SCOPE AND SPECIFICATION

TURKEY NEST DAM CONSTRUCTION

Warri Gate Road

VOLUME 3 OF 4

CONTRACT No.
T2025-2026-208 – Dam Construction

CONTRACT SERVICES

Bulloo Shire Council is seeking tenders from appropriately qualified contractors to complete works associated with Contract T2025-2026-208 Turkey Nest Dam Construction – Various Locations within Bulloo Shire.

The Contract works will be provided in accordance with the tendered Schedule of Rates as submitted in the relevant *Schedule K1 Contract Works Pricing Schedule and Schedule K2 Additional Works Pricing Schedule*.

SCOPE AND SPECIFICATION DOCUMENTS

This Volume 3 Scope and Specification document comprises of and is to be read in conjunction with the following documents:

- Volume 3 Scope and Specification.
- Applicable Australian Standards
- Draft design drawing

CONTRACT SPECIFIC CLAUSES

SECTION 1 – PRELIMINARIES

1.1 SCHEDULE OF RATES CONTRACT

The Contractor shall note that the basis of the Contract is a schedule of rates, tendered to complete a defined body of work as detailed in Schedule K1 Contract Pricing Schedule and Schedule K2 Additional Works Pricing Schedule.

1.2 EXTENT OF WORKS

The works to be completed under the contract are specifically designed to provide for the construction of two turkey nest style dams within Bulloo Shire. The extent of work is based on approvals provided by Bulloo Shire Council and the Queensland Reconstruction Authority.

1.3 SITE LOCATION MAPS

Maps are provided detailing the Contract worksite locations. The Contractor shall note that the maps are provided for information, planning and visual reference purposes only. Due to changes to the specified works, which may occur throughout the contract period and the lead up to it, the maps must not be relied upon by the Contractor as the sole source of information beyond the tender period.

The Contractor shall ensure that only the infield application program is used to determine and confirm the current extent of approved works during the Contract Period.

The maps are provided in Appendix A.

1.4 SCOPE OF WORK

General

General works across all sites include but are not limited to the following works.

- Development, implementation and management of site specific Temporary Traffic Management Plans.
- Development, implementation and management of site specific Safe Work Method Statements.
- Development, implementation and management of site specific environmental controls.
- Development, implementation and management of site specific Fatigue Management Plan.
- Development, implementation and management of site specific Chain of Responsibility Management Plan.
- Development, implementation and management of site specific Quality Management Plan.
- Site establishment.
- Management and maintenance of the worksite.
- Site disestablishment and clean up.

Dam Construction

Bulloo Shire Council invites tenders from suitably qualified and experienced contractors for the construction of two turkey nest style water storage dams at two separate locations in the south western region of Bulloo Shire, Queensland, as specified in Volume 3 Scope and Specification. The dams are intended to support Council road construction and maintenance activities. Tenderers must price all three dam lining options described in Volume 3 and Schedule K1 so Council can compare whole-of-work costs for each option.

Each dam has a plan surface area at Full Supply Level (FSL) of approximately 10,000m² and a total holding capacity of approximately 50ML (50,000m³), with a maximum operating water depth of 8.0 m, subject to the final design, Drawings and set-out. Combined storage capacity of both completed dams will be approximately 100 ML.

Note: The two dam sites are located a significant distance apart (approximately 65 kilometres). Tenderers must allow for separate mobilisation, logistics, site establishment and management at each location, and provide a construction program and methodology addressing sequencing between the two sites.

The Works include (as a minimum):

- site establishment, access management, remote logistics, and site disestablishment;
- survey set-out and as-constructed survey;
- clearing, grubbing, stripping and stockpiling topsoil;
- excavation and construction of embankments/bunds (turkey nest/ring dam configuration);
- key trench/foundation preparation and proofing;
- supply and installation of dam lining (pricing of all three Lining Options required);
- inlet/outlet pipework, valves and overflow arrangements as shown on drawings and/or specified;
- fencing / safety measures, erosion control and rehabilitation; and
- testing, commissioning, documentation and handover.

1.2 STANDARDS AND GUIDELINES

Unless stated otherwise, the Works must comply with current versions of the following (as applicable):

- AS4000-1997 (as amended) – General Conditions of Contract;
- AS1289 series – Methods of testing soils for engineering purposes;
- AS/NZS 2566 series and AS/NZS 4130 (as applicable) – buried flexible pipelines and PE pipe;
- Queensland WHS legislation and codes of practice relevant to excavation, plant and remote work;
- Manufacturer requirements for proprietary geomembrane liner systems and appurtenances.

1.5 COUNCIL INDUCTIONS

The Contractor shall note that all personnel working on site to deliver the Contract Works, along with all approved subcontractor personnel must complete a Bulloo Shire Council induction prior to establishing the worksite or commencing works.

1.6 RESTRICTIONS ON WORKS

The Contractor shall be restricted in the works to be performed under this Contract as follows:

- Roads shall be returned to normal traffic operation outside of working hours and/or during any time that the Contractor is not undertaking works at the site;
- Access to properties shall be maintained at all times throughout the period of the Contract.
- The Contractor shall provide a minimum of 48 hours notice to landowners of any works that will affect the owner's access. Work on the notified owner's access shall not commence prior to the 48 hours notice period, unless the Contractor has written permission from the owner;
- ~~No works on the roads shall occur between Saturday 20 December 2025 and Sunday 11 January 2026 inclusive. All sealed road works shall be sealed and safe to use for the travelling public during the Christmas/New Year holiday period without the need for ongoing monitoring by Council or the Contractor's personnel.~~
- No works on the roads shall occur over the Easter period between Thursday 2 April 2026 and Tuesday 7 April 2026 inclusive. All sealed road works shall be sealed and safe to use for the travelling public during the holiday period without the need for ongoing monitoring by Council or the Contractor's personnel.

- Claims for extra payment arising from these restrictions and any other restriction outlined in the Specification will not be considered.

1.7 DAYS AND HOURS OF WORK

The Contractor shall only undertake works associated with this Contract during the following days and hours:

Monday to Friday	6.00am to 6.00pm
Saturday	6.00am to 6.00pm
Sunday	6.00am to 6.00pm
Public Holidays (national, state and local)	No work permitted

The Contractor shall adjust the hours noted above as required to account for seasons of the year or local weather conditions where low visibility may impact on the safety of site personnel and/or road users. No work on site shall be undertaken in low visibility conditions. Low visibility conditions include but are not limited to hours of darkness, including dawn and dusk and atmospheric and/or weather conditions.

The hours noted above shall not be changed or extended beyond the Contract limits without the prior written approval from the Superintendent. In the case of emergency situations the need for extended work hours shall be notified to the Superintendent at the earliest possible opportunity.

1.8 AFTER HOURS WORKS

If the Contractor wishes to undertake programmed works outside of the hours nominated in Clause 1.7 Days and Hours of Work, then advance approval of the proposed work period shall be sought from the Superintendent and confirmed in writing.

The Contractor must seek written approval at least 48 hours prior to the proposed additional working time.

1.9 CONTRACTORS REPRESENTATIVE

The Contractor shall nominate, in writing, an authorised representative for the Contract. The nominated representative shall be a person an experienced delivering similar Contract works.

The Contractor's nominated representative shall act as the primary contact for the Superintendent's Representative and be responsible for administering the Contract.

The Contractor's nominated representative shall supervise all subcontractors during delivery of the Contract Works. All queries from sub-contractors shall be directed to the Superintendent's Representative via the Contractor's representative.

1.10 CONTRACTOR CONTACTS

The Contractor shall provide phone and email contact details to enable the Contractor's nominated representative to be reliably contacted both within and outside of business hours.

The Contractor shall also supply the Superintendent's Representative with all key personnel's contact details to enable efficient contract management in addition to alternative contact options should the nominated representative be unavailable.

1.11 QLEAVE LEVY PAYMENT

The Principal will be responsible for meeting all requirements and payment of the QLeave Levy for works associated with this Contract.

1.12 CONTRACT MANAGEMENT PLAN SUBMISSION, REVIEW AND ENDORSEMENT

Management Plan Submission

The Contractor shall prepare and submit the following management plan documents to the Superintendent's Representative for review and endorsement, prior to the commencement of work on site:

- Work Health and Safety Management Plan
- Fatigue Management Plan
- NHVR Chain of Responsibility Management Plan
- Environmental Management Plan
- Quality Management Plan
- Temporary Traffic Management Plan

Each management plan shall comply with all relevant legislative and regulatory requirements and industry best practice standards. Each management plan shall as a minimum meet the requirements detailed in the Contract and be specific to the requirements of the Works Under Contract, work locations and scope of work. For the avoidance of doubt, each management plan document shall be contract specific and relate exclusively to the Works Under Contract and the location and circumstances within which the works will be undertaken.

Superintendent Endorsement

The Superintendent's endorsement of the submitted management plans shall signify that the plans have been reviewed to ensure they meet the general requirements of the Contract. The endorsement does not imply approval or acceptance of responsibility for the content or implementation of the plans.

The Contractor shall remain fully responsible for the adequacy, implementation, and management of all endorsed plans, and shall ensure that all construction activities are conducted in accordance with the endorsed plans.

Revisions and Updates

The Contractor shall promptly revise and update the management plans as necessary to address any changes in scope, site conditions, or regulatory requirements. All revisions and updates shall be submitted to the Superintendent's Representative for review and endorsement prior to implementation on site.

The Contractor shall maintain records of all revisions and provide the Superintendent's Representative with updated copies of the endorsed plans.

Non-Compliance

Failure by the Contractor to submit the required management plans for review and endorsement or to implement the endorsed plans in accordance with the requirements of the Contract may result in the suspension of work, withholding of payments, or other remedies available to the Superintendent under the Contract.

Contractor's Responsibility

The Contractor acknowledges that the preparation, submission, and implementation of the management plans are solely the responsibility of the Contractor. The Superintendent's endorsement of the management plans does not relieve the Contractor of any responsibilities or liabilities under this Contract.

The Contractor is responsible for undertaking all training, workshopping, toolbox meetings and personnel engagement required to develop, document and maintain its management systems and documentation. All personnel present on site shall be inducted into the requirements of the Contractor's management systems in addition to routine site specific inductions.

The Contractor shall record and maintain all records associated with its implementation and compliance with the Contract Management Plans. The Contractor shall make all information and records available for audit and inspection if requested.

If the Contractor becomes aware of a non-conformance in the implementation of its management systems and/or a non-conformance is identified via third-party audit, the non-conformance shall be reported to the Superintendent at the earliest opportunity. The Contractor shall report the non-conformance to the Superintendent along with proposed remedial actions. The Contractor shall also report to the Superintendent when the non-conformance has been closed out and the measures implemented to prevent a reoccurrence.

General Management Plan Requirements

The Contractor shall comply with any reasonable direction given by the Superintendent or their representatives relating to the effective and appropriate implementation of management plan requirements.

The Contractor shall comply with the requirements of all local, state and federal legislation and regulations associated with the management and delivery of the Contract Works. All costs associated with the Contractor's compliance with these obligations shall be included in the tendered Contract rates.

1.13 NHVR CHAIN OF RESPONSIBILITY

The Principal considers the National Heavy Vehicle Regulator (NHVR) Chain of Responsibility regulations to be an important aspect of road safety for heavy vehicles and other road users. The Principal requires its contractors to implement, operate and maintain a comprehensive NHVR Chain of Responsibility Management Plan which helps to keep all road users safe.

Notwithstanding the requirements of Clause 1.12 Contract Management Plan Submission, Review and Endorsement the Contractor shall supply its Chain of Responsibility Management Plan to the Superintendent's Representative for review and endorsement prior to the commencement of work on site. The Contractor's Chain of Responsibility Management Plan shall ensure all personnel having Chain of Responsibility duties are identified and their roles and obligations clearly defined.

The Contractor shall ensure the Chain of Responsibility Management Plan and all work associated with delivery of Works Under Contract involving the use of heavy vehicles is undertaken in accordance with the requirements of the management plan and NHVR law.

The Contractor shall record and maintain all records associated with its implementation and compliance with the NHVR Chain of Responsibility Plan. The Contractor shall make all information and records available for audit and inspection if requested.

1.14 FATIGUE MANAGEMENT

The Principal recognises that fatigue is an important consideration within the overall management of work health and safety. This is particularly the case with the type of work being undertaken and the long distances within the Bulloo region. This means fatigue can be a significant factor when ensuring that the Works Under Contract are completed in a safe and efficient manner, while ensuring that all personnel arrive home safely.

Notwithstanding the requirements of Clause 1.12 Contract Management Plan Submission, Review and Endorsement the Contractor shall supply its Fatigue Management Plan to the Superintendent's Representative for review and endorsement prior to the commencement of work on site. The Fatigue Management Plan shall apply to all workers associated with the delivery of the Works Under Contract, regardless of their role.

The Contractor shall ensure that all work associated with the delivery of the Works Under Contract and any works requiring the use of heavy vehicles is undertaken in accordance with the requirements of Work Health

and Safety legislation and the Fatigue Management Plan. The Fatigue Management Plan shall ensure it meets the requirements of, and addresses the work vs rest hours required under NHVR law.

The Contractor shall record and maintain all records associated with its implementation and compliance with the Fatigue Management Plan. The Contractor shall make all information and records available for audit and inspection if requested.

1.15 BIOSECURITY MANAGEMENT

The Contractor shall take reasonable and practical steps to address and/or mitigate biosecurity risks. The Contractor shall manage and implement its biosecurity obligations under the Biosecurity Act 2014 (QLD) and the Bulloo Shire Council Biosecurity Plan 2022 Onwards.

The Contractor shall be aware of the potential risks associated with carriers and the movement and sourcing of materials, vehicles and machinery and the disturbance, import or export of soils. The Contractor shall ensure that where necessary appropriate measures are implemented that reduce or eliminate, where practicable, the chance of biosecurity risks being exacerbated or a contravention occurring.

1.16 TEMPORARY TRAFFIC MANAGEMENT

The Contractor shall supply, install and maintain all temporary traffic management (TTM) required to complete the Contract Works safely, in accordance with the adopted Temporary Traffic Management Plan (TTMP). The Contractor shall ensure that the endorsed TTMP and installed TTM meets the requirements of the Australian Standard AS 1742 “Manual of Uniform Traffic Control Devices” and the Queensland Department of Transport and Main Roads “Manual of Uniform Traffic Control Devices, MUTCD, Part 3 – Work on Roads.

The Contractor shall ensure that the worksite shall be left safe for traffic overnight and when the site is unattended. Any hazards shall be clearly signposted and appropriate traffic management provided.

The Contractor shall ensure that all excess materials from its works are removed from the road surface and disposed of in a suitable manner to the satisfaction of the Superintendent's Representative while the site is unattended and at the completion of work on site.

1.17 ACCOMMODATION CAMPS

Accommodation camps supplied by Contractor to house personnel delivering Contract works are to be fully self-contained and managed by contractor. The Contractor shall provide a standard of accommodation which allows all personnel to take care of themselves, rest and recover in a manner that helps to prevent and/or mitigate fatigue.

The Contractor shall only use approved locations for camps. The Contractor shall seek approval from the Superintendent for all proposed camp locations prior to the commencement of work on site. The Contractor shall ensure that the camp extent does not encroach or impact on previously uncleared or unused areas of land. In particular the Contractor shall ensure that no damage to the environment or disturbance to cultural heritage sites and/or artifacts occurs.

The Contractor shall ensure that all sites used for camps are left in a clean and tidy manner. All litter and waste produced by the Contractor’s personnel in a camp shall be collected and managed by the Contractor and disposed of in an approved manner in accordance with BSC guidelines.

1.18 COMPLAINTS

The Principal will pass on to the Contractor the details of all complaints received, which are associated with the works. The Contractor shall maintain a record of all complaints received via the Principal or from members of the public. The Superintendent's Representative must be advised of all complaints received by the Contractor at the earliest possible opportunity.

The Contractor shall, if the complaint is genuine and with basis, respond to and address the cause of the complaint at the earliest possible opportunity. The Contractor shall notify the Superintendent's Representative when the cause of the complaint has been resolved and the details of the resolution.

1.19 APPROVALS AND OTHER LAW

Definitions

In this clause:

Approvals means *certificates, licenses, accreditations, clearances, authorisations, consents, permits, approvals, determinations and permissions from any Authority and any related fees and charges*; and

Authority means *any Federal, State, or local government authority, administrative or judicial body or tribunal, department, commission, agency, government owned corporation, statutory body or instrumentality or any other person having jurisdiction*.

Identifying, obtaining and maintaining Approvals

The Contractor shall identify and notify the Principal of all Approvals which are necessary for the completion of Contract Works (other than Approvals which the Principal has advised the Contractor it has already obtained). The Contractor must obtain and maintain all such Approvals until all of the Contractor's other obligations under the Contract are complete. The cost of obtaining and maintaining all such Approvals shall be borne by the Contractor.

Compliance

The Contractor shall and must ensure that its Personnel comply with all Approvals and other laws which are in anyway applicable to the delivery of the Contract Works, including, unless the Contract expressly provides otherwise, by paying all fees, royalties, levies, charges, costs, expenses, taxes or duties.

Obtaining or Granting of Approvals by Principal

The Principal gives no warranty and makes no representation that it will be able to obtain, or obtain within any particular timeframe; or where the principal is the relevant Authority, that it will grant, any Approval required for the Contractor to perform the Services.

No fetter

Nothing in the Contract shall be taken to fetter the power, rights or authority of the Principal as the sublessor under the *Land Act 1994 (Qld)* or an Authority under the *Local Government Act 2009 (Qld)*, the Local Government.

1.20 POSSESSION OF SITE

Granting of Possession of Site will be in accordance with the requirement of Volume 2 Conditions of Contract Annexure A Item 22 Time for Giving Possession. The Contractor shall not commence physical works on site until the Superintendent has granted Possession of Site in writing.

The Superintendent may negotiate and agree alternative Possession of Site arrangements with the Contractor if site conditions and the progress of other works facilitate alternative arrangements. The Superintendent will not consider claims by the Contractor due to a change to the Possession of Site date.

SECTION 2 – SERVICE LEVELS AND QUALITY

2.1 SERVICE LEVEL, SCOPE AND QUALITY

The Contractor shall ensure that the specified Contract Works are delivered in accordance with the requirements of the Contract, within the required timeframe and to the required quality standards. The table below details the requirements and standards, against which the Contractor will be assessed.

The Superintendent's Representative will review the Contractor's delivery performance of the Contract Works against the following Service Levels at the frequency stated in the table below. The Superintendent may seek a written explanation and proposed solution from the Contractor if any Service Levels detailed below are breached or the completed work does not meet the specified standards.

Service Level	Requirement	Review Period
Delivery of program accepted by superintendent	As per contractor program supplied at time of tender award	Reviewed at progress meetings held at start of each agreed day of roster commencement.
Scope of works delivery	In accordance with scope "long form" of each treatment type. Refer Design and Contract documents	Review at daily inspections with Superintendent Representative
Quality of works	In accordance with scope "long form" of each treatment type. Refer Design and Contract documents	Review at daily inspections with Superintendent Representative

2.2 QUALITY AND CONFORMANCE

The Works Under Contract will be supervised by the nominated Superintendent's Representative(s).

The Contractor shall report to Superintendent's Representative daily regarding the progress and completion of works on site. The Contractor shall submit for review on a weekly basis, on the first working day of the week, as a minimum, the previous weeks tip and load sheets, and water usage records.

The Superintendent's Representative will be required to sign off Hold Points and complete Inspections of the Contractor's works at the times and work stages detailed below. The Contractor shall provide 48 hours notice when the works are ready for hold point or final inspection.

Work	Work Stage	Inspection / Hold Point
All works	Lot Identification	Hold Point
	Set out of works	Hold Point
Subgrade / Embankment	Subgrade preparation (shape, level and density)	Hold Point
Material Quality (All Works)	Use of quarry or material source	Hold Point
	Compliance of all materials prior to their haulage to the works	Hold Point

Work	Work Stage	Inspection / Hold Point
Dam Wall (in addition to Subgrade)	Wall density (proof roll)	Inspection
	Geometry (finished surface shape, alignment and level)	Inspection
	Depth of material layers	Inspection
All Works	Non-conformance to any specified criteria	Hold Point
	Final Inspection prior to practical completion	Hold Point
	Practical Completion prior to leaving the site	Inspection

2.3 INSPECTION AND TEST PLANS (ITPs)

General

The Contractor shall develop, implement and maintain contract specific Inspection and Test Plans (ITPs) for all significant work activities associated with the Works Under Contract.

The ITPs shall form part of the Contractor's Quality Management Plan and shall provide a structured framework for demonstrating that the Works Under Contract conform to the requirements of this Specification, the applicable Contract specification and Australian Standard requiremets, as relevant to the work being undertaken.

The ITPs shall be contract specific and relate exclusively to the Works Under Contract, the locations at which the works will be undertaken and the methods and sequence of construction proposed by the Contractor. Generic or corporate ITPs shall not be used unless they have been adapted and revised to address the specific requirements of this Contract.

No work to which an ITP applies shall commence on site until the corresponding ITP has been submitted to, and endorsed by, the Superintendent's Representative.

Preparation and Content

The Contractor shall prepare ITPs for each major work type and/or construction activity, including but not limited to:

- Earthworks and subgrade preparation;
- Material placement and compaction;
- All pipework supporting the dams operation;
- Liner material and installation;
- Spillway construction;
- Concrete works of any kind; and
- Any other works identified by the Contractor or directed by the Superintendent's Representative.

Each ITP shall as a minimum:

1. Identify the specific work activity, location(s), lot definition and applicable drawing, and specification.
2. Identify all inspection, test and verification activities required to demonstrate conformity, including those specified in Clause 2.2 Quality and Conformance and any additional requirements of the relevant Australian Standard.

3. Clearly identify Hold Points and Witness Points, including:
    - the stage of work at which the Hold or Witness Point occurs;
    - the party responsible for requesting the inspection or test; and
    - the Superintendent's Representative's role and the requirement for approval or sign-off before work may proceed beyond a Hold Point.
4. Nominate the method of inspection or test, the frequency of inspections or tests, and the acceptance criteria, by reference to this Specification, without restating detailed tolerances.
5. Allocate responsibilities for carrying out inspections, sampling, testing, verification and sign-off, including subcontractors and testing laboratories where applicable.
6. Provide for the recording of:
    - date and time of the inspection or test;
    - location and lot identification;
    - results and conformity / non-conformity status; and
    - name and signature (or electronic equivalent) of the person performing the inspection or test and the person authorising the result.
7. Provide for the cross-referencing and attachment of supporting evidence, including test certificates, calibration certificates, photographs, as-built records and Fulcrum App records where relevant.

ITPs shall be prepared using a structured, tabular format that clearly sets out the sequence of work activities and associated inspections and tests in the order they are to be performed on site.

Submission, Review and Endorsement

The Contractor shall submit all ITPs to the Superintendent's Representative for review and endorsement in accordance with Clause 1.12 Contract Management Plan Submission, Review and Endorsement, and not less than ten business days prior to the intended commencement of the associated work on site, unless otherwise agreed with the Superintendent's Representative.

The Superintendent's endorsement of an ITP signifies that the ITP has been reviewed for general conformity with the requirements of the Contract. Endorsement shall not relieve the Contractor of its responsibility for the adequacy, implementation and effectiveness of the ITP or for the conformity of the Works Under Contract.

The Superintendent's Representative may direct the Contractor to amend an ITP where, in the opinion of the Superintendent's Representative, it does not adequately address the requirements of the Contract or does not provide sufficient control over the quality of the work. The Contractor shall promptly revise and resubmit any such ITP for further review and endorsement.

Implementation On Site

The Contractor shall implement the endorsed ITPs for all relevant activities and shall ensure that work is not carried out in advance of the inspections and tests required by the ITPs.

The Contractor shall ensure that current endorsed copies of all relevant ITPs are available at the worksite at all times while the corresponding activities are being undertaken. ITPs may be made available in hard copy or electronic form, provided they are readily accessible to site personnel, the Superintendent's Representative and any authorised auditors.

The Contractor shall ensure that all relevant personnel, including subcontractors and testing providers, are familiar with the requirements of the applicable ITPs and understand their responsibilities in relation to inspection, testing, record keeping and sign-off.

Work subject to a Hold Point shall not proceed beyond that Hold Point until the Superintendent's Representative has inspected the work, verified conformity (or otherwise accepted the work) and released the Hold Point.

Records, Traceability and Reporting

The Contractor shall complete and maintain ITP records contemporaneously with the inspections and tests undertaken. Under no circumstances shall ITP records be compiled retrospectively for work that has already been covered up or progressed beyond the relevant inspection or test stage.

The Contractor shall ensure that ITP records:

- are legible, complete and accurate;
- clearly identify the lots, locations and work activities to which they relate;
- cross-reference all associated test results, certificates, calibration records and Fulcrum App entries; and
- clearly indicate whether each inspection or test has achieved a conforming result.

Completed ITPs and associated records shall be submitted to the Superintendent's Representative:

- upon request at any time during the Contract Period;
- as part of the supporting documentation for progress claims relating to the associated work; and
- at or prior to Practical Completion for inclusion in the quality records for the Works Under Contract.

All ITP records shall be retained by the Contractor for the duration of the Contract and any defects liability or maintenance period and shall be made available to the Superintendent's Representative on request.

Revisions, Non-Conformances and Corrective Actions

The Contractor shall promptly amend ITPs to reflect changes in construction methods, materials, hold points, witness points, testing requirements or other relevant aspects of the work. Revised ITPs shall be submitted to the Superintendent's Representative for review and endorsement prior to their implementation on site.

Where a non-conformance with the requirements of an ITP, this Specification or the relevant Australian Standard is identified (whether by the Contractor, the Superintendent's Representative or an auditor), the Contractor shall:

- record the non-conformance on the relevant ITP and within its non-conformance management system;
- notify the Superintendent's Representative at the earliest practical opportunity;
- propose appropriate corrective actions and timeframes for their implementation; and
- record verification that the corrective actions have been completed and that the work has been returned to a conforming condition, or otherwise managed in accordance with the Superintendent's direction.

Non-Compliance with ITP Requirements

Failure by the Contractor to:

- prepare and submit contract specific ITPs in accordance with this Clause;
- implement the endorsed ITPs for the relevant work activities; or
- maintain complete and accurate ITP records,

may be treated by the Superintendent as a failure to comply with the Contractor's quality obligations under the Contract.

Without limiting any other rights under the Contract, the Superintendent may, in the event of such failure:

- direct the suspension of affected work until satisfactory ITPs and/or records are submitted;
- withhold certification of payment for work that is not supported by adequate ITP records;

- require additional inspections and tests to be undertaken at the Contractor’s cost; and/or
- direct the removal, rework or replacement of non-conforming work at the Contractor’s cost.

All costs associated with the preparation, implementation, maintenance and revision of ITPs and the keeping of related records shall be deemed to be included in the Contractor’s tendered Contract rates and no separate payment shall be made.

SECTION 3 – SITE WORKS

3.1 ORDER OF WORK

The Contractor shall ensure the Works Under Contract are undertaken in accordance with the following work order requirements.

- There are no specified order of work requirements for this Contract.

3.2 WORKS PROGRAM AND PROGRESS

Works Program

The Contractor shall submit to the Superintendent's Representative for review, a detailed works program within ten days of the date of contract award. The works program shall include the following information:

- Detailed activities for all construction works.
- Activity dependencies.
- Critical path activities identified for the Works and any Separable Portion of the Works.
- Activity duration indicating the start and finish dates for each activity.
- Milestones which identify significant events including completion of Separable Portions.
- Allowance for adverse weather.
- Non-work periods.

The Contractor's works program should reflect delivery from furthest site to the closest, where possible, to avoid cartage over recently completed work.

The Contractor shall ensure that all works are complete on each road and have been approved by the Superintendent's Representative prior to work commencing on a new road.

The submitted construction program will be reviewed by the Superintendent's Representative. If the Superintendent's Representative considers that the submitted works program or any subsequent revision does not show sufficient details, or is impractical, or does not comply with the requirements of the Contract, or will not result in completion of the Contract Works by the Date for Practical Completion, the Superintendent may direct the Contractor to revise and resubmit to the Superintendent an amended works program within five business days for further review.

Works Progress

The Superintendent's Representative will monitor the Contractor's progress against the agreed works program throughout the contract period.

The Contractor shall note that if the Principal or Superintendent is not satisfied with the Contractor's progress compared to the agreed works program, the Contractor will be requested to demonstrate how the works will be brought back onto schedule.

If the Contractor is unable or unwilling to bring the works back onto schedule in accordance with the agreed works program to the satisfaction of the Principal or Superintendent, or if it is considered that the work cannot be completed by the Date for Practical Completion, additional resources may be procured by the Principal, and a separable portion of the Contract Works may be awarded to a third party to meet works delivery time constraints.

3.3 ADVERSE WEATHER

Notwithstanding the requirements of Clause 34A Delay Costs the Contractor shall make allowance in the submitted works program for adverse weather and the effects of the adverse weather. The Contractor shall make the following allowances for adverse weather in the submitted works program.

Work Zone	Adverse Weather Allowance
Turkey Nest Dams	12 Working Days

The adverse weather allowance does not include allowance for periods when works are suspended due to adverse weather. This allowance is included in the Contract duration and is not to be construed as the actual time lost due to adverse weather conditions likely to be encountered during the Contract.

The Contractor's representative shall notify the Superintendent's Representative immediately of any time lost due to adverse weather conditions and shall confirm such notification in writing within five business days. The confirmation shall provide details of the nature and extent of delays and the construction activities affected. The Superintendent, if satisfied that the Contractor has taken reasonable steps to minimise the period of delay, will certify at the end of each month an appropriate period of time lost and will issue to the Contractor a monthly summary of certified time lost. The maximum period of time which will be certified on any working day will be ten hours.

Where the Contractor is required to provide a construction program, only delays affecting critical activities will be considered as time lost due to adverse weather conditions.

If the total period of time certified exceeds the total allowance for the Contract Works specified above, the Superintendent's Representative will, in accordance with the General Conditions of Contract, grant an extension of time for completion of the Contract Works on the basis of one working day for each ten hours of certified time in excess of the allowance. No extension of time will be granted until the total excess period equals ten hours or a multiple thereof. Periods of less than ten hours' duration shall accrue to form part of any subsequent extension of time.

No additional payment for costs arising from extensions of time granted due to excess adverse weather will be made.

3.4 COMMENCEMENT OF WORK

The Contractor shall provide 72 hours' notice of the intention to commence work on a new site. Notification shall be provided to the Superintendent's Representative in writing.

3.5 WORK TIMEFRAMES

Notwithstanding the requirements of Clause 39.2 Contractor's Default Parts c) and d) the Contractor shall ensure that all works are completed in a timely and efficient manner to enable overall Contract timeframes to be met.

3.6 WORK TO BE COMPLETED BY OTHERS

The Contractor shall note that amongst other activities, the Principal has routine maintenance contractors for road work. The Principal also employs its own maintenance crews who also maintain the road network. The Contractor may from time to time be required to share use of the worksite and stockpile sites with other contractors and/or Council work crews.

The Principal has in place or will award other roadworks contracts to construct, upgrade and/or repair its road network. The Contractor may from time to time be required to share use of the worksite and stockpile sites with other contractors and/or Council work crews. In addition the Contractor's worksite may be impacted by other parties transporting plant, equipment, materials and personnel required to complete works not associated with this Contract.

The Contractor shall ensure it does not delay or hinder the works of others and works collaboratively with other contractors and Council personnel to enable all works to be delivered in a safe, efficient and timely manner. The Contractor shall ensure that sufficient documentary photos and records are taken and kept throughout the Contract Period. This is to ensure that any abnormal damage or degradation of completed works can be identified, quantified and substantiated.

3.7 UTILITY SERVICES

The Contractor shall be responsible for identifying utility services on site and any special requirements the various utility service authorities have concerning works in the vicinity of their assets.

The Contractor shall take account of any identified restrictions to the works when pricing work packages. Any costs associated with complying with the identified restrictions shall be included in the quotes for the relevant work package and identified as a separate cost.

The Contractor shall also note and account for the presence of private utilities within the road reserve, such as water supply pipes for stock or irrigation purposes. The Contractor shall note that private utilities of this nature are unlikely to be present on Before You Dig plans. The Contractor shall ensure that appropriate measures are taken to ensure that any such utility services are not damaged as a result of the Contract Works.

3.8 ELECTRONIC RECORDS AND INFIELD APP

The Principal, via the Superintendent's Representative, uses an infield data capture and works management application. The data collected by the application program is used to provide reports internally, and externally to other agencies, on the progress of Contract works. The Contractor and its personnel shall be required to use the application program daily as part of works delivery.

The app is used to provide and confirm information about the approved works along with recording the completed works, materials used and problems encountered. The app will also be used by the Superintendent's Representative to record inspections completed and final approval of completed works for payment claims.

The Contractor shall supply suitable Android phones or tablets to site personnel to enable the application program to be installed and appropriate login details provided.

The Superintendent's Representative will provide training to the contractor's personnel on the usage and Principal's expectations of application program. Additional training relating to the usage and expectations for the application program will be provided as required by the Superintendent's Representative.

The application used by Bulloo Shire Council is Fulcrum App.

3.9 WORK SET OUT AND LOT IDENTIFICATION

The initial identification and set out of general work site area will be undertaken by the Superintendent's Representative. The set out will include the following:

- Location pegs of the boundary extents of the nominated sites.

The Contractor shall check and confirm all work details at each site, prior to the commencement of work at a site. If discrepancies are identified, they shall be immediately communicated to the Superintendent's Representative and direction sought.

3.10 DAM CONSTRUCTION MATERIAL SOURCES AND ACCESS

Dam construction material are expected to be sourced either exclusively or predominately from the construction worksite. Materials shall be obtained from the following sources:

Onsite Materials: If materials located on site are deemed to be suitable for use in all aspects of dam construction they shall be used by the Contractor for the construction of all aspects of dam. If the clay liner option is selected this material may need to be imported if suitable material does not exist on site.

Gravel Pits: Some material may be required to be sourced from Principal nominated gravel pits, as agreed with and directed by the Superintendent's Representative. The nominated source of granular pavement material for each worksite will be provided to the Contractor material is required to be imported from gravel pits. Granular pavement material shall be loaded and supplied to worksites by the Contractor.

If materials are required to be imported from nominated gravel pits the following requirements shall apply.

Granular Pavement Material Procurement

All granular material required to complete the Contract will be stockpiled at the nominated gravel pit sites, ready for loading and haulage by the Contractor.

The Contractors shall provide at least 72 hours notice to the Superintendent's Representative of the intention to procure material from a nominated gravel pit.

Granular Pavement Material Records

The Contractor shall record the quantity of all material sourced from each gravel pit. The quantity measure shall be recorded via the weight of material removed from the pit.

The Contractor shall keep records of all granular material used for the delivery of the Contract works. All records shall be supplied to the Superintendent's Representative on a daily basis. The records supplied shall detail the following information as a minimum:

- Quantity of material loaded and delivered to site.
- Source of the materials.
- Location that the material is being delivered to.
- Roads used for carting materials.

Gravel Pit Access

The Contractor shall be responsible for facilitating access to the nominated pit. The Contractor shall maintain the access road to the pit and ensure no damage occurs from the extraction operations to support the Contract works. The Contractor shall undertake any required maintenance to the access road before, during and upon completion of the extraction operations to ensure safe access to the pit is maintained and is safe for all vehicles requiring access to the pit.

3.11 MATERIAL BULK DENSITY AND BULKING FACTOR

The Contractor shall complete work associated with the Contract using a nominated bulk density material rate and bulking factor as detailed below.

Material Bulk Density	2.2T/m^3

Material Bulking Factor	30%

3.12 WATER PROCUREMENT

The Contractor shall be responsible for sourcing and supplying all water required for completion of the Contract works.

General

For the extraction and supply of all water required to deliver the Works Under Contract, the Contractor shall ensure that consideration is given to the following when considering options for sourcing water:

- The Contractor shall ensure that the supply of water in sufficient quantities is identified and the costs of providing the water to deliver the Works Under Contract is incorporated into the Contractor's rates.
- The Contractor is responsible for ensuring the proposed water sources, function, are able to be physically accessed, are suitable for the intended use on site and do not adversely impact other parties.
- The Contractor shall supply, install and maintain all equipment necessary to extract water from the planned source at its cost.

The Superintendent will not consider claims from the Contractor associated with the procurement of water.

Creeks and Rivers

Extraction of water from creeks and rivers will require a written permit from the relevant authority. The Contractor is responsible for applying and obtaining any permit(s) to extract the water required to complete the Contract works. The Contractor shall pay all costs associated with obtaining and meeting the ongoing compliance requirements of the permit(s). The Contractor shall supply a copy of the permit to the Superintendent's Representative within ten working days of its receipt and prior to the extraction of any water.

Private Sources

If the Contractor wishes to obtain water from private property, the Contractor shall negotiate the use and extraction of the water with the property owner. The Contractor shall pay all costs sought by the property owner for the extraction and use of the water. The Contractor shall ensure the details of the agreement with the private property owner are documented in writing. The Contractor shall supply a copy of the written agreement to the Superintendent's Representative within ten working days of the agreement's finalisation and prior to the extraction of any water.

Bores

Extraction of water from bores requires written permission from the relevant authority and/or owner of the bore. The Contractor is responsible for applying and obtaining any permit(s) to extract the water required to complete the Contract works. The Contractor shall pay all costs associated with obtaining and meeting the ongoing compliance requirements of the permit(s). The Contractor shall supply a copy of the permit to the Superintendent's Representative within ten working days of its receipt and prior to the extraction of any water.

3.13 HAUL ROADS

The Contractor shall be responsible for the condition and maintenance of haul roads used for the delivery of the Contract works. Maintenance works shall include, but not be limited to:

- The use of water carts to maintain the road surface and for dust suppression.
- Grading of the road surface to remove potholes, corrugations and reinstate shape.

The Contractor shall complete prior to the use of all haul roads an existing condition report to identify the current condition. The Contractor shall repair, at its cost, any damage caused by haulage operations.

Haulage of materials shall not occur during the following periods or situations:

- On closed roads as defined by the BSC Road Report.
- During periods of wet weather.
- On roads affected or damaged by wet weather.
- Between the hours of 6pm and 6am during delivery of the Contract works.

The Contractor's Tendered rates shall allow for maintenance works to be undertaken on all haul roads utilised in the delivery of the Works Under Contract.

3.14 TURN AROUND FACILITIES

Contractors shall only utilise existing turnaround facilities across the Principal's road network. The Contractor shall not form new turnaround facilities unless specific approval for each facility is provided in writing by the Superintendent's Representative.

The Contractor's Tendered rates shall include all costs associated with material haulage and trafficking between turnaround areas. The Contractor shall make allowance for any impact on production rates and the Contract program of the need to account for any extra distance and inefficiencies introduced by the location of approved turn around facilities.

SECTION 4 – EARTHWORKS

4.1 CLEARING, GRUBBING AND TOPSOIL

Extent of Clearing and Grubbing

The Contractor shall clear and grub only to the extent necessary to safely and efficiently undertake the Works. The Contractor shall not clear outside the approved work footprint (including borrow areas, access tracks, stockpile areas and camp areas) without the prior written approval of the Superintendent's Representative.

Prior to clearing, the Contractor shall:

- confirm and mark the limits of disturbance on site (including exclusion zones);
- identify and protect any existing services, fencing, drainage lines and environmental/cultural heritage constraints; and
- implement controls to prevent the spread of weeds and pests, including plant and vehicle wash-down where required by the Contractor's Biosecurity Management obligations.

Vegetation, roots, stumps and organic debris shall be removed from areas where the Works will be constructed, including:

- the dam floor and embankment/bund footprint;
- key trench footprint;
- inlet/outlet/spillway footprints (where applicable); and
- areas required for site establishment, laydown and access.

Grubbing shall remove roots and organic matter that could create voids, settlement, piping paths, or compromise liner/subgrade integrity.

Cleared/grubbed material shall be disposed of or managed in an approved manner. Material shall not be buried beneath embankments, dam floors or lining systems.

Topsoil Stripping

The Contractor shall strip topsoil from:

- the dam footprint (floor and batters as applicable);
- embankment/bund footprint and tie-in areas; and
- all work areas that will be trafficked or disturbed (including access tracks, stockpiles and laydown areas).

Topsoil shall be stripped to the depth encountered as topsoil (typically to the top of subsoil), without contaminating the topsoil with clay, subsoil, rock or debris.

The Contractor shall keep topsoil separate from subsoil and from any potentially dispersive, saline or contaminated materials. Topsoil stockpiles shall not be mixed with trench spoil, embankment material or unsuitable material.

Stockpiling and Protection

Topsoil shall be stockpiled in stable locations clear of drainage lines and outside areas that may be inundated or eroded. Stockpiles shall be protected against erosion and sediment loss (wind and water) and maintained in a condition suitable for reuse.

The Contractor shall:

- maintain stockpiles to minimise weed growth and seed spread;

- shape stockpiles with stable batters; and
- install sediment/erosion controls around stockpiles where required.

Re-spreading and Rehabilitation
Following completion of construction and after final trimming, the Contractor shall respread stripped topsoil over disturbed areas nominated for rehabilitation.

Topsoil shall be respread evenly and in a manner that promotes stabilisation and revegetation, without leaving windrows, scours or ponding. Final surfaces shall be left safe and stable, and free draining.

4.2 FOUNDATION PREPARATION AND KEY TRENCH

Foundation Preparation
The Contractor shall prepare the dam foundations (including dam floor, embankment/bund footprint, tie-ins and appurtenant footprints) by:

- stripping topsoil and organic material in accordance with Clause 4.1;
- removing all unsuitable material, including soft, wet, dispersive, collapsible or organic soils;
- trimming to the design line and level; and
- proof rolling to identify soft spots and non-uniform foundation conditions.

Proof rolling shall be undertaken using appropriate plant for the foundation conditions and shall be performed in the presence of the Superintendent's Representative where directed. Any pumping, rutting, weaving or deflection indicative of unsuitable foundation shall be treated as a nonconformance.

Where unsuitable material is encountered, the Contractor shall:

- delineate the extent of unsuitable material;
- notify the Superintendent's Representative;
- agree on the extent, treatment method and receive approval to complete the work;
- remove unsuitable material to solid founding material; and
- backfill with suitable material placed and compacted in controlled layers to the specified density requirements for the relevant zone.

The Contractor shall not place embankment/bund fill or liner subgrade material onto foundations that are wet, unstable, pumping, or otherwise unsuitable.

Key Trench (Cut-Off Trench) – General
The Contractor shall excavate and construct a key trench/cut-off trench beneath the dam embankments to control seepage and reduce piping risk.

The key trench shall be excavated to the alignment, depth, width and side slopes shown on the Drawings. Where dimensions are not fully detailed, the Contractor shall propose key trench geometry and construction methodology as part of its ITPs for endorsement by the Superintendent's Representative prior to construction.

The key trench shall extend into solid, low-permeability founding material and shall be kept free of loose, slaked, softened or disturbed material prior to backfilling.

The Contractor shall protect the key trench excavation from inundation, drying, slaking and contamination. If the trench becomes unsuitable due to weather or construction activities, it shall be reconditioned to the satisfaction of the Superintendent's Representative prior to backfilling.

Key Trench Backfill, Moisture Conditioning and Compaction

Key trench backfill material shall be suitable cohesive material consistent with the seepage control function of the trench and compatible with the embankment/liner zone materials.

Backfill shall be placed in controlled layers and moisture conditioned to achieve the required compaction. Unless otherwise directed or approved:

- maximum layer thickness in the key trench shall be 150 mm (compacted); and
- compaction shall achieve not less than 98% SMDD (Standard Maximum Dry Density) at a moisture content suitable to achieve a dense, low-permeability outcome (typically OMC to OMC +2% for cohesive materials).

Hold Points
The following are **Hold Points**:

- completion of foundation stripping and trimming and prior to placement of any fill or liner-related subgrade layers (Foundation Proofing Hold Point); and
- completion of key trench excavation and conditioning, and prior to backfilling (Key Trench Excavation Hold Point); and
- completion of key trench backfill and compaction, and prior to placement of overlying embankment/liner works (Key Trench Completion Hold Point).

The Contractor shall provide the Superintendent's Representative with not less than 48 hours' notice when Hold Points are ready for inspection and release.

4.3 EMBANKMENT/BUND CONSTRUCTION

Material Suitability and Segregation
Dam embankment fill shall be:

- free of organic matter, debris, topsoil and deleterious materials;
- of a nature that can be placed, moisture conditioned and compacted to achieve the specified density and stability outcomes; and
- consistent with the intended function of each zone, structural fill vs seepage control/liner support zones.

The Contractor shall segregate materials by source and type where variability exists and shall not blend materials in a manner that reduces performance or makes compliance difficult to demonstrate.

Placement in Layers and Moisture Control
Dam embankment fill shall be placed and compacted in controlled layers. Unless otherwise approved:

- maximum layer thickness shall be 150 mm (compacted) for general dam embankment fill; and
- maximum layer thickness shall be 150 mm (loose) in key trench zones and any liner support / seepage control zones.

The Contractor shall manage moisture content prior to compaction. Unless otherwise approved:

- general dam embankment fill shall be compacted at moisture content typically within OMC ±2%; and
- seepage control / cohesive zones, including key trench and compacted soil/clay liner support zones shall be compacted at moisture content typically OMC to OMC +2%, or as otherwise demonstrated by test section / ITP methodology to achieve a low-permeability outcome.

The Contractor shall not place or compact fill during conditions that will prevent achieving conformity, including rainfall, flooding, excessive drying, or where foundations are unstable.

Compaction Requirements
The Contractor shall compact dam embankment fill to achieve the required density for each zone, verified by field density/moisture testing in accordance with the Contract requirements. Unless otherwise directed or approved:

- general embankment/bund fill shall achieve not less than 95% SMDD; and
- key trench and other seepage control zones shall achieve not less than 98% SMDD.

Any area failing compaction requirements shall be treated as a nonconformance, rectified, reworked and/or replaced as necessary, and represented for testing until compliance is achieved.

Construction Methodology, Bonding and Tie-ins
The Contractor shall construct embankments/bunds to avoid lamination, planes of weakness and seepage paths. The Contractor shall ensure successive layers are adequately keyed/bonded and that fill placement ties into foundations and abutments as required.

Where construction is staged, the Contractor shall bench and key the existing surface prior to continuing fill placement, to achieve proper bonding between stages.

Geometry and Surface Finish
The Contractor shall shape dam batters and crest to the geometry shown on the Drawings. Finished surfaces shall be trimmed to provide a stable, trafficable crest (where required), and batters shall be smooth and stable with no abrupt changes in profile.

The Contractor shall protect completed embankment surfaces from erosion and damage during construction and prior to handover.

4.4 MATERIAL PROPERTIES TESTING AND COMPLIANCE

General
The Contractor shall be fully responsible for sampling, testing, certification and demonstration of compliance of all materials incorporated into the Works, including materials for:

- dam embankment/bunds, floor shaping and trims;
- in-situ liner materials (Option 1);
- imported clay liner materials (Option 2);
- any subgrade/bedding layers and filter/drainage materials (if used);
- rock armour/riprap and erosion protection materials (if used);
- geosynthetics and polymer liner system components (Option 3), including geomembrane, geotextiles, cushioning/protection layers, adhesives, welding rod (if applicable), boots/flanges and appurtenances.

No material shall be incorporated into the Works until it has been tested and verified as complying with the Contract requirements, or otherwise accepted in writing by the Superintendent (or Superintendent's Representative).

Testing and compliance is required separately for each dam site and for each material source. Results from one location, one borrow pit, or one dam are not automatically transferable to another.

Standards, Laboratories and Competence
Unless otherwise directed, testing shall be undertaken in accordance with the relevant AS 1289 methods (soils) and other applicable Australian Standards for the material type. For polymer liner systems, testing may also

utilise recognised international standards (e.g., ASTM/ISO) where no directly applicable Australian Standard exists, provided the proposed standards are nominated in the Contractor's ITPs and accepted by the Superintendent prior to use.

All laboratory testing shall be performed by a NATA-accredited laboratory (for the relevant test methods), unless otherwise approved in writing.

Sampling shall be undertaken by competent personnel using appropriate chain-of-custody processes and sample identification referencing:

- dam site (Dam A / Dam B),
- material type and zone,
- source/borrow location,
- date/time, and
- lot/batch/volume represented.

Pre-commencement Characterisation and Acceptance of Sources
Prior to commencement of bulk earthworks (and prior to importing any clay or bringing polymer liner materials to site), the Contractor shall submit a Material Source Register identifying all proposed sources (including on-site excavation zones), and provide representative test results demonstrating suitability for the intended purpose(s).

A proposed material source (including on-site excavation zones) shall be treated as unapproved until the Superintendent provides written acceptance of the source for use.

Minimum Test Suites (by material type)
The Contractor shall undertake, as a minimum, the following tests for each distinct material type/source and as required to demonstrate compliance with the Specification acceptance criteria:

A. Earthworks / embankment / general fill materials

- soil classification (including particle size distribution and Atterberg limits where applicable);
- compaction characteristics (Standard and/or Modified Proctor as specified);
- linear shrinkage / dispersion indicators (where cohesive soils are proposed, particularly in liner zones);
- any additional durability/erodibility indicators nominated in the Contractor's design/methodology for dam performance.

B. Liner materials – Option 1 (in-situ) and Option 2 (imported clay)

- full soil classification (grading, Atterberg limits, plasticity index, linear shrinkage);
- compaction characteristics for the nominated compactive effort;
- permeability indicator testing or other acceptance testing nominated by the Contractor to demonstrate the liner will achieve the specified seepage/impermeability performance (noting that the Superintendent may direct confirmatory permeability testing where risk warrants);
- dispersivity/erosion susceptibility indicators appropriate to clay liner performance in service.

C. Polymer liner materials – Option 3 (geomembrane system)

- manufacturer certification for each roll/batch (polymer type, thickness, density where relevant, and conformance properties);
- certification for ancillary components (geotextiles, protective layers, boots/flanges, sealants/adhesives);
- where required, verification/traceability of delivered roll numbers to the "as-built" panel/weld map.

Frequency of Material Properties Testing

The Contractor shall propose frequencies in its ITPs; however, the minimum frequencies below apply unless the Superintendent approves otherwise:

- Earthworks/general fill: at least one full classification test per material type/source per 2,000m³ placed, and at least one per change in material condition/stratum.
- Liner materials (Option 1 / Option 2): at least one full classification and plasticity test set per material type/source per 1,000m³ placed, and at least one compaction curve per material type/source per 5,000 m³ (or per change in material).
- Imported clay (Option 2): each imported lot/batch shall be tested for conformity, and at least one full compliance test set per 500m³ imported (unless a different lot definition is accepted by the Superintendent).
- Polymer liner (Option 3): certification for every roll/batch delivered; additional verification tests where directed or where certification is incomplete/unclear.

The Superintendent may increase testing frequency at any time where:

- results indicate variability,
- a nonconformance is identified,
- there is a change in source/processing/handling, or
- the Superintendent considers the risk profile warrants additional verification.

Test Reporting and Records
The Contractor shall provide test results to the Superintendent (or Superintendent's Representative) as soon as practicable after receipt, and in any case within the contractually required timeframe for construction records

Test results shall clearly identify:

- lot/batch represented,
- location/chainage/zone,
- depth/lift where relevant,
- acceptance criteria,
- pass/fail status, and
- any remarks on variability or anomalies.

The Contractor shall maintain a Material Compliance Register linking each test to the relevant work lots, and this register shall form part of the Dam Completion Report / handover records

Nonconformances
Where any material test result does not meet the Specification requirements, the Contractor shall:

- immediately notify the Superintendent (or Superintendent's Representative),
- quarantine the affected material/work lot,
- submit a Nonconformance Report (NCR) and a Rectification Method Statement, and
- implement rectification at no additional cost to the Principal.

Nonconforming material/work shall not be covered up or incorporated into subsequent work without written acceptance by the Superintendent.

Rectification may include (as applicable) reprocessing, blending, moisture conditioning, removal and replacement, or other measures to achieve compliance, followed by re-testing to verify compliance.

4.5 COMPACTION TESTING AND EARTHWORKS PLACEMENT CONTROL

General

The Contractor shall control and verify compaction for all earthworks and liner-related placement works, including (as applicable):

- embankment/bund fill (all zones);
- floor subgrade preparation and proofing;
- liner layers (Option 1 and Option 2);
- subgrade/bedding layers beneath a polymer liner system (Option 3), including shaping and trimming of the dam floor and batters to the required tolerances prior to liner deployment.

Compaction verification shall be undertaken via field density/moisture testing and associated conformance checks in accordance with the relevant AS 1289 methods (or equivalent accepted methods), using appropriately calibrated equipment.

Inspection and Test Plans (ITPs) and Hold Points
The Contractor shall submit ITPs covering compaction and earthworks control as part of its Construction Quality Plan deliverables (refer Contract deliverables)

The ITPs shall define work lots and include hold/witness points for (as a minimum):

- approval of each material source and liner material type prior to use;
- approval of foundation/subgrade stripping and preparation prior to placement of fill/liner;
- acceptance of each liner layer (Option 1/2) prior to placement of the next layer;
- acceptance of final subgrade prior to polymer liner deployment (Option 3);
- acceptance of crest and batter finishing prior to practical completion of each dam stage.

Placement Controls
The Contractor shall ensure that:

- layer thicknesses do not exceed those stated in the Contractor's accepted methodology/ITPs;
- moisture content is managed to achieve the specified density requirements;
- compaction plant and pass counts are appropriate to the material type and lift thickness;
- the earthworks are keyed and bonded between lifts to avoid lamination and planes of weakness (particularly within liner zones).

The Contractor shall protect placed/compacted layers from drying, saturation, rutting, or disturbance prior to completion of the overlying layers and acceptance.

Minimum Frequency of Compaction Testing
The Contractor shall propose test frequencies in its ITPs; however, the minimum frequencies below apply unless the Superintendent approves otherwise:

- Embankment/bund fill: at least one field density/moisture test per 1000m² per compacted layer, and not less than one per 400 m³ placed, per distinct zone.
- Dam floor subgrade (beneath liner or wearing surface): at least one test per 1000m², and at least two tests per day of subgrade preparation per dam (when subgrade preparation is underway).
- Liner layers (Option 1 / Option 2): at least one test per 500m² per compacted layer (or more frequently where variability is observed), and additional tests at transitions, tie-ins, penetrations, and around structures.

Testing shall be increased at:

- changes in material, moisture condition, lift thickness or compaction plant;
- any area reworked following a failed test;
- tie-ins to structures, ramps, crests, batters, and areas of restricted plant access.

Acceptance Criteria
Compaction compliance shall be assessed against the acceptance criteria stated elsewhere in this Specification (earthworks and liner performance criteria).

Where acceptance criteria are not explicitly stated for a particular zone, the Contractor shall nominate proposed criteria in its ITPs for Superintendent review prior to commencing work in that zone.

The Contractor shall also demonstrate compliance with:

- geometry and tolerances (levels, grades, batter slopes),
- surface condition (no pumping/soft spots), and
- proofing of foundations/subgrades where required.

Provision of Results and Linkage to Payment/Completion
Compaction results are part of the construction records that must be provided progressively as works proceed and form part of the Practical Completion deliverables. The Contractor shall clearly link each test to its work lot and location so the Superintendent can verify compliance for:

- progress claim assessment, and
- inclusion of the work in completion/handover records.

The Contractor acknowledges the Contract mechanism linking testing compliance (including provision of results) to progress claim assessment and required deductions

Nonconformances, Rework and Re-testing
If any compaction test result fails to meet the acceptance criteria, the Contractor shall:

- immediately notify the Superintendent (or Superintendent's Representative),
- delineate and mark out the affected area,
- investigate cause (moisture, lift thickness, plant, number of passes, material variability),
- rework the affected area (including ripping/scarifying, moisture conditioning and re-compaction, or removal and replacement where required),
- re-test until compliance is achieved, and
- keep full records of the failure, corrective action and passing retest results.

No subsequent layer shall be placed over failed or unverified work without the Superintendent's written acceptance.

All costs of rework, delays, additional testing and associated remediation are borne by the Contractor.

SECTION 5 – DAM LINING OPTIONS

5.1 GENERAL

The Contractor shall allow for the supply and installation of dam lining for two separate turkey nest dams at separate locations, as shown on the Drawings and described elsewhere in this Specification.

Tenderers shall price all three Lining Options in Schedule K1. The Principal may select any option for either dam and may select different options for each dam.

The lining system shall provide a serviceable, watertight storage suitable for Council operational water supply, primarily road construction and maintenance. The Contractor shall deliver the lining system as a complete system including subgrade preparation, anchorage, penetrations, connections to inlet/outlet/overflow works, protection measures, quality verification, and handover documentation.

The Contractor shall plan works with regard to remote logistics and limited local specialist availability. Where specialist personnel and/or proprietary products are required (particularly Option 3), the Contractor shall include those resources within its tendered rates and program, noting the two dams are a significant distance apart (approximately 65 kilometres).

5.2 LINING EXTENTS AND INTERFACES

Unless otherwise shown on the Drawings, the lining system (any option) shall extend to cover the full wetted area of the dam including:

- dam floor; and
- internal batters up to the nominated Full Supply Level (FSL) plus freeboard (or to the crest/anchor location shown).

The Contractor shall ensure all transitions, tie-ins and interfaces are watertight, including at:

- inlet structures and discharge protection;
- outlet pipe penetrations and valve arrangements;
- overflow/spillway interfaces (where lining terminates);
- any ramps or access points (if constructed).

Where penetrations through the liner are required, the Contractor shall detail and install sealing arrangements appropriate to the lining option, including puddle flanges/boots/compaction collars as applicable. Penetrations are a high-risk seepage feature; the Contractor shall include appropriate inspection, hold points and verification testing in the ITPs.

5.3 SUBGRADE AND LINER FOUNDATION PREPARATION (ALL OPTIONS)

The Contractor shall prepare the liner subgrade to provide a stable, smooth and uniform foundation for the selected lining option. Subgrade preparation shall include (as applicable):

- trimming to line and level;
- removal of rocks, roots, sharp objects, debris and deleterious material;
- proofing and rectification of soft spots;
- moisture conditioning and compaction to the requirements of Section 4 (Compaction Testing and Earthworks Placement Control); and
- final surface trimming to provide a smooth surface free of abrupt steps, rutting or loose material.

For Options 1 and 2 (soil/clay liners), the subgrade shall be prepared so the liner layers can be placed without contamination and without loss of moisture.

For Option 3 (geomembrane liner), the subgrade shall be smooth-trimmed and free of protrusions that may puncture or stress the liner. The Contractor shall not traffic heavy plant directly on prepared subgrade or installed liner except as permitted by the liner manufacturer and the Contractor's endorsed methodology.

HP Liner subgrade acceptance (shape, level, surface condition and density) shall be a Hold Point prior to placing any liner layer or deploying any geomembrane.

5.4 INSPECTION AND TEST PLANS AND QUALITY RECORDS (ALL OPTIONS)

Lining works shall be covered by contract-specific ITPs in accordance with Section 2.3 (ITPs). ITPs shall include, as a minimum:

- lot definitions (by dam and by liner area/zone);
- hold and witness points;
- inspection and test activities;
- acceptance criteria; and
- record forms and traceability requirements.

The Contractor shall maintain a Liner Construction Register recording:

- dam identification (Dam 1 / Dam 2);
- lining option and material source/batch;
- dates and weather conditions during installation;
- test results and inspection sign-offs; and
- nonconformances and rectification actions.

No lining works are to be covered, protected, flooded, or otherwise made inaccessible until the required inspections and tests are completed and accepted/released by the Superintendent's Representative.

5.5 OPTION 1 – IN-SITU MATERIAL LINER (ON-SITE MATERIAL)

Description

Option 1 comprises a compacted in-situ liner constructed using suitable materials obtained from excavation of the dam and/or other on-site sources.

Material Suitability

The Contractor shall identify proposed in-situ liner materials and demonstrate suitability by material properties testing in accordance with Section 4.4.

If the on-site materials are variable, the Contractor shall segregate materials and nominate which material types will be used in liner zones.

If suitable liner material is not available on-site in sufficient quantity or quality, the Contractor shall notify the Superintendent's Representative promptly and may propose use of Option 2 (imported clay) or other directed approach. No additional payment shall be made unless directed as a Variation.

Liner thickness, placement and compaction

Unless otherwise shown on the Drawings or approved in writing, provide a minimum compacted liner thickness of 300 mm, placed in a minimum of two layers.

Each liner layer shall be moisture conditioned and compacted to achieve a dense, low-permeability outcome. Unless otherwise approved:

- compact in layers not exceeding 150 mm (loose); and
- achieve a minimum of 98% SMDD in the liner zone at moisture content typically OMC to OMC +2%.

The Contractor shall manage drying and cracking risk. Liner works shall not be left exposed and allowed to desiccate. Where exposure is unavoidable due to weather or program constraints, the Contractor shall implement measures (e.g. light watering, temporary covers, sequencing) to protect the liner surface from cracking and degradation.

Acceptance
Acceptance shall be based on:

- compliance with thickness;
- compaction and moisture results;
- surface condition (uniform, no loose areas, no soft spots);
- absence of significant shrinkage cracking at time of acceptance; and
- satisfactory treatment of tie-ins, penetrations and interfaces.

Any nonconformance (including failed density tests, contamination, laminations, cracking, or soft areas) shall be rectified by reworking and re-testing at the Contractor's cost.

5.6 OPTION 2 – IMPORTED CLAY LINER

Description
Option 2 comprises a compacted clay liner constructed using imported clay material sourced off-site and transported to the dam location.

Clay Source Nomination and Testing
The Contractor shall nominate the proposed clay source(s) and provide evidence of suitability and consistency, including representative test results in accordance with Section 4.4.

Due to the remote nature of the works and potential variability in source material, the Superintendent's Representative may require confirmation testing at the start of importation and at reasonable intervals thereafter to verify ongoing conformity.

Liner Thickness, Placement and Compaction
Unless otherwise shown on the Drawings or approved in writing, provide a minimum compacted clay liner thickness of 300 mm, placed in a minimum of two layers.

Clay shall be placed, moisture conditioned, and compacted to achieve a dense, low-permeability outcome. Unless otherwise approved:

- compact in layers not exceeding 150 mm (loose); and
- achieve a minimum of 98% SMDD at moisture content typically OMC to OMC +2%.

The Contractor shall avoid contamination of clay with sandy or gravelly materials, topsoil, organic matter or debris.

Handling, Moisture and Cracking Control
The Contractor shall manage moisture during haulage, placement and compaction to avoid:

- overly dry placement leading to inadequate bonding and shrinkage cracking; or

- overly wet placement leading to pumping and instability.

Where drying conditions are extreme, the Contractor shall sequence works and protect exposed clay surfaces to minimise cracking prior to inundation.

Acceptance
Acceptance shall be based on the same principles as Option 1, with particular emphasis on:

- conformity of imported clay to nominated properties;
- compaction/moisture results; and
- continuity and integrity of the liner at all interfaces and penetrations.

5.7 OPTION 3 – POLYMER GEOMEMBRANE LINER (SEALED LINER SYSTEM)

Description
Option 3 comprises a manufactured polymer geomembrane liner system supplied and installed in accordance with the manufacturer's requirements and the Contract.

Minimum System Requirements (Basis of Tender)
Unless otherwise approved, tender on the basis of:

- minimum 1.5 mm thick UV-stabilised geomembrane suitable for exposed water storage applications; and
- suitable geotextile protection/cushion layer beneath the geomembrane where required to protect against puncture and subgrade irregularities.

The Contractor may propose an equivalent system (e.g. alternative polymer type or protective layer configuration) provided it offers equal or better durability and performance for exposed water storage and is supported by manufacturer data.

Installer Competence and Logistics
Due to the specialist nature of geomembrane installation, the Contractor may utilise a specialist subcontractor. The Contractor shall remain fully responsible for quality, program and compliance.

The Contractor shall ensure installation is undertaken by personnel experienced in geomembrane lining works, including welding and testing, and shall provide evidence of competence (e.g. installer experience summary, welding qualification records, manufacturer accreditation where applicable).

The Contractor shall allow for remote logistics including transport, storage and handling of rolls to prevent damage (UV exposure, tearing, contamination).

Subgrade Preparation and Protection
Prior to deployment, the subgrade shall be accepted under the Hold Point in Clause 5.3(d).

The geomembrane shall not be installed during conditions likely to compromise installation quality (high winds, extreme heat affecting welding quality, dust storms, rainfall) unless the Contractor implements suitable controls.

Installed geomembrane shall be protected against damage from plant, personnel, animals, and UV exposure beyond the manufacturer's allowances. The Contractor shall include practical protection measures appropriate to remote conditions (e.g. controlled access, temporary protection mats at access points, etc.).

Seams, Joints and Penetrations
Seaming/welding shall be performed in accordance with the geomembrane manufacturer's requirements and accepted installation methodology.

Penetrations, terminations and anchorages shall be detailed and constructed to maintain watertightness and resist uplift, slippage, and thermal movement.

Anchor trenches/terminations shall be backfilled and compacted to provide secure restraint without damaging the liner.

Testing and Quality Verification (fit-for-purpose for remote work)
The Contractor shall implement a practical QA/QC regime that achieves reliable outcomes without imposing unnecessary third-party burdens, including:

- manufacturer certification for each roll/batch supplied;
- visual inspection of all seams and details;
- non-destructive seam testing as applicable to the welding method (e.g. air channel testing, vacuum box testing); and
- a reasonable frequency of destructive seam test coupons (peel/shear) consistent with the installer's methodology and manufacturer guidance.

Testing frequency shall be nominated in the ITPs and may be increased where results, conditions, or workmanship indicate variability.

HP Completion of geomembrane installation, seam testing and repairs (including submission of QA records and weld maps) prior to flooding/commissioning.

Acceptance and Handover Deliverables
Acceptance shall include provision of a practical liner QA pack including:

- manufacturer certificates (roll/batch, thickness, material type);
- as-installed panel layout / weld map (sketch acceptable, scaled survey not required unless directed);
- seam testing results and repair records;
- photographic record of key details (anchor trench, penetrations, terminations); and
- written confirmation that installation complies with manufacturer requirements.

5.8 GENERAL NONCONFORMANCE REQUIREMENTS (ALL OPTIONS)

Any nonconforming lining work (including inadequate thickness, failed density tests, unsuitable material, contamination, cracking, seam defects, punctures, or incomplete QA records) shall be rectified at the Contractor's cost.

Rectification shall include rework/replacement and re-testing/re-inspection until compliance is achieved.

No lining system shall be accepted, covered, protected or flooded until all nonconformances affecting that area have been closed out to the satisfaction of the Superintendent's Representative.

SECTION 6 – HYDRAULIC APPURTENANCES

6.1 GENERAL

This Section covers the supply, installation, testing and commissioning of hydraulic appurtenances required for each dam, including inlet/fill arrangements, outlet/draw-off arrangements, and overflow/spillway works, as shown on the Drawings and as otherwise required for a complete and functional installation.

The Contractor shall coordinate hydraulic works with earthworks and lining works (Section 5) so that:

- pipe penetrations, anchorages and interfaces are watertight and structurally stable; and
- linings are protected from erosion, impact, puncture and undermining at all interfaces.

The Contractor shall allow for the remote outback environment, including limited local specialist availability, and shall provide a solution that is constructible with standard civil earthworks plant and readily available materials, while still achieving a durable, serviceable outcome.

Unless otherwise specified, all materials shall be new and suitable for water storage service conditions (UV exposure where applicable, abrasion at inlets, and corrosion resistance). All proprietary components shall be installed in accordance with the manufacturer's requirements.

The Contractor shall provide complete hydraulic appurtenances at each dam site, including separate mobilisation and commissioning.

6.2 MEASUREMENT AND PAYMENT (Hydraulic Appurtenances – Provisional Sum)

Provisional Sum Items

Schedule K1 includes a Provisional Sum Item for each dam for the supply and installation of the hydraulic appurtenances works described in this Section 6. The Provisional Sum Items are included to ensure tender pricing is compared on a consistent basis.

Scope of Provisional Sum Work

The Provisional Sum Work includes (as applicable to each dam): supply, delivery, installation, testing, commissioning and documentation for inlet/fill arrangements, outlet/draw-off arrangements (including valves and fittings), and overflow/spillway related appurtenances, including all interfaces with earthworks and lining works required to achieve a complete, functional and stable installation in accordance with the Specification and Drawings.

(c) Proposal and Approval Prior to Procurement

Before ordering or installing any major hydraulic appurtenance components, the Contractor shall submit a Hydraulic Appurtenances Proposal brief to the Superintendent's Representative for review and acceptance, including:

1. a schedule of proposed components (pipe material/class, valves, fittings, penetrations/boots, headwalls/energy dissipation, valve boxes/covers, etc.);
2. description and/or drawings of how the proposed arrangements meets the functional requirements of Section 6 and the lining interface requirements (as applicable);
3. supplier quotations and lead times including multiple quotes where practicable, having regard to the remote location and availability of suppliers; and
4. the proposed installation methodology and associated ITPs and commissioning approach.

The Contractor shall not proceed with procurement of components until the Superintendent has provided written acceptance, which may include reasonable conditions.

Valuation – Supply (Cost Reimbursable + Margin)

Payment for the supply and delivery of hydraulic appurtenance materials and equipment under the Provisional Sum shall be on the basis of:

- the actual invoiced cost of items accepted by the Superintendent and incorporated into the Works (or handed over to the Principal as approved spares/special tools), plus
- a margin of up to 10% applied to those actual invoiced costs.

The Contractor shall provide, with each claim: supplier tax invoices, delivery dockets/freight invoices, and a reconciliation identifying the items, quantities, and the dam site to which they relate. Any rebates, credits or discounts received shall be passed in full to the Principal i.e., the margin applies to the net invoiced cost. For clarity, the Principal will not pay for any goods or equipment which does not become a permanent physical part of the dam infrastructure or is handed over to the to the Principal for later use.

Valuation – Installation / Construction Work

Installation, earthworks interfaces, testing and commissioning work associated with hydraulic appurtenances shall be valued as follows (as applicable):

1. where a relevant rate exists in Schedule K1 or Schedule K2, at the tendered rate; otherwise
2. as a Variation valued in accordance with Clause 36 of the General Conditions of Contract (AS4000 as amended), based on agreed lump sum, or agreed daywork rates where directed.

For clarity, the 10% margin detailed above under Valuation – Cost, applies to supply only and does not apply to installation labour/plant already paid under Schedule rates or otherwise valued under Clause 36.

Adjustment of the Provisional Sum

The Provisional Sum Item is an allowance only. The Contract Sum will be adjusted up or down to reflect the value of the hydraulic appurtenances work as determined under subclauses Variation – Supply and Variation Installation. Any unspent portion of the Provisional Sum shall be credited to the Principal.

Ownership and Risk

Upon payment by the Principal of the invoiced cost of any hydraulic appurtenance item, title to that item shall vest in the Principal. Notwithstanding title, the Contractor remains responsible for the care, custody, protection and rectification of loss or damage to the items up to Practical Completion for the relevant dam.

Value for Money / Directions

The Contractor shall use reasonable endeavours to achieve value for money having regard to fitness-for-purpose, durability and availability in a remote environment. The Superintendent may reasonably direct the Contractor to obtain additional quotations where practicable and/or may direct selection of an alternative accepted option.

6.3 INLET / FILL ARRANGEMENTS

Scope

Provide inlet pipework, fittings and discharge arrangements as shown on the Drawings, including any:

- inlet pipelines and connections,
- headwall/termination arrangements,
- energy dissipation protection at the discharge point,
- liner protection at and around the inlet (where lining is provided).

Where inlet details are not fully shown on the Drawings, the Contractor shall submit a proposed inlet detail (including erosion protection and liner interface) for acceptance by the Superintendent's Representative prior to construction.

Performance requirements

Inlet arrangements shall be configured to:

- minimise erosion of dam floor and internal batters;
- prevent undermining of the embankment/bund;

- prevent damage to liner systems (Options 1–3); and
- operate safely without creating unstable slopes, scour holes, or uncontrolled discharge pathways.

Discharge shall be directed onto an energy dissipating structure and/or protective layer appropriate to the expected flow rate, drop height and local material erodibility.

Typical Minimum Inlet Protection Requirements
Unless otherwise detailed on the Drawings or accepted otherwise, provide an energy dissipating arrangement such as:

- rock riprap apron with geotextile filter underlay;
- pre-cast or cast-in-situ concrete splash pad with protective interface to liner;
- rock mattress or equivalent robust erosion protection.

The inlet protection zone shall extend sufficiently to prevent localised scour, including downstream and lateral extent to suit the discharge configuration.

For lined dams:

- ensure any rock/concrete protection does not puncture or abrade the lining; and
- where geomembrane is used (Option 3), include a protective geotextile layer and/or purpose-designed protection system between the geomembrane and the protective works.

Hold Points and Inspections

HP The inlet termination / protection detail (including liner interface and any penetration sealing arrangement) shall be inspected and accepted prior to the inlet being put into service and prior to any flooding/commissioning.

6.4 OUTLET / DRAW-OFF ARRANGEMENTS

Scope
Provide outlet/draw-off arrangements, valves and fittings as shown on the Drawings. The outlet arrangements shall provide the Principal with a practical means to draw water for operational use (roadworks/maintenance) and shall be suitable for remote operation and maintenance.

Where outlet details are not fully shown, the Contractor shall submit a proposed outlet arrangement for acceptance prior to construction, including:

- outlet location and level,
- penetration sealing arrangement (if penetrating a lined area or embankment),
- valve type and placement,
- protection against erosion/scour, and
- safe access and protection (lockable covers/valve box).

Materials and Installation
All outlet pipework and valves shall be suitable for buried service and for the site environment. Pipe materials shall comply with the relevant current Australian Standards for the product type (e.g., PE, PVC, ductile iron) and be pressure rated to suit duty.

Where the outlet includes a pipeline through an embankment/bund or through liner zones, the Contractor shall:

- provide sealing measures at penetrations to prevent seepage along the pipe interface (e.g., puddle flange, welded boot, collar arrangement, or other accepted method appropriate to the lining option);
- ensure backfill around the pipe is placed, moisture conditioned and compacted in controlled layers to prevent seepage paths and settlement; and
- provide restraint/thrust protection for fittings, valves and bends (as applicable).

The Contractor shall protect outlet components from accidental damage by plant and vehicles and from UV exposure where components are above ground.

Valve Boxes / Covers / Security
Provide lockable valve boxes or lockable covers where valves are accessible to prevent unauthorised operation and to protect the assembly from debris and animal interference.

Valve boxes/covers shall be trafficable where required and positioned to allow safe access for the Principal's personnel and plant.

Functional Requirements and Commissioning
Outlet arrangements shall be watertight, functional and capable of being operated by the Principal's personnel without specialist tools.

Provide Operations and Maintenance (O&M) information including:

- valve type/model, operating instructions and maintenance requirements;
- any special tools required; and
- as-constructed location information for all buried services.

HP Outlet installation and penetration sealing (including compaction records around the penetration zone where applicable) shall be inspected and accepted prior to covering up and prior to commissioning.

6.5 OVERFLOW / SPILLWAY ARRANGEMENTS

Scope
The Contractor shall provide overflow/spillway arrangements as shown on the Drawings to safely pass overflow flows without erosion that could compromise the embankment/bund.

Spillways must:

- resist erosion and scour for the expected overflow events;
- not undermine the embankment; and
- discharge flows in a controlled manner to stable downstream areas.

Where spillway details are not fully shown, the Contractor shall submit proposed spillway geometry and erosion protection details for acceptance prior to construction.

Spillway construction and erosion protection
Spillway excavation and shaping shall be undertaken to the design levels and geometry, verified by survey set-out and as-constructed survey.

Unless otherwise approved, provide erosion protection appropriate to the foundation and flow conditions, which may include:

- rock riprap with geotextile filter underlay;
- rock mattress or equivalent proprietary armouring;
- formed spillway with protective lining and stable transitions.

Spillway protection shall include:

- protection of the spillway crest and invert against headcutting;
- stable tie-ins to natural ground;
- protection at the downstream discharge zone to prevent scour and gully initiation.

The spillway arrangement must be designed and constructed so that spillway flows cannot track along the embankment or erode the embankment toe.

Interface With Dam Lining
Where the dam lining terminates near a spillway, the Contractor shall provide a stable termination detail that prevents:

- uplift, peeling or slippage of liner edges; and
- erosion or undermining at the liner termination.

For geomembrane-lined dams (Option 3), the termination shall be anchored and protected in accordance with manufacturer requirements and the accepted installation method.

Hold Points

HP Spillway set-out (crest/invert levels and tie-ins) shall be verified prior to final trimming and placement of erosion protection.

HP Spillway erosion protection shall be inspected and accepted prior to commissioning and prior to flooding where it affects liner interfaces.

6.6 TESTING, COMMISSIONING AND RECORDS (ALL HYDRAULIC APPURTENANCES)

Testing

The Contractor shall test all pipeline and valve works to demonstrate watertightness and functionality. Testing shall be appropriate to the pipe material and installation, and shall be performed in accordance with relevant standards/manufacturer requirements.

As a minimum:

- pressure pipelines shall be pressure tested (where applicable);
- valves shall be function-tested through full travel;
- all joints/penetrations shall be visually inspected and verified for leakage after initial wetting/commissioning (where practicable).

Commissioning

The Contractor shall commission inlet, outlet and overflow works in a controlled manner to ensure:

- no scour occurs at inlets/outlets during initial operation; and
- spillway discharge areas remain stable.

Any defects identified during commissioning including but not limited to leaks, scour and instability shall be rectified and retested/reinspected until compliant.

As-constructed and O&M Deliverables

Provide, as part of handover:

- as-constructed information showing locations and levels of inlet/outlet/overflow works;
- product data sheets for valves and proprietary components;
- operating instructions and maintenance requirements; and
- any recommended spare parts (where practical and reasonable for remote operation).

6.7 NONCONFORMANCES

Any nonconforming hydraulic work including but not limited to leaks, inadequate compaction around penetrations, scour and/or erosion issues, unstable spillway tie-ins, or damage to liners at interfaces shall be rectified at the Contractor's cost.

Rectification shall include rework and re-testing/reinspection until compliance is achieved.

No hydraulic appurtenance shall be accepted or commissioned unless:

- required inspections/hold points are released; and
- test results and records have been provided to the Superintendent's Representative.

SECTION 7 – SITE REHABILITATION AND DEMOBILISATION

7.1 GENERAL

The Contractor shall rehabilitate all areas disturbed by the Works Under Contract to a safe, stable condition that is consistent with surrounding landform and suitable for long-term operation and maintenance of the dams.

Rehabilitation obligations apply to all disturbed areas including (but not limited to):

- dam footprint (external areas and any non-wetted areas);
- embankment/bund external batters and crest shoulders (outside the lined/wetted zone);
- spillway and downstream discharge areas;
- access tracks, temporary crossings and turning areas;
- laydown areas, plant refuelling/servicing areas, camps, and temporary hardstands;
- topsoil stockpiles and borrow areas (if any);
- sediment controls and temporary drainage works.

Rehabilitation shall be progressively undertaken where practicable, and shall be completed prior to Practical Completion.

7.2 REGRADING AND SURFACE FINISHING

Disturbed ground shall be regraded to:

- remove ruts, wheel tracks, windrows and uneven surfaces;
- reinstate natural drainage patterns and avoid ponding;
- prevent concentration of flows that could initiate erosion; and
- provide stable batters and transitions to surrounding ground.

External batters, spillway discharge zones and other erosion-prone areas shall be trimmed and stabilised to prevent gullying and scour, including by installation of erosion protection where required by the Drawings or directed by the Superintendent's Representative.

All temporary bunds, banks, diversion drains and works used solely for construction shall be removed or regraded unless specifically required to remain as part of the permanent Works.

7.3 TOPSOIL REPLACEMENT

Stockpiled topsoil (from Clause 4.1) shall be respread on disturbed areas nominated for rehabilitation. Topsoil shall be placed evenly and without contamination by subsoil, clay liner material, gravel, rock or construction debris.

Topsoil shall be respread to a thickness sufficient to support revegetation and stabilisation and consistent with available stockpiled quantities. Where topsoil is insufficient, the Contractor shall notify the Superintendent's Representative and propose a reasonable alternative stabilisation approach.

Topsoil shall not be placed on surfaces where it would compromise dam function or safety, e.g., spillway crest/invert protection zones, lined internal batters where lining must remain exposed, valve access areas, unless shown on the Drawings or approved.

7.4 STABILISATION AND EROSION CONTROL

The Contractor shall stabilise rehabilitated surfaces so they are resistant to wind and water erosion in the remote outback environment. Stabilisation measures shall be appropriate to the soil type, season and site conditions and may include, as applicable:

- surface roughening/ripping on the contour;
- track walk-down and contour banks where needed to break up flow paths;

- placement of rock, geotextile, erosion matting or other armouring at concentrated flow areas;
- seeding/revegetation where appropriate and practicable; and/or
- other measures proposed by the Contractor and accepted by the Superintendent's Representative.

The Contractor shall remove all temporary erosion and sediment controls only after disturbed areas are stabilised and are no longer at high risk of erosion.

Any erosion, scour, gullying, slumping or instability resulting from the Contractor's activities, including from poor drainage, inadequate surface finish, or removal of controls too early shall be rectified by the Contractor at no additional cost.

7.5 WASTE, DEBRIS AND CONTAMINATION MANAGEMENT

On completion of the Works, the Contractor shall remove all construction waste and debris from site, including, without limitation:

- packaging, scrap materials, offcuts and surplus geosynthetics;
- demolished temporary works;
- surplus pipe, fittings and consumables;
- general rubbish and food waste.

No waste is to be buried on site unless specifically directed by the Principal and approved by the Superintendent.

The Contractor shall ensure no hydrocarbons, chemicals or contaminants remain on site. Any spills shall be cleaned up promptly, contaminated material removed and disposed of off-site in accordance with applicable requirements, and the area reinstated.

Refuelling and servicing areas shall be rehabilitated by removal of contaminated material (if any), regrading and topsoiling/stabilisation.

7.6 ACCESS TRACKS, LAYDOWN AREAS AND BORROW AREAS

Temporary access tracks and laydown areas not required for ongoing dam operation shall be:

- ripped/scarified, where compacted;
- regraded to reinstate drainage and prevent erosion;
- topsoiled and stabilised as required.

Where borrow pits or material excavation areas have been used, the Contractor shall:

- regrade to stable batters and safe profiles;
- reinstate drainage and avoid ponding where practical;
- topsoil and stabilise; and
- leave the area safe for livestock/wildlife and future Council access.

7.7 SAFETY AND SECURITY AT COMPLETION

The Contractor shall leave the Works and all disturbed areas in a safe condition, including:

- removal of hazards (open excavations, steep unsupported edges, unstable stockpiles);
- removal of temporary barriers/fencing that are no longer required; and
- ensuring permanent fencing, gates and signage required under the Contract are installed and operational.

The Contractor shall ensure all valve boxes/covers, penetrations and appurtenances are secured and left safe for the Principal's use.

7.8 COMPLETION VERIFICATION

The Contractor shall submit a brief Rehabilitation Completion Statement confirming that all rehabilitation requirements have been met, supported by:

- photos of rehabilitated areas (minimum: each dam site; access/laydown areas; spillway discharge zone);
- confirmation that all waste has been removed; and
- a register of any remaining minor defects and proposed rectification dates (if any).

Rehabilitation works shall be inspected as part of Practical Completion. Any identified defects (including erosion, unstable areas, unrehabilitated tracks/laydown areas, or debris) shall be rectified prior to acceptance.

SECTION 8 – HANDOVER

8.1 HANDOVER AND PRACTICAL COMPLETION DELIVERABLES

Practical Completion will not be achieved, and the Works Under Contract will not be accepted, until the Contractor has provided to the Superintendent the following minimum handover deliverables for each dam site, and those deliverables have been reviewed and accepted:

As-Constructed Information

- As-constructed survey or set-out confirmation demonstrating the dam footprint, crest levels, batter geometry and spillway levels are in accordance with the Drawings (or approved variations).
- Locations of inlet, outlet and overflow/spillway works and any buried services (sketch plan acceptable where survey is not practicable).

Quality and Testing Records

- Earthworks compliance records including material properties test results (where required), field density/moisture results and any proof-rolling/hold point release records.
- Nonconformance register (NCR log) showing all NCRs closed out.

Liner Completion Records (as applicable to the selected option)

- Option 1 or 2: liner thickness confirmation (where measured) and compaction/moisture compliance records for liner layers.
- Option 3: manufacturer product certificates (roll/batch), installation record, seam testing/repair records and an as-installed layout/weld map (sketch acceptable).

Hydraulic Appurtenance Commissioning

- Commissioning and functional test confirmation for inlet/outlet arrangements and spillway/overflow works (including confirmation of erosion protection installed and stable).
- O&M information for valves and proprietary components, including operating instructions and any special tools required.

Rehabilitation Completion

- Confirmation (with photos) that the site has been rehabilitated in accordance with the Specification, is free of debris and hazards, and is left safe and stable.

All handover information shall be packaged into a concise Dam Completion Package for each site and submitted prior to the Contractor requesting Practical Completion.

SECTION 9 – MEASUREMENT AND PAYMENT

9.1 GENERAL

This section covers the requirements for measurement and computation to be used in the determination of quantities of materials furnished and work performed under the Contract and provides the basis for payment.

Except for the specific items listed in this section, or unless otherwise specified, lengths and areas will be measured in the horizontal plane.

Where payment is made at rate per unit, payment will be made at the relevant tendered rate for the measured quantities of materials supplied and work performed in accordance with the requirements of the Contract.

9.2 PREPARATION AND MAINTENANCE OF MANAGEMENT SYSTEMS

No separate payment shall be made for the costs of work associated with planning, establishing, implementing and maintaining Contract Management Systems. All costs associated with planning, establishing, implementing and maintaining Contract Management Systems will be deemed to be included in the Contract Rates.

9.3 JOINT MEASUREMENT

Unless otherwise specified, a joint measure shall be undertaken to confirm final quantities of all works completed under the Contract.

The Contractor shall notify the Superintendent in sufficient time and at such appropriate time to enable a joint assessment by the Superintendent and the Contractor.

9.4 MEASUREMENT BY MASS

Where material is to be measured by mass it shall be measured in tonnes to the nearest one tenth of a tonne. The Contractor shall measure and document the mass of all materials supplied under the Contract in accordance with the Specification and the Contractor's Quality Plan. The Contractor shall supply all necessary documentation, objective where possible, of the quantity of material used.

Further, the Contractor shall provide, on request by the Superintendent, objective evidence to the ongoing verification of the accuracy of any weighing devices to assure the Superintendent of the accuracy of the measured mass of material delivered.

9.5 MEASUREMENT BY LENGTH

Where work is to be measured by length it shall be measured in meters to the nearest one tenth of a meter. The Contractor shall measure and document the length of all work completed under the Contract in accordance with the Specification and the Contractor's Quality Plan.

Further, the Contractor shall provide, on request by the Superintendent, objective evidence to the ongoing verification of the accuracy of any measuring devices to assure the Superintendent of the accuracy of the measured length of work completed.

9.6 MEASUREMENT BY AREA

Where work is to be measured by area it shall be measured in square meters to the nearest one tenth of a square meter. The Contractor shall measure and document the area of all work completed under the Contract in accordance with the Specification and the Contractor's Quality Plan.

Further, the Contractor shall provide, on request by the Superintendent, objective evidence to the ongoing verification of the accuracy of any measuring devices to assure the Superintendent of the accuracy of the measured area of work completed.

9.7 MEASUREMENT BY VOLUME

Where work is to be measured by volume it shall be measured in cubic meters to the nearest one tenth of a cubic meter. The Contractor shall measure and document the volume of all work completed under the Contract in accordance with the Specification and the Contractor's Quality Plan.

Further, the Contractor shall provide, on request by the Superintendent, objective evidence to the ongoing verification of the accuracy of any measuring devices to assure the Superintendent of the accuracy of the measured volume of work completed.

9.8 MEASUREMENT BY EACH

Where work is to be measured by each it shall be measured as a singular item or numbers of items measured as a whole number. The Contractor shall measure and document the number of items delivered or work completed under the Contract in accordance with the Specification and the Contractor's Quality Plan.

Further, the Contractor shall provide, on request by the Superintendent, objective evidence to the ongoing verification of the accuracy of any measuring devices to assure the Superintendent of the accuracy of the measured items delivered or included in the works.

9.9 PAYMENT REDUCTION

Work which fails to fully satisfy the specified standards but is acceptable on reduced payment, will be valued in accordance with the percentage reduction stated in the relevant clause or table. The reduced payment will be based on rates submitted in the Schedules or where no rate or reference table is provided, on the value or rate for the work as agreed between the Superintendent and the Contractor. Where no agreement can be reached the work will be valued by the Superintendent.

9.10 MEASUREMENT AND PAYMENT OF SCHEDULE OF RATES ITEMS – SCHEDULE K1

Measurement for Schedule of Rates Items in Schedule K1 – Contract Works Pricing Schedule, will be made using the units denoted in the schedule of rates table against the applicable item.

Payment for Schedule of Rates Items in Schedule K1 – Contract Works Pricing Schedule, will be made using the tendered rate in the schedule of rates table. Tendered rates shall include full compensation for the supply of all labour, materials, plant, overheads, profit and any other costs incurred in completing the specified work covered by the item.

9.11 MEASUREMENT AND PAYMENT OF PLANT AND PERSONNEL – SCHEDULE K2

From time to time additional works to those specified in Schedule K1 may be instructed by the Superintendent. Where relevant rates are listed in Schedule K2 Additional Works Pricing Schedule, these shall be used as the

basis of payment. Where no such rate exists the value of works shall be determined in accordance with Clause 36 Variations of the General Conditions of Contract.

Payment for items in Schedule K2 – Additional Works Pricing Schedule, will be made using the tendered rate in the schedule of rates table. Tendered rates for plant, equipment and personnel shall include full compensation for the supply of the plant, equipment and personnel and include appropriate allowances for labour, overheads, profit and any other costs incurred in supplying the item.

No payments will be made for standby of plant, equipment and personnel.

9.12 PAYMENTS TO CONTRACTOR

All payments due to the Contractor for works, supplies or services provided under this Contract will be made by Electronic Funds Transfer (EFT).

Within 14 days of award of the Contract, the Contractor shall submit the following details to the Superintendent:

name and address of a financial institution participating in the Direct Entry System to which payment is to be made;

- relevant Bank State Branch code or participating financial institution number (BSB);
- account name; and
- account number.

The Contractor shall within seven days of any change to the above details inform the Superintendent in writing of that change. Bulloo Shire Council shall not be responsible for any delay in transmission of funds arising from incorrect or out of date information supplied by the Contractor.

Payments to the Contractor shall be deemed to have been made by Bulloo Shire Council within 24 hours from the date Bulloo Shire Council has:

(a) correctly entered all necessary information; and
(b) sent; and
(c) had processed under a processing date;

all relevant debits online into the Electronic Funds Transfer System.

Bulloo Shire Council shall not be responsible for any delays or failures in transmission of funds arising from or relating to system failure, temporary system constraints or other functional transfer problems in the EFT direct entry system.

APPENDIX A – SITE LOCATION MAPS

APPENDIX B – CONCEPT DESIGN