Request for Tender

MSAF Tender No.04/2023

for the

FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE

Date of Issue	27 January 2024
Closing Date	16 February 2024
Lodgment Address	MSAF Tender Box Level 4, Kadavu House, 414 Victoria Parade, Suva, Fiji.

Maritime Safety Authority of Fiji
September, 2023

REQUEST FOR TENDER

PROJECT: FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE

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DEFINITIONS

"***AS***" means Australian Standard
"***BS***" means British Standard
"***DBGA***" means Department of Buildings & Government Architect, Ministry of Public Works, Transport & Meteorological Services
"***INCLEMENT WEATHER*"** means continuous heavy rain or storm which may impede the progress of work
"***MSAF***" means Maritime Safety Authority of Fiji
"***NZS***" means New Zealand Standard
"***Standard Contract***" means Fiji Standard Form of Building Contract
"***TENDERER****"* may include the contractor and or subcontractor.

INTERPRETATION

Headings are for convenience only and do not affect interpretation. The following rules of interpretation apply unless the context requires otherwise.

(a) The ***singular*** includes the plural and conversely.

(b) A ***gender*** includes all genders.

(c) Where a ***word or phrase*** is defined, its other grammatical forms have a corresponding meaning.

(d) A reference to a ***person*** includes a body corporate, an unincorporated body or other entity and conversely.

SECTION 1: FORM OF TENDER

for the

Fabrication, Supply & Construction of 20 Metres Lattice Tower for Vatoa Island Lighthouse

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Maritime Safety Authority of Fiji
September, 2023

FORM OF TENDER

(To be submitted with the Tender Submission)

Tender for**:**

FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE

Name of Tenderer .....…….....

We, the undersigned, hereby offer to execute and complete the whole works as stated on the said documents for the Fixed Lump Sum of:-

(in words and numbers)
……

……

TOTAL TENDER PRICE [F$.....VIP]

The above Lump Sum must include VAT (15%) and with no provision for fluctuations in the cost for Labour and Materials.

As witnessed in our hands this day .....day of.....

Tenderer's *Name:* ……..

Signature: .....

Office Stamp: ….....

Address: ….....

Witness *(Name in Capitals)* ….....

Signature: ……..

Address ….....

Occupation ….....

APPENDIX 1

PROJECT DURATION AND COMPLETION DETAILS

Tender for:

FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE

Duration	: 15 Calendar Weeks
Defects Liability Period (Clause 15, 16 & 30)	: 12 Months
Retention	: 10% at the end of the Defects Liability Period
Liquidated and Ascertained Damage (Clause 22)	: $200.00 per day
Public Liability Insurance (Clause 19 (1) a)*	: $500,000.00 (minimum)
Insurance for the Works	: Value of the Contract Sum (minimum)
Contractors All Risks	: Approved Contract Sum plus 10%
Workers Compensation Insurance	: $500,000.00
Performance Bond	: 30% of the project value

***All prices to be in Fijian Dollars**.*

*** Clauses referred to above are contained in the Fiji Standard Form of Building Contract (Without Quantities, Public Works Department Edition 1978).**

APPENDIX 2

SUMMARY OF TRADES/COSTS

	Summary of Trade Description	**Cost (VIP)**
01	Preliminaries	
02	Metal/Steel Works (supply, fabricate &installation of lattice tower)	
03	Concrete & reinforcing steel (supply & construction of tower base/foundation)	
04	Solar Panel Frame & Battery Box (supply & installation)	
05	Supply & construct fencing & entry gate	
06	Insurance & Freight (Suva)	
07	Subtotal	
09	Sub Total	
10	VAT (15%)	
H.	**TOTAL TENDERED SUM**	

Signature of Tenderer …….....

Tenderer's Stamp ……..….....

Date ……..….....

APPENDIX 3

LABOUR RATES SCHEDULE

Labour Rates Summary

3.1 All Tenderers shall submit their Labour and Plant rates applicable for this Project; this is a mandatory requirement. If any job/trade or plant/equipment classification is missing from below, the Tenderer is required to add it in the spaces provided.

3.2 Labour Rates Summary

Item	Job Classification (Trades)	Hourly Rate ($)
01	Supervisor	
02	Foreman	
03	Welder/Fabricator	
04	Carpenter	
05	Plaster man	
06	Leading Hand	
07	Painter	
08	Labourer	
09	Rigger	
10	Machinery operator	
11	*Add on other job classification (trades) as necessary for this project.*	
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

APPENDIX 4

PLANT HIRE RATES

Plant/Equipment Rates Summary

4.1 All Tenderers shall submit their Plant/equipment rate that is applicable to this Project; this is a mandatory requirement. If any job or equipment classification is missing from below the Tenderer is required to add it in the spaces provided.

Item	Plant/Equipment Classification	Hourly Rate ($)
01	Concrete Mixer	
02	Welding Plant	
03	Barge	
04	Vibro/Drop Hammer	
05	Rotary Hammer Drill	
06	Electrical Saw	
07	Pile driver	
08	Auger	
09	*Add on other job classification (trades) as necessary for this project.*	
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

APPENDIX 5

ADDITIONAL INFORMATION REQUIRED FROM ALL TENDERERS

Project:

FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE

Contents

Notes to Tenderers

1. Please fill in clearly and neatly the spaces provided below.

2. Additional information may be attached at the back, if necessary.

3. Any queries regarding the filling of the Form of Tender are to be directed to MSAF.

A STRUCTURE AND ORGANIZATION

1. Name of Company:

   Certificate No. :

   Tax Identification No. (T.I.N)

   Contact Person:

   Telephone Number:

   Mobile: E-mail Address:

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2. Description of Company (for example, General Contractor)

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3. Number of years' experience as a General Contractor in Fiji:

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4. Please present organization chart showing the Tenderer/Company structure including the position of directors and key personnel.

Notes to Tenderers

1. *Please fill-in clearly and neatly the spaces provided below.*
2. *Additional information may be attached at the back, if necessary.*
3. *Any queries regarding the filling of the Form of Tender are to be directed to MSAF.*

B FINANCIAL STATUS

1. Annual value of construction work undertaken for each of the last two years.

2021	2022

2. Current commitments and value of work at hand since 2021 till to date.

3. Attach copies of the Tenderer's previous two years audited financial accounts.

4. Name and address of Banker where references can be obtained. Provide Bankers Report, financial status and overdraft facilities.

Notes to Tenderers

1. *Please fill-in clearly and neatly the spaces provided below.*
2. *Additional information may be attached at the back, if necessary.*
3. *Any queries regarding the filling of the Form of Tender are to be directed to MSAF.*

C RESOURCES: PERSONNEL/PLANT EQUIPMENT

1. Total Number of Staff in the Company:

Technical:	Administrative:

2. Staff proposed to work on this Project:

Name:	Position:	No. of Years of experience in construction:

3. Main plant/equipment:

Considered by the Tenderer to be necessary for executing the Project and whether the plant is owned or will be purchased or hired.

Notes to Tenderers

1. *Please fill-in clearly and neatly the spaces provided below.*
2. *Additional information may be attached at the back, if necessary.*
3. *Any queries regarding the filling of the Form of Tender are to be directed to MSAF.*

D RESOURCES: OTHER

1. State any part of the works to be undertaken by subcontractor(s), if any, and give name(s) and address of the subcontractor(s).

2. Provide details of 'off-site' fabrication available to the Tenderer.

3. Provide Tentative Work Program (Gantt Chart).

Notes to Tenderers

1. *Please fill-in clearly and neatly the spaces provided below.*
2. *Additional information may be attached at the back, if necessary.*
3. *Any queries regarding the filling of the Form of Tender are to be directed to MSAF.*

SECTION 2: CONDITIONS OF TENDER

for the

Fabrication, Supply & Construction of 20 Metre Lattice Tower for Vatoa Island Lighthouse

Maritime Safety Authority of Fiji
September, 2023

Table of Contents

Note: **All clauses noted refer to the Fiji Standard Form of Building Contract (without quantities, Public Works edition 1978**)

1.0 General Description of the Scope of Works

1.1 The said works entail all necessary works for the ***FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE***.

2.0 Tenderer to Inform Himself

2.1 The tenderer shall inspect and examine the structural drawings including the sites and surroundings, as to the form and nature of the project site and the cost implications of the provision of ships, accessories, electricity and water supply lines to the site. This shall be satisfied before the submission of the tender. The tenderer should also have a clear understanding of the quantity of the work and materials necessary, accommodation required, the availability of conditions and rates of pay of labour and shall inform himself of all risks, contingencies and other circumstances which may affect this tender.

2.2 Inspection of the site is to be carried out with MSAF and DBGA through arrangement with MSAF before submitting the tender.

3.0 Detailed Description of the Work

3.1 The extent of this Contract includes supply of all materials, labour, transportation and plant for the execution of the said project in accordance with the specifications and structural drawings.

4.0 Tenders

4.1 Tenders are to be completed and submitted on the enclosed FORM OF TENDER.
This shall be submitted in a plain sealed envelope, marked:

Request for **Tender – MSAF Tender 04/2023**
"FABRICATION, SUPPLY & CONSTRUCTION OF 20 METRES LATTICE TOWER FOR VATOA ISLAND LIGHTHOUSE".

and addressed to:-

The Chairperson, Tender Committee
Maritime Safety Authority of Fiji
Level 4, Kadavu House, 414 Victoria Parade
Suva, Fiji

Tenders are to be submitted no later than Friday, 16 February 2024 at 1500hours. (Late tenders will not be accepted.)

4.2 The lowest or any tender need not necessarily be accepted.

4.3 The Maritime Safety Authority of Fiji reserves the right to REDUCE THE SCOPE OF WORKS to suit budgetary requirements. This will be decided prior to the contract signing.

4.4 All clarification's / discrepancies on tender documents must be made and resolved before the closing of tenders either in writing or verbally to MSAF.

5.0 Qualification of Tenders

5.1 Any Tenders not complying with any Tender condition/requirement stated in the Tender documents shall be considered non – conforming and will be disqualified.

5.2 Failure to submit the Tender Form fully completed will render the tender invalid.

6.0 Tender Documents

6.1 The documents for this Tender (inclusive in the contract) shall include the following:

a) Tender Letter
b) Conditions of Tender
c) Form of Tender
d) Specifications
e) Structural Drawings

If there are discrepancies or divergence between two or more of the documents including a divergence between parts of any one of them or between documents of the same description, the order of precedence shall be:-

a) Structural Drawings
b) Conditions of Tender
c) Specifications

7.0 Project Management

7.1 GENERAL: The Contractor shall be responsible for work executed under the contract including the work of the Sub-Contractor nominated or otherwise. The Contractor shall be responsible for the proper supervision of all works for which he is responsible and shall take all necessary measures to ensure quality control and workmanship.

7.2 Foreman: A competent Supervisor / Foreman shall be appointed and shall be in charge of the work for the duration of the Contract. Instructions given to him by MSAF shall be deemed to have been given to the Contractor. The Foreman must be able to fully understand the drawings and instructions he has to administer.

8.0 Progress Gantt Charts

8.1 The tenderer shall, within seven (7) days of the official acceptance of his tender, **submit three (3) copies of detailed work programs and order of work for approval.** The works include ordering of materials, elemental construction, fabrication, plant and equipment.

8.2. One (1) copy of the approved programme shall be kept on the site at all times and shall be marked regularly and clearly to indicate the progress throughout the construction period.

9.0 Site Meetings

9.1 MSAF with DBGA may arrange site meetings with the contractors and sub-contractors (as necessary). The Minutes of the meeting shall be recorded and circulated to all concerned by MSAF.

10.0 Inspection of Works

10.1 MSAF and DBGA shall at all times during construction have full access to all phases of the work for inspection.

11.0 Fluctuations

11.1 For the purpose of this Contract, the tender costs is to be Fixed Lump Sum and will not be subject to government regulated monetary fluctuations.

12.0 Performance Bond

12.1 The successful Contractor shall be expected to provide a Performance Bond equivalent of 10% of the Contract Sum. The Bond shall be released upon Practical Completion. Performance Bond is to be directly paid to MSAF by the successful bidder upon signing the contract.

13.0 Period of Final Inspection

13.1 The period of final valuation shall be twelve (12) months from the date of the practical completion certificate.

14.0 Delays / Time Extensions

14.1 Period of delay and extension of time shall be allowed after the submission made by contractor and assessment carried out by the DBGA's office (maximum 1 month).

15.0 Completion

15.1 At completion, remove from the work site all plant, equipment, surplus materials, wastes and clean up the worksite. Make good where necessary (checked and determined by MSAF and DBGA) and facilitate testing of all hardware and equipment as necessary to ensure all are in working order before handover.

16.0 Liquidated and Ascertained Damages

16.1 This shall be in accordance with the Standard Contract and to be Two Hundred Dollars ($200.00) per day.

17.0 Claims and Payments

17.1 Progress payment claims and certified payments are to be made on the construction progress basis and in accordance with the Contract.

18.0 Retention

18.1 Retention shall be 10% of the contract sum and shall paid be at the end of Defect Liability Period.

19.0 Defects Liability Period

19.1 The period shall be twelve (12) months.

20.0 Insurance

20.1 The Contractor is specifically required to insure against injury to persons and property:

a) A policy related to this building contract under the Accidents Compensation Act 2017;
b) A policy Specified related to this building contract for its legal liability to the General Public to an amount not less than **five hundred thousand dollars ($500,000.00);** and
c) Insurance against the works. Minimum cover – Value of the Contract sum.

21.0 Duration of Works

21.1 This should refer as calendar weeks with 5 working days i.e., Monday to Friday with 45 hours of work per week. Any work beyond the aforementioned will be the prerogative of the contractor.

22.0 Miscellaneous

22.1 Tenderer to provide a Certificate of Ownership and individual shares in the company certified by a chartered accountant registered under the Fiji Institute of Accountants.

22.2 Tenderer to provide the following documents with tender submission:

a. VAT Registration Certificate
b. Tax Compliance Certificate
c. Company Certificate (Registrar of Company)
d. FNPF Compliance Certificate
e. Compliance Letter (FNU Levy Payment)
f. Experience in marine structural works
g. Latest bank statements
h. Latest financial statements

22.3 Tenderer may contact the following officers for technical queries:

Manager Safety, Compliance & Response
Maritime Safety Authority of Fiji
Phone: 3315266 or Mobile: 7706331

SECTION 3: GENERAL SPECIFICATION

for the

Fabrication, Supply & Construction of 20 Metres Lattice Tower for Vatoa Island Lighthouse

Notes:

- The Specifications are divided into sections as listed in the following index. Each section is complementary to the other Sections and all shall be constructed as mutually explanatory.
- Cross reference is given in the text to assist the Contractor. Cross referencing is not exhaustive and the absence of a cross reference shall not be taken as limiting the application of any clause.
- The Contractor shall notify the MSAF and DBGA in writing of any ambiguities or discrepancies in the specifications. The MSAF and DBGA will explain or adjust the specifications and will advise the Contractor in what manner the work is to be carried out.

Maritime Safety Authority of Fiji
September, 2023

General Structural Specifications

SECTION 1

1. GENERAL PRELIMINARIES

1.1. Project Description

1.1.1. The document is for the Construction of Vatoa Island Lighthouse. The lighthouse site is situated at Vatoa Island in the Southern Lau Group.

1.1.2. It is 220 nautical miles from Port of Suva at Latitude 19° 48'.41 South, 178° 14'.40 West.

1.1.3. Refer to the locality diagram on Sheet 01 of the structural drawing and navigation chart extract.

1.2. Scope of Work

1.2.1. The work covered under this Contract is the Construction of new concrete base, 20 metre Hot Dip Galvanised Steel tower materials. Fabrication, Supply, Installation new tower with the foundation and fencing as per the structural drawing and technical specification,

1.3. The Site

1.3.1. The location of the work in this contract and adjacent areas is shown on the attached drawings. The Contractor shall ensure that during the construction works there is minimal disturbance to marine/aquatic fauna in the area.

1.4. Access to Site

1.4.1. Access to the site is by a ship or helicopter or seaplane. The contractor is to obtain permission from MSAF to visit the site.

1.5. Non-Interference with Local Operation

1.5.1. The contractor is required to liaise closely with relevant authorities through MSAF to ensure minimum disruption to the local operations (fishing boats, tourist boats, dive boats and passage boats) is achieved.

1.6. Security

1.6.1. The Contractor shall provide at all times such suitable and reliable security as maybe required to protect the works and to ensure the safety of personnel working in the project site. The Contractor will be entirely responsible for the security of his plant and materials and MSAF accepts no liability whatsoever for any loss or damage thereto.

1.7. Contractor's Superintendent

1.7.1. In accordance with the Conditions of Contract, before commencement of any work on site the Contractor shall inform MSAF and DBGA in writing of his proposed arrangements for supervising the works and obtain MSA and DBGA's approval thereto.

1.8. Existing Services

1.8.1. The Contractor shall prior to the commencement of work on site enquire of the relevant services within the project area, which do not form part of the Contract. The Contractor shall be responsible for taking all proper and reasonable precaution to protect these existing services and utilities from damage and shall make good any damage caused as a result of his own activities or his sub-contractor at his own cost.

1.9. Water, Electricity and Telephone

1.9.1. The Contractor shall make his own arrangements for all temporary electrical, water and telephone services required for the execution of the works and shall pay all costs incurred.

1.10. Stand-Down

1.10.1. The Contractor may allow for disruption to his programme in carrying out the works due to circumstances beyond his control.

1.11. Construction Programme

1.11.1. The Contractor shall prepare a detailed Construction Programme as required by the Contract. The Programme shall be in the form of a detailed gantt chart with interlinked activities and shall update and improve the programme submitted with the Contractor's Tender. Critical dates determined shall clearly be shown.

1.11.2. At the end of each month the Contractor shall furnish MSAF and DBGA with the following information in writing:

a) The actual starting dates of all activities commence during the month;
b) The actual dates of completion of activities concluded during the month;
c) The current status of all work underway at the time of the report; and
d) The reasons for any discrepancies between the Construction Programme and the progress as achieved under parts (a) and (c) above, together with the Contractor's proposals for ensuring that all key and critical dates are achieved.

1.11.3. The Contractor shall fourteen (14) days prior to making major revisions in the Construction Programme, advise MSAF and DBGA of such revisions. Any such revision shall be subject to MSAF AND DBGA's approval.

1.11.4. MSAF AND DBGA reserves the right to review the progress of the works from time to time and the Contractor shall assist with such reviews. MSAF and DBGA reserves the right to instruct the Contractor to modify and up-date the Construction Programme at any time during the progress of the Contract to ensure completion by the due dates and any such revisions shall be carried out at the Contractor's own cost but shall not relieve him of the responsibility for the sufficiency thereof. If any event occurs which delays the Contractor in the execution of any part of his works, it is the Contractor's responsibility to revise the programme in order to minimise the effect of any such delays.

1.12. Method of Work Statement

1.12.1. The Contractor shall prepare and submit for approval by MSAF and DBGA a method statement indicating how the Contractor proposes to carry out the works. The statement shall include:

a) a list of equipment proposed to be used;
b) a list of professional staff;
c) a detailed description of the construction method and sequence, including setting out, survey and quality control methods;
d) allowance made due to sea conditions, inclement weather, access restrictions, operation restrictions and other such factors;
e) reference to the construction programme and temporary works as required;
f) a detailed site preparation and method for the disposal of the unwanted material; and

1.12.2. Approval by MSAF and DBGA of the method statement shall not relieve the Contractor of any of his responsibilities to complete the work in accordance with the requirements of the Contract.

1.13. Permits, Certificates and other Consents

1.13.1. The Contractor shall obtain necessary permits, certificates and other like consents from Government and Local Authorities and shall submit all such permits to MSAF and DBGA.

1.14. Contractor's Works and Establishment Areas

1.14.1. The Contractor is responsible for making all arrangements and meeting all costs for his area, sheds, offices, stores and the storage of plant and materials within the establishment areas and within the area of the works..

1.14.2. The Contractor shall at all times maintain his establishment area, office amenities, etc., in a clean and tidy condition.

1.15. Use of the Site

1.15.1. The Contractor shall not use any portion of the site for any purpose not directly connected with the Works unless written permission of MSAF is first obtained.

1.15.2. The site in its entirety shall be deemed as private property and the Contractor shall keep out all trespassers and all persons lacking authorization by MSAF.

1.15.3. The Contractor shall confine his construction operations within the site, or such other areas as may be negotiated and provided by MSAF and shall instruct his employees not to trespass.

1.15.4. Subject to any unavoidable disturbance, which maybe necessitated by the execution of the Contract, the Contractor shall not interfere with any environment sensitive areas, endangered species, areas of conservation fishing or other rights which may exist on or near the site.

1.15.5. The Contractor shall not erect or allow to erect an advertisement in any form on the site or on adjoining grounds without the written approval of MSAF.

1.15.6. The Contractor shall not set up or cause or allow to be set up on the site any business or retail establishment of any sort without the approval of MSAF.

1.15.7. The Contractor shall not establish on any portion of the site any living accommodation for his staff, employees, or sub-contractors without the written approval of MSAF.

1.16. Confidential Information

1.16.1. All plans, drawings and specifications and the subject matter contained therein remain the property of MSAF and all other information given to or obtained by the Contractor in connection with the Work shall be held in confidence by the Contractor and shall not be used by the Contractor for any purpose other than for the performance of the Work or as authorised in writing by MSAF.

1.17. Records

1.17.1. Within one (1) week of commencing work on the site, the Contractor shall furnish to MSAF AND DBGA a fully detailed record of all plant and personnel employed on the Works, and additions or reductions shall thereafter be notified weekly within two (2) working days of the end of the weekly period.

1.17.2. The record shall differentiate between plant owned by the Contractor and that which is hired. In the case of hired plant, the record shall state from whom the plant has been hired, size, capacity, output and power rating of all plant shall be stated in the return.

1.17.3. The labour record shall show by trades the number of men employed, rates of pay, the work upon which they are engaged, and shall include employees of all subcontractors

1.17.4. The Contractor shall, upon request, also supply to MSAF AND DBGA any other records relating to work under the Contract which MSAF AND DBGA may reasonably require.

1.17.5. The Contractor shall not destroy any of his records, timesheets, vouchers and the like on labour, constructional plant, materials and things before the end of the Contract and such records shall be available at any time for inspection by MSAF AND DBGA and/or by a competent Authority for compliance with the requirements of the Contract and of the local laws and regulations and in order to enable investigation by MSAF AND DBGA of any claim by the Contractor.

1.18. Publicity

1.18.1. The Contractor shall not make media releases or publish or disclose anything pertaining to the works under this Contract, without obtaining the written approval of MSAF.

1.18.2. Except for the purposes specified in clause 1.19.1, the taking of photographs on the site by, or on behalf of the Contractor or his sub-contractors shall not be allowed unless prior

consent in writing has been obtained from MSAF. Should such consent be given one (1) copy of each photograph must be submitted to MSAF for its retention as soon as available at no cost to MSAF.

1.19. Photography

1.19.1. Prior to the commencement of the Works, the Contractor shall provide to MSAF in duplicate photographic record of each Site and any adjacent offshore areas, identified disposal site, structures, roads, fields and crops.

1.19.2. The Contractor his expense shall supply progress photographs 150mm by 100mm in size (including digital copies) at monthly intervals. All photographs shall be annotated with the date and location.

1.20. Day work

1.20.1. Further to the Conditions of Contract, the Contractor may be required to perform additional works not defined elsewhere in the Contract by Day work.

1.20.2. All labour, plant and materials used on Day work shall be as agreed in writing by MSAF and DBGA prior to the commencement of the work. Three (3) quotations for the supply of materials or externally hired plant shall be obtained by the Contractor unless otherwise agreed by MSAF and DBGA.

1.20.3. Changes in resources employed on any items of Day work shall only be made with the written permission of MSAF and DBGA.

1.20.4. Day work shall be performed in accordance with the following provisions:-

a. **Labour**

- All Day work shall be carried out during the Contractor's normal working hours or as otherwise notified to MSAF and DBGA and no increase in Day work rates shall apply to any overtime, unless such overtime is outside the Contractor's normal working hours and the Contractor has been ordered in writing by MSAF and DBGA to perform work by Day work outside his normal working hours.

b. **Material**

- Materials required for Day work shall be supplied by the Contractor, unless otherwise directed by MSAF and DBGA.

c. **Hire of Plant and Equipment**

- The Contractor shall make reasonably available for Day work any item of plant or equipment normally employed on the work site. If such plant is committed on other work under the Contract, externally hired plant may be utilised.

• Payment of Day work shall be made in accordance with following provisions:

i. Generally

- Where plant or labour are employed on Day work the Contractor shall, not later than noon on the next working day after such plant or labour is utilised, deliver to the MSAF or its authorized representative, duplicate copies of daily time sheets recording the amount of plant and labour so utilised for verification.

- After verification, MSAF will sign and return one (1) copy of each time sheet, either approved or modified, acknowledging the supply of plant or labour. The Contractor shall forward a copy of this countersigned sheet with his claim for payment which shall be made within twenty- eight (28) days of the work being completed.

- Operations of plant which has been ordered to standby (and being paid under relevant items in the Bill of Quantities) shall be paid for under the Schedule of Rates provided that they too are standing by and cannot be engaged in other work.

ii. Labour

• The Contractor's labour rates shall be deemed to cover all costs arising from the employment of labour including higher duties and mixed functions, overtime loading, night work, meals and meal money, holidays and annual leave, absence through sickness, shift work and overtime by shift works, food and accommodation allowances, walking and travelling time, travelling allowances and fares, tool allowances and special provisions.

• The rates shall be deemed to allow for all other labour-connected costs and for his remuneration in executing Day work under the Contract, including site supervision and administrative staff (MSAF and DBGAs, foremen surveyors, draftsmen, time-keepers and clerks etc.), bonus or other additional emoluments, provision and maintenance of all hand tools and equipment, lamps, protective clothing and similar equipment, income tax, all insurances, inclement weather, cost of camps and cookhouse personnel, head office chargers and profit as applicable. The hours paid for will be those actually worked.

1.21. Meeting

1.21.1. The Contractor shall make regular meeting with MSAF and DBGA to discuss the progress of the Contract. Meetings shall be held once every month and additional meetings may be called by MSAF and DBGA when required.

1.21.2. MSAF and DBGA or their representatives would chair the meeting and shall take and distribute the minutes of such meetings. The minutes of the meeting shall be endorsed by all parties.

1.22. Inspection

1.22.1. The Contractor shall be required:

a) To furnish, upon the request of MSAF and DBGA or their authorized representative, any Government official, or their authorized representative, the use of such boats, boatmen and labourers reasonably necessary for the purposes of inspecting and supervising the work; and

b) To furnish, upon the request of MSAF and DBGA or their authorised representative, suitable transportation from all points on shore designated by MSAF and DBGA, to and from the various pieces of plant, and to and from the disposal site for the purposes of inspecting and supervising the work.

1.22.2. Should the Contractor refuse, neglect or delay compliance with these requirements, the specific facilities maybe furnished and maintained by MSAF AND DBGA, and the cost thereof will be deducted from any amounts due or to become due to the Contractor.

1.23. Reasonable Satisfaction

1.23.1. No expression of MSAF and DBGAs reasonable satisfaction or approval shall be deemed to be an acceptance of the defective materials or workmanship not complying with the terms of this Contract nor as authority for any variation except where such variation is authorized as provided in the contract in writing by MSAF AND DBGA.

1.24 Demolition and Surplus Materials

All surplus materials removed from demolition and excavation work shall remain the property of the Owner, unless otherwise agreed. Contractor to allow for removal of surplus materials off the site, within a distance of 10Km from the site, subject to consultation with MSAF.

1.25 Delays

1.25.1 DELAY OF WORKPLAN BY INCLEMENT WEATHER

a) Only those elements indicated in the WORKPLAN of the programme of work as being able to be affected by inclement weather will be considered when claims for extension of times are presented.

b) The claim must be backed by a certificate from the Fiji Meteorological Office indicating continuous inclement weather.

c) Only delays occurring in the work week from Monday to Friday and during normal working hours will be considered. Any work done during the Saturday & Sunday is the prerogative of the contractor.

d) The claim must be supported by the clerk of Works weekly reports.

1.25.2 Delays due to unavailability/delivery of materials will be considered if procedures outlined in Clause 1.20 have been adhered to.

SECTION 2
2 CONCRETE WORKS

2.1.1 General

2.1.2 This shall be the Technical Specification for reinforced Concrete pile Construction for the site.

2.1.3 The work to be executed under this specification consists of the supply and placement of concrete and ancillary requirements like site preparation.

2.1.4 Material and workmanship shall conform to the relevant S.A.A Codes or equivalent Codes approved by DBGA.

2.1.5 Refer to NOTES on Structural Drawings.

2.2 Reference Documents

2.2.1 Documents reference in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

2.2.2 Australian Standards

AS 1012.1-Sampling fresh concrete
AS 1012.3.1-Determination of properties related to the consistency of concrete Slump Test
AS 1012.8-Making and curing concrete compression, indirect tensile and flexure test specimens in the laboratory or in the field.
AS 1012.9-Determination of the compressive strength of concrete specimens
AS 1012.14-Securing and testing cores from hardened concrete for Compressive strength
AS 1141.14-Particle shape by proportional calliper
AS 1141.21-Aggregate crushing value
AS 1302-Steel reinforcing bars for concrete
AS 1303-Steel reinforcing wire for concrete
AS 1304-Welded wire reinforcing fabric for concrete
AS 1379-The specification and manufacture of concrete
AS 1478-Chemical admixtures for concrete
AS 2271-Plywood and blackboard for exterior use
AS 2758.1-Concrete aggregates
AS 3600-Concrete structures
AS 3610-Formwork for concrete
AS 3972-Portland and blended cements

2.3 Alignment

2.3.1 The Contractor shall be responsible for setting out the concrete works accurately to line and level in accordance with the instruction supplied, and arrangements must be made with DBGA to have the setting out checked prior to the work commencing. All spalling of concrete and fragments of previous concrete beams shall be removed and disposed properly. No stockpiling of demolished material shall be left on shores. Unless otherwise directed by MSAF and DBGA. The level of beam shall be such as that the finish level is in line with the other older beam height.

2.4 Dimensions

2.4.1 Beam: The confirmed size of the beam is to be as per the structural drawing, all relevant specification on the drawings related to the concreting of this beam is to be followed or as per the instruction provided by MSAF and DBGA.

2.5 Materials

2.5.1 CEMENT: Shall be standard Portland and cement of approved manufacture delivered to the site in sealed bags as provided by the manufacturer. No cement showing signs of lumping shall be used; no re-bagged cement shall be delivered to the site. Cement shall be stored off the ground in a clean, dry, weatherproof construction specifically constructed for and

exclusively used for this purpose. Cement shall be used as nearly as practicable in the order in which it is delivered to the site.

2.5.2 SAND: Shall be clean coarse grained, free from silt, salt and deleterious or carbonaceous matter and where requested by DBGA shall be washed in fresh water. Sources of sand shall be inspected prior to transportation to the site. Sands shall be mixed if so required by DBGA to obtain acceptable grading.

2.5.3 COARSE AGGREGATE: Shall be sieved to specified grades and stock-piled separately with samples of each grade taken from time to time by DBGA and mix tested to suit quality and grading of these aggregates.

Passing 38mm sieve and retained on 19mm sieve.
Passing 19mm sieve and retained on 6mm sieve.
Passing 6mm and retained on No.14 sieve.

2.5.4 WATER: Shall be potable (drinkable), clean and fresh, free from salt and other impurities.

2.5.5 REINFORCEMENT: Shall be round mild steel bars complying with AS1302 or the equivalent BSS, clean and free from dirt, grease or other foreign matter. Remove all loose scale before concrete is poured. Rods shall be cold bent to the correct shapes with all hooks as shown. Wire mesh reinforcement consisting of steel fabric composed of wires or bars welded into a mesh shape constructed from steel which before welding shall comply with the requirements of British Standard Specification and shall be supplied in flat sheets. All bars over 12dia. shall be deformed complying with the BSS code for deformed bars. Unless otherwise shown or specified, the minimum clear cover to main reinforcement shall be as follows:-

where concrete is in contact with ground - 75mm
b.) under-sides of beams and all columns - 40mm
c.) sides of beams - 25mm
d.) floor slabs - 20mm
Or else refer to the structural notes on the structural drawing.

2.5.6 Secure alternate passing with 16 gauge black binding wire to prevent movement while concreting. Splices of reinforcement shall be made only at the points shown on drawings except with the approval of DBGA.

2.5.7 Lapping reinforcement shall be of a length as to develop the full strength of the bars. In splices the length bars shall be placed at the minimum distance apart of 1 1/2 times the diameter of the bars provided that in no case the spacing between bars less than 1 1/2 times the maximum size of the coarse aggregate. Fabric reinforcement shall be lapped to develop the full strength of the bars in both directions.

2.6 Mixing

2.6.1 GENERAL: Concrete shall be mixed only in the quantities required for immediate use. The use of partly hardened concrete or remixing of such without additional cement, aggregate or water, will not be permitted.

2.6.2 MACHINE MIXING: Concrete shall be mixed in batch mixes of an approved type or types which will ensure uniform distribution of the ingredients throughout the mass. During mixing, the drum shall be rotated at the manufacture or, where no such recommendation has been

made, at the speed of not less than fourteen (14) or more than twenty (20) revolutions per minute.

The mixers shall be in good operating condition and the interior of the drums and the mixing blades shall be kept thoroughly clean and free of hardened concrete or mortar. Mixing shall be continued for a minimum of one and a half (1 1/2) minutes after all the ingredients are in the mixer before any portion of the batch is discharged.

2.6.3 HAND MIXER: Mixing by hand shall not be permitted except in an emergency and then only subject to the approval of DBGA.

2.6.4 PRE-MIXING: Concrete which has been mixed in an approved central plant and transported to the site in a pre-mixed condition by means of specially constructed conveyance or transit mixers will be accepted, provided that it complies in all respects with the requirements of this specification and AS139 "Ready Mixed Concrete" or the equivalent British Standard Specifications.

2.6.5 The Contractor must notify MSAF AND DBGA two (2) days in advance of his intention to use ready-mixed concrete to enable arrangements to be made for MSAF AND DBGAto be present at the plant and/or the site during placing.

2.6.6 The Concrete shall be discharged at the site within 1 1/4 hours after the cement and water have been added to the mix in the factory and shall be placed in position within fifteen (15) minutes after discharges.

2.7 Tests

2.7.1 Compression Test: The Contractor shall allow the taking of three (3) concrete test cylinders, either (304.8) (152.4) per concrete pour, or, as may be directed by DBGA. These cylinders may be taken from any random delivery by DBGA and shall be cured on site in conditions as near as possible to those under which the pour were taken when being cured. The cylinders shall be prepared from a representative sample of the delivery.

Concrete Strength: Unless otherwise stated, the characteristic strength of the concrete shall be as follows:

50 MPa generally

All concrete shall be ready mixed unless otherwise approved.

2.8 Consistency

2.8.1 Slump tests, in accordance with AS102 part 3 or relevant British Standard Specification shall be made by the Contractor at least once a day at the commencement of work and at such other times as MSAF AND DBGA may require. The Contractor shall provide all materials, labour and facilities required for this purpose, including the necessary standard mould. The consistency of the concrete shall be such as to produce slump, under test within the following ranges:

2.8.2 footings, retaining and other walls - 50 to 70mm

2.8.3 floor slabs - suspended & on ground - 25 to 75mm

2.8.4 beams and columns - 50 to 75mm

2.9 Placing

2.9.1 All concrete shall be finally placed in position within 30minutes of leaving the mixer. It shall be minimum handling between the mixer and the final position and shall not be allowed to drop freely more than 180mm. Placing should be in uniform layers, well vibrated by approved mechanical electrical vibrator to consolidate concrete without segregation.

2.9.2 Concrete shall be placed in daylight or under such lighting conditions as may be approved by DBGA.

2.9.3 No concrete shall be placed until reinforcement and formwork have been inspected and approved by DBGA. Twenty four (24) hours notice shall be given to DBGA of the intention to place concrete.

2.9.4 Prior to commence placing of concrete, the concrete surface of all appliances to be used for this work shall be thoroughly cleaned of all hardened concrete or foreign matter. Formwork shall be cleaned of debris and free of water.

2.9.5 Concrete shall not be deposited in wet trenches or in running water.

2.9.6 Concrete shall be conveyed from the mixers to the place of final deposit without delay and by methods which will not cause or permit segregation and/or loss of materials. It shall be transported on substantial gangways supported above the reinforcement by trestles resting on the formwork.

2.9.7 Each monolithic portion of the work shall, except where the use of construction joints us approved, be placed in one continuous operation. The order of placing shall be as required by DBGA and shall be so arranged that new concrete is continually being placed against unset concrete so that a monolithic structure will result.

2.9.8 No concrete which has partially hardened or has contaminated by foreign materials shall be deposited in the work. Re-tempered concrete shall not be used.

2.9.9 Concrete shall not be placed at a rate greater than that which will permit satisfactory compaction or to a depth greater than 450mm before compaction thereof. The Contractor shall, at all times provide adequate labour to ensure that the concrete is compacted in the forms to the satisfaction of DBGA.

2.9.10 If ready-mixed concrete is used, the Contractor must organize the delivery of concrete to the site in such quantities as can be efficiently handled by the labour available.

2.9.11 All vertical members including walls shall be placed and compacted at least twelve (12) hours before any horizontal members (including reinforcement) which they support, are placed.

2.10 Compaction By Hand

2.10.1 Where mechanical vibration cannot be used, as determined by DBGA, the concrete shall be thoroughly compacted by means of continuous stampling, spading and slicing during and immediately after placing. Care shall be taken to fill every part of the forms, to work the concrete under and around the reinforcement without displacing it, to work coarse aggregate back from the faces and to remove all air bubbles and voids.

2.11 Compaction By Mechanical Vibration

2.11.1 Mechanical vibration shall be used throughout for compacting the concrete.

2.11.2 Vibrators shall be of an approved type transmitting not less than 9,000 impulses per minute when under load.

2.11.3 Vibrators shall be operated to the satisfaction of DBGA. They shall be uniformly spaced and not further apart from 600mm of the radius beyond which vibration is visibly effective. They shall be provided in sufficient number to ensure compaction at a rate satisfactory to DBGA. In addition, at least one vibrator of each type shall be kept in reserve for emergency use. Vibrators shall be moved continuously throughout the wet concrete and shall not be allowed to remain in any one position for more than 10 seconds.

2.11.4 Vibration should achieve uniform density of the concrete but should not be continued to the extent that localized areas of void are formed. Particular care shall be exercised to avoid damage to partially set concrete.

2.12 Poor Compaction

2.12.1 If in the opinion of DBGA the concrete when exposed by stripping the forms, is incompletely compacted, the Contractor shall immediately hack back, removing all laitance and make good the honeycombed areas with a 3:1 sand and cement mortar while the concrete is still green. The Contractor shall reconstruct at his own expense any structural members or portions of the work which are shown to be faulty, either by tests or inspection.

2.13 Construction Joints

2.13.1 The location of construction joints shall be planned in advance and shall be approved by DBGA prior to commencement of concreting.

2.14 Protection

2.14.1 Freshly cast concrete shall be protected from premature drying and excessively hot or cold temperatures. In windy conditions, windbreaks shall be erected to shield the concrete surface during and after placing. The concrete shall be maintained at a reasonably constant temperature with minimum moisture loss for the curing period.

2.14.2 The responsibility for the curing and protection of the concrete shall rest entirely with the contractor. Curing methods which do not conform to this specification shall be rejected.

2.15 Curing

2.15.1 All exposed surfaces of concrete shall be cured by one of the following methods:

2.15.2 Ponding or continuous sprinkling with water.

2.15.3 Covering with an impermeable membrane concrete that has taken its initial set and that has been moistened with a fine spray of water. The covering materials shall be held firmly against the concrete for the full length of all edges and laps and at frequent intervals between so that there shall be no air circulation at the concrete surface.

2.15.4 The use of an absorptive cover, kept continuously wet. The use of the curing compounds confirming to ASTM C309 are not permissible except with DBGA's approval in writing.

2.16 Curing Period

2.16.1 Curing shall commence immediately after initial set of concrete and shall continue for 7 days.

2.17 Damage

2.17.1 The concrete shall be protected from damage due sea swells, heavy shocks and excessive vibration, particularly during the curing period.

2.17.2 All finished concrete surface shall be protected from damage due to any cause such as construction activities, rain and running water. Self-supporting structures shall not be loaded in any way which will overstress the concrete.

2.18**Tolerances**

a. sides of members and thickness of slabs:
   +6mm, - 0mm
b. surfaces: 3mm, -3mm to 3m long straight edge
c. surface deviation: +1.5mm, -1.5mm in 300m
d. abutting surfaces at joint: 1.5mm, -1.5mm

2.19 Building-In

2.19.1 Allow for all sub-contractor's work. Building in all metal work etc.

2.19.2 Form all openings; set-downs etc. keep all exposed bolt threads clean.

2.19.3 Build in all under floor pipeworks, leave sleeve for drains, pipes etc., as necessary.

2.20 Formwork

2.20.1 Formwork shall conform to SAA Codes AS1082, AS1510 or equivalent BSS. The responsibility for the sufficiency of the whole of the formwork shall rest entirely with the Contractor. Formwork shall be constructed from sound materials properly supported and braced or tied to maintain position and shape during and after the placing of concrete. Formwork shall be supported in a manner which will prevent its settlement. Formwork shall be kept in place for 3 days at column and beam sides and 14 days for soffits generally and to DBGA's approval and in accordance with SAA Codes AS1082, AS1509 and AS1510 or equivalent BSS.

2.21 Concrete Paving to Receive Special Finish

2.21.1 All exterior concrete paving surfaces to receive special finish of applied aggregate by Nominated Applicator must comply with the following requirements.

2.21.2 Surfaces must be rough-broomed with hard bristle broom and must be free of all laitance to form key and bond with applied finish.

2.21.3 All surfaces must be roughened to the satisfaction of the Special Finish Applicator.

2.21.4 All surfaces not accepted by the Special Finish Applicator must be fixed at the Contractors own expense.

SECTION 3
3 METAL WORKS

3.1 General

This Technical Specification applies for the supplying of galvanized structural steel for the light house tower. This includes supply of raw materials, fabrication, galvanising and delivery of the structural members with the necessary and required bolts, connections and other materials to make the complete light house tower.

All tower material are to be new and without any dents, bends, pitting or any other defects

Refer to NOTES in the Structural Drawings

3.2 Materials

3.2.1 All materials shall conform to the AS/NZS or ASTM standard. When specified on the engineering drawings, material manufactured to other standards will be accepted provided the material comply with the appropriate ASTM standards.

3.2.2 The quality of all materials used in the execution of this contract shall comply with the requirements of the following Standard Specification:

AS/NZS 1163 Cold-formed structural steel hollow sections
AS/NZS 1252 High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers
AS/NZS 1397 Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1554 Structural steel welding
AS/NZS 3678 Structural steel – Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1 Structural steel – Hot rolled bars and sections
AS/NZS 3679.2 Structural steel – Welded I-sections

3.2.3 The Contractor shall supply to MSAF/DBGA prior to the commencement of fabrication copies of the steel material test certificate and showing the chemical properties.

3.2.4 MSAF/DBGA may at any time require any materials to be tested in accordance with the requirements of the listed specifications.

3.2.5 The Contractor shall, if required, promptly supply at his expense, test pieces as required by MSAF/DBGA.

3.3 Shop Drawings

3.3.1 Before fabrication is commenced, the Contractor shall prepare shop drawings. These drawings shall clearly show all sizes, markings and corrections and set out the positions, sizes, and lengths of all welds as necessary for the complete fabrication, assembly and erection of the steelwork. Contractor to allow for onsite measurement prior to shop drawing and fabrications.

3.3.2 No fabrication shall be commenced for any variation or substitutions made in the shop drawings unless these have been approved in writing by MSAF/DBGA.

3.4 Fabrication

All workmanship and finish shall be of best quality, first class throughout and shall conform to the best-approved method of Fabrication. All the pieces shall be finished straight, true to detail drawings. All holes and edges shall he free from burrs. Shearing and chipping, bevel cutting, bending, grinding etc.

All identical pieces bearing the same erection number must he exactly interchangeable with each other and interchangeable in their relative position in all towers or structures of which they-form a part

3.4.1 CUTTING AND BENDING

All members, plates, brackets etc. shall be neatly and accurately sheared, sawn or profited to the required shape as shown on the drawings. After cutting, all rough edges shall be ground off.

3.4.2 PUNCHING AND BORING

All holes for bolts must be punched with holes 1.5mm larger in diameter than the bolts used. Holes for bolts in material thicker than 16mm must be drilled or sub-punched and reamed.

3.4.3 BOLTING

All bolts used shall be of such lengths that at least one full thread is exposed beyond the nut after the nut has been tightened.

Where a nut or bolt-head would bear on an inclined surface a bevelled washer of the correct size shall be interposed between the two surfaces. Bevelled washers shall not be allowed to get out of position during fabrication and erection for this purpose may be spotted to the steel surface.

3.5 Welding

3.5.1 Welding shall be avoided as far as possible, however if used, shall be carried out before galvanizing. Electrodes for manual welds shall comply with the requirements of AS4854 and shall be of approved make. Welding shall be continuous unless otherwise specified. Caution shall be exercised to obtain full penetration of weld when welding light members to heavy members.

3.5.2 All welds shall be made only by welders and welding operators who have been properly trained and previously qualified by tests to perform the type of work required and prescribed in the relevant applicable standards.

3.5.3 All welds shall be free from defects like blow holes, slag inclusion, lack of penetration, under cutting, cracks etc. All welds shall be cleaned of slag or flux and show uniform sections, smoothness of weld metal, feather edges without overlap and freedom from porosity.

3.5.4 Fillet welds larger than 8 mm shall be, made with 2 or more passes. Each layer of multiple layer welds, except the root and surface run, may be moderately pined with light blows from a blunt tool. Care shall be exercised to prevent scaling or flaking of weld and base metal from over pining.

3.5.5 Marking **-** After checking and inspection, all members shall be marked for identification during erection. The mark shall conform to the piece marks on the approved detail drawings. Markings shall be stamped with metal dye prior to galvanizing

3.5.6 Errors **-** Any error in shop work, which prevents proper assembling and fitting up of parts in the field by moderate use of drift pin or moderate amount of reaming, shall be rejected as defective workmanship.

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3.6 Cleaning and Galvanizing

3.6.1 After all the shop work is complete, all the structural materials shall be hot-dip galvanized. Before galvanizing, the steel shall be thoroughly cleaned of any paint, grease, rust scale, acid or alkali or such other foreign matters as or likely to interfere with the galvanizing process or with the quality and durability of the zinc coating. Pickling shall be very carefully done and shall be proper.

3.6.2 Galvanizing for structural steel members, bolts, nuts, step bolts and other accessories of tower shall meet the requirements of **AS/NZS 4680, AS/NZS 1214, AS/NZS 2312.**

3.6.3 The galvanized surface shall consist of a continuous and uniformly thick coating of zinc, firmly adhering to the surface of steel. The finished surface shall be clean and smooth, and shall be free from defects like discoloured patches, bare spots, unevenness of coating, which is loosely attached to the steel, globules, spiky deposits, blistered surface, flaking or peeling off etc. The presence of any of these defects noticed on visual or microscopic inspection shall render the material liable to rejection.

3.6.4 There shall be no flaking or loosening when struck squarely with a chisel faced hammer. The galvanized steel member shall withstand minimum number of one minute dips in copper sulphate solution as per tests specified ASTM A-239.

Structural members, gussets : 6no. of dips
Bolts, nuts & other accessories : 4no. of dips

3.6.5 The minimum repetition times for one minute dip in uniformity tests shall be as follows: Galvanizing of each member shall be carried out in one complete immersion. When the steel section is removed from the galvanizing kettle excess shall be removed by 'bumping'. The process known as 'wiping' or 'scraping' shall not be used for this purpose.

3.6.6 Wherever galvanized bolts, nuts, locknuts, washers, accessories etc. are specified, they shall be hot dip galvanized.

3.6.7 Defects in certain members indicating presence of impurities in the galvanizing bath in quantities larger than that permitted by the Specifications, or lack of quality control in any manner in the galvanizing plant, shall render the entire production in the relevant shift liable to rejection.

3.6.8 All galvanized members shall be treated with Sodium Dichromate solution or an approved equivalent after galvanizing, so as to prevent white storage stains.

3.6.9 Contractor shall ensure that galvanizing is not damaged in transit and shall at his cost replace such members as are damaged in transit.

3.7 Inspection of Completed Product

3.7.1 Not less than three (3) working days after the completion and receipt of the fabricated steel component, the contractor shall notify MSAF/DBGA the product is available for inspection.

If any errors on the drawings or fabrication are discovered, all the corrections or modifications shall be incorporated in the drawings and correct part re- fabricated and assembled. All revised drawings shall be resubmitted for approval.

3.8 Bolts, Nuts and Washers

3.8.1 The bolt supplier shall supply the fabricator with a certified material test certificate outlining the chemical composition and mechanical properties of all bolts supplied. The test certificate shall be able to be traced back to the batch of bolts. All the bolts, nuts and washers to conform with the **AS/NZS 1258** and **AS 2528** standard.

3.9 Delivery

3.9.1 Take delivery of steelwork ex-factory and transport to the site in good condition and replace any members bent or twisted in transit.

3.10 Erection

3.10.1 All erection shall be carried out by competent and experienced men and the contractor shall take every care to safeguard the public, workmen and adjoining property.

3.10.2 All gear used shall be adequate strength and shall comply with all regulations current at the time and all steelwork shall be adequately bolted, guyed and braced to make the structure secure. The Contractor shall be held responsible for all damage caused to the structure, works or buildings during erection.

3.10.3 In making corrections, drifting of unfair holes will not be permitted and holes not matching properly shall be reamed or drilled out and a larger bolt inserted with DBGA's approval.

3.10.4 No member or part of member which has bent or distorted shall be erected in that condition, all straightening shall be done on the ground and checked by DBGA.

3.10.5 All bolts shall be left tight and all bevelled washers and plates properly positioned.

3.10.6 Column shall be wedged to line and level on steel or cast iron wedges and checked by DBGA. After acceptance column bases shall be caulked to approval before wedges are removed.

3.11 Minor Parts

3.11.1 If neither the Specification, drawings nor schedule of quantities contains any particulars of minor parts which are obviously necessary for proper complement of the work, all such parts shall be supplied and executed by the Contractor without extra charge.

3.12 Coating

3.12.1 Immediately after preparation work has been completed, apply type of primer as specified in Schedule of paint. Finishes strictly to manufacturer’s instructions.

3.12.2 The primer shall be spray applied except where written approval is given by DBGA to substitute brushing for spraying.

3.12.3 After erection, all damaged portions shall be cleaned back to the satisfaction of DBGA and made good to match original coating in thickness, texture and colour

SECTION 4
4 PAINTING

4.1 General

4.1.1 This Technical Specification applies for the painting of the existing structure and the new day mark wall. REFER TO DRAWINGS FOR THE PAINT SPECIFICATION.

4.1.2 All coatings to be carried out other than those specially provided for in other parts.

4.1.3 In any case, finishing coats of the works covered by other part will be executed in conjunction with painting and surface treatments provided for in this part.

4.1.4 Work shall be pre-planned and executed to meet the needs of trade and services.

4.1.5 While work shall follow completed work sections, premature finishing coatings shall be avoided.

4.2 Materials Generally Manufactured

4.2.1 ALL PAINTS MUST BE ANTI- MOULD, ANTI- FUNGAL, EPOXY/ZINC BASE MARINE GRADE PAINT

All paints and coatings shall be of the same manufacture specific and as approved by the MSAF AND DBGAand comply by current S.A.A requirements for their respective kinds. All paints, primers, undercoats and finishing's coats are to be lead-free. All paint undercoat, primer, etch primer etc. shall be obtained from ONE Manufacturer.

4.2.2 APPLY STRICTLY TO MANUFACTURER'S INSTRUCTIONS

CONTAINERS

All materials shall be delivered in sealed labelled containers of the manufacturer of the paint.

PRIMING

- ALL SURFACES MUST BE INSPECTED BY DBGA BEFORE PRIMING AND BETWEEN COATS.
- Priming for metalwork shall be a.b.s Metalwork and as allowed for in that section.

4.2.3 UNDERCOATS

(a) To all finishes shall be those recommended by the manufacturer of the relative coat finishes.

4.3 Delivery and Storage of Materials

4.3.1 Deliveries shall be made well in advance of application and shall be stored undercover or in sheds on timber platform.

5.4. Workmanship

All surfaces must be inspected by MSAF AND DBGAbefore painting and between coats.

All surfaces must be mould-free, fungus free before painting.

All timber and plywood with mould shall be rejected and removed from site immediately.

All other surfaces shall be free treated with anti-mould solution strictly to manufacturer's instruction before painting if found to have mould.

Coating shall not be applied to any surface which is not thoroughly dry except where recommended by the manufacturer or acceptable.

All surfaces shall be inspected and where defective, made good before work proceeds.

Applications of paint or stains or clear finish will be considered as acceptance of surface conditions for reception of materials by both contractor and respective paint manufacturer.

5.5. **Cleaning Up Before Painting**

Prior to commencement of painting, the area to be painted plus the surrounding area shall have all debris removed and then swept clean and left for a period of 4 hours after which all dust shall be removed.

5.6. **Commencement**

5.6.1. Generally no painting shall commence until; such time as the work of all other trades has been completed within the area to be painted.

5.6.2. Where it is necessary to lay a floor covering after the painting has been completed, the best coat shall be applied after the laying of the floor covering.

5.6.3. All adjacent finishes shall be adequately protected and any paint splashes removed without injury to the affected area immediately.

5.6.4. All work shall be performed by skilled tradesman in a neat and workman like manner, cutting in and finished edges shall be clean and straight.

5.6.5. All materials shall be mixed and applied in strict accordance with the manufacturer's printed recommendations.

5.6.6. Concrete and Grano pavings which have been splashed with paint shall be taken up and re-laid and all costs involved shall be borne by the Contractor. If walls are damaged in effecting any relaying, they shall repainted at the contractor's expense.

5.6.7. Concrete and plaster surfaces shall be ground down before painting.

5.6.8. Surfaces shall be rubbed down before painting. Each shall be well rubbed down and/or washed down as required prior to the application of the following coat. The exception is stain coating which is not rubbed back between coats.

5.6.9. Application of paint shall not be carried out in wet and/or windy weather. The latter is to be at the discretion of DBGA.

5.6.10. Galvanized or rustproof surfaces shall be left until last for painting.

5.6.11. Timber shall be primed before fixing on all faces required to build in and at all joint before fabrication.

5.6.12. All open grained timber work shall be filled with an approved filler. Knots that have been accepted, shall be given a coat of knotting before painting.

5.6.13. Undercoats shall be tinted differently from the preceding coat and each approved before the next coat is applied.

5.6.14. Except where otherwise specified or approved, all paint shall be applied with first quality brush ware.

5.6.15. Paint shall be brushed on thoroughly and laid off so that no brush marks show on the finished area.

5.6.16. Samples of each colour and finish shall be prepared on selected surfaces for approval by DBGA before painting commences. A sample shall not be less than 0.4sq.m.

5.6.17. Where certain colours may require tinting and/or intermixing shall only be done with paints of the same manufacturer.

5.7. **Finishes**

5.7.1. Opaque Finishes: Full Gloss paint shall be approved quality, high gloss opaque alkyd paint. It shall be non-toxic, lead free, having high resistance to abrasives, fair resistance to chemicals and solvents.

5.7.2. Full Gloss Enamel: shall be an approved first quality, high gloss opaque alkyd enamel. It shall be non-toxic, lead free, having high resistance to abrasive, fair resistance to chemical and solvents.

5.7.3. Semi-Gloss Acrylic: shall be an approved semi-gloss opaque, water borne, acrylic paint. It shall be non-toxic, lead free, having very good resistance to abrasive, high resistance to chemicals and solvents.

5.7.4. Flat Acrylic: shall be approved flat, opaque water based acrylic paint. It shall be nontoxic lead free having good resistance to abrasives, chemicals and solvents.

5.7.5. Polyurethane finish shall be an approved oil rich timber stain containing a combination of natural oils, preservatives and water proofing compounds. Clear Stain finish shall be an approve oil rich timber stain containing a combination of natural oils, preservatives and water proofing compounds. Natural Timber Finish External shall be as for clear Stain Finish with the addition of permanent pigments.

5.7.6. Special waterproof coating (if applicable) shall be supplied and applied by a specialist sub-contractor or obtained from a specialist supplier and applied in accordance with AS/NZS.

- 1 coat enamel undercoat
- 2 coats high gloss enamel or
- 2 coats industrial enamel.

5.8. **Making Good**

Make good a.b.s. 'Preliminaries' in addition by cracks appearing in paintwork before expiration of maintenance period shall be made good and the surface on which the cracks occur, repainted to the satisfaction of the DBGA.

5.9. **Paint Type**

All clear finish, stain and paint, undercoat, primer, equipment, filler, sealer anti-mould solution etc. shall be obtained from ONE Manufacturer.

TENDER EVALUATION CHECKLIST

CLAUSE	BRIEF REQUIREMENTS OF THE TENDER	Yes	No	N/A
1	Brief Background/History of Company including details of Parent Companies and subsidiaries.			
2	Certified Copy of Valid Company Registration Certificate (Local/Overseas).			
3	Local Bidders to provide quotes which include Duty, VAT and delivery-to-site on an *"as and when required"* basis. Overseas bidders to provide quote which include Cost, Freight & Insurance to the port of Suva.			
4	Certified Copy of Valid FRCS Compliance Letter			
5	Certified Copy of Valid FNPF Compliance Letter.			
6	Complete tender forms with relevant information and furnished with other tender documents.			
7a	Separate Quoting for each item and not on whole lot basis.			
7b	Price should be valid for a period of 90 days from the closing date of tender.			
8	Evidence of the business relationship: a. List all Partner(s)/Supplier(s)/Subcontractors. b. Attach letter(s) from each Partner/Supplier/Subcontractor to confirm the business relationship (for all applicable).			
9	The payment mode should be upon satisfactory execution of the order in compliance with the tendered prices, delivery time &full supply of quantity ordered.			
10	Submission of bids to be on official letterhead, clearly written or typed and signed with all relevant contact details clearly specified.			
11(a)	Currency used:			
11(b)	Back-up services			
12	Company Insurance			
12(a)	Delivery time /availability or Completion period / plan			
13	Product samples and technical literatures brochures/photos to be submitted.			
14	Warranty period for the item / Defects Liability Period to be stated.			
15	Financial Statement for 3 years			
16	MSAF Form (Company Particulars) to be fully completed.			

MARITIME SAFETY AUTHORITY OF FIJI

Company Particulars

Name			
Date of Reg^{n}			
Registered Office			
Postal Address			
Telephone		**Facsimile**	
Email		**Website**	
Principal Activities			
Directors			
Share Capital Authorised Issued&Paid-Up			
Accountant			

The undersigned attest that the above information is true and correct as of the date hereby given.

Name: ..... Name: .....

Signature: ..... Signature: .....

Designation: ..... Designation: .....

Date……

Company Stamp/Seal

SECTION 4: STRUCTURAL DRAWINGS

for the

Fabrication, Supply & Construction of 20 Metres Lattice Tower for Vatoa Island Lighthouse

Maritime Safety Authority of Fiji
September, 2023

PROPOSED VATOA ISLAND LIGHT TOWER

K4759

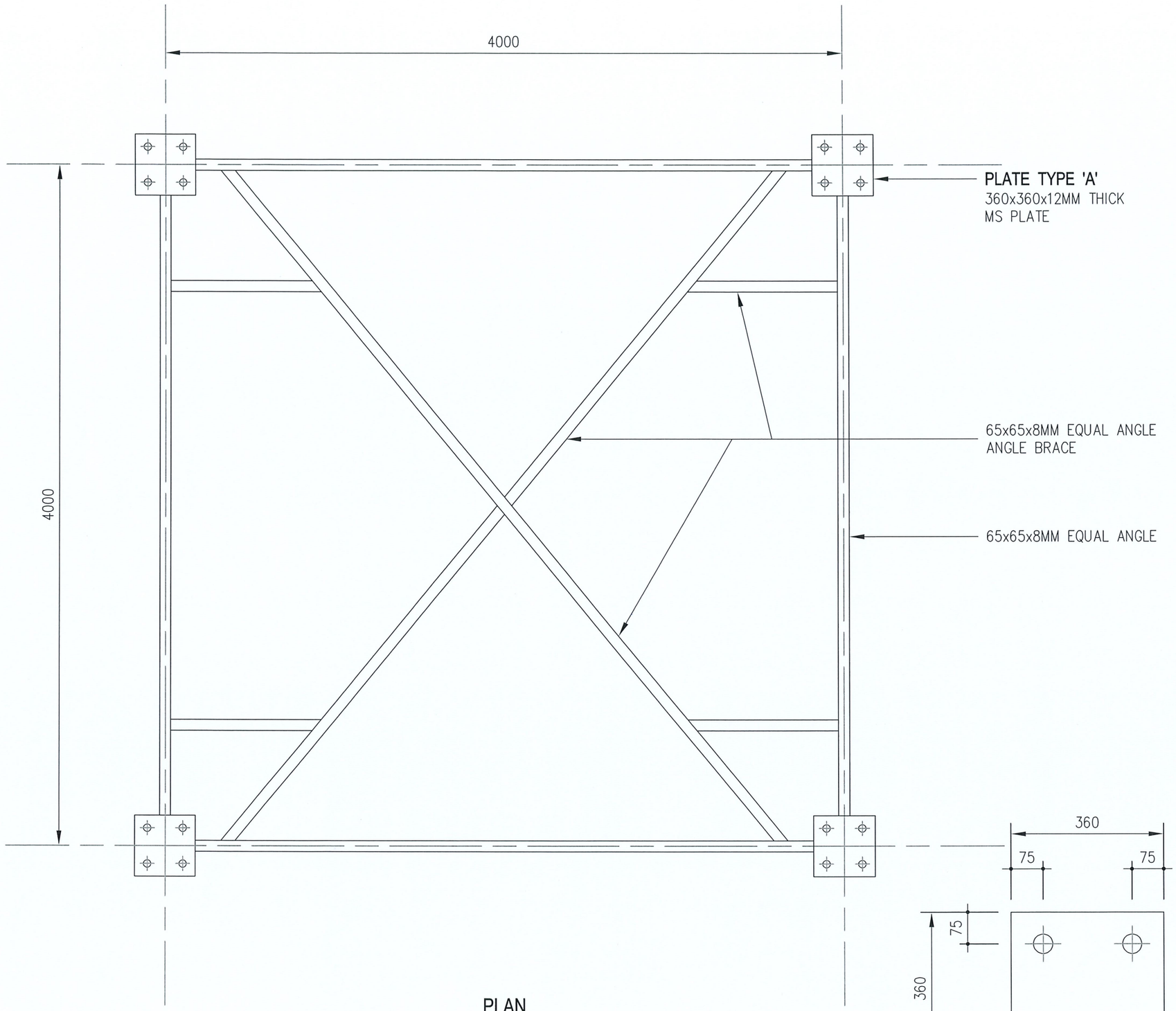
drawing schedule

STRUCTURAL DRAWINGS :

01 - TOWER BASE STEEL TEMPLATE
02 - TOWER BASE CONCRETE LAYOUT
03 - TOWER BASE REINFORCEMENT DTLE.
04 - GENERAL NOTES
05 - GENERAL PLAN
06 - TOWER BODY - 1
07 - TOWER BODY - 2
08 - TOWER BODY - 3
09 - TOWER BODY - 4
10 - TOWER SHOES
11 - LADDER - 1
12 - LADDER - 2
13 - WORKING PLATFORM
14 - REST PLATFORM - 1
15 - REST PLATFORM 2
16 - SOLAR PANEL FRAME GENERAL LAYOUT
17 - SOLAR PANEL FRAME FIXING DETAIL
18 - BATTERY BOX
19 - FENCE - PLAN ELEVATION DETAIL
20 - FENCE - POST & DOOR DETAIL

structures section

MINISTRY OF PUBLIC WORKS TRANSPORT & METEOROLOGICAL SERVICES
NASILIVATA HOUSE LEVEL - 2 , 87 RATU MARA ROAD
SAMABULA. SUVA, FIJI ISLANDS



PLAN

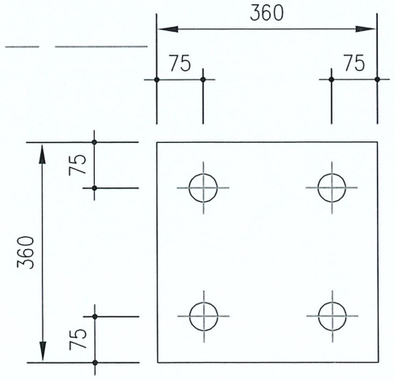


PLATE TYPE 'A'

12MM THICK MS PLATE DRILLED
WITH 4No. 46MM HOLES

A3 ORIGINAL PAPER SIZE

Notes

1. ALL CONCRETE ELEMENTS TO HAVE A MINIMUM CHARACTERISTIC COMPRESSIVE STRENGTH (f'c) OF 30MPa @ 28 DAYS.

2. SEA SAND IS NOT TO BE USED FOR CONCRETE OR GROUT MIX.

3. SOIL UNDER COLUMN PADS TO BE COMPACTED TO ACHIEVE A BEARING CAPACITY OF 150KPa.

4. REINFORCEMENT TO BE 50MM UNLESS STATED.

5. PROVIDE SUFFICIENT BAR SUPPORTS UNDER REINFORCEMENT TO ENSURE THEY ARE SUPPORTED IN THEIR CORRECT POSITION DURING CONCRETING AND MAINTAIN COVER AS INDICATED.

no.	date	details

amendments

approval

approval

client: MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for PWMST	section head		
T.Vakadravuyaca	A. Pene		
principle arch/eng	project arch/eng		
K. M. Zahidul			
surveyed	designed: K.M.Z.	drawn: TD	amend
checked	date: Sept 23	head subhead	plot date: 12/09/2023

MINISTRY OF PUBLIC WORKS
METEOROLOGICAL SERVICES & TRANSPORT

project: VATOA LIGHT TOWER
No. K4759

block/sub proj.

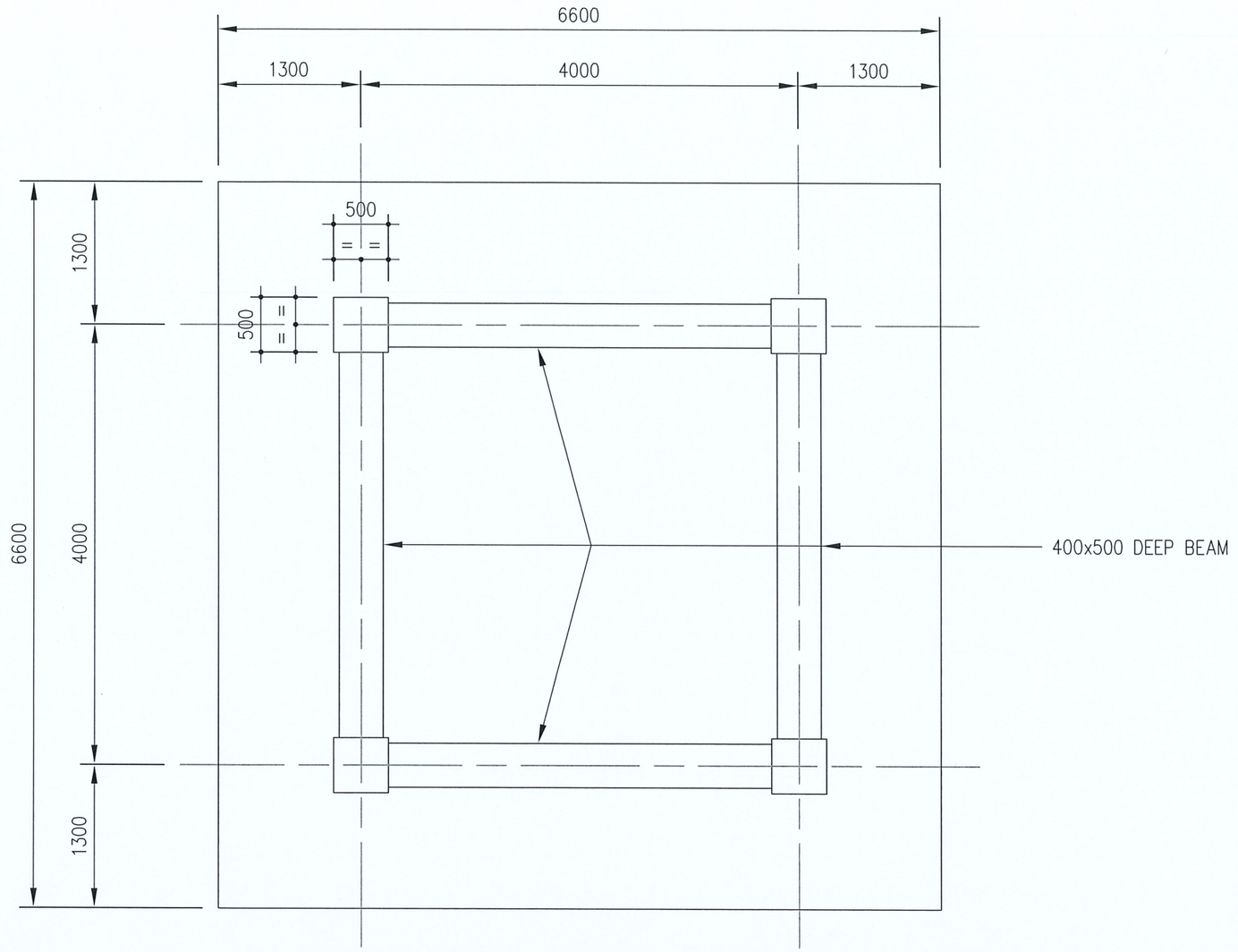
drawing title: TOWER BASE
STEEL TEMPLATE

scale: 1:25

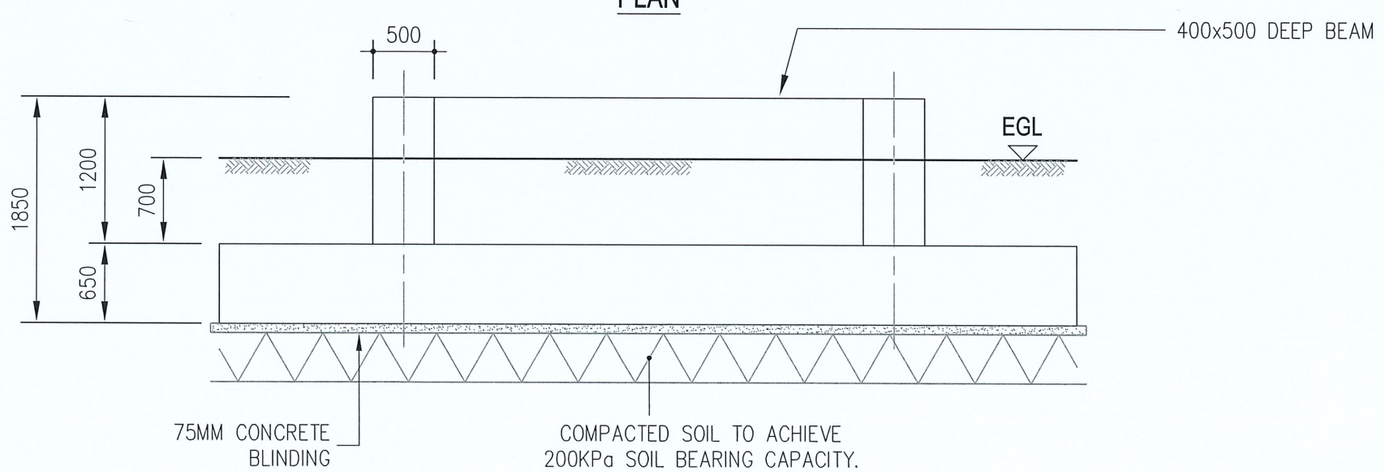
connected drawings

location no. | building no. | File no.

project no.	sheet no.	amend
STR 1255	01	



PLAN



ELEVATION

TENDER COPY

A3 ORIGINAL PAPER SIZE

Notes

6. ALL STEEL USED TO BE GRADE 300MPa.

7. ALL BOLTS USED TO BE HIGH TENSILE (AJAX OR SIMILAR). ALL BOLTS TO BE FITTED WITH WASHERS & NUTS.

8. FACES TO BE BOLTED SHALL BE PAINT, OIL, RUST, BURR AND ALL SURFACES TO BE ABRASIVE CLEANED AND COATED WITH ZINC SILICATE.

9. FOR STEEL CONNECTION, HOLE SIZE TO BE MAXIMUM 2mm LARGER THAN BOLT DIA.

10. ALL WELDING ELECTRODES USED TO BE "STRUCTURAL PURPOSE (SP) WELD QUALITY". ALL WELDING WORKS TO ATTAIN STRUCTURAL QUALITY WELDS.

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for PWMST	section head
T.Vakadravuyaca	A. Pene
principle arch/eng	project arch/eng
K. M. Zahidul	

surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	plot date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS
METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

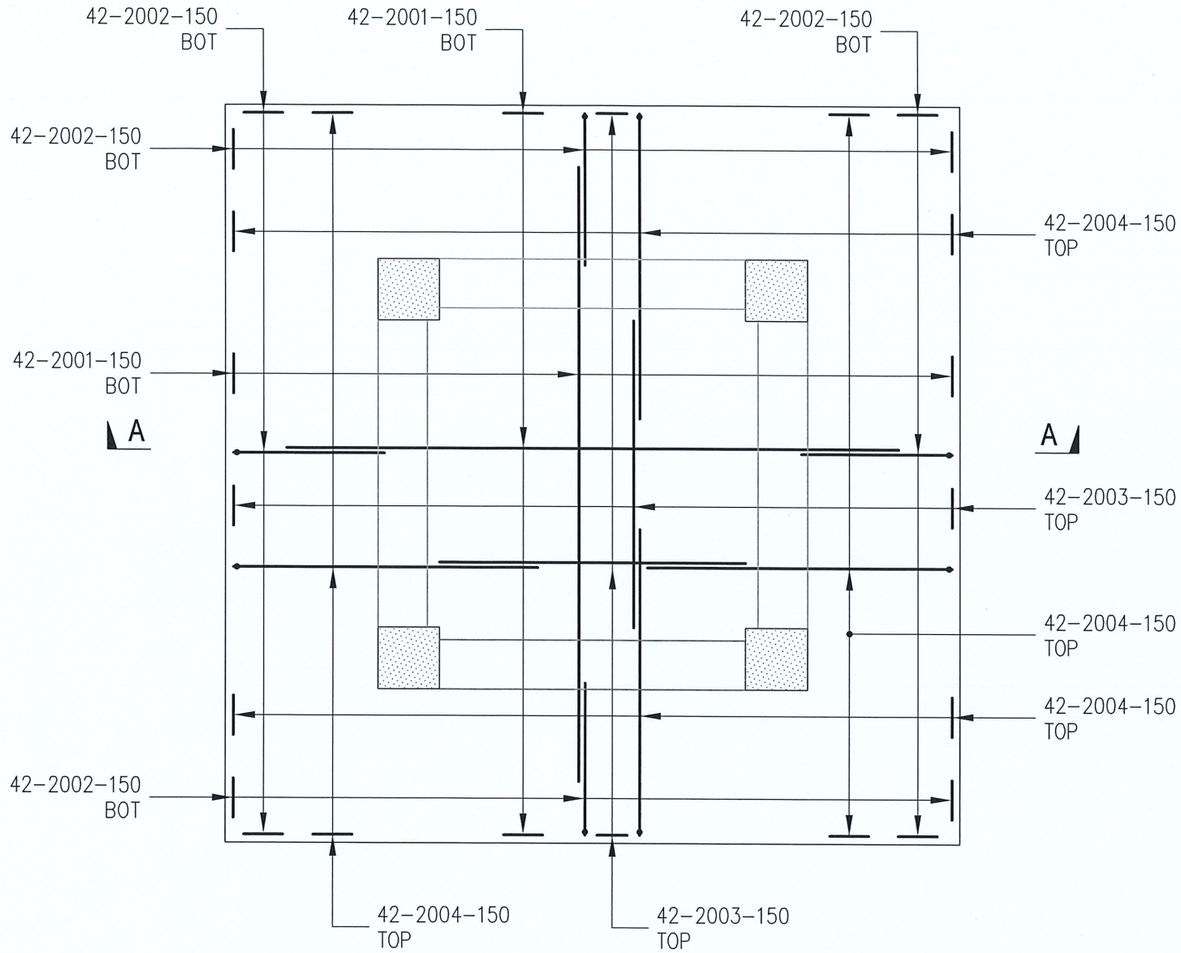
drawing title
TOWER BASE
CONCRETE LAYOUT

scale
As Indicated

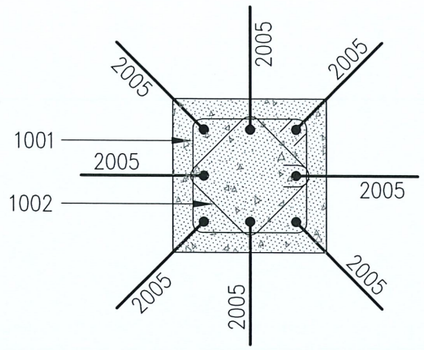
connected drawings

location no. | building no. | File no.

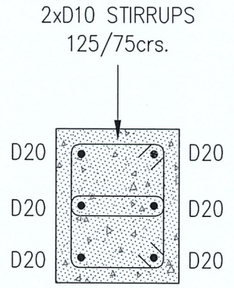
project no.	sheet no.	amend
STR 1255	02	



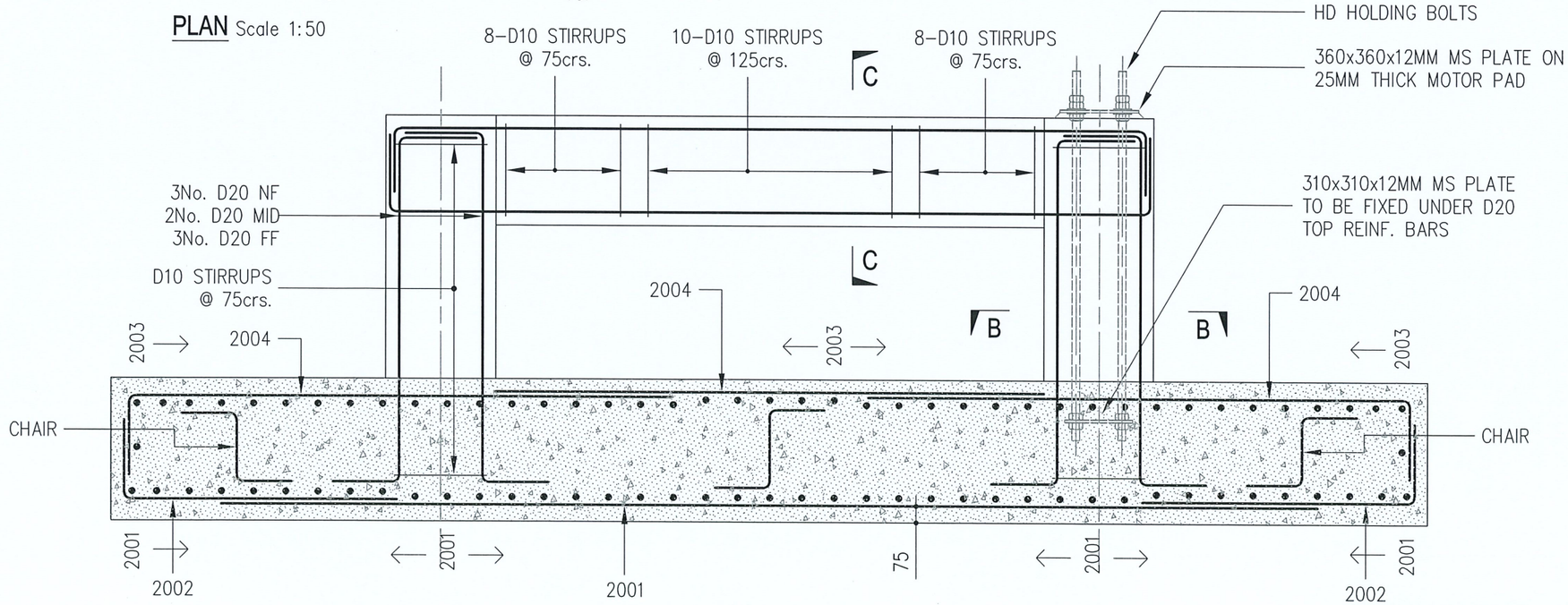
PLAN Scale 1:50



SECTION B - B
Scale 1:20



SECTION C - C



SECTION A - A Scale 1:25

TENDER COPY

Notes

11. ALL WELDS TO BE FULL WELDS WELDED ALL AROUND.

12. STEEL REINFORCEMENT GRADE TO BE 300 MILD STEEL DEFORMED BARS.

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for PWMST	section head	
T.Vakadravuyaca	A. Pene	
principle arch/eng	project arch/eng	
K. M. Zahidul		
surveyed	designed: K.M.Z.	drawn: TD / amend
checked	date: Sept 23	head subhead / plot date: 12/09/2023

MINISTRY OF PUBLIC WORKS
METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
TOWER BASE
REINFORCEMENT DTL.

scale As Indicated

connected drawings

location no. / building no. / File no.

project no.	sheet no.	amend
STR 1255	03	

A3 ORIGINAL PAPER SIZE

GENERAL DESCRIPTION

1 A shop drawing design for MARITIME SAFETY AUTHORITY OF FIJI.
2 Technical specifications:
(1) Contract and Document:
B. Technical Specifications of marintime tower project.
(2) Codes:
A. Structural Standard for Antenna Suporting Structures and Antennas , ANSI/TIA-222-G
B. Design of Latticed Steel Transmission Structures, ANSI/ASCE 10-97
(3) Design Loads:
Basic wind speed: 72m/s (10m height, 3 s gust);Exposure category: C; Topographic category: 1.
1 No. marine beacon; 4 Nos. RF antennas; 2 Nos. MW dishes
(4) Primary Member:
All material sign and size should adopt present National standards of the People's Republic of China as follows:.
Better material can be used under the permission of the designer.
GB/T706-1988 hot-roll I; GB/T707-1988 hot-roll channel;
GB/T9787-1988 hot-roll angle with equal legs; GB/T9788-1988 hot-roll angle with unequal legs;
GB/T8162-1999 seamless pipe; QB/T2959-2008 Steel mesh.
A. Steel members:Column and Tower shoes(Q345) ; Others(Q235);
B. Bolts:M12(grade of 4.8 C) ;Others(grade of 8.8 C).Refer to GB/T 5780,GB/T 5782
C. Welding rod Q235 and Q235 E4301--4311; Q345 and Q345 E5015-A1--6015-D1
Q235 and Q345 E4301--4311.
D. Anchor bolts Q345/45#
E. Concrete foundation under layer: C10; foundation: C30
foundation secondary pour layer C30
secondary pour layer shall use no shrinking concrete
special treatment shall be applied when the environment is erodible
F. Reinforcing steel bar HPB235 for hoop;
HRB335 for bearing bar.
G. Bolt directrixs of angle stee:
1).The derectrixs of angle steel is shown in sheet 1.
2).All angle steel members should refer to sheet 1 except for special instruction in shop drawings .
H. Lofting directrixs:
1).Angel steel:column members the directrixs are at the edge of the angle steel;
other members the same as the bolts' directrixs(See figure 1);
2).Pipe or rod:axial line
I. Fibreglass gratings for platform: 30x38.1 square mesh. The size and connection as shown in the right.
3. This is a design for 20m lattice tower.
4. Height of the tower: 20m, Width of bottom:4m.
5. The detailed shop drawings should be accomplished by specialized agency.
Any modification should be permitted by the designers.
6. Allowable deviation of finished members:
(1) Length of members L: L<5m ±2mm; L>5m ±3mm.
(2) Length deviation of members at the same level is: 1mm.
(3) Total member deflection shall not exceed L/1000 and 5mm.Local deflection shall not exceed L/750 and 3mm.
7. The quality standard of butt weld and fillet weld are class-Ⅱ and class-Ⅲ, ultrasonic detection shall be carried out to inspect the inner defects; the assessing class is Ⅲ, and the testing class is B. Weld shall be full weld.
8. All bolts shall be galvanized.For column conection,one bolt with one flat washer, one closely nut and one ordinary nut
For other connectionl,the bolts should be full of screw thread.One bolt with one ordinary nut.
The distance between the bolts and the edge of the member should refer to sheet 2
The screw shall extend out of the nut 2-3 thread after screwed down.The washer should be used at interspace of the connection.(If the quantity of washer is more than 2 or the interspace is more than 8mm, the subplate should be used)
9. The bolts at the connection of columns shall be staggered. The up and down directrix of angle steel should be cooperated.All bolts are spaced out 100mm at the joints(See figure 2,figure 3).
10. All members including ladders shall be checked and pre-assembled before galvanization.
11. Steel members (including bolts) shall take different protection methods under different conditions.
Coastal area and islands: galvanization + dope; Other area: galvanization.
Thickness of galvanization 125μm; Thickness of dope 100μm.
Steel members or part of them that will be embedded in concrete should not be doped.
After the installation of the tower, the damaged parts of the members should be patched.
The surface of basic material shall be rustless before the gavalization, the assessing class is Sa2-.
12. Ensure that no engender elasticity deformation of the members during transportation.
13. Allowable deviation of fabrication:
(1) Tower vertical deviation Total vertical deviation: ≤H/1500; vertical deviation of two nearby layers: ≤H/1000.
(2) Tower torsion degree ≤1°.
(3) Tower section dimension Diagonal length: when ≤4m ≤±2.0mm; when>4m ≤±3.0mm.
Side length: when ≤4m ≤±1.5mm; when>4m ≤±2.5mm.
14. The lightning down-lead is fixed on the structure and connected to the grounding of foundation.
All joints shall be welded and be coated for anticorrosion. Grounding resistance shall be smaller than 5 ohm.
15. A staircase with safeguard shall be mounted in the structure. The feeder angle steel is fixed on the staircase.
16. The structure should be checked and maintained termly by specialized agency.
In the first year after installation,it should be checked for each half year.And then, it can be checked once a year.
Check the structure after suffering strong wind and if some damage happened.
17. Construction and acceptance:
Construction and acceptance standards should match the requirements of design certification
It also can be referred to the following present National standards of the People's Republic of China.
(1) Code for acceptance of construction quality of building foundation, GB50202-2002;
(2) Code for acceptance of construction quality of concrete structures, GB50204-2002;
(3) Code for acceptance of construction quality of steel structures, GB50205-2001;
(4) Specification for the fabrication, erection and inspection of steel structural tower and guyed mast, CECS80:2006.

Sheet1 表1 Unit: mm 单位 毫米

序号 NO	宽度 Width	单肢 Single side	双肢 Double side Q_1	双肢 Double side Q_2	间距 Space	螺孔直径 Diameter of holes Ø
1	40	20				13.5
2	45	23				13.5
3	50	25				17.5
4	56	28				17.5
5	63	30				21.5
6	70	35				21.5
7	75	40				21.5
8	80	40				21.5
9	90	45				21.5
10	100	50				23.5
11	110	55				25.5
12	125	60	50	90	40	25.5
13	140	70	55	100	45	25.5
14	160	80	65	115	50	25.5
15	180	90	70	130	60	25.5
16	200	100	75	140	65	25.5

Sheet2 表2 Unit: mm 单位 毫米

螺栓 BLOTS	直径 DIA (MM)	螺栓间距 pitch of bolts 单排 single row	双排 double row	端距
M12	13.5	40	60	25
M16	17.5	50	80	35
M20	21.5	60	100	40
M24	25.5	75	120	50

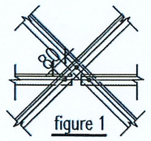


figure 1

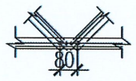
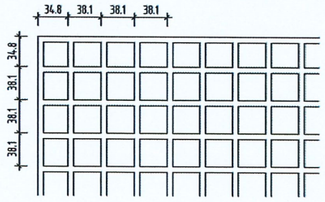
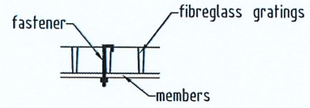


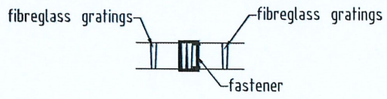
figure 1



fibreglass grating 1:5



Connection of gratings and members 1:5



Connection between gratings 1:5

Note: The connection of fibreglass gratings and structure members is fastener which is designed for the fibreglass gratings provided by the fibreglass gratings manufacturer.

TENDER COPY

Notes

no.	date	details

amendments

approval
approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure	section head
T.Vakadravuyaca	A. Pene
principle archiveng	project archiveng
K. M. Zahidul	
surveyed	designed: K.M.Z.
drawn	amend
checked	date: Sept 23
head subhead	check date: 19/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
GENERAL NOTES

scale 1:25

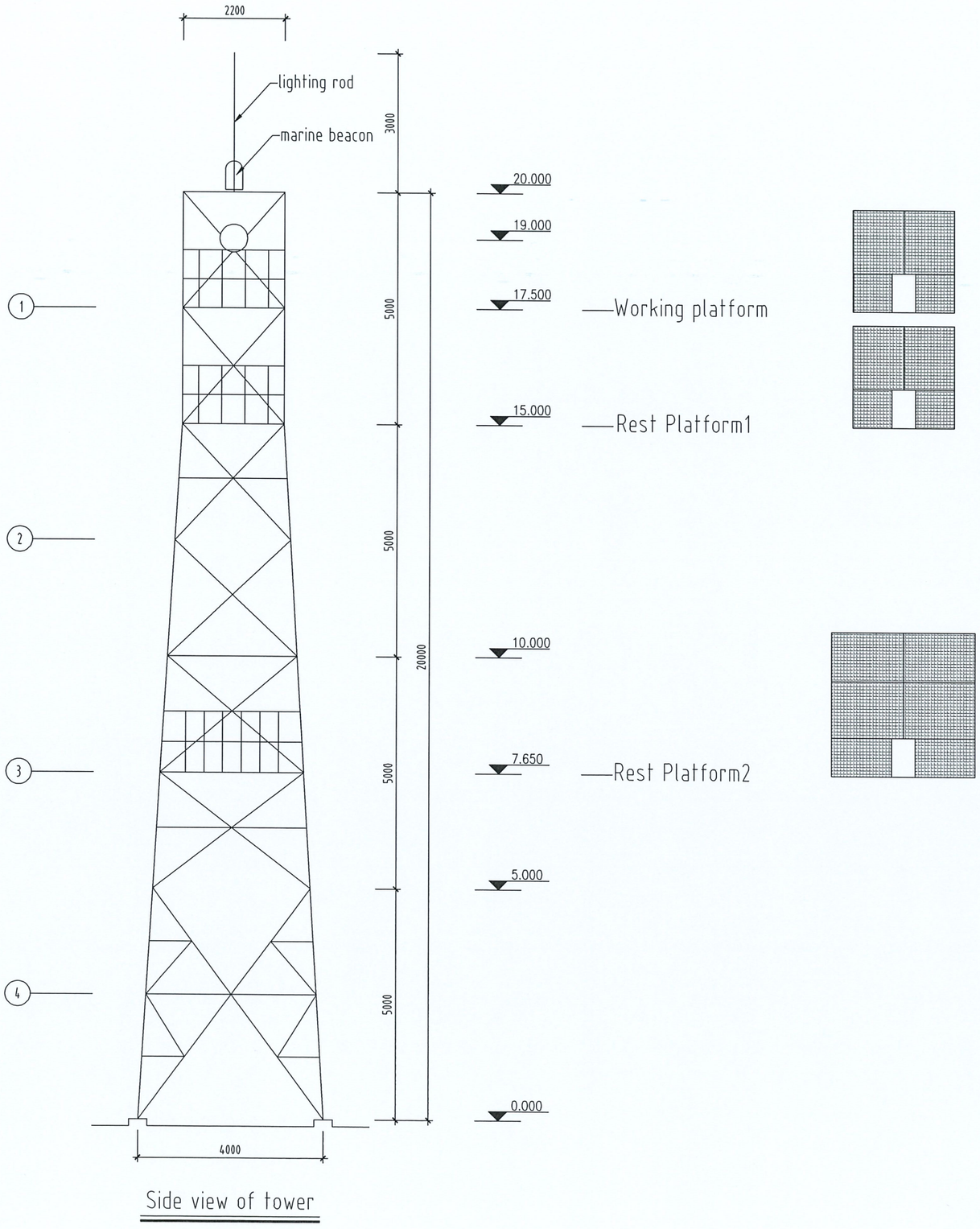
connected drawings

location no. | building no. | Fie no.

project no.	sheet no.	amend
STR 1255	04	

A3 ORIGINAL PAPER SIZE

PLOT DATE 19/09/2023



Side view of tower

STRUCTRUES WEIGHT LIST

No.	COMPONENT	WGT.(kg)	NOTE
1	tower body-1	757.1	
2	tower body-2	834.2	
3	tower body-3	1187.2	
4	tower body-4	1263.8	
5	tower shoes	628	
6	ladder	394.7	
	Total	5065	*kg*

ACCESSORY LIST

No.	COMPONENT	WGT.(kg)	NOTE
1	lighting rod	93.5	
2	MV antenna bracket	112.4	2set
3	RF&MV antenna bracket	529.0	
4	working platform	56.0	
5	rest platform1	56.0	
6	rest platform2	105.3	
	Total	952.2	*kg*

FIBREGLASS GRATING

No.	COMPONENT	WGT.(kg)	NOTE
1	FRP grating	234.5	
	Total	234.5	*kg*

TENDER COPY

Notes

1. ALL CONCRETE ELEMENTS TO HAVE A MINIMUM CHARACTERISTIC COMPRESSIVE STRENGTH (f'c) OF 30MPa @ 28 DAYS.

2. SEA SAND IS NOT TO BE USED FOR CONCRETE OR GROUT MIX.

3. SOIL UNDER COLUMN PADS TO BE COMPACTED TO ACHIEVE A BEARING CAPACITY OF 150KPa.

4. REINFORCEMENT TO BE 50MM UNLESS STATED.

5. PROVIDE SUFFICIENT BAR SUPPORTS UNDER REINFORCEMENT TO ENSURE THEY ARE SUPPORTED IN THEIR CORRECT POSITION DURING CONCRETING AND MAINTAIN COVER AS INDICATED.

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure	section head		
T.Vakadravuyaca	A. Pene		
principle arch/eng	project arch/eng		
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
GENERAL PLAN

scale

connected drawings

location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	05	

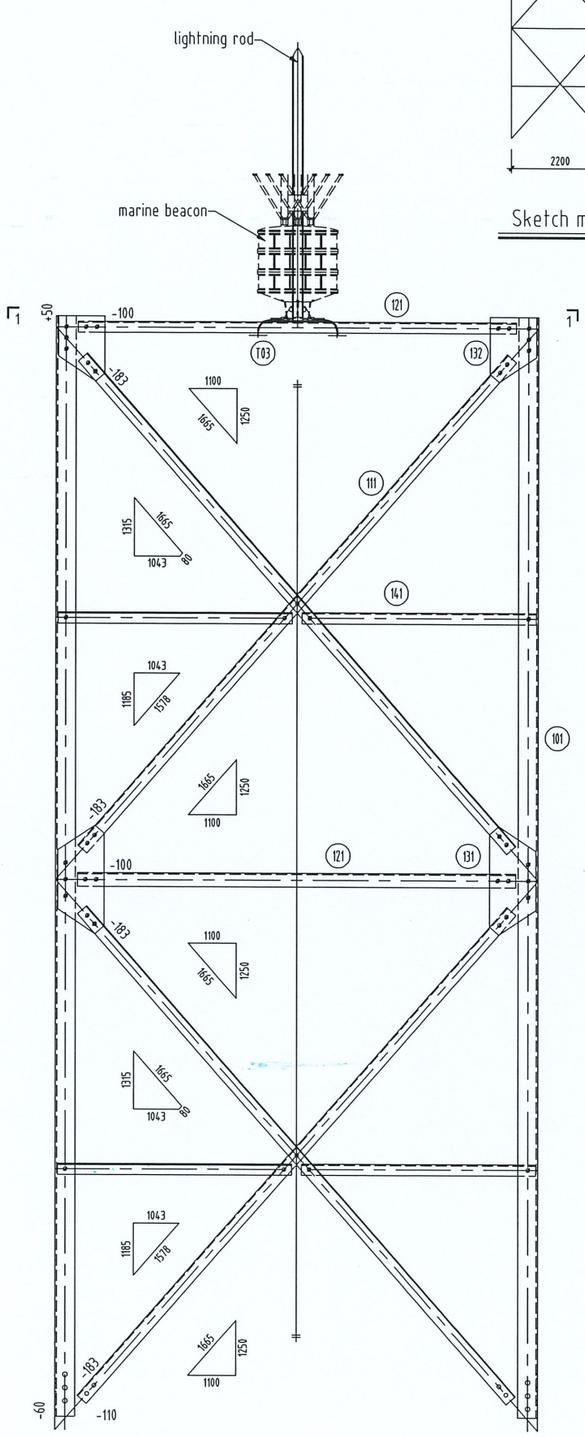
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

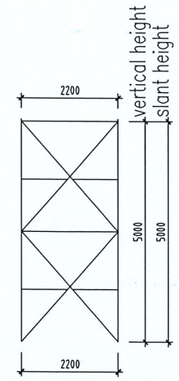
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
101	L90x7	4990	4	48.2	192.8	Q345
111	L63x6	2964	16	17.0	272.0	Q235
121	L63x6	2000	8	11.4	91.2	Q235
131	-6	492x211	8	4.9	39.2	Q235
132	-6	296x211	8	2.9	23.2	Q235
141	L50x5	1068	16	4.0	64.0	Q235
151R	L50x5	1481	1	5.6	5.6	Q235
151L	L50x5	1481	1	5.6	5.6	Q235
152R	L50x5	1481	1	5.6	5.6	Q235
152L	L50x5	1481	1	5.6	5.6	Q235
153	L50x5	2220	1	8.4	8.4	Q235
154	L50x5	1835	1	6.9	6.9	Q235
155	L50x5	1022	2	3.9	7.8	Q235
	M12x45	●	12	0.1	0.9	Grade 4.8C
	M16x50	●	184	0.2	28.3	Grade 8.8C
				Total	757.1	*kg*

No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
T01	ϕ50x5.0	3000	1	16.7	16.7	Q235
T02	-6	652x430	1	13.2	13.2	Q235
T03	-4	25000x40	2	31.4	62.8	Q235
T04	-6	80x50	4	0.2	0.8	Q235
				Total	93.5	*kg*

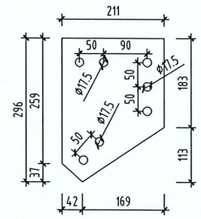
Notes



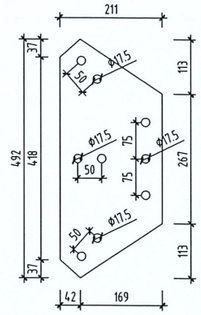
Tower Body-1 1:20



Sketch map 1:100

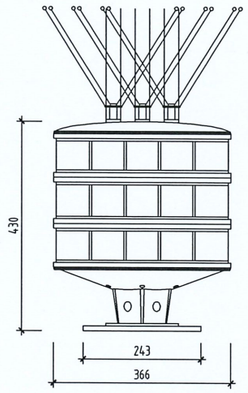


(132) 1:10



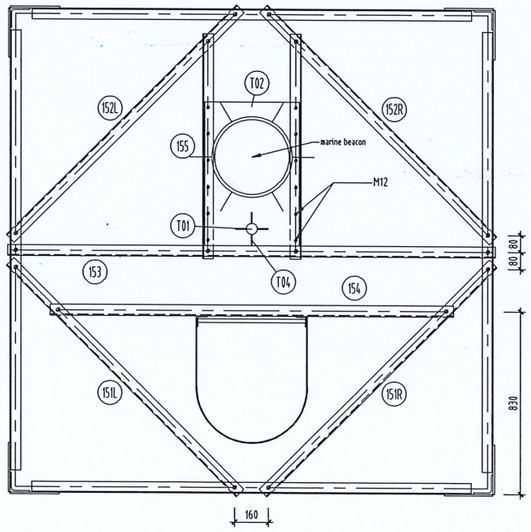
(131) 1:10

Note: The size of connection plate is for reference only.

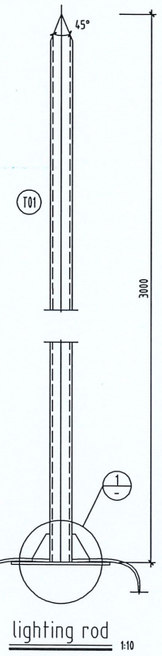


Marine beacon 1:10

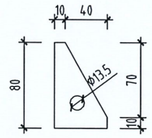
ϕ245x8mm thick stainless steel plate to be used for lantern base plate. Bolt size and positions to be determined by the LED 350H series lantern to be supplied by MSAF



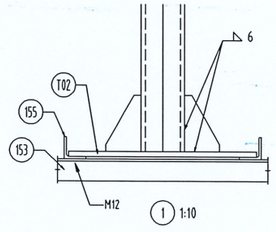
1-1 1:20



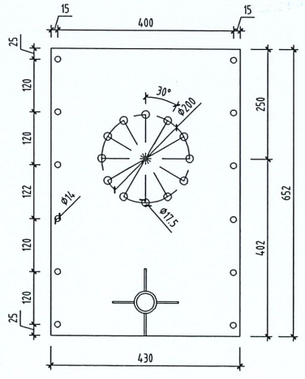
lighting rod 1:10



(T04) 1:5



(1) 1:10



(T02) 1:10

TENDER COPY

no. | date | details

amendments

approval

approval

client: MARITIME SAFETY AUTHORITY LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure		section head	
T.Vakadravuyaca		A. Pene	
principle arch/eng		project arch/eng	
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		19/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project: VATOA LIGHT TOWER No. K4759

block/sub proj.

drawing title: TOWER BODY - 1

scale

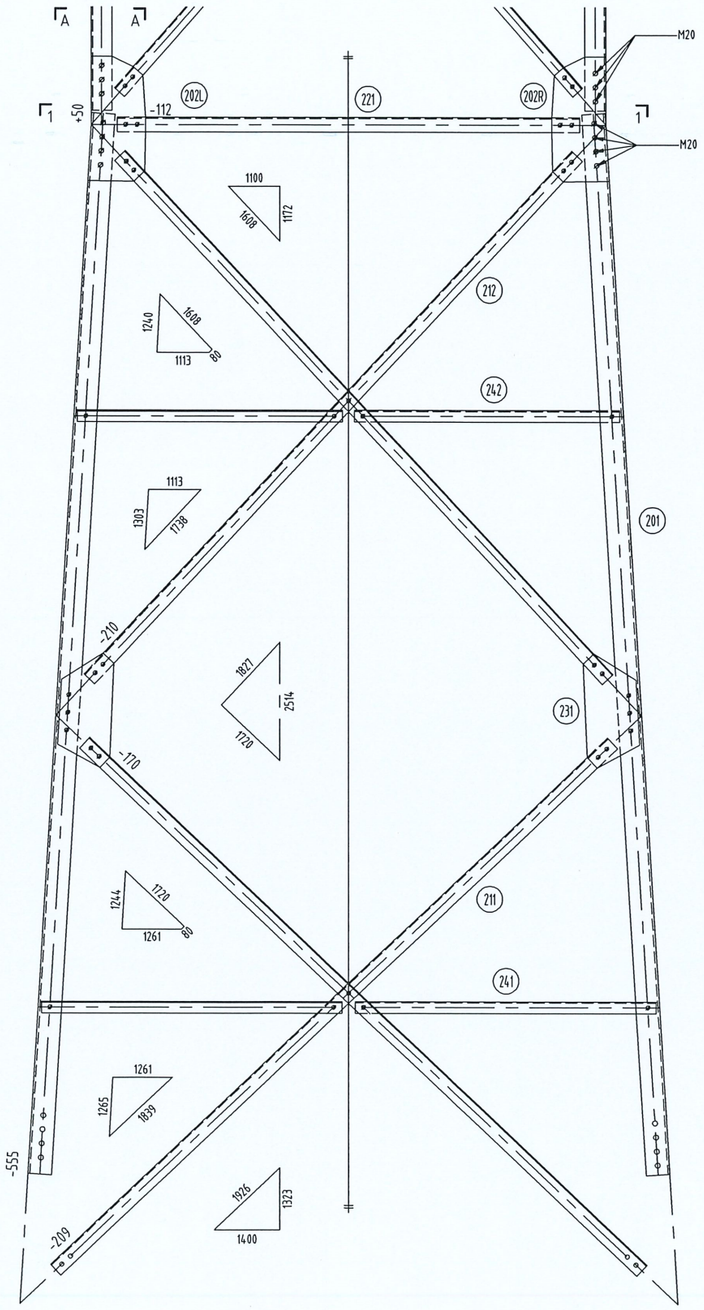
connected drawings

location no. | building no. | File no.

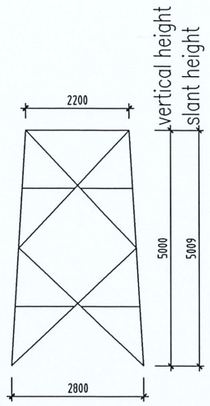
project no.	sheet no.	amend
STR 1255	06	

A3 ORIGINAL PAPER SIZE

PLOT DATE 19/09/2023

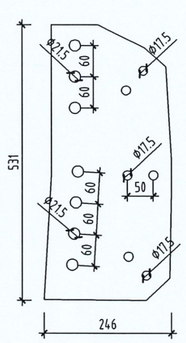


Tower Body-2 1:20

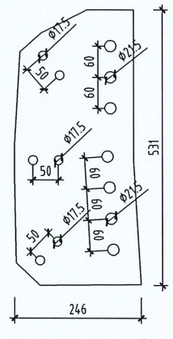


Sketch map 1:100

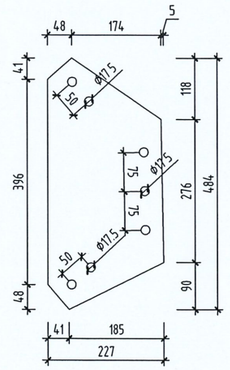
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
201	L100x8	4513	4	55.4	221.6	Q345
202R	-8	531x246	4	8.2	32.8	Q345
202L	-8	531x246	4	8.2	32.8	Q345
203	L90x7	550	4	5.3	21.2	Q345
211	L63x6	3267	8	18.7	149.6	Q235
212	L63x6	3043	8	17.4	139.2	Q235
221	L63x6	1977	4	11.3	45.2	Q235
231	-6	484x227	8	5.2	41.6	Q235
241	L50x5	1281	8	4.8	38.4	Q235
242	L50x5	1133	8	4.3	34.4	Q235
251R	L50x5	1481	1	5.6	5.6	Q235
251L	L50x5	1481	1	5.6	5.6	Q235
252	L50x5	1481	2	5.6	11.2	Q235
253	L50x5	2220	1	8.4	8.4	Q235
254	L50x5	1835	1	6.9	6.9	Q235
	M20x55	Ø	56	0.3	15.7	Grade 8.8C
	M16x50	Ø	156	0.2	24.0	Grade 8.8C
				Total	834.2	*kg*



202L 1:10

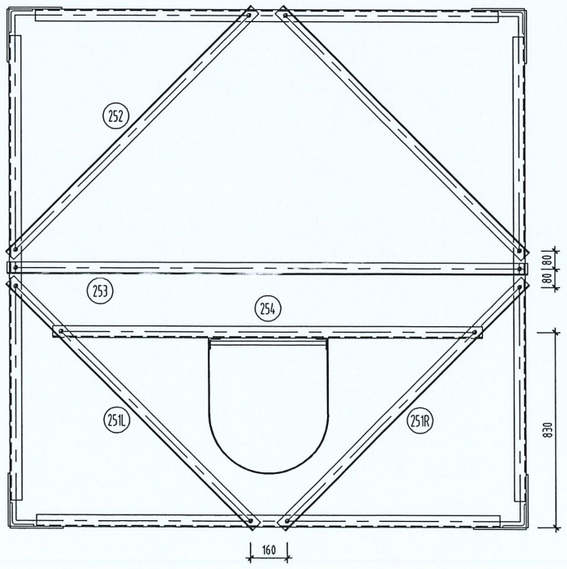


202R 1:10

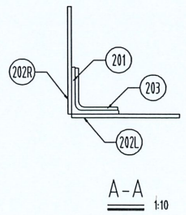


231 1:10

Note: The size of connection plate is for reference only.



1-1 1:20



A-A 1:10

TENDER COPY

Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure	section head		
T.Vakadravuyaca	A. Pene		
principle arch/eng	project arch/eng		
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
TOWER BODY - 2

scale

connected drawings

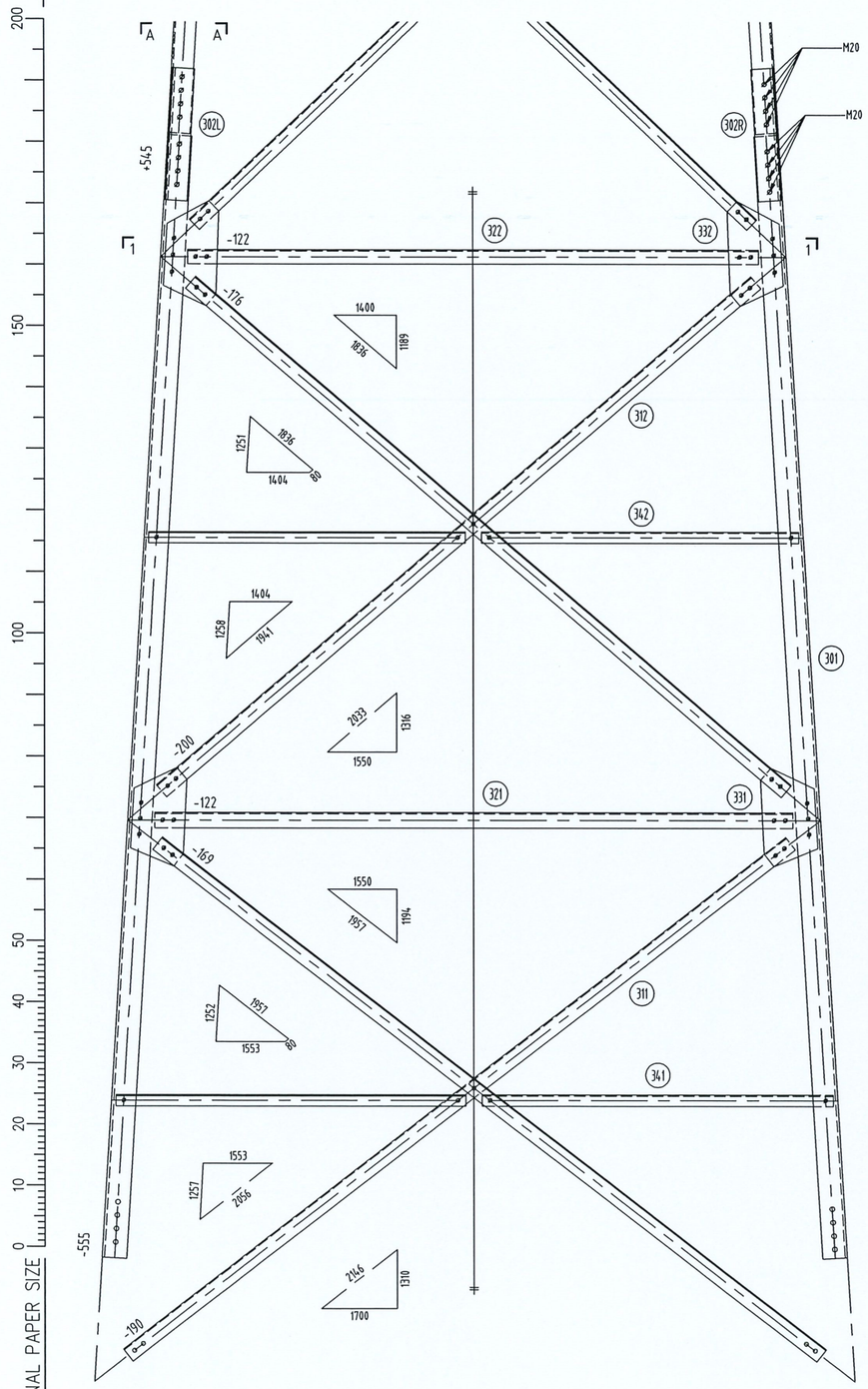
location no. | building no. | File no.

project no.	sheet no.	amend
STR 1255	07	

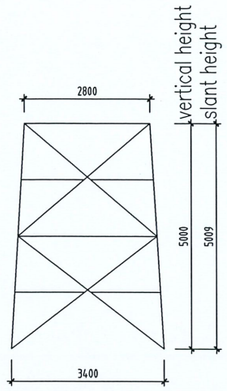
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

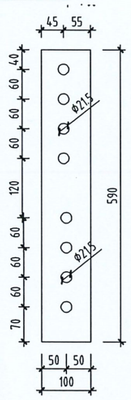
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
301	L110x10	5008	4	83.6	334.4	Q345
302R	-8	590x100	4	3.7	14.8	Q345
302L	-8	590x100	4	3.7	14.8	Q345
303	L100x8	590	4	7.2	28.8	Q345
311	L70x6	3745	8	24.0	192.0	Q235
312	L70x6	3494	8	22.4	179.2	Q235
321	L70x6	2855	4	18.3	73.2	Q235
322	L63x6	2556	4	14.6	58.4	Q235
331	-8	438x238	8	6.5	52.0	Q235
332	-8	467x237	8	7.0	56.0	Q235
341	L50x5	1568	8	5.9	47.2	Q235
342	L50x5	1419	8	5.3	42.4	Q235
351R	L50x5	1896	1	7.1	7.1	Q235
351L	L50x5	1896	1	7.1	7.1	Q235
352	L50x5	1896	2	7.1	14.2	Q235
353	L50x5	2807	1	10.6	10.6	Q235
354	L50x5	1822	1	6.9	6.9	Q235
	M20x55	∅	64	0.3	17.9	Grade 8.8C
	M16x50	∅	196	0.2	30.2	Grade 8.8C
				Total	1187.2	*kg*



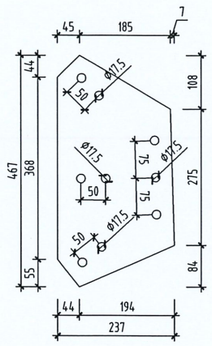
Tower Body-3 1:20



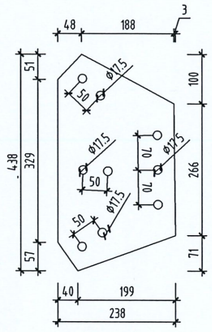
Sketch map 1:100



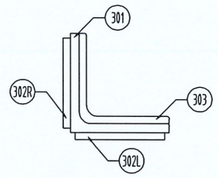
302L/R 1:10



332 1:10

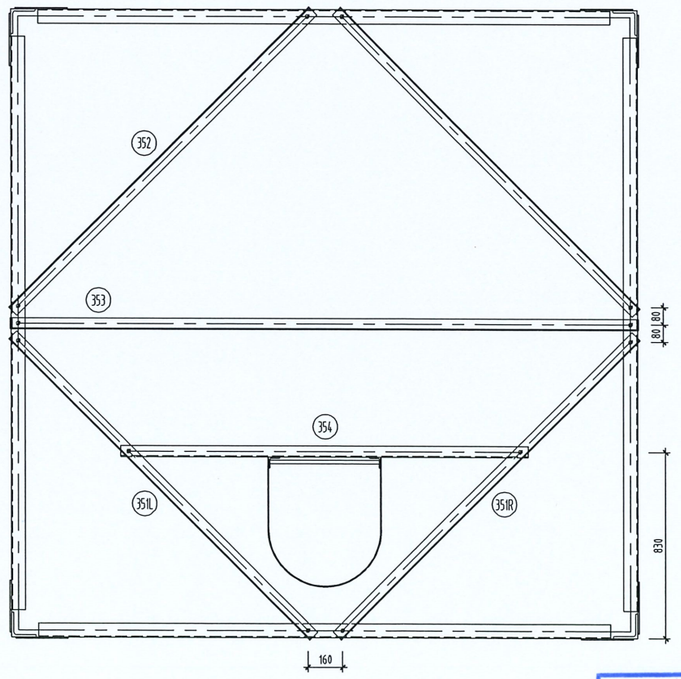


331 1:10



A-A 1:5

Note: The size of connection plate is for reference only.



1-1 1:20

TENDER COPY

Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for Infrastructure	section head
T.Vakadravuyaca	A. Pene
principle arch/eng	project arch/eng
K. M. Zahidul	

surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
TOWER BODY - 3

scale

connected drawings

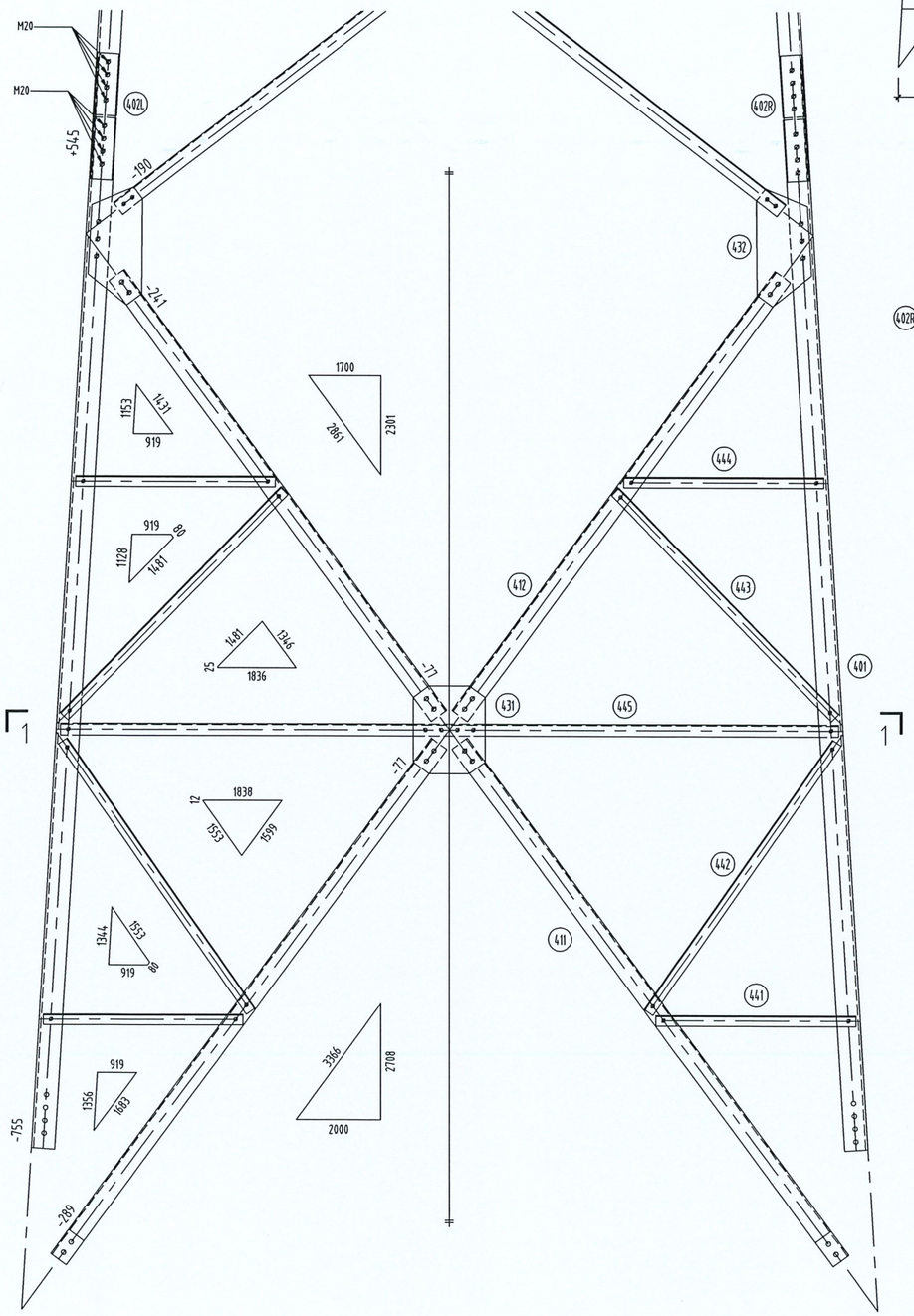
location no. | building no. | File no.

project no.	sheet no.	amend
STR 1255	08	

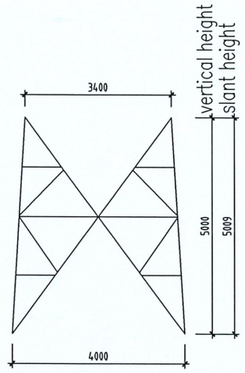
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

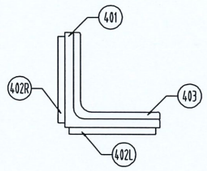
Note: The size of connection plate is for reference only.



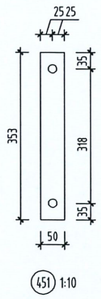
Tower Body-4 1:20



Sketch map 1:100

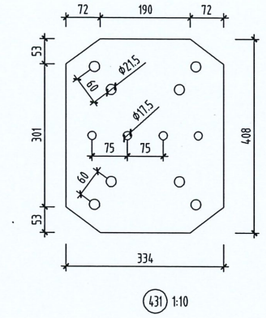


A-A 1:5

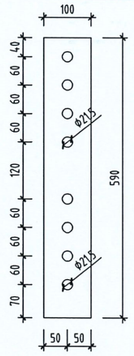


451 1:10

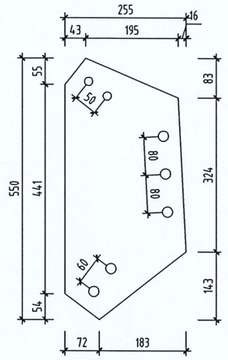
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
401	L110x10	4808	4	80.2	320.8	Q345
402R	-8	590x100	4	3.7	14.8	Q345
402L	-8	590x100	4	3.7	14.8	Q345
403	L100x8	590	4	7.2	28.8	Q345
411	L90x7	2996	8	28.9	231.2	Q235
412	L90x7	2540	8	24.5	196.0	Q235
431	-8	408x334	4	8.6	34.4	Q235
432	-8	550x255	4	8.8	70.4	Q235
441	L50x5	934	8	3.5	28.0	Q235
442	L50x5	1534	8	5.8	46.4	Q235
443	L50x5	1467	8	5.5	44.0	Q235
444	L50x5	934	8	3.5	28.0	Q235
445	L56x5	3635	4	15.4	61.6	Q235
451	-6	344x50	4	0.8	3.2	Q235
452	L50x5	1133	4	4.3	17.2	Q235
453	L50x5	2470	4	9.3	37.2	Q235
454	L50x5	1860	4	7.0	28.0	Q235
	M20x55	∅	136	0.3	38.1	Grade 8.8C
	M16x50	∅	136	0.2	20.9	Grade 8.8C
				Total	1263.8	*kg*



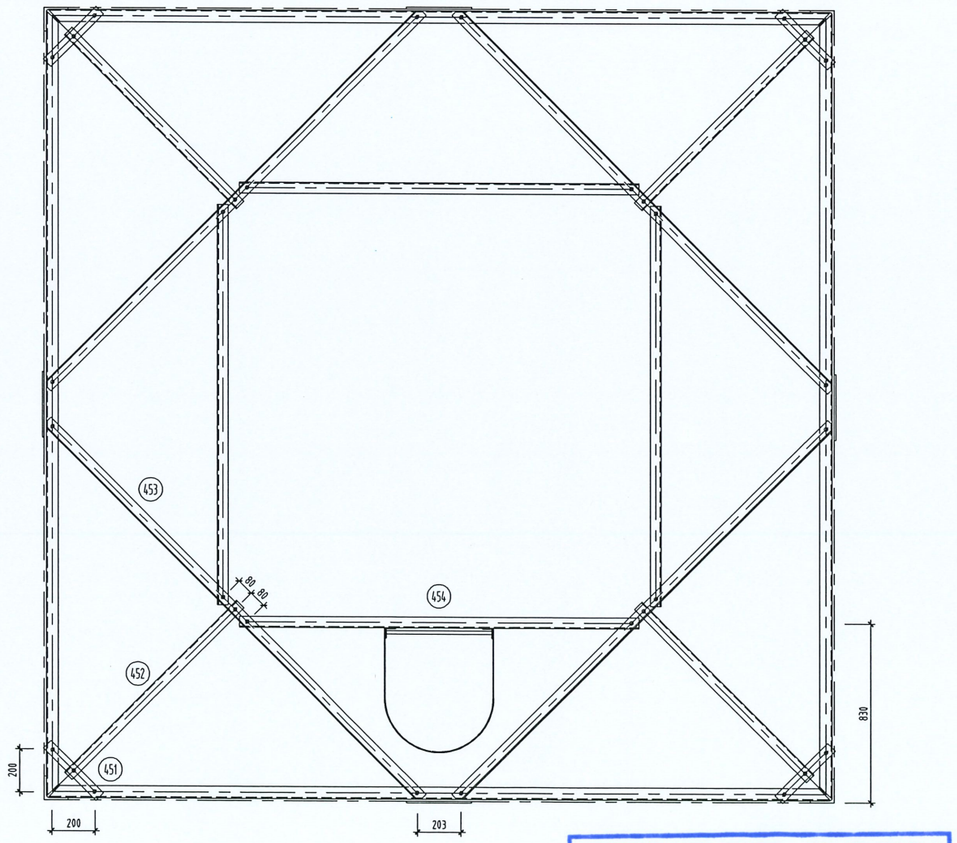
431 1:10



402L/R 1:10



432 1:10



1-1 1:20

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Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastrucdure	section head
T.Vakadravuyaca	A. Pene
principle arch/eng	project arch/eng
K. M. Zahidul	

surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
TOWER BODY - 4

scale

connected drawings

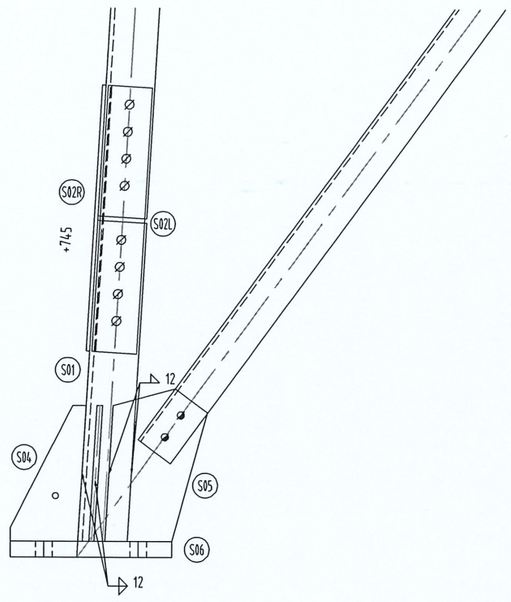
location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	09	

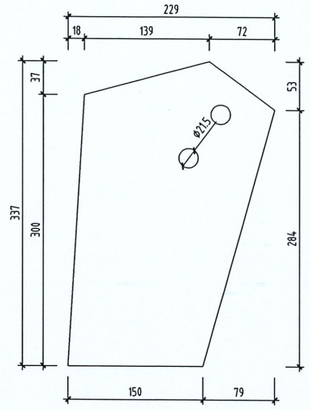
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

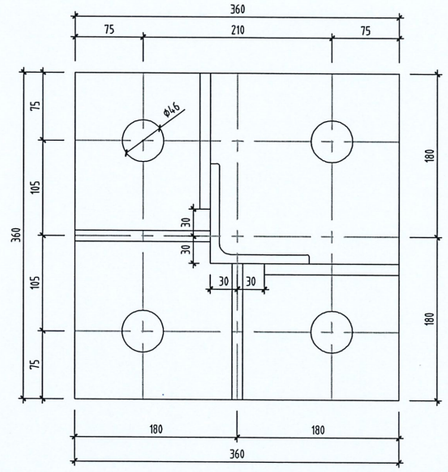
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
S01	L110x10	710	4	11.8	47.2	Q345
S02R	-8	590x100	4	3.7	14.8	Q345
S02L	-8	590x100	4	3.7	14.8	Q345
S03	L100x8	590	4	7.2	28.8	Q345
S04	-10	300x168	8	4.0	32.0	Q345
S05	-10	337x229	8	6.1	48.8	Q345
S06	-32	360x360	4	32.6	130.4	Q345
S07	-12	310x310	4	9.1	36.4	anchor template
S08	-12	310x310	4	9.1	36.4	locating plate
	M20x55	Ø	80	0.3	22.4	Grade 8.8C
	ø36	1500	16	13.5	216.0	Q345/45#
S08	-12	80x80	16	0.6	9.6	flat washer
				Total	628.0	*kg*



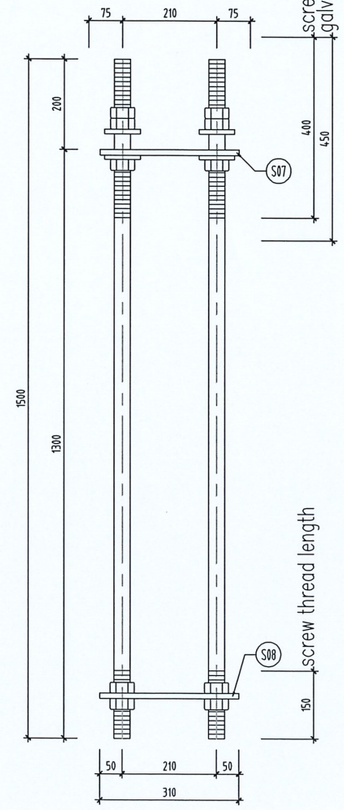
Tower Shoe 1:10



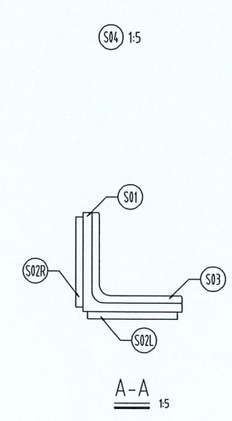
S05 1:5



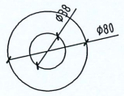
S06 1:5



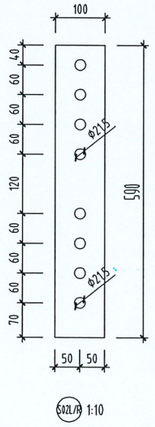
HD bolts 1:10



S04 1:5

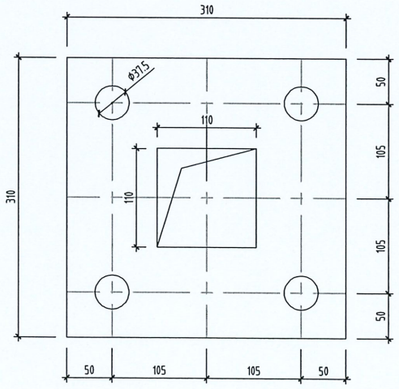


Flat washer 1:5



S02L/R 1:10

A-A 1:5



S07/08 1:5

TENDER COPY

Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure		section head	
T.Vakadravuyaca		A. Pene	
principle archiveng		project archiveng	
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check data
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
TOWER SHOES

scale

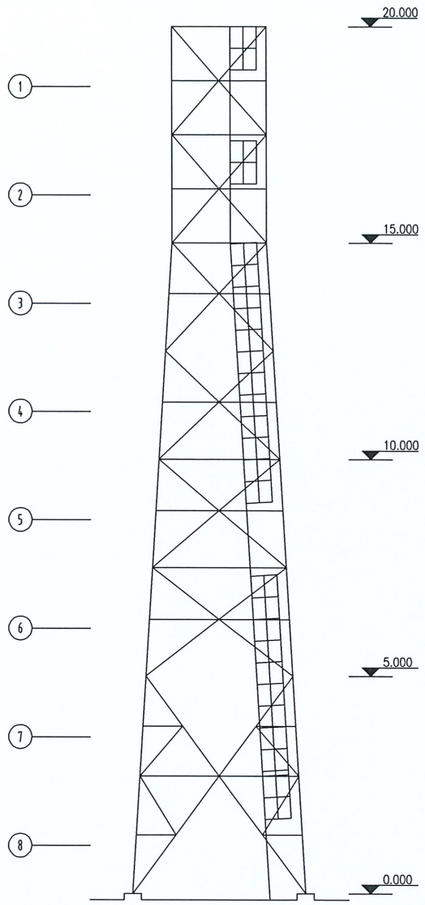
connected drawings

location no. | building no. | File no.

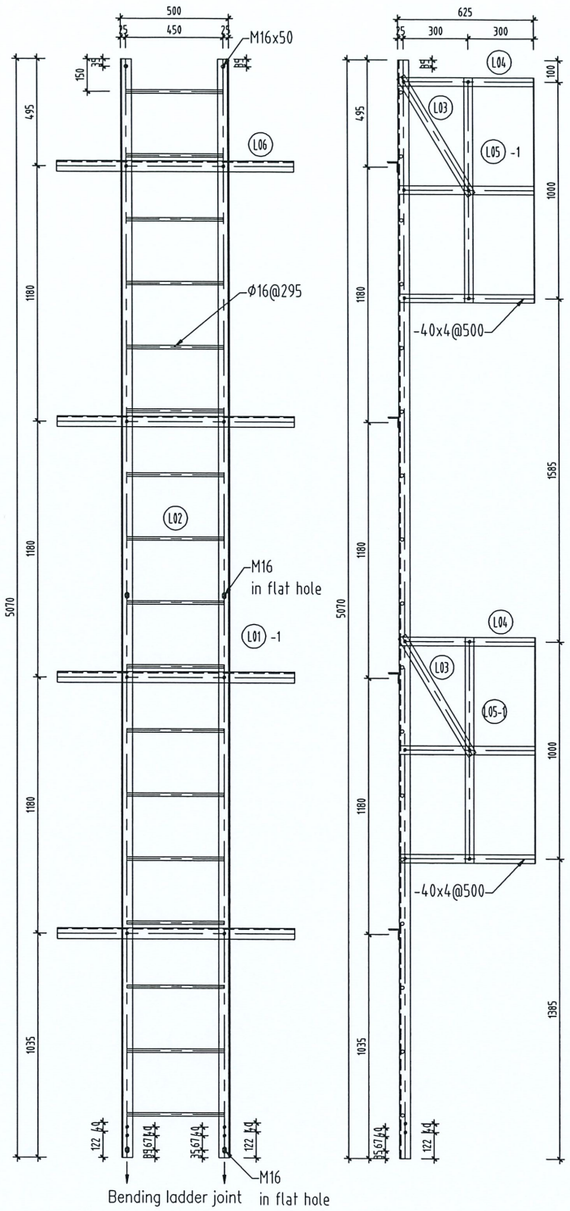
project no.	sheet no.	amend
STR 1255	10	

A3 ORIGINAL PAPER SIZE

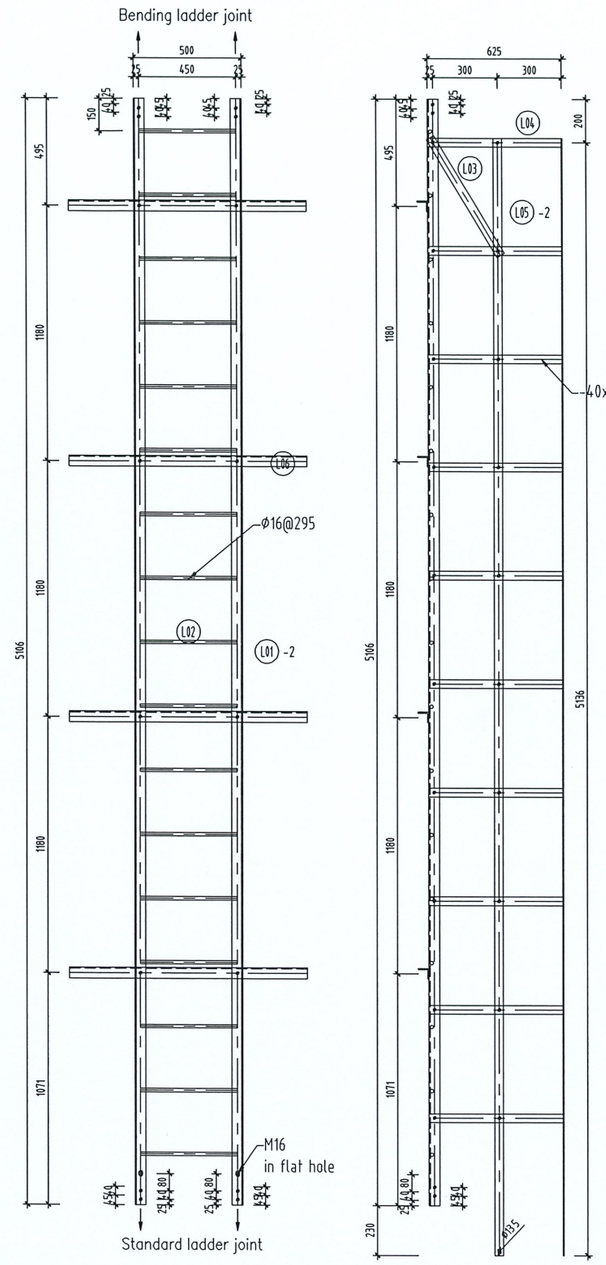
PLOT DATE 12/09/2023



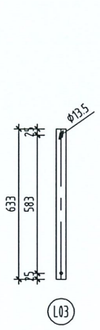
Side view of ladder

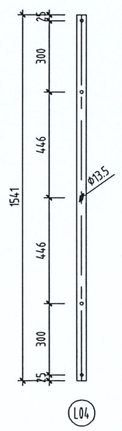


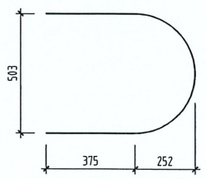
Ladder-1 1:20

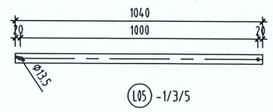


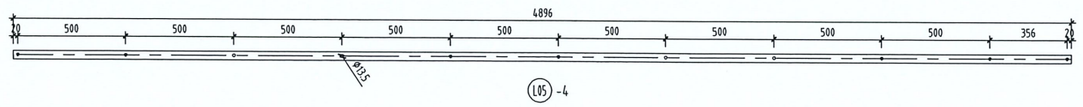
Ladder-2 1:20

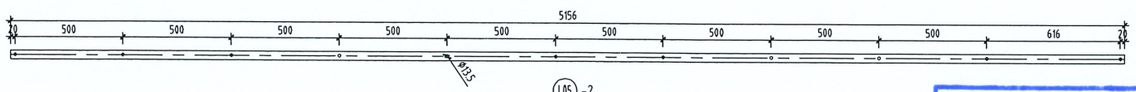












Safe railing 1:20

TENDER COPY

Notes

no.	date	details

amendments

approval	
approval	

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for Infrastructure	section head		
T.Vakadravuyaca	A. Pene		
principle arch/eng	project arch/eng		
K. M. Zahidul			
surveyed	designed: K.M.Z.	drawn: TD	amend
checked	data: Sept 23	head subhead	check data: 12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
LADDER - 1

scale

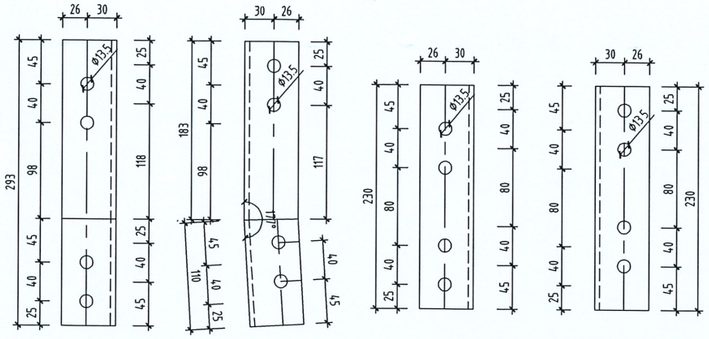
connected drawings

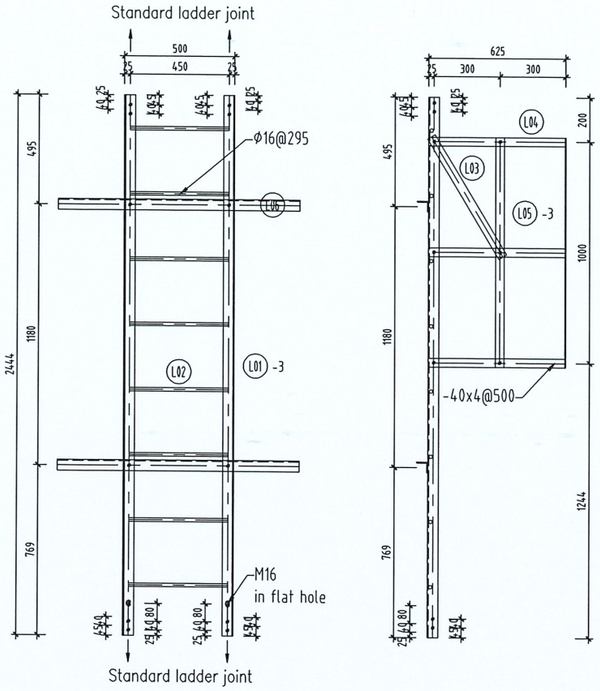
location no. | building no. | File no.

project no.	sheet no.	amend
STR 1255	11	

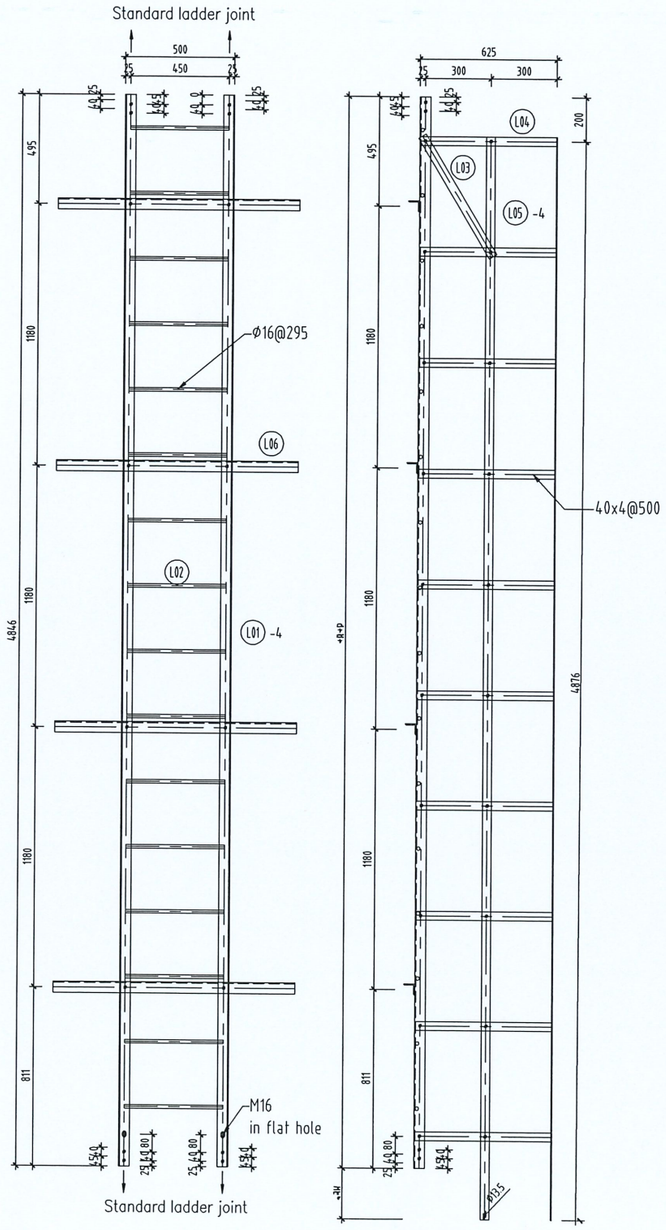
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

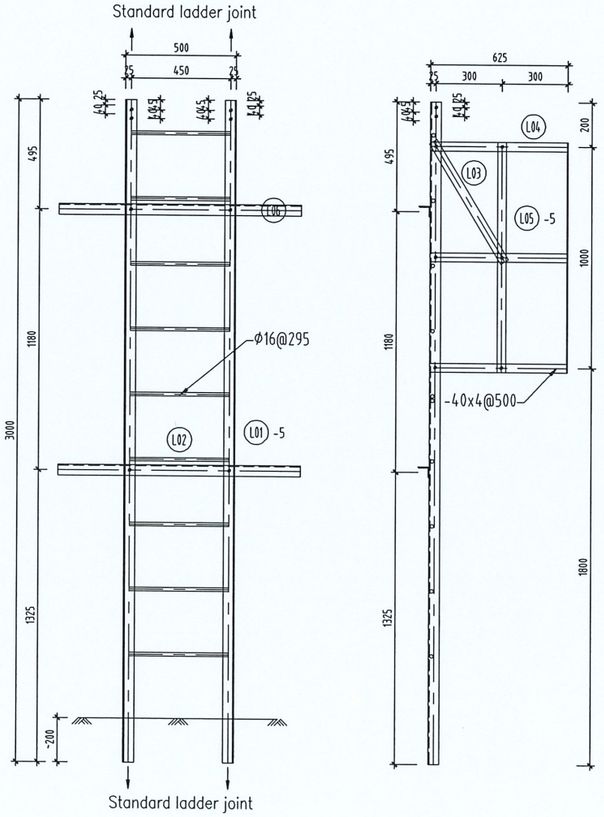




Ladder-3 1:20



Ladder-4 1:20



Ladder-5 1:20

Ladder-1						
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
L01-1	L50x5	5070	2	19.1	38.2	Q235
L02	ø16	450	17	0.7	11.9	HRB335
L03	-4	633x40	4	0.8	3.2	Q235
L04	-4	1541x40	6	1.9	11.4	Q235
L05-1	-4	1040x40	6	1.3	7.8	Q235
L06	L50x5	1100	4	4.1	16.4	Q235
	M12x45	●	54	0.1	4.1	Grade 4.8C
	M16x50	◪	6	0.2	0.9	Grade 8.8C
				Total	93.9	kg

Ladder-2						
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
L01-2	L50x5	5106	2	19.2	38.4	Q235
L02	ø16	450	17	0.7	11.9	HRB335
L03	-4	633x40	2	0.8	1.6	Q235
L04	-4	1541x40	10	1.9	19.0	Q235
L05-2	-4	5156x40	3	6.5	19.5	Q235
L06	L50x5	1100	4	4.1	16.4	Q235
	M12x45	●	74	0.1	5.6	Grade 4.8C
	M16x50	◪	2	0.2	0.3	Grade 8.8C
				Total	112.7	kg

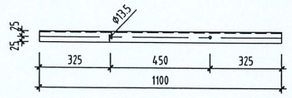
Ladder-3						
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
L01-3	L50x5	2444	2	9.2	18.4	Q235
L02	ø16	450	8	0.7	5.6	HRB335
L03	-4	633x40	2	0.8	1.6	Q235
L04	-4	1541x40	3	1.9	5.7	Q235
L05-3	-4	1040	3	0.0	0.0	Q235
L06	L50x5	1100	2	4.1	8.2	Q235
	M12x45	●	35	0.1	2.7	Grade 4.8C
	M16x50	◪	2	0.2	0.3	Grade 8.8C
				Total	42.5	kg

Ladder-4						
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
L01-4	L50x5	4846	2	18.3	36.6	Q235
L02	ø16	450	16	0.7	11.2	HRB335
L03	-4	633x40	2	0.8	1.6	Q235
L04	-4	1541x40	10	1.9	19.0	Q235
L05-4	-4	4896	3	0.0	0.0	Q235
L06	L50x5	1100	4	4.1	16.4	Q235
	M12x45	●	74	0.1	5.6	Grade 4.8C
	M16x50	◪	2	0.2	0.3	Grade 8.8C
				Total	90.7	kg

Ladder-5						
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
L01-5	L50x5	3000	2	11.3	22.6	Q235
L02	ø16	450	9	0.7	6.3	HRB335
L03	-4	633x40	2	0.8	1.6	Q235
L04	-4	1541x40	3	1.9	5.7	Q235
L05-5	-4	1040	3	0.0	0.0	Q235
L06	L50x5	1100	2	4.1	8.2	Q235
	M12x45	●	27	0.1	2.1	Grade 4.8C
				Total	46.5	kg

Ladder-5						
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
	L56x5	293	2	1.2	2.4	Bending ladder joint
	L56x5	230	6	1.0	6.0	Standard ladder joint
				Total	8.4	kg
				Ladder weight	394.7	kg

Note:
1. Ladder material to be Hot Dip Galvanised.
2. Ladder Safety Case to be Hot Dip Galvanised.
3. All bolts used for the ladder structure & Cage are to be HDG.



Feeder angle iron 1:20

Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure	section head		
T.Vakadravuyaca	A. Pene		
principle arch/eng		project arch/eng	
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
LADDER - 2

scale

connected drawings

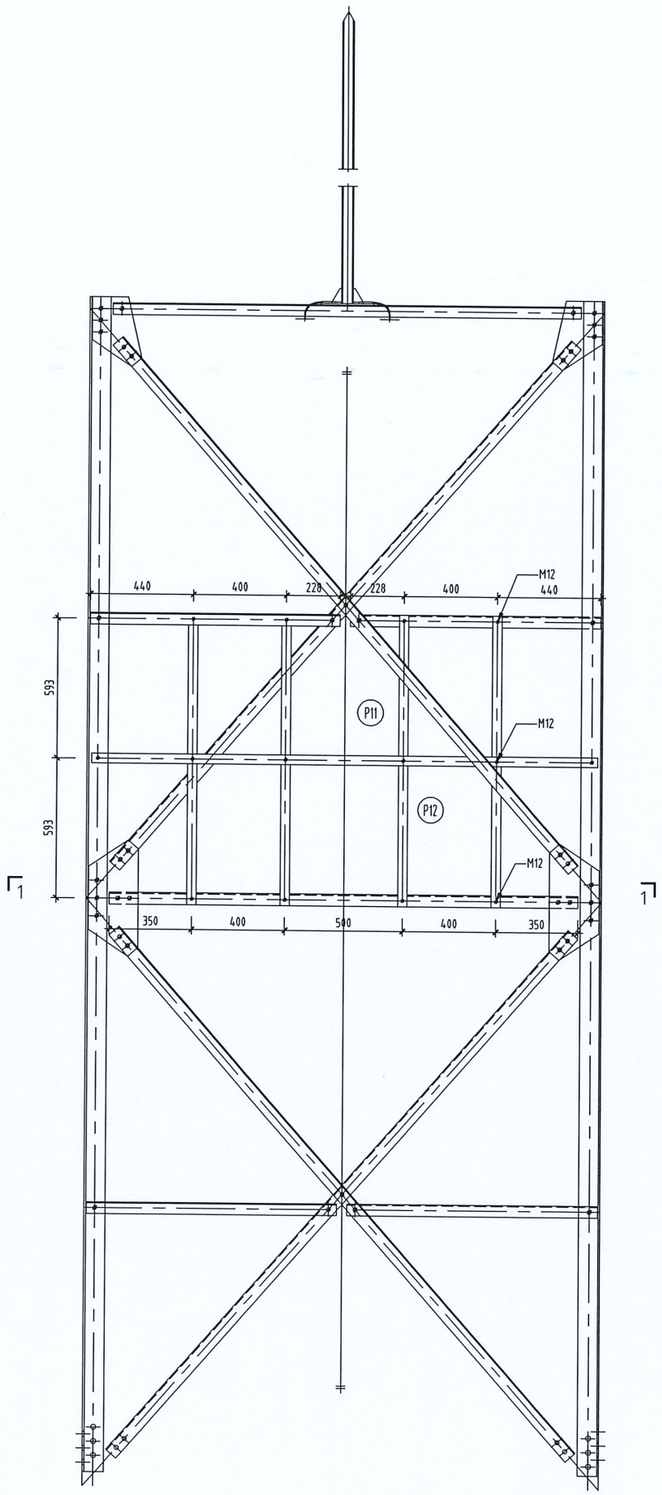
location no.		File no.
	building no.	

project no.	sheet no.	
STR 1255	12	amend

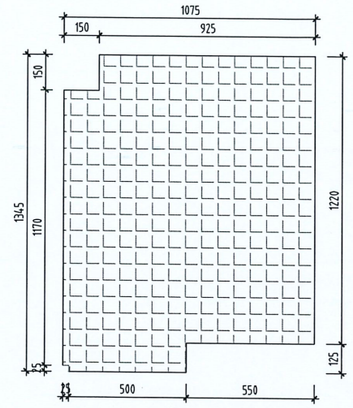
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

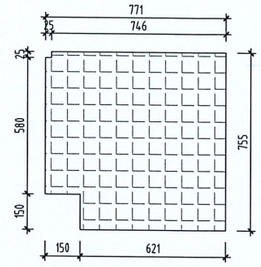
No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
P11	-4	2160x40	4	2.7	10.8	Q235
P12	-4	1235x40	16	1.6	25.6	Q235
P13	L50x5	2220	1	8.4	8.4	Q235
P14	L50x5	806	2	3.0	6.0	Q235
	M12x45	●	56	0.1	4.3	Grade 4.8C
	M16x50	⌀	6	0.2	0.9	Grade 8.8C
				Total	56.0	*kg*
PG11	30x38.1 Square Mesh	1345x1075	2	20.5	41.1	fibreglass grating
PG12	30x38.1 Square Mesh	755x771	2	8.3	16.5	fibreglass grating
				Grating Total	57.6	*kg*



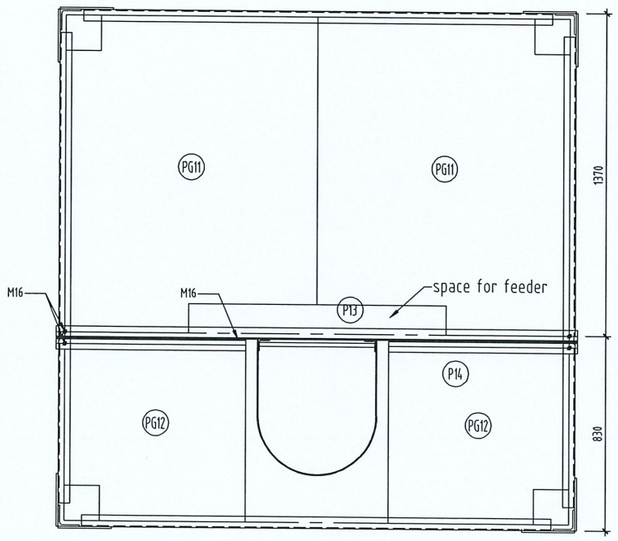
Working Platform 1:20



PG11 1:20



PG12 1:20



1-1 1:20

TENDER COPY

Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for Infrastructure	section head
T.Vakadravuyaca	A. Pene
principle archiveng	project archiveng
K. M. Zahidul	

surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
WORKING PLATFORM

scale

connected drawings

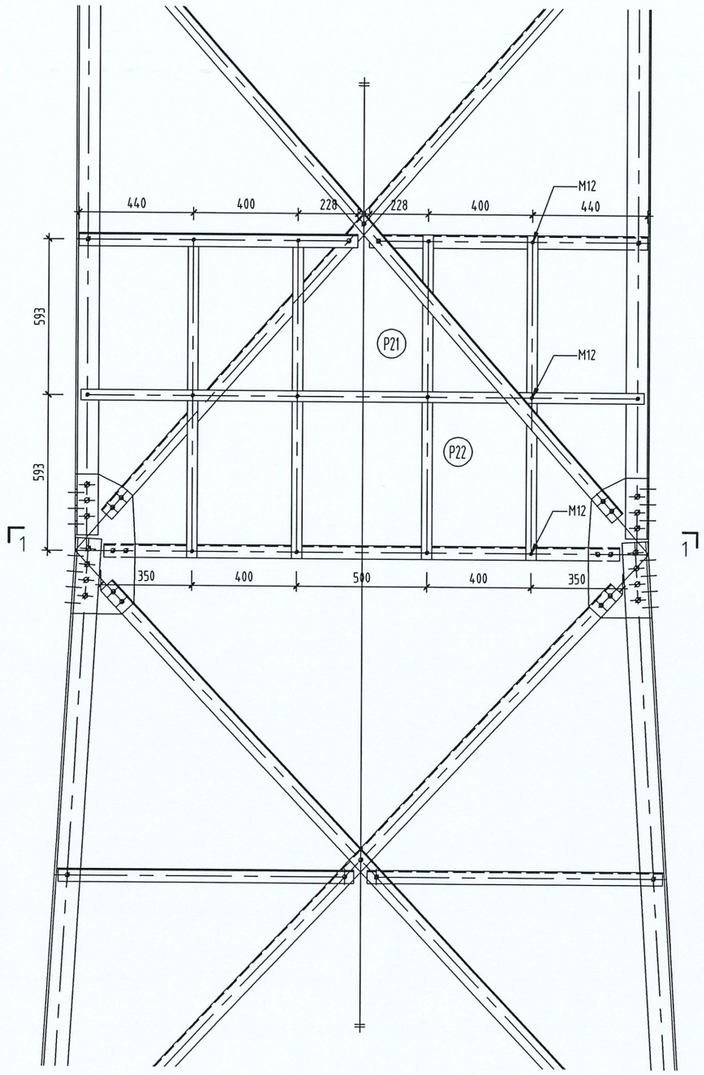
location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	13	

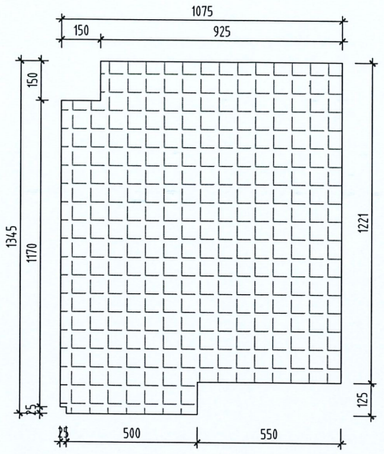
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
P21	-4	2160x40	4	2.7	10.8	Q235
P22	-4	1235x40	16	1.6	25.6	Q235
P23	L50x5	2220	1	8.4	8.4	Q235
P24	L50x5	806	2	3.0	6.0	Q235
	M12x45		56	0.1	4.3	Grade 4.8C
	M16x50		6	0.2	0.9	Grade 8.8C
				Total	56.0	kg
PG21	30x38.1 Square Mesh	1345x1075	2	20.5	41.1	fibreglass grating
PG22	30x38.1 Square Mesh	755x771	2	8.3	16.5	fibreglass grating
				Grating Total	57.6	kg



Rest Platform 1
1:20



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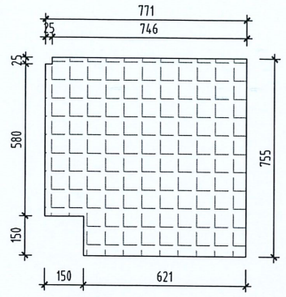
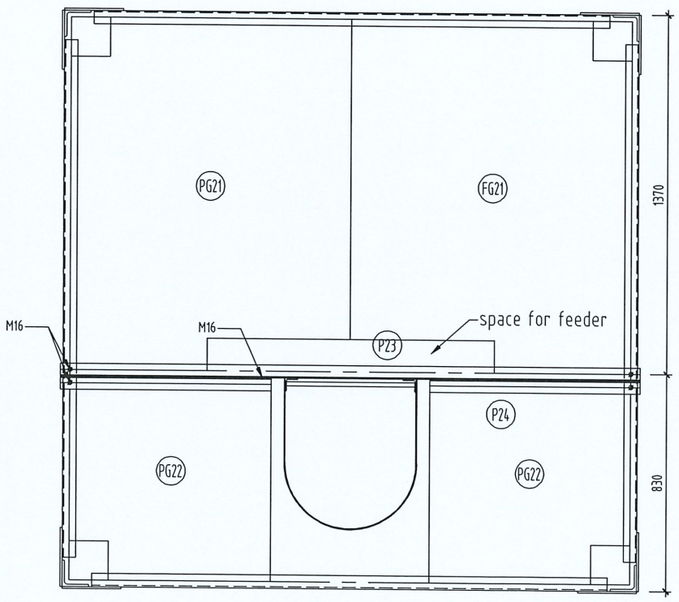


PG12 1:20



1-1
1:20

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Notes

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MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure		section head	
T.Vakadravuyaca		A. Pene	
principle arch/eng		project arch/eng	
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		12/09/2023

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
REST PLATFORM - 1

scale

connected drawings

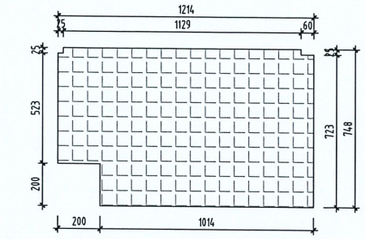
location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	14	

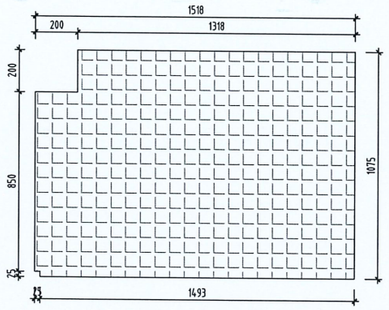
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

No.	Type	Size (mm)	Qty.	Unit Weight (kg)	Sub Weight (kg)	Remark
P31	-4	2965x40	4	3.7	14.8	Q235
P32	-4	1306x40	24	1.6	38.4	Q235
P33	L50x5	3107	3	11.7	35.1	Q235
P34	L50x5	1249	2	4.7	9.4	Q235
	M12x45		80	0.1	6.1	Grade 4.8C
	M16x50		10	0.2	1.5	Grade 8.8C
				Total	105.3	*kg*
PG31	30x38.1 Square Mesh	1518x1075	2	23.2	46.3	fibreglass grating
PG32	30x38.1 Square Mesh	1518x1114	2	24.0	48.0	fibreglass grating
PG32	30x38.1 Square Mesh	1214x723	2	12.5	24.9	fibreglass grating
				Grating Total	119.3	*kg*



PG33 1:20



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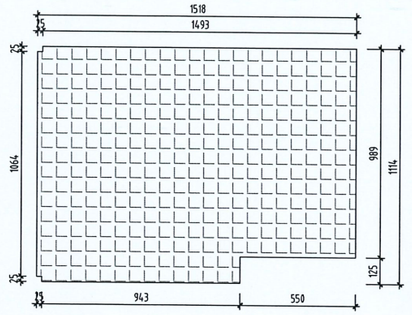

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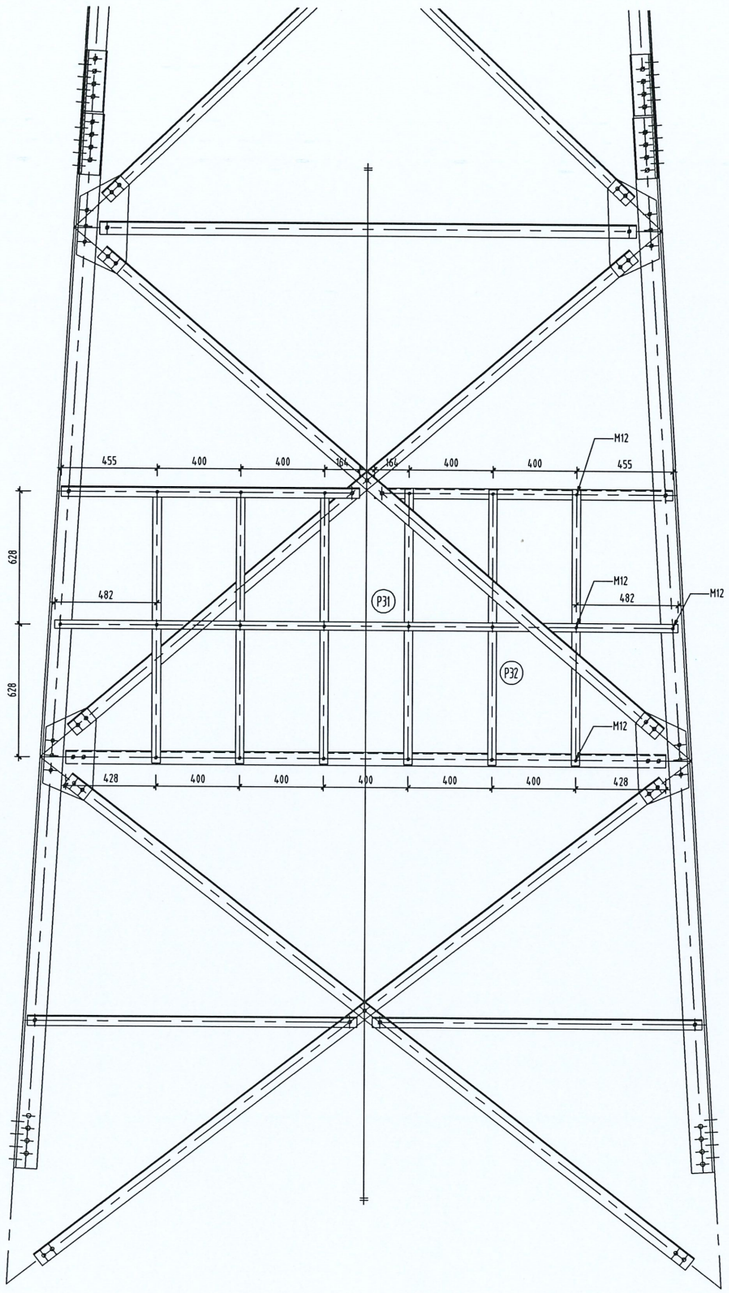
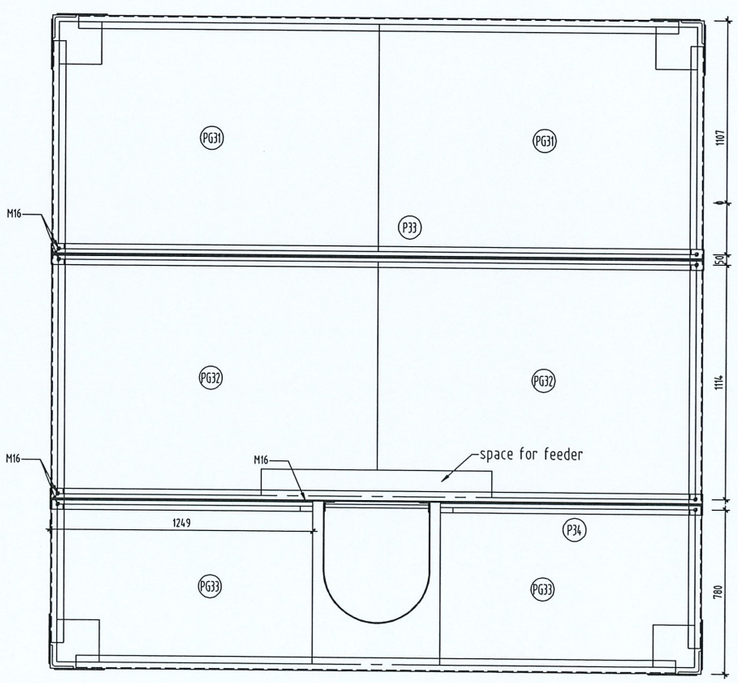


Rest Platform 2 1:20



1-1 1:20

Notes

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MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure	section head		
T.Vakadravuyaca	A. Pene		
principle arch/eng	project arch/eng		
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
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MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER
No. K4759

block/sub proj.

drawing title
REST PLATFORM - 2

scale

connected drawings

location no. | building no. | File no.

project no.	sheet no.	amend
STR 1255	15	

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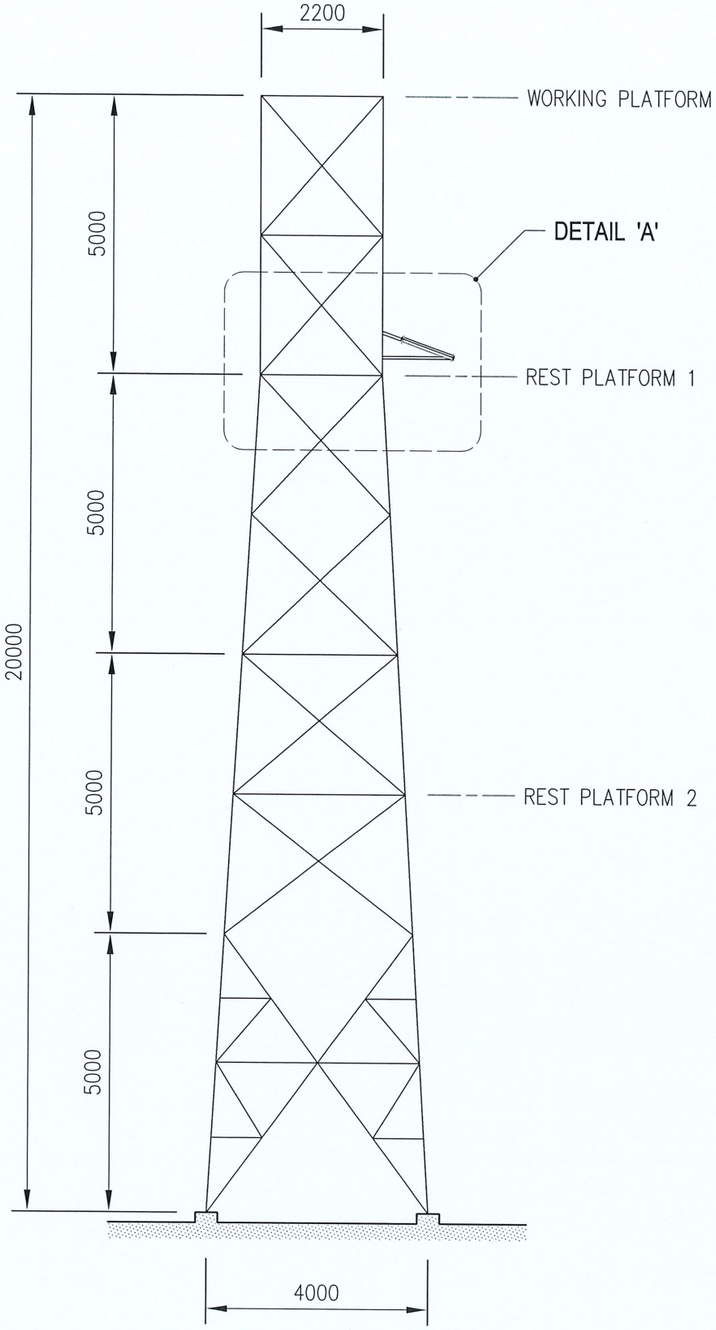
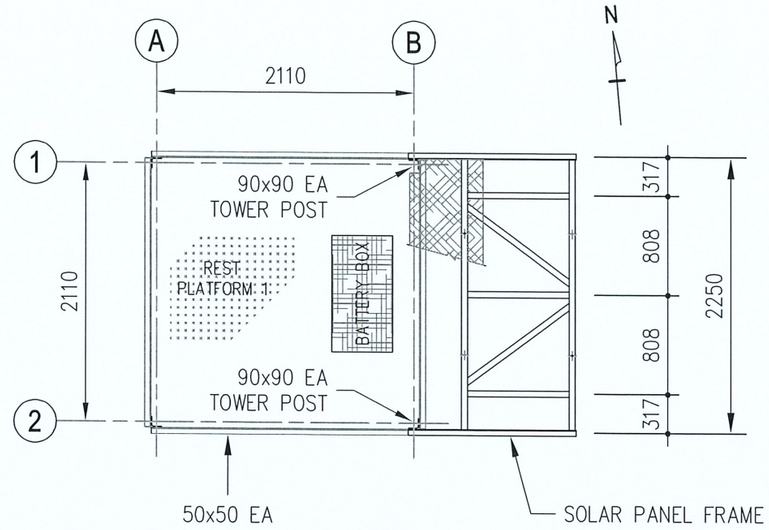
A3 ORIGINAL PAPER SIZE

PLOT DATE 12/09/2023

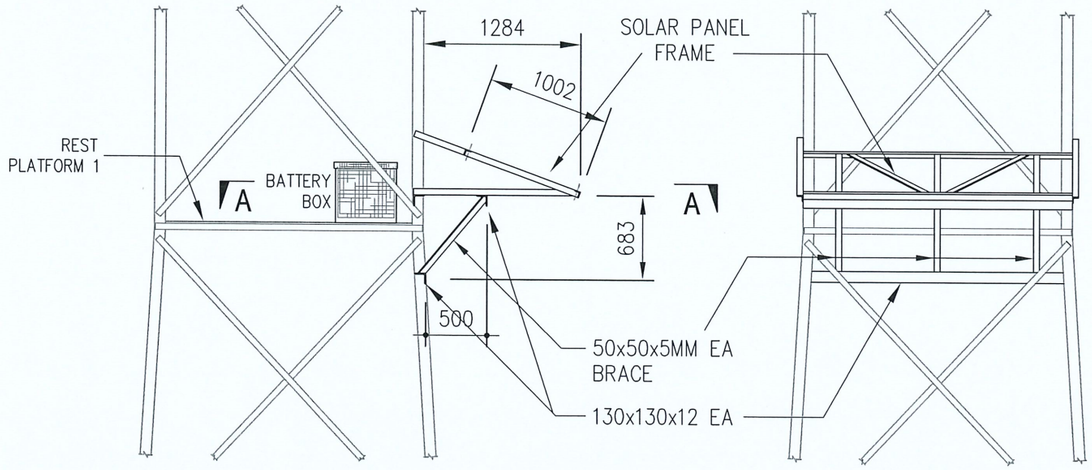


CROSS - SECTION THROUGH TOWER

Scale 1:110



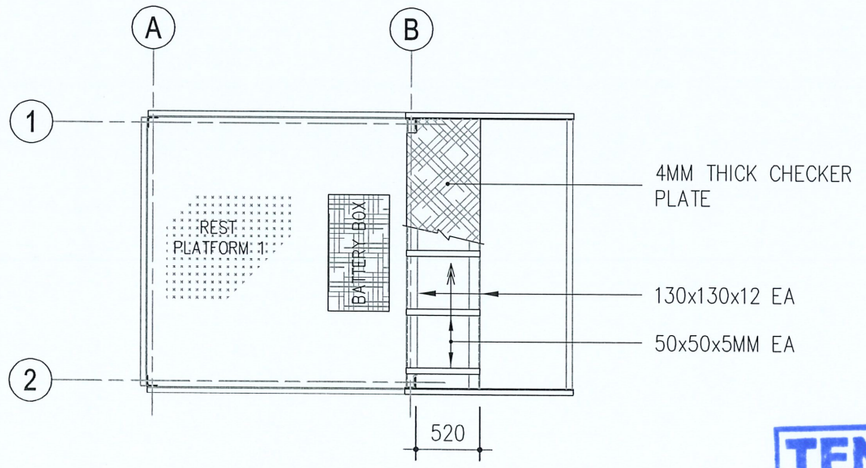
PLAN



DETAIL 'A'

Scale 1:50

ELEVATION



SECTION A - A

TENDER COPY

Notes

01. ALL SOLAR PANEL FRAME MEMBERS TO BE STAINLESS STEEL.

02. BOLTS USED TO BE HIGH TENSILE (AJAX OR SIMILAR) AND ALL BOLTS TO BE FIXED WITH WASHERS & NUTS.

03. ALL FACES TO BE BOLTED SHALL BE FREE OF PAINT, OIL, RUST, BURR ALL SURFACES TO BE ABRASIVE CLEANED AND COATED WITH ZINC SILICATE.

no.	date	details

amendments

approval	
approval	

client: MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for MPWMST	section head		
T.Vakadravuyaca	A. Pene		
principle archiveng	project archiveng		
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	plot date
	Sept 23		

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project: VATOA LIGHT TOWER SOLAR PANEL FRAME

block/sub proj.

drawing title: SOLAR PANEL FRAME GENERAL LAYOUT

scale

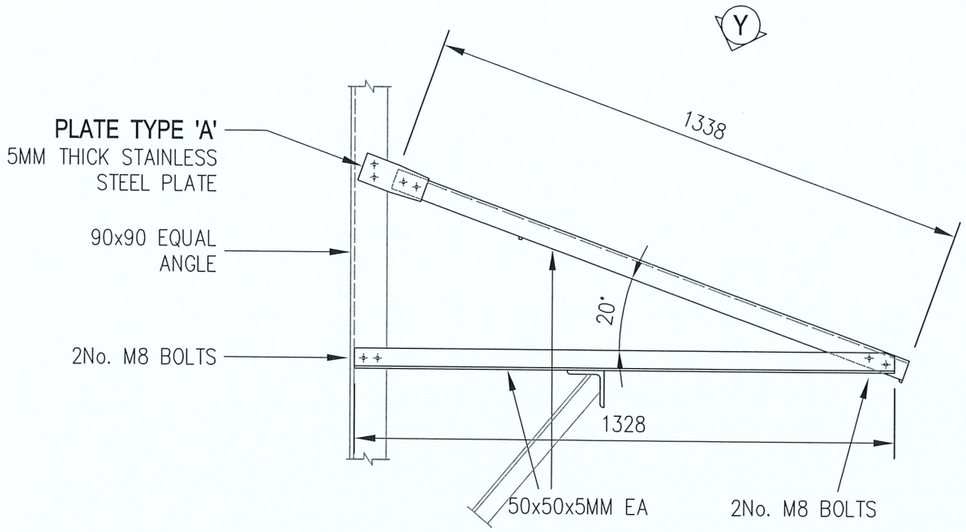
connected drawings

location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	16	

A3 ORIGINAL PAPER SIZE

PLOT DATE 19/09/2023



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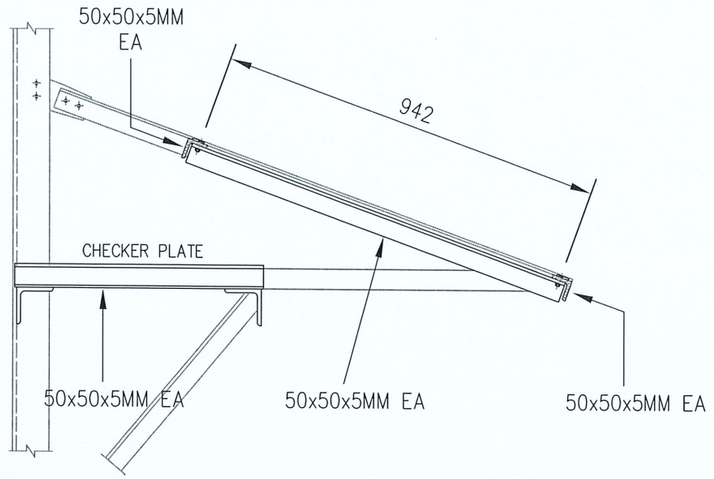
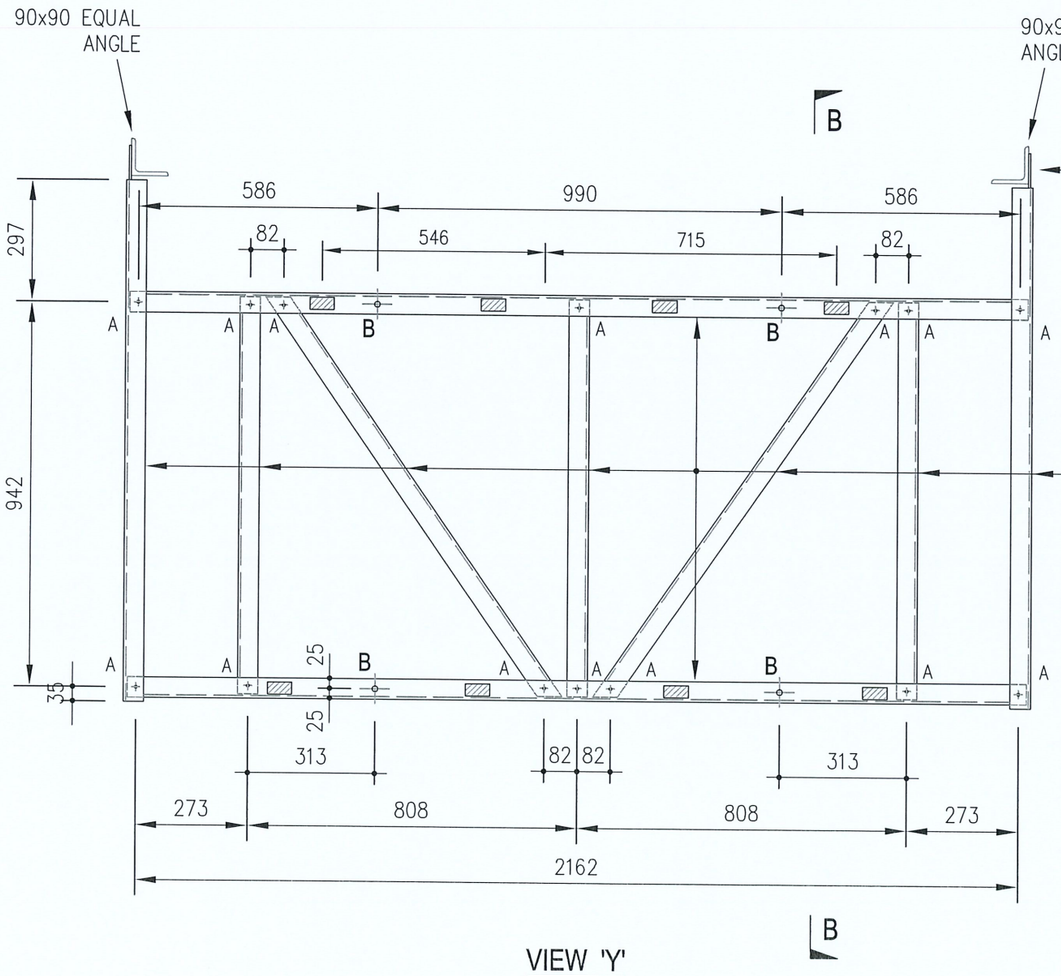


SECTION B - B



VIEW 'Y'

DRILL LEGEND

A — ø10MM HOLES TO SUIT M8 BOLTS FOR FRAME FIXING

B — ø14MM HOLE TO SUIT M12 BOLTS FROM SOLAR PANEL

60x30x5MM THICK STAINLESS STEEL PLATE WELDED ON TOP OF SOLAR FRAME

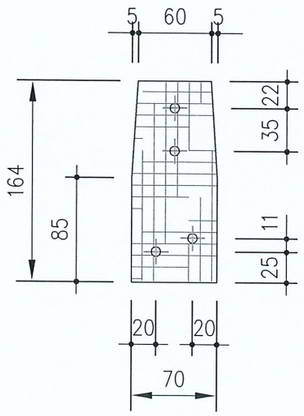


PLATE TYPE 'A' Scale 1:5

5MM THICK STAINLESS STEEL DRILLED WITH 4No. ø10MM HOLES

TENDER COPY

Notes

no.	date	details

amendments

approval

approval

client: MARITIME SAFETY AUTHORITY LVL 4. KADAVU HOUSE, SUVA

perm. sec. for MPWMST	section head	
T.Vakadravuyaca	A. Pene	
principle arch/eng	project arch/eng	
K. M. Zahidul		
surveyed	designed: K.M.Z.	drawn: TD	amend
checked	date: Sept 23	head subhead	plot date

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project: VATOA LIGHT TOWER SOLAR PANEL FRAME

block/sub proj.

drawing title: FIXING DETAIL

scale

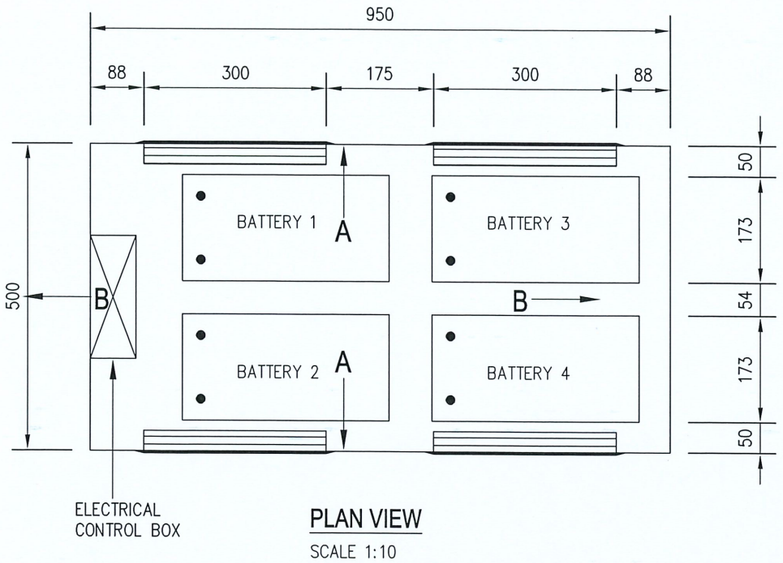
connected drawings

location no. | building no. | file no.

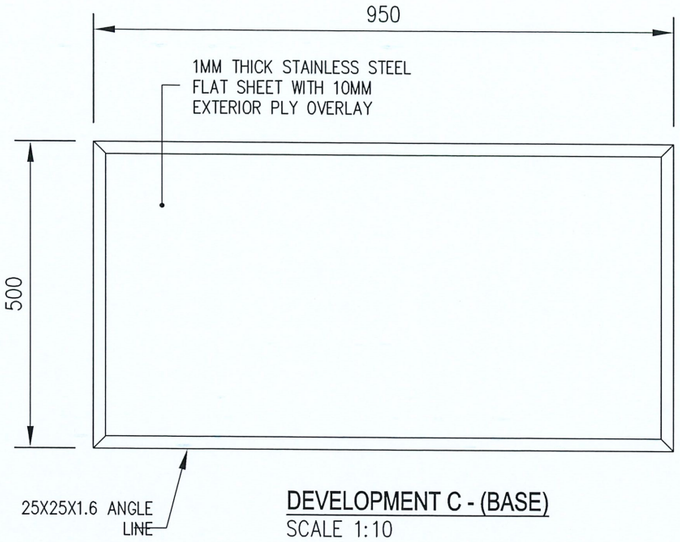
project no.	sheet no.	amend
STR 1255	17	

A3 ORIGINAL PAPER SIZE

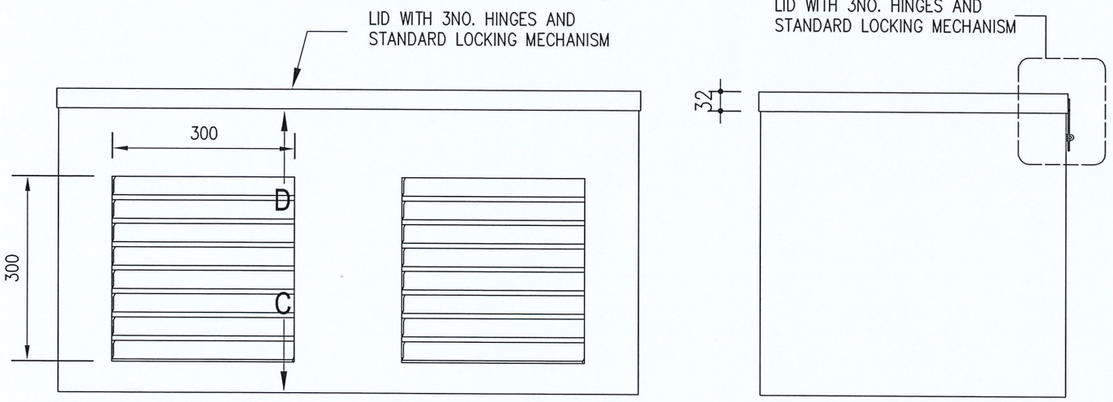
PLOT DATE 19/09/2023



PLAN VIEW
SCALE 1:10

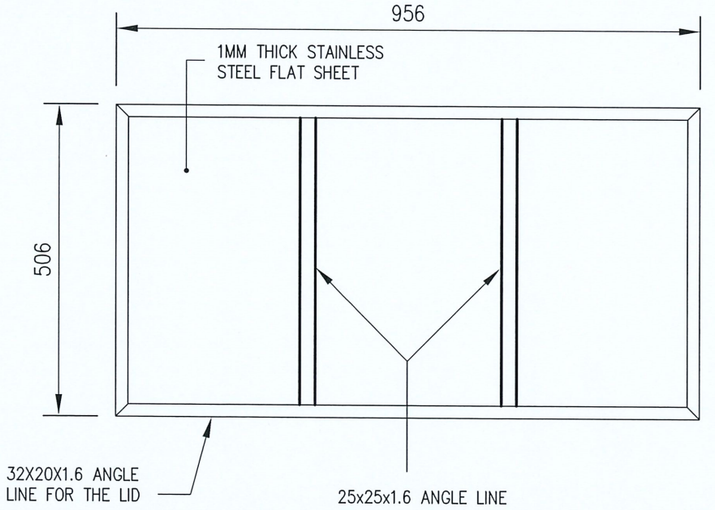


DEVELOPMENT C - (BASE)
SCALE 1:10

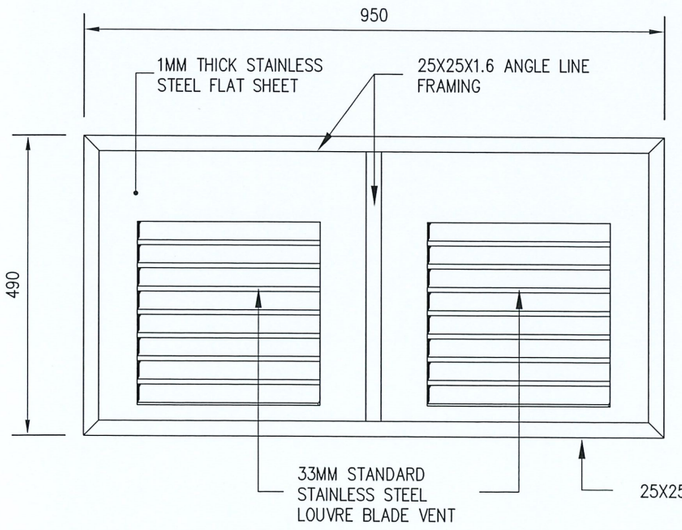


FRONT VIEW
SCALE 1:10

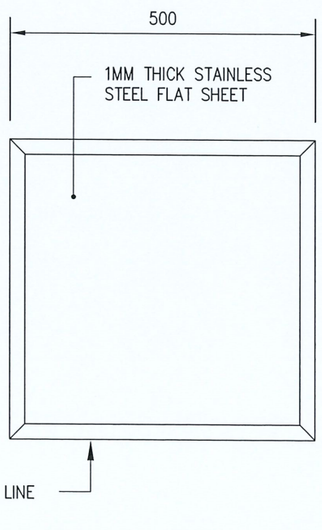
END VIEW
SCALE 1:10



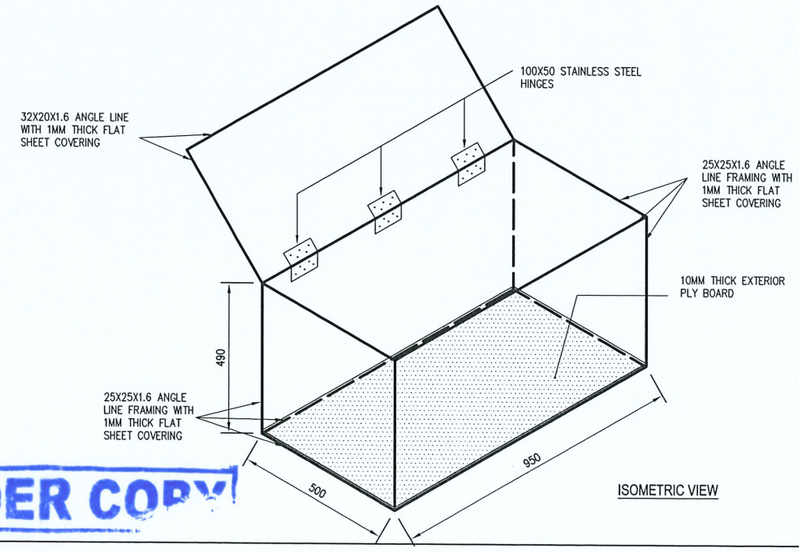
DEVELOPMENT D -(LID)
SCALE 1:10



DEVELOPMENT A
SCALE1:10



DEVELOPMENT B
SCALE1:10



ISOMETRIC VIEW

TENDER COPY

Notes

1. ALL THE MATERIALS USED FOR THE BOX TO BE STAINLESS STEEL AND CONNECTION TO ALL ELEMENTS EITHER BE RIVETED OR BRAISED WELD. ALL JOINTS TO BE WATER TIGHT WITH APPLICATION OF APPROPRIATE WATER SEALING PRODUCT.
2. PROVIDE BASE FOR THE BATTERY BOX, THE FLOOR PANEL OF THE BATTERY BOX TO BE PERFORATED AND WHICH BE OVERLAID WITH 10MM EXTERIOR PLY.
3. PROVIDE A SUITABLE LOCKING MECHANISM FOR THE BATTERY BOX (ALL TO BE STAINLESS STEEL)
4. DEVELOPMENT 'A' AND 'C' TO BE MADE FROM ONE PIECE OF SHEET AND FIXED OVER THE ANGLE FRAME
5. BATTERY BOX TO BE SITUATED AT SECOND PLATFORM FROM THE TOP (REFER DRAWINGS FOR THE POSITIONING) AND SECURED TO THE PLATFORM PROPERLY.

no.	date	details

amendments

approval	
approval	

client: MARITIME SAFETY AUTHORITY LVL 4. KADAVU HOUSE, SUVA

perm. sec. for MPWMST: T.Vakadravuyaca	section head: A. Pene
principle arch/eng: K. M. Zahidul	project arch/eng:
surveyed:	designed: K.M.Z.
drawn: TD	amend:
checked:	date: Sept 23
head subhead:	plot date:

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project: VATOA LIGHT TOWER BATTERY BOX

block/sub proj.:

drawing title: BOX FABRICATION DETAIL

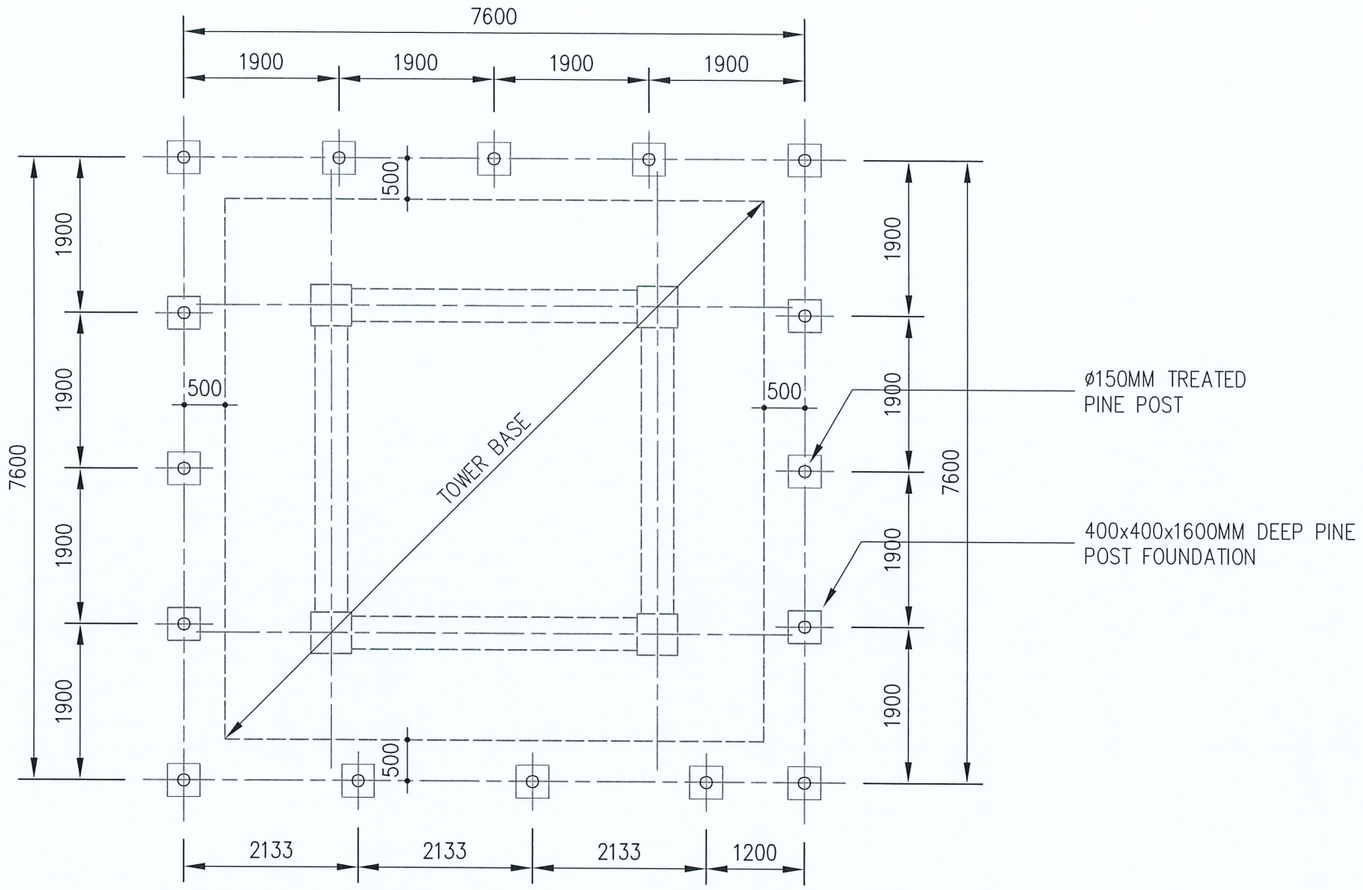
scale:

connected drawings:

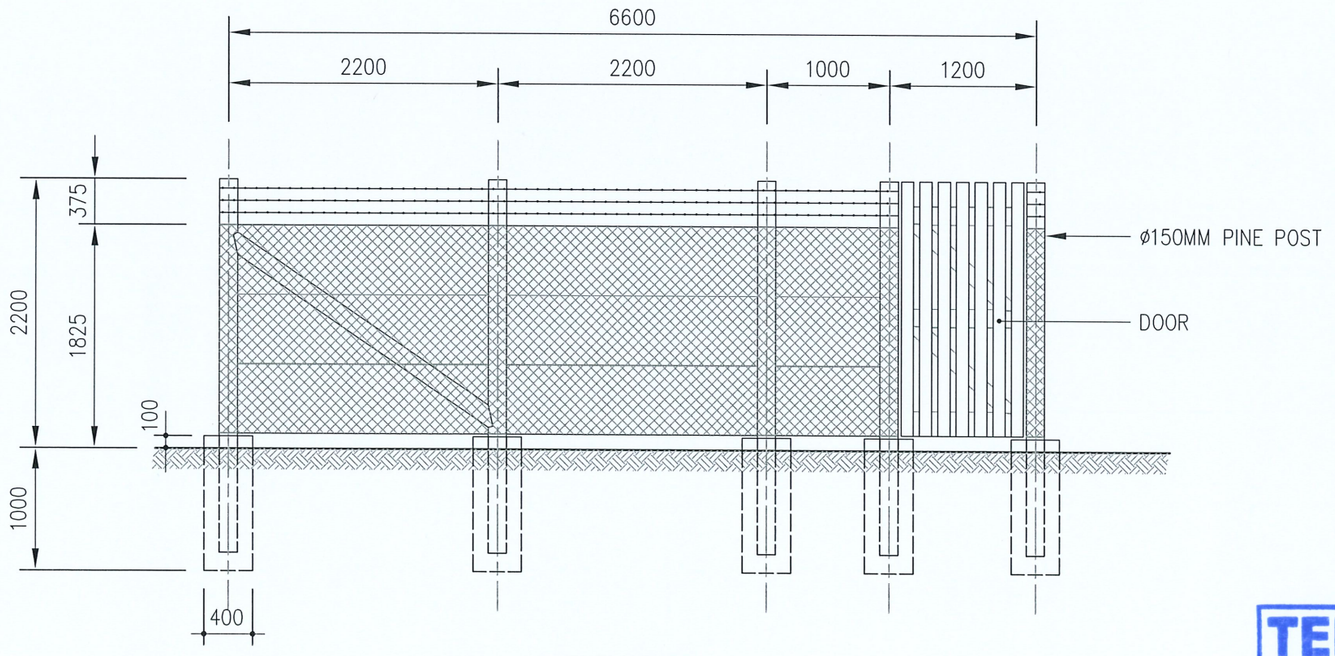
location no.	file no.
building no.	
project no.: STR 1255	sheet no.: 18
amend	

A3 ORIGINAL PAPER SIZE

PLOT DATE 19/09/2023



PLAN Scale 1:75



ELEVATION Scale 1:50

TENDER COPY

Notes

1. CONCRETE TO HAVE A CYLINDER STRENGTH OF 25MPa AT 28 DAYS.

2. PINE POSTS TO BE PRESSURE TREATED.

3. ALL FRAMING TIMBER TO BE No. 1 FRAMING GRADE, STRESS GRADE F7 & STRENGTH GRADE TO BE SD6.

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for Infrastructure	section head		
T.Vakadravuyaca	A. Pene		
principle archi/eng	project archi/eng		
K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER FENCE DETAIL

block/sub proj.

drawing title
PLAN ELEVATION DETAIL

scale As Indicated

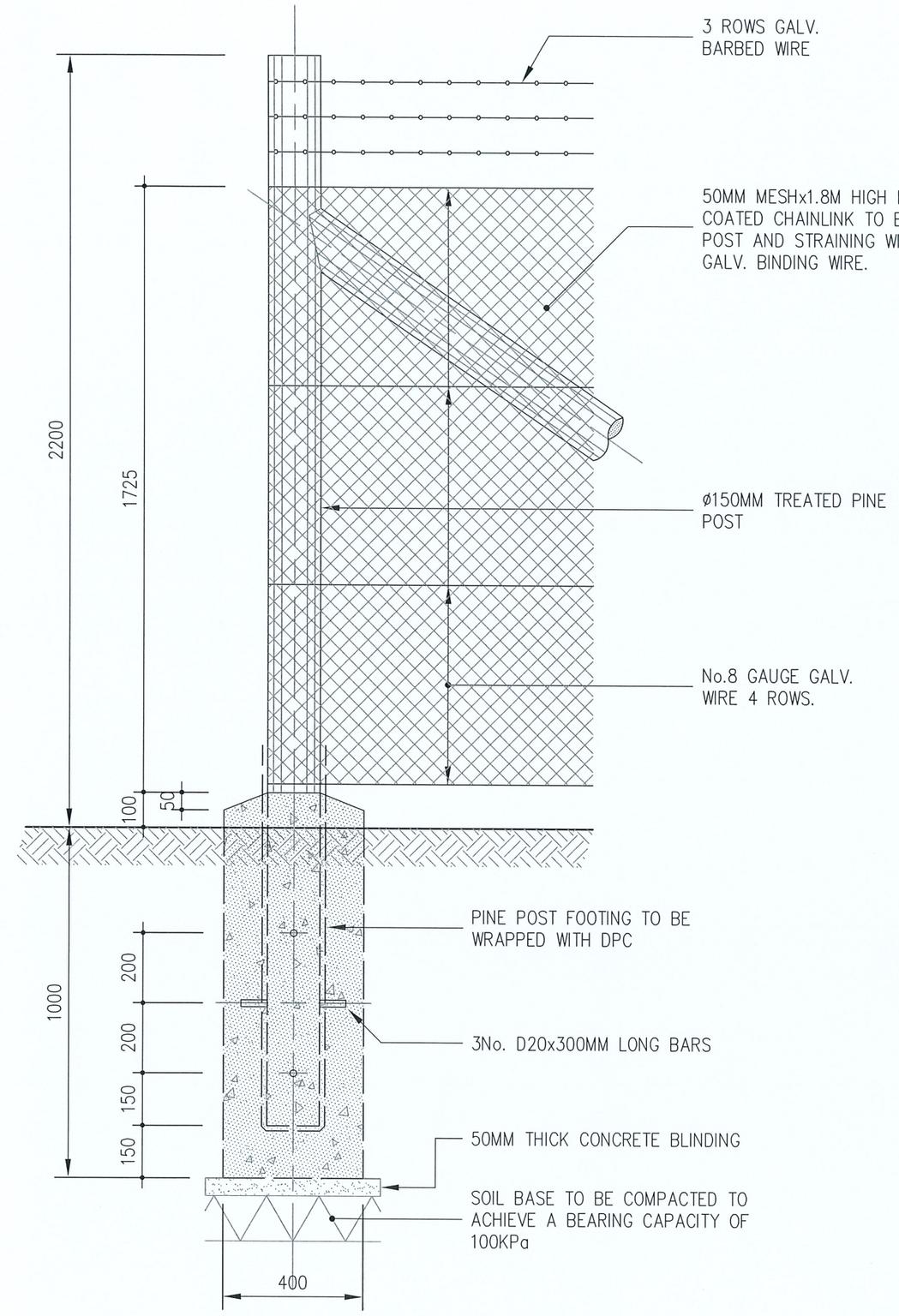
connected drawings

location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	19	

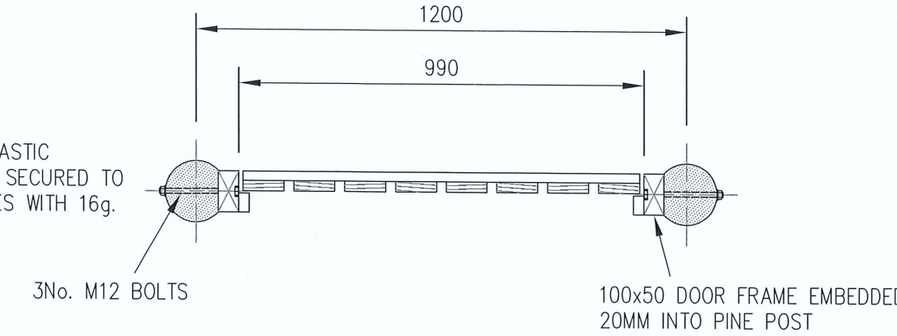
A3 ORIGINAL PAPER SIZE

PLOT DATE 14/09/2023

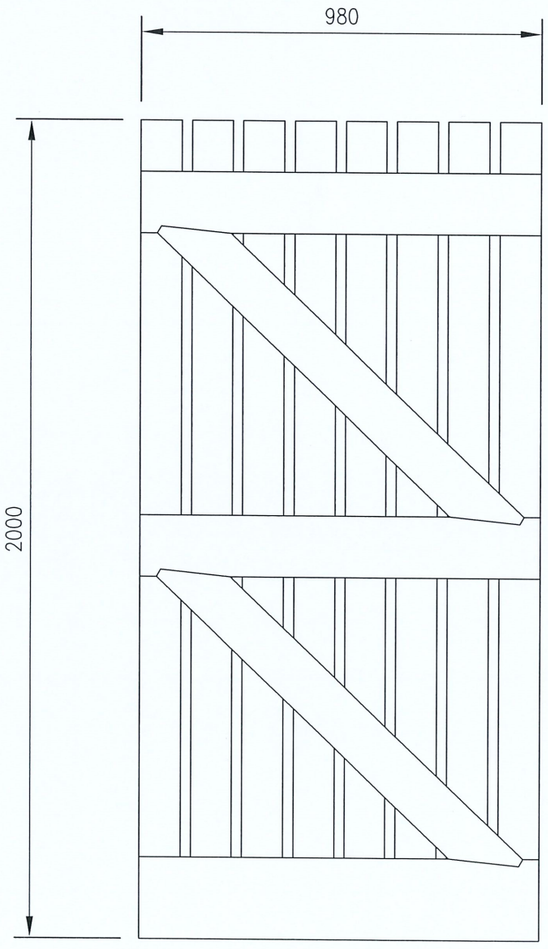


TYPICAL CORNER POST DETAIL

Scale 1:15



PLAN



TYPICAL DOG LEGGED DOOR

Scale 1:15

TENDER COPY

Notes

no.	date	details

amendments

approval

approval

client
MARITIME SAFETY AUTHORITY
LVL 4. KADAVU HOUSE, SUVA

perm. sec. for infrastructure	section head		
T.Vakadravuyaca	A. Pene		
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K. M. Zahidul			
surveyed	designed	drawn	amend
	K.M.Z.	TD	
checked	date	head subhead	check date
	Sept 23		

MINISTRY OF PUBLIC WORKS & METEOROLOGICAL SERVICES & TRANSPORT

project
VATOA LIGHT TOWER FENCE DETAIL

block/sub proj.

drawing title
POST & DOOR DETAIL

scale
As Indicated

connected drawings

location no. | building no. | file no.

project no.	sheet no.	amend
STR 1255	20	

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PLOT DATE 14/09/2023