsoil

- Handle topsoil with care to prevent compaction and maintain its structure and fertility during transport and placement.
- Methodically distribute topsoil over the site, following established grading and elevation plans to ensure even coverage and consistent depth.
- Manage moisture levels in the resspread topsoil to promote seed germination and establishment of vegetation.
- Implement watering schedules as necessary to maintain optimal moisture conditions for plant growth.

Applying Soil Ameliorants (Organic Matter, Elemental Sulphur, Seed & Fertiliser)

- Identify the required ameliorants based on soil analysis, project specifications, and vegetation requirements. Procure from reputable suppliers.
- Ensure proper handling and storage of ameliorants to prevent contamination, degradation, or loss of effectiveness.
- Spread the ameliorants evenly over the prepared topsoil surface using appropriate spreading equipment or techniques.

Watering in Ameliorants (Organic Matter, Elemental Sulphur, Seed & Fertiliser)

- Apply water evenly and gently to the area to avoid erosion or displacement of ameliorants.
- Control the rate of water application to prevent overwatering or waterlogging of the soil.
- Monitor soil moisture levels and adjust watering rates as needed to maintain optimal growing conditions.

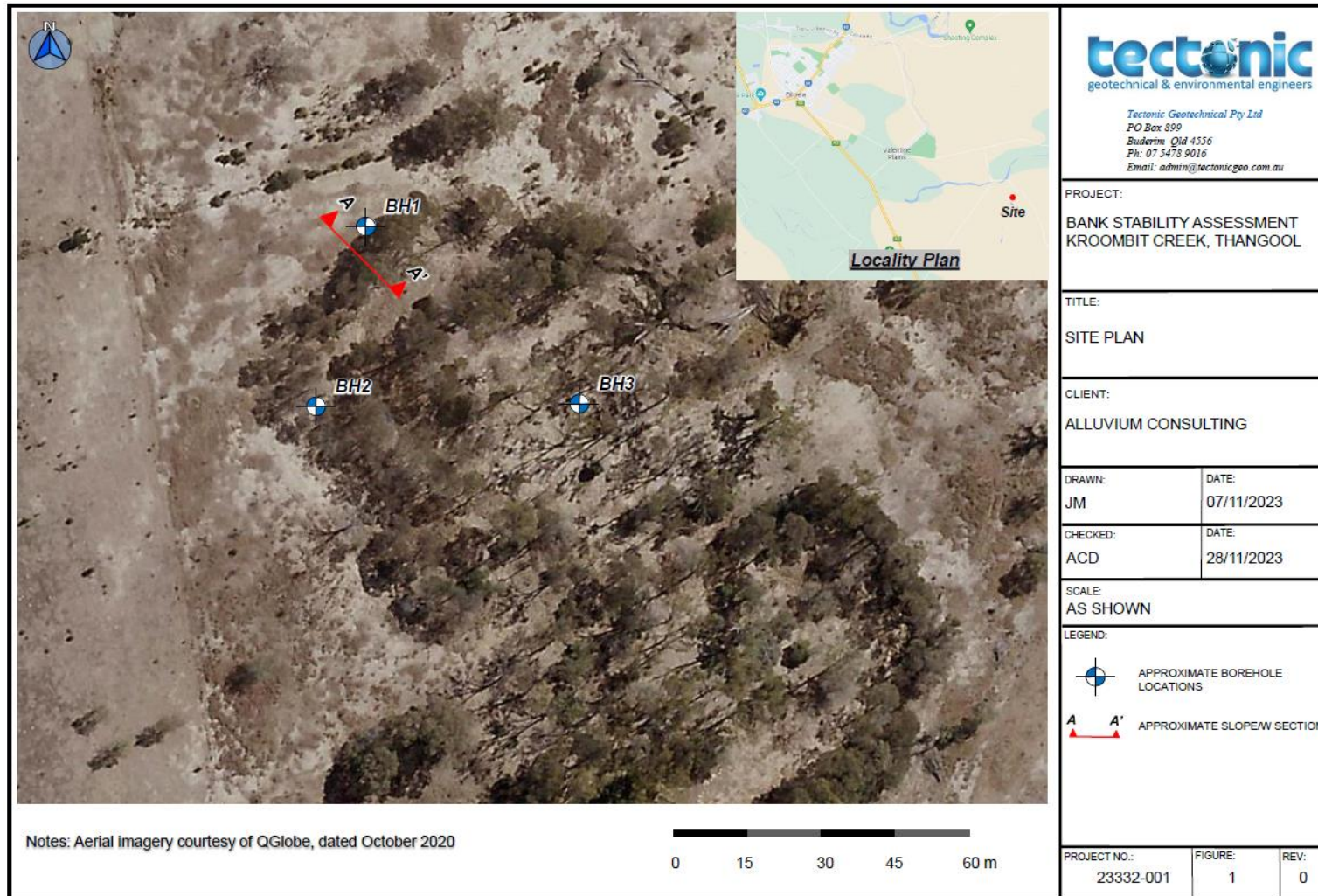
Spread Mulch

- Utilize woody mulch from trees cleared on-site.
- Evenly distribute the woody mulch over the ground surface.



- Ensure uniform coverage and thickness of mulch layer to achieve desired soil protection and moisture retention benefits.
- Pay special attention to critical areas such as slopes, erosion-prone zones, and newly planted areas to maximize erosion control effectiveness.

4.5 Geotechnical Report

















Engineering Log - Borehole

Project No.: 23332-001

| Client: Alluvium Consulting | | Commenced: 24/10/2023 | | | | | | | | | | | | | |
|---|-----------------|-----------------------|--|---------------------------------------|--------|-----------|-------------|-----------------------|---|--------------------|-------------|------------------|-------------------------------|-----------------------|---------------------------------------|
| Project Name: Proposed Bank Stabilisation | | Completed: 24/10/2023 | | | | | | | | | | | | | |
| Hole Location: Kroombit Creek, Thangool | | Logged By: JM | | | | | | | | | | | | | |
| Hole Position: 255734.4 m E 7295363.5 m N MGA2020 Zone 56 | | Checked By: MCC | | | | | | | | | | | | | |
| Drill Model and Mounting: Hydrapower Scout | | Inclination: -90° | | | | | | | | | | | | | |
| Hole Diameter: 100 mm | | Bearing: 360° | | | | | | | | | | | | | |
| | | RL Surface: 199.00 m | | | | | | | | | | | | | |
| | | Datum: AHD | | | | | | | | | | | | | |
| | | Operator: Drillsure | | | | | | | | | | | | | |
| Drilling Information | | | | Material Description and Observations | | | | | | | | | | | |
| Method | Penetration | Water | Samples Tests Remarks | Recovery | RL (m) | Depth (m) | Graphic Log | Classification Symbol | Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour | Moisture Condition | Consistency | Relative Density | Pocket Penetrometer UCS (kPa) | Shear Vane Test (kPa) | Structure and Additional Observations |
| ADIT | Net Encountered | | D6 0.2-0.5m SPT 8,15,16 N=31 | | 199.0 | 1 | | CI | Silty Sandy CLAY, (TOPSOIL), low plasticity, brown, fine to medium grained, with rootlets | VS | | | | | 0.00: TOPSOIL 0.10: ALLUVIAL |
| | | | SPT 7,14,15 N=25 | | 197.0 | 2 | | | trace fine gravels | D to M | | | | | |
| | | | SPT 12,22,18 N=40 | | 196.0 | 3 | | | becoming brown | H | | | | | |
| | | | SPT 8,13,15 N=28 | | 194.0 | 5 | | | | M | | | | | |
| | | | | | 193.0 | 6 | | | | | | | | | |
| | | | | | 192.0 | 7 | | | | | | | | | |
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| | | | | | 112.0 | 87 | | | | | | | | | |
| | | | | | 111.0 | 88 | | | | | | | | | |
| | | | | | 110.0 | 89 | | | | | | | | | |
| | | | | | 109.0 | 90 | | | | | | | | | |
| | | | | | 108.0 | 91 | | | | | | | | | |
| | | | | | 107.0 | 92 | | | | | | | | | |
| | | | | | 106.0 | 93 | | | | | | | | | |
| | | | | | 105.0 | 94 | | | | | | | | | |
| | | | | | 104.0 | 95 | | | | | | | | | |
| | | | | | 103.0 | 96 | | | | | | | | | |
| | | | | | 102.0 | 97 | | | | | | | | | |
| | | | | | 101.0 | 98 | | | | | | | | | |
| | | | | | 100.0 | 99 | | | | | | | | | |
| | | | | | 99.0 | 100 | | | | | | | | | |
| | | | | | 98.0 | 101 | | | | | | | | | |
| | | | | | 97.0 | 102 | | | | | | | | | |
| | | | | | 96.0 | 103 | | | | | | | | | |
| | | | | | 95.0 | 104 | | | | | | | | | |
| | | | | | 94.0 | 105 | | | | | | | | | |
| | | | | | 93.0 | 106 | | | | | | | | | |
| | | | | | 92.0 | 107 | | | | | | | | | |
| | | | | | 91.0 | 108 | | | | | | | | | |
| | | | | | 90.0 | 109 | | | | | | | | | |
| | | | | | 89.0 | 110 | | | | | | | | | |
| | | | | | 88.0 | 111 | | | | | | | | | |
| | | | | | 87.0 | 112 | | | | | | | | | |
| | | | | | 86.0 | 113 | | | | | | | | | |
| | | | | | 85.0 | 114 | | | | | | | | | |
| | | | | | 84.0 | 115 | | | | | | | | | |
| | | | | | 83.0 | 116 | | | | | | | | | |
| | | | | | 82.0 | 117 | | | | | | | | | |
| | | | | | 81.0 | 118 | | | | | | | | | |
| | | | | | 80.0 | 119 | | | | | | | | | |
| | | | | | 79.0 | 120 | | | | | | | | | |
| | | | | | 78.0 | 121 | | | | | | | | | |
| | | | | | 77.0 | 122 | | | | | | | | | |
| | | | | | 76.0 | 123 | | | | | | | | | |
| | | | | | 75.0 | 124 | | | | | | | | | |
| | | | | | 74.0 | 125 | | | | | | | | | |
| | | | | | 73.0 | 126 | | | | | | | | | |
| | | | | | 72.0 | 127 | | | | | | | | | |
| | | | | | 71.0 | 128 | | | | | | | | | |
| | | | | | 70.0 | 129 | | | | | | | | | |
| | | | | | 69.0 | 130 | | | | | | | | | |
| | | | | | 68.0 | 131 | | | | | | | | | |
| | | | | | 67.0 | 132 | | | | | | | | | |
| | | | | | 66.0 | 133 | | | | | | | | | |
| | | | | | 65.0 | 134 | | | | | | | | | |
| | | | | | 64.0 | 135 | | | | | | | | | |
| | | | | | 63.0 | 136 | | | | | | | | | |
| | | | | | 62.0 | 137 | | | | | | | | | |
| | | | | | 61.0 | 138 | | | | | | | | | |
| | | | | | 60.0 | 139 | | | | | | | | | |
| | | | | | 59.0 | 140 | | | | | | | | | |
| | | | | | 58.0 | 141 | | | | | | | | | |
| | | | | | 57.0 | 142 | | | | | | | | | |
| | | | | | 56.0 | 143 | | | | | | | | | |
| | | | | | 55.0 | 144 | | | | | | | | | |
| | | | | | 54.0 | 145 | | | | | | | | | |
| | | | | | 53.0 | 146 | | | | | | | | | |
| | | | | | 52.0 | 147 | | | | | | | | | |
| | | | | | 51.0 | 148 | | | | | | | | | |
| | | | | | 50.0 | 149 | | | | | | | | | |
| | | | | | 49.0 | 150 | | | | | | | | | |
| | | | | | 48.0 | 151 | | | | | | | | | |
| | | | | | 47.0 | 152 | | | | | | | | | |
| | | | | | 46.0 | 153 | | | | | | | | | |
| | | | | | 45.0 | 154 | | | | | | | | | |

Engineering Log - Borehole


Project No.: 23332-001

| Client: Alluvium Consulting | | Commenced: 24/10/2023 | | | | | | | | | | | | | |
|---|--|-----------------------|-----------------------|---|--------|-----------|---|---|---|--------------------|-------------|------------------|-------------------------------|-----------------------|---------------------------------------|
| Project Name: Proposed Bank Stabilisation | | Completed: 24/10/2023 | | | | | | | | | | | | | |
| Hole Location: Kroombit Creek, Thangool | | Logged By: JM | | | | | | | | | | | | | |
| Hole Position: 255726.8 m E 7295328.1 m N MGA2020 Zone 56 | | Checked By: MCC | | | | | | | | | | | | | |
| Drill Model and Mounting: Hydrapower Scout | | Inclination: -90° | | | | | | | | | | | | | |
| Hole Diameter: 100 mm | | Bearing: 360° | | | | | | | | | | | | | |
| | | RL Surface: 199.00 m | | | | | | | | | | | | | |
| | | Datum: AHD | | | | | | | | | | | | | |
| | | Operator: Drillsure | | | | | | | | | | | | | |
| Drilling Information | | | | Material Description and Observations | | | | | | | | | | | |
| Method | Penetration | Water | Samples Tests Remarks | Recovery | RL (m) | Depth (m) | Graphic Log | Classification Symbol | Material Description soil type, plasticity or particle characteristics, secondary and minor components, colour | Moisture Condition | Consistency | Relative Density | Pocket Penetrometer UCS (kPa) | Shear Vane Test (kPa) | Structure and Additional Observations |
| ADVT |  | Not Encountered | SPT 11,10,11 N=21 |  | 198.0 | 1 |  | CI | Silty Sandy CLAY, (TOPSOIL), medium plasticity, brown, with rootlets | D to M | VS | | | | 0.00: TOPSOIL 0.10: ALLUVIAL |
| | | | SPT 11,17,20 N=27 |  | 197.0 | 2 |  | Sandy CLAY, medium plasticity, brown, fine to coarse grained sand, trace silt | | | | | | | |
| | | | SPT 10,17,16 N=33 |  | 196.0 | 3 |  | | | | | | | | |
| | | | SPT 18,24,19 N=43 |  | 195.0 | 4 |  | | | | | | | | |
| | | | |  | 194.0 | 5 |  | | | | | | | | |
| | | | |  | 193.0 | 6 |  | | | | | | | | |
| Hole Terminated at 6.00 m Target depth | | | | | | | | | | | | | | | |
| <div><div><div>Method ADVT-Auger Drilling TC Bit ADV-Auger Drilling V Bit RT - Rotary Tri-cone Bit RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</div><div>Penetration VE - Very Easy E - Easy F - Firm H - Hard VH - Very hard  Core recovered (hatching indicates material) Core loss</div><div>Water Level (Date) Inflow Partial Loss Complete Loss</div><div>Samples and Tests U - Undisturbed Sample (# mm) DS - Disturbed Sample BDS - Bulk Disturbed Sample SPT - Standard Penetration Test</div><div>Moisture Condition D - Dry M - Moist W - Wet Plastic Limit < PL = PL > PL</div><div>Consistency/Relative Density VS - Very Soft S - Soft F - Firm VST - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense R - Friction</div><div>Classification Symbols and Soil Descriptions Based on Unified Soil Classification System</div></div></div> | | | | | | | | | | | | | | | |

Engineering Log - Borehole

Project No.: 23332-001

| Client: Alluvium Consulting | | Commenced: 24/10/2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|-----------------------|-----------------------|---------------------------------------|--------|-----------|-------------|-----------------------|---|--------------------|-------------|------------------|-------------------------------|-----------------------|---------------------------------------|----------------------|--------|---|----|---|--------|---|-----|-----|----------------------|--------|---|--|---|---|-----|-----|----------------------|--------|---|--|--|-----|-----|--|--------|---|--|--|-----|-----|
| Project Name: Proposed Bank Stabilisation | | Completed: 24/10/2023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hole Location: Kroombit Creek, Thangool | | Logged By: JM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hole Position: 255782.7 m E 7295330.3 m N MGA2020 Zone 56 | | Checked By: MCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drill Model and Mounting: Hydropower Scout | | Inclination: -90° | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hole Diameter: 100 mm | | RL Surface: 199.00 m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Bearing: 360° | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Datum: AHD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Operator: Drillsure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drilling Information | | | | Material Description and Observations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Method | Penetration | Water | Samples Tests Remarks | Recovery | RL (m) | Depth (m) | Graphic Log | Classification Symbol | Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour | Moisture Condition | Consistency | Relative Density | Pocket Penetrometer UCS (kPa) | Shear Vane Test (kPa) | Structure and Additional Observations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADIT | | Not Encountered | SPT 12,12,14 N=36 | | 1928.0 | 1 | | CL | Silty Sandy CLAY, (TOPSOIL), medium plasticity, brown, fine to medium grained sand, with rootlets, Sandy CLAY, low plasticity, brown, fine to medium grained sand, trace silt | VS | H | H | 100 | 100 | 0.00: TOPSOIL 0.10: ALLUVIAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | SPT 10,12,16 N=38 | 1937.0 | 2 | CI | becoming medium plasticity, trace fine gravel | D to M | H | 100 | 100 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | SPT 11,17,17 N=34 | 1956.0 | 3 | | becoming pale brown, brown, with clayey sand lenses | H | 100 | 100 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | SPT 16,21,20 N=41 | 1964.0 | 4 | | | 100 | 100 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1981.0 | 5 | | | 100 | 100 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hole Terminated at 5.50 m Target depth | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Method: ADIT - Auger Drilling TC Bit ADIV - Auger Drilling V Bit RT - Rotary Tri-cone Bit RD - Rotary Drilling INULC - Rock Core HA - Hand Auger | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Penetration: VE - Very Easy E - Easy F - Firm H - Hard VH - Very hard | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Water: Level (Date) Inflow Partial Loss Complete Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Samples and Tests: U# - Undisturbed Sample (#mm) DS - Disturbed Sample BDS - Bulk Disturbed Sample SPT - Standard Penetration Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture Condition: D - Dry M - Moist W - Wet | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Consistency/Relative Density: VS - Very Soft S - Soft F - Firm VS - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense Fr - Frangible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plastic Limit: < PL = PL > PL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Classification Symbols and Soil Descriptions: Based on Unified Soil Classification System | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Graphic Log/ Core Loss: Core recovered (hatching) Indicates material Core loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



TERMS USED ON LOGS

DRILLING/EXCAVATION METHOD

| | | | | | |
|-----|----------------|----|--------------------------|------|-----------------------------|
| AD* | Auger Drilling | RA | Rotary Air | BH | Tractor Mounted Backhoe |
| ADH | Hollow Auger | RD | Rotary Blade or Drag bit | EX | Tracked Hydraulic Excavator |
| HA | Hand Auger | RT | Rotary Tri-cone bit | HMLC | Core – 63mm |
| *T | TC-Bit | | | HQ | Core – 63mm |
| *V | V-Bit | | | NMLC | Core – 47mm |
| | | | | NQ | Core – 52mm |
| | | | | R | Ripper |
| | | | | RH | Rock Hammer |


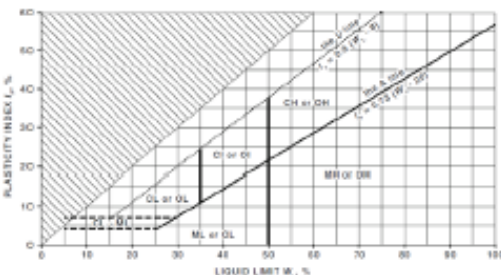
WATER

| | |
|-----------------------------|--|
| GROUNDWATER NOT OBSERVED | The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit. |
| GROUNDWATER NOT ENCOUNTERED | The borehole/test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period. |

SAMPLING AND TESTING

| | |
|-------------|---|
| SPT | Standard Penetration Test to AS1289.6.3.1-2004 |
| 5,4,10 N=14 | 5,4,10 = Blows per 150mm. N = Blows per 300mm penetration following 150mm seating |
| 30/65mm | Where practical refusal occurs, the blows and penetration for that interval are reported |
| RW | Penetration occurred under the rod weight only |
| HW | Penetration occurred under the hammer and rod weight only |
| HB | Hammer double bouncing on anvil |
| DS | Disturbed sample |
| BDS | Bulk disturbed sample |
| SV | Field shear vane test expressed as uncorrected shear strength (s_v = peak value, s_r = residual value) |
| PP | Pocket penetrometer test expressed as instrument reading in kPa |
| U50 | Thin walled tube sample - number indicates nominal sample diameter in millimetres |
| DCP | Dynamic cone penetration test |
| CPT | Electronic cone penetration test |
| CPTu | Electronic cone penetration test with pore pressure (u) measurement |

Rev1
February 2021

| | | | | | | |
|---|---------------------|---|--|--------------|------------------------|------------------|
|  | | | METHOD OF SOIL DESCRIPTION USED ON LOGS | | | |
| CLASSIFICATION AND INFERRED STRATIGRAPHY Soil is classified and described in borehole and test pit logs using the preferred method given in AS1726 – 2017. The material properties are assessed in the field by visual/tactile methods. | | | | | | |
| Particle Size | | | Plasticity Properties | | | |
| Major Division | Sub Division | Particle Size |  | | | |
| BOULDERS | | > 200 mm | | | | |
| COBBLES | | 63 to 200 mm | | | | |
| GRAVEL | Coarse | 19 to 63 mm | | | | |
| | Medium | 6.7 to 19 mm | | | | |
| | Fine | 2.36 to 6.7 mm | | | | |
| SAND | Coarse | 0.6 to 2.36 mm | | | | |
| | Medium | 0.21 to 0.6 mm | | | | |
| | Fine | 0.075 to 0.21 | | | | |
| SILT | | 0.002 to 0.075 | | | | |
| CLAY | | < 0.002 mm | | | | |
| NOTE: The U line is an approximate upper bound for most materials. Data which plot above the U line may represent unusual/problem soil behavior, or unreliable data and should be considered carefully. | | | | | | |
| MOISTURE CONDITION | | | AS1726 - 2017 | | | |
| Symbol | Term | Description | | | | |
| D | Dry | Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery. | | | | |
| M | Moist | Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere. | | | | |
| W | Wet | Soils exude free water. Sands and gravels tend to cohere. | | | | |
| CONSISTENCY AND DENSITY | | | AS1726 - 2017 | | | |
| Symbol | Term | Undrained Shear Strength | Symbol | Term | Density Index % | SPT "N" # |
| VS | Very Soft | 0 to 12 kPa | VL | Very Loose | Less than 15 | 0 to 4 |
| S | Soft | 12 to 25 kPa | L | Loose | 15 to 35 | 4 to 10 |
| F | Firm | 25 to 50 kPa | MD | Medium Dense | 35 to 65 | 10 to 30 |
| St | Stiff | 50 to 100 kPa | D | Dense | 65 to 85 | 30 to 50 |
| VSt | Very Stiff | 100 to 200 kPa | VD | Very Dense | Above 85 | Above 50 |
| H | Hard | Above 200 kPa | | | | |
| In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material. # SPT correlations are not stated in AS1726 – 2017, and may be subject to corrections for overburden pressure and equipment type. | | | | | | |

Rev1
October 2017

4.6 Revegetation Design

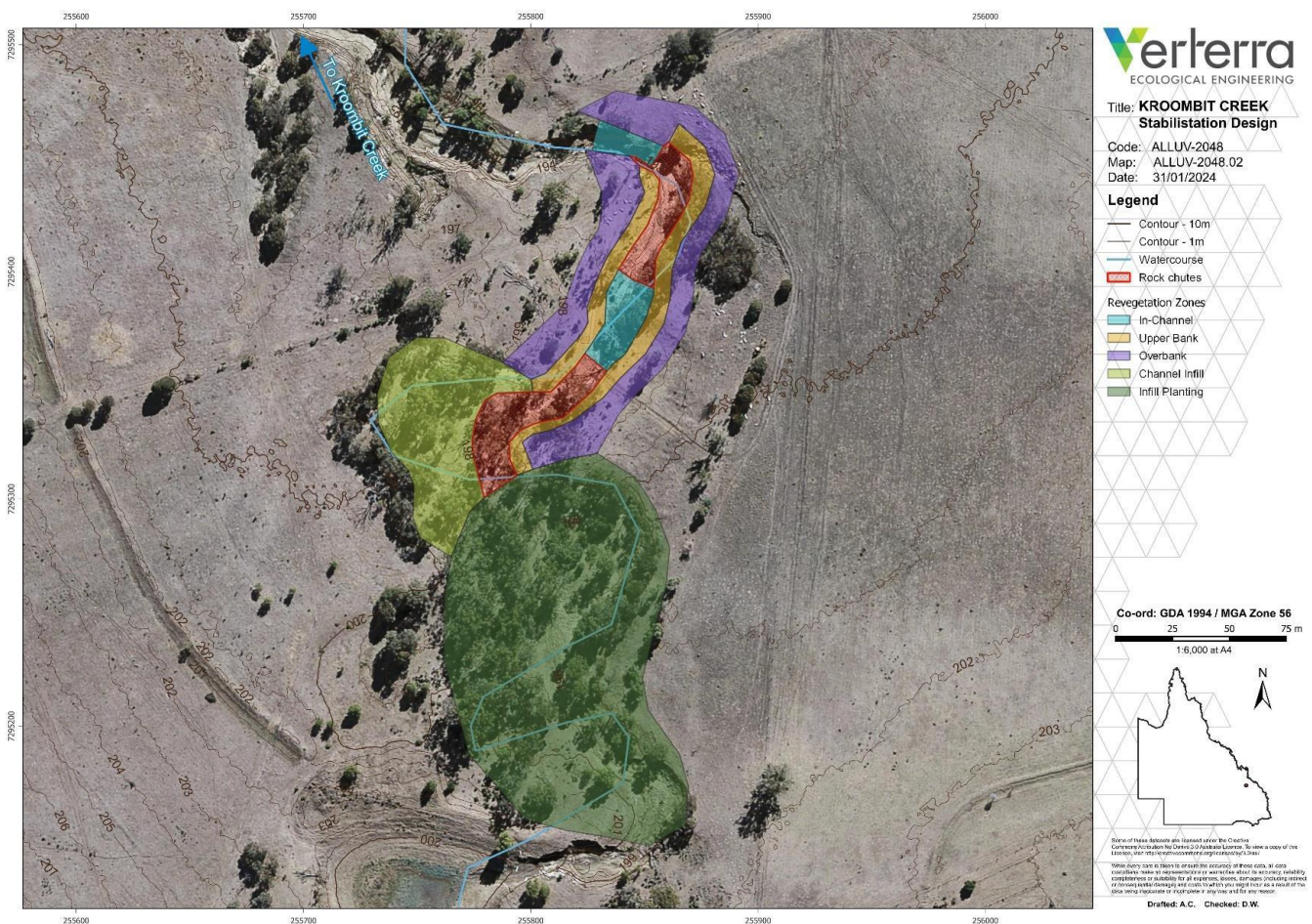
| Aspect | In-Channel | Upper Bank | Overbank | Channel Infill | Infill Planting | Reference |
|--------------------------|---|---|----------------|----------------|-----------------|-----------|
| Length (m) | 69 | 305 | 345 | 90 | 180 | Table 2 |
| Average width (m) | 14 | 7 ^[1] | 15 | 35 | 85 | |
| Area (ha) | 0.098 | 0.220 ^[1] | 0.432 | 0.340 | 1.383 | |
| Grade (assumed) | Existing grade | 1V:3H | Existing grade | Existing grade | Existing grade | |
| Soil Management (kg) | | | | | | |
| Mono-ammonium phosphate | - | 154 | 302 | 238 | 968 | Table 3 |
| Sulfate of potash | - | 33 | 65 | 51 | 207 | |
| Organic matter | - | 1,892 | 3,715 | 2,924 | 11,894 | |
| Gypsum | - | 3,432 | 6,739 | 5,304 | 21,575 | |
| Elemental sulphur | - | 330 | 648 | 510 | 2,075 | |
| Seed Demand (kg) | | | | | | |
| Tree | - | 0.22 | 0.43 | 0.34 | 1.38 | Table 8 |
| Pasture Grass | - | 0.66 | 1.30 | 1.02 | 4.15 | |
| Native Grass | - | 0.66 | 1.30 | 1.02 | 5.15 | |
| Sedge | - | 0.44 | 0.86 | 0.68 | 2.77 | |
| Legume | - | 0.66 | 1.30 | 1.02 | 4.15 | |
| Cover crop | - | 2.20 | 4.32 | 3.40 | 13.83 | |
| Total Seed | - | 4.84 | 9.50 | 7.48 | 30.43 | |
| Tubestock Demand (stems) | | | | | | |
| Tree | - | 165 | 324 | 255 | 519 | Table 9 |
| Sedge-Rush | 196 | 220 | 432 | 340 | 692 | |
| Total Tubes | 196 | 385 | 756 | 595 | 1,211 | |
| Approach | | | | | | |
| Ground preparation | - | Apply gypsum at prescribed rate. Dozer rip subsoil along the contour to 300mm. Water in. | | | - | Table 6 |
| Topsoil application | - | Spread topsoil to 200mm. | | | - | Table 4 |
| Ameliorant application | - | Spread ameliorants (including gypsum for Infill Planting Zone) at prescribed rates. Incorporate to 200mm. | | | | Table 3 |
| Seed application | - | Sow seed mix at prescribed rate. Incorporate to 10mm. | | | | Table 8 |
| Water-in sown seed | - | Water, but avoid runoff. | | | | |
| Tubestock planting | Plant seedlings at prescribed rate. | | | | | Table 9 |
| Fertiliser application | Apply 150g of organic fertiliser per seedling. | | | | | Table 10 |
| Water-in tubestock | Water within four hours, avoid runoff. | | | | | |
| Maintenance | As per establishment and maintenance schedules. | | | | | Table 12 |

Revegetation Zone Characteristics

The stabilisation design has identified four separate revegetation zones. These zones, including their grade and treatment areas, are detailed in the table and figure below.

| Zone | Grade | Treatment Area (m ²) |
|-----------------|-----------------|----------------------------------|
| In-Channel | Existing grade | 981 |
| Upper Bank | 1V:3H (Assumed) | 2,195 ^[1] |
| Overbank | Existing grade | 4,321 |
| Channel Infill | Existing grade | 3,398 |
| Infill Planting | Existing grade | 13,828 |

^[1] Reprofiled zone treatment areas are based on estimated batter surface areas calculated from assumed slope grade.



Topsoil management

Amelioration

Recommended ameliorants are detailed in the following sections.

The table summarises recommended ameliorant application rates and total demands. Noting, ameliorants are not recommended for the In-Channel Zone and have been excluded from the Treatment Area and Total Demand calculations.

Fertiliser blends

To address the topsoil nutrient deficiencies, the following fertilisers are recommended:

- NPKS product with approximately 10 : 22 : 0 : 2 (e.g., Mono-ammonium phosphate);
- NPKS product with approximately 0 : 0 : 41 : 18 (e.g., Sulfate of potash).

The two fertilisers should be procured as a blend to allow for easier application and ensure even coverage over all areas. The fertiliser blend should be surface applied once topsoil has been spread.

Organic matter

Incorporating organic matter (e.g., compost) promotes robust plant development and soil stability, improving soil structure, nutrient retention, microbial health and moisture management. Organic matter should be used to supplement the mineral fertilisers, provide additional soil stability and erosion control and increase the oxidation rate of the elemental sulfur.

Organic matter rates have been recommended based on a product with 50% organic matter content.

Organic matter should be surface applied once topsoil has been spread, and ideally be mixed with the elemental sulphur to maximise microbial oxidation.

Gypsum

Gypsum requirement is a function of soil sodicity, cation exchange, soil treatment depth, and soil bulk density. For most applications it is adequate to assume a soil bulk density of 1.3t/m³. Gypsum application rates should also consider the product purity (typically 90%) and make an allowance of 67% for the sparingly soluble nature of gypsum (i.e., Gypsum should be applied at the theoretical rate for the target soil depth treated and residual ESP post treatment, multiplied by a factor of 1.5).

Gypsum has been recommended at rates to achieve subsoil ESP of <6%.

Gypsum should be surface applied before topsoil spreading occurs in the civil works area. Since the Infill Planting Zone will not have its topsoil stripped, gypsum should be surface applied and incorporated with the other ameliorants (i.e., shallow ripped using harrows or tynes).

Elemental sulphur

Reducing strong soil alkalinity provides a more favourable environment for vegetation establishment. By lowering the soil pH, essential nutrients (P, B, Cu, Fe, Mn and Zn) become more readily available to plants, microbial activity is enhanced, erosion risk is reduced through improved soil structure and the inhibiting effect that alkalinity can have on root development is mitigated.

Soil pH should be reduced by the application of elemental sulphur (S). Elemental S rates have been provided to reduce pH to <8.0. Noting, the mono-ammonium phosphate fertiliser will provide an additional acidifying effect that will aid in pH reduction.

Elemental sulphur should be surface applied once topsoil has been spread, and ideally be mixed with the organic matter to maximise microbial oxidation.

| Ameliorant | Application Rate (kg/ha) | Treatment Area (ha) | Total Demand (tonnes) |
|-------------------------|--------------------------|---------------------|-----------------------|
| Mono-ammonium phosphate | 700 | | 1.66 |
| Sulfate of potash | 150 | | 0.36 |
| Organic matter | 8,600 | | 20.42 |
| Gypsum ^[1] | 15,600 | | 37.04 |
| Elemental S | 1,500 | | 3.56 |

^[1] Gypsum rates are based on reducing the subsoil ESP to <6% and should be applied before topsoil spreading where possible.

Topsoil Demand

All available topsoil will be returned to the project area with all disturbed areas (0.99ha) requiring topsoil be spread to a minimum of 200mm (1,983m³).

Due to the erosion features and creek bed through the section, topsoil may need to be stripped to a deeper depth to provide enough volume for respreading. I.e., if an 80% recovery rate is assumed, topsoil should be stripped at a minimum of 250mm to allow for the minimum 200mm spreading depth.

A summary of various topsoil stripping and spreading depth volumes is in Table 4. Topsoil stripping, stockpiling and spreading is subject to detailed construction design and is not discussed in detail here as a schedule of quantities is yet to be developed.

| Revegetation Zone | Area (m ²) | Topsoil volume of 200mm depth (m ³) | Topsoil volume of 250mm depth (m ³) | Topsoil volume of 300mm depth (m ³) |
|-------------------|------------------------|---|---|---|
| In-Channel | NA | NA | NA | NA |
| Upper Bank | 2,195 | 439 | 549 | 659 |
| Overbank | 4,321 | 864 | 1,080 | 1,296 |
| Channel Infill | 3,398 | 680 | 850 | 1,019 |
| Infill Planting | NA | NA | NA | NA |
| Total | 9,914 | 1,983 | 2,479 | 2,974 |

Revegetation approach by zone

Subsoil amelioration, topsoil management and revegetation will follow completion of civil earthworks, which includes the installation of two rock chutes, the battering of eroded banks and the backfilling of the original channel alignment.

A summary of the revegetation task sequence for each Zone is presented in the table.

Revegetation risks and controls are detailed in Appendix 2. Hold points and quality assurance steps are detailed in Appendix 3.

| Task | Description | Rate/ Frequency/ Ref |
|--|--|--|
| Upper Bank, Overbank and Channel Infill Zones | | |
| Ground preparation | <p>Spread gypsum over final landform at prescribed rate using appropriate machinery (e.g., centrifugal/belt spreader).</p> <p>Dozer rip subsoil to 300mm. Rip to a maximum of 1m separation and leave surface rough-textured.</p> <p>Water subsoil surface, ensure that surface runoff is avoided.</p> <p>Spread treated topsoil to a minimum 200mm, or as per Detailed Design or Schedule of Quantities.</p> <p>NOTE: Ripping will be along the contour.</p> <p>NOTE: Grade control structures will be installed prior to revegetation works.</p> | <p>Table 3</p> <p>300mm depth (maximum)</p> <p>2mm/ha (20,000L/ha). Once.</p> <p>200mm depth (minimum)</p> |

| Task | Description | Rate/ Frequency/ Ref |
|---|--|---|
| Amelioration | Apply ameliorants at prescribed rates using appropriate machinery (e.g., centrifugal/belt spreader). Incorporate ameliorants to a maximum of 200mm with harrows or offsets. | Table 3 200mm depth (maximum) |
| Infill Planting Zone | | |
| Amelioration | Apply ameliorants (including gypsum) at prescribed rates using appropriate machinery (e.g., centrifugal/belt spreader). Improving water infiltration rates and encouraging ground cover in this zone will reduce pressure on the adjacent banks and batters. Opportunisticly dozer rip (tynes max 1m separation) to a maximum 200mm to incorporate ameliorants. Observe ripping set-back distance from standing mature trees to minimise lateral root damage (e.g., beyond the drip line). | Table 3 200mm depth (maximum). |
| Upper Bank, Overbank, Channel Infill and Infill Planting Zones | | |
| Seeding | Sow seed mix at prescribed rate using appropriate machinery. Incorporate seed mix to maximum 10mm depth. | Table 8 Appendix 6 |
| Watering | Water-in sown seed. Avoid surface runoff during watering events. | 6mm/ha (60,000L/ha) at sowing, then water per maintenance schedule. |
| All Zones | | |
| Planting | Manually plant tubestock (seedlings) at prescribed stocking densities as per recommended palette. Plant sedge species close to the waterline. Incorporate nitrogen-rich organic fertiliser into each tubestock planting hole and surrounds (75g at the base of the planting hole and 75g surrounding the planted tube). | Table 9 Table 10 Appendix 6 150g per seedling |
| Watering | Water-in tubestock within 4 hrs of planting. | 6 litres per tubestock once. |
| | Establishment follow-up watering. | Per maintenance schedule. |

Suite of suitable revegetation species

| | |
|--|---|
| <p>Trees (canopy) species:</p> <ul style="list-style-type: none"> <i>Casuarina cristata</i> <i>Casuarina cunninghamiana</i> <i>Eucalyptus crebra</i> <i>Eucalyptus melanophoia</i> <i>Eucalyptus populnea</i> <i>Eucalyptus tereticornis</i> <p>Trees (sub-canopy) and shrubs:</p> <ul style="list-style-type: none"> <i>Acacia harpophylla</i> <i>Acacia salicina</i> <i>Acacia leiocalyx</i> <i>Alphitonia excelsa</i> <i>Atalaya hemiglauc^[1]</i> <i>Atriplex</i> sp. <i>Bauhinia hookeri</i> <i>Carissa ovata</i> <i>Enchylaena tomentosa</i> <i>Eremophila deserti</i> <i>Eremophila mitchellii</i> <i>Geijera parviflora</i> <i>Lophostemon suaveolens</i> <i>Lysiphyllum carroni</i> <i>Melaleuca bracteata</i> <i>Owenia venosa^[1]</i> <p>Improved Pasture (non-native) species:</p> <ul style="list-style-type: none"> <i>Chloris gayana</i> cv. <i>reclaimer</i> <i>Urochloa mosambicens</i> | <p>Native grass species:</p> <ul style="list-style-type: none"> <i>Aristida latifolia^[1]</i> <i>Aristida leptopoda^[1]</i> <i>Aristida personata^[1]</i> <i>Arundinella nepalensis</i> <i>Bothriochloa bladhii</i> <i>Chloris truncata</i> <i>Dichanthium sericeum</i> <i>Enteropogon acicularis</i> <i>Panicum decompositum</i> <i>Themeda triandra</i> <p>Sedge species:</p> <ul style="list-style-type: none"> <i>Cyperus gracilis</i> <i>Gahnia aspera</i> <i>Juncus</i> sp. <i>Lomandra longifolia</i> <p>Legume species:</p> <ul style="list-style-type: none"> <i>Desmanthus progarides</i> <i>Lablab purpureus</i> <i>Stylosanthes scabra</i> <p>Cover crop species:</p> <ul style="list-style-type: none"> <i>Echinochloa esculenta</i> (summer) <i>Panicum miliaceum</i> (summer) <i>Avena sativa</i> (winter) <i>Lolium multiflorum</i> (winter) |
|--|---|

^[1] If available (species may be difficult to source).

| Stratum | Rate (kg/ha) | In-Channel (0.098 ha) | Upper Bank (0.220 ha) | Overbank (0.432 ha) | Channel Infill (0.340 ha) | Infill Planting (1.383 ha) | Total by stratum |
|----------------------|--------------|-----------------------|-----------------------|---------------------|---------------------------|----------------------------|------------------|
| Kilograms | | | | | | | |
| Tree | 1.0 | - | 0.22 | 0.43 | 0.34 | 1.38 | 2.38 |
| Pasture Grass | 3.0 | - | 0.66 | 1.30 | 1.02 | 4.15 | 7.13 |
| Native Grass | 3.0 | - | 0.66 | 1.30 | 1.02 | 5.15 | 7.13 |
| Sedge | 2.0 | - | 0.44 | 0.86 | 0.68 | 2.77 | 4.75 |
| Legume | 3.0 | - | 0.66 | 1.30 | 1.02 | 4.15 | 7.13 |
| Cover Crop | 10.0 | - | 2.20 | 4.32 | 3.40 | 13.83 | 23.75 |
| Total by zone | 22.0 | - | 4.84 | 9.50 | 7.48 | 30.43 | 52.25 |

| Stratum | Rate (sph) | In-Channel (0.098 ha) | Upper Bank (0.220 ha) | Overbank (0.432 ha) | Channel Infill (0.340 ha) | Infill Planting (1.383 ha) | Total by stratum |
|----------------------|--------------|-----------------------|-----------------------|---------------------|---------------------------|----------------------------|------------------|
| | | Stems | | | | | |
| Tree | 750 | - | 165 | 324 | 255 | 519 ^[2] | 1,263 |
| Sedge | 1,000 | 196 ^[1] | 220 | 432 | 340 | 692 ^[2] | 1,880 |
| Total by zone | 1,750 | 196 | 385 | 756 | 595 | 1,211 | 3,143 |

4.7 Detailed Design

2.4 Geotechnical properties

As part of this study Tectonic Geotechnical and Environmental Engineers were commissioned to undertake a geotechnical investigation. The investigation comprised of the drilling of boreholes at five locations across the site where the civil bank stabilisation works are proposed, in situ strength testing, and laboratory testing. The geotechnical investigation locations for each site are outlined below in Figure 12. The report is provided in Attachment A.

A summary of the results from the boreholes are shown in Table 1. A brief summary of the subsurface conditions at each site is provided below (Tectonic, 2023).



Figure 12. Geotechnical investigation borehole locations at the Kroombit Creek tributary site

The subsurface conditions encountered across the boreholes were generally consistent and comprised of:

- Topsoil – Very stiff, silty sandy clay from ground surface to 0.1 m below ground level (BGL); then
- Alluvium – Sandy clays of generally medium plasticity and hard consistency to borehole termination depths of 5.5 m – 6 m BGL,

Table 1. Summary of subsurface materials

| Bore hole 1 | | Bore hole 2 | | Bore hole 3 | |
|------------------|----------------|------------------|----------------|------------------|----------------|
| | Depth (m) | | Depth (m) | | Depth (m) |
| Silty sandy clay | 0.0 - 0.1 | Silty sandy clay | 0.0 - 0.1 | Silty sandy clay | 0.0 - 0.1 |
| Sandy clay | 0.1 – 6.0 (TD) | Sandy clay | 0.1 – 6.0 (TD) | Sandy clay | 0.1 – 5.5 (TD) |

Bed control works

Bed control works are required limit the headward progression of incision and support the revegetation works. Two rock chute grade control structures are proposed, one at the upstream extent where the channel will be realigned through the meander cutoff development zone, and one at the downstream extent of the works. The abutment protection will continue between the two chutes as a rock toe. Rootball logs will protrude from under the rock toe, in between the chutes and downstream of chute 2, into the channel to increase channel roughness. Rock chute style grade control structures are one of the most effective methods to halt incision. The structures limit deepening by providing a fixed hardened point within the channel bed. Cut-off walls at the crest and toe provide further security against this process. The structures can also lower the hydraulic gradient upstream of the crest which can reduce stream power, aid sediment trapping and increase the likelihood of vegetation establishment. An example of a rock chute in Laidley Creek is shown in Figure 18.

Two bunds should be constructed at the chute entry to convey any floodplain flows into the chutes to reduce the risk of outflanking.

The proposed rock chute alignments are shown in Figure 17, long section of chutes shown in Figure 19, and typical sections shown in Figure 20.

Chute sizing and location

The proposed structure was sized using the industry standard CHUTE program. The downstream boundary conditions adopted for the structures was a normal depth of 0.0025 m/m for chute 1 and 0.008m/m for chute 2 and a Manning's n of 0.055 for both chutes. A factor of safety of 1.2 was adopted to ensure a high likelihood of success and to protect the integrity of the reach upstream.

Chute 1 has a 2.6 m fall from crest to apron and has been designed with a 1V:30H grade. The chute has been designed to be 83 m long. The inputs to CHUTE are shown in Table 5. Chute 2 has a 1.4 m fall from crest to apron and has been designed with a 1V:30H grade. The chute has been designed to be 57 m long. The inputs to CHUTE are shown in Table 6 .

Chute 1 is expected to provide hydraulic control up to a flow rate of around 50 m³/s before it drowns out (this is just above the 50% AEP flow) and Chute 2 up to a flow rate of around 75 m³/s (this is between the 50% and 20% AEP flow). The structure has been designed with crest elevations which tie into the existing and new design surfaces. The finished elevation of the apron of the structure should be located below the existing stream bed elevation and blended into the existing waterway bed downstream (i.e. the top of the apron).

The largest rock size is required for small and large flows with the chute drowning out in moderate flows. A sensitivity test showed that the required rock size and the magnitude of flow that causes the chute to drown out both decrease as chute width widens. The specified rock size has been selected based on CHUTE analysis and experience in designing rock chutes. The structure dimensions and quantities are shown in Table 7.

The rock abutment protection is to be extended upstream approximately 5 m of chute 1 and 22.5 m upstream of chute 2. Rock abutment protection should also extend approximately 22.5 m downstream of chute 1 and 10 m downstream of chute 2. The abutment protection should extend approximately 2 m vertically up the bank. The abutment protection may be modified slightly to protect existing vegetation. All disturbed areas surrounding the works should be reprofiled to a stable gradient (approximately 1V:3H) and blend in with the existing terrain.

Table 5. CHUTE input table for Chute 1 (upstream structure)

| CHUTE - Input Table | | | | About |
|--|---------------|-------|-------------------|-------|
| A design program for rock chutes for stabilisation of river grade and prevention of headward erosion | | | | |
| Input Table | | | | |
| Variable Name | Allowed range | Value | Units | |
| Chute Drop | 0.1-20 | 2.6 | m | |
| Chute Length | 1-200 | 83 | m | |
| Apron Rise | 0-10 | | m | |
| Apron Length | 1-100 | 5 | m | |
| Flowrate (minimum) | | 20 | m ³ /s | |
| Flowrate (maximum) | | 100 | m ³ /s | |
| Chute Width | | 7 | m | |
| Rock Angle of Repose | 30-44 | 42 | degrees | |
| Specific Gravity of Rock | 1.5-3.0 | 2.65 | | |
| Factor of Safety | 1.0-3.0 | 1.2 | | |
| Critical Depth (min) | calculated | 0.941 | m | |
| Critical Depth (max) | calculated | 2.750 | m | |
| Chute Slope | calculated | 0.031 | | |
| Apron Slope | calculated | 0.000 | | |
| Input Warnings | | | | Ok |
| | | | | Ok |
| | | | | Ok |

Table 6. CHUTE input table for Chute 2 (downstream structure)

| CHUTE - Input Table | | | | About |
|--|---------------|-------|-------------------|-------|
| A design program for rock chutes for stabilisation of river grade and prevention of headward erosion | | | | |
| Input Table | | | | |
| Variable Name | Allowed range | Value | Units | |
| Chute Drop | 0.1-20 | 1.4 | m | |
| Chute Length | 1-200 | 57 | m | |
| Apron Rise | 0-10 | 0 | m | |
| Apron Length | 1-100 | 2 | m | |
| Flowrate (minimum) | | 20 | m ³ /s | |
| Flowrate (maximum) | | 100 | m ³ /s | |
| Chute Width | | 7 | m | |
| Rock Angle of Repose | 30-44 | 42 | degrees | |
| Specific Gravity of Rock | 1.5-3.0 | 2.65 | | |
| Factor of Safety | 1.0-3.0 | 1.2 | | |
| Critical Depth (min) | calculated | 0.941 | m | |
| Critical Depth (max) | calculated | 2.750 | m | |
| Chute Slope | calculated | 0.025 | | |
| Apron Slope | calculated | 0.000 | | |
| Input Warnings | | | | Ok |
| | | | | Ok |
| | | | | Ok |

Bank reprofiling

Bank reprofiling works are to be undertaken adjacent to the rock chutes where the existing bank slope is near vertical to achieve a stable gradient suitable for native vegetation establishment. It is estimated that 5,050 m³ of spoil will be produced from the chute construction and upper bank reprofiling. The excess spoil generated from earthworks activities will be used to infill the previous low flow channel to the west of the chute (see Figure 17), which will take approximately 1,950 m³, leaving a balance of approximately 3,340 m³. An appropriate disposal site for the excess spoil outside of the immediate floodplain area will need to be negotiated with the landholder. A typical section showing the upper bank reprofiling above the chute and channel infill is presented in Figure 21 and Figure 22.

Top soils should be separated and stockpiled during the earthworks. A 150 - 200 mm layer of topsoil should be placed on the reprofiled bank prior to the installation of erosion matting. It is estimated that topsoil demand at 175 mm across the reprofiled surface at the site is approximately 550 m³. Ripping and stockpiling the top 500 mm within the disturbance area will meet this demand. Soils analysis indicates a moderate to high dispersivity and nutrient deficiencies, and it is therefore recommended that gypsum, organic matter, elemental sulfur and fertilizer blend be incorporated into the topsoil. Soil amelioration is recommended at the prescribed rates in section 3.2 of the detailed revegetation design report (Attachment C).

The earthworks should ensure drainage from the local catchment is not conveyed across the reprofiled bank. This may require small earth bunds to redirect runoff to the river away from the proposed works (i.e. downstream of the works). No ponding of water is allowed within 15m of the top of the reprofiled bank.

3.4 Revegetation works

Revegetation works should be undertaken on all disturbed areas including reprofiled banks above the rock chutes, in channel zone between chutes and downstream of chute 2, and infilled low flow channel and floodplain. Targeted infill planting should be implemented in the floodplain zone immediately upstream of the proposed civil works.

A detailed revegetation design/plan has been developed by Verterra Ecological Engineering for the site is included in Attachment C and is summarised below. The revegetation aims to encourage the rapid establishment of a vegetation community that contributes to bank stability, and a stable landscape that can tolerate creek flows and periodic inundation from the Kroombit Creek tributary and is representative of the surrounding riparian community. Revegetation planting works will proceed as soon as practical after civil works

are completed. However, the revegetation contractor/project manager will work with the civil works contractors in the revegetation planning (including soil management and amelioration), procurement (of seed, seedlings etc.) and management to ensure effective delivery of revegetation works.

Revegetation management zones have been delineated into five discrete zones as outlined below in Figure 23. The soil preparation and management, fertilizing requirements, seeding and planting species/rates/methods and watering requirements have been developed for each zone and are outlined in detail in the revegetation design report (Attachment C).

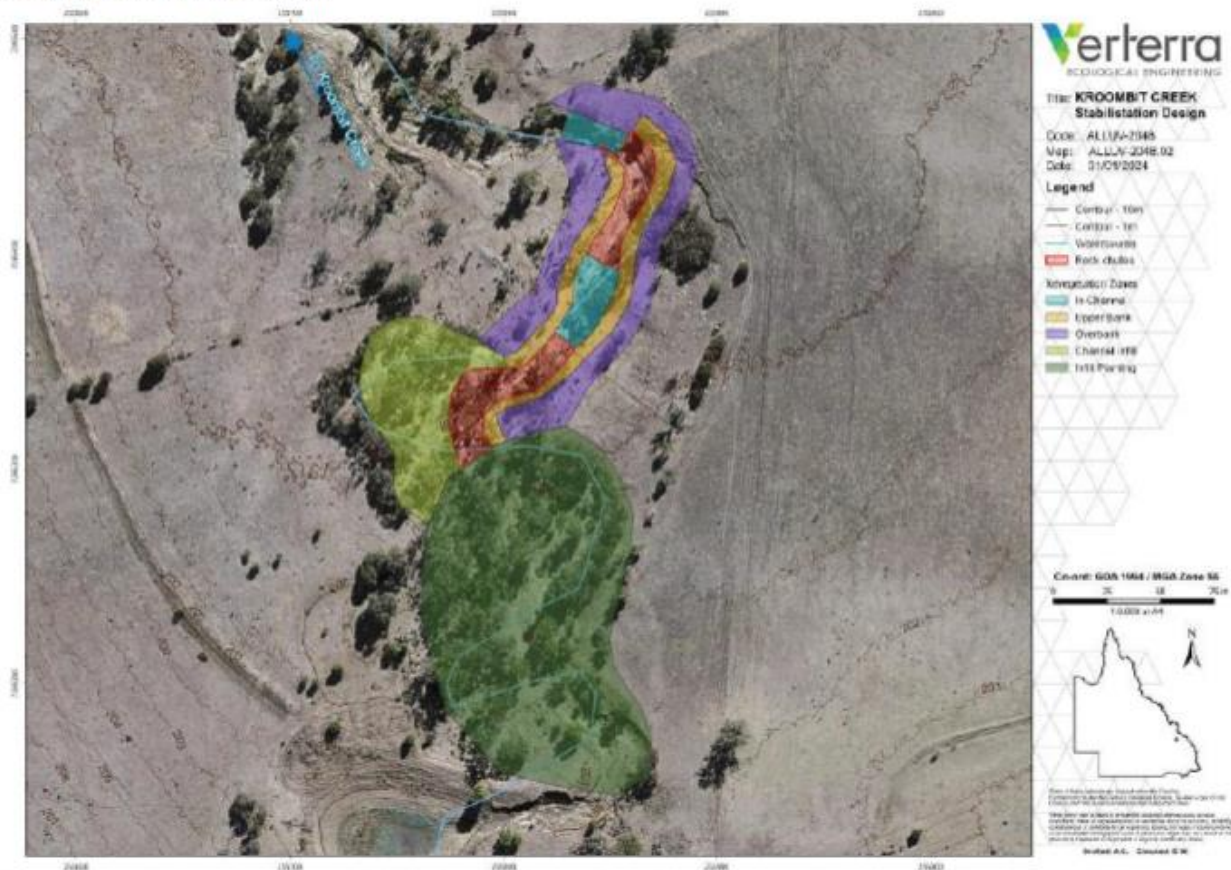


Figure 23. Revegetation zones

The intent is to reinstate a biodiverse riparian zone that is resilient to future flood events. A detailed revegetation maintenance and monitoring program has been developed and is outlined in detailed revegetation plan in Attachment C. With implementation of the maintenance program a good coverage of the bank would be expected in the first one or two-years following establishment. Stock exclusion will maintained to allow for successful establishment of vegetation.

The establishment of robust and diverse riparian vegetation on the bank will be critical to the long term stability of the works.

3.5 Construction management

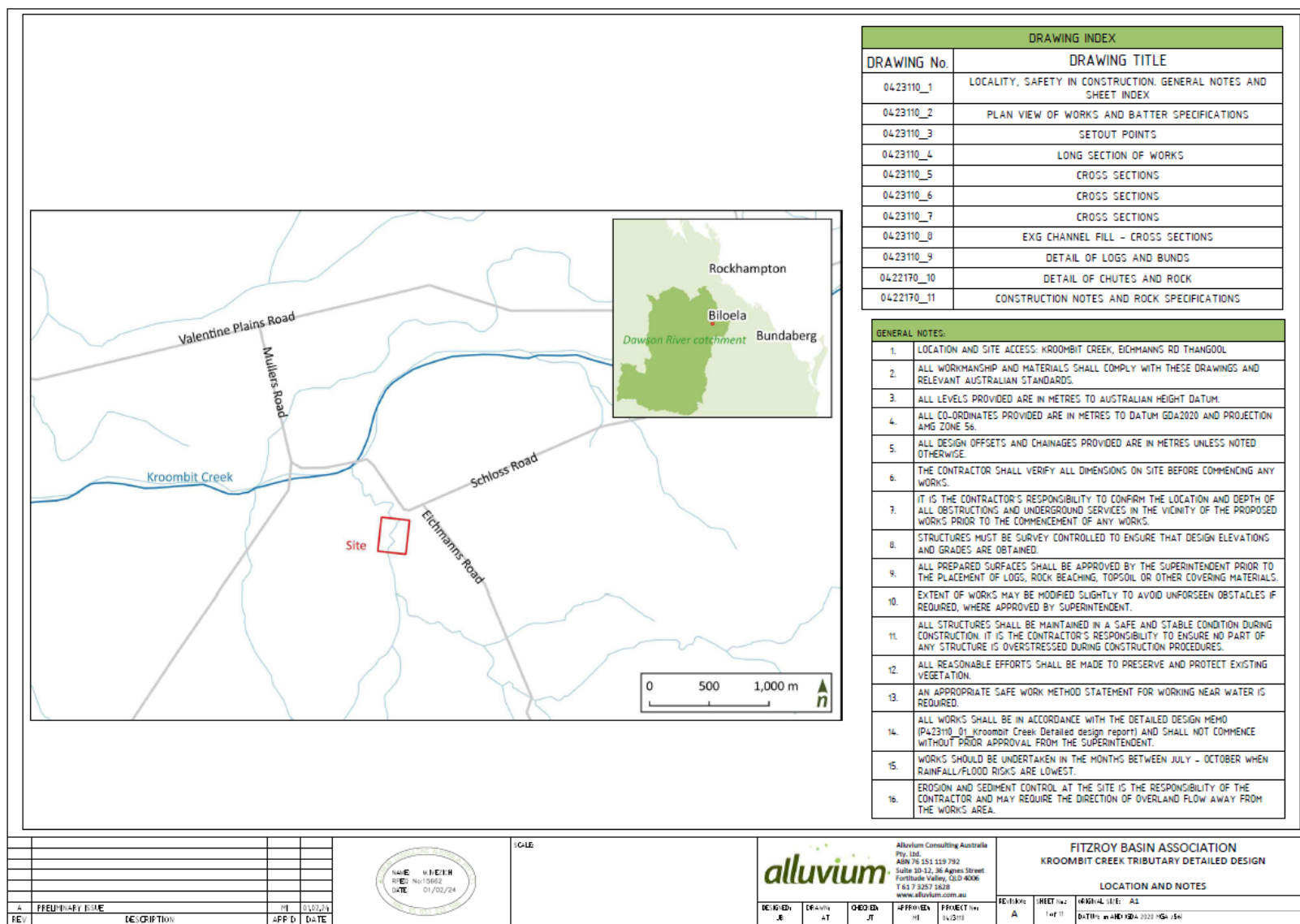
The proposed works have been designed to limit safety hazards during construction and post implementation. The proposed works can be constructed safely providing the appropriate risks of working adjacent to a shear bank and working in and near water are accounted for. This includes limiting slopes to those which are safe to operate machinery and monitor and maintain vegetation. Minimum safety standards for working within site conditions. These include:

- A recommendation that no personnel or plant work within 5 m of the crests of the riverbanks. It is envisaged that any material required as fill would likely to be 'pushed' to the toe from above, with all spoil 'pulled' back.
- Excavations within the natural soils are expected to be achievable using conventional earth moving equipment such as tracked excavators with toothed buckets or small dozers. The proposed permanent bank batters of 1V:3H are acceptable from a geotechnical viewpoint.
- Trafficability for plant will be difficult in wet weather over the silty/clayey soils and consideration should be given to the placement of a coarse granular working surface to provide 'all weather' site access. A minimum thickness of approximately 150 mm is anticipated over the silty/clayey subgrade for light equipment.

It is proposed that the contractor and design engineer identify construction hazards during construction planning and develop mitigation measures and work methods to limit safety hazards. These are likely to include methods for undertaking earthworks near the steep unstable slope and identifying the critical flows in the Kroombit Creek tributary above which it is no longer safe to undertake works at the site.

The development of an appropriate safe work method statement will ensure the safety of contractors during the construction phase. It is recommended that the contractors and the engineer agree on a safe work method statement prior to commencement of the works. The method will need to include the proposed approach for the rock placement. A Safety in Design report has been prepared for the works and is provided in Attachment D.

In addition, guidance by the design engineer should be provided during the construction of the proposed works. Note that it is the contractors responsibility to ensure all underground services have been located prior to the commencement of works.





| CHUTE BOUNDARY SET OUT POINTS | | | |
|-------------------------------|------------|-------------|---------|
| POINT | EASTING | NORTHING | LEVEL |
| 1 | 255788.331 | 7295303.644 | 196.935 |
| 2 | 255781.779 | 7295298.358 | 198.009 |
| 3 | 255772.458 | 7295320.258 | 197.807 |
| 4 | 255775.890 | 7295335.100 | 197.214 |
| 5 | 255783.484 | 7295347.667 | 196.897 |
| 6 | 255803.485 | 7295351.948 | 197.083 |
| 7 | 255813.485 | 7295355.865 | 197.083 |
| 8 | 255813.960 | 7295367.239 | 197.162 |
| 9 | 255826.104 | 7295378.774 | 196.793 |
| 10 | 255826.991 | 7295393.852 | 196.911 |
| 11 | 255834.984 | 7295408.279 | 196.697 |
| 12 | 255846.386 | 7295424.410 | 196.365 |
| 13 | 255851.120 | 7295440.172 | 196.237 |
| 14 | 255857.342 | 7295449.870 | 192.896 |
| 15 | 255867.135 | 7295465.137 | 198.442 |
| 16 | 255878.092 | 7295452.484 | 198.385 |
| 17 | 255880.921 | 7295441.446 | 198.525 |
| 18 | 255873.623 | 7295425.973 | 197.369 |
| 19 | 255861.769 | 7295405.559 | 197.119 |
| 20 | 255862.031 | 7295386.334 | 199.216 |
| 21 | 255860.195 | 7295374.653 | 198.882 |
| 22 | 255846.895 | 7295357.500 | 197.454 |
| 23 | 255832.519 | 7295345.627 | 197.281 |
| 24 | 255815.500 | 7295334.193 | 197.545 |
| 25 | 255803.963 | 7295331.232 | 197.531 |
| 26 | 255798.361 | 7295328.355 | 197.553 |
| 27 | 255794.040 | 7295321.266 | 197.865 |
| 28 | 255797.271 | 7295316.142 | 198.587 |
| 29 | 255796.353 | 7295310.115 | 198.386 |

| EAST BUND HORIZONTAL POINTS | | | | | |
|-----------------------------|----------|------------|-------------|---------|--------------|
| PT | CHAINAGE | EASTING | NORTHING | HEIGHT | BEARING |
| IP 1 | 0.000 | 255797.728 | 7295317.215 | 196.510 | 86°24'16.03" |
| IP 2 | 35.185 | 255832.844 | 7295319.421 | 196.750 | 86°24'16.03" |

| WEST BUND HORIZONTAL POINTS | | | | | |
|-----------------------------|----------|------------|-------------|---------|----------------|
| PT | CHAINAGE | EASTING | NORTHING | HEIGHT | BEARING |
| IP 1 | 0.000 | 255754.500 | 7295279.576 | 199.957 | 75°26'03.25" |
| IP 2 | 13.643 | 255771.705 | 7295283.007 | 198.023 | |
| IP 3 | 18.713 | 255776.175 | 7295285.398 | 198.059 | |
| IP 4 | 24.287 | 255778.879 | 7295290.181 | 198.136 | |
| IP 5 | 29.299 | 255779.517 | 7295295.233 | 197.900 | |
| IP 6 | 34.875 | 255780.022 | 7295300.786 | 197.889 | |
| IP 7 | 43.556 | 255777.715 | 7295309.000 | 197.747 | |
| IP 8 | 49.649 | 255774.616 | 7295314.511 | 197.824 | 33°4'44'48.61" |

| CHUTE CENTRELINE HORIZONTAL POINTS | | | | | | | | |
|------------------------------------|----------|------------|-------------|---------|---------|-------------|----------|--------------|
| PT | CHAINAGE | EASTING | NORTHING | HEIGHT | BEARING | RAD/SPIRAL | A-LENGTH | DEFL-ANGLE |
| IP 5 | 32.122 | 255787.439 | 7295303.092 | 196.934 | | R = 15.000 | 10.872 | 41°31'43.14" |
| IP 6 | 41.196 | 255784.609 | 7295311.978 | 196.665 | | R = 30.000 | 2.236 | 4°16'14.61" |
| IP 7 | 45.170 | 255783.689 | 7295315.845 | 196.542 | | R = 17.000 | 0.823 | 2°46'22.23" |
| IP 8 | 48.167 | 255783.136 | 7295318.791 | 196.449 | | R = 15.000 | 1.844 | 7°02'35.96" |
| IP 9 | 51.112 | 255782.952 | 7295321.737 | 196.358 | | R = 15.000 | 3.065 | 11°42'23.17" |
| IP 10 | 53.711 | 255783.320 | 7295324.315 | 196.277 | | R = 15.000 | 1.152 | 4°23'55.34" |
| IP 11 | 58.715 | 255784.425 | 7295329.287 | 196.120 | | R = 15.000 | 5.309 | 20°16'50.25" |
| IP 12 | 64.013 | 255787.279 | 7295333.714 | 195.957 | | R = 15.000 | 1.844 | 7°02'40.33" |
| IP 13 | 67.701 | 255789.643 | 7295336.545 | 195.843 | | R = 13.000 | 0.293 | 1°17'34.70" |
| IP 14 | 67.847 | 255789.739 | 7295336.656 | 195.838 | | | | |
| IP 15 | 67.859 | 255789.747 | 7295336.665 | 195.838 | | | | |
| IP 16 | 74.747 | 255794.766 | 7295342.408 | 195.624 | | R = 12.900 | 13.777 | 61°11'23.11" |
| IP 17 | 88.427 | 255809.421 | 7295339.203 | 195.200 | | R = -11.000 | 11.666 | 59°43'17.81" |
| IP 18 | 96.506 | 255815.299 | 7295345.592 | 194.949 | | R = 10.000 | 3.671 | 21°02'01.92" |
| IP 19 | 98.347 | 255816.963 | 7295346.416 | 194.897 | | | | |
| IP 20 | 98.362 | 255816.981 | 7295346.425 | 194.892 | | | | |
| IP 21 | 100.082 | 255818.543 | 7295347.199 | 194.838 | | R = -8.700 | 3.440 | 22°39'18.44" |
| IP 22 | 103.503 | 255820.802 | 7295349.199 | 194.732 | | R = 10.000 | 0.443 | 2°32'14.57" |
| IP 23 | 106.960 | 255823.791 | 7295352.313 | 194.625 | | R = -15.000 | 3.950 | 15°05'17.77" |
| IP 24 | 110.378 | 255824.875 | 7295355.350 | 194.579 | | R = -15.000 | 2.080 | 7°56'35.97" |
| IP 25 | 114.081 | 255826.126 | 7295358.810 | 194.404 | | R = 15.000 | 3.730 | 14°14'56.54" |
| IP 26 | 118.351 | 255828.570 | 7295362.334 | 194.361 | | R = 20.000 | 4.461 | 12°50'14.78" |
| IP 27 | 125.171 | 255833.612 | 7295366.940 | 194.344 | | R = 20.000 | 1.069 | 3°03'47.76" |
| IP 28 | 131.715 | 255838.832 | 7295371.220 | 194.328 | | R = -15.000 | 10.193 | 38°55'59.03" |
| IP 29 | 141.678 | 255840.901 | 7295381.196 | 194.303 | | R = -16.000 | 4.958 | 17°40'52.22" |
| IP 30 | 152.736 | 255839.701 | 7295392.675 | 194.275 | | R = 22.000 | 17.766 | 44°42'20.43" |
| IP 31 | 167.842 | 255846.192 | 7295400.165 | 194.210 | | R = -14.000 | 2.301 | 9°24'54.99" |
| IP 32 | 172.717 | 255850.932 | 7295409.203 | 193.979 | | R = 25.000 | 1.235 | 2°49'45.49" |
| IP 33 | 182.427 | 255856.327 | 7295417.785 | 193.737 | | R = -25.000 | 7.478 | 17°01'25.17" |
| IP 34 | 189.162 | 255858.095 | 7295424.321 | 193.576 | | R = 35.000 | 5.925 | 9°42'00.59" |
| IP 35 | 197.519 | 255861.609 | 7295431.916 | 193.376 | | R = -12.000 | 2.616 | 12°29'21.34" |
| IP 36 | 202.748 | 255862.728 | 7295437.029 | 193.151 | | R = 18.000 | 0.989 | 3°08'56.09" |
| IP 37 | 209.997 | 255864.937 | 7295444.998 | 193.077 | | R = -10.000 | 12.708 | 72°48'43.93" |
| IP 38 | 219.464 | 255856.108 | 7295450.662 | 192.893 | | R = -15.000 | 1.988 | 7°35'42.63" |
| IP 39 | 225.816 | 255850.336 | 7295453.362 | 192.880 | | R = -15.000 | 4.571 | 17°27'39.40" |

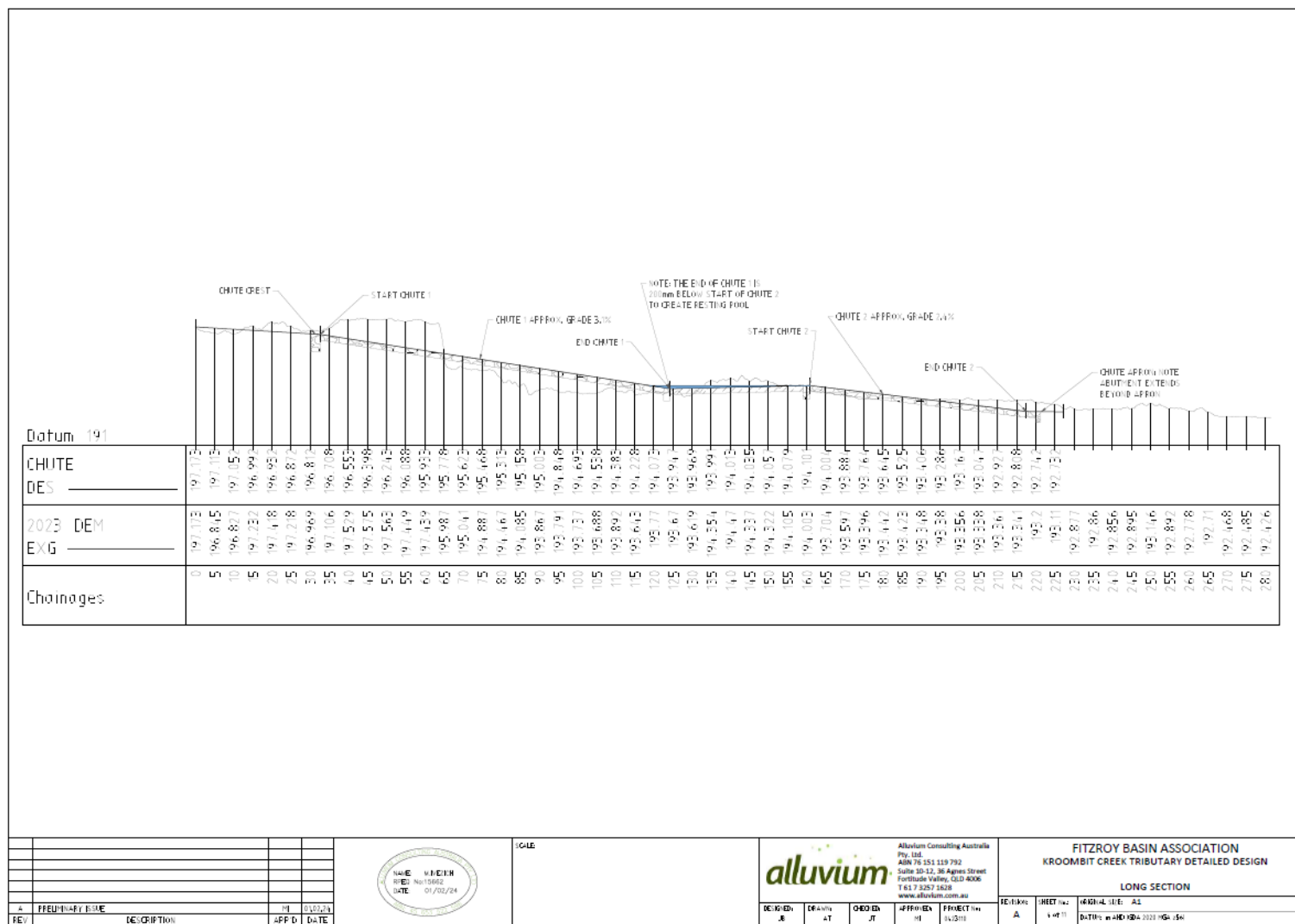
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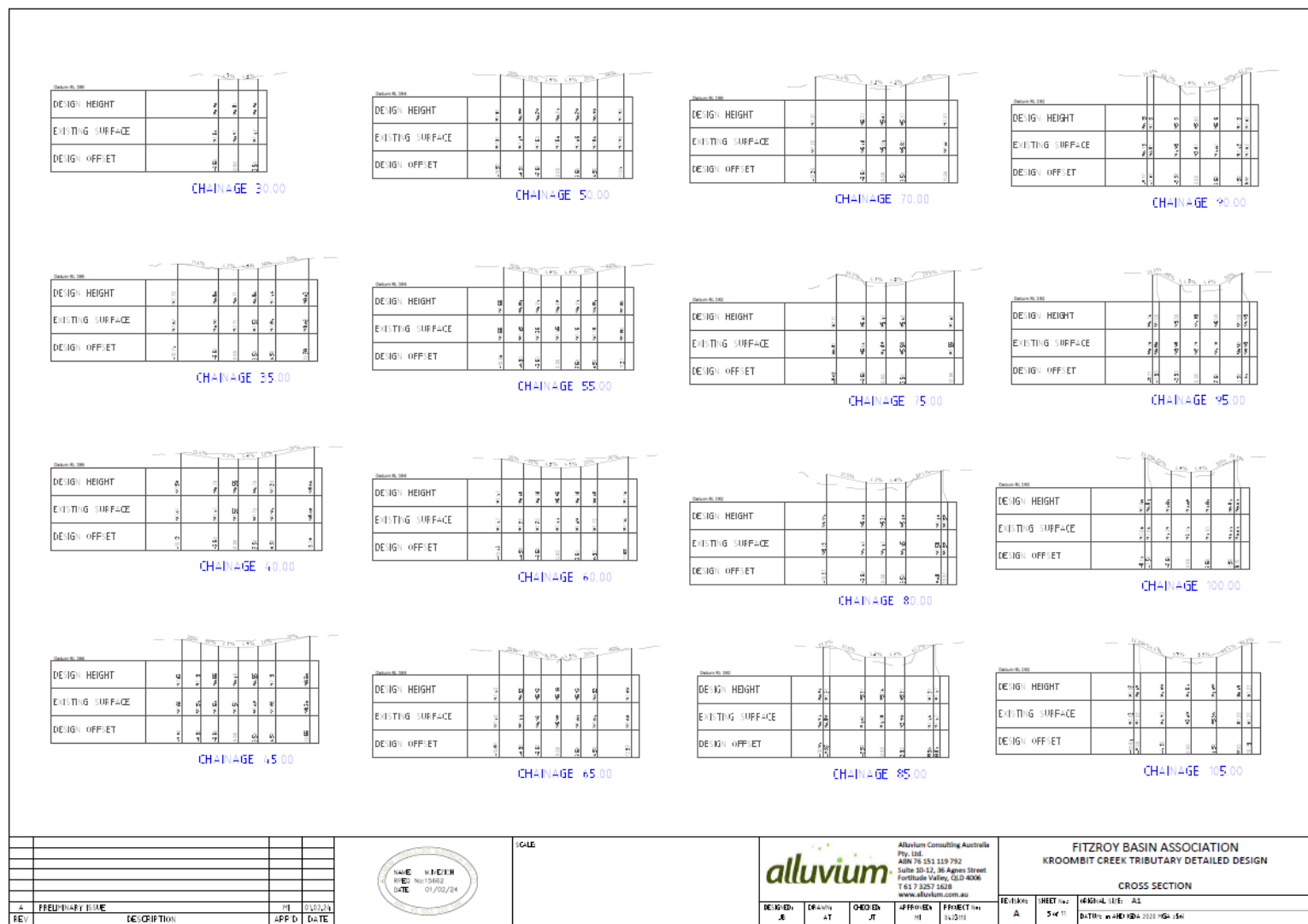


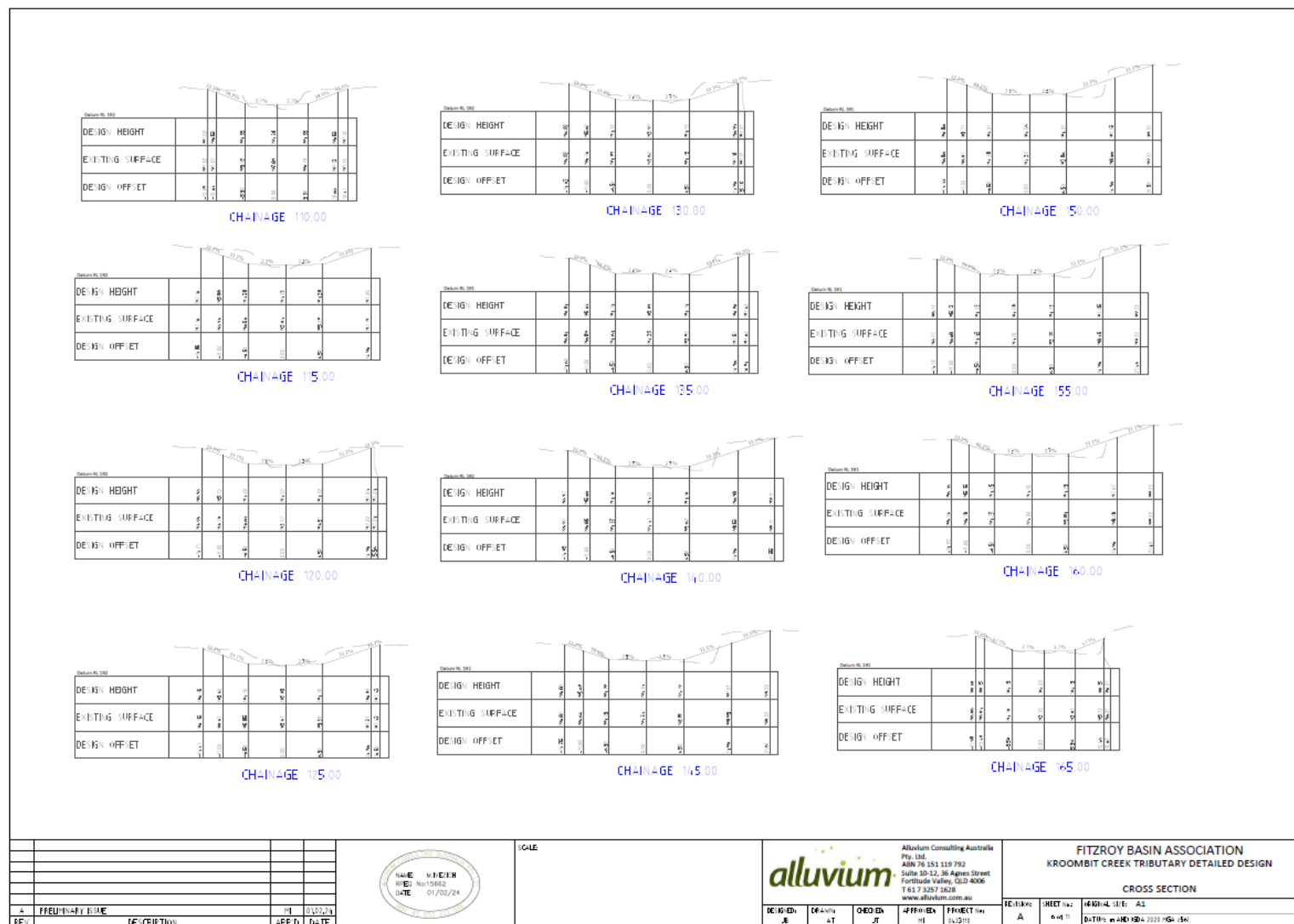
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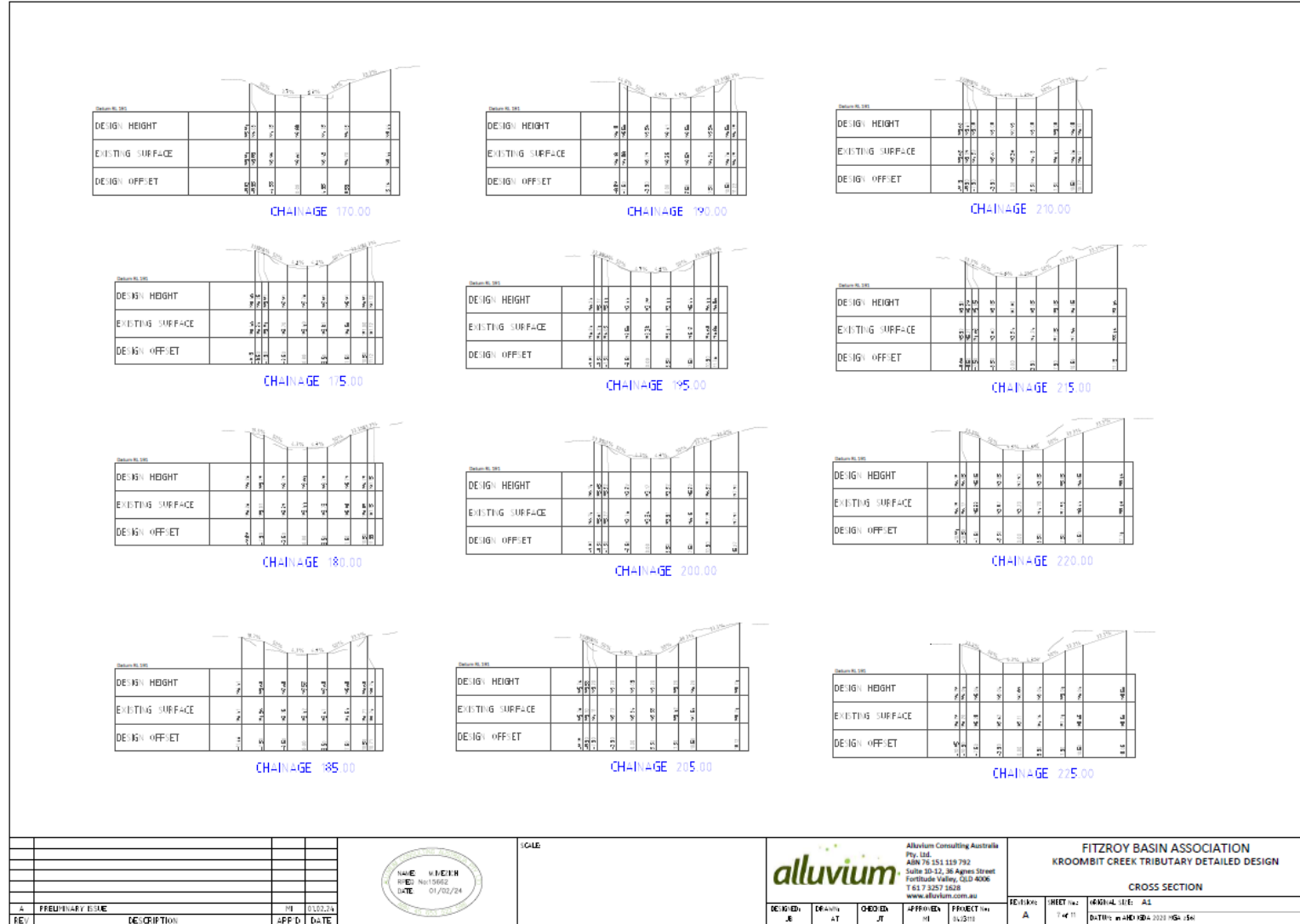
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|  | | | | | Alluvium Consulting Australia Pty. Ltd. ABN 76 551 119 792 Suite 10-12, 36 Agnes Street Fortitude Valley, QLD 4006 161 7 3257 1618 www.alluvium.com.au |
| DESIGNED BY | DRAWN BY | CHECKED BY | APPROVED BY | PROJECT NO. | DESIGNED: A DRAWN: 3 of 11 CHECKED: A APPROVED: A PROJECT NO: A3 |

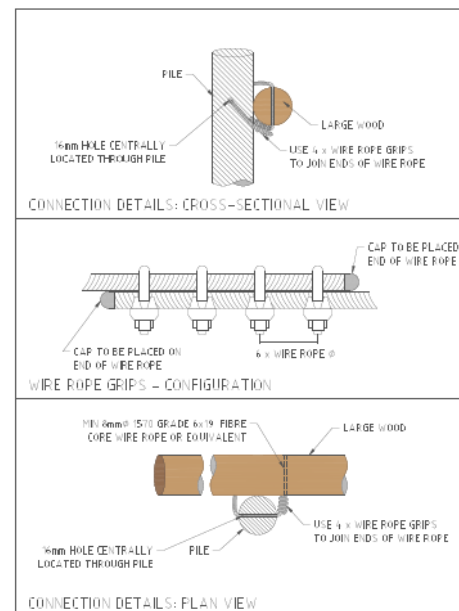
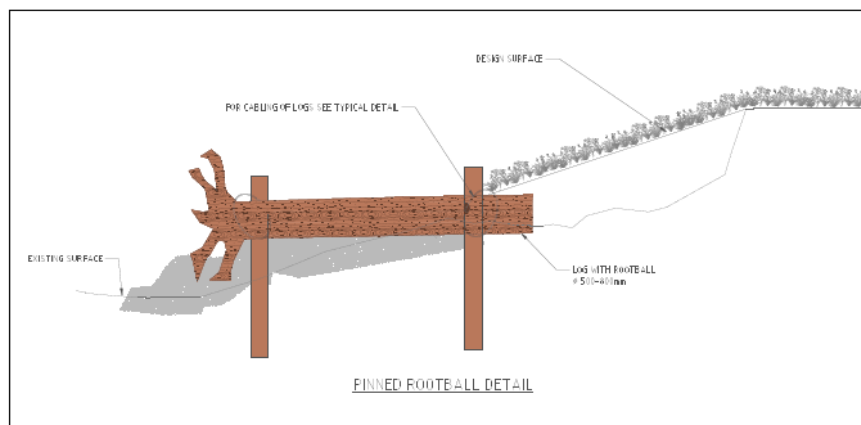
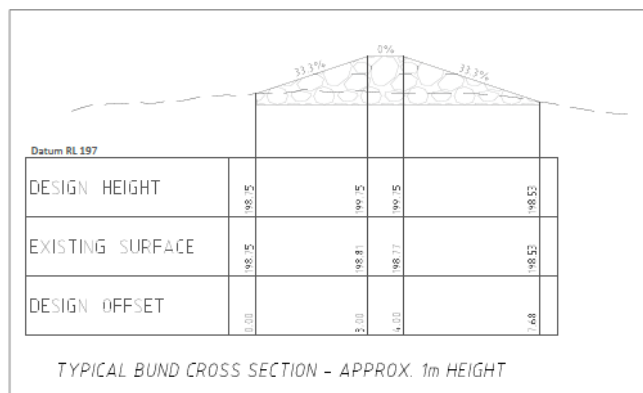
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| SETOUT POINTS | |
| DESIGNED BY | DESIGNED: A3 DRAWN: A3 CHECKED: A3 APPROVED: A3 |











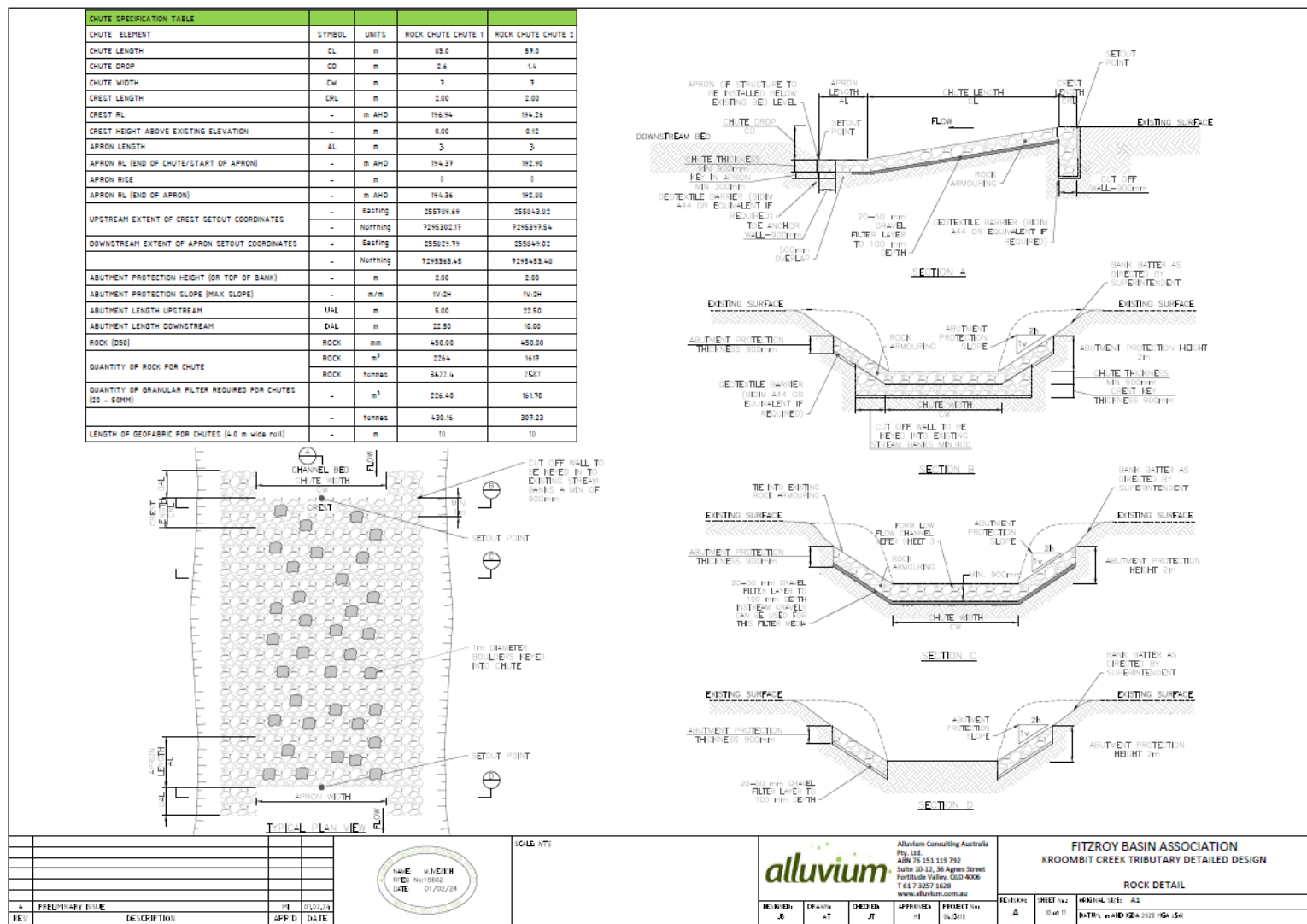
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| FITZROY BASIN ASSOCIATION KROOMBIT CREEK TRIBUTARY DETAILED DESIGN | | |
| LOG DETAIL | | |
| REVISION | SHEET No. | ORIGINAL SIZE: A1 |
| A | 9 of 10 | DATE: 24 APR 2024 HGA 1561 |



| | |
|---|---|
| EXCAVATION | |
| 1. | EXCAVATION SHALL BE UNDERTAKEN IN A MANNER THAT MINIMISES DISTURBANCE TO MATERIAL OUTSIDE THE LIMITS OF THE WORKS. |
| 2. | EXCESS EXCAVATED MATERIAL SHALL BE DISPOSED OF IN A MANNER APPROVED BY THE SUPERINTENDENT, BUT THE EXCESS MATERIAL MUST NOT BE SOLD TO ANY OTHER INDIVIDUAL OR PARTY AND THEN REMOVED FROM THE PROPERTY. |
| 3. | BANKS TO BE REPROFILED TO 1V:3-4H. |
| 4. | EARTHWORKS SHOULD GRADUALLY TRANSITION OVER 10 m TO MATCH THE ADJACENT BANK AT EACH END OF THE WORKS. |
| 5. | TOP SOIL SHOULD BE STOCK PILED AND SPREAD OVER FINISHED BANK SLOPE. |
| 6. | MATERIAL USED FOR THE BUND SHOULD BE COMPACTED, NON-DISPERSIVE CLAY. A TOP SOIL LAYER SHOULD BE ADDED AND CONTINUOUS GRASS COVER ESTABLISHED. |
| ROCK SUPPLY AND PLACEMENT FOR ROCK PROTECTION WORKS: | |
| 7. | SUPPLY AND PLACEMENT OF ROCK TO BE IN ACCORDANCE WITH THESE DRAWINGS AND ONSITE DIRECTION BY DESIGN ENGINEER OR SITE SUPERINTENDENT. |
| 8. | ROCK PLACEMENT SHALL NOT COMMENCE UNTIL THE PREPARED SURFACE HAS BEEN APPROVED BY THE SUPERINTENDENT. |
| 9. | ROCK SHALL BE CAREFULLY PLACED BY BUCKET FROM A LOADER OR EXCAVATOR FROM NO GREATER THAN 1.0 m ABOVE THE MATERIAL ONTO WHICH IT IS TO BE PLACED. |
| 10. | ROCK SHALL BE WORKED INTO PLACE SO AS TO PRODUCE A BLANKET OF INTERLOCKING ROCK THAT HAS NO SIGNIFICANT VOIDS AND DOES NOT MOVE UNDER FOOT. |
| 11. | GRADING SHALL PRODUCE A CONSISTENT MIX OF ROCK SIZES. |
| REHABILITATION OF DISTURBED AREAS | |
| 12. | REHABILITATION OF DISTURBED AREAS SHALL NOT BE UNDERTAKEN UNTIL THE PREPARED AREA HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND APPROVED BY THE SUPERINTENDENT. |
| 13. | THE EXPOSED REPROFILED SLOPE AND ROCK PROTECTION SHALL BE COVERED WITH TOPSOIL AND REVEGETATED. REVEGETATION SHALL EXTEND A MINIMUM 15 m BEYOND THE TOP OF BANK. |
| 14. | WHERE SLOPES ARE TOO STEEP FOR DIRECT PLANTING NATURAL REGENERATION IS PROPOSED. |
| 15. | EROSION PROTECTION MATTING OR ALTERNATIVE SUITABLE GROUND COVER MAY BE USED ON REPROFILED BANK DURING THE VEGETATION ESTABLISHMENT PHASE, AT THE DISCRETION OF THE SUPERINTENDENT, TO REDUCE RISK TO THE WORKS. |
| 16. | REVEGETATE THE WORKS SITE AND SURROUNDING AREA AS PER THE DETAILED REVEGETATION PLAN PROVIDED IN ATTACHMENT C OF DETAILED DESIGN REPORT. |
| ROCK PROTECTION MATERIALS | |
| 17. | ROCK SHOULD NOT BE ADVERSELY AFFECTED BY REPEATED WETTING AND DRYING AND SHALL HAVE A CRUSHING STRENGTH OF NOT LESS THAN 25 MPa. |
| 18. | BEACHING MATERIAL TO COMPRISE WELL-GRADED ANGULAR ROCK, FREE OF CRACKS AND FOREIGN MATERIAL. |
| 19. | ROCK USED MUST MEET THE FOLLOWING SIZE SPECIFICATION: |
| 20. | GRADING SHALL PRODUCE A CONSISTENT MIX OF ROCK SIZES. |
| 21. | ROCK SHALL BE WORKED INTO PLACE SO AS TO PRODUCE A BLANKET OF INTERLOCKING ROCK THAT HAS NO SIGNIFICANT VOIDS AND DOES NOT MOVE UNDER FOOT. |
| ROCK CHUTE | |
| 22. | CHUTE LENGTH MUST NOT BE REDUCED. BATTER SLOPES SHALL BE NO STEEPER THAN 1V:15H |
| 23. | REFER ANY DEVIATION BETWEEN BED ELEVATION AND DESIGN ELEVATION OF CREST OR APRON TO SUPERINTENDENT |
| 24. | CREST CUTOFF WALL IS TO EXTEND THE TOTAL CHUTE WIDTH |
| 25. | CREST OF CHUTE AND START OF APRON TO BE CLEARLY DEFINED BY CHANGE IN GRADE |
| 26. | ABUTMENT PROTECTION TO EXTENT A MINIMUM OF 3M UPSTREAM OF CHUTE CREST AND 5M DOWNSTREAM OF APRON AND TOP DRESSED WITH LOCALLY EXCAVATED MATERIAL. FINAL EXTENT OF ABUTMENT PROTECTION TO BE DETERMINED BY SUPERINTENDENT. |
| 27. | BANK BATTERS ABOVE ABUTMENT PROTECTION TO BE AT THE SAME SLOPE OR FLATTER THAN ABUTMENT PROTECTION SLOPE. |
| 28. | ROCK PLACE TO FORM ROCK CHUTES SHALL BE PLACED ONTO GRAVEL FILTER LAYER WHERE SHOWN ON DRAWINGS |
| 29. | CREST AND APRON CUTOFF WALL SHOULD BE LINED WITH A GEOTEXTILE FILTER AS SHOWN ON DRAWINGS |

| ROCK PROTECTION SIZE SPECIFICATION | |
|------------------------------------|-------------------------------------|
| EQUIVALENT SPHERICAL DIAMETER | PERCENT (BY WEIGHT) OF SMALLER SIZE |
| 675-900mm (15-2.0 D50) | 100% |
| 450mm (D50) | 50% |
| 135-180mm (0.3-0.4 D50) | 10-20% |
| 45mm (0.1 D50) | <5% |

| BANK STABILISATION AND FISHWAY SPECIFICATION TABLE | | |
|--|----------------|---------|
| MATERIAL SPECIFICATION | UNITS | QUANTIT |
| CHUTE AND BANK REPROFILING CUT | m ² | 6,510 |
| CHUTE AND BANK REPROFILING FILL | m ² | 965 |
| VOLUME OF CUT OVER FILL IN CHUTE | m ³ | 5,545 |
| EXISTING CHANNEL FILL | m ² | 1,933 |
| WEST BUND FILL | m ² | 230 |
| EAST BUND FILL | m ² | 101 |
| TOPSOIL AREA | m ² | 3,142 |
| TOPSOIL VOLUME (175mm DEPTH) | m ³ | 550 |
| TOTAL VOLUME OF CUT OVER FILL | m ³ | 2,732 |
| CHUTE 1 BOULDERS (1m DIAMETER) | No. | 92 |
| CHUTE 2 BOULDERS (1m DIAMETER) | No. | 59 |
| ROCK VOLUME | m ³ | 3,801 |

[illegible]

4.8 Contract Requirements

WHS

Risk and Hazard Identification

The Contractor is responsible for identifying potential hazards and safety requirements related to the work. A Risk and Hazard report detailing site-specific concerns will be incorporated into the prestart considerations and documentation.

Hazard Reporting

Contractors must promptly report any observed hazards at FBA sites, with the individual in control completing an Incident Report.

Wildlife Risks

NA

Working Near Water

NA

Contractor Documentation

The Contractor must establish a management system as part of this Contract. A qualified representative, empowered to oversee quality, safety, and environmental management systems on-site, should be nominated. The Contractor is responsible for adhering to all relevant legislation, regulations, and guidelines.

The Contractor should provide the following documents to FBA at least ten calendar days before commencing work on-site:

- Project Management Plan outlining implementation methodology
- Work Program
- Safety Management Plan
- Environmental Management Plan, including a biosecurity plan for equipment and materials entering or leaving the property
- Emergency Management Plan

These documents must, at a minimum, encompass the following details:

- Project Organization Chart or list of designated Project Personnel with their roles, communication channels, and responsibilities
- Quality management procedures
- Safety management and emergency procedures (including reporting frequency)
- Environmental management and emergency procedures (including reporting frequency)
- Biosecurity plan details
- Traffic management plan details
- Emergency management procedures

A list of intended project documents, along with proformas, should also be submitted. Site access will be granted only upon receipt and approval of all Contractor documentation.



The Contractor should additionally submit job safety assessments and/or work method statements related to different construction phases, applicable to the project, at least seven (7) days before the relevant activity starts. Such reviews by FBA won't affect Contractor warranties or guarantees.

Project Safety Management Plan

Before initiating work on-site, the Contractor is required to prepare and provide a Project Safety Management Plan to FBA. This plan should include:

- A documented statement describing the work, identifying activities with health and safety risks, and detailing control measures
- Hazard assessment inherent to site work and strategies for hazard elimination or minimization
- Proposed Traffic Management Plan, encompassing speed limits on haul and access roads for the safety of personnel, landowners, and occupants
- Fire management risk assessment and mitigation strategies

Throughout work execution, the Contractor must have a competent site health and safety manager or representative on-site, ensuring compliance with the Contractor's Safety Management Plan and FBA's requirements.

Site entry and departure notifications should be directed to the designated FBA representative via text or phone daily.

Inductions

Site-Specific Induction

Contractor staff members accessing an FBA site, whether for work or any other purpose, must receive a site-specific induction upon arrival. Records of site-specific inductions for contract staff should be provided to FBA's Project Manager upon request.

Site Works

General Requirements

The 'Contractor' bears the responsibility of ensuring that all subcontractors and individuals falling under a 'Duty of Care' obligation comply. The Contractor must ensure that all individuals under their 'Duty of Care,' including subcontractors, adhere to the following:

- Verify that all tools and equipment to be used are in proper working condition and appropriately tagged while on-site.
- Possess the required licenses, certifications, and industry-mandated competencies relevant to their assigned tasks.

Sign-In and Sign-Out

Upon arriving at the work site, all contract staff members are required to sign in on the Visitor Register before initiating work. When leaving the site, all contract staff members must sign out. Copies of all relevant regulatory documentation should be provided to FBA upon request or, at a minimum, upon the practical completion of the work.



Site Facilities

The Contractor is obligated to supply any necessary welfare facilities as mandated by law for workers and authorized individuals present on the site. These facilities must be removed upon the completion of the works. The placement of the Contractor's site facilities requires approval from FBA.

The Contractor is also responsible for providing a dedicated working space for FBA within their own site facilities. At a minimum, this space should include desk with power outlets.

All arrangements and associated fees for any temporary services required for executing the works under this contract are the Contractor's responsibility.

A designated site laydown area for machinery and materials will be allocated adjacent to the works.

Existing Services

Before initiating any work, the Contractor must acquaint themselves with all existing services both on the Site and in its vicinity. The following existing services have been identified on-site but are not limited to:

- Telephone cable
- Overhead power

The Contractor is responsible for comprehending the DBYD information, exercising informed judgment, and, if necessary, conducting additional investigations concerning the existing site services before commencing work.

In cases where overhead public utility lines, surface drainage structures, or underground pipes, conduits, or cables are present near the work area, the Contractor must take precautions to safeguard these facilities from harm. If any damage does occur to such facilities, it must be promptly reported to the plant owner and FBA. The full cost of necessary repairs or replacements shall be entirely borne by the Contractor.

Should it become necessary to adjust the location or elevation of any existing mains or services to align with the construction stipulated in this Contract, the Contractor must promptly notify FBA.

In the event of damage to any water, gas, electric, drainage, sewerage, telephone, signaling, or other services within the area, the Contractor is obligated to cover the expenses associated with repairing the damage.

Site Access

In order to dispose of spoil from the work site, it will be essential to traverse portions of the property the landholder utilizes for their operations. The contractor must integrate appropriate mitigations into their site management plan to address potential effects. These mitigations should encompass:

- Setting speed limits, outlining travel directions, ensuring visibility, and regulating equipment movement.
- Establishing effective site communication measures.
- Defining procedures for traversing the property, including guidelines for gates.
- Implementing strategies to minimize the impact of noise, dust, light, and odours.

Site Condition Records

Before initiating site works, the Contractor must compile a photographic record of the current state of access roads and associated infrastructure. This record should meet the satisfaction of FBA and be provided to them. The record should minimally cover the condition of:

- All existing facilities such as buildings, fences, hard-standing areas, roads, and structures.
- The surrounding environment, encompassing grassy areas, shrubs, and trees.



- Existing internal and external access roads used for material transport or equipment movement under this Contract.

Throughout the Contract, the Contractor must take necessary precautions to prevent any undue harm to existing facilities, the surrounding environment, and other features beyond the work's scope.

Any damages attributed to negligence, as determined by FBA, will be the Contractor's responsibility to repair, restoring them to their original (or improved) condition.

Project Documents

Technical Documents

The technical documents pertaining to the project include:

- Project Drawings
- Inspection Test Plans
- Scope of Works (this document)
- Detailed Design Report

Project Drawings

The project drawings outline the proposed design for the project. It's important to read the Drawings alongside this Scope of Works (including all referenced standards) for comprehensive requirements. The drawings contain design aspects that require approval on-site from the design engineer.

Precedence of Documentation

If any discrepancies arise between plans, specifications, and standard specifications, the following order of documentation precedence will apply:

- Detailed Design Drawings and specifications provided within the drawings.
- Scope of Works
- Material, Product, and Manufacturer's Specifications and Drawings
- AS/NZS Standards
- ISO Standards

In case of conflict, the Contractor should consult FBA for clarification.

4.9 Reference Specifications

Supply and placement of timber pile fields

Timber details

Timber piles shall meet the requirements of Australian Standard AS 3818.3-2001 Timber – Heavy structural products – Visually graded – Piles. In particular, piles shall meet the requirements of section 3, Hardwood Pile Intended for Use without Full Length Preservative Treatment.

Table 1 Timber pile specification

| ITEM | DETAILS |
|--------------------|--|
| Species | Strength Group: S3 Durability Class: 3 Species to be adopted in accordance with AS 3818.3-2001. |
| Length | Refer to schedule of quantities |
| Nominal Diameter* | 250mm – 350mm |
| Length Tolerance | ± 0.1m |
| Diameter Tolerance | ± 0.1 x diameter (mm) |
| Characteristics | In accordance with Australian Standard AS 3818.3-2001 Timber – Heavy structural products – Visually graded – Piles. Piles shall meet the requirements of section 3, Hardwood Pile Intended For Use Without Full-Length Preservative Treatment. |

*Nominal diameter provides the diameters at the small and large ends, respectively.

The minimum diameter of the timber piles without bark shall be 180mm at the smaller end; and the maximum diameter of the timber piles without bark shall be 350mm at the larger end. Timber piles should taper from the larger to the smaller end of the diameter scale to aid in driveability of the pile.

Pile driving

The following tolerances shall apply to piles after driving:

- The pile head shall finish within 100mm of the specified horizontal location; and

The Contractor shall be responsible for ensuring that adequate machinery is supplied and used to drive all of the piles to these tolerances. Adequate machinery is considered to be an excavator mounted vibrating head and/or hammer.

Piles shall be driven to the levels specified or otherwise set out by the Superintendent or the Superintendent's representative. The only exceptions shall be where failure to meet the requirements is beyond the control of the Contractor. Such exceptions may include contact with bedrock or buried timber. Increasing resistance in sand shall not be considered as an exception beyond the control of the Contractor as adequate machinery will be deemed by the Superintendent as necessary to overcome increasing resistance in sand. Piles may take up to 15min per pile to drive.

The practice of trenching or ripping the bed material for the installation of piles requires prior discussion with, and approval by, the Superintendent and designer.

AS 3818.3-2001 Timber - Heavy structural products - Visually graded - Piles

TABLE C1
SPECIES PROPERTIES

| Standard common name Botanical Name | Hardwood or softwood | State of origin | Dura- bility | Lyctid* suscept- ibility | Code for mark | Joint group | Strength group |
|--|----------------------------|--------------------|-----------------|--------------------------------|------------------|----------------|-------------------|
| ash, alpine <i>Eucalyptus delegatensis</i> | H | N, T, V | 4 | S/R ‡ | AA | J3 | S4 |
| ash, mountain <i>E. regnans</i> | H | T, V | 4 | R | MA | J2 | S4 |
| blackbutt <i>E. pilularis</i> † | H | N, Q | 2 | R | BB | J2 | S2 |
| blackbutt, New England <i>E. andrewsii</i> † <i>E. campanulata</i> † | H | N, Q | 2 | S | NA | J2 | S3 |
| blackbutt, Western Australia <i>E. patens</i> † | H | W | 2 | S | BA | J2 | S4 |
| bloodwood, brown <i>Corymbia trachyphloia</i> † | H | N, Q | 1 | S | BD | — | S3 |
| bloodwood, red <i>E. intermedia</i> † <i>E. polycarpa</i> † <i>Corymbia gummifera</i> † | H | N, Q, V | 1 | S | RW | — | S3 |
| box, grey <i>E. microcarpa</i> † <i>E. moluccana</i> † <i>E. woollsiana</i> | H | N, Q, V | 1 | S | GB | — | S2 |
| box, grey, coast <i>E. bosistoana</i> † | H | N, V | 1 | S | CB | J1 | S1 |
| box, red <i>E. polyanthemus</i> † | H | N, V | 2 | S | RX | — | S3 |
| box, steel <i>E. rummeryi</i> | H | N | — | — | — | — | — |
| box, white <i>E. albens</i> † | H | N, Q, S, V | 2 | S | WX | — | (S2) |
| box, white topped <i>E. quadrangulata</i> † | H | N, Q | 2 | S | WT | — | S2 |
| box, yellow <i>E. melliodora</i> † | H | N, Q, V | 1 | R | YB | J1 | S3 |
| brownbarrel <i>E. fastigata</i> | H | N, V | 4 | S | BL | J3 | S4 |
| cadaga <i>E. torelliana</i> | H | Q | 3 | S | CG | — | S2 |
| candlebark <i>E. rubida</i> | H | N, S, T, V | 3 | S | CD | J3 | S5 |
| carbeen <i>Corymbia tessellaris</i> | H | N, Q | 2 | S | CN | — | S1 |
| gidgee <i>Acacia cambagei</i> | H | N, Q, S, Y | 1 | — | G | — | (S1) |

(continued)

TABLE C1 (continued)

| Standard common name Botanical Name | Hardwood or softwood | State of origin | Dura- bility | Lyctid* suscept- ibility | Code for mark | Joint group | Strength group |
|---|----------------------------|--------------------|-----------------|--------------------------------|------------------|----------------|-------------------|
| gum, blue, southern <i>E. globulus</i> | H | V, T | 3 | S ** | BG | J2 | S3 |
| gum, blue, Sydney <i>E. saligna</i> | H | N, Q | 3 | S | SY | J2 | S3 |
| gum, grey <i>E. canaliculata</i> † <i>E. punctata</i> † <i>E. propinqua</i> † | H | N, Q | 1 | R | GG | J1 | S1 |
| gum, grey, mountain <i>E. cypellocarpa</i> | H | N, V | 3 | S | MT | J2 | S3 |
| gum, Maiden's <i>E. maidenii</i> | H | N, V | 3 | S | MG | | S3 |
| gum, manna <i>E. viminalis</i> | H | N, S, T, V | 4 | S | MN | J3 | S4 |
| gum, mountain <i>E. dakrympleana</i> | H | N, T, V | 4 | S | MO | J3 | S4 |
| gum, poplar <i>E. alba</i> | H | Q, W, Y | 3 | — | PG | — | (S2) |
| gum, red, forest <i>E. blakelyi</i> † <i>E. tereticornis</i> † | H | N, Q, V | 2 | R | FR | J1 | S3 |
| gum, red, river <i>E. camaldulensis</i> † | H | N, Q, V, S | 2 | S | RR | J2 | S5 |
| gum, rose <i>E. grandis</i> | H | N, Q | 3 | R | RO | J2 | S3 |
| gum, salmon <i>E. salmonophloia</i> † | H | W | 3 | R | SA | — | (S3) |
| gum, spotted <i>C. maculata</i> † <i>C. citriodora</i> † <i>E. henryi</i> | H | N, Q, V | 2 | S ** | SG | J1 | S2 |
| gum, yellow <i>E. leucosylon</i> † | H | S, V | 1 | S | — | — | (S4) |
| ironbark, grey <i>E. drepanophylla</i> † <i>E. paniculata</i> † <i>E. siderophloia</i> † | H | N, Q | 1 | R | GI | J1 | S1 |
| ironbark, gum-top <i>E. decorticans</i> † | H | Q | 1 | R | — | — | (S2) |
| ironbark, red <i>E. sideroxylon</i> † | H | N, Q, V | 1 | S | RI | J1 | S2 |
| ironbark, red, broad- leaved <i>E. fibrosa</i> † | H | N, Q | 1 | R | BI | J1 | S1 |
| ironbark, red, narrow- leaved <i>E. crebra</i> † | H | N, Q | 1 | R | NI | J1 | S2 |

(continued)

TABLE C1 (continued)

| Standard common name Botanical Name | Hardwood or softwood | State of origin | Dura- bility | Lyctid* suscept- ibility | Code for mark | Joint group | Strength group |
|--|----------------------------|----------------------|-----------------|--------------------------------|------------------|----------------|-------------------|
| ironwood, Cooktown <i>Erythrophloeum chlorostachys</i> † | H | Q | 1 | — | IW | — | S1 |
| jarrah <i>E. marginata</i> † | H | W | 2 | S | J | J2 | S4 |
| karri <i>E. diversicolor</i> | H | W | 3 | R | K | J2 | S3 |
| mahogany, red <i>E. pellita</i> † <i>E. resinifera</i> † | H | N, Q | 2 | S | RM | J1 | (S2) |
| mahogany, southern <i>E. botryoides</i> † | H | N, V | 2 | R | SM | J2 | S2 |
| mahogany, white <i>E. acmenoides</i> † <i>E. tenuipes</i> † <i>E. umbra</i> † | H | N, Q | 2 | R | WM | J1 | S2 |
| marri <i>E. calophylla</i> | H | W | 3 | S | ME | J2 | S3 |
| messmate <i>E. obliqua</i> | H | N, V, T | 3 | S ** | MS | J3 | S3 |
| messmate, Gympie <i>E. cleoziana</i> † | H | Q | 1 | R | GM | — | S2 |
| penda, brown <i>Xanthostemon chrysanthus</i> † | H | Q | 2 | R | PN | — | (S2) |
| penda, red <i>X. whitei</i> † | H | Q | 2 | R | PD | J1 | (S2) |
| peppermint, black <i>E. amygdalina</i> | H | T | 3 | — | — | — | (S5) |
| peppermint, Queensland <i>E. exserta</i> † | H | Q | 1 | S | — | — | (S2) |
| peppermint, narrow-leaved <i>E. australiana</i> <i>E. radiata</i> <i>E. robertsonii</i> | H | N N, V N, V, T | 3 | S | NL | — | S4 |
| peppermint, white <i>E. pulchella</i> | H | V, T | 3 | S | — | — | S4 |
| pine, bunya <i>Araucaria bidwillii</i> | S | Q | 4 | NA | — | — | S6 |
| pine, Canary <i>Pinus canariensis</i> | S | N, S, V, W | 4 | NA | — | — | — |
| pine, Caribbean <i>P. caribaea</i> | S | N, Q | 4 | NA | PB | — | (S6) |
| pine, Corsican <i>P. nigra</i> | S | N, S, V, W | 4 | NA | — | — | (S7) |
| pine, hoop, <i>Araucaria cunninghamii</i> | S | N, Q | 4 | NA | HP | — | S6 |

(continued)

TABLE C1 (continued)

| Standard common name Botanical Name | Hardwood or softwood | State of origin | Dura- bility | Lyctid* suscept- ibility | Code for mark | Joint group | Strength group |
|---|----------------------------|---------------------|-----------------|--------------------------------|------------------|----------------|-------------------|
| pine, kauri Agathis microstachia A. palmerstonii A. robusta | S | Q | 4 | — | — | — | (S7) |
| pine, loblolly P. taeda | S | N, Q | 4 | NA | PL | — | S6 |
| pine, maritime P. pinaster | S | S, V, W | 4 | NA | PM | — | (S6) |
| pine, patula P. patula | S | N, Q | 4 | NA | — | — | (S7) |
| pine, radiata P. radiata | S | N, Q, S, T, V, W | 4 | NA | PR | — | S6 |
| pine, slash P. elliotii | S | N, Q, W | 4 § | NA | PS | — | S5 |
| pine, ponderosa P. ponderosa | S | — | 4 | NA | — | — | (<S7) |
| pine, white, western P. monticola | S | N, T | 4 | NA | — | — | — |
| satinay Syncarpia hillii† | H | Q | 2 | R | S | J2 | S3 |
| satinbox Phebalium squameum | H | T, V | 2 | — | — | — | — |
| stringybark, blue-leaved E. agglomerata | H | N | 3 | — | — | — | S2 |
| stringybark, brown E. capitellata | H | N, V, T | 3 | R | BS | J2 | S3 |
| stringybark, red E. macrorrhyncha† | H | N, V, T | 2 | S | RS | J2 | S3 |
| stringybark, silvertop E. laevopinea | H | N, Q | 3 | — | SS | J3 | S2 |
| stringybark, white E. eugenioides† E. globoidea E. phaeotricha | H | N, Q, V | 2 | R | WS | J2 | S3 |
| stringybark, yellow E. muelleriana† | H | N, Q, V | 2 | R | YS | J2 | S3 |
| tallowwood E. microcorys† | H | N, Q | 1 | S | TW | J1 | S2 |
| turpentine Syncarpia glomulifera† | H | N, Q | 1 | R | TP | J2 | S3 |
| wandoo E. wandoo† | H | W | 1 | R | WG | J1 | S2 |
| wandoo, powderbark E. accedens† | H | W | 1 | — | PW | — | (S3) |
| woollybut E. longifolia† | H | N | 2 | S | — | — | S3 |

Proposed Location of Access Track

Kroombit Creek

Proposed Location of Access Track to Site

24°25'54"S 150°35'13"E

24°25'54"S 150°35'48"E



24°26'25"S 150°35'13"E

24°26'25"S 150°35'48"E

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Queensland
Government
Department of Resources

Proposed Clearing to Conduct Earthworks

Kroombit Creek

Clear and Grub Design Footprint - 1.40 hectares

24°26'0"S 150°35'12"E

24°26'0"S 150°35'35"E

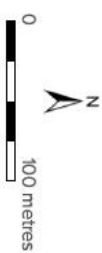


24°26'18"S 150°35'12"E

24°26'18"S 150°35'35"E



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4.10 As-Constructed Data and Works Certification

As-Constructed Survey

For recording as-constructed details and measurement of quantities, the Contractor must conduct a survey covering final extents and surfaces. The survey results must be submitted to FBA in both hard copy plans, sections, and a digital format compatible with the I2D computer modelling program. Survey accuracy should be within +/- 10mm in level and +/- 50mm in plan. Progressive as-built surveys are to be produced during the work, with a final survey provided alongside the DRAFT As-Constructed Drawings within 2 weeks of work completion.

As-Constructed Drawings

FBA will supply the "Issued for Construction" job drawings in "Adobe PDF" format for the Contractor's use in preparing "As Constructed" drawings. The process is as follows:

- Within 2 weeks of work completion, the Contractor will provide DRAFT "As Constructed" drawings in various formats to FBA for review.
- FBA will offer comments within 2 weeks of receiving the drawings.
- The Contractor will update the As-Constructed drawings and reissue them to FBA within 2 weeks of receiving reviewed drawings.
- All drawings must adhere to AS1100.101, industry norms, and FBA requirements.
- Levels provided must be reduced to AHD.
- Grid coordinates must be in MGA.
- Drawings should primarily be black and white, with possible coloured lines and shading for identification.
- The As-Constructed drawings must be certified by a registered Surveyor and by a Design representative and will form part of the Works Certification submission.
- Certified drawings shall follow AS1100.101: Technical drawing – General principles.
- Drawings must be provided in hard copy and digital formats, including vector-based "AutoCAD 2010" files.
- Changes to this process can be made in consultation with FBA.

Works Certification

All construction must be certified by a Professional Engineer of Queensland (RPEQ) to ensure alignment with design intent. The Contractor is responsible for obtaining RPEQ signoff on the as-constructed drawings for submission to FBA. FBA will provide contact details for the design engineer to assist if needed. The Contractor must notify FBA within 48 hours of implementing agreed witness and hold points. Suitable QA records and notifications are necessary for RPEQ certification, including signoff of the As-Constructed Drawings. All relevant construction documentation and records, including completed Inspection and Test plans, photos, reports, surveys, and As-Constructed Drawings, must be submitted to FBA within 2 weeks of work completion.

4.11 Quality Management

Requirement

The Contractor is obliged to establish a quality management system for this Contract. This system should include enough quality records to offer tangible proof of meeting Contract requirements, including relevant records from Subcontractors.



Quality System Documentation

Within 14 days of letter of acceptance or before site possession, the Contractor must submit these documents to FBA: the Project Quality Plan.

Access to Corporate Quality Procedures pertinent to this Contract must also be granted to FBA.

The Project Quality Plan should adhere to interim Australian and International Standard AS/NZS ISO 9004.5 (Part 5), incorporating guidelines from Australian Standard AS/NZS ISO 3905.

Inspection and Test Plans

Inspection and Test Plans must include the following for each significant activity in the relevant process:

- Activity description
- Specification requirements/reference
- Person responsible (title)
- Hold Points and Witness Points
- Activity checklists
- Inspection and test type
- Acceptance criteria
- Relevant procedure and quality records
- Test/inspection frequency
- Work item identification

FBA will review these plans, which should integrate the Technical Specifications and Inspection and Test Plans. Additional Hold Points or Witness Points may be requested by FBA, ensuring both Contractor and FBA sign off.

Non-conformance Reports

Upon detecting non-conforming work, the Contractor must submit a Non-conformance Report to FBA within 48 hours. This report should detail:

- The non-conformance nature and extent
- Work lot or item number
- Relevant information, data, test results, measurements
- Proposed corrective and preventive actions.
- Timeframe for rectification

The Project Quality Plan should outline the method for isolating/identifying non-conforming work. The proposed corrective action requires FBA approval.

Hold Points and Witness Points

Hold Points mandate mandatory verification by the QAR or FBA before further work proceeds. Mandatory Hold Points apply before commencing designated work lots/items, and they encompass acceptance of Contract Documentation, Site possession, survey approval, and more. A Witness Point allows for attendance and witnessing of inspection and test.

Inspection, Testing, and Testing Fees

The Site Supervisor can order additional testing to ensure Contract compliance. The Contractor covers costs for non-compliance testing. If the Contractor fails in testing obligations, the Principal can perform testing at Contractor's expense.

Failure to Submit Relevant Documentation

Late submission of Contractor Documentation results in a stop work order. Besides rectifying non-conforming work, the Contractor bears its own costs for delays due to this breach.

Subcontracted Work

Subcontracted work must meet quality assurance standards. Subcontractors must possess legislated insurance. Notice and compliance for subcontracted work on site is Contractor's responsibility.

Proprietary Items

Contractor must use specified proprietary items or approved equivalents. Alternative products need FBA approval for inclusion in the contract.

4.12 Measurement and Payment

This works package is structured as a Lump Sum, derived from items detailed in the Schedule 2 Bill of Quantities. Any unpriced items in the Schedule of Rates are accounted for in the pricing of other items.

In case of omissions in the Bill of Quantities or Schedule of Rates, the Contractor can either add them for inclusion in the Tender Price or assume allowance in other prices.

Design based on LIDAR requires the Contractor to survey the existing surface (pre-strip) and the Stripped Surface before earthworks for accurate quantification. This is incorporated in the Inspection & Testing Plan. Quantities in the Bill of Quantities are in situ; swell factor isn't considered.

Preliminaries and General

- Establishment and Disestablishment: Payment divided as 50% upon possession of site and 50% upon disestablishment.
- Insurances: Payment on a percent complete basis. Minimum required insurances listed.
- Project Management: Payment on a percent complete basis, covering project management documentation.
- Survey Set Out, Site Measurement, and Service Location: Payment on a percent complete basis, including survey, set-out, and services handling.
- QA Documentation/All Testing Required: Payment upon FBA's acceptance of documentation.
- As-Constructed Drawings & RPEQ Works Certification: Lump Sum covering As-Constructed drawings and RPEQ certification. Final payment upon approval of documentation and RPEQ certification.

Provisional Sum Items

Provisional Items executed only under FBA instruction in writing. Payment upon completion and submission of quantity evidence.

The costs encompass planning, stakeholder interaction, mobilization/demobilization, equipment, insurances, biosecurity, amenities, labour, and more. Costs should provide a clear schedule of rates. The project is projected to take 2 to 3 months.

4.13 Project Management Authority

| Task | Authority Level |
|--------------------------------|---|
| Staff decision | FBA's FBA Management Team collaboration. |
| Budget Management and Variance | FBA's Adoption Manager, collaborating with Chief Executive Officer. |
| Technical Decisions | FBA's Adoption Manager for project deliverables, working with Project Engineer or delegate for approach. |
| Conflict Resolution | FBA's Adoption Manager has authority for internal and external conflict resolution, discussing reputational risks with the CEO. |

4.14 Expected Schedule and Timing

Schedule

The deadline for the civil works on this project is 19 December 2024.

A site visit has been scheduled for October 1, 2024. Please contact **Ben Reimers 0413 027 155** or ben.reimers@fba.org.au to confirm attendance.

Expected Deliverables / Milestones

| Task # | Milestone | Due Date |
|--------|---|-----------------------------------|
| I | Project initiation Before the commencement of on-site operations, the Contractor is to provide copies of the subsequent documents at least ten calendar days in advance: <ul style="list-style-type: none"> • Project Management Plan outlining implementation methodology • Work Program • Safety Management Plan • Environmental Management Plan • Emergency Management Plan • Project Organization Chart or list of designated Project Personnel • Quality management procedures • Safety management and emergency procedures • Environmental management and emergency procedures • Biosecurity plan details • Traffic management plan details • Intended project documents list | 10 days before site establishment |

| | | |
|---|---|---------------------|
| | <ul style="list-style-type: none"> • Job safety assessments and work method statements • Site-specific induction records | |
| 2 | <p>Construction Phase</p> <p>1. Project Initiation (Payment 1)</p> <ul style="list-style-type: none"> • Wash-down machinery to meet biosecurity requirements • Mobilisation <p>2. Site Preparation & Vegetation Management (Payment 2)</p> <ul style="list-style-type: none"> • Maintain Access Track • Pre-construction / Site Set Out Survey • Clear and Grub Design Footprint • Mulch Woody Vegetation <p>3. Earthworks (Payment 3)</p> <ul style="list-style-type: none"> • Stockpile Batter Topsoil • Cut • Fill • Landform Enhancement <p>4. Rock Chute Grade Control Structures (Payment 4)</p> <ul style="list-style-type: none"> • Lay and Compact Granular Filter for Chutes • Install Geofabric for Chutes • Construct Rock Chutes • Key Boulders into Rock Chute <p>5. Revegetation & Timber Installation (Payment 5)</p> <ul style="list-style-type: none"> • Install Rootball Logs • Install 3m Piles • Attach Rootball Logs to Piles • Spread & Incorporate Gypsum • Rip/Scarify • Watering • Respread Topsoil • Spread Ameliorants • Water in Ameliorants • Spread Mulch <p>6. Project Completion (Payment 6)</p> <ul style="list-style-type: none"> • As constructed survey • Return site to original or improved condition • Demobilisation | By 19 December 2024 |

Part 5: Returnable Schedules

5.1 Tender Checklist

A conforming tender meets the requirements of the ITT Part I Section I.9. Failure to return any of the following items may result in the Tender being excluded from evaluation due to non-conformance:

| Checklist of required attachments | | |
|-----------------------------------|---|---|
| <input type="checkbox"/> | Part 5: Returnable schedules completed in full and signed by an authorised representative of the Tenderer | |
| <input type="checkbox"/> | Completed Supplier Details Form | Schedule 1: Supplier Details Form |
| <input type="checkbox"/> | Certificates of Currency for insurances as defined in Schedule 2 | Schedule 2: Insurances |
| <input type="checkbox"/> | Business Licences as appropriate as defined in Schedule 3 | Schedule 3: Business Licences |
| <input type="checkbox"/> | CVs of key personnel as defined in Schedule 4 | Schedule 4: Key Personnel |
| <input type="checkbox"/> | Requirements to meet the Assessment Criteria <ul style="list-style-type: none"> <input type="checkbox"/> Proposed Methodology <input type="checkbox"/> Proposed Project Schedule <input type="checkbox"/> Management Systems <input type="checkbox"/> Examples of Demonstrated Experience | Schedule 5: Non-Price Assessment Requirements |
| <input type="checkbox"/> | Price schedule as an Excel document | Schedule 6: Price Schedule |



5.2 Schedule I: Supplier Details Form

Please complete the attached Word document **Schedule I - Supplier Details Form.docx**.

5.3 Schedule 2: Insurances

| 1. Public Liability Insurance (FBA requires at least \$20,000,000 per claim) | |
|--|----|
| Insurer: | |
| Limit of Cover: | \$ |
| Policy Number: | |
| Expiry Date: | |
| Exclusions: | |

| 2. Workers' Compensation (WorkCover) Insurance (as required by law) | |
|---|----|
| Insurer: | |
| Limit of Cover: | \$ |
| Policy Number: | |
| Expiry Date: | |

| 3. Professional Indemnity Insurance | |
|-------------------------------------|----|
| Insurer: | |
| Limit of Cover: | \$ |
| Policy Number: | |
| Expiry Date: | |
| Exclusions: | |

| 4. Plant and Equipment Insurance | |
|----------------------------------|----|
| Insurer: | |
| Limit of Cover: | \$ |
| Policy Number: | |
| Expiry Date: | |
| Exclusions: | |

5.4 Schedule 3: Business Licences

Include all business licenses relevant to the Scope of Works.

| Licence | Number | Class/Category | Other details |
|---------|--------|----------------|---------------|
| | | | |
| | | | |
| | | | |
| | | | |

5.5 Schedule 4: Key Personnel

The Tenderer must nominate the key personnel proposed for delivery of the Works. Attach resumes/CVs to the Tender submission.

| Key Contact for FBA – [Project Role Title] | |
|--|--|
| Name | |
| Position Title | |
| Phone | |
| Email | |
| Qualifications | |
| Relevant Licences | |
| Relevant Experience | |

| [Project Role Title] | |
|----------------------|--|
| Name | |
| Position Title | |
| Qualifications | |
| Relevant Licences | |
| Relevant Experience | |

| [Project Role Title] | |
|----------------------|--|
| Name | |
| Position Title | |
| Qualifications | |
| Relevant Licences | |
| Relevant Experience | |

| [Project Role Title] | |
|----------------------|--|
| Name | |
| Position Title | |
| Qualifications | |
| Relevant Licences | |
| Relevant Experience | |



5.6 Schedule 5: Non-price Assessment Requirements

Tenderer should submit documentation and evidence supporting the assessment criteria outlined in **Part 3: Evaluation of Tenders**. Minimum evidence required is:

- Proposed methodology;
- Project schedule;
- Management systems; and
- Examples of demonstrated experience.

The Tenderer may submit more documentation to support their Tender as they see fit.

FBA reserves the right to:

- a. consider or not consider Tenders that do not supply the minimum documentation; and
- b. consider or not consider any documentation exceeding the minimum documentation.



5.7 Schedule 6: Price Schedule

Please complete the two worksheets, Bill of Quantities and Schedule of Rates, in the attached **Schedule 6: Price Schedule.xlsx** file.

The Bill of Quantities should contain all expected costs associated with delivery of the works and the final price to FBA that will form the Contract. Tenderers may add items to, but should not remove items from, the Bill of Quantities. Where an item is not completed, Tenderers should note the reason in the Comments column or risk the Tender being found non-conformant.

The prices the Tenderer provides in the Schedule of Rates are for the development of any potential variations to the Contract should they be required.

The Tenderer may also complete the Payment Schedule worksheet to suggest a schedule of payments against milestones for the potential Contract. If no proposed Payment Schedule is provided, FBA will develop the payment schedule when finalising the Contract.

5.8 Schedule 7: Contract Term Non-conformances

Tenderer must outline proposed non-conformances with **Part 5: Draft Contract**. FBA reserves the right to consider or not consider any Tender not conforming to the requirements outlined in the Tender Documents.

| Term Ref. | Description | Reasoning | Impact |
|-----------|-------------|-----------|--------|
| | | | |
| | | | |
| | | | |
| | | | |



5.9 Schedule 7: Tenderer's Acknowledgement

The signatory below makes the following declarations for an on behalf of the Tenderer to Fitzroy Basin Association (FBA):

1. The Tenderer has examined all of the Invitation Documents;
2. The Tenderer declares that:
 - a. the Tender constitutes a formal Offer for the provision of the Works;
 - b. it has read and understood the obligations outlined in the Invitation Documents;
 - c. all of the contents of the Tender are accurate;
 - d. there are no relationships between the Tenderer and FBA, FBA staff, or other parties with dealings with FBA that may constitute a conflict of interest, either actual, potential or perceived should the Tenderer be selected;
 - e. it has sufficient financial, staff and other resources to carry out and supply the Works in accordance with the Invitation to Tender;
 - f. it is not aware of any circumstances, including but not limited to legal action, that could impact on the viability of the Tenderer or the capacity to deliver the Works; and
 - g. it has or will have all insurance required before entering into Contract for the works and for the duration of the Works.

Signed by an Authorised Representative of the Tenderer who declares that they are duly authorised to sign for and enter into contracts on behalf of _____ [Business Name]

Authorised Person Name

Authorised Person Signature

Date of Signature



Part 6: Draft Contract

Refer to the attached **Part 6 – Draft Contract.pdf**.



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fitzroy-basin-association



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fba.org.au

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