ENERGY FIJI LIMITED
INVITATION TO TENDER

132kV Transmission Lines Tower Slippage Rehabilitation Works at T104 on the Wailoa-Cunningham Line – Phase 2.

Tender No: MR 282/2025

LETTER OF INVITATION

Reference: 282/2025

20th September 2025

Dear Sir/Madam,

Subject:

1. You are kindly requested to submit a comprehensive proposal for the 132kV Transmission Line Tower T104 slippage rehabilitation works caused at the river bed which is close to the Lattice Tower legs on Wailoa-Cunningham 132kV Line of T104 Foundations, as specified in these bidding Documents and Scope of Works.

2. This proposal will cover the required upgrading works – refer **Annex I, Annex II and Annex V**.

3. To enable you to submit a proposal for the services, please find enclosed:

   a. Annex I: Instruction to bidders
   b. Annex II: Introduction and Background
   c. Annex III: General Conditions: FIDIC White Book 2017
   d. Annex IV: Schedule Rates & Price
   e. Annex V: Scope of Works
   f. Annex VI: Service Conditions & Standards
   g. Annex VII: Tender Check List & Submission

   This letter is not to be construed in any way as an offer to contract with your firm/company.

Site Visit

All interested bidders must attend a **compulsory site visit** as follows:

Location: Nabukaluka Junction, Naqali

Date: 23/09/25

Time: 11.30am

Contact Person: Kausheel Charan

Phone: 8915712

Failure to attend compulsory site visit will result in tender being disqualified.

All tenderers shall inspect and examine the site, its surroundings, and shall satisfy themselves before submitting the tender bid, as to the nature of the work and necessity for carrying out the contract work.

All bibbers must come in proper PPE for the site visit. Safety or closed shoes is encouraged.

ANNEX I
A. INSTRUCTIONS TO BIDDERS
Invitation to Tender no: MR 282/2025
Tower Slippage Rehabilitation Works

1. Introduction

Energy Fiji Limited ("EFL") is a limited liability company that was established under the Companies Act (2015), Laws of Fiji. It is supervised by a Board of Directors comprising a Chairman and representatives from its shareholders.

The Executive Management team of EFL consists of the Chief Executive Officer, Chief Finance Officer, General Manager Human Resources, General Manager Generation, General Manager Network, General Manager Customer Services, General Manager System Planning and Control, General Manager Special Projects and Chief Information Officer.

EFL is primarily responsible for generation, transmission and distribution of electricity in Viti Levu, Vanua Levu, Ovalau and Tavueni in Fiji. It owns over twenty (20) power stations and thirty (30) substations and switching stations on the islands of Viti Levu, Vanua Levu, Taveuni and Ovalau. EFL owns, operates and maintains a network of 147km of 132kV transmission lines, 576km of 33kV lines and over 11,148km of 11kV and 415V distribution lines, as at 31st December 2024.

Energy Fiji Limited (EFL) is hereby inviting Proposals for comprehensive proposal for the 132kV Transmission Line Tower T104 slippage rehabilitation works caused at the river bed which is close to the Tower Legs on Wailoa-Cunningham 132kV Line of T104 Foundations, as specified in these bidding Documents and Scope of Works at Viti Levu.

2. Acknowledgement and/or Withdrawal

2.1 Immediately upon receipt of this tender, if you intend to submit a proposal, you must send an email message to EFL's Contract Officer (Clause 6) advising who your contact person will be.

2.2 If at any point when considering this tender, you decide your organization is unable to respond or continue with this invitation, please contact the EFL Contract Officer (as shown in Clause 6) as soon as possible. This will enable EFL to evaluate the effects of such a withdrawal upon our procurement process.

3. Timetable

3.1 The following is our proposed timetable for this tender

20/09/25	Issue of tender
08/10/25	Closing Date
1 Month from Closing Date	Final Evaluation and Selection of contractor (if any). Negotiation with contractor will take place after this date.
6 Months from Closing Date	Proposal must remain open for acceptance by EFL.

3.2 Please note this timetable is indicative only and may be subject to change at the sole discretion of EFL. EFL will notify participants of any changes. Fiji Public Holidays are to be excluded for consideration days.

4. Circulation of Tender

This tender has also been sent to those potential vendors that we believe could meet our requirements. EFL does not intend to disclose the identity of organizations that have responded to this tender.

5. Delivery of Proposals and Contact Details

5.1 All proposals to be received by 1600hrs, 08/10/25
Submission of proposals are to be done through EFL Tender link Portal - https://www.tenderlink.com/efl

5.2 Tender will be in two (2) Proposals:

- Proposal 1 will be your Technical Solution
- Proposal 2 will be your Commercial Submission

6. Further Communications

6.1 All communications as to this tender, or requests for clarification or further information, should be directed to EFL's Contracts Officer (CO);

Jitendra Reddy
Manager Procurement, Inventory & Supply Chain
2 Marlow Street, Suva, FIJI.
Phone: 679 3222320
Email: JReddy@efl.com.fj

6.2 At any time, additional discussions to clarify details in a Proposal may be required. As a matter of principle:

6.2.1 If such matters affect the content or interpretation of the terms or specifications in our tender, all Contractors will be advised without indicating the source of the query and the registered Contractors will be sent a formal Notice to Contractors (NTC). All NTC's issued will become part of this tender;

6.2.2 If the discussion relates only to a proposal being made by an individual Contractor, any matters raised will not be discussed with other Contractors.

6.3 EFL will not be bound by any statement, written or verbal, made by any person other than the CEO. The CEO (or any other person authorized by CEO) is the only person authorized to make representations or explanations to Contractors as to this tender.

7. Confidentiality of Information

7.1 The information supplied by EFL (either itself or through its agents or advisors) in connection with this Proposal or any contract that may arise out of it, is confidential. The information contained in this tender is provided for the sole purpose of allowing you to submit your Proposal to EFL. The information contained in this tender is not to be used for any other purpose or revealed to any other person or party not directly involved in the submission of your proposal. You are responsible for any unauthorized disclosure of such information by your employees, agents and sub-contractors.

7.2 You must not release or disclose any of the information to any other person (other than your employees or advisors), without the prior written consent of EFL.

7.3 You may not make any public statements to third parties or release any information to the press or other media in relation to this tender, its contents, your response to it, or the awarding of any consequential contract without the written permission of our CEO or his delegate.

7.4 EFL will keep Proposals received confidential except if the information is needed for the day to day running of EFL's business.

8. Proposal Validity Period

Your Proposal must be continuing and irrevocable and open for acceptance for 6 months (**180 Days**) from the closing date.

9. Bid Clarification

You may be asked to clarify your bid or provide additional information during the Proposal evaluation process. These requests will require prompt action and you must respond in writing within two business days or the time specified in the request. Otherwise, EFL reserves the right not to consider your Proposal.

10. Representations

In submitting your Proposal in response to this tender, you are required by EFL to acknowledge specifically in your Proposal, that:

"Energy Fiji Limited may rely upon all representations made by you, in your Proposal and in conjunction with your Proposal to Energy Fiji Limited, whether such representations are expressed or implied, or given in writing or verbally. At Energy Fiji Limited's sole discretion, such responses may form part of any consequential contract to be entered into".

11. No Canvassing

All communications concerning this tender should be with the Contracts Officer only. You should not directly or indirectly lobby or attempt to influence any EFL employee or Board member or advisor in relation to this Proposal. Should you directly or indirectly make such an approach then you may be disqualified from the Proposal.

12. Propriety Rights

You must certify to EFL that any proprietary products or services, supplied with, or required by, the solution you propose are products or services over which you or your associated third party hold rights to supply and such right will continue to be available to EFL under license or other agreement and that for this purpose you may be required to disclose details of all relevant contracts with your suppliers and sub-contractors.

13. Acceptance of Proposals

13.1 EFL reserves the right to:

- Reject any or all Proposals at its sole discretion and not accept the lowest Proposal or any Proposal;
- Award separately for each scope of works depending on submissions/offers received;
- Deal separately with any of the divisible elements of any Proposal, unless the relevant Proposal specifically states that those elements must be taken collectively;
- Re-call the Proposal;
- Waive any irregularities or informalities in the tender process;
- Amend the closing date, the acceptance date or any other date in the Proposal documents;
- Amend this tender, or any associated documents, by the issue of a written amendment notice to each supplier;
- Seek clarification of any Proposal;
- Suspend or cancel, (in whole or in part), this Proposal process;
- Meet with any Contractor after Proposal close and prior to placing any order;
- Consider or reject any alternative Proposal, in EFL's sole discretion.

13.2 EFL Proposal will only be deemed to have been accepted or rejected when the fact of acceptance or rejection has been notified in writing to you by EFL. Prior to such written notification, by submitting a Proposal to EFL, you acknowledge that you are owed no legal or tortuous obligations by EFL.

14. Late Proposals

EFL reserves the right to accept or decline late Proposals at any time at EFL's absolute discretion. Should the decision to accept late Proposals be made prior to the notified Closing Date above, all Contractors shall be advised of the extended deadline for submitting or re-submitting their Proposals.

15. Changes to the Tender

15.1 EFL reserves the right to vary the requirements of this tender. Nothing in this tender or any subsequent communication or correspondence (taken individually or collectively) prior to our contract(s) being executed with the successful Proposal(s) will in any way bind EFL or impose any obligation on EFL.

15.2 EFL reserves the right to amend this tender in order to correct errors, rectify omissions or discrepancies. EFL also reserves the right to withdraw this tender at any time before the bid date and to accept any bid and to reject any or all bids for any reason and without cause.

15.3 EFL makes no representations and gives no warranties as to the information provided to you. You must examine this tender yourself, and make all other investigations you consider necessary (including as to the information provided by EFL in relation to this tender), before submitting your Proposal.

15.4 EFL accepts no responsibility for any error or mis-description in this tender, or any associated documents.

16. Amendments to your Proposal

16.1 EFL is under no obligation to check any Proposal for errors. Acceptance of a Proposal that contains errors will not invalidate any subsequent contract.

16.2 We may require you to document any amendment to your Proposal or to re-submit a revised Proposal prior to the execution of any contract between you and EFL.

17. Information Complete and Accurate

17.1 By submitting your Proposal you warrant that all information provided by you to EFL or the CO, in or in relation to your Proposal is complete and accurate in all material respects. You also warrant to EFL that the provision of that information to EFL, and the use of it by EFL for the evaluation of your Proposal and for the negotiation of any resulting contract, will not breach any third party intellectual property rights.

17.2 The bidder should provide the response in compliance to the requirements and any non-compliance or over compliance must be clearly and elaborately explained for it to be considered in the evaluation. There is no assurance that EFL will consider any explanations for non-compliance and the bid may be rejected on account of such non-compliance, unless it is submitted as an alternate to the specified requirements in the best interest of EFL.

17.3 By submitting your Proposal, it shall be deemed that you have understood the specifications / scope and no claims on the grounds of 'lack of knowledge' will be accepted.

18. Ownership of Tender and Proposed Documents

The tender documents are the property of EFL and may not be copied or reproduced in any way (other than for the purposes of preparing and submitting your Proposal) without the prior written approval of EFL.

19. Status of Discussions and Communications

Unless as stipulated in this tender, no contractual negotiations, decisions or actions are to be initiated by you as a result of discussions with any of our employees or any other person purporting to act on our behalf. Only communications in writing from EFL which are signed by authorized individuals, can be regarded as duly authorized expressions on behalf of EFL.

20. Evaluation Criteria

The main points or selection criteria for comparative analysis and objective assessment of the Contractor's ability to perform the contract is as follows:-

EFL reserves the right to apply any weighting to the criteria

20.1 Technical Solution:-

- Information about your organization / Company profile
- Reference customers that is similar to this tender
- Ability to supply required service in a timely manner
- Registrations – Company registration / business license, FNPF Compliance, VAT Compliance, FNU Compliance

20.2 Commercial Solution:-

- Pricing VIP in Fijian Dollars
- Price validity
- Delivery time
- Work Schedule
- Milestone Payment
- Acceptance of EFL's 180-days term

21. Results of this Tender Action

On completion of our evaluation stage, EFL expects to either:

21.1 Enter directly into negotiation(s) with a preferred Contractor(s); or

21.2 Seek further Proposals; or

21.3 Terminate our tender process

22. The Successful Bidder

The successful bidder will be expected to carry out the whole project as stipulated in the scope of works within a period of **2 months** or less, from the time a purchase order is issued. **The successful bidder will also need to submit a detailed work program with weekly progress updates for the duration of the works as well as monthly reports.**

22.1 Eligible Bidders

The bidder shall demonstrate that they have the relevant Engineering Design and Project Construction Phase experience in carrying out civil works near high voltage electrical installations.

Documented evidence of suitable relevant experience shall be provided with the tender bid including project details and names of referees who can be contacted for verification.

Bidders with relevant technical expertise and demonstrated experience in the Power Transmission Industry with a firm understanding of technical compliance requirements of relevant AS/NZS, IEC, IEEE, and ANSI standards.

Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer as the Employer shall reasonably request.

Bidders shall not be under a declaration of ineligibility for corrupt or fraudulent practice.

22.2 Proposed Personnel

Provide relevant details of (and attach CVs for):

- Proposed Director in active charge.
- Proposed Civil Engineer(s) tasked to carry out the Civil Engineering works during the Construction Phase of this project
- Proposed Structural Engineer(s) tasked to carry out the Structural Engineering role during the Construction Phase of this project
- Proposed Technical support personnel to carry out Electrical High Voltage Engineering, Civil Engineering and Structural Engineering inspections, witness tests, sign off and certify works, attend site meetings and provide technical support during the Construction Phase of this project
- Proposed support personnel.

  Details should include relevant experience, proposed role statements and an organizational chart for your team showing links to the Client, The Project Manager, The Design Consultants and any other relevant parties. Please concentrate on relevancy of information and be succinct.

22.3 Assessment Criteria

The following Assessment Criteria are also subject to review as a part of the submission. The submissions should provide specific statements and details with regard to the following:

- Task Appreciation: 20%
- Relevant Experience 30%
- Proposed Personnel 20%
- Tender Bid Price 30%

Bidders shall note that the evaluation scoring will include evaluation of Task Appreciation, Relevant Experience, and Proposed Personnel for Deployment. Bidders shall note that the evaluation scoring will include evaluation of Quality Assurance, HSE Compliance, Past Records of Safety and Quality

22.4 One Bid per Bidder

Each bidder shall submit only one bid either by itself, or as a partner in a joint venture. A bidder who submits or participates in more than one bid will cause all those bids to be rejected.

22.5 Cost of Bidding

The bidder shall bear all costs associated with the preparation and submission of its bid and the Employer will in no case be responsible or liable for those costs.

22.6 Tender submission

Tenders shall be submitted in two parts in the following manners: -

Bidders are requested to upload electronic copies via Tender Link by registering their interest at: https://www.tenderlink.com/efl

Energy Fiji Limited will not accept any hard copy submission to be dropped in the tender box at EFL Head Office in Suva.

This tender closes at 4.00pm (1600hrs) on Wednesday 08/10/2025.

For further information or clarification please contact our Supply Chain Office on phone (+679) 3224360 or (+679) 9992400 or email us on tenders@efl.com.fj

The bidders must ensure that their bid is inclusive of all Taxes payable under Fiji Income Tax Act.

The lowest bid will not necessarily be accepted as the successful bid.

The Tender Bids particularly the “Price” must be typed and not hand written.

Any request for the extension of the closing date must be addressed to EFL in writing three (3) working days prior to the tender closing date.

Tender Submission via email or fax will not be accepted.

22.7 Insurances

Certificates of following valid insurances are mandatory for bidders:

1. Public Liability : FJD 500,000
2. Contractors all risk : FJD 500,000

For Companies Registered in Fiji

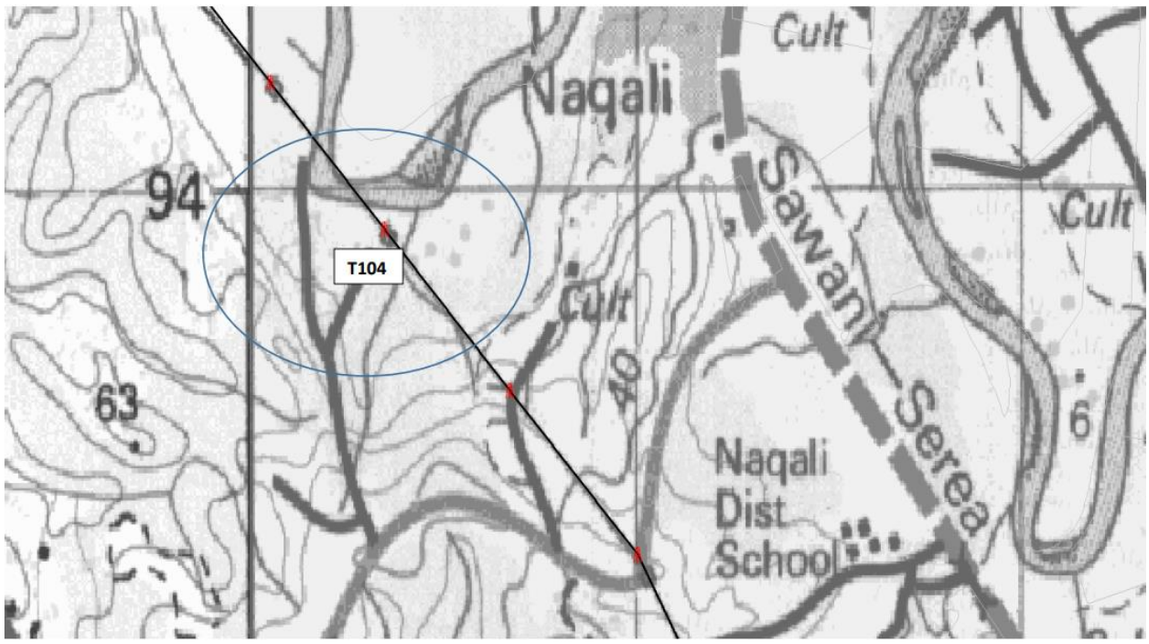
- Companies must comply with the Fiji Income Tax and the Value added tax regulation.
- Provision of valid Tax Compliance Certificate.
- Provision of valid FNPF Compliance Certificate.
- Provision of insurance policies – Public Liability
- EFL will deduct 5% from supplier payment and remit to FRCS as provisional Tax under new tax administration decree.

1. INTRODUCTION & BACKGROUND

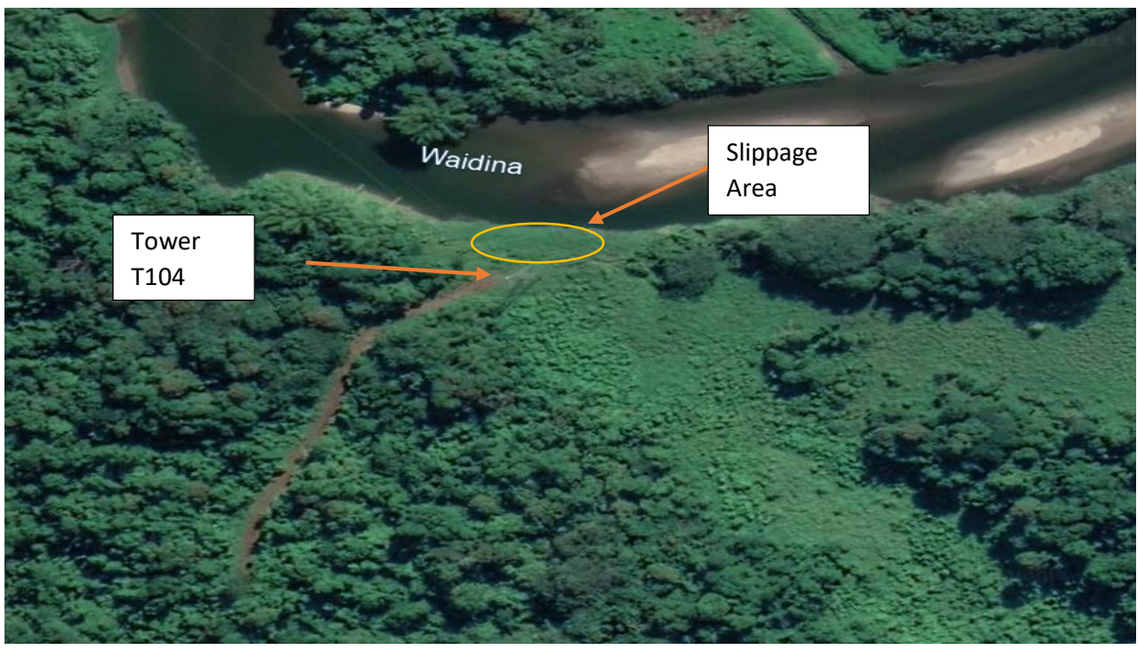
The Energy Fiji Limited (EFL) is a limited liability company, which is solely responsible for generating, transmitting, distributing and retailing electricity in the Republic of Fiji Islands.

The EFL has undertaken major refurbishment works on its aged Transmission Lines. The services of a Civil Construction Contractor is required to execute Phase 2 of the slippage rehabilitation works near a river bank that has exposed the foundations of a 132kV Suspension Tower T104 on 132kV Wailoa-Cunningham Transmission Line. The Suspension HSL+9 Tower have served a life span of more than 40 years.

Locality Plan



Google Earth Image



CONDITIONS OF CONTRACT FOR TOWER SLIPPAGE REHABILITATION WORKS

The Conditions of Contract for Tower Slippage Rehabilitation Works for the Contract shall be based on the NZS 3910 General Conditions for Contract for Building and Civil Engineering Construction.

Copy is available for inspection at the Engineers Office and original can be downloaded from the NZS website.

ANNEX IV
D. SCHEDULE RATES AND PRICES
Invitation to Tender no: MR 282/2025
Tower Slippage Rehabilitation Works

Basis for Remuneration

Submit a fixed price**,** lump sum fee proposal for this project, in Fijian Dollars with all applicable duties, taxes, withholding taxes included and clearly identified.

Submit the tender bid price as per the bid price schedule, Bidders Returnable

Schedules of this document.

In addition to the fixed lump sum fee, the bidder shall all confirm hourly rate[s] applicable for all resources intended to be used in this project.

Price Schedule

Item	Description	Quantity	Rate ($VIP)	Cost ($VIP)
1	Allow for Preliminary and General including Site Mobilization, all Overheads and required Insurances such as CAR insurance and Public Liability.	Item		
2	Allow for construction and reinstatement after works of a gravel road(AP65) including site clearing, 200mm subgrade preparation, placement, compaction, and 200mm finishing of gravel surface for the existing access road with a width of approximately 5m.	700 linear meters	($/lm)	
3	Allow to supply and deliver to site 27 linear meters of SP4W sheet piles as per drawings and specifications.	27 linear meters	($/lm)	
4	Allow to align and drive sheet piles with a vibration or hydraulic pile driver as per the sheet pile layout in the drawings (without sealant)	27 linear meters	($/lm)	
5	Allow to trim and align all sheet pile to finished level of RL:9.5m	Item		
6	Allow to construct 27 linear meters of concrete beam for the tie rods.	41 cubic meters	($/$m^3$)	
7	Allow to supply and install the Hot Dipped Galvanized PFC walers with the tie rods after the driving of the sheet piles.	27 linear meters	($/lm)	
8	Allow to backfill all the trenches for the tie rods and the concrete tie beam to RL:9.5.	Item		
9	Allow to backfill and compact soapstone to finish level of RL: 9.5m. Existing stockpile of soapstone on site can be	210 m^3	($/$m^3$)	

	utilized, however, contractor to allow if extra quantity is required.			
10	Allow to demobilize and leave site in neat and tidy condition.	Item		
			TOTAL VIP	

1.0	**Day Works Rates (All sites)**	**Unit**	**Hourly Rate**
1.1	**Project Director**	**hr.**	
1.2	Principal Electrical Engineer	hr.	
1.3	Principal Civil Engineer	hr.	
1.4	Senior Structural Designer	hr.	
1.5	Electrical Engineer	hr.	
1.6	Civil Engineer	hr.	
1.7	Electrical Technician	hr.	
1.8	Civil Technician	hr.	
1.9	Site Supervisor	hr.	
1.10	Works Supervisor	hr.	

1) SECTION 1 - EXCAVATION AND SITE WORK

A. Preliminary & General

Refer to Preliminary & General clauses which apply to all trades.

B. Set Out Certificate

Contractor is responsible for the actual set out. Prior to proceeding with filling, submit to the Project Manager/Engineer a Registered Surveyor's Certificate and diagram indicating the true location of the Works in relation to legal boundary pegs.

C. Site Clearing

This section of the Contract includes removal of any existing structures, trees, plants or bush that obstructs any part of the new works.

Where BIDIM A64 Geotextile Fabric is to be laid on grade, remove existing topsoil to a depth of 500mm. All top soil shall be stockpiled where directed on site by the Project Manager.

D. Excavation

Give three (3) days' notice to the Project Manager/Engineer for any inspections of the following:

I. Setting Out.
II. Commencement of final trimming and excavation.
III. Completed excavation before filling work is commenced.

Excavate as required for all foundation pads, piers, drains etc. Excavation depth for each foundation element has to be taken relative from the ground level height on that spot. Excavator to allow for excavating in fill, clay and soapstone and where required shall allow for de-watering and shoring. Excavate to depths below finished floor level as shown on drawings.

Remove water from all excavations by pumping to provide dry and workable conditions at all times prior to pouring concrete and laying drains.

E. Hardfill

Where necessary hard fill under concrete slabs shall be approved AP40 granular hard fill 200mm thick at minimum. Thoroughly consolidate by using mechanical means in 200mm layers to the Engineer's approval and satisfaction.

F. Backfill

Backfill in layers not exceeding 200mm, properly rammed and compacted. All backfilling and ramming shall be to the Engineer's approval and satisfaction complete with Geotech testing as specified.

The Contract includes clearing, cutting and filling of the site as required. After cutting and filling, accurately grade to final levels with 150mm top soil free from building debris, roots, weeds and other noxious materials.

2) SECTION 2 - EARTHWORKS

A. Clearing and Grubbing

I. Description

This section covers the requirements for clearing and grubbing and for the disposal of the materials produced by clearing and grubbing.

II. Definition

Clearing and grubbing is the removal within specified limits of:

- Vegetation such as trees, tree stumps, tree roots, logs, brush, noxious weeds and decayed vegetable matter.
- Refuse such as pole stumps, rubbish dumps and sawdust piles resting on or protruding from the ground surface.
- Obstructions such as concrete paving, concrete edgings, drainage pits, foundations, fences and disused structures.

III. Limits of Work

Unless otherwise specified, the limits of clearing and grubbing shall be:

- The areas shown in the attached drawings.

IV. Clearing

Except as otherwise specified or directed by the Engineer, the area within the specified limits shall be cleared of all vegetation, refuse and obstructions. The Engineer may direct that any tree or shrub designated by him shall be retained.

Trees shall be brought down in such a manner as to avoid danger to traffic or damage to other trees, shrubs, structures or property outside the area being cleared or designated to be retained within the area being cleared. Any such damage to structures or property shall be rectified by the Contractor at no cost to the Employer.

V. Grubbing

Except as otherwise specified the cleared area shall be grubbed free from vegetation, refuse and obstructions.

In areas where excavation will be made, all vegetation, refuse and obstruction shall be removed. In areas to be covered by embankments, all vegetation, refuse and obstructions shall be grubbed to a depth of not less than 0.5m below die stripped surface, in areas to be covered by embankments exceeding 1 m in height, foundations may remain if located or cut off not more than 0.4m above the natural surface hut not less than 1w below subgrade level.

Holes resulting from grubbing shall be backfilled with material similar to the surrounding material and compacted to the same degree as the surrounding material.

VI. Disposal of Materials

All materials resulting from clearing and grubbing shall be disposed of by the Contractor.

B. Forming and Grading of Earthworks

I. Description

This section covers the forming and grading of earthworks including excavation, placement and compaction of filling, disposal of surplus and unsuitable materials and the trimming of batters, surface drains and formation.

II. Definitions

Formation

Formation is the finished surface after completion of the earthworks excluding any cut or fills batters.

Subgrade

Subgrade is the trimmed or prepared portion of the formation on which the pavement and shoulders are constructed.

Batter

Batter is the uniform side slope of a cut or fill.

Catch Drain

A surface channel constructed above a cut batter or below a fill batter to intercept surface water.

Table Drain

A longitudinal surface drain located adjacent to and at the bottom of cut slopes or the top of fill slopes.

Verge

The portion of the formation between the shoulder and the table drain.

Nominal Size of Material

For the purposes of control of moisture content of filling and determination of compaction procedure, material of nominal size 40mm or less is material which has 20% or less by weight retained on a 37.5mm AS sieve and material of nominal size greater than 40mm is material which has more than 20% by weight retained on that sieve.

III. Conformity with Drawings

Earthworks shall be finished to conform within the following limits to the levels, lines, grades and cross sections specified or shown on the drawings or directed by the Engineer.

Formation level and shape (outside subgrade width)

The level at any point on the finished surface outside those areas to be paved shall not differ by more than 50mm from the specified level and the surface shall be free from depressions capable of retaining water. Unless otherwise permitted by the Engineer, no point on the surface shall lie more than 35mm below a 3 m straightedge laid on the surface.

Subgrade level and shape

The level at any point on the finished surface shall not differ by more than —25mm or +10mm from the specified level. The Engineer may require that the shape be checked by means of a 3m straightedge laid parallel to the centreline of the road or, except on crowned sections, laid at right angles to the centreline in which case no point on the surface shall lie more than 20mm below the straightedge.

Batter Slope and Shape

At any cross section the batter slope shall not be steeper than the slope specified. The hatter face shall he finished to a reasonably uniform shape.

IV. Materials

Materials used for fill construction shall be subject to the approval of the Engineer, and except for topsoil, shall be free from perishable matter.

Materials conforming to the following descriptions shall be used for particular purposes as and when specified or directed by the Engineer.

Topsoil

Topsoil is fertile, friable soil containing organic matter and is reasonably free from subsoil, refuse, tree roots, noxious weeds, clay lumps and stones.

Common Filling (Bulk Filling)

Common filling is material from site or borrow excavation which is free of perishable matter and after compaction has a maximum particle dimension of not more than:

- 40mm within 400mm of the subgrade.
- 400mm at depths greater than 400mm below subgrade.

Selected Subgrade and Structural Filling (Engineered Fill)

Selected subgrade filling is the better quality stony cohesive fill obtained during site excavation or from borrow pits which is free from material having a maximum dimension after compaction greater than 40mm.

Structural filling is the better quality stony cohesive fill obtained during site excavation or from borrow pits which is free from material having a maximum dimension after compaction greater than 75mm.

Selected subgrade filling and structural filling shall be free of organic material and shall be readily compactable. Material +5% / -15% of optimum moisture content shall not be accepted as selected subgrade or structural fill.

C. Management of Earthworks

The Contractor shall manage the earthworks in such a way that:
Materials are maintained in a condition suitable for their intended use. The earthworks are kept well drained. The trimming and final grading of the surface is completed as work proceeds. The work is executed in safe neat and workmanlike manner.

I. Stripping of Topsoil

In cut areas, for the width between the limits of the batters including any rounding, the Contractor shall strip all topsoil.

In areas to be covered by embankments, the Contractor shall strip topsoil from the cleared and grubbed surface unless directed by the Engineer.

Stripped surface which are to be surveyed for the purpose of measurement of excavation shall be graded to an even self-draining surface.

Topsoil shall be stockpiled unless otherwise approved by the Engineer. Such stockpiles shall be maintained in a neat, well-shaped state capable of shedding water and re-used as directed.

II. Excavation and Filling for Road and Drainage Works

General Excavation for road and drainage works shall include excavation beneath the stripped surface within the limits of the batters, and drainage and other minor excavation outside these limits and placement and compaction of excavated material into the formation. It shall include material excavated and placed as common fill, rocky material, structural filling, selected subgrade filling or unsuitable material.

III. Table and Catch Drains

Prior to commencing site excavation works the Contractor shall, where shown on the drawings or directed by the Engineer, construct such drains for the diversion of surface runoff to suitable outlets.

IV. Excavation Operation

The Contractor shall so conduct the operations that the area outside the limits of the excavation is not unduly disturbed. Loose and unstable rock on cut batters shall he removed immediately.

Unless otherwise specified, where the excavation at subgrade level is rocky material, the subgrade shall be loosened and rocks or boulders removed to a depth of at least 150mm below subgrade level in areas on which pavement is to be placed. Any resulting depressions shall be free draining to the table drain prior to being backfilled with suitable material similar to the surrounding insitu material and such backfilling together with the loosened material shall be reworked and compacted as specified.

Where removal of material below subgrade level is not required the surface shall be loosened to a depth of 150mm and re-compacted to specified requirements.

D. Unsuitable Material

I. General

Unsuitable materials include those materials which are specified as such or which are soft, excessively wet or unstable or otherwise not suitable for the specified use. Material used to replace excavated unsuitable material shall be obtained from site excavation. Unsuitable materials shall he disposed of outside the formation.

II. Cuts

In cuts, unsuitable materials which exist or develop during construction immediately below subgrade level, or the level of the bottom of any selected subgrade filling shall be treated in situ or excavated and replaced with approved material spread and compacted as specified in layers not exceeding a compacted thickness of 150 mm.

Where material has become unsuitable to any depth due to the Contractor’s negligence or use of inappropriate methods it shall be treated in situ or excavated and replaced.

III. Areas Upon Which Filling is to Placed

After completion of clearing, grubbing and stripping of areas upon which filling is to be placed any unsuitable material immediately below these areas shall be treated in situ or excavated to depths as directed or authorized and replaced with approved material which shall be spread and compacted as specified.

IV. Fills

Unsuitable materials in fills shall be treated in situ or excavated and replaced.

V. Disposal

Excavated unsuitable material shall not be used on the site. The Contractor shall follow the conditions of this specification when any material is removed from the site.

VI. Disposal of Surplus Excavated Material

The Contractor shall dispose of surplus excavated material outside the formation such that it does not obstruct any storm water flow or create any road safety issue. No material shall be removed from the site The Contractor shall follow the provisions of Part C1 if material is to be removed from the site.

VII. Preparation of Underlying Surface

Unless otherwise specified, prior to placing any geotextiles the Contractor shall excavate the surface material to the depth shown on the drawings. Where possible, the area shall then be trimmed to provide a uniform surface freely draining to points clear of the formation.

The Contractor shall not commence placing the geotextile on the trimmed surface until the Engineer has Inspected the area and has given consent to proceed.

E. Fill Construction

I. General

Fill construction includes the preparation of areas upon which fills are to be constructed and the selection, placement, and compaction of filling.

II. Areas Upon Which Fills are to be Constructed

Areas upon which fills are to be constructed shall be prepared for test rolling by the Contractor. The surface of the prepared area shall be test rolled in accordance with the Contractors approved test rolling method and any unstable areas detected by Geotech testing shall be rectified.

Existing pavement which are not required to be salvaged shall be scarified to a depth of not less than 150mm and compacted as specified.

III. Moisture Content of Filling

- **Material of nominal size 40mm or less**

  Filling which will have a nominal size after compaction of 40mm or less shall have during compaction a minimum moisture content of in the range 85% to 100°/o of the optimum moisture content.

  Material shall be treated as unsuitable if the moisture content exceeds 100% of the optimum moisture content. The optimum moisture content is as determined in the Standard compaction test. After completion of compaction of a layer the moisture content of the material in the layer shall he maintained within the range specified until the subsequent layer is placed or, when no subsequent layer is to be placed until the layer has been test rolled.

- **Material of nominal size greater than 40mm**

  In the case of fill which has a nominal size after compaction greater than 40mm the Contractor will determine the Standard Optimum Moisture Content for the fraction of filling passing the 37.5mm AS sieve and during compaction of filling the moisture content of that fraction shall be a minimum of 85% of the optimum moisture content.

IV. Placing of Filling

General

Filling shall be placed and spread in uniform layers and shall be compacted as specified. The Contractor shall ensure that an adequate bond will develop between each layer of filling.

Any rocky material present in the filling for any layer shall be uniformly distributed within the layer and the whole shall be compacted as specified.

During the filling operation the surface of each layer shall be kept generally parallel to the surface of the subgrade. Prior to the cessation of work each day, the top of the fill shall be shaped and compacted to minimize damage resulting from wet weather.

Selected Sub Grade Filling

Where shown on the drawings or as required by the Engineer, selected subgrade filling shall he spread and compacted across the full formation width to a compacted thickness as shown on the drawings.

Common Filling (Bulk Fill)

The compacted thickness of each layer shall not exceed 200mm, except where rocky material containing by volume 25% or more of material which will not break down significantly during compaction is used and which is too large to be compacted in layers 200mm thick.
Common filling shall only be placed in locations shown on the drawings.

V. Structural Filling (Engineered Fill)

Structural Filling shall be placed in layers with compacted thickness of 200mm.

VI. Requirements for Testing and Acceptances of Compaction

General

The Contractor shall not commence work on any layer until the preceding layer has been tested and has met or exceeded the specified requirements.

Material of Nominal Size 40mm or Less

Filling, and other material within 150mm of subgrade level in cuts, which will have a nominal size after compaction of 40mm or less shall be compacted to comply with the following requirements.

Unless otherwise specified, acceptance of work as far as compaction is concerned will be based on density testing of the work in lots. A lot will consist of a single layer of work which is considered to have been constructed under essentially homogenous conditions with respect to material and general appearance.

The lot will be inspected and shall be test rolled. Any unstable area detected by test rolling or any area which is otherwise deemed unsuitable by the Engineer will be excluded from the lot before testing commences. Excluded areas shall be rectified using methods —agreed to by the Engineer except that, if the total of the excluded areas exceed 20% of the area the lot shall be ripped, re-worked and re-presented for testing.

For each lot, sites for density testing will be selected on an essentially random basis and will be tested for compliance as detailed in **Table 1.1** and shall be based on Standard Compaction.

Density testing on a lot basis shall be undertaken on all layers of common fill at the commencement of the work to establish acceptance of a roller routine, thereafter density testing

on a lot basis shall be undertaken at least once for each 4000m3 of filling or 5 working days, whichever is the sooner.

Table 1.1

	SCALE A	SCALE B	ASSESSMENT
Position of layer	Mean value of relative compaction	Mean value of relative compaction	Action to taken by contractor
	>100	>99	No action – lot accepted
	98 -100	97 – 99	Re – roll
	<98	<97	Rip, re – work and re – test
Elsewhere in earthwork including top 150 mm of area under fills and reinforced earth fill.	>97	>96	Nil – lot accepted
	95 – 97	94 – 96	Re – roll
	<95	<94	Rip, re work and re – test
Unsuitable material; material within the formation but outside the 1.5 : 1 batter. Material in spoil disposal areas.	>95	>94	Lot accepted

NOTE Minimum number of tests per lot is 5. Material of Nominal Size Greater Than 40mm

Unless otherwise specified or directed by the Engineer, filling and material within 150mm of subgrade level in cuts, which will have a nominal size after compaction greater than 40mm shall be compacted after grading, mixing and watering using an approved rolling routine.

Acceptance of work as tar as compaction is concerned will be based on test rolling.

Any unstable areas detected by test rolling shall be rectified by the Contractor using methods agreed to by the Engineer and re-presented for test rolling. Where unstable areas exceed 20% of the area being test rolled, the whole of the area shall, unless otherwise approved or directed by the Engineer, be ripped, re-compacted as specified above, and re-presented for test rolling.

VII. Test Rolling

Areas upon which fills are to be constructed, all layers of filling, and material within 150mm of subgrade level in cuts, shall be compacted so as to be capable of withstanding test rolling, without (visible deformation or springing, with a smooth steel wheeled roller to comply with the following:

Steel wheeled: Not less than l2tonne mass with a load intensity on the rear wheels of not less than 6tonne per meter width.

The moisture content of the compacted material being test rolled shall be as specified. Each layer should be test rolled immediately following completion of compaction but if test rolled at some later date the surface shall be watered and given not less than eight coverage's of the testing roller before

test rolling commences.

The Engineer reserves the right to direct the Contractor to undertake further test rolling on any layer prior to it being covered by a successive layer.

VIII. Standard of Compaction

The following standard of compaction is specified for the Works.

ROADWAY	CHAINAGE	COMPACTION: SCALE (A OR B)
All Roadway areas	-	Scale A
Reinforced Earth	-	Scale B
Structural/General Fill	-	Scale C
Spoil Disposal Areas	-	Scale D

IX. Open Drains

Excavation

All open drains shall be excavated to the grades and levels shown on the drawings. Any over excavation shall be reinstated with rock spalls. Drains must be effectively constructed to collect surface water run-off from roads and properties.

3) SECTION 3: CONCRETOR

A. Preliminary and General

Refer to the general conditions of the contract and the preliminary and general clauses that shall apply to this section of the work.

B. Standards

The following standards shall form part of this specification:

AS1379	Specification and Supply of Concrete
NZS 3104	Specification for Concrete Production
NZS 3108	Approval and Test Specification
NZS 3109	Concrete Construction
NZS 3112	Methods of Test for Concrete
NZS 3114	Specification and Production of Concrete Surface Finishes
NZS 3422	Welded Fabric of Drawn Steel Wire for Concrete Reinforcement
NZS 3121	Water and Aggregate for Concrete
NZS 3631	New Zealand Timber Grading Rules
AS/NZS 4671	Steel Reinforcing Materials
AS/NZS 1111	ISO Metric Hexagon Commercial Bolts and Screws
AS/NZS 9002	Quality systems
BS 4670	Specification for Alloy Steel Forgings

C. Co-Operation

Allow to co-operate with other trades to inspect position and build in all fixing bolts, pipes, sleeves, nailing grounds, chases, conduits, reinforcing starters, weather-bars, inspection chambers etc. Also cooperate with the Block-layer in the filling of cavities.

D. Materials

I. General

All materials shall be delivered, stored, and handled as to prevent the inclusion of foreign materials and the damage of materials by water or breakage. Package materials shall be delivered and stored in original packages until ready to be used.

II. Cement

Cement shall be Portland cement or Rapid Hardening Portland Cement, each conforming to the above standards.

III. Aggregate

Fine and coarse aggregate shall comply with the above standards. Maximum aggregate size shall be 20mm. Coarse aggregates shall compose of Basalt only.

IV. Concrete

Concrete for all the structural elements such as piers, pads and slabs should have a Characteristic Compressive strength of 32Mpa ready mix unless noted otherwise.

V. Water

Water shall be clean and free from all impurities conforming to the above standards and of such a standard that if required to, in other word, the water can be drinkable.

E. Workmanship

All work in this section shall be carried out by tradesman skilled in the mixing and placing of concrete to the satisfaction of the Engineer.

F. Formwork

I. General

Formwork may be constructed in timber and/or steel. Reference may be made at the end of this section concerning any special conditions applicable to this contract.

II. Timber

All timber shall be sound and free from knotholes. Timber in contact with concrete shall not be less than 20mm thick, or resin bonded plywood constructed so as to produce mortar tight joints.

III. Form Oil

Where form oil is used to preserve forms, the oil shall be of a recognized proprietary brand, which shall not affect the bond of plaster to the concrete.

IV. Workmanship

All formwork shall be securely braced and supported to prevent any distortions due to pressure of concrete and loads from buildings operations. Particular attention shall be given to all wall and beam surfaces to render them straight and true.

V. Cleaning

Formwork shall be provided with suitable clean out points to ensure the removal of all foreign matter from the interior before each pour. Before placing concrete, all forms shall be fixed to proper lines and levels and shall be saturated with water, if form oil is not used.

VI. Stripping

Do not disturb forms until concrete is hardened enough to withstand formwork movements and removal without damage.

Foundation sides: 1 day (24 Hrs) Beam sides: 2 days (48 Hrs) Columns: 5 days.
Beams soffits and slabs: 21 days with Engineers approval.
Others that not mentioned: Engineers to be advice.

VII. Removal of Formworks

The formwork shall be so arranged as to be readily dismantled and removed from the cast concrete without shock, disturbance, or damage.

G. Placing

The hard filling, placing, protecting, and curing of all concrete shall be strictly in accordance with the above standards.

Care shall be taken to prevent segregation of the concrete spreading of formwork and other defects likely to cause faulty concrete work. Concrete shall not be dropped over 1350 into forms. Should honeycombing be evident after stripping of formwork, the Engineer shall decide whether the honeycombing has deleterious effect on the structure or appearance in which case the concrete shall be cut out and replaced as directed or if not of a serious nature, the surface may be repaired as directed by the Engineer all at the expense of the Contractor.

Adequate means of protecting finished concrete surfaces shall be taken and effective damp curing by use of polythene sheet or sand covering kept continuously damp is also essential. All concrete shall be thoroughly consolidated by vibration. Minor surface blemishes on fair-face concrete shall be bagged in. Concreting shall not be carried out when rain is falling.

H. Protection Or Curing

Placed concrete shall be protected from rain, sun and drying winds, by suitable coverings, immediately available on site. The whole of the surface area of concrete shall be properly cured by being kept continuously damp for 7 days. Artificial curing such as “curecrete” etc. shall be allowed for at all times. Polythene sheets may also be used.

I. Reinforcing Steel

I. General

Refer to the general conditions of the contract, the preliminary and general clauses, which will also apply to this section of the work.

II. Standards

Refer to applicable standards as listed above.

III. Materials

Only deformed bars are to be used except where 6mm bars are approved by the Engineer. Provide all supports, hangers, spacers and ties for approval where not shown. Grade 500E reinforcement to be used for foundation and slabs.

Plain and deformed bars shall comply with AS/NZS 4671 and be of mild steel and shall have a guaranteed minimum yield point of 500 MPa (500E reinforcing steel).

Welded wire fabric shall conform to NZS 3423.

Alternative steel for reinforcement may be approved provided that by composition, manufacture, certified tests of strength, elongation, fatigue resistance and readability of the alternative has equivalent properties to that specified above.

IV. Origin & Specification

Before delivery provide certificate stating origin manufacture's name, steel specification: Also, a test certificate to prove steel conforms to specifications stated. All steel delivered to site shall be carefully marked for identifications with relevant certificates.

V. Protection

Steel to be stored above ground and to be covered from adverse conditions. Provide walkways to approval if required. Brace adequately all reinforcement projecting more than 3m from concrete, cut out defects around bars caused by movement as directed before resuming concreting.

VI. Fabrication

Fit ties and stirrups tightly around main reinforcement. Bend deformed bars around rollers, not fixed pins. Bend deformed bars only once.

VII. Protective Cover

The concrete cover is to the surface of stirrups / ties reinforcement.

VIII. Placing & Fastening

SUPPORT steel on CHAIRS or by other approved means, precast blocks are not "PERMITTED". Tie reinforcement with not less than 1.25mm SOFT black iron wire sufficiently to maintain correct relative positions. Bundle bars should be tied together at 500ctrs with 2.65mm mm soft wire.

IX. Laps

Except as SHOWN, no lapping of reinforcement is permitted without written approval.

X. Welding

Welding of reinforcement shall comply with "Standard Arc Welding (Minor Works) unless otherwise specified. Welding reinforcement in any form (including spot welding) is not permitted without written approval. Identify rods or bars to be welded with tags or branding.

Before concreting, reinforcement must be inspected by supervising officers. Arrange with Engineer suitable time for inspection before approval work done without his approval will be rejected. Twenty-four hours' notice is required.

Remove all formwork preventing proper inspection.

Extra will not be paid for remedial work caused by this inspection.

J. Damp Proof Course

Where shown on drawings, lay under floor slabs on ground 200 micron polythene DPC over 50mm sand blinding for any protrusions likely to puncture the DPC. Tape all joints, protrusions, around pipes, tears, etc. with pressure sensitive tape. Carry DPC under-thickening in slabs and seal DPC to foundation walls. It is essential that the DPC is

continuous so that dampness cannot penetrate. Prior to the pouring of concrete, the whole of the DPC shall be checked for any puncture, which shall then be taped. The Engineer shall be notified prior to the pouring of concrete so that it may be inspected.

K. Construction & Control Joints

Reinforcement to be continuous and joints shall be well cleaned before pouring adjacent slabs. Construction joints shall be in the positions indicated on the drawings. Construction joints in beams shall be generally located at the midpoint of the span; however, the Engineer should be notified prior to pouring so that he may approve the location.

L. Foundation

I. Set Out

The accurate set out of the foundations is very important to the satisfactory construction of the rest of the building. Refer to the drawing setting out the exact dimensions for this work.

II. Footings

Ensure that the bed for all footings is on solid bearing, fill soft spots with weak concrete; provide a solid even clean base for the pouring of the footings. Pour the footings to the shape and sizes indicated on the structural drawings.

III. Drainage Works

Co-operate with the drain layer in the construction of the septic tank, inspection chambers, etc. indicated on the drainage plan.

IV. Blocklayer

Work in and co-operate with the Block layer in the construction of block walls, the filling and reinforcing the same and location of all starter bars etc.

V. Building-In

Allow to co-operate with other trades, spec, position and build in all fitting bolts, pipe sleeves, nailing blocks, chases, conduits, reinforcing, starters, weather bars etc. as shown on the drawings.

VI. Testing

a. Compression Test

Concrete shall be sampled, cured, tested and assessed by an Independent IANZ laboratory as follows:

a) Samples shall be taken from the concrete as and when discharged after completion of mixing, but prior to site handling. Do not sample from the first 0.2m3 or from the last 0.2m3.
b) At least one sample shall be taken for testing from every 3.5m3 of concrete supplied to the site. A sample shall consist of 3-cylinder specimens, one tested on the 7th day and the remaining two shall be tested on the 28th day.
c) Cylinder Specimen dimensions: 300mm long x 150mm diameter.

d) Unless noted otherwise in this Technical Specification, refer to AS1012.8.1 for Method of Making and Curing Concrete for Compression and Indirect Tensile Test Specimens.
e) Cylinder specimen shall be stored under the following conditions as per AS 1012.8.1:
    a. Undisturbed in their moulds with lids on a rigid horizontal surface for a period of not less than 18 hours from moulding.
    b. At a location protected at all times from strong wind and direct sunlight.
    c. The cylinder shall be moved at least after 18 hours of moulding and entry into the standard moist curing condition shall not exceed 36 hours. Standard moist-curing conditions ensure that the concrete specimens are kept wet and at a temperature of 27 ± 2 °C.
f) Testing shall be carried out by an IANZ accredited laboratory and in the presence of HLE Engineers. Testing and reporting of the cylinder specimens shall be carried out in accordance with AS 1012.9.
g) The concrete cylinder specimens shall be assessed based on AS1379. A Production Assessment shall be carried out with the data gathered from this project only. The compliance of the concrete will be based on the following formula:
f_cm≥f_c^'+ k_c s

Where:
- fcm is the mean value of the compressive strength of concrete at the relevant age, determined over the production interval.
- f'c is the characteristic compressive strength of concrete at 28 days.
- kc is the assessment factor based on Clause 6.3.1.4 of AS1379 (3.2 for 4 samples or less, 2.5 for 5 samples, 2.1 for 6 samples, 1.9 for 7 samples)
- s, standard deviation for the grade being assessed. 3MPa for 5 samples or fewer.

Refer to AS 1379 for further information.
Should the concrete cylinder test results fall short of the Production Assessment requirements highlighted above and on AS 1379, concrete shall be assessed based on concrete cores taken from the project site. Assessment of concrete cores shall be based on BS EN 1379: Assessment of in-situ compressive strength in structures and precast concrete components. Concrete cores failing to comply with BS EN 1379 shall be deemed to be rejected.

b. Slump Test

This test shall be made in accordance with the requirements of NZSS 3112. A slump test shall be made immediately after concreting is started at all times when Compression Test Samples are taken and at such other times when directed. Slump tests shall be made in accordance with NZSS 3112.

c. Concrete Strengths

Refer to drawing "structural notes" for the required 28th day Characteristic Strength required for the concrete.

M. Additional Documentation From The Contractor

The Contractor shall provide as a minimum, to the Engineer, the following:

- Target water/ cement ratio

- Target strength
- Type and brand of cement
- Batch weights of cement and aggregate
- Curing methodology including contingency plans for conditions which may adversely affect the curing of the concrete
- Type, purpose and quantity of admixtures and rate and method of application
- Allowances made for aggregate moisture content
- Target slump
- Amount of air entrainment
- Batch size and yield
- Lab test results for aggregates and compliance certificates for cement, admixtures, and water
- Slump test records – single results and mean of last six

Other than those specifically noted, other Quality Records shall be made available to the Engineer and shall be submitted if requested.

4) SECTION 4: PILING

A. General

This section covers the construction of structural piles of concrete or steel or a combination of these materials.

B. Piling Layout

The piling layout, the minimum pile size and/or capacity and acceptable type together with the steel reinforcement and class of concrete required shall be as detailed and specified on the Drawings unless specified otherwise in the Special Provisions.

C. Plant and Equipment

The plant and equipment used for driving, forming of holes or other methods of sinking piles shall be in good working order and to the Engineer's approval. All machinery shall comply with relevant legislation.

Installation equipment shall be of such design as to ensure that piles can be installed in their proper position and to their correct alignment slope.

D. Piling Platforms

Piling platforms shall include the prepared insitu material, or artificial islands or any structure, excluding the piling equipment, constructed to gain access to the pile position and for carrying out the piling operations.

The foundation material required to support the piling plant and equipment shall, where necessary, be consolidated to provide firm support. The Contractor may use any material he deems suitable for the construction of piling platforms but shall note that obstructions to piling encountered within the artificially constructed platform material shall not be measured and paid for.

Prior to and during the course of installation of piles, the level and alignment of the piling frame shall be constantly checked, and any deviation immediately corrected.

On completion of the piling the Contractor shall remove the artificially constructed platforms and reinstate the site to the satisfaction of the Engineer.

E. Setting Out

The Contractor shall set out the pile positions and shall stake these positions with a durable marker. Where the level from which the piling is undertaken is above the underside of pile capping slab, due allowance shall be made for the offset of raking piles so that the pile at the underside of pile capping slab is at the correct position. Pile positions, vertically and rake shall be within the tolerances.

F. Ground Surface of Piling

Prior to commencement of any piling, the Contractor shall notify the Engineer in good time to ensure that levels of the ground surface be taken in order that the ground surface which the piling is to be measured be established and agreed to between the Engineer and the Contractor. Where piling at a site is preceded by excavation or the construction of fill, the surface from which piling is to be undertaken shall be formed

as near as possible to the underside of the pile capping slab or as directed by the Engineer.

G. Cast In-Situ Concrete Piles

I. Steel Casing

a. Quality

Steel for the casing shall be mild steel to Grade 300 to AS/NZS3679.1 or equivalent.

b. Forming

The casings shall be manufactured from plates rolled to circular shape or spirally wrapped and welded and shall be brought to the site with all shop welds corn completed. These tubular steel casings will be fabricated and be ready for delivery at the nominated yard. The contractor is to arrange for pick up, arrange for sandblasting and painting before delivery in appropriate lengths to the job site.

c. Welding

All welding shall conform to the requirements of Structural Steelwork of the Specification.

The manufacturing shall be of sufficient accuracy to ensure that units may be welded together on the site without excessive forming and propping. Adjacent section, of shells to be welded together shall mate within the tolerance necessary to produce an acceptable weld in terms of the welding Specification. If the casing is to be considered as contributing to the permanent strength of the cylinders all joints including filed joints shall be full strength butt welds. If the casing is required only for the support during construction of the cylinder the welds shall be sufficient to carry the construction loads.

II. Reinforcing

The reinforcing shall be supplied and fabricated in accordance with Steel Reinforcement for Structures' of the Specification or to a recognized Standard where different strength grade reinforcing is proposed.

The reinforcing for each pile shall be as detailed in the drawings. Steel reinforcement shall be accurately maintained in position without damage to the sides of the hole or the reinforcing cage. Where reinforcement is made up in cages, they shall be sufficiently rigid to enable them to be placed, handled and concreted without damage. Plastic wheel spacers or other types of spacer approved by the Engineer shall be used to maintain reinforcement at the required distance from the inside face of the casing or pile shaft and shall not cause zones through which aggressive ground water may penetrate towards the reinforcement.

Splicing of reinforcement will be permitted and the Contractor shall keep available on the site sufficient steel reinforcement so that an additional length of pile reinforcement can be assembled whenever necessary. The number of joints in

longitudinal reinforcement shall be kept to a minimum. Laps shall not be permitted in sections of the pile which may form plastic hinges during a seismic event.

The assembly of this additional reinforcement shall be carried out expeditiously, and before concreting of any specific pile commences. If splices have to be provided, the longitudinal bars shall overlap a distance of 40 bar diameters or as required by the Engineer.

At the lower end of the cage a circular steel band 75 mm wide by mm thick shall be fitted and welded to the vertical rods so that the cage does not drift whilst concrete is being placed and compacted. Plastic wheel spacers shall be provided to the reinforcing cage as required by the Contractor.

Except for the bottom band no welding to Grade 500 reinforcing shall be permitted unless shown on the drawings.

If welded hoops are used and the splices are made on the cage the longitudinal bars shall be shielded from weld splatter.

III. Concrete

All concrete used in the pile shafts shall conform with Concrete for Structures of the Specification and shall have the minimum 48 day crushing strength and cement content as shown on the Drawings. The slump shall be not less than 140mm to ensure that the concrete will pass through the reinforcing cage and form the full diameter of the pile without excessive ramming or vibration.

Concreting of the piles shall not commence before the Engineer has given his permission.

Concrete shall be placed in a manner that will prevent grout loss, segregation or bleeding.

IV. Construction

a. Location and Alignment

Piles shall be located in the positions indicated on the drawing and shall be constructed vertical or to the required rake throughout their length. The maximum tolerance for the plan position of the pile head shall be 75 mm.

Piles shall be driven until the required set is achieved or unless otherwise instructed by the Engineer as a result of ground conditions being different from that adopted for design purposes.

b. Construction Method

The Contractor shall be responsible for all measures and all expenses direct and indirect in constructing acceptable piles, down to the required founding level, with bases giving the specified bearing capacity.

c. Tolerances

The tolerance of casings after installation shall nowhere exceed 45 mm measured as the difference between any two mutually perpendicular diameters in the same plane at right angles to the longitudinal centreline of the casing. The average of any two diameters measured as above shall not vary from the nominal diameter of the shell as specified in the drawings by more than 45 turn. The casing shall be watertight when in its final position, prior to concreting. The casings shall be cut off at the level specified with a tolerance of ± 10 mm.

d. Cutting Ring

It will be the responsibility of the Contractor to ensure that each casing can penetrate any materials likely to be encountered during driving, and to ensure that the casing does not buckle or distort excessively.

Any sharpening or hardfacing, mild steel or hardened steel ring which may be added to the pile casing shall be wholly at the expense of the Contractor. Before undertaking the manufacture of the casing he shall obtain the approval of the Engineer to the details to be adopted.

e. Inspection

Should it be necessary for any reason for personnel to descend into the pile excavation (including inspection and repair, etc.) the Contractor shall take adequate precautions as will be acceptable to the appropriate Government Authorities arid the Engineer to protect personnel and shall comply fully with the requirements of any relevant Act or Regulation.

f. Placing Reinforcing

Reinforcement shall not be placed in the pile shaft until immediately before concreting. Before the reinforcement is placed, the bottom of the hole shall be thoroughly cleaned of mud, and any lose or soft material.

The reinforcement cage shall be positioned accurately in the casing using appropriate wheel spacers to the approval of the Engineer to ensure that the stipulated cover to the steel reinforcement is maintained throughout. The top of the cage shall be oriented so as to provide spaces between the pile reinforcing for the pile cap reinforcing.

g. Concreting

If in the judgement of the Contractor, the casing can be safely dewatered it shall be emptied for inspection and placing of the concrete.

After concreting of the pile shaft has been completed, the top of the concrete shall be scabbled to sound concrete before the remainder of the concrete is placed. Concreting of the pile shaft should be done in one complete operation without construction joints. The concrete may be discharged down the centre of the pile and allowed to free fall provided it is clear of the reinforcing cage.

No casing installation or pile shaft excavation shall be carried out adjacent to a pile which had just been concreted, for a period of at least 44 hours.

H. Steel Piles

I. Materials

Unless otherwise described in the Contract, steelwork for piling shall comply with the requirements of AASHTO M I 83.

II. Permanent pile casing

The thickness of permanent pile casings that are not designed or required to assist in (carrying loads on the Permanent Works shall be determined by the Contractor to suit the purpose for which they are required. The casings shall be sufficiently rigid so as not to deform permanently or damage during handling and installation and shall remain grout-tight.

III. Driven pile casing

Driven pile casings shall have sufficient strength to permit them being driven and not being distorted by the driving of adjacent piles. They shall be sufficiently watertight to prevent water leaking through the casing walls during the placing of concrete.

IV. Storage and handling

Where piles are to be stored, they shall be placed on sufficient supports on firm ground to avoid damage. Packings of uniform thickness shall be provided between pile groups.

Each pile shall be indelibly marked to show its identification number, grade of steel and length.

V. Driving

Piles previously driven shall not be used, except with the approval of the Engineer, for any Permanent Work.

The Engineer shall be notified 44 hours before the commencement of driving. Piles shall be driven to the approved set or prescribed depth and in the sequence of driving approved by the Engineer. The set shall be taken in the presence of the Engineer or his representative unless permission to the contrary has been obtained in writing.

Driving of bearing piles shall be continuous until the approved set or prescribed depth has been reached, except that the Engineer may permit the suspension of driving if he is satisfied that the rate of penetration before the suspension will be substantially re-established on its resumption.

VI. Lengthening of piles

Full penetration butt welds shall be used for all joining and lengthening in accordance with the details specified on the drawings. All piles shall be from the

same rolling wherever practicable to facilitate welding. Sections to be jointed shall be maintained in true alignment and position. After welding, the affected areas shall be thoroughly cleaned and protected in the same way as adjacent surfaces.

Longitudinal seam welds and spiral seam welds of lengths of tubular piles shall wherever possible be evenly staggered, but in order to achieve a satisfactory match of the ends of piles or the specified straightness, the longitudinal seam or spiral seams are brought closely to one alignment at the joint then they shall be staggered by at least 100 mm.

VII. Tolerances

All steel piles shall conform to the tolerances stated in the specification.

a. Driving

Installation Equipment

Piles and pile casings shall be driven with a gravity hammer and bottom driven. The hammer shall not, during driving operations, damage any permanent component of the pile. Pile driving leaders shall be constructed by such a manner as to afford freedom of the movement of the hammer and shall be held in position to ensure adequate support of the pile or pile casing during installation.

Installation sequence

Unless otherwise specified or ordered, the sequence of installing piles shall be the responsibility of the Contractor. However, the sequence of driving piles in a group shall be programmed to minimize the creation of consolidated blocks of ground into which piles cannot be driven or which cause fictitious penetration values.

Piling shall generally commence at the centre of the group and be progressively extended to the perimeter piles unless otherwise agreed to by the Engineer.

The installation of piles shall be taken in such a manner that structural damage, distortion or positioning defects are not caused to previously installed piles or casings.

Heaving of piles

In soils of which the installation of piles may cause previously installed piles to heave, accurate level marks shall be placed on each pile immediately after installation and all piles that have heaved shall be redriven to the required resistance, unless redriving tests on neighboring piles have shown this to be unnecessary. Piles shall not be concreted nor shall any pile capping slab be constructed until the piles within a heave influence zone have been redriven as required.

b. Obstructions

Definitions

Identified Obstructions

Identified obstructions shall mean any obstruction that has been described on the Drawings or in the Special Provisions and for which provision for payment for penetrating the obstructions has been made in the Bill of Quantities.

Unidentified Obstructions

Where provision has been made in the Bill of Quantities for penetrating identified obstructions and obstructions not described are encountered, such obstructions shall be classified as unidentified obstructions are paid for and subject to the condition that the rate of penetration drops to below that achieved for identified obstructions when using the same methods and effort:, or subject to additional methods and effort over and above those required for identified obstructions being required to penetrate the obstruction

OR

Where no provision is made in the Bill of Quantities for penetrating identified obstructions and obstructions are encountered and, after resorting to the methods specified in the submission, it is found not possible to form the holes in the proper position, inclination and depth, and the Contractor has to resort to additional methods to successfully form the pile holes, such obstructions shall be classified as unidentified obstructions.

Classification of materials

For piling only the following classification of materials shall apply to the identification and description of obstructions.

Matrix

The matrix shall comprise that part of the material with a particle size that will pass through a sieve with 50 x 50 mm openings.

Coarse gravel

Coarse gravel shall compromise that part of the material (stones, pebbles, cobbles, etc) that will pass through a 400 x 400 mm opening, but will not pass through a 50 x 50 mm opening.

Boulders

Boulders shall mean any rock mass of at least Class R1 rock hardness that will pass through a square opening of dimension equal to the maximum size boulder specified in the Bill of Quantities but will not pass through a 400 x 400 mm opening.

Rock formation

Rock formation shall be any rock of at least Class R1 rock hardness that will not pass through a square opening of dimension equal to the maximum boulder specified in the Bill of Quantities.

Where a boulder is cut through and part thereof is left imbedded in the wall of the hole, such bolder obstruction shall be classified as rock formation.

For the identification of rock in terms of this clause, the classification in the following table shall apply.

Table: Rock Classification

DESCRIPTION OF HARDNESS			
Class	Description	Field Indicator Tests	Confirmed Compression Strength (Mpa)
R1	Very soft rock	Material crumbles under firm (moderate) blows with a sharp end of geological pick and can be peeled off with a knife; it is too hard to cut a triaxial sample by hand	0.7 to 3.0
R4	Soft rock	Can just be scraped and peeled with a knife; indentations 1 mm to 3mm show in specimens with firm (moderate) blows of the pick point	3.0 to 10.0
R3	Hard rock	Cannot be scraped or peeled with a knife; specimen can be broken with hammer end of a geological pick - with a single firm (moderate) blow	10.0 to 40.0
R4	Very hard rock	Hand—held specimen breaks with hammer end of pick under more than one blow	40.0 to 70.0
R5	Extremely Hard rock	Specimen requires many blows with hard rock geological pick to break through intact material	More than 70.0

c. Driven displacement and prefabricated piles

Where obstructions make it difficult to install driven displacement and prefabricated piles on the position and inclination shown and to the proper

lengths by the methods specified in the submission, the Contractor shall resort to additional methods feasible to the pile type. If it is not possible to successfully install any pile after resorting to such methods, the Engineer may order an additional pile or piles to be installed. All such work and additional piles shall be paid for in accordance with the tendered rates where these are applicable.

d. Determination of pile length

The design of the piles, and pile groups, and quantities in the Bill of Quantities are based on subsurface data gathered during investigation of the site. The depth of pile is determined by a 1:2 ratio of the height of the piles above the natural ground level to the depth below the natural ground level.

Should there be variations in the subsurface conditions as regards materials and height of water table, the Engineer shall be informed immediately.

If the Contractor is not satisfied that the piles will be capable of carrying the specified loads at the depth determined by the Engineer, he shall have the right to vary the length of pile to reach a founding depth at which he is willing to guarantee the load bearing capacity of the pile. The length of pile installed is paid for at the tendered rates.

The Engineer may require additional foundation investigation on piles to be test loaded in order to determine final pile length and foundation levels.

e. Piling records

Records of The information listed hereunder shall be kept for each pile installed in a form prescribed by the Engineer.

f. Driven Piles

(i) The effort used to drive the pile and the resistance to penetration at founding Details of the number of blows required to achieve each 500mm penetration over the full length of each individual pile.

(ii) The quality of the materials used in the manufacture of the pile as well as the permanent casing if used.

(iii) An individual ‘set card’ for each pile driven taken at the pile founding level which shows the final set and temporary compression values.

(iv) The maximum working load of the pile.

(v) The length of the pile and the accuracy of installation in respect of position and inclination.

g. Reinforcement

The reinforcement for the tops and toes of the piles will be scheduled on the Drawings showing the number, size, type and arrangement of the bars.

h. Cutting Back Piles

The ‘cut—off level for steel piles shall be deemed to be a level 50 mm above the underside of the pile capping slab.

Concrete cast in place piles shall be broken back to sand concrete, prior to start of construction of the base or pile cap.

i. Construction of pile capping slab

The Contractor shall not be permitted to construct the pile capping slab before the Engineer has confirmed in writing that all relevant load testing if required has been completed and the piles have been accepted.

j. Defective pile

The trial piles and/or test piles and the piles represented by the test pile shall be classified as defective if shown, in terms of Subclause 6010.13(u or v), to have inadequate bearing capacity or excessive settlement when compared with the design values. Defective piles shall also include any pile damaged beyond repair, piles with structural defects or piles that do not comply with the tolerance requirements of Subclause 6140.3.

Defective piles shall be corrected by one of the following methods approved by the Engineer.
Extracting the pile and replacing it with a new pile.
Installing a new pile adjacent to the defective pile.
Lengthening the pile to the correct length if defective in length only.
Altering the design to meet the new conditions caused by the defective pile(s).

Piles which are deemed to be defective by virtue of damage to the pile, structural defects, or failure to comply with the tolerance requirements shall be corrected at the Contractor’s expense. Piles designed by the Contractor which are found to be defective for any reason shall be corrected at the Contractor’s expense.

k. Painting for Splash Zone

Steel piles and steel permanent casings are to be protected with paint as specified on the drawings. All surfaces of the steelwork shall be prepared and coated in accordance with the provisions of this specification.

I. Sheet Piles

I. General

All steel sheet piling shall be new and unspliced material throughout, unless otherwise reviewed and accepted by ENGINEER. Steel sheet piles and special fabricated shapes shall be of a design that ensures continuous interlock throughout the entire length when in place.

II. Materials

(a) Steel sheet piling shall meet the requirements of AS2159:2009, (Grade 390 min).

(b) Steel corners, tees, wyes, and crosses shall meet the requirements of AS2159:2009

(c) Steel sheet piles required for the PROJECT shall be the type and weight shown on the DRAWINGS.

(d) For interlock filling a threading interlock is factory filled with a durable, sufficiently malleable bitumen compound. In the case of multiple piles, the gaps of the prefabricated interlocks are sealed with polyurethane. The filled threading interlocks are sealed with polyurethane. The filled threading interlock must be inserted first in the direction of driving; it should be closed on site from below with a rivet or the like. The filling materials are to be environmentally friendly and do not release any water pollutants. For percussion driving a bitumous putty is recommended. This is cold bitumen reinforced with fibers. It should be injected in the factory.

(e) Steel sheet piles and interlocks shall not have excessive kinks, camber or twist that would prevent the pile from reasonably free sliding to grade.

(f) All fabricated connections shall be made with the use of angles or bent plates, as necessary, and shall be adequately welded or connected with high strength bolts as accepted by ENGINEER.

(g) Handling Holes: If handling holes are provided, they shall be two (2) standard 50mm diameter handling holes located 150mm from one end. The holes shall be plugged by welding a piece of steel over the hole prior to installing any riprap, backfill or drop structure cap. The plated hole shall be watertight.

III. Storage and Handling

(a) Do not subject piles to damage by impact bending stresses in transporting to and storing piles onsite.

(b) Store and handle piles such that corrosion protection coating will not be damaged.

IV. Execution

a. Examination

(a) Do not begin sheet pile installation until the earthwork in the area where the piles are to be driven has been completed to the extent that the grade elevation is at no more than 300mm above or below the top of the piling elevation as indicated on the DRAWINGS.

b. Preparation

(a)Any fill along the alignment of the sheet pile must be in place to sub-grade elevations and compacted prior to driving the sheet pile. Fill material (except riprap, boulders, bedding and grout) is not to be placed around the sheet pile after the sheet pile is in place.

c. Installation

(a) All welding or gas cutting shall be in accordance with the current standards of the Australian Welding Institute.

(b) Steel sheet piling shall be driven to the depths shown on the DRAWINGS or to virtual refusal.
(c) Virtual refusal is defined as ten (10) blows per 25mm with an approved pile hammer.
(d) A pile hammer shall be used to determine virtual refusal.
(e) The hammer shall be operating at the manufacturer's recommended stroke and speed when virtual refusal is measured.

V. Sheet Piling Driving

(a) Steel sheet piling shall be assembled before driving and then driven as a continuous wall, progressively in stages to keep the piles aligned correctly and minimize the danger of breaking the interlock between the sheets.
(b) Steel sheet piling shall be driven to form a tight bulkhead.
(c) A driving head shall be used and any piling which is damaged in driving or which has broken interlocks between sections shall be pulled and replaced at CONTRACTOR's expense.
(d) The piling shall be driven within the following tolerances:

a. Alignment

(a) Sheet pile shall be driven to form a relatively straight line between the terminating
points shown on the drawings.
(b) Horizontal deviation of any point from a straight line connecting the two ends of the wall section shall be a maximum of 150mm.

b. Plumbness

(a) Each individual sheet pile section shall be driven vertical, within a horizontal tolerance of two percent (2%) of any vertical length measured along the pile.

c. Elevation

(a) Tops of sheet pile sections shall be within a tolerance of one 25mm from plan elevations.
(b) CONTRACTOR shall not be paid for excess sheet pile trimmed off the end of the pile to meet final grade.
(c) CONTRACTOR shall brace and/or provide soil grading as necessary during construction operations in order to provide lateral stability for the sheet pile wall. The sheet pile wall has been designed for the soil grades of the final configuration denoted on the DRAWINGS only. Other temporary configurations during the construction period shall not be allowed.
(d) Care shall be taken during driving to keep from causing deformations of the top of the piles, splitting of section, or breaking of the interlock between sections. Care shall also be taken during driving to prevent and correct any tendency of steel sheet piles to twist or get out of plumb.
(e) Steel Z piling shall be driven with the ball-end leading. Proper care and planning shall be used to allow for this construction procedure in both immediate and possible future walls.

(f) Alternate Z piles shall be reversed end for end for proper interlocking in the “normal” position. Piles shall also be aligned properly to maintain a “normal” driving width.

(g) For sheet piles driven into the native soils, pre-drilled soils, or excavated soils a vibratory driver may be used as long as the required depth is obtained.

(h) For sheet piles being driven into bedrock, an approved hammer utilizing minimum hammer energy of 19,000 foot-pounds per square inch of steel section shall be used to obtain the required depth or virtual refusal. The hammer shall be clearly marked so that it can be identified at the job site.

(i) Steel sheet pile that is full length as shown on the DRAWINGS and is required to be driven below the specified cutoff elevation shall be spliced with additional steel sheet piling with a full penetration butt weld.

J. Measurement and Payment

The unit of measurement shall be the linear meter of sheet piling installed on site in accordance with the drawings or by the Engineer’s written instructions.

The tendered rate shall include full compensation for the supply of all materials, the manufacture transport, delivery to the point of use and handling of the prefabricated cages.

1. Reference Conditions:

The following environmental conditions are applicable to this site.

I) Elevation above mean sea level 50 metres

ii) Average barometric pressure 1012 mBar

iii) Ambient air temperature

Design Temperature	35 Deg C
minimum	14 Deg C
maximum	40 Deg C

iv) Relative Humidity

Maximum relative humidity	95%
Minimum relative humidity	70%

v) Seismic Condition

All equipment shall be capable of withstanding an acceleration of 3.3 m/sec² in any direction without sustaining any damage.

The temperature of the fresh water supply is always less than 30 ° C at the site. The following is an analysis of the supply water available:

pH	8.3
Alkalinity	mg $CaCO_3$/Ltr68.2
Chloride	mg/Ltr7.3
Sulphate	mg SO_4/Ltr8.4
Free CO_2	mg/Ltr0.62
Temporary Hardness	mg/Ltr3.6
Permanent Hardness	mg/Ltr64.0
Total Hardness	mg $CaCO_3$/Ltr68.2
Total suspension solids	mg/Ltr<1
Total dissolved solids	mg/ltr126
Maximum Wind Speed (under cyclonic conditions)	85m/sec - gusting (under cyclonic conditions)
Isokeraunic Level	50

Seismic Level	7 on the open ended Richter scale
Average Rainfall per year	2663mm

Note: Fiji is situated in a region where cyclones are experienced frequently. All works shall be designed and constructed to withstand these extreme conditions. All installation shall be rust proof, vermin proof and weather proof and designed to be suitable for a damp, tropical climate, which may be experienced simultaneously.

2. Reference Standards:

IEC Standards are to be adopted in general. British or Australian standards too may be applied wherever necessary. Any other national or international standard may be used if such standards are not less exacting than corresponding IEC Standard. In all instances a copy of the relevant standard adopted should be forwarded to the Engineer. All civil works should be carried out in conformity with Fiji Building Code. The Works shall be constructed in accordance with the laws of Fiji and associated Acts and Regulations.

These Includes:

The Electricity Act (2017) and Electricity Regulations (2019) Building Code of Fiji

Health and Safety at Work Act – 1996

Environment Management Act and subsidiary Regulations

In order to achieve Regulatory compliance under the Electricity Act, the Works shall comply with the Electricity Regulations and AS/NZS 3000:2018 “Wiring Rules”.

In the absence of specific standards being nominated in the specifications, the following standards shall apply:

Australian/New Zealand Standards

AS/NZS	1170	Structural Design Actions
AS/NZS	1768	Lightning Protection
AS	1824	Insulation coordination – Definitions, principles and rules
AS	1940	The storage and handling of flammable and combustible liquids
AS/NZS	2312	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
AS/NZS	2373	Electric cables – Twisted pair for control and protection circuits
AS/NZS	3000	Wiring Rules
AS/NZS	3008.1.1	Electrical installations – Selection of cables – Cables for alternating voltages up to and including 0.6/1 (1.2) kV.
AS	3011.2	Electrical installations – Secondary batteries installed in buildings, Part 2: Sealed cells
AS/NZS	3080	Telecommunications installations - Generic cabling for commercial premises
AS/NZS	3155	Approval and test specification - Electric cables - Neutral screened – For working voltages up to and including 0.6/1 kV
AS/NZS	3835	Earth potential rise - Protection of telecommunications network users,

			personnel and plant
AS	4024.1		Safety of machinery, (all relevant parts)
AS	60529		Degrees of protection provided by enclosures (IP Code)
AS/NZS	60898		Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Circuit-breakers for a.c. operation
AS	1345		Identification of the contents of pipes, conduits and ducts
AS/NZS	2053		Conduits and fittings for electrical installations (all parts)
AS	2700		Color standards for general purpose

International Electro technical Commission (IEC)

IEC	11801		Information technology – Generic cabling for customer premises
IEC	14763		Information technology – Implementation and operation of customer
IEC	24702		premises cabling Information technology – Generic cabling – Industrial premises
IEC	60269		Low-voltage fuses
IEC	60304		Standard colours for insulation for low frequency cables and wires
IEC	60364		Electrical installations of buildings
IEC	60934		Circuit breakers for equipment
IEC	61009		Residual current operated circuit-breakers with integral overcurrent
IEC	61089		protection for household and similar uses (RCBOs) Round wire concentric lay overhead electrical stranded conductors
IEC	61232		20SA/A Aluminium clad wires for electrical purposes

British Standards (BS)

BS	EN ISO	1461	Hot dip galvanized coatings on fabricated iron and steel articles
BS	6231		Specification for PVC-insulated cables for switchgear and controlgear wiring
BS	6651		Protection of structures against lightning.
BS	7354		Code of Practice for Design of high-voltage open-terminals stations,Section 7: Earthing.
BS	7430		Code of Practice for Earthing.

Important Instructions for Bid Submission

Description: Dear Valued Suppliers,

This is a reminder to all suppliers to ensure that your bid submissions are made under the registered name of your business, as per your official business registration. This is important to avoid any confusion related to business identity. If there have been any changes to your business name or registration details, kindly update the information accordingly in your TenderLink user profile.
For local suppliers, please double-check your pricing calculations, including both the detailed breakdown and the total bid amount. Also, clearly indicate whether your prices are inclusive or exclusive of VAT. The prices should be received on your company letter heads, or put a company stamp.
For overseas suppliers, kindly state the currency in which you intend to submit your bid, along with the applicable Incoterm. This will assist us in accurately analyzing your submission.
Before submitting your bid, please ensure that all required documents have been uploaded to avoid incomplete submissions. Please upload valid Tax compliance, Valid FNPF Compliance and Valid FNU Levy Compliance for local bidders.

Lastly, please ensure that the Tender Submission Checklist is completed in full, including:

Company name: _____

Names of directors: _____

Contact phone number: _____

Email address: _____

These details are essential for us to reach out for any required clarifications.

Kindly ensure that you upload your tenders at least one hour before the closing time to avoid any last-minute internet or technical issues.

Thank you for your cooperation.

Kind regards,
EFL Supply Chain

ANNEX VII
G. TENDER CHECK LIST & SUBMISSION
Invitation to Tender no: MR 282/2025
Tower Slippage Rehabilitation Works

TENDER CHECKLIST

The Bidders must ensure that the details and documentation mention below must be submitted aspart of their tender Bid

Tender Number_____

Tender Name _____

Full Company / Business Name: _____

(Attach copy of Registration Certificate)

2. Director/EFL(s): _____

3. Postal Address: _____

4. Phone Contact:_____

5. Fax Number: _____

6. Email address: _____

7. Office Location: _____

8. TIN Number:_____

(Attach copy of the VAT/TIN Registration Certificate - Local Bidders Only **(Mandatory)**

9. FNPF Employer Registration Number:_____**(For Local Bidders only) (Mandatory)**

10. Provide a copy of Valid FNPF Compliance Certificate (Mandatory- Local Bidders only)

11. Provide a copy of Valid FRCS (Tax) Compliance Certificate (Mandatory Local Bidders only)

12. Provide a copy of Valid FNU Compliance Certificate (Mandatory Local Bidders only)

13. Contact Person: _____

I declare that all the above information is correct.

Name:_____

Position:_____

Sign:_____

Date: _____

Tender submission

Bidders are requested to upload electronic copies via Tender Link by registering their interestat: https://www.tenderlink.com/efl

EFL will not accept any hard copy submission to be dropped in the tender box at EFL HeadOffice in Suva.

This tender closes at 4.00pm (1600hrs) on Wednesday 08/10/2025.

For further information or clarification please contact our Supply Chain Office on phone **(+679)3224360 or (+679) 99926520 or (+679) 9983096** or email us on tenders@efl.com.fj

The bidders must ensure that their bid is inclusive of all Taxes payable under Fiji Income TaxAct. Bidders are to clearly state the percentage of VAT that is applicable to the bid prices.

The lowest bid will not necessarily be accepted as the successful bid.

The Tender Bids particularly the "Price" must be typed and not hand written.

Any request for the extension of the closing date must be addressed to EFL in writing three

(3) working days prior to the tender closing date.

Tender Submission via email or fax will not be accepted.