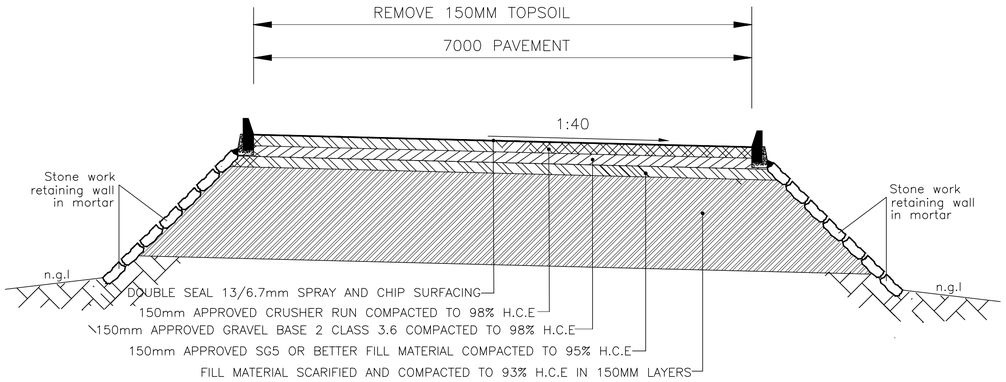
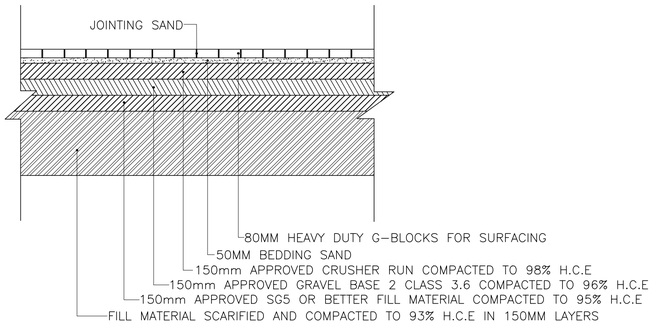
NOTES:	AMENDMENT	Description :

Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

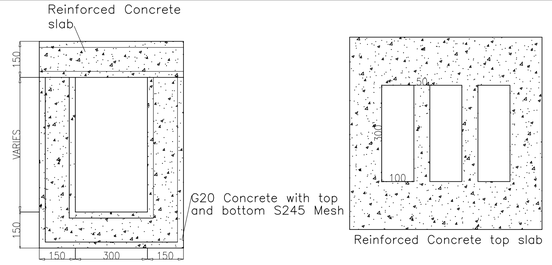
Engineer: L.M	Director Eng: H.Hungwe	Ministry: ZIMBABWE REVENUE AUTHORITY	Centre: MUTARE
Designed: L.M	Branch head: E.N	Title: FORBES HEAVY VEHICLE PARKING LOT	
Drawn: S.K	Scale: 1:850	Description: ROAD AND STORMWATER LAYOUT	
Checked: M.M	Date: 2022		
Telephone 700811		Project No: FORBES/CE/RLO1	



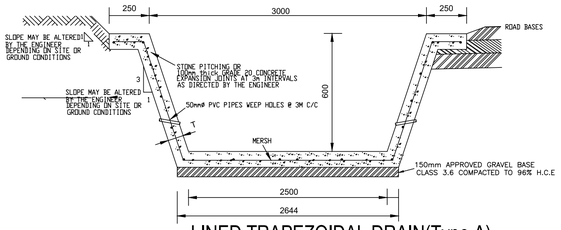
SECTION THROUGH ROAD 4
N.T.S



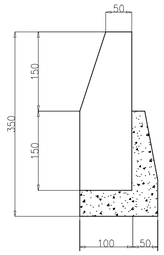
CROSS SECTION FOR FILL AREAS
N.T.S



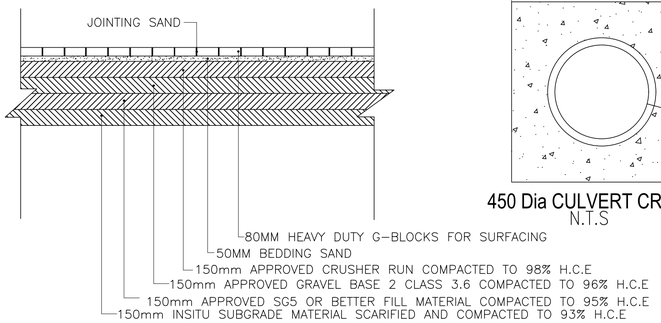
RECTANGULAR DRAIN-SIDE VIEW & PLAN VIEW
N.T.S



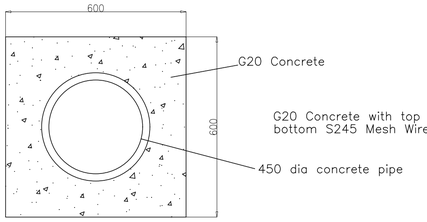
LINED TRAPEZOIDAL DRAIN(Type A)
N.T.S



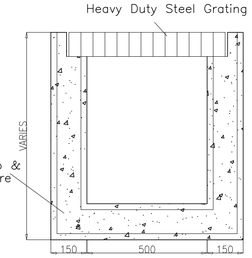
BARRIER KERBING(N.T.S)
N.T.S



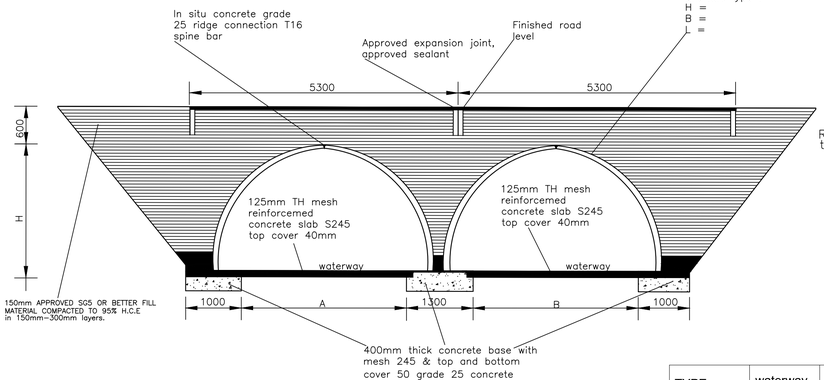
CROSS SECTION FOR CUT AREAS
N.T.S



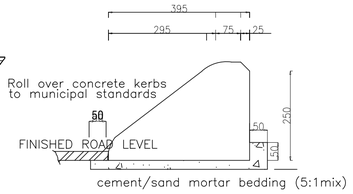
450 Dia CULVERT CROSS SECTION
N.T.S



CATCH PIT
N.T.S



Precast concrete half arch
Shelvert type :
H =
B =
L =



ROLL OVER CONCRETE KERBING
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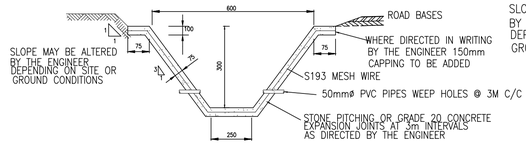
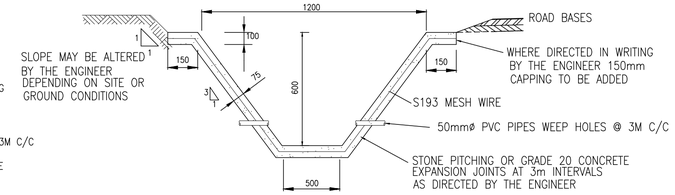


LINED TRAPEZOIDAL DRAIN(Type C)
N.T.S



LINED TRAPEZOIDAL DRAIN(Type B)
N.T.S

Precast concrete half arch
Shelvert type :
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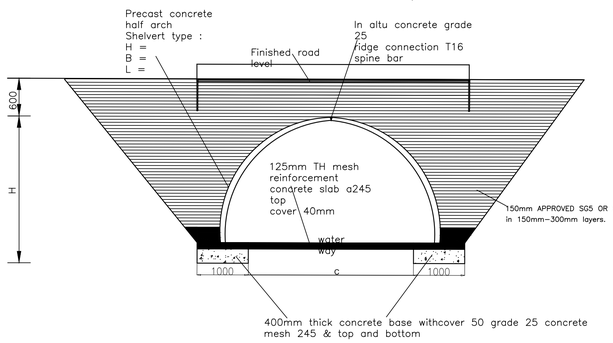
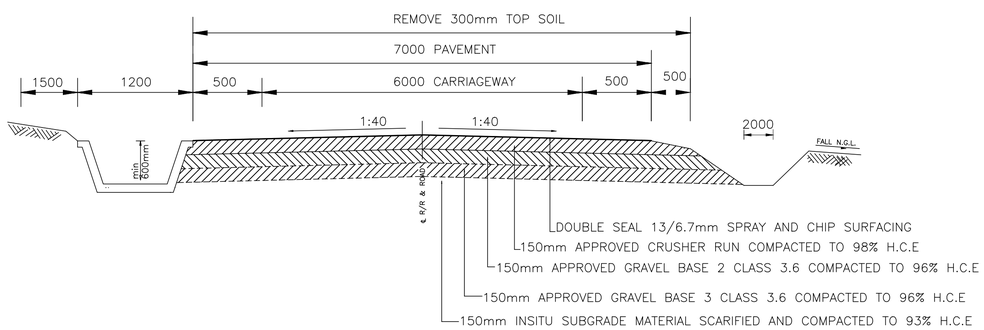
B =
L =



TYPE	waterway	section mm	Mass/unit kg	H mm	B mm	L mm
1m2 shelvert	1	395x150	105	876	1740	400
2m2 shelvert	2	395x150	148	1220	2440	400
3m2 shelvert	3	395x150	165	1800	2500	400
4m2 shelvert	4	395x200/150	225	1850	3000	400
6m2 shelvert	6	595x200/250	520	2195	3900	600
8m2 shelvert	8	695x200/300	760	2520	4500	700
10m2 shelvert	10	795x200/300	960	2830	5000	800
15m2 shelvert	15	895x200/400	1400	3520	6000	900

(Specifications can be altered by the Engineer to suit ground conditions)

SHELVERTS DRAIN DIMENSIONS TABLE



SECTION THROUGH ROAD 3&5
N.T.S

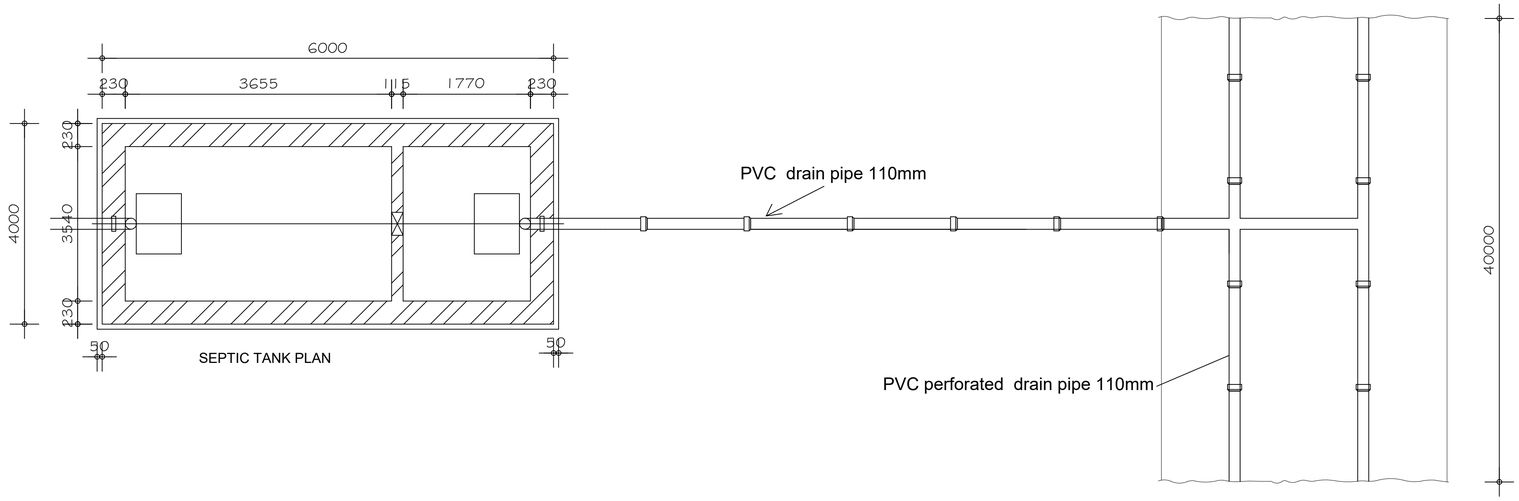
NOTES:

AMENDMENT			Description :
Ltr	date	Init	
Micro-film Drwg No			

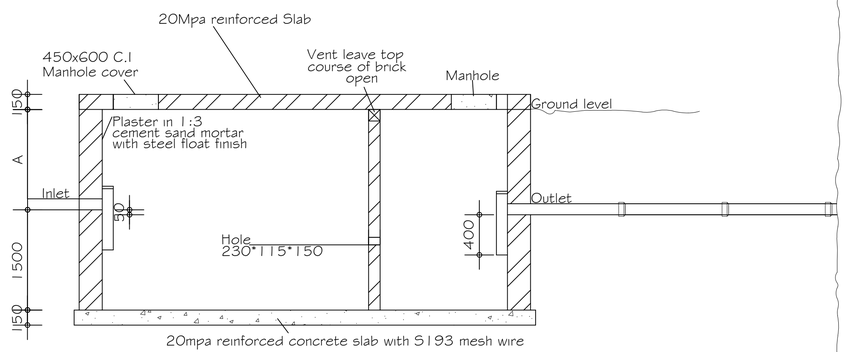
Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

Arch Eng A.S		A/Director Eng E.N	
Designed L.M		Branch Head E.N	
Drawn L.M		Scale NTS	
Checked E.M		Date 2021	
Telephone 700811			

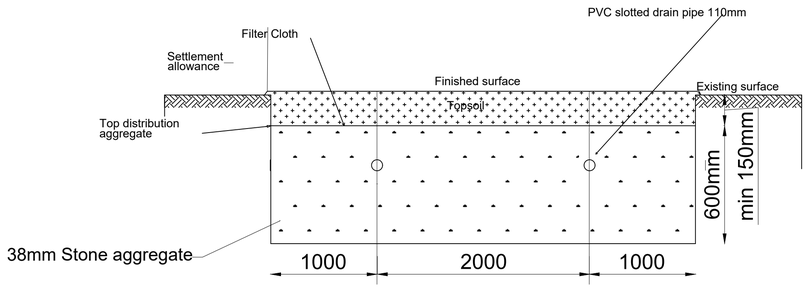
Ministry ZIMRA	Centre MUTARE
Title FORBES HEAVY VEHICLE PARKING LOT	
Description ROAD CROSS SECTIONS AND STANDARD DETAILS	
G.P. No	Proj No FORBES /CE/RD/01



SEPTIC TANK PLAN



SECTION THROUGH SEPTIC TANK



SOAKAWAY SECTION

SEPTIC TANK DIMENSIONS				
No. of persons	LENGTH (m)	WIDTH (m)	Slab thickness (mm) top and bottom	Capacity (m^3)
150	6	4	150	36
SOAKAWAY DIMENSIONS				
No. of persons	LENGTH (m)	WIDTH (m)		
150	40	4		

NOTES:
DIMENSION 'A' TO BE DETERMINED ON SITE

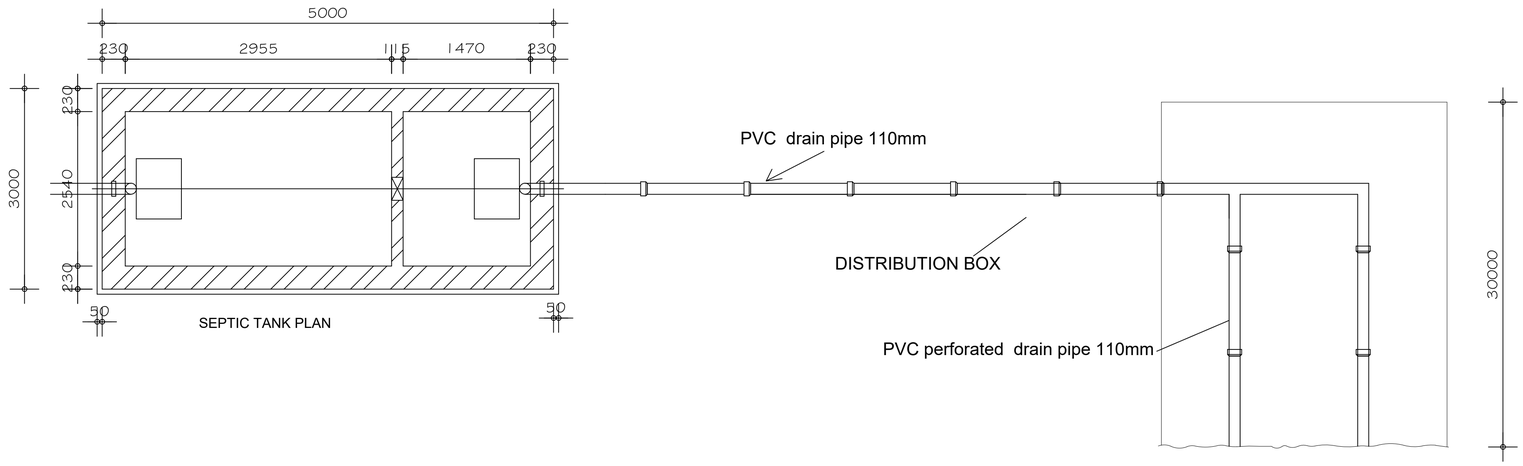
AMENDMENT		
Ltr	date	Init

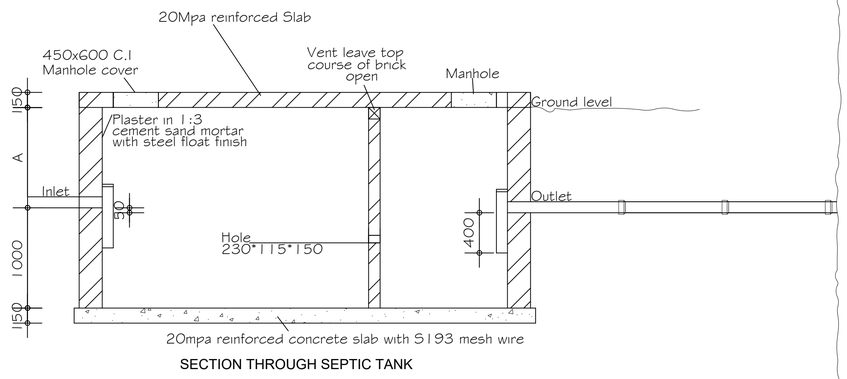
Description :

Micro-film Drwg No

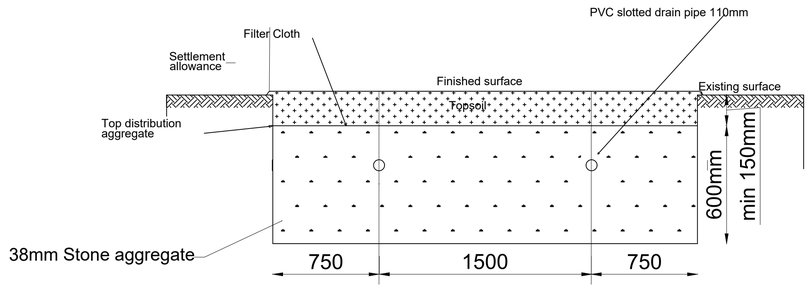
Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

Arch Eng A.S	Director Eng H.Hungwe	Ministry ZIMRA	Centre HARARE
Designed L.M	Branch Head E.N	Title FORBES HEAVY VEHICLE PARKING LOT	
Drawn L.M	Scale N.T.S	Description SEPTIC TANKS AND SOAK AWAY DETAILS	
Checked M.M	Date JUNE 2022		
Telephone 700811			ProjNo FORBES/CE/SP01





SECTION THROUGH SEPTIC TANK



SOAKAWAY SECTION

SEPTIC TANK DIMENSIONS				
No. of persons	LENGTH (m)	WIDTH (m)	Slab thickness (mm) top and bottom	Capacity (m^3)
35	5	3	150	15
SOAKAWAY DIMENSIONS				
No. of persons	LENGTH (m)	WIDTH (m)		
35	30	3		

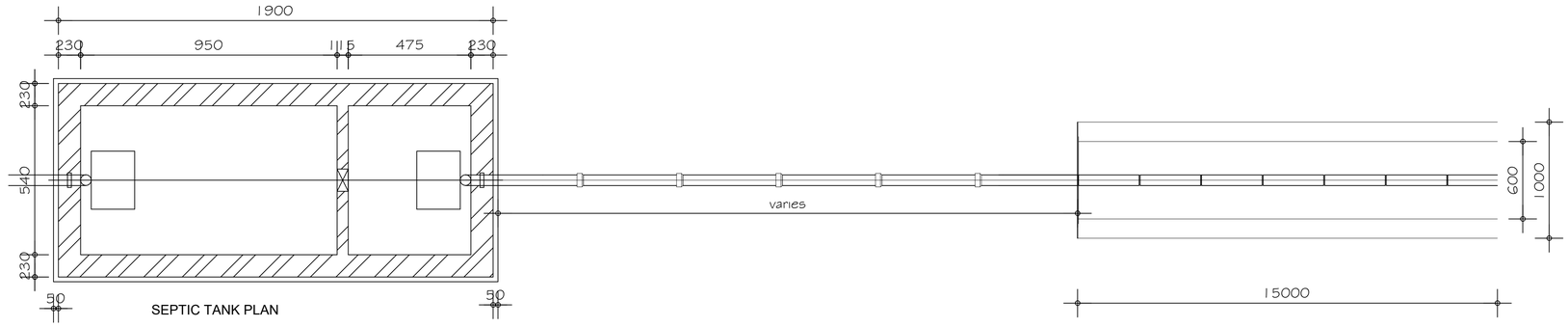
NOTES:
DIMENSION 'A' TO BE DETERMINED ON SITE

AMENDMENT			Description :
Ltr	date	Init	
Micro-film Drwg No			

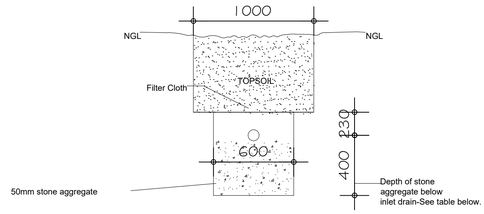
Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

Arch Eng A.S		Director Eng H.Hungwe	
Designed L.M		Branch Head E.N	
Drawn L.M		Scale N.T.S	
Checked M.M		Date JUNE 2022	
Telephone 700811			

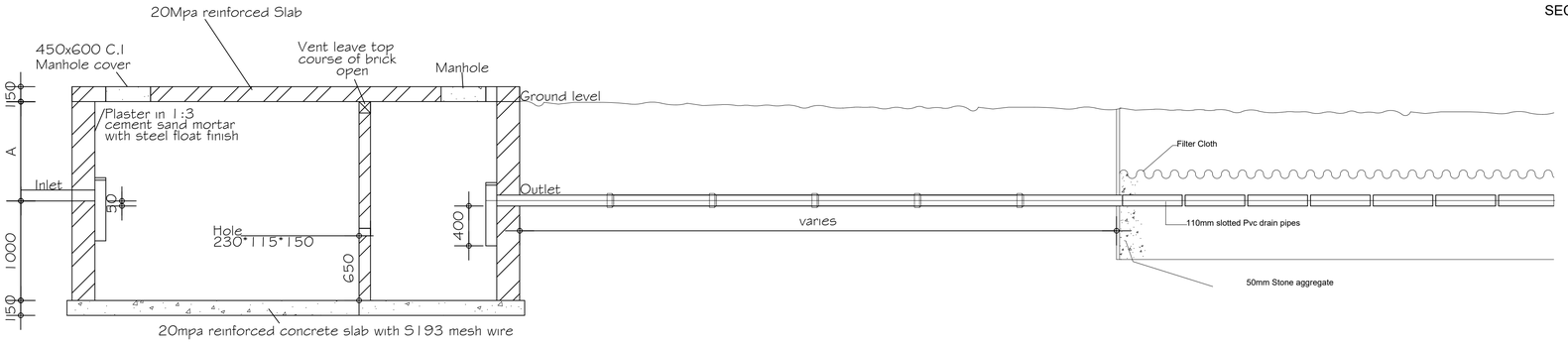
Ministry ZIMRA
Centre HARARE
Title FORBES HEAVY VEHICLE PARKING LOT
Description SEPTIC TANKS AND SOAK AWAY DETAILS
ProjNo FORBES/CE/SP02



SEPTIC TANK PLAN



SECTION THROUGH SOAKAWAY



SECTION THROUGH SEPTIC TANK

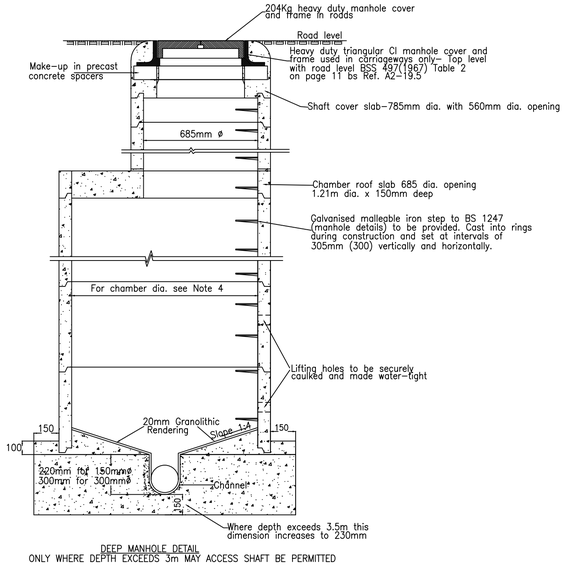
SEPTIC TANK DIMENSIONS				
No. of persons	LENGTH (m)	WIDTH (m)	Slab thickness (mm) top and bottom	Capacity (m^3)
5	2	1	150	3
SOAKAWAY DIMENSIONS				
No. of persons	LENGTH (m)	WIDTH (m)		
5	15	1.2		

NOTES:
DIMENSION 'A' TO BE DETERMINED ON SITE

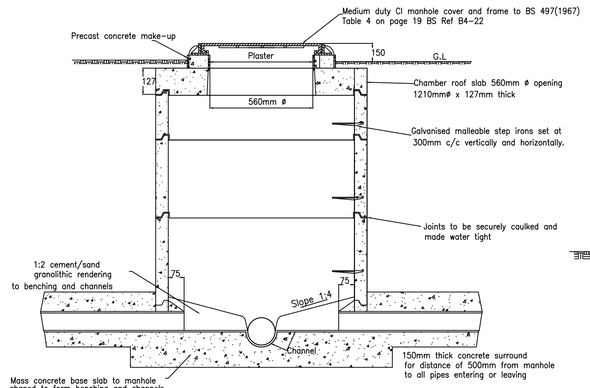
AMENDMENT			Description :
Ltr	date	Init	
Micro-film Drwg No			

Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

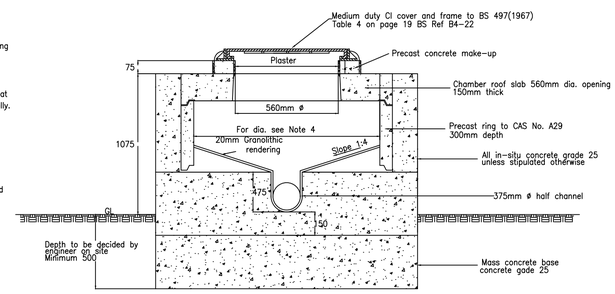
Arch Eng A.S	Director Eng H.Hungwe	Ministry ZIMRA	Centre MUTARE
Designed L.M	Branch Head E.N	Title FORBES HEAVY VEHICLE PARKING LOT	
Drawn T.M	Scale N.T.S	Description Septic Tank and Soak Away Details	
Checked M.M	Date JUNE 2022		
Telephone 700811		Proj No	G.P. No FORBES/CE/SP03



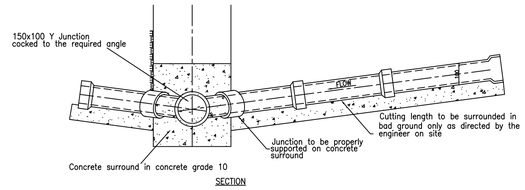
DEEP MANHOLE DETAIL
ONLY WHERE DEPTH EXCEEDS 3m MAY ACCESS SHAFT BE PERMITTED



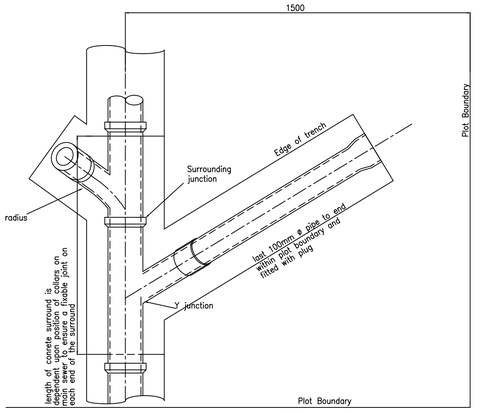
SHALLOW MANHOLE DETAIL



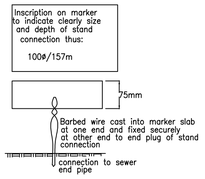
ELEVATED MANHOLE DETAIL



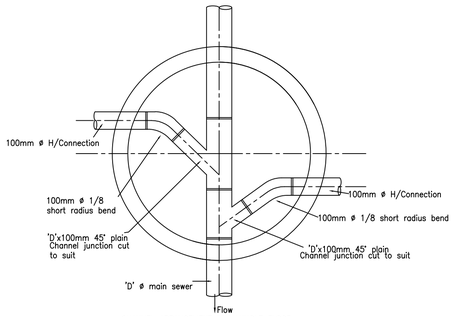
SECTION



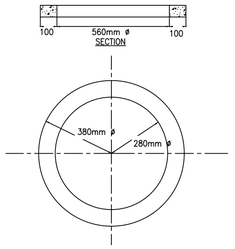
PLAN
STANDARD CONNECTION TO MAIN SEWER DETAIL (TYPE 1)



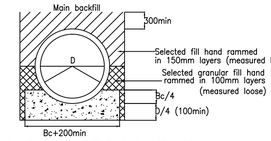
STANDARD CONNECTION MARKERS
To be used where Y junctions are used on main sewer



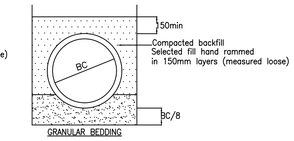
CHANNEL ARRANGEMENT IN MANHOLE FLOOR FOR DOUBLE STAND CONNECTIONS



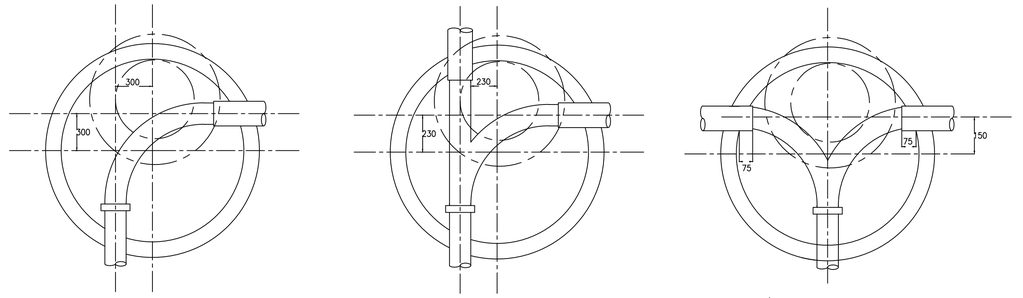
ALTERNATIVE PRECAST CONCRETE MANHOLE SPACER RINGS



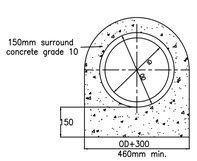
CLASS A (FM=2.6) CONCRETE BEDDING (UNREINFORCED)



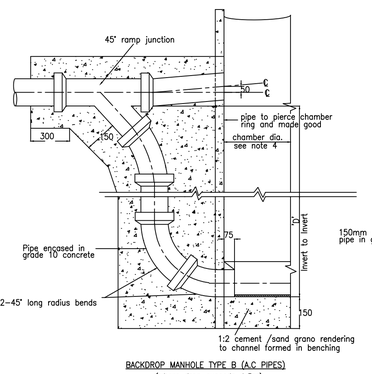
GRANULAR BEDDING



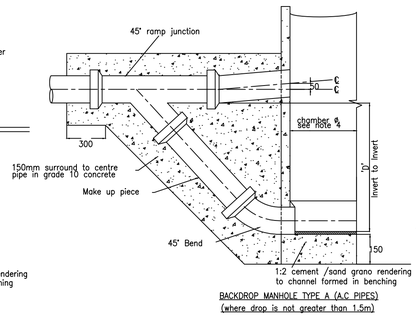
TYPICAL ARRANGEMENTS OF CHANNELS IN MANHOLE FLOORS
Benching and grano finish similar to standard Manhole Crowns of Branch sewers are to be level with the crown of the main channel unless the Engineer specifically directs otherwise. Medium levels to be used wherever possible.



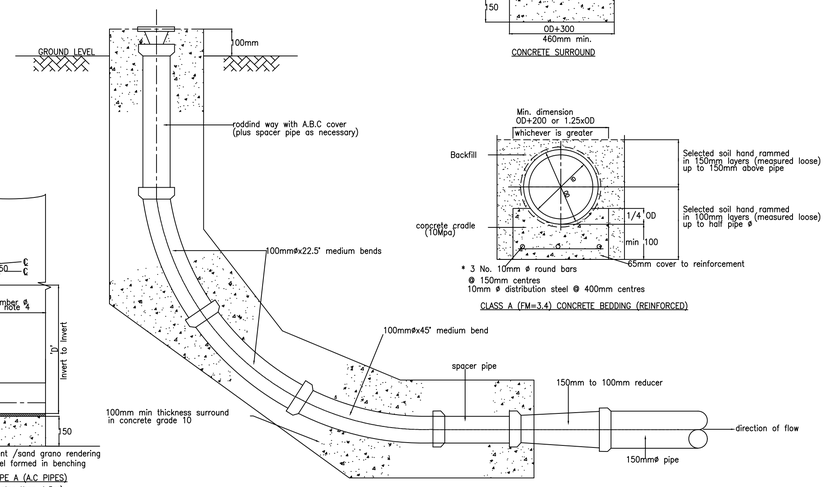
CONCRETE SURROUND



BACKDROP MANHOLE TYPE B (A.C PIPES)
(where drop exceeds 1.5m)

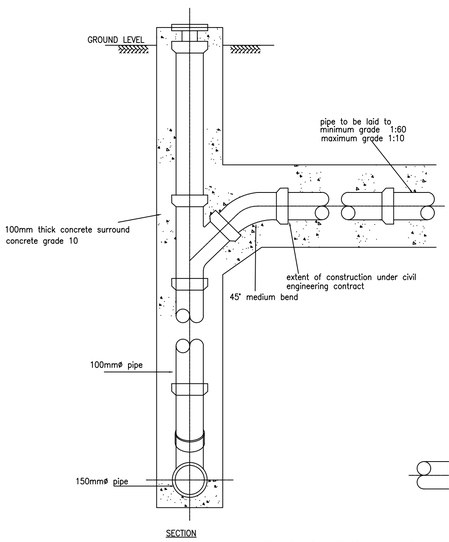


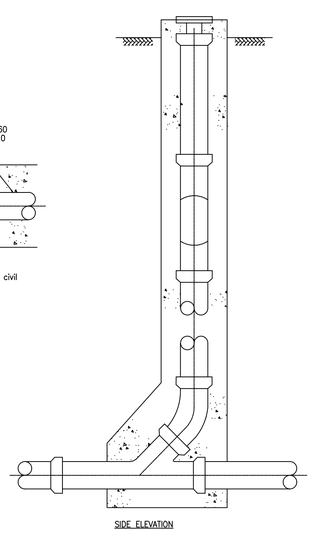
BACKDROP MANHOLE TYPE A (A.C PIPES)
(where drop is not greater than 1.5m)



RODDING WAY

CLASS A (FM=3.4) CONCRETE BEDDING (REINFORCED)





DEEP CONNECTION

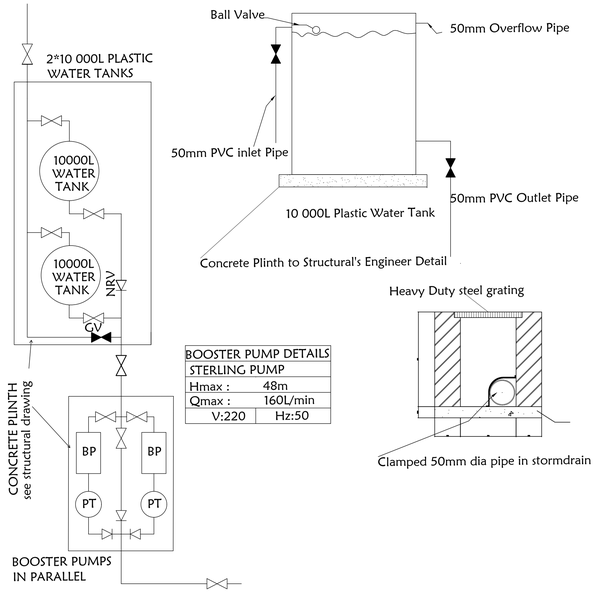
NOTES:

AMENDMENT			Description :
Lttr	date	Init	
Micro-film Drwg No			

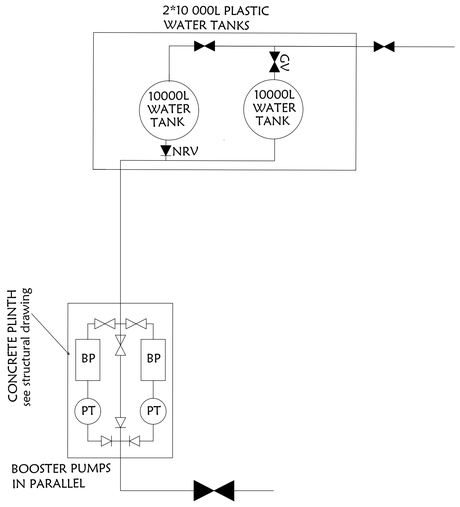
Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

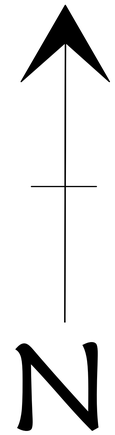
Arch Eng	A.S	A/Director Eng	E.N
Designed	L.M	Branch Head	E.N
Drawn	L.M	Scale	NTS
Checked	M.M	Date	2022
Telephone 700811			

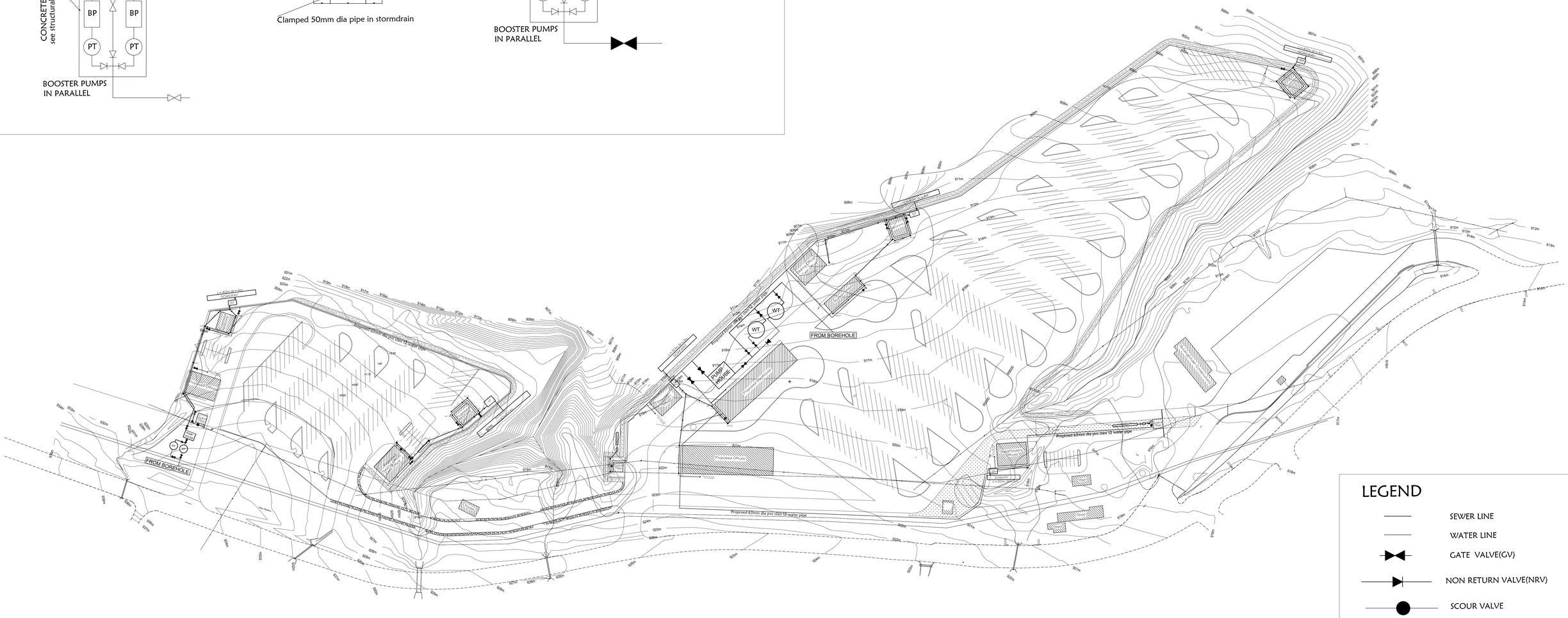
Ministry: ZIMBABWE REVENUE AUTHORITY
Centre: MUTARE
Title: FORBES HEAVY VEHICLE PARKING LOT
Description: SEWER STANDAERD DETAILS
G.P. No:
Proj No: FORBES/CE/SW01



BOOSTER PUMP DETAILS	
STERLING PUMP	
Hmax :	48m
Qmax :	160L/min
V:220	Hz:50







LEGEND

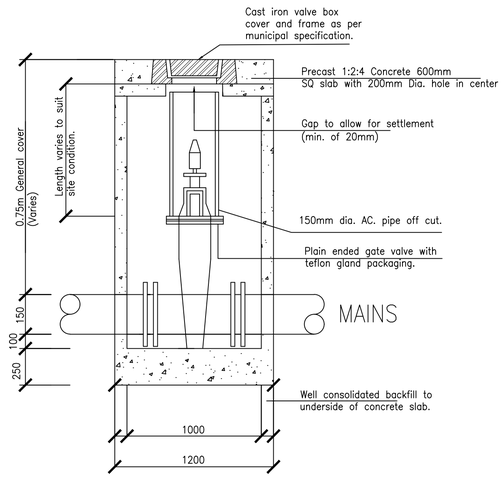
- SEWER LINE
- WATER LINE
- GATE VALVE(GV)
- NON RETURN VALVE(NRV)
- SCOUR VALVE
- END CAP

NOTES:
1.Borehole location to be determined on site.
2.All sewer pipes to 110mm dia.

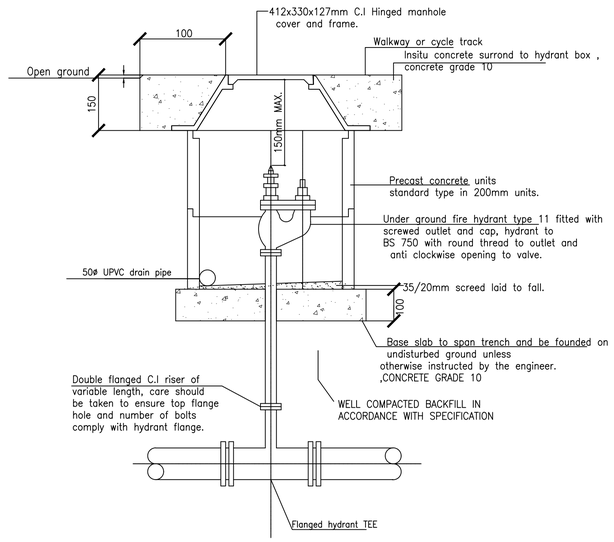
AMENDMENT	Description :

Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

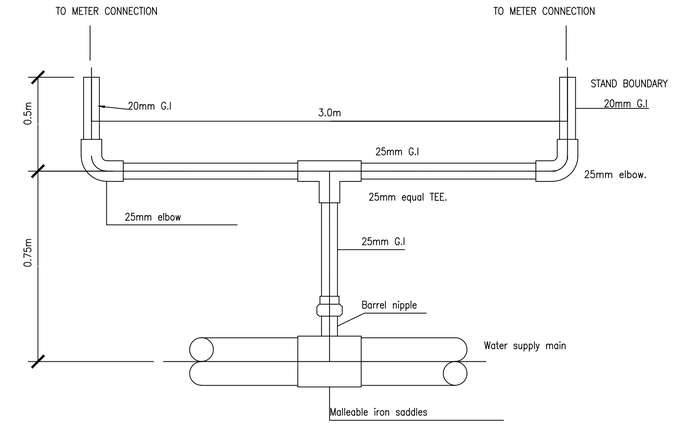
Engineer: L.M	Director Eng: H.Hungwe	Ministry: ZIMRA	Centre: HARARE
Designed: L.M	Branch head: E.N	Title: FORBES HEAVY VEHICLE PARKING LOT	
Drawn: S.K	Scale: 1:850	Description: WATER & SEWER RETICULATION LAYOUT	
Checked: M.M	Date: 2021		
Telephone 700811	Description :	Project No: FORBES/CE/02	



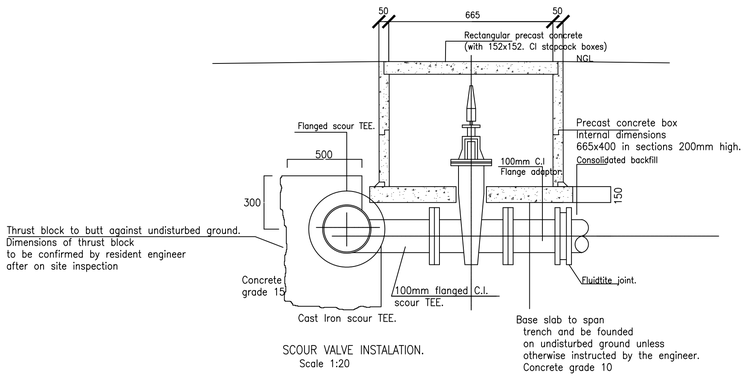
GATE VALVE INSTALLATION AND BOX
(MAINS up to 300mm)



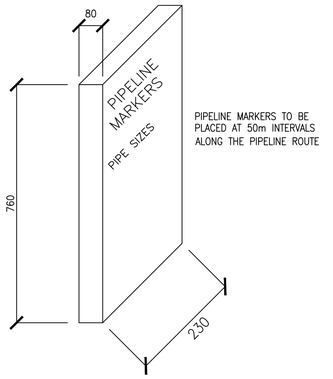
FIRE HYDRANT AND BOX DETAILS



TWO WAY CONNECTION TO HOUSES

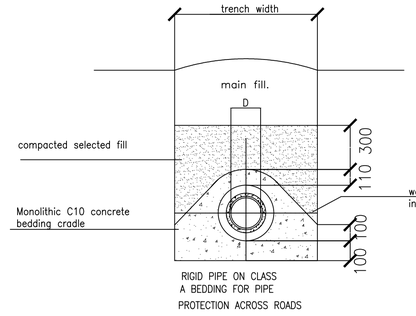


SCOUR VALVE INSTALATION.
Scale 1:20

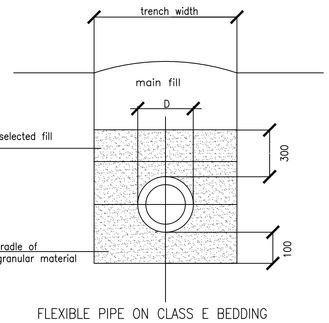


PIPELINE MARKERS TO BE
PLACED AT 50m INTERVALS
ALONG THE PIPELINE ROUTE

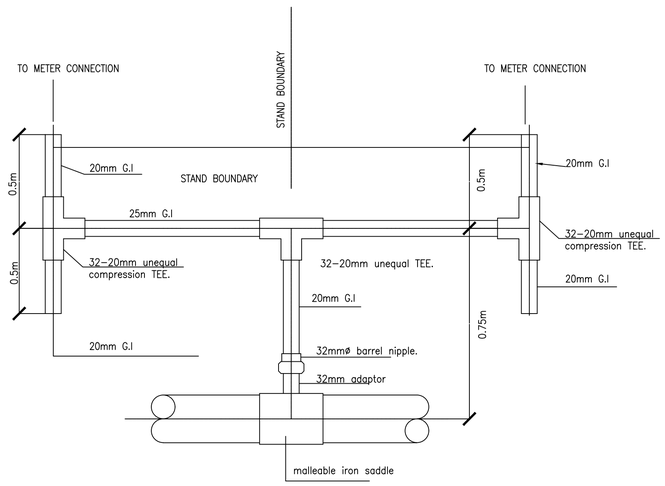
PRECAST CONCRETE PIPELINE
MAKER DETAILS



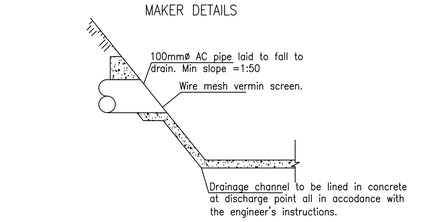
RIGID PIPE ON CLASS
A BEDDING FOR PIPE
PROTECTION ACROSS ROADS

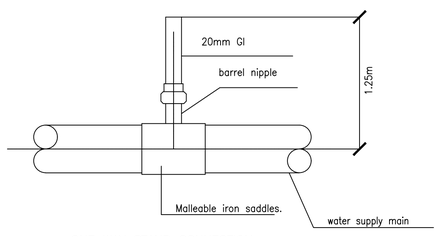


FLEXIBLE PIPE ON CLASS E BEDDING

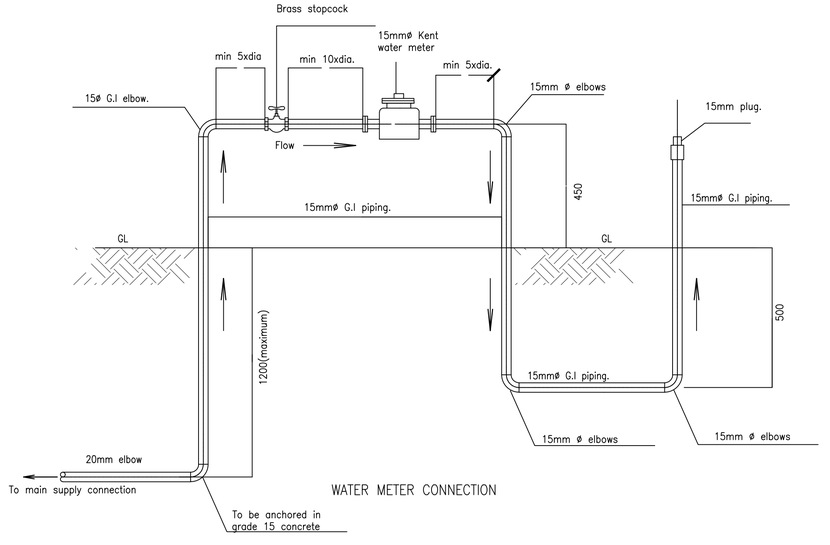


FOUR WAY CONNECTION TO HOUSES





ONE WAY STAND CONNECTION



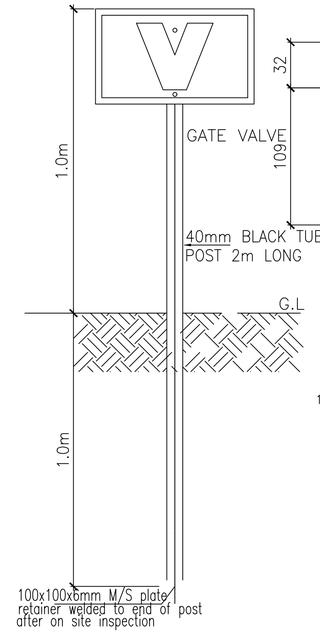
WATER METER CONNECTION

NOTES:

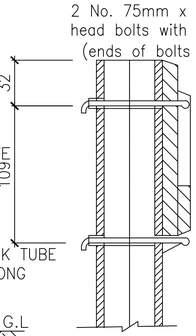
AMENDMENT			Description :
Lttr	date	Init	
Micro-film Drwg No			

Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

Arch Eng A.S	A/Director Eng E.N	Ministry ZIMBABWE REVENUE AUTHORITY	Centre MUTARE
Designed L.M	Branch Head E.N	Title FORBES HEAVY VEHICLE PARKING LOT	
Drawn L.M	Scale NTS	Description STANDARD WATER DETAILS 1	
Checked E.M	Date 2022		
Telephone 700811		G.P. No	Proj No FORBES/CE/WS01



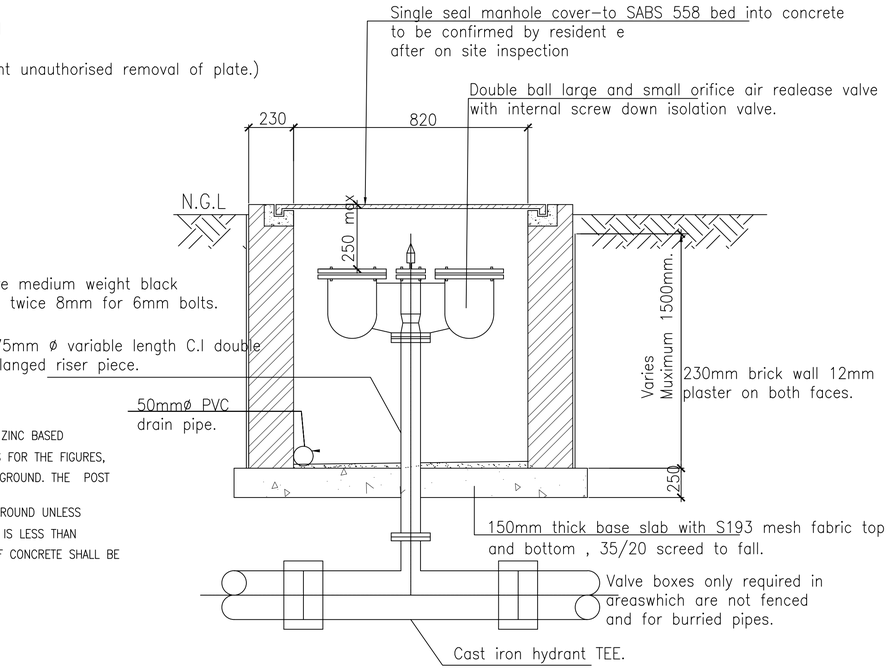
DETAILS OF HYDRANT MARKER PLATES POST



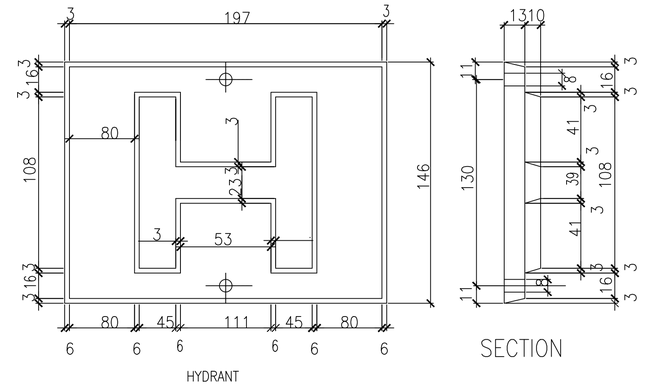
DETAIL AT HEAD OF POST

NOTES

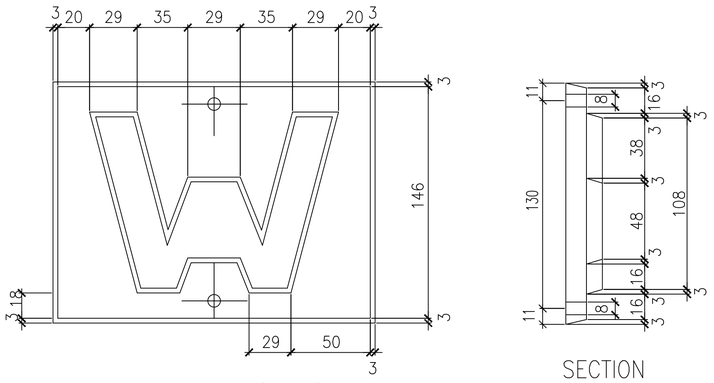
1. THE PLATES SHALL BE THOROUGHLY CLEANED WITH A ZINC BASED PRIMER & PAINTED TWO COATS BLACK ENAMEL GLOSS FOR THE FIGURES, TWO COATS YELLOW REFLECTIVE PAINT FOR THE BACKGROUND. THE POST SHALL BE SIMILARLY PAINTED YELLOW.
2. MARKER POSTS SHALL NOT BE CONCRETED TO THE GROUND UNLESS IF ROCK IS PRESENT OR IF THE BASE OF THE POST IS LESS THAN 600mm BELLOW GROUND LEVEL THEN 0.03 Cu m OF CONCRETE SHALL BE



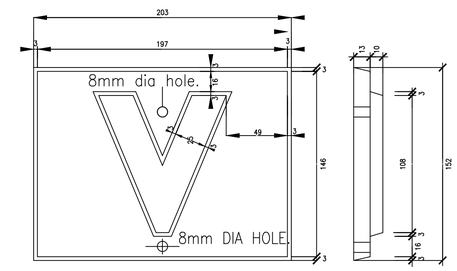
SECTION B – B



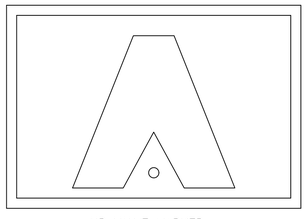
HYDRANT



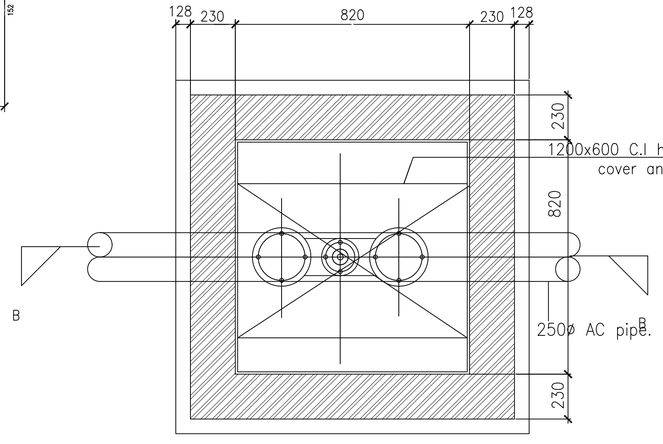
WATER METER (Reverse)



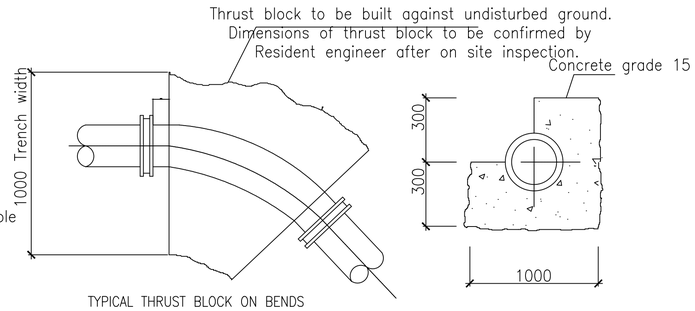
VALVE PLATE INDICATOR PLATE



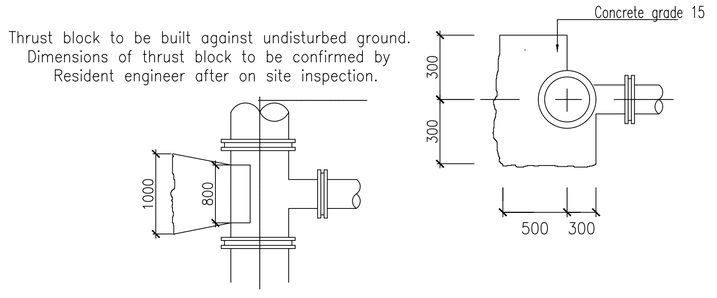
AIR VALVE MARKER



DOUBLE AIR VALVE & BOX PLAN



TYPICAL THRUST BLOCK ON BENDS



NOTES:

AMENDMENT			Description :
Ltr	date	Init	
Micro-film Drwg No			

Ministry of Local Government,
Public Works and National Housing
P.O. Box CY7755 , Causeway
Zimbabwe

Arch Eng A.S	A/Director Eng E.N	Ministry ZIMBABWE REVENUE AUTHORITY	Centre MUTARE
Designed L.M	Branch Head E.N	Title FORBES HEAVY VEHICLE PARKING LOT	
Drawn L.M	Scale NTS	Description STANDARD WATER DETAILS 2	
Checked E.M	Date 2022	G.P. No	Proj No FORBES/CE/WS02
Telephone 700811			

BIDDING DOCUMENT FOR THE PROCUREMENT OF CONSTRUCTION WORKS FOR FORBES TRUCK PARK PROJECT: MUTARE
PROCUREMENT REFERENCE NO:

THE GOVERNMENT OF ZIMBABWE

MINISTRY OF LOCAL GOVERNMENT
AND PUBLIC WORKS
HEAD OFFICE

TECHNICAL SPECIFICATION FOR
THE SUPPLY AND FIX
OF

ROADS, CARPARKS, RETAINING, WATER &SEWER RETICULATION

AT

FORBES BORDER POST IN MUTARE, ZIMBABWE

TABLE OF CONTENTS

SECTION 1

1.0 DEFINITION OF TERMS

In applying these general conditions and specifications, the following words shall have the meaning herein assigned to them, unless there is something in the subject matter or context inconsistent with such construction

1. The "EMPLOYER" shall mean the Commissioner General of the Zimbabwe Revenue Authority and shall include their duly authorised representatives.

2. The "ENGINEER" shall mean the Secretary of the Ministry of Local Government and Public Works and shall include their duly authorised representative.

3. The "CLIENT" shall mean the Zimbabwe Revenue Authority

4. The "ENGINEERING SUPERVISOR" shall mean the Employer or his appointed agent.

5. The "CONTRACTOR" shall mean the person or firm named in the contract as having been accepted by the Employer to carry out the Works specified in the Contract and shall include the Contractor's legal and personal representatives, successors, administrators, and/or assigns.

6. The "CONTRACT" shall mean the agreement between the Contractor and the Employers for the execution of the Works specified in the Contract.

7. The "CONTRACT PRICE" shall mean the sum named in the Contract as the Contract price, subject to additions or deductions from such sum as may be made the provisions hereinafter contained.

8. The "TENDER" shall mean the tender form on which the Contractor shall show the Contract Price.

9. The "SPECIFICATION" shall mean the Specification on which the Tender is based.

10. The "SITE" shall mean the actual place or places to which plant shall be delivered or where work shall be done by the Contractor together with so much of the area surrounding the said place or places the Contractor shall with the consent of the Contractor or the Employer actually use in connection with the Works, otherwise than merely for the purpose of access to the said place or places.

11. The "WORKS" shall mean the Contract works and includes all plant to be provided and work to be done by the Contractor under the Contract and shall include repair, fixing, testing, regulating and commissioning the installation described in the Specification.

12. The "PLANT" shall mean all appliances of whatsoever nature or for the execution, completion or maintenance of the works, including (without thereby limiting the foreign definitions) all machinery, tools, coverings, patterns templates and profiles, power or very kind, water light, workshops, shed, building stores, materials and things fixed or moveable but does not include materials or other items forming or intended to form part of the Works.

13. "TECHNICAL SPECIFICATION" shall mean the typed document including all schedules and appendices together with all drawings schedules and instructions issued by the Engineer for this particular project.

14. The "RESIDENT ENGINEER" is the representative of the Engineer on site.

1.1 DRAWING LIST

The following drawings have been used in the preparation of these Bills of Quantities

FORBES/ CE/ RL01-ROAD AND STORMWATER LAYOUT
FORBES/ CE/ RD/ 01 -ROAD CROSS SECTONS AND STANDARD DETAILS
FORBES/ CE/ SP01 SEPTIC TANKS AND SOAK AWAY DETAILS
FORBES/ CE/ SP02 SEPTIC TANK AND SOAK AWAY DETAILS
FORBES/ CE/ SP03-SEPTIC TANK AND SOAK AWAY DETAILS
FORBES/ CE/ SW01-SEWER STANDARD DETAILS
FORBES/ CE/ 02-WATER AND SEWER RETICULATION LAYOUT
FORBES/ CE/ WS01-STANDARD WATER DETAILS
FORBES/ CE/ WS02 -STANDARD WATER DETILS 2

SECTION TWO

CONTRACTUAL DATA

2.1.0 General Conditions of Contract

This contract shall be governed by the Articles of Agreement and Conditions of Contract 1985 and the General Conditions of Contract entitled ZGCC4, FOURTH EDITION-1984, except in so far as they are modified, qualified or added in the general conditions of the contract included hereinafter. In the case of a conflict or disagreement, the of Articles of Agreement and Conditions of Contract (1985) takes precedence

The following additions are to general conditions of contracts:

2.1.1 Program of works

Prior to the commencement of work, the Contractor shall send for the approval of the Engineer, his Program for the typing of the various sections of the work and his proposed methods of execution of the Works. The Program of Works as accepted by the Engineer may be amended from time to time by the Engineer or the Contractor with the approval of the Engineer/Architect.

2.1.2 Variation of Price

1) Labour and materials

Escalations in cost of labour and materials is to be on a proven cost basis as stated in clauses 70 (a) and 70 (c)

The cost of labour and materials, as per the contractors' basic price list at the tender shall be taken as the base prices. The contractor shall provide receipts for any materials purchased against which a claim for increase in cost is being made. Increase in cost of labour shall be made against a schedule of labour on site and involved in executing meaningful works. The schedule of labour shall be checked and verified by the Engineer.

2) Bidders wet rate for plant and equipment must hold good for the duration of the contract.

2.1.3 Documents Mutually Explanatory

The order of priority of the documents forming the contract shall be as follows:

1) The Contract Agreement
2) The Letter of Acceptance
3) The Instructions of Tenders
4) General Conditions of Contract
5) Amendments To General Specifications
6) General Specifications
7) Bill Of Quantities and Schedules
8) The Drawings

2.1.4 Insurance of works

When for any reason (whether as a result of Variation Orders given the terms of the Clause 51 or not) the Contract Price shall differ materially from the amount which the Employer shall deem necessary to cover the employer against all loss of damage (other than from the expected risks) including loss or damage incidental to the execution of the contract, the contractor shall, if so required by the Engineer/Architect, take out an amended insurance for such amount as may be required by the Engineer/Architect, and the contractor shall be reimbursed for the amount of any

additional premium paid. Provided that, where the difference is not as a result of Variation Orders given in terms of Clause 51, the Engineer shall specify the circumstances for which the increased or decreased cover as the case may be, is required.

SECTION 3

SPECIFICATIONS

3.1 PRELIMINARY AND GENERAL

3.1.1 General

The Specifications also include for the maintenance of the whole of the Works carried out under this contract for a period of 12 months after the issue of the Certificate of Completion, which is to include three months of the wet season defined as commencing on 15 November.

The Works involved in this Contract are to be carried out in accordance with: -

The General Specifications of Materials and Workmanship issued by the Ministry of Local Government, Public Works and National Housing, dated January 1978, with subsequent revisions.

The Standard Method of Measurement of Civil Engineering Quantities for Zimbabwe, Second Edition 1984 - ZCQE.2

Special Conditions of Contract, Particular Specification and Drawings, Bills of Quantities and Schedules included in this Contract Document.

3.1.2 Location and Description of Works

The site of the works is located at Forbes Border Post, Mutare Rural District Council, Manicaland Province, Zimbabwe and the works involve the construction of carparks, retaining walls, buildings and landscaping at the Proposed Forbes Truck Park.

3.1.3 Site Liaison and Other Contractors On-Site

In the event that other construction works are taking place at the site during the course of this contract, it may be necessary to order the works in such a way that as little disturbance as possible will be made to the reasonable progress of other contractors on site who likewise will be expected to meet the reasonable progress of this contract.

The Contractor shall do all in his power to prevent the occurrence of fires or the pollution of the environment. Should a fire occur, he should take immediate steps to extinguish it whether apparently caused by his staff or not.

He shall arrange for the collection of waste paper and other materials discarded by his staff or in the area of his works and shall discourage these and any other obvious acts of pollution to maintain the site in a clean and tidy condition throughout the construction period.

3.1.4 Instruments.

The contractor shall supply for his own and the Engineers use and keep continuously on the site a level and theodolite of approved make. These instruments shall be maintained and calibrated to the satisfaction of the Engineer.

The contractor shall also supply for his own, Engineer's use Metric staff, steel tapes, ranging rods, boning rods and such other instruments, and appliances as are required to properly set out the works during the Contract period

The Contractor shall provide the use of such staff men, chainmen and labourers as are required by the Engineer in checking the setting out and construction operations.

3.1.5 Protection of Existing Services and Structures.

Before commencing any section of the work, the Contractor shall obtain at his own expense full information with regard to the position of existing services and structures and shall exercise the utmost care when working in their vicinity. He must serve notice of his intention to work near the services or structure to the Responsible Authority, and obtain their written approval before commencing work, which must be carried out in accordance with the responsible Authority's requirements.

The Contractor's tendered rates shall include for all costs arising out of the protection of existing services and structures. The Contractor shall bear the full cost of remedial work to the existing services, which are damaged by the Contractor during construction.

3.1.6. Contractor to Provide Everything Necessary.

The Contractor shall provide all plant, tools, equipment, and cartage and labour as necessary and required for the proper execution of the works.

3.1.7. Quantities

The Quantities set out in the bills of quantities are estimated quantities of the works to be executed by the Contractor in fulfilment of his obligations under the contract. The employer will accept no responsibility for materials, which are incorrectly ordered from quantities given in the bills of quantities.

3.1.8 Items of specified make or Manufacture

Where items of specific make or manufacture are called for in the Specifications , Contractors are free to propose similar and approved alternatives. In such cases full details of the cost, nature, type, performance, manufacturer, etc. shall be submitted with the Tender.

3.1.9 Dimensions

Figured dimensions shall take precedence and Contractors may only use scaled dimensions with the Engineer's consent. Before any works commence which require the incorporation or fixing of materials into the permanent works the Contractor shall check the size and fixing details of these with the suppliers and inform the Engineer regarding any amendments required to the Contract Documents.

3.1.10 Provide all Plant.

The Contractor shall include in his price the provision of adequate construction plant (Mechanical and otherwise), tools, tarpaulins, etc., and allow for all labour and materials in operating, moving, adapting and maintaining the plant as necessary.

3.1.11. First Aid Outfit

The Contractor shall supply and maintain, fully stocked on site an adequate and easily accessible First Aid outfit.

3.1.12. Samples and Tests

The Engineer may require the Contractor to furnish samples of materials or workmanship as may be used in the construction of the works. Such samples shall be approved in writing by the Engineer and in any case, of rejected samples further samples shall be provided until approval is obtained. All samples, which are approved by the Engineer, shall be retained on site, as standard for comparison and the contractor may be required to furnish further samples at frequent and regular intervals.

Any rejected samples shall be removed from site at the Contractor's expense.

3.1.13 Blasting

The Contractor shall conform to all Government and other Regulations regarding storage, handling and use of explosives and shall take all necessary precautions to prevent flying debris etc. No blasting shall be undertaken without the written consent of the Engineer or Engineer's Representative.

3.1.14. Protection for Public and Property.

The Contractor shall be responsible for the protection of persons, animals, vehicles and property from injury or damage because of the works. To this end he shall provide all watching, lighting, warning signs, guardrails, temporary detours and such protective devices that may be considered necessary or desirable in and around the immediate vicinity of the works and the site in general.

3.2.0 CONCRETE AND REINFORCED WORKS

3.2.1 Concreting Works -General

Unless otherwise directed or specified herein, all concrete and reinforced concrete works shall comply with the following codes of practice.

BS 8110: Part 1&2 :1985 "the structural use of concrete design,
Part 1 "Code of practice for design and construction"
Part 2; "Code of Practice for Special circumstances"

B.S CP 116: Part 1: 1969 "The structural use of precast concrete' for retaining aqueous liquids'

Concrete mixes required for various parts of the works are as indicated on the drawings and / or in the bills of quantities. they are designated by their characteristics strengths in N/MM2 (Mpa) Unless otherwise directed, the contractor shall comply with all the relevant provisions of the above codes of practice for proportioning, whether by mass or by volume, and mixing concrete. Proposed methods for batching, mixing, transporting and placing concrete shall be submitted to the Engineer
For approval before any work is commenced. Concrete shall be placed with due dispatch after mixing.

3.2.2 Cement

All cement used shall be Portland cement normal setting quality complying with CAS A46: 1972 Portland blast furnace cement may not be used unless otherwise authorized by the Engineer for blinding, bedding, haunching and stabilization of soils and gravels.

All cement should be delivered to the site in the original sealed bags of the manufacturer and shall be stored not less than 250mm above ground level in an approved watertight shed.
Cement of different consignment shall be stored separately and shall be used in the order they are delivered to site. Cement on site for longer than three months shall be deemed unusable and removed from site.

Manufacture`s test certificate is to be produced to ensure that all cement delivered to site complies with relevant standards

3.2.3 Aggregate for cement Products

Aggregates for concrete and mortar shall comply with C.A.S 223: 1978 AND CAS 190:1978

Aggregate is to consist of rivet or pit ballast ,crushed stone or other hard non friable material of approved quality ,grading and shape ,it is to be clean ,hard and durable and free from dust ,slate ,clay ,loam slag, breeze ,coal or any other deleterious matter .it is to be so screened that all the materials passes the maximum size specified and is to be evenly graded down to the minimum size required .flaky material will not be accepted .The grading shall be such as to permit the production of sound=d dense concrete of the strength specified.
Sand should be clean, sharp, river or pit sand washed free from dust, clay, organic matter or any other impurities and should be graded from fine to coarse as specified and required.

Sand for plaster shall conform with B. S 1199.Sand and aggregates are to be stored in separate heaps on the site in such a manner that the materials cannot mix with each other or be fouled with dust, vegetation, rubbish, earth or other impurities.
Unless or otherwise authorized by the engineer, coarse and fine

3.2.4 Water
All water required for the works shall be clean, fresh from dirt, vegetable matter, mineral salt or other impurities and shall satisfy the requirements of B.S 3148.
Contractor will include in his rates for the supply of all water as required including charges and payments thereof. He shall also bear the cost of any chemical analyses of the water to prove its suitability for use in concrete work.

3.2.5 Additives
Materials to be added to the concrete for the purposes of increasing the strength of concrete at early stages, or air entrainment or wetting or any other alteration of the basic characteristics of the concrete shall only be used with the written approval of the Engineer
. Materials to be added to the concrete for the purposes of increasing the strength of concrete at early stages, or air entrainment or wetting or any other alteration of the basic characteristics of the concrete shall only be used with the written approval of the Engineer
Calcium chloride or additives containing chlorides shall not be approved for use.

3.2.6 Reinforcement
Steel reinforcement shall comply in all respects with the following: -
BS 4449: - Hot rolled steel bars for the reinforcement of concrete
BS 4461: - Cold worked steel bars for the reinforcement of concrete
B.S 4482: - Hard drawn mild steel wire for the reinforcement of concrete
B.S 4483: - Steel fabric for the reinforcement of concrete
Certificates of tests showing that reinforcement supplied to the contractor conforms with the requirements of the appropriate B.S shall be made available as required by the Engineer
Steel reinforcement shall be of approved manufacture, free form all defects oil, grease, dirt, loose rust, mill scale and other deleterious material.

3.2.7 Formwork
The contractor may use timber boarding or steel plate
Where timber boarding is used, the timber used shall be properly seasoned,
In all cases, the materials used shall be suitable to provide the specified concrete finishes for the works to be constructed

3.2.8 Formwork oil
The material to be used for oiling of from work prior to the pouring of concrete shall be approved in writing by the engineer

The material shall effectively prevent sticking and shall not stain the concrete surfaces or have any other deleterious effect on the concrete.

3.2.9 Form ties
Where the contractor wishes to use form ties for the temporary connection of the opposite sides of formwork, the materials for and design of the tiles, shall be approved by the Engineer in writing.

3.2.10 Polythene sheeting

Sheeting shall be 100-gauge polythene sheeting or such other thickness as may be specified on the drawings or bill of
quantities, complying with the requirements of B.S 4646.the sheeting where specified shall be laid on blinded surfaces of compacted bottoms of excavation or on hardcore , as a continuous damp -proof layer .Joints in sheeting shall be taped.
with plastic adhesive tape 500mm wide and treble folded with a 150mm fold. The sheeting shall not be stretched but shall be laid loose with sufficient wrinkles to permit shrinkage up to 15%.

3.2.11 Grades of concrete

It is the intent of this specification to secure dense homogenous concrete which will have the specified strength together with a durability and impermeability
end, the characteristics of the mix shall be as specified in table 1 below.
All grades of concrete shall comply in all respects with the codes of practice and standards referred to in section 4.4.1 above

TABLE 1

Concrete grade	Cement kg	Total aggregate kg	Fine Aggregate %	Workability	Max Size Aggregate
7	210	1900	35-50	medium	20mm
10	240	1850	35-50	medium	20mm
15	280	1800	35-50	medium	20mm
20	320	1750	35-40	medium	20mm
25	360		35-40	medium	20mm

Notes:

1. Weights of cement and total dry aggregate in 1kg to produce approximately 1 cu m of fully compacted concrete.
2. Fine aggregate expressed as percentage by weight of total dry aggregate.
3. In each mix the concrete grade number is also the “characteristics strength” of the mix.

3.2.12 General Supervision

During the time that concrete is placed the whole concreting operation shall be under the direct supervision of a suitability qualified and experienced foreman.

3.2.13 Records

A complete record of all concrete work shall be kept, which shall cover the quality and quantity of concrete, the results of all tests, the taking of test cubes and their results, the daily record of

concrete placed and the position of any construction joints not shown on the drawings. The records shall be kept on the site, and shall be available at all times for inspection by the Engineer.

3.2.14 Workability

The concrete be of such consistency and composition that it can be worked readily into the corners and angles of forms and around the reinforcement without permitting the material to segregate or free water to collect on the surface .Subject to the limitations of table 1 , the contractor shall adjust proportions of cement and aggregate as may be necessary to produce a mixture which will be easily placeable at all times ,due to consideration being given to the methods of placing and compacting used and the finish required.

3.2.15 Changes in consistency of concrete for mechanical vibration

When high frequency mechanical vibration is used for compacting concrete, the determined water cement ratios shall be modified to the written approval of the engineer.
The proportions and consistencies shall be such that with the equipment in use the full requirements of clauses 4.4.15 and 4.4.18 above shall be satisfied.

3.2.16 Determination of proportions

The proportions of cement, coarse and fine aggregate and water necessary to produce concrete conforming with the requirements of table 1 shall be determined by laboratory tests of concrete made with cement, aggregate and water to be used on the work.
Contractor shall submit, for approval samples of the materials he proposes to use.

He is to allow a sufficient period of time to enable the required tests to be carried out on the materials that will be used.

Prior to the beginning of the work, he shall submit a statement of the proportions proposed for each grade of concrete together with a report in detail from an approved testing laboratory showing for at least 3 different water contents the 7-day and 28-day concrete strengths obtained when using the materials proposed for the work. The strength determinations shall be based on not less than 4 specimens for each water content.

The strength tests shall be made in accordance with B.S 1981: 1952

Method of testing concrete

The ratio between the 7 -day and 28 -day strengths established by the preliminary tests may be used to determine the 7-day strengths necessary to satisfy the strength requirements of table 1 .this ratio shall be modified as work progresses if the need for such a change is indicated by the results of tests made in accordance with Clause 4.4.23 below.

3.2.17 Changes in proportions of materials by the engineer

The Engineer shall have the right to make check tests on concrete made from the materials proposed by the contractor for the work and to order such changes in materials or proportions or both as may be necessary in his opinion in order to meet the requirements of table 1.
If during the progress of the work the requirements set out in clause 4.2.15 and 4.4.18 are not satisfied by concrete manufactured with the materials of material proportions being used by the

contractor, the engineer may order such changes in proportions or materials or both as may be necessary in order to meet these requirements.
Where any changes as described above are ordered these shall be made at the contractor`s expense and no extra payment will be allowed by reason of such change.

3.2.18 Changes in proportions of materials by the contractor
If during the progress of the work, the contractor desires to use materials or proportions other than those originally approved, or if the materials from the sources or originally approved change in characteristics, he shall provide evidence satisfactory to the engineer that the new material and / or new combinations of materials will produce concrete meeting the requirements of table 1 and will not bring about changes in appearance or other characteristics of the structure.

Any change permitted shall be at the contractor s expense and no extra payment will be allowed by reason of such change.

Notwithstanding the acceptance of the laboratory test results, representative samples of this concrete shall be made and tested and accepted by the engineer before the use of the proposed mix in the works.

3.2.19 Measuring of ingredients
Batches should be such that only whole pockets of cement are used. A standard pocket may be assumed to have a weight of 50 kilograms.

All cement in bulk and fractions of pockets shall be assumed by weight and shall be within 2% of the specified amount.

Water shall be measured by weight or by volume to an accuracy of 3% making allowance for water contained in the aggregates and the accuracy of any measuring devices shall be checked daily

Aggregate shall be measured by volume or by an approved mechanical weight-batching plant. When batching by volume, aggregates shall be measured in accurate batching boxes, which shall be filled and seeded off level to their topmost edges. Adjustments to volumes by filling to different levels in the boxes will not be permitted. Where fractions of cubic meters are required, boxes shall be made to the exact size to measure the fractions.

If aggregates are wet or dump, the contractor shall make due allowance for bulking.

In weight batching the required weights of aggregates shall be determined from the volume and density of the aggregates.

3.2.20 Preparation for concreting
The contractor shall at all times give the engineer at least 48 hours' notice of his intention to commence concreting and the approval of the engineer shall be obtained before concreting is commenced

Before mixing any concrete, the construction joints are to be prepared, the shutters and reinforcements secured in position, means of access to all points to be concreted provided, and

the formwork is to be washed down and all debris to be removed from the space to be occupied by concrete.

3.2.21 Mixing concrete

The mixing of concrete is to be carried out in an approved mechanical batch mixer .The sequence of charging the mixer is subject to the approval of the engineer ,the volume of the mixed material shall not exceed the manufacturer rated capacity of the mixer and the concrete is to be mixed for a period not less than 2 minutes from the time the last of the ingredients for the batch is added .the mixer shall be completely emptied of one batch before recharging with the ingredients of the next batch

All equipment used in the manufacture of concrete is to be thoroughly cleaned at the end of each concreting operation and shall at all times be maintained in good order and condition, any worn or damaged parts (e.g., mixer blades) shall be replaced

3.2.22 Ready mixed concrete

Concrete obtained from an approved central mix plant shall be delivered on the site in a plastic condition, requiring no further treatment and having the slump and compressive strength specified elsewhere in the specifications.

In order to ensure uniformity in any batch, the slump of any portion of the batch shall conform to the requirements of these specifications. In general, any departure from these specifications will result in that batch being rejected by the engineer.

The maximum size and type of the aggregates and other requirements shall be specified elsewhere in the specifications.

Aggregate cement and water shall be the mixed at a central mixing plant and delivered in containers fitted with agitating devices.

The temperature of the concrete at the point and time of delivery shall be not less than 5*C and no concrete shall be delivered when the site temperature is less than 7 degrees Celsius. The temperatures of the concrete shall not exceed 30 degree Celsius.

For the purposes
Of this contract, the supplier of ready mixed concrete shall be deemed to be a sub-contractor.

It shall be the responsibility of the contractor to ensure that: -

(a) The concrete from the supplier conform to the requirement of the specifications, including the requirements of supplying details of the materials and the mix design
(b) Adequate facilities are provided by the supplier for the engineer to take samples of the materials used and to inspect the process and methods used in the manufacture and delivery of concrete.

The Engineer shall be at liberty to have full time inspector at the mixing plant or to inspect the site when concrete is being mixed for or delivered for works

3.3.0 ROADS AND STORMWATER

3.3.1 General

The workmanship described under road works covers the construction of access roads, car parks and retaining walls and includes earthworks, formation, subgrade compaction, base construction drains, pipe culverts and kerbing.

3.3.2 Order of Construction

All culverts and water pipes crossing roads must be completed before compaction of the pavements, and construction of the roadside drainage system must form an integral part of roadworks construction.

3.3.3 Setting out

In general, roads will be constructed longitudinally to the existing ground levels and transversely in accordance with the typical layouts and cross sections. Following site clearance, it is necessary to carry out the first level survey on which all measurement will subsequently be based.

Should instructions or drawings be issued requiring the Contractor to work to predetermined levels, the Contractor shall set up level pegs or profiles to the correct levels, clear of construction. Two level pegs shall be set at each point, one on each side of the carriage way. These shall be used for each stage of construction and shall remain in position until road construction is complete. Any pegs or profiles destroyed during construction shall be immediately replaced.

Roads and side drains must be self-draining and no depressions likely to form puddles and hold standing water are to be created.

3.3.4 Site clearance of road reserves

Before excavation or road construction commences the Contractor will be required to remove grass, scrub, bush, trees, and anthills, boulders, huts and debris, etc, but not topsoil, so that excavation and construction may be carried out and also to prevent the appearance of vegetable or other deleterious matter in the road structure. Generally, all tree roots shall be grubbed up and all debris shall be removed and spread on an approved dumping site within 1km free haul. The Engineer may direct that selected tree be left undisturbed.
Anthills shall be excavated to 300mm below sub-grade level or such other depth as the Engineer may decide. The excavated material shall be refilled to sub-grade level with approved fill in 150mm layers well compacted by hand ramming or machine. Antbear holes shall be excavated to expose the full workings and re-filled with approved material as above. Where considered necessary by the Engineer the excavated area shall be treated with an approved insecticide.

The final operation in clearing the road reserves shall be a machine levelling whereby all local irregularities will be evened out. The intention is not to move quantities of earth, but to give a final surface reasonably regular for construction traffic, and provide general site access.

No existing overhead or underground services, ditches or drains shall be disturbed, damaged or filled without the consent the Engineer.

Items in the Bill for clearing cover all work specified above, and the unit of measurement shall be per square metre of cleared road reserve including the removal of trees not exceeding 1 metre girth (measured 1m above ground level) and carting away the disposal of surplus material within a radius of 1 km. Generally, grass and anthills will be spread and levelled on ground adjacent to the road reserve to the satisfaction of the Engineer.

3.3.5 Removal of topsoil

The Engineer may require the Contractor to remove topsoil in designated areas, and spread the material within or adjacent to the road reserve, clear of the carriageway and side drain. A separate

item in the Bill of Quantities measured in square metres for the stated depth will be provided if necessary.

3.3.6 Removal of unsuitable material

Where directed by the Engineer unsuitable material and anthills encountered in cuts or under fills shall be removed to waste. The waste material shall be neatly dumped and spread to the satisfaction of the Engineer. Cavities formed by the removal of unsuitable material shall be backfilled with approved material to a density not less than 93% HCE. Removal shall be paid as cut to waste and refill as compacted material.

The unit of measurement for the removal of unsuitable material is the cubic metre measured in cut before excavation. Backfilling of cavities will be measured and paid in cubic metres in place after compaction.

3.3.7 Cut to spoil/stockpile

Where material if either unsuitable or surplus to requirements it shall be cut to spoil or stockpile. Material which is suitable for future use shall be deposited in a separate area from the unsuitable material.

The tendered rate shall include for the removal of the material from source, placing in the spoil site or stockpile in a neat and orderly fashion. The material shall be spread in layers not exceeding 250mm. Where reasonable, the Contractor shall use his haul equipment to compact the material however no compaction density is specified.

On completion of the Works, the spoil dumps and stockpiles shall be shaped and top spoiled and left in a free draining and aesthetically pleasing condition.

The location of all spoil/stockpile sites shall be agreed with the Engineer prior to deposition of any material.

3.3.8 Borrow

Where necessary to borrow material for the construction of road works or backfilling the site of the borrow pit, the material borrowed must be approved by the engineer and the responsible authority before commencing borrow operations

3.3.9 Preparation of surface of subgrade

On completion of formation level, the material beneath shall be scarified to a depth of 150mm with suitable equipment. All stone and lumps of material with a maximum dimension exceeding 100mm shall be either broken down or removed.

The material shall then be compacted at or near optimum moisture content to a density of 95% HCE unless a higher density is called for in Bill of Quantities. Any water required before compaction starts is to be added gradually in successive applications by means of an approved sprinkler equipment capable of applying the water evenly and uniformly over the area being processed. Between applications the water shall be thoroughly mixed into the material by means of suitable equipment such as ploughs, disc harrows or motor graders, until a uniform mixture is obtained. Should the material be too wet, for any reason, it shall be harrowed and allowed to dry out to the required moisture content before compacting proceeds.

On achieving the required water content, compacting shall immediately proceed using approved equipment suitable for satisfactorily compacting the material being processed, and continue until the material has been compacted to not less than the density specified. the required shape of the work shall be preserved during compaction and all ruts, holes and depressions corrected by frequent blading. The finished surface shall be uniform and smooth.

Payment for sub-grade preparation will be made by the square metre based on subgrade widths shown on the drawings and the Contractor’s rate shall include for all operations needed to comply

with the requirements of the Contract, including the supply, haulage and application of water as necessary.

3.3.10 Preparation of Road Bed

On completion of excavation and before any fill is superimposed the top 150 mm of the existing ground shall, where shown on the drawings or directed by the Engineer, be compacted to not less than 93% HCE. Road bed preparation will be measured per square metre.

3.3.11 Placing and compaction of fill

No fill shall be deposited in water except with the written consent of the Engineer.

Sufficient water shall be added to bring the moisture content of the material to within + 0% or -2% of the optimum moisture content immediately before compaction. The addition of water, if necessary, shall be made by successive applications of water from approved water sprinklers and the water shall be evenly applied over the whole area to be compacted and it shall then be thoroughly mixed with the material until a homogeneous mixture is obtained.

There will be no separate measurement for the provision of water.

Suitably selected material from the cut areas is to be used for fill. The material is to be thoroughly and evenly compacted in 150 mm thick layers to 96% Higher Compactive Effort

When filling is used to form an embankment for road or hardstanding the Contractor shall direct construction traffic uniformly over the full width of the embankment.

The Contractor shall obtain the approval of the Engineer to each successive layer of compacted fill before spreading a further layer on top.

Suitable measures shall be taken to minimise erosion of refilled excavations during wet weather and to avoid the formation of waterways along trenches. Under no circumstances will the Employer be held responsible for damage due to flooding by stormwater or seepage and the Contractor is to ensure that at all times storm flow is excluded, and seepage removed, from the excavations.

Where the soil obtained from the excavation is considered insufficient or unsuitable for fill the Engineer may order the Contractor not to use it. The Contractor will then be required to obtain suitable material from borrow pits, to cart all required quantities to the sites specified and to remove any unsuitable excavated soil to a dumping area to be indicated by the Engineer. Payment will be made for excavating, transporting and offloading this imported refilling material, and items are provided in the Bill of Quantities for this purpose.

No payment will be made for moving soil from one point on the Works to another for any purpose where the two points are not more than 0,5 km apart, nor for making good any deficiency in refilling or banking material due to the negligence of the Contractor.

3.3.12 Selection of fill material

The Contractor shall arrange such tests in advance of excavations as are considered necessary by the Engineer to determine the suitability of material to be excavated for use as fill. Only material which has been approved by the Engineer is to be used in embankments. Where the material from site excavations is considered insufficient or unsuitable the Contractor will be required to obtain suitable material from borrow pits.

3.3.13 Supply of gravel

The Contractor shall be responsible for obtaining from approved sources gravels which meet the requirements of this specification. If pit plans are provided then the Contractor shall exercise all necessary care and attention to ensure that only the approved gravel seams are stockpiled and that neither the overburden nor underlying soils are mixed with gravel. The Contractor shall

submit samples of the stockpiled gravel for testing and approval by the Engineer before commencement of road pavement construction.

Superficial clearing of borrow areas, removal of overburden and rehabilitation will be paid for under the appropriate item in the Bill. Overburden, unsuitable or unwanted material encountered in borrow areas shall be carefully removed or left in place as directed by the Engineer. Surplus material shall be removed to spoil dumps at the sides of the borrow pit and then returned to the inside edges of the pit after all gravel has been stockpiled, and spread and levelled to a neat and tidy profile to the satisfaction of the Engineer.

The Contractor shall stockpile all gravel in borrow pits and such stockpiles shall be subject to the regular testing and approval of the Engineer prior to transportation to the Site. The Contractor will be responsible for providing and maintaining all temporary access to borrow areas. The cost of stockpiling and access tracks must be included in the Billed Rates for selected fill or gravel.

In order to avoid the formation of pools in the borrow pits during excavation or for the reduction of excessive moisture content, drainage ditches shall be constructed by the Contractor to the extent required by the Engineer.

Material in borrow areas shall be tested and samples submitted regularly to the Engineer to determine its suitability and the Contractor shall provide, at his own cost, facilities for the Engineer to obtain test samples.

All borrow pits shall have their sides trimmed to a slope of not less than 1 vertical to 2 horizontal and shall be drained and left in a neat and tidy condition to the satisfaction of the Engineer on completion of the Contract.

3.3.14 Testing of gravel

3.3.14.1General

Suitable methods described in SAZS No 185 shall be used for testing gravels.

3.3.14.2 Grading

The gravel for the pavement shall be evenly distributed throughout the particle size range without having an excess or deficiency of any particular size. It shall also be free from any organic matter which, in the opinion of the Engineer, is harmful, or which shall affect its load carrying capacity. See **Table Q1 below**. Not more than 10% shall be retained between each pair of successive sieves excepting the largest pair.

STANDARD SIEVE SIZE TO BS 1377	PERCENT PASSING FOR NOMINAL MAXIMUM SIZE		
	75 mm	37.5 mm	19 mm
75 mm	100		
37.5 mm	80-100	100	
20 mm	60-80	80-100	100
10 mm	45-65	55-80	80-100
5 mm	30-50	40-60	50-75
2 mm	-	30-50	35-50
600 µm	10-30	15-30	15-35
75 µm	5-15	5-15	5-15

Table Q1: Gravel grading

3.3.14.3 Plasticity

On the portion of the sample passing the 0,425mm sieve the plasticity index and liquid limit shall not exceed the following values:

Section	PI	LL
Wearing course	15	
Sub-base	12	
Base	8	25

3.3.14.4Strength

The minimum C.B.R. for the gravel after four days soaking shall be as follows:

Base - 80% at 98% HCE

Sub-base - 35% at 95% HCE

3.3.15 Base construction

3.3.15.1 DESCRIPTION

Base construction includes the stockpiling, loading and hauling, laying, mixing and compaction of suitable gravel to the specified density and profile.

3.3.15.2 Materials

The Contractor will be responsible for supplying gravel which meets the specification. Material shall be selected and stockpiled by blading and ripping where necessary and the Contractor shall ensure that the material is well mixed during stockpiling operations. When stockpiling, no material of an inferior quality shall be incorporated in the stockpiles.

After use, borrow areas shall be rehabilitated to the satisfaction of the Engineer.

3.3.15.3 Laying and compacting

The material shall be laid to the dimensions, levels and grades shown on the drawings or indicated by the Engineer.

The base layer shall only be constructed provided that the underlying layer has been approved. The material shall be placed, spread, watered, mixed, shaped and compacted by methods which shall not disturb the underlying layer and such methods shall be to the approval of the Engineer.

The surface of the finished layer shall be smooth and free from irregularities to the approval of the Engineer and any weak areas in the layer which become apparent during compaction shall be cut out and replaced with sound material before the compaction of the next layer commences.

The layer shall be compacted to not less than the densities indicated in the Bill of Quantities.

3.3.15.4 Water for compaction

Sufficient water shall be added to bring the moisture content of the material within + 0% to -2% of the optimum moisture content. The addition of water, if necessary, shall be made by successive applications of water from approved sprinklers and the water shall be evenly applied over the whole area to be compacted and it shall then be thoroughly mixed with the material until a homogeneous mixture is obtained before compaction is commenced.

3.3.15.5 Stabilisation with cement

Where directed by the Engineer the base layers will be stabilised with 2% cement. The material to be stabilised shall be spread, mixed and shaped before the addition, by an approved means, of the stabilising agent. The water shall then be added to the mixture and the material compacted as indicated above.

All compaction and finishing shall be completed within 6 hours of the addition of water, and within 10 hours of the addition of cement.

On completion of the stabilised layer the surface shall be kept damp for 5 days or until the layer is sealed.

The rate for gravel will include for locating and proving the gravel pit, removal of overburden, stockpiling, rehabilitation of gravel pit, hauling, mixing, watering and compacting to the density specified. The unit of measurement is the cubic metre measured after compaction in place

3.3.15.6 Surfacing of roadworks

3.3.15.7 General

Surfacing should only be placed after all other services have been provided to avoid damage by construction traffic.

All equipment for the surfacing of roads shall be approved by the Engineer and shall be on the site and in proper working condition before surfacing may begin.

The compacted area to be surfaced shall be approved by the Engineer before the start of any surfacing work, and the Contractor shall give the Engineer's Representative at least 24 hours' notice of his intention to spray.

3.3.15.8. Prime

Priming will normally be required before the application of either a spray and chip surface dressing or a pre-mix carpet, but alternative specifications using bitumen emulsion will be considered, especially if tar prime is not available.

The edges of the work shall be set out before priming, and the surface shall be free from irregularities, corrugations, ruts or loose patches. All loose material shall be broomed off the surface.

The surface to be primed shall be damp, and if necessary, a light, uniform application of water shall be given to the prepared surface before prime is applied.

Spraying of prime shall not be undertaken when the base is wet, during wet or misty conditions, when rain appears imminent, or when the road temperature is less than 10^0C.

Prime shall preferably be MC30 cut-back bitumen sprayed at 60^0C, or may be tar prime TP7 sprayed at 70^0C. The above temperatures are not to be exceeded by more than 10^0C nor maintained for longer than six hours.

Arrangements for longitudinal overlaps and for entrance and exit paths for the distributor shall be to approval of the Engineer.

After spraying, the road shall be closed to traffic for at least 3 days and may not be opened without the Engineer's approval.

3.3.15.9.Premix

Only straight run bitumen of 80/100 Penetration grade will be acceptable for premix wearing courses.

Before premix application the primed base shall be swept clean of all dust and organic matter, and any remaining pools of prime removed.

Laying of premix shall not be undertaken when the primed base is wet, during wet or misty conditions, when rain appears imminent, or when the air temperature is less than 15ºC.

Delivery temperature is to be not less than 120ºC.

Wherever practicable, premix is to be laid by mechanical paver and the operation is to be as far as possible continuous. Any unavoidable hand spreading is to be executed by competent staff.

Rolling in a longitudinal direction, starting at the verge and working towards the crown, is to commence as soon as possible after paving, in the first instance using an 8 to 10 tonne steel wheeled roller for at least three passes at premix temperature range of 100 to 120ºC.

A 15 -20 tonne self-propelled pneumatic roller with tyre pressure approximately 600 Kpa (87 p.s.i.) is to be used for three to four passes immediately after the steel roller, after which the 8 - 10 tonne steel wheeled roller is to be used for about two passes to restore finish.

Any cold joints between areas of paving are to be cut back vertically, cleaned and painted with a thin coat of Class 3, slow breaking bitumen emulsion.

3.3.15.10.Tolerances

The level of any point in the finished surface shall be within 10 mm of the level specified or calculated from information given on the drawings or by the Engineer. The maximum allowable gap under a 3-metre straight edge may not exceed 5 mm.

3.3.16 Stormwater drainage

All culverts and headwalls shall be complete before final shaping and compaction of the road pavement is commenced.

Suitable surplus spoil from culvert and trapezoidal drain excavations shall be used for building up adjacent road formations prior to initial compaction of that formation. Unsuitable spoil shall be disposed of as directed by the Engineer. The Contractor's programme shall allow for this order of construction.

3.3.16.1.Tolerances in levels and line

The invert of storm drains and culverts shall be within 10mm of the level shown on the drawing or directed by the Engineer. Between such points the invert of drains shall not vary by more than 20 mm or culverts by more than 10mm from the level for that point as calculated from the levels and gradients indicated. The level of any pipe joint shall not differ by more than 5 mm from the straight line between the joints on either side of it. The horizontal deviation from the specified alignment shall not exceed 25mm.

3.3.16.2 Pipe culverts

Pipe culverts under roadways shall be of Class X concrete pipes with ogee joints (SAZS A17) mortar filled unless otherwise specified, laid on Class A bedding at a gradient of 1/80. When cover to the pipe is less than 500mm it shall be surrounded in Grade 15 concrete as shown on the drawings.

Measurement and payment will be per metre of pipe laid and the rate shall include for the supply, transport to site, excavate not exceeding 1,2m deep, lay with open butt joints, and carefully backfill and compact to a density of 90% HCE.

Concrete will be measured and paid per cubic metre, and the rate shall include for all shuttering.

Headwalls for culverts shall be constructed in accordance with the drawings in Grade 15 concrete and paid for per cubic metre of concrete wall, including all excavation, backfilling and cutting or shaping of pipes.

3.3.16.3 Trapezoidal drains

These drains shall in general be excavated after the wide V drain which forms part of the road construction has been completed. Unsuitable spoil shall be generally spread down hill from the roads or, for particularly unsuitable spoil such as rock, disposed of to spoil dumps as directed by the Engineer. Unsuitable spoil shall be carefully spread or dumped to the complete satisfaction of the Engineer. The Contractor shall include in his rates for all such spoil disposal, spreading and dumping within a free haul distance of 0,5km.
Concrete linings will normally be in Grade 20 concrete but the Engineer may instruct substitution of no fines concrete lining in wet ground.

Payment for excavation and forming shall be per cubic metre for the different sizes specified, and lining shall be measured and paid per cubic metre.

3.3.16.4 Stone pitching

Stone pitching shall be constructed of selected approved stone, providing a layer about 150mm thick firmly grouted with a 4:1 sand/cement mortar. Measurement and payment will be by the square metre.

3.3.16.5 Kerbing

Three types of kerbing will be specified.

(a) Precast concrete kerb.

(b) Pavement edging.

(c) Heavy duty roll over kerbing.

The Contractor shall allow in his price for Bitumen/cement infill if he proposes to place kerbing after surfacing. If kerbing is to be placed before surfacing every precaution must be taken to prevent splash on the kerbing. All kerbing to be set in 10Mpa concrete and have an earth backfill.

Price per metre shall include for all the above.

3.4.0 WATER RETICULATION

3.4.1 GENERAL

Unplasticized polyvinyl chloride (UPVC) pipes class 12 shall be used except where otherwise indicated in small sizes or as specified by the Engineer.

3.4.2 Handling of materials

The Contractor will be responsible for transporting, off-loading, storing and distribution of materials.No damaged materials will be used in the works but shall be laid aside for inspection by the engineer who shall decide whether damage is so extensive as to warrant rejection or is sufficiently slight as to be capable of remedy on site.

3.4.3Width of Trenches

Trench excavation should be kept to a minimum width, allowing just sufficient working area for jointing and embedment compaction around the pipe.

-For small diameter pipes, a trench 300mm wider than the diameter of the pipe allows enough room for jointing.

- For pipes 300mm in diameter and larger, the trench widths recommended in the relevant sections of SANS 2001 should be followed.

3.4.4 Pipe laying

Immediately before laying, each pipe and fitting to be inspected internally and externally for damage and defects and all stone, grit and foreign matter removed. Each pipe must be evenly laid on undisturbed ground free of all projections and solidly supported along its entire length between joint holes. The badger and the ropes are to be of soft material which will not damage the internal surface of the pipes. A properly fitting expanding or other approved plug shall be fitted to the end of the last pipe in any particular run and shall only be removed when final connection is made.

3.4.5Jointing of pipes and fittings

The contractor shall clean both ends to be joined so as to ensure removal of all deleterious matter. After light sanding and application of approved solvent cement as recommended by the manufacturer, the male end of the pipe shall be inserted, the full length of the chamfer of adjoining pipe or fitting. Pipes shall not be disturbed for a period of 24 hours after joining. Pipes shall be stored and stacked in an approved manner.

3.4.6 Screwed galvanised pipes

Shall be joined using paint and hemp, an approved jointing compound or tape applied uniformly to the male thread. Under no circumstances will compounds containing red led be used.

3.4.7 Fire Hydrants

Fire hydrants shall be of the pillar type using 75mm n.d. galvanized mild steel pipe as indicated on the drawing and including a 20mm diameter heavy duty hose cock and landing valve with turn down instantaneous outlet on hand wheel

Fire hydrants shall be suitably marked by cast iron maker plates firmly erected on mild steel tubular posts 2.0m long with 1.0m above surrounding ground level.

3.4.8 Depth of cover

Depth of cover to be measured from finished ground level to top of pipe barrel-

-Pipes laid across roadways -1200mm minimum

-Pipes laid through stands and road verges -750mm minimum

3.5.0 SEWERAGE RETICULATION

3.5.1 General

The sewerage piping shall be 110mm internal diameter UPVC or other approved
The sewerage piping shall be laid carefully to the invert levels provided by the Engineer

3.5.1 Materials

Unplasticized polyvinyl chloride (Upvc) sewer and Drain and Fitting for use below ground shall conform to CAS 219

3.5.2 Handling of Materials

No damaged materials are to be used in the work but laid aside for inspection by the Engineer who shall decide whether damage is so extensive as to warrant rejection or is sufficiently slight as to be capable of remedy on site. Damaged materials shall be made good or replaced at the Contractors own expense.

3.5.3 Sight Rails

Before excavating trenches, sight rail to be erected at every manhole for which an invert level is specified in the drawings, or at the interval of 100m whichever is the lesser. Rails shall be of substantial construction painted in contrasting alternate colours and in addition, suitable boning rods shall be provided all to approval of the Engineer. Rail supporting posts shall be firmly fixed each side of the trench and sight rail fixed with top edge definite hight in even centimetres above level invert of pipes to be laid.

3.5.4 Laying and Jointing

Only competent drain layers shall be employed and the person actually jointing the pipes must be at least a journeyman in the trade. Only proper tools shall be used in executing of the work.

Trenches must be kept dry during laying and jointing and until such time as the work has been inspected, tested and approved.

Laying to be carried out from lower end of length to higher end. Socket of pipe always to be on uphill side.

The whole barrel of the pipe shall have a firm bedding on the trimmed bottom of the trench. The use of loose material to support pipes is not permitted. Joint holes shall be formed as short as practicable and sufficiently deep to allow jointer to work right round the pipe. Every assistance will be afforded to the Engineer to inspect and approve the bedding of pipes.

3.5.5 Backfilling

Prior to backfilling, any length of jointed pipe work shall be checked for level and bedding and a water testing applied. All to the approval of the Engineer.
Backfilling shall commence with the approved backfilling materials being carefully placed and tamped on both sides of the pipe, up to, but not over the crown of the

pipe. Thereafter, if the Engineer is satisfied that the pipe has not been disturbed, backfilling band ramming will be continued up to a level of 300mm above the crown of the pipe, and the test repeated;

Therefore, backfilling shall continue as specified elsewhere.

3.5.6 Manhole Construction

Rings shall be of two types constructed in precast reinforced, dolomitic aggregated Grade 30 concrete rings with ogee, walls thickness shall not be less that:

62mm for 9000mm nominal diameter rings

69m for 1050mm nominal diameter rings

3.5.7 Floor slabs

Shall be Grade 20 concrete place in rammed level bed to a minimum depth of 75mm below invert. Invert shall be of the same material as the connecting sewer or may, by agreement, with the Engineer to be formed in the manhole floor with 20mm cement screed steel trowelled finish, branches being led in with smooth sweep and rounded corners. Channel shall have a fall through the manhole of 25mm and the benching shall fall 1 in 6 from the manhole walls and finish tangentially vertical to the channel depth not less than the channel diameter. Benching shall be 75mm thick steel trowelled cement screed and intersect the channel side with a 19mm radius. Step irons to be firmly built into manhole walls a required.

3.5.8 Cover and Adaptors Slabs shall be precast Grade 25 reinforced concrete with dimensions in accordance with the drawings.

3.5.9 Manhole Covers and Frames: shall be provided as detailed on the drawing and frames set in the roof slab in 1:2 cement mortar.in roadway, the manhole cover shall be bedded to finish flush with the final flush with the final road level and to same crossfall: in all other areas, covers shall finish 150mm above natural ground level.

All manhole covers and frames shall be cast iron to S.A.B.S 67 or B.S.S 497 and be of shape and in three qualities as detailed:

Light weight (circular) - approximately 32kg weight

Medium weight (circular) - approximately 110kg weight

Heavy weight (triangular) -approximately 204kg weight

All covers to be dipped in bitumen before in installation

3.5.10 Sewer testing

Wherever possible, testing shall be carried out from manhole. Short branch drains of length less than half of the manhole-to-manhole distance of the respective mainline, connected to a main sewer between manholes shall be tested as one system with the main sewer. Long branches shall be tested separately.

Sewer shall be tested

(i) After laying, including the placing of concrete if any, but before backfilling and
(ii) After backfilling has been completed.

Pipes not exceeding 750mm nominal internal diameter shall be tested in one of the following ways;

3.5.11 Water

A test pressure of 1:2 metres head of water above the soffit of the sewer shall be applied at the high end by means of a standpipe. The length of the section under test shall be such the head at the lower end does not exceed 6 metres. Steeply graded sewer shall be tested in stages where the above maximum head will be exceeded if a whole section is tested at once. A period 1 hour shall be allowed for absorption
The loss of water over a period of 30minutes shall be measured by adding water from a measuring vessel at regular intervals of 10minutes and nothing the quality required to maintain the original water level in standpipe. The average quality of water added shall not exceed 0.1litres per hour per 100linear metre per millimetre of nominal bore of the sewer.

When required but the contractor, the sewer shall be tested for obstruction by the insertion and pulling through a twin coupled rubber plungers of the same diameter as the sewer.

3.5.12 Manhole testing

Before my backfilling to manhole takes place, the manhole shall be securely plugged and filled with clean water to the level of the underside of the cover slab. A one-hour absorption period will be allowed, thereafter the manhole will be topped up again and drop in water level shall not exceed a drop corresponding to 2 litres per hour. Leakage and excessive sweating will be made good to the approval of the Engineer.

3.5.13 Steel pipes and Specials

Steel Pipes for sewerage shall be fabricated from the following:

(i) Seamless steel manufactured to BS 3601, or
(ii) Spirally-welded steel pipe 5.4mm wall thickness or
(iii) Longitudinal (seam) – welded steel pipe 4.5mm wall thickness

Pipes hall be grit blasted to Sa2 standard, hot bitumen dipped and spun bitumen lined, 3mm thick. Pipes laid below ground shall be sheathed externally with double 5mm thick fibre-glass/ bitumen sheathing. Pipes in exposed location shall be bitumen dipped externally and painted on-site with 2 coats of approved flexible joints. The ends of fabricated pipe lengths shall be within the roundness and dimensional tolerance required by the coupling manufacturer for water tight jointing.

Steel pipe-work above original ground shall be supported on cast in-situ reinforced concrete column at each joint location.

Rodding access point, consisting of 45 degrees angle branches, shall be installed in above –ground pipeline at interval not exceeding 90m.The angle branches shall be the same diameter as the through-sewer with flange connections coupled to Viking Johnson' or similar approved flange adaptors fitted to the main. The rodding branch shall have a steel blank flange bolted to the angle flange.

3.6.0 STORM-WATER DRAINAGE

3.6.1 GENERAL

Piped storm water drains under roads and in fact all pipe-work, duct, etc to be laid under roads, should where ever possible be constructed prior to the application of the road construction layers and shall be laid on a trench floor well compacted.

The layout of drains and location and size of culverts shall be shown on the drawings or as determined on site. All side drains ,lined drains ,bolsters, pipe culverts and storm water pipelines shall be constructed in accordance with drawings attached this document or as otherwise specified, and to line ,level and cross-section as shown on the drawings, or as directed by the engineer

In the laying out and construction of the drainage particular attention shall be paid to the to the prevention of soil erosion

3.6.2 **Contractor's Responsibility -PROTECTION OF WORKS**

The contractor shall take responsibility for providing adequate drainage (whether such drainage is incorporated in the final work or not) for the protection of the work covered by the contractor during construction , as claims will not be entertained arising from flood , storm-water damage ,e.t.c caused by lack of such work

3.6.3 Pipe culverts and storm-water pipelines

3.6.3.1 **Pipes for culverts and storm- water pipelines shall be manufactured** in accordance with C.A.S A17 – "concrete pipes -non pressure" .All pipes shall be reinforced as specified in the afore -mentioned Central African Standard , class 'S' (reinforced)

3.6.3.2 All pipes under roads shall be laid on a concrete bed 10 MPa and shall be haunched with the same class concrete where specified

3.6.3.3 Culverts shall be laid to grade not flatter than 1:100.

3.6.3.4 Head walls and wing walls e.t.c. shall be constructed in accordance with the drawings or a specified by the engineer and shall consist of vibrated concrete 15MPa

3.6.4 Stone or brick pitching

The inlets and outlets from culverts and other areas subject to erosion shall be pitched with suitably durable stone or brick or other approved hard material to a thickness not less than 100mm or as otherwise ordered ,well bedded anchored into the soil bed.

Where plain pitching is ordered, the stones shall be closely butted with interstices packed with small stones and soil, otherwise the pitching shall be laid into and grouted according to the type of pitching used and to the approval of the Engineer. The line of the pitching shall be true and free from irregularities to the approval of the engineer. Bedding and density of pitching shall be to the approval of the engineer.

3.6.5 Open Drains

Open drains shall normally be constructed to a flat V-section by machine at gradient of not flatter than 1 in 200 and to a minimum depth of 450mm unless otherwise indicated on the drawings or by the engineer

Drain outfalls shall of course reduce in depth and effectively spread the discharge of water over a wide area of natural ground surface

At outlets from culverts and elsewhere as may be necessary ,hand excavation may be required to form trapezoidal shaped open drains with the side slopes appropriate to the nature of soil to limit erosion

On steep runs of open drain, concrete or stone pithed bolsters shall be provided to give stepped gradients not steeper than 1 in 60

Directions of flow of drains shall be checked before construction commences and any departure from specified direction of flow will be brought to the attention of the engineer.

3.6.6 Handling of materials

No damaged materials are to be used in works but laid aside for inspection by the engineer who shall decide whether damage is so extensive as to warrant rejection or is sufficiently slight as to be capable of remedy on site. Damaged materials shall be made good or replaced at the contractor's own expense.

3.6.7 Sight Rails

Before excavating trenches , sight rails to be erected at every manhole for which an invert level is specified in the drawing or at intervals of 100m whichever is the lesser. Rails shall be of substantial construction painted in contrasting alternate colours and , in addition ,suitable boning rods shall be provided, all to the approval of the engineer.

3.6.8 Laying and Jointing

3.6.8.1 Only competent drain layers shall be employed and the person actually jointing the pipes must be at minimum a journeyman in the trade. Only proper tools shall be used in execution of the work.

3.6.8.2 Trenches must be kept dry during laying and jointing and until such time as the work has been inspected , tested and approved

3.6.8.3 laying to be carried out from lower end of length to higher end. Socket of pipe always to be on uphill

3.6.8.4 All storm-water pipe joints shall be made with Ogee joints approved by the Engineer and laid according to manufacturer's instructions. Cement, bitumen and other forms of jointing will only be used with written approval of the Engineer

3.6.8.5 The whole barrel of the pipe shall have a firm bedding on the trimmed bottom of the trench. The use of loose material to support pipes is not permitted. Joint holes shall be formed as short as practicable and sufficiently deep to allow jointer to work right around the pipe. Every assistance will be afforded to the Engineer to inspect and approve the bedding of pipes.

3.6.8.6 Wooden covers or plugs shall be provided for covering the mouth of the first and last pipe at all times while pipe laying is not actually proceeding. All laid lengths of pipe shall immediately be stopped off with cement or other stoppers to the approval of the engineer.

3.6.9 Backfilling

3.6.9.1 Prior to backfilling any length of jointed pipe work shall be checked for line level and bedding and an air testing applied. All to the approval of the Engineer.

3.6.9.2 Backfilling shall commence with approved backfill material being being carefully placed and tamped on both sides of the pipe , up to but not over the crown of the pipe .

Thereafter , if the Engineer is satisfied that the alignment of the pipe has not been disturbed , back filling and ramming will be continued with grade 1 material up to level of 300mm above the crown of the pipe , and the test repeated

3.6.9.3 Thereafter backfilling shall continue as specified elsewhere

3.6.10. Manhole construction

3.6.10.1 Rings shall be of two types constructed in pre-cast reinforced , dolomitic aggregate Grade 30 concrete rings with Ogee joints , wall thickness shall not be less than :-

67mm for 1050mm nominal diameter rings

76mm for 1200mm nominal diameter rings

3.6.10.2 Floor slabs shall be of grade 20 concrete placed on rammed level bed to a minimum depth of 75mm below channel invert.

Inverts shall be of the same material as the connection sewer or may , by agreement with the Engineer , be formed in the manhole floor with a 20mm cement screed , steel trowelling finish , branches being led in with smooth sweeps and rounded corners

Channels shall have a fall through the manhole of 25mm and the benching shall fall 1 in 6 from the manhole walls and finish tangentially vertical to the channel providing a total channel depth not less than the channel diameter.

Benching shall be 75mm thick steel trowelled cement screed and intersect the channel sides with a 19mm radius. Step irons to be firmly built into manhole walls as required.

3.6.10.3 Cover and adaptor slabs shall be of precast Grade 25 reinforced concrete with dimensions in accordance with the drawings

3.6.10.4 Manhole Covers and Frames shall be provided as detailed on the drawing and frames set in the roof slabs in 1:2 cement mortar.

In roadway and foot paths the manhole cover shall be bedded to finish flush with the final road and or foot path level and to the same cross-fall ; in all other areas covers shall finish 75mm above natural ground level .

All manhole covers and frames shall be of cast iron to S.A.B.S 67 or B.S.S 497 and be of shape and in thee qualities as detailed :-

Lightweight	- approximately 32kg
(circular)	
Medium weight	- approximately 110kg
(circular)	
Heavy weight	- approximately 204kg
(triangualar)	

All covers to be dipped in bitumen before installation

3.7.0 APPENDIX TO BILL OF QUANTITIES

PREAMBLE TO BILL OF QUANTITIES

3.7.1. The Bill of Quantities shall be read in conjunction with Instructions to Tenderers, Form of Tender, Conditions of Contract, Schedules, Drawings and Specifications. The Contractor shall be deemed to have examined the drawings and to have acquainted himself with the detailed description of the works to be carried out and the manner in which they are to be carried out and the specific requirements and standards of the finished works**.**

3.7.2. The quantities set down against the items in the Bill of Quantities are an estimate of the quantity of each kind of work included in the sub-contract and are therefore subject to re-measurement during the progress or on completion of the works. The re-measured works shall be paid for at the rates and prices entered in the Bills of Quantities.

3.7.3. The Bill of Quantities is not intended for the ordering of material except at the Sub-Contractor's own risk.

3.7.4. Unless expressly stated to the contrary, all items shall be measured and paid for net, no allowance being made for cutting, waste and all other contingent work, the cost of which shall be deemed to be included in the Tendered Rates.

3.7.5. The Contractor's rates and prices entered in the Bills of Quantities shall include for all costs and expenses which may be required in and for the execution of the works described together with all general risks, liabilities and obligations set for the or implied in the tender document.

3.7.6. A rate or a price or the word NIL shall be entered in ink against each item to the Bill of Quantities as required. Where no rate or price is entered against an item the cost of the work shall be deemed to be included in other rates and prices whether or not the word NIL is entered. The Engineer shall have the right to ask the Contractor to indicate under which other item(s) these un-priced item(s) have been allowed for.

3.7.7. Descriptions of items in the Bill of Quantities have been kept as brief as possible. The Contractor shall ensure that he understands the full extent of each item by reference to the relevant sections of the tender document.

3.7.8. No alteration is to be made to the Bills of Quantities without the written permission of the Engineer.

3.7.9. Any items, materials and equipment shown on the drawings and not shown in the Bill of Quantities shall be brought to the attention of the Engineer at least seven days before the close of tender.

Any subsequent claims for revision of the accepted price will not be considered with no liability admitted in respect of such discrepancies.

All cable lengths shown in the Bill of Quantities are for tendering purposes only. All cable lengths are subject to measurement during the progress or on completion of works.

3.7.10. If the discrepancies are not brought to the attention of the Engineer, it shall be noted that the drawings, the specification and Bill of Quantities form a complete tender document. Therefore, any item, materials and equipment not shown on the Bill of Quantities but shown on the drawings shall be deemed to be part of the tender document and shall therefore be priced.

..... **……..**

SIGNATURE OF TENDERER **DATE**

3.8.0. SCHEDULE OF BASIC PRICES

3.8.1. ESCALATIONS FOR MATERIALS

Orders for purchase of materials shall be placed with all of the Contractor's Suppliers within four weeks from site handover.

Photocopies of these orders shall immediately be submitted to the Engineer and shall be the basis for claims of fluctuation in prices.

It is brought to the attention of the Contractor that he shall only change Suppliers with the written authority of the Engineer upon submission of documents from the supplier stating his grounds for failure to meet his obligations.

3.8.2 ESCALATIONS FOR LABOUR

The Contractor shall complete a schedule of his labour rates for both skilled and unskilled workers he intends to employ during the contract.

Such numbers shall be changed with the approval of the Engineer from time to time due to fluctuations in workload during the course of the construction period.

The Contractor shall also clearly show the build-up of his workers` wages i.e. he shall stipulate the National Employment Council (NEC) for the Construction Industry of Zimbabwe contribution such as Pension and General funds.

The rates so specified shall be the basis for future escalations in labour rate. However, if no rates are specified the current labour stipulated by the N.E.C shall be applied. No contributions shall be applied to temporary or casual labourers

DESCRIPTION	**$ (PER HOUR)**
Skilled Worker 1	**$**
Skilled Worker 2	**$**
Skilled Worker 3	**$**
Skilled Worker 4	**$**
Installation Wiremen	**$**
Worker Grade 1	**$**
Worker Grade 2	**$**
Worker Grade 3	**$**
Worker Grade 4	**$**
Guards and watchmen	**$**
Any other (specify)	**$**

Signature……. Date…….

3.8.3 PRICE SUMMARY

3.8.3.1 The Contractor shall complete this form and return this specification, drawings and form of tender when these completed documents are called for.

The following prices are to be entered having been brought forward from section 3.9.0 – Bills of approximate quantities

(a) Total carried to summary brought forward from Bill No.6

US$.....

Tenderers must note that they will only be considered for recommendation when all tender documents including specification and drawings are submitted at the time of tender.

Tenderers are to submit a schedule of basic prices for materials and accessories for the whole of the electrical installation.

Tenderers to submit a schedule of basic rates for various categories of labour upon which the tender is based on the date of tender.

No material increases will be paid unless accompanied by the supplier invoices and Tenderers order clearly stating project name, contract number and dates. All adjustment will be net with no allowance for profit, etc. All claims for increased labour costs must be accompanied by the original workers sheets.

NAME OF ELECTRICAL SUBCONTRACTOR.....

ADDRESS.....

TELEPHONE.....

..... **.....**

SIGNATURE OF CONTRACTOR **DATE**

3.9.0 ENVIRONMENTAL SPECIFICATION FOR CONSTRUCTION

3.9.1 SITE ESTABLISHMENT AND MANAGEMENT

3.9.2General

Every precaution shall be taken, in accordance with this specification, to prevent pollution of air, soil, ground and surface water as a result of construction or associated activities at all locations (including borrow pits) of the contract.

Traffic routes to working areas: no indigenous site vegetation shall be destroyed by construction vehicles, unless authorised by the RE.

Staff ablution facilities: only chemical toilets or flush toilets discharging into approved septic tanks and soakaway will be allowed on site, so as to limit potential groundwater pollution caused by other forms of ablution facilities.

Stormwater control measures: care should be taken during construction not to alter natural stormwater drainage in ways that could cause pollution.

Pollution control:

- Discharge of hazardous chemicals on the site or to the stormwater system is prohibited.
- Soil erosion caused by construction activities shall be kept to a minimum. Care should be taken in the siting of facilities and materials.
- All wastewater leaving the site shall be contained and treated before release into watercourses, streams, rivers, lakes and dams, at the Contractor's expense, to comply with Government standards for wastewater/effluent discharge.

Management of waste*:* litter and solid waste, associated with construction activities, shall be confined to areas designated for that specific use by the Resident Engineer.

The Contractor shall draw up a plan of all parts of the construction site, showing the layout of site establishment, topsoil stockpiles, planned access and circulation routes, borrow pits, etc. The plan shall be submitted to the Engineer for comment and approval before site establishment commences.

Where the Environmental Specification is in conflict with other sections of the technical specification, the Environmental Specification shall take precedence.

3.9.3 Housekeeping

The Contractor shall ensure that the Contractor’s camp and working areas are kept clean and tidy at all times. The Resident Engineer shall inspect these areas on a regular basis.

3.9.4 Demarcated areas and fencing

Routes for temporary access and haul roads shall be located within the approved demarcated areas and vehicle movement shall be confined to these roads. Movement of vehicles outside the designated working areas shall not be permitted without written authorization from the Resident Engineer

All construction activities shall be restricted to designated working areas shown on the drawings and/or approved by the Resident Engineer. Materials, including spoil, shall only be stockpiled on designated areas.

Fences shown on the drawings and tender specification shall be maintained throughout the construction period. All temporary fencing shall be removed on completion of the contract.

3.9.5 Fire risk and burning

Burning of vegetation including tree trunks and stumps cut during site clearing and establishment shall not be permitted unless authorised by the Engineer. Material arising from site clearing that is suitable for firewood may be used by the Contractor's workmen and any surplus should be offered to the surrounding community. All vegetation not so disposed of shall be removed to a site designated by the Resident Engineer.

The Contractor shall ensure that the risk of fire at any location on the site is kept to a minimum. The Contractor shall supply fire-fighting equipment appropriate to the fire risk presented by the type of construction and other on-site activities and materials used on site. This equipment shall be kept in good operating order.

Open fires for heating and cooking shall only be permitted in protected areas designated by the Resident Engineer for this purpose.

No fires will be allowed adjacent to the boundary fence, either inside or outside the Works.

3.9.6. Storage of fuel and other materials

Fuel, lubricants, transmission and hydraulic fluids shall be stored only in the designated areas.

3.9.7. Control of damage to plants, trees and animals

The underlying requirement is to minimise damage to natural habitats within the designated area. In practice a certain amount of damage is sometimes unavoidable, in which case the disturbed land is to be rehabilitated to the Resident Engineer's instructions or according to a rehabilitation plan approved by the Resident Engineer.

3.9.8 Destruction of plants and trees

Shrubs and trees within the designated area shall only be moved or removed with prior written approval of the Resident Engineer to areas specified by the Resident Engineer. Removal, damage or disturbance of any shrubs or trees outside such areas is not permitted

Gathering of firewood outside the designated area shall not be permitted.

3.9.9 Disturbance of animals

Any animals resident within the site shall not be killed nor unnecessarily disturbed. Where sensitive species occur, these shall be relocated at the Employer's cost.

3.9.10 Control of damage to soil and water

3.9.10.1 Topsoil

Topsoil shall be stripped from the areas to be occupied by structures, roads and temporary storage areas prior to commencement of construction in the particular area, and stockpiled for use in reinstatement and rehabilitation (see also Clauses C303.1, C307 and Q1706).

The Contractor shall ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation.

Stripping of topsoil shall be undertaken in such a way as to minimise erosion by wind or runoff.

Areas from which topsoil is to be removed shall be cleared of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.

Topsoil shall be stockpiled in areas designated by the Resident Engineer. Where required the stockpiles shall either be vegetated or covered by a suitable fabric to prevent erosion and invasion by weeds.

Topsoil shall be stripped from the above areas to a depth not exceeding 300 mm from the original ground level unless otherwise specified by the Resident Engineer, after clearing and grubbing of the area is complete.

3.9.10.2 Care of waterways

Site staff shall not be permitted to use natural or man-made water sources for the purpose of bathing, washing of clothing or vehicles nor disposal of any type of waste, unless authorised by the Resident Engineer.

The Contractor shall not in any way modify nor damage the banks or bed of watercourses, streams, rivers, dams or lakes unless required as part of the specified construction works.

Where modification or disturbance of watercourses is unavoidable or is required in terms of the contract (e.g. pipeline scour chambers), the disturbance of the water body shall be kept to a minimum, particularly as regards the removal of riparian vegetation and opening up of the stream channel.

3.9.10.3 Control of pollution

As a minimum requirement, all waste emissions (hazardous, airborne, liquid and solid) from the site shall be kept within the limits of standards set in terms of relevant national and local pollution legislation and regulations.

3.9.10.3.1 General

No waste of a solid, liquid or gaseous nature shall be emitted from the site without approval by the Resident Engineer.

Accidental pollution incidents shall be reported to the Resident Engineer immediately after they occur and shall be cleaned-up (to the satisfaction of the Resident Engineer) by the Contractor or a nominated clean-up organisation at the expense of the Contractor.

3.9.10.3.2 Soil

Vehicle and plant maintenance shall be confined to the areas demarcated for this purpose. Should any fuel, transmission oil or hydraulic fluids be spilled onto the soils the Resident Engineer shall be informed immediately.

3.9.10.3.3 Water

The Employer reserves the right to monitor the quality of water bodies on and/or adjacent to the site before, during and after construction.

3.9.10.3.4 Air

All reasonable measures should be taken to minimise air emissions in the form of smoke, dust and gases e.g. by applying dust prevention techniques such as the sprinkling of water.

3.9.11 Management of waste

All waste arising from construction activities are to be handled, transported and disposed of in accordance with the relevant regulations. All efforts should be made to minimise, reclaim or recycle waste, and failing that, dispose of it in a manner licensed by the government for that purpose.

3.9.11.1 Sewage

The Contractor shall provide sanitation facilities in the form of chemical toilets or flush toilets at the camp, office, workshop and construction site for staff and visitors discharging to septic tank(s) and soakaway(s). The location, number and sizing of all such facilities shall be to the approval of the Resident Engineer. No other form of sanitation will be permitted except with the written approval of the Engineer. No surface discharge of septic tank effluent will be permitted.

3.9.11.2 Wastewater

All runoff from fuel tanks/drums, truck washing areas and wash water from concreting vehicles and other equipment shall be collected and directed through oil traps to settlement ponds and treated to comply with Zimbabwe standards for effluent disposal. The settlement ponds shall be suitably lined at the Contractor's expense, if required in the opinion of the Resident Engineer, in order to minimise potential groundwater pollution.

3.9.11.3 *Solid waste*

Definition*:* "Refuse" refers to all construction waste (such as rubble, cement bags, waste cement, timber, cans, other containers, wires and nails), household and office waste.
Refuse shall be collected and stored in demarcated, fenced areas in skips and/or bins. The fenced areas or containers should be designed to prevent refuse from being blown out by wind and should be strategically and conspicuously placed throughout the site.

Wherever possible waste that is recyclable is to be recycled.

3.9.11.4 Hazardous wastes

Definition*:* Hazardous wastes are those which are proven to be toxic, corrosive, explosive, flammable, carcinogenic, radioactive, poisonous or as determined by the Hazardous Substances and Articles Act as amended. Hazardous waste products shall include, but shall not necessarily be limited to, cement, diesel, petroleum, oil and lubricants, explosives, drilling fluids, pesticides, concrete additives and water purification chemicals.
Discharges of hazardous chemicals (such as paint, turpentine and oil) on the site or to the stormwater system are prohibited, as declared under the Hazardous Substances and Articles Act as amended.

Potentially hazardous raw and waste materials shall be handled and stored on-site in accordance with the manufacturer's specification and relevant legal requirements.

All hazardous waste products shall be removed from site and disposed of in a manner, and at a site, approved by the Hazardous Substances and Articles Control Board.

3.9.12. Management of storm water and erosion

The aim is to minimise soil loss from the site due both to wind and water.

3.9.12.1 Stormwater

At all stages of the contract, stormwater control measures to the satisfaction of the into cross and side drains, does not cause erosion.

3.9.12.2. Rehabilitation

Resident Engineer shall be applied to keep soil on-site by minimising:

- erosion of temporary stockpiles of topsoil and permanent spoil dumps;
- erosion from construction roads, excavations and borrow pits;
- silt-laden run-off from all areas stripped of vegetation, including excavation surfaces and stockpiles of spoil and topsoil; □contaminated run-off from storage areas; thereby preventing it from entering water courses.

Natural stormwater run-off, which is not polluted by site operations, shall be diverted around spoil dumps and topsoil stockpiles. Where uncontaminated stormwater has accumulated in the

workings and needs to be pumped out, it must be disposed of into a watercourse in such a way that erosion does not occur along the course of its passage.

3.9.12.3. Control of erosion

At all stages of the contract, erosion of bare soil, other excavation surfaces and stockpiles of topsoil and spoil shall be prevented by the application of suitable erosion control measures.

Should erosion occur due to negligence on the part of the Contractor in applying the above measures, the Contractor will be responsible for reinstatement of the eroded area to its former state at his own expense. Any surface water pollution occurring as a result of this negligence will be cleaned up by the Contractor or a nominated clean up organisation at the expense of the Contractor.

Cross and side stormwater drainage measures shall be constructed on access and haul roads to the site and on roads within the site.

The Contractor shall ensure that run-off from access and haul roads, and that diverted

On completion of the works, the Contractor shall spread topsoil over the entire surface of all borrow areas and other exposed excavations specified by the Resident Engineer. He shall then plant these surfaces with indigenous grass and plants according to landscaping instructions. This work shall be completed within 30 days after completion of the construction activity, to the satisfaction of the Resident Engineeer

3.10.0 SCHEDULES TO BE PROVIDED BY TENDERER

3.9.1 Day work rates
3.9.2 General
3.9.3 Labour
3.9.4 Hire of plant
3.9.5 Materials
3.9.6 Constructional plant
3.9.7 Personnel to be employed on site
3.9.8 Similar works done
3.9.9 List of sub-contractors
3.9.10 Supply of materials
3.9.11 Program of work(Provisional)

3.11.0 BILLS OF APPROXIMATE QUANTITIES

3.11.1 PREAMBLE

The rates and prices in the Bill of Quantities shall be deemed to be full inclusive rates and prices for the finished work described under the respective items and to cover all labour, materials, temporary work, plant, on-cost items and other overhead charges, profit, and the general liabilities, obligations and risks arising out of the Conditions of Contract and the Specifications.

3.11.2 A rate or price is to be entered against each item in the Bill of Quantities against which a unit of measurements stated, whether quantities are stated or not. Any item which no rate or price is entered will be considered as covered by other rates and prices in the Bill and the rate or price has to be clearly highlighted as inclusive.

3.11.3 Except where expressly stated to the contrary all items are measured net in accordance with the drawings, no allowance being made for cutting, waste or contingent work, which will be deemed to have been provided for by the Tenderer in his rates and prices.

3.11.4 All quantities given in the Bill of Quantities are estimated only and will be subject to remeasurement during the progress or on completion of the Works. Quantities for materials are to be ordered from the working drawings, checked where necessary by the site measurements.

3.11.5 Directions and descriptions of work and material given in the Specification or other parts of the Tender documents are not necessarily repeated in the Bill of Quantities, and references to such documents made in the Bill are not necessarily comprehensive or complete.

3.11.6 All prime costs or daywork costs of materials in the Bill refer to cost delivered to site including any Sales Tax, duties, etc

3.11.7 These Bill of Quantities have been drawn up in accordance with the standard method of measurements of Civil Engineering Quantities Second Edition 1994 (ZCE Q2) approved by ZIE, The Federation of Civil engineering Contractors and the Zimbabwe Association of Consulting Engineers.

3.11.8 Contractors are required to use materials produced or manufactured in Zimbabwe provided that the price, quality and delivery of local materials is satisfactory.

3.11.9 Directions and descriptions of work and material given in the specification or other parts of the tender documents are not necessarily repeated in the bill of quantities and references to such documents made in the bill are not necessarily comprehensive or complete.

THE GOVERNMENT OF ZIMBABWE

BILLS OF QUANTITIES

PROPOSED OFFICE BLOCKS, GUARD HOUSES, ABLUTIONS BLOCKS, GANTRY AND CIVIL WORKS

AT FORBES BOARDER POST

IN

MUTARE

FOR

ZIMBABWE REVENUE AUTHORITY

ARCHITECTS, ENGINEERS AND QUANTITY SURVEYORS

MINISTRY OF LOCAL GOVERNMENT AND PUBLIC WORKS

P BAG 7755

CAUSEWAY

HARARE

OCTOBER 2022

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NOTICES TO BIDDERS

GENERALLY

These Bills of Quantities are to be read in conjunction with, and all workmanship and materials, unless otherwise describes, shall comply with the Ministry of Local Government and Public Works' "General Specification" revised in January 1978.

It is hereby made condition that the Contractor's submission of a tender based on these Bills of Quantities shall be accepted as proof that he is in possession of the above mentioned General Specification at the time of tendering and his tendered price was based on the requirements of such General Specification.

The Contractor is required to check the number of pages of all the documents, and all references thereto in Summary and the collections. Should any pages be missing or duplicated, or the figures or typing be indistinct, or the descriptions be ambiguous, he is to apply at once to the Ministry of Local Government and Public Works and have the same rectified.

Any errors or claims arising through the Contractor's failing to comply with the above will not be admitted after submission of his tender.

These Bills of Quantities are to be priced by the contractor and returned, fully priced in ink, only when his Tender is being considered for acceptance, and when called for by the Ministry of Local Government and Public Works.

SYSTEM OF MEASUREMENT

The method of measurement of these Bills of Quantities is in accordance with the general principles laid down in the System of Measurement of Building Work in Zimbabwe, third edition, dated 1st May 1985, as issued by the Zimbabwe Institute of Quantity Surveyors and Construction Industry Federation of Zimbabwe. This system may be modified in certain respects as described in these Bills of Quantities and it is to be understood that the system of measurement adopted in these Bills of

Quantities is the only system which will be recognised in connection with this Contract.

TRADE NAMES, ETC.

Where names, manufacturer's catalogue or reference numbers, etc., are used in these Bills of Quantities, the items referred thereto shall be of equal quality, specification and mass in all respects to those specified and approved for any substitution shall be obtained in writing from the Ministry of Local Government and Public Works before submission of tenders, otherwise the specified materials, fittings, etc. will be assumed to have been allowed for in the tender.

DRAWINGS

The following drawings have been used in the preparation of these Bills of Quantities, and may be seen at offices of Ministry of Local Government and Public Works.

Architectural drawings

DRAWING TITTLE	**PAPER SIZE**	**DRAWING No**
Forbes boarder post guard room		
Forbes boarder temporary office		
Forbes boarder ablutions		

SECTION 1 - PRELIMINARIES AND GENERALS

BILL NO. 1

PRELIMINARIES

NOTES TO TENDERERS

A The following Preliminaries shall apply to all tenders whether based on Bills of Quantities or on a Specification, issued by the Ministry of Local Government and Public Works.

B In the case of a tender based on Bills of Quantities the Tenderer should allow for all costs incurred in complying with these Preliminaries in the money column of this Bill and carry the total (if any) to the appropriate Summary in the Main Bills of Quantities, or as otherwise instructed in the Tender Documents.

C In the case of a Tender based on a Specification, the Tenderer should include for all costs and expenses in complying with these Preliminaries in his lump sum Tender figure for the work.

D In the case of a Contract based on a Specification those Preliminaries which refer to "Bills of Quantities", shall apply only where such term is synonymous with the term "Specification".

E The Specification or Bills of Quantities are to be read in conjunction with, and all workmanship and material, unless otherwise described, shall comply with the current edition of the Ministry of Local Government and Public Works "General Specification of Materials and Workmanship" and with any amendments thereto. It is hereby made a condition that the submission of a tender based on Bills of Quantities or a Specification issued by the Ministry of Local Government and Public Works shall be accepted as proof that the Tenderer was in possession of a copy of this "General Specification" and amendments thereto at the time of tendering and that his tender price was based upon the requirements of such "General Specification" and amendments thereto.

Carried to Collection $

A	No representation, explanation or statement which in any way alters the tender or contract documents, made prior to the acceptance of a tender or during the progress of the contract shall bind the Secretary for Local Government and Public Works unless such explanation, statement or alteration be made and confirmed under the signature of the Secretary for Local Government and Public Works.		
B	Should there be any doubt or obscurity as to the meaning of any particulars in the Specification, Bills of Quantities or Tender Documents, the Tenderer must obtain an explanation as to the true intent and meaning in writing from the Secretary for Local Government and Public Works before submitting his tender. No claim for extras arising from any doubt or obscurity will be admitted after the delivery of his tender.		
C	The Tenderer is required to check the number of pages in the Specification (and in the case of Bills of Quantities all pages and references thereto in the "Collections" and Summary), and should any pages or references thereto be missing or duplicated or the figures or typing be indistinct, he is to apply at once to the Secretary for Local Government and Public Works and have the same rectified. Any errors arising through the Tenderer failing to do this will not be admitted after the submission of his tender.		
D	The Contractor shall, when requested by the Secretary for Local Government and Public Works, deposit his Bills of Quantities fully priced out in ink with the Secretary for Local Government and Public Works, and on the basis of this Bill of Quantities all extras and ommissions will be valued. The Secretary for Local Government and Public Works shall be at liberty to call for such adjustments of individual rates and rectify discrepancies as he considers necessary provided that the Tendered Amount is not altered.		
	<u>CONDITIONS OF CONTRACT</u>		
E	The Tenderer is referred to the "Conditions of Contract" and if he considers any of the clauses (or any amplification thereof given below) in such Conditions involves expense not inluded elsewhere, he should inlude for same.		
	Carried to Collection	$	

A	Should the Tenderer not be in possession of the Ministry of Local Government and Public Works Standard Conditions of Contract, two copies will be issued to him on application being made.		
B	A Tenderer's failure to obtain a copy of the Conditions of Contract will not absolve him from complying with such Conditions.		
C	Clause No. 1: Scope of Contract.		
D	Clause No. 2: Drawings, Specifications and Bills of Quantities, etc.		
E	Clause No. 3: Local and Other Authorities' Notices and Fees.		
F	Clause No. 4: Setting Out of Works.		
G	Clause No.5: Materials and Workmanship to Conform to Description.		
H	Clause No. 6: Foreman.		
J	Clause No. 7: Access for Architect to Works.		
K	Clause No. 8: Clerk of Works.		
L	Clause No. 9: Ascertainment of Prices for Variations.		
M	Clause No. 10: Bills of Quantities.		
	Should the Contractor not affix any figures in the money column against any particular items, he shall write hyphens thus:- - against such items.		
	Carried to Collection	$	

All measurements, sizes and quantities throughout the Bills of Quantities are taken nett and should be held to mean the finished measurement and sizes, unless otherwise stated. The Quantities represent the actual nett quantities left in the building. The Contractor must allow in his prices for all cutting and waste, etc.

The Bills of Quantities are not to be used for the ordering of materials except at the Contractor's own risk. They have been prepared in order to enable the Contractor to furnish an estimate for the work and to provide unit rates for adjustment of variations.

No alterations, erasures or additions are to be made by the Tenderer in the text of the Bills of Quantities, and should any such alterations or additions be made the same will not be recognised and the text of the Bills of Quantities will be adhered to.

To assist the Tenderer in casting the various trades in these Bills of Quantities, sufficient space has been left at the end of each trade to enable him to cast each page separately, and carry the same to a column on the page in question under the heading of "Collection".

A Clause No. 11: Unfixed Materials when taken into account to be Property of the Government.

B Clause No. 12: Defects After Completion.

C Clause No. 13: Assignment or Sub-letting.

D Clause No. 14: Injury to Persons or Property.

(a) Injury to Persons: The Contractor is to allow for all costs and charges in taking out an Insurance Policy covering THIRD PARTY RISKS, in the joint names of the Government and the Contractor.

(b) Workmen's Compensation.
(c) Injury to Property.
(d) Damage resulting from riot or civil commotion.

Carried to Collection $

A	Clause No. 15: Insurance. The Contractor is to allow for all costs and charges in insuring the building against fire, for the full amount of the Contract plus 12½% to cover professional fees, from the commencement of work until the building is handed over. The policy is to be deposited with the Secretary for Local Government and Public Works and payments to the Contractor may be withheld until this Clause has been complied with.		
B	Clause No. 16: Occupation.		
C	Clause No. 17: Date of Possession and Completion.		
D	Clause No. 18: Damages for Non-completion.		
E	Clause No. 19: Delay and Extension of Time.		
F	Clause No. 20: Determination by Government.		
G	Clause No. 21: Determination by Contractor.		
H	Clauses No. 22 and 23: Nominated Sub-contractors and Suppliers. Where the Government becomes the nominated sub-contractor or the nominated supplier no cash discount will be allowed. When during the course of the contract the Government omits Provisional Sums included in the Bills of Quantities, Specification or Tender Documents for nominated sub-contractors or nominated suppliers and negotiates a separate contract for such work to be paid direct by the Government, the main Contractor shall allow such facilities and he shall be entitled to payment of profit and attendance at the rates included by him in the Bills of Quanties against the respective items, adjusted pro rata on the amount paid direct by the Government, but shall not be entitled to claim cash discount or compensation for loss thereof.		
	Carried to Collection		$

In the event of Provisional Sums for nominated sub-contractors' or suppliers' work being omitted in whole or in part, and such work not being otherwise carried out during the period of this contract all cash discount, profit and attendance shall be similarly omitted in whole, or in part pro rata.

A

Clause No. 24: Artists, Tradesmen and Works Outside the Contract.

The Government reserves the right at all times during the progress of the contract to let separate contracts for Specialists' work, or any other similar work not included in the Bills of Quantities, Specification or Tender Documents, and the main Contractor must grant access, and all facilities to such artists, tradesmen and others so engaged by the Government and such persons shall not be regarded as sub-contractors under this contract and no builders' discount or profit in respect thereof shall be payable to the Main Contractor, but in the event of attendance and making good being required payment will be made on a fair valuation of the services performed.

To assist the Contractor in arranging any attendance required, the Government may, when there is prior knowledge of specialist work, state in the Specification or Bills of Quantities the approximate value of such intended or existing separate contracts, but the inclusion of this information is for the Contractor's guidance only and shall not be deemed to be an amount included in the value of the Contract.

B

Clause No. 25: Certificates and Payment

The Contractor when requiring a progress payment, shall furnish the Secretary for Local Government and Public Works with an approximate statement of the work executed, detailed and priced under trades and based on his original tender.

In all cases where the Contractor requires payment for unfixed materials on the site, the application for a progress payment must be accompanied by a complete list of all such materials, signed by the Contractor and countersigned by the Clerk of Works. All such material shall become the property of the Government and shall not be taken away (except for use in the building) without the written permission of the Secretary for Local Government and Publi Works.

Carried to Collection $

Not more than 80% of the value of any materials on site will be included in progress payments and such payments will only be made for materials which are properly protected from weather and theft, and which have not, in the opinion of the Quantity Surveyor, been brought prematurely upon the site.

All monies due to the nominated sub-contractors or suppliers and which are included in the contractor's certificate shall be paid to the sub-contractors or suppliers by the Contractor within 21 days after the date of the certificate in which the sum due is included. in the event of such payment not being made within the above stipulated time, the Contractor shall lose all right to claim any cash discount on the monies involved and the Secretary for Local Government and Public Works reserves the right to deduct ALL sums of maney that are due to the said sub-contractors or suppliers from the Contractor's next certificate and pay them direct to the sub-contractors or suppliers.

It is a condition of this contract that the Government shall not be bound to pay (except under an Order of the Court) any monies due or to become due hereunder to any persons save the Contractor who shall not have the right to assign his rights to payment to any third party without first obtaining the written consent of the Government to such assignment.

A Clause No. 26: Wages

B Clause No. 27: Non-Payment of Certificates

Notwithstanding the provisions of Clause 25 of the "Conditions of Contract", the Government reserves the right to withhold retention money beyong the retention period until the Contractor has submitted to the Secretary for Local Government and Public Works all receipts in respect of monies due to nominated sub-contractors and nominated suppliers which have been included in payments made to the Contractor, and in the event of the Contractor failing to produce within 14 days of being asked in writing, conclusive evidence that such amounts have been fully paid, the Government shall have the right to make final payment direct to such sub-contractors or suppliers and to deduct the value thereof from the retention money, or other monies due under the Contract.

Carried to Collection $

A	Clause No.28: Surety Bond The Contractor is to allow for all costs and charges in taking out the surety bond.	
B	Clause No. 29: Corrupt Gifts and Payments of Commission.	
C	Clause No. 30: Photographs.	
D	Clause No. 31: Articles of Value or Antiquity.	
E	Clause No. 32: Patent Rights and Royalties. .	
F	Clause No. 33: Arbitration.	
	PRELIMINARIES AND GENERAL The tenderer is referred to section B, Preliminaries and General, Pages B.1 to B.9 of the General Specification and if he considers that any of the clauses or any amplification thereof given below involves expense not elsewhere included, he should include for same hereunder.	
	Clause B.1 Public Liability.	
G	1.1 Noise control.	
H	1.2 Nuisance. The Contractor shall make adequate provision by spraying, erecting screens or other suitable methods, against nuisance or damage by dust to all works under this Contract, to persons or property in the vicinity, and he will be held solely responsible for any complaints, damage or claims in this connection.	
J	1.3 Adjoining owners. The Contractor shall not in the execution of the Works enter upon or otherwise make use of any lands adjoining the site of the Works as demarcated on the site plan, without the consent in writing of the Secretary for Local Government and Public Works or without the consent of the owners of such adjoining lands, having been previously obtained, but shall (except with such consent) confine his operations within the site of the Works. No trespassing beyond the limits as	
	Carried to Collection	$

		above described will be allowed.	
A	1.4	Adjoining property.	
B	1.5	Police regulations.	
C	1.6	Statutory obligations.	
D	1.7	Notices, fees and charges.	
	Clause B.2	Prevention of Damage or Loss	
E	2.1	Locate existing services.	
F	2.2	Protect existing services.	
G	2.3	Damage to services.	
H	2.4	Fire precautions.	
J	2.5	Damage to roads.	
K	2.6	Repairs to roads.	
L	2.7	Clear roads Nothing shall be done by the Contractor or anyone employed by him that shall in anyway interfere with the free use by the public of any of the roads, gravel drives, paths, etc., within or approaching the site.	
M	2.8	Protect trees and shrubs.	
N	2.9	Replace trees and shrubs.	
O	2.10	Existing features. Make good or reinstate at the Contractor's expense all damage which may occur to gates, fences, buildings or other Government property existing upon the site.	
P	2.11	Existing damage.	
	Clause B.3	Management/administration Procedures	
Q	3.1	Programme.	
R	3.2	Submit.	
S	3.3	Submission	
		Carried to Collection	$

A	3.4	Receipt.		
B	3.5	Monitoring. The Contractor shall provide on site a carbon copy record book which shall provide one original and two copies in which shall be recorded all site visits and daily record of work done.		
C	3.6	Safety, health and welfare.		
D	3.7	Use of site.		
E	3.8	Site meetings.		
F	3.9	Minutes.		
G	3.10	Measurements.		
H	3.11	Labour return.		
J	3.12	Daywork vouchers.		
K	3.13	Order materials.		
	Clause B.4	Resources/Temporary Works and Services		
L	4.1	Locations.		
M	4.2	Temporary works.		
N	4.3	Roads.		
O	4.4	Buildings.		
P	4.5	SO's site office.		
Q	4.6	Storage for cement and lime.		
R	4.7	Sanitary accommodation for supervisory staff.		
S	4.8	Sanitary accommodation for artisan staff.		
T	4.9	Hoardings, gantries and scaffolding.		
U	4.10	Name boards.		
V	4.11	Telephones.		
W	4.12	Water. Allow for providing all water for the Works and for		
		Carried to Collection	$	

		sub-contractors, pay all fees and charges legally demandable and provide all necessary piping, taps and other fittings, storage tanks, etc. If this Contract embodies work at a Government building or institution where water is already lain on, the Contractor may by agreeing in writing with the Secretary for Local Government and Public Works, use the water from this supply. (Any connection to or extensions of the existing supply pipes must be provided at the Contractor's expense.) If permission be thus obtained and the Contractor uses the water from this source, he shall pay the Government (by deduction from the amount due under the contract) a sum equal to one quarter percent (¼%) of the final completed cost of the work executed under this contract as disclosed in the final statement, and shall allow in his price for water such amount as he considers necessary to cover this cost. The use of water from a Government supply is granted subject to the condition that the water used by the Contractor shall be for building purposes only and should the Government be satisfied that the Contractor is unduly wasting water and/or using water for any subsidiary purpose such as providing for living accommodation of his workmen on the site, the Government reserves the right to deduct from monies due under the contract their assessment of all such additional water used.	
A	4.13	Lighting and power. It is entirely the Contractor's responsibility to ascertain before tendering the availability of electricity and all costs and charges thereof, and no claim arising out of this clause will be considered after the submission of a tender.	
B	4.14	Plant.	
C	4.15	Sole use of plant.	
D	4.16	Removal of plant.	
E	4.17	Plant to comply.	
F	4.18	Protective clothing.	
		<u>Clause B.5</u> <u>Nominated Firms/Public Bodies</u>	
G	5.1	Prime cost or provisional sums. Where Provisional and Prime Cost Sums are included	
		Carried to Collection	$

for works to be performed, or materials supplied by nominated sub-contractors or suppliers, the Secretary for Local Government and Public Works will invite tenders (or may request the Contractor to obtain not less than three tenders) and direct the Contractor to accept a tender from a sub-contractor who will then become a nominated sub-contractor or supplier in terms of the Conditions of Contract: Clauses 22 and 23". The main Contractor will be entirely responsible for the proper and timely execution of the sub-contract and no contract will exist between the will nominated sub-contractor or supplier and the Government, and it is the responsibility of the main Contractor to ensure that the sub-contractor indemnifies the Contractor against the same obligations in respect of the sub-contract, as those for which the Contractor is liable in reslepect of the main contract.

The Contractor shall not order any materials for which Provisional or Prime Cost Sums are included without first receiving instructions in writing from the Secretary for Local Government and Public Works so to do.
so to do.

The Contractor will be required to produce all receipted invoices, if demanded by the secretary for Local Government and Public Works for the adjustment of accounts.

If items are reserved for work of a nature usually carried out by the Contractor in the course of his business, the Government may give the Contractor an opportunity of tendering for the same without prejudice to the Government's right to reject the lowest or any tender.

A 5.2 Sub-contractors.
The names of all sub-contractors (other than nominated) whom the Contractor proposes to employ shall be submitted to the Secretary for Local Government and Public Works for approval before the signing of the Contract. Such approval shall not be unreasonably withheld.

B 5.3 General Attendance.
Wherever the words 'allow for attendance" occur, it shall be deemed to cover all the Contractor's costs involved in the following:-

(a) For giving the sub-contractor every facility to enable him to execute his work in a workmanlike manner and in proper order and sequence.

Carried to Collection $

(b) For allowing the sub-contractor free use of all scaffolding and plant as may be reasonably required by him, and for erecting, shifting and removing as necessary such scaffolding and plant free of charge to the sub-contractor.

(c) For providing water or electricty required by the sub-contractor.

(d) For receiving, unloading, checking, and removing to store all the sub-contractor's materials, articles and fittings on arrival at the site, and where necessary for providing proper storage accommodation for the prevention of pilferage, damage, etc., returning all empties and packing of same carriage paid, and for hoisting or lowering materials, articles, or fittings to the requisite levels and positions in the the building.

(e) For agreeing with the sub-contractor proper and accurate working dimensions and other particulars and for obtaining from the sub-contractor full data and particulars as to the sub-contrctor's requirements, with particular regard to chases, recesses, mortices, notchings, holes, perforations, etc., and for obtaining full information from the sub-contractor to enable the Contractor to make proper arrangements and provisions during the general execution of the work for the receptopn of the sub-contractor's work. The cost of any alterations consequent upon the non fulfilment of the foregoing stipulations will be at the Contractor's sole expense.

(f) For all items, conditions or requirements with regard to the sub-contractor's work mentioned or described in the general Conditions of Contract, Specification and Preliminaries not specifically stated in the foregoing.

A 5.4 Supervision.

B 5.5 Programme.

Carried to Collection $

	Clause B.6 Quality/Testing/Approvals.		
A	6.1 Commodities.		
B	6.2 Manufacturer's Recommendations.		
C	6.3 Standards.		
D	6.4 Single Sources.		
E	6.5 Samples of commodities.		
F	6.6 Samples of work.		
	Clause B.7 Accuracy/Setting Out.		
G	7.1 Set out the works.		
H	7.2 Profiles.		
J	7.3 Permanency.		
K	7.4 Instruments.		
L	7.5 Check all dimensions.		
M	7.6 Dimensions.		
	Clause B.8 Protection.		
N	8.1 Safeguard the site. Provide all necessary barriers, hoardings, footways, etc., and provide all necessary watching and lighting as required for the protection of the Works and materials and plant on the site, and for the protection of the public. The Contractor will be held responsible for all injury or accident that may happen through failure to provide adequate protection and lighting.		
O	8.2 Inclement weather.		
P	8.3 Stormwater and surface water. The Contractor must satisfy himself as to the quantities of subsoil and surface water to be dealt with and is to keep the building foundations and work generally clear of surface, subsoil and stormwater by baling, pumping or otherwise. Provide for dealing with springs, underground streams, etc., which may be opened up and provide all necessary pipes and machinery sufficient for the above purposes, and an ample supply		
	Carried to Collection	$	

	of power, and apply the same as necessary to enable all operations to be promptly and efficiently performed, including night and day attendance and work as necessary.		
A	8.4 Overloading.		
B	8.5 Cleanliness.		
C	8.6 Damage by sunlight.		
D	8.7 Datum.		
	Clause B.9 Prefabricated Elements.		
E	9.1 Delivery.		
F	9.2 Check fixings.		
G	9.3 Authorise erection.		
H	9.4 Notice.		
	Clause B.10 Work at Completion.		
J	10.1 Clean the works.		
K	10.2 Cleaning.		
L	10.3 Remove.		
M	10.4 Painted surfaces.		
N	10.5 Moving parts.		
O	10.6 Security at completion.		
P	10.7 Making good defects.		
Q	10.8 Maintenance instructions.		
	Clause B.11 Miscellaneous.		
R	11.1 Photographs.		
S	11.2 Articles of value or antiquity.		
	Carried to Collection	$	

A VISIT SITE

The Contractor must visit the site of the Works before submitting his tender and carefully examine the conditions that exist, and he is to satisfy himself as to the nature of the materials to be excavated as well as all natural conditions, water and light services, transport facilities, etc. No allowance will be made in the event of conditions being different from what he expected.

B FLUCTUATIONS IN COSTS

1) Where applying to nominated sub-contractors or suppliers

Where the following provisions for fluctuations in wages, cost of living allowances or prices of materials are applicable to a nominated sub-contractor or nominated supplier, the additional payments to them are to be regarded as a reimbursement of expense only, upon which the contractor shall not be entitled to claim any additional pro rata profit in terms of Clause 25 (e) of the conditions of contract.

2) Fluctuations in wages and cost of living allowances

The Contractor is to pay not less than the recognised Standard Rate of wages and Allowances to all employees.

If at any time between the date of delivery of the Contractor's tender and the date for the completion of the Works any statutory fluctuation (i.e. any specific increase or decrease stipulated by the Government Gazette) takes place in the Standard Rate of Wages, Cost of Living Allowances, or other statutory compulsory contribution in respect of the men employed on the Works covered by this Contract, whether on the site or in the workshops or yards of the Contractor or sub-contractors (but not in respect of merchants or suppliers), the Contractor is to submit WEEKLY to the Secretary for Local Government and Public Works receipted time sheets, together with aweekly return of the number of hours worked, signed by the Foreman and countersigned by the Clerk of Works, and the contract price shall be adjusted in accordance with the statutory fluctuation. Variations, if any, made under this clause shall be a nett increase or increase or decrease, and no allowance will be made for any profit whatsoever. No claims will be admitted in respect of labour employed after the expiration of the contract completion date or any ammendments thereto under Clause 19 of the Conditions of contract.

Carried to Collection $

3) Fluctuations in prices of materials

Should any statutory fluctuation (i.e. any secified increase or decrease in control prices of materials stipulated by notices published in the Government Gazette) take place after the date of delivery of the Contractor's tender, the Contractor is to submit invoices for such materials certified by the Clerk of Works and the contract price shall be adjusted in accordance with the statutory fluctuation. Such variations, if any, made under this clause shall be a nett increase or decrease, and no allowance will be made for any profit whatsoever.

The term "statutory fluctuation" is accepted to cover variation in custom duty or other Government tax, duty or surcharge only when detailed in the relevant Act of Parliament or statutory notices as payable direct on specified building materials and items incorporated in a building structure but will not be accepted to cover any indirect variation of costs or overheads, etc., of the Contractor, sub-contractors, merchants or suppliers, arising from fluctuations in such items as railage, shipping rates, insurance, postage, dock dues, clearance charges, transport, power and fuel costs, etc., whether arising directly or indirectly from Government action.

No claims will be admitted under this Clause for statutory fluctuations coming into effect after the expiration of the contract completion date or any amendments - theretp under Clause 19 of the Conditions of Contract.

If the Contractor wishes to be protected against fluctuations in cost of any basic materials he is to attach to the Form of Tender a list of such materials and prices in respect of which he wishes to be protected. Such prices to be those upon which he bases his tender.

In support of these prices, the Contractor is to furnish with his tender bona fide current merchants quotations (for quantities as required for the job).

The prices actually paid must be substantiated by receipted invoices, and all adjustment will be nett with no allowance for profit, provided that if the variations are positive then the Contractor may add not more than 5% to the nett amount.

At completion of the works the Contractor will be required to substantiate the quantities used and the prices actually paid for all items listed in order that Government may benefit for any decrease in price that may have occured.

Carried to Collection $

Orders for materials as listed shall have been placed within a reasonable time after the date of acceptance of the tender, otherwise no adjustment will be made. Such time to be mutually agreed when the tender is provisionally accepted.

All delivery notes for materials as listed must be certified by the Clerk of Works as having been delivered to the site, and shall be submitted to the Secretary for Local Government and Public Works failing which no adjustment will be made.

Where no materials have been listed the tender shall be treated as a firm tender.

Dumping duties are not acceptable as fluctuations, and it is a condition of the tender that any dumping duty levied at an time on items and goods incorporated in this contract shall be payable by the successful tenderer, and not recoverable from the government.

A AGREED WORKING HOURS

No work of any kind or description shall be done outside the agreed working hours of the building industry except such as shall be unavoidable or absolutely necessary for the saving of life or property, or the safety and protection of the works. Should the Contractor desire to execute any work outside the agreed working hours of the building industry, he shall first obtain the permission of the Secretary for Local Government and Public Works and any work executed outside such hours without the written permission having been first obtained will not be paid for, or if the Secretary for Local Government and Public Works desires the same taken out or pulled down and removed.

B DISMISSAL OF INCOMPETENT WORKMEN

The Contractor shall on the request of the Secretary for Local Government and Public Works immediately dismiss from the works any persons employed thereon who may, in the opinion of the Secretary for Local Government and Public Works be incompetent or miscounduct himself, or is likely to cause or who has caused strikes, disturbances or delays, and such persons shall not again be employed on the works without permission from the Secretary for Local Government and Public Works.

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COLLECTION

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BILL NO. 1: PRELIMINARIES
CARRIED TO SUMMARY PAGE OF MAIN BILL $

....
SIGNATURE OF CONTRACTOR DATE

SECTION 2 - OFFICE BLOCK

	BILL NO.2				
	FOUNDATIONS (PROVISIONAL)				
	(For Preambles see General Specification)				
	Note: Foundations have been measured to top of surface bed.				
	SITE CLEARANCE				
A	Clear site of all rubbish, bushes, shrubs, undergrowth, hedges, small trees, stumps, roots,	m^2	266		
B	Cut down and remove tree exceeding 500 and not exceeding 1000 mm girth measured 1000 mm above ground level including grubbing up roots and filling in holes.	no.	3		
C	Ditto tree exceeding 1000 mm and not exceeding 2000 mm ditto.	no.	3		
	EXCAVATION				
	Pumping and bailing				
D	Allow for the keeping excavations free of storm, surface and mud by pumping and bailing.	item	1		
E	Excavate over site to remove vegetable soil average 150 mm deep and deposit on site not exceeding 100 metres.	m^2	202		
F	Disposal of topsoil	m^3	31		
	Carried to collection				

	Excavate in pickable earth for				
A	Reduced levels not exceeding 2 metres deep.	m^3	31		
B	Surface trenches not exceeding 2 metres deep.	m^3	69		
C	Allow for searching and excavation all ants' nests below ground level, treating with "Shelldrite Ant Poison "fill in and well ram selected excavated material and consolidate.	m^3	1		
D	Extra over excavation in pickable material for excavation in hard pickable material.	m^3	20		
E	Ditto excavation in rock.	m^3	13		
	Planking and strutting				
F	Allow for maintaining and supporting sides of all excavations and making good all slips.	m^2	287		
	Disposal				
G	Redig from spoil heap, return, fill and well compact selected excavated material around foundations to 95% L.C.E. density.	m^3	33		
H	Redig from spoil heap and cart off site.	m^3	68		
	Carried to collection				

	Formation				
A	Scarify ground to a depth of 150 mm and compact to 95% L.C.E. density.	m^2	202		
B	Selected and approved clean, hard, non-expansive granular filling supplied and brought onto site by the contractor well watered and mechanically compacted under ground slabs in layers of 150 mm thick to 90% HCE density	m^3	62		
	SUNDRIES				
C	250 Micron black polythene sheeting well lapped at joints including all cutting and waste (measured nett) laid over filling to receive concrete.	m^2	202		
	TERMITES				
D	Termite treatment as described to top of filling and foundation walls with "Shelldrite Ant Poison" by a specialist company and provide a written 10 year guarantee.	m^2	202		
	PLAIN CONCRETE				
	Concrete (Grade 30MPa) in				
E	Footings.	m^3	16		
F	Ground floor slabs.	m^3	19		
	Sundries				
G	Strike off and cure top of concrete.	m^2	202		
	Carried to collection				

	Welded fabric reinforcement of approved manufacture including all cutting, tying, placing in position with necessary temporary supports and minimum 300 mm laps both ways (measured nett)				
A	Ref. S193 (mass of 1.93 kg/square metre) in top reinforcement to slab.	m²	186		
	BRICKWORK				
	Brickwork in approved common bricks in cement mortar as described				
B	Half brick wall.	m²	68		
C	One brick wall.	m²	56		
	Reinforcement				
	Brickforce lapped at joints and junctions and building in as the work proceeds (measured nett)				
D	Ref. C1 in half brick walls.	m	261		
E	Ref. C2 in one brick walls.	m	215		
	Carried to collection				

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	BILL NO.2: FOUNDATIONS (PROVISIONAL) CARRIED TO SUMMARY		

	BILL NO.3				
	CONCRETE, FORMWORK AND REINFORCEMENT				
	(For Preambles see General Specification)				
	STRUCTURAL CONCRETE				
	Vibrated reinforced concrete Grade 30 Mpa in				
A	Beams	m^3	1		
	Formwork Class A as described to				
B	Soffit of beams, lintels.	m^2	1		
C	Sides of beams, lintels.	m^2	2		
	REINFORCEMENT				
	Mild and high tensile steel reinforcement to concrete including all bending, hooked ends, binding wire and temporary supports.				
D	High yield deformed steel reinforcement bars all sizes.	kg	21		
	Sundries				
E	Strike off and cure top of concrete.	m^2	1		
	Carried to collection				

	PRECAST CONCRETE				
	Lintels				
A	115 x 170 x 1273mm long	no	10		
B	115 x 170 x 1460mm long	no	1		
C	230 x 170 x 990mm long	no	2		
D	230 x 170 x 2000mm long	no	6		
E	230 x 170 x 2060mm long	no	1		
F	230 x 170 x 2330mm long	no	6		
G	230 x 170 x 2950mm long	no	9		
	Dripstones				
H	Rainwater dripstone 200 mm wide and 120 mm thick and 800 mm long with segmental channel formed in top and place in position.	no.	4		
	TESTING				
I	Allow for carrying out slump tests when directed as described.	item	1		
	Carried to collection				

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BILL NO.3: CONCRETE, FORMWORK AND REINFORCEMENT CARRIED TO SUMMARY

	BILL NO.4				
	BRICKWORK				
	(For Preambles see General Specification)				
	SAMPLES				
A	Allow for providing samples of all bricks as described.	item	1		
	BRICKWORK				
	Brickwork in approved common bricks in cement mortar as described				
B	Half brick wall.	m²	203		
C	Half brick in beam filling.	m²	11		
D	One brick wall.	m²	125		
	SUNDRIES				
E	Bed wall plate in cement mortar.	m	61		
F	1,25 mm Galvanised hoop iron tie 25 mm wide and 1000 mm long one end built into brickwork or cast into concrete and other end wrapped around and spiked to wall plate and foot of truss.	no.	82		
G	230 x 150 mm Terra Cotta louvred and gauze backed external air brick and building into brick wall.	no.	46		
H	230 x 150 mm cast plaster internal air brick and building into opening in plastered wall.	no.	46		
I	Precast terrazzo external cill with brashed finish.	m	44		
J	Softwood internal cill.	m	44		
	Carried to collection				

	DAMP PROOF COURSE				
	One layer of three ply bituminous felt sheeting as damp proof course as described, well lapped at joints and junctions (measured nett)				
A	On half brick walls.	m²	9		
B	On one brick walls.	m²	14		
C	Under cills.	m²	6		
	REINFORCEMENT				
	Brickforce lapped at joints and junctions and in as the work proceeds (measured nett)				
D	Ref. C1 in half brick walls.	m	629		
E	Ref. C2 in one brick walls.	m	368		
	BUILDING IN				
F	Set up in position, cross brace and build in steel door frame not exceeding 5 square metres.	no.	11		
	Leave or form opening through one brick wall including temporary centering to flat soffits of brickwork complete with all strutting, shoring not exceeding 5 metres high, bolting, wedging easing, striking and removing				
G	Opening for Purpose made aluminium doors not exceeding 5 square metres in area	no.	23		
	Carried to collection				

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BILL NO.4: BRICKWORK
CARRIED TO SUMMARY

BILL NO.5

ROOF COVERINGS

(For Preambles see General Specification)

0.6 mm Chromadek roof sheeting to be fixed in strict accordance with the manufacturer's printed instructions, on timber purlins at 900 mm centres including all square cutting and waste

A	Roofing sheets to be fixed on softwood purlins.	m²	235		
B	Ridge or hip capping.	m	43		
C	Two layers of alucushion insulation half lapped.	m²	235		

BILL NO.5: ROOF COVERINGS CARRIED TO SUMMARY

	BILL NO.6				
	CARPENTRY				
	(For Preambles see General Specification)				
	PREFABRICATED ROOF TRUSSES				
	The trusses are to be "Gangnail" Hydronail or other equal and approved prefabricated timber trusses with all members in the same plane and jointed together with steel plate nails. All timbers are to be sw.				
	The roof is to be created in accordance with the drawings.				
	Prices are to include for all necessary trusses and bracing, and for hoisting and fixing in position.				
	The roof is designed to carry chromadeck roofing sheets and, plasterboard ceilings with trusses spaced at approximately 1200 mm centres and the contractor may be required to produce all design calculations for checking, notwithstanding which , he will be held responsible for the sufficiency of the design.				

A	Trusses, necessary hips, jack rafters, bracing, purlins etc fixed complete as per drawings	item	1		
	Sawn softwood				
B	38 x 114 mm wall plate.	m	61		
	EAVES AND VERGES				
C	225 x 12 mm cement fibre fascia board	m	64		
	BILL NO.6: CARPENTRY CARRIED TO SUMMARY				

	BILL NO.7				
	JOINERY AND IRONMONGERY				
	(For Preambles see General Specification)				
	CEILINGS				
A	6 mm plasterboard ceiling boarding (plaster finish elsewhere measured) and fixing to and including 50 x 25 mm sawn softwood brandering at 400mm centres one way next wall and at end joints, skew nailed in opposite directions to roof timbers (elsewhere measured) including covering all joints with and including 75 mm wide strip of scrim planted on including all square cutting and waste	m^2	186		
	Cornices				
B	75mm Rhino coved cornice including mitres, etc.	m	208		
	DOORS				
	Semi-solid core internal quality flush doors with venner suitable for painting both sides.				
C	44 mm Door. Size 813 x 2030 mm.	no.	10		
D	44 mm Door. Size 1000 x 2030 mm.	no.	1		
	Solid core external quality fire rated flush doors with veneer suitable for painting both sides				
E	44 mm Double door. Size 1600 x 2030 mm.	no.	1		
	Carried to collection				

	IRONMONGERY				
A	Union No. CZ682 - 24 - 95CH two lever mortice lockset.	no.	11		
B	Union No. CZ682 - 24 - 77CH three lever mortice lockset.	no.	1		
	BUILT IN CUPBOARDS (PROVISIONAL)				
C	Provide a sum for the installation of kitchen cupboards with granite vanity top executed complete as per drawings and specifications.	item	1		
	Wrot hardwood miscellaneous items				
D	19 x 76mm Wrot Meranti skirting plugged to wall including 19mm quadrant.	m	143		
	Carried to collection				

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BILL NO.7: JOINERY AND IRONMONGERY
CARRIED TO SUMMARY

	BILL NO.8				
	METALWORK (For Preambles see General Specification) STANDARD DOOR FRAMES				
	Standard full profile pressed steel door frames with chromium plated striking plates where appropriate (building in elsewhere measured)				
	To suit half brick wall (P.B.S.) for				
A	44 mm Door size 813 x 2030 mm.	no.	2		
B	44 mm Door size 813 x 2030 mm with fanlight size 305 x 813mm.	no.	8		
C	44 mm Door size 1000 x 2030 mm.	no.	1		
	To suit one brick wall (P.B.S.) for				
D	44mm Door size 832 x 2030 mm.	no.	2		
	PURPOSE MADE ALUMINIUM WINDOWS AND FRAMES AS DESCRIBED (BUILDING IN ELSEWHERE MEASURED) INCLUDING				
	The whole to be executed by an approved firm of specialists. (Refer to the Window Schedule for type in parenthis)				
E	Window type AC5F size 530 x 950 mm high with and including 4-6mm obsure laminated glass.	no.	2		
F	Window type AZC4 size 1870 x 950 mm high with and including 4-6mm clear laminated glass.	no.	6		
G	Window type W1 size 2490 x 1545 mm high with and including 4-6mm clear laminated glass.	no.	9		
H	Window type W2 size 1540 x 350 mm high with and including 4-6mm clear laminated glass.	no.	6		
	BILL NO.8: METALWORK CARRIED TO SUMMARY				

	BILL NO.9				
	PLASTERING AND WALL LININGS				
	(For Preambles see General Specification)				
	EXTERNALLY				
	One coat cement plaster (1:4) as described including all labours with a fine woodfloat finish on				
A	Walls.	m²	125		
B	Ditto in narrow widths.	m²	11		
	INTERNALLY				
	One coat cement/sand plaster (1:4) and set in rhinoset plaster with woodfloat finish on to the following surfaces				
C	Walls.	m²	531		
D	Ditto in narrow widths.	m²	11		
	Two coats “Rhinobond” plaster and one skimming coat of “Rhinoset” plaster applied with an approved flicking machine to give a tyrolean finish to an even thickness to the Architect approval on plasterboard				
E	Ceilings	m²	186		
	Carried to collection				

A	Extra for 50 mm wide steel trowelled margin to edge of ceiling	m	208		
	<u>Sundries</u>				
B	150 x 150 mm recessed type toilet roll holder with spring loaded removable wood spindle and building into plastered brickwork.	no.	2		
	Carried to collection				

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BILL NO.9: PLASTERING AND WALL LININGS CARRIED TO SUMMARY

	BILL NO.10				
	PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC				
	(For Preambles see General Specification)				
	SCREEDS				
	Cement and sand screed (1:4) finished to a true and even surface				
A	40 mm thick screed to receive ceramic tiles.	m²	22		
B	40 mm screed to receive carpet	m²	159		
C	Untinted granolithic finish as described including all labours	m²	5		
D	100 mm high skirting with cove at junction with floor and square top edge, including mitres, etc.	m	9		
	CERAMIC FLOOR TILES				
	300 x 300mm Ceramic tiles with non-slip surface, as in "Samca Tiles" or similar approved, colour from manufacturer's standard colour range, on adhesive to manufacturer's recommendation and 3mm wide grout joints.				
E	Tiles laid on floors.	m²	22		
F	100 mm Skirting.	m	36		
	Carried to collection				

	CARPETS				
A	"Berber Point" carpets or equal approved 100% poly proylene stable fibre plain backed carpets on screed (elswhere measured).	m²	159		
B	Raking cutting	m	43		
	Sundries				
C	3 x 40mm Aluminium division strip set in position between different floor finishes.	m	4		
	Carried to collection				

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	BILL NO.10: PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC CARRIED TO		

BILL NO.11

PLUMBING (PROVISIONAL)

(For Preambles see General Specification)

RAINWATER DISPOSAL AND FLASHINGS

PVC as described in

A	100 mm Diametre semi-circle section eaves gutter on brackets as described to fascia boards.	m	64		
B	100 mm Dia stop ends.	no.	4		
C	Extra for angle.	no.	4		
D	Ditto outlet with nozzle for and joint to 100 mm Dia rainwater down pipe.	no.	4		
E	100 mm Diameter rainwater pipe fixed 38 mm clear of wall with holderbats.	m	13		
F	Extra for shoe.	no.	4		
G	Ditto eaves offset.	no.	4		
	SANITARY FITTINGS				
H	510 x 405 mm white glazed vitreous china wash hand basin with concealed brackets, complete with integral overflow, chromium plated outlet, plug and chain, pair of 15 mm chromium plated colour coded pillar taps, bolt to brackets to wall and connect up.	no.	2		

Carried to collection

A	Approved low level W.C. Suite comprising white glazed vitreous china pan with "P" trap, plastic double flap seat , 14 litre cistern and white plastic flush pipe, bolt to cistern to wall, fix pan to concrete flooor and connect up.	no.	2		
B	Citi Metal Series double bowl overlay stainless steel sink unit, size 1500 x 535mm, complete with integral overflow, chromium plated waste outlet, plug, chain and backnut, with turndown at edge; tap set in position and including fixing one pair of Citi metal 25 x 25 mm galvanised mild steel gallows, square fixing (code SGB)	no.	1		
	SANITARY PLUMBING				
	"Promat" or equal rigid P.V.C. waste piping with solvent cement and joints and fitting as described				
C	110 mm diameter pipe laid in ground including excavating in trench not exceeding 2 metres deep and fill in and ram and cart off site surplus material.	m	2		
D	50 mm diameter pipe laid under floors	m	3		
E	50 mm diameter pipe fixed to walls.	m	4		
	Carried to collection				

	Extra on P.V.C. piping for				
A	50 mm bend.	no.	3		
B	50 mm bend with inspection eye.	no.	3		
C	110 mm bend.	no.	2		
D	110 mm bend with inspection eye.	no.	2		
E	110mm Inspection junction.	no.	2		
F	110mm Reducing junction.	no.	1		
G	110 mm Straight pan connector and joint to W.C. pan.	no.	2		
H	110 mm P.V.C. vent cowl and fixing to top of 110 mm diameter pipe.	no.	1		
I	Assembled gulley trap with 110 mm diameter outlet connected to drain and gulley head with universal back inlet and removable grate.	no.	1		
J	Joint small pipe to gulley.	no.	1		
K	Ditto large pipe to gulley.	no.	1		
	Traps				
L	32 - 40 mm diameter "Flexitrap" or equal "P" trap and joint to fitting and P.V.C. pipe.	no.	4		
	Carried to collection				

	HOT AND COLD WATER RETICULATION				
	Copper tubing as described				
A	15 mm diameter pipe fixed to walls.	m	1		
B	15 mm ditto to walls in and including chase.	m	5		
C	20 mm diameter pipe fixed to walls.	m	2		
D	20 x 15 mm reducer.	no.	1		
E	15 mm elbow.	no.	5		
F	20 mm elbow.	no.	1		
G	20 x 15 x 20 mm tee.	no.	1		
H	20 mm socket union.	no.	1		
I	15 mm diameter bent connector	no.	5		
J	15 mm swivel elbow.	no.	1		
K	15 mm socket union.	no.	2		
	Brasswork				
L	15 mm diameter brass high pressure screw down stop cock and joints to copper pipe.	no.	3		
M	25 mm diameter brass or equal high pressure undertile stopcock, and joint to copper pipe.	no.	1		
	Carried to collection				

	PVC pipes as described				
A	22 mm diameter pipe fixed to walls.	m	1		
B	22 mm ditto to walls in and including chase.	m	1		
C	22 mm diameter pipe underground.	m	4		
D	22 x 20 mm reducer.	no.	1		
E	22 mm elbow.	no.	1		
F	22 mm socket union.	no.	1		
	FIRE SERVICE INSTALLATION				
	Galvanised Iron Pipes to BS 2871				
G	50mm service pipe fixed to walls, etc	m	4		
H	Ditto, but under concrete surface beds	m	2		
I	Ditto, but in trench not exceeding 1 metre deep	m	12		
	Extra over galvanised pipes for fittings				
J	50mm Bend	no.	3		
K	50 mm tee	no.	1		
L	50mm Socket	no.	1		
M	50mm Isolating valves and jointing to pipes	no.	2		
	Carried to collection				

	Sundries				
A	Approved fire hose reel of the swinging type holding 30m long 25mm bore non-kink rubber hose with nozzle and cock, complete with inlet valve with hand wheel marked to show direction of opening (the reel assembly shall have been tested to a pressure of at least 14 bars) and roller or bead type hose guide with check plates free of sharp edges and finished in red enamel and with all bright fittings chromium plated complete and fixed in position to wall including jointing to water supply	no.	1		
B	Approved 9 litre water-gas fire extinguisher including fixing backing plate to wall	no.	2		
C	Approved 9kg dry powder fire extinguisher including fixing backing plate to wall	no.	2		
	BUILDER'S WORK IN CONNECTION WITH PLUMBING (PROVISIONAL)				
I	Chase brickwork for small pipe and flush up in cement mortar (1:3).	m	6		
	Hole for small pipe including making good through				
J	Half brick wall.	no.	1		
K	One brick wall.	no.	5		
	Hole for large pipe including making good through				
L	One brick wall.	no.	2		
	TESTING				
M	Allow for the testing of all the Plumber's work to the satisfaction of the Engineers and for the retesting after making good defects.	item	1		
	Carried to collection				

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BILL NO.11: PLUMBING (PROVISIONAL)
CARRIED TO SUMMARY

	BILL NO.12				
	GLAZING				
	(For Preambles see General Specification)				
	Mirrors				
A	6 mm clear float quality glass silvered and sealed mirror with bevelled edges sprayed on back with clear lacquer before fixing four times drilled for and plugged and screwed to plastered walls with and including chromium plated capped mirror screws and rubber washers, size 600 x 600 mm.	no.	2		
	BILL NO.12: GLAZING CARRIED TO SUMMARY				

	BILL NO.13				
	PAINTING				
	(For Preambles see General Specification)				
	ON PLASTER, ETC				
	Prepare and apply three coats external quality P.V.A. emulsion paint externally on				
A	Fine woodfloat plastered walls.	m²	125		
B	Fine woodfloat plastered walls in narrow widths	m²	11		
	Prepare and apply three coats internal quality P.V.A. emulsion paint internally on				
C	Steel trowelled plastered walls.	m²	531		
D	Ditto in narrow widths.	m²	11		
	Prepare and apply three coats internal quality ceiling white PVA paint internally on				
E	Ceilings	m²	186		
	Carried to collection				

	ON METAL				
	Clean down, touch up priming coat and apply one undercoat and two finishing coats high gloss enamel paint on				
A	Pressed door frames.	m²	14		
	ON WOOD, ETC				
C	Carbolineum saturate sawn softwood wall plate before fixing.	m²	19		
	Clean down, prime, stop and apply one undercoat and two finishing coats high gloss enamel pain on				
D	General surfaces of doors.	m²	44		
	LEAVE CLEAN				
E	Allow for touching up all work throughout, clean off all paint, oil, cement or other stains or marks, floors, ceilings, glass, etc. and leave all surfaces in full and proper working order.	item	1		
	Carried to collection				

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BILL NO.13: PAINTING
CARRIED TO SUMMARY

	BILL NO.14				
	SPECIALIST SERVICES				
	(For Preambles see General Specification)				
	PRIME COST SUMS				
	The Contractor shall allow for profit and Attendance after each Prime Cost Sum. Where no allowance has been made by the Contractor, it shall be assumed the allowance made by the Contractor, shall have been included elsewhere in the rates for other works.				
	Provide the following Prime Cost Sums for work to be executed and completed by Nominated Subcontractors				
A	Provide the sum of US$30,000.00 for electrical fittings and installations executed complete.	sum	1	30,000.00	
B	Profit	%			
C	Attendence	%			
	BILL NO.14: SPECIALIST SERVICES CARRIED TO SUMMARY				

SUMMARY

CARRIED TO MAIN SUMMARY

SECTION 3 - GUARD HOUSE

BILL NO.2

FOUNDATIONS (PROVISIONAL)

(For Preambles see General Specification)

Note: Foundations have been measured to top of surface bed.

SITE CLEARANCE

A	Clear site of all rubbish, bushes, shrubs, undergrowth, hedges, small trees, stumps,	m^2	64
B	Cut down and remove tree exceeding 500 and not exceeding 1000 mm girth measured 1000 mm above ground level including grubbing up roots and filling in holes.	no.	2
C	Ditto tree exceeding 1000 mm and not exceeding 2000 mm ditto.	no.	2

EXCAVATION

Pumping and bailing

D	Allow for the keeping excavations free of storm, surface and mud by pumping and bailing.	item	1
E	Excavate over site to remove vegetable soil average 150 mm deep and deposit on site not exceeding 100 metres.	m^2	42
F	Disposal of topsoil	m^3	7

Carried to collection

	Excavate in pickable earth for		
A	Reduced levels not exceeding 2 metres deep.	m^3	7
B	Surface trenches not exceeding 2 metres deep.	m^3	23
C	Allow for searching and excavation all ants' nests below ground level, treating with "Shelldrite Ant Poison "fill in and well ram selected excavated material and consolidate.	m^3	1
D	Extra over excavation in pickable material for excavation in hard pickable material.	m^3	5
E	Ditto excavation in rock.	m^3	3
	Planking and strutting		
F	Allow for maintaining and supporting sides of all excavations and making good all slips.	m^2	73
	Disposal		
G	Redig from spoil heap, return, fill and well compact selected excavated material around foundations to 95% L.C.E. density.	m^3	11
H	Redig from spoil heap and cart off site.	m^3	20

Carried to collection

	Formation		
A	Scarify ground to a depth of 150 mm and compact to 95% L.C.E. density.	m²	42
B	Selected and approved clean, hard, non-expansive granular filling supplied and brought onto site by the contractor well watered and mechanically compacted under ground slabs in layers of 150 mm thick to 90% HCE density	m³	14
	SUNDRIES		
C	250 Micron black polythene sheeting well lapped at joints including all cutting and waste (measured nett) laid over filling to receive	m²	42
	TERMITES		
D	Termite treatment as described to top of filling and foundation walls with "Shelldrite Ant Poison" by a specialist company and provide a written 10 year guarantee.	m²	42
	PLAIN CONCRETE		
	Concrete (Grade 30MPa) in		
E	Footings.	m³	6
F	Ground floor slabs.	m³	4
	Sundries		
G	Strike off and cure top of concrete.	m²	42
	Carried to collection		

	Welded fabric reinforcement of approved manufacture including all cutting, tying, placing in position with necessary temporary supports and minimum 300 mm laps both ways (measured nett)		
A	Ref. S193 (mass of 1.93 kg/square metre) in top reinforcement to slab.	m²	36
	BRICKWORK		
	Brickwork in approved common bricks in cement mortar as described		
B	Half brick wall.	m²	9
C	One brick wall.	m²	26
	Reinforcement		
	Brickforce lapped at joints and junctions and building in as the work proceeds (measured		
D	Ref. C1 in half brick walls.	m	36
E	Ref. C2 in one brick walls.	m	103
	Carried to collection		

COLLECTION	PAGE
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BILL NO.2: FOUNDATIONS (PROVISIONAL) CARRIED TO SUMMARY

BILL NO.3

CONCRETE, FORMWORK AND REINFORCEMENT

(For Preambles see General Specification)

PRECAST CONCRETE

Lintels

A	115 x 170 x 1273mm long	no	3
B	230 x 170 x 1273mm long	no	1
C	230 x 170 x 990mm long	no	2
D	230 x 170 x 2330mm long	no	1
E	230 x 170 x 2950mm long	no	2

Dripstones

F	Rainwater dripstone 200 mm wide and 120 mm thick and 800 mm long with segmental channel formed in top and place in position.	no.	4

Carried to collection

	STRUCTURAL CONCRETE		
	Vibrated reinforced concrete Grade 25 Mpa in		
A	Beams	m^3	1
	Formwork Class A as described to		
B	Soffit of beams	m^2	2
C	Sides of beams	m^2	2
	REINFORCEMENT		
	Steel bar reinforcement		
D	High yield deformed steel reinforcement bars all sizes.	kg	30
	Sundries		
E	Strike off and cure top of concrete.	m^2	5

Carried to collection

COLLECTION	PAGE
	60
	61

BILL NO.3: CONCRETE, FORMWORK AND REINFORCEMENT CARRIED TO SUMMARY

BILL NO.4

BRICKWORK

(For Preambles see General Specification)

SAMPLES

A	Allow for providing samples of all bricks as described.	item	1

BRICKWORK

Brickwork in approved common bricks in cement mortar as described

B	Half brick wall.	m²	23
C	Half brick in beam filling.	m²	5
D	One brick wall.	m²	62

SUNDRIES

E	Bed wall plate in cement mortar.	m	28
F	1,25 mm Galvanised hoop iron tie 25 mm wide and 1000 mm long one end built into brickwork or cast into concrete and other end wrapped around and spiked to wall plate and foot of	no.	37
G	230 x 150 mm Terra Cotta louvred and gauze backed external air brick and building into brick wall	no.	10
H	230 x 150 mm cast plaster internal air brick and building into opening in plastered wall.	no.	10
	Precast terrazzo external cill with brashed finish.	m	8
	Softwood internal cill.	m	8

Carried to collection

	DAMP PROOF COURSE		
	One layer of three ply bituminous felt sheeting damp proof course as described, well lapped at joints and junctions (measured nett)		
A	On half brick walls.	m²	2
B	On one brick walls.	m²	7
C	Under cills.	m²	1
	REINFORCEMENT		
	Brickforce lapped at joints and junctions and bedding in as the work proceeds (measured nett)		
D	Ref. C1 in half brick walls.	m	82
E	Ref. C2 in one brick walls.	m	182
	BUILDING IN		
F	Set up in position, cross brace and build in steel door frame not exceeding 5 square metres.	no.	4
	Leave or form opening through one brick wall including temporary centering to flat soffits of brickwork complete with all strutting, shoring not exceeding 5 metres high, bolting, wedging easing, striking and removing		
G	Opening for Purpose made aluminium windows not exceeding 5 square metres in area.	no.	5
	Carried to collection		

COLLECTION	PAGE
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BILL NO.4: BRICKWORK
CARRIED TO SUMMARY

BILL NO.5

ROOF COVERINGS

(For Preambles see General Specification)

0.6 mm Chromadek roof sheeting to be fixed in strict accordance with the manufacturer's printed instructions, on timber purlins at 900 mm centres including all square cutting and waste

A	Roofing sheets to be fixed on softwood purlins.	m²	58		
B	Two layers of alucushion insulation half lapped.	m²	58		

BILL NO.5: ROOF COVERINGS CARRIED TO SUMMARY

BILL NO.6

CARPENTRY

(For Preambles see General Specification)

PREFABRICATED ROOF TRUSSES

The trusses are to be "Gangnail" Hydronail or other equal and approved prefabricated timber trusses with all members in the same plane and jointed together with steel plate nails. All timbers are to be sw.

The roof is to be created in accordance with the drawings.

Prices are to include for all necessary trusses and bracing, and for hoisting and fixing in position.

The roof is designed to carry chromadeck roofing sheets and, plasterboard ceilings with trusses spaced at approximately 1200 mm centres and the contractor may be required to produce all design calculations for checking, notwithstanding which , he will be held responsible for the sufficiency of the design.

A	Trusses, necessary hips, jack rafters, bracing, purlins etc fixed complete as per drawings	item	1		
	Sawn softwood				
B	38 x 114 mm wall plate.	m	28		
	EAVES AND VERGES				
C	225 x 12 mm cement fibre fascia board	m	30		

BILL NO.6: CARPENTRY
CARRIED TO SUMMARY

BILL NO.7

JOINERY AND IRONMONGERY

(For Preambles see General Specification)

CEILINGS

A	6 mm plasterboard ceiling boarding (plaster finish elsewhere measured) and fixing to and including 50 x 25 mm sawn softwood brandering at 400mm centres one way next wall and at end joints, skew nailed in opposite directions to roof timbers (elsewhere measured) including covering all joints with and including 75 mm wide strip of scrim planted on including all square cutting and waste	m^2	36
	Cornices		
B	50 x 25mm hardwood cornice planted on	m	46
	DOORS		
	Semi-solid core internal quality flush doors with venner suitable for painting both sides.		
C	44 mm Door. Size 813 x 2032 mm.	no.	3
	Solid core external quality flush doors with veneer suitable for painting both sides		
D	44 mm Door. Size 813 x 2030 mm.	no.	1

Carried to collection

	IRONMONGERY				
A	Union No. CZ682 - 24 - 95CH two lever mortice lockset.	no.	3		
B	Union No. CZ682 - 24 - 77CH three lever mortice lockset.	no.	1		
	CUPBOARDS				
C	Provide a sum for the installation of kitchen cupboards with granite vanity top executed complete as per drawing and specifications.	item	1		
	Carried to collection				

COLLECTION	PAGE
	68
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BILL NO.7: JOINERY AND IRONMONGERY CARRIED TO SUMMARY

BILL NO.8

METALWORK
(For Preambles see General Specification)

STANDARD DOOR FRAMES

Standard full profile pressed steel door frames with chromium plated striking plates where appropriate (building in elsewhere measured)

To suit half brick wall (P.B.S.) for

A	44 mm Door size 813 x 2032 mm.	no.	3

To suit one brick wall (P.B.S.) for

B	44mm Door size 813 x 2032 mm.	no.	1

PURPOSE MADE ALUMINIUM WINDOWS AND FRAMES AS DESCRIBED (BUILDING IN ELSEWHERE MEASURED) INCLUDING GLAZING

The whole to be executed by an approved firm of specialists. (Refer to the Window Schedule for type in parenthis)

C	Window type AC5F size 530 x 950 mm high with and including 4-6mm obsure laminated	no.	2
D	Window type AZC4 size 1870 x 950 mm high with and including 4-6mm clear laminated glass.	no.	1
E	Window type W1 size 2490 x 1545 mm high with and including 4-6mm clear laminated glass.	no.	2

BILL NO.8: METALWORK CARRIED TO SUMMARY

BILL NO.9

PLASTERING AND WALL LININGS

(For Preambles see General Specification)

EXTERNALLY

One coat cement plaster (1:4) as described including all labours with a fine woodfloat finish on

A	Walls.	m²	62
B	Ditto in narrow widths.	m²	3

INTERNALLY

One coat cement/sand plaster (1:4) and set in rhinoset plaster with woodfloat finish on to the following surfaces

C	Walls.	m²	100
D	Ditto in narrow widths.	m²	3

Two coats “Rhinobond” plaster and one skimming coat of “Rhinoset” plaster applied with an approved flicking machine to give a tyrolean finish to an even thickness to the Architect approval on plasterboard

E	Ceilings	m²	36

Carried to collection

A	Extra for 50 mm wide steel trowelled margin to edge of ceiling	m	46
	<u>Sundries</u>		
B	150 x 150 mm recessed type toilet roll holder with spring loaded removable wood spindle and building into plastered brickwork.	no.	1
C	150 x 150 mm white glazed ceramic recessed type soap dish and building into plastered brickwork including bedding in an approved tile adhesive and neatly pointing all round in white cement.	no.	1

Carried to collection

COLLECTION	PAGE
	72
	73

BILL NO.9: PLASTERING AND WALL CARRIED TO SUMMARY

BILL NO.10

PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC

(For Preambles see General Specification)

SCREEDS

Cement and sand screed (1:4) finished to a true and even surface

A	40 mm thick screed to receive ceramic tiles.	m²	36		

CERAMIC FLOOR TILES

600 x 600mm Ceramic tiles with non-slip surface, as in "Samca Tiles" or similar approved, colour from manufacturer's standard colour range, on adhesive to manufacturer's recommendation and 3mm wide grout joints.

B	Tiles laid on floors.	m²	36		
C	100 mm Skirting.	m	35		

Sundry

D	3 x 40mm Aluminium edge strip set in position.	m	5		

BILL NO.10: PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC CARRIED TO SUMMARY

BILL NO.11

PLUMBING (PROVISIONAL)

(For Preambles see General Specification)

RAINWATER DISPOSAL AND FLASHINGS

PVC as described in

A	100 mm Diametre semi-circle section eaves gutter on brackets as described to fascia	m	30
B	100 mm Dia stop ends.	no.	4
C	Extra for angle.	no.	4
D	Ditto outlet with nozzle for and joint to 100 mm Dia rainwater down pipe.	no.	4
E	100 mm Diameter rainwater pipe fixed 38 mm clear of wall with holderbats.	m	13
F	Extra for shoe.	no.	4
G	Ditto eaves offset.	no.	4

SANITARY FITTINGS

H	510 x 405 mm white glazed vitreous china wash hand basin with concealed brackets, complete with integral overflow, chromium plated outlet, plug and chain, pair of 15 mm chromium plated colour coded pillar taps, bolt to brackets to wall and connect up.	no.	1

Carried to collection

A	Approved low level W.C. Suite comprising white glazed vitreous china pan with "P" trap, plastic double flap seat , 14 litre cistern and white plastic flush pipe, bolt to cistern to wall, fix pan to concrete flooor and connect up.	no.	1
B	Citi Metal Series single bowl overlay stainless steel sink unit, size 533 x 500mm, complete with integral overflow, chromium plated waste outlet, plug, chain and backnut, with turndown at edge; tap set in position and including fixing one pair of Citi metal 25 x 25 mm galvanised mild steel gallows, square fixing (code SGB)	no.	1
C	Shower set comprising pair of 15 mm chromium colour coded undertile stopcocks, bridging piece, 900 mm copper riser with chromium plated arm and approved chromium plated rose including chasing into wall and joint one valve to copper pipes.	no.	1
	SANITARY PLUMBING		
	"Promat" or equal rigid P.V.C. waste piping with solvent cement and joints and fitting as		
D	110 mm diameter pipe laid in ground including excavating in trench not exceeding 2 metres deep and fill in and ram and cart off site surplus	m	3
E	50 mm diameter pipe laid under floors	m	3
F	50 mm diameter pipe fixed to walls.	m	4
	Carried to collection		

	Extra on P.V.C. piping for		
A	50 mm bend.	no.	3
B	50 mm bend with inspection eye.	no.	2
C	110 mm bend.	no.	1
D	110 mm bend with inspection eye.	no.	1
E	110mm Inspection junction.	no.	1
F	110mm Reducing junction.	no.	1
G	110 mm Straight pan connector and joint to W.C. pan.	no.	1
H	110 mm P.V.C. vent cowl and fixing to top of 110 mm diameter pipe.	no.	1
I	Assembled gulley trap with 110 mm diameter outlet connected to drain and gulley head with universal back inlet and removable grate.	no.	1
J	Joint small pipe to gulley.	no.	1
K	Ditto large pipe to gulley.	no.	1
	Traps		
L	32 - 40 mm diameter "Flexitrap" or equal "P" trap and joint to fitting and P.V.C. pipe.	no.	3

Carried to collection

	HOT AND COLD WATER RETICULATION		
	Copper tubing as described		
A	15 mm diameter pipe fixed to walls.	m	1
B	15 mm ditto to walls in and including chase.	m	5
C	20 mm diameter pipe fixed to walls.	m	6
D	20 x 15 mm reducer.	no.	1
E	15 mm elbow.	no.	3
F	20 mm elbow.	no.	3
G	20 x 15 x 20 mm tee.	no.	1
H	20 mm socket union.	no.	2
I	15 mm diameter bent connector	no.	3
J	15 mm swivel elbow.	no.	1
K	15 mm socket union.	no.	1

Carried to collection

	Brasswork		
A	15 mm diameter brass high pressure screw down stop cock and joints to copper pipe.	no.	4
B	25 mm diameter brass or equal high pressure undertile stopcock, and joint to copper pipe.	no.	1
	PVC pipes as described		
C	22 mm diameter pipe fixed to walls.	m	1
D	22 mm ditto to walls in and including chase.	m	1
E	22 mm diameter pipe underground.	m	4
F	22 x 20 mm reducer.	no.	1
G	22 mm elbow.	no.	1
H	22 mm socket union.	no.	1
	BUILDER'S WORK IN CONNECTION WITH PLUMBING (PROVISIONAL)		
I	Chase brickwork for small pipe and flush up in cement mortar (1:3).	m	6
	Hole for small pipe including making good through		
J	Half brick wall.	no.	4
K	One brick wall.	no.	1
	Hole for large pipe including making good through		
L	One brick wall.	no.	1

Carried to collection

	GEYSERS				
A	100 Litre Approved roof type solar gravity geyser with electrical backup heating ,and jointing to water supplies, and electrical supply ;	no.	2		
	TESTING				
B	Allow for the testing of all the Plumber's work to the satisfaction of the Engineers and for the retesting after making good defects.	item	1		
	Carried to collection				

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BILL NO.11: PLUMBING (PROVISIONAL)
CARRIED TO SUMMARY

BILL NO.12

GLAZING

(For Preambles see General Specification)

Mirrors

A	6 mm clear float quality glass silvered and sealed mirror with bevelled edges sprayed on back with clear lacquer before fixing four times drilled for and plugged and screwed to plastered walls with and including chromium plated capped mirror screws and rubber washers, size	no.	1		

BILL NO.12: GLAZING
CARRIED TO SUMMARY

BILL NO.13

PAINTING

(For Preambles see General Specification)

ON PLASTER, ETC

Prepare and apply three coats external quality P.V.A. emulsion paint externally on

A	Fine woodfloat plastered walls.	m²	62
B	Fine woodfloat plastered walls in narrow widths	m²	3

Prepare and apply three coats internal quality P.V.A. emulsion paint internally on

C	Steel trowelled plastered walls.	m²	100
D	Ditto in narrow widths.	m²	3

Prepare and apply three coats internal quality ceiling white PVA paint internally on

E	Ceilings	m²	36

Carried to collection

	ON METAL		
	Clean down, touch up priming coat and apply one undercoat and two finishing coats high gloss enamel paint on		
A	Pressed door frames.	m²	5
	ON WOOD, ETC		
B	Carbolineum saturate sawn softwood wall plate before fixing.	m²	9
	Clean down, prime, stop and apply one undercoat and two finishing coats high gloss		
C	General surfaces of doors.	m²	4
	LEAVE CLEAN		
D	Allow for touching up all work throughout, clean off all paint, oil, cement or other stains or marks, floors, ceilings, glass, etc. and leave all surfaces in full and proper working order.	item	1

Carried to collection

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	84
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BILL NO.13: PAINTING
CARRIED TO SUMMARY

	BILL NO.14				
	SPECIALIST SERVICES				
	(For Preambles see General Specification)				
	PROVISIONAL SUMS				
	The following Provisional Sums are to be spent as directed by the Architect or deducted in whole or in part if not required (No profit is to be				
A	Provide a sum of USD20,000.00 for the supply and delivery of ten (10) "2021 model, 11 inch iPad Pro, 256 GB, M1 Processor, Wifi+ Cellular connectivity" or similar approved tablets.	sum	1	20,000.00	
	PRIME COST SUMS				
	The Contractor shall allow for profit and Attendance after each Prime Cost Sum. Where no allowance has been made by the Contractor, it shall be assumed the allowance made by the Contractor, shall have been included elsewhere in the rates for other works.				
	Provide the following Prime Cost Sums for work to be executed and completed by Nominated Subcontractors				
B	Provide the sum of US$2,000.00 for electrical fittings and installations executed complete.	sum	1	2,000.00	
C	Profit	%			
D	Attendence	%			
	BILL NO.14: SPECIALIST SERVICES CARRIED TO SUMMARY				

SUMMARY

CARRIED TO MAIN SUMMARY

SECTION 4 - ABLUTIONS

BILL NO.2

FOUNDATIONS (PROVISIONAL)

(For Preambles see General Specification)

Note: Foundations have been measured to top of surface bed.

SITE CLEARANCE

A	Clear site of all rubbish, bushes, shrubs, undergrowth, hedges, small trees, stumps, roots,	m^2	156
B	Cut down and remove tree exceeding 500 and not exceeding 1000 mm girth measured 1000 mm above ground level including grubbing up roots and filling in holes.	no.	1
C	Ditto tree exceeding 1000 mm and not exceeding 2000 mm ditto.	no.	1

EXCAVATION

Pumping and bailing

D	Allow for the keeping excavations free of storm, surface and mud by pumping and bailing.	item	1
E	Excavate over site to remove vegetable soil average 150 mm deep and deposit on site not exceeding 100 metres.	m^2	110
F	Disposal of topsoil	m^3	17

Carried to collection

	Excavate in pickable earth for				
A	Reduced levels not exceeding 2 metres deep.	m^3	17		
B	Surface trenches not exceeding 2 metres deep.	m^3	54		
C	Allow for searching and excavation all ants' nests below ground level, treating with "Shelldrite Ant Poison "fill in and well ram selected excavated material and consolidate.	m^3	1		
D	Extra over excavation in pickable material for excavation in hard pickable material.	m^3	14		
E	Ditto excavation in rock.	m^3	9		
	Planking and strutting				
F	Allow for maintaining and supporting sides of all excavations and making good all slips.	m^2	193		
	Disposal				
G	Redig from spoil heap, return, fill and well compact selected excavated material around foundations to 95% L.C.E. density.	m^3	29		
H	Redig from spoil heap and cart off site.	m^3	42		
	Carried to collection				

	Formation				
A	Scarify ground to a depth of 150 mm and compact to 95% L.C.E. density.	m^2	110		
B	Selected and approved clean, hard, non-expansive granular filling supplied and brought onto site by the contractor well watered and mechanically compacted under ground slabs in layers of 150 mm thick to 90% HCE density	m^3	34		
	SUNDRIES				
C	250 Micron black polythene sheeting well lapped at joints including all cutting and waste (measured nett) laid over filling to receive concrete.	m^2	110		
	TERMITES				
D	Termite treatment as described to top of filling and foundation walls with "Shelldrite Ant Poison" by a specialist company and provide a written 10 year guarantee.	m^2	110		
	PLAIN CONCRETE				
	Concrete (Grade 30MPa) in				
E	Footings.	m^3	13		
F	Ground floor slabs.	m^3	10		
	Sundries				
G	Strike off and cure top of concrete.	m^2	110		
	Carried to collection				

	Welded fabric reinforcement of approved manufacture including all cutting, tying, placing in position with necessary temporary supports and minimum 300 mm laps both ways (measured nett)				
A	Ref. S193 (mass of 1.93 kg/square metre) in top reinforcement to slab.	m^2	100		
	BRICKWORK				
	Brickwork in approved common bricks in cement mortar as described				
B	Half brick wall.	m^2	38		
C	One brick wall.	m^2	51		
	Reinforcement				
	Brickforce lapped at joints and junctions and building in as the work proceeds (measured nett)				
D	Ref. C1 in half brick walls.	m	150		
E	Ref. C2 in one brick walls.	m	201		
	Carried to collection				

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BILL NO.2: FOUNDATIONS (PROVISIONAL)
CARRIED TO SUMMARY

BILL NO.3

CONCRETE, FORMWORK AND REINFORCEMENT

(For Preambles see General Specification)

STRUCTURAL CONCRETE

Vibrated reinforced concrete Grade 30 Mpa in

A	Beams	m^3			
	Formwork Class A as described to				
B	Soffit of beams, lintels.	m^2			
C	Sides of beams, lintels.	m^2			
	REINFORCEMENT				
	Mild and high tensile steel reinforcement to concrete including all bending, hooked ends, binding wire and temporary supports.				
D	High yield deformed steel reinforcement bars all sizes.	kg			
	Sundries				
E	Strike off and cure top of concrete.	m^2			

Carried to collection

	PRECAST CONCRETE				
	Lintels				
A	115 x 170 x 1273mm long	no	8		
B	230 x 170 x 990mm long	no	27		
C	230 x 170 x 1273mm long	no	2		
	Dripstones				
D	Rainwater dripstone 200 mm wide and 120 mm thick and 800 mm long with segmental channel formed in top and place in position.	no.	4		
	TESTING				
E	Allow for carrying out slump tests when directed as described.	item	1		
	Carried to collection				

COLLECTION	PAGE
	94
	95

BILL NO.3: CONCRETE, FORMWORK AND REINFORCEMENT CARRIED TO SUMMARY

BILL NO.4

BRICKWORK

(For Preambles see General Specification)

SAMPLES

A	Allow for providing samples of all bricks as described.	item	1

BRICKWORK

Brickwork in approved common bricks in cement mortar as described

B	Half brick wall.	m²	17
C	Half brick wall 2100mm high.	m²	59
D	Half brick in beam filling.	m²	7
E	One brick wall.	m²	131

SUNDRIES

F	Bed wall plate in cement mortar.	m	40
G	1,25 mm Galvanised hoop iron tie 25 mm wide and 1000 mm long one end built into brickwork or cast into concrete and other end wrapped around and spiked to wall plate and foot of truss.	no.	54
H	230 x 150 mm Terra Cotta louvred and gauze backed external air brick and building into brick	no.	54
I	230 x 150 mm cast plaster internal air brick and building into opening in plastered wall.	no.	54
J	Precast terrazzo external cill with brashed finish.	m	15
K	Softwood internal cill.	m	15

Carried to collection

	DAMP PROOF COURSE				
	One layer of three ply bituminous felt sheeting as damp proof course as described, well lapped at joints and junctions (measured nett)				
A	On half brick walls.	m²	5		
B	On one brick walls.	m²	13		
C	Under cills.	m²	2		
	REINFORCEMENT				
	Brickforce lapped at joints and junctions and in as the work proceeds (measured nett)				
D	Ref. C1 in half brick walls.	m	244		
E	Ref. C2 in one brick walls.	m	385		
	BUILDING IN				
F	Set up in position, cross brace and build in steel door frame not exceeding 5 square metres.	no.	10		
	Leave or form opening through one brick wall including temporary centering to flat soffits of brickwork complete with all strutting, shoring not exceeding 5 metres high, bolting, wedging easing, striking and removing				
G	Opening for Purpose made aluminium windowa not exceeding 5 square metres in area	no.	27		
	Carried to collection				

COLLECTION	PAGE
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BILL NO.4: BRICKWORK
CARRIED TO SUMMARY

BILL NO.5

ROOF COVERINGS

(For Preambles see General Specification)

0.6 mm Chromadek roof sheeting to be fixed in strict accordance with the manufacturer's printed instructions, on timber purlins at 900 mm centres including all square cutting and waste

A	Roofing sheets to be fixed on softwood purlins.	m²	135		
B	Ridge or hip capping.	m	33		
C	Two layers of alucushion insulation half lapped.	m²	135		

BILL NO.5: ROOF COVERINGS CARRIED TO SUMMARY

BILL NO.6

CARPENTRY

(For Preambles see General Specification)

PREFABRICATED ROOF TRUSSES

The trusses are to be "Gangnail" Hydronail or other equal and approved prefabricated timber trusses with all members in the same plane and jointed together with steel plate nails. All timbers are to be sw.

The roof is to be created in accordance with the drawings.

Prices are to include for all necessary trusses and bracing, and for hoisting and fixing in position.

The roof is designed to carry chromadeck roofing sheets and, plasterboard ceilings with trusses spaced at approximately 1200 mm centres and the contractor may be required to produce all design calculations for checking, notwithstanding which , he will be held responsible for the sufficiency of the design.

A	Trusses, necessary hips, jack rafters, bracing, purlins etc fixed complete as per drawings	item	1		
	Sawn softwood				
B	38 x 114 mm wall plate.	m	40		
	EAVES AND VERGES				
C	225 x 12 mm cement fibre fascia board	m	48		

BILL NO.6: CARPENTRY
CARRIED TO SUMMARY

BILL NO.7

JOINERY AND IRONMONGERY

(For Preambles see General Specification)

CEILINGS

A	6 mm plasterboard ceiling boarding (plaster finish elsewhere measured) and fixing to and including 50 x 25 mm sawn softwood brandering at 400mm centres one way next wall and at end joints, skew nailed in opposite directions to roof timbers (elsewhere measured) including covering all joints with and including 75 mm wide strip of scrim planted on including all square cutting and waste	m^2	100

Cornices

B	75mm Rhino coved cornice including mitres, etc.	m	86

DOORS

Semi-solid core internal quality flush doors with venner suitable for painting both sides.

C	44 mm Door. Size 813 x 2032 mm.	no.	8

Solid core external quality fire rated flush doors with veneer suitable for painting both sides

D	44 mm Door. Size 813 x 2032 mm.	no.	2

Carried to collection

	IRONMONGERY				
A	Union No. CZ682 - 24 - 95CH two lever mortice	no.	8		
B	Union No. CZ682 - 24 - 77CH three lever mortice lockset.	no.	2		
	Carried to collection				

COLLECTION	PAGE
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BILL NO.7: JOINERY AND IRONMONGERY
CARRIED TO SUMMARY

	BILL NO.8		
	METALWORK (For Preambles see General Specification)		
	STANDARD DOOR FRAMES		
	Standard full profile pressed steel door frames with chromium plated striking plates where appropriate (building in elsewhere measured)		
	To suit half brick wall (P.B.S.) for		
A	44 mm Door size 813 x 2032 mm.	no.	8
	To suit one brick wall (P.B.S.) for		
B	44mm Door size 832 x 2032 mm.	no.	2
	PURPOSE MADE ALUMINIUM WINDOWS AND FRAMES AS DESCRIBED (BUILDING IN ELSEWHERE MEASURED) INCLUDING		
	The whole to be executed by an approved firm of specialists. (Refer to the Window Schedule for type in parenthis)		
C	Window type AC5F size 530 x 950 mm high with and including 4-6mm obsure laminated glass.	no.	27
	BILL NO.8: METALWORK CARRIED TO SUMMARY		

BILL NO.9

PLASTERING AND WALL LININGS

(For Preambles see General Specification)

EXTERNALLY

One coat cement plaster (1:4) as described including all labours with a fine woodfloat finish on

A	Walls.	m²	131		
B	Ditto in narrow widths.	m²	8		

INTERNALLY

One coat cement/sand plaster (1:4) and set in rhinoset plaster with woodfloat finish on to the following surfaces

C	Walls.	m²	281		
D	Ditto in narrow widths.	m²	8		

Two coats “Rhinobond” plaster and one skimming coat of “Rhinoset” plaster applied with an approved flicking machine to give a tyrolean finish to an even thickness to the Architect approval on plasterboard

E	Ceilings	m²	100		

Carried to collection

A	Extra for 50 mm wide steel trowelled margin to edge of ceiling	m	86		
	<u>Sundries</u>				
B	150 x 150 mm recessed type toilet roll holder with spring loaded removable wood spindle and building into plastered brickwork.	no.	8		
C	150 x 150 recessed type soap dish and building into plastered brickwall	no.	7		
	Carried to collection				

COLLECTION	PAGE
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BILL NO.9: PLASTERING AND WALL LININGS CARRIED TO SUMMARY

BILL NO.10

PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC

(For Preambles see General Specification)

SCREEDS

Cement and sand screed (1:4) finished to a true and even surface

A	Untinted granolithic finish as described including all labours	m²	100		
B	100 mm high skirting with cove at junction with floor and square top edge, including mitres, etc.	m	140		

BILL NO.10: PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC CARRIED TO

BILL NO.11

PLUMBING (PROVISIONAL)

(For Preambles see General Specification)

RAINWATER DISPOSAL AND FLASHINGS

PVC as described in

A	100 mm Diametre semi-circle section eaves gutter on brackets as described to fascia boards.	m	43		
B	100 mm Dia stop ends.	no.	4		
C	Extra for angle.	no.	4		
D	Ditto outlet with nozzle for and joint to 100 mm Dia rainwater down pipe.	no.	4		
E	100 mm Diameter rainwater pipe fixed 38 mm clear of wall with holderbats.	m	12		
F	Extra for shoe.	no.	4		
G	Ditto eaves offset.	no.	4		

SANITARY FITTINGS

H	510 x 405 mm white glazed vitreous china wash hand basin with concealed brackets, complete with integral overflow, chromium plated outlet, plug and chain, pair of 15 mm chromium plated colour coded pillar taps, bolt to brackets to wall and connect up.	no.	16		

Carried to collection

A	Approved low level W.C. Suite comprising white glazed vitreous china pan with "P" trap, plastic double flap seat , 9 litre cistern and white plastic flush pipe, bolt to cistern to wall, fix pan to concrete flooor and connect up.	no.	6
B	Vaal Potteries vitreous china "Protea" or equal approved floor mounted paraplegic suite (comprising 90 degree outlet pan and matching 9 litre cistern), complete with lid fitments and purpose made side flush lever bottom inlet with water supplied from same side as flush lever and connect	no.	
C	32mm Stainless steel side grab rails, fixed to walls walls.	no.	2
D	32mm Stainless steel rear grab rail around cistern, fixed to walls.	no.	2
E	Vaal Potteries vitreous china wall mounted "Lavatera" or equal approved urinal bowl, size 610 x 385mm complete with top inlet, 38mm chromium plated domical grating, chromium plated spreader and two hanger brackets, with and including Springbok automatic 4.5litre syphonic cistern complete with flush pipe and fitting code ; brackets plugged and screwed to walls, and jointing to waste pipes and water supplies.	no.	6
F	Vaal Potteries vitreous china division pieces, overall size 610 x 310mm.	no.	10
G	Double bowl precast concrete laundry sink unit, chromium plated waste outlet, plug, chain and backnut, with turndown at edge; pair of 15 mm chromium plated colour coded pillar taps, fix sink to floor and wall connect up.	no.	2

Carried to collection

	SANITARY PLUMBING		
	"Promat" or equal rigid P.V.C. waste piping with solvent cement and joints and fitting as described		
A	110 mm diameter pipe laid in ground including excavating in trench not exceeding 2 metres deep and fill in and ram and cart off site surplus material.	m	12
B	50 mm diameter pipe laid under floors	m	24
C	50 mm diameter pipe fixed to walls.	m	12
	Extra on P.V.C. piping for		
D	50 mm bend.	no.	25
E	50 mm bend with inspection eye.	no.	31
F	110 mm bend.	no.	4
G	110 mm bend with inspection eye.	no.	8
H	110mm Inspection junction.	no.	5
I	110mm Reducing junction.	no.	2
J	110 mm Straight pan connector and joint to W.C. pan.	no.	8
K	110 mm P.V.C. vent cowl and fixing to top of 110 mm diameter pipe.	no.	8
L	Assembled gulley trap with 110 mm diameter outlet connected to drain and gulley head with universal back inlet and removable grate.	no.	3
M	Joint small pipe to gulley.	no.	2
N	Ditto large pipe to gulley.	no.	4
	Carried to collection		

	Traps		
A	32 - 40 mm diameter "Flexitrap" or equal "P" trap and joint to fitting and P.V.C. pipe.	no.	31
	HOT AND COLD WATER RETICULATION		
	Copper tubing as described		
B	15 mm diameter pipe fixed to walls.	m	12
C	15 mm ditto to walls in and including chase.	m	36
D	20 mm diameter pipe fixed to walls.	m	12
E	20 x 15 mm reducer.	no.	2
F	15 mm elbow.	no.	2
G	20 mm elbow.	no.	18
H	20 x 15 x 20 mm tee.	no.	1
I	20 mm socket union.	no.	3
J	15 mm diameter bent connector	no.	31
K	15 mm swivel elbow.	no.	3
L	15 mm socket union.	no.	7
	Carried to collection		

	Brasswork				
A	15 mm diameter brass high pressure screw down stop cock and joints to copper pipe.	no.	15		
B	25 mm diameter brass or equal high pressure undertile stopcock, and joint to copper pipe.	no.	3		
	PVC pipes as described				
C	22 mm diameter pipe fixed to walls.	m	3		
D	22 mm ditto to walls in and including chase.	m	3		
E	22 mm diameter pipe underground.	m	12		
F	22 x 20 mm reducer.	no.	1		
G	22 mm elbow.	no.	3		
H	22 mm socket union.	no.	2		
	FIRE SERVICE INSTALLATION				
	Galvanised Iron Pipes to BS 2871				
I	50mm service pipe fixed to walls, etc	m	6		
J	Ditto, but under concrete surface beds	m	6		
K	Ditto, but in trench not exceeding 1 metre deep	m	6		
	Extra over galvanised pipes for fittings				
L	50mm Bend	no.	2		
M	50 mm tee	no.	2		
N	50mm Socket	no.	2		
O	50mm Isolating valves and jointing to pipes	no.	2		
	Carried to collection				

	Sundries				
A	Approved fire hose reel of the swinging type holding 30m long 25mm bore non-kink rubber hose with nozzle and cock, complete with inlet valve with hand wheel marked to show direction of opening (the reel assembly shall have been tested to a pressure of at least 14 bars) and roller or bead type hose guide with check plates free of sharp edges and finished in red enamel and with all bright fittings chromium plated complete and fixed in position to wall including jointing to water supply	no.	1		
B	Approved 9 litre water-gas fire extinguisher including fixing backing plate to wall	no.	1		
C	Approved 9kg dry powder fire extinguisher including fixing backing plate to wall	no.	1		
	BUILDER'S WORK IN CONNECTION WITH PLUMBING (PROVISIONAL)				
D	Chase brickwork for small pipe and flush up in cement mortar (1:3).	m	17		
	Hole for small pipe including making good through				
E	Half brick wall.	no.	6		
F	One brick wall.	no.	6		
	Hole for large pipe including making good through				
G	One brick wall.	no.	10		
	TESTING				
H	Allow for the testing of all the Plumber's work to the satisfaction of the Engineers and for the retesting after making good defects.	item	1		
	Carried to collection				

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BILL NO.11: PLUMBING (PROVISIONAL)
CARRIED TO SUMMARY

BILL NO.12

GLAZING

(For Preambles see General Specification)

Mirrors

A	6 mm clear float quality glass silvered and sealed mirror with bevelled edges sprayed on back with clear lacquer before fixing four times drilled for and plugged and screwed to plastered walls with and including chromium plated capped mirror screws and rubber washers, size 600 x 600 mm.	no.	6		

BILL NO.12: GLAZING
CARRIED TO SUMMARY

BILL NO.13

PAINTING

(For Preambles see General Specification)

ON PLASTER, ETC

Prepare and apply three coats external quality P.V.A. emulsion paint externally on

A	Fine woodfloat plastered walls.	m²	131
B	Fine woodfloat plastered walls in narrow widths	m²	8

Prepare and apply three coats internal quality P.V.A. emulsion paint internally on

C	Steel trowelled plastered walls.	m²	281
D	Ditto in narrow widths.	m²	8

Prepare and apply three coats internal quality ceiling white PVA paint internally on

E	Ceilings	m²	100

Carried to collection

	ON METAL				
	Clean down, touch up priming coat and apply one undercoat and two finishing coats high gloss enamel paint on				
A	Pressed door frames.	m²	15		
	ON WOOD, ETC				
B	Carbolineum saturate sawn softwood wall plate before fixing.	m²	13		
	Clean down, prime, stop and apply one undercoat and two finishing coats high gloss enamel pain on				
C	General surfaces of doors.	m²	33		
	LEAVE CLEAN				
D	Allow for touching up all work throughout, clean off all paint, oil, cement or other stains or marks, floors, ceilings, glass, etc. and leave all surfaces in full and proper working order.	item	1		
	Carried to collection				

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BILL NO.13: PAINTING
CARRIED TO SUMMARY

	BILL NO.14				
	SPECIALIST SERVICES				
	(For Preambles see General Specification)				
	PRIME COST SUMS				
	The Contractor shall allow for profit and Attendance after each Prime Cost Sum. Where no allowance has been made by the Contractor, it shall be assumed the allowance made by the Contractor shall have been included elsewhere in the rates for other works.				
	Provide the following Prime Cost Sums for work to be executed and completed by Nominated Subcontractors				
A	Provide the sum of US$2,500.00 for electrical fittings and installations executed complete.	sum	1	2,500.00	
B	Profit	%			
C	Attendence	%			
	BILL NO.14: SPECIALIST SERVICES CARRIED TO SUMMARY				

SUMMARY

CARRIED TO MAIN SUMMARY

SECTION 5- GANTRY

BILL NO.2

FOUNDATIONS (PROVISIONAL)

(For Preambles see General Specification)

Note: Foundations have been measured to top of surface bed.

SITE CLEARANCE

A	Clear site of all rubbish, bushes, shrubs, undergrowth, hedges, small trees, stumps, roots,	m²	845
B	Cut down and remove tree exceeding 500 and not exceeding 1000 mm girth measured 1000 mm above ground level including grubbing up roots and filling in holes.	no.	1
C	Ditto tree exceeding 1000 mm and not exceeding 2000 mm ditto.	no.	1

EXCAVATION

Pumping and bailing

D	Allow for the keeping excavations free of storm, surface and mud by pumping and bailing.	item	1
E	Excavate over site to remove vegetable soil average 150 mm deep and deposit on site not exceeding 100 metres.	m²	651
F	Disposal of topsoil	m³	98

Carried to collection

	Excavate in pickable earth for		
A	Reduced levels not exceeding 2 metres deep.	m³	98
B	Surface trenches not exceeding 2 metres deep.	m³	85
C	Column bases not exceeding 2 metres deep.	m³	92
D	Allow for searching and excavation all ants' nests below ground level, treating with "Shelldrite Ant Poison "fill in and well ram selected excavated material and consolidate.	m³	1
E	Extra over excavation in pickable material for excavation in hard pickable material.	m³	55
F	Ditto excavation in rock.	m³	36
	Planking and strutting		
G	Allow for maintaining and supporting sides of all excavations and making good all slips.	m²	415
	Disposal		
H	Redig from spoil heap, return, fill and well compact selected excavated material around foundations to 95% L.C.E. density.	m³	150
I	Redig from spoil heap and cart off site.	m³	118
	Carried to collection		

	Formation				
A	Scarify ground to a depth of 150 mm and compact to 95% L.C.E. density.	m²	651		
B	Selected and approved clean, hard, non-expansive granular filling supplied and brought onto site by the contractor well watered and mechanically compacted under ground slabs in layers of 150 mm thick to 90% HCE density	m³	308		
	SUNDRIES				
C	250 Micron black polythene sheeting well lapped at joints including all cutting and waste (measured nett) laid over filling to receive concrete.	m²	598		
	TERMITES				
D	Termite treatment as described to top of filling and foundation walls with "Shelldrite Ant Poison" by a specialist company and provide a written 10 year guarantee.	m²	651		
	REINFORCED CONCRETE				
	Concrete (Grade 30MPa) in				
E	Footings.	m³	20		
F	Ground floor slabs.	m³	90		
G	Column bases.	m³	31		
H	Columns.	m³	5		
	Sundries				
I	Strike off and cure top of concrete.	m²	651		
	Carried to collection				

	REINFORCEMENT				
	Mild and high tensile steel reinforcement to concrete including all bending, hooked ends, binding wire and temporary supports.				
A	High yield deformed steel reinforcement bars all sizes.	kg	7724		
	Welded fabric reinforcement of approved manufacture including all cutting, tying, placing in position with necessary temporary supports and minimum 300 mm laps both ways (measured nett)				
B	Ref. S193 (mass of 1.93 kg/square metre) in top and bottom reinforcement to slab.	m²	1196		
	Formwork Class A as described to				
C	Soffit of columns.	m²	35		
	BRICKWORK				
	Brickwork in approved common bricks in cement mortar as described				
D	Half brick wall.	m²	16		
E	One brick wall.	m²	259		
	Reinforcement				
	Brickforce lapped at joints and junctions and building in as the work proceeds (measured nett)				
F	Ref. C1 in half brick walls.	m	64		
G	Ref. C2 in one brick walls.	m	1020		
	Carried to collection				

	EXPANSION JOINTS				
	Saw-cut joints				
A	10mm Wide x 25mm deep saw-cut joint with rounded edges to 3mm radius cleared and injected with an approved joint sealant horizontally	m	67		
B	10mm "Kaylite" or equal appproved expansion joint filler between concrete columns.	m²	8		
	Carried to collection				

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BILL NO.2: FOUNDATIONS (PROVISIONAL)
CARRIED TO SUMMARY

BILL NO.3

CONCRETE, FORMWORK AND REINFORCEMENT

(For Preambles see General Specification)

STRUCTURAL CONCRETE

Vibrated reinforced concrete Grade 30Mpa in

A	Beams	m^3	10
B	Rectangular columns.	m^3	34
	Formwork Class A as described to		
C	Soffit of beams.	m^2	27
D	Sides of beams.	m^2	77
E	Sides of columns.	m^2	167
F	Sides of columns in narrow widths.	m^2	118
	REINFORCEMENT		
	Mild and high tensile steel reinforcement to concrete including all bending, hooked ends, binding wire and temporary supports.		
G	High yield deformed steel reinforcement bars all	kg	7920
	Sundries		
H	Strike off and cure top of concrete.	m^2	27

Carried to collection

	PRECAST CONCRETE				
	Lintels				
A	115 x 170 x 1360mm long	no	4		
B	230 x 170 x 1360mm long	no	2		
	Dripstones				
C	Rainwater dripstone 200 mm wide and 120 mm thick and 800 mm long with segmental channel formed in top and place in position.	no.	6		
	TESTING				
D	Allow for carrying out slump tests when directed as described.	item	1		
	Carried to collection				

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BILL NO.3: CONCRETE, FORMWORK AND REINFORCEMENT CARRIED TO SUMMARY

	BILL NO.4				
	BRICKWORK				
	(For Preambles see General Specification)				
	SAMPLES				
A	Allow for providing samples of all bricks as described.	item	1		
	BRICKWORK				
	Brickwork in approved common bricks in cement mortar as described				
B	Half brick wall.	m²	16		
C	Half brick in beam filling.	m²	20		
D	One brick wall.	m²	933		
	SUNDRIES				
E	230 x 150 mm Terra Cotta louvred and gauze backed external air brick and building into brick	no.	26		
F	230 x 150 mm cast plaster internal air brick and building into opening in plastered wall.	no.	26		
	Carried to collection				

	DAMP PROOF COURSE				
	One layer of three ply bituminous felt sheeting as damp proof course as described, well lapped at joints and junctions (measured nett)				
A	On half brick walls.	m²	1		
B	On one brick walls.	m²	30		
	REINFORCEMENT				
	Brickforce lapped at joints and junctions and in as the work proceeds (measured nett)				
C	Ref. C1 in half brick walls.	m	106		
D	Ref. C2 in one brick walls.	m	2744		
	BUILDING IN				
E	Set up in position, cross brace and build in steel door frame not exceeding 5 square metres.	no.	6		
F	Set up in position, cross brace and build in steel window frame not exceeding 5 square metres.	no.	13		
	Carried to collection				

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BILL NO.4: BRICKWORK CARRIED TO SUMMARY

BILL NO.5

ROOF COVERINGS

(For Preambles see General Specification)

0.6 mm Chromadek roof sheeting to be fixed in strict accordance with the manufacturer's printed instructions, on timber purlins at 900 mm centres including all square cutting and waste

A	Roofing sheets to be fixed on softwood purlins.	m²	709		
B	Two layers of alucushion insulation half lapped.	m²	709		

BILL NO.5: ROOF COVERINGS CARRIED TO SUMMARY

	BILL NO.6				
	JOINERY AND IRONMONGERY				
	(For Preambles see General Specification)				
	DOORS				
	Semi-solid core internal quality flush doors with venner suitable for painting both sides.				
A	44 mm Door. Size 813 x 2032 mm.	no.	3		
	Solid core external quality fire rated flush doors with veneer suitable for painting both sides				
B	44 mm Door. Size 813 x 2032 mm.	no.	3		
	IRONMONGERY				
C	Union No. CZ682 - 24 - 95CH two lever mortice. lockset.	no.	3		
D	Union No. CZ682 - 24 - 77CH three lever mortice lockset.	no.	3		
	BILL NO.6: JOINERY AND IRONMONGERY CARRIED TO SUMMARY				

	BILL NO.7				
	METALWORK (For Preambles see General Specification)				
	STANDARD DOOR FRAMES				
	Standard full profile pressed steel door frames with chromium plated striking plates where appropriate (building in elsewhere measured)				
	To suit half brick wall (P.B.S.) for				
A	44 mm Door size 813 x 2032 mm.	no.	4		
	To suit one brick wall (P.B.S.) for				
B	44mm Door size 832 x 2032 mm.	no.	2		
	MILD STEEL WINDOWS (BUILDING IN ELSEWHERE MEASURED)				
	The whole to be executed by an approved firm of specialists. (Refer to the Window Schedule for type in parenthis)				
C	Window type W1 size 1066 x 1308 mm high.	no.	4		
D	Window type W2 size 2052 x 1308 mm high.	no.	7		
E	Window type W3 size radius 1600 mm.	no.	2		
	BILL NO.7: METALWORK CARRIED TO SUMMARY				

	BILL NO.8				
	PLASTERING AND WALL LININGS				
	(For Preambles see General Specification)				
	EXTERNALLY				
	One coat cement plaster (1:4) as described including all labours with a fine woodfloat finish on				
A	Walls.	m²	899		
B	Ditto in narrow widths.	m²	10		
	INTERNALLY				
	One coat cement/sand plaster (1:4) and set in rhinoset plaster with woodfloat finish on to the following surfaces				
C	Walls.	m²	1021		
D	Ditto in narrow widths.	m²	10		
	Sundries				
E	150 x 150 mm recessed type toilet roll holder with spring loaded removable wood spindle and building into plastered brickwork.	no.	4		
	BILL NO.8: PLASTERING AND WALL LININGS CARRIED TO SUMMARY				

BILL NO.9

PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC

(For Preambles see General Specification)

SCREEDS

Cement and sand screed (1:4) finished to a true and even surface

A	Untinted granolithic finish as described including all labours	m²	598		
B	100 mm high skirting with cove at junction with floor and square top edge, including mitres, etc.	m	123		

BILL NO.9: PAVINGS, FLOOR COVERINGS, PLASTIC LININGS, ETC CARRIED TO

BILL NO.10

PLUMBING (PROVISIONAL)

(For Preambles see General Specification)

RAINWATER DISPOSAL AND FLASHINGS

PVC as described in

A	100 mm Diametre semi-circle section eaves gutter on brackets as described to fascia boards.	m	60		
B	100 mm Dia stop ends.	no.	6		
C	Extra for angle.	no.	6		
D	Ditto outlet with nozzle for and joint to 100 mm Dia rainwater down pipe.	no.	6		
E	100 mm Diameter rainwater pipe fixed 38 mm clear of wall with holderbats.	m	57		
F	Extra for shoe.	no.	6		
G	Ditto eaves offset.	no.	6		

SANITARY FITTINGS

H	510 x 405 mm white glazed vitreous china wash hand basin with concealed brackets, complete with integral overflow, chromium plated outlet, plug and chain, pair of 15 mm chromium plated colour coded pillar taps, bolt to brackets to wall and connect up.	no.	4		

Carried to collection

A	Approved low level W.C. Suite comprising white glazed vitreous china pan with "P" trap, plastic double flap seat , 9 litre cistern and white plastic flush pipe, bolt to cistern to wall, fix pan to concrete	no.	3		
B	Vaal Potteries vitreous china "Protea" or equal approved floor mounted paraplegic suite (comprising 90 degree outlet pan and matching 9 litre cistern), complete with lid fitments and purpose made side flush lever bottom inlet with water supplied from same side as flush lever and connect	no.	1		
C	32mm Stainless steel side grab rails, fixed to walls walls.	no.	1		
D	32mm Stainless steel rear grab rail around cistern, fixed to walls.	no.	1		
E	Vaal Potteries vitreous china wall mounted "Lavatera" or equal approved urinal bowl, size 610 x 385mm complete with top inlet, 38mm chromium plated domical grating, chromium plated spreader and two hanger brackets, with and including Springbok automatic 4.5litre syphonic cistern complete with flush pipe and fitting code ; brackets plugged and screwed to walls, and jointing to waste pipes and water supplies.	no.	2		
F	Vaal Potteries vitreous china division pieces, overall size 610 x 310mm.	no.	4		
	Carried to collection				

	SANITARY PLUMBING		
	"Promat" or equal rigid P.V.C. waste piping with solvent cement and joints and fitting as described		
A	110 mm diameter pipe laid in ground including excavating in trench not exceeding 2 metres deep and fill in and ram and cart off site surplus material.	m	30
B	50 mm diameter pipe laid under floors	m	6
C	50 mm diameter pipe fixed to walls.	m	6
	Extra on P.V.C. piping for		
D	50 mm bend.	no.	4
E	50 mm bend with inspection eye.	no.	4
F	110 mm bend.	no.	2
G	110 mm bend with inspection eye.	no.	4
H	110mm Inspection junction.	no.	2
I	110mm Reducing junction.	no.	2
J	110 mm Straight pan connector and joint to W.C. pan.	no.	4
K	110 mm P.V.C. vent cowl and fixing to top of 110 mm diameter pipe.	no.	4
L	Assembled gulley trap with 110 mm diameter outlet connected to drain and gulley head with universal back inlet and removable grate.	no.	1
M	Joint small pipe to gulley.	no.	2
N	Ditto large pipe to gulley.	no.	2
	Carried to collection		

	Traps		
A	32 - 40 mm diameter "Flexitrap" or equal "P" trap and joint to fitting and P.V.C. pipe.	no.	4
	HOT AND COLD WATER RETICULATION		
	Copper tubing as described		
B	15 mm diameter pipe fixed to walls.	m	6
C	15 mm ditto to walls in and including chase.	m	12
D	20 mm diameter pipe fixed to walls.	m	1
E	20 x 15 mm reducer.	no.	1
F	15 mm elbow.	no.	5
G	20 mm elbow.	no.	2
H	20 x 15 x 20 mm tee.	no.	1
I	20 mm socket union.	no.	1
J	15 mm diameter bent connector	no.	8
K	15 mm swivel elbow.	no.	3
L	15 mm socket union.	no.	3

Carried to collection

	Brasswork		
A	15 mm diameter brass high pressure screw down stop cock and joints to copper pipe.	no.	4
B	25 mm diameter brass or equal high pressure undertile stopcock, and joint to copper pipe.	no.	1
	PVC pipes as described		
C	22 mm diameter pipe fixed to walls.	m	5
D	22 mm ditto to walls in and including chase.	m	3
E	22 mm diameter pipe underground.	m	12
F	22 x 20 mm reducer.	no.	1
G	22 mm elbow.	no.	2
H	22 mm socket union.	no.	2
	FIRE SERVICE INSTALLATION Galvanised Iron Pipes to BS 2871		
I	50mm service pipe fixed to walls, etc	m	6
J	Ditto, but under concrete surface beds	m	30
K	Ditto, but in trench not exceeding 1 metre deep	m	6
	Extra over galvanised pipes for fittings		
L	50mm Bend	no.	4
M	50 mm tee	no.	2
N	50mm Socket	no.	5
O	50mm Isolating valves and jointing to pipes	no.	4
	Carried to collection		

	Sundries		
A	Approved fire hose reel of the swinging type holding 30m long 25mm bore non-kink rubber hose with nozzle and cock, complete with inlet valve with hand wheel marked to show direction of opening (the reel assembly shall have been tested to a pressure of at least 14 bars) and roller or bead type hose guide with check plates free of sharp edges and finished in red enamel and with all bright fittings chromium plated complete and fixed in position to wall including jointing to water supply	no.	4
B	Approved 9 litre water-gas fire extinguisher including fixing backing plate to wall	no.	4
C	Approved 9kg dry powder fire extinguisher including fixing backing plate to wall	no.	4
	BUILDER'S WORK IN CONNECTION WITH PLUMBING (PROVISIONAL)		
D	Chase brickwork for small pipe and flush up in cement mortar (1:3).	m	30
	Hole for small pipe including making good through		
E	Half brick wall.	no.	1
F	One brick wall.	no.	4
	Hole for large pipe including making good through		
G	One brick wall.	no.	4
	TESTING		
H	Allow for the testing of all the Plumber's work to the satisfaction of the Engineers and for the retesting after making good defects.	item	1
	Carried to collection		

COLLECTION	PAGE
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BILL NO.10: PLUMBING (PROVISIONAL) CARRIED TO SUMMARY

	BILL NO.11				
	GLAZING				
	(For Preambles see General Specification)				
	Mirrors				
A	6 mm clear float quality glass silvered and sealed mirror with bevelled edges sprayed on back with clear lacquer before fixing four times drilled for and plugged and screwed to plastered walls with and including chromium plated capped mirror screws and rubber washers, size 600 x 600 mm.	no.	2		
	Glazing to steel sashes with putty				
B	3 mm Clear sheet glass	m²	35		
C	3-4 mm Obscure glass	m²	6		
	BILL NO.11: GLAZING CARRIED TO SUMMARY				

BILL NO.12

PAINTING

(For Preambles see General Specification)

ON PLASTER, ETC

Prepare and apply three coats external quality P.V.A. emulsion paint externally on

A	Fine woodfloat plastered walls.	m²	899		
B	Fine woodfloat plastered walls in narrow widths	m²	10		

Prepare and apply three coats internal quality P.V.A. emulsion paint internally on

C	Steel trowelled plastered walls.	m²	1021		
D	Ditto in narrow widths.	m²	10		

Carried to collection

	ON METAL				
	Clean down, touch up priming coat and apply one undercoat and two finishing coats high gloss enamel paint on				
A	Pressed door frames.	m²	30		
B	Pressed window frames.	m²	41		
	Clean down, prime, stop and apply one undercoat and two finishing coats high gloss enamel pain on				
C	General surfaces of doors.	m²	23		
	LEAVE CLEAN				
D	Allow for touching up all work throughout, clean off all paint, oil, cement or other stains or marks, floors, ceilings, glass, etc. and leave all surfaces in full and proper working order.	item	1		
	Carried to collection				

COLLECTION	PAGE
	148
	149

BILL NO.12: PAINTING
CARRIED TO SUMMARY

	BILL NO.13				
	SPECIALIST SERVICES				
	(For Preambles see General Specification)				
	PRIME COST SUMS				
	The Contractor shall allow for profit and Attendance after each Prime Cost Sum. Where no allowance has been made by the Contractor, it shall be assumed the allowance made by the Contractor shall have been included elsewhere in the rates for other works. Provide the following Prime Cost Sums for work to be executed and completed by Nominated Subcontractors				
A	Provide the sum of US$40,000.00 for electrical fittings and installations executed complete.	sum	1	40,000.00	
B	Profit	%			
C	Attendence	%			
D	Provide the sum of US$316,000.00 for Gantry installation executed complete.	sum	1	316,000.00	
E	Profit	%			
F	Attendence	%			
G	Provide the sum of US$16,380.00 for Structural steel roof installation executed complete.	sum	1	16,380.00	
H	Profit	%			
I	Attendence	%			
J	Provide the sum of US$480,000.00 for Solar Street Lighting installations executed complete.	sum	1	480,000.00	
K	Profit	%			
L	Attendence	%			
	BILL NO.13: SPECIALIST SERVICES CARRIED TO SUMMARY				

SUMMARY

CARRIED TO MAIN SUMMARY

SECTION 6- CIVIL WORKS

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	BILL NO.2				
B	**ROADS AND STORMWATER**				
	Site Clearance				
B1.1	Clearing of road reserve and car parks,including cutting down of trees of girth less than 1m(including parking area)	m^2	72000		
B1.2	Remove trees and stumps of girth more than 1m measured 1m above ground level, including stacking and grubbling roots.	No	50		
	Road Earthworks				
B1.3	Remove topsoil to a depth of 150mm from parking/roadbed width ,spread to waste withiin 0.5km free haul	m^3	10800		
B1.4	Excavate to formation level, stockpile,haul not exceeding 1km and fill layers and control compact in layers to 93% ModAASHTO density. (Cut to fill)	m^3	33100		
B1.5	Excavate to formation level, haul to spoil haul distance not exceeding 1km .Include for spreading and levelling.(Cut to spoil)	m^3	5600		
B1.6	Excavate for removal of anthills and backfilling.	m^3	108		
B1.7	Allow for poisoning of anthills using an approved antkiller at the specialist's specified rate	Sum	1		
B1.8	Extra over items B1.4 and B1.5 for i) intermediate excavation ii) rock excavation	 m^3 m^3	 3000 1000		
B1.9	Scarify/rip, water, mix, trim and compact upper 150mm of road formation to form subgrade for roadbed and carparks to not less than 93% Mod.AASHTO	m^2	72000		
	Pavement Construction There will be no pavement material obtainable on site.The contractor is to source all imported material from commercial or own sources to the best price advantage. Allow for sourcing base 1,2 and 3 gravel material from nearest commercial source gravel borrow pits and dump along road formation or carpark, volume measured as compacted.				
B2.2	Gravel Base 3 (150mm) material, class 3.0 including hauling, spreading, watering,mixing and compacting in 150mm layers to 96% mod AASHTO	m^3	10800		
B2.3	Gravel Base 2 (150mm) material, class 3.0 including hauling, spreading, watering,mixing and compacting in 150mm layers to 96% mod AASHTO	m^3	10800		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
B2.4	Crusher run (150mm) for base 1 material including hauling,spreading, watering,mixing and compacting in 150mm layers to 98% mod AASHTO	m^3	10800		
	SURFACING				
	Bituminous Surfacing				
B3	PRIME Prime all roads/parking and surfaces to be Bituminous sealed				
B3.1	Supply all materials and apply Wankie Tar Prime(TP7) or cutback bitumen MC30 at the rate of 0.8 To 1.1l/m2	m^2	2900		
B3.2	Apply 40mm Asphalt Concrete	m^2	2900		
	G-Blocks Surfacing				
B3.3	Supply,spread and compact 50mm Quarry Dust	m^3	3600		
B3.4	Supply and lay 80mm minimum crushing strength 35MPa interlocking pavers.	no	3600000		
B3.5	Sand cover as may be ordered by the Engineer	m^3	100		
B4	**Culverts and stormwater pipes**				
B4.1	Excavate for all pipe culverts	m^3	273		
B4.2	Extra over item B4.1 Supply and install Class S standard reinforced stormwater pipes with interlocking Ogee joints for underground drainage pipes and culverts				
	i.450 diameter	m	1900		
	ii.900 diameter	m	26		
B4.3	Concrete to haunches,surrounds and foundation for culverts				
	i.Grade 10 to haunches/blinding	m^3	173		
	ii.Grade 20 to surrounds	m^3	190		
B4.4	Supply and construct catchpit	no	18		
B4.5	Stone pitching to end of pipe culverts	m^2	1100		
	Trapezoidal drains				
B4.6	Excavate trim for lined and unlined trapezoidal drains and make ready to receive concrete drains	m^3	1552		
B4.7	Extra over B4.6 for constructing G20 conrete lined trapezoidal drains as detailed	m^3	442		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
B4.8	Allow for reinforcing trapezoidal drains with S193 mesh	m^2	5600		
B4.9	Allow for carting away excavated material within 0.5km from site	m^3	1552		
B4.10	Allow a provisional sum for any other stormwater materials not specified above	SUM	1		
	Rectangular Drain				
B5.0	Excavate trim for concrete lined rectangular drains and make ready to receive concrete drains.	m^3	784		
B5.1	Extra over B5.0 for constructing G20 conrete lined rectangular drains as detailed.	m^3	550		
B5.2	Supply and instal reinforced concrete slabs for rectangular drains	no	2903		
B5.3	Allow for reinforcing rectangular drains with S245 mesh wire	m^2	7316		
B5.4	Allow for carting away excavated material within 0.5km from site	m^3	784		
B5.5	Allow a provisional sum for any other stormwater materials not specified above	SUM	1		
	Shelverts				
B5.6	Excavate trim for shelvert concrete bases	m^3	12		
B5.7	Extra over B5.6 for constructing G25 shelvert conrete bases	m^3	12		
B5.8	Allow for reinforcing shelvert concrete bases with S245 mesh wire	m^2	20		
B5.9	Allow for constructing 125mm thick concrete slab(G25) on waterway as detailed	m^3	11		
B6.0	Allow for reinforcing conrete slab on waterway with S245 mesh wire	m^2	80		
B6.1	Allow a provisional sum for any other shelvert materials not specified above	SUM	1		
	Retaining wall				
	D-Blocks Retaining wall				
B6.2	Supply and lay D-Blocks on top of one another as detailed to form retaining wall	m^2	7074		
B6.3	Fill D-Blocks voids with loam soil	m^3	1415		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
B6.4	Supply and lay lawn on top of D-Blocks	m^2	7074		
	Stone Pitched Retaining wall				
B6.5	Allow for constructing 20mm thick G20 concrete apron	m^3	60		
B6.6	Supply and lay glitter stones on top of conrete appron form retaining wall	m^2	7074		
	Landscaping				
B6.5	Supply and spread loam soil over areas to be landscapped as shown on drawing layout	m^2	11876		
B6.6	Supply and lay lawn for landscapping	m^2	11876		
	Traffic Signs				
B6.7	"Stop Signs"	No	3		
	Carriageway Markings				
B6.8	Carriageway markings as directed onsite				
	i.Markings in reflective white paint	m^2	200		
	ii.Markings in reflective white paint	m^2	200		
	iii.Shoulder markings in reflective yellow paint	m^2	200		
	Kerbing				
B6.9	Supply and lay where shown on the drawing or as directed, municipal kerbing including excavation excavation and concrete bedding,jointing,haunching , backfilling behind and painting in alternate black and white PVA,two coats				
	i.305 x 100mm H7 Barrier Kerbs	m	5404		
	ii.Roll over Kerbing	m	95		
	Perimeter fence				
B7.0	Supply and fix clearview fence including spikes with following specifications:Fence panel length=3.0m,Fence panel height= 2.1m,Clamps bolts and nuts,square tube 60*60*2mm,Spikes & grey finish.	m	2250		
	TOTAL CARRIED TO SUMMARY				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	BILL NO.3				
C	**WATER RETICULATION**				
	Site Clearance				
C1.1	Clear vegetation and trees of girth up to 1m,measuring 1m above ground level (width of line maximum 2m)	m^2			
C2.1	**Excavation**				
	Excavation in all materials for trenches backfill and compact depth between 0.5m-1m for pipes				
	i)63mm PVC class 12 pipes	m^3	443		
C2.2	Extra-over all excavations For				
	i)Hard material excavations	m^3	20		
	ii)Hard rock excavations	m^3	5		
	Pipe Bedding				
C3.1	Supply and place bedding material as directed by the Engineer and measured compacted for				
	i)Selected granular/sand material.	m^3	110		
C3.2	Allow for alternative concrete bedding under roadways and shallow areas,				
	i.Grade 15 concrete	m^3	0.5		
C3.3	Allow for carting away and disposing of unsuitable or surplus material from trench	m^3/km	110		
C3.4	Allow for pumping of trenches to remove excess water in excavations	sum	1		
	PIPE LAYING				
C3.5	Supply,handle and lay Pvc pipes complete with fluid-tight joints				
	i.50mm PVC class 12 pipes	m	315		
	ii.63mm PVC class 12 pipes	m	1664		
	FITTINGS				
	Supply,lay,bed and joint,including cut pipes to length where required,test and include for CISC joints				
	Supply and fix the following fittings:				
C3.6	Gate valves clockwise closing				
	i.50mm PVC class 12 pipes	No	9		
	ii.63mm PVC class 12 pipes	No	17		
C3.7	PVC Bends				
	i.63*90 degree bends	No	21		
	ii.63*45degree bends	No	11		
	iii.63*22.5 degree bends	No	6		
	iv.63*11.25degree bends	No	1		
	v.50*90 degree bends	No	7		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
C3.8	Fire hydrants				
	i.50mm PVC class 12 pipes	No	5		
	ii.63mm PVC class 12 pipes	No	5		
C3.9	PVC tees				
	63mm*63mm equal tees.	No	9		
	63mm*50mm unequal tees.	No	12		
C4.1	Reducer				
	63mm*50mm reducer	No			
C4.2	End Caps				
	i.50mm PVC class 12 pipes	No	4		
	ii.63mm PVC class 12 pipes	No	2		
C4.3	Non-return valve	No	#REF!		
C4.4	Supply and fix precast chambers as detailed for the following fittings with C.I covers				
	i.Gate valves	No	24		
	ii.Fire hydrant	No	10		
	iii.Non-return valve	No	#REF!		
C4.5	Supply and fix marker posts for the following fittings as detailed.				
	i.Gate valves	No	24		
	ii.Fire hydrant	No	10		
	iii.Non-return valve	No	#REF!		
C4.6	Allow a provisional sum for any other fittings not specified above	SUM	1		
C4.7	Supply and fix 4*10 000litre plastic water tanks with necessary fittings	SUM	1		
C4.8	Supply and instal 2 pump houses with neccssary fittings	SUM	1		
	Ancillaries				
C4.9	Anchor/Thrust blocks and pedestals including formwork where required				
	Grade 20 concrete	m^3	0.5		
	Pressure testing of water mains				
C5.0	Allow for all costs for pressure testing as specified or directed by the Engineer.	SUM	1		
	Disinfect pipelines				
C5.1	Allow for all cost of flushing and sterilizing of pipelines as specified or directed by the Engineer	SUM	1		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
C5.2	Allow for connection into existing pipelines including all municipal charges and connection fees	SUM	1		
	Borehole Drilling				
C5.3	Site and Install boreholes with all necessary fittings	No	2		
C5.4	Allow for water quality test for boreholes	No	2		
C5.5	Allow for all cost for water quality test for boreholes	No	2		
	Total water reticulation carried to summary				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	BILL NO.4				
D	**SEWERAGE RETICULATION**				
	Site Clearance				
D1.1	Clear vegetation and trees of girth up to 0.5m(width of line maximum 1.5m)	m^2			
D1.2	Extra over item D1.1 for trees with girth over 0.5m	no			
	Excavation				
D1.3	Excavate in all materials for trenches backfill and compact for depth up to 2m	m^3	380		
D1.4	Extra over all excavations for:				
	Hard material excavation	m^3	40		
	Hard rock excavation	m^3	10		
	Pipe bedding				
D1.5	Allow for supplying and placing bedding material for all sewer pipes measured compacted				
	i)Selected granular/sand material	m^3	72		
D1.6	Concrete bedding or concrete surround including formwork and compacting for shallow pipework under roads.				
	i) Grade 10 concrete sorround	m^3	1		
	ii) Grade 15 concrete sorround	m^3	1		
D1.7	Allow for carting away excess and unsuitable material from trenches	m^3/km	72		
	Pipework				
	Supply, lay, bed, joint and test sewer pipes :Bed Class to be determined by Engineer on site				
D1.8	Pvc sewer pipes				
	i) 110mm diam.	m	615		
	Construction of Manholes				
D1.9	Allow for supplying and pouring G20 concrete for manhole slabs including for making good benching and channels with smooth finish.	m^3	7.2		
D2.0	Supply and fix 900*300mm precast manhole rings and ensure water tight joints for manholes exceeding 1.5m deep.	no	240		
D2.1	Supply and fix stepping irons for deep manholes.(each stepping iron)	no	240		
D2.2	Supply and install precast concrete manholes slabs complete with cover and frames(915mm diam) for				
	i) heavy duty manhole covers	no	40		
	ii) ordinary manhole covers	no			
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
	Sundries				
D2.3	Test Manholes for water tightness	No	40		
D2.4	Break into and connect into existing sewer line including flexible joints and make good all benching at the connection point.	sum			
D2.5	Allow for pumping of trenches to remove excess water	sum	1		
	Septic Tank for 35 People *2				
D2.6	Excavate for 35 persons septic tank(5m*3m*2.5m)	m^3	75		
D2.7	Supply and pour G20 concrete for base slabs of septic tank including screed	m^3	5		
D2.8	Supply and erect brickwork and plastering	m^2	100		
D2.9	Supply pour G20 concrete to septic tank top slab	m^3	5		
D3.0	Supply and install S193 wire mesh	m^2	92		
D3.1	Provide for shuttering for top septic slab	m^2	30		
D3.2	Provide and fix manhole covers complete with frames(600*450)	no	4		
D3.3	Provide and fix 110mm T-pieces	no	4		
D3.4	Provide and fix rodding eye	no			
	Soakaway for 35 people*2				
D3.5	Excavate for soakaway (30m*3m*1.8m depth)	m^3	216		
D3.6	Scarify floor of excavation	m^2	180		
D3.7	Provide and place distribution aggregates	m^3	189		
D3.8	Supply and place corrugated iron sheet over distribution aggregate	m^2	180		
D3.9	Backfill over corrugated iron sheet or dispose by spreeding on site	m^3	27		
D4.1	Supply and lay pvc slotted drainage pipe 110mm or 110mm pvc slotted borehole casing	m	120		
D4.2	Supply and lay 110mm pvc pipe	m	6		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
D4.3	110mm pvc pipe fittings				
	i) Tees	no	2		
	ii)110*90mm bends	no	2		
	Septic Tank for 150 People *4				
D4.4	Excavate for 150 persons septic tank(6m*4m*2m)	m^3	192		
D4.5	Supply and pour G20 concrete for base slabs of septic tank including screed	m^3	15		
D4.6	Supply and erect brickwork and plastering	m^2	168		
D4.7	Supply pour G20 concrete to septic tank top slab	m^3	15		
D4.8	Supply and install S193 wire mesh	m^2	288		
D4.9	Provide for shuttering for top septic slab	m^2	96		
D5.0	Provide and fix manhole covers complete with frames(600*450)	no	8		
D5.1	Provide and fix 110mm T-pieces	no	8		
D5.2	Provide and fix rodding eye	no			
	Soakaway for 150 people*4				
D5.3	Excavate for soakaway (40m*4m*0.8m depth)	m^3	512		
D5.4	Scarify floor of excavation	m^2	96		
D5.5	Provide and place distribution aggregates	m^3	416		
D5.6	Supply and place corrugated iron sheet over distribution aggregate	m^2	96		
D5.7	Backfill over corrugated iron sheet or dispose by spreeding on site	m^3	96		
D5.8	Supply and lay pvc slotted drainage pipe 110mm or 110mm pvc slotted borehole casing	m	320		
D5.9	Supply and lay 110mm pvc pipe	m	8		
D6.0	110mm pvc pipe fittings				
	i) Tees	no	4		
	ii)Cross	no	4		
	Total carried forward				

ITEM No	DESCRIPTION	UNIT	QNTY	RATE	AMOUNT
	Total brought forward				
	Septic Tank for 5 People *2				
D6.1	Excavate for 5 persons septic tank(2m*1m*1.5m)	m^3	6		
D6.2	Supply and pour G20 concrete for base slabs of septic tank including screed	m^3	0.6		
D6.3	Supply and erect brickwork and plastering	m^2	11		
D6.4	Supply pour G20 concrete to septic tank top slab	m^3	0.6		
D6.5	Supply and install S193 wire mesh	m^2	12		
D6.6	Provide for shuttering for top septic slab	m^2	4		
D6.7	Provide and fix manhole covers complete with frames(600*450)	no	4		
D6.8	Provide and fix 110mm T-pieces	no	4		
D6.9	Provide and fix rodding eye	no			
	Soakaway for 5 people*2				
D7.0	Excavate for soakaway (15m*1.2m*0.9m depth)	m^3	94		
D7.1	Scarify floor of excavation	m^2	18		
D7.2	Provide and place distribution aggregates	m^3	11.5		
D7.3	Supply and place corrugated iron sheet over distribution aggregate	m^2	30		
D7.4	Backfill over corrugated iron sheet or dispose by spreeding on site	m^3	82.5		
D7.5	Supply and lay pvc slotted drainage pipe 110mm or 110mm pvc slotted borehole casing	m	30		
D7.6	Supply and lay 110mm pvc pipe	m	4		
D7.7	110mm pvc pipe fittings				
	i) Tees	no			
	ii)Cross	no			
	Total sewer reticulation carried to summary				

COST ESTIMATES FOR CIVIL WORKS

SECTION	DESCRIPTION				AMOUNT
BILL 1	PRELIMENARY& GENERAL				
BILL 2	ROADS AND STORMWATER				
BILL 3	WATER RETICULATION				
BILL 4	SEWER RETICULATION				
	TOTAL CARRIED TO MAIN SUMMARY				

SECTION 7 - MAIN SUMMARY

SECTION	MAIN SUMMARY	PAGE	AMOUNT	QUANTITY	TOTAL AMOUNT
1	PRELIMINARIES AND GENERALS	19		1	
2	OFFICE BLOCK	54		5	
3	GUARD HOUSE	88		3	
4	ABLUTIONS	122		4	
5	GANTRY	152		1	
6	CIVIL WORKS	163		1	
	SUB-TOTAL A				
	Add 10% CONTIGENCY				
	SUB-TOTAL B				
	Add 14.5% VAT				
	…….. Signature of Contractor		……. Date		
	TOTAL CARRIED TO FORM OF TENDER				