

**Independent Public Business Corporation
The Independent State of Papua New Guinea**

**DETAILED DESIGN (PHASE 2)
ON
PORT MORESBY SEWERAGE SYSTEM
UPGRADING PROJECT
IN
THE INDEPENDENT STATE OF
PAPUA NEW GUINEA**

FINAL REPORT

PART II: Bidding Documents

Volume II – Bill of Quantities

December 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

**Independent Public Business Corporation
The Independent State of Papua New Guinea**

**PORT MORESBY SEWERAGE SYSTEM
UPGRADING PROJECT**

(JAPANESE ODA LOAN NO. PN-P9)

**BIDDING DOCUMENTS
FOR
PROCUREMENT
OF
PORT MORESBY SEWERAGE SYSTEM
UPGRADING WORKS**

**Volume 2
(Bill of Quantities)**

[Insert Month and Year]

- I. The Bills of Quantities shall be fully priced to provide a detailed breakdown of the Tender with the rate of each item inserted. Each item in the Bills of Quantities is to be priced.
 1. If any item is left unpriced, whether quantity is stated or not, it shall be deemed to have no financial value and to have the cost of executing the work described thereunder covered by rates and prices set against other items in the Bills of Quantities.
 2. If any extended item in the Bills of Quantities is found to be at variance with the amount obtained by multiplying the Bid rate by the quantity, then the Bid rate shall prevail and shall be used for determining the sum payable under the Contract.
- J. Where descriptions of items contain a classification of length, width, size or volume with upper and lower limits, it is to be noted that the extent of such classification is defined by a lower limit, which is exceeded, and an upper limit, which is not exceeded (i.e. which is a maximum). The total quantity included in the interim and final measurement of each item shall be measured to the nearest integer value for that item, or to the decimal place(s) if so indicated in the Bills of Quantities.
- K. The quantities set out in the Bills of Quantities are the estimated quantities of the work and they are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfilment of his obligations under the Contract. No claim for adjustment of Contract rates and prices arising from such variations in quantities shall be considered.
- L. The Bills of Quantities are not to be taken as sufficiently precise for ordering materials and the Contractor, in placing orders, shall be guided by the actual requirements of the work. The Bidders shall note that the Employer will not take over any materials rendered surplus.
- M. The Permanent Works shall be measured net notwithstanding any general or local custom except where otherwise specifically described or prescribed in the Contract. Due allowance shall be made in his rates for all necessary laps, cutting and waste and increase or decrease in bulk whether specifically described in the Bills of Quantities or not. Unless otherwise described or unless separate items have been measured all prices for permanent works are to include for all costs involved in the supply, installation, fixing and any temporary works, plant required necessary for the installation and fixing. Rates for materials shall include for insurance, freight, duty and import charges, handling and transport to site, storage and small quantities required by the extent of the Works.
- N. Payments against all Lump Sum items will be paid in periodic instalments (unless otherwise indicated) in proportion to the extent of which at the end of the period in question in the opinion of the Engineer the relevant services have been satisfactorily provided. Lump Sum amounts quoted by the Contractor in the Bills of Quantities for individual items of work shall deem to cover all labour, plant/equipment, material and all necessary incidentals and items to produce complete and fully functional assembly even if details shown on the drawings or described in the specification are not complete.
- O. Payment for items which are measured on a monthly basis will not be made until the full facilities described in the items and the specification have been provided to the satisfaction of the Engineer. Payment will continue until such time as the Engineer shall signify that facilities are no longer required.
- P. Items in the Bills of Quantities marked “Provisional” or “Provisional Sum” shall only be executed if ordered in writing by the Engineer and used wholly, or in part or not at

all as the Engineer may direct. The amount of work not carried out shall be deducted from the Contractor and the Contractor shall not have any right at any time to claim for delays or extra expenditure incurred by him if such works are executed only in part or not at all.

Provisional Sum items are followed by an item where the Bidders shall indicate, as a percentage, all his financial and administrative costs including costs of liaison with external agencies, profits, overheads and any other costs for the "Provisional Sum" item. This percentage will be the basis of assessing the actual amount payable to the Contractor.

This percentage shall, however, not be applied to the works carried out by the Contractor himself and valued based on the Contractor's rates in the Bills of Quantities.

- Q. Where in the Bills of Quantities, there is an item indicated as a "Prime Cost", the percentage stated in any space provided for evaluating the Contractor's overheads and profit shall be used for payment, only when the work is ordered to be done and valued in accordance with the Contract.
- R. If required by the Engineer, quotations for Specialist Work and items supplied only which are the subject of Prime Cost or Provisional Sum shall be obtained by the Contractor and submitted in good time for the Engineer's approval in order to comply with the construction programme. Where the whole or part of the work contained in the Prime Cost or Provisional Sum is carried out by the Contractor, it shall be priced at rates contained in the Bills of Quantities or pro rata thereto or as instructed or accepted by the Engineer.
- S. "Extra Over" items over and above the cost of work already measured under the main items have been provided in the Bills to facilitate pricing where additional expenses may become necessary in special situations which could not conveniently be included in the rate against the main item of work. The Bidder shall quote only the additional unit rate he requires over and above the rate that he has quoted for the main item.
- T. In addition to the breakdown of the Bid rates and amounts in the Rate Analysis Schedule attached to the Bills of Quantities, the Bidder will be required to provide the Engineer with a full and detailed Rate Breakdown within 48 hours of being so requested. The breakdown is to show the actual calculations of the Preliminaries, Labour, Plant and Materials costs for the works, the build-up of measured rates with profit and overheads and any other allowances used to arrive at the Bid Price.
- U. In submitting a Bid, the Bidder shall be deemed to have accepted and complied with all the requirements of the method of measurement prescribed herein.

II. THE CONTRACT

- A. The Contract comprises the supply, construction, completion and maintenance of the Works including the provision of all labour, materials, plant, temporary works and any incidental works whether of a temporary or permanent nature required for the completion of the Works.
- B. Generally, descriptions in the Bills of Quantities identify only definitive permanent components and do not state the tasks either basic or incidental required to be carried out by the Contractor, nor do they comprehensively register all the materials and work required. The rates inserted in the Bills of Quantities multiplied by the quantities shall be deemed to cover the full inclusive cost of the Work and shall include for all necessary operations, temporary works, compliance with the express requirements of the Specification and for all general liabilities, risk and obligations set forth or implied in the documents on which the tender is based.

- C. In certain cases, for the sake of clarity, amplification of the materials, operations and requirements to be covered is given for specific items in the preambles and item notes and reference are made to relevant clauses of the Specification. The omission of such amplification or reference in any particular case shall not prejudice the provisions stated in the first paragraph above or relieve the Contractor to satisfy himself as to have allowed all costs and expenses required in and for the proper execution and completion of the Works described or implied in the Contract as a whole.
- D. The costs of complying with the Conditions of Contract shall be covered by the rates quoted for the various items in the Bills of Quantities. The rates shall also allow for the phasing requirements of Works (if necessary) including the special arrangements in coordinating with other contractors and the effect on the programming of the Works of all traffic and drainage diversions (if any), and all the Contractor's liabilities and obligations set forth or implied in the Contract including all matters and things necessary for the proper completion of the Works.

NO ADDITIONAL PAYMENT SHALL BE MADE IN RESPECT OF ANYTHING DESCRIBED IN THE CONTRACT OR SHOWN ON THE DRAWINGS FOR WHICH APPARENTLY NO CORRESPONDING ITEM IS GIVEN IN THE BILLS OF QUANTITIES AND THE COST THEREOF SHALL BE DEEMED TO BE INCLUDED IN AND COVERED BY OTHER RATES AND PRICES IN THE BILLS OF QUANTITIES

III. THE RATES

- A. The rates and sums which are entered in the Bill of Quantities shall be the full inclusive value for the work, finished complete in every respect, whether separately or specifically described in the Contract Documents or not. The Contractor shall be deemed to have taken full account of all requirements and obligations, whether expressed or implied, covered by all parts of this Contract, and to have priced the items herein accordingly.
- B. The rates and sums must include for all incidental and contingent expenses and risks of every kind necessary to construct, complete and maintain the whole of works in accordance with the Contract.

Unless otherwise stipulated in the Instruction to Bidders or Conditions of Contract, or covered under other items in the Bills of Quantities, full allowance shall be made in the rates and/or sums, inter alia, which are referred to and/or specified herein:

- all costs arising out of quality assurance and quality control requirements;
- payment for registrations for contractors and/or suppliers in accordance with the local regulations;
- paying fees and giving notice to authorities;
- payment of all patent rights and royalties;
- all site investigations which may be necessary;
- all setting out and survey work;
- safety precautions and all measures to prevent and suppress fire and other hazards;
- interference to the works by persons, vehicles, vessels and the like using the existing land and water facilities;
- full maintenance of access to the existing roads and waterways during the period of construction;
- works in connection with the protection and safety of adjacent structures;
- maintaining public roads and footpaths and maintaining access upon existing roads or recognized routes;
- temporary fencing, watching, and lighting;

- supporting faces of excavation, temporary or permanent shoring, shuttering & scaffolding etc.
 - dewatering, if required, and working in the dry except where otherwise permitted by the specification;
 - supply, inspection, sampling and testing of materials and of the Works under construction, including the provision and use of equipment;
 - providing, transporting to site, setting to work, operating (including all fuel and consumable stores), maintaining and removing from the site upon completion all construction plant and equipment necessary for the execution of the work, including the cost of all tests and other requirements in respect to such plant and equipment;
 - recruitment, bringing to and from the site, accommodating and feeding and all incidental costs and expenses involved in the provision of all necessary skilled and unskilled labour and supervision;
 - supplying, maintaining and removing on completion the Contractor's own accommodation, offices, stores, workshops, transport, welfare services and all charges in connection therewith;
 - reinstatement of the site to the satisfaction of the Engineer;
 - all costs of design, drawings, and related data for materials, pipework and equipment;
 - all costs arising out of inspection and testing at manufacturers' works before dispatch of materials, pipework and equipment;
 - all ancillary parts, minor fittings, bolts, nuts, gaskets, washers, fixings, etc. joining materials, protective coating and sleeving and other items not specifically listed, but necessary for the proper installation of the materials, pipework and equipment;
 - all costs of packaging and protection for export and storage for materials, pipework and equipment;
 - all costs of freight, insurance and related documentation for shipment to Papua New Guinea for materials, pipework and equipment;
 - all costs of custom duty, cess, GST, surcharges and excise duty etc for materials, pipework and equipment;
 - all costs of unloading at the port, road transport, offloading, stacking and storage in temporary sheds or weather proof sheds etc. and double handling as required at site for materials, pipework and equipment;
 - drawings and reports as specified and otherwise required during the execution of the works;
 - Contractor's indirect costs and profit in conjunction with the execution of the work.
- C. No claim will be considered for further payment in respect of any work or method of execution, which may be described in the Contract or is inherent in the construction of the work and detailed on the drawings on account of:
- extra work ordered by the Engineer but necessitated due to the negligence of, or any other shortcomings of, the Contractor;
 - items omitted from the Bill of Quantities, but depicted on the drawings;
 - any omission from the wording of the items or from a clause in the Preamble; or
 - no mention of such work or method of execution having been in the Preamble.
- D. The Contractor shall be deemed to have taken into account all of the following in his Tender prices and his construction programmes:
- all recognized holidays, festivals, religious and other customs;
 - any stoppage of work or delays due to adverse weather conditions.

- E. The rates and sums entered by the Contractor against all items in the Bill of Quantities shall bear a proper relationship to the cost of carrying out the work described in the Contract. All on-costs and similar charges which are applicable to the Contract as a whole are to be spread over all the rates in the Bill of Quantities, whilst those which are applicable only to particular sections of the Contract are only to be spread over items to which those sections refer.
- F. Rates for all items shall include for complying with the recognised standard of workmanship and specification and any manufacturer's instruction. The words "rates" and "prices" shall have the same meaning throughout these Bills of Quantities.
- G. Items against which no price is entered shall be deemed to be covered by other rates and prices in the Bills of Quantities.
- H. Except where stated to the contrary all rates for items including excavated materials obtained outside the Site shall be deemed to include for all royalties and dues which the Contractor may be required to pay.

IV. METHOD OF MEASUREMENTS

- A. These Bills of Quantities have been measured for the purpose of ascertaining the value of all variations or remeasurement. In any case, the Engineer shall be empowered to decide on the appropriate method of measurement to be used.
- B. The quantities stated in the Bills of Quantities are provisional only.
They are given so that Tenders can be complied and compared on an equal basis and are no guarantee that such quantities will in fact be required nor will not be exceeded. The total amount to be paid to the Contractor upon completion of this Contract shall be ascertained by remeasurement of the completed works as they are actually executed. The valuation of such remeasured quantities shall be upon the basis of the rates set down by the Contractor in the Bills of Quantities or the rates as adjusted by the Engineer as described.
- C. All measurements are strictly net unless otherwise stated, the unit rates quoted by the Contractor will be deemed to cover tolerance, penetration, working space, overbreaks, waste, etc. and the work will be measured to the net finished limits as indicated on the Drawings or as specified in the specification.
- D. No separate measurement shall be made in respect of items whether specified or not, requiring mortar/sealant; building in or fixing to blockwork, concrete, metalwork or timber; painting and protective treatment; welding; drilling; bolting, inclusive of bolts, nuts and washers; screws, nails and plugs; jointing and joint materials; formwork; boxing out and filling thereof; grouting; packing; bedding; insulation between different metals; making good; conduits and fittings; cutting; waste; labour; materials; temporary works; constructional plant; storing; handling; and all incidental work to the items concerned and their surroundings.

PREAMBLE TO THE BILLS OF QUANTITIES

GENERAL

I. GENERAL

- A. This Preamble shall be applied for the following parts of Bills of Quantities:
- Vol. IV Priced Bill of Quantities
- B. The preambles are prepared for the guidance of the Bidders in pricing the Works. The Bidders is to include, within the prices for the item contained in the Bills of Quantities, for all works both for temporary and permanent purposes in order to complete the contract as shown on the Drawings or as detailed in the Specification whether or not it is described in the Bills of Quantities or in the preambles thereto.
- C. The Preambles herein shall apply to the whole of the Works regardless of the Trade Headings under which they have been described and shall be read in conjunction with the accompanying Bills of Quantities and shall be taken into account when pricing these Bills of Quantities. These Bills of Quantities are to be read in conjunction with the Instruction to Bidders, Conditions of Contract, Specifications and Contract Drawings.
- D. In the Bills of Quantities, the sub-headings and item descriptions identify the work covered by the respective items, but the exact nature and extent of the work to be performed is to be ascertained by reference to the Drawings, Specification, Instructions to Bidders and Conditions of Contract as the case may be, read in conjunction with the matters listed against the relevant headings as described hereinafter.
- E. Differences in the method of billing and in the phraseology used in various parts of the Bills of Quantities will not be recognised as a basis of any claim for an increase in the Contract Price.
- F. The Bidders must refer to the Specification and Drawings to determine the full extent and requirement of the Works and are not necessarily repeated in the Bills of Quantities to be priced. The cost of any works which he considers is not covered by items in the Bills of Quantities shall be deemed to be included in and covered by other rates and prices in the Bills of Quantities. No consideration will be given, after the Contract is let or during the course of the contract, to any items not so listed either in any final measurement or the measurement of variations.
- G. The Contractor will have been deemed to have examined the Drawings, Specification, General Conditions of Contract and Bills of Quantities and have provided in his Tender for everything necessary including any overtime and shift working to complete the whole of the works in the section required and in accordance with the programme as set out in the Instruction to Bidders or as otherwise agreed and to maintain the works all in accordance with the Contract. A reference clause number set against any item in the Bills of Quantities indicates a clause in the Specifications in which work or material covered by the item is described. Further requirements for the work or material in question may also be stated in other clauses in the Specifications or in the Conditions of Contract or in the Drawings. Rate shall be deemed to cover also the cost of complying with any such further requirements.
- H. The Contractor will be held to have familiarised himself with all site conditions, any borehole and probe records, means of access and locality of existing services, in order to execute the works measured and described hereafter. No claim for want of knowledge in this respect will be reimbursed.

Part I

Preamble to the Bill of Quantities

Section I

General Requirements

SECTION 1

GENERAL REQUIREMENTS

1.01 General

A. The following definitions/terms shall be observed throughout Section 1 for determining the amount of progress payments to Contractor for the General and Preliminaries Items where the unit measurement is in Lump Sum:

1. This method of measurement for payment is subject to the Engineer's discretion to determine the payment amount which he deems fair and reasonable.
2. Proportion for the value of actual work done including approved variation works shall be determined by dividing the total value of work done including approved net cost variation works as at the end of a defined period by the sum of all Bills (excluding Bill Section 1), i.e.,

$$V = \frac{\text{Value of Work done}}{\text{(Bill Section 2 + Bill Section 3 + up to the last Section)}}$$

3. Programme period shall be the construction period allowed for in the Contract and which shall be adjusted to any recognised or anticipated delay.

- B. Except as provided for in the Bills of Quantities, no separate valuation shall be made for complying with the requirements of [Division 1 of Vol. IIIA General Specification of the Technical Specifications](#).
- C. The preliminary items shall be measured and paid for by Unit Rate or Lump Sum respectively for every item provided and accepted in accordance with the Specification and to the satisfaction of the Engineer.
- D. The preliminary items for which the measurement unit is in terms of duration, such items shall be measured for the actual period for which the facilities, services, etc. are actually provided as required in accordance with the construction programme.
- E. Measurement will commence only after the completion of the mobilization period and on the day by agreement of the Engineer, the facilities, services, etc., are fully provided.
- F. The above instalments can be suspended, reduced or deleted from any Contract Payment, if, in the opinion of the Engineer, the Contractor is not fulfilling his obligations under the Contract.

1.02 Contractual Requirements

A. Insurance Policies (BOQ Item 1)

The unit of measurement for all insurances shall be lump sum.

The measurement for payment of insurance shall be in a lump sum for each of the insurance itemised above upon submission of the receipts with respect to the above mentioned and the balance shall be paid according to the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

B. Performance Bond (BOQ Item 2)

The unit of measurement shall be lump sum.

The Contractor shall be paid an initial amount up to the receipt value (upon submission of receipts), and the balance shall be paid according to the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

1.03 **Specified Requirements**

A. Engineer's Office and Mobile Phone (BOQ Item 3)

The unit of measurement for:

- 1 provision and erection;
- 2 removal

shall be lump sum.

The items for provision and erection of office shall include:-

- 1 provision and preparation of site;
- 2 foundations, bases and hand railings;
- 3 water, sanitation, power and lighting services;
- 4 fences, notice and direction boards;
- 5 vehicle access, hard standings, parking areas and foot paths;
- 6 office, furnishing, fittings, supplies and initial consumable stores.
- 7 procurement of all equipment, mobile phones (including accessories, chargers, hands free sets, and payment for all registration, charges), and furnishing as specified (mobile telephones shall be revert back to the Contractor upon completion).

The items for removal of office shall include:-

- 1 receiving back from the Engineer and removing equipment, furniture, fittings and supplies off site;
- 2 disconnecting and removing services and sealing off disused services;
- 3 disposal of surplus materials;
- 4 reinstatement of the site occupied by the office accommodation.

The Contractor shall be paid an initial amount of 50% upon completion of office accommodation and ready to use; 30% will then be paid progressively based on the programme period for the duration of the Contract. The final amount of 20% shall be paid upon removal of this office accommodation and clearing up of site.

B. Maintenance of Engineer's Office and Mobile Phone (BOQ Item 4)

The unit of measurement shall be month for which the offices are used by the Engineer.

The items for maintaining office shall include:-

- 1 charges for utilities as specified;
- 2 depreciation and maintenance of buildings, services, fences, notice and direction boards, vehicle access, parking areas, hard standings and footpath;
- 3 depreciation and maintenance of office equipment furnishings, fittings and supplies;
- 4 cleaning accommodation;
- 5 replenishment of consumable stores.
- 6 Attendance required by the Engineer.

The measurement of servicing offices for the Engineer until the completion of the Works shall be in a continuous period from the occupation and the use of those offices until the issuance of the certificate of completion and Making Good Defects by the Engineer in accordance with [Clause 45 \(e\) of the Conditions of Contract](#).

C. Provision and Maintenance of Site Testing Laboratory for Soil and Concrete and removal on completion (BOQ Item 5)

The unit of measurement for:

- 1 provision and erection;
- 2 removal

shall be lump sum.

The items for provision and erection of Site Testing Laboratory shall include:-

- 1 provision and preparation of site;
- 2 foundations, bases and hand railings;
- 3 water, sanitation, power and lighting services;
- 4 fences, notice and direction boards;
- 5 vehicle access, hard standings, parking areas and foot paths;
- 8 office, furnishing, fittings, supplies and initial consumable stores.
- 9 procurement of all equipment, , and furnishing as specified.

The items for removal of office shall include:-

- 1 receiving back from the Engineer and removing equipment, furniture, fittings and supplies off site;
- 2 disconnecting and removing services and sealing off disused services;
- 3 disposal of surplus materials;
- 4 reinstatement of the site occupied by the laboratory.

The items for maintaining laboratory shall include:-

- 1 charges for utilities as specified;
- 2 depreciation and maintenance of buildings, services, fences, notice and direction boards, vehicle access, parking areas, hard standings and footpath;
- 3 depreciation and maintenance of equipment, furnishings, fittings and supplies;
- 4 replenishment of consumable stores.
- 5 Attendance required by the Engineer.

The Contractor shall be paid an initial amount of 50% upon completion of laboratory and ready to use; 30% will then be paid progressively based on the programme period for the duration of the Contract. The final amount of 20% shall be paid upon removal of laboratory and clearing up of site.

D. Provision of Vehicle (BOQ Item 6)

The unit of measurement for vehicles required for the Engineer's use shall be lump sum.

The items for vehicles for the Engineer and his staff shall include:-

- (a) provision of the vehicle type and quantities as specified;
- (b) taxes for use on public highway and for carriage of goods and samples;

- (c) comprehensive insurance covering the Engineer and any drivers authorised by him and the carriage of goods and samples;
- (d) provision of suitable replacement including equipment when a regular vehicle is not available or unserviceable for more than 24 hours;
- (e) depreciation;
- (f) collection from site when the vehicle is returned;
- (g) overtime used.
- (h) on completion vehicle to be reverted back to the Contractor.

The Contractor shall be paid upon delivery of all specified vehicles at site and acceptance by the Engineer.

E. Maintenance of Site Vehicle (BOQ Item 7)

The unit of measurement shall be by vehicle-month.

The items for maintenance of site vehicle shall include:-

- 1 payment of all taxes, insurances and other charges;
- 2 provision of fuel and oil;
- 3 maintenance in a road-worthy condition and in conformity with the vehicle manufacturers recommendations and necessary repair.

Payment shall be made progressively based on the actual vehicle-month.

F. Contractor's Temporary Site Facilities and removal on Completion (BOQ Item 8)

The unit of measurement for:-

- 1 provision and erection;
- 2 servicing/maintenance;
- 3 removal

shall be lump sum.

The items for provision and erection, servicing and removal of the Contractor's Office and Accommodation shall include for everything required by the Contractor.

The measurement of servicing Contractor's office, stores, etc. until completion of Works shall be the programme period from the occupation and use of those office and certified by the Engineer in accordance with [Clause 39 \(b\) of the Conditions of Contract](#).

The Contractor shall be paid in the following manner:-

- 1 An initial amount of 50% shall be paid upon erection;
- 2 An amount of 30% shall be paid progressively based on the programme period for the duration of the Contract;
- 3 A final amount of 20% shall be paid upon removal and clearing up of site.

G. Pre-Condition Survey and Initial Photographs (BOQ Item 9)

The unit of measurement for pre-condition survey and initial photographs shall be lump sum.

The item for pre-condition survey shall include:-

- 1 topographic survey of the construction site including roadway cross section by a professional licensed surveyor;
- 2 all survey instruments and equipment required by the survey;

- 3 surveyors, chainmen and attendance;
- 4 all materials required for establishing and maintaining survey stations, benchmarks and the like;
- 5 all attendance required and setting out records and data required for the Works;
- 6 maintain all survey and setting out records and data required for the Works.

The items for initial photographs shall include:-

- 1 delivery and supply to the Engineer's office;
- 2 identification marking on the prints and soft files.

The Contractor shall be paid upon delivery of all pre-condition survey and photographs as required and acceptance by the Engineer.

H. Monthly Progress Reports and Photographs of the Works (BOQ Item 10)

The unit of measurement for the monthly progress reports and photographs shall be month.

The items for progress reports and photographs shall include:-

- 1 delivery and supply to the Engineer's office;
- 2 identification marking on the prints and soft files.

The measurement for payment shall be based on the actual months for the duration of the Contract.

I. Inspection and Testing of Materials by the Engineer at Manufacturer's Works (BOQ Item 11)

The unit of measurement for the inspection and testing of materials at Manufacturer's works shall be lump sum.

The item for the inspection and testing of materials works shall include:-

- 1 cost of all samples and materials for testing including obtaining them and all costs in connection therewith;
- 2 cost of transporting, storing and protecting the samples and materials;
- 3 cost of all necessary testing equipment;
- 4 cost of supervision and labour required to carry out the tests;
- 5 providing test reports to the Engineer;
- 6 attendance including overheads and profits.

The Contractor shall be paid based on the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

J. Preparation and Submission of As-built Drawings, Construction Records, and O&M Manuals for Equipment (BOQ Item 12)

The unit of measurement for as-built drawings, construction records, and O&M manuals for equipment shall be lump sum.

The items for preparation and submission as-built drawings with microfilming, construction records, and O&M manuals for equipment shall include:-

- 1 preparation of drawing and details of completed works to the size and format directed by the Engineer;

- 2 providing labour, tools and equipment necessary to take measurement and obtaining such information on site as are required by the Engineer for the preparation of as-built drawings;
- 3 confirming correctness of as-built drawings;
- 4 printing and delivery of all approved as-built drawings and microfilms to the Engineer.
- 5 preparation and submission of construction records and O&M manuals of equipment.

The payment shall be made upon submission and approval of the as-built drawings by the Engineer.

K. Preparation of Environmental Management Plan (BOQ Item 13)

The unit of measurement for preparation of Environmental Management Plan shall be lump sum.

The rates shall include preparation of the Environmental Management Plan (EMP) and submission to the Department of Environment (DOE) with copy to the Engineer.

The Contractor shall be paid for upon acceptance of the EMP by DOE.

L. Conduct Environmental Monitoring (BOQ Item 14)

The unit of measurement for conduct of Environmental Monitoring shall be month.

The rates shall include for:-

- (a) Conduct of monthly environmental monitoring inclusive of all personnel, equipment, laboratory testing for the proper execution of the works.
- (b) Submission of monthly environmental monitoring reports to the Engineer as required.
- (c) Submission of quarterly environmental monitoring reports to the DOE with copy to the Engineer.
- (d) Submission of quarterly environmental compliance reports to the DOE with copy to the Engineer.

M. Mobilisation and Demobilisation (BOQ Item 15)

The unit of measurement for mobilisation and demobilisation shall be lump sum.

The item for Mobilisation and Demobilisation in the Bills of Quantities is understood to be full compensation for furnishing all labour, materials, tools, equipment and incidentals necessary to do all work required for moving in the site and shall include payment for:-

- (a) transportation of and installation of all construction plants necessary to complete the works from places of assembly in Papua New Guinea or other sites to the sites where they are to be used on the works.
- (b) dismantling and removal of all installation and construction plant and equipment required by these specifications and clearing up of site upon completion of Works so that the site is restored in a neat and tidy condition to the satisfaction of the Engineer.

Contractor shall be paid an initial amount of 70% upon mobilisation of all plants, equipment and labour for proper execution of the Works and the payment shall be progressive to plant schedule. The balance of 30% shall be paid upon removal of the above and clearing up of site upon completion of Works.

N. Contractor's Project Management, Site Superintendence and Control (BOQ Item 16)

The unit of measurement shall be lump sum.

The rates for the provision shall be used to value any provision to be provided during the contract period. The rates shall include for:-

- 1 the wages and other emoluments paid to the site superintendence staffs exclusive of overtime payment;
- 2 the site superintendence staffs working the contractor's normal working hour if so required by the Engineer;
- 3 costs and expenses incurred consequent upon the employment or hiring of the site superintendence staffs including payment of employee provident fund, insurance, medical and hospitalisation;
- 4 replacement of unsuitable site superintendence staffs;
- 5 substitution of site agent/ staff when the appointed site agent/ staff is absent or on leave.
- 6 Co-ordination with the Employer and consideration of their technical requirements, including the requirement not to affect the operation of existing treatment facilities where construction works are to be undertaken at existing operational locations.

The Contractor shall be paid based on the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

O. Watching, Lighting and Guarding (BOQ Item 17)

The unit of measurement for Watching, Lighting and Guarding shall be lump sum.

The measurement for payment shall be made according to the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

P. Health and Safety Requirement (BOQ Item 18)

The unit of measurement for Safety Measures shall be lump sum.

The items for safety measures shall include:-

- 1 provision of temporary fencing, barriers, warning notices throughout the duration of Contract and removal upon completion of Works;
- 2 provision of protective gears, safety helmets, fluorescent jackets, safety boots and other necessary safety gadgets throughout the duration of Contract;
- 3 compliance with all requirements of Occupational Safety and Health Act and all safe construction practices.

The measurement for payment shall be made according to the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

Q. Signage and Traffic Diversion (BOQ Item 19)

The unit of measurement for the project signboard, temporary signage for road safety and warning, and traffic diversion and control shall be lump sum.

The items for signage and traffic diversion shall comprise of project signboard, warning and safety signs, traffic diversion and control required during the contract duration and shall also include:-

- 1 preparation of diversion plans for submission to the Engineer and relevant authorities for prior approval;
- 2 securing of permits from relevant authorities in connection therewith;
- 1 implementation of necessary partial road closures, traffic diversions, traffic control, signalling, flagging, and other necessary works associated therewith during construction works;

- 2 provision of warning signs, road markings, barricades, traffic control devices, hazard lamps, and other necessary equipment associated therewith.
- 3 painting, reflectorisation and illumination;
- 4 cleaning, maintaining and repairing;
- 5 dismantling and removing from site;
- 6 unless otherwise stated in the contract, reinstatement of surfaces.
- 7 Other works necessary to complete all work stated above.

The measurement for payment shall be made according to the value or equivalent amount of actual work done in the proportion as described in Section 1 – Clause 1.01A.

R. Setting Out and As – Built Survey (BOQ Item 20)

The unit of measurement for setting out and as-built survey shall be lump sum.

The item for setting out shall include:-

- 1 topographic survey of the mainline and all local roads including roadway cross section by a professional licensed surveyor as directed by the Engineer;
- 2 all survey instruments and equipment required by the survey;
- 3 surveyors, chainmen and attendance;
- 4 all materials required for establishing and maintaining survey stations, bench marks and the like;
- 5 all attendance required and setting out records and data required for the Works;
- 6 maintain all survey and setting out records and data required for the Works.

The method of payment shall be 70% progressively based on the programme period for carrying out all survey works and conducting as-built survey for the duration of the Contract.

The remaining 30% shall be paid upon finishing and completion of all survey works.

S. Search of Utility Records and Conduct Utility Surveys (BOQ Item 21)

The unit of measurement shall be lump sum.

The search for utility records shall also include conducting all the necessary site investigation and utility surveys to identify the nature and location of the utilities, using non-destructive utility detection methods and trial pits (if allowed by authorities).

The Contractor shall be paid according to the value or equivalent amount of actual work done.

T. Provision of Setting Out and Survey Instruments for Engineer's Use. (BOQ Item 22)

The unit of measurement for the provision and maintenance of

- 1 survey instruments;
- 2 setting out instruments

shall be lump sum.

The item for the provision of setting out and survey instruments shall include:-

- 1 provision of setting out and survey instruments in accordance to the requirement and particulars of the specification;
- 2 provide suitable replacement when the regular instrument is not available for more than 24 hours;
- 3 depreciation;

- 4 maintenance to a working order condition.
- 5 All survey work comprising of topographic survey and setting out including chaining, levelling, and checking the condition of the existing facilities including production of the results of all surveys and reports as specified/directed by the Engineer.
 - i) Provision of all survey drawings, results of all surveys, design drawings, as-built record drawings, etc. prepared on an electronic medium and printed as approved by the Engineer including the provision of assistance to the Engineer and all costs in connection therewith.
 - ii) Allowance shall be made in the rates for repeating survey work and/or results of surveys, reports and testing as directed by the Engineer.
 - iii) All trial holes, sampling and tests necessary in order to ensure compliance with the requirements of the Specification.

The measurement for payment for provision and maintenance of survey and setting out instruments shall be in the following manner:-

- 1 70% upon receipt and approval for all instruments supplied;
- 2 30% for maintaining to working order based on the programme period for the duration of the Contract.

U. Service of the Chainman for Engineer's Use (BOQ Item 23)

The unit of measurement shall be per day basis.

The Contractor shall be paid at the quoted rate per chainman – day of normal working hours.

V. First Aid Facilities (BOQ Item 24)

The unit of measurement shall be lump sum.

The item for the first-aid facilities shall include :

- 1 Provision of First-aid facilities.
- 2 Maintenance and replenishment of consumed items.

Payment shall be made progressively based on the programme period for the duration of the Contract.

W. Site Utilities and Environmental Control Facilities (BOQ Item 25)

The unit of measurement for all site utilities and facilities required for the construction work shall be lump sum.

The measurement for payment (method of payment) shall be 10% initially upon installation of electrical supply, water supply, sanitary facilities, telephone system, fax machine and other utilities and facilities as may deem necessary.

The remaining 90% shall be paid progressively based on the programme period on utilisation of electricity, water, telephone, fax and other necessities as well as for cleaning and refuse collection services as necessary for the Works within the duration of the Contract.

X. One-Year Training for Operators after Completion (BOQ Item 26)

The unit of measurement for training or operators shall be lump sum.

The item for training shall include:-

- 1 preparation of all training material;

- 2 costs of personnel participating as trainers, including remuneration, transportation, accommodation, per diem, and all incidentals necessary to assign and dispatch personnel, and conduct the training as specified;
- 3 cost of other expenses required for training except for operating expenses for the treatment facilities, which will be under the responsibility of operators;
- 4 cost of providing venue for lectures or seminars as necessary;
- 5 all other costs and expenses required for conducting the training.

Contractor shall be paid an initial amount of 10% upon official notice of commencement of training by the Contractor. The amount of 30% shall be paid after six months from the commencement of training. The balance of 60% shall be paid upon completion and acceptance of the training by the Engineer.

- Y. Provisional sum for providing of deposits, bank guarantees, and payment of all fees and other payment to Local authorities. Government Bodies and Utility Companies exclusively for approvals, wayleaves and permits (BOQ Item 28)

The item shall include for all costs pertaining to obtaining approvals, wayleaves and permits from government bodies, authorities and companies including advance payments to utility companies for the purposes of facilitating service connections.

All costs associated with non-refundable payments made under this item shall be reimbursed complete to the Contractor upon submission of receipt or documentation for payment of all fees, charges, etc. to the approving authority or body. Deposits, bank guarantees or performance bonds required by the approving authority or body shall be provided by the Contractor and he shall only be reimbursed for financing costs, interest and bank charges for providing these deposits, bank guarantees or performance bonds.

- Z. Provisional sum for permanent diversion, support, protection, or replacement, existing utilities services as directed by the Engineer (BOQ Item 30)
- AA. Provisional sum for additional soil investigations as directed by the Engineer (BOQ Item 32)
- BB. Provisional sum for material testing by third party as directed by the Engineer (BOQ Item 34)

For Item Z, AA, and BB

All costs associated with non-refundable payments made under this item shall be reimbursed complete to the Contractor upon submission of receipt or documentation for payment of all fees, charges, etc. to the approved contractors or sub-contractors

Section II
Trunk Sewer

SECTION 2 TRUNK SEWER

All items, specifications and installation methods for Pilot Project done by the Contractor shall be complied with the Standard Specifications Part I Division 02 section 02700 Pipework and section 02712 Sewerage, and the Particular Specifications Part I Division 1 General Requirements and Division II Site work.

2.01 Pipe Installation (HDPE)

The unit of measurement for pipe installation (HDPE) shall be liner meter.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for pipe installation. The type of excavation and reestablishment of the site shall be varied by the condition of the site. These costs shall be included to pipe installation work.

2.02 Precast Manhole

The unit of measurement for precast manhole installation shall be number of pieces.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for precast manhole installation. The type of excavation shall be varied by the condition of the site. This cost shall be included to pipe installation work.

2.03 Air Valve

The unit of measurement for air valve and air valve box shall be number of pieces.

The item of air valve and air valve box shall be included material cost and installation cost such as excavation, pipe bedding, back filling and sand compaction.

2.04 Drain (Scour) Valve

The unit of measurement for drain (scour) valve and drain valve box shall be number of pieces.

The item of drain valve box shall be includes material cost and installation cost such as excavation, pipe bedding, back filling and sand compaction.

2.05 Ductile Cast Iron Tee for Air and Drain Valve

The unit of measurement for ductile cast iron tee for air and drain valve drain (scour) valve shall be number of pieces.

The item of ductile cast iron tee for air and drain valve drain (scour) valve shall be include material and installation cost.

2.06 Bend

The unit of measurement for bend shall be number of pieces.

The item of bend shall be included material and installation cost.

2.07 Flange Adaptor

The unit of measurement for flange adaptor shall be number of pieces.

The item of flange adaptor shall be included material and installation cost.

2.08 Drain Pipe Connection to Branch Sewer

The unit of measurement for drain pipe connection to branch sewer shall be liner meter.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for drain pipe connection to branch sewer installation.

2.09 HDPE Reducer

The unit of measurement for HDPE reducer shall be number of pieces.

The item of HDPE reducer shall be included material and installation cost.

2.10 Flow Meter Box

The unit of measurement for flow meter box shall be number of pieces.

The item of flow meter box shall be included material and installation cost.

2.11 Receiving well

The unit of measurement for receiving well shall be number of pieces.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for drain pipe connection to branch sewer installation.

2.12 Pressure Reducing Manhole

The unit of measurement for pressure reducing manhole shall be number of pieces.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for drain pipe connection to branch sewer installation.

Section III
Branch Sewer

SECTION 3 BRANCH SEWER

All items, specifications and installation methods for Pilot Project done by the Contractor shall be complied with the Standard Specifications Part I Division 02 section 02700 Pipework and section 02712 Sewerage, and the Particular Specifications Part I Division 1 General Requirements and Division II Site work.

3.01 Pipe Installation (uPVC)

The unit of measurement for pipe installation (HDPE) shall be liner meter.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for pipe installation. The type of excavation and reestablishment of the site shall be varied by the condition of the site. These costs shall be included to pipe installation work.

3.02 Precast Manhole

The unit of measurement for precast manhole installation shall be number of pieces.

The item shall be included material cost, excavation, pipe bedding, back filling and sand compaction for precast manhole installation. The type of excavation shall be varied by the condition of the site. This cost shall be included to pipe installation work.

3.03 Connection to Existing Sewer/ocean outfall

The unit of measurement for connection to existing sewer/ocean outfall shall be number of pieces.

The item of existing sewer/ocean outfall shall be included material cost and installation cost such as excavation, pipe bedding, back filling and sand compaction.

3.04 House Connection 100mm diameter

The unit of measurement for house connection 100 mm diameter shall be number of pieces.

The item of house connection 100 mm diameter shall be includes material cost and installation cost such as excavation, pipe bedding, back filling and sand compaction.

Section IV

Pumping Stations

SECTION 4 PUMPING STATIONS

All items, specifications and installation methods for Pilot Project done by the Contractor shall be complied with the Standard Specifications Part I Division I and Particular Specification Part I Division I.

4.01 Excavation and Bedding

A. Excavation

1. Excavate by Machine in all materials other than bed rock.

The unit of measurement for Excavate by Machine in all materials other than bed rock shall be *cubic meter*.

2. Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock).

The unit of measurement for Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock) shall be *cubic meter*.

3. Supply, spread & compact selected imported Sand Backfilling.

The unit of measurement for Supply, spread & compact selected imported Sand Backfilling shall be *cubic meter*.

4. Supply, spread & compact selected surplus Soil Backfilling.

The unit of measurement for Supply spread & compact selected surplus Soil Backfilling shall be *cubic meter*.

5. Disposal of surplus soil to dumping site (10km distance).

The unit of measurement for Disposal of surplus soil to dumping site (10km distance) shall be *cubic meter*.

6. Disposal of surplus soil to dumping site (10km distance).

The unit of measurement for Disposal of surplus soil to dumping site (10km distance) shall be *cubic meter*.

7. Concrete demolition.

The unit of measurement for Concrete demolition shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

B. Bedding

The unit of measurement for Bedding shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

4.02 Concrete Works

A. Concrete Binding

1. Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)

The unit of measurement for Blinding with Concrete 75mm Thick (Strength Grade 15Mpa) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Concrete Supply

1. Concrete in structure (Grade 32Mpa)

The unit of measurement for Concrete in structure (Grade 32Mpa) shall be *cubic meter*.

2. Concrete in structure (Grade 40Mpa)

The unit of measurement for Concrete in structure (Grade 40Mpa) shall be *cubic meter*.

3. Plain Concrete (Mass concrete) (Grade 20Mpa)

The unit of measurement for S Plain Concrete (Mass concrete) (Grade 20Mpa) be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Reinforcing Bars

1. Reinforcing bars and fabrication for reinforced concrete

The unit of measurement for Reinforcing bars and fabrication for reinforced concrete shall be weight *ton*.

2. Welded Wire Mesh / Fabric Mesh Wire

The unit of measurement for Welded Wire Mesh / Fabric Mesh Wire shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

D. Formworks

1. Formwork for concrete slab, footings, etc. at ground level.

The unit of measurement for Formwork for concrete slab, footings, etc. at ground level shall be *square meter*.

2. Formwork for structural concrete columns

The unit of measurement for Formwork for structural concrete columns shall be *square meter*.

3. Formwork for structural concrete beams & suspended slab

The unit of measurement for Formwork for structural concrete beams & suspended slab shall be *square meter*.

4. Formwork for structural concrete with curved surface

The unit of measurement for Formwork for structural concrete with curved surface shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

E. Concrete Sundries

1. Black visqueem dpc membrane.

The unit of measurement for Black visqueem dpc membrane shall be *square meter*.

2. Plastic chairs

The unit of measurement for Formwork for Plastic chairs shall be number of *piece*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

F. Others

1. Construct concrete splashback, 400x300x150 dp

The unit of measurement for Construct concrete splashback, 400x300x150 dp shall be number of *piece*.

2. Construct concrete drainage pit, 800x500x450 dp incl. metal grate over.

The unit of measurement for Construct concrete drainage pit, 800x500x450 dp incl. metal grate over shall be number of *piece*.

3. Construct shallow concrete spoon drain

The unit of measurement for Construct shallow concrete spoon drain shall be *liner meter*.

4. Expansion Joint with PVC plate, Width 300mm

The unit of measurement for Expansion Joint with PVC plate, Width 300mm shall be *liner meter*.

5. Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk

The unit of measurement for Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.03 Inlet Pipe & Overflow Pipe Works

A. Inlet Pipe

1. Inlet Pipe

The unit of measurement for Inlet Pipe shall be *liner meter*.

The item for the works shall be included material cost and installation cost.

B. Precast Manhole**1. Precast Manhole**

The unit of measurement for Precast Manhole shall be number of *piece*.

2. Manhole cover

The unit of measurement for Manhole cover shall be number of *piece*.

The item for the works shall be included material cost and installation cost.

C. Connection to Existing Sewer**1. Connection work to Existing Sewer (including invert modification)**

The unit of measurement for Connection work to Existing Sewer (including invert modification) shall be number of *place*.

The item for the works shall be included material cost, labour cost, installation cost and machinery cost.

2. Cleaning of Existing Sewer and Manhole

The unit of measurement for Cleaning of Existing Sewer and Manhole shall be number of *place*.

The item for the works shall be included material cost, labour cost and machinery cost.

D. Overflow HDPE**1. Overflow HDPE**

The unit of measurement for Overflow HDPE shall be number of *place*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.04 Miscellaneous Works**A. Handrail, ladders and Stop Logs others.****1. Step Iron, Width=300mm, SS-304**

The unit of measurement for Step Iron, Width=300mm, SS-304 shall be number of *piece*.

2. EDA RANU wave & fence (2.6m high)

The unit of measurement for EDA RANU wave & fence (2.6m high) shall be number of *piece*.

3. EDARANU wave & gate (2.6m high, 3.0m width)

The unit of measurement for EDARANU wave & gate (2.6m high, 3.0m width) shall be number of *piece*.

4. Water Reticulation Pipeworks: Mild Steel Pipe dia. 25 mm.

The unit of measurement for Water Reticulation Pipeworks: Mild Steel Pipe dia. 25 mm shall be number of *piece*.

5. Supply material and lying flap gate

The unit of measurement for Supply material and lying flapgate shall be number of *piece*.

6. PS-16 Temporary works

The unit of measurement for PS-16 Temporary works shall be number of *place*.

7. Pipe Installation

The unit of measurement for Pipe Installation shall be *liner meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

BUILDING AND STRUCTURES

4.05 Excavation and Bedding

A. Excavation

1. Excavate by Machine in all materials other than bed rock

The unit of measurement for Excavate by Machine in all materials other than bed rock shall be *cubic meter*.

2. Supply, spread & compact selected imported Sand Backfilling

The unit of measurement for Supply, spread & compact selected imported Sand Backfilling shall be *cubic meter*.

3. Supply, spread & compact selected surplus Soil Backfilling

The unit of measurement for Supply spread & compact selected surplus Soil Backfilling shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

B. Bedding

The unit of measurement for Bedding shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

4.06 Concrete Works

A. Concrete Supply

1. Concrete in structure (Grade 32Mpa)

The unit of measurement for Concrete in structure (Grade 32Mpa) shall be *cubic meter*.

2. Plain Concrete (Mass concrete) (Grade 20Mpa)

The unit of measurement for S Plain Concrete (Mass concrete) (Grade 20Mpa) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Reinforcing Bars

1. Reinforcing bars and fabrication for reinforced concrete

The unit of measurement for Reinforcing bars and fabrication for reinforced concrete shall be weight *ton*.

2. Welded Wire Mesh / Fabric Mesh Wire

The unit of measurement for Welded Wire Mesh / Fabric Mesh Wire shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Formworks

1. Formwork for concrete slab, footings, etc. at ground level

The unit of measurement for Formwork for concrete slab, footings, etc. at ground level shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

D. Concrete Sundries

1. Black visqueem dpc membrane.

The unit of measurement for Black visqueem dpc membrane shall be *square meter*.

2. Plastic chairs

The unit of measurement for Formwork for Plastic chairs shall be number of piece.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

E. Others

1. Construct concrete splashback, 400x300x150 dp

The unit of measurement for Construct concrete splashback, 400x300x150 dp shall be number of *piece*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.07 Block works

A. Concrete Blockwork

1. Supply 100mm thk blockwork to walls.

The unit of measurement for Supply 100mm thk blockwork to walls shall be *square meter*.

2. Supply 200mm thk blockwork to walls Masonry Reinforcement.

The unit of measurement for Supply 200mm thk blockwork to walls Masonry Reinforcement shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Masonry Reinforcement

1. Supply Reinforcing Bars to blockwork in walls Core Fill Material.

The unit of measurement for Supply Reinforcing Bars to blockwork in walls Core Fill Material shall be in *tons*.

C. Core Fill Concrete.

1. Supply 15Mpa corefill to bockwork in walls.

The unit of measurement for Supply 15Mpa corefill to bockwork in walls shall be in *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.08 Metal Works

A. Structural Steel Column & Beams

1. 65x65x5.0mm shs steel house post at awining,pref

The unit of measurement shall be number of *piece*

2. 50x50x3mm equal angle hood framing

The unit of measurement shall be in *tons*

3. Install 50/40mm dia. steel escape ladder

The unit of measurement shall be in number of *items*

4. Allow for brackets, plates, bolts & nuts

The unit of measurement shall be in number of *items*

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.09 Carpentry Works

A. Ceiling Framing

1. 50x50 hwd ceiling framing.

The unit of measurement for 50x50 hwd ceiling framing shall be in linear meter.

2. Suspended metal ceiling grid system.

The unit of measurement for Suspended metal ceiling grid system shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Roof Framing.

1. 150x50 hwd rafters to main roof.

The unit of measurement for 150x50 hwd rafters to main roof shall be in *linear meter*.

2. 75x50 hwd roof purlins at 900 centres to main hood roof.

The unit of measurement for 75x50 hwd roof purlins at 900 centres to main hood roof shall be in *linear meter*.

3. 100x50 hwd stiffener wall plate at awning roof and wall plates.

The unit of measurement for 100x50 hwd stiffener wall plate at awning roof and wall plates shall be in *linear meter*.

4. 200x50 hwd beam over at awning roof

The unit of measurement for 100x50 hwd stiffener wall plate at awning roof and wall plates shall be in *linear meter*.

5. 200x38 hwd fascia board to main roof.

The unit of measurement for 200x38 hwd fascia board to main roof shall be in *linear meter*.

6. 200x75 hwd beam over.

The unit of measurement for 200x75 hwd beam over shall be in *linear meter*.

7. 75x50 hwd struts & ties to truss stairs.

The unit of measurement for 75x50 hwd struts & ties to truss stairs shall be in *linear meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.10 Lining & Finishes

A. Wall Lining & Finishes

1. Colour bond trim deck external wall cladding

The unit of measurement for Colorbond trimdek external wall cladding shall be in *square meter*

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Ceiling Lining & Finishes.

1. 12mm thk plaster board ceiling lining.

The unit of measurement for 12mm thk plaster board ceiling lining shall be in *square meter*.

2. Plaster board cornice strips to ceiling.

The unit of measurement for Plaster board cornice strips to ceiling shall be in *square meter*.

3. 75mm thk noise control/proof insulation blanket in ceiling lining.

The unit of measurement for 75mm thk noise control/proof insulation blanket in ceiling lining shall be *square meter*.

4. Tape & compound to ceiling lining.

The unit of measurement for Tape & compound to ceiling lining shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.11 Roofing & Insulation

A. Metal Roofing

1. Colorbond corr. Sheeting to roof.

The unit of measurement for Colorbond corr. Sheeting to roof shall be in *square meter*.

2. Colorbond trimdek sheeting to roof.

The unit of measurement for Colorbond trimdek sheeting to roof shall be in *square meter*.

3. Double sided sisalation to roof.

The unit of measurement for Double sided sisalation to roof shall be in *square meter*.

4. Galvanised strap bracing to roof.

The unit of measurement for Galvanised strap bracing to roof shall be in *linear meter*

5. Chicken wire mesh to roof.

The unit of measurement for Chicken wire mesh to roof shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Roof Plumbing & Accessories

1. Colorbond sheerline gutter to main roof.

The unit of measurement for Colorbond sheerline gutter to main roof shall be in *linear meter*.

2. Colorbond flashing to hood roof.

The unit of measurement for Colorbond flashing to hood roof shall be in *linear meter*.

3. 100mm dia. PVC down pipe to main roof, incl. dropper, clips, bends.

The unit of measurement for 100mm dia. PVC down pipe to main roof, incl. dropper, clips, and bends shall be in *linear meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.12 Doors & Windows

A. Doors

1. Steel security grill to external door, DA2 1000 x 2100 high.

The unit of measurement for Steel security grill to external door, DA2 1000 x 2100 high shall be in *numbers*.

2. Timber door 900 x 2100 high, external solid core.

The unit of measurement for Timber door 900 x 2100 high, external solid core shall be in *numbers*.

3. Install 50 x 25mm hwd door architrave.

The unit of measurement to Install 50 x 25mm hwd door architrave shall be in *linear meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Windows & Glazing

1. Aluminium powder coat frame glass blocks, obscure windows 1200 x 400 high.

The unit of measurement for Aluminium powder coat frame glass block, obscure window 1200x400mm high shall be in *numbers*.

2. Aluminium powder coat frame glass blocks, obscure windows 1000 x 400 high.

The unit of measurement for Aluminium powder coat frame glass blocks, obscure windows 1000 x 400mm high shall be in *numbers*.

3. Aluminium powder coat frame glass blocks, obscure windows 600 x 400 high.

The unit of measurement for Aluminium powder coat frame glass blocks, obscure windows 600 x 400mm high shall be in *numbers*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Door Hardware

1. 536 Escape lockset & 007 Round ext. Cylinder, tubular deadlocks.

The unit of measurement for 536 Escape lockset & 007 Round ext. Cylinder, tubular deadlocks shall be in *numbers*.

2. 234 Series Brass padlock to security grill door.

The unit of measurement for 234 Series Brass padlock to security grill door shall be in *numbers*.

3. 100mm steel butt hinges.

The unit of measurement for 100mm steel butt hinges shall be number of *pairs*.

4. Rubber door stops, 65-70mm, skirting mounted.

The unit of measurement for Rubber door stops, 65-70mm, skirting mounted shall be in *numbers*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.13 Painting Works

A. Painting

1. Supply and apply painting to block walls, both internal external faces.

The unit of measurement for Supply and apply painting to block walls, both internal external faces shall be measured in *square meter*.

2. Supply and apply painting to internal ceiling.

The unit of measurement for Supply and apply painting to internal ceiling shall be measured in *square meter*.

3. Supply and apply painting to doors and door frames, security grills etc.

The unit of measurement for Supply and apply painting to doors and door frames, security grills etc. shall be measured in *square meter*.

4. Supply and apply painting to windows and window frames, security grills, etc.

The unit of measurement for Supply and apply painting to windows and window frames, security grills, etc. shall be measured in *square meter*.

5. Supply and apply painting to security grill to windows

The unit of measurement for Supply and apply painting to security grill to windows shall be measured in *square meter*.

6. Supply and apply painting to windows & window frames

The unit of measurement for Supply and apply painting to windows & window frames shall be measured in *square meter*.

7. Supply and apply painting to skirtings, architraves, stops, cover strips

The unit of measurement for Supply and apply painting to skirtings, architraves, stops, cover strips shall be measured in *square meter*.

8. Supply and apply painting to steel security grill doors

The unit of measurement for Supply and apply painting to steel security grill doors shall be measured in *square meter*.

9. Supply & apply painting to steel columns

The unit of measurement for Supply & apply painting to steel columns shall be in *square meter*.

10. Supply and apply painting to stairs and handrails.

The unit of measurement for Supply and apply painting to stairs and handrails shall be measured in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

4.14 Miscellaneous Works

A. Handrail, ladders and Stop Logs

1. Handrail, Height = 1100mm, Galvanised mild steel.

The unit of measurement for Handrail, Height = 1100mm, Galvanised mild steel shall be measured in *meters*.

2. Ladders, Width = 400mm, Galvanised mild steel.

The unit of measurement for Ladders, Width = 400mm, Galvanised mild steel shall be in *meters*.

3. Step Iron, Width = 300mm, SS-304.

The unit of measurement for Step Iron, Width = 300mm, SS-304 shall be in *numbers*.

4. Stop logs with frame, Water depth less than 1.5m.

The unit measurement for Stop logs with frame, Water depth less than 1.5m shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Covers

1. Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar.

The unit of measurement for Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar shall be in *square meter*.

2. Grated Cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar

The unit of measurement for Grated Cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar shall be in *square meter*.

3. FRP cover with frame, 35mm thk, Fiber Reinforced Plastic.

The unit of measurement for FRP cover with frame, 35mm thk, Fiber Reinforced Plastic shall be in *square meter*.

4. FRP cover with frame, 75mm thk, Fiber Reinforced Plastic.

The unit of measurement for FRP cover with frame, 75mm thk, Fiber Reinforced Plastic shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

Section V
Sewage Treatment Plant

SECTION 5 SEWAGE TREATMENT PLANT

All items, specifications and installation methods for Pilot Project done by the Contractor shall be complied with the Standard Specifications Part I Division I and Particular Specification Part I Division I.

CIVIL WORKS

5.01 Excavation and Bedding

A. Excavation

1. Excavate by Machine in all materials other than bed rock.

The unit of measurement for Excavate by Machine in all materials other than bed rock shall be *cubic meter*.

2. Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock).

The unit of measurement for Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock) shall be *cubic meter*.

3. Supply, spread & compact selected imported Sand Backfilling.

The unit of measurement for Supply, spread & compact selected imported Sand Backfilling shall be *cubic meter*.

4. Supply, spread & compact selected surplus Soil Backfilling.

The unit of measurement for Supply spread & compact selected surplus Soil Backfilling shall be *cubic meter*.

5. Disposal of surplus soil to dumping site (10km distance).

The unit of measurement for Disposal of surplus soil to dumping site (10km distance) shall be *cubic meter*.

6. Disposal of surplus soil to dumping site (10km distance).

The unit of measurement for Disposal of surplus soil to dumping site (10km distance) shall be *cubic meter*.

7. Concrete demolition.

The unit of measurement for Concrete demolition shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

B. Bedding

The unit of measurement for Bedding shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

5.02 Concrete Works

A. Concrete Binding

1. Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)

The unit of measurement for Blinding with Concrete 75mm Thick (Strength Grade 15Mpa) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

- B. Concrete Supply

1. Concrete in structure (Grade 32Mpa)

The unit of measurement for Concrete in structure (Grade 32Mpa) shall be *cubic meter*.

2. Concrete in structure (Grade 40Mpa)

The unit of measurement for Concrete in structure (Grade 40Mpa) shall be *cubic meter*.

3. Plain Concrete (Mass concrete) (Grade 20Mpa)

The unit of measurement for S Plain Concrete (Mass concrete) (Grade 20Mpa) be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

- C. Reinforcing Bars

1. Reinforcing bars and fabrication for reinforced concrete

The unit of measurement for Reinforcing bars and fabrication for reinforced concrete shall be weight *ton*.

2. Welded Wire Mesh / Fabric Mesh Wire

The unit of measurement for Welded Wire Mesh / Fabric Mesh Wire shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

- D. Formworks

1. Formwork for concrete slab, footings, etc. at ground level.

The unit of measurement for Formwork for concrete slab, footings, etc. at ground level shall be *square meter*.

2. Formwork for structural concrete columns

The unit of measurement for Formwork for structural concrete columns shall be *square meter*.

3. Formwork for structural concrete beams & suspended slab

The unit of measurement for Formwork for structural concrete beams & suspended slab shall be *square meter*.

4. Formwork for structural concrete with curved surface

The unit of measurement for Formwork for structural concrete with curved surface shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

E. Concrete Sundries

1. Black visqueem dpc membrane.

The unit of measurement for Black visqueem dpc membrane shall be *square meter*.

2. Plastic chairs

The unit of measurement for Formwork for Plastic chairs shall be number of *piece*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

F. Others

1. Construct concrete splashback, 400x300x150 dp

The unit of measurement for Construct concrete splashback, 400x300x150 dp shall be number of *piece*.

2. Construct concrete drainage pit, 800x500x450 dp incl. metal grate over.

The unit of measurement for Construct concrete drainage pit, 800x500x450 dp incl. metal grate over shall be number of *piece*.

3. Construct shallow concrete spoon drain

The unit of measurement for Construct shallow concrete spoon drain shall be *liner meter*.

4. Expansion Joint with PVC plate, Width 300mm

The unit of measurement for Expansion Joint with PVC plate, Width 300mm shall be *liner meter*.

5. Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk

The unit of measurement for Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.03 Inlet Pipe & Overflow Pipe Works

A. Inlet Pipe

1. Inlet Pipe

The unit of measurement for Inlet Pipe shall be *liner meter*.

The item for the works shall be included material cost and installation cost.

B. Precast Manhole

1. Precast Manhole

The unit of measurement for Precast Manhole shall be number of *piece*.

2. Manhole cover

The unit of measurement for Manhole cover shall be number of *piece*.

The item for the works shall be included material cost and installation cost.

C. Connection to Existing Sewer

1. Connection work to Existing Sewer (including invert modification)

The unit of measurement for Connection work to Existing Sewer (including invert modification) shall be number of *place*.

The item for the works shall be included material cost, labour cost, installation cost and machinery cost.

2. Cleaning of Existing Sewer and Manhole

The unit of measurement for Cleaning of Existing Sewer and Manhole shall be number of *place*.

The item for the works shall be included material cost, labour cost and machinery cost.

D. Overflow HDPE

1. Overflow HDPE

The unit of measurement for Overflow HDPE shall be number of *place*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.04 Miscellaneous Works

A. Handrail, ladders and Stop Logs others.

1. Step Iron, Width=300mm, SS-304

The unit of measurement for Step Iron, Width=300mm, SS-304 shall be number of *piece*.

2. EDA RANU wave & fence (2.6m high)

The unit of measurement for EDA RANU wave & fence (2.6m high) shall be number of *piece*.

3. EDARANU wave & gate (2.6m high, 3.0m width)

The unit of measurement for EDARANU wave & gate (2.6m high, 3.0m width) shall be number of *piece*.

BUILDING AND STRUCTURES

5.05 Excavation and Bedding

A. Excavation

1. Excavate by Machine in all materials other than bed rock

The unit of measurement for Excavate by Machine in all materials other than bed rock shall be *cubic meter*.

2. Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock).

The unit of measurement for Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock) shall be *cubic meter*.

3. Supply, spread & compact selected imported Sand Backfilling

The unit of measurement for Supply, spread & compact selected imported Sand Backfilling shall be *cubic meter*.

4. Supply, spread & compact selected surplus Soil Backfilling

The unit of measurement for Supply spread & compact selected surplus Soil Backfilling shall be *cubic meter*.

5. Disposal of surplus soil to dumping site (10km distance).

The unit of measurement for Disposal of surplus soil to dumping site (10km distance) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

B. Bedding

1. Bedding with selected Gravel, 200mm Thk

The unit of measurement for Bedding with selected Gravel, 200mm Thk shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

5.06 Concrete Works

A. Concrete Binding

1. Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)

The unit of measurement for Blinding with Concrete 75mm Thick (Strength Grade 15Mpa) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Concrete Supply

1. Concrete in structure (Grade 32Mpa)

The unit of measurement for Concrete in structure (Grade 32Mpa) shall be *cubic meter*.

2. Concrete in structure (Grade 40Mpa)

The unit of measurement for Concrete in structure (Grade 40Mpa) shall be *cubic meter*.

3. Plain Concrete (Mass concrete) (Grade 20Mpa)

The unit of measurement for S Plain Concrete (Mass concrete) (Grade 20Mpa) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Reinforcing Bars

1. Reinforcing bars and fabrication for reinforced concrete

The unit of measurement for Reinforcing bars and fabrication for reinforced concrete shall be weight *ton*.

2. Welded Wire Mesh / Fabric Mesh Wire

The unit of measurement for Welded Wire Mesh / Fabric Mesh Wire shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

D. Formworks

1. Formwork for concrete slab, footings, etc. at ground level

The unit of measurement for Formwork for concrete slab, footings, etc. at ground level shall be *square meter*.

2. Formwork for structural concrete columns.

The unit of measurement for Formwork for structural concrete columns shall be *square meter*.

3. Formwork for structural concrete beams & suspended slab.

The unit of measurement for Formwork for structural concrete beams & suspended slab shall be *square meter*.

4. Formwork for structural concrete with curved surface.

The unit of measurement for Formwork for structural concrete with curved surface shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

E. Concrete Sundries

1. Black visqueem dpc membrane.

The unit of measurement for Black visqueem dpc membrane shall be *square meter*.

2. Plastic chairs

The unit of measurement for Formwork for Plastic chairs shall be number of *piece*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

F. Others

1. Construct concrete splashback, 400x300x150 dp

The unit of measurement for Construct concrete splashback, 400x300x150 dp shall be number of *piece*.

2. Construct concrete drainage pit, 800x500x450 dp incl. metal grate over

The unit of measurement for Construct concrete drainage pit, 800x500x450 dp incl. metal grate over shall be number of *piece*.

3. Construct shallow concrete spoon drain.

The unit of measurement for Construct shallow concrete spoon drain shall be *liner meter*.

4. Expansion Joint with PVC plate, Width 300mm

The unit of measurement for Expansion Joint with PVC plate, Width 300mm shall be *liner meter*.

5. Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk

The unit of measurement for Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.07 Block works

A. Concrete Blockwork

1. Supply 100mm thk blockwork to walls.

The unit of measurement for Supply 100mm thk blockwork to walls shall be *square meter*.

2. Supply 150mm thk blockwork to walls.

The unit of measurement for Supply 150mm thk blockwork to walls shall be *square meter*.

3. Supply 200mm thk blockwork to walls Masonry Reinforcement.

The unit of measurement for Supply 200mm thk blockwork to walls Masonry Reinforcement shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Masonry Reinforcement

1. Supply Reinforcing Bars to blockwork in walls Core Fill Material.

The unit of measurement for Supply Reinforcing Bars to blockwork in walls Core Fill Material shall be in *tons*.

C. Core Fill Concrete.

1. Supply 15Mpa corefill to bockwork in walls.

The unit of measurement for Supply 15Mpa corefill to bockwork in walls shall be in *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.08 Metal Works

A. Structural Steel Column & Beams

1. 100mm dia. CHS steel post (entry canopy)

The unit of measurement for 100mm dia. CHS steel post (entry canopy) shall be in *tons*.

2. 50 x 50 x 3mm equal angle hood framing

The unit of measurement for 50 x 50 x 3mm equal angle hood framing shall be in *tons*.

3. 150 x 50 x 3mm RHS steel roof truss (pre-fabricated)

The unit of measurement for 150 x 50 x 3mm RHS steel roof truss (pre-fabricated) shall be in *numbers*.

4. Install 50/40mm dia. steel escape ladder

The unit of measurement shall be in number of *items*.

5. Allow for brackets, plates, bolts & nuts

The unit of measurement shall be in number of *items*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.09 Carpentry Works

A. Stud wall Partitions

1. 75x50 hwd stud partition wall Ceiling Framing.

The unit of measurements for 75x50 hwd stud partition wall Ceiling Framing shall be in *linear meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Floor Framing

1. 150 x 50 hwd floor joist

The unit of measurement for 150 x 50 hwd floor joist

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Ceiling Framing

1. 75x50 hwd ceiling joist.

The unit of measurement for 75x50 hwd ceiling joist shall be in *linear meter*.

2. 50x50 hwd ceiling framing.

The unit of measurement for 50x50 hwd ceiling framing shall be in *linear meter*.

3. Suspended metal ceiling grid system.

The unit of measurement for Suspended metal ceiling grid system shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

D. Roof Framing.

1. 75 x 50 hwd roof purlins

The unit of measurement for 75 x 50 hwd roof purlins shall be in *linear meters*.

2. 100 x 50 hwd roof truss

The unit of measurement for 100 x 50 hwd roof truss shall be in *linear meters*.

3. 150 x 50 hwd rafter

The unit of measurement for 150 x 50 hwd rafter shall be in *linear meters*.

4. 200 x 30 hwd fascia board

The unit of measurement for 200 x 30 hwd fascia board shall be in *linear meters*.

5. 150 x 50 hwd beam over

The unit of measurement for 150 x 50 hwd beam over shall be in *linear meters*.

6. 200 x 75 hwd beam over

The unit of measurement for 200 x 75 hwd beam over shall be in *linear meters*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

E. Stairs

1. 150x50 hwd hand rails to stairs.

The unit of measurement for 150x50 hwd hand rails to stairs shall be in *linear meter*.

2. 100x50 hwd handrails to stairs.

The unit of measurement for 100x50 hwd handrails to stairs shall be in *linear meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.10 Lining & Finishes

A. Wall Lining & Finishes

1. Bathroom wall lining (seratone or similar).

The unit of measurement for Bathroom wall lining (seratone or similar) shall be in *square meter*.

2. 12mm thk plaster board wall lining.

The unit of measurement for 12mm thk plaster board wall lining shall be in *square meter*.

3. 100x20mm thk shiplap internal wall lining.

The unit of measurement for 100x20mm thk shiplap internal wall lining shall be in *linear meter*.

4. 300x300 ceramic wall tiles

The unit of measurement for 300x300 ceramic wall tiles shall be in *square meter*.

5. 150x100 ceramic skirting tiles

The unit of measurement for 150x100 ceramic skirting tiles shall be in *linear meter*.

6. 70x25 hwd timber skirtings

The unit of measurement for 70x25 hwd timber skirtings shall be in *linear meter*.

7. Metal Corner strips (plasterboard)

The unit of measurement for Metal Corner strips (plasterboard) shall be in *linear meter*.

8. Color bond trim deck external wall cladding

The unit of measurement for Colorbond trimdek external wall cladding shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Floor Lining & Finishes

1. 300x300 ceramic tiles non-slip

The unit of measurement for 300x300 ceramic tiles non-slip shall be in *square meter*.

2. Selected ceramic splashback tiles

The unit of measurement for selected ceramic splashback tiles shall be in *square meter*.

3. 100x20mm thk T&G Flooring

The unit of measurement for 100x20mm thk T&G Flooring shall be in *linear meters*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Ceiling Lining & Finishes.

1. 12mm thk plaster board ceiling lining.

The unit of measurement for 12mm thk plaster board ceiling lining shall be in *square meter*.

2. Plaster board cornice strips to ceiling.

The unit of measurement for Plaster board cornice strips to ceiling shall be in *square meter*.

3. 4mm plywood ceiling lining.

The unit of measurement for 4mm plywood ceiling lining shall be in *square meter*.

4. 1200 x 600mm ceiling tiles

The unit of measurement for 1200x600mm ceiling tiles shall be in *square meter*.

5. 75mm thk noise control/proof insulation blanket in ceiling lining.

The unit of measurement for 75mm thk noise control/proof insulation blanket in ceiling lining shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.11 Roofing & Insulation

A. Metal Roofing

1. Colorbond corr. Sheeting to roof.

The unit of measurement for Colorbond corr. Sheeting to roof shall be in *square meter*.

2. Colorbond trimdek sheeting to roof.

The unit of measurement for Colorbond trimdek sheeting to roof shall be in *square meter*.

3. Double sided sisalation to roof.

The unit of measurement for Double sided sisalation to roof shall be in *square meter*.

4. Galvanized strap bracing to roof.

The unit of measurement for Galvanised strap bracing to roof shall be in *linear meter*

5. Chicken wire mesh to roof.

The unit of measurement for Chicken wire mesh to roof shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Roof Plumbing & Accessories

1. Colorbond sheerline gutter to main roof.

The unit of measurement for Colorbond sheerline gutter to main roof shall be in *linear meter*.

2. Colorbond ridge capping to roof

The unit of measurement for Colorbond ridge capping to roof shall be in *linear meter*.

3. Colorbond barge mould to main roof.

The unit measurement of Colorbond barge mould to main roof shall be *linear meter*.

4. Colorbond flashing to hood roof.

The unit of measurement for Colorbond flashing to hood roof shall be in *linear meter*.

5. 100mm dia. PVC down pipe to main roof, incl. dropper, clips, bends.

The unit of measurement for 100mm dia. PVC down pipe to main roof, incl. dropper, clips, and bends shall be in *linear meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.12 Doors & Windows

A. Doors

1. Steel security grill to external door D1 1800 x 2100 high.

The unit of measurement for Steel security grill to external door D1 1800 x 2100 high shall be in *numbers*.

2. Steel security grill to external door, D3 1000 x 2100 high

The unit of measurement for Steel security grill to external door, D3 1000 x 2100 high shall be in *numbers*.

3. Roller door shutter to details, complete with fitting & accessories.

The unit of measurements for Roller door shutter to details complete with fitting & accessories shall be in *numbers*.

4. Timber door - Type D1 1800 x 2100 high, solid core 2 leaf

The unit of measurement for Timber door - Type D1 1800 x 2100 high, solid core 2 leaf shall be in *numbers*.

5. Timber door- Type D2 1600 x 2100 high

The unit of measurement for Timber door- Type D2 1600 x 2100 high shall be in *numbers*.

6. Timber door - Type D3 1000 x 2100 high, external solid core

The unit of measurement for Timber door - Type D3 1000 x 2100 high, external solid core shall be in *numbers*.

7. Timber door - Type D4 1000 x 2100 high, internal hollow core

The unit of measurement for Timber door - Type D4 1000 x 2100 high, internal hollow core shall be in *numbers*.

8. Timber door - Type D5 700 x 1850 high

The unit of measurement for Timber door - Type D5 700 x 1850 high shall be in *numbers*.

9. Sliding door - Type D6 1000 x 2000 high, including tracks & accessories

The unit of measurement for Sliding door - Type D6 1000 x 2000 high, including tracks & accessories shall be in *numbers*.

10. Install 50 x 25mm hwd door architrave

The unit of measurement for 50 x 25mm hwd door architrave shall be in *linear meters*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Windows & Glazing

1. Timber framed Louvre window - Type W1 1800 x 1500 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W1 1800 x 1500 high, including insect screen & steel security bars shall be in *numbers*.

2. Timber framed Louvre window - Type W2 1800 x 1000 high, including insect screen & steel security bars

The unit of measurement for Timber framed Louvre window - Type W2 1800 x 1000 high, including insect screen & steel security bars shall be in *numbers*.

3. Timber framed louver window - Type W3 1200 x 1000 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W3 1200 x 1000 high, including insect screen & steel security bars shall be in *numbers*.

4. Timber framed louver window - Type W4 1200 x 900 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W4 1200 x 900 high, including insect screen & steel security bars shall be in *numbers*.

5. Timber framed louver window - Type W5 600 x 1000 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W5 600 x 1000 high, including insect screen & steel security bar shall be in *numbers*.

6. Timber framed louver window - Type W6 1800 x 1100 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W6 1800 x 1100 high, including insect screen & steel security bars shall be in *numbers*.

7. Timber framed louver window - Type W7 1200 x 1300 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W7 1200 x 1300 high, including insect screen & steel security bars shall be in *numbers*.

8. Timber framed louver window - Type W8 1800 x 1300 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W8 1800 x 1300 high, including insect screen & steel security bars shall be in *numbers*.

9. Timber framed louver window - Type W9 1800 x 700 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W9 1800 x 700 high, including insect screen & steel security bars shall be in *numbers*.

10. Timber framed louver window - Type W10 1200 x 1500 high, including insect screen & steel security bars

The unit of measurement for Timber framed louver window - Type W10 1200 x 1500 high, including insect screen & steel security bars shall be in *numbers*.

11. Timber framed fixed glass panel window - 1800 x 900 high

The unit of measurement for Timber framed fixed glass panel window - 1800 x 900 high shall be in *numbers*.

12. Timber framed fixed glass panel window - 2700 x 900 high

The unit of measurement for Timber framed fixed glass panel window - 2700 x 900 high shall be in *numbers*.

13. Timber framed fixed glass panel window - 3600 x 900 high

The unit of measurement for Timber framed fixed glass panel window - 3600 x 900 high shall be in *numbers*.

14. Timber framed fixed glass panel window with timber flap (openable from inside) - 1400 x 1200 high

The unit of measurement for Timber framed fixed glass panel window with timber flap (openable from inside) - 1400 x 1200 high shall be in *numbers*.

15. Install 75 x 25mm hwd window architrave

The unit of measurement to Install 75 x 25mm hwd window architrave shall be in *linear meters*.

16. Install 25 x 25mm hwd window beads

The unit of measurement to Install 25 x 25mm hwd window beads shall be in *linear meters*.

17. Install 32 x 19mm hwd window cover strips

The unit of measurement to Install 32 x 19mm hwd window cover strips shall be in *linear meters*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

C. Door Hardware

1. 536 Escape lockset & 007 Round ext. Cylinder, tubular deadlocks.

The unit of measurement for 536 Escape lockset & 007 Round ext. Cylinder, tubular deadlocks shall be in *numbers*.

2. Barrel lockset with indicators (to toilets).

The unit of measurements for Barrel lockset with indicators (to toilets) shall be in *numbers*.

3. 234 Series Brass padlock to security grill door.

The unit of measurement for 234 Series Brass padlock to security grill door shall be in *numbers*.

4. 401 Hydraulic door closer.

The unit of measurement for 401 Hydraulic door closer shall be in *numbers*.

5. 100mm steel butt hinges.

The unit of measurement for 100mm steel butt hinges shall be number of *pairs*.

6. Rubber door stops, 65-70mm, skirting mounted.

The unit of measurement for Rubber door stops, 65-70mm, skirting mounted shall be in *numbers*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.13 Painting Works

A. Painting

1. Supply and apply painting to block walls, both internal external faces.

The unit of measurement for Supply and apply painting to block walls, both internal external faces shall be measured in *square meter*.

2. Supply & install 100 x 20mm thk shiplap wall lining to stair area

The unit of measurement for Supply & install 100 x 20mm thk shiplap wall lining to stair area shall be measured in *square meter*.

3. Supply & apply painting to plaster board wall

The unit of measurement for Supply & apply painting to plaster board wall shall be measured in *square meter*.

4. Supply & apply painting to internal ceiling, including entry canopy

The unit of measurement for Supply & apply painting to internal ceiling, including entry canopy shall be measured in *square meter*.

5. Supply & apply painting to doors & door frames

The unit of measurement for Supply & apply painting to doors & door frames shall be measured in *square meter*.

6. Supply and apply painting to windows & window frames

The unit of measurement for Supply and apply painting to windows & window frames shall be measured in *square meter*.

7. Supply and apply painting to skirtings, architraves, stops, cover strips

The unit of measurement for Supply and apply painting to skirtings, architraves, stops, cover strips shall be measured in *square meter*.

8. Supply and apply painting to steel security grill doors

The unit of measurement for Supply and apply painting to steel security grill doors shall be measured in *square meter*.

9. Supply & apply painting to steel columns at entry canopy

The unit of measurement for Supply & apply painting to steel columns at entry canopy shall be in *square meter*.

10. Supply and apply painting to stairs and handrails.

The unit of measurement for Supply and apply painting to stairs and handrails shall be measured in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5.14 Miscellaneous Works

A. Handrail, ladders and Stop Logs

1. Handrail, Height = 1100mm, Galvanised mild steel.

The unit of measurement for Handrail, Height = 1100mm, Galvanised mild steel shall be measured in *meters*.

2. Ladders, Width = 400mm, Galvanised mild steel.

The unit of measurement for Ladders, Width = 400mm, Galvanised mild steel shall be in *meters*.

3. Step Iron, Width = 300mm, SS-304.

The unit of measurement for Step Iron, Width = 300mm, SS-304 shall be in *numbers*.

4. Stop logs with frame, Water depth less than 1.5m.

The unit measurement for Stop logs with frame, Water depth less than 1.5m shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

B. Covers

1. Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar.

The unit of measurement for Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar shall be in *square meter*.

2. Grated Cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar

The unit of measurement for Grated Cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar shall be in *square meter*.

3. FRP cover with frame, 35mm thk, Fibre Reinforced Plastic.

The unit of measurement for FRP cover with frame, 35mm thk, Fibre Reinforced Plastic shall be in *square meter*.

4. FRP cover with frame, 75mm thk, Fibre Reinforced Plastic.

The unit of measurement for FRP cover with frame, 75mm thk, Fibre Reinforced Plastic shall be in *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

Section VI

Plant Mechanical Works

SECTION 6
PLANT MECHANICAL WORKS

6.01 to 6.23 Plant Mechanical Works

A General Requirement for Mechanical Works

The rates and lump sums for Provision of Spare Parts and Lubricant shall include for all necessary tools and test equipment, including diagnostic equipment necessary for routine maintenance, calibration and trouble shooting of the systems, as recommended by the manufacturer of the respective system.

B Equipment Supply and Installation

Each item in the Bill of Quantities should be measured for supply and installation and/or provision of each item.

The supply and installation and/or provision of equipment, mechanical works, piping and materials shall be valued by the measurement of such items only as are included in the Bills of Quantities. If no specific item is provided then the work is deemed to be included in the Contractor's other rates.

The work shall include product design, manufacturing, inspection and testing, provision of the specified accessories and spare parts, packing, shipment, expenses for custom clearance and other taxes, in-land transportation, delivery to the place at site designated by the Engineer, safeguarding and protection from inclement conditions during storage prior to, and after, installation.

The work shall also include all multiple handling necessary prior to installation, including during storage and carrying in to the site, installation including all necessary permanent and temporary supports, building in, painting, calibration, performance testing, provision of operation and maintenance manuals, and any other works necessary to meet the requirements shown on the drawings and/or specified.

Payment shall be full compensation to cover all the Contractor's obligations under the Contract for providing all materials, labour, tools, equipment, and incidentals necessary to complete the said works.

Section VII

Plant Electrical Works

SECTION 5
PLANT ELECTRICAL WORKS

7.01 to 7.24 Supply and Installation of Electrical and Instrumentation System

Each item in the Bill of Quantities should be measured for supply and installation and/or provision of each item.

The supply and installation and/or provision of equipment, electrical works, cabling, piping and materials shall be valued by the measurement of such items only as are included in the Bills of Quantities. If no specific item is provided then the work is deemed to be included in the Contractor's other rates.

The work shall include product design, manufacturing, inspection and testing, provision of the specified accessories and spare parts, packing, shipment, expenses for custom clearance and other taxes, in-land transportation, delivery to the place at site designated by the Engineer, safeguarding and protection from inclement conditions during storage prior to, and after, installation.

The work shall also include all multiple handling necessary prior to installation, including during storage and carrying in to the site, installation including all necessary permanent and temporary supports, building in, painting, calibration, performance testing, provision of operation and maintenance manuals, and any other works necessary to meet the requirements shown on the drawings and/or specified.

Payment shall be full compensation to cover all the Contractor's obligations under the Contract for providing all materials, labour, tools, equipment, and incidentals necessary to complete the said works.

Section VIII

Pilot Project

SECTION 8**PILOT PROJECT**

All items, specifications and installation methods for Pilot Project done by the Contractor shall be complied with the Particular Specification Part III Pilot Project.

Support**8.01 Excavation and Bedding****A. Excavation**

1. Excavate by Machine in all materials other than bed rock.

The unit of measurement for Excavate by Machine in all materials other than bed rock shall be *cubic meter*.

2. Supply, spread & compact selected surplus Soil Backfilling.

The unit of measurement for Supply spread & compact selected surplus Soil Backfilling shall be *cubic meter*.

5. Disposal of surplus soil to dumping site (10km distance).

The unit of measurement for Disposal of surplus soil to dumping site (10km distance) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

B. Bedding

The unit of measurement for Bedding shall be *cubic meter*.

The item for the works shall be included material cost, labour cost and/or machinery cost.

8.02 Concrete Works**A. Concrete Supply**

1. Concrete in structure (Grade 32Mpa)

The unit of measurement for Concrete in structure (Grade 32Mpa) shall be *cubic meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

5. Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk

The unit of measurement for Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk shall be *square meter*.

The item for the works shall be included material cost, labour cost, installation cost and/or machinery cost.

Sewer and water distribution

8.03 HDPE (Supply)

The unit of measurement for HDPE Supply shall be liner meter.

All specifications for HDPE material shall be complied with the Particular Specification Part III Pilot Project.

8.4 HDPE Fittings (Supply)

The unit of measurement for HDPE Fittings (Supply) shall be number of pieces.

All specifications for HDPE fitting materials shall be complied with the Particular Specification Part III Pilot Project.

8.5 HDPE (Installation)

The unit of measurement for HDPE installation shall be liner meter.

All specifications for HDPE material shall be complied with the Particular Specification Part III Pilot Project.

8.6 uPVC (Supply)

The unit of measurement for uPVC (Supply) shall be liner meter.

All specifications for uPVC material shall be complied with the Particular Specification Part III Pilot Project.

8.7 uPVC Fittings (Supply)

The unit of measurement for uPVC Fittings (Supply) shall be number of pieces.

All specifications for uPVC material shall be complied with the Particular Specification Part III Pilot Project.

8.7 uPVC (Installation)

The unit of measurement for uPVC installation shall be liner meter.

All specifications for uPVC material shall be complied with the Particular Specification Part III Pilot Project.

8.8 Precast Manhole

The unit of measurement for precast manhole shall be number of pieces.

8.9 Clamp with bolt (Supply)

The unit of measurement for clamp with bolt (Supply) shall be number of pieces.

8.10 Clamp with bolt (installation)

The unit of measurement for clamp with bolt (installation) shall be number of pieces.

8.11 Flexible Joint with Flange (Supply)

The unit of measurement for Flexible Joint with Flange (Supply) shall be number of pieces.

8.12 Flexible Joint with Flange (Installation)

The unit of measurement for Flexible Joint with Flange (Installation) shall be number of pieces.

8.13 Toilet with Flush tank and drain (Supply)

The unit of measurement for Toilet with Flush tank and drain (Supply) shall be number of pieces.

8.14 Toilet with Flush tank and drain (Installation)

The unit of measurement for Toilet with Flush tank and drain (Installation) shall be number of pieces.

8.15 Clean out ND200, Black HDPE, PN 20

The unit of measurement for Clean out ND200, Black HDPE, PN 20 shall be number of pieces.

8.16 Bulk Meter (Supply)

The unit of measurement for Bulk Meter (Supply) shall be number of pieces.

8.17 Bulk Meter (Installation)

The unit of measurement for Bulk Meter (Installation) shall be number of pieces.

8.18 Gate Valve (Supply)

The unit of measurement for Gate Valve (Supply) shall be number of pieces.

8.19 Gate Valve (Installation)

The unit of measurement for Gate Valve (Installation) shall be number of pieces.

8.20 Tapping Saddle Ferrule (Supply)

The unit of measurement for Bulk Meter (Supply) shall be number of pieces.

8.21 Tapping Saddle Ferrule (Installation)

The unit of measurement for Bulk Meter (Installation) shall be number of pieces.

8.22 Galvanised Steel Pipe (Supply)

The unit of measurement for Galvanised Steel Pipe (Supply) shall be liner meter.

8.23 Galvanised Steel Pipe (Installation)

The unit of measurement for Galvanised Steel Pipe (Installation) shall be liner meter.

8.24 Polyethylene Pipe (Supply)

The unit of measurement for Polyethylene Pipe (Supply) shall be liner meter.

8.25 Polyethylene Pipe (Installation)

The unit of measurement for Polyethylene Pipe (Installation) shall be liner meter.

8.26 Water Meter (Supply)

The unit of measurement for Water Meter (Supply) shall be liner meter.

8.27 Water Meter (Installation)

The unit of measurement for Water Meter (Installation) shall be liner meter.

8.28 Stop valve for water meter (Supply)

The unit of measurement for Stop valve for water meter (Supply) shall be liner meter.

8.29 Stop valve for water meter (Installation)

The unit of measurement for Stop valve for water meter (Installation) shall be liner meter.

8.30 Precast concrete slab with centre hole with 160mm uPVC 1m, 600mm x 600mm x 100mm thick

The unit of measurement for Precast concrete slab with centre hole with 160mm uPVC 1m, 600mm x 600mm x 100mm thick shall be number of pieces.

8.31 Surface box with minimum clear opening box, 150mm x 150 mm

The unit of measurement for Surface box with minimum clear opening box, 150mm x 150 mm shall be number of pieces.

8.32 Surface box with minimum clear opening box, 150mm x 150 mm

The unit of measurement for Surface box with minimum clear opening box, 150mm x 150 mm shall be number of pieces.

Section IX
Procurement Works

SECTION 9 PROCUREMENT WORKS

9.01 General Requirements

The unit of measurement shall be lump sum.

All items and specifications for the procurement work done by the Contractor shall be complied with the Particular Specification Part IV Procurement.

9.02 Equipment Supply and Installation

The unit of measurement shall be number of vehicles.

All items and specifications for the procurement work done by the Contractor shall be complied with the Particular Specification Part IV Procurement.

The rates and lump sums for Provision of Spare Parts and Lubricant shall include for all necessary tools and test equipment, including diagnostic equipment necessary for routine maintenance, calibration and trouble shooting of the systems, as recommended by the manufacturer of the respective system.

Each item in the Bill of Quantities should be measured for supply and installation and/or provision of each item.

The supply and installation and/or provision of equipment and materials shall be valued by the measurement of such items only as are included in the Bills of Quantities. If no specific item is provided then the work is deemed to be included in the Contractor's other rates.

The work shall include inspection and testing, provision of the specified accessories and spare parts, packing, shipment, expenses for custom clearance and other taxes, in-land transportation, delivery to the place at site designated by the Engineer, safeguarding and protection from inclement conditions during storage prior to, and after, installation.

The work shall also include all multiple handling necessary prior to installation, including during storage and carrying in to the site, installation including all necessary permanent and temporary supports, building in, painting, calibration, performance testing, provision of operation and maintenance manuals, and any other works necessary to meet the requirements shown on the drawings and/or specified.

Section X

Social and Environmental Consideration Programme

SECTION 10

SOCIAL AND ENVIRONMENTAL CONSIDERATION PROGRAMME

10.01 Social and Environmental Consideration Programme

The unit of measurement for the work shall be lump sum.

All items and specifications for Social Consideration Programme done by the Contractor shall be complied with the Particular Specification Part V Social and Environmental Consideration Programme.

Section XI

Operation and Maintenance Training Works

SECTION 11

OPERATION AND MAINTENANCE TRAINING WORKS

11.1 to 11.5 Equipment Supply for Operation and Maintenance training works

The unit of measurement shall be lump sum.

All items and specifications for the procurement work done by the Contractor shall be complied with the Particular Specification Part I Division 12 Furnishings.

All items and specification for the operation and maintenance training by the Contractor shall be complied with the Standard Specification Part I Division 1 General Requirements 01670 Training.

Section XII

Daywork Rates

PREAMBLE TO DAYWORK RATES

Any work ordered by the Engineer to be carried out under daywork shall be paid for at the rates entered hereunder subject to the following conditions:

1. The rates entered for labour shall be deemed to include all on-costs associated with the employment of such labour, including head office charges, overhead charges, profit, site supervision and staff, insurances, wages, travelling time and expenses, subsistence allowances, time lost due to inclement weather, bonus, holiday and sick pay, and any other employee's fringe benefit(s), small tools and consumable stores, temporary equipment such as wedges, temporary tracks, ladders staging, scaffolding and all items of a similar nature unless these are provided or set up exclusively for daywork.
2. The wages of gangers and leading hands working with their gangs shall be paid for at the appropriate rates, but the time of walking gangers, sub-foreman and foremen will not be included and shall be deemed to be included in the rates entered for labour under site supervision and staff.
3. Payment for overtime work, if chargeable and approved by the Engineer shall be made at the rates entered herein, but the time so worked as overtime shall be adjusted in the same proportion as that used for paying the normal workmen on the site and approved by the Engineer. Thus if a man works 1 hour overtime for which the rate payable is double time, payment shall be made for 2 hours at the rate entered in the daywork schedule.

NOTE: Overtime is working time over and above eight (8) hours per working day including Saturday or 48 hours per week.

4. Cost of special watching and lighting necessitated by daywork shall be included in the rates.
5. The rates entered for plant shall apply only to plant which the Contractor has available on the site. Such rates shall be deemed to include all overhead charges, profit, site supervision and staff, hire charges, fuel, maintenance, consumable stores, spare parts, insurances, etc., but shall exclude the cost of wages for drivers and operators, which shall be payable separately as dealt with under Paragraph 1 above.
6. Payment for mechanically operated plant shall be made only at such times as the plant is engaged in daywork and shall exclude all standing, idle or downtime.
7. If any workmen or items of plant on daywork do not readily belong to any classification included in the schedule or inserted by the Contractor at the time of tendering, the Engineer shall determine the equivalent classification to be adopted for such workmen or items or plant, and payment for such will be made accordingly.

8. The rates inserted by the Contractor shall be realistic rates in conformity with those on which his tender has been based, and shall be based on conditions prevailing at the time of tender but bearing in mind that claims for escalation will not be entertained.
9. The Contractor shall produce for verification to the Engineer vouchers specifying the time and materials employed on the work, if required, the Contractor shall also produce his receipted bills and wages books in support of his account.
10. Where special mechanical plant is required for use on daywork, the cost to be paid to the Contractor shall be subject to agreement by the Engineer.
11. Only time on work actually done will be allowed. A 'day' is considered to be normal working day of eight (8) hours. Fraction of a day will be paid for pro-rate.
12. Rates for power driven tools are not included in the labour rates but charges for hand tools shall be deemed to be included.

Part II

Bill of Quantities

BILL OF QUANTITIES								
Bill Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 1		Common						
	1	Section 1 General Requirements						
Section 2		Trunk Sewer						
		2.1 Trunk Sewer No.1						
		2.2 Trunk Sewer No.2						
		2.3 Trunk Sewer No.3						
		2.4 Trunk Sewer No.4						
		2.5 Trunk Sewer No.5						
		2.6 Trunk Sewer No.6						
		2.7 Trunk Sewer No.7						
		2.8 Trunk Sewer No.8						
		2.9 Trunk Sewer No.9						
		2.10 Trunk Sewer No.10						
		2.11 Trunk Sewer No.11						
		2.12 Trunk Sewer No.12						
		2.13 Trunk Sewer No.13						
		2.14 Trunk Sewer No.14						
		2.15 Trunk Sewer No.15						
		2.16 Trunk Sewer No.16						
		2.17 Trunk Sewer No.17						
		2.18 Trunk Sewer No.18						
		2.19 Trunk Sewer No.19						
Section 3		Branch Sewer						
		3.1 Idubada Area						
		3.2 Hanuabada Area						
		3.3 Ela Makana Area						
		3.4 Touaguba Area						
		3.5 Koki Area						
		3.6 Badili Area						
		3.7 Gabutu Area						
		3.8 Kaugere Area						

BILL OF QUANTITIES								
Bill Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		3.9 Kila Kila Area						
Section 4		Pump Station						
		4.1 Kanudi Pumping Station (PS-1)						
		4.2 Idubada Pumping Station (PS-2)						
		4.3 Hagara Pumping Station (PS-3)						
		4.4 Hanuabada Pumping Station (PS-4)						
		4.5 Konedobu Pumping Station (PS-5)						
		4.6 Old Yacht Club Pumping Station (PS-6)						
		4.7 Stanley Esplanade Pumping Station (PS-7)						
		4.8 Sea Park Pumping Station (PS-8)						
		4.9 Davara Pumping Station (PS-9)						
		4.10 Lawes Road Pumping Station (PS-10)						
		4.11 Koki Pumping Station (PS-11)						
		4.12 Badili Pumping Station (PS-12)						
		4.13 Kila Police Pumping Station (PS-13)						
		4.14 Konebada Pumping Station (PS-14)						
		4.15 Gabutu Pumping Station (PS-15)						
		4.16 Horsecamp Pumping Station (PS-16)						
		4.17 Kaugere Pumping Station (PS-17)						
Section 5		Sewage Treatment Plant						
		5.1 Grit Chamber						
		5.2 Distribution Tank						
		5.3 Oxidation Ditch						
		5.4 Final Sedimentation Tank						
		5.5 Sludge Pump Room						
		5.6 Treated water tank & Chlorination Room						
		5.7 Gravity Thickener						
		5.8 Sludge Pump Room & Local Control Room						
		5.9 Sludge Holding Tank						
		5.10 Electrical Substation						
		5.11 Administration Building						
		5.12 Building Service (Mechanical works)						

BILL OF QUANTITIES								
Bill Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		5.13 Building Service (Electrical works)						
		5.14 Yard Pipe						
		5.15 Yard Work						
		5.16 Access Road						
		5.17 Ocean Outfall Pipe						
Section 6		Mechanical Work						
		6.1 Kanudi Pumping Station (PS-1)						
		6.2 Idubada Pumping Station (PS-2)						
		6.3 Hagara Pumping Station (PS-3)						
		6.4 Hanuabada Pumping Station (PS-4)						
		6.5 Konedobu Pumping Station (PS-5)						
		6.6 Old Yacht Club Pumping Station (PS-6)						
		6.7 Stanley Esplanade Pumping Station (PS-7)						
		6.8 Sea Park Pumping Station (PS-8)						
		6.9 Davara Pumping Station (PS-9)						
		6.10 Lawes Road Pumping Station (PS-10)						
		6.11 Koki Pumping Station (PS-11)						
		6.12 Badili Pumping Station (PS-12)						
		6.13 Kila Police Pumping Station (PS-13)						
		6.14 Konebada Pumping Station (PS-14)						
		6.15 Gabutu Pumping Station (PS-15)						
		6.16 Horsecamp Pumping Station (PS-16)						
		6.17 Kaugere Pumping Station (PS-17)						
		6.18 Grit Chamber						
		6.19 Distribution Chamber						
		6.20 Oxidation Ditch						
		6.21 Clarifier						
		6.22 Utility Water & Disinfection Facility						
		6.23 Sludge Treatment Building						
Section 7		Electrical Work						
		7.1 Kanudi Pumping Station (PS-1)						

BILL OF QUANTITIES								
Bill Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		7.2 Idubada Pumping Station (PS-2)						
		7.3 Hagara Pumping Station (PS-3)						
		7.4 Hanuabada Pumping Station (PS-4)						
		7.5 Konedobu Pumping Station (PS-5)						
		7.6 Old Yacht Club Pumping Station (PS-6)						
		7.7 Stanley Esplanade Pumping Station (PS-7)						
		7.8 Sea Park Pumping Station (PS-8)						
		7.9 Davara Pumping Station (PS-9)						
		7.10 Lawes Road Pumping Station (PS-10)						
		7.11 Koki Pumping Station (PS-11)						
		7.12 Badili Pumping Station (PS-12)						
		7.13 Kila Police Pumping Station (PS-13)						
		7.14 Konebada Pumping Station (PS-14)						
		7.15 Gabutu Pumping Station (PS-15)						
		7.16 Horsecamp Pumping Station (PS-16)						
		7.17 Kaugere Pumping Station (PS-17)						
		7.18 Grit Chamber						
		7.19 Oxidation Ditch						
		7.20 Clarifier						
		7.21 Utility Water & Disinfection Facility						
		7.22 Sludge Treatment Building						
		7.23 Administration Building						
		7.24 Electrical Substation						
Section 8		Pilot Project						
Section 9		Procurement						
Section 10		Social Development Program						
Section 11		O&M Training						
Section 12		Provisional Sum						

BILL OF QUANTITIES								
Bill Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 13		Daywork						
GRAND SUMMARY								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 1								
	1	Total of Section 1 (from Page Collection)						
Total carried forward to Grand Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		<u>Contractual Requirements</u>						
	1	All insurances in accordance with the Conditions of Contract	LS					
	2	Submission of Performance Bond	LS					
		<u>Specified Requirements</u>						
01500	3	Engineer's Main Office and Mobile Phone and removal on completion	LS					
01500	4	Maintain Engineer's Main Office and Mobile Phone	month					
01500	5	Engineer's Mobile Offices and removal on completion	LS					
01500	6	Maintain Engineer's Mobile Offices	month					
01500	7	Provision of Vehicles	L.S.					
01500	8	Maintanance of Vehicles	veh.- month					
01500	9	Contractor's temporary site facilites and removal on completion	LS					
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
01380	10	Preparation of Initial Photograph Records	LS						
01380	11	Preparation of Monthly Progress Photographs	month						
01400 01600	12	Inspection and testing of materials by the Engineer at Manufacturer's works	LS						
01300 01700	13	Submission of As-built Drawings, Records and O&M Manuals	LS						
01350	14	Preparation and submission of the Environmental Management Programme	LS						
01350	15	Conduct Environmental Monitoring and preparation and submission of Reports	month						
01500	16	Mobilisation and demobilisation of Plant, Equipment and Labour to be used by the Contractors.	LS						
01043 01400 01500	17	Contractor's Project Management, Site Superintendence and Control	LS						
01500	18	Watching, Lighting and Guarding	LS						
01450	19	Health and Safety Requirement	LS						
Carried forward to page collection									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
01570	20	Signage and Traffic Diversion and Control -	LS						
01580		Project Sign Board, Road Safety Signages and Warning Signages							
01050	21	Setting-out and Surveys (by Licensed Surveyor)	LS						
01050	22	Search for Utility Records and Conduct of Utility Detection Surveys	LS						
01050	23	Provision of Setting-out and Survey Instrument for Engineers Use	LS						
01050	24	Service of Chainman for Engineers Use	day						
01450	25	First Aid Facilities	LS						
01500	26	Site and Environmental Control Facilities	LS						
01670	27	Training for operators for one year after completion.	LS						
	28	Allow for all cost and works deemed necessary but not included in this section or elsewhere, for completion of the work according to the Specifications, Drawings, and Conditions of Contract.	LS						
Carried forward to page collection									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	29	Provisional Sum for payments of deposits, bank guarantees, all fees and other payments to Local Authorities, Government Bodies, and Utility Companies exclusively for approvals, wayleaves and permits.	PS					
	30	Contractor's profit and overhead, etc. on the above Provisional Sum item in _____% except for work executed by the Contractor.	item					
	31	Provisional Sum for permanent diversion, support, protection or replacement of existing utilities services as directed by the Engineer	PS					
	32	Contractor's profit and overhead, etc. on the above Provisional Sum item in _____% except for work executed by the Contractor.	item					
	33	Provisional Sum for additional soil investigations as directed by the Engineer	PS					
	34	Contractor's profit and overhead, etc. on the above Provisional Sum item in _____% except for work executed by the Contractor.	item					
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Collection 1-2 to 1-5								
		Sum of Page 1-2						
		Sum of Page 1-3						
		Sum of Page 1-4						
		Sum of Page 1-5						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 2								
	1	Total of Section 2.1 Trunk Sewer No.1 (from Page Collection)						
	2	Total of Section 2.2 Trunk Sewer No.2 (from Page Collection)						
	3	Total of Section 2.3 Trunk Sewer No.3 (from Page Collection)						
	4	Total of Section 2.4 Trunk Sewer No.4 (from Page Collection)						
	5	Total of Section 2.5 Trunk Sewer No.5 (from Page Collection)						
	6	Total of Section 2.6 Trunk Sewer No.6 (from Page Collection)						
	7	Total of Section 2.7 Trunk Sewer No.7 (from Page Collection)						
	8	Total of Section 2.8 Trunk Sewer No.8 (from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 2 (Continue)								
	9	Total of Section 2.9 Trunk Sewer No.9 (from Page Collection)						
	10	Total of Section 2.10 Trunk Sewer No.10 (from Page Collection)						
	11	Total of Section 2.11 Trunk Sewer No.11 (from Page Collection)						
	12	Total of Section 2.12 Trunk Sewer No.12 (from Page Collection)						
	13	Total of Section 2.13 Trunk Sewer No.13 (from Page Collection)						
	14	Total of Section 2.14 Trunk Sewer No.14 (from Page Collection)						
	15	Total of Section 2.15 Trunk Sewer No.15 (from Page Collection)						
	16	Total of Section 2.16 Trunk Sewer No.16 (from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 2 (Continue)								
	17	Total of Section 2.17 Trunk Sewer No.17 (from Page Collection)						
	18	Total of Section 2.18 Trunk Sewer No.18 (from Page Collection)						
	19	Total of Section 2.19 Trunk Sewer No.19 (from Page Collection)						
	20	Total of Section 2.20 Trunk Sewer No.20 (from Page Collection)						
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.1 Trunk Sewer No.1								
		2.1 Trunk Sewer No.1						
	1	No.1_HDPE Pipe Installation Pressure Pipe from Kanudi P.S to Idubada P.S HDPE DN 110 L=1,100.10m Air Valve 1 unit						
	1.1	DN110 (linside diameter 96mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	241.42				
	b)	1.0m =or< Invert Level < 2.0m	m	491.89				
	c)	2.0m =or< Invert Level < 3.0m	m					
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m	20.74				
	b)	1.0m =or< Invert Level < 2.0m	m	346.05				
	c)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-4 to 2-5								
		Sum of Page 2-4						
		Sum of Page 2-5						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.2 Trunk Sewer No.2								
		2.2 Trunk Sewer No.2						
	1	No.2_HDPE Pipe Installation Pressure Pipe from Idubada P.S to Hagara P.S HDPE DN 110 L=897.04m Air Valve 1 unit						
	1.1	DN110 (inside diameter 96mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	245.09				
	b)	1.0m =or< Invert Level < 2.0m	m	343.09				
	c)	2.0m =or< Invert Level < 3.0m	m	39.68				
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m	19.85				
	b)	1.0m =or< Invert Level < 2.0m	m	289.01				
	c)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.2 Trunk Sewer No.2 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr	1				
	1.6	Bend						
	a)	11.25 degree	nr	6				
	b)	22.5 degree	nr	2				
	c)	30 degree	nr					
	d)	45 degree	nr	2				
	e)	60 degree	nr					
	f)	90 degree	nr	1				
	1.7	Frang adopter						
	a)	Frang adopter DN110 for Tee/P.S outlet	nr	3				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-7 to 2-8								
		Sum of Page 2-7						
		Sum of Page 2-8						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.3 Trunk Sewer No.3								
		2.3 Trunk Sewer No.3						
		No.3-1						
	1	No.3_HDPE Pipe Installation Pressure Pipe from Hagara P.S to Receiving MH HDPE DN 225 L=790.48m Air Valve 1 unit Drainage 1 unit (to Drainage Tank) Pipe DN is enlarged from DI 100 to DN 225 at the outlet of P.S						
	1.1	DN 225 (inside diameter 198mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	82.23				
	b)	1.0m =or< Invert Level < 2.0m	m					
	c)	2.0m =or< Invert Level < 3.0m	m					
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m	196.08				
	a)	1.0m =or< Invert Level < 2.0m	m	462.67				
	b)	2.0m =or< Invert Level < 3.0m	m	52.50				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.3 Trunk Sewer No.3 (Continue)								
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr	1				
	b)	Drain Valve box	nr	1				
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.200x100	nr	1				
	b)	Dia.200x75	nr	1				
	1.6	Bend						
	a)	11.25 degree	nr	1				
	b)	22.5 degree	nr	2				
	c)	30 degree	nr					
	d)	45 degree	nr	2				
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frangle adopter						
	a)	Frangle adopter for DN225 for Tee	nr	4				
	b)	Frangle adopter DN110 for Drain/P.S outlet	nr	2				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110 Asphalt h=1-2m	m	7				
	b)	DCI Dia.100 BEND 45 degree	nr	1				
	c)	Drainage Tank	LS	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.3 Trunk Sewer No.3 (Continue)								
	1.9	HDPE PEDUCER at P.S outlet						
	a)	HDPE REDUCER 225x 110	nr	1				
		No.3-2						
	2	No.3-2_HDPE Pipe Installation						
		Gravity Pipe from Receiving MH to Hanuabada P.S						
		HDPE DN 355 L= 529.90m						
		Manhole 12 unit						
	2.1	DN355 (linside diameter 312mm)						
		Type A (Soil/Right of Way)						
	a)	2.0m =or< Invert Level < 3.0m	m					
	b)	4.0m =or< Invert Level < 5.0m	m	8.36				
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m	26.45				
	b)	1.0m =or< Invert Level < 2.0m	m	207.67				
	c)	2.0m =or< Invert Level < 3.0m	m	111.69				
	d)	3.0m =or< Invert Level < 4.0m	m	161.92				
		Type C (Concrete)						
	a)	1.0m =or< Invert Level < 2.0m	m					
	b)	4.0m =or< Invert Level < 5.0m		6.61				
	2.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr	1				
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	5				
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr	4				
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr	2				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.3 Trunk Sewer No.3 (Continue)								
	e)	Dia. 1200 Precast Manhole, h<5.0m	nr	2				
	f)	Manhole cover (Iron)	nr	8				
	2.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
	2.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	2.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	2.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr					
	2.7	Frangle adopter						
	a)	Frangle adopter for DN110	nr					
	2.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	2.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-10 to 2-13								
		Sum of Page 2-10						
		Sum of Page 2-11						
		Sum of Page 2-12						
		Sum of Page 2-13						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.4 Trunk Sewer No.4								
		2.4 Trunk Sewer No.4						
	1	No.4_HDPE Pipe Installation						
		Pressure Pipe from Hanuabada P.S to Konedobu P.S						
		HDPE DN 355 L=1,310.84 m						
		Air Valve 1 unit						
		Drainage 2 units, one to existing sewer another to drainage tank						
	1.1	DN 355 (inside diameter 312mm)						
		Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	314.58				
	b)	3.0m =or< Invert Level < 4.0m	m	15.40				
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	685.84				
	b)	2.0m =or< Invert Level < 3.0m	m	324.50				
		Type C (Concrete)						
	a)	1.0m =or< Invert Level < 2.0m	m	10.88				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.4 Trunk Sewer No.4 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 200mm	nr	2				
	b)	Drain Valve box	nr	2				
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.300x200	nr	2				
	b)	Dia.300x75	nr	1				
	1.6	Bend						
	a)	11.25 degree	nr	5				
	b)	22.5 degree	nr	5				
	c)	30 degree	nr					
	d)	45 degree	nr	1				
	e)	60 degree	nr					
	f)	90 degree	nr	1				
	1.7	Frangle adopter						
	a)	Frangle adopter DN355 for Tee/P.S outlet	nr	7				
	b)	Frangle adopter for DN225 for dain	nr	2				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 225 Asphalt h=1-2m	m	8.1				
	b)	DCI Dia.200 BEND 45 degree	nr	2				
	c)	Drainage Tank	LS	1				
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.4 Trunk Sewer No.4 (Continue)								
	2.0	Highway Crossing	m					
		Additional 1.5 times high unit price of Type B 1-2m						
	2.1	Stream (Big Culvert) Crossing	m					
		Additional 1.5 times high unit price of Type B 2-3m						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-14 to 2-16								
		Sum of Page 2-14						
		Sum of Page 2-15						
		Sum of Page 2-16						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.5 Trunk Sewer No.5								
		2.5 Trunk Sewer No.5						
	1	No.5-1_HDPE Pipe Installation Pressure Pipe from Konedobu P.S to Receiving Well (2) HDPE DN 450 L=1,361.85m Air Valve 1 unit Drainage 1 unit to existing Old Yacht Club P.S						
	1.1	DN450 (linside diameter 396mm) Type A (Soil/Right of Way)						
	b)	2.0m =or< Invert Level < 3.0m	m					
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m	138.94				
	b)	1.0m =or< Invert Level < 2.0m	m	602.47				
	c)	2.0m =or< Invert Level < 3.0m	m	609.81				
	d)	3.0m =or< Invert Level < 4.0m	m	213.51				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.5 Trunk Sewer No.5 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 200mm	nr	1				
	b)	Drain Valve box	nr	1				
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.400x200	nr	1				
	b)	Dia.400x75	nr	1				
	1.6	Bend						
	a)	11.25 degree	nr	5				
	b)	22.5 degree	nr	1				
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr	1				
	1.7	Frang adopter						
	a)	Frang adopter DN450 for Tee/P.S Outlet	nr	5				
	b)	Frang adopter for DN225	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 225 Asphalt h=1-2 m	m	16				
	b)	DCI Dia.200 BEND 45 degree	nr	1				
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.5 Trunk Sewer No.5 (Continue)								
	2	No.5-2_HDPE Pipe Installation						
		Gravity Pipe from Receiving Well (2) to Ela Beach Road						
		HDPE 450 L=175.24m						
		HDPE 560 L=27.44m						
		One water pressure reducing chamber after HDPE 450 pipe						
	2.1	DN 560 (inside diameter 492mm)						
		Type B (Asphalt)						
	a)	1.0m ≤or< Invert Level < 2.0m	m	27.44				
	2.2	DN 450 (inside diameter 396mm)						
		Type B (Asphalt)						
	a)	1.0m ≤or< Invert Level < 2.0m	m	158.24				
	b)	2.0m ≤or< Invert Level < 3.0m	m	17				
	2.3	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	2.4	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.5 Trunk Sewer No.5 (Continue)								
	2.5	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	2.6	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	2.7	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr					
	2.8	Frangle adopter						
	a)	Frangle adopter for DN110	nr					
	2.9	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	2.10	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
	2.11	RECEIVING WELL(2)	LS	1				
	2.12	Pressure Reducing MH	LS	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-18 to 2-21								
		Sum of Page 2-18						
		Sum of Page 2-19						
		Sum of Page 2-20						
		Sum of Page 2-21						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.6 Trunk Sewer No.6								
		2.6 Trunk Sewer No.6						
	1	No.6_HDPE Pipe Installation Pressure Pipe from Stanley Esplanade P.S to Ela Beach Road HDPE DN 160 L=445.73 m Air Valve 1 unit Pipe DN is enlarged from DI 100 to DN 160 at the outlet of P.S						
	1.1	DN 160 (inside diameter 96mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	23.72				
	b)	2.0m =or< Invert Level < 3.0m	m					
	c)	3.0m =or< Invert Level < 4.0m	m					
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	422.01				
	b)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.6 Trunk Sewer No.6 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.150x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr	1				
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr	1				
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frangle adopter						
	a)	Frangle adopter for DN160	nr	2				
	b)	Frangle adopter for DN110 for P.S outlet	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 160x 110	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES									
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
Page Collection 2-23 to 2-24									
		Sum of Page 2-23							
		Sum of Page 2-24							
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.7 Trunk Sewer No.7								
		2.7 Trunk Sewer No.7						
	1	No.7_HDPE Pipe Installation Pressure Pipe from Sea Park P.S to Ela Beach Road HDPE DN 110 L=630.82 m						
	1.1	DN110 (inside diameter 96mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	14.98				
	b)	1.0m =or< Invert Level < 2.0m	m	520.21				
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	90.05				
		Type C (Concrete)						
	a)	1.0m =or< Invert Level < 2.0m	m	5.58				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.7 Trunk Sewer No.7 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr	3				
	b)	22.5 degree	nr	7				
	c)	30 degree	nr					
	d)	45 degree	nr	1				
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frangle adopter						
	a)	Frangle adopter for DN110/for P.S outlet	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
Page Collection 2-26 to 2-27									
		Sum of Page 2-26							
		Sum of Page 2-27							
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.8 Trunk Sewer No.8								
		2.8 Trunk Sewer No.8						
	1	No.8_HDPE Pipe Installation						
		Gravity Pipe from the Receiving Manhole to No.9 Pipe						
		HDPE DN 355 L=241.07 m						
		Manhole 5 units						
	1.1	DN355 (inside diameter 312mm)						
		Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	118.73				
	b)	2.0m =or< Invert Level < 3.0m	m	122.34				
	c)	3.0m =or< Invert Level < 4.0m	m					
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	2				
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr	3				
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr	5				
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.8 Trunk Sewer No.8 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frang adopter						
	a)	Frang adopter for DN110	nr					
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-29 to 2-30								
		Sum of Page 2-29						
		Sum of Page 2-30						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.9 Trunk Sewer No.9								
		2.9 Trunk Sewer No.9						
	1	No.9_HDPE Pipe Installation						
		Gravity Pipe from Meeting Point of No.5-2 and No.8 Pipe to Davara P.S						
		HDPE DN 630 L=184.23 m						
		Manhole 6 units						
	1.1	DN 630 (inside diameter 554mm)						
		Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m	176.07				
	c)	3.0m =or< Invert Level < 4.0m	m					
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	3.00				
	b)	2.0m =or< Invert Level < 3.0m	m	5.16				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr	6				
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr	6				
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.9 Trunk Sewer No.9 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frangle adopter						
	a)	Frangle adopter for DN110	nr					
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-32 to 2-33								
		Sum of Page 2-32						
		Sum of Page 2-33						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.10 Trunk Sewer No.10								
		2.10 Trunk Sewer No.10						
	1	No.10_HDPE Pipe Installation Pressure Pipe from Davara P.S to Lawes Road P.S HDPE DN 450 L=745.75 m Air Valve 1 unit Pipe DN is enlarged from DI 350 to DN 450 at the outlet of P.S						
	1.1	DN 450 (inside diameter 396mm) Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	709.27				
	b)	2.0m =or< Invert Level < 3.0m	m	24.80				
	c)	3.0m =or< Invert Level < 4.0m	m					
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	13.66				
	b)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.10 Trunk Sewer No.10 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.400x75	nr	1				
	1.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr	1				
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frangle adopter						
	a)	Frangle adopter for DN450	nr	2				
	b)	Frangle adopter for DN400 for outlet of P.S	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 450x400	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-35 to 2-36								
		Sum of Page 2-35						
		Sum of Page 2-36						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.11 Trunk Sewer No.11								
		2.11 Trunk Sewer No.11						
	1	No.11_HDPE Pipe Installation						
		Pressure Pipe from Lawes Road P.S to Receiving Well (1)						
		HDPE DN 500 L= 2,708.22m						
		Air Valve 3 units						
		Drainage 3 units						
	1.1	DN 500 (inside diameter 440mm)						
		Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m	7.96				
	c)	3.0m =or< Invert Level < 4.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	1207.47				
	b)	2.0m =or< Invert Level < 3.0m	m	1467.68				
	b)	3.0m =or< Invert Level < 4.0m	m	4.55				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	3				
	b)	Air Valve box	nr	3				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.11 Trunk Sewer No.11 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 200mm	nr	3				
	b)	Drain Valve box	nr	3				
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.450x200	nr	3				
	b)	Dia.450x75	nr	3				
	1.6	Bend						
	a)	11.25 degree	nr	13				
	b)	22.5 degree	nr	13				
	c)	30 degree	nr					
	d)	45 degree	nr	5				
	e)	60 degree	nr					
	f)	90 degree	nr	2				
	1.7	Frangle adopter						
	a)	Frangle adopter for DN500 forTee/P.S outlet	nr	13				
	a)	Frangle adopter for DN225 of drainage pipe	nr	3				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 225	m	49.25				
	b)	DCI Dia. 200mm BEND 45 degree	nr	3				
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-38 to 2-39								
		Sum of Page 2-38						
		Sum of Page 2-39						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.12 Trunk Sewer No.12								
		2.12 Trunk Sewer No.12						
	1	No.12_HDPE Pipe Installation Pressure Pipe from New Koki P.S to the existing pressure pipe HDPE DN 225 L=71.47m Connection to existing DI 250 pressure pipe						
	1.1	DN225 (linside diameter 96mm) Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	71.47				
	b)	2.0m =or< Invert Level < 3.0m	m					
	c)	3.0m =or< Invert Level < 4.0m	m					
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.12 Trunk Sewer No.12 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100						
	b)	Dia.100x75						
	1.6	HDPE DN 225 Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr	2				
	c)	30 degree	nr					
	d)	45 degree	nr	2				
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frang adopter						
	a)	Frang adopter DN225 for P.S outle/connecting	nr	2				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	1.9	Connection to existing pressure pipe						
	a)	All Dlanged Tee (DCI) Dia 250x200	nr	1				
	b)	Blind Flange (DCI) Dia.250	nr	1				
	c)	All Dlanged Tee (DCI) Dia 250x200	nr	1				
	d)	One Dlanged Short Piece (DCI) Dia. 250 L=600mm	nr	1				
	e)	Collar (DCI) Dia 250	nr	1				
	f)	DCI 250 Pipe cutting	nr	2				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-41 to 2-42								
		Sum of Page 2-41						
		Sum of Page 2-42						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.13 Trunk Sewer No.13								
		2.13 Trunk Sewer No.13						
	1	No.13_HDPE Pipe Installation Pressure Pipe from Badili P.S to Receiving Well (1) HDPE DN 400 L= 1,161.84m Air Valve 1 unit Flow Meter Chamber 1 unit						
	1.1	DN400 (linside diameter 352mm) Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	16.99				
	b)	2.0m =or< Invert Level < 3.0m	m					
	c)	3.0m =or< Invert Level < 4.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	275.48				
	b)	2.0m =or< Invert Level < 3.0m	m	575.43				
	c)	3.0m =or< Invert Level < 4.0m	m	77.84				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.13 Trunk Sewer No.13 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.350x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr	1				
	b)	22.5 degree	nr	3				
	c)	30 degree	nr					
	d)	45 degree	nr	3				
	e)	60 degree	nr					
	f)	90 degree	nr	4				
	1.7	Frang adopter						
	a)	Frang adopter DN400 for Tee/P.S outlet	nr	3				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
	1.10	FLOW METER BOX						
	a)	FLOW METER BOX	LS	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-44 to 2-45								
		Sum of Page 2-44						
		Sum of Page 2-45						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.14 Trunk Sewer No.14								
		2.14 Trunk Sewer No.14						
		No.14-1						
	1	No.14-1_HDPE Pipe Installation Pressure Pipe from Kila Police P.S to Receiving MH HDPE DN 110 L=221.06m						
	1.1	DN110 (linside diameter 96mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	84.14				
	b)	1.0m =or< Invert Level < 2.0m	m	136.92				
	c)	2.0m =or< Invert Level < 3.0m	m					
	d)	3.0m =or< Invert Level < 4.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m					
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.14 Trunk Sewer No.14 (Continue)								
		No.14-2						
	2	No.14-2_HDPE Pipe Installation Gravity Pipe from Receiving MH to Konebada P.S HDPE DN 225 L=432.32m Manhole 9 units						
	2.1	DN 225 (linside diameter 198 mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	39.80				
	b)	2.0m =or< Invert Level < 3.0m	m	181.26				
	c)	3.0m =or< Invert Level < 4.0m	m	6.00				
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	281.23				
	b)	2.0m =or< Invert Level < 3.0m	m	101.14				
	c)	3.0m =or< Invert Level < 4.0m	m	43.95				
	2.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	6				
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr	1				
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr	2				
	e)	Manhole cover (Iron)	nr	9				
	2.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.15 Trunk Sewer No.15								
		2.15 Trunk Sewer No.15						
		No.15-1						
	1	No.15-1_HDPE Pipe Installation Pressure Pipe from Konebada P.S to Receiving MH HDPE DN 110 L=214.19m						
	1.1	DN110 (inside diameter 96mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	10.03				
	b)	1.0m =or< Invert Level < 2.0m	m	4.70				
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m					
	b)	1.0m =or< Invert Level < 2.0m	m	380.56				
	c)	2.0m =or< Invert Level < 3.0m	m	142.87				
	d)	3.0m =or< Invert Level < 4.0m	m	7.37				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.15 Trunk Sewer No.15 (Continue)								
		No.15-2						
	2	No.15-2_HDPE Pipe Installation Gravity Pipe from Receiving MH to Babutu P.S HDPE DN 225 L=330.84m Manhole 10 units						
	2.1	DN225 (linside diameter 96mm) Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	69.83				
	b)	2.0m =or< Invert Level < 3.0m	m	23.7				
	c)	3.0m =or< Invert Level < 4.0m	m	7.37				
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	133.64				
	b)	2.0m =or< Invert Level < 3.0m	m	87.11				
		Type C (Concrete)						
	a)	1.0m =or< Invert Level < 2.0m	m	9.19				
	2.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	6				
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr	2				
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr	2				
	e)	Manhole cover (Iron)	nr	10				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.15 Trunk Sewer No.15 (Continue)								
	2.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
	2.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	2.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	2.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr					
	2.7	Frangle adopter						
	a)	Frangle adopter for DN110	nr					
	2.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	2.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-52 to 2-55								
		Sum of Page 2-52						
		Sum of Page 2-53						
		Sum of Page 2-54						
		Sum of Page 2-55						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.16 Trunk Sewer No.16								
		2.16 Trunk Sewer No.16						
	1	No.16_HDPE Pipe Installation Pressure Pipe from Gabutu P.S to Receiving Well (1) HDPE DN 125 L=735.65m Pipe DN is enlarged from DI 100 to DN 125 at the outlet of P.S						
	1.1	DN125 (linside diameter 110mm) Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	18.52				
	b)	2.0m =or< Invert Level < 3.0m	m	58.65				
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m	331.94				
	b)	1.0m =or< Invert Level < 2.0m	m	248.70				
	c)	2.0m =or< Invert Level < 3.0m	m					
	d)	3.0m =or< Invert Level < 4.0m	m	77.84				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.16 Trunk Sewer No.16 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr	5				
	b)	22.5 degree	nr	3				
	c)	30 degree	nr					
	d)	45 degree	nr	1				
	e)	60 degree	nr					
	f)	90 degree	nr	1				
	1.7	Frangle adopter						
	a)	Frangle adopter for DN110 P.S outlet	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-57 to 2-58								
		Sum of Page 2-57						
		Sum of Page 2-58						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.17 Trunk Sewer No.17								
		2.17 Trunk Sewer No.17						
	1	No.17_HDPE Pipe Installation						
		Gravity Pipe from Receiving Well (1) to Kaugere P.S						
		HDPE DN 710 L=627.30m						
		Manhol 11 units						
		Receiving Well (1) is included in this section						
	1.1	DN710 (linside diameter 624mm)						
		Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m	18.54				
	c)	3.0m =or< Invert Level < 4.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m					
	b)	2.0m =or< Invert Level < 3.0m	m	160.34				
	c)	3.0m =or< Invert Level < 4.0m	m	423.97				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr	6				
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr	5				
	e)	Manhole cover (Iron)	nr	11				
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.17 Trunk Sewer No.17 (Continue)								
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr					
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr					
	1.7	Frang adopter						
	a)	Frang adopter for DN110	nr					
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 125x 110						
	1.10	RECEIVING WELL						
	a)	RECEIVING WELL (1)	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 2-60 to 2-61								
		Sum of Page 2-60						
		Sum of Page 2-61						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.18 Trunk Sewer No.18								
		2.18 Trunk Sewer No.18						
	1	No.18_HDPE Pipe Installation Pressure Pipe from Kaugere P.S to Kila Kila STP HDPE DN 710 L=1,933.91m including 385m of in-plant pipe installation Air Valve 1 unit Drainage 1 unit Pipe DN is enlarged from DI 400 to HDPE 710 at the outlet of P.S						
	1.1	DN 710 (inside diameter 624 mm) Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	457.58				
	b)	2.0m =or< Invert Level < 3.0m	m	423.77				
	c)	3.0m =or< Invert Level < 4.0m	m	27.81				
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	304.67				
	b)	2.0m =or< Invert Level < 3.0m	m	501.75				
	c)	3.0m =or< Invert Level < 4.0m	m	115.89				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.18 Trunk Sewer No.18 (Continue)								
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr	1				
	b)	Air Valve box	nr	1				
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr	1				
	b)	Drain Valve box	nr	1				
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.600x200	nr	1				
	b)	Dia.600x75	nr	1				
	1.6	Bend						
	a)	11.25 degree	nr	1				
	b)	22.5 degree	nr	4				
	c)	30 degree	nr					
	d)	45 degree	nr	5				
	e)	60 degree	nr					
	f)	90 degree	nr	1				
	1.7	Frangle adopter						
	a)	Frangle adopter DN710 for Tee	nr	4				
	a)	Frangle adopter DN 450 for P.S outlet	nr	4				
	b)	Frangle adopter for DN225 for Drain	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 225	m	18				
	b)	DCI Dia.200mm BEND 45 degree	nr	1				
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 710x 450	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.19 Trunk Sewer No.19								
		2.19 Trunk Sewer No.19						
	1.1	DN225 (inside diameter 198mm) Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	231.5				
	b)	1.0m =or< Invert Level < 2.0m	m	574.83				
	c)	2.0m =or< Invert Level < 3.0m	m	23.92				
	d)	4.0m =or< Invert Level < 5.0m	m					
		Type B (Asphalt)						
	a)	Invert Level < 1.0m	m					
	b)	1.0m =or< Invert Level < 2.0m	m	13.15				
	1.2	Precast Manhole						
	a)	Dia. 1050 Precast Manhole, h<1.0m	nr					
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr					
	c)	Dia. 1200 Precast Manhole, h<3.0m	nr					
	d)	Dia. 1200 Precast Manhole, h<4.0m	nr					
	e)	Manhole cover (Iron)	nr					
	1.3	Air Valve (Made in Japan)						
	a)	Air Valve dia.75mm for sewage	nr					
	b)	Air Valve box	nr					
	1.4	Drain (Scour) Valve						
	a)	Sluce Valve dia. 100mm	nr					
	b)	Drain Valve box	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
2.19 Trunk Sewer No.19 (Continue)								
	1.5	Ductile Cast Iron Tee for Air and Drain valve						
	a)	Dia.100x100	nr					
	b)	Dia.100x75	nr					
	1.6	Bend						
	a)	11.25 degree	nr					
	b)	22.5 degree	nr	1				
	c)	30 degree	nr					
	d)	45 degree	nr					
	e)	60 degree	nr					
	f)	90 degree	nr	1				
	1.7	Frangle adopter						
	a)	Frangle adopter DN110 for P.S outlet	nr	1				
	1.8	Drain Pipe Connection to Branch Sewer						
	a)	HDPE DN 110	m					
	b)	DCI BEND 45 degree						
	1.9	HDPE PEDUCER						
	a)	HDPE REDUCER 225x 110	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area								
	1	KL1_uPVC Pipe Installation						
	1.1	150mm diameter Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	281.15				
	b)	2.0m =or< Invert Level < 3.0m	m	125.43				
		Type B (Asphalt)						
	c)	1.0m =or< Invert Level < 2.0m	m	128.81				
	d)	2.0m =or< Invert Level < 3.0m	m	10.09				
	1.2	Precast Manhole Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	4				
	b)	Dia. 1200 Precast Manhole, h<3.0m	nr	3				
		Type B (Asphalt)						
	c)	Dia. 1050 Precast Manhole, h<2.0m	nr	2				
	d)	Manhole cover (Iron)	nr	9				
	1.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	1				
	b)	Cleaning of Existing Sewer and Manhole	nr	1				
	1.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	90				
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	2	KL2 uPVC Pipe Installation						
	2.1	150mm diameter						
		Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	37.00				
		Type B (Asphalt)						
	b)	1.0m =or< Invert Level < 2.0m	m	249.17				
	2.2	225mm diameter						
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	112.64				
	2.3	Precast Manhole						
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	2				
	b)	Dia. 1200 Precast Manhole, h<3.0m	nr	1				
		Type B (Asphalt)						
	c)	Dia. 1050 Precast Manhole, h<2.0m	nr	5				
	d)	Manhole cover (Iron)	nr	8				
	e)	Drop pipe	m	0.64				
	2.4	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	2.5	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location)	m	80				
		Total length should not be changed						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	3	KL3_uPVC Pipe Installation						
	3.1	150mm diameter						
		Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	37.19				
		Type B (Asphalt)						
	b)	1.0m =or< Invert Level < 2.0m	m	209.74				
	3.2	Precast Manhole						
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	2				
		Type B (Asphalt)						
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	4				
	c)	Manhole cover (Iron)	nr	6				
	3.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	3.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location)	m	60				
		Total length should not be changed						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	4	KL4_uPVC Pipe Installation						
	4.1	150mm diameter						
		Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	44.53				
		Type B (Asphalt)						
	b)	1.0m =or< Invert Level < 2.0m	m	108.37				
	4.2	Precast Manhole						
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	1				
		Type B (Asphalt)						
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	4				
	c)	Manhole cover (Iron)	nr	5				
	4.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	4.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location)	m	50				
		Total length should not be changed						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	5	KL5_uPVC Pipe Installation						
	5.1	150mm diameter						
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	143.53				
	5.2	Precast Manhole						
		Type B (Asphalt)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	3				
	b)	Manhole cover (Iron)	nr	3				
	c)	Drop pipe dia. 100mm, uPVC	m	0.71				
	5.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	5.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	30				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	6	KL6_uPVC Pipe Installation						
	6.1	150mm diameter						
		Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	85.08				
	6.2	Precast Manhole						
		Type B (Asphalt)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	2				
	b)	Manhole cover (Iron)	nr	2				
	6.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	6.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	20				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	7	KL7_uPVC Pipe Installation						
	7.1	150mm diameter						
		Type A (Soil/Right of Way)						
	a)	Invert Level < 1.0m	m	96.07				
	b)	1.0m =or< Invert Level < 2.0m	m	245.53				
		Type B (Asphalt)						
	c)	1.0m =or< Invert Level < 2.0m	m	166.10				
	d)	2.0m =or< Invert Level < 3.0m	m	52.30				
	7.2	Precast Manhole						
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	7				
		Type B (Asphalt)						
	b)	Dia. 1050 Precast Manhole, h<2.0m	nr	5				
	c)	Manhole cover (Iron)	nr	12				
	7.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	7.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	120				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	8	KL8_uPVC Pipe Installation						
	8.1	225mm diameter						
		Type A (Soil/Right of Way)						
	a)	2.0m =or< Invert Level < 3.0m	m	100.23				
		Type B (Asphalt)						
	b)	2.0m =or< Invert Level < 3.0m	m	130.28				
	8.2	Precast Manhole						
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	3				
		Type B (Asphalt)						
	b)	Dia. 1200 Precast Manhole, h<3.0m	nr	4				
	c)	Manhole cover (Iron)	nr	7				
	8.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	1				
	b)	Cleaning of Existing Sewer and Manhole	nr	1				
	8.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	70				
	8.5	DN355(ID:312mm) HDPE pipe						
		Type A (Soil/Right of Way)						
	a)	2.0m =or< Invert Level < 3.0m	m	11.97				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	10	KL10_uPVC Pipe Installation						
	10.1	150mm diameter Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	214.24				
	10.2	Precast Manhole Type B (Asphalt)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	6				
	b)	Manhole cover (Iron)	nr	6				
	10.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	10.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	60				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	11	KL11_uPVC Pipe Installation						
	11.1	150mm diameter						
		Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	237.81				
	11.2	Precast Manhole						
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	4				
	b)	Manhole cover (Iron)	nr	4				
	11.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	11.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	40				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	12	KL12_uPVC Pipe Installation						
	12.1	150mm diameter Type B (Asphalt)						
	a)	1.0m =or< Invert Level < 2.0m	m	62.08				
	b)	2.0m =or< Invert Level < 3.0m	m	87.21				
	12.2	Precast Manhole Type B (Asphalt)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	4				
	b)	Manhole cover (Iron)	nr	4				
	c)	Drop pipe, dia.150mm, uPVC	m	0.92				
	12.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	1				
	b)	Cleaning of Existing Sewer and Manhole	nr	1				
	12.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	40				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section 3.9 Kila Kila Area (Continue)								
	13	KL13 uPVC Pipe Installation						
	13.1	150mm diameter Type A (Soil/Unpaved Road)						
	a)	1.0m =or< Invert Level < 2.0m	m	184.81				
	b)	2.0m =or< Invert Level < 3.0m	m	8.48				
	13.2	Precast Manhole Type A (Soil/Unpaved Road)						
	a)	Dia. 1050 Precast Manhole, h<2.0m	nr	6				
	b)	Manhole cover (Iron)	nr	6				
	13.3	Connection to Existing Sewer						
	a)	Connection work to Existing Sewer (including invert modification)	nr	-				
	b)	Cleaning of Existing Sewer and Manhole	nr	-				
	13.4	House Connection 100mm diameter						
	a)	10m uPVC Pipe per each Manhole (length will be arranged at each location) Total length should not be changed	m	60				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 3-69 to 3-81								
		Sum of Page 3-69						
		Sum of Page 3-70						
		Sum of Page 3-71						
		Sum of Page 3-72						
		Sum of Page 3-73						
		Sum of Page 3-74						
		Sum of Page 3-75						
		Sum of Page 3-76						
		Sum of Page 3-77						
		Sum of Page 3-78						
		Sum of Page 3-79						
		Sum of Page 3-80						
		Sum of Page 3-81						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 4								
	1	Total of Section 4.1 Kanudi Pumping Station (PS-1) (from Page Collection)						
		Total of Section 4.2 Idubada Pumping Station (PS-2) (from Page Collection)						
		Total of Section 4.3 Hagara Pumping Station (PS-3) (from Page Collection)						
		Total of Section 4.4 Hanubada Pumping Station (PS-4) (from Page Collection)						
		Total of Section 4.5 Konedobu Pumping Station (PS-5) (from Page Collection)						
		Total of Section 4.6 Old Yacht Club Pumping Station (PS-6) (from Page Collection)						
		Total of Section 4.7 Stanley Esplanade Pumping Station (PS-7) (from Page Collection)						
		Total of Section 4.8 Sea Park Pumping Station (PS-8) (from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 4 (Continue)								
		Total of Section 4.9						
		Davara Pumping Station (PS-9)						
		(from Page Collection)						
		Total of Section 4.10						
		Lawes Road Pumping Station (PS-10)						
		(from Page Collection)						
		Total of Section 4.11						
		Koki Pumping Station (PS-11)						
		(from Page Collection)						
		Total of Section 4.12						
		Badili Pumping Station (PS-12)						
		(from Page Collection)						
		Total of Section 4.13						
		Kila Police Pumping Station (PS-13)						
		(from Page Collection)						
		Total of Section 4.14						
		Konebada Pumping Station (PS-14)						
		(from Page Collection)						
		Total of Section 4.15						
		Gabutu Pumping Station (PS-15)						
		(from Page Collection)						
		Total of Section 4.16						
		Horsecamp Pumping Station (PS-16)						
		(from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 4 (Continue)								
		Total of Section 4.17						
		Kaugere Pumping Station (PS-17) (from Page Collection)						
		Total of Section 4.18						
		4.18 Generator House (20kVA) (from Page Collection)						
		Total of Section 4.19						
		4.19 Generator House (37.5kVA) (from Page Collection)						
		Total of Section 4.20						
		4.20 Generator House (50/75kVA) (from Page Collection)						
		Total of Section 4.21						
		4.21 Generator House - 200 kVA (from Page Collection)						
		Total of Section 4.22						
		4.22 Generator House (250kVA) (from Page Collection)						
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.1 Kanudi Pumping Station (PS-1)								
		4.1 Kanudi Pumping Station (PS-1)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	223.06				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	189.66				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	31.7				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³	1.13				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	0.57				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	20.53				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.1 Kanudi Pumping Station (PS-1) (continue)								
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe uPVC 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	99.1				
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<2.0m	nr	4				
	3.2.2	Manhole cover (Iron)	nr	4				
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr	2				
	3.2.2	Cleaning of Existing Sewer and Manhole	nr					
	3.4							
	3.1.1	Overflow HDPE 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	38.7				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	10				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	36				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :200dia	no	1				
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-4 to 4-6								
		Sum of Page 4-4						
		Sum of Page 4-5						
		Sum of Page 4-6						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.2 Idubada Pumping Station (PS-2)								
		4.2 Idubada Pumping Station (PS-2)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	190.3				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	187.78				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	132.68				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	190.3				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	187.78				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	0.57				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	28.71				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	3.45				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.2 Idubada Pumping Station (PS-2) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²	3.06				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	52.6				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe uPVC 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	99.1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.2 Idubada Pumping Station (PS-2) (continue)								
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<2.0m	nr	1				
	3.2.2	Manhole cover (Iron)	nr	1				
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr	1				
	3.2.2	Cleaning of Existing Sewer and Manhole	nr					
	3.4							
	3.1.1	Overflow HDPE 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	31				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	25				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	39				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :200dia	no	1				
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-8 to 4-10								
		Sum of Page 4-8						
		Sum of Page 4-9						
		Sum of Page 4-10						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.3 Hagara Pumping Station (PS-3)								
		4.3 Hagara Pumping Station (PS-3)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	126.03				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	241.97				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	68.51				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	126.03				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	241.97				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	0.57				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	28.18				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced c	t	3.38				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.3 Hagara Pumping Station (PS-3) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²	78.16				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²	122.13				
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	184.14				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe uPVC300mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	68				
	3.2	Precast Manhole						
	3.2.1	Dia. 1050 Precast Manhole, h<4.0m	nr	2				
	3.2.2	Manhole cover (Iron)	nr	2				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.3 Hagara Pumping Station (PS-3) (continue)								
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr					
	3.2.2	Cleaning of Existing Sewer and Manhole	nr	2				
	3.4							
	3.1.1	Overflow HDPE 280mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	73				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	41				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	41.2				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :200dia	no	-				
	4.1.6	Pipe(DIP) 100mm dia	m	4.3				
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-12 to 4-14								
		Sum of Page 4-12						
		Sum of Page 4-13						
		Sum of Page 4-14						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.4 Hanuabada Pumping Station (PS-4)								
		4.4 Hanuabada Pumping Station (PS-4)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	290.65				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	400.25				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	192.35				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	301.45				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	400.25				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	1.78				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	88.25				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	10.59				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.4 Hanuabada Pumping Station (PS-4) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	24				
	2.4.2	Formwork for structural concrete columns	m ²	317.52				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	93				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	STORM WATER DRAIN HDPE 710mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	21				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.4 Hanuabada Pumping Station (PS-4) (continue)								
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<4.0m	nr	1				
	3.2.2	Manhole cover (Iron)	nr	1				
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr	1				
	3.2.2	Cleaning of Existing Sewer and Manhole	nr					
	3.4							
	3.1.1	Overflow HDPE 400mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	18				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	42				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	41.2				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :200dia	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
Page Collection 4-16 to 4-18								
		Sum of Page 4-16						
		Sum of Page 4-17						
		Sum of Page 4-18						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.5 Konedobu Pumping Station (PS-5)								
		4.5 Konedobu Pumping Station (PS-5)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³					
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	1476.48				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	799.2				
	1.1.4	Supply, spread & compact selected surplus Soil	m ³					
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	1476.48				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	2.17				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	110.79				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	13.29				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.5 Konedobu Pumping Station (PS-5) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	47.25				
	2.4.2	Formwork for structural concrete columns	m ²	361.43				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	148.05				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe HDPE 400mm diameter Type A (Soil/Right of Way) 5.0m< Invert Level < 6.0m	m	19.1				
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<7.0m	nr	3				
	3.2.2	Manhole cover (Iron)	nr	3				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.5 Konedobu Pumping Station (PS-5) (continue)								
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr	2				
	3.2.2	Cleaning of Existing Sewer and Manhole	nr					
	3.4							
	3.1.1	Overflow HDPE 560mm diameter Type B (Asphalt) 1.0m =or< Invert Level < 2.0m	m	58				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	67				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	48				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :200dia	no					
	4.1.6	Pipe(DIP)300mm dia	m	6.4				
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-20 to 4-22								
		Sum of Page 4-20						
		Sum of Page 4-21						
		Sum of Page 4-22						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
4.6 Old Yacht Club Pumping Station (PS-6)								
		4.6 Old Yacht Club Pumping Station (PS-6)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³					
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³					
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³					
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³					
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t					
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.6 Old Yacht Club Pumping Station (PS-6) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²					
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	15.99				
	3	Inlet Pipe & Overflow Pipe Works						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.6 Old Yacht Club Pumping Station (PS-6) (continue)								
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no					
	4.1.2	EDA RANU wave & fence (2.6m high)	m	23.6				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	1				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :200dia	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-24 to 4-26								
		Sum of Page 4-24						
		Sum of Page 4-25						
		Sum of Page 4-26						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
4.7 Stanley Esplanade Pumping Station (PS-7)								
		4.7 Stanley Esplanade Pumping Station (PS-7)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³					
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³					
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³					
	1.1.6	Disposal of surplus soil to dumping site (10km distance)	m ³					
		Concrete Idemolition	m ³	4.2				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³					
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.7 Stanley Esplanade Pumping Station (PS-7) (continue)								
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t					
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²					
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	44.75				
	3	Inlet Pipe & Overflow Pipe Works						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
4.7 Stanley Esplanade Pumping Station (PS-7) (continue)								
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no					
	4.1.2	EDA RANU wave & fence (2.6m high)	m					
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no					
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m					
	4.1.5	Supply material and lying flapgate :200dia	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-28 to 4-30								
		Sum of Page 4-28						
		Sum of Page 4-29						
		Sum of Page 4-30						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.8 Sea Park Pumping Station (PS-8)								
		4.8 Sea Park Pumping Station (PS-8)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³					
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³					
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³					
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³					
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t					
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.8 Sea Park Pumping Station (PS-8) (conrinue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²					
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	51.34				
	3	Inlet Pipe & Overflow Pipe Works						
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no					
	4.1.2	EDA RANU wave & fence (2.6m high)	m					
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.8 Sea Park Pumping Station (PS-8) (conrinue)								
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no					
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m					
	4.1.5	Supply material and lying flapgate :200dia	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-32 to 4-34								
		Sum of Page 4-32						
		Sum of Page 4-33						
		Sum of Page 4-34						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
4.9 Davara Pumping Station (PS-9)								
		4.9 Davara Pumping Station (PS-9)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³					
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³					
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³					
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³					
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t					
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.9 Davara Pumping Station (PS-9) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²					
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	48.22				
	3	Inlet Pipe & Overflow Pipe Works						
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no					
	4.1.2	EDA RANU wave & fence (2.6m high)	m					
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
4.9 Davara Pumping Station (PS-9) (continue)								
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no					
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m					
	4.1.5	Supply material and lying flapgate :200dia	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-36 to 4-38								
		Sum of Page 4-36						
		Sum of Page 4-37						
		Sum of Page 4-38						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.10 Lawes Road Pumping Station (PS-10)								
		4.10 Lawes Road Pumping Station (PS-10)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	810.61				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	544.64				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	265.97				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³	4.34				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	2.17				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	102.74				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	12.33				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.10 Lawes Road Pumping Station (PS-10) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	47.25				
	2.4.2	Formwork for structural concrete columns	m ²	319.38				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	129.15				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe uPVC 300mm diameter Type A (Soil/Right of Way) 2.0m< Invert Level < 3.0m	m	31.3				
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<3.0m	nr	1				
	3.2.2	Manhole cover (Iron)	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
4.10 Lawes Road Pumping Station (PS-10) (continue)								
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr					
	3.2.2	Cleaning of Existing Sewer and Manhole	nr	2				
	3.4							
	3.1.1	Overflow HDPE 560mm diameter Type B (Asphalt) 1.0m =or< Invert Level < 2.0m	m	17.1				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	36				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	56				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate	no					
	4.1.6	Pipe(DIP)450mm dia	m	5.4				
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
Page Collection 4-40 to 4-42								
		Sum of Page 4-40						
		Sum of Page 4-41						
		Sum of Page 4-42						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.11 Koki Pumping Station (PS-11)								
		4.11 Koki Pumping Station (PS-11)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	446.16				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	327.6				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	118.56				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³	2.74				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	1.37				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	56.94				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	6.83				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.11 Koki Pumping Station (PS-11) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	12				
	2.4.2	Formwork for structural concrete columns	m ²	183.9				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	66				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe HDPE 355mm diameter Type B (Asphalt)						
		1.0m =or< Invert Level < 2.0m	m	72.4				
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<3.0m	nr	3				
	3.2.2	Manhole cover (Iron)	nr	3				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.11 Koki Pumping Station (PS-11) (continue)								
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr					
	3.2.2	Cleaning of Existing Sewer and Manhole	nr	2				
	3.4							
	3.1.1	Overflow HDPE 355mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	22.6				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	42				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	47.2				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
Page Collection 4-44 to 4-46								
		Sum of Page 4-44						
		Sum of Page 4-45						
		Sum of Page 4-46						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.12 Badili Pumping Station (PS-12)								
		4.12 Badili Pumping Station (PS-12)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³					
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³					
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³					
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³					
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	58.72				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	7.05				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.12 Badili Pumping Station (PS-12) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²	191				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	42.19				
	3	Inlet Pipe & Overflow Pipe Works						
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no					
	4.1.2	EDA RANU wave & fence (2.6m high)	m	36.3				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.12 Badili Pumping Station (PS-12) (continue)								
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate :600dia	no	1				
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-48 to 4-50								
		Sum of Page 4-48						
		Sum of Page 4-49						
		Sum of Page 4-50						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.13 Kila Police Pumping Station (PS-13)								
		4.13 Kila Police Pumping Station (PS-13)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	169.73				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	82.32				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	44.58				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	169.73				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	82.32				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	0.57				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	22.11				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	2.65				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.13 Kila Police Pumping Station (PS-13) (continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²	78.16				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²	84.03				
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion	m ²	32.97				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe uPVC 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	3.7				
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<2.0m	nr	1				
	3.2.2	Manhole cover (Iron)	nr	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.13 Kila Police Pumping Station (PS-13) (continue)								
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr	1				
	3.2.2	Cleaning of Existing Sewer and Manhole	nr	1				
	3.4							
	3.1.1	Overflow HDPE 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m	5.8				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	12				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	34				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe	m	30				
	4.1.5	Supply material and lying flapgate :	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 4-52 to 4-54								
		Sum of Page 4-52						
		Sum of Page 4-53						
		Sum of Page 4-54						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.14 Konebada Pumping Station (PS-14)								
		4.14 Konebada Pumping Station (PS-14)						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	173.56				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	154.1				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	173.56				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	105.05				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	154.1				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 150mm Thick	m ³					
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength	m ³	0.57				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³					
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	26.07				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	3.13				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²					
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.14 Konebada Pumping Station (PS-14) (continue)								
		4.14 Konebada Pumping Station (PS-14)						
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²					
	2.4.2	Formwork for structural concrete columns	m ²	78.16				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²	110.41				
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²					
	2.5.2	Plastic chairs	bags					
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no					
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	44.75				
	3	Inlet Pipe & Overflow Pipe Works						
	3.1							
	3.1.1	Inlet Pipe uPVC 225mm diameter Type A (Soil/Right of Way) 1.0m =or< Invert Level < 2.0m	m					
	3.2	Precast Manhole						
	3.2.1	Dia. 1200 Precast Manhole, h<2.0m	nr					
	3.2.2	Manhole cover (Iron)	nr					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
4.14 Konebada Pumping Station (PS-14) (continue)								
	3.3	Connection to Existing Sewer						
	3.3.1	Connection work to Existing Sewer (including invert modification)	nr					
	3.2.2	Cleaning of Existing Sewer and Manhole	nr					
	3.4							
	3.1.1	Overflow HDPE 225mm diameter Type B (Asphalt) 1.0m =or< Invert Level < 2.0m	m	4.7				
	4	Miscellaneous Works						
	4.1	Handrail, ladders and Stop Logs others						
	4.1.1	Step Iron, Width=300mm, SS-304	no	20				
	4.1.2	EDA RANU wave & fence (2.6m high)	m	69				
	4.1.3	EDARANU wave & gate (2.6m high, 3.0m width)	no	2				
	4.1.4	Water Reticulation Pipeworks :Mild Steel Pipe dia. 25 mm	m	30				
	4.1.5	Supply material and lying flapgate	no					
	4	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
Page Collection 4-56 to 4-58								
		Sum of Page 4-56						
		Sum of Page 4-57						
		Sum of Page 4-58						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.11 Electrical Substation (Continue)								
	8.2.12	Timber framed fixed glass panel window -	no	-				
	8.2.13	Timber framed fixed glass panel window -	no	-				
	8.2.14	Timber framed fixed glass panel window with	no	-				
	8.2.15	Install 75 x 25mm hwd window architrave	lm	16.20				
	8.2.16	Install 25 x 25mm hwd window beads	lm					
	8.2.17	Install 32 x 19mm hwd window cover strips	lm	20.70				
	8.3	Door Hardware						
	8.3.1	536 Escape lockset & 007 Round ext. cylinder,	no	7.00				
	8.3.2	Barrel lockset with indicators (to toilets)	no					
	8.3.3	234 Series Brass padlock to security grill door	no	4.00				
	8.3.4	401 Hydraulic door closer	no	10.00				
	8.3.5	100mm steel butt hinges	pair	10.00				
	8.3.6	Rubber door stops, 65-70mm, skirting	no	10.00				
	9	Painting Works						
	9.1	Painting						
	9.1.1	Supply & apply painting to external & internal	m ²	587.58				
	9.1.2	Supply & apply painting to internal block walls	m ²	-				
	9.1.3	Supply & apply painting to plaster board wall	m ²	-				
	9.1.4	Supply & apply painting to internal ceiling	m ²	126.48				
	9.1.5	Supply & apply painting to doors & door	m ²	36.96				
	9.1.6	Supply & apply painting to windows & window	m ²	3.65				
	9.1.7	Supply & apply painting to skirtings,	m ²	6.50				
	9.1.8	Supply & apply painting to steel security grill	m ²	-				
	9.1.9	Supply & apply painting to steel columns	m ²	-				
	9.1.10	Supply & apply painting to stairs and hand rails	m ²	-				
	10	Miscellaneous Works						
	10.1	Handrail, ladders and Stop Logs						
	10.1.1	Handrail, Height=1100mm, Galvanised mild	m	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
5.11 Electrical Substation (Continue)								
	10.1.2	Ladders, Width=400mm, Galvanised mild steel	m	-				
	10.1.3	Step Iron, Width=300mm, SS-304	no	-				
	10.1.4	Stop logs with frame, Water depth less than 1.5m	m ²	-				
	10.2	Covers						
	10.2.1	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar	m ²	-				
	10.2.2	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar	m ²	-				
	10.2.3	FRP cover with frame, 35mm thk, Fiber Reinforced Plastic	m ²	-				
	10.2.4	FRP cover with frame, 75mm thk, Fiber Reinforced Plastic	m ²	-				
	11	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1.0				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-67 to 5-73								
		Sum of Page 5-67						
		Sum of Page 5-68						
		Sum of Page 5-69						
		Sum of Page 5-70						
		Sum of Page 5-71						
		Sum of Page 5-72						
		Sum of Page 5-73						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building								
		5.12 Administration Building						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	123.84				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	45.00				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	45.00				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³					
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 200mm Thick	m ³	11.14				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	205.37				
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³					
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	22.59				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²	612.00				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building (Continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	8.76				
	2.4.2	Formwork for structural concrete columns	m ²	224.00				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²	807.04				
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²	300.00				
	2.5.2	Plastic chairs	bags	24.00				
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no	4.00				
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no	1.00				
	2.6.3	Construct shallow concrete spoon drain	lm	40.00				
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²					
	3	Block Works						
	3.1	Concrete Blockwork						
	3.1.1	Supply 100mm thk blockwork to walls	m ²					
	3.1.2	Supply 150mm thk blockwork to walls	m ²					
	3.1.3	Supply 200mm thk blockwork to walls	m ²	633.78				
	3.2	Masonry Reinforcement						
	3.2.1	Supply reinforcing bars to blockwork in walls	tons	6.16				
	3.3	Core Fill Concrete						
	3.3.1	Supply 15Mpa corefill to blockwork in walls	m ³	50.70				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building (Continue)								
	4	Metal Works						
	4.1	Structural Steel Column & Beams						
	4.1.1	100mm dia. CHS steel post (entry canopy)	tons	0.08				
	4.1.2	50 x 50 x 3mm equal angle hood framing	tons	0.55				
	4.1.3	150 x 50 x 3mm RHS steel roof truss (pre-fabricated)	no	17.00				
	4.1.4	Install 50/40mm dia. steel escape ladder	item	1.00				
	4.1.5	Allow for brackets, plates, bolts & nuts	item	1.00				
	5	Carpentry Works						
	5.1	Stud wall Partitions						
	5.1.1	75 x 50 hwd stud partition wall	lm	741.48				
	5.2	Floor Framing						
	5.2.1	150 x 50 hwd floor joist	lm	375.00				
	5.3	Ceiling Framing						
	5.3.1	75 x 50 hwd ceiling joist	lm					
	5.3.2	50 x 50 hwd ceiling framing	lm	2,073.84				
	5.3.3	Suspended metal ceiling grid system	m ²	257.02				
	5.4	Roof Framing						
	5.4.1	75 x 50 hwd roof purlins	lm	657.20				
	5.4.2	100 x 50 hwd roof truss	lm	32.70				
	5.4.3	150 x 50 hwd rafter	lm					
	5.4.4	200 x 30 hwd fascia board	lm	88.50				
	5.4.5	150 x 50 hwd beam over	lm	4.80				
	5.4.6	200 x 75 hwd beam over	lm					
	5.5	Stairs						
	5.5.1	150 x 50 hwd hand rails to stairs	lm	10.60				
	5.5.2	100 x 50 hwd hand rails to stairs	lm	10.60				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
5.12 Administration Building (Continue)								
	6	Lining & Finishes						
	6.1	Wall Lining & Finishes						
	6.1.1	Bathroom wall lining (seratone or similar)	m ²	45.66				
	6.1.2	12mm thk plaster board wall lining	m ²	165.10				
	6.1.3	100 x 20mm thk shiplap internal wall lining	lm	102.90				
	6.1.4	300 x 300 ceramic wall tiles	m ²	88.12				
	6.1.5	150 x 100 ceramic skirting tiles	m ²	7.08				
	6.1.6	70 x 25 hwd timber skirtings	lm	210.00				
	6.1.7	Metal corner strips (plasterboard)	lm	210.00				
	6.1.8	Colorbond trimdek external wall cladding	m ²	19.50				
	6.2	Floor Lining & Finishes						
	6.2.1	300x300 ceramic tiles non-slip	m ²	500.00				
	6.2.2	Selected ceramic splashback tiles	m ²	2.06				
	6.2.3	100x20mm thk T&G Flooring	lm	1,500.00				
	6.3	Ceiling Lining & Finishes						
	6.3.1	12mm thk plaster board ceiling lining	m ²	222.16				
	6.3.2	Plaster board cornice strips to ceiling	m ²	150.00				
	6.3.3	4mm plywood ceiling lining	m ²	11.76				
	6.3.4	1200 x 600mm ceiling tiles	m ²	365.56				
	6.3.5	75mm thk noise control/proof insulation blanket in	m ²					
	7	Roofing & Insulation						
	7.1	Metal Roofing						
	7.1.1	Colorbond corr. sheeting to roof	m ²	392.08				
	7.1.2	Colorbond trimdek sheeting to roof	m ²	136.44				
	7.1.3	Double sided sisalation to roof	m ²	379.32				
	7.1.4	Galvanised strap bracing to roof	lm	110.80				
	7.1.5	Chicken wire mesh to roof	m ²	379.32				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building (Continue)								
	7.2	Roof Plumbing & Accessories						
	7.2.1	Colorbond sheerline gutter to roof	lm	49.20				
	7.2.2	Colorbond ridge capping to roof	lm	24.60				
	7.2.3	Colorbond barge mould to roof	lm	39.20				
	7.2.4	Colorbond flashing to roof	lm	113.70				
	7.2.5	100mm dia. PVC down pipe to roof, incl. dropper, clips, bends	lm	38.40				
	8	Doors & Windows						
	8.1	Doors						
	8.1.1	Steel security grill to external door D1 1800 x 2100 high	no	1.00				
	8.1.2	Steel security grill to external door, D3 1000 x 2100 high	no	3.00				
	8.1.3	Roller door shutter to details, complete with fitting & accessories	no	1.00				
	8.1.4	Timber door - Type D1 1800 x 2100 high, solid core 2 leaf	no	1.00				
	8.1.5	Timber door - Type D2 1600 x 2100 high	no	2.00				
	8.1.6	Timber door - Type D3 1000 x 2100 high, external solid core	no	8.00				
	8.1.7	Timber door - Type D4 1000 x 2100 high, internal hollow core	no	6.00				
	8.1.8	Timber door - Type D5 700 x 1850 high	no	7.00				
	8.1.9	Sliding door - Type D6 1000 x 2000 high, including tracks & accessories	no	1.00				
	8.1.10	Install 50 x 25mm hwd door architrave	lm	251.20				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building (Continue)								
	8.2	Windows & Glazing						
	8.2.1	Timber framed louvre window - Type W1 1800 x 1500 high, including insect screen & steel security bars	no	27.00				
	8.2.2	Timber framed louvre window - Type W2 1800 x 1000 high, including insect screen & steel security bars	no	3.00				
	8.2.3	Timber framed louvre window - Type W3 1200 x 1000 high, including insect screen & steel security bars	no	2.00				
	8.2.4	Timber framed louvre window - Type W4 1200 x 900 high, including insect screen & steel security bars	no	2.00				
	8.2.5	Timber framed louvre window - Type W5 600 x 1000 high, including insect screen & steel security bars	no	2.00				
	8.2.6	Timber framed louvre window - Type W6 1800 x 1100 high, including insect screen & steel security bars	no	3.00				
	8.2.7	Timber framed louvre window - Type W7 1200 x 1300 high, including insect screen & steel security bars	no	2.00				
	8.2.8	Timber framed louvre window - Type W8 1800 x 1300 high, including insect screen & steel security bars	no	1.00				
	8.2.9	Timber framed louvre window - Type W9 1800 x 700 high, including insect screen & steel security bars	no	2.00				
	8.2.10	Timber framed louvre window - Type W10 1200 x 1500 high, including insect screen & steel security bars	no	5.00				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building								
	8.2.11	Timber framed fixed glass panel window - 1800 x 900 high	no	3.00				
	8.2.12	Timber framed fixed glass panel window - 2700 x 900 high	no	1.00				
	8.2.13	Timber framed fixed glass panel window - 3600 x 900 high	no	2.00				
	8.2.14	Timber framed fixed glass panel window with timber flap (openable from inside) - 1400 x 1200 high	no	1.00				
	8.2.15	Install 75 x 25mm hwd window architrave	lm	312.00				
	8.2.16	Install 25 x 25mm hwd window beads	lm	156.00				
	8.2.17	Install 32 x 19mm hwd window cover strips	lm	174.00				
	8.3	Door Hardware						
	8.3.1	536 Escape lockset & 007 Round ext. cylinder, tubular deadbolts	no	17.00				
	8.3.2	Barrel lockset with indicators (to toilets)	no	7.00				
	8.3.3	234 Series Brass padlock to security grill door	no	4.00				
	8.3.4	401 Hydraulic door closer	no	19.00				
	8.3.5	100mm steel butt hinges	pair	29.00				
	8.3.6	Rubber door stops, 65-70mm, skirting mounted	no	26.00				
	9	Painting Works						
	9.1	Painting						
	9.1.1	Supply & apply painting to external & internal block walls	m ²	1,093.32				
	9.1.2	Supply & install 100 x 20mm thk shiplap wall lining to stair area	m ²	10.29				
	9.1.3	Supply & apply painting to plaster board wall	m ²	165.10				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building (Continue)								
	9.1.4	Supply & apply painting to internal ceiling, including entry canopy	m ²	233.92				
	9.1.5	Supply & apply painting to doors & door frames	m ²	109.20				
	9.1.6	Supply & apply painting to windows & window frames	m ²	86.50				
	9.1.7	Supply & apply painting to skirtings, architraves, stops, cover strips	m ²	46.80				
	9.1.8	Supply & apply painting to steel security grill doors	m ²	4.75				
	9.1.9	Supply & apply painting to steel columns at entry canopy	m ²	2.60				
	9.1.10	Supply & apply painting to stairs and hand rails	m ²	5.12				
	10	Miscellaneous Works						
	10.1	Handrail, ladders and Stop Logs						
	10.1.1	Handrail, Height=1100mm, Galvanised mild steel	m					
	10.1.2	Ladders, Width=400mm, Galvanised mild steel	m					
	10.1.3	Step Iron, Width=300mm, SS-304	no					
	10.1.4	Stop logs with frame, Water depth less than 1.5m	m ²					
	10.2	Covers						
	10.2.1	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar	m ²					
	10.2.2	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar	m ²					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.12 Administration Building (Continue)								
	10.2.3	FRP cover with frame, 35mm thk, Fiber Reinforced Plastic	m ²					
	10.2.4	FRP cover with frame, 75mm thk, Fiber Reinforced Plastic	m ²					
	11	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-67 to 5-73								
		Sum of Page 5-75						
		Sum of Page 5-76						
		Sum of Page 5-77						
		Sum of Page 5-78						
		Sum of Page 5-79						
		Sum of Page 5-80						
		Sum of Page 5-81						
		Sum of Page 5-82						
		Sum of Page 5-83						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House								
		5.13 Guard House						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	14.50				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³					
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	5.40				
	1.1.4	Supply, spread & compact selected surplus Soil	m ³	5.40				
	1.1.5	Disposal of surplus soil to dumping site (10km	m ³					
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 200mm Thick	m ³	1.12				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength	m ³					
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	6.72				
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³					
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³					
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced conc	t	0.47				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²	16.00				
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	2.40				
	2.4.2	Formwork for structural concrete columns	m ²					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House (Continue)								
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²					
	2.4.4	Formwork for structural concrete with curved surface	m ²					
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²	17.20				
	2.5.2	Plastic chairs	bags	1.00				
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no	2.00				
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no					
	2.6.3	Construct shallow concrete spoon drain	lm					
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm					
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²					
	3	Block Works						
	3.1	Concrete Blockwork						
	3.1.1	Supply 100mm thk blockwork to walls	m ²					
	3.1.2	Supply 150mm thk blockwork to walls	m ²	6.50				
	3.1.3	Supply 200mm thk blockwork to walls	m ²	28.81				
	3.2	Masonry Reinforcement						
	3.2.1	Supply reinforcing bars to blockwork in walls	tons	0.27				
	3.3	Core Fill Concrete						
	3.3.1	Supply 15Mpa corefill to blockwork in walls	m ³	2.82				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House (Continue)								
	4	Metal Works						
	4.1	Structural Steel Column & Beams						
	4.1.1	100mm dia. CHS steel post (entry canopy)	tons	0.06				
	4.1.2	50 x 50 x 3mm equal angle hood framing	tons					
	4.1.3	150 x 50 x 3mm RHS steel roof truss (pre-	no					
	4.1.4	Install 50/40mm dia. steel escape ladder	item					
	4.1.5	Allow for brackets, plates, bolts & nuts	item	1.00				
	5	Carpentry Works						
	5.1	Stud wall Partitions						
	5.1.1	75 x 50 hwd stud partition wall	lm					
	5.2	Ceiling Framing						
	5.2.1	75 x 50 hwd ceiling joist	lm					
	5.2.2	50 x 50 hwd ceiling framing	lm	103.20				
	5.2.3	Suspended metal ceiling grid system	m ²					
	5.3	Roof Framing						
	5.3.1	75 x 50 hwd roof purlins	lm	56.00				
	5.3.2	100 x 50 hwd top chord of roof truss	lm	33.60				
	5.3.3	150 x 50 hwd bottom chord of roof truss	lm	25.20				
	5.3.4	200 x 30 hwd fascia board	lm	10.50				
	5.3.5	150 x 50 hwd beam over	lm					
	5.3.6	200 x 75 hwd beam over	lm	4.00				
	5.3.7	75 x 50 hwd struts & ties to truss	lm	23.60				
	5.4	Stairs						
	5.4.1	150 x 50 hwd hand rails to stairs	lm					
	5.4.2	100 x 50 hwd hand rails to stairs	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House (Continue)								
	6	Lining & Finishes						
	6.1	Wall Lining & Finishes						
	6.1.1	Bathroom wall lining (seratone or similar)	m ²					
	6.1.2	12mm thk plaster board wall lining	m ²					
	6.1.3	100 x 20mm thk shiplap internal wall lining	lm					
	6.1.4	200 x 200 ceramic splashback tiles	m ²	0.90				
	6.1.5	200mm high ceramic skirting tiles	lm	8.50				
	6.1.6	70 x 25 hwd timber skirtings	lm					
	6.1.7	Metal corner strips (plasterboard)	lm					
	6.1.8	Colorbond trimdek external wall cladding	m ²					
	6.2	Floor Lining & Finishes						
	6.2.1	200x200 ceramic tiles non-slip	m ²	3.60				
	6.2.2	Selected ceramic splashback tiles	lm					
	6.3	Ceiling Lining & Finishes						
	6.3.1	12mm thk plaster board ceiling lining	m ²					
	6.3.2	Plaster board cornice strips to ceiling	m ²					
	6.3.3	4mm plywood ceiling lining	m ²	17.20				
	6.3.4	25 x 25 hwd cornice strip to ceiling junction	m ²	30.00				
	6.3.5	75mm thk noise control/proof insulation blanket in ceiling lining	m ²					
	7	Roofing & Insulation						
	7.1	Metal Roofing						
	7.1.1	Colorbond corr. sheeting to roof	m ²	7.84				
	7.1.2	Colorbond trimdek sheeting to roof	m ²					
	7.1.3	Double sided sisalation to roof	m ²	7.84				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House (Continue)								
	7.1.4	Galvanised strap bracing to roof	lm	12.00				
	7.1.5	Chicken wire mesh to roof	m ²	7.84				
	7.2	Roof Plumbing & Acessories						
	7.2.1	Colorbond sheerline gutter to roof	lm	21.69				
	7.2.2	Colorbond ridge capping - circular cap 300mm dia.	no	1.00				
	7.2.3	Colorbond barge mould to roof	lm					
	7.2.4	Colorbond flashing to roof	lm	11.60				
	7.2.5	100mm dia. PVC down pipe to roof, incl. dropper, clips, bends	lm	6.40				
	8	Doors & Windows						
	8.1	Doors						
	8.1.1	Steel security grill to external door D1 1800 x 2100 high	no					
	8.1.2	Steel security grill to external door, D3 1000 x 2100 high	no					
	8.1.3	Roller door shutter to details, complete with fitting & accessories	no					
	8.1.4	Timber door - Type D1 1800 x 2100 high, solid core 2 leaf	no					
	8.1.5	Timber door - Type D2 1600 x 2100 high	no					
	8.1.6	Timber door 900 x 2100 high, external solid core	no	1.00				
	8.1.7	Timber door 730 x 2100 high, internal hollow core	no	1.00				
	8.1.8	Timber door - Type D4 900 x 2100 high	no					
	8.1.9	Timber door - Type D5 700 x 1850 high	no					
	8.1.10	Sliding door - Type D6 1000 x 2000 high, including tracks & accessories	no					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House (Continue)								
	8.1.11	Install 50 x 25mm hwd door architrave	lm	20.80				
	8.2	Windows & Glazing						
	8.2.1	Timber framed louvre window, 7no. blades 1200 x 1100 high, including insect screen & steel security bars	no	2.00				
	8.2.2	Timber framed louvre window, 7no. blades 1800 x 1100 high, including insect screen & steel security bars	no	1.00				
	8.2.3	Timber framed louvre window, 4no. blades 900 x 600 high, including insect screen & steel security bars	no	2.00				
	8.2.15	Install 50 x 25mm hwd window architrave	lm	21.00				
	8.2.16	Install 25 x 25mm hwd window beads	lm					
	8.2.17	Install 32 x 19mm hwd window cover strips	lm	25.40				
	8.3	Door Hardware						
	8.3.1	536 Escape lockset & 007 Round ext. cylinder, tubular deadbolts	no	1.00				
	8.3.2	Barrel lockset with indicators (to toilets)	no	1.00				
	8.3.3	234 Series Brass padlock to security grill door	no					
	8.3.4	401 Hydraulic door closer	no					
	8.3.5	100mm steel butt hinges	pair	3.00				
	8.3.6	Rubber door stops, 65-70mm, skirting mounted	no	2.00				
	9	Painting Works						
	9.1	Painting						
	9.1.1	Supply & apply painting to external & internal walls	m ²	70.62				
	9.1.2	Supply & apply painting to internal block walls	m ²					
	9.1.3	Supply & apply painting to plaster board wall	m ²					
	9.1.4	Supply & apply painting to internal ceiling	m ²	17.20				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.13 Guard House (Continue)								
	9.1.5	Supply & apply painting to doors & door frames	m ²	8.32				
	9.1.6	Supply & apply painting to windows & window	m ²	4.80				
	9.1.7	Supply & apply painting to skirtings, architraves,	m ²	7.20				
	9.1.8	Supply & apply painting to steel security grill doors	m ²					
	9.1.9	Supply & apply painting to steel columns	m ²					
	9.1.10	Supply & apply painting to stairs and hand rails	m ²					
	10	Miscellaneous Works						
	10.1	Handrail, ladders and Stop Logs						
	10.1.1	Handrail, Height=1100mm, Galvanised mild steel	m					
	10.1.2	Ladders, Width=400mm, Galvanised mild steel	m					
	10.1.3	Step Iron, Width=300mm, SS-304	no					
	10.1.4	Stop logs with frame, Water depth less than 1.5m	m ²					
	10.2	Covers						
	10.2.1	Grated cover in Hot dip galvanised steel angle	m ²					
	10.2.2	Grated cover in Hot dip galvanised steel angle	m ²					
	10.2.3	FRP cover with frame, 35mm thk, Fiber Reinforced	m ²					
	10.2.4	FRP cover with frame, 75mm thk, Fiber Reinforced	m ²					
	11	Allow for all cost and works deemed necessary but	ls					
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-85 to 5-91								
		Sum of Page 5-85						
		Sum of Page 5-86						
		Sum of Page 5-87						
		Sum of Page 5-88						
		Sum of Page 5-89						
		Sum of Page 5-90						
		Sum of Page 5-91						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port								
		5.14 Car Port						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	66.91				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	-				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	30.66				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	30.66				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	-				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 200mm Thick	m ³	1.07				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength Grade 15Mpa)	m ³	-				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	26.79				
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	-				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³	-				
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	0.38				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²	106.00				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port (Continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	8.38				
	2.4.2	Formwork for structural concrete columns	m ²	-				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²	-				
	2.4.4	Formwork for structural concrete with curved surface	m ²	-				
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²	106.00				
	2.5.2	Plastic chairs	bags	5.00				
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no	2.00				
	2.6.2	Construct concrete drainage pit, 600x600x450 dp incl. metal grate over	no	1.00				
	2.6.3	Construct concrete spoon dreain, 150mm wide	lm	7.50				
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm	-				
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	-				
	3	Block Works						
	3.1	Concrete Blockwork						
	3.1.1	Supply 100mm thk blockwork to walls	m ²	-				
	3.1.2	Supply 150mm thk blockwork to walls	m ²	-				
	3.1.3	Supply 200mm thk blockwork to walls	m ²	-				
Carried forward to page collection								
5.14 Car Port (Continue)								
	3.2	Masonry Reinforcement						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	3.2.1	Supply reinforcing bars to blockwork in walls	tons	-				
	3.3	Core Fill Concrete						
	3.3.1	Supply 15Mpa corefill to blockwork in walls	m ³	-				
	4	Metal Works						
	4.1	Structural Steel Column & Beams						
	4.1.1	Supply & install 125 x 125 x 6.0mm shs steel post at 6.40 & 7.00M (6 off)	tons	0.86				
	4.1.2	50 x 50 x 3mm equal angle hood framing	tons	-				
	4.1.3	150 x 50 x 3mm RHS steel roof truss (pre-fabricated)	no	-				
	4.1.4	Install 50/40mm dia. steel escape ladder	item	-				
	4.1.5	Allow for brackets, plates, bolts & nuts	item	1.00				
	5	Carpentry Works						
	5.1	Stud wall Partitions						
	5.1.1	75 x 50 hwd stud partition wall	lm	-				
	5.2	Ceiling Framing						
	5.2.1	75 x 50 hwd ceiling joist	lm	-				
	5.2.2	50 x 50 hwd ceiling framing	lm	-				
	5.2.3	Suspended metal ceiling grid system	m ²	-				
	5.3	Roof Framing						
	5.3.1	Supply & install 150 x 75 x 5.0 rhs steel rafter beam	tons	0.45				
	5.3.2	Supply & install 100 x 50 x 4.0 rhs steel roof frame	tons	0.34				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port (Continue)								
	5.3.3	Supply & install 75 x 50 x 4.0 rhs steel roof purlins	tons	1.01				
	5.3.4	Supply & install 250mm wide steel fascia & barge board to roof	lm	57.00				
	5.3.5	150 x 50 hwd beam over	lm	-				
	5.3.6	200 x 75 hwd beam over	lm	-				
	5.3.7	75 x 50 hwd struts & ties to truss	lm	-				
	5.4	Stairs						
	5.4.1	150 x 50 hwd hand rails to stairs	lm	-				
	5.4.2	100 x 50 hwd hand rails to stairs	lm	-				
	6	Lining & Finishes						
	6.1	Wall Lining & Finishes						
	6.1.1	Bathroom wall lining (seratone or similar)	m ²	-				
	6.1.2	12mm thk plaster board wall lining	m ²	-				
	6.1.3	100 x 20mm thk shiplap internal wall lining	lm	-				
	6.1.4	200 x 200 ceramic splashback tiles	m ²	-				
	6.1.5	200mm high ceramic skirting tiles	lm	-				
	6.1.6	70 x 25 hwd timber skirtings	lm	-				
	6.1.7	Metal corner strips (plasterboard)	lm	-				
	6.1.8	Colorbond trimdek external wall cladding	m ²	-				
	6.2	Floor Lining & Finishes						
	6.2.1	200x200 ceramic tiles non-slip	m ²	-				
	6.2.2	Selected ceramic splashback tiles	lm	-				
	6.3	Ceiling Lining & Finishes						
	6.3.1	12mm thk plaster board ceiling lining	m ²	-				
	6.3.2	Plaster board cornice strips to ceiling	m ²	-				
	6.3.3	4mm plywood ceiling lining	m ²	-				
	6.3.4	25 x 25 hwd cornice strip to ceiling junction	m ²	-				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port (Continue)								
	6.3.5	75mm thk noise control/proof insulation blanket in ceiling lining	m ²	-				
	7	Roofing & Insulation						
	7.1	Metal Roofing						
	7.1.1	Colorbond corr. sheeting to roof	m ²	134.40				
	7.1.2	Colorbond trimdek sheeting to roof	m ²	-				
	7.1.3	Double sided sisalation to roof	m ²	-				
	7.1.4	Galvanised strap bracing to roof	lm	36.80				
	7.1.5	Chicken wire mesh to roof	m ²	-				
	7.2	Roof Plumbing & Accessories						
	7.2.1	100mm dia. pvc gutter to roof	lm	11.20				
	7.2.2	Colorbond ridge capping - circular cap 300mm dia.	no	-				
	7.2.3	Colorbond barge mould & flashing to roof	lm	36.00				
	7.2.4	Colorbond flashing to roof	lm	-				
	7.2.5	100mm dia. PVC down pipe to roof, incl. dropper, clips, bends	lm	12.80				
	8	Doors & Windows						
	8.1	Doors						
	8.1.1	Steel security grill to external door D1 1800 x 2100 high	no	-				
	8.1.2	Steel security grill to external door, D3 1000 x 2100 high	no	-				
	8.1.3	Roller door shutter to details, complete with fitting & accessories	no	-				
	8.1.4	Timber door - Type D1 1800 x 2100 high, solid core 2 leaf	no	-				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port (Continue)								
	8.1.5	Timber door - Type D2 1600 x 2100 high	no	-				
	8.1.6	Timber door 900 x 2100 high, external solid core	no	-				
	8.1.7	Timber door 730 x 2100 high, internal hollow core	no	-				
	8.1.8	Timber door - Type D4 900 x 2100 high	no	-				
	8.1.9	Timber door - Type D5 700 x 1850 high	no	-				
	8.1.10	Sliding door - Type D6 1000 x 2000 high, including tracks & asessories	no	-				
	8.1.11	Install 50 x 25mm hwd door architrave	lm	-				
	8.2	Windows & Glazing						
	8.2.1	Timber framed louvre window, 7no. blades 1200 x 1100 high, including insect screen & steel securuty bars	no	-				
	8.2.2	Timber framed louvre window, 7no. blades 1800 x 1100 high, including insect screen & steel securuty bars	no	-				
	8.2.3	Timber framed louvre window, 4no. blades 900 x 600 high, including insect screen & steel securuty bars	no	-				
	8.2.15	Install 50 x 25mm hwd window architrave	lm	-				
	8.2.16	Install 25 x 25mm hwd window beads	lm	-				
	8.2.17	Install 32 x 19mm hwd window cover strips	lm	-				
	8.3	Door Hardware						
	8.3.1	536 Escape lockset & 007 Round ext. cylinder, tubular deadbolts	no	-				
	8.3.2	Barrel lockset with indicators (to toilets)	no	-				
	8.3.3	234 Series Brass padlock to security grill door	no	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port (Continue)								
	8.3.4	401 Hydraulic door closer	no	-				
	8.3.5	100mm steel butt hinges	pair	-				
	8.3.6	Rubber door stops, 65-70mm, skirting mounted	no	-				
	9	Painting Works						
	9.1	Painting						
	9.1.1	Supply & apply painting to shs steel posts	m ²	20.10				
	9.1.2	Supply & apply painting to steel roof rafters and support frame	m ²	17.82				
	9.1.3	Supply & apply painting to plaster board wall	m ²	-				
	9.1.4	Supply & apply painting to internal ceiling	m ²	-				
	9.1.5	Supply & apply painting to doors & door frames	m ²	-				
	9.1.6	Supply & apply painting to windows & window frames	m ²	-				
	9.1.7	Supply & apply painting to skirtings, architraves, stops, cover strips	m ²	-				
	9.1.8	Supply & apply painting to steel security grill doors	m ²	-				
	9.1.9	Supply & apply painting to steel columns	m ²	-				
	9.1.10	Supply & apply painting to stairs and hand rails	m ²	-				
	10	Miscellaneous Works						
	10.1	Handrail, ladders and Stop Logs						
	10.1.1	Handrail, Height=1100mm, Galvanised mild steel	m	-				
	10.1.2	Ladders, Width=400mm, Galvanised mild steel	m	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.14 Car Port (Continue)								
	10.1.3	Step Iron, Width=300mm, SS-304	no	-				
	10.1.4	Stop logs with frame, Water depth less than 1.5m	m ²	-				
	10.2	Covers						
	10.2.1	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar	m ²	-				
	10.2.2	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar	m ²	-				
	10.2.3	FRP cover with frame, 35mm thk, Fiber Reinforced Plastic	m ²	-				
	10.2.4	FRP cover with frame, 75mm thk, Fiber Reinforced Plastic	m ²	-				
	11	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-93 to 5-100								
		Sum of Page 5-93						
		Sum of Page 5-94						
		Sum of Page 5-95						
		Sum of Page 5-96						
		Sum of Page 5-97						
		Sum of Page 5-98						
		Sum of Page 5-99						
		Sum of Page 5-100						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover								
		5.15 GC Step Cover						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	0.61				
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	-				
	1.1.3	Supply, spread & compact selected imported Sand Backfilling	m ³	-				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	-				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	-				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 200mm Thick	m ³	-				
	2	Concrete Works						
	2.1	Concrete Blinding						
	2.1.1	Blinding with Concrete 75mm Thick (Strength	m ³	-				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	0.61				
	2.2.2	Concrete in structure (Grade 40Mpa)	m ³	-				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³	-				
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	-				
	2.3.2	Welded Wire Mesh / Fabric Mesh Wire	m ²	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
5.15 GC Step Cover (Continue)								
	2.4	Formworks						
	2.4.1	Formwork for concrete slab, footings, etc. at grnd level	m ²	-				
	2.4.2	Formwork for structural concrete columns	m ²	-				
	2.4.3	Formwork for structural concrete beams & suspended slab	m ²	-				
	2.4.4	Formwork for structural concrete with curved surface	m ²	-				
	2.5	Concrete Sundries						
	2.5.1	Black visqueem dpc membrane	m ²	-				
	2.5.2	Plastic chairs	bags	-				
	2.6	Others						
	2.6.1	Construct concrete splashback, 400x300x150 dp	no	1.00				
	2.6.2	Construct concrete drainage pit, 800x500x450 dp incl. metal grate over	no	-				
	2.6.3	Construct shallow concrete spoon drain	lm	-				
	2.6.4	Expansion Joint with PVC plate, Width 300mm	lm	-				
	2.6.5	Vinyl Ester Resin Lining for corrosion	m ²	-				
	3	Block Works						
	3.1	Concrete Blockwork						
	3.1.1	Supply 100mm thk blockwork to walls	m ²	-				
	3.1.2	Supply 150mm thk blockwork to walls	m ²	-				
	3.1.3	Supply 200mm thk blockwork to walls	m ²	-				
	3.2	Masonry Reinforcement						
	3.2.1	Supply reinforcing bars to blockwork in walls	tons	-				
	3.3	Core Fill Concrete						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover (Continue)								
	3.3.1	Supply 15Mpa corefill to blockwork in walls	m ³	-				
	4	Metal Works						
	4.1	Structural Steel Column & Beams						
	4.1.1	Supply & install 75 x 75 x 5.0mm shs steel post at 3.25 & 3.00M (4 off)	tons	0.13				
	4.1.2	50 x 50 x 3mm equal angle hood framing	tons	-				
	4.1.3	Supply & install 40mm dia. Steel handrail fully prefab. Upright bottom ends bolted to concrete with M10 bolts	lm	10.40				
	4.1.4	Install 50/40mm dia. steel escape ladder	item	-				
	4.1.5	Allow for brackets, plates, bolts & nuts	item	1.00				
	5	Carpentry Works						
	5.1	Stud wall Partitions						
	5.1.1	75 x 50 hwd stud partition wall	lm	-				
	5.2	Ceiling Framing						
	5.2.1	75 x 50 hwd ceiling joist	lm	-				
	5.2.2	50 x 50 hwd ceiling framing	lm	-				
	5.2.3	Suspended metal ceiling grid system	m ²	-				
	5.3	Roof Framing						
	5.3.1	Supply & install 100 x 50 x 3.0 rhs steel rafter beam	lm	0.04				
	5.3.2	Supply & install 100 x 50 x 4.0 rhs steel roof frame	lm	-				
	5.3.3	Supply & install 60 x 60 x 5.0 shs steel roof purlins	lm	0.26				
	5.3.4	Supply & install 50x50x3mm equal angle hood framing (25.50lm angle)	lm	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover (Continue)								
	5.3.5	Supply & install 250mm wide steel fascia & barge board to roof	lm	16.20				
	5.3.6	200 x 75 hwd beam over	lm	-				
	5.3.7	75 x 50 hwd struts & ties to truss	lm	-				
	5.4	Stairs						
	5.4.1	150 x 50 hwd hand rails to stairs	lm	-				
	5.4.2	100 x 50 hwd hand rails to stairs	lm	-				
	6	Lining & Finishes						
	6.1	Wall Lining & Finishes						
	6.1.1	Bathroom wall lining (seratone or similar)	m ²	-				
	6.1.2	12mm thk plaster board wall lining	m ²	-				
	6.1.3	100 x 20mm thk shiplap internal wall lining	lm	-				
	6.1.4	200 x 200 ceramic splashback tiles	m ²	-				
	6.1.5	200mm high ceramic skirting tiles	lm	-				
	6.1.6	70 x 25 hwd timber skirtings	lm	-				
	6.1.7	Metal corner strips (plasterboard)	lm	-				
	6.1.8	Colorbond trimdek external wall cladding	m ²	-				
	6.2	Floor Lining & Finishes						
	6.2.1	200x200 ceramic tiles non-slip	m ²	-				
	6.2.2	Selected ceramic splashback tiles	lm	-				
	6.3	Ceiling Lining & Finishes						
	6.3.1	12mm thk plaster board ceiling lining	m ²	-				
	6.3.2	Plaster board cornice strips to ceiling	m ²	-				
	6.3.3	4mm plywood ceiling lining	m ²	-				
	6.3.4	25 x 25 hwd cornice strip to ceiling junction	m ²	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover (Continue)								
	6.3.5	75mm thk noise control/proof insulation blanket in ceiling lining	m ²	-				
	7	Roofing & Insulation						
	7.1	Metal Roofing						
	7.1.1	Colorbond corr. sheeting to roof	m ²	16.42				
	7.1.2	Colorbond trimdek sheeting to roof	m ²	-				
	7.1.3	Double sided sisalation to roof	m ²	-				
	7.1.4	Galvanised strap bracing to roof	lm	11.70				
	7.1.5	Chicken wire mesh to roof	m ²	-				
	7.2	Roof Plumbing & Accessories						
	7.2.1	Supply & install 100mm dia. pvc gutter and down pipe to roof, including dropper, clips, bends, etc.	lm	7.70				
	7.2.2	Supply & install colorbond barge mould & flashing to main roof	no	11.60				
	7.2.3	Colorbond barge mould to roof	lm	-				
	7.2.4	Colorbond flashing to roof	lm	-				
	7.2.5	100mm dia. PVC down pipe to roof, incl. dropper, clips, bends	lm	-				
	8	Doors & Windows						
	8.1	Doors						
	8.1.1	Steel security grill to external door D1 1800 x 2100 high	no	-				
	8.1.2	Steel security grill to external door, D3 1000 x 2100 high	no	-				
	8.1.3	Roller door shutter to details, complete with fitting & accessories	no	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover (Continue)								
	8.1.4	Timber door - Type D1 1800 x 2100 high, solid core 2 leaf	no	-				
	8.1.5	Timber door - Type D2 1600 x 2100 high	no	-				
	8.1.6	Timber door 900 x 2100 high, external solid core	no	-				
	8.1.7	Timber door 730 x 2100 high, internal hollow core	no	-				
	8.1.8	Timber door - Type D4 900 x 2100 high	no	-				
	8.1.9	Timber door - Type D5 700 x 1850 high	no	-				
	8.1.10	Sliding door - Type D6 1000 x 2000 high, including tracks & asessories	no	-				
	8.1.11	Install 50 x 25mm hwd door architrave	lm	-				
	8.2	Windows & Glazing						
	8.2.1	Timber framed louvre window, 7no. blades 1200 x 1100 high, including insect screen & steel securuty bars	no	-				
	8.2.2	Timber framed louvre window, 7no. blades 1800 x 1100 high, including insect screen & steel securuty bars	no	-				
	8.2.3	Timber framed louvre window, 4no. blades 900 x 600 high, including insect screen & steel securuty bars	no	-				
	8.2.15	Install 50 x 25mm hwd window architrave	lm	-				
	8.2.16	Install 25 x 25mm hwd window beads	lm	-				
	8.2.17	Install 32 x 19mm hwd window cover strips	lm	-				
	8.3	Door Hardware						
	8.3.1	536 Escape lockset & 007 Round ext. cylinder, tubular deadbolts	no	-				
	8.3.2	Barrel lockset with indicators (to toilets)	no	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover (Continue)								
	8.3.3	234 Series Brass padlock to security grill door	no	-				
	8.3.4	401 Hydraulic door closer	no	-				
	8.3.5	100mm steel butt hinges	pair	-				
	8.3.6	Rubber door stops, 65-70mm, skirting mounted	no	-				
	9	Painting Works						
	9.1	Painting						
	9.1.1	Supply & apply painting to shs steel posts	m ²	13.07				
	9.1.2	Supply & apply painting to steel roof rafters	m ²	11.58				
	9.1.3	Supply & apply painting to plaster board wall	m ²	-				
	9.1.4	Supply & apply painting to internal ceiling	m ²	-				
	9.1.5	Supply & apply painting to doors & door frames	m ²	-				
	9.1.6	Supply & apply painting to windows & window frames	m ²	-				
	9.1.7	Supply & apply painting to skirtings, architraves, stops, cover strips	m ²	-				
	9.1.8	Supply & apply painting to steel security grill doors	m ²	-				
	9.1.9	Supply & apply painting to steel columns	m ²	-				
	9.1.10	Supply & apply painting to stairs and hand rails	m ²	-				
	10	Miscellaneous Works						
	10.1	Handrail, ladders and Stop Logs						
	10.1.1	Handrail, Height=1100mm, Galvanised mild steel	m	-				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.15 GC Step Cover (Continue)								
	10.1.2	Ladders, Width=400mm, Galvanised mild steel	m	-				
	10.1.3	Step Iron, Width=300mm, SS-304	no	-				
	10.1.4	Stop logs with frame, Water depth less than 1.5m	m ²	-				
	10.2	Covers						
	10.2.1	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thick or similar	m ²	-				
	10.2.2	Grated cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 45mm thick or similar	m ²	-				
	10.2.3	FRP cover with frame, 35mm thk, Fiber Reinforced Plastic	m ²	-				
	10.2.4	FRP cover with frame, 75mm thk, Fiber Reinforced Plastic	m ²	-				
	11	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1.0				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-102 to 5-109								
		Sum of Page 5-102						
		Sum of Page 5-103						
		Sum of Page 5-104						
		Sum of Page 5-105						
		Sum of Page 5-106						
		Sum of Page 5-107						
		Sum of Page 5-108						
		Sum of Page 5-109						
Carried forward to Section Summary								

BILL OF QUANTITIES									
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
5.16 Building Service(M)									
		<u>5.16 Building Service(M)</u>							
Carried forward to page collection									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₪	PNGK	₪
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.16 Building Service(M) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-111 to 5-120								
		Sum of Page 5-111						
		Sum of Page 5-112						
		Sum of Page 5-113						
		Sum of Page 5-114						
		Sum of Page 5-115						
		Sum of Page 5-116						
		Sum of Page 5-117						
		Sum of Page 5-118						
		Sum of Page 5-119						
		Sum of Page 5-120						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works)								
		5.17 Building Service (Electrical works)						
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.17 Building Service (Electrical works) (Continue)								
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-122 to 5-131								
		Sum of Page 5-122						
		Sum of Page 5-123						
		Sum of Page 5-124						
		Sum of Page 5-125						
		Sum of Page 5-126						
		Sum of Page 5-127						
		Sum of Page 5-128						
		Sum of Page 5-129						
		Sum of Page 5-130						
		Sum of Page 5-131						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.18 In-plant Yard Work								
		5.18 In-plant Yard Work						
	1	Site Preparation and Cleaning	ha	3.82				
	2	Earthworks						
	2.1	Cut or trim formation level to required depth						
	2.1.1	Work by Machine in all materials other than bed rock	m ³	20,973				
	2.1.2	Work in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	48,937				
	2.2	Embankment or fill to surcharge level with suitable imported material to the grade and compact in layers	m ³	50,890				
	2.3	Disposal of surplus soil to dumping site (10km distance)	m ³	9,444				
	3	In-plant Roads						
	3.1	Compaction of Subgrade to 20% CBR	m ²	3836.1				
	3.2	Granular sub-base (200mm thick) 45% CBR	m ³	1345.4				
	3.3	Road base-course (150mm thick) 80% CBR	m ³	1009.05				
	3.4	Bituminous surfacing (40mm thick)	m ²	6587.06				
	3.5	2 Coat Bitumen Seal		6587.06				
	3.5.1	19mm Aggregate size - 1st seal	m ²	6587.06				
	3.5.2	13mm Aggregate size - 2nd seal	m ²	6587.06				
	3.5.3	2mm Coat Seal	m ²	6587.06				
	3.6	60mm thk Asphalt Seal	m ²	6587.06				
	3.7	200 thk Reinforced Conc. Pavement F102 mesh T&B	m ³	1317.41				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
5.18 In-plant Yard Work (Continue)								
	3.8	Road Kerbs & Others with 25 Mpa concrete;						
	3.8.1	Barrier Kerb - Type 1 (150wd, 300dp)	lm	601.62				
	3.8.2	Barrier Kerb & Channel - Type 2(450wd, 300dp & 150dp)	lm	1263.39				
	3.8.3	Semi Mountable Kerb & Channel - Type 3 (750wd, 150thk)	lm	19.2				
	3.8.4	Spoon Drain (600wd, 250thk)	lm	50				
	3.9	Guard Rails	lm	242				
	3.10	Road Traffic Signages	No.	8				
	3.11	Road & Car Park line marking for;						
	3.11.1	Stop line, centre line, edge marking, car park, motorcycle park and tanker or lorry park etc.	lm	1265.8				
	3.11.2	Go straight and turning arrow, two-way turninarrow etc.	m ²	25.8				
	3.11.3	Speed Hump	No.	1				
	4	Ground Improvement Works						
	4.1	Supply and lay chain mesh along slopes as specified on the drawings	m ²	4389.87				
	5	Stormwater Pipeworks						
	5.1	Excavate trench, Supply material & laying of uPVC Pipe with sand bedding only (exclude pavement materials);						
	5.1.1	dia. - 225mm	lm					
	5.1.2	dia. - 350mm	lm					
	5.1.3	dia. - 450mm	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.18 In-plant Yard Work (Continue)								
	5.2	Excavate trench, Supply material & laying Reinforced Concrete Pipes with approved sand bedding & fill material only (exclude pavement materials);						
	5.2.1	dia. - 450mm	lm	112				
	5.2.2	dia. - 500mm	lm					
	5.2.3	dia. - 650mm	lm	425				
	5.2.4	dia. - 750mm	lm	128.2				
	5.2.5	dia. - 900mm	lm	45				
	5.2.6	dia. - 1200mm	lm	59				
	5.2.7	dia. - 1500mm	lm					
	5.3	Excavate trench, Supply material & laying Reinforced Box Culverts with approved sand bedding & fill material only (exclude pavement materials);						
	5.3.1	750 x 750mm RC box culvert	lm					
	5.3.2	1200 x 1200mm RC box culvert	lm					
	5.3.3	1500 x 1500mm RC box culvert	lm					
	5.4	Stormwater Culverts RC Headwall & Wingwalls at both ends ;						
	5.4.1	Headwall Inlet (H= , W= , Th=)	lm					
	5.4.2	Wingwall Inlet (H= , W= , Th=) x2	lm					
	5.4.3	Base Inlet (L= , W= , Th=)	lm					
	5.4.4	Headwall Outlet (H= , W= , Th=)	lm					
	5.4.5	Wingwall Outlet (H= , W= , Th=) x2	lm					
	5.4.6	Base Outlet (L= , W= , Th=)	lm					
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.18 In-plant Yard Work (Continue)								
	6	Sumps						
	6.1	Excavate trench, Supply material & laying the Reinforced conc. box pit with approved sand bedding & fill material;						
	6.1.1	Std Con. Sump Pit; avg depth 0.5m to 2.5m with F92 mesh centrally placed.	No.	25				
	6.1.2	Grating cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thk or similar.	No.	25				
	6.1.3	Grating cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thk or similar.	m ²	25				
	7	Drainage Channel						
	7.1	Excavate trench, Supply material & laying the Trepezoidal Stone Pitcighed OLD with concrete base slab of 100 thk conc. F72 mesh;						
	7.1.1	Type 1 (A= 1200 , B=2400 , H=1200)	lm					
	7.1.2	Type 2 (A= 1050, B=2100 , H=1050)	lm					
	7.1.3	Type 3 (A=900, B=1800, H=450)	lm					
	7.1.4	Type 4 (A= 750, B=1500 , H=750)	lm					
	7.1.5	Type 5 (A= 600, B=1200 , H=600)	lm	280				
	7.1.6	Type 6 (A= 450, B=900 , H=450)	lm					
	7.1.7	Type 7 (A= 300, B=600 , H=300)	lm					
	7.2	Excavate trench, Supply material & laying the						
	7.2.1	Type 1 (B=200 , H=200)	lm					
	7.2.2	Type 2 (B=300 , H=300)	lm					
	7.2.3	Type 3 (B=550 , H=550)	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.18 In-plant Yard Work (Continue)								
	8	Sewer Pipeworks & Manholes in Plant Yard						
	8.1	Internal Manholes:						
	8.1.1	Std Con. Manhole; avg depth 1m to 1.2m with F92 mesh centrally placed.	No.	7				
	8.1.2	Pre-cast reinf. Conc. Cover, 100mm thk incl. lifting lugs.	No.	7				
	8.2	Internal Sewer Pipeworks:						
	8.2.1	dia. - 160mm (ND)	lm	154.7				
	9	Water Reticulation Pipeworks						
	9.1	Excavate trench, Supply material & laying of HDPE Pipe and recompact with sand bedding or approved fill only (exclude pavement materials);						
	9.1.1	HDPE Pipe dia. 90mm(ND) connection to Eda Ranu mains	lm	2700				
	9.1.2	HDPE Pipe dia. 63mm (ND)	lm	229				
	9.2	Provide and install bulk meter connection	No.	1				
	9.3	Hidrant - HDPE Pipes 80mm (ND)	m	187				
	9.4	Fire Hydrants	No.	2				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.18 In-plant Yard Work (Continue)								
	10	Earth Retaining Structures						
	10.1	Stone Pitched Mass Wall : Excavate to founding level at the base of wall, supply materials (Lime tones & Cement Motar) & compact base with 150 thk road base.	m ³	1296				
	10.2	Seawall Protection Barrier Wall : Supply materials to construct a Riprap or Rock Armour along the shoreline:						
	10.2.1	Limestone (approx. 400 - 600mm min. dia.)	m ³	859.5				
	10.2.2	Granite (approx. 400 - 600mm min. dia.)	m ³	859.5				
	11	Fencing & Landscaping						
	11.1	Supply materials for the Steel Picket Fencing made of;						
	11.1.1	400 sqr block piers (supports) with 4-Y16 vertical bars & R10's at 400 cts horizontal	lm	684.1				
	11.1.2	25mm SHS (as pickets at 0.15m cts) and 25x50 RHS T&B (as leteral support) with height 2.4m.	lm	684.1				
	11.1.3	25x50 RHS T&B (as leteral support) with height 2.4m.	lm	684.1				
	11.1.4	300 wd 900 dp stone picthed wall with Y-12 vertical bars at 600 cts.	lm	684.1				
	11.1.5	Footing 600sqr x 300dp with 3 Y16 T&B either directions	ton					
	11.1.6	Strip Footing (300wd x 300dp) 2 Y12 T&B, R10 at 400cts	ton					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	11.4	Entrance Gates;						
	11.4.1	Manual Slidding Gate (7m wd 2.85m dp) & Single leaf chain mesh gate	No.	1				
	11.4.2	Chain Link Fencing(Two Leaf Gate - 2.4m High & 6m wd)	No.	1				
	11.4.3	Boom-gate 8m Cantilevered Truss liver arm (one side loaded)	No.	1				
	12	Process Pipe Work						
	12.1	Excavate trench, Supply material & laying of HDPE Pipe with sand bedding only (exclude pavement materials);						
	12.1.1	dia. - 225mm (ND)	lm	385				
	12.1.2	dia. - 400mm (ND)	lm	85.2				
	12.1.3	dia. - 450mm (ND)	lm	231.8				
	12.1.4	dia. - 500mm (ND)	lm	345.5				
	12.1.5	dia. - 710mm (ND)	lm	523.5				
	13	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5-133 to 5-138								
		Sum of Page 5-133						
		Sum of Page 5-134						
		Sum of Page 5-135						
		Sum of Page 5-136						
		Sum of Page 5-137						
		Sum of Page 5-138						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.19 Access Road to KilaKila STP								
		5.19 Access Road to KilaKila STP						
	1	Site Preparation and Cleaning	ha	2.9				
	2	Earthworks						
	2.1	Cut or trim formation level to required depth						
	2.1.1	Work by Machine in all materials other than bed rock	m ³	9713.54				
	2.1.2	Work in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	22664.93				
	2.2	Embankment or fill to surcharge level with suitable imported material to the grade and compact in layers	m ³	25732.29				
	2.3	Disposal of surplus soil to dumping site (10km distance)	m ³	7746				
	3	Access Road						
	3.1	Compaction of Subgrade to 20% CBR	m ²	11600				
	3.2	Granular sub-base (200mm thick) 45% CBR	m ³	2320				
	3.3	Road base-course (150mm thick) 80% CBR	m ³	1740				
	3.4	Bituminous surfacing (40mm thick)	m ²	11600				
	3.5	2 Coat Bitumen Seal		11600				
	3.5.1	19mm Aggregate size - 1st seal	m ²	11600				
	3.5.2	13mm Aggregate size - 2nd seal	m ²	11600				
	3.5.3	2mm Coat Seal	m ²	11600				
	3.6	60mm thk Asphalt Seal	m ²	11600				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
5.19 Access Road to KilaKila STP (Continue)								
	3.8	Road Kerbs & Others with 25 Mpa concrete;						
	3.8.1	Barrier Kerb - Type 1 (150wd, 300dp)	lm					
	3.8.2	Barrier Kerb & Channel - Type 2(450wd, 300dp & 150dp)	lm	1450				
	3.8.3	Semi Mountable Kerb & Channel - Type 3 (750wd, 150thk)	lm					
	3.8.4	Spoon Drain (600wd, 250thk)	lm	12				
	3.9	Guard Rails	lm	900				
	3.10	Road Traffic Signages	No.	10				
	3.11	Road & Car Park line marking for;		900				
	3.11.1	Stop line, centre line, edge marking, car park, motorcycle park and tanker or lorry park etc.	lm	4350				
	3.11.2	Go straight and turning arrow, two-way turninarrow etc.	m ²	25.8				
	3.11.3	Speed Hump	No.	1				
	4	Ground Improvement Works						
	4.1	Supply and lay chain mesh along slopes as specified on the drawings	m ²					
	5	Stormwater Pipeworks						
	5.1	Excavate trench, Supply material & laying of uPVC Pipe with sand bedding only (exclude pavement materials);						
	5.1.1	dia. - 225mm	lm					
	5.1.2	dia. - 350mm	lm					
	5.1.3	dia. - 450mm	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.19 Access Road to KilaKila STP (Continue)								
	5.2	Excavate trench, Supply material & laying Reinforced Concrete Pipes with approved sand bedding & fill material only (exclude pavement materials);						
	5.2.1	dia. - 450mm	lm					
	5.2.2	dia. - 500mm	lm	126				
	5.2.3	dia. - 650mm	lm	1005				
	5.2.4	dia. - 750mm	lm	90				
	5.2.5	dia. - 900mm	lm					
	5.2.6	dia. - 1200mm	lm	72				
	5.2.7	dia. - 1500mm	lm					
	5.3	Excavate trench, Supply material & laying Reinforced Box Culverts with approved sand bedding & fill material only (exclude pavement materials);						
	5.3.1	750 x 750mm RC box culvert	lm					
	5.3.2	1200 x 1200mm RC box culvert	lm					
	5.3.3	1500 x 1500mm RC box culvert	lm					
	5.4	Stormwater Culverts RC Headwall &						
	5.4.1	Headwall Inlet (H= , W= , Th=)	m ³	6				
	5.4.2	Wingwall Inlet (H= , W= , Th=) x2	m ³	4				
	5.4.3	Base Inlet (L= , W= , Th=)	m ³	36				
	5.4.4	Headwall Outlet (H= , W= , Th=)	m ³	6				
	5.4.5	Wingwall Outlet (H= , W= , Th=) x2	m ³	4				
	5.4.6	Base Outlet (L= , W= , Th=)	m ³	36				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.19 Access Road to KilaKila STP (Continue)								
	6	Sumps						
	6.1	Excavate trench, Supply material & laying the Reinforced conc. box pit with approved sand bedding & fill material;						
	6.1.1	Std Con. Sump Pit; avg depth 0.5m to 2.5m with F92 mesh centrally placed.	No.	38				
	6.1.2	Grating cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thk or similar.	No.	38				
	6.1.3	Grating cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thk or similar.	No.	38				
	7	Drainage Channel						
	7.1	Excavate trench, Supply material & laying the Trepezoidal Stone Pitted OLD with concrete base slab of 100 thk conc. F72 mesh;						
	7.1.1	Type 1 Drain (H=600 , Th=150) & (Base W=450 , Th= 150)	lm	270				
	7.1.2	Type 2 Drain (H=750 , Th=150) & (Base W=550 , Th= 150)	lm	532				
	7.1.3	Type 3 Drain (H=900 , Th=150) & (Base W=650 , Th= 150)	lm	405				
	7.2	Excavate trench, Supply material & laying the						
	7.2.1	Type 1 (B=200 , H=200)	lm					
	7.2.2	Type 2 (B=300 , H=300)	lm					
	7.2.3	Type 3 (B=550 , H=550)	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
	8	Sewer Pipeworks & Manholes in Plant Yard						
	8.1	Internal Manholes: Excavate trench, Supply material & laying the						
	8.1.1	Std Con. Manhole; avg depth 1m to 1.2m with F92 mesh centrally placed.	No.					
	8.1.2	Pre-cast reinf. Conc. Cover, 100mm thk incl. lift	No.					
	8.2	Internal Sewer Pipeworks: Excavate trench, Supply material & laying of						
	8.2.1	dia. - 160mm (ND)	lm					
	9	Water Reticulation Pipeworks						
	9.1	Excavate trench, Supply material & laying of HDPE Pipe and recompact with sand bedding						
	9.1.1	HDPE Pipe dia. 90mm(ND) connection to Eda Ranu mains	lm					
	9.1.2	HDPE Pipe dia. 63mm (ND)	lm					
	9.2	Provide and install bulk meter connection	No.					
	9.3	Hidrant - HDPE Pipes 80mm (ND)	No.					
	9.4	Fire Hydrants	No.					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	10	Earth Retaining Structures						
	10.1	Stone Pitched Mass Wall : Excavate to founding level at the base of wall, supply materials (Lime tones & Cement Motar) & compact base with 150 thk road base.	m ³	1890				
	10.2	Seawall Protection Barrier Wall : Supply materials to construct a Riprap or Rock Armour along the shoreline:						
	10.2.1	Limestone (approx. 400 - 600mm min. dia.)	m ³					
	10.2.2	Granite (approx. 400 - 600mm min. dia.)	m ³					
	11	Fencing & Landscaping						
	11.1	Supply materials for the Steel Picket Fencing						
	11.1.1	400 sqr block piers (supports) with 4-Y16	lm					
	11.1.2	25mm SHS (as pickets at 0.15m cts) and	lm					
	11.1.3	25x50 RHS T&B (as leteral support) with	lm					
	11.1.4	300 wd 900 dp stone picthed wall with Y-12	lm					
	11.1.5	Footing 600sqr x 300dp with 3 Y16 T&B either	ton					
	11.1.6	Strip Footing (300wd x 300dp) 2 Y12 T&B,	ton					
	11.4	Entrance Gates;						
	11.4.1	Manual Sliddng Gate (7m wd 2.85m dp) &	No.					
	11.4.2	Chain Link Fencing(Two Leaf Gate - 2.4m	No.					
	11.4.3	Boom-gate 8m Cantilevered Truss liver arm	No.					
	11.5	Landscaping						
	11.5.1	Provisional Sum for Landscaping	PS					
	12	Process Pipe Work						
	12.1	Excavate trench, Supply material & laying of						
	12.1.1	dia. - 225mm (ND)	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	12.1.2	dia. - 400mm (ND)	lm					
	12.1.3	dia. - 450mm (ND)	lm					
	12.1.4	dia. - 500mm (ND)	lm					
	12.1.5	dia. - 710mm (ND)	lm					
	13	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5.19-2 to 5.19-5								
		Sum of Page 5.19-2						
		Sum of Page 5.19-3						
		Sum of Page 5.19-4						
		Sum of Page 5.19-5						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.20 Access Road to Morata STP								
		5.20 Access Road to Morata STP						
	1	Site Preparation and Cleaning	ha	2.31				
	2	Earthworks						
	2.1	Cut or trim formation level to required depth						
	2.1.1	Work by Machine in all materials other than bed rock	m ³	2676				
	2.1.2	Work in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	1147				
	2.2	Embankment or fill to surcharge level with suitable imported material to the grade and compact in layers	m ³	4354				
	2.3	Disposal of surplus soil to dumping site (10km distance)	m ³	6972				
	3	Access Road						
	3.1	Compaction of Subgrade to 20% CBR	m ²	10328				
	3.2	Granular sub-base (200mm thick) 45% CBR	m ³	2066				
	3.3	Road base-course (150mm thick) 80% CBR	m ³	1549				
	3.4	Bituminous surfacing (40mm thick)	m ²	10328				
	3.5	2 Coat Bitumen Seal		10328				
	3.5.1	19mm Aggregate size - 1st seal	m ²	10328				
	3.5.2	13mm Aggregate size - 2nd seal	m ²	10328				
	3.5.3	2mm Coat Seal	m ²	10328				
	3.6	60mm thk Asphalt Seal	m ²	10328				
	3.8	Road Kerbs & Others with 25 Mpa concrete;						
	3.8.1	Barrier Kerb - Type 1 (150wd, 300dp)	lm					
	3.8.2	Barrier Kerb & Channel - Type 2(450wd,	lm	1291				
	3.8.3	Semi Mountable Kerb & Channel - Type 3	lm					
	3.8.4	Spoon Drain (600wd, 250thk)	lm	12				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.20 Access Road to Morata STP (Continue)								
	3.9	Guard Rails	lm	475				
	3.10	Road Traffic Signages	No.	5				
	3.11	Road & Car Park line marking for;						
	3.11.1	Stop line, centre line, edge marking, car park, motorcycle park and tanker or lorry park etc.	lm	1291				
	3.11.2	Stop line, pedestrian crossing marking etc.	m ²	1.2				
	3.11.3	Go straight and turning arrow, two-way turninarrow etc.	m ²					
	3.11.4	Speed Hump	No.	1				
	4	Ground Improvement Works						
	4.1	Supply and lay chain mesh along slopes as specified on the drawings	m ²					
	5	Stormwater Pipeworks						
	5.1	Excavate trench, Supply material & laying of uPVC Pipe with sand bedding only (exclude pavement materials);						
	5.1.1	dia. - 225mm	lm					
	5.1.2	dia. - 350mm	lm					
	5.1.3	dia. - 450mm	lm					
	5.2	Excavate trench, Supply material & laying Reinforced Concrete Pipes with approved sand bedding & fill material only (exclude pavement materials);						
	5.2.1	dia. - 450mm	lm					
	5.2.2	dia. - 500mm	lm	250				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.20 Access Road to Morata STP (Continue)								
	5.2.3	dia. - 650mm	lm	580				
	5.2.4	dia. - 750mm	lm	80				
	5.2.5	dia. - 900mm	lm					
	5.2.6	dia. - 1200mm	lm	36				
	5.2.7	dia. - 1500mm	lm					
	5.3	Excavate trench, Supply material & laying Reinforced Box Culverts with approved sand bedding & fill material only (exclude pavement materials);						
	5.3.1	750 x 750mm RC box culvert	lm					
	5.3.2	1200 x 1200mm RC box culvert	lm					
	5.3.3	1500 x 1500mm RC box culvert	lm					
	5.4	Stormwater Culverts RC Headwall & Wingwalls at both ends ;						
	5.4.1	Headwall Inlet (H= , W= , Th=)	m ³	3				
	5.4.2	Wingwall Inlet (H= , W= , Th=) x2	m ³	2				
	5.4.3	Base Inlet (L= , W= , Th=)	m ³	18				
	5.4.4	Headwall Outlet (H= , W= , Th=)	m ³	3				
	5.4.5	Wingwall Outlet (H= , W= , Th=) x2	m ³	2				
	5.4.6	Base Outlet (L= , W= , Th=)	m ³	18				
	6	Sumps						
	6.1	Excavate trench, Supply material & laying the Reinforced conc. box pit with approved sand bedding & fill material;						
	6.1.1	Std Con. Sump Pit; avg depth 0.5m to 2.5m with F92 mesh centrally placed.	No.	31				
	6.1.2	Grating cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thk or similar.	No.	31				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
5.20 Access Road to Morata STP (Continue)								
	6.1.3	Grating cover in Hot dip galvanised steel angle frame, incl. webforce WA HDG grating 25mm thk or similar.	m ²	31				
7		Drainage Channel						
	7.1	Excavate trench, Supply material & laying the						
	7.1.1	Type 1 Drain (H=600 , Th=150) & (Base W=450 , Th= 150)	lm	675				
	7.1.2	Type 2 Drain (H=750 , Th=150) & (Base W=550 , Th= 150)	lm	493				
	7.1.3	Type 3 Drain (H=900 , Th=150) & (Base W=650 , Th= 150)	lm	132				
	7.2	Excavate trench, Supply material & laying the						
	7.2.1	Type 1 (B=200 , H=200)	lm					
	7.2.2	Type 2 (B=300 , H=300)	lm					
	7.2.3	Type 3 (B=550 , H=550)	lm					
8		Sewer Pipeworks & Manholes in Plant Yard						
	8.1	Internal Manholes: Excavate trench, Supply material & laying the Reinforced conc. box pit with approved sand bedding & fill material;						
	8.1.1	Std Con. Manhole; avg depth 1m to 1.2m with F92 mesh centrally placed.	No.					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	8.1.2	Pre-cast reinf. Conc. Cover, 100mm thk incl. lifting lugs.	No.					
	8.2	Internal Sewer Pipeworks: Excavate trench, Supply material & laying of HDPE Pipe with sand bedding only (exclude pavement materials);						
	8.2.1	dia. - 160mm (ND)	lm					
	9	Water Reticulation Pipeworks						
	9.1	Excavate trench, Supply material & laying of HDPE Pipe and recompact with sand bedding or approved fill only (exclude pavement materials);						
	9.1.1	HDPE Pipe dia. 90mm(ND) connection to Eda Ranu mains	lm					
	9.1.2	HDPE Pipe dia. 63mm (ND)	lm					
	9.2	Provide and install bulk meter connection	No.					
	9.3	Hidrant - HDPE Pipes 80mm (ND)	No.					
	9.4	Fire Hydrants	No.					
	10	Earth Retaining Structures						
	10.1	Stone Pitched Mass Wall :	m ³					
	10.2	Seawall Protection Barrier Wall : Supply materials to construct a Riprap or Rock Armour along the shoreline:						
	10.2.1	Limestone (approx. 400 - 600mm min. dia.)	m ³					
	10.2.2	Granite (approx. 400 - 600mm min. dia.)	m ³					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	11	Fencing & Landscaping						
	11.1	Supply materials for the Steel Picket Fencing						
	11.1.1	400 sqr block piers (supports) with 4-Y16 vertical bars & R10's at 400 cts horizontal	lm					
	11.1.2	25mm SHS (as pickets at 0.15m cts) and 25x50 RHS T&B (as leteral support) with height 2.4m.	lm					
	11.1.3	25x50 RHS T&B (as leteral support) with height 2.4m.	lm					
	11.1.4	300 wd 900 dp stone picthed wall with Y-12 vertical bars at 600 cts.	lm					
	11.1.5	Footing 600sqr x 300dp with 3 Y16 T&B either directions	ton					
	11.1.6	Strip Footing (300wd x 300dp) 2 Y12 T&B, R10 at 400cts	ton					
	11.4	Entrance Gates;						
	11.4.1	Manual Sliddng Gate (7m wd 2.85m dp) & Single leaf chain mesh gate	No.					
	11.4.2	Chain Link Fencing(Two Leaf Gate - 2.4m High & 6m wd)	No.					
	11.4.3	Boom-gate 8m Cantilevered Truss liver arm (one side loaded)	No.					
	11.5	Landscaping						
	11.5.1	Provisional Sum for Landscaping	PS					
	12	Process Pipe Work						
	12.1	Excavate trench, Supply material & laying of HDPE Pipe with sand bedding only (exclude pavement materials);						
	12.1.1	dia. - 225mm (ND)	lm					
	12.1.2	dia. - 400mm (ND)	lm					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	12.1.3	dia. - 450mm (ND)	lm					
	12.1.4	dia. - 500mm (ND)	lm					
	12.1.5	dia. - 710mm (ND)	lm					
	13	Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls					
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5.20-2 to 5.20-5								
		Sum of Page 5.20-2						
		Sum of Page 5.20-3						
		Sum of Page 5.20-4						
		Sum of Page 5.20-5						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	2	Underground Piping HDPE DN800, L=397m						
	1	Excavation & Bedding						
	1.1	Excavation						
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	4,105				
	1.1	DN 800 Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	397				
	2.3	Asphalt Pavement	m ²	1,580				
	2.4	Kerb installation	m	780				
	2.5	Retaining Wall Installation						
	a)	L=390m	m	1,229				
	2.6	Handrail Installation						
	a)	Handrail along the Administration Road	m	390				
	b)	Handrail for Stairs	m	5				
	2.8	Concrete Stairs for Access to Shore line Access to Shore line W=4m/ W=1m	LS	1.0				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	3	Shore Line Piping HDPE DN800, L=318m						
		Excavation & Bedding						
	1.1	Excavation						
	1.1.2	Excavate in bed rock* (Port Moresby beds or Paga beds of highly weathered bed rock)	m ³	1,078				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	477				
	1.1	DN 800 Type A (Soil/Right of Way)						
	a)	1.0m =or< Invert Level < 2.0m	m	318				
		Concrete Works						
		Concrete Encasement for Pipe Protection						
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	1361				
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced	t	136.1				
	2.2	Concrete Supply						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	16.22				
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced	t	1.62				
	3	Handrail Installation	m	318				
	3.5	Connection to Submarine Pipe	nr	1				
	3.8	Site Cleaning	m ²	1280				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 5.21-2 to 5.21-5								
		Sum of Page 5.21-2						
		Sum of Page 5.21-3						
		Sum of Page 5.21-4						
		Sum of Page 5.21-5						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 6								
	1	Total of Section 6.1 Kanudi Pumping Station (PS-1) (from Page Collection)						
		Total of Section 6.2 Idubada Pumping Station (PS-2) (from Page Collection)						
		Total of Section 6.3 Hagara Pumping Station (PS-3) (from Page Collection)						
		Total of Section 6.4 Hanubada Pumping Station (PS-4) (from Page Collection)						
		Total of Section 6.5 Konedobu Pumping Station (PS-5) (from Page Collection)						
		Total of Section 6.6 Old Yacht Club Pumping Station (PS-6) (from Page Collection)						
		Total of Section 6.7 Stanley Esplanade Pumping Station (PS-7) (from Page Collection)						
		Total of Section 6.8 Sea Park Pumping Station (PS-8) (from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		Total of Section 6.9						
		Davara Pumping Station (PS-9)						
		(from Page Collection)						
		Total of Section 6.10						
		Lawes Road Pumping Station (PS-10)						
		(from Page Collection)						
		Total of Section 6.11						
		Koki Pumping Station (PS-11)						
		(from Page Collection)						
		Total of Section 6.12						
		Badili Pumping Station (PS-12)						
		(from Page Collection)						
		Total of Section 6.13						
		Kila Police Pumping Station (PS-13)						
		(from Page Collection)						
		Total of Section 6.14						
		Konebada Pumping Station (PS-14)						
		(from Page Collection)						
		Total of Section 6.15						
		Gabutu Pumping Station (PS-15)						
		(from Page Collection)						
		Total of Section 6.16						
		Horsecamp Pumping Station (PS-16)						
		(from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
		Total of Section 6.17 Kaugere Pumping Station (PS-17) (from Page Collection)						
		Total of Section 6.18 Grit Chamber (from Page Collection)						
		Total of Section 6.19 Distribution Chamber (from Page Collection)						
		Total of Section 6.20 Oxidation Ditch (from Page Collection)						
		Total of Section 6.21 Clarifier Facility (from Page Collection)						
		Total of Section 6.22 Utility Water & Disinfection Facility (from Page Collection)						
		Total of Section 6.23 Sludge Treatment Building (from Page Collection)						
Total carried forward to Grand Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.1 Kanudi Pumping Station (PS-1)								
		6.1 Kanudi Pumping Station (PS-1)						
	M01-01-01/02	Lifting Pump 1	unit	2				
	M01-01-03	Monorail Hoist Unit	unit	1				
	M01-01-04	Piping	lot	1				
	M01-01-05	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
6.2 Idubada Pumping Station (PS-2)									
		6.2 Idubada Pumping Station (PS-2)							
	M01-02-01/02	Lifting Pump 2	unit	2					
	M01-02-03	Monorail Hoist Unit	unit	1					
	M01-02-04	Piping	lot	1					
	M01-02-05	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
6.3 Hagara Pumping Station (PS-3)									
		6.3 Hagara Pumping Station (PS-3)							
	M01-03-01/02	Lifting Pump 3	unit	2					
	M01-03-03	Monorail Hoist Unit	unit	1					
	M01-03-04	Piping	lot	1					
	M01-03-05	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.4 Hanuabada Pumping Station (PS-4)								
		6.4 Hanuabada Pumping Station (PS-4)						
	M01-04-01/02	Lifting Pump 4	unit	2				
	M01-04-03	Monorail Hoist Unit	unit	1				
	M01-04-04	Piping	lot	1				
	M01-04-05	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
6.5 Konedobu Pumping Station (PS-5)									
		6.5 Konedobu Pumping Station (PS-5)							
	M01-05-01/04	Lifting Pump 5	unit	4					
	M01-05-05/07	Delivery Valve	unit	3					
	M01-05-08	Monorail Hoist Unit	unit	1					
	M01-05-09	Piping	lot	1					
	M01-05-10	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.6 Old Yacht Club Pumping Station (PS-6)								
		6.6 Old Yacht Club Pumping Station (PS-6)						
	M01-06-01/02	Lifting Pump 6	unit	2				
	M01-06-03	Monorail Hoist Unit	unit	1				
	M01-06-04	Piping	lot	1				
	M01-06-05	Steel Works	lot	1				
	M01-06-06	Dismantlement cost	lot	1				
			LS					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.7 Stanley Esplanade Pumping Station (PS-7)								
		6.7 Stanley Esplanade Pumping Station (PS-7)						
	M01-07-01/02	Lifting Pump 7	unit	2				
	M01-07-03	Monorail Hoist Unit	unit	1				
	M01-07-04	Piping	lot	1				
	M01-07-05	Steel Works	lot	1				
	M01-07-06	Dismantlement cost	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.8 Sea Park Pumping Station (PS-8)								
		6.8 Sea Park Pumping Station (PS-8)						
	M01-08-01/02	Lifting Pump 8	unit	2				
	M01-08-03	Monorail Hoist Unit	unit	1				
	M01-08-04	Piping	lot	1				
	M01-08-05	Steel Works	lot	1				
	M01-08-06	Dismantlement cost	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.9 Davara Pumping Station (PS-9)								
		6.9 Davara Pumping Station (PS-9)						
	M01-09-01/04	Lifting Pump 9	unit	4				
	M01-09-05	Monorail Hoist Unit	unit	1				
	M01-09-06	Piping	lot	1				
	M01-09-07	Steel Works	lot	1				
	M01-09-08	Dismantlement cost	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
6.10 Lawes Road Pumping Station (PS-10)									
		6.10 Lawes Road Pumping Station (PS-10)							
	M01-10-01/04	Lifting Pump 10	unit	4					
	M01-10-05/07	Delivery Valve	unit	3					
	M01-10-08	Monorail Hoist Unit	unit	1					
	M01-10-09	Piping	lot	1					
	M01-10-10	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.11 Koki Pumping Station (PS-11)								
		6.11 Koki Pumping Station (PS-11)						
	M01-11-01/02	Lifting Pump 11	unit	2				
	M01-11-03	Monorail Hoist Unit	unit	1				
	M01-11-04	Piping	lot	1				
	M01-11-05	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.12 Badili Pumping Station (PS-12)								
		6.12 Badili Pumping Station (PS-12)						
	M01-12-01/04	Lifting Pump 12	unit	4				
	M01-12-05/07	Delivery Valve	unit	3				
	M01-12-08	Monorail Hoist Unit	unit	1				
	M01-12-09	Piping	lot	1				
	M01-12-10	Steel Works	lot	1				
	M01-12-11	Dismantlement cost	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
6.13 Kila Police Pumping Station (PS-13)									
		6.13 Kila Police Pumping Station (PS-13)							
	M01-13-01/02	Lifting Pump 13	unit	2					
	M01-13-03	Monorail Hoist Unit	unit	1					
	M01-13-04	Piping	lot	1					
	M01-13-05	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
6.14 Konebada Pumping Station (PS-14)									
		6.14 Konebada Pumping Station (PS-14)							
	M01-14-01/02	Lifting Pump 14	unit	2					
	M01-14-03	Monorail Hoist Unit	unit	1					
	M01-14-04	Piping	lot	1					
	M01-14-05	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
6.15 Gabutu Pumping Station (PS-15)									
		6.15 Gabutu Pumping Station (PS-15)							
	M01-15-01/02	Lifting Pump 15	unit	2					
	M01-15-03	Monorail Hoist Unit	unit	1					
	M01-15-04	Piping	lot	1					
	M01-15-05	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.16 Horsecamp Pumping Station (PS-16)								
		6.16 Horsecamp Pumping Station (PS-16)						
	M01-16-01/02	Lifting Pump 16	unit	2				
	M01-16-03	Monorail Hoist Unit	unit	1				
	M01-16-04	Piping	lot	1				
	M01-16-05	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.17 Kaugere Pumping Station (PS-17)								
		6.17 Kaugere Pumping Station (PS-17)						
	M01-17-01/04	Lifting Pump 17	unit	4				
	M01-17-05/07	Delivery Valve	unit	3				
	M01-17-08	Monorail Hoist Unit	unit	1				
	M01-17-09	Piping	lot	1				
	M01-17-10	Steel Works	lot	1				
	M01-17-11	Dismantlement cost	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.18 Grit Chamber								
		6.18 Grit Chamber						
	M02-01-01/02	Grit Chamber Inlet Gate	unit	2				
	M02-02-01/02	Fine Screen	unit	2				
	M02-03-01/02	Grit Collector	unit	2				
	M02-04-01/02	Grit Pump	unit	2				
	M02-05-01/02	Sump Drain Pump	unit	2				
	M02-06	Grit Separator	unit	1				
	M02-07	Oil skimmer	unit	1				
	M02-08-01/02	Oil Discharge Pump	unit	2				
	M02-09	Scum Screen	unit	1				
	M02-10	Screenings Conveyer	unit	1				
	M02-11-01/02	Coarse Screen	unit	2				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
6.18 Grit Chamber									
	M02-12	Piping	lot	1					
	M02-13	Steel Works	lot	1					
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to page collection									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 6-22 to 6-23								
		Sum of Page 6-22						
		Sum of Page 6-23						
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.19 Distribution Chamber								
		6.19 Distribution Chamber						
	M03-01-01/04	Distribution Weir	unit	4				
	M03-02	Piping	lot	1				
	M03-03	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.20 Oxidation Ditch								
		6.20 Oxidation Ditch						
	M04-01-01/03	Air Diffuser	lot	3				
	M04-02-01/12	Reactor Tank Mixer	unit	12				
	M04-03-01/03	Outlet Gate	unit	3				
	M04-04-01	Isolation Gate	unit	1				
	M04-05-01/05	Aeration Blower	unit	5				
	M04-06-01/02	Hoist Block for Blower	unit	2				
	M04-07-01/02	Aeration Control Valve	unit	2				
	M04-08-01/06	Waste Sludge Pump	unit	7				
	M04-09	Piping	lot	1				
	M04-10	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.20 Clarifier Facility								
		6.20 Final Sedimentation Tank						
	M05-01-01/03	Clarifier	unit	3				
	M05-02-01/06	Return Sludge Pump	unit	6				
	M05-03-01/02	Hoist Block for Sludge Pump	unit	2				
	M05-04-01/04	Sump Drain Pump	unit	4				
	M05-05-01/04	Scum Pump	unit	4				
	M05-06	Piping	lot	1				
	M05-07	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
6.22 Utility Water & Disinfection Facility								
		6.22 Utility Water & Disinfection Facility						
	M06-01	Chlorine Solution Tank	unit	1				
	M06-02	Chlorine Solution Storage Tank	unit	1				
	M06-03-01/02	Chlorine Solution Dosing Charger	unit	2				
	M06-04	Utility TE Water Supply Unit	lot	1				
	M06-05-01/04	Auto Strainer	unit	4				
	M06-06-01/02	Defoaming Pump	unit	2				
	M06-07-01/02	Ultra Violet Disinfection Unit	lot	2				
	M06-08-01/03	Disinfection Inlet Gate	unit	3				
	M06-09	Hosit Block of UV Unit	unit	1				
	M06-10	Hosit Block of Utility Pump	unit	1				
	M06-11	Disinfection Outlet Weir	unit	1				
	M06-12	Piping	lot	1				
	M06-13	Steel Works	lot	1				
Carried forward to page collection								

BILL OF QUANTITIES									
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
6.22 Utility Water & Disinfection Facility									
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS						
Carried forward to page collection									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
Page Collection 6-26 to 6-27								
		Sum of Page 6-26						
		Sum of Page 6-27						
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
6.23 Sludge Treatment Building								
		6.23 Sludge Treatment Building						
	M07-01-01/02	Sludge Dewatering Unit	unit	2				
	M07-02	Sludge Cake Conveyor	unit	1				
	M07-03	Sludge Cake Hopper	unit	1				
	M07-04-01/02	Polymer Dissolving Tank	lot	2				
	M07-05-01/02	Polymer Feeder	unit	2				
	M07-06-01/02	Polymer Feed Pump for Dewatering	unit	2				
	M07-07-01/02	Air Compressor	unit	2				
	M07-08-01/02	Air Dryer	unit	2				
	M07-09-01/02	Hoist Block for Dewatering Unit	unit	2				
	M07-10-01/02	Hoist Block for Sludge Treatment Building	unit	2				
	M07-11-01/02	Sump Drain Pump	unit	2				
	M07-12-01/02	Waste Water Mixer	unit	2				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
	M07-13-01/02	Waste Water Pump	unit	2				
	M07-14	Biological Odor Control	unit	1				
	M07-15-01/02	Deodorization Fan	unit	2				
	M07-16	Utility Potable Water Supply Unit	lot	1				
	M07-17	Hoist Block for Utility Pump	unit	1				
	M07-18	Piping	lot	1				
	M07-19	Steel Works	lot	1				
		Allow for all cost and works deemed necessary but not included elsewhere, the completion of the work according to the Specifications, Drawings and Conditions of Contract	LS					
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
Page Collection 6-29 to 6-30								
		Sum of Page 6-29						
		Sum of Page 6-30						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 7								
	1	Total of Section 7.1 Kanudi Pumping Station (PS-1) (from Page Collection)						
	2	Total of Section 7.2 Idubada Pumping Station (PS-2) (from Page Collection)						
	3	Total of Section 7.13 Hagara Pumping Station (PS-3) (from Page Collection)						
	4	Total of Section 7.4 Hanubada Pumping Station (PS-4) (from Page Collection)						
	5	Total of Section 7.5 Konedobu Pumping Station (PS-5) (from Page Collection)						
	6	Total of Section 7.6 Old Yacht Club Pumping Station (PS-6) (from Page Collection)						
	7	Total of Section 7.7 Stanley Esplanade Pumping Station (PS-7) (from Page Collection)						
	8	Total of Section 7.8 Sea Park Pumping Station (PS-8) (from Page Collection)						

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
	9	Total of Section 7.9 Davara Pumping Station (PS-9) (from Page Collection)						
	10	Total of Section 7.10 Lawes Road Pumping Station (PS-10) (from Page Collection)						
	11	Total of Section 7.11 Koki Pumping Station (PS-11) (from Page Collection)						
	12	Total of Section 7.12 Badili Pumping Station (PS-12) (from Page Collection)						
	13	Total of Section 7.13 Kila Police Pumping Station (PS-13) (from Page Collection)						
	14	Total of Section 7.14 Konebada Pumping Station (PS-14) (from Page Collection)						
	15	Total of Section 7.15 Gabutu Pumping Station (PS-15) (from Page Collection)						
	16	Total of Section 7.16 Horsecamp Pumping Station (PS-16) (from Page Collection)						

BILL OF QUANTITIES									
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
	17	Total of Section 7.17 Kaugere Pumping Station (PS-17) (from Page Collection)							
	18	Total of Section 7.18 Grit Chamber (from Page Collection)							
	19	Total of Section 7.19 Oxidation Ditch (from Page Collection)							
	20	Total of Section 7.20 Clarifier (from Page Collection)							
	21	Total of Section 7.21 Utility Water & Disinfection Facility (from Page Collection)							
	22	Total of Section 7.22 Sludge Treatment Building (from Page Collection)							
	23	Total of Section 7.23 Administration Building (from Page Collection)							
	24	Total of Section 7.24 Electrical Substation (from Page Collection)							
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
7.1 Kanudi Pumping Station (PS-1)									
		<u>7.1 Kanudi Pumping Station (PS-1)</u>							
	01-01 PCP01	PS1 Pump Control Panel	set	1					
	01-01 TMP01	PS1 Telemetry Panel	set	1					
	01-01 GEN01	PS1 Diesel Generator Set	set	1					
		Cablling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
7.2 Idubada Pumping Station (PS-2)									
		7.2 Idubada Pumping Station (PS-2)							
	01-02 IFP01	PS2 Incoming/Feeder Panel	set	1					
	01-02 PCP01	PS2 Pump Control Panel	set	1					
	01-02 TMP01	PS2 Telemetry Panel	set	1					
	01-02 GEN01	PS2 Diesel Generator Set	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.3 Hagara Pumping Station (PS-3)								
		<u>7.3 Hagara Pumping Station (PS-3)</u>						
	01-03 IFP01	PS3 Incoming/Feeder Panel	set	1				
	01-03 PCP01	PS3 Pump Control Panel	set	1				
	01-03 TMP01	PS3 Telemetry Panel	set	1				
	01-03 GEN01	PS3 Diesel Generator Set	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
7.4 Hanuabada Pumping Station (PS-4)									
		7.4 Hanuabada Pumping Station (PS-4)							
	01-04 IFP01	PS4 Incoming/Feeder Panel	set	1					
	01-04 PCP01	PS4 Pump Control Panel	set	1					
	01-04 TMP01	PS4 Telemetry Panel	set	1					
	01-04 GEN01	PS4 Diesel Generator Set	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.5 Konedobu Pumping Station (PS-5)								
		7.5 Konedobu Pumping Station (PS-5)						
	01-05 IFP01	PS5 Incoming/Feeder Panel	set	1				
	01-05 PCP01/02/03	PS5 Pump Control Panel	set	3				
	01-05 TMP01	PS5 Telemetry Panel	set	1				
	01-05 GEN01	PS5 Diesel Generator Set	set	1				
	01-05 LE01	PS5 Level Meter	set	1				
	01-05 FE01	PS5 Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
7.6 Old Yacht Club Pumping Station (PS-6)									
		7.6 Old Yacht Club Pumping Station (PS-6)							
	01-06 PCP01	PS6 Pump Control Panel	set	1					
	01-06 TMP01	PS6 Telemetry Panel	set	1					
	01-06 GEN01	PS6 Diesel Generator Set	set	1					
		Cablinng Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
7.7 Stanley Esplanade Pumping Station (PS-7)									
		7.7 Stanley Esplanade Pumping Station (PS-7)							
	01-07 IFP01	PS7 Incoming/Feeder Panel	set	1					
	01-07 PCP01	PS7 Pump Control Panel	set	1					
	01-07 TMP01	PS7 Telemetry Panel	set	1					
	01-07 GEN01	PS7 Diesel Generator Set	set	1					
	01-07 FE01	PS7 Flow Meter	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
7.8 Sea Park Pumping Station (PS-8)								
		7.8 Sea Park Pumping Station (PS-8)						
	01-08 PCP01	PS8 Pump Control Panel	set	1				
	01-08 TMP01	PS8 Telemetry Panel	set	1				
	01-08 GEN01	PS8 Diesel Generator Set	set	1				
	01-08 FE01	PS8 Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
7.9 Davara Pumping Station (PS-9)									
		7.9 Davara Pumping Station (PS-9)							
	01-09 IFP01	PS9 Incoming/Feeder Panel	set	1					
	01-09 PCP01	PS9 Pump Control Panel	set	1					
	01-09 TMP01	PS9 Telemetry Panel	set	1					
	01-09 GEN01	PS10 Diesel Generator Set	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.10 Lawes Road Pumping Station (PS-10)								
		7.10 Lawes Road Pumping Station (PS-10)						
	01-10 IFP01	PS10 Incoming/Feeder Panel	set	1				
	01-10 PCP01/02/03	PS10 Pump Control Panel	set	3				
	01-10 TMP01	PS10 Telemetry Panel	set	1				
	01-10 GEN01	PS10 Diesel Generator Set	set	1				
	01-10 LE01	PS10 Level Meter	set	1				
	01-10 FE01	PS10 Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
7.11 Koki Pumping Station (PS-11)								
		7.11 Koki Pumping Station (PS-11)						
	01-11 IFP01	PS11 Incoming/Feeder Panel	set	1				
	01-11 PCP01/02	PS11 Pump Control Panel	set	2				
	01-11 TMP01	PS11 Telemetry Panel	set	1				
	01-11 GEN01	PS11 Diesel Generator Set	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.12 Badili Pumping Station (PS-12)								
		<u>7.12 Badili Pumping Station (PS-12)</u>						
	01-12 IFP01	PS12 Incoming/Feeder Panel	set	1				
	01-12 PCP01/02	PS12 Pump Control Panel	set	3				
	01-12 TMP01	PS12 Telemetry Panel	set	1				
	01-12 GEN01	PS12 Diesel Generator Set	set	1				
	01-12 LE01	PS12 Level Meter	set	1				
	01-12 TMP02	Flow Meter Telemetry Panel	set	1				
	01-12 FE01	PS12 Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
7.13 Kila Police Pumping Station (PS-13)									
		<u>7.13 Kila Police Pumping Station (PS-13)</u>							
	01-13 PCP01	PS13 Pump Control Panel	set	1					
	01-13 TMP01	PS13 Telemetry Panel	set	1					
	01-13 GEN01	PS13 Diesel Generator Set	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.14 Konebada Pumping Station (PS-14)								
		7.14 Konebada Pumping Station (PS-14)						
	01-14 PCP01	PS14 Pump Control Panel	set	1				
	01-14 TMP01	PS14 Telemetry Panel	set	1				
	01-14 GEN01	PS14 Diesel Generator Set	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.15 Gabutu Pumping Station (PS-15)								
		7.15 Gabutu Pumping Station (PS-15)						
	01-15 IFP01	PS15 Incoming/Feeder Panel	set	1				
	01-15 PCP01	PS15 Pump Control Panel	set	1				
	01-15 TMP01	PS15 Telemetry Panel	set	1				
	01-15 GEN01	PS15 Diesel Generator Set	set	1				
	01-15 FE01	PS15 Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₹	PNGK	₹	
7.16 Horsecamp Pumping Station (PS-16)									
		7.16 Horsecamp Pumping Station (PS-16)							
	01-16 PCP01	PS16 Pump Control Panel	set	1					
	01-16 TMP01	PS16 Telemetry Panel	set	1					
	01-16 GEN01	PS16 Diesel Generator Set	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	₪	PNGK	₪	
7.17 Kaugere Pumping Station (PS-17)									
		7.17 Kaugere Pumping Station (PS-17)							
	01-17 IFP01	PS17 Incoming/Feeder Panel	set	1					
	01-17 PCP01/02/03	PS17 Pump Control Panel, 3 sets	set	3					
	01-17 TMP01	PS17 Telemetry Panel	set	1					
	01-17 GEN01	PS17 Diesel Generator Set	set	1					
	01-17 LE01	PS17 Level Meter	set	1					
	01-17 FE01	PS17 Flow Meter	set	1					
		Cabling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.18 Grit Chamber								
		7.18 Grit Chamber						
	02-LCP01	Fine Screen LCP	set	1				
	02-LCP02	Grit Collector LCP	set	1				
	02-LCP03	Grit Pump LCP	set	1				
	02-LCP04	Grit Washer/Separator LCP	set	1				
	02-LCP05	Oil Discharge/Transfer Pump LCP	set	1				
	02-LCP06	Scum Screen LCP	set	1				
	02-LCP07	Sump Drain Pump LCP at Grit Chamber	set	1				
	02-LE11	No.1 Fine Screen Upstream Level Meter	set	1				
	02-LE12	No.1 Fine Screen Downstream Level Meter	set	1				
	02-LE21	No.2 Fine Screen Upstream Level Meter	set	1				
	02-LE22	No.2 Fine Screen Downstream Level Meter	set	1				
	02-LE31	No.3 Fine Screen Upstream Level Meter	set	1				
	02-LE32	No.3 Fine Screen Downstream Level Meter	set	1				
	02-FE01	Influent Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.19 Oxidation Ditch								
		<u>7.19 Oxidation Ditch</u>						
	04-BCP01/05	Air Blower Control Panels	set	5				
	04-MCC01	No.1/2 OD /Clarifier MCC	set	1				
	04-MCC02	No.3 OD /Clarifier MCC	set	1				
	04-RIO01	RIO Panel at Blower House -1	set	1				
	04-RIO02	RIO Panel at Blower House -2	set	1				
	04-LCP01	No.1-1/2 OD Mixer LCP	set	1				
	04-LCP02	No.1-3/4 OD Mixer LCP	set	1				
	04-LCP03	No.2-1/2 OD Mixer LCP	set	1				
	04-LCP04	No.2-3/4 OD Mixer LCP	set	1				
	04-LCP05	No.3-1/2 OD Mixer LCP	set	1				
	04-LCP06	No.3-3/4 OD Mixer LCP	set	1				
	04-LCP07	No.1/2/3 Blower LCP	set	1				
	04-LCP08	No.4/5 Blower LCP	set	1				
	04-LCP09/10/11	Waste Sludge Pump LCP	set	1				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
7.19 Oxidation Ditch								
	04-FE11	No.1 Air Blower Flow Meter	set	1				
	04-FE21	No.2 Air Blower Flow Meter	set	1				
	04-FE31	No.3 Air Blower Flow Meter	set	1				
	04-AE11	No.1 DO Meter	set	1				
	04-AE21	No.2 DO Meter	set	1				
	04-AE31	No.3 DO Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
Page Collection 7-22 to 7-23									
		Sum of Page 7-22							
		Sum of Page 7-23							
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.20 Clarifier								
		<u>7.20 Clarifier</u>						
	05-LCP01/02/03	Clarifier LCP	set	3				
	05-LCP04/05/06	Return Sludge Pump LCP	set	3				
	05-LCP08	Scum Screen LCP	set	1				
	05-LCP08/09	Sump Drain Pump LCP at Sludge Pump Room	set	2				
	05-FE11	No.1 Return Sludge Flow Meter	set	1				
	05-FE21	No.2 Return Sludge Flow Meter	set	1				
	05-FE21	No.3 Return Sludge Flow Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
7.21 Utility Water & Disinfection Facility								
		7.21 Utility Water & Disinfection Facility						
	06-MCC01	Utility Water and Disinfection MCC	set	1				
	06-LCP01	Chlorine Tank Mixer LCP	set	1				
	06-LCP02	Defoaming Pump LCP	set	1				
	06-FE01	Effluent Flow Meter	set	1				
	06-LE11	No.1 Chlorine Tank Level Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
7.22 Sludge Treatment Building									
		<u>7.22 Sludge Treatment Building</u>							
	07-MCC01	Sludge Treatment MCC	set	1					
	07-RIO01	RIO Panel at Sludge Treatment Building	set	1					
	07-LCP01	Polymer Tank Mixer LCP	set	1					
	07-LCP02	Polymer Feeder LCP	set	1					
	07-LCP03	Polymer Feed Pump LCP	set	1					
	07-LCP04	Sludge Cake Conveyer LCP	set	1					
	07-LCP05	Sludge Cake Hopper LCP	set	1					
	07-LCP06	Air Dryer LCP	set	1					
	07-LCP07	Sump Drain Pump LCP	set	1					
	07-LCP08	Waste Water Tank LCP	set	1					
	07-LCP09	Deodorization Fan LCP	set	1					
	07-LE11	No.1 Polymer Tank Level Meter	set	1					
	07-LE21	No.2 Polymer Tank Level Meter	set	1					
	07-AE01	Waste Sludge Densitometer	set	1					
Carried forward to page collection									

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
7.22 Sludge Treatment Building (Continue)								
	07-FE01	Waste Sludge Feed Flow Meter	set	1				
	07-FE12	No.1 Polymer Feed Flow Meter	set	1				
	07-FE22	No.2 Polymer Feed Flow Meter	set	1				
	07-WE01	Hopper Weight Meter	set	1				
		Cabling Works And Others	Lot	1				

Carried forward to page collection

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 7-27 to 7-28								
		Sum of Page 7-27						
		Sum of Page 7-28						
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
7.23 Administration Building									
		7.23 Administration Building							
	08-PLC01/02	PLC Panel	set	1					
	08-LCD01	LCD/LED Large Screen	set	1					
	08-PRT01/02	Printers, 2 sets	set	1					
	08 OS01	Operator Station For Pumping Stations	set	1					
	08 OS02	Operator Station For STP	set	1					
	08 SER 01	Server 1	set	1					
	08 SER 02	Server 2	set	1					
	08 ENG 01	Engineering Station	set	1					
		Cablling Works And Others	Lot	1					
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
7.24 Electrical Substation								
		<u>7.24 Electrical Substation</u>						
	09-GEN01	Diesel Generator Set	set	1				
	09-LV01	Incoming Panel	set	1				
	09-LV02	Feeder Panel	set	1				
	09-LV03	Static Capacitor Panel	set	1				
	09-UPS01	UPS Panel	set	1				
	09-MCC01	Grit Chamber MCC	set	1				
	09-RIO01	RIO Panel at Electrical Substation	set	1				
	09-AE21	No.2 DO Meter	set	1				
	09-AE31	No.3 DO Meter	set	1				
		Cabling Works And Others	Lot	1				
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 8								
	1	Total of Section 8.1 (from Page Collection)			-	-		
	2	Total of Section 8.2 (from Page Collection)			-	-		
	3	Total of Section 8.3 (from Page Collection)			-	-		
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.1 Support								
	1	Excavation & Bedding						
	1.1.1	Excavate by Machine in all materials other than bed rock	m ³	542.5				
	1.1.4	Supply, spread & compact selected surplus Soil Backfilling	m ³	457.8				
	1.1.5	Disposal of surplus soil to dumping site (10km distance)	m ³	84.7				
	1.2	Bedding						
	1.2.1	Bedding with selected Gravel, 200mm Thick	m ³	124.3				
	2	Concrete Works						
	2.2.1	Concrete in structure (Grade 32Mpa)	m ³	58.6				
	2.2.3	Plain Concrete (Mass concrete) (Grade 20Mpa)	m ³	12.4				
	2.3	Reinforcing Bars						
	2.3.1	Reinforcing bars and fabrication for reinforced concrete	t	4.1				
	2.6.5	Vinyl Ester Resin Lining for corrosion protection of concrete, 1.0mmThk	m ²	400				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 8-2								
		Sum of Page 8-2						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.2 Sewer								
		Main Sewer Material, HDPE, ND200 mm dia. PN20, SDR 9, Black HDPE with carbon black	m	123				
		Main Sewer Installation (Above GL), HDPE, ND200 mm dia. (Butt welding or Electro Fusion welding)	m	87				
		Main Sewer Installation (Under GL), HDPE, ND200 mm dia. (Butt welding or Electro Fusion welding), minimum earth cover 600mm	m	36				
		Main Sewer Material, uPVC, 150 mm dia.	m	69				
		Main Sewer Installation (Under GL), uPVC, 150 mm dia., minimum earth cover 600mm	m	69				
		Clamp with Bolts (supply), Dia. 200mm, SUS444b or SUS316 or equivalent material (Anticorrosion)	Nos	44				
		Clamp with Bolts (Installation), Dia. 200mm	Nos	44				
		Blank End (End cap) (Supply), HDPE, ND 200 mm dia. Black HDPE with carbon black	Nos	2				
		Blank End (End cap) (Installation), Butt welding or Electro Fusion welding	Nos	2				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
8.2 Sewer (Continue)								
	1.2	Precast Manhole	nr	2				
		Type A (Soil/Right of Way)						
	a)	Dia. 1050 Precast Manhole, h<2.0m						
		House Connection Material, HDPE, ND 125 mm dia. PN16, SDR 11, Black HDPE with carbon black	m	300				
		House Connection Installation, HDPE, ND 125 mm dia. (Butt welding or Electro Fusion welding)	m	300				
		Suspending for a pipe, Bracket type (Supply), Dia. 125mm, SUS444b or SUS316 or equivalent material (Anticorrosion)	Nos	300				
		Suspending for a pipe, Bracket type (Installation), Dia. 125mm Fittings		300				
		45 Degree Reducing Junction (Supply), HDPE, ND200 mm x 125mm, PN16, SDR11, Black	Nos	20				
		45 Degree Reducing Junction (Installation), HDPE, ND200 mm x 125mm, (Butt welding or Electro Fusion welding)	Nos	20				
		HDPE, ND200 mm x 125mm, (Butt welding or Electro Fusion welding))	Nos	20				
		EF(Electro-Fusion) Bend 45 Degree (Supply), HDPE, ND125mm, PN16, SDR11, Black HDPE	Nos	20				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.2 Sewer (Continue)								
		EF(Electro-Fusion) Bend 45 Degree (Installation), HDPE, ND125mm (EF welding)	Nos	20				
		Flange Spigot ND125 (Supply), HDPE, ND125, ISO PN10, Flange of SUS444 or SUS316 or equivalent	Nos	20				
		Flange Spigot ND125 (Installation), HDPE, ND125, ISO PN10	Nos	20				
		Flexible Joint 100mm with Flange (Supply), Rubber Type with SUS444 or SUS316 or equivalent Flange, ISO PN10, Eccentricity 100mm	Nos	20				
		Flexible Joint 100mm with Flange (Installation), Rubber Type with Flange, ISO PN10	Nos	20				
		EF Flange ND125 (Supply), HDPE, ND125mm, ISO PN10, Flange of SUS444 or SUS316 or equivalent	Nos	20				
		EF Flange ND125 (Installation), HDPE, ND125mm, (Butt welding or EF welding)	Nos	20				
		90 Degree Bend ND125 (Supply), HDPE, ND125mm, PN16, SDR11, Black HDPE	Nos	100				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.2 Sewer (Continue)								
		90 Degree Bend ND125 (Installation), HDPE, ND125mm, (Butt welding or EF welding)	Nos	100				
		90 Degree Sweep Junction (Tee) (Supply), HDPE, ND125mm	Nos	60				
		90 Degree Sweep Junction (Tee) (Installation), HDPE, ND125mm, (Butt welding or EF welding)	Nos	60				
		Flushing Toilet System						
		Toilet with Flush tank and drain (Supply)	Nos	20				
		Toilet with Flush tank and drain (Installation)	Nos	20				
		Cleanout, ND200, Black HDPE, PN20	Nos	4				
		Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1.0				
					Carried forward to page collection			

BILL OF QUANTITIES									
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
Page Collection 8-4 to 8-6									
		Sum of Page 8-4							
		Sum of Page 8-5							
		Sum of Page 8-6							
		Sum of Page 8-7							
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
8.3 Water Distribution Pipe								
		Distribution Pipe Material (Supply), HDPE, ND63 mm dia., PN20, SDR9, Black HDPE with carbon black	m	167				
		Pipe Installation (Above GL), HDPE, ND63 mm dia. (Butt welding or Electro Fusion welding)	m	87				
		Pipe Installation (Under GL)HDPE, ND63 mm dia. (Butt welding or Electro Fusion welding) minimum earth cover 600mm	m	80				
		Clamp with Bolts (Supply), Dia. 63mm, SUS444b or SUS316 or equivalent material (Anticorrosion)	Nos	174				
		Clamp with Bolts (Installation), Dia. 63mm	Nos	174				
		Bulk Meter (Supply), 50 mm	Nos	1				
		Bulk Meter Insallation, 50 mm, minimum earth cover 600mm	Nos	1				
		Bulk Meter Box Installation, Same as Sewer "gate valve box"		1				
		Gate Valve (Supply), 50 mm	Nos	1				
		Gate Valve (Installation), 50 mm	Nos	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₹	PNGK	₹
8.3 Water Distribution Pipe (Continue)								
		Tapping Saddle Ferrule (Supply), 150mm x 50 mm, PN16	Nos	1				
		Tapping Saddle Ferrule (Installation), 150mm x 50 mm, PN16	Nos	1				
		Flang spigot, PN10 (Supply), HDPE, ND63 mm, ISO	Nos	1				
		Flange spigot, PN10 (Installation), HDPE, ND63 mm, ISO (Butt welding or EF welding)	Nos	1				
		Restrained Dismantling Joint (Supply), 50 mm	Nos	1				
		Restrained Dismantling Joint (Installation), 50 mm	Nos	1				
		Flange spigot ND 63 (Suppy), HDPE,ND 63mm, ISO	Nos	1				
		Flange spigot ND 63 (Installation), HDPE,ND 63mm (Butt welding or EF welding)	Nos	1				
		Flang adoptor for HDPE ND63mm (Supply), PN10, ISO	Nos	1				
		Flang adoptor for HDPE ND63mm (Installation), PN10, ISO	Nos	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.3 Water Distribution Pipe (Continue)								
		90 Degree Junction (Tee) (Supply), HDPE, ND63 mm, PN16, SDR11	Nos	1				
		90 Degree Junction (Tee) (Installation), HDPE, ND63 mm, PN16, SDR11(Butt welding or EF welding)	Nos	1				
		45 Degree Bend (Supply), HDPE, ND63mm, PN16 SDR11	Nos	1				
		45 Degree Bend (Installation), HDPE, ND63mm, PN16 SDR11(Butt welding or EF welding)	Nos	1				
		Water Meter Material, 15 mm	Nos	20				
		Water Meter Installation, 15 mm	Nos	20				
		Stop valve for water meter (Supply), 20 mm	Nos	20				
		Stop valve for water meter (Installation), 20 mm	Nos	20				
		Tapping Saddle Ferrule (Supply), HDPE, ND63mm x ND25 mm, PN16	Nos	20				
		Tapping Saddle Ferrule (Installation), HDPE, ND63mm x ND25 mm, PN16	Nos	20				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.3 Water Distribution Pipe (Continue)								
		EF Flange ND25 (Supply), HDPE, ND25mm, PN10, ISO, Flange of SUS444 or 316 or equivalent (Anticorrosion)	Nos	40				
		EF Flange ND25 (Installation), HDPE, ND25mm, EF welding	Nos	40				
		Flexible Joint 20mm with Flange (Supply), Rubber Type with SUS444 or SUS316 or equivalent Flange, ISO PN10, Eccentricity 100mm	Nos	20				
		Flexible Joint 20mm with Flange (Installation), Rubber Type with Flange, ISO PN10	Nos	20				
		Galvanised Steel Pipe (Supply), OD 25mm, hot dip galvanizing type (anticorrosion type) or equivalent with corrosion-proof tape	m	40				
		Galvanised Steel Pipe (Installation), OD 25mm, above GL	m	40				
		Polyethylene Pipe (Supply), OD 32mm	m	300				
		Polyethylene Pipe (Installation), OD 32mm, Above GL	m	300				
		Polyethylene PipeFitting Tee (Supply), OD 32mm	Nos	60				
		Polyethylene PipeFitting Tee (Installation), OD 32mm, Above GL	Nos	60				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
8.3 Water Distribution Pipe (Continue)								
		Transition Adaptor PE/Brass (Supply), 20mm dia.	Nos	20				
		Transition Adaptor PE/Brass (Installation), 20mm dia.	Nos	20				
		Lean Concrete (Anchor block)	m3	0.5				
		Mechanical joint for HDPE ND63mm	Nos	1				
		Tapping Saddle Ferrule (Supply), 150mm x 50 mm	Nos	1				
		Tapping Saddle Ferrule (Installation), 150mm x 50 mm	Nos	1				
		Surface box with minimum clear opening box, 150mm x 150 mm	Nos	1				
		Precast concret slab with center hole with 160mm uPVC 1m, 600mm x 600mm x 100mm thk	set	1				
		Tee, PN20 (Installation) ND63 x ND25, Black	Nos	20				
		Tee, PN20 (Supply) ND63 x ND25, Black	Nos	20				
		Allow for all cost and works deemed necessary but not included in this section or elsewhere for the completion of the work according to the Specifications, Drawings and Condition of Contract	ls	1.0				
Carried forward to page collection								

BILL OF QUANTITIES									
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount		
					PNGK	¥	PNGK	¥	
Page Collection 8-8 to 8-11									
		Sum of Page 8-8							
		Sum of Page 8-9							
		Sum of Page 8-10							
		Sum of Page 8-11							
		Sum of Page 8-12							
Carried forward to Section Summary									

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 9								
	1	Total of Section 9.1 (from Page Collection)						
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
9.1 Procurement								
	1	General Requirement	LS	1				
	2	High Velocity Jet Truck	ea	1				
	3	Vacuume Truck	ea	2				
	4	Dump Truck	ea	2				
	5	Water Tank Truck	ea	1				
	6	Car with Television Inspection	ea	1				
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 10								
	1	Total of Section 10.1 Social Development Program	LS	1				
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
10.1 Social Development Program								
	1	Social and Environmental Consideration Programme	LS					
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
Section Summary of Section 11								
	1	Total of Section 11.1 Analysis/Measurement Equipment, Glass Wares and Chemicals	LS	1				
	2	Total of Section 11.2 Glass Wares, etc.	LS	1				
	3	Total of Section 11.3 Necessary Reagents, etc. during Training of Water Quality Analysis	LS	1				
	4	Total of Section 11.4 Necessary Reagents, etc. during two months' Commissioning Period	LS	1				
Total carried forward to Grand Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
Section 11 Operation and Maintenance training								
		11.1 Analysis/Measurement Equipment, Glass Wares and Chemicals	LS	1				
		11.2 Glass Wares, etc.	LS	1				
		11.3 Necessary Reagents, etc. during Training of Water Quality Analysis	LS	1				
		11.4 Necessary Reagents, etc. during two months' Commissioning Period	LS	1				
		11.5 Operation and Maintenance Training	LS	1				
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
11.1 Analysis/Measurement Equipment, Glass Wares and Chemicals								
	1	pH/ORP meter	No.	1				
	2	Potable pH/ORP meter	No.	1				
	3	Potable EC meter	No.	1				
	4	Potable EC meter	No.	1				
	5	Transparency meter	No.	1				
	6	MLSS meter	No.	1				
	7	Simple COD analysis set	No.	1				
	8	BOD analysis set	No.	1				
	9	DO meter	No.	1				
	10	Soxlet extraction unit for 3 samples	No.	1				
	11	Nitrogen and phosphorus analysis set	No.	1				
	12	Simple nitrogen analysis kit	No.	1				
	13	Potable Residual chlorine meter	No.	1				
	14	Pure water production equipment	No.	1				
	15	Distilled water production equipment	No.	1				
	16	Auto precise balancer	No.	2				
	17	Storage shelf	No.	3				
	18	Centrifugal	No.	1				
	19	Shaker	No.	1				
	20	SS analysis set	No.	1				
	21	Stirrer	No.	3				
	22	Dryer	No.	2				
	23	Digital microscope	No.	1				
	24	Electro balancer	No.	2				
	25	Dryer shelf	No.	3				
	26	Ultrasonic cleaning machine	No.	1				
	27	Desicator	No.	2				
	28	Distillation equipment	No.	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.1 Analysis/Measurement Equipment, Glass Wares and Chemicals (Cont')								
	29	Air pump	No.	1				
	30	Water bath	No.	1				
	31	Muffle furnace	No.	1				
	32	Hot plate	No.	2				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
Page Collection 11.1-2 to 11.1-3								
		Sum of Page 11.1-2						
		Sum of Page 11.1-3						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.2 Glass Wares, etc.								
	1	Conical flask, 300 mL	pc	14				
	2.1	Beaker, 50 mL	pc	6				
	2.2	Beaker, 100 mL	pc	6				
	2.3	Beaker, 300 mL	pc	6				
	2.4	Beaker, 500 mL	pc	4				
	2.5	Beaker, 1,000 mL	pc	3				
	2.6	Beaker, 10 L, PE	pc	1				
	3.1	Pipette, Mess 1mL	pc	6				
	3.2	Pipette, Mess 2mL	pc	6				
	3.3	Pipette, Mess 5mL	pc	6				
	3.4	Pipette, Mess 10mL	pc	6				
	3.5	Pipette, Mess 25mL	pc	6				
	3.6	Pipette, Hole 50 mL	pc	6				
	3.7	Pipette, Hole 100 mL	pc	2				
	4.1	Messzylinder, 20 mL with stopper	pc	4				
	4.2	Messzylinder, 50 mL with stopper	pc	7				
	4.3	Messzylinder, 100 mL with stopper	pc	4				
	4.4	Messzylinder, 250 mL with stopper	pc	4				
	4.5	Messzylinder, 500 mL with stopper	pc	4				
	4.6	Messzylinder, 1,000 mL	pc	7				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.2 Glass Wares, etc. (Cont')								
	5.1	Messflask, 20 mL	pc	2				
	5.2	Messflask, 50 mL	pc	4				
	5.3	Messflask, 100 mL	pc	6				
	5.4	Messflask, 250 mL	pc	2				
	5.5	Messflask, 500 mL	pc	4				
	5.6	Messflask, 1,000 mL	pc	2				
	6.1	Plastic bottle (wide mouth), 100 mL	pc	20				
	6.2	Plastic bottle (wide mouth), 250 mL	pc	14				
	6.3	Plastic bottle (wide mouth), 500 mL	pc	8				
	6.4	Plastic bottle (wide mouth), 1,000 mL	pc	3				
	7.1	Wash bottle, 250 mL	pc	4				
	7.2	Wash bottle, 500 mL	pc	4				
	8.1	Measuring/transfer pipette, 25 mL	pc	6				
	8.2	Syringe, PE, 5 mL	pc	4				
	8.3	Pipette stand	pc	3				
	8.4	crucible, melting pot, 15 mL, high purified alumina for VSS	pc	4				
	8.5	Watch glass, Φ 9 cm	pc	20				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
11.2 Glass Wares, etc. (Cont')								
	9.1	Evaporating dish, 100 mL	pc	20				
	9.2	Spatula	pc	4				
	9.3	Nitrate reduction column, Cupper-	pc	4				
	9.4	Auto burette, White 25 mL, 2,000 mL container	pc	4				
	9.5	Auto burette, Brown 25 mL, 2,000 mL container	pc	1				
	9.6	No.5 A filter, Dia.110 mm	pc	6				
	9.7	Funnel, Dia.60 mm	pc	6				
	9.8	Pincet, Length 125 mm	pc	4				
	9.9	Mortar, Dia.60 mm with pestle	pc	2				
	9.10	Agate Mortar, 50 mm with pestle	pc	1				
	9.11	Separation funnel, 500 mL, Pear shaped type with PTFE cock	pc	3				
	9.12	Separation funnel stand	pc	3				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 12-5to 12-8								
		Sum of Page 11.1-5						
		Sum of Page 11.1-6						
		Sum of Page 11.1-7						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.3 Necessary Reagents, etc. during Training of Water Quality Analysis								
		pH						
	1.1	pH standard 7, 500ml	pc	1				
	1.2	pH standard 4, 500ml	pc	1				
		SS						
	2	Glass filter for SS measurement, 47 mm, 100 sheet	Lot	1				
		VSS						
	3	Ammonium nitrate, 500g	Lot	1				
		M-alkalinity						
	4.1	Grade Hydrochloric acid, 500ml	Lot	1				
	4.2	Methyl red , 25g	Lot	1				
	4.3	Bromocresol green, 25g	Lot	1				
	4.4	95 % grade ethanol, 500ml	Lot	1				
	4.5	0.1 mol/L hydrochloric acid standard, 5,000ml	Lot	1				
		CODMn-Offial						
	5.1	Grade sulfuric acid, 500ml	Lot	1				
	5.2	Grade silver nitrate, 500g	Lot	1				
	5.3	Sodium oxalate(volumetric analysis), 50g	Lot	3				
	5.4	Potassium permanganate, 500g	Lot	1				
	5.5	5 mmol/L potassium permanganate standard solution, 5000ml	Lot	1				
	5.6	0.05mol/l(N/10)-Sodium oxalate solution, 20,000mL	Lot	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.3 Necessary Reagents, etc. during Training of Water Quality Analysis (Cont')								
		CODMn-simple						
	6.1	A solution, 100mL	Lot	1				
	6.2	B solution, 500mL	Lot	1				
		BOD5						
	7.1	Hydrochloric acid, 500mL	Lot	1				
	7.2	Sodium hydroxide, 500g	Lot	1				
	7.3	Dipotassium hydrogenphosphate, 500g	Lot	1				
	7.4	Potassium dihydrogenphosphate, 500g	Lot	1				
	7.5	Disodium hydrogen phosphate, 500g	Lot	1				
	7.6	Ammonia chloride, 500g	Lot	1				
	7.7	Magnesium sulfate heptahydrate, 500g	Lot	1				
	7.8	Calcium chloride, 500g	Lot	1				
	7.9	Iron (III) chloride hexahydrate, 500g	Lot	1				
	7.10	D (+) -glucose, 500g	Lot	1				
	7.11	L--glutamic acid, 1,000g	Lot	1				
		Hexane Extract						
	8.1	Grade Hydrochloric acid, 500mL	Lot	1				
	8.2	Methyl orange, 25g	Lot	1				
	8.3	Acetone, 500mL	Lot	1				
	8.4	Sodium sulfate Anhydrous, 500g	Lot	1				
	8.5	Hexane, 3,000L	Lot	1				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.3 Necessary Reagents, etc. during Training of Water Quality Analysis (Cont')								
		NH4-N (EDA)						
	9.1	Sulfuric acid, 500mL	Lot	1				
	9.2	Sodium hydroxide, 500g	Lot	1				
	9.3	Magnesium oxide, 25g	Lot	1				
	9.4	Phenol, 500g	Lot	1				
	9.5	Sodium hydrochloride (effective chlorine more than 5 %), 500mL	Lot	1				
	9.6	Ammonium ion NH4 1,000 standard solution, 500mL	Lot	1				
	9.7	Reagent No.00683, 100sample	Lot	1				
		NH4-N (Site)						
	10	Reagent set, 100sample	Lot	1				
		NO2-N (EDA)						
	11.1	4-aminobenzenesulfonamide, 100g	Lot	1				
	11.2	N-1-naphthylenediammonium dichloride, 25g	Lot	1				
	11.3	Nitrite ion standard solution 1000, 1 ampoule	Lot	1				
		NO3-N (EDA)						
	11.1	Ammonium chloride, 500g	Lot	1				
	11.2	Aqueous ammonia, 500mL	Lot	1				
	11.3	Nitrate ion standard solution 1000, 500mL	Lot	1				
	11.4	Disodium hydrogen ethylene-demine tetra acetate dihydrate, 500g	Lot	1				
	11.5	Copper (II) sulfate pentahydrate, 25g	Lot	1				
	11.6	Nitric acid, 500g	Lot	1				
	11.7	Copper-cadmium packing , 4L	Lot	1				
	11.8	Glass wool	Lot	1				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₪	PNGK	₪
11.3 Necessary Reagents, etc. during Training of Water Quality Analysis (Cont')								
		NO ₃ -N (EDA)						
	13	Reagent No. 09713, 100 samples	Lot	0				
		NO ₃ -N (site)						
	14	Reagent set, 100 samples	Lot	0				
		T-N (EDA)						
	15	Reagent No. 14763, 25 samples	Lot	0				
		T-P (EDA)						
	16	Reagent No. 14543, 25 samples	Lot	0				
		Coliforms						
	17.1	Deoxycholate agar culture medium, 500g	Lot	1				
	17.2	BGLB culture medium, 300g	Lot	1				
	17.3	Durham fermentation tube	Lot	10				
	17.4	Durham fermentation tube cap	Lot	10				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 11.1-9 to 11.1-12								
		Sum of Page 11.1-9						
		Sum of Page 11.1-10						
		Sum of Page 11.1-11						
		Sum of Page 11.1-12						
Carried forward to Section Summary								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.4 Necessary Reagents, etc. during two months' Commissioning Period								
		pH						
	1.1	pH standard 7, 500ml	pc	2				
	1.2	pH standard 4, 500ml	pc	2				
		SS						
	2	Glass filter for SS measurement, 47 mm, 100 sheet	Lot	5				
		VSS						
	3	Ammonium nitrate, 500g	Lot	0				
		M-alkalinity						
	4.1	Grade Hydrochloric acid, 500ml	Lot	1				
	4.2	Methyl red , 25g	Lot	0				
	4.3	Bromocresol green, 25g	Lot	0				
	4.4	95 % grade ethanol, 500ml	Lot	0				
	4.5	0.1 mol/L hydrochloric acid standard, 5,000ml	Lot	1				
		CODMn-Offial						
	5.1	Grade sulfuric acid, 500ml	Lot	1				
	5.2	Grade silver nitrate, 500g	Lot	1				
	5.3	Sodium oxalate(volumetric analysis), 50g	Lot	0				
	5.4	Potassium permanganate, 500g	Lot	0				
	5.5	5 mmol/L potassium permanganate standard solution, 5000ml	Lot	1				
	5.6	0.05mol/l(N/10)-Sodium oxalate solution, 20,000mL	Lot	0				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.4 Necessary Reagents, etc. during two months' Commissioning Period (Cont')								
		CODMn-simple						
	6.1	A solution, 100mL	Lot	3				
	6.2	B solution, 500mL	Lot	9				
		BOD5						
	7.1	Hydrochloric acid, 500mL	Lot	1				
	7.2	Sodium hydroxide, 500g	Lot	0				
	7.3	Dipotassium hydrogenphosphate, 500g	Lot	0				
	7.4	Potassium dihydrogenphosphate, 500g	Lot	0				
	7.5	Disodium hydrogen phosphate, 500g	Lot	0				
	7.6	Ammonia chloride, 500g	Lot	0				
	7.7	Magnesium sulfate heptahydrate, 500g	Lot	0				
	7.8	Calcium chloride, 500g	Lot	0				
	7.9	Iron (III) chloride hexahydrate, 500g	Lot	0				
	7.10	D (+) -glucose, 500g	Lot	0				
	7.11	L--glutamic acid, 1,000g	Lot	0				
		Hexane Extract						
	8.1	Grade Hydrochloric acid, 500mL	Lot	1				
	8.2	Methyl orange, 25g	Lot	0				
	8.3	Acetone, 500mL	Lot	0				
	8.4	Sodium sulfate Anhydrous, 500g	Lot	1				
	8.5	Hexane, 3,000L	Lot	1				
Carried forward to page collection								

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
11.4 Necessary Reagents, etc. during two months' Commissioning Period (Cont')								
		NH4-N (EDA)						
	9.1	Sulfuric acid, 500mL	Lot	1				
	9.2	Sodium hydroxide, 500g	Lot	1				
	9.3	Magnesium oxide, 25g	Lot	1				
	9.4	Phenol, 500g	Lot	0				
	9.5	Sodium hydrochloride (effective chlorine more than 5 %), 500mL	Lot	1				
	9.6	Ammonium ion NH4 1,000 standard solution, 500mL	Lot	0				
	9.7	Reagent No.00683, 100sample	Lot	1				
		NH4-N (Site)						
	10	Reagent set, 100sample	Lot	3				
		NO2-N (EDA)						
	11.1	4-aminobenzenesulfonamide, 100g	Lot	0				
	11.2	N-1-naphthvlenediammonium dichloride, 25g	Lot	0				
	11.3	Nitrite ion standard solation 1000, 1 ampoule	Lot	0				
		NO3-N (EDA)						
	11.1	Ammonium chloride, 500g		1				
	11.2	Aqueous ammonia, 500mL		0				
	11.3	Nitrate ion standard solation 1000, 500mL		0				
	11.4	Disodium hydrogen ethylene-demine tetra acetate dihydrate, 500g		0				
	11.5	Copper (II) sulfate pentahydrate, 25g		1				
	11.6	Nitric acid, 500g		1				
	11.7	Copper-cadmium packing , 4L		0				
	11.8	Glass wool		0				
					Carried forward to page collection			

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₱	PNGK	₱
11.4 Necessary Reagents, etc. during two months' Commissioning Period (Cont')								
		NO ₃ -N (EDA)						
	13	Reagent No. 09713, 100 samples		1				
		NO ₃ -N (site)						
	14	Reagent set, 100 samples		3				
		T-N (EDA)						
	15	Reagent No. 14763, 25 samples		1				
		T-P (EDA)						
	16	Reagent No. 14543, 25 samples		1				
		Coliforms						
	17.1	Deoxycholate agar culture medium, 500g		2				
	17.2	BGLB culture medium, 300g		0				
	17.3	Durham fermentation tube		0				
	17.4	Durham fermentation tube cap		0				
Carried forward to page collection								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Page Collection 12-14 to 12-17								
		Sum of Page 12-14						
		Sum of Page 12-15						
		Sum of Page 12-16						
		Sum of Page 12-17						
Carried forward to Section Summary								

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
Section Summary of Section 12								
	1	Total of Section 12.1 Provisional Sum for Electrical Work						
	2	Total of Section 12.2 Provisional Sum for Pipework						
Total carried forward to Grand Summary							-	

BILL OF QUANTITIES								
Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	¥	PNGK	¥
12. Provisional Sum								
12.1 Provisional Sum for Electrical Work								
	1	LV Connection for PS-1	LS					
	2	LV Connection for PS-2	LS					
	3	LV Connection for PS-3	LS					
	4	LV Connection for PS-4	LS					
	5	LV Connection for PS-13	LS					
	6	LV Connection for PS-14	LS					
	7	LV Connection for PS-15	LS					
	8	LV Connection for PS-16	LS					
	9	LV Connection for Receiving Well 1	LS					
	10	11 KV Extension with Transformer	LS					
		Sub Total						
	11	Contractor's profit and overhead, etc. on the above Provisional Sum item in ___% except for work executed by the Contractor.	item					
	12	Provisional Sum for Electricak work as directed by the Engineer	PS					
Carried forward to page collection							-	

BILL OF QUANTITIES

Specification Reference	Item No.	Description	Unit	Quantity	Rate		Amount	
					PNGK	₳	PNGK	₳
12.2 Provisional Sum for Pipe Work								
	1	Concrete Reinstatement for branch sewer	LS					
	2	Concrete Reinstatement for trunk sewer	LS					
	3	Landscaping for branch sewer	LS					
	4	Landscaping for trunk sewer	LS					
		Sub Total						
	11	Contractor's profit and overhead, etc. on the above Provisional Sum item in ____% except for work executed by the Contractor.	item					
	12	Provisional Sum for Electricak work as directed by the Engineer	PS					
Carried forward to page collection								