

**AFRICAN CENTER OF EXCELLENCE FOR GENOMICS
OF INFECTIOUS DISEASES (ACEGID),
REDEEMER'S UNIVERSITY**

CONTRACT DOCUMENTS

-702-

**PROPOSED ACEGID ULTRA MODERN RESEARCH
LABORATORY COMPLEX**

-A7-

REDEEMER'S UNIVERSITY, GBOGAN – OSHOGBO ROAD, EDE,
OSUN STATE

Quantity Surveyors: Taoheed Adeosun & Co
33, Akinwunmi/Joju Road,
Ota, Ogun State
Tel:, 0803 300 7353, 0805 103 4421
e-mail – taadeosun@yahoo.com

NOVEMBER, 2017

CONSULTANTS

Project Architects

MASS DESIGN GROUP

334, Boylston St # 120h Beverly
MA01915,
USA

Architects of Record:

YUSUF & PARTNERS

3, Ayanboye Street
Anthony Village,
Lagos

Structural Engineers:

UP J CONCEPT ENGINEERING SERVICES

7, Alafia Close, Ojoo
Ibadan.

**Mechanical & Electrical
Engineers:**

Build Health International

100 Cummings Center #120 Beverly,
MA 01915
USA

Quantity Surveyors:

Taoheed Adeosun & Co

33, Akinwunmi/Joju Road,
Ota, Ogun State.

Project Co-ordinator:

**The Directorate of Works and Physical Planning,
Redeemer's University**

Gbongan - Oshogbo Road, Ede,
Osun State.

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BRIEF OUTLINE SCOPE OF WORKS

BUILDING

This is a Two - floor building approximately 2160m². It is generally concrete frame structure on a simple pad/raft foundation. Upper floor is concrete and roof is of Ultraspan galvanized trusses, aluminum covering and feltwork. Windows are powder coated aluminum glazed with tinted glass.

Walls are of Sandcrete hollow blocks / Hydraform. Specialised Rammed Earth Walls may be introduced in some areas later.

Doors and frames are a combination of glazed aluminum and flush. Internal walls are rendered and painted with tiling in wet areas. Internal floors are generally vitrified with non-slip ceramic tiles in wet areas. Internal ceilings are a mixture of render and paint, and Armstrong suspended ceiling. External walls are a mixture of render, float screed mixed with damp proof treatment and paint.

External works comprise site clearance, parkings, driveways, Landscaping and drainage works (septic tanks, soakaway pits inspection chambers and pipe runs)

The building is fully serviced and comprise: Mechanical services and general electrical installations

INSTRUCTIONS TO PERSONS TENDERING

INSTRUCTIONS TO PERSONS TENDERING

1) DOUBT OR OBSCURITY

Should there be any doubt or obscurity as to the meaning of any of the Contract Documents or to anything to be done or not to be done by the Contractor or as to those instructions or as to any other matter or thing, persons tendering must set forth in writing such doubt or obscurity and submit the same to the Quantity Surveyors with copies to the Architects.

The Contractor is advised to read carefully and understand all documents and the clients intentions in respect of the execution of the contract and the works.

2) TENDER PROCEDURE

As in 1 above, questions in respect of the tender documents should be completed and submitted to the quantity surveyors. Tenders are expected to be returned by to the offices of the client, The Director ACEGID Genomics Center, Redeemer's University, Gbongan – Oshogbo Road, Ede.

3) CONTRACT DOCUMENTS

The Contractor is to read carefully the documents issued and the Contractor will be deemed to have included in his Tender Figures for the implications and requirements of the contract Documents and no claims for increase in the Tender figure will be entertained subsequent to its acceptance on the grounds of misrepresentation, misinformation or any verbal or written instructions or promise given other than what is allowed for under the Contract.

4) CONTRACTOR'S ATTENTION

The Contractor's attention is drawn in particular to the following:-

- (i) The time for completion shall be inserted in the space provided on the Form of Tender
- (ii) This will be Fixed Firm Price Contract – All references to fluctuations deleted in its entirety.
- (iii) The provision for Liquidated Damages (Clause 22 of the Conditions of Contract and Appendix thereto refers)
- (iv) The contractor shall make due allowance in the tender for withholding tax, other taxes and levies in consonance with tax laws prevailing at the date of tender.

5) **COMPLETION OF FORM OF TENDER**

The Tender shall be made out in ink on the Form of Tender provided. The Tender amount is to be written in words and figures in the space provided. The Tender when completed shall be signed in full by the MD and /or authorized representative of the firm. The full name and address of the Contractor shall be printed in block letters or typed in the space provided below the signature.

6) **RETURN OF TENDER**

The Form of Tender and the priced Bills of Quantities duly completed together with any drawings shall be enclosed and sealed in their respective envelopes provided and returned as instructed on or before the date for return of Tenders. Tenders received after this time will not be considered.

7) **ACCEPTANCE OF TENDER**

The employer does not bind himself to accept the lowest or any tender and will not assign any reason for the rejection of any tender.

8) **METHOD STATEMENT**

The contractor is to return with his tender a statement setting out the method of construction, plant, workshops, etc. preferably in the form of a simple drawing. He should also give details of the various Site Supervisors and other Administrative Staff he proposes to employ on this contract

9) **PRELIMINARIES**

All items in the PRELIMINARIES MUST be priced separately (Nil for items not required); combined pricing of preliminary items may lead to disqualification of the Tenderer.

10) **COMPLETENESS OF THE TENDER DOCUMENTS**

The Contractor is to satisfy himself that there are no pages missing from the tender documents and that all page totals are included in the collections and summaries and that the Schedule of Rates contained in this bill is duly completed.

11) **ADJUSTMENT OF ERRORS**

After the pricing documents have been examined by the Quantity Surveyor, all errors will be pointed out to the Project Managers/Architects who will determine the action to be taken in accordance with the normal procedure.

ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT

Made the day of 2017

BETWEEN AFRICAN CENTER OF EXCELLENCE FOR GENOMICS OF INFECTIOUS DISEASES (ACEGID) REDEEMER'S UNIVERSITY of (or whose registered office is situated at) **GBONGAN - OSHOGBO ROAD, EDE, OSUN STATE** (hereinafter called "the Employer" which term shall where the context so admits include its successors in the title and assigns) of the one part And **PLATFORM CONCEPT LIMITED** a company incorporated in Nigeria of (or whose registered office is situate at) **Suite 11, Okaka Plaza, Ist Avenue, Festac. Town, Lagos** (hereinafter called the "contractor" which term shall where the context so admits include its successors -in-title and assigns) of the other part .

WHEREAS

- 1) The Employer is desirous of constructing and completing **Ultra Modern Research Laboratory Complex at Redeemer's University, Gbongan - Oshogbo Road, Ede, Osun State** (hereinafter called "the works") and has caused **DRAWINGS and BILLS OF QUANTITIES** showing and describing the works to be done to be prepared by or under the direction of **MASS DESIGN GROUP, 334, Boylston St, #120h Beverly, USA.**
- 2) The Contractor has supplied the Employer with a fully priced copy of the said **BILLS OF QUANTITIES** (which copy is hereinafter referred to as "the Contract Bills") and
- 3) The said Drawings listed in the "Schedule of Drawings" (hereinafter referred to as "the Contract Drawings") and the Contract Bills have been signed by or on behalf of the parties hereto.

NOW IT IS HEREBY AGREED AS FOLLOWS:

Article 1

For the consideration hereinafter mentioned the Contractor shall upon and subject to the Conditions annexed hereto carry out and complete the works shown upon the Contract Drawings and described by or referred to in the Contract Bills and in the said Conditions.

Article 2

The Employer will pay to the Contractor the sum of Four hundred and seventy five million, fifteen thousand three hundred and eleven naira, twenty three kobo only (~~₦~~**475,015,311.23**) including Value Added Tax. (hereinafter referred to as "the contract sum") or such other as shall become payable hereunder at the times and in the manner specified in the said conditions.

Article 3

I/We, undertake that the completion time is 42 calendar weeks, and Date for possession is the ----- day of -----, 2017

With the date for completion being the ----- day of-----, 2018.

Article 4

The term, "the Architect" in the said Articles and Conditions shall mean **MESSRS MASS DESIGN GROUP**, of 334, Boylston St, #120h Beverly, USA. or in the event of his death or ceasing to be the Architect for the purpose of this Contract, such other person as the Employer shall nominate within a reasonable time but in any case not later than 21 days after such death or cessation for that purpose, not being a person to whom the Contractor not later than 7 days after such nomination shall object for reasons considered to be sufficient by an Arbitrator appointed in accordance with Clause35 of the said Conditions.

Article 5

The term, "the Architect of record" in the said Articles and Conditions shall mean **MESSRS YUSUF AND PARTNERS**, 3, Ayanboye Street, Anthony Village, Lagos or, in the event of his death or ceasing to be the Architect of record for the purpose of this Contract, such other person as the Employer shall nominate within a reasonable time but in any case not later than 21 days after such death or cessation for that purpose, not being a person to whom the Contractor not later than 7 days after such nomination shall object for reasons considered to be sufficient by an Arbitrator appointed in accordance with Clause35 of the said Conditions.

Article 6

The term "**the Quantity Surveyor**" in the said Conditions shall mean **MESSRS TAOHEED ADEOSUN & CO.** of 33, Akinwunmi/Joju Road, Ota, Ogun State or, in the event of his death or ceasing to be the Quantity Surveyors for the purpose of this Contract, such other person as the Employer shall nominate within a reasonable time but in any case not later than 21 days after such death or cessation for that purpose not being a person to whom the Contractor not later than 7 days after such nomination shall object for reasons considered to be sufficient by an Arbitrator appointed in accordance with Clause 35 of the said Conditions.

Article 7

The term "**the Structural Engineer**" in the said Articles and Conditions shall mean **MESSRS VPJ CONCEPT ENGINEERING SERVICES**, 7, Alafia close, Ojoo, Ibadan or, in the event of his death or ceasing to be the Structural Engineer for the purpose of this Contract, such other person as the Employer shall nominate within a reasonable time but in any case not later than 21 days after such death or cessation for that purpose not being a person to whom the Contractor not later than 7 days after such nomination shall object for reasons considered to be sufficient by an Arbitrator appointed in accordance with Clause 35 of the said Conditions.

Article 8

The **Project Co-ordinator** shall mean, The Directorate of works and physical planning, Redeemer's University, Gbongan – Oshogbo Road, Ede, Osun State.

Article 9

The term “**Mechanical and Electrical Engineers**” in the said Articles and Conditions shall mean **MESSRS Build Health International, 100 Cummings Center #120 Beverly, U.S.A.** or, in the event of his death or ceasing to be the **Mechanical and Electrical Engineer** for the purpose of this Contract, such other person as the Employer shall nominate within a reasonable time but in any case not later 21 days after such death or cessation for that purpose, not being a person to whom the Contractor not later than 7 days after such nomination shall object for reasons considered to be sufficient by an Arbitrator appointed in accordance with Clause 35 of the said Conditions.

Article 10

- i) The Contractor shall at his own expense maintain until the issue of the Final Certificate of Completion of the Contract the Bond or Guarantee of an Insurance Company or a Bank acceptable to the employer to be jointly and severally bound with the contractor to the employer in the sum of ten per cent (10%) of the contract price for the performance of the contract.
- ii) The Contractor shall at his own expense maintain an ‘Advance Payment Bond’ from an approved Bank until the advance payment is fully repaid back to the employer
- iii) These bonds or guarantee shall be irrevocable and shall be read along with the Articles of Agreement and shall require the approval of the Employer (which approval shall not be unreasonably withheld) and shall be lodged with the Employer / Project Architects at the time the Articles of agreement are signed by the Contractor.
- iv) This is a FIXED FIRM PRICE Contract. All references to fluctuations deleted in its entirety.
- v) The contract is subject to withholding tax, other taxes and levies in consonance with prevailing tax laws.

IN WITNESS whereof the parties hereunto set their seals the day and year first above written.

Signed by the said

_____ **Employer**

Signed in the presence of

Name: _____ Signature _____

Address: _____

Occupation: _____

Signed by the said

_____ **Contractor**

Signed in the presence of

Name: _____ Signature: _____

Address: _____

Occupation: _____

THE CONDITIONS HEREIN BEFORE REFERRED TO

1.0 Contractor's obligations

- Contractor to carry out works 1.1 The contractor shall upon and subject to these Conditions carry out and complete the works shown upon the Contract Drawings and described by or referred to in the Contract Bills and in these conditions in every respect to the reasonable satisfaction of the Architect/Co-ordinator.
- Discrepancy in or divergence between documents 1.2 If the contractor shall find any discrepancy in or divergence between the Contract Drawings and/or the Contract Bills he shall immediately give to the Architect/Co-ordinator written notice specifying the discrepancy or divergence and the Architect/Co-ordinator shall issue instructions in regard thereto.
- Programme and Progress charts 1.3 Upon the appointment of the Contractor and the site being made available to the contractor free from all encumbrances by the Employer in accordance with clause 2.1.1, the Contractor shall produce a programme/progress chart in accordance with the accepted completion period of the Contract for the approval of the Architect/Co-ordinator.

If any alteration or amendment is deemed necessary to this programme, it shall be with the approval of the Architect/Co-ordinator.

2.0 Architect's/Co-ordinator's instructions

- Compliance with Architect/Co-ordinator's Instruction 2.1 The contractor shall (subject to clause 2.2, 2.3 and 11.4 forthwith comply with all instructions issued to him by the Architect/Co-ordinator's in regard to any matter in respect of which the Architect/co-ordinator is expressly empowered by these conditions to issue instructions. If within 5 working days after receipt of written notice from the Architect/Co-ordinator requiring compliance with an instruction the Contractor does not comply therewith, then the employer may employ and pay other persons to execute any work which may be necessary to give effect to such instruction and all costs incurred in connection with such employment shall be recoverable from the Contractor by the Employer as a debt or may be deducted by him from any monies due or to become due to the Contractor under this Contract.
- Provisions empowering instruction 2.2 Upon receipt of what purports to be an instruction issued to him by the Architect/Co-ordinator, the contractor may request the Architect/Co-ordinator to specify in writing the provision of these conditions empowers the issue of the said instruction. The Architect/Co-ordinator shall forthwith comply with any such request and if the Contractor shall thereafter comply with the said instruction (neither party before such compliance having given to the other a written request to concur in the appointment of an Arbitrator under clause 35 in order that it may be decided weather the provision specified by the Architect empowers the issue of the said instruction) then the issue of the same shall be deemed for all the purposes of this Contract to have been empowered by the provision of these conditions specified by the Architect/Co-ordinator in answer to the Contractor's request.

Instruction to be in Writing	2.3	All instructions issued by the Architect/Co-ordinator shall be in writing. Any instruction issued orally shall be of no immediate effect, but shall be confirmed in writing by the Contractor to the Architect/Co-ordinator within 5 working days, and if not dissented from in writing by the Architect/Co-ordinator to the contractor within 5 working days from receipt of the Contractor's confirmation shall take effect as from the expiration of the latter said 5 days. Provided always:
Procedure for Instructions given Other than in writing	2.3.1	that if the Architect/Co-ordinator within 5 working days of giving such an oral instruction shall himself confirm the same in writing, then the Contractor shall not be obliged to confirm as aforesaid, and the said instruction shall take effect as from the date of the Architect's/Co-ordinator's confirmation.
Statements in the Minutes of a site Meeting purporting to be an instruction	2.3.2	that any statement purported to be an instruction contained in the minutes of site meetings shall be deemed to be an oral instruction and shall be subject to confirmation as provided by clause 2.3.
Channeling of instructions	2.3.3	that any instruction(s) purported to be issued to the Contractor by any other agent of the Employer shall be of no effect unless issued through the Architect/co-ordinator.

3.0 Contract Documents

Custody of Contract Bills and Contract Drawings	3.1	The Contract Drawings and the Contract Bills shall remain in the custody of the Employer. Certified true copies of the Contract Bills shall be giving to the Contractor, the Architect/Co-ordinator and the Quantity Surveyor.
	3.2	Immediately after the execution of this contract, the Employer without charge to the Contractor, shall furnish him (unless he shall have been previously furnished) with:
	3.2.1	one copy certified on behalf of the Employer of the Articles of Agreement and these Conditions.
	3.2.2	two copies of the Contract Drawings, and
	3.2.3	two copies of the unpriced Bills of Quantities and (if requested by the Contractor)
Specification Descriptive, Schedule etc	3.3	So soon as is possible after the execution of this contract the Architect/Co-ordinator without charge to the Contractor shall furnish him (unless he shall have been previously furnished) with two copies of the specifications, descriptive schedules or other like documents necessary for use in carrying out the works Provided that nothing contained in the said Specifications, descriptive schedules or other documents shall impose any obligation beyond those imposed by the Contract Documents, namely: the Contract Drawings, the Contract Bills, the Articles of Agreement and these Conditions.
Drawings or details	3.4	As and when from time to time may be necessary the Architect/Co-ordinator without charge to the Contractor shall furnish him with two copies of such drawings or details as are reasonably necessary either to explain and amplify the contract Drawings or to enable the Contractor to carry out and complete the Works in accordance with this Conditions.
Availability of Certain documents	3.5	The contractor shall keep one copy of the Contract Drawings, one copy of the unpriced Bills of Quantities, one copy of the specifications, descriptive schedules or other documents referred to in clause 3.3 and one copy of the drawings and details referred to in clause 3.4 upon the works so as to be available to the Architect/Co-ordinator or his representative at all reasonable times.
Return of drawings etc.	3.6	Upon final payment under clause 30.6 the contractor shall if so requested by the Architect/Co-ordinator forthwith return to the Architect/co-ordinator all drawings, details, descriptive schedules and other documents of like nature which bear his name.
Limits to use of Documents	3.7	None of the documents herein before mentioned shall be used by the Contractor for any purpose other than this Contract and neither the Employer, the Architect/Co-ordinator nor the Quantity Surveyor shall divulge or use except for the purpose of this Contract any of the prices in the Contract Bills.

4.0 Statutory obligations, notices, fees and charges

Statutory Requirements

4.1 The Contractor shall comply with and give all or any regulation or bye-law of any local authority or of any statutory undertaker which has any jurisdiction with regard to the Works or with whose systems the same are or will be connected. The Contractor before making any variation from the Contract Drawings or Contract Bills necessitated by such compliance shall give to the Architect/Co-ordinator a written notice specifying and giving the reason for such variation and the Architect/Co-ordinator may issue instructions in regard thereto. If within 5 working days of receipt by the Architect/Co-ordinator of the said written notice the Contractor does not receive an instruction in regards to the matters therein specified he shall proceed with the work conforming to the legislation, instrument, rule, order, regulation or bye-law in questions and any variation thereby necessitated shall be deemed to be a variation required by the Architect/Co-ordinator.

Fees or Charges

4.2 The contractor shall pay and indemnify the Employer against liability in respect of any fees or charges (including any rate or taxes) legally demandable under any legislation, or instrument, rule or order made under any legislation or an regulation bye-law of any local authority or of any statutory undertaker in respect of the works. Provided that the amount of any such fees or charges (including any rates or taxes) shall be added to the Contract Sum unless the:

4.2.1 arise in respect of work executed or materials or goods supplied by a local authority or statutory undertaker for which a prime cost sum has arisen as a result Architect's/Co-ordinator's instructions given under clause 2 or

4.2.2 are priced or stated by way of a provisional sum in the Contract bills.

5.0 Levels and setting out of the Works

The Architect/Co-ordinator shall determine any levels, which may be required for the execution of the works, and shall furnish to the Contractor by way of accurately dimensioned drawings such information as shall enable the Contractor to set out the Works at ground level. Unless the Architect/Co-ordinator shall otherwise instruct, in which case the Contract Sum shall be adjusted accordingly, the Contractor shall be responsible for and shall entirely at his own cost amend any errors arising from his own inaccurate setting out.

6.0 Quality of materials goods and workmanship to conform to description, testing and inspection

Kinds and standard

6.1 All materials, goods workmanship shall so far as procurable be of the respective kinds and standards in the Contract Bills.

Vouchers materials and goods

6.2 The contractor shall upon the request of the Architect/Co-ordinator furnish him with vouchers to prove that the materials and goods comply with clause 6.1

Inspection – tests	6.3	The Architect/Co-ordinator may issue instructions requiring the Contractor to open up for inspection any work covered up or to arrange for or carry out any test of any materials or goods (whether or not already incorporated in the works) or any executed works and the cost of such opening up or testing (together with the cost of making good in consequence thereof) shall be added to the Contract Sum unless provided for in the Contract Bills or unless the inspection or test shows that the work, materials or goods are not in accordance with this Contract.
Powers of Architect/Co-ordinator-work not In accordance with the contract.	6.4	The Architect/Co-ordinator may but not unreasonably or vexatiously issue instructions in regard to the removal from site of any work, materials or goods which are not in accordance with this Contract.
Exclusion from the Works of persons Employed thereon	6.5	The Architect/Co-ordinator may but not unreasonably or vexatiously issue instructions to the Contractor requiring the exclusion from the Works of any person(s) employed thereon. The reasons for such instructions (such as negligence, poor workmanship, failure to adhere to reasonable instructions or any other) shall be clearly stated in writing. In the event of such an instruction being given, the Contractor shall be allowed a reasonable period to replace the person(s) so removed.
	7.0	Royalties and Patent Rights
Treatment of Royalties, etc Indemnity to Employer	7.1	All royalties or other sums payable in respect of the supply and use in carrying out the Works as described by or referred to in the Contract Bills of any patented articles, processes or inventions shall be deemed to have been included in the Contract Sum and the Contractor shall indemnify the Employer from and against all claims, proceedings, damages, cost and expenses which may be brought or made against the Employer or to which he may be put by reason of the Contract infringing or being held to have infringed any patent rights in relation to any such articles, processes or inventions.
Architect's/Co-ordinator's instructions treatment of royalties, etc	7.2	Provided that where in compliance with the Architect's/Co-ordinator's instructions the Contractor shall supply and use in carrying out the Works any patent articles, processes or inventions, which but for the Architect's/Co-ordinator's instruction he would not have supplied and use to carry out the original works, the contractor shall not be liable in respect of any infringement or alleged infringement of any patent rights in relation to any such articles, processes or inventions and all royalties, damages or other monies which the Contractor may be liable to pay the persons entitled to such patent right shall be added to the Contract Sum.

8.0 Person-in-Charge

- 8.1 The Contractor shall constantly keep upon the works a competent and English-speaking Site Agent and any instructions given to him by the Architect/Co-ordinator shall be deemed to have been issued to the Contractor.
- 8.2 Where in the opinion the Architect/Co-ordinator the Site Agent does not satisfy any of the provisions of clause 8.1 the Architect/Co-ordinator shall issue an instruction for his replacement which instruction shall be complied with within 14 days.

9.0 Access for Architect/Co-ordinator to the Works

The Architect/Co-ordinator and his representative(s) shall at all times have access to the works and to the workshops or other places of the Contractor where work is being prepared for his Contract and when work is to be prepared in workshops or other places of a sub-contractor (whether or nor a Nominated Sub-Contractor as defined in clause 27) the Contractor shall by a term in the sub-contract so far as possible, secure a similar right of access to those workshop or places for the Architect/Co-ordinator and his representative(s) and shall do all things reasonably necessary to make such rights effective.

10.0 Clerk of works

The Employer shall be entitled to appoint a clerk of works whose duty shall be to act solely as inspector on behalf of the Employer under the directions of the Architect/Co-ordinator.

The Contractor shall afford every reasonable facility for the performance of the duty. If any direction is given to the Contractor or to his Site Agent upon the works by the Clerk of works, the same shall be of no effect unless given in regard to a matter in respect of which the Architect/Co-ordinator is expressly empowered by these conditions to issue instruction and unless confirmed in writing by the Architect/Co-ordinator within 5 working days of it being given. If any such direction is so and confirmed or is put into writing and sent by the Contractor to the Architect/Co-ordinator so as to reach the Architect/Co-ordinator within 2 working days of such direction having been given by the clerk of works and if not dissented from the Architect/co-ordinator within 5 working days of it's receipt by him, then as from the date of the direction having been given by the Clerk of Woks it shall be deemed to be an Architect's/Co-ordinator's instruction.

11.0 Variation, provisional and prime cost sums

Definition of
Variation

- 11.1 The term 'Variation' as used in these Conditions means the alteration or modification of the design, quality and quantity of the works as shown upon the Contract Drawings and described by or referred to in the Contract Bills. It includes the addition, omission, substitution or postponement of any work, the alteration of the kind or standard of any materials or goods used or to be used in work and the removal from the site of any work, materials or goods used or to be used in or brought to the site by the Contractor for the purpose of the works, other than work, materials or goods which are not in accordance with

this Contract. It also includes the corrections of errors and omissions in the Contract Drawings and Contract Bills.

- | | | |
|--|----------|--|
| Reasons for Variations | 11.2 | Variation may arise due to the following reasons: |
| | 11.2.1 | Circumstances that could not have been reasonably foreseen before signing of the Contract. |
| | 11.2.2 | additional requirement of the Employer |
| | 11.2.3 | compliance with new government orders or legislations |
| | 11.2.4 | corrections of errors or omissions in the contract Drawings and Contract Bills |
| | 11.2.5 | non-availability of materials and goods and workmanship specified in the contract |
| | 11.2.6 | substitution of materials, goods and workmanship specified in the Contract |
| Instructions Requiring a variation | 11.3 | The Architect/Co-ordinator may issue instructions requiring a variation and he may sanction in writing any variation made by the Contractor otherwise than pursuant to the instructions of the Architect/Co-ordinator. No variation required by the Architect/Co-ordinator or subsequently sanctioned by him shall vitiate this contract. |
| Limit to variation | 11.4 | Notwithstanding the provision of clause 11.3 variation required by the Architect/Co-ordinator resulting in a net addition to the Contract sum in excess of the amount stated in the Appendix shall be of no effect unless approved by the Employer in writing to the Architect/Co-ordinator which approval shall be given by the Employer within 14 working days of request. |
| Instructions on Provisional sums | 11.5 | The Architect/Co-ordinator shall issue instructions in regard to the expenditure of prime cost and provisional sums included in the Contract Bills. |
| Valuation of work on Variations and Provisional sums | 11.5.1 | All variations required by the Architect/Co-ordinator or subsequently sanctioned by him in writing and all work executed in accordance with instructions by the Architect/Co-ordinator as to the expenditure of prime cost and provisional sums which are included in the Contract Bills shall be measured and valued by the Quantity Surveyor and such valuation (in these Conditions called "the Valuation") shall, unless otherwise agreed by the Employer and the Contractor be made in accordance with the following rules: |
| | 11.5.1.1 | Where the work is of similar character to or is executed under similar conditions as and does not significantly change the quantity of work set out in the Contract Bills, the rates and prices for the work so set out shall determine the valuation; |
| | 11.5.1.2 | Where the work is of similar character to set out in the Contract Bills but is not executed under similar conditions thereto and/or significantly changes the quantity thereof the rate and prices for the work so set out shall be the basis for determining the valuation and the valuation shall include a fair allowance for such difference in condition and/or quantity; |

- 11.5.1.3 Where the work is not of similar character to work set out in the Contract Bills the work shall be valued at fair rate and prices;
- 11.5.1.4 Where work cannot properly be measured and valued, the contractor shall be allowed day-work rates on the basis of the Prime cost of materials, labor and plant used thereon together with percentage additions to each section of the prime cost at the rate set out by the Contractor in the Contract Bills and recorded in the Appendix. Provided that in any case vouchers specifying the time daily spent upon the work and if required by the Architect/Co-ordinator the workmen's names, materials and plant employed shall be delivered for verification to the Architect/co-ordinator or his authorized representative not later than the end of the week following that in which the work has been executed;
- 11.5.1.5 The prices in the Contract Bills shall determine the valuation of items omitted, provided that if omissions substantially vary the conditions under which any remaining items of work are carried out the prices for such remaining items shall be valued under clause 11.5.1.2.

Contractor right to be Present at the measurement	11.6	Where it is necessary to measure work for the purpose of the valuation, the Quantity Surveyor shall give to the contractor an opportunity of being present at the time of such measurement and of taking such notes and measurement as the Contractor may require.
Valuations addition to or deduction from Contract Sum	11.7	Effect shall be given to the measurement and Variations under clause 11.5 in interim certificates and by adjustment of the Contract Sum; and effect shall be given to the measurement and valuation of work for which a provisional sum is included in the Contract Bills under the said clause in interim certificates and by adjustment of the Contract Sum in accordance with clause 30.5.3
Reimbursement for Direct loss and/or Expense for work on Variation and Provisional sums	11.8	If upon written application being made to him by the Contractor, the Architect/ Co-ordinator is of the opinion that a variation or execution by the Contractor of work for which a provisional sum is included in the contract bills (other than work for which a tender made under clause 27.7 has been accepted) has involved the Contractor in direct loss and/or expense for which he would not be reimbursed by payment in respect of a valuation made in accordance with the rules contained in clause 11.5 and if the said application is made within a reasonable time of the loss or expense having been incurred, then the Architect/Co-ordinator shall instruct the Quantity Surveyor to ascertain the amount of such loss and/or expense.

Any amount from time to time so ascertained shall be added to the Contract Sum, and if an interim certificate is issued after the date of ascertainment, any such amount shall be added to the amount which would otherwise be stated as due in such certificate.

12.0 Contract Bills

The quality and quantity of the work included in the Contract Sum shall be deemed to be that which is set out in the Contract Bills referred to in clause 3. The Contract Bills have been prepared in general accordance with the principles of Standard Method of Measurement of Building works issued by the Institute of Chartered Surveyor (1968 Edition).

Any error in description or in quantity or any omission of items from the Contract bills shall not vitiate this Contract but shall be rectified and treated as a variation.

13.0 Contract Sum

The contract sum shall not be adjusted or altered in any way whatsoever otherwise than in accordance with the provisions of these conditions, and subject to clause 12 any error whether of arithmetic or not in computation of the Contract Sum shall be deemed to have been accepted by the parties hereto.

14.0 Unfixed materials and goods

Unfixed materials and goods intended or delivered to and placed on the works or any location approved by the Architect/Co-ordinator in consultation with the Employer shall not be removed except for use upon the Works unless the Architect/Co-ordinator has consented in writing to such removal which consent shall not be unreasonably withheld. Where the value of any such materials or goods has in accordance with clause 30.2 been included in any interim certificate under which the Contractor has received payment, such materials and goods shall become the property of the Employer, but subject to clause 20(B) or clause 20(C) (if applicable), the Contractor shall remain responsible for loss or damage therefore and for the cost of storage, handling and insurance of same.

15.0 Practical completion and defect liability

Certificate of Practical completion

15.1 When in the opinion of the Architect/Co-ordinator the works are practically completed, he shall forthwith issue a certificate to that effect and practical completion of the works shall be deemed for all the purposes of this Contract to have been taken place on the named in such certificate.

15.2 If however, in the opinion of the Contractor practical completion of the works has been achieved, he shall notify the Architect/Co-ordinator in writing and if within 14 days there is no letter to the contrary from the Architect/Co-ordinator then it shall be presumed that practical completion has been achieved.

Defect, shrinkages Faults.

15.3 Any defect shrinkages or other faults which shall appear within and under the defect liability period stated in the Appendix and which are due to materials or workmanship not in accordance with this Contract or to exposure to sun or weather occurring before practical completion of the Works shall be specified by the Architect/Co-ordinator in a schedule of defects which he shall deliver to the Contractor not later than 14 days after the expiration of the said defect liability period, and within a reasonable time after receipt of such

schedule, the defects, shrinkages and other faults therein specified shall be made good by the Contractor and (unless the Architect/Co-coordinator shall otherwise instruct in which case the contract sum shall be adjusted accordingly) entirely at his own cost..

- | | | |
|--|-------------|---|
| Defects etc, Architect's/Co-ordinator's instructions | 15.4 | Notwithstanding clause 15.3 the Architect/ Co-ordinator may whenever he consider it necessary so to do, issue instructions requiring any defects, shrinkages or other faults which shall appear within the Defects Liability Period named in Appendix which are due to materials or workmanship not in accordance with this contract or to exposure to sun or weather occurring before practical completion of the Works to be made good, and the Contract shall within a reasonable time after receipt of such instruction comply the same and (unless the Architect/Co-coordinator shall otherwise instruct, in which case the Contract Sum shall be adjusted accordingly) entirely at his own cost. Provided no such instruction shall be issued after delivery of a schedule of defects or after 14 days from the expiration of the Defects Liability Period. |
| Certificate of Completion of Making good Defects | 15.5 | When in the opinion of the Architect/Co-ordinator any defects, completion of shrinkages or other faults which he may have required to be made good, under clause 15.3 and 15.4 shall have been made good, he shall issue a certificate to that effect and completion of making good defects shall be deemed for all purposes of this Contract to have taken place on the date named in such certificate. |
| Damage by weather | 15.6 | In no case shall the Contractor be required to make good at his own cost any damage by sun or weather which appear after practical completion of the Works' unless the Architect/Co-ordinator shall certify that such damage is due to injury which took place before completion of the works. |
| | 16.0 | Sectional completion |
| Possession by Employer relevant Part | 16.1 | If at anytime or times before practical completion of the works the Employer with the consent of the Contractor shall take possession of any part or parts of the same (any such part being hereinafter in this clause referred to as the relevant part) the notwithstanding anything expressed or implied elsewhere in this Contract. |
| Valuation – relevant Part | 16.1/1 | Within 7 days from the date on which the Employer shall have taken possession of the relevant part, the Architect/co-coordinator shall issue a certificate stating his estimate of the approximate total value of the relevant part and for all the purposes of clause 16 (but no other) the value so stated shall be deemed to be the total value of the relevant part, |
| Practical completion Relevant part | 16.1/2 | for the purposes of clause 15.3, 15.4 and 15.6 and clause 16.1.6.2 practical completion of the relevant part shall be deemed to have occurred and the Defect liability period in respect of the part shall be deemed to have commenced on the date on which the Employer shall have taken possession thereof, |

Defect, etc relevant Part	16.1/3	when the opinion of the Architect/Co ordinator any defects, shrinkages or other faults in the relevant part which he may have required to be made good under clause 15.3 or 15.4 shall have been made good, he shall issue a certificate to that effect.
Insurance – relevant	16.1/4	the Contractor shall reduce the value insured under clause 20(A) part (if applicable) by full value of the relevant part and the said relevant part shall as from the date on which the Employer shall have taken possession thereof be at the sole risk of the Employer as regards any of the contingencies referred to the said clause,
Liquidated damages relevant part	16.1/5	in lieu of any sum to be paid or allowed by the Contractor under clause 22 in respect of any period during which the Works may remain incomplete occurring after the date on which the Employer shall have taken possession of the relevant part there shall be paid or allowed such sum as bears the same ratio to the sum which would be paid or allowed apart from the provisions of clause 16 as does the Contract Sum less the total value of the said relevant part of the Contract Sum,
Relevant fund relevant part	16.1.6	within 30 days of the date on which the Employer shall have taken possession of the relevant part there shall be paid to the Contractor from the sum(s) then retained clause 30.3 (if any) one moiety of such amount as bears the same ratio to the unreduced amount named in the Appendix as Limit of Retention fund as does total value of the relevant part of the contract sum and the amount named in the Appendix as limit of retention shall be reduced by the amount of such moiety.
	.1	
	16.1.6	on the expiration of the Defect Liability Period named in the Appendix in respect of the relevant part or on the issue of the Certificate of completion or making good defects in respect of the relevant part, whichever is the later, there shall be paid to the Contractor from the sum(s) then retain under clause 10.3 (if any) the other moiety of the amount referred to in clause 16.1.6.1 and the amount named in the Appendix as Limit Retention Fund shall be reduced by the amount of such moiety.
	.2	

Assignment or sub-letting

Assignment by Employer	17.1	The Employer shall not without the written consent of the Contractor assign this Contract.
Assignment by Contractor	17.2	The Contractor shall not without the written consent of the Employer assign this Contract.
Sub-letting	17.3	The Contractor shall not without the written Consent of the Architect/ Co-ordinator (which consent shall not be unreasonably withheld) sublet any portion of the works which subletting shall not relieve the Contractor of his obligation(s) to the Employer under this Contract.
Determination of Employment of Sub-Contractor	17.4	Provide that it shall be a condition in any sub-letting, which may occur that the employment of contractor under the sub-contract shall determine immediately upon the determination for any reason of the Contractor's employment under this Contract. Nothing within this clause shall be deemed to affect the Contractor's employment of task workers.

18.0 Injury to persons and property and indemnity to Employer

Liability of Contractor for injury or damage to property indemnity Employer

18.1 The Contractor shall be liable for, and shall indemnify the Employer against any expense, liability, loss, claim or proceedings whatsoever arising under any statute or at common law in respect of personal injury to or death of any person whomsoever arising out of or in the course of or caused by the carrying out of the works, except to the extent that the same is due to any act or neglect of the Employer or of any person for whom the Employer is responsible including the persons employed or otherwise engaged by the employer to whom clause 29 refers.

Liability of Contractor for injury or damage to property indemnity Employer

18.2 The Contractor shall subject to clause 18.3 and, where applicable clause 20 (C), be liable for, and shall indemnify the Employer against any expense, liability, loss, claim or proceedings in respect of any injury or damage whatsoever to any property real or personal in so far as such injury or damage arises out of or by reason of carrying out of the Works, and to the extent that the same is due to any negligence, breach of statutory duty, omission or default of the Contractor, his staff or agent(s) or of any person employed or engaged upon or in connection with the Works or any part thereof, his staff or agent(s) of any other person who may properly be on the site upon or in connection with the Works or any part thereof, his staff or agent(s).

Injury or damage to Property exclusion of the works and site materials

18.3 The reference to real or personal property in clause 18.2 does not include the works being executed, materials on site or any other location approved by the Architect/Coordinator or the Employer.

18.4 Upon the issue of the certificate of sectional completion of any portion of the works, the relevant part shall become real or personal property.

19.0 Insurance against injury to persons or property

Contractor's Insurance for Personal injury or death injury or damage to property

19.1 Without prejudice to his obligation to indemnify the Employer under clause 18, the Contractor shall take out and maintain and cause any sub-contractor to take out and maintain such insurances necessary to cover the liability of the Contractor, or as the case may be, of such sub-contractor in respect of of personal injury or death arising out of or in the course of or caused by carrying out of the Works not due to any act or neglect of the Employer or of any person for whom the Employer is responsible including the persons employed or otherwise engaged by the Employer to whom clause 29 refers and in respect of injury or damage to property (real or personal), arising out of or in the course of or by reason of the carrying out of the Works and caused by negligence, omission or default of the Contractor, his staff or agent(s) or as the case may be of such sub-contractor his staff or agent(s) and also such insurances as are necessary against claims by third parties under public liability risks in, respect of injury and/or damage to property (real or personal) including third party fire risk arising out of or in the course of or by reason of the carrying out of the works and caused by any negligence, omission or default of the Contract, his staff of agent(s) or, as the case may be, of such sub-contractor, his staff or agent(s).

- 19.1.2 The insurance in respect of claim(s) for personal injury to, or death of any person under a contract of service or apprenticeship with the contractor or the sub-contractor as the case may be, and arising out of and in the course of such person's employment, shall comply with the appropriate law and statutory orders made thereunder or any amendment or re-enactment thereof. For all other claim(s) to which clause 19 applies, the insurance cover shall be the sum stated in the Appendix (or such greater sum as the Contractor may choose) for any one occurrence or series of occurrence arising out of one event.
- 19.1.3 As and when he is reasonably required so to do by the Employer, the Contractor shall send and shall cause any sub-contractor to send to the Architect/Co-coordinator for inspection documentary evidence that the insurance(s) required by clause 19 have been taken out and are being maintained but at any time the Employer or the Architect/Co-coordinator may (but not unreasonable or vexatiously) require to have produced for his inspection the policy or policies and premium receipts in question.
- 19.1.4 If the Contractor defaults in taking out or in maintaining, or causing any sub-contractor to take out and maintain, insurance as provided in clause 19, the Employer may himself insure against any liability or expenses which he may incur arising out of such default and the sum(s) equivalent to the amount paid or payable by him in respect of premium(s) therefore may be deducted by him from any money or monies due or to become due to the Contractor under this Contract or such amount may be recoverable by the Employer from the Contractor as a debt.

Provisional sum for Insurance

- 19.2.1 Where a provisional sum is included in the Contract Bills in respect of the insurance to which this clause refers the Contractor shall maintain in the joint names of the Employer and the Contractor insurance(s) for such amount(s) of indemnity as may be specified in the Contract Bills in respect of any expense, liability, loss, claim or proceedings which the Employer may incur or sustain by reason of damaged to any property other than the Works caused by collapse, subsidence, vibration, weakening or removal of support or lowering of ground water arising out of or in the course of or by reason of the carrying out of the Works excepting damage as specified in the clause.
- 19.2.2 Any such insurance as is referred to in clause 19.2.1 shall be placed with insurers to be approved by the Employer and the Contractor shall send to the Architect/Co-coordinator for deposit with the Employer the policy or policies and the receipt in respect of premiums paid.
- 19.2.3 The amount(s) expended by the Contractor to maintain the insurance(s) referred to in the clause 19.2.1 shall be an adjustment to the Contract Sum.

Excepted risk

- 19.3.1 Notwithstanding the provisions of clause 18.2 or clause 19.1 and 19.2, the Contractor shall not be liable to indemnify the Employer or to insure against any damage, loss or injury caused to the Works, the site or any property by the effect or ionizing radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties or any explosive nuclear assembly or nuclear component thereof, pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds.

And also excepting damage:

- 19.3.1 .1 Caused by the negligence, omission or default of the Contractor, his staff or agents(s)
- 19.3.1 .2 Attributable to errors or omissions in the designing of the works.
- 19.3.1 .3 Which can reasonable be foreseen to be inevitable having regard to the nature of the work to be executed or the manner of its execution.
- 19.3.1 .4 Which is the responsibility of the Employer to insure under clause 20(B) or 20(C) (if applicable).

20.0 Insurance of the Works

Contractor to take out and maintain a joint names policy

20(A) **Erection of new buildings-All risks Insurance of the Works by the Contractor**

20(A).1 The Contractor shall take out and maintain in joint names of the Employer and Contractor a policy for All Risks insurance to cover for full reinstatement value of the Works (plus the percentage, if any, to cover professional fees stated in the Appendix) and shall subject to clause 16 maintain such policy up to and including the date of issue of the Certificate of Practical Completion or up to and including the date of determination of the employment of the Contractor under clause 25 or clause 26 (whether or not the validity of that determination is contested) whichever is the earlier. Single policy of insurance approved by Employer and failure by Contractor to insure.

20(A).2 The insurance referred to in clause 20(A). 1 shall be taken out with insures approved by the Employer and the Contractor shall send to the Architect/Co-ordinator for deposit with the Employer that policy and the premium receipt(s) thereof and also any relevant endorsement or endorsements thereof as may be required to comply with the obligation to maintain to maintain policy set out in clause 20(A).1 and the premium receipt(s) thereof. If the Contractor defaults in taking out or in maintaining such policy the Employer may himself take out and maintain such policy and risk in respect of which the default shall have occurred and sum or sums equivalent to the amount paid or payable by him in respect of premiums thereof may be deducted by him from any money or monies due or to become due to the Contractor under this Contract or such amount may be recoverable by the Employer from the Contractor as a debt.

Use of annual policy maintained by Contractor

20(A).3.1 If the Contractor independently of his obligation under this Contract maintains a policy of insurance which provides (interalia) All Risks Insurance to cover for the full reinstatement value of the Works (plus the percentage, if any, to cover professional fees stated in the Appendix) then the maintenance by the Contractor of such policy shall, if the Employer's interest in that policy of insurance is endorsed thereon be a discharge of the Contractor's obligation to take out and maintain a policy under clause 20(A).1 in the joint names of the Employer and the Contractor, if and so long as the

Contractor is able to send for inspection by the Architect/Co-coordinator or by the Employer as and when he is reasonably required to do so by the Employer documentary evidence that such a policy is being maintained, then the Contractor shall be discharged from his obligation under clause 20(A).2 to deposit the policy and the premium receipt(s) with the Employer but on any occasion the Employer may (but not unreasonably or vexatiously) required to have sent for inspection by the Architect/Co-coordinator or the Employer the policy to which this clause refers and premium receipt(s) thereof. The annual renewal date as supplied by the Contractor of the insurance referred to in this clause is to be stated in the Appendix.

20(A) The provisions of clause 20(A) shall apply in regard to any default
3.2 in taking out or in maintaining insurance under clause 20(A).3.1.

Loss or damage to
the works
insurances claims
Contractor's
Obligations use of

20(A). If any loss or damage affecting work executed or any part thereof
4.1 or any materials on site is occasioned by any one or more of the risks covered by such policy referred to in clause 20(A).1, 20(A).2, and 20(A).3 then upon discovering the said loss or damage, the Contractor shall forthwith give notice in writing both to the Architect/Co-coordinator insurance monies to the Employer of the extent, nature and location thereof.

20(A) The occurrence of such loss or damage shall be dis-regarded in
4.2 computing any amount(s) payable to the under or by Contractor virtue of this Contract.

20(A) After any inspection required by the insurers in respect of a claim under
4.3 the policy referred to in clause 20(A).1, 20(A).2, and 20(A).3 has been completed, the Contractor with due diligence shall restore such work damaged, replace or repair any such materials on site which have been lost or damaged, remove and dispose of any debris and proceed with the carrying out and completion of the works.

20(A). The Contractor, for himself and for all Nominated Sub-Contractors
4.4 who are recognized as insured under the policy referred to in clause 20(A) 20(A).2., and 20(A).3, shall authorize the insurers to pay all money or monies from such insurance in respect of the loss or damage referred to in clause 20(A).1., to the Employer. The Employer shall pay such money or monies (less only the percentage, if any, to cover professional fees stated in the Appendix) to the Contractor by installments under certificates of the Architect/Co-ordinator issued at the period of interim certificates.

20(A). The Contractor shall not be entitled to any payment in respect of the
4.5 restoration, replacement or repair of such loss or damage and (when required) the removal and disposal of debris other than the money or monies received under the aforesaid insurance.

20(B) Erection of new buildings-All Risks Insurance of the Works by the Employer

Employer to take out and maintain a policy

20(B).1 The Employer shall take out and maintain a policy for All Risk Insurance to cover for full reinstatement value of the Works (plus the percentage, if any, to cover professional fees stated in the Appendix) and shall (subject to clause 16) maintain such policy up to and including the date of determination of the employment of the Contractor under clause 25 or clause 26 (whether or not the validity of that determination is contested) whichever is the earlier.

Failure of Employer to insure rights of Contractor

20(B).2 The Employer shall, as and when reasonably required to do so by the Contractor, produce documentary evidence and receipt(s) showing that the policy required under clause 20(B).1 has been taken out and in being maintained. If the Employer defaults in taken out or in maintaining the policy required under clause 20(B).1 then the Contractor may himself take out and maintain a policy against any risk in respect of which a default shall have occurred and a sum or sums equivalent to the amount paid or payable by him in respect of the premium(s) thereof shall be added to the Contract Sum.

Loss of damage to the Works insurance claims Contractor Obligations payment by Employer

20(B) 3.1 If any loss or damage affecting work executed or any part thereof or any one or more of the risks covered by the policy referred to in clause 20(B).1 or clause 20(B).1 then upon discovering the said loss or damage, the Contractor shall forth with give notice in writing both to the Architect/Co-ordinator and to the Employer of the extent, nature and location thereof.

20(B) 3.2 The occurrence of such loss or damage shall be disregarded in computing any amount(s) payable to the Contractor under or by virtue of this Contract.

20(B) 3.3 After any inspection require by the insures in respect of any claim under the Policy referred to in clause 20(B) or clause 20 (B).2 has been completed, the Contractor with due diligence shall restore such work damaged, replace or repair any such materials on site which have been lost or damaged, removed and dispose of any debris and proceed with carrying out any completion of the Works.

20(B) 3.4 The restoration replacement or repair of such loss or damage and (when required) the removal and disposal of debris shall be treated as a variation required by an instruction of the Architect/Co-coordinator under clause 11.3

20(B) 3.5 The Contractor, for himself and for all Nominated Sub-Contractors who are recognized as insured under the policy referred to in clause 20(B).1 or clause 20(B).2, shall authorize insurers to pay all money or monies from such insurance in respect of the loss or damage referred to in clause 20(B).1 to the Employer.

20C Insurance of Works in or Extensions to existing structures

Existing structure and contents
Employer to take and maintain a policy

- 1.0 The Employer shall take out and maintain a policy for All Risk Insurance in respect of the existing structures (which shall include from the relevant date any relevant part to which clause 16 refers) together with the contents thereof owned by him or for which he is responsible for the full costs of reinstatement, repair or replacement of loss or damage up to and including the date of determination of the employment of the Contractor under clause 20(C) 4.3.1, and 20 (C) 4.3.2 and clause 25 or clause 26 (whether or not the validity of that determination is contested) whichever is the earlier. The Contractor, for himself and for all Nominated Sub-contractors who are recognized as insured under the policy referred to in clause 20(C).1, 20(C).2 and 20(C).3, shall authorize the insurers to pay all money or monies from such insurance in respect of loss or damage to the Employer.

The Employer shall take out and maintain a policy for All Risk Insurance in the joint names of the Employer and the Contractor to cover for the full reinstatement value of the work (plus the percentage, if any, to cover professional fees stated in the Appendix) and shall, subject to clause 16, maintain such policy up to and including the date of issue of the Certificate of Practical Completion or up to and including the date of determination of the employment of the Contractor under clauses 20(c) 4.3.1 and 20(c)4.3.3 or clause 25 or clause 26 (whether or not the validity of that determination is contested) whichever is the earlier.

Works in or Extension to existing Structures Employer to take out and maintain a joint names policy

- 3.0 The Employer shall as and when reasonably required to do so by the Contractor, produce documentary evidence and receipt(s) showing that the policy required under 20(C).1 or clause 20 (c).2 has been taken out or and being maintained. If the Employer defaults in taking out or in maintaining the policy required under clause 20(c).1, the Contractor may himself take out and maintain a policy against any risk in respect of which the defaults shall have occurred and for that purpose shall have such right of entry and inspection as may be required to make a survey and inventory of the existing structure and of the relevant contents. If the Employer defaults in taking out or maintaining the policy required under clause 20(c).2, then the Contractor may take out and maintain a policy against any risk in respect of which the default shall have occurred. A sum or sums equivalent to the premium(s) paid or payable by the Contractor pursuant to this clause shall be added to the Contract Sum.

Loss or damage to The works applicable provision

- 4.0 If any loss or damage affecting work executed or to any part thereof any materials on site is occasioned by any one or more of the risks covered by the policy referred to in clause 20(c).2 and clause 20(c).3, then, upon discovering the said loss or damage, the Contractor shall forthwith give notice in writing to the Architect/Co-ordinator and to the Employer of the extent, nature and location thereof and:

- 20(c) The occurrence of such loss or damage shall be disregarded
- 4.1 in computing any amount(s) payable to the contractor under or by virtue of this contract,
- 4.2 The Contractor, for himself and for all Nominated Sub-contractors who are recognized as insured under the policy, shall authorized the insurers to pay all money or monies from such insurance in respect of loss or damage referred to in this clause to the Employer.
- 4.3.1 If it is just and equitable so to do, the employment of the Contractor under this contract may within 20 days of the occurrence of such loss or damage be determined at the option of either party by notice by registered post or recorded delivery from either party to the other. Within 7 days of receiving such a notice (but not thereafter), either party may give to the other a written request to concur in the appointment of an Arbitrator under clause 35 in order that it may be determine whether such determine will be just and equitable.
- 4.3.2 upon the given or receiving by the Employer of such a notice of determination, or, where a reference to arbitration is made as aforesaid upon the Arbitrator upholding the notice of determination, the provisions of clause 26.2 except clause 26.2.2.4 shall apply.
- 4.4 If no notice of determination is served under clause 20(c)4.3.1 or, where a reference to arbitration is made as aforesaid, if the Arbitrator decides against the notice of determination then:
- 4.4.1 after any inspection required by the insurers in respect of a claim under the policy referred to in clause 20(C).2 or clause 20(c).3 has been completed the contractor, with due diligence, shall restore such work damaged, replace or repair any such materials on site which has been lost or damaged removed and dispose of any debris and proceed with caring out and completing of the works and
- 4.4.2 the restoration, replacement or repair of such loss or damage and (when required) the removal and disposal of debris shall be treated as a variation required by an instruction of the Architect/Co-ordinator under clause 11.3

21.0 Possession, commencement, completion and postponement

Date of possession
progress to
completion date

- 21.1 Upon the appointment of the Contractor and the site being available to the Contractor free of all encumbrances by the Employer a date shall be fixed by which the Contractor should be fully mobilized. The date so fixed shall be the date for commencement and the contractor shall thereupon begin the works and proceed regular and diligently with the same and shall complete the same on or before the date for completion stated in the Appendix subject nevertheless to the provision for extension of time contained in clause 23 and 33.1.3.

Architect's / Co-ordinator's postponement

21.2 Upon the application of either party of this Contract and without prejudice to any other rights and obligations under this Contract, the Architect/Co-ordinator may issue instructions in regard the postponed of any work to be to executed under the provisions of this Contract.

22.0 Liquidated and Ascertained damaged for non-completion

If any contractor fails to complete the works by the date for completion stated in the Appendix or within any extended time fixed under clause 23 or clause 33.1.3 and the Architect/Co-ordinator certifies in writing that in his opinion the same ought reasonably so to have been completed, then the Contractor shall pay or allow to the Employer a sum calculated at the rate stated in the Appendix as liquated and ascertained damaged for the period during which the works shall so remain or have remain incomplete, and the Employer may deduct such sum from any money or monies due to or to become due to the contract under this contract.

23.0 Extension of time

Notice by Contractor of delay to progress

23.1 Upon it becoming reasonably apparent that the progress of the works is delayed, the Contractor shall forwith give written notice of the cause of the delay to the Architect/Co-ordinator and if in the opinion of the Architect/co-ordinator completion of the works is likely to be or has been delayed beyond the date of completion stated in the Appendix or beyond any extended time previously fixed either this clause or clause 33.1.3:

Relevant events

23.1.1 by force majeure, or

23.1.2 by reason of any exceptionally inclement weather other than could reasonably be expected in the season, or

23.1.3 by reason of loss or damage occasioned by any one or more of the contingencies referred to in clause 20(A), 20(B) or 20(c), or

23.1.4 by reason or civil commotion, local combination of workmen, strike or lockout affecting any of the trades engaged in preparation, manufacture or transportation of any of the goods or materials required for the works, or

23.1.5 by reason of Architect's/Co-ordinator's instructions issued under clause 1.2, 11.1,11.3, 21.2 and 34.2, or

23.1.6 by reason of the Contractor not having received in due time necessary instructions, drawings, details, levels or approvals from statutory or other similar authorities and/or the Architect/Co-ordinator for which he specifically applied in writing on a date which having regard to the date for completion stated in the Appendix or to any extension of time then fixed under this clause or clause 33.1.3 was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for him to receive the same, or

- 23.1.7 by the delayed completion of work by any Nominated Sub-contractor provided that such delayed completion has been the subject of an extension of time granted to the Nominated sub-contractor in accordance with these conditions and provided also that such extension of time was not granted on the grounds of delay to the Nominated sub-contractor by the Contractor, or by the delayed delivery of materials supplied by a Nominated Supplier, provided that such delayed delivery has been the subject of an extension of delivery time granted by the Architect/Co-ordinator to the Nominated Supplier, or
- 23.1.8 by delay on the part of artists, tradesmen or others engaged by the Employer in executing work not forming part of this contract, or
- 23.1.9 by reason of the opening up for inspection of any work covered up of the testing of any of the materials or goods in accordance with clause 6.3 (including making good in consequence of such opening up or testing), unless the inspection or test showed that the materials or goods were not in accordance with this contract, or

Contractor not entitled to additional payment

The granting of an extension of time by virtue of this clause shall not entitle the Contractor to any additional payment unless he is thus entitle under any of the specific provisions of clause 24.

24.0 Loss and expense caused by disturbance of regular progress of the works

24.1 If an extension of time is granted pursuant to clause 23 and if such extension of time is due to any of the reasons specified in clauses 24.1.1. to 24.1.6 inclusive:

Matters materially affecting regular progress of the works direct loss and/or expense

24.1 The Contractor not having received in due time necessary instructions drawings, details, level or approvals from statutory or similar authorities and/or the Architect/Co-ordinator for which he specifically applied in writing on a date which having regard to the date for completion stated in the Appendix or to any extension of time then fixed under clause 23 or clause 33.1.3 was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for him to receive the same, or

24.1.2 the opening up for inspection of any work covered up or the testing of any of the materials of goods in accordance with clause 6.3 (including making good in consequence of such opening up or testing), unless the inspection or test showed that the materials or goods were not in accordance with this Contract. or

24.1.3 any discrepancy in or divergence between the Contract Drawings, or

24.1.4 delay on the part of artists, tradesmen or others engaged by the Employer in executing work not forming part of this Contract, or

24.1.5 Architect/Co-ordinator's instructions issued in regards to the postponement or suspension of any work to be executed under the provisions of the contract, or

24.1.6 delay on the part of the Employer in honouring the Architect's/Coordinator's certificate of payment(s), then the Architect/Co-ordinator shall request the Quantity Surveyor to ascertain the additional payment due to the Contractor in accordance with the rules set out in clauses 11.8 and 30.1.2.

Amount ascertained
added to Contract
Sum

Any amount from time to time so ascertained in clause 24.1 shall be added to the Contract Sum, and if an interim certificate is issued after the date of ascertainment, such amount shall be added to the amount which would otherwise be stated as due in such certificate.

Reservation of
Rights and remedies
of Contractor

24.3 The provision of these conditions are without prejudice to any other rights and

25.0 Determination by Employer

Default by
Contractor

25.1 without prejudice to any other rights or remedies which the Employer may possess Contractor if the contractor shall default in any one or more of the following respects, that is to say:

25.1.1 if he without any reasonable cause wholly suspends the carrying out of the work before completion thereof, or

25.1.2 if he fails to proceed regularly and diligently with the works, or

25.1.3 if he refuses or persistently neglect to comply with a written notice from the Architect/Co-coordinator requiring him to remove defective work or improper materials or goods and by such refusal or neglect the Works are materially affected, or

25.1.4 if he fails to comply with the provision of clause 17, then the Architect/Coordinator may give to him a notice by registered post or recorded delivery specifying the default and signed by the Employer. If the Contractor either shall continue such default for 14 days after receipt of such notice or shall at any time thereafter repeat such default (whether previously repeated or not), then the Employer without prejudice to any other rights or remedies, may within 14 days after such continuance or repetition give to him notice by registered post or recorded delivery and signed by the Employer to Forthwith determine the employment of the Contractor under this Contract provided that such notice shall not be given unreasonably or vexatiously.

Contractor becoming bankrupt etc	25.2 In event of the Contractor becoming bankrupt or making a composition or arrangement with his creditors or having a winding up order or (except for purposes of reconstruction) a resolution for voluntary winding up passed or a receiver or manager of his business or undertaking duly appointed, or possession taken, by or on behalf of the holders of any debentures secured by a floating charge, of any property comprised in or subject to the floating charge, the employment of the Contractor under this Contract shall be forthwith automatically determined but the said employment may be reinstated and continued if the Employer and the Contractor, his trustee in bankruptcy, liquidator, receiver or manager as the case may be shall so agree.
Corruption	25.3 If the Contractor shall have been proved to have offered or given or agreed to give to any person any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any action in relation to the obtaining or execution of this Contract with Employer, or for showing or forbearing to show favour or disfavour to any person in relation to this Contract or any other Contract with the Employer, or if the like acts shall have been proved to have been done by any person employed by the Contractor or acting on his behalf (whether with or without the knowledge of the Contractor), or if in relation to this Contractor or any other Contract with the Employer, the Contractor or any person employed by him or acting on his behalf shall have committed an offence under the Criminal Code of the Laws of the Federal Republic of Nigeria, the Employer shall be entitled to determine forthwith the employment of the Contractor under this Contract.
Rights and duties of Employer and Contractor	<p>25.4 In the event of the employment of the Contractor being determined as as aforesaid and so long as it has not been reinstated and continued, the following shall be the respective right and duties of the Employer and Contractor:</p> <p>25.4.1 the Employer may employ and pay other persons to carry out and complete the works and he may enter upon the works and use all temporary buildings, plants, tools, equipment, materials, and goods intended for, delivered to and placed on or adjacent to the Works and may purchase all materials and goods necessary for carrying out and completion of the works,</p>
Contractor to assign the benefit of any agreement	25.4.2 The Contractor shall, if so required by the Employer or Architect/ Co-ordinator within 14 days of the date of determination, assign to the Employer without payment, the benefit of any agreement for the supply of materials or goods and/or for the execution of any work for the purposes of this Contract but on terms that a supplier or a sub-contractor shall be entitled to make any reasonable objection to any further assignment thereof by the Employer. In any case, the Employer may pay any supplier or sub-contractor for any material or goods delivered or works executed for the purposes of this Contract (whether before or after the date of determination) in so far as the cost price thereof has not already been paid by the contractor. The Employer's right under this clause are in addition to his right to pay Nominated

sub-contractors as provided in clause 27.3 and payments made under this clause may be deducted from any sum(s) due or to become due to the Contractor.

Contractor to
Remove temporary
Building etc

25.4.3 The contractor shall, as and when required in writing by the Architect/Coordinator so to do (but not before), remove from the work any building, plants, tools and equipment, materials and goods belonging to or hired by him. If within a reasonable time after any such requirement has been made the Contractor has not complied therewith then the Employer may (but without been responsible for any loss or damage), remove and sell any such property of the Contractor, holding the proceeds less all costs incurred to the credit of the contractor.

25.4 Without prejudice to any other rights or remedies which the Employer may possess under clause 25.4.5, the Architect/Coordinator shall instruct the Quantity Surveyor to prepare the Final Account for settlement in accordance with Clause 30,

Contractor to pay for
direct loss and/or
damage

25.4.5 The Contractor shall allow or pay to the Employer in the manner hereinafter appearing the amount of any direct loss and/or damage caused to the Employer by the determination. Until after completion of works under clause 25.4.1 the Employer shall not be bound by any provision of this Contract to make further payment to the Contractor, but upon such completion and the verification within a reasonable time of the accounts by the Quantity Surveyor thereof, the Architect/Coordinator shall certify the amount of expenses properly incurred by the Employer and the amount of any direct loss and/or damage caused to the employer by the determination and if such amounts when added to the money or monies paid to the Contractor before the date of determination exceed the total amount which would have been payable on due completion in accordance with this Contract, the difference shall be a debt payable to the Employer by the Contractor; and if the said amount, when added to the money or monies be less than the said amount, the difference shall be a debt payable by the Employer to the Contractor.

26.0 Determination by Contractor

26.1 Without prejudice to any other rights and remedies which the contractor may possess, if:

Acts etc giving
Grounds for
Determination

26.1.1 The Employer does not pay the Contractor the amount due on any certificate within the period for honouring certificates names in the names in the Appendix and continues such default for 7 days after receipt by registered post or recorded delivery of a notice from the Contractor stating that notice of determination under this condition will be served if payment is not made within 7 days from receipt thereof, or

26.1.2 The Employer interferes with or obstructs the issue of any certificate due under this contract, or

26.1.3 The carrying out of the whole or substantially of the uncompleted works (other than the execution of work required under clause 15) is suspended for a continuous period of time named in the Appendix by reason of:

26.1.3 force majeure, or
.1

26.1.3 loss or damage occasioned by any one or more of the contingencies
.2 referred to in clause 20(A) or clause 20(B) (as applicable), or

26.1.3 civil common, or
.3

26.1.3 Architect's/Coordinator's instructions
.4 issued under clause 1.2, 11.1, 11.3,21.2 or 34.2, or

26.1.3 The contractor not having received in due time necessary instruction,
.5 drawings, details or levels from the Architect/Coordinator for which he specifically applied in writing on a date which having regard t the date for completion stated in Appendix or to any extension of time then fixed under clause 23 or clause 33.1.3 was neither unreasonably distance from nor unreasonably close to the date on which it was necessary for him to receive the same, or

26.1.3 Delay on the part of artists, tradesmen or other engaged by the
.6 Employer in executing work not forming part of this contract, or

26.1.3 The opening up for inspection of any work covered up or the testing of
.7 any of the work, materials or goods in accordance with clause 6.3 (including making good in consequence of such opening up or testing), unless the inspection or test showed that the work, materials or goods were not accordance with this Contract, then the contractor may thereupon by registered post or recorded delivery to the Employer and copied to the Architect/Coordinator give 14 days notice of his intention to determine his employment under this Contract provided that such notice shall not be given unreasonably or vexatiously. Upon the expiration of the said notice the contractor shall proceed to determine the Contract,

Rights and duties of
Employer and
Contractor

26.2 Upon such determination, then without prejudice to the accrued rights or remedies of either party to any liability of the classes mentioned in clause 18 which may accrue either before the Contractor or the Nominated Sub-Contractors shall have removed his or their temporary buildings, plants, tools, equipment, materials or goods or by reason of his or their so removing the same, the respective rights and liabilities of the contractor and the Employer shall be as follows;

- 26.2.1 The contractor shall be with reasonable dispatch and in such manner and with such precautions as will prevent injury, death or damage of the classes in respect of which before the date of determination he was liable to indemnify the Employer under clause 18 remove from the site all temporary building, plants tools, equipment, materials and goods and shall give facilities for his sub-contractors to do the same, but subject to the provision of clause 26.2.2.4.
- 26.2.2 After taking into account amounts previously paid under this contract the contractor shall be paid by the Employer.
- 26.2.2 The total value of work completed at the date
.1 of determination.
- 26.2.2 The total value of work begun and executed but not completed at the
.2 date of determination, the value been ascertained in accordance with clause 11.5 as if such work were a variation required by the Architect/Co-coordinator,
- 26.2.2 Any sum ascertained in respect of direct loss and/or expense under
.3 clause 11.7.24 and 34.3 (whether ascertained before or after the determination),
- 26.2.2 The cost of materials or goods properly ordered for the Works for
.4 which the contractor shall have paid or for which the Contractor is legally bound to pay, and on such payment by the Employer any materials or goods so paid for shall become the property of the Employer,
- 26.2.2 The reasonable cost of removal under clause
.5 26.2.1,
- 26.2.2 Any direct loss and/or damage caused to the contractor by the
.6 determination. Provided that in addition to all other remedies the Contractor upon such determination may take possession of and shall have a lien upon all unfixed materials and goods which may have become the property of the Employer under clause 14 until payment of all money/monies due to the Contractor from the Employer.

27.0 Nominated Sub-Contractors

Definition of a
Nominated Sub-
Contractor

- 27.1 The following provisions of this condition shall apply where prime cost sums are included in the Contract Bills, or arise as a result of Architect's/Coordinator's instruction(s) given in regard to the expenditure of provisional sum, in respect of persons to be nominated by the Architect/Co-coordinator to supply and fix materials or goods or to executed works.

Procedures for
Nomination of a sub-
Contractor

27.1 Such sums shall not include any cash discount and shall be expended in favour of such persons as the Architect/Coordinator shall instruct, and all specialists or others who are nominated by the Architect/Coordinator are hereby declared to be sub-contractors employed by the contractor and are referred to in these conditions as 'Nominated Sub-Contractors' provided that the Architect/Coordinator shall not nominate any person as a sub-contractor against whom the Contractor shall make reasonable objection, or (save where the Architect/Coordinator and Contractor shall otherwise agree) who will not enter into a sub-Contract with him which provides (inter alia):

27.1.1 That the Nominated Sub- contractor shall carry out and complete the
.1 sub-contract works in every respect to the reasonable satisfaction of the Contractor and of the Architect/Coordinator,

Sub-Contractor to
observe and comply
with main contract

27.1.1 That the Nominated Sub-contractor shall observe perform and comply
.2 with all the provisions of this Contract on the part of the contractor to be observed, performed and complied with (other than clause 20(A) if applicable) so far as they relate and apply to the sub-contract works or to any portion of the same.

Sub-contractor to
Indemnify the main

27.1.1 That the Nominated Sub-contractor shall indemnify the Contractor
.3 against the same liabilities in respect of the sub-contract works as as those for which the Contractor is liable to indemnify the Employer under this Contract.

27.1.1 That the Nominated Sub-contracted shall indemnify the Contractor
.4 the Contractor against claims in respect of any negligence, omissions or default of such sub-contractor, his staff or agent(s) or any misuse by him or them of any scaffolding or other plant and shall insure himself against any such claims and produce the policy or policies and receipt(s) in respect of premium(s) paid as and when required by either the Employer or the Contractor.

27.1.1 That the sub-contract works shall be completed within the period or
.5 (where they are to be competed in sections) period therein specified, that the contractor shall not without the written consent of the Architect/Coordinator grant any extension of time for the completion of a sub-contract works or any section thereof, and that the Contractor shall inform the Architect/Coordinator of any representation made by the Nominated Sub-contractor as to the cause of any delay in the progress or completion of the sub-contract works or of any section thereof.

Sub-contractor's
failure to complete
work

27.1.1 That if the Nominated Sub-contractor shall fail to complete the sub-
.6 complete the sub-contract works or (where the sub-contract works are to be completed in sections) any section thereof within the period therein specified or within any extended time granted by the contractor with the written consent of the Architect/Coordinator and the Architect/coordinator certifies in writing to the Contractor that the same ought reasonably so to have been competed, the Nominated sub-contractor shall pay or allow to the contractor either a sum calculated at the rate therein agreed as liquidated and ascertained damages for

the period during which the said works or any section thereof as the case may be shall so remain or have remained incomplete or (where no such rates is therein agreed) a sum equivalent to any loss or damage suffer or incurred by the Contractor and caused by the failure of the Nominated Sub-Contractor as aforesaid.

27.1.1 .7 That payment in respect of any work, materials or goods comprised in the sub-contract shall be made within 7 days after receipt of payment by the Contractor of money or monies due in any Architect's/coordinator's certificate under clause 30 which states as due amount calculated by including the total of such works, materials or goods, and shall when due be subjected to retention by the Contractor of the sums mention in clause 27.1.1.8.

27.1.1 .8 That the Contractor shall retain from the sum directed by the Architect/coordinator as having been included in the calculation of the amount stated as due in any certificated issued under clause 30 in respect of the value of work, materials or goods executed or supplied by the Nominated sun-contractor, the percentage of such value named in the Appendix as percentage of certificated value retained up to a total amount not exceeding a sum which bears the same ratio to the sub-contract price as the unreduced sum named in the Appendix as limit of Retention Fund bears to the Contractor sum; and that the contractor's interest in any sums so retained (by whomsoever held) shall be fiduciary as trustee for the Nominated sub-contractor and that the Nominated sub-contractor's beneficial interest in such sums shall be subject only to the right of the Contractor to have recourse thereto from time to time for payment of any amount which he is entitled under the sub-contract to deduct from any sum(s) due or to become due or any part thereof are released to the Nominated sub-contractor they shall be in full.

27.1.1 .9 That the Architect/Coordinator and his representative(s) shall have a right of access to the workshops and other places of the Nominated Sub-Contractor referred to in Clause 9.

Payment of
Nominated Sub-
Contractor

27.2 The Architect/Coordinator shall direct the Contractor as to the total total value of work, materials or goods executed or supplied by the Nominated Sub-contractor included in the calculation of the amount stated as due in any certificate issued under clause 30 and shall forthwith inform the Nominated sub-contractor in writing of the amount of the said total value. The sum representing such total value shall be paid by the contractor to the Nominated Sub-contractor within 7 days of receipt of payment by the Contractor on the said Architect's/Coordinator's less only any retention money which the Contractor may be entitle to deduct under the terms of the sub-contract and any sum to which the Contractor may be entitled in respect of delay in the completion of the sub-contract works or any section thereof.

Direct payment of Nominated Sub-Contractor due to Contractors default	27.3 Before issuing any certificate under clause 30 the Architect/ Co-ordinator may request the Contractor to furnish with reasonable proof that all amounts included in all the calculation of the amount in all the calculation of the amount stated as due in previous certificate(s) in respect of the total value of the work, materials or goods executed or supplied by any Nominated Sub-contractor have been duly paid and if the Contractor fails to comply with any such requests, the Architect/Coordinator shall issue a certificate to that effect and thereupon the Employer may pay such amounts to any Nominated sub-contractor concerned and deducted the same from any sums due or to become due to the Contractor.
Extension of Period or completion of nominated sub-contract works	27.4.1 The Contractor shall not grant to any Nominated Sub-contractor any extension of the period within which the sub-contract works or (where the sub-contract works or are to be completed in sections) any section thereof is to be completed without the written consent of the Architect/Co-ordinator provided always that the Contractor shall inform the Architect/Co-ordinator of any representation made by the Nominated Sub-contractor as to the cause of any delay in the progress or completion of the sub-contract works or of any section thereof, and that the consent of the Architect/Co-ordinator shall not be unreasonably withheld.
Failure to complete sub-contract works	27.4.2 If any Nominated Sub-contractor fails to complete works or (where the sub-contract works are to be completed in sections) any section thereof within the period specified in the sub-contract or within any extended time granted by the Contractor with the written consent of the Architect's/Coordinator's then if the same ought reasonably so to have been completed., the Architect/Coordinator shall certify in writing accordingly; any such certificate shall be issued to the Contractor and immediately upon issue, the Architect/Coordinator shall send a duplicate copy thereof of the Nominated Sub-contractor.
Early final payment of Nominated sub-contractor after practical completion of nominated sub-contract works	27.5 If the Architect/Co-ordinator desires to secure final payment to any Nominated sub- contractor before final has payment is due to the contractor, and if such sub-contractor has satisfactorily indemnified the Contractor against any latent defects, then the Architect/Co-ordinator may, in an interim certificate, include an amount to cover the said final payment, and thereupon the Contractor shall pay to such Nominated Sub-contractor the amount so certified. Upon such final payment, the amount named in the Appendix as Limit of Retention Fund shall be reduced by the sum that bears the same ratio to the said amount as does such Nominated Sub-contractor's price to the Contract Sum, and save for latent defects the Contractor shall be discharged from all liability for work executed or materials or goods supplied by such Nominated Sub-contractor under the sub-contract to which the payment relates.
Position of Employer in Relation to Nominated Sub-Contractor	27.6 Neither the existence nor the exercise of the foregoing powers nor anything else contained in these Conditions shall render the Employer in any way liable to any Nominated Sub-contractor.

Contractor's tender for works otherwise Reserved for Nominated Sub-contractor

27.7 Where the Contractor in the ordinary course of his business directly carries out works for which prime cost sums are included in the Contract Bill and where items of such works are set out in the Appendix and the Architect/Co-ordinator is prepared to receive tenders from the Contractor for such items, then the Contractor shall be permitted to tender for the same or any of these but without prejudice to the Employer's right to reject the lowest of any tender. If the Contractor's tender is accepted, he shall not sub let the work without the written consent of the Architect/Co-ordinator.

Provided that where a prime cost sum arises under Architect's/Coordinator's instructions issued in clause 11.5 it shall be deemed for the purpose of this clause to have been included in the Contract Bills and the items of works to which it relates shall likewise be deemed to have been set out in the Appendix.

It shall be a condition of any tender accepted under clause 27 that clause 11 shall apply in respect of the items of work included in the tender as if the reference therein to the Contractor Drawings and the Contract Bills there were references to the equivalent documents included in or referred to in the tender.

28.0 Nominated Suppliers

Architect's/ Coordinators instruction

28.1 The following provisions of this condition shall apply where prime cost sums are included in the Contract Bills or arises as a result of the Architect's/Coordinator's instructions given in regards to the expenditure of provisional sums, in respect of any materials or goods to be fixed by the contractor,

Sum deemed to include 5 percent cash discount

28.1.1 Such sums shall be deemed to included 5 percent cash discount and the term 'prime cost' when included or arising as aforesaid shall be understood to mean the net cost to be defrayed as prime cost after deducting any trade or other discount (except the said discount of 5 percent), and shall include customs duty (where applicable), and the cost of packing, carriage and delivery. Provided that where in the opinion of the Architect/Co-ordinator, the Contractor has incurred expenses for special packing or special carriage, such special expense shall be allowed as part of the sum actually paid by the Contractor:

Definition of a Nominated Supplier

28.1.2 Such sums shall be expended in favour of such persons as the Architect/Co-ordinator shall instruct and all specialists, merchants, workmen or others who are nominated by the Architect/Coordinator to supply materials or goods are hereby declared to be the suppliers to the Contractor and are referred to in the Conditions as Nominated Suppliers. Provided that the Architect/Coordinator shall not (save where the Architect/Coordinator shall otherwise agree) nominate as a supplier a person who will not enter into a contract of sale which provide (inter alia):

	28.1.2 That the materials or goods to be supplied shall be to the .1 reasonable satisfaction of the Architect/Co-ordinator.
Treatment of defects in materials or Goods supplied	28.1.2 That the nominated supplier shall make good by replacement or .2 otherwise any defect in the materials or goods supplied which appear within such period as is therein mention and shall bear any expenses reason reasonably incurred by the Contractor as a direct consequence of such defects, provided that: 28.1.2 where the materials have been used or fixed such defects are not such .2.1 that examination by the Contractor ought to have revealed them before using or fixing. 28.1.2 such defects are due solely to defective workmanship or materials in .2.2 the goods supplied and shall not have been caused improper storage by the Contractor, or by misuse or by any act or neglect of either the Contractor, Architect/Coordinator or the Employer or by any person for whom they may be responsible,
Materials and goods to be supplied as directed by contractor	28.1.2 that delivery of the materials or goods supplied shall be .3 commenced and completed as such times as the contractor may reasonably direct.
Nominated supplier to allow 5 percent cash discount to the contractor	28.1.2 that the Nominated supplier shall allow the contractor a discount .4 for cash of 5 percent if the Contractor makes payment in full within 30 days of the end of the month during which delivery is made.
Materials and goods not to be supplied after determination of the Contract	28.1.2 that the Nominated supplier shall not be obliged to make any delivery .5 of materials or goods (except any which may have been paid for in full less only the discount for cash) after the determination (for any reason) of the Contractor's employment under this Contract.
All payment to be in full	28.1.3 All payment by the Contractor for materials or goods supplied by a Nominated Supplier shall be in full and shall be paid within 30 days of the end of the month during which delivery is made less only a discount for cash of 5 percent if so paid.

29.0 Artists and tradesmen

The Contractor shall permit the execution of work not forming part of this Contract by artists, tradesmen or others engaged by the Employer. Every such person shall for the purposes of clause 18 be deemed to be a person for whom the Employer is responsible and not to be Nominated Sub-Contractor.

30.0 Certificates and Payments

Interim certificates and valuations	30.1 At the period of interim certificates named in the Appendix, the the Architect/Coordinator shall issue a certificate stating the amount due to the Contractor from the Employer and the Contractor shall be
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entitle to payment thereof within the period for honouring certificates named in the Appendix.

- | | | |
|--|--------|--|
| Interim certificates and valuations additional payment | 30.1.2 | If the Employer fails to honour the Architect's/Coordinator's certificates within the period stated in the Appendix, the Contractor notwithstanding his other rights and remedies under this Contract, shall be entitle to receive additional payment as stated in the Appendix for the period during which the certified amount remains unpaid. The amount so due shall be ascertained by the Quantity Surveyor and included in the next valuation. |
| Ascertainment of amount due in interim certificates | 30.2 | The amount stated in an interim certificate shall, subject to any agreement between the parties as to stage payments, be the total value of the work properly executed and of the materials and goods delivered to or adjacent to the Works or stored in any other location approved by the Architect/Coordinator consultation with the Employer for the use thereon less any amount which may be retained by the employer (as provided in clause 30.3) and less any installment(s) previously paid under these conditions. Provided that such certificate shall only include the value of the said materials and goods as and from such time as they are reasonably, properly and not prematurely brought to the Works or any other approved location, and then only if adequately protected against weather or other casualties. |
| Retention-Rules for ascertainment | 30.3 | The Employer may retain the percentage of the total value of the work, materials and goods referred to in clause 30.2, which is named in the Appendix as percentage of certified value retained. Provided always that when the sum of the amount so retained equals the amount named in the said Appendix as Limit or Retention Fund or that amount as reduced in pursuance of clause 16.1.6.1 and/or clause 16.1.6.2 as the case may be, no further amount(s) shall be retained by virtue of this clause. |
| Rules on treatment of retention | 30.4 | The amount(s) retained by virtue of clause 30.3 shall be subject to the following rules:

30.4.1 The Employer's interest in any amount(s) so retained shall be fiduciary as trustee for the Contractor, and the Contractor's beneficial interest therein shall be subject only to the right of the Employer to have recourse thereto from time to time for payment of any amount(s) which he is entitled under the provisions of this Contract to deduct from any sum(s) due or to become due t the Contractor.

30.4.2 On the issue of the Certificate of Practical Completion, the Architect/Coordinator shall issue a certificate for one moiety of the total amount(s) then so retained and the Contractor shall be entitled to payment of the said moiety within the period for honouring certificates named in the Appendix;

30.4.3 On the expiration of the Defects Liability Period named in the Appendix, or on the issue of the certificate of completion of making good defects, whichever is the later, the Architect/Coordinator shall |

issue a certificate for the residue of the amounts so retained and the Contractor shall be entitled to payment of the said residue within the Period for honouring Certificate named in the Appendix.

Priced bills of variations – to Contractors

30.5.1 The measurement and valuation of works shall be completed within the period of Final Measurement and Valuation stated in the Appendix and the Contractor shall be supplied with a copy of the priced bills of variations not later than the end of the said period and before the issue of the Final Certificate under clause 30.6.

Final adjustment of Contract Sum - documents from Contractor

30.5.1 .2 Either before or within a reasonable time after Practical Completion of the works the Contractor shall send to the Quantity Surveyor all documents necessary for the purposes of the final adjustment of all Contract Sum required by these Conditions including all documents relating to the accounts of Nominated Sub-contractors and Nominated Suppliers.

Items included in adjustment of Contract Sum

30.5.3 In the settlement of accounts, the amount(s) paid or payable under the appropriate contracts by the Contractor to Nominated Sub-contractors or Nominated Suppliers, the amount(s) paid or payable by virtue of clause 4.2 in respect of fees or charges for which a provisional sum is included in the Contract Bills, the amount(s) paid or payable in respect of any insurance maintained in compliance with clause 19.2, the tender sum (or such other sum as is appropriate in accordance with the terms of the tender) for any work for which a tender made under clause 27.7 is accepted and the value of any work executed by the Contractor for which a provisional sum is included in the Contract Bills shall be set against the relevant prime cost of provisional sum mentioned in the Contract Bills of arising under Architect's/Coordinator's instruction (so issued under clause 11.5 as the case may be, and the balance after allowing in all cases prorate for the Contractor's profit at the rates shown in the Contract Bills, shall be added to or deducted from the Contract Sum.

Provided that no deduction shall be made in respect of all damage(s) paid or allowed to the Contractor by any Nominated Sub-Contractor or Nominated Supplier.

Issue of Final Certificate

30.6 So soon as is practicable but before the expiration of the period the length of which is stated in the Appendix from the end of Defect Liability Period (also stated in the Appendix) or from completion of making good defects under clause 15 or from receipt by the Quantity Surveyor of the documents referred to in clause 30.5.2 which is the latest, the Architect/Co-ordinator shall issue the Final Certificate. The Final Certificate shall state:

30.6.1 the sum of the amounts paid to the Contractor under interim certificates and the amount named in the said Appendix as Limit of Retention Fund and

30.6.2 the Contract sum adjusted as necessary in accordance with the terms of these conditions, and the difference (if any) between the two sums shall be expressed in the said certificate as balance due to the

Contractor from the Employer or to the Employer from the Contractor as the case may be, and subject to any deductions authorized by these Conditions, the said balance shall as from 28 days after the issue of the said certificate shall be a debt payable as the case may be by the Employer to the Contractor or by the Contractor to the Employer.

Effect of Final Certificate

30.7 Unless a written request to concur in the appointment of an Arbitrator shall have been given under clause 35 by either party before the Final certificate has been issued or by the Contractor within 28 days after such, the said certificate shall be conclusive evidence in any proceedings arising out of this Contract (whether by arbitration under clause 35 or otherwise) that the works have been properly carried out and completed in accordance with the terms of this Contract and which require an adjustment to be made to the Contract Sum, except and in so far any Sum mentioned in the said Certificates is erroneous by reason of:

30.7.1 fraud, dishonesty or fraudulent concealment relating to the works, or any part thereof, or to any matter dealt with in the said certificate, or

30.7.2 any defect (including any omission) in the Works, or any part thereof which reasonable inspection or examination at any reasonable time during the carrying out of the works or before the issue of the said certificate would not have disclosed, or

30.7.2 any accidental inclusion or exclusion or any work, materials, goods or figure in any computation or any arithmetical error in any computation.

Effect of certificates other than Final

30.8 Save as aforesaid, no certificate to the Architect/Co-ordinator shall of itself be conclusive that any works, materials or goods to which it relates are in accordance with this Contract

Certificate to be issued to the

30.9 Any certificate to be issued by the Architect/co-ordinator under these conditions shall, subject to clause 27.4 be issued to the Employer and immediately upon the issue of any certificate the Architect/Co-ordinator shall send a duplicate copy thereof to the Contractor.

3.10 Fluctuations

Approved terms

31.1 The Employer shall entertain fluctuations only in respect of approved basic wages and emoluments and certain materials or certain sections of the works listed in the Appendix to the Contract

Items included in adjustment of Contract Sums

31.2 The Contract Sum shall be deemed to have been calculated in the manner set out below and shall be subject to variation in the events specified hereunder:

31.2.1 The prices contained in the Contract Bills are based upon the rates of wages and other emoluments and expenses (including the cost of employer's liability insurance and third party insurance) payable by the Contractor to workers engaged upon or in connection with the Works in accordance with the rate or wages fixed by the National Joint

Industrial Council and Federal Ministry of Labour, Employment and productivity, current at the date of tender and applicable to the area concerned.

31.2.2 If any the said rates of wages and other emoluments and expenses (including the cost of employer's liability insurance and third party insurance) shall be increased or decreased after 'the date of tender', the net increase or decrease of such wages and other emoluments and expenses shall be paid to or allowed by the Contractor.

31.2.3 The prices contained in the Contract Bills are based on the market prices of materials including purchase tax(es), import duty or any other levy (if any) applicable at 'the date of tender', (hereinafter referred to as 'the basic price')

31.2.4 If during the progress of works the market prices of materials used in works varies from 'the basic prices' thereof, then the net difference in price thus arising shall be paid to or allow by the Contractor.

Definition date of tender

31.3 The expression 'date of tender' as used in these conditions means 10 days before the date fixed for the receipt of tenders by the Employer.

Contractors to give written notice

31.4 The Contractor shall within a reasonable time give written notice to the Architect/Coordinator of the happening of any of the events referred to in clause 31.2

Adjustment not to alter profit to Contractor

31.5 No addition to or deduction from the Contract Sum made by virtue of this clause shall alter in any way the amount of profit to the Contractor included in the Contract Sum.

32.0 Outbreak of hostilities

Notice of determination of the Contractor's employment

32.1 If during the currency of this contract there shall be an outbreak of hostilities (whether war is declared or not) in which Nigeria shall be involved on a scale involving the general mobilization of the armed forces, then either the Employer or the Contractor may at any time by by notice, by registered post or recorded delivery to the other, forthwith determine the employment of the Contractor under this Contract, provided that such a notice shall not be given.

32.1.1 Before the expiration of 28 days from the date on which the order is given for general mobilization as aforesaid, or

32.1.2 After practical completion of the works unless the works or any part thereof shall have sustained war damaged as define in clause 33.4.

Parties may make further arrangements

32.2 The parties hereto, in event of any outbreak of hostilities, may at any time by agreement between them make such further arrangements as they think fit to meet the circumstances.

Protective work etc.

32.3 The Architect/Co-ordinator may within 14 days after a notice under clause 32.1 shall have been given or received by the Employer issue instructions to the Contractor requiring the execution of such protective

work as; shall be specified therein and/or continuation of the works up to point of stoppage to be specified therein and the contractor shall comply with such instructions as if the notice of determination had not been given.

Provided that if the Contractor shall for reasons beyond his control before completing the work to which the said instruction relate within 3 months from the date the instruction were issued, he may abandon such work.

Payment

32.4 Upon the expiration of 14 days from the date on which a notice of determination shall have been given or received by the Employer under clause 32.1, or where works are required by the Architect/Co-ordinator under clause 32.3 or upon completion or abandonment as the case may be of any such works, the provisions of clause 26.2 (except clause 26.2.2.6) shall apply and the Contractor shall also be paid by the Employer the value of work executed pursuant to instructions given under clause 32.3 the value being ascertained in accordance with clause 11.5 as if such work were a variation required by the Architect/Co-ordinator.

33.0 War damage

Effect of War damage

33.1 In the event of the works or any part thereof any unfixed materials of goods intended for/or delivered to an placed on or adjacent to the Works sustaining war damage then notwithstanding anything expressed or implied elsewhere in the Contract:

33.1.1 The occurrence of such war damage shall be disregarded in computing any amount payable to the Contractor under or by virtue of this Contract.

33.1.2 The Architect/Co-ordinator may issue instructions requirng the contractor to remove and/or dispose on any debris and/or to execute such protective works as shall be specified.

33.1.3 The Contractor shall reinstate or make good such war damaged and shall proceed with the carrying out and completion of the works, and the Architect/Co-ordinator shall grant to the Contractor a fair and reasonable extension of time for completion of the Works.

Protective work, etc

33.2 If at any time after the occurrence of war damage as aforesaid either party serves notice of determination under clause 32, the expression 'protective work' as used in the said clause shall in such case be deemed to include any matters in respect of which the Architect/Co-ordinator can issue instructions under clause 33.12 and any instructions issued under the said clause prior to the date on which notice of determination is given or received by the Employer and which shall not by then have been completely complied with shall be deemed to have given under this clause.

Use of compensation for war damage

33.3 The Employer shall be entitled to any compensation which may at any time become payable out of the monies provided by Government in respect of war damage sustained by the Works or any part thereof or any fixed materials or goods intended for the Works which shall at any time have become the property of Employer.

Definition of war damage

33.4 The expression "War damage" as used in these conditions means:

33.4.1 damage occurring (whether accidentally or not) as the direct result of action in combating the enemy or in repelling an imaged attack by the enemy.

33.4.2 damage occurring (whether accidentally or not) as the direct result or measures taken under such damage as aforesaid.

33.4.3 any precautionary measure taken under proper authority with a view to preventing or hindering the carrying out of attack by the enemy, or

33.4.3 any precautionary or preparatory measures involving the doing of work on land taken proper authority in any way in anticipation of enemy action, being in either case measures involving a substantial degree of risk to property.

providing that the measures mentioned in clause 33.4 do not include the imposing of restriction on the display of lights and measures taken for training

34.0 Antiquities

Effect of find of Antiquities

34.1 All fossils, antiquities and other objects of interest or value, which may be found on site or in excavating the same during the progress of works shall become the property of the Employer and upon discovery of such an object the Contractor shall forthwith:

34.1.1 use his best endeavors not to disturb the object and shall cease work if and in so far as the continuance of work would endanger the object or impede it's removal,

34.1.2 take all steps which may be necessary to preserve the object in the exact position and condition in which it was found and

34.1.3 inform the Architect/Co-ordinator or the Clerk of Works of the discovery and precise location of the object.

Architect's Co-ordinator's instructions on antiquities found

34.2 The Architect/Co-ordinator shall issue instructions in regard to what is to be done concerning an object report by the Contractor under clause 34.1 and without prejudice to the to generality this power such instruction may require the contractor of permit examination, excavation or removal of the object by the third party. Any such third party shall for the purpose of clause 18 be deemed to be person for

whom Employer is responsible and not to be Nominated Sub-contractor.

Direct loss and/or expense on antiquities found

- 34.3 If in the opinion of the Architect/Co-ordinator compliance with the provisions of clause 34.1, or with an instruction issued under clause 34.2 has involved the Contractor in the direct loss and/or expense for which he would not be reimbursed by a payment made under any other provision in this Contract, then the Architect/Co-ordinator shall request the Quantity Surveyor to ascertain the amount of such loss and/or expense. Any amount from time to time so ascertained shall be added to the Contract Sum, and if an interim certificate is issued after the date of ascertainment, any such amount shall be added to the amount, which would otherwise be stated as due in such a certificate.

35.0 Arbitration

Settlements of disputes notice to be in writing appointment of Arbitrator

- 35.1 Provided always that in case any dispute or difference shall arise between the Employer or the Architect/Co-ordinator on his behalf Contractor, either during the progress or after the completion or abandonment of the works as to the construction of this Contract or as to any matter or thing of whatsoever nature arising thereunder or in connection therewith (including any matter or things left by this Contract to the discretion of the certificate to which the Contractor may claim to be entitled or the measurement and valuation mentioned in clause 30.5.1 or the rights and liabilities of the parties under clause 25,26, and 33, the same shall not be allowed to interfere with or delay the execution of the works but either party shall forthwith give to the other notice in writing of such dispute or difference and such dispute or difference shall be and is hereby referred to the arbitration and final decision of a person to be agreed between the parties to act as Arbitrator. Such a person shall be an experienced professional in the building industry or failing agreement, a person appointed (at the request of either party) by the president of any of the undermentioned professional bodies: The Nigerian Institute of Architects (NIA), The Nigerian Institute of Quantity Surveyors (NIQS), The Nigerian Society of Engineers (NSE) and The Nigerian Institute of Building (NIOB).

Award to be final

- 35.2 The award of such Arbitrator shall be final and binding on the parties

Law to apply

- 35.3 Whatever the nationality, residence or domicile of the Employer, the Contractor, any sub-contractor or supplier or the Arbitrator, and wherever the Works or any part thereof are situated, the Law of the Federal Republic of Nigeria shall be the proper law of this Contract and shall apply to any arbitration under this Contract wherever the same or any part of it shall be conducted.

APPENDIX TO CONDITIONS OF CONTRACT

The following shall be incorporated as the Appendix to the Condition of Contract:

Defects liability period (Clause 15)	Twelve (12) months from the day named in the certificate of practical completion of the works or the end of the rainy season (30 th September whichever is the later
Insurance against injury to persons or Property (Public Liability Insurance) (Clause 19)	To be effected by Contractor
Insurance of works (Clause 20)	To be effected by Contractor for Contract value including 12% to cover professional fees
Annual renewal date (Clause 20A 3.1)	Copies of all policy Document to be forwarded to Architect
Date of possession (Clause 21)	
Date of completion (Clause 21)	
Liquidated and ascertained damages (Clause 22)	At the rate of N500,000.00 per week or prorata thereof
Period of delay (Clause 20A or 20B)	
i) By reason of loss or damage cause by any one of the contingencies referred to in clause 20A or clause 20B	Three (3) months
ii) For any other reason	One (1) month
Price cost sums for which the Contractor Desires to tender (Clause 27.7)	
Period on Interim Certificates (Clause 30.1.1)	Four weekly intervals (one month)
Period of honouring interim certificates (Clause 30.1.1)	Payment shall be made to the contractor within 28 days following receipt of the Architects certificate

Percentage of certified value retained (Clause 30.3)	5%
Limit of retention fund (Clause 30.3)	5% of contract value
Release of retention (clause 30.4.2 and Clause 30.4.3)	All per relevant clauses, retention shall be held and released interest free
Period of final measurement and valuation (Clause 30.5)	Twelve (12) months from the date of Practical completion
Period of issue of Final Certificate (Clause 30.6)	Three (3) months per clause 30.6

Clause 31.0 shall be deleted in its entirety and replaced with the following:

“No qualification in respect of fluctuations in cost in respect of labour, plant, materials. Preliminaries etc will be accepted. All variations in costs inter alia costs of labour and materials, taxes (excluding Value Added Tax) currency fluctuations, exchange rates, transport charges, plant, overheads, etc after submission of the offer shall be to the Contractor's account. Rates shall remain fixed irrespective of any increase or decrease in the final value of the Contract Work”

TRADE PREAMBLES

GENERAL

A. Materials to B.S.

Materials shall so far as obtainable, be of Nigerian manufacture and all material used in the Work shall comply with the requirements of the latest British Standard issued by the British Standard Institution and the Contractor shall produce all necessary certificate to substantiate this fact if so request by the Architect. Materials shall be of the best quality unless otherwise described.

B. Workmanship

Workmanship generally is to be of the highest standard obtainable and in all cases where a British Code of Practice exists and is applicable to any portion of the Works, the Contractor shall allow for complying with the recommended practice unless this procedure would conflict with requirements stated elsewhere in the Contract Documents.

C. New Materials

The whole of the materials in the works shall be new unless otherwise described.

D. Proprietary Materials

Materials specified of proprietary manufacture may be substituted by material of different manufacture provided that such substitutions are in all respect equal to the original specification and that the Architect's prior written approval is obtained to all substitution affected. All proprietary materials are to be used, fixed or applied in accordance with the manufacturer's instructions.

E. Conflicting description or specifications

In the event of the description of any measured item or group of items in the Bills of Quantities conflicting with the general specification clauses contained in the Trade Preamble, the detailed description of the measured work shall take precedence.

In the event of these Trade Preambles conflicting with the provisions of and specification forming part of the Contract or with any specification notes on the Contract Drawings, then in either case the latter shall take precedence.

F. Preamble apply to all trade.

The Trade Preamble relating to each particular section shall apply equally to all work carried out of a similar nature under other sections (i.e. Excavation and Earthwork preamble apply equally to External Works)

DEMOLITIONS AND ALTERATIONS

A. Protection of Adjoining Property.

The Contractor shall be responsible for protecting the adjoining property and buildings and must take all necessary precaution against damage being caused.

B. Provision of Dust Sheets, Tarpaulins etc.

The Contractor shall provide all necessary dust sheets, tarpaulins, etc to avoid annoyance and inconvenience to adjoining owners and general public whilst demolitions are being carried out.

C. Materials derived from Demolitions.

All materials derived from demolitions unless otherwise described shall become the property of the Contractor who shall allow a **credit** for any materials so acquired. Notwithstanding the foregoing, the employer reserves the right to take possession of any material so derived and the Contractor will be allowed **full credit** value if any.

EXCAVATION AND EARTHWORK

D. Nature of ground

The Contractor is to determine for himself the nature of the ground to be excavated and prices are to include for excavating in whatever soil may be met with and for grubbing up and removing any drains, pipes, roots and any other obstructions encountered excepting concrete, blockwork, masonry and rock.

E. Site clearance

The Contractor is under no circumstances to commence site clearance without the Architect's written approval as to the extent and nature of the works to be executed.

F. Architect to be notified

The Contractor shall report to the Architect or Engineer when excavations are ready to receive concrete foundations and shall not proceed with concrete until they have been passed and approved. Any concrete or other work put in before this has been done will have to be removed if so required by the Architect or Engineer at the Contractor's expense.

G. Sand and ballast

Sand or ballast found on the site is not to be used in the work

B. Maintain excavation

The sides of the excavations shall be timbered and shored as is necessary to secure them from falling in

EXCAVATION AND EARTHWORK (CONT'D)

A. Excavation beyond limits

Should the Contractor excavate to a greater depth or width than shown on the drawings or instructed by the Architect he shall at his own expense fill in such greater depth or width of excavation with concrete as described for foundations

B. Excavation in rock

Should the presence of rock make excavation for foundations or concrete foundations themselves unnecessary to the extent shown on the drawings the Architect or Engineer must be consulted before omitting excavations or foundations.

C. Protect foundation

The Contractor shall provide all necessary boards and covering lay same to protect the trenches or excavations from the effect of inclement required by the Architect

D. Keep excavation free from water and mud

All excavation shall at all times be kept free from water and mud from whatsoever source arising by pumping and/or baling as required

E. Excess excavation and Laterite filling

No more soil shall be removed than is absolutely necessary and if loose, soft or bad soil is met with, the matter shall be reported at once to the Architect or Engineer

The Contractor shall not fill in over any work until it has been approved by the Architect or Engineer. The earth shall then be brought from the place where it was temporarily deposited and the trenches or other excavations which so require it shall be filled up to the required level with earth in layers of not more than 150mm in thickness. Each layer shall be carefully rammed and shall be further consolidated by the addition of water. All refilling to raise level of site shall be done in similar layers carefully rammed and consolidated in a like manner.

F. Filling and backfilling

The Contractor shall take due precautions to ensure the safety of any walls which may be subjected to excessive load during the compaction of the fill and/or hardcore by shoring or otherwise protecting these walls.

EXCAVATION AND EARTHWORK (cont'd)

Filling and back filling (cont'd)

Where backfill is to be placed on both sides of a wall, it shall be placed on both sides together, so that at no time will the difference in level exceed 300mm.

A. Removing surplus spoil

The spoil arising from the excavations (where not required, to be returned or refilled at once) shall be wheeled or carted to spoil heaps where required on the site for refilling around foundations or to make up levels under floors and outside lines of building and any" surplus is to be wheeled, spread and levelled or carted away from the site as directed. All refilling and carting away have been measured separately.

B. Hardcore

Hardcore shall be composed of concrete, hard tile, stone rubble or such other materials as may be approved by the Architect or Engineer. Where hardcore is specified under slabs or other concrete, it shall be broken to pass a 75mm diameter ring, and retained on 50mm ring spread over the prepared ground or filling, well consolidated, and leveled off. Under no circumstances shall lime concrete be allowed as hardcore.

C. Laterite

Laterite is to be hard, clean, dry, selected, roughly graded and free from dust or other foreign matter and broken to pass a 100mm ring The hardcore and Laterite beds are to be deposited and consolidated in layers not exceeding 150mm thick and shall contain sufficient fine materials to form a solid and homogeneous mass and are to be thoroughly consolidated by tamping and rolling with a heavy roller and the top surface blinded with approved fine material and finished to exact levels to form a clean and solid foundation

D. Rock

The term "rock" shall mean hard stone as can only be removed, in the opinion of the Architect, by barring, wedging, drilling, splitting or blasting. The Contractor must provide and allow in his prices for whatever method of removal may be adopted and there is no guarantee given or implied that blasting will be allowed.

Rates for excavations in rock shall include for getting out and disposal of any additional material arising from 'overbreak' or 'overblast' and for additional filling in weak concrete occasioned thereby.

E. Anti-Termite Treatment

The Contractor shall destroy all ants, nests and vermin encountered during excavation.

F. Prices to Include The prices of excavation of any nature are to include for levelling or grading and ramming bottoms of excavations or surfaces of general excavations to receive concrete foundations,

I.

Concrete profiles, hardcore, beds, etc.

This method of measurement expressly excludes the measurement of these items in accordance with the principles of the Standard Method of Measurement.

CONCRETE WORK

A. General

Concrete shall be made with cement and fine aggregate and coarse aggregate and water. No other agent or ingredient shall be added to the concrete without the prior approval of the Engineer. The Contractor shall ensure that the use of any such approved additive will not adversely affect the strength, durability or appearance of the finished concrete works.

B. Definitions

The following terms wherever used in these Concrete Work Preambles shall be taken to have the meanings assigned to them below:

"Unreinforced concrete" or "mass concrete" shall mean concrete used in members made with a Structural grade of concrete listed in Table I, but not containing steel reinforcement

"Structural props" shall mean those components of the Strutting to formwork which will be retained in position when the shuttering is removed from concrete faces.

"Satisfactory" shall mean to the satisfaction of the Architect.

"Approval" shall mean approved by the Architect.

"Required" shall mean required by the terms of this specifications, or any other contract document.

"B.S and C.P" shall mean the British Standard and Code of Practice current at the time of tender.

"Passed by the Architect" shall mean accepted as complying with specification requirements as far as can be judged from visual inspection

"Testing Authority" shall mean an organization nominated by the Contractor and approved by the Engineer fully equipped to carry out all tests and checks required by these preambles. It may be an independent firm or a laboratory set up and maintained by the Contractor or combination of both.

"Current Issue" shall mean the latest issue at the date of tender invitation

"Failure to comply with this specification" shall mean failure to comply with all the requirements of these concrete work preambles.

TP/5

A. **Responsibility**

No approval by the Engineer shall in any way relieve the Contractor of his responsibility for the quality of materials and the standard of workmanship in the finished works and for the strength and durability and appearance of the finished concrete works.

B. **Rates**

The Contractor's rates for all Measured, items relating to the concrete Works and tests shall include for carrying out the Works in accordance with all the terms and requirements of these Preambles.

C. **Variations**

No variations to these Preambles may be made unless approved by the Engineer.

D. **Defective Work**

Where in the opinion of the Engineer any of the finished work or the materials or workmanship in any part of the Works do not comply with all the relevant requirements of these Preambles that part of the Works shall be classed as defective work.

All work classed as defective work shall be cut out and removed from the Works and replaced to the satisfaction of the Engineer

The extent of the work to be removed and the methods to be used in the removal and replacement of this work shall be in accordance with the Engineer's directions

DESIGN

E. Reinforced Concrete

The reinforced concrete works have been designed generally in accordance with the recommendations contained in C. P. 114 and the Contractor shall comply with the recommendations made in Sections 2, 5 and 6 of this Code of Practice unless specifically excluded or modified hereafter

F. **Unreinforced Concrete**

Unreinforced Concrete shall comply with all the relevant requirements of these preambles

MATERIALS

G. **General**

All materials used in the Works shall comply in all respects with the relevant B. S except for any deviations specifically authorized in subsequent clauses of these Preamble.

CONCRETE WORK (cont'd)

MATERIALS (cont'd)

A. Cement

The cement shall be Portland cement complying with B. S 12 or Portland blast furnace cement complying with B.S. 146. "

All cement shall be delivered to the site in bulk cement lorries of approved design or in sealed bags or in sealed tins.

B. Aggregate

Aggregate shall comply with the recommendations of B.S. 882. In special circumstances a deviation from B. S 882 in respect of grading of aggregate may be accepted subject to the prior approval of the Engineer

For exposed or pre-stressed or sulphateresisting cement concretes the salt content expressed as the percentage of sodium chloride on the dry weight of aggregate shall not exceed 0.1%.

For other concretes the total salt in a mix (sodium chloride from aggregate plus calcium chloride from any additive) shall not exceed 2.0% of the weight of cement

For structural concrete grades the maximum size of the fine aggregate shall be 5mm and the coarse aggregate shall be 20mm.

Any special requirements in regard to size, type or colour of aggregate are specified under "design and Control of Concrete Mixes" hereinafter included.

C. Water

The water to be used in the Works shall be clean and free from all harmful matter in suspension or solution

D. Reinforcement

The steel for reinforcement is to be obtained from an approved manufacturer and to Conform to B.S No. 4449, 4461, 4482 and 4483. Any steel which shows any sign of faults shall not be used but removed from the site at the Contractor's expense. All mesh to B.S. 4483 shall be delivered in flat sheets. All steel for reinforcement shall be properly stacked in properly constructed racks above ground level

E. Storage

All cement shall be stored in a weatherproof shed of adequate size having a raised dry floor or in silos of approved design.

Aggregates shall be stored in approved containers or on hard paved self-draining areas with adequate dividing walls to prevent mixing of different types of aggregate.

CONCRETE WORK (cont'd)

Storage (cont'd)

Cement and aggregates shall be used in the order in which they are received on site and their storage shall be arranged to facilitate this procedure

Reinforcement shall be stored on racks clear of the ground.

Where the materials are to be stored on suspended floor or roofs the Contractor shall ensure that such storage will not overload or distort the structural frame.

A. Rejected Materials

All materials which have been damaged or are contaminated or have deteriorated or do not comply with the requirements of these Preambles shall be rejected and shall be removed from the site immediately at the Contractor's expense.

TESTS

B. General

All tests and checks carried out on site shall be in the presence of or as directed by the Engineer.

The Contractor shall send copies of all test results and check results to the Engineer.

The Contractor shall include in his rates for all tests specifically required in this preambles and not billed separately.

The Contractor will not be paid for any special test called for by the Engineer in consequence of any failure by the Contractor to comply with these preambles.

The Contractor will be paid at rates to be agreed for any other special tests called for by the Engineer unless the test results show failure by the Contractor to comply with these preambles.

C. Cement

The Manufacturer's certificate of tests including compressive strength tests carried out in accordance with B.S. 12 for Portland Cement or B.S. 146 for Portland blast-furnace cement shall be supplied and kept on site for each consignment of cement delivered to the Works. At the commencement of the Contract the Contractor shall deliver sufficient sample of each type of cement he intends to use to the approved testing Authority.

One bag of cement in every 100 delivered shall be check weighed.

CONCRETE WORK (cont'd)

A. Aggregates

All sampling and testing of aggregates shall be carried out in accordance with the relevant recommendations of B. S. 812.

At the commencement of the Contract the Contractor shall deliver to the Approved Testing Authority for inspection and analysis 3 separate and sufficient samples of each type of Aggregate to be used in the structural concrete grades. For each type of aggregate the 3 samples shall be taken at the proposed source of supply at intervals of not less than one day.

To ensure that no significant variation in the grading of the aggregate occurs during the Contract, sieve analyses shall be carried out on site at fortnightly intervals. The results of these analyses shall be recorded on a chart to be kept on the site and to be handed to the Engineer on completion of the structural concrete works.

If the grading of any aggregate changes the Engineer shall be notified before any of this aggregate is used in the works.

The quantity of water contained in the aggregate shall be determined by an approved method at least once a day when concrete mixing is in progress.

B. Mixing Plant

Weigh-batching plant shall be checked weekly or as directed by the Engineer. The checking shall be carried out with approved weights provided by the Contractor for this purpose.

The water gauging equipment shall be inspected and checked weekly.

If any fault in the mixing plant or water-gauging equipment is detected by these checks or otherwise the fault shall be rectified to the satisfaction of the Engineer before any further use is made of the equipment.

C. Concrete Tests

All concrete test cubes shall be made and cured and tested and the results recorded in accordance with the recommendations of B.S. 1881 unless specifically modified in subsequent clauses of these Preambles. The testing shall be carried out by the Testing Authority.

The test specimens shall be 6" (150mm) cubes made in steel moulds of approved design. Slump tests of compaction factor tests of the mixed concrete shall be carried out as directed by the Engineer.

D. Exposed Concrete Finishes

Where exposed concrete finishes are required the Contractor shall provide in a suitable position test samples of each type of finish to be used in the Works. These test samples shall be approved by the Architect and the Engineer before these finishes are put in hand in the Works.

CONCRETE WORK (cont'd)

Exposed Concrete finishes (cont'd)

The test pieces shall be vertical panels 1 metre square and 225mm thick. After approval. They shall be retained in position until the concrete works have been completed when they shall be demolished and removed from the Works.

A. Load Tests

Load tests of completed parts of the structure may be called for by the Engineer.

The standards of acceptance of structural load test as" stipulated in Clauses 6.05 of B.S. CP. 114 are specifically excluded from this Specification. The test procedure and the standard of acceptance will be specified by the Engineer.

Where the results of such tests indicate that any member or part of the structure does not comply with this Specification that part of the structure shall be classed as defective work.

B. Concrete Mixes

For Structural Concrete Mixes, made with Ordinary Portland Cement, the average 28 days Work strength shall be not less than that specified in Table 1. If not, it shall be increased by 263.40kg/sq.mm.

Blinding concrete grades for blinding and filling are specified in Table 2

The mixes required are as follows:- .

TABLE 1

Grade	28 Days Works Strength Kg/ Sq.mrn	Fine Aggregate	Coarse Aggregate.	Special Requirements
I	1360.80	100-5mm	15mm-19mm	Reinforced Concrete Precast Concrete
II	1360-80	100-5mm	9mm	Precast Concrete

CONCRETE WORK (cont'd)

TABLE 2

Grade	Fine Aggregate Proportions		Coarse Aggregate	All-in Aggregate	Description
III	1	3	6 19mm aggregate		Mass Concrete
IV	1	12		25mm Maximum Aggregate	Blinding and filling

DESIGN AND CONTROL OF CONCRETE MIXES

A. Grades

Concrete mix described as	Cement by weight (Kg.)	Fine Aggregate (dry weight in Kg.)	Coarse aggregate (dry weight in Kg.)
"A" 1:2:4	50	100	200 (20mm aggregate)
"A" 1: 1:3	50	75	150 (20mm aggregate) (10mm aggregate for sections of 100mm or under)
"B" 1 :3:6	50	150	300 (20mm aggregate)
"C" 1:10	50	150	300 (20mm aggregate)

Determination of Mix Proportion

Mix proportions shall be determined by the Contractor by an approved method for the grade of concrete specified above. Complete relevant information for the mix proportions by weight of each grade of concrete shall be submitted to the Engineer prior to preliminary test cubes being made.

The mix proportions shall be such that the designed mean strength at 28 days shall exceed the specified strength at 28 days by twice the design standard deviation. Initially the design standard deviation shall be $7N/mm^2$. The concrete shall have sufficient workability to be placed and compacted by the methods to be used on site.

CONCRETE WORK (cont'd)

Determination of Mix Proportion (cont'd)

The Contractor shall arrange and supply all the necessary material for specimen cubes to be made in accordance with the British Standard Code of Practice C.P. 110 before making any change in the ingredient of the concrete or the water/cement ratio, or when the Architect directs

The minimum strength of these cubes of Quality "A" and "A1" concrete shall be as follows:

	Mix "A"		Mix "A1"	
	<i>N/mm²</i>	<i>lb/sq in</i>	<i>N/mm²</i>	<i>lb/sq in</i>
Preliminary Test at 7 days	16	2,300	18	2,500
Works Test at 28 days	21	2,600	26	3,750

The following information shall be supplied with each and every test cube:

- I Serial No. of Cube (to be marked on cube)
- ii. Position from which taken
- iii Date Cast
- iv. Time Cast
- v. Temperature
- vi. Type of coarse aggregate
- vii. Type of fine aggregate
- viii Type and batch of cement'
- ix. Water/Cement Ratio
- x. By whom taken .

Should any test cube fail to meet the minimum requirements laid down as aforesaid the Architect at his sole discretion reserves the right to test those portions of the structure which he considers necessary either ,by means of loading tests or by cutting out from the finished work samples of concrete to be further tested or by such other means as may be determined by and acceptable to the Architect. If the results of these tests are not satisfactory, the Architect shall require the Contractor to cut out and/or pull down all work shown to be defective.

A. Acceptance of Mix Proportions

Before any grade of concrete is placed in the works three trial mixes of the grade shall be made to the submitted mix proportions and from each mix six cubes shall be made, three for testing at 7 days and three at 28 days and the results submitted to the Engineer as soon as available.

The mix proportions shall be accepted for use in the Works only if the 28 days cube strengths fulfill the following conditions:-

- (a) The average strength of each set of cubes exceeds the designed mean strength and
- (b) The difference between the lowest and highest strengths of anyone set does not exceed 15% of the average of that set and
- (c) The difference between the lowest and highest strengths of all three sets does not exceed 20% of the average of all three sets.

CONCRETE WORK (cont'd)

A. Sampling of Works Concrete

On each of the first 10 occasions for each grade of concrete used, four samples shall be taken and on each occasion thereafter at least one sample shall be taken. The samples shall be taken at the mixer from typical batches as directed by and in the presence of the Engineer without prior notice. From each sample two test cubes shall be made one for testing at 7 days and the other at 28 days.

The Contractor shall maintain on site a complete record of the date and time and grade and location in the Works of the mix from which the sample was taken and shall submit this information with the test results to the Engineer as soon as they are available.

B. Acceptance of Works Concrete

If the strength of all cube tested at 28 days is less than the specified 28 days strength, or if the strength of any cube tested at 7 days multiplied by the average ratio of 28 days or 7 day strengths for that grade of concrete as determined from the relevant trial mix results is less than the specified 28 days strength, then no further work shall be carried out on that part of the work containing the mix from which the cubes were taken until a full investigation into the cause has been carried out by the Contractor to the satisfaction of the Engineer.

If as a result of the investigation the Engineer decides that the concrete does not meet the requirements of these Preambles then the concrete will be classed as defective work. In addition the 28 days works cube results of each grade shall be examined in consecutive (but not overlapped) sets of four for which the average and the range of each set shall be calculated. If the results of any ten consecutive (but not overlapping) sets do not satisfy all the following conditions the concrete shall be classed as defective work:

- (a) not more than two individual results of the 40 cube tests shall fall below the specified 28 day works cube strength.
- (b) no value of the range in any set shall exceed four times the design standard deviation.
- (c) not more than one set shall have an average which is less than the specified strength plus $4/3$ times the design standard deviation.
- (d) no value of the average for any set shall be less than the specified strength plus the design standard deviation.
- (e) the standard deviation of all 40 cube tests shall be less than the design standard deviation.

C. Re-determination of Mix Proportions

If the Contractor maintains a consistent standard deviation less than $7N/mm^2$ (1,000 x 1b./sq.in.) to the satisfaction of the Engineer then the Engineer may permit the mix to be re-proportioned substituting an approved standard deviation for the design standard deviation as specified. The minimum standard deviation which will be permitted by the Engineer in this respect is $4N/mm^2$ (600 1b./sq.in.)

CONCRETE WORK (cont'd)

A. Ready Mixed Concrete

The Engineer may permit the use of ready mixed concrete provided complete details of the mix proportions and workability have been submitted to him for prior approval. Such permission shall only be given for as long as the Engineer is satisfied that the concrete complies with these preambles and the recommendations of B.S. 1926.

The Engineer will require a slump test and may require test cubes from each truck load prior to the concrete being placed.

Each load shall be accompanied by a delivery note stamped with the time of mixing and stating the consignee and quantities of each material including water and additives.

FORMWORK

B. General

Before construction commences the Contractor shall notify the Engineer of the general method and system of formwork he proposes to use.

All joints in the formwork and joints between the formwork and previous works shall be sufficiently tight to prevent loss of liquid from the concrete through these joints.

Methods of fixing and locating formwork which result in holes through the concrete section when the formwork is removed shall not be used

No metal part of any device for maintaining formwork in the correct location shall remain permanently within the specified concrete cover to the main reinforcement.

The use of concrete retarders or similar preparations on the formwork surfaces shall be subject to the prior approval of the Engineer.

C. Classes of Unformed Surface Finish

Class U3 - This is a hard smooth steel - trowelled finish for surfaces of concrete pavings, tops of walls, copings and other members exposed to weathering, surfaces of beds and slabs to receive thin flexible sheet or tile paving bedded in adhesive, seating for bearing plates and the like where the metal is in direct contact with the concrete. Troweling shall not commence until the moisture film has disappeared and the concrete has hardened sufficiently to prevent excess laitance from being worked to the surfaces. The surface shall be trowelled under firm pressure and left free from trowel marks. The finished surface shall be such that any deviation from a straight 1.5 metre template does not exceed 3mm.

Classes of Unformed Surface Finish (cont'd.)

Clause U2 - This is a floated finish for surfaces of beds and slabs to receive mastic pavings or blocks or tile pavings bedded in mastic and for exposed surfaces of pavings where a hard smooth steel-trowelled surface is not required. Floating shall be done only after the concrete has hardened sufficiently and may be by hand or machine. Care shall be taken that the concrete is worked no more than is necessary to produce a uniform surface free from screed marks.

Class U1 - This is a tamped finish for surfaces of foundation, beds, slabs and structural members to be covered by backfill, subsequent stages of construction, bonded concrete topping or cement mortar, beds to receive pavings and on exposed surfaces of pavings where a superior finish is not required.

A. **Classes of Formed surface Finishing**

Example of Formwork Material

	<u>Description</u>	
F3		Plastic, Steel, Factory Sealed surface plywood
F2	High Quality	Steel or Plywood Panels
F1	Medium Quality	Sawn Board or sheet steel
	Low Quality	

Class F3 - This is an exposed surface finish which shall be uniform in colour without efflorescence, hydration, discoloration, aggregate transparency or other differential change in colour. The surface area of irregularities such as blowholes, honey-combing, scouring and scaling shall be less than 0.2 per cent of the surface area of concrete in any separate area 300mm square. The surface finish shall be such that no making good is required other than the filling of bolt and tie-rod holes.

Class F2 - This is a medium quality surface finish for all hidden work above ground level. Surfaces to be rendered or plastered shall be treated by an approved method to provide a key.

Fine and other minor surface defects shall be remedied by methods approved by the Architect. All surface treatment necessary to achieve the required class of finish shall be at the Contractor's expense.

Formwork facing shall be impermeable with a semi-matt finish e.g. steel or plywood panels. Joints between panels and the lines of bolt or tie-rod holes shall be horizontal and vertical unless otherwise directed and shall line through on successive lifts and adjacent pours of concrete. New plywood forms shall be thoroughly oiled with release agent prior to first use.

Class F1 - This is a comparatively low quality surface finish for surfaces for work below ground level. Surface irregularities such as blowholes, scouring or scaling are acceptable provided that any such imperfections do not affect the structural quality of the concrete. Formwork facing shall consist of sawn boards, sheet metal or any other suitable material which will prevent the loss of fines when the concrete is vibrated.

A. Finishes to Roof Slabs

Unless otherwise agreed with the Architect, all the roof slabs shall be finished by either power floating or trowelling the top surface to a true and level surface ready to accept the roofing membrane.

Generally, sand-cement screeds will not be provided except for the areas specified on the Architect's drawings.

The Contractor's attention is drawn to the following in connection with power floating and trowelling:

- (a) Skilled operators shall be used to achieve the quality of finish required.
- (b) The concrete shall be placed with adequate surcharge and fully compacted by sufficient number of passes of a vibration beam-type screeder.

Shuttering and temporary forms to edges of bays must be securely fixed.

- (c) The timing of final finishing by disc planning and subsequent blade finishing is critical and must be carefully judged as this depends on.-
 - I Workability of concrete
 - li Cement content
 - lii Ambient temperature
 - iv Relative humidity
 - v. Weight of the machine used.
- (d) The work must be done in such a way that each area of slab is completed in one operation. Water brought to the surface of concrete during disc planning operation must be allowed to stabilize before starting blade finishing.
- (e) Adequate weather protection must be provided to allow operators to work at any time, including nights, depending on timing of pours of concrete slabs so that the finishing can be carried out at the appropriate time.
- (f) Finished roofs must be protected from damage accumulation of dirt, oil pillage, etc., prior to the application of the roofing membrane.
- (g) If the Contractor chooses to carry out the power float type of finish or the manual trowelling of the top of the roof surface to provide the required finish (to which points (a) to (e) above equally apply) he shall include in his tender for all the items as necessary required to successfully complete the roof.

The Contractor's detailed proposals to achieve the specified finish shall be submitted to the Architect prior to commencement of the work.

A. Mortice, Holes. Chases in Concrete

Fixing blocks and ends of brackets and bars and bolts etc., shall be cast in the concrete at the time of placing and together with all mortices and holes and apertures and chases and grooves etc., shall be accurately set out in the formwork before the concrete is placed. No part of the concrete works shall be cut away for any such items or for any other reason without the Engineer's approval.

The Contractor shall obtain from all sub-contractors complete information of their requirements regarding conduits and pipes and fixing blocks or boxes and chases and holes and any other items to be cast or formed in concrete members subject to the condition that failure of a Sub- Contractor to supply such information shall not be allowed to delay the progress of the Contract.

The Contractor shall ensure that all Sub-Contractors are informed of his programme for the structural works at the commencement of the Contract. He shall also ensure that the sub-contractor's requirements relating to concrete members are approved by the Engineer before work is commenced.

At the commencement of the contract, the Contractor shall supply all the Sub-contractors with written copies of this section (Page TP / 17 item A)

B. Propping

The vertical propping to all formwork shall be carried down sufficiently far to provide the necessary support without damage or overstress or displacement of any part of the construction.

Structural props (ACRO Props) shall be retained in position until new construction is sufficiently strong to support its own weight and any loads to be placed on it during the contract period.

Each member shall be supported by structural props (ACRO Props) which are spaced at not more than 3metre centres in two directions.

All formwork to soffits shall be constructed so that it can be removed without disturbing the structural props (ACRO Props).

C. Cambers

Unless otherwise detailed on the drawings the formwork of all beams and slabs shall be constructed with the following upward camber:-

i) Spanning between supports:-

Roof beams and slabs 0.2% of the span at mid-span.

Floor beams and slab 0.1 % of the span at mid-span.

ii) Cantilever:-

Beams and slabs 0.4% of the projection at the free end.

A Final Preparation

The internal faces of the formwork may be coated with an approved preparation to prevent adhesion of the concrete to the forms provided that the use of this preparation will not stain the surface of the finished concrete. None of this preparation shall be allowed to touch the reinforcement

Immediately before the concrete is placed in any section of the formwork the interior of that section shall be completely cleared of all extraneous materials including water.

Each section of the formwork to structural members shall be inspected by the Engineer immediately before concrete is placed in that section"

CONSTRUCTION JOINTS AND EXPANSION JOINTS.

B. Position of Construction Joints.

The Contractor shall ensure that all construction joints are arranged to minimize the effect of shrinkages of the concrete. Generally the distance between construction joints in walls and slabs shall not exceed 6 metres,

The positions of all joints not shown on the drawings shall be agreed with the Engineer before work is commenced

C. Treatment of Construction Joints.

All construction joints other than horizontal joints shall be formed with proper stop- boards and the stop-boards shall be fixed' vertically unless otherwise directed,

At all construction joints the laitance shall be completely removed from the contract face before the adjacent section is concreted Where an adjacent face of the concrete is to be exposed in the finished works, treatment of the joints shall be determined 12mm away from the face to be exposed.

Horizontal joints at exposed faces shall be formed against a straight batten at least 12mm thick.

REINFORCEMENT.

D. General

Reinforcement bending schedules will be provided listing the cut length and diameter or size and bending dimensions and location of each bar in the Works

CONCRETE WORK (cont'd)

Reinforcement (cont'd)

General (cont'd)

Before the bars are cut to length the Contractor must check:-

1. That reinforcement schedules are provided for each part of the structure sufficiently in advance of his concreting programme
2. That each schedule includes the correct quantities of reinforcement as detailed on the drawing to which it relates
3. That the grades of reinforcement given in each schedule correspond to those shown on the relevant drawing.

The Engineer shall be notified of any errors disclosed by these checks

A. Bending

All reinforcement bars shall be accurately shaped in a manner that will not injure the material to the details shown on the drawings and bending schedules. Bar shall not be bent hot

All bending shall be done cold in an approved machine capable of dealing with the largest bars used. The ends of all bars shall be hooked or bent to the standard hook or bend shown in B. S. 1478:1948 unless other forms of anchorage are shown on the drawings. The Contractor shall be responsible for checking all details shown on the Bending Schedules prepared by the engineers prior to ordering and placing the bars in the work

The number, size, form, and position of all steel bars, ties, links, and stirrups shall be in exact accordance with the working drawings. Nothing shall be allowed to interfere with the specified arrangement of the bars and the Contractor shall make a special point of seeing that they are all laid out accordingly and are all rigidly fixed in their respective positions, so that no displacement may occur when concreting operations begin. All bars shall be straight and taut, and all crossings or junctions securely wired with No.16 gauge soft iron wire. Ties or links shall be taut so that the main bars are braced in every direction. Timber blocks shall not be used for packing the steel off the shuttering. Only skilled steel benders and placers shall be employed on this work.

Unless otherwise shown on the Drawings the cover to the main reinforcement shall comply with Clause 307 of the Code of Practice for the Structural Use of Reinforced Concrete in Building (CP.114).

The rates for all steel bar reinforcement are to include for all necessary cutting to lengths hooking at ends, bending and lapping or inter-sections with tying wire. The tying wire is not included in the calculated weights.

The rates for all steel fabric reinforcement are to include for lapping a minimum of 150mm both ways and all necessary tying or inter-sections with annealed iron tying wire.

CONCRETE WORK (cont'd)

Bending (cont'd)

The rates for plain and reinforced concrete shall include for hoisting to any heights required, forming necessary construction joints, work in all sectional areas and thickness leaving surfaces ready for screed and pavings, cutting and forming chases, groove mortise and holes for pipes and sundry labours of a like nature.

No metal part of any device used for connecting bars or for maintaining reinforcement in the correct position against faces exposed to the elements earth or water shall remain permanently within the specified minimum concrete cover to the reinforcement.

A Cleaning

All reinforcement shall be freed of all loose mill scale and thoroughly cleaned to remove all loose rust and oil and grease or other harmful matter, immediately prior to being placed in position in the Works.

B. Placing

All reinforcement shall be accurately placed with the correct cover and securely fixed in the positions shown on the drawings by an approved method. Unless otherwise shown on the drawings the cover to the main reinforcement shall comply with Clause 30 of the Code of Practice for the Structural Use of Reinforcement Concrete in Building (C.P.114)

The Bills of quantities rates shall include the steel reinforcement used for approved chairs (excluding those listed on the bending schedules) which exceeds 1 % of the total weight of the reinforcement fixed.

No metal part of any device used for connecting bars or for maintaining reinforcement in the correct position against faces exposed to the elements earth or water shall remain permanently within the specified minimum concrete cover to the reinforcement.

C. Welding

Welding of reinforcement shall only be carried out with the Engineer's approval.

Welding of cold-worked high tensile steel reinforcement will not be permitted.

D. Projecting Reinforcement

Reinforcement shall not be bent up within the formwork unless approved by the Engineer.

The contractor shall ensure that projecting reinforcement does not cause rust staining to any part of the works.

CONCRETEING

A. MIXING

The quantities of cement and aggregates for each batch shall be weighed separately in approved weigh batching equipment. Where cement is delivered in bags each batch of concrete shall be proportioned to use a whole number of bags.

Concrete shall be mixed in approved mechanical batch type concrete mixer. Mixing shall be continued until there is a uniform distribution of the materials in the mixer and the mass is uniform in colour. The mixing time for each batch shall not be less than the minimum period recommended by the mixer manufacturer.

The volume of mixed materials in each batch shall not exceed the rated capacity of the mixer. Each batch of concrete shall be discharged completely before the mixer drum is re-charged.

The mixer drum shall be thoroughly washed out whenever mixing ceases.

B. Transporting

Concrete shall be transported as quickly as possible from the mixer to its final position without segregation or loss of any of the ingredients.

All plant and equipment used for transporting concrete shall be kept clean. All containers used for transporting concrete shall be thoroughly washed out whenever mixing ceases.

Runs or gangways for concrete transporters and main runs for foot traffic shall not be supported or allowed to bear on the fixed reinforcement.

C Placing

Concrete shall be placed while still sufficiently plastic for adequate compaction.

At all times when reinforced concrete is being placed a competent steel fixer shall be in continuous attendance on the concretors to adjust and correct the position of any reinforcement which may be displaced.

The Contractor shall keep on site a complete record of the Works showing the time and date when concrete is placed in each part of the Works. This record shall be available at all times for inspection by the Engineer.

D. Compacting

Concrete shall be thoroughly compacted during the placing and shall be carefully worked around all reinforcement and embedded fixtures and into the sides and corners of the formwork.

Unless otherwise specified all structural concrete in the grades specified previously shall be compacted by the use of suitable mechanical vibrators. Wherever possible internal vibrators shall be used.

CONCRETE WORK (cont'd)

A. Curing

All surfaces of freshly placed structural concrete shall be covered with an approved material and cured by being kept moist for 7 days except that for concrete made with rapid hardening cement the minimum curing period shall be 3 days.

Soffit and side forms left in position will be regarded as effective in keeping those surfaces moist.

The Contractor shall notify the Engineer of the system and methods of curing he proposes to use for all structural concrete members before work is commenced.

B. Record of Temperature

A maximum and minimum thermometer of approved design shall be kept on site close to the Works for measuring atmospheric shade temperature

A daily record of maximum minimum morning and evening temperatures shall be maintained on site. The daily average temperature shall be calculated as the arithmetic mean of the maximum and minimum morning and evening temperatures recorded in each 24 hours.

STRIKING OF FORMWORK

General

The structure shall not be distorted damaged or overloaded in any way by the removal of the formwork from concrete members.

The responsibility for the safe removal of any part of the formwork or strutting, shall rest with the Contractor.

D. Minimum Striking Times

The minimum time for completion of placing concrete to the removal of formwork from structural members shall be determined from the following table:-

MINIMUM STRIKING TIMES

Location	Ordinary Portland Cement Concrete	Rapid Hardening Portland Cement Concrete
Beam and wall sides	3	3
Columns	3	3
Slab Soffits (Struct Props left in.)	7	5
Beam Soffits (Struct. Props left in)	7	4
Slab Structural Props	14	11
Beam Structural Props	14	11

Minimum Striking Times (cont'd)

The times are given in days where each day is to be of 24 hours duration during which the concrete temperature is above 5°C (40°F).

A. Minimum Striking Strengths

Alternatively the Contractor may determine at his own expense the time for removal of formwork by the strength of the concrete in the member concerned. The formwork to a structural member may be removed when two 150mm concrete cubes left to cure under the same conditions as the member both exceed the strengths given in the following table:-

Location	Minimum crushing strength as percentage of specified 28 days strength
Slab soffits (Structural Props left in)	40%
Beam Soffits (Structural Props left in)	50%
Structural Props in Slabs	60%
Structural Props in Beams	70%

CONCRETE IN WATERTIGHT CONSTRUCTION

B. General

- . All work so indicated on the drawings shall be watertight.
- . The Contractor shall include in his rates for such water - bars and waterproof additives as he deems to be necessary but the use of such additives shall be subject to the prior approval of the Engineer.

When in the opinion of the Engineer damp patches or leakage of water in the finished works are due to failure of the Contractor to comply with these preambles the affected work shall be made good at the Contractor's expense.

C. Water Bars

Where water-bars are incorporated in construction joints they shall be of approved material and make and design. Water-bars shall be jointed in an approved manner.

Before commencing the work the Contractor shall obtain the Engineer's approval on the methods to be used to support and maintain the water-bars in the correct locations while the concrete is placed,

FINISHING WORK TO CONCRETE FACES

A. General

After removal of the formwork no treatment of any kind will be permitted other than that required for curing the concrete faces until they have been inspected by the Engineer.

B. Exposed Concrete Faces.

Unless otherwise specified all concrete faces to be exposed in the finished works shall be left as struck.

After inspection all superfluous fins and similar projections shall be carefully removed. No render or other applied finish shall be used to obtain a fair face to the concrete.

All concrete faces to be exposed in the finished works shall be adequately protected against damage and surface staining during the execution of subsequent works.

Any finished work which the Architect and Engineer shall judge inferior in any respect to the standard of the relevant approved sample or which is subjected to subsequent damage or surface staining shall be rejected and treated as defective work.

TOLERANCE

C. Setting out

On Plant:-At every structural level the Contractor shall set out a horizontal reference grid in a form agreed with the Engineer.

The dimensions between intersections of the reference grids shall be within + 2mm of dimensions given by or computed from the drawings.

The reference grid at each level shall be:

- (a) Vertically above the corresponding grid on the level immediately below' within a tolerance of 0.05% of the vertical distance between the levels considered and
- (b) Vertically above the corresponding grid on the lowest level within a tolerance of 05% of the vertical distance between the levels considered.

Levels:- At the commencement of the contract, the Contractor shall establish an approved bench mark. The bench mark shall be used as a site datum for all subsequent levelling on the contract. At every structural level the Contractor shall establish a datum level. This datum level shall be:

- (a) The computed height above the datum on the level immediately below within a tolerance of 0.05% of the height considered and
- (b) The computed height from the bench, mark within a tolerance of 0.05% of the height considered.

CONCRETE WORK (cont'd)

A. Grout

The grout used for filling cavities and ducts shall be made with Ordinary Portland Cement and water. Subject to the approval of the Engineer, additives may be used provided they do not contain chlorides or nitrates.

The grout shall be sufficiently fluid to ensure that all cavities are filled completely using a maximum pressure of 0.5 N/mm²

B. Position of Structural Elements

Unless otherwise indicated on the drawings the center lines of the finished structural elements at all points shall be within ± 4 mm of their correct position on plan relative to the nearest reference grid line and within ± 41 mm of their correct level relative to the datum level.

C. Size of Structural Elements

All sections of structural elements shall be within the tolerances below:-

For dimensions not exceeding 200mm ± -4 mm -0

For dimensions exceeding 200mm but not exceeding 3m ± 4 mm

For dimensions exceeding 3 metres ± 8 mm

Surfaces exposed in the finished work shall not depart by more than 4mm from a 1.50 metre straight edge placed anywhere on the surface.

D. Size of Openings

Where prefabricated components fit between as struck concrete faces, the following takes preference over anything specified above. Unless indicated otherwise on the drawings the tolerances between the as struck concrete faces shall be:

For dimensions less than 3 metres ± 4 mm

For dimensions greater than 3 metres +8mm

PRECAST CONCRETE

A **General**

The requirements of the Reinforced Concrete Specification shall apply to all the precast concrete work, except where specifically modified by the Clauses set out below.

B. **Programme**

The Contractor shall ensure that units are stored and delivered to the site to suit construction requirements. This programme shall be agreed with the precast concrete manufacturer in writing.

C. **Handling**

Before removal from the casting beds the concrete shall have obtained sufficient strength to prevent any damage or distortion or overstressing of the precast units. The Contractor shall provide all necessary lifting devices which shall be subject to the approval of the Engineer, prior to manufacture of the units.

D. **Protection**

During all subsequent handling, storage and transporting the precast units shall be protected against any damage or surface staining. The Engineer may reject any units which are damaged or stained,

E. **Identification**

Immediately after removal from the casting beds all units shall be marked in a manner and in a position approved by the Engineer.

F. **Approval**

All precast units shall be made available for checking of dimensions and surface finish and shall be approved by the Engineer before erection.

G. **Erection**

Prior to the commencement of erection the Contractor shall submit for approval of the Engineer details of his proposed arrangements for lifting and erecting units on site.

Units which require temporary fixing in position shall be rigidly propped at a suitable point to be indicated by the Engineer.

H **Jointing,**

All joint surfaces shall be thoroughly cleaned. Dry-packed mortar joints shall be formed by compacting the mortar in one inch layers with a steel tool.

Bedded mortar joints shall be formed by bedding the precast units on a firm layer of mortar. The Units shall be levelled on steel shims located with the top surface just below the surface

Jointing (cont'd)

level of the mortar. The shims shall have a minimum cover of one inch of mortar or concrete. Thin bedded mortar joints shall be formed with a neat cement mortar spread evenly to form a thin bed just sufficient to take up any high points on the bedding surface.

A. **Dressing**

All precast concrete works have been designed generally in accordance with the recommendations of British Standard Code of Practice C. P 116 except specified hereinafter in this Specification.

B. **Grout**

The grout used for filling cavities and ducts shall be made with Ordinary Portland Cement and water. Subject to the approval of the Engineer additives may be used provided they do not contain chlorides or nitrates.

The grout shall be sufficiently fluid to ensure that all cavities are filled completely using a maximum pressure of 0.5 N/mm².

The water/cement ratio of the grout shall not exceed 0.45.

C. **Mortar**

The mortar used for dry-packing in joints shall be made of Ordinary Portland Cement, sand and water in the proportions of 1 part cement to 3 parts sand by volume.

Mortar used for dry-packing shall be of such consistency that it can be properly compacted by ramming.

D. **Reinforcement**

Reinforcement shall not be bent up within the formwork unless approved by the Engineer.

All projecting reinforcement shall be suitably treated to prevent rust staining of the finished concrete surfaces without affecting the bond resistance of the bar.

E. **Steam Curing**

Precast units made with Ordinary Portland Cement may be steam cured at Atmospheric Pressure. The temperature of the units shall be raised at a steady rate which shall not exceed 40°F per hour and in addition the curing shall comply with the following:

Temperature of Unit

90°F
212°F

Time taken to reach temperature from
Commencement of steam curing

Not less than 2 hours
Not less than 6 hours

CONCRETE WORK (cont'd)

A. Tolerances

Unless otherwise indicated on the drawings all dimensions of the precast units shall be within the tolerances given below:

All dimensions of 3mm and over	±5mm
∧11 dimensions of less than 3mm	±3mm

Precast units shall also comply with each of the following tolerances which may modify those tolerances given above for particular conditions. Tolerances are not cumulative.

Permissible bow, 5mm in 3mm

Permissible twist from any plane surface as defined by any three exterior corner = ±3mm

BLOCKWORK

D. Material

The Portland Cement shall be as before described in "Concrete Works".

The sand shall be as before described in "Concrete Works".

Mix Proportion: The mix shall be 1 part of (0.21m³) cement to 6 parts of sand (50kg of cement to 0.18m³ (112lbs.) of cement to 7.5 cu.ft. of sand). The amount of water to be used in the mix shall be regulated to produce the driest possible mix consistent with full compaction, proper hydration of the cement and the ability of the block to withstand damage during handling.

Curing: On removal from the machine on pallets, the blocks are to be matured in the shade in separate rows, one block high with a space between for at least 24 hours and sprayed with water. They may then be removed from the pallets but not stacked or removed from the shade for a further 4 days and shall be sprayed with water at intervals. Following this, the blocks may be stacked not more than five blocks high in the shade for a further 21 days and allowed to dry out. **No blocks are to be built into any part of the building until they are matured in the manner described for at least 28 days**

C. Sandcrete Block

Sandcrete Blocks shall be manufactured on site in approved block making machine. The materials used in the manufacture of sandcrete blocks shall be not less than one part cement to six parts of sand by volume and blocks produced shall have a minimum crushing strength of 2.76N/mm² (400 lbs. per sq. inch) of net area of block work at 28 days:

The materials for making blocks are to be mixed together on a clean watertight platform and after thoroughly mixing together in a dry state, sufficient water only shall be added to bind the materials together. The mixture is to be placed in the block making machine in layers not exceeding 75mm in thickness, each layer to be thoroughly tamped and consolidated. After consolidation under pressure in the machine the blocks are to be carefully removed on their pallets and laid out in sheds to mature. All blocks are to be finished with square clean

BLOCKWORK (cont'd)

Sandcrete Block (cont'd)

sharp arises. Blocks of special sizes required to form proper bonding at corners, openings etc. shall be made in approved wooden moulds.

The blocks are to be allowed to mature for twenty-four hours and shall be protected from the Direct rays of the sun and the prevailing breeze.

After twenty-four hours the blocks shall be carefully removed from their pallets and laid out on the ground under cover and are to be kept wet for a further seven days.

Blocks may then be stacked not more than 5 blocks high under cover for a further 14 days. The stacks of blocks are to be well watered. No blocks shall be used for building purposes until 21 days after their manufacture.

A Mortar

The mortar used shall be composed of cement and sharp sand in the proportion of 1 part of cement to 6 parts of sand or as otherwise specified and gauged with "Rendaplas" or similar mortar plasticiser used strictly in accordance with manufacturer's instructions. All mortar shall be used as mixed. No mortar which has been allowed to set for more than **2 hours** shall be used in the work.

Suction: Adjustment of suction by wetting of the blocks on their bedding faces is to be avoided. The mortar consistency should be adjusted to suit the suction of the blocks.

B. Blocklaying

All block work is to be laid in stretcher bond properly bedded jointed and flushed up in cement mortar as described. Walls are to be carried up regularly not leaving any part 1 metre lower than another at any one time. Walls left at different levels are to be raked back. Courses are to be level, propounds kept vertical and quoins, jambs and other angles plumbed as work proceeds.

To effect a proper bond, fractional length blocks precast to correct dimensions are to be used or formed in situ between limpet shuttering. Proper scaffolding is to be provided and used and work executed overhand will not be permitted. Walls and partitions of different thickness are to be properly bonded to one another at junctions and intersections. Walls and blocks are to be thoroughly wetted whilst work proceeds.

Strap ties or bars attached to concrete or steel structural frames are to be built into blockwalls where they abut.

All items described in these Bills as "solid block walling" shall mean approved hollow Blocks with the cavities filled in-situ as the works proceed with concrete (20N/mm²). The prices of all items of cutting or building in to blockwork shall include for casting and laying solid blocks if necessary.

Finish: Block work to be rendered is to have all joints raked out to form a key. Blocks used for this work may have their faces scratched during manufacture.

BLOCKWORK (cont'd)

Loose blocks: Remove or cut out all loose or imperfectly bedded blocks and reset. Care should be taken when erecting shuttering not to disturb adjacent block work.

Blockwall Generally form all openings as shown with true reveals prepared to receive frames. Wedge and pin up blockwork to soffits of concrete slab, etc. Build in galvanized steel ties to reinforced concrete columns.

Concrete filled blockwall: Where measured, fill the voids of hollow blockwork, walls, etc., below damp proof course level and load bearing walls and piers above damp proof course level with concrete 20.50N/mm² (3,000 lbs.) 10mm (3/8") aggregate, filled in, well tamped and consolidated as works proceeds, including bedding reinforcement where indicated.

Bed frame, etc.: Bed all frames, plates, etc.

Fix Lintel: Hoist and set in position over openings as necessary, precast concrete lintels.

Build in, Cut and Pin in: Build in or cut, bed and pin-in ends of all lintels, frames, bearers, timber members and make good as necessary.

Form holes: Cut or form all holes through blockwork walls for pipes, etc., and make good in cement mortar.

Chases: Cut or form all chases, grooves and the like in blockwork walls and make good in cement mortar.

C. Stone walling

The stone for stone walling shall, unless otherwise specified be approved local stone obtained - from an approved quarry and selected for colour and texture and shall be hard, durable and free from flaws. Unless otherwise described stonework shall be square and uncoursed. In each square metre of wall at least two stones shall bond into the full thickness of the wall. Beds shall be horizontal unless otherwise shown on the drawings. Stone shall be solidly bedded in cement, mortar (1:6) and the joints shall be raked out and pointed with a 19mm recessed joints as the works proceeds. Stones shall be thoroughly wetted before laying and surfaces of work left off shall be thoroughly soaked with water before new work is commenced. Stonework shall be kept damp with water for seven days after laying.

D. Prices to include

The prices of blockwork are to include for all templates, work at all heights, rough and fair cutting, cutting or forming grooves, chases, mortices, building in or cutting and pinning ends of all lintels, timbers, steps, steel joists, bedding and pointing frames forming or leaving holes for pipes, raking out for and pointing flashing etc and the like and making good in all trades on completion.

The prices for stone walling shall include all labours, templates and the like, hoisting, setting jointing, raking out joints and pointing both sides and cleaning off on completion.

ROOFING

A. Roof Generally

The whole of the roofing is to be left secure and in a water-tight condition. The Contractor is to ensure that the roof is adequately protected against the movement of the following trades and to reduce such movement to a minimum. Unless otherwise stated roofing materials are to be fixed strictly in accordance with the manufacturer's printed instructions.

B. Felt Roofing

The bituminous roofing felts shall be in two or three layer as specified and in all cases must comply with B.S. 747. The top layer shall be fine sand surfaced bitumen glass fibre felt type 3B. Under layers if applicable shall be in similar felt and the venting base layer shall be bitumen glass fibre felt type 3G.

Chippings shall be 12mm maximum and in accordance with B.S. 63 and shall be light coloured granite or other approved light coloured aggregate. On completion surplus chippings shall be removed.

Bitumen dressing compound shall comply to B.S. 3690.

C. Laying

The screed shall be clean and dry and primed with cutback bitumen primer. The first layer shall be fully bonded to the screed with bitumen bonding compound and each subsequent layer fully bonded to the previous layer. Apply bitumen dressing compound to the top layer and dress with granite chippings at the rate of 16kg/square metre and remove loose,

D. Purlins

Purlins must strictly follow the profile of the roof and maintain an even slope over all crosses and must be checked in the presence of the Architect and the roofing sub-contractor, if such sub-contractor is required in the contract, before sheeting commences.

Any defective purlins will be removed or otherwise corrected as directed by the Architect before sheeting commences.

E. Corrugated roofsheeting

All corrugated asbestos, aluminum and galvanized iron sheeting is to be fixed in accordance with the recommendations of the manufacturer. Unless otherwise stated the sheets are to be fixed with the recommended side laps and 225mm end laps between the sheets and prices are to include for such laps.

Sheet sizes are to be such that all horizontal laps occur immediately over a purlin. All holes for fixing are to be drilled in the top of the corrugations.

ROOFING (cont'd)

Felt roofing materials

Bitumen felt roofing shall be in accordance with BS. 747 and CP 14 1961. Rolls shall be stored on end under cover on boards

CARPENTRY

B. General

All timber to be of the best quality free from all sap shakes large, loose or dead knots, waney edges, borers or termites or other defects. To be properly seasoned and to hold the full scantlings specified. Wrought timber shall be to the specified dimensions.

Any timber that warps, gets into winding or develops shakes or other defects shall be replaced with new at the Contractor's expense

All timber shall have been stocked for not less than 6 months before use and shall have reached a moisture content to not more than 12% All timber to be treated with an approved preservative before incorporation into the Works

All constructional timber shall be in OPEPE, IROKO, or AGBA or approved and all frames and external joinery shall be in MAHOGANY or approved prepared to take preservative.

The workmanship shall be of the best quality. Scantlings and boarding shall be accurately sawn and shall be of uniform width and thickness throughout. All carpenter's work shall be left with a sawn surface except where otherwise specified or required by the drawings. It shall be accurately set out in strict accordance with the drawings and shall be framed together and accurately fixed in the best possible manner and with properly made joints. All wood posts beams etc, shall be in one length between supports or fixings. All brads, nails, screws, plugs, pins, bolts, straps, etc., to be provided as necessary and as directed and approved. Generally all timbers are to be fixed with solid brass screws and galvanized finish screws in exposed conditions.

The preparation of timber is to commence simultaneously with the beginning of the work generally and should proceed continuously until all the woodwork is prepared and stacked under cover on or near the site so as to permit free air circulation.

All timber of large scantlings is to be sawn immediately the building is commenced to allow any shrinkage that may take place.

Ends of timbers built into walls shall have 16mm air space left between themselves and the walling. Unwrought timbers shall be sawn straight and shall when fixed hold the full specified sizes. An allowance of not exceeding 3mm for each wrought face on the dimensions specified shall be permitted.

Hardboard is to be standard type in accordance with BS 1142.

CARPENTRY (Cont'd)

A. Plywood

Plywood is to be best external quality free from all discolourations due to glue or any other cause and obtained from a firm to be approved by the Architect and is to comply with B.S. 1186 or B.S. 1455.

The Constructional timber shall be treated in a mixture of one part creosote to one part of crude fuel oil to give a final absorption of 53 litres per cubic metre. The timber shall be completely immersed in a bath of cold mixture which shall then be heated to 99oC and kept at this temperature for forty minutes when it is to be removed and stacked for drying. Alternatively, the timber shall be given two creosotes or other approved wood preservative in which case the treatment shall be strictly in accordance with the maker's instructions. Similar treatment to be given to all joints before being framed together and to all cuts, nails, holes, bruises and any disturbed surfaces.

All timber of large scantlings shall be sawn immediately the building is commenced to allow for any shrinkage that may take place. The specified scantlings of unwrought work shall be in all cases finished sizes. For wrought work the thickness specified are before planning and 3.2mm will be allowed for each wrought face from all specified thickness." Ends of timbers built into walls shall have an inch air space left between the timber and the walling.

B. Nails and Screws

All nails and screws shall comply with B.S. 1201 and B.S. 1210 respectively. Oval or' round brands of nails shall be used for fixing all face work and heads shall be properly punched in.

JOINERY

C. General

Timber for joinery is to be good quality well-seasoned IROKO, MAHOGANY, or approved AGBA, cut square, free from disease wane, sapwood, dead knots or other defects, and is to be of straight and even grain and to comply with the requirements of B. S. 1186.

All timber shall have been stocked for not less than 6 months before use and shall have reached a moisture content of not more than 12%. All timber to be treated with an approved preservative before incorporation into the Works.

All joiner's work is to be accurately set out, framed and executed in accordance with the detailed drawings and finished in a proper and workmanlike manner. Joiner's work is to be executed in the best possible manner and properly screwed, tenoned, shouldered, wedged, pinned and glued with all exposed faces brought and papered as required. All glued joints are to be cross tongued and all arises where not moulded are to be slightly rounded.

JOINERY (cont'd)

General (cont'd)

The size of wrought timber specified on the drawings and described in these Bills of Quantities are finished sizes except where otherwise stated as nominal sizes. Allowance of 3.2mm has been made for each wrought face. All sizes and dimensions are to be taken out on the building and on detail drawings and not from these Bill of Quantities and the Contractor will be held responsible for their accuracy.

The joinery work is to be cut and skeleton framed and stacked on site immediately the Contractor is given possession of the site and receives detail drawings. It is to be carefully stored and protected from the weather but is not to be wedged up until required for fixing in the building. Any portions that warp or develop shakes or other defects are to be replaced with new before being wedged up. The joinery unless otherwise specified is to be the Contractor's own make and must be inspected and approved by the Architect or his representative before being primed.

The prices for all hardwood are to include for slightly rounded arises and where described as screwed are to include for fixing with countersunk headed screws and pallating over in grain

All machine made work is to be finished off by hand where required and wrought in the best manner for painting and to be finished off by the iron where polishing is required. Where required, screws shall be solid brass. Galvanized finish screws shall be used in exposed conditions.

A Plywood

Plywood is to be as described in Carpentry unless otherwise specified

B. Block Board

Block board is to be faced both sides with plywood, hardwood lipped on all exposed edges and obtained from an approved firm and to comply with B. S. 3444 type W7.

C. Formica

Formica descriptive laminate shall be as manufactured by approved manufacturer and is to be fixed strictly in accordance with their instructions.

JOINERY (cont'd)

A. Flush Door's

The flush doors are to be of hollow or solid core as stated of approved design to comply with D.S. 459 with adequate lock stocks and vertical core ventilation and with 16mm hardwood lipping all round.

Internal flush doors shall be skeleton cored and shall be covered on both sides with tropical selected veneer quality plywood suitable for polishing and shall comply with B.S. 459 Part 2 Doors shall be hardwood lipped on all edges Adhesives are to have properties equal to either type B. 100 or C 100 as specified in B.S. 1204 Flush doors are to be obtained from a manufacturer approved by the Architect.

External flush doors shall be solid cored and covered both sides with tropical selected veneer external quality plywood suitable for polishing.

All Joinery immediately, after delivery at the site: shall be stored and protected from the Weather.

Hidden faces of joinery timber shall be primed before fixing.

B. Framing

The whole or the Carpenter's work is to be framed and trussed where required, in the best possible manner, and fitted with all bolts, screws are to be sawn square. truly fitted together and securely strapped Joiner's work shall be executed in the best possible manner, properly screwed, tenoned shouldered. wedged, pinned and glued.

C. Plugs and Fillets

Provide all hardwood plugs, fillets, ground backings, blocks, cradlings and fittings, and all other minor articles of carpentry necessary for the proper execution of the work. Screws generally are to be brass.

D. Time of Preparation

The preparation of the timber is to commence immediately after the contract IS signed, and scantlings must be sawn out at once to allow for any shrinkage to take place.

E. Setting Out

All joiner's work shall be accurately set out and executed in accordance with the Drawings and finished in a proper manner to receive the various finishes.

All machine made work is to be finished off by hand where required and wrought in the best manner for painting and to be finished off by the iron where polishing is required

Joinery is to be framed together immediately it is made, but it is not to be glued and wedged until the building is ready to receive it, All to be kept stacked in a dry place. Any portion of the joiner's work that warps or develops shakes or other defects is to be replaced by new before being wedged up

JOINERY (cont'd)

A. Crossed-tongued joints

All glued joints to be cross-tongued.

B. Sizes

All sizes of wrought timber are nominal sizes

All sizes and dimensions shall be taken out on the building and detailed drawings and not from these Bills of Quantities and the Contractor will be held responsible for their inaccuracy.

C. Prices to include

Prices for timber are to include for all nails and screws, irregular framing, mitres, ends, short lengths and all borings, notching and perforations and where described, for casting approved plugs into concrete or buildings in plugs to joints of block walling,

This method of measurement expressly excluded the measurement of these items in accordance with the principles of the Standard Method of Measurement.

IRONMONGERY

D. GENERAL

All ironmongery shall be the best of its kind and samples must be submitted for approval to the Architect.

E. Oil and adjust fittings

Protect during construction and oil and adjust all locks and other fittings on completion and leave in perfect working order.

F. Screws

All ironmongery shall be fixed with screws of the same metal and finish as the fittings or shall be of an approved type for the particular fitting. All screws damaged in fixing, or from any other cause are to be removed and replaced by undamaged ones.

G. Locks and Keys

All keys to be fitted with wood tabs clearly marked as to their location and handed to Architect.

H. Test

Test all locks and fittings and make certain that they work properly and easily, and leave all in good order at completion.

STRUCTURAL STEEL WORK AND METALWORK

A. General

Structural steelwork and metalwork shall be in accordance with the requirements of B.S. 449 and Materials and Workmanship shall be in accordance with that standard unless specifically varied.

MATERIALS

B. Steel

Steel for hot rolled sections shall comply with grade 43 of BS 4360. Cold formed steel sections shall comply with steel to BS 1449, Part 1 and shall have a yield stress of not less than 215N/mm².

C. Structural sections

Dimensions, properties, tolerances and rolling margins of steel sections shall comply with European standards or B. S. 4. BS 484 and B.S.4320 .

D. Bolts

Black bolts and nuts shall comply with BS.4320.

E. Welding electrodes

Electrodes for manual welding shall comply with BS.639
All electrodes shall be classified, coded and marked in accordance with B.S. 1719.
Electrodes shall be stored and protected from weather effects in accordance with the condition specified by the manufacturer.

WORKMANSHIP

Fabrication

F. General

Work off site shall conform with the appropriate clauses of B.S.449 and shall be carried out in such a way that the erected structure conform to the requirements of the setting out clause of this specification.

Structural steel work (cont'd)

A. Burrs

Burrs and sharp arises shall be removed by grinding.

B. Bolting

The end of each bolt shall protrude by at least one complete thread beyond the outer face of the nut. Bolt assemblies shall be in such condition immediately before installation so that the nut turns freely on the bolt.

Each bolt assembly shall contain at least one washer which shall be placed under the part being rotated.

Taper washer shall be placed under bolt heads and nut bearing on surface sloping 30 or more.

C. Welding

Metals used in welding or steel complying with B.S.4360 grade 43 shall be in accordance with B.S.3551. The electrodes used shall give a well deposit having mechanical properties not less than the minimum specified for the parent metal

The following class electrodes shall be used when metals are used in welding steel to B. S.4360 grade 43, unless specified otherwise:-

- (a) Class 2, .3, or 6 for thickness up to and including 50mm.
- (b) Class 6 hydrogen controlled for thickness over 50mm.

D. End craters

End craters shall be ignored when calculating weld lengths.

E. Removal of slag

Slag shall be removed by light hammering, wire brushing or other methods that do not disturb the weld.

F. Storing and handling

All members stored on site shall be kept clean and free from construction dirt. Individual members markings shall be visible when members have been stacked together. All painted. or metal coated steelwork shall be kept off the ground.

STRUCTURAL STEEL WORK AND METAL WORK (cont'd)

A. Setting Out

Members shall be set out to the required dimension, whether shown or calculable from the drawings within the degree of accuracy indicated below:-

Levels: The vertical dimension between any two points to be within 0.05% or 5mm whichever is the greater.

Plan: The plan dimension between any two points to be within 0.03% or 5mm whichever is the greater but no dimension shall differ by more than 20mm from the correct dimension.

Plumb: The vertical axis of columns shall not be more than 0.05% or 5mm out of plumb whichever is the greater but the horizontal distance between any point on a reference grid and the corresponding point on a lower reference grid should not be greater than 10mm

The Contractor must satisfy himself that stanchion foundations, holding down bolts, or any points of support, or points to be connected by structural steelwork, are correctly placed in position and level.

B. Columns

Columns shall be plumbed using sawn steel packs and not larger than necessary for the purpose.

C. Bolting

The site bolting of permanent connections shall conform to clause 62 of BS.449, 1959.

D. Welding

Site welding shall conform to the relevant sub-clause of this preambles.

E. Inspection and testing

The Contractor shall carry out or arrange to be carried out such tests on materials and workmanship as the Structural Engineer or Architect may direct.

All tests shall be carried out by an approved testing authority. Test and inspection results shall be submitted immediately they are available.

When required the Contractor shall submit test certificate relating to the steel work. The test shall be those described in the appropriate British Standard

When required the Contractor shall submit specimens of welded joints and welded metal to an approved testing authority for testing to B.S.709 as directed.

STRUCTURAL STEEL WORK AND METAL WORK (cont'd)

A Protection against corrosion

The system of protection shall be in accordance with current B.S. Code of Practice CP 2008 All materials and workmanship used in providing the protective treatment shall comply with this Code.

For the purpose of protective treatment, all steelwork contained in this Contract is deemed to be Clause 3 as defined in Sub-Clause 502b. CP 200S

The grading shall be as recommended in Table 3 CP 2008

The composition of the protective system shall be:-

(a)	Surface preparation	D
(b)	Metal Coating	None
(c)	Pretreatment	None
(d)	Priming Paint	IH
(e)	finishing Paint	2T

As classified in Table 4. "Key to Treatment" CP 2003

B. Application of the Protective Scheme

Before application of the priming coat, the steelwork shall be thoroughly wire brushed to remove all mill-scale, dirt and loose rust. Surfaces contaminated by oil or grease shall be cleaned with white spirit or naphtha or by means of steam jets. Before application of subsequent coats surfaces should be similarly free of all dust, dirt, oil or grease. Surfaces should be dry before application of priming or finishing paint.

Immediately following the cleaning, one coat of red lead primer to BS. 2523 type B or C should be applied. The dry film thickness shall be not less than 40 microns.

Where application of the red lead primer is made prior to fabrication two coats shall be Applied and after the erection, any untreated or damaged areas of the priming coats shall be cleaned and the edges of the undamaged paint leveled by sandpaper. They shall then be made good by brushing on the red lead primer. The patched thus formed shall overlap the old paint by 50mm minimum.

Bolts, washers and contact surfaces shall be cleaned and two coats of red lead primer shall be applied. Upon completion of the application of the primer or. the repair work, two coats of finishing Paint shall be applied. Each coat shall be applied by brush not before the preceding coat has Attained a sufficient degree of hardness, the finishing paint shall be oil based to BS. 2525-32.

STRUCTURAL STEEL WORK AND METAL WORK (cont'd)

Application of the Protective Scheme (cont'd)

The total dry film thickness of the protective scheme shall be not less than 100 microns.

The painting shall be carried out in favourably ambient conditions

All transport and handling at the works or on the site shall be planned and carried out by the Contractor in a manner designed to protect painted surfaces from damage.

The Contractor shall allow in his rates for Steelwork and Metalwork for the protective treatment.

A. **Fixing of metal windows and door frames**

Fixing metal windows and door frames shall be deemed to include for building in lugs to blockwork or concrete jambs, head; and sill as necessary, bedding in mortar and pointing one side with tropical mastic applied with a gun.

B. Deviations from the Standard Method of Measurement

- (a) Hoisting and handling irrespective of position.
- (b) Sections or any length.
- (c) Grinding welds to a smooth finish unless otherwise described.
- (d) Rates for steelwork and metalwork to include for protective treatment.
- (e) Protection.

FLOOR, WALL AND CEILING FINISHES
ORDINARY RENDERING

A. Materials

The cement shall be Ordinary Portland Cement as previously described in Concrete Work

Sand shall be clean sharp river or pit sand and shall comply with US 1199. The sand is to be approved by the Architect and is to be free from impurities. Sand from the seashore or tidal estuary is not to be used. Sand is to be stored under conditions that prevent it from becoming dirty and if required by the Architect is to be washed.

Lime, if use approved by the Architect, shall be hydrated best quality quicklime.

B. Mix for Internal Rendering

Internal rendering is to be executed in cement and sand. mixed in the proportions of one part of cement to six part of sand gauged with "Rendaplass" or similar and approved strictly in accordance with the manufacturer's instructions, or, if gauged with lime putty to be in the proportions or one part cement to two parts of lime to seven parts of sand or cement and sand mixed in the proportions of 1 :4.

C. Mix for External Rendering

The external rendering is to be executed in cement and sand mixed in the proportions of one part of cement to three parts of sand gauged with "Impermo" or similar and approved strictly in accordance with the manufacturer's instructions.

D. Application

All rendering shall be executed in two coats to a total finished thickness of not less than 12mm unless otherwise stated.

The suction of the surface to be plastered is to be tested and adjusted as necessary by wetting before applying rendering coat. The surface of the rendering is to be leveled with a straight edge to a true even surface and finished so as to leave the surface even and free from blemishes. Excessive floating is to be avoided to prevent crazing. The Rendering coat shall be scratched over before it has set to provide a key for the setting coat which is not to be applied before the first coat has properly set and dried out. Should for any reason rendering be applied of a thickness more than 20mm approved chicken wire is to be embedded within the rendering In the positions and to an extent as directed by the Architect.

FLOOR, WALL AND CEILING FINISHES (cont'd)

A Finish

Surfaces are to be finished smooth with a steel or wood float as specified.

TYROLEAN RENDERING

B. Materials

The materials for Tyrolean "Cullamix" or equal approved wall finish shall be as supplied by approved manufacturer and mixed in accordance with their instructions. Alternatively local sand may be used with "Colorcrete" or "Snowcrete". The sand shall be white or light in colour, clean and fine.

C. Mix Application and Finish

Tyrolean "Cullamix" is to be in three coats.

- (i) The first coat shall consist of one part of cement to which 2% "Impermo" Waterproofed has been added and two parts of sand and mixed to a thin slurry and shall be applied by throwing-on with a trowel.
- (ii) The second coat shall consist of one part of cement and four parts of sand gauged with one tenth part of lime and shall be applied 2111m thick not less than 24 hours after the first coat and brought to a level finish with a rule,
- (iii) The third coat shall be "cullamix" or "Snowcrete" mixture of Tyrolean grade, all in accordance with the manufacturer's instruction. This third coat shall be applied in three applications with a "Tyrolean" machine to a thickness of 6-5mm in an almost continuous application in strict accordance with the manufacturer's instructions.

D Colour

To be approved by the Architect.

E. Workmanship

The whole of the work is to be carried out in a workmanlike manner by proper tradesmen all to the satisfaction of the Architect. External arrises and angles are to be sharp and truly aligned and to have a slight "pencil" roundness. Internal angles are to be sharp and true without blemishes

The Contractor is not to execute any plastering internally or externally until all the metal windows and doors and fixing grounds for frame, electric wiring etc, have been fixed. All arises reveals and the like are to be executed all the same time the adjoining wall surfaces in order that there is no making good between arises and wall surfaces. ; .

FLOOR, WALL AND CEILING FINISHES (cont'd)

A. Wall Tiling

Glazed wall and floor tiles shall be in accordance with B.S 1281. The tiles are to be laid with straight unbroken joints and bedded and jointed in cement and sand (1:2) and painted in white or matching coloured cement. The tiles are to be soaked in water for at least six hours before use and the underside of each tile brushed with a neat cement slurry 24 hours before bedding, Tiling to be washed and cleaned down on completion.

B. Cement and Sand Screed in Flooring

Cement, sand and water to be as described in Concrete Work.

To be mixed in the proportion of 1 part of cement and 3 parts of sand. Materials to be mixed thoroughly in dry form and only sufficient water added to give a stiff mix.

Surface of concrete sub-floor to be left rough and well wetted before the application of the screed.

Paving etc., are to be laid on the concrete sub-floor to thickness not less than 25mm or otherwise as necessary to achieve correct finished levels. Finish with steel trowel to a hard, smooth and even surface without blemish; immediately before final hardening of the surface lightly stipple with a soft hair brush to provide a light and even texture. The paving is to be divided by Ebonite strips as indicated on the drawings, or as otherwise instructed; by the Architect, into areas not exceeding 3 square metres. Keep surface moist and shaded from direct sunlight until hardening and curing completed.

C. In-Situ Granolithic Paving

Cement and water to be as directed under concrete Work. Granite chips to be 6mm down. Free from dust and with not more than 20% of fine material passing a 4mm sieve.

To be mixed in the proportion of 2 parts cement to 5 parts of granite chips. Materials to be mixed thoroughly in dry form and only sufficient water added to give a stiff mix.

The water content of the topping concrete shall be kept as low as possible to obtain full compaction. The materials shall be mixed for a period of not less than 1.5 minutes. Each batch shall be discharged from the mixer completely before another batch is introduced. No extra water, or other materials shall be added to the mix after it has left the mixer.

The sub-floor shall be prepared by completely removing laitance of base concrete by mechanical methods or manually with picks to expose clean coarse aggregate particles. Thoroughly hack surface by mechanical means or by hand. All traces of dust as a result of hacking, etc., to be removed before laying granolithic screed, the base concrete is to be saturated with clean water.

FLOOR, WALL AND CEILING FINISHES (cont'd)

In-situ Granolithic Paving (cont'd)

The paving is to be laid in bays not exceeding 3 square metres divided by ebonite or wood strips as indicated on the drawings. Setting out of ebonite or wood strips to be approved by the Architect on the site. Not more than 25 minutes before the topping is laid, a thin coat of cement slurry is to be scrubbed into the surface of tile sub-floor.

Granolithic topping to be not less than 25mm thickness or as necessary to achieve correct finished levels and falls, fully compacted by means of a hand tamper weighing not less than 12 Kg per metre run or a power float used in accordance with the manufacturer's instructions. Ensure full compaction along edges and in corners of bays. After the granolithic has been placed levelled and fully compacted it is to be trowelled at least three times at intervals during the next 6-10 hours so as to produce a uniform and hard surface with a high resistance to abrasion. Any laitance is to be removed before trowelling.

Skirting to have a 20mm radius at floor level.

As soon as the surface has been finished it shall be protected against rapid drying for a minimum of 7 days by one of the following means-

1. 50 mill or damp sand laid on the surface and kept continually damp and in position for the full curing period
2. Continuous building paper or waterproof sheeting overlapped a minimum of 75mm at Edges.

To finish, clean down in accordance with manufacturer's instructions and brush with one coat of Liquid Hardener obtained from an approved source.

A. Monolithic Granolithic Paving

Materials Mix & Mixing to be as described for "In-Situ Granolithic Paving".

The paving is to be laid while the concrete sub-floor is still 'green' that is not more than 4-5 hours after the sub-floor has been laid. The thickness is to be a minimum of 20mm and staggered bays of maximum 3 metre square are to be finished square edged with an approved temporary 20 x 20mm wood filler.

During laying, the finish is to be compacted by means of hand tamper weighing not less than 12Kg per metre run or a power float used in accordance with the manufacturer's instructions. Ensure full compaction along edges and corners of bays

After granolithic has been placed levelled and fully compacted it is to be trowelled at least three times at intervals during the next 6-10 hours to produce a uniform and hard surface with a high resistance to abrasion. Any laitance is to be removed before trowelling.

FLOOR, WALL AND CEILING FINISHES (cont'd)

Monolithic Granolithic Paving (cont'd)

After curing the 20 x 20mm fillets shall be carefully removed and the joints carefully filled flush with approved filling.

Curing and finish to be as described for In-Situ Granolithic Paving.

The Contractor is to note that where steelwork or plant is to be erected after the floor finish is complete, he should allow for adequate protection from damage due to steel erection or plant

A. Cement and Sand Screeded and Floated beds under hard floor finishes.

Material

Cement, sand and water to be as described in Concrete Work.

Mix

To be mixed in the proportion of 1 part of cement and 3 parts of sand Materials to be mixed thoroughly in dry form, and only sufficient water added to give a stiff mix.

Preparation

Surface of concrete sub-floor to be left rough and well wetted before the application of the screed

Application

Lay on concrete sub-floor a bed of specified thickness to achieve correct finished levels. Finish with wood or steel float and keep surface moist and shaded from direct sunlight until hardening and curing is completed.

B. **Cement and Sand Trowelled beds under Flexible Floor Finishes**

Cement, sand and water to be as described in Concrete Work

To be in the proportion of 1 part of cement and 3 parts of sand, Materials to be mixed thoroughly in dry form and only sufficient water added to give a stiff mix.

Surface of concrete sub-floor to be left rough and well wetted before the application of the screed.

Lay on concrete sub-floor a bed of specified thickness to achieve correct finished levels. Finish with steel trowel to a hard, smooth and even surface without blemish; immediately before final hardening of the surface lightly stipple with a soft hair brush to provide a light and even texture. Keep surface moist and shaded from direct sunlight until hardening and curing is completed.

FLOOR, WALL AND CEILING FINISHES (cont'd)

A. Cement and sand Floated Beds in Gutters and Flat Roofs

Cement, sand and water to be as described in Concrete Work.

To be mixed in the proportion of 1 part of cement and 3 parts of sand. Materials to be mixed thoroughly in dry form and only sufficient water added to give a stiff mix and gauged with "Impermo" or similar approved water-proofing material used strictly in accordance with manufacturer's instructions

Surface of concrete, gutters or roofs to be left rough. . .

Lay bed on concrete gutters and roofs to thicknesses and falls as shown on the drawings, or to a minimum of 38mm in 6 metres. Finish with wood float to a smooth and even surface. Keep surface moist and shaded from direct sunlight until hardening and curing is completed.

B. In-situ Terrazzo Paving
Material

Cement, sand and water to be as described under Concrete Work.

Marble chips to be irregular 3mm and 6mm single size materials of approved colour.

Coloured cement to be "Colourcrete" or other equal and approved, or colour to Architect's approval.

Mix

Mix or bed to be as described in "Cement and Sand Screeded or floated beds under hard floor finishes."

Mix of Terrazzo topping to be in the proportion of 1 part of coloured cement and 2 parts of marble chips

Preparation of Sub-floor

Surface of concrete sub-floor to be left rough and well cleaned and wetted.

Application

Apply a coat of cement slurry and lay sand/cement screed 20mm thick or as specified finished with a wood float in bays not exceeding 1.5 square metres divided by ebonite strips standing sufficiently proud to take the terrazzo topping to form an approved pattern. When the bed has hardened sufficiently and not later lay terrazzo topping 20mm thick minimum or as necessary to achieve correct finished levels. rolled or trowelled to a dense even surface free from holes and blemishes.

When thoroughly hardened the surface is to be rubbed down and polished by machine to expose the aggregate using stones 30, 60, 120, 200,300. Skirting, where specified, to be 20mm thick either in-situ or formed in precast units. All to match paving with rounded top edge and cove at junction with flooring.

FLOOR, WALL AND CEILING FINISHES (cont'd)

A. Mosaic Tiling

Mosaic wall tiling shall be 19mm x 1911111 x 8.2mm glazed tiles, to Architect's approval, and shall be laid in cement mortar (1:1) or in an approved adhesive. The paper backing shall be completely removed on completion by washing down with the minimum quantity of fresh water and- the tiles grouted in coloured cement. The prices for mosaic work shall include for work in isolated areas not exceeding one square metre and at all heights, laying to simple patterns based on full sheet sizes and all cutting, including cutting and making good around pipes and the like and rounded arrises.

B. Marble Paving

Palladiana marble paving shall be composed of white carrara, random broken marble or other approved imported marble 12mm thick the average size of each piece being 125mm in any one direction bedded on a layer of cement and sand (1 :4) and grouted in marble dust. terrazzo chippings and white cement mortar (5:2). The average width of joints shall not exceed 9mm. The paving thickness specified is the total thickness of marble and bedding. Marble paving shall be perfectly level and brought to a mirror like shine.

Marble Skirting or risers shall be carrara or other approved imported marble well matched for shade and colour.

Where the marble paving are described as polished, the Surface shall be brought to a mirrorlike shine with a power driven grinding and polishing machine as follows:-

- a) Preliminary grinding with graduated abrasives.
- b) Final grinding with lead 'stones'.
- c) Application of acid solution and washing off to remove lead.
- d) Buffing with polishing mops.

For small areas, corners, margins, skirting and the like, a flexible drive grinding and polishing machines, using shaped abrasive will be used. Hand grinding will only be permitted where it is impossible for a machine to operate.

C. Water proofed Rendering

Unless otherwise specified, rendering described as "Waterproofed shall incorporate "Pudlo" or other approved admix used in accordance with the manufacturer's instructions.

D. Cement fibre Sheets

Flat cement fibre sheets are to comply with BS. 690 and unless otherwise specified shall be 4mm thick. The sheets shall be fixed at not more than 600mm intervals with 32mm galvanized clout headed nails and sealed off with approved mastic or putty.

FLOOR, WALL AND CEILING FINISHES (cont'd)

A. Insulation Board

Insulation Board is to be Celotex Insulation Board 12mm thick with "V" joints in 600mm x 600mm tiles or as described in the Bills of Quantities. The tiles are to be bonded and stapled or nailed to Manufacturer's instructions

B. Colourcrete Paving

Colourcrete Paving shall consist of one part approved coloured cement to three parts of sand by volume and shall be finished smooth with a steel trowel.

C. Non-Slip Carborundum Finish

Non slip carborundum finish to granolithic paving shall comprise 1.07kg of carborundum applied to each square metre of paving and lightly trowelled in

D. Precast Terrazzo

The precast terrazzo tile paving shall be composed of 2.5 parts of 6mm white marble chippings and one part of coloured cement finished fair on top and rubbed down to a polished surface free from holes and blemishes.

E. Brick Facing Tiles

The brick facing tiles shall be obtained from Clay Industry (Nigeria) Limited, Oregun, Ikeja. Lagos and fixed as detailed in the drawings.

F. Wood Block Flooring

The wood blocks shall comply with B.S 118 and be laid to a square basket pattern unless otherwise stated. The flooring is to be laid in accordance with recommendations of the British Standard Code of Practice CP .201. Prices are to include for all cutting and fitting and for laying with single block borders and sanding down polishing on completion. .

G. Tile Paving

Thermoplastic, cork and other tile paving shall be laid and bedded strictly in accordance with the manufacturer's instructions and shall be of approved colour.

The prices for cork paving and skirting shall include for sealing,

H. Beds and Backings

The screed to floors shall be composed of cement/sand (1 :3) laid to levels or falls and of thickness as required on a concrete bed, finished hard and smooth with a steel trowel.

The concrete bed must be roughened, thoroughly cleaned down and coated with a cement slurry to provide the necessary key.

FLOOR, WALL AND CEILING FINISHES (cont'd)

A. Defective Work

Plaster work which does not thoroughly adhere to any surface shall be removed and re-executed in a proper manner. Such hollowness, cracks, blisters and any other defects will constitute a defect under the Defects Liability Clause of the Contract. Should the Contractor execute any defective work which at the end of the Defects Liability period causes repair to be made which affects the decoration of the building, the Contractor shall redecorate as necessary in order that the repair is not visible or apparent.

B. Prices to include

The prices for plaster work are to include for work to either concrete or blockwork raking out joints or hacking concrete to form key, temporary rules, angles arrises, fair edges, making good up to pipes, frames and other fixtures, cutting and fitting tiling mosaic marble and paving around pipes bars and other fixtures and all other sundry labours and for protecting paving with suitable covering after laying.

This method of measurement expressly excludes the measurement of these items in accordance with the principles of the Standard Method of Measurement.

C. Deviations from Standard Method of Measurement

The prices for plasterwork and other floor, wall and ceiling finishings are to include for the following:-

- (a) Hacking surfaces to receive rendering or pavings.
- (b) Preparation of surfaces to receive finishings.
- (c) Work in isolated areas not exceeding one square metre.
- (d) Cutting of any description.
- (e) Labours to all edges and arrises and the like.
- (f) Dishing around gullies and the like.
- (g) Work at all heights.
- (h) Extra labour working finishings to window, door frames and the like.
- (j) Fair joints to other finishings.
- (k) Making good around pipes and the like.
- (l) Forming mortices grooves and chases and the like.
- (m) Laying to simple patterns.
- (n) Work in forming openings not exceeding 0.50 square metre.
- (o) Protection.

GLAZING

General

A. **Glass**

All glass shall be manufactured by Pilkington Glass (Nig.) Ltd. or other approved firm and shall be free from flaws, waves, scratches and other defects and shall be of uniform thickness to BS 952.

Sheet glass shall be ordinary glazing quality.

Obscured sheet glass shall be sandblasted unless otherwise described

Float glass shall be glazing quality.

B. **Preparation**

Ensure that all rebates and grooves are clean, dry and unobstructed at the time of priming, sealing and glazing.

C. **Glazing**

Glazing to wood shall be in linseed oil putty to comply with BS 544 prices and shall include for springs

Glazing to metal shall be in approved metal casement putty. Prices shall include for spring clips, glazing with beads shall be in approved flexible glazing compound, prices shall include for PVA distance pieces and location blocks and bedding beads in approved sealing compounds

Rates for wired and patterned glass include for aligning adjacent panes both vertically and horizontally.

D. **Completion**

Thoroughly clean all glass on both sides on practical completion. Replace all glass and fixing materials broken or damaged before practical completion and redecorate.

E. **Deviation from the Standard Method of Measurement**

Prices of glazing are to include for the following:-

- (a) Priming on sealing rebates and beads as recommended by the manufacturer of the glazing compound.
- (b) Springs, clips, distance pieces and location blocks.
- (c) Bedding beads in sealing compound.
- (d) Protection

PAINTING

A. General

All paints etc. shall be Luxol manufactured by Berger Paints Nigeria Limited are to be obtained from manufacturer approved in writing by the Architect. and are to be delivered to site in sealed containers with the manufacturer's name clearly defined. Samples are to be submitted to the Architect for his approval both as to quality and colours and paints are to be used strictly in accordance with the manufacturer's instructions.

All paints are to be synthetic paints ready mixed for use and are to comply with the general clauses of Section 2 of BS 929. Exterior quality only is to be used and no dilution of the paint will be allowed except strictly in accordance with the manufacturer's instructions.

B. Undercoats

Paint for undercoats shall be obtained from the same manufacturer as paint for the finishing coat and shall be manufacturer's recommended undercoat for that finish

Knotting is to be all approved patent knotting or shellac to conform to BS. 1336

Stopping is to be "Pollyfilla" or other equal and approved used strictly in accordance with the manufacturer's instructions.

C Primers

Priming paints are to be approved patent primers of appropriate type to suit material being painted and all in accordance with OS 2521 - 4. Priming paint for non-ferrous metals is to be an approved zinc chromate primer and for woodwork is to be aluminium primer.

Where timber is to be left with a clear finish, apply at the time of delivery to site one coat of I.C.I. sanding sealer.

Workmanship

D. Woodwork

Woodwork shall not be painted when wet and exterior work shall not be painted during or immediately before rain. Joints, tongues, grooves and inaccessible ends shall be primed before assembly. Door and window frames, etc., shall be stack-primed before erection giving two coats on end or open grains. Woodwork to be painted shall be knotted, primed and stopped in the workshop before delivery to the site or as soon as possible on site and stored out of the weather. All top, bottom and side edges of joinery shall be given the full number of coats specified.

E. Stirring and cleanliness

Paints shall be thoroughly stirred up and used from the original container.

PAINTING (cont'd)

A. Thinning

Thinning shall be used **Only** where necessary **and** according to the manufacturer's instruction. Paint shall not be adulterated in any way and different types of brands of paint shall not be mixed together.

B. Masking

Surfaces not to be painted e.g. switches, ironmongery, etc shall be masked or removed and replaced in a clean condition when paint is dry.

Surfaces shall be evenly coated and free from runs, sags, skins, grit and bristles. Floor shall be protected from droppings.

C. Mould and Algae

Any surfaces showing mould or algae growth are to be treated before painting with 'Luxol' Sterilizing Solution used in accordance with manufacturer's instruction

Surfaces shall be evenly coated and free from sags, skins, grit and bristles. Floors shall be protected from droppings.

D. Completion

On completion remove all drips, splashes and over paint to edges. Touch up and make good. Remove all finger marks and dirt.

Approved Emulsion Paint on Cement Rendering

E. Preparation

On no account should lime wash and/or cement based paints be used as a first coat.

Stop all holes and cracks and rub smooth. Brush to remove dust, loose rendering and all efflorescence.

Surface must be reasonably dry before applying first coat

F. Application

(i) First Coat

Emulsion paint thinned if necessary in strict accordance with manufacturer's instructions or in tile proportion 1:4 with water and applied as a "mist" coat.

(ii) Second coat

Emulsion paint, in strict accordance with the manufacturer's Instructions.

(iii) Third Coat

Emulsion paint in strict accordance with the manufacturer's instructions

PAINTING (CONT'D)

Approved Synthetic Gloss Paints on Woodwork Internally and Externally

A Preparation

Rub down with glass paper and dust off, Knot with shellac knotting or an aluminium primer and allow to harden.

B. Application

(i) First Coat

One coat Wood primer and allow to dry before making good with "Polyfilla" or similar approved and allow to harden. Rub down lightly and dust off.

(ii) Second Coat

Exterior quality undercoating. Allow to harden for at least 48 hours.

(iii) Third Coat

As second coat.

(iv) Fourth Coat

Exterior quality gloss finish. Allow to harden.

Approved Synthetic Gloss Paint on Iron and Steel Internally and Externally

C Preparation

Remove all rust scale and dirt by wire brushing and scraping. If the surfaces are contaminated with oil or grease this will be removed by white spirit or other suitable solvent. If a shop coat is of a bituminous nature remove or seal with aluminium primer. Prepared surfaces should not be left overnight before painting.

D. Application

(i) First Coat

Approved calcium plumbate or other approved primer which should be followed as quickly as possible by the second coat.

(ii) Second Coat

Exterior quality undercoating, allow to harden for at least 48 hours.

(iii) Third Coat

As second coat.

PAINTING Cont'd

(iv) Fourth Coat

Exterior quality gloss finish, Allow to harden,

Approved Synthetic Gloss Paint on Zinc including Galvanized and other zinc coated metals.

A Preparation

- (i) New galvanized iron or steel.-Liberally apply .copper chloride solution (to 8 litres of water) Leave for one hour and then wash down with clean water, Allow to dry.
- (ii) Weathered galvanized iron or steel and sherardised or zinc spayed surface
Removed all dirt and rust by wire brushing, Clean clown and remove any oil or grease bywashing with white spirit.

B. Application

- (i) First coat
Calcium plumbate or other approved zinc primer
- (ii) Second Coat
Exterior quality undercoating
- (iii) Third coat
As second coat
- (iv) Fourth coat
Exterior quality gloss finish

C. Approved Block Bituminous Paint for Treatment of Plinths Below D.P.C. Level Preparation

Clean of all soil and excavate below ground level to expose surface to be painted, stop all holes and cracks

D. Application

Apply two coats of paint.

PAINTING (Cont'd)

A. Matt Synthetic clear finish for wood

Material for matt synthetic clear finish are to be "DUCO" Precatalysed wood finishes supplied by Messrs I.C. Paints (Nigeria) Limited, or other equal and approved

B. Preparation

Rub down with gloss paper and dust air

C. Application

(Sapele Wood and Veneers)

- (i) Fill with "DUCO" 513-lime wood filler thinned with up to 10% Thinner 50/NIG/8 Air dry for 2 hours minimum.
- (ii) Dry scuff
- (iii) Spray apply 2 coats "Duco" Pre-catalyzed Sealer 008/NIG/1016. Air dry for 15-20 minutes between coats.
- (iv) Spray apply 2 coats "Duco" matching stain. Air dry for 5 to 10 minutes.
- (v) Spray apply 2 coats "Duco" Pre-Catalyzed finish 005/NIG/2513. Air dry 15 to 20 minutes between coats

(Teak Afromosia and Iroko)

- (i) Spray apply one coat "DUCO" Pre-Catylised sealer 008/NIG 1016. Air dry 30 minutes.
- (ii) Spray apply one coat "DUCO" pre-Catylised finish 005/NIG/2513

D. Fungicidal Treatment

Where existing painted surfaces are to be redecorated and after the basic preparation described above has been carried out, the contractor shall apply two coats of an approved fungicidal liquid.

EXTERNAL WORKS

A. **Generally**

Preambles to all trades shall apply equally to this section.

B. **Site Clearance**

The prices for site clearance shall include for clearing and removing from site all bushes, vegetation, shrub, small trees not exceeding 600mm girth tree stumps, anthills, ant-nests, and the like. All roots shall be grubbed up and voids shall be filled with laterite and compacted to a density at least equivalent to that of the surrounding ground except where under future roads or buildings where compaction shall be by power rammer to a density of 100 percent of the maximum dry density of the soil in the West Africa Standard Compaction Test.

The Contractor shall consult the Structural Engineer and Architect before felling any trees which do not obstruct the construction of the buildings.

Apart from trees which the Contractor is specifically instructed to fell, the Contractor shall protect all trees on the site from damage during the execution of the works and prices shall include for same.

Cleared materials shall be burnt or disposed of as directed by the Structural Engineer and Architect. The trees to be cut down shall have all light branches trimmed off and burned and useful timber shall be cut in suitable lengths and stacked at the roadside for removal as directed by the Structural Engineer and Architect.

C. **Grassing**

Grassing shall include for raking over the area to be grassed and removing and carting away all large stones from the surface and planting with approved grass at 75mm centres, well watering until properly established, weeding as necessary and replaced all dead roots until the area is evenly covered with a healthy growth.

D. **Pavement Construction**

Definitions

The terms used to define various layers of pavement construction shall be defined as follows:-

- (a) **Sub-base**:- Where provided, the layer or layers of pavement laid on the formation Beneath the base or concrete pavement
- (b) **Round base**:- The pavement layer lying on the formation or sub-base, if provided and immediately beneath the surfacing

EXTERNAL WORKS (cont'd)

Pavement construction (cont'd)

(c) Surfacing:- The final pavement layer or layers forming the surface of a pavement and laid on the road base

A Preparation

Prior to the construction of each pavement layer, the previously prepared formation or layer shall be thoroughly cleaned of all foreign substances. Any ruts or soft spots which occur or any deviation from the specified tolerances or degrees of compaction shall be corrected by scarifying, removing and/or adding approved material, relaying and recomposing the unsatisfactory areas to the required density and to the required lines and levels.

Should any damage occur to the formation or a pavement layer prior to the construction of the next layer, it shall be rectified to the satisfaction of the Architect at the expense of the Contractor.

B Alignment and level control

Stakes, boards and boning rods of substantial construction shall be furnished set and maintained by the Contractor, in order that the work will conform to the lines and levels shown on the drawings. The stakes shall be set at intervals not exceeding 30 meters in lines parallel with the centre line and not more than 25 meters apart. Stakes, boards and boning rods shall be painted in such a manner as to indicate clearly the lines and levels to be worked to for each layer of pavement.

C. Thickness and surface tolerances

The thickness of each pavement layer shall be such that the depths from the required finished surface levels of the pavement to the surface of each pavement layer shall nowhere be less than the depths shown on the drawings. The surfaces of each layer other than the final layer may be lower than the required surface within the tolerances stated below, provided that any such deficiency shall be made good at the Contractor's expense by increasing the thickness of the course above the surface in question.

Each layer of pavement shall be finished to a surface profile parallel to the finished surface of the pavement shown on the drawings within the level tolerances shown below:-

	<u>Variations permitted (mm)</u>	
Sub-base	+0	-40
Road base	+0	-25
Surfacing	+0	-6

EXTERNAL WORKS (cont'd)

Thickness and surface tolerances (cont'd)

The finished surface of all pavements shall be such that when tested with a straight edge 3 meters long placed in any position and directed, there shall not be any gap greater than 5mm between the bottom of the straight edge and the surface of the pavement. In addition to this requirement there shall not be any deflection exceeding 10mm from a straight line between any two longitudinal points 30 meters apart. Neither of these requirements shall apply across crowns. These smoothness tolerance shall be applied to vertical curves.

A Laterite Sub-base

The material used shall be good quality naturally occurring laterite gravel from a source approved by the Architect. It shall be subject to suitable testing at the direction of the Architect to show that it has 4-day soaked CBR of not less than 30% at 100% BS. Compaction. The grading of the materials shall show a smooth grading curve parallel to and within the limits stated for laterite road base below. The material shall have a plasticity index not exceeding 20%.

The sub-base material shall be spread to the full width of the cross-section and to loose thickness so that after compaction the finished thickness will be those specified. Oversize pieces shall be removed or separately broken down. The method of compaction shall be approved by the Architect and shall be such as to compact the material to 100% BS. Compaction through its full depth. Control testing shall be carried out if directed by the Architect.

B Laterite road base

The material used shall be best quality naturally occurring, laterite gravel from a source approved by the Architect. It shall be subject to suitable testing at the direction of the Architect to show that it has a 4-day soaked CBR of not less than 60% at 100% BS. Compaction. The grading of the material shall show a smooth grading curve parallel to and within the limits stated below. The material shall have a plasticity index not exceeding 12%.

<u>BS Sieve Size</u>	<u>Percentage passing</u>		
37.5mm	100		
20	80-100	100	
10	55-80	80-100	100
5	40-60	50-75	80-100
2.36	30-50	35-60	50-80
1.18			40-65
600 Microns	15-30	15-35	
300			20-40
75	5-15	5-15	10-25

Immediately before applying the road base, the surface of the sub-base shall in all respects comply with the specification and be thoroughly clear of all loose foreign matter.

The road base material shall be placed on the prepared sub-base by an approved method to a thickness which on compaction will result in the thickness required. If necessary, the moisture content of the material shall be adjusted to ensure optimum compaction.

EXTERNAL WORKS (cont'd)

Laterite road base (cont'd)

Immediately following the placing, the layer shall be compacted by approximately 15 passes of an 8 tonne pneumatic-tyred roller or equivalent passes of a vibrating or smooth-wheeled roller, to 100% BS. Compaction. Rolling shall progress from the sides to the entire of the areas under construction. Areas inaccessible to the roller shall be compacted by mechanical plate compactors. Control testing shall be carried out if directed by the Architect.

A. Protection of Pavement layers

No construction traffic shall run over the exposed formation or over sub-base layers.

Sub-base or road base material when no sub-base is specified, shall be laid on the formation as soon as the last 150mm of material protecting it has been removed, in a continuous operation, and no formation shall be opened which cannot quickly be covered with sub-base or road base respectively.

The placing of the road base shall be followed as soon as practicable by the placing of the surfacing. Should the Contractor, however, wish to use the base for construction traffic and delay placing the surfacing, this will be permitted following the application of a temporary surface dressing seal coat to the requirements of the Architect at the Contractor's expense.

B Prime Coat

A prime coat shall be applied to the road base before surface dressing or asphalt surfacing.

The surface shall be thoroughly swept by brooms, all Latinate, loose and foreign material removed and the clean surface of the base and hard particles in the layer exposed as a mosaic. All loose material shall be swept well clear of the area to be primed. The surface shall be checked for line, cross fall and level and made good as necessary and approved by the Architect before any bitumen prime is applied. Where required by the Architect, immediately prior to the application of prime, the surface shall be lightly sprayed with water but not saturated.

The prime coat shall be sprayed immediately after the preparation of the stone layer is completed and approved. The type of prime coat shall be medium-curing cutback bitumen MC0 grade. The rate of spray will be as directed by the Architect between 0.5 lit/m² -1.0 lit/m². The quantity used must give complete coverage with a slight trace of-run off in places. Should the Contractor find that at the rate of spray directed the coverage is inadequate, or there is too much run off, he shall immediately inform the Architect and amend the spray as directed. The prime should penetrate about 3 to 6mm and dry to a Matt surface in 24 to 48 hours, leaving no pools of free bitumen on the surface.

During spraying all kerbs, head walls, drains and the like which are liable to be disfigured by splashing of bitumen shall be protected, and any such feature which is accidentally marred by bitumen, shall be cleaned with a suitable solvent or if this is not possible removed and made good at the Contractor's expense.

EXTERNAL WORKS (cont'd)

A Surfacing dressing

The surface dressing shall be carried out with hard approved stone aggregate. The use of literate aggregate will not be permitted. Aggregate for surface treatment shall have a 10 percent fines value of 8 or more and an aggregate crushing value not exceeding 30%.

The previously primed surface shall be swept clean with brooms and the debris deposited well clear of the surface to be surfaced. Any defects of the surface shall be made good as directed by the Architect and no binder shall be applied until the surface has been approved by the Architect.

The binder for surface dressing shall be straight run hot bitumen of grade 80/100 per m² applied by a bitumen distributor complying with BS. 1707 at a temperature between 1450C and 2050C.

During spraying all kerbs, head walls, drains and the like which are liable to be disfigured by splashing bitumen shall be protected, and any such feature which is accidentally marred by bitumen, shall be cleaned with a suitable solvent or if this is not possible removed and made good at the Contractor's expense.

Immediately after the binder has been applied, clean dry stone chippings shall be spread at the rate directed by the Architect. Immediately the stone chippings have been spread they shall be rolled initially so that the whole area receives at least one pass within ten minutes of the bitumen being sprayed. Immediately after the initial rolling, any area which is deficient in chippings shall be made good by hand spreading. Brooming of the material to effect redistribution of chippings will not be permitted. The number of passes of the roller shall be laid down by the Architect, but shall be at least two. A certain amount of crushing under the roller is permissible, but should any general shattering occur, the Architect may direct that rolling shall cease, regardless of the number of passes completed. Pneumatic tyred rollers are preferred for rolling of all bitumen seal work though finishing with smooth steel wheeled rollers may be permitted with the approval of the Architect. No rollers or construction equipment shall be permitted to park on the completed work.

The road shall not be opened to traffic until the bitumen has attained sufficient viscosity to prevent stones being removed, and not earlier than 24 hours in the case of the first application of chippings.

Unless allowed otherwise by the Architect the area shall not be opened to works traffic before the application of the full number of specified coats.

After traffic has been permitted to run on surface dressing for a period of at least a fortnight, all loose material shall be swept to the side, collected up and disposed off. No windows of loose chippings shall be allowed to accumulate at the sides.

B. Asphalt concrete surfacing

The coarse aggregate shall consist of clean crushed rock, as free as practicable from flat, elongated, soft and weathered pieces and dust, dirt and deleterious matter. It shall have an Aggregate Crushing Value not exceeding 25% and Flakiness index less than 30%. The fine aggregate may consist of stone.

EXTERNAL WORKS (cont'd)

Asphalt concrete surfacing (cont'd)

Screenings or natural sand free from clay and organic matter. The filler may consist of cement, hydrated lime or stone dust. The bitumen shall be straight run of grade 60/70 penetration. The combined grading of aggregates and filler shall show a smooth grading curve parallel to and within the limits set out below:-

<u>BS, sieve size</u>	<u>Percentage passing</u>
20mm	100
14	80-100
5	54-72
2.36	42-58
1.18	34-48
600 microns	26-38
300	18-28
150	12-20
75	6-12

The bitumen content shall be between 5.7 and 7.0% by weight.

In addition to the above requirements the material shall when compacted exhibit the following Marshall Test values.

Minimum stability	250kg
Flow value between	2-5mm

Control testing to ensure compliance with these requirements shall be carried out as directed by the Architect.

The surfacing material shall be mixed in a purpose-made mixing plant of the weight or continuous mixing type in good order and approved by the Architect, shall be transported to the works in clean covered vehicles and laid by a self-propelled mechanical spreader/finished without delay. The mix temperature when placed in the spreader shall not be less than 135oC and the temperature falls below 120oC.

Compaction shall be by an 8-10 tonne smooth-wheeled roller of roll width greater than 450mm or by pneumatic-tyred roller of equivalent mass. The material shall be rolled from side to center in a longitudinal direction. Cold joints shall be formed on a new cut vertical face and painted with hot bitumen. Rolling shall continue until all roll marks are eliminated and 98% of the laboratory density is obtained. Roller shall not stone on newly laid surfacing.

A. Kerbs, edgings and quadrants

Kerbs, edgings and quadrants may be supplied in precast concrete to BS.340 or dressed hard stone to the approval of the Architect. In the latter case, kerbs will be accepted without batter and in random lengths. They shall be bedded and haunched in concrete and the joints are to be pointed in 1:3 cement mortar.

EXTERNAL WORKS (cont'd)

A. White line markings

White line markings shall be painted in long life Chlorinated rubber road marking paint.

Drainage

B. General

This section of the specification covers the laying of surface water and foul drains and sewers.

C. Preparation

Prior to laying a section of pipe or constructing any drains sights rails shall be erected at each end and at each change in grade and direction with a maximum distance apart of 30m. Sights rails and boning rods shall be of substantial construction and shall be painted to indicate clearly the lines and levels to be worked to.

D. Handling Pipes

All pipes and drains are to be carefully handled and stacked. Any pipes which exhibit signs of damage shall be rejected by the Architect must be removed from the site forthwith.

The Architect shall have the right to reject consignment or stocks of piping from which failed pipes have drawn, or order them to be pressure-tested outside the pipelines, even though no defects are apparent.

E. Laying of pipes

Immediately before pipe laying commences the excavation shall be thoroughly cleaned of all stones, soil or other debris which may have fallen therein and the section concerned shall be inspected and approved by the Architect.

The pipes shall be laid with the bed being shaped to ensure uniform bearing over the whole length of the pipe with depressions to accommodate each pipe joint.

Immediately before being laid, each pipe and fittings shall be carefully examined both inside and outside for any damage, and all dust, dirt and foreign matter shall be removed from the inside.

Care shall be taken to ensure that each pipe and fitting remains clean during laying.

In order to prevent stones and soil from entering the pipe, a suitable plug shall be provided when pipe laying is not actually in progress. The plug shall be of the screw-up expanding type or of tapered wood.

Pipes must be laid true to line and level. Each pipe shall mate concentrically with the next to preserve a true and uniform invert. Pipes shall be uniformly beaded and must not be

EXTERNAL WORKS (cont'd)

Laying of pipes (cont'd)

Allowed to rest on the joints or on stones or hard objects in the bottom of the trench.

In laying non-pressure pipes the work is to commence at the lower end of each length and the sockets in every case shall be laid pointing opposite to the direction of flow.

Jointing pipes

A Generally

After bedding to the correct line and level, pipes shall be jointed strictly in accordance with the manufacturer's recommendations and the appropriate requirements given below.

B. Concrete pipes

Concrete pipes and fittings shall comply with BS.556 or 4010. They shall carry the British Standards Institution registration certification trade mark, or test certificates shall be furnished by the manufacturers.

For ogee-jointed pipes, the joints shall be thoroughly cleaned before laying, and cement mortar 1 to 2 shall be applied evenly to the ends for jointing so as to completely fill the joint. The pipes shall then be properly drawn together and the outside of the joint shall be neatly pointed with a band of cement mortar approximately 125mm wide x 25mm thick. The inside of each joint shall also be pointed up as the work proceeds.

Special care shall be taken to ensure that the excess of cement mortar is neatly cleaned off while each joint is being made and any earth, cement or other materials thoroughly cleaned out of the pipes by drawing a tight-fitting wad through them as the work proceeds, or by other approved means.

C. Cast Iron Pipes and Fittings

Cast iron spigot and socket drain pipes and fittings shall comply with BS.7, or BS. 43 with caulked lead joints.

D. Sewer and drain connections

Where pipe connections are made to a sewer culvert stone pitched or lined channel, the pipe shall be well and tightly build into the concrete or masonry work, and be so placed as to discharge in the direction of flow of the main sewer, drain or channel and with the end of the pipe carefully cut to the necessary angle. Where the connections are between pipe sewers or drains, special connecting pipes as shown on the drawings shall be supplied and truly laid and properly jointed.

E. Bedding, surrounding or hanching of pipes

Bedding, surrounding or hanching of pipes, where concrete is to be used the contractor shall take care to pace the concrete under and around the pipes to ensure even bedding and solidity in the concrete and the concrete shall not be thrown directly on to the pipes. The upper surface of the concrete shall be struck off with a

EXTERNAL WORKS (cont'd)

Bedding, surrounding or hanching of pipes (cont'd)

Wooden screed or template and neatly finished off.

No concrete surround or hanching shall be placed until the pipework concerned has been inspected and approved by the Architect. No backfilling shall commence until the complete concrete surround or hanching has also been inspected and approved by the Architect.

Concrete surround shall be constructed at least to the minimum dimensions shown on the Drawings. The cost of any formwork shall be included in the rates for concrete surround.

Payment will be made only for the concrete bedding, surround and haunches shown on the drawings, and any additional concrete to completely fill trenches, etc, shall be deemed to be included in the rates for concrete bedding, surrounds and haunches.

Where pipes are not laid on concrete the bottoms of the trenches as excavated shall be absolutely smooth and shall be free from stones or other projections. Holes cut out at the joints shall be of as small a size as possible, the pipes shall have a uniform and solid bearing trough their entire length.

The soil filled around, and for 300mm over the top of the pipes shall be free from stones and organic matter and filled in with the utmost care, special attention being paid to joint holes so as to obtain the greatest possible compactness and solidity, and soil if necessary being screened to exclude material, which would damage the pipes.

Manholes and chambers

A. Generally

Manholes and chambers shall be constructed in accordance with the Drawings and in the position shown on the Drawings or directly by the Architect. Foundation slabs shall consist of similar concrete or building blocks or precast concrete rings tapers and shafts in accordance with the drawings.

The side walls shall be internally fair faced or rendered. They shall be brought up vertically to receive a precast or in-situ slab formed in concrete of the class specified and reinforced all as shown on the drawings. Covers and frames shall be provided as specified and shown on the drawings. The tops of the covers shall be flush at all points with the surrounding surface of paved areas or as directed in unpaved areas. Any slight adjustment of the slab level which may be necessary to accomplish this shall be effected by topping the side walls or cover slab with concrete. Bends and junctions at the manhole invert shall be formed from class 10/20 concrete and rendered with 1:3 inlet and outlet pipework. The channels will have half round inverts and vertical sides to the equivalent diameter of the channel.

All manholes and chambers when completed shall be water-tight and to the satisfaction of the Architect.

EXTERNAL WORKS (cont'd)

Manholes and chambers (cont'd)

A. Manholes covers

Manhole covers and frames shall conform to BS. 497 and shall be of pattern, size, duty and type as specified in the manholes schedule or elsewhere.

Manhole cover frames, shall be set on cement mortar and in the case of manholes in roads they shall be set to the chamber and/or fall of the road. The covers shall be fixed on the downstream end of the manholes. Class 'As' engineering brick or dressed stone headers set radially in 1 to 3 cement mortar shall be constructed on the concrete cover slab as a seating for the cover frame and packed to adjust the height and slope of the frames.

B. Step Irons

Step irons shall comply with BSS. 1247, 1975, and shall be of the dimensions set out in figure 1 of that specification for steps in benching and blockwork manholes and as in figure 2 for steps in precast concrete sections.

C. Pipe anchor and thrust blocks

Pipe anchor and thrust blocks, as shown on the drawings or directed by the Architect, shall be constructed on pipelines at all bends, steep stop ends. The Contractor shall ensure that each one is built firmly into the bottom and sides of the trench and that the ground is solid and has not been softened by water from leakages or other cause. The blocks shall be of concrete as shown on the drawings and shall have been completed, hardened and cured for at least seven days before testing of the pipelines.

D. Sluice valves

Sluice valves shall be in accordance with BS. 1218 and 3464 and of the appropriate class for the pressure under which they will operate.

All sluice valves shall have non-rising spindles.

E. Surface boxes and inspection covers

Surface boxes on sluice valve chambers shall be in accordance with BS. 3461

Fire hydrant covers and frames shall be cast iron and comply with BS. 750. They shall be of the lift-out chained cover type and all covers shall be lettered 'Fire Hydrant'.

All surface boxes and inspection covers shall be of the appropriate load-bearing duty for their location.

F. Valve and hydrant chambers

Generally valve and hydrant chambers shall consist of an insitu concrete base, walls formed by precast concrete sections and a precast concrete cover slab, as shown on the drawings.

EXTERNAL WORKS (cont'd)

Valve and hydrant chambers (cont'd)

The top of the base shall be finished smooth and level with a rebate around the inside edge to receive the first wall section. The rebate on the top of the last wall section laid shall be filled with cement mortar and squared off.

The cover slab shall at all times have the face with the lifting eyes showing upwards and the cover slab only be lifted by means of the lifting eyes.

All joints between units shall be left open.

The Contractor shall ensure that the precast chamber units are handled with care and any damage incurred shall be made good at the Contractor's own expense.

TESTING

A. Testing of pipelines

The Contractor shall provide all labour, air pump and gauges, water drain stoppers, bends and other necessary appliances for conducting the tests, and no pipes or other work shall be covered up until they have been inspected and passed by the Architect's Representatives as being watertight.

Testing shall be by means of water or by air at the direction of the Architect, and the Contractor should note and allow in his rates for the additional difficulties that under certain circumstances there may be no out fall nor may water be readily available.

Where a water test is required by the Architect, each section of pipe shall normally withstand a head of water not less than 1m above the highest point of the section to the extent that the loss of water over a period of 30 minutes is not in excess of 1 litre per hour per 30 meters per 25mm of nominal internal diameter of sewer, the water being added from a measured vessel at regular intervals of 10minute.

In carrying out these tests care shall be taken that no part of the system is subjected to a pressure greater than a head of 6 meters of water.

In every case the water used for testing the pipes shall be left in the pipes until they are covered with earth or other trench filling materials to a depth of at least 1.2m over the top of the pipes and until permission is given by the Architect's representative for the water to be released.

Where an air test is required by the Architect, a manometer tube shall be attached by rubber tubing to a suitable nipple in one of the stoppers sealing the length to be tested. Water shall be introduced into the manometer tube until the level of the two lengths are equal and approximately half the tube is filled. Air pressure shall be applied to the pipes by hand pump until the difference in water level is 100mm and this pressure shall be maintained for five minutes without the difference in water level dropping to below 75mm.

All inlets for temporary connections, testing purpose, laterals etc, are to be securely stopped with proper stoneware stoppers covered in with cement mortar, cast iron stoppers jointed with lead, or screwed or bolted plugs, as the case may be.

EXTERNAL WORKS (cont'd)

A. Testing of manholes and drains

Should the Architect so direct, manholes shall be tested by completely filling with water and there shall be no loss over a period of two hours. The Contractor shall provide all labour and apparatus for the above test.

After each length of drain has been laid and jointed and before any backfilling commences, the drain shall be inspected and approved by the Architect, in respect of grade, direction, level appearance and correct jointing.

B. Generally

Should any position of the works fail to pass the tests applied, to the satisfaction of the Architect, the fault shall be made good at the Contractor's expense according to methods approved by the Architect, and the work shall be tested again. The cost of all retesting shall be borne by the Contractor.

C. Rates for pipes and drains

Rates entered in the Bills of Quantities shall include for supplying, laying, jointing, cleaning and testing all in accordance with the requirements of this specification.

D. Earth interceptor ditches

Earth interceptor ditches shall be constructed in advance of any excavation and where indicated by the Architect as shown on the drawings. They shall have a bottom width of 500mm and side slopes neatly finished off to a slope of 1 in 1 with rounded tops.

E. Kerb entry gullies

Kerb entry gullies shall be supplied and laid in accordance with the drawings. The rates included in the Bills of Quantities shall include for excavation, making junctions with connections to main drains and disposal of surplus material.

F. Surface water drains

Precast or in-situ concrete drainage channels shall be formed of concrete of the class specified to the dimensions shown on the drawings. Drains shall not normally be laid to a radius of curvature less than 10 times the bed width of the main. Earth sides above such channels shall be neatly finished to a slope of 1 to 1 or such other slope as the Architect may direct.

Precast elements shall be laid on a 100mm minimum thickness of compacted litterate and be neatly jointed with cement mortar 1 to 2 as the work proceeds.

EXTERNAL WORKS (cont'd)

A. Open mesh flooring

The open mesh flooring and gratings shall be made of galvanized mild steel. Where the flooring is fixed over a chamber it shall be provided in easily removable panels.

The flooring shall be set flush in frames of the same material which shall be provided with lugs for building in

B. Paving slabs

Precast concrete paving slabs shall be in accordance with BS. 368 and shall be 50mm thick and except where cutting is necessary a uniform width of 600mm, a minimum length of 450mm and a maximum length of 900mm.

C. Deviations from the Standard Method of Measurement

The prices for external works are to include for all deviations previously referred to in the separate trade preambles.

ITEM		AMOUNT
	<p>BILL NO. 1</p> <p>GENERAL CONDITIONS AND PRELIMINARIES</p> <p>Definitions</p> <p>The following words and expression shall have the meanings hereby assigned to them except where the context otherwise requires</p> <ol style="list-style-type: none"> 1. Employer means African Center of Excellence for Genomics of Infectious Diseases (ACEGID), Redeemer's University Ede Osun State, Nigeria as defined in the Articles of Agreement 2. The Architects means MASS Design Group 334, Boylston st # 120h Beverly, MA 01915, USA as defined in the Articles of Agreement 3. The Architects of Record means Yusuf and Partners, 3, Ayanboye Street, Anthony, Lagos as defined in the Articles of Agreement 4. Structural Engineer means UP J Concept Engineering Services 7, Alafia Close, Ojoo Ibadan, Oyo State as defined in the Articles of Agreement 5. Quantity Surveyor means TAOHEED ADEOSUN & CO. 33, Akinwunmi/Joju Road, Ota, Ogun State as defined in the Articles of Agreement. 6. 'Approved' or 'Approval' means approved or approval in writing by the Architect unless otherwise stated. 7. 'Architect's Representative' means any person appointed from time to time by the Architect or the Employer to perform the duties set forth in these Conditions and whose authority shall be notified in writing to the Contractor by the Architect or the Employer 8. 'Architect's Instructions' means drawings, details, instructions, directions, explanations, approvals or orders issued in writing by the Architect or Architect's Representative 9. 'Constructional plant' means all appliances or things of whatever nature required in or about the execution, completion or maintenance of the works or Temporary Works and includes (without thereby limiting the foregoing definition) all machinery, tools, coverings, patterns, templates, profiles, power of every kind, water, light, pumping, workshops, sheds, buildings, stores, materials and things fixed or movable 10. 'Contract Documents' mean the Conditions, Drawings, Bills of Quantities, Tender and the Articles of Agreement <p style="text-align: center;">To Collection</p> <p style="text-align: center;">1/1</p>	

ITEM		AMOUNT
	<p>11. 'Contract Sum' means the sum named in the Articles of Agreement and Tender subject to such additions thereto or deductions therefrom as may be made under the Contract</p> <p>12. 'Contractor' means the person or persons, firm or company whose tender has been accepted by the employer and who has signed the contract and includes the Contractor's legal personal representatives, successors, and permitted assigns. The contractor's name has been mentioned in the Articles of Agreement.</p> <p>13 'Date of possession' means the date notified in writing to the Contractor by the Architect or Architect's Representative on which official possession of the site passes to the Contractor</p> <p>14. 'Date of Tender' means the date 10 days before the date fixed for the submission of tenders</p> <p>15. 'Defects Liability Period' means the period expiring twelve (12) months from Practical Completion of the Works or at the end of a rainy season whichever is later</p> <p>16 . 'Directed' or 'direction' means directed or direction in writing by the Architect unless otherwise specified</p> <p>17. 'Drawings' means the drawings referred to in the Contract Bills and any modifications of such drawings approved in writing by the Architect and such other drawings as may from time to time be furnished or approved in writing by the Architect</p> <p>18. 'Month' means calendar month</p> <p>19. 'Period of Final Measurement' means twelve months from Practical Completion of the Works</p> <p>20. 'Period of Interim Certificates' means as far as possible monthly</p> <p>21. 'Practical Completion' means substantially completed, satisfactorily tested and ready for occupation or use; and certified as such by the Architect's Certificate</p> <p>22 'Site' means the lands and other places on, under, in or through which the works are to be executed or carried out and any other lands or places provided by the employer for the purpose of the Contract</p> <p>23. 'Temporary Works' means all temporary works of every kind required in or about the execution, completion or maintenance of the Works</p>	
	<p>To Collection</p>	

ITEM

- 24. 'Unfixed materials' means materials and goods intended for and placed upon or adjacent to the works but not incorporated in the Works
- 25. 'Works or Work' means the works to be executed in accordance with the Contract
- 26. 'Writing' includes any manuscript, typewritten or printed statement under or over signature or mark as the case may be

Bills of Quantities Descriptions and Quantity Denominations

The quantity denomination abbreviations used throughout these Bills of Quantities are as follows:

Abbreviation	Meaning
M3	cubic metre
M2	square metre
L.M./M	linear metre
No./Nr	number
kg	kilogramme

To Collection

ITEM		AMOUNT
A	<p>Scope of Works</p> <p>A brief outline of the scope of the work appears on page (iv) of these documents. The Contractor is to allow here in this Estimate any sum in respect of the scope of the work.</p>	
B	<p>Location of Site</p> <p>For a brief description of the location of site, see page (iv) of these documents. The Contractor is to allow here in this Estimate any sum in respect of the Location of Site.</p>	
C	<p>Visit Site</p> <p>The Contractor is to visit the site to acquaint himself with local conditions, nature of the existing roads or other means of communication, access to the Works and <u>available land for storage</u> or other purposes (within or without the site) the nature of the ground and sub-soil to be excavated and the position of approved soil tips. The contractor is also to obtain his own information as to the availability of sand aggregate and fresh water, the conditions affecting the supply of labour and all other materials required for the works. <u>No claim resulting from failure to comply with the condition of this clause will be entertained.</u></p>	
D	<p>Restrictions on use of Site, etc</p> <p>The Contractor shall confine his activities and those of his work people to area and confines of the site as shown. The Contractor shall not allow his work people to trespass into the buildings or property outside the confines of his site. The Contractor shall not without the express permission of the Architect permit the loading or unloading of materials on the site outside normal working hours.</p>	
E	<p>Drawings</p> <p>The drawings referred to in the Form of Contract as the "Contract Drawings" and as prepared by the Architects and listed in Appendix "A" to the Bills of Quantities are to be considered by all parties to be the property of the Architect to whom copyright is vested and are to be returned to him on the completion of the Works. The drawings may be inspected during normal working hours by appointment at the offices of the Quantity Surveyors.</p> <p>The Contractor is to check carefully the dimensions on site. Any discrepancy between the drawings and the conditions on site shall be referred immediately to the Architect for further instructions.</p> <p>The Contractor is to allow for mounting one complete set of both Architect's and Engineer's drawings on insulation board, plywood or other suitable rigid panels and keeping them on site throughout the contract period, Figure dimensions on drawings are to be followed in preference to scaled dimension.</p> <p style="text-align: center;">To Collection</p>	

ITEM

Drawings (cont'd)
 The whole of the works to be executed in strict accordance with the Architect's drawings and instructions

The Contractor must give adequate advance notice of requirements to the architect with regards to detailed drawings, instructions, etc., in the absence of such advance written notice from the Contractor to the Architect, it will be assumed that the progress of the works is not affected by want of such information

A Bills of Quantities

These Bills of Quantities are to be priced in ink throughout, all items are to be priced separately and any items not priced will be deemed to be included in the rates

These Bills of Quantities will form part of the Contract and no alteration is to be made in the text of same. Should any alteration, amendment, note or addition be so made, the same will not be recognised and the reading of these Bills of Quantities as prepared by the Quantity Surveyors will be adhered to

The Contractor is to carry out the work as shown on the drawings and described in these Bills of Quantities. No variation on these will be allowed unless a variation order signed by the Architect is produced.

B Form of Contract

The Form of Contract will be private Edition of the standard Form of Contract 1986 Edition issued under sanctions of the Royal Institute of British Architects for use where Quantities form part of the Contract and specially altered and modified for use in Nigeria (a copy of the conditions is included in these documents provided for tendering)

The Contractor is referred to the Clauses there in and enumerated below and he is to allow here in this Estimate against each item for the cost of fulfilling all obligations and liabilities contained therein.

The Contractor's attention is drawn in particular to the amendments and adaptation clauses.

- Clause No. 1 Contractor's Obligations
- Clause No. 2 Architect's/Co-ordinator's Instructions
- Clause No. 3 Contract Documents
- Clause No. 4 Statutory Obligations, notices, fees and charges
- Clause No. 5 Levels and setting out of the Works
- Clause No. 6 Quality of Materials, goods and workmanship to conform to description, testing and inspection

To Collection

ITEM	ACEGID Project, Ede		AMOUNT
	Form of Contract (Cont'd)		
	Clause No. 7 Royalties and patent rights		
	Clause No. 8 Foreman-in-charge		1,000,000.00
	Clause No. 9 Access for Architect Co-ordinator to the Works		
	Clause No. 10 Clerk of Works		
	Clause No. 11 Variations, provisional and prime cost sums		
	Before putting in hand any works which the Contractor claims will not be executed under similar conditions and to which he considers the rates in the Bills of Quantities will not apply by reason or varying conditions, he shall give notice in writing to the Architect and the Quantity Surveyors.		
	Clause No. 12 Contract Bills		
	Clause No. 13 Contract Sum		
	Clause No. 14 Unfixed Materials and goods		
	Clause No. 15 Practical Completion and Defects Liability		
	Clause No. 16 Sectional Completion		
	The Employer reserves the rights to take over any part of the work as it is completed		
	Clause No. 17 Assignment or sub-letting		
	Clause No. 18 Injury to persons and property and Employer's Indemnity	See General Summary	
	Insurance is to be maintained in the joint names of the Employer and Contractor		
	Clause No. 19 Insurance against injury to Persons and Property	See General Summary	
	The Contractor is to maintain insurances as described in the joint names of the Employer and the Contractor in respect of all the risks including the following:		
	1. Third party fire and Explosion,		
	2. Fatal Accidents Acts,		
	3. Employer's Liability Acts		
	4. Liability in case of Specific Industrial Diseases,		
	5. Common Law Liabilities,		
	to cover the liability of the Contractor and any Sub-contractor in respect of personal injuries or deaths as described in paragraph (1) () (l) of this clause and also in respect of injury or damage to property real or personal as described in paragraph (1) (a) (ii) of this Clause.		
	To Collection		1,000,000.00

ITEM	AMOUNT
<p>Form of Contract (Cont'd)</p> <p>In so far as any of the foregoing insurances relate to injury or damage as described in paragraph (1) (a) (ii) of this clause, such insurances to provide cover up to N1,000,000.00 for any one incident, the number of incidents for which cover is provided being unlimited specific to this contract. (see General Summary for Provisional Sum for insurances in respect of items described in paragraph (2) (a) of this Clause)</p> <p>Clause No. 20 Insurance of the Works against Fire, etc</p> <p>Clause No. 21 Possession, Completion and Postponement</p> <p>Clause No 22 Liquidated and Ascertained damages for non-completion</p> <p>Clause No 23 Extension of Time</p> <p>The Contractor must make his own arrangement with Nominated Sub-Contractors as to the time and the manner in executing their work and is to ensure that they accept and adhere to the times for commencement and completion and the progress of their work as incorporated in the Time and Progress Chart</p> <p>Should it, at any time, appear likely that a Nominated Sub-Contractor or supplier will not adhere to schedule, either for commencement, progress or completion, the Contractor must immediately notify the Architect in writing at the same time seeking in writing from the Nominated Sub-Contractor or supplier reasons for the likelihood of delay.</p> <p>The Contractor is to ensure that all Nominated Sub-Contractors and Nominated Suppliers are aware of the amendments to this Clause and their resultant obligation to allow to the Contractor the cost of any liquidated and ascertained damages paid to the Employer in respect of delays on their part</p> <p>Clause No. 24 Loss and expense caused by disturbance of regular progress of the works</p> <p>Clause No. 25 Determination by Employer</p> <p>Clause No. 26 Determination by Contractor</p> <p>Clause No. 27 Nominated Sub-Contractors</p> <p>Clause No 28 Nominated Suppliers</p> <p>Clause No 29 Artists and Tradesmen</p> <p>Clause No 30 Certificates and Payments</p> <p>Clause No 31 Fluctuations</p> <p style="text-align: center;">To Collection</p>	

ITEM		AMOUNT
	<p>Method of Measurement (Cont'd)</p> <p>Clause No 32 Outbreak of Hostilities</p> <p>Clause No. 33 War Damage</p> <p>Clause No. 34 Antiquities</p> <p>Clause No 35 Arbitration</p>	
<p>A</p>	<p>Method of Measurement</p> <p>These Bills of Quantities have been prepared in accordance with the general principles laid down in the fifth edition of the "Standard Method of Measurement of Building Works" issued by the Royal Institution of Chartered Surveyors. Departures have been made from these documents to conform to the differing building construction industry in Nigeria and to reduce the number of measured labours and to simplify certain other items. Where such departures have been made the fact has been recorded in the general note on method of measurement to indicate which labours have been included in the general rates</p> <p>The Contractor's attention is expressly drawn to this fact in order that the Tender figure shall represent the total cost of all items of work involved in the construction and satisfactory of the Works.</p> <p>Although descriptions in these Bills are generally given in metric sizes, no adjustment to the Contract Sum will be made for any costs incurred due to materials or goods available in Imperial sizes.</p>	
<p>B</p>	<p>Alteration, etc., to the Contract Documents</p> <p>Any alteration amendment addition to or deletion from the printed text of these Contract Documents or the Form of Tender by the Contractor without the express authorisation of the Surveyor will be invalid and not recognised or taken into account in interpreting the obligations and requirements of the Contract Documents.</p>	
<p>C</p>	<p>Basic Rates and Prices</p> <p>The Contract Sum shall be deemed to have been calculated in the manner set out in Clause 31 of the Conditions of Contract. The only variations that will be adjusted in connection with rates of wages will be the National or Regional increases or decreases authorised by the properly recognised official Negotiating Bodies.</p>	
<p>D</p>	<p>The Contractor shall make due allowance in tender for withholding tax, other taxes and levies in consonance with tax laws prevailing at the date of tender</p>	
	<p style="text-align: center;">To Collection 1/8</p>	

ITEM		AMOUNT
A	<p>Delays</p> <p>The Contractor will be deemed to have provided in his estimate for all risks and costs attributable to delays in obtaining labour and materials and no claims will be entertained on this basis.</p>	
B	<p>Extension of Time</p> <p>Should the Contractor be granted an extension of time under Clause 23 of the Conditions of Contract he will not be reimbursed for any additional cost of Preliminaries, etc. incurred in connection with keeping the job open for this extended period other than any direct loss and/or expenses which may be payable in accordance with Clause 11(8), 24 or 34 (3) of the Conditions of Contract.</p>	
C	<p>Overtime</p> <p>Allow for working all overtime necessary in order to complete the works within the time given for completion or such extended time as is granted under Clause 23 of The Conditions of Contract and for the cost of non-productive time and all other expenses in connection with overtime.</p>	
D	<p>Overtime will not be paid for unless specifically ordered by the Architect in writing, prior to its execution, in which case the net extra cost of increased hourly payments only will be met.</p>	
E	<p>Contractor to keep Records</p> <p>The Contractor shall keep such books of Accounts and other documents and records as are necessary to show the increases in costs incurred and the reductions obtained under Clause 31 of the Conditions of Contract and shall furnish such books accounts documents and records to the Architect or other person authorised to receive them at monthly intervals or as requested throughout the duration of the Contract</p>	
F	<p>Advertisement</p> <p>The Contractor shall not display, or permit the display of any advertisement within the boundaries of the site or upon any temporary fencings, hoardings, plant, etc., save upon the written instructions of the Architect.</p>	
G	<p>Site Board</p> <p>Provide and erect a site board showing the title of the Contract, names and addresses of the Consultants, Nominated Supplier and Sub-Contractors and such other information as may be required by the Architect, who shall approve the design layout and colours of the board.</p>	200,000.00
	To Collection	200,000.00

ITEM		AMOUNT
	<p>Lettering shall be "cut -out" plywood or plastic of an approved thickness, and shall be 150mm high for the main title, and 150mm or 175mm high elsewhere. The whole board shall be maintained in good condition, repainted as necessary, and removed when no longer required.</p>	
<p>A</p>	<p>Scaffolding and Plant</p> <p>Allow for providing all scaffolding, needling, shoring, temporary enclosures to openings old and new, and for hoists, tackle and other plant, profiles, templates, centerings, and equipment generally required for the proper, safe and efficient execution of the Works and for all necessary labour in adapting and altering same as necessary during the progress of the Works including sub-contract works and for taking same down and clearing away on completion of the Works and making good all works disturbed.</p> <p>Allow for providing all labour and things required by the Architect for testing and measuring the Works and for weighing measuring or testing the efficiency of any portion of the works</p> <p>The Contractor is particularly to note that scaffolding, staging, needling, shoring and the like is to be provided both for the execution of his own works and that of sub-contractor employed under this Contract, including that required solely for the execution of work by sub-contractors.</p> <p>Allow for providing all gangways, walkways, planking, deckings, temporary platforms, etc., necessary to construct and afford access to or between all parts of the Works.</p>	<p>4,500,000.00</p>
<p>B</p>	<p>Temporary Roads and Fences</p> <p>Allow for providing and maintaining all necessary temporary roads, paths, hard standings, hoardings, fans and gantries enclosures, gates, temporary entrances and crossovers and all other facilities for the proper execution and protection of the Works and the Public and for maintaining, altering and adapting same as required and for removing and clearing away at completion of the Works and making good all works disturbed</p>	<p>1,000,000.00</p>
	<p style="text-align: center;">To Collection</p>	<p>5,500,000.00</p>

ITEM		AMOUNT
A	<p>Setting Out</p> <p>The Contractor shall be solely responsible for the accurate setting out of the Works and shall include for providing all pegs, templates, instruments and labour necessary for so doing and as required by the Architect for Checking this work. Any errors found in the setting out to be made good at the Contractor's own expenses.</p> <p>Excavation shall not be commenced until the permission of the Architect is obtained.</p> <p>Provide when required on the site a "Dumpy" or "Precise" type level, complete with tripod within tripped and staff and allow for the free use of the levelling equipment by the Architect, Engineer or Quantity Surveyors.</p>	300,000.00
B	<p>Ordering of Materials</p> <p>Upon receipt of the order to commence the Works, the Contractor shall immediately place orders for all the required materials and will be held responsible for any delays occurring due to the late placing of such orders.</p> <p>The Contractor shall, if so requested by the Architect, make available to him all documents in connection with the ordering of materials for the Works, showing agreed delivery dates, sources of supply and the like.</p> <p>If upon receiving quotations for any materials required for the Works it appears that delivery by the date quoted will delay the Works, the Contractor shall inform the Architect of this fact before placing the orders.</p>	
C	<p>Defects</p> <p>The Contractor will be held responsible for any defective works done or materials supplied by any sub-contractor employed by him on or in connection with the Works.</p>	
D	<p>Samples</p> <p>Allow for submitting samples of materials and/or settling up samples panels for the Architect's approval, prior to the commencement of any works, of all materials intended to be incorporated in the works. Subsequent to the Architect's approval all materials and workmanship incorporated in the works shall be equal to the approved samples. Any materials or workmanship not being equal to the approved samples will be rejected and are to be taken down and replaced, together with any work damaged in consequence thereof at the Contractor's expense.</p>	
	<p>To Collection</p> <p>1/11</p>	300,000.00

ITEM		AMOUNT
<p>A</p>	<p>Materials to conform to Specification</p> <p>All articles and materials supplied and all works executed is to conform with latest requirements of British Standard Specification and Code of Practice where applicable. Otherwise they are to be to the specific requirements laid down by the Architect either in Drawings or in the Bills of Quantities and to be consistent with the performance required and are to be the best of their kind. When materials specified are not available the Contractor may not substitute materials without the previous notification and consent of the Architect in writing.</p> <p>Allow for testing materials as required and for providing all necessary appliances, materials, etc., and paying all fees in connection therewith.</p>	
<p>B</p>	<p>Prime Cost Items</p> <p>(a) Definition: The term "Include the P.C. Sum" herein shall indicate a sum of money to cover the cost of goods to be supplied or work to be executed by a Supplier or a Sub-Contractor to be nominated by the Architect. All prime Cost (P.C.) Sums are deemed to include where applicable custom and import duties entries and clearance charges, wharfage and harbour dues and bank transfer charges unless otherwise stated in the items.</p> <p>All such prime cost sums are at the complete disposal of the Architect who may direct how they are expended and may deduct same wholly or in part from the Contract Sum.</p> <p>(b) <u>Receipted Invoices</u>: At the time of settling interim and final valuation, the Contractor will be required to reproduce for the Quantity Surveyor's inspection receipted invoices from the Nominated Suppliers and Sub-Contractors for monies previously certified on their behalf. In the event of non-payment by the Contractor, the Employer reserves the right to pay the Nominated Suppliers and Sub-Contractors direct and deduct the amount of all such payments from any monies due to the Contractor. The contractor will be required to account for any increase in the amount of any invoices over the amount of the accepted quotation.</p> <p>(c) <u>Fix Only</u>: Where an item of "Fix Only" has been measured for fixing goods supplied an amount should be allowed against such items for taking delivery at stores paying all storage charges, transporting to site, unloading, inspecting, getting, in storing, taking from store, getting or hoisting in position, assembling and fixing as described.</p> <p style="text-align: center;">To Collection</p>	

ITEM		AMOUNT
<p>A</p>	<p>Provisional Sums</p> <p>The term "provisional Sum" in the Bills of Quantities indicates a sum of money to cover the cost of a portion of the works, the extent or nature of which is not known at the time of preparing the contract documents, or which cannot be determined accurately until the Works are executed.</p> <p>Provisional sums are entirely at the disposal of the Architect and may be deducted in whole or in part if not required.</p> <p>Work executed against provisional sums shall be measured and valued in accordance with Clause 11 of the Conditions of Contract with the exception that the cost materials falling within the scope of P.C. Items elsewhere in the Bills of Quantities will be offset against those P.C. Items.</p>	
<p>B</p>	<p>Omission of P.C. or Provisional Sums or measured work</p> <p>The Employer reserves the right to omit any P.C. or provisional Sum or measured work from the Contract and no claim for loss of profit arising from such omission will be entertained. This clause shall be binding on the contractor whether or not he has read it.</p>	
<p>C</p>	<p>Attendance Upon Sub-Contractors and Specialist Tradesmen</p> <p>1. General Attendance</p> <p>Where the words "Allow for General Attendance" follow a P.C. Sum in respect of portion of the works executed by others allowance should be made against this item for attending upon such nominated sub-contractors specialist tradesmen during the course of their work. Such general attendance upon nominated sub-contractor or specialist tradesmen shall include the following on the part of the General Contractor:</p> <p>Making available use of standing scaffolding, messrooms, sanitary accommodation and welfare facilities, providing space for office accommodation and for storage of plant and materials., providing light and water and clearing away rubbish, and for any unskilled labour for general attendance upon the Sub-Contractor's skilled workpeople.</p> <p>2. Special Attendances</p> <p>Any special attendances required (other than general attendance) such as unloading, storing, hoisting, placing in position of materials, providing power, special scaffolding and the like has been described and should be allowed for after the item on which such special attendance is required.</p> <p>3. Builder's Work</p> <p>Builder's Work or the like in connection with the Sub-Contractors has been described and measured separately. has been described and measured separately.</p>	
	<p>To Collection</p>	

ITEM			AMOUNT
A	<p>Covering Up</p> <p>The Contractor must give at least seven clear day's notice to the Architect before covering up any of the work in foundations and drains in order that proper measurement may be taken of the works as executed and in the event of the Contractor failing to provide such notice he is at own expense to uncover as required to allowed the measurements to be taken and afterwards to reinstate.</p>		
B	<p>Examination of Work</p> <p>The Contractor shall as directed by the Architect open up for inspection any work covered up and should the Contractor neglect or refuse to comply with such directions the Architect may employ other persons to open up the same.</p> <p>If on being opened the work is found not to be in accordance with the Contract Documents or with the instructions of the Architect the expenses incurred in opening up the Works and consequent reconstruction shall be at the entire expense of the Contractor. If the work is found to be in accordance with the Contract Documents then all expenses incurred will be borne by the Employer.</p>		
C	<p>Architect's Instructions</p> <p>All instructions regarding the Works as issued by the Architect shall be in writing. In all cases where the words "approval of the Architect" occur shall means to the approval of the Architect in writing.</p>		
D	<p>Watching and Lighting</p> <p>Provide all necessary watching and lighting and protection for the Works and site as is required by day and night and at week-ends) and Public Holidays during the period of the Contract and the Contractor is to make good any loss or damage caused by his neglect of such provision.</p>		1,250,000.00
E	<p>Water</p> <p>Provide the whole of the water required for the Works including that required by any sub-Contractors or workmen of any kind authorised and on the site together with all requisite plumbing storage tanks stand pipes etc. and pay all fees and charges incurred.</p>	See General Summary	
F	<p>Temporary Lighting and Power</p> <p>Provide all temporary artificial lighting and electric power required for carrying out the works, pay all fees and charges connected therewith and execute all necessary temporary wiring, etc.</p>		2,350,000.00
	<p>To Collection</p>		3,600,000.00

ITEM		AMOUNT
A	<p>Sheds, Offices and Sanitary Facilities</p> <p>(l) The Contractor shall provide all temporary sheds and offices as follows:-</p> <ul style="list-style-type: none"> (a) Canteen accommodation for workmen (b) Suitable weather proof office accommodation for general foreman with furniture and lighting (c) Suitable weather proof office accommodation for clerk of works with furniture and lighting (d) Sheds for storage of materials (e) Sanitary accommodation with sanitary facilities for all work people 	2,750,000.00
B	<p>Licenses etc.</p> <p>The Contractor shall make all arrangements for the issue of Licenses etc. required for the execution of the contract as far as the supply of labour and materials are concerned, and to obtain necessary permits, and complete and lodge all forms which may be required at his own expense, and he must allow here for any costs involved.</p> <p>Allow for complying with the Building Regulations and all other local Bye-Laws and Regulations of the Local Authorities etc. and all other applicable legislation and Customary rites.</p>	
C	<p>Religious Rites</p> <p>Religious rites shall not be interfered with unnecessarily.</p>	
D	<p>Discovery of bones or burial remains</p> <p>The Contractor shall inform the Architect immediately upon the discovery of any bones or burial remains on the site and shall protect same and hand over to the Architect if so required after inspection. No extension of time will be allowed on account of disturbance among workmen due to such discovery.</p>	
E	<p>Exterminate and Prevent Pests</p> <p>Allow for effectively destroying all vermin and insect pests to the whole area of the site and taking all necessary preventive measures to maintain the site in a clean sanitary conditions to the satisfaction of the Architect.</p>	
F	<p>Care of existing installations and works</p> <p>The Contractor will be held responsible for protecting and maintaining all pipes ducts and cables met in excavations for keeping all ditches gullies and channels clear and unobstructed and for making good any damage caused to public or private buildings, installations, roads, paths, curbs and drains and is to pay all costs and charges incurred.</p>	
	<p>To Collection</p>	2,750,000.00

ITEM		AMOUNT
A	<p>Programme of work,Progress Chart and Progress Photographs</p> <p>The Contractor shall allow here for preparing and furnishing to the Architect within 14 days of date of possession of the site, four copies of a time and progress chart for approval which chart shall continuously be reviewed and kept up to date as the work proceed. Include also for providing the Consultants monthly with progress photographs clearly endorsed with date and location of picture. Allow for providing four sets of coloured progress photograph (up to 24 photographs per site each size 130 x 175mm)</p> <p>The contractor shall also in collaboration with the principal Sub-contractors submit a working programme for the Architects approval and shall supply to the Architect four copies of a monthly progress report to the satisfaction of the Architect.</p>	300,000.00
B	<p>Site accomodation for employer's representatives</p> <p>Allow for providing suitable weather proof office with furniture, fittings (fridges, air conditioners etc) and lighting to the satisfaction of the Architects.</p>	1,750,000.00
C	<p>Monthly Valuations Materials on Site</p> <p>The Contractor shall each month or and/or by the date agreed for the preparation of the monthly valuation provide for agreement with the Quantity Surveyor and detail schedule of those materials which have been brought upon the site and invoices to ascertain the value thereof.</p>	
D	<p>Receipts</p> <p>At the time of each valuation the Contractor must produce for the Quantity Surveyor's inspection, receipts for the amounts previously certified for Nominated Suppliers and Sub-Contractors. In the absence of each receipts, the Employer reserves the right to pay Nominated Suppliers and Sub-Contractors direct and deduct such sums from any monies due to the Contractor.</p>	
E	<p>Contractor to give notice in advance of requirements</p> <p>The contractor is to give adequate advance notice in writing to the Architect of his requirements with regard to instructions details drawings etc. required.</p>	
F	<p>Materials and Equipment delivered to Site</p> <p>The Contractor will be responsible for the safekeeping and storage of all materials and equipment delivered to the site by himself, or by any of the Sub-Contractors or Specialists, or by the Employer and he is to provide the necessary temporary sheds or coverings for the safekeeping of same from theft, damage by weather or any other causes and will be required to make good any loss or damage at his own expenses.</p>	
G	<p>Tests</p> <p>Allow for carrying out or having carried out tests on any materials either before or after use in the works and for obtaining and offering up samples of all any materials or specifications to the Architect for approval. Any materials used are to be equal in all respects to the approval samples.</p>	200,000.00
	<p>To Collection</p> <p>1/16</p>	2,250,000.00

ITEM		AMOUNT
A	<p>Direct Payment by Employer for Items covered in the Contract Documents</p> <p>The employer reserves the right to supply and pay direct for any items covered in this contract by measurement. Adjustment will be made to the Contractor's rates inserted against these items to reflect the supply cost and transport charges omitted and to reduce the level of profit and overhead charges, should this right be exercised.</p>	
B	<p>Pricing Bills of Quantities</p> <p>The Pricing of these Bills of Quantities is to be in Nigeria Naira Currency and is to be in ink throughout. Should the priced Bills of Quantities of the Tender considered for acceptance show (after a complete arithmetical check correct) a difference between the tender figure and the arithmetically correct figure the difference will be brought to the relevant Contractor's notice and with his consent the prices of the "builder's works" (that is the arithmetically correct figure less all Prime Cost (P.C.) and Provisional Sums and Contingencies) shall be subject to a percentage of adjustment calculated upon the total amount of such errors in relation to the "builder's works" so that the original tender figure shall remain unaltered. Variations of "builder's works" will be subject to the percentage adjustment. Should the Contractor withhold his consent to this procedure he may be asked to withdraw his Tender. The Contractor will be deemed to have included in his tender for the obligations and requirements of all items in these Contract Documents whether or not he has placed a rate or price against the items. The rates and prices included against priced items are deemed to include for and to be sufficient to enable the Contractor to perform the obligations and requirements of those items not priced without further charge.</p>	
C	<p>Maintenance of Public & Private Roads</p> <p>The Contractor shall be responsible for the protection and maintenance of public and private roads, footpaths, kerbs, drains etc. and any cables or pipes, etc., encountered in excavations. The Contractor shall also keep all gullies and ditches clear and free from obstruction. The Contractor shall also comply with all police Regulation, pay all Local and other Authority charges affecting the execution of the works.</p>	
D	<p>National Provident Fund, etc.</p> <p>The Contractor shall allow for all payment due and all costs and expenses incurred in connection with the National Provident and Savings' Schemes and these shall be held to be included in the Contract Sum.</p>	
E	<p>Safeguarding against damage or theft</p> <p>The Contractor is to allow for the complete safeguarding all works, materials and plant against damage of any kind and theft and shall be responsible for the reinstatement of any damage works at his own expense.</p>	
<p>To Collection</p> <p>1/17</p>		

ITEM		AMOUNT
A	<p>Fluctuations</p> <p>The Contractor shall submit all details of fluctuations in rates of labour and prices of materials and goods (supported by invoices, receipted accounts and delivery notes/way bills). No adjustment for fluctuations in the price will be allowed in respect of materials and goods (other than those for which P.C prices and sums are given) which are not included in the schedule of Basic Prices at the time of tendering. Labour claims must be supported by daily records of labour allocation schedules specifying activities.</p>	
B	<p>Welfare and Safety</p> <p>The Contractor is responsible for the safety, health and welfare of all workpeople employed upon the works and shall provide protection and amenities in accordance with any applicable legislation. The Contractor shall recognize and allow for all statutory and religious holidays and rites.</p>	400,000.00
C	<p>Stormwater Drainage</p> <p>The Contractor shall keep the whole of the site from Storm-flooding and must provide such temporary drainage as he may consider necessary. Any damage caused by neglect of this item shall be made good at the Contractor's expense.</p>	
D	<p>Surveying Equipment, etc</p> <p>The Contractor is to make available free of charge to the Consultants at all times during the length of the Contract surveying instruments and field equipment for use in the Works. In addition the Contractor is to provide free of charge all necessary labour, staff-holders etc. and the like for use with the equipment.</p>	
E	<p>Removal of rubbish and disposal</p> <p>Clear and cart away direct from the site all rubbish shavings superfluous and waste materials as it accrues and on completion clean all floors paving and stains, clean off deodourise all sanitary fittings, clean down walls, tiling and paintwork, touch up damaged decoration, replace cracked or broken glass and roof coverings, clean out gutter and down pipes, clean windows, oil and/or grease all locks and other moving parts and leave the whole of the works clean and to the satisfaction of the Architect on completion and ready for immediate occupation.</p>	1,000,000.00
F	<p>As-Built Drawings</p> <p>The Contractor is to allow for furnishing the Architect with one (1) copy of electronic drawings and two (2) hard copies of the As-built architectural, structural and services drawings including all shop drawings and manufacturers catalogues as may be required.</p>	250,000.00
	To Collection	1,650,000.00

		AMOUNT
	<u>Transport for Work-people</u>	
A	Allow for all costs in connection with provision of transport for work-people.	500,000.00
	<u>Site Meetings</u>	
B	The Contractor is to attend periodic meetings with the Architects or their representatives on the site usually monthly or as may otherwise be decided by the Architect and the Architect is to prepare and distribute minutes of the meetings to the Contractor and Sub-contractors and any interested parties.	250,000.00
	<u>Temporary Sanitary Facilities</u>	
C	The Contractor shall provide adequate fly-proof sanitary accommodation for use of the Consultants and Sub--contractors work-people in a position to be approved by the Architect and keep same in a clean and sanitary condition to the satisfaction of the Public Health Authorities and shall cause such laterines and soil to be cleared away whenever necessary and shall make good all works disturbed by these conveniences.	
	<u>IRREVOCABLE GUARANTEES</u>	
D	Allow for providing the Performance Bond on 10% of contract sum	350,000.00
E	Allow for providing Advance Payment Bond	600,000.00
	To collection	1,700,000.00

ITEM	<u>COLLECTION</u>	AMOUNT
	Page No. 1/1	
	Page No. 1/2	
	Page No. 1/3	
	Page No. 1/4	
	Page No. 1/5	
	Page No. 1/6	1,000,000.00
	Page No. 1/7	
	Page No. 1/8	
	Page No. 1/9	200,000.00
	Page No. 1/10	5,500,000.00
	Page No. 1/11	300,000.00
	Page No. 1/12	
	Page No. 1/13	
	Page No. 1/14	3,600,000.00
	Page No. 1/15	2,750,000.00
	Page No. 1/16	2,250,000.00
	Page No. 1/17	
	Page No. 1/18	1,650,000.00
	Page No. 1/19	1,700,000.00
BILL No. 1 - PRELIMINARIES AND GENERAL CONDITIONS CARRIED TO GENERAL SUMMARY		18,950,000.00

Item	Description	Qty	Unit	Rate	Amount
<u>BILL NO.2 -BUILDING</u>					
<u>ELEMENT 1 - SUBSTRUCTURE</u>					
<u>(ALL PROVISIONAL)</u>					
A	Excavate oversite average 150mm deep to remove top soil and vegetable matter spread and levelled on site as directed	1,257	m ²	150.00	188,550.00
B	Excavate pit for column bases starting at oversite level maximum depth not exceeding 2.00m.	105	m ³	900.00	94,500.00
C	Excavate trench for foundation ditto	588	m ³	900.00	529,200.00
D	Backfilling with selected excavated material around walls etc.	459	m ³	250.00	114,750.00
E	Load up surplus excavated material and spread and levelled on site as directed.	234	m ³	350.00	81,900.00
F	Level and compact bottom of excavation to receive concrete.	629	m ²	150.00	94,350.00
G	Level roll and compact existing ground to receive new filling	1,032	m ²	150.00	154,800.00
H	Approved imported laterite filling in making up levels under slab well watered and compacted in 150mm layers.	413	m ³	2,000.00	826,000.00
J	Spray surfaces of all excavations and filling with approved anti-termite solution in accordance with manufacturer's printed instructions.	2,445	m ²	150.00	366,750.00
<u>Plain in-situ concrete (15N/mm2)</u>					
K	50mm blinding under column bases	95	m ²	1,250.00	118,750.00
L	50mm blinding under foundation	534	m ²	1,250.00	667,500.00
M	50mm blinding under ground floor slab.	1,032	m ²	1,250.00	1,290,000.00
N	Plain in-situ concrete (25N/mm2) foundation	8	m ³	32,000.00	256,000.00
	To collection				4,783,050.00

Item	Description	Qty	Unit	Rate	Amount
	<u>Substructure Cont'd</u>				
	<u>Reinforced in-situ concrete (25N/mm²) filled into formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately). In:</u>				
A	Wall bases	107	m ³	32,000.00	3,424,000.00
B	Column bases	19	m ³	32,000.00	608,000.00
C	Stub wall/beam	122	m ³	32,000.00	3,904,000.00
D	Stub columns	3	m ³	32,000.00	96,000.00
E	Entrance steps	2	m ³	32,000.00	64,000.00
F	150mm Ground slab	1,120	m ²	4,800.00	5,376,000.00
	<u>Reinforcement</u>				
	<u>Reinforcement</u>				
	<u>High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying wire etc. in:</u>				
	<u>Column Bases</u>				
G	25mm diameter bars	1,596	Kg	300.00	478,800.00
	<u>Wall bases</u>				
H	16-10mm diameter bars	5,487	Kg	300.00	1,646,100.00
	<u>Stub wall/beam</u>				
J	16-10mm diameter bars	9,175	Kg	300.00	2,752,500.00
	<u>Column starters</u>				
K	25-10mm diameter bars	450	Kg	300.00	135,000.00
	To collection				18,484,400.00

Item	Description	Qty	Unit	Rate	Amount
	<u>Substructure Cont'd</u>				
A	Single layer steel fabric mesh reinforcement Ref. A142 with 225mm minimum side and end laps (measured nett - no allowance made for laps) in bed.	1,120	m ²	1,000.00	1,120,000.00
	<u>Sawn formwork to:</u>				
B	Vertical sides of stub wall/beam	609	m ²	2,500.00	1,522,500.00
C	Vertical sides of stub columns	28	m ²	2,500.00	70,000.00
D	Edge of foundation 230mm wide	101	m	575.00	58,075.00
E	Edge of column base 300mm wide	114	m	750.00	85,500.00
F	Edge of wall base 300mm wide	480	m	750.00	360,000.00
G	Edge of Riser 150mm wide.	6	m	375.00	2,250.00
H	Edge of ground slab 150mm wide.	137	m	375.00	51,375.00
J	230mm "Sandcrete" hollow blockwalling in cement mortar (1:4) filled solid with concrete (15N/mm ²)	78	m ²	4,500.00	351,000.00
K	1000mm gauge polythene sheet as damp proof membrane laid with 300mm taped side and end laps.	1,032	m ²	350.00	361,200.00
	To collection				3,981,900.00

Item	Description	Qty	Unit	Rate	Amount
	<p><u>Under floor Drainage</u></p> <p>(Pipes and fittings, To be included in M&E Bills of Quantities.)</p> <p><u>Excavate trench for pipe not exceeding 150mm diameter starting at ground level maximum depth not exceeding 1.00m part backfill and consolidate and remainder load up and spread and level on site as directed.</u></p>				
A	Average 500mm deep	61	m	1,200.00	73,200.00
	<u>Plain in-situ concrete (25N/mm²)</u>				
B	Bed and surround to pipes not exceeding 150mm diameter, 150mm below, 150mm above and 500mm wide.	42	m	1,800.00	75,600.00
	<u>Plain in-situ concrete (25N/mm²) (Cont'd)</u>				
C	Bed and surround to pipes not exceeding 100mm diameter, 100mm below, 150mm above and 500mm wide.	19	m	1,500.00	28,500.00
D	Allow Provisional sum of <u>N2,500,000.00</u> for additional foundation works to be expended as directed by the PM/Architects.		sum		2,500,000.00
	To collection				2,677,300.00
	<p style="text-align: center;"><u>COLLECTION</u></p> <p style="text-align: center;">Page 2/1</p> <p style="text-align: center;">Page 2/2</p> <p style="text-align: center;">Page 2/3</p> <p style="text-align: center;">Page 2/4</p>				<p style="text-align: right;">4,783,050.00</p> <p style="text-align: right;">18,484,400.00</p> <p style="text-align: right;">3,981,900.00</p> <p style="text-align: right;">2,677,300.00</p>
	<p style="text-align: center;">ELEMENT 1</p> <p style="text-align: center;">SUBSTRUCTURE (ALL PROVISIONAL)</p> <p style="text-align: center;">TO BILL NO.2 MAIN SUMMARY</p>				29,926,650.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 2A</u>				
	<u>FRAMES</u>				
	<u>Reinforced in-situ concede (25N/mm²) filled into formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately) in:</u>				
A	Column	29	m ³	32,000.00	928,000.00
B	Floor beam	36	m ³	32,000.00	1,152,000.00
	<u>Reinforcement (All Provisional)</u>				
	<u>High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying, wire etc. in:</u>				
	<u>Columns</u>				
C	25-10mm diameter bars	7,975	Kg	300.00	2,392,500.00
	<u>Beams</u>				
D	25-10mm diameter bars	11,160	Kg	300.00	3,348,000.00
	<u>Sawn formwork to:-</u>				
E	Sides and soffit of beam	353	m ²	2,500.00	882,500.00
F	Vertical sides of column	286	m ²	2,500.00	715,000.00
	BILL NO.2 -ELEMENT 2A - FRAMES TO GROUP ELEMENT 2 SUMMARY				9,418,000.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 2B</u> <u>UPPER FLOOR</u>				
	<u>Reinforced in-situ concrete (25N/mm2) filled into formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately) in:</u>				
A	150mm horizontal suspended floor slab	110	m ²	4,800.00	528,000.00
B	200mm horizontal suspended floor slab	816	m ²	6,400.00	5,222,400.00
C	150mm suspended sloping slab as ramp	114	m ²	4,800.00	547,200.00
	<u>Reinforcement (All Provisional)</u>				
	<u>High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying, wire etc. in:</u>				
D	12mm diameter bars	10,098	Kg	300.00	3,029,400.00
E	10mm ditto	1,783	Kg	300.00	534,900.00
	<u>Sawn formwork to:</u>				
F	Horizontal soffit of suspended slab.	698	m ²	2,500.00	1,745,000.00
G	Sloping soffit of suspended slab	92	m ²	2,500.00	230,000.00
H	Edge of slab 200mm wide	159	m	500.00	79,500.00
J	Edge of slab 150mm wide	159	m	375.00	59,625.00
	<u>Stainless steel Railings</u>				
K	Supply and install 2mm thick, 48.4mm diameter round: stainless steel top rail on 42x3mm diameter stainless steel round baluster 900mm high complete with 5No. 12mm stainless midrails and associated fittings	22	m	60,000.00	1,320,000.00
L	Ditto but set raking in ramp	100	m	60,000.00	6,000,000.00
M	Supply and install 42x2mm wall hand rail with concealed associated fittings	15	m	23,000.00	345,000.00
	BILL NO.2 -ELEMENT 2B - UPPER FLOOR TO GROUP ELEMENT 2 SUMMARY.				19,641,025.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 2C</u> <u>ROOF</u>				
	<u>Reinforced in-situ concrete (25N/mm²) filled into formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately) in:</u>				
A	Upstand beam	10	m ³	32,000.00	320,000.00
B	Roof beam	22	m ³	32,000.00	704,000.00
C	150mm horizontal suspended gutter sole	135	m ²	4,800.00	648,000.00
D	200mm horizontal suspended roof slab.	143	m ²	6,400.00	915,200.00
E	150mm gutter wall	124	m ²	4,800.00	595,200.00
F	150mm Fascia	45	m ²	4,800.00	216,000.00
	<u>Reinforcement (All Provisional)</u> <u>High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying, wire etc. in:</u>				
	<u>Roof Slab</u>				
G	12-10mm diameter bars	5,291	Kg	300.00	1,587,300.00
	<u>Roof/UpstandBeam</u>				
H	25-10mm diameter bars	6,560	Kg	300.00	1,968,000.00
	<u>Gutter sole/wall</u>				
J	12-10mm diameter bars	7,524	Kg	300.00	2,257,200.00
	<u>Sawn formwork to:</u>				
K	Horizontal soffit of gutter sole	83	m ²	2,500.00	207,500.00
L	Horizontal soffit of roof slab	120	m ²	2,500.00	300,000.00
M	Vertical sides of upstand beam	83	m ²	2,500.00	207,500.00
N	Sides and soffit of roof beam	191	m ²	2,500.00	477,500.00
O	Vertical sides of gutter wall/fascia	337	m ²	2,500.00	842,500.00
P	Edge of roof slab 200mm wide.	49	m	500.00	24,500.00
Q	Edge of gutter sole 150mm wide	276	m	375.00	103,500.00
	To collection				11,373,900.00

Item	Description	Qty	Unit	Rate	Amount
	<u>0.70mm 'Tower' or approved equal colour coated longspan corrugated aluminium roofing sheet incorporating 60mm thick polyurethane insulation including aluminium drive screw, bolt and washers and laid in accordance with manufacturer's printed instruction and leave a watertight/weather proof finish.</u>				
A	Roofing fixed to steel purlins.	885	m ²	9,800.00	8,673,000.00
B	Roofing fixed to steel Trellis (provisional)	692	m ²	9,800.00	6,781,600.00
C	Ridge capping 600mm girth	98	m	5,100.00	499,800.00
D	Flashing 650mm girth.	181	m	7,475.00	1,352,975.00
E	Eaves angle 300mm girth	139	m	2,550.00	354,450.00
F	1mm thick colour coated thrice bent aluminium gutter 1500mm girth	130	m	12,750.00	1,657,500.00
	<u>4mm TNT scudoplast or approved equal green mineral finish water proofing roof finish torch bonded to surface treatment with approved primer and laid in accordance with manufacturer's instructions.</u>				
G	Membrane laid to falls and crossfalls on floated bed (measured separately)	131	m ²	5,000.00	655,000.00
H	Lining to gutter 1800mm girth	138	m	9,000.00	1,242,000.00
J	Skirting to roof slab 900mm girth	49	m	4,500.00	220,500.00
	<u>1200 Guage "Visqueen" or approved equal polythene sheet laid loose on floated bed (measured separately) with 300mm side and end laps (measured nett-no allowance made for laps)</u>				
K	Isolation layer laid to falls and cross falls	131	m ²	1,800.00	235,800.00
L	50mm thick polystyrene or equal and approved high density insulation laid loose to falls and cross falls on waterproof membrane (measured separately) provisional	131	m ²	4,800.00	628,800.00
	To collection				22,301,425.00

Item	Description	Qty	Unit	Rate	Amount
	<u>Beds and Backings</u>				
	<u>Cement and sand (1:3)</u>				
A	50mm (average) water proof floated bed laid to falls and cross falls.	214	m ²	2,000.00	428,000.00
B	15mm water proof floated backing	169	m ²	1,200.00	202,800.00
C	50 x 50mm water proof Angle fillet.	324	m	500.00	162,000.00
	<u>Trusses</u>				
D	Include the P.C. sum of <u>N11,500,000.00</u> for Nigerite Ultraspan roof trusses to be executed complete by the sub-contractor.		sum		11,500,000.00
E	<u>Add for profit</u>		4%		460,000.00
F	Allow for attendances		sum		230,000.00
G	"CSA Interior" or equal and approved high quality "Danpalon" translucent polycarbonate skylight panels, 8mm thick fixed to steel structures (provisional)		m ²	20,000.00	Rate only
H	0.70mm 'Tower' High quality translucent sheet fixed to steel structures on Trellis (provisional)	692	m ²	11,650.00	8,061,800.00
	<u>Trellis</u>				
J	Include provisional sum of <u>N17,500,000.00</u> for steel Trellis to be expended as directed by the Architect		sum		17,500,000.00
	To collection				38,544,600.00

Item	Description	Qty	Unit	Rate	Amount
	<u>COLLECTION</u>				
	Page 2/7				11,373,900.00
	Page 2/8				22,301,425.00
	Page 2/9				38,544,600.00
	Page 2/10				-
	BILL NO.2 - ELEMENT 2C - ROOF TO GROUP ELEMENT 2 SUMMARY				72,219,925.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 2D - STAIRCASES</u>				
	<u>Reinforced in-situ concrete (25N/mm²) filled to formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately) in:</u>				
A	Staircase	20	m ³	32,000.00	640,000.00
B	150mm suspended landing	10	m ²	4,800.00	48,000.00
	<u>Reinforcement (Provisional)</u>				
	<u>High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying wire etc.</u>				
C	16mm diameter bars	560	Kg	300.00	168,000.00
D	12mm ditto	1,871	Kg	300.00	561,300.00
E	10mm ditto	312	Kg	300.00	93,600.00
	<u>Sawn formwork to:</u>				
F	Horizontal soffit of suspended landing	10	m ²	2,500.00	25,000.00
G	Sloping soffit of staircase	38	m ²	2,500.00	95,000.00
H	Curved soffit of staircase	12	m ²	2,500.00	30,000.00
J	Open string of staircase.	18	m ²	2,500.00	45,000.00
K	Ditto but curved	5	m ²	2,500.00	12,500.00
L	Edge of riser 175mm wide	125	m	438.00	54,750.00
M	Edge of landing 150mm wide.	22	m	375.00	8,250.00
	<u>Stainless steel railings (provisional)</u>				
N	Supply and install 2mm thick, 48.4mm diameter round: stainless steel top rail on 42x3mm diameter stainless steel round baluster 900mm high complete with 5No. 12mm stainless midrails and associated fittings	40	m	60,000.00	2,400,000.00
O	Ditto but curved	28	m	60,000.00	1,680,000.00
P	Supply and install 42x2mm stainless steel wall handrails with concealed associated fittings	15	m	23,000.00	345,000.00
	To collection				6,206,400.00

Item	Description	Qty	Unit	Rate	Amount
	<u>Staircase Cont'd</u>				
	<u>15mm cement and sand (1:3) smooth rendering on:</u>				
A	Horizontal soffit of landing	10	m ²	1,200.00	12,000.00
B	Sloping soffit of staircase	38	m ²	1,200.00	45,600.00
C	Curved soffit of staircase	12	m ²	1,200.00	14,400.00
D	Open string of staircase	18	m ²	1,200.00	21,600.00
E	Ditto but curved	5	m ²	1,200.00	6,000.00
F	Prepared and apply one skim coat of gypsum plaster on rendered surfaces sanded smooth	83	m ²	1,200.00	99,600.00
	<u>Tiling Works</u>				
	<u>10mm approved size fully vitrified tiles (p.c. N6,500/m² ex-store) laid to approved pattern on screeded bed and backing (measured separately) and bedded and jointed in cement mortar and jointed in white cement on:-</u>				
G	Tiling to landings	10	m ²	9,300.00	93,000.00
H	Tiling to edge of Riser 175mm wide.	125	m	1,630.00	203,750.00
J	Tiling to tread 275mm wide including chamfered edge.	117	m	2,560.00	299,520.00
K	Skirting 100mm wide to landing.	10	m	930.00	9,300.00
L	Ditto in short length to profile of tread and risers 100mm wide	16	m	930.00	14,880.00
	<u>Beds and Backing</u>				
	<u>Cement and Sand (1:3)</u>				
M	40mm screeded bed on landing	10	m ²	1,800.00	18,000.00
N	40mm screeded bed to tread 275mm wide.	117	m	720.00	84,240.00
O	15mm screeded backing to riser 175mm wide.	125	m	315.00	39,375.00
P	Ditto to skirting 100mm wide.	26	m	180.00	4,680.00
	To collection				965,945.00

Item	Description	Qty	Unit	Rate	Amount
	<u>Staircase Cont'd</u>				
	<u>Prepare and apply one mist coat and three full coats of 'Luxol' or approved emulsion paint on</u>				
A	Sloping soffit of staircase.	38	m ²	1,250.00	47,500.00
B	Curved soffit of staircase	12	m ²	1,250.00	15,000.00
C	Horizontal soffit of landing.	10	m ²	1,250.00	12,500.00
D	Open string of staircase.	23	m ²	1,250.00	28,750.00
	To collection				103,750.00
	<u>COLLECTION</u>				
	Page 2/11				6,206,400.00
	Page 2/12				965,945.00
	Page 2/13				103,750.00
	BILL NO.2 - ELEMENT 2D - STAIRCASES TO GROUP ELEMENT 2 SUMMARY.				7,276,095.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 2E</u>				
	<u>EXTERNAL WALLS</u>				
	<u>Reinforced in-situ concrete, (25N/mm²) filled into formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately) in:</u>				
A	Lintel (provisional)	3	m ³	32,000.00	96,000.00
	<u>Reinforcement (Provisional)</u>				
	<u>High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying, wire etc. in:</u>				
B	16-10mm diameter bars	495	Kg	300.00	148,500.00
	<u>Sawn formwork to:</u>				
C	Sides and soffit of lintel (provisional)	43	m ²	2,500.00	107,500.00
	<u>"Sandcrete" blockwalling in cement mortar (1:4)</u>				
D	100mm Solid blockwalling as planter wall	32	m ²	3,000.00	96,000.00
E	230mm hollow blockwalling	162	m ²	4,100.00	664,200.00
F	Extra over 230mm hollow blockwalling for solid top course.	371	m	550.00	204,050.00
G	4 TNT Scudoplast or approved membrane as before described as lining to planter	38	m ²	5,000.00	190,000.00
H	Dishing to outlet	10	No	1,000.00	10,000.00
	<u>Moulded Glass Fibre</u>				
J	10mm thick lining to planter laid on waterproof membrane (measured separately)	38	m ²	5,000.00	190,000.00
K	100mm diameter hole for drainage fitting	10	No	1,000.00	10,000.00
L	230mm "sandcrete" hollow blockwalling in cement mortar (1:4) / hydraform (in lieu of REW) provisional	1,418	m ²	4,800.00	6,806,400.00
	BILL NO.2 ELEMENT 2E - EXTERNAL WALLS				
	TO GROUP ELEMENT 2 SUMMARY				8,522,650.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 2F</u>				
	<u>WINDOWS AND EXTERNAL DOORS</u>				
	<u>Supply and fix complete the following first quality 'Nigalex' or approved equal purpose made powder coated aluminium units glazed with and including 6mm thick tinted glass, subframes etc.</u>				
	<u>Window/Skywall</u>				
A	Window overall size 500x3300mm high (W3)	74	No	57,750.00	4,273,500.00
B	Ditto size 500x3600mm high (W4)	6	No	63,000.00	378,000.00
C	Ditto size 500x3900mm high (W5)	40	No	68,250.00	2,730,000.00
D	Ditto size 900x3000mm high (W2)	8	No	94,500.00	756,000.00
E	Ditto size 3000x3000mm high (W9)	5	No	315,000.00	1,575,000.00
	<u>Doors</u>				
F	Door overall size 900x2550mm high (D1)	7	No	135,000.00	945,000.00
G	Ditto size 1727x2032mm high (D3)	5	No	195,000.00	975,000.00
H	Ditto size 1800x3820mm high (D2)	1	No	380,000.00	380,000.00
	BILL NO.2 - ELEMENT 2F WINDOWS AND EXTERNAL DOORS. TO GROUP ELEMENT 2 SUMMARY				12,012,500.00

Item	Description	Qty	Unit	Rate	Amount
	ELEMENT 2G INTERNAL WALLS				
	<u>Reinforced in-situ concrete, (25N/mm2) filled into formwork and well tamped, packed and vibrated around steel reinforcement (formwork and reinforcement measured separately) in:</u>				
A	Lintel	4	m ³	32,000.00	128,000.00
	<u>Reinforcement (Provisional) High tensile high yield twisted steel bars to B.S. 4449/4466 including all hooks, bends, distance blocks, tying, wire etc. in:</u>				
B	16-10mm diameter bars	656	Kg	300.00	196,800.00
C	Sawn formwork to sides and soffit of lintel.	58	m ²	2,500.00	145,000.00
	<u>"Sandcrete" blockwalling in cement mortar (1:4)</u>				
D	150mm hollow blockwalling	917	m ²	3,800.00	3,484,600.00
E	230mm hollow blockwalling	237	m ²	4,100.00	971,700.00
F	Extra over 150mm hollow blockwalling for solid top course.	353	m	450.00	158,850.00
G	Extra over 230mm ditto.	102	m	550.00	56,100.00
H	6mm diameter galvanized mild steel wall ties 600mm long with one end cast into concrete and other end bent and temporarily fixed into formwork and later straightened out and built into joint of blockwork (Provisional)	460	Nr.	580.00	266,800.00
J	230mm "sandcrete" hollow blockwalling in cement mortar (1:4) / hydraform (in lieu of REW)	385	m ²	4,800.00	1,848,000.00
	BILL NO.2 - ELEMENT 2G - INTERNAL WALLS TO GROUP ELEMENT 2 SUMMARY				7,255,850.00

Item	Description	Qty	Unit	Rate	Amount
	ELEMENT 2H INTERNAL DOORS				
	<u>45mm thick high standard laminated plywood flush doors lipped all round with hardwood complete with frames, Architraves and ironmongery</u>				
A	Door to suit structural opening size 1020x2370mm high (D4B)	39	No	120,000.00	4,680,000.00
B	Ditto size 925x2025mm high but sliding (D5)	4	No	85,000.00	340,000.00
	<u>Supply and fix complete the following first quality 'Nigalex' or approved equal purpose made powder coated aluminium units glazed with and including 6mm thick tinted glass, subframes etc.</u>				
C	Door to suit structural opening size 900x2550mm high (D1)	11	No	140,000.00	1,540,000.00
D	Door size 1020x2370mm high (D4B)	38	No	145,000.00	5,510,000.00
	BILL NO.2 - ELEMENT 2H -INTERNAL DOORS TO GROUP ELEMENT 2 SUMMARY				12,070,000.00

Item	Description	Qty	Unit	Rate	Amount
	<u>BILL NO.2 - GROUP ELEMENT 2 - SUPERSTRUCTURE</u> <u>SUMMARY</u>				
		<u>PAGE NO</u>			
	2A - FRAMES	2/5			9,418,000.00
	2B - UPPER FLOORS	2/6			19,641,025.00
	2C - ROOF	2/10			72,219,925.00
	2D - STAIRCASES	2/13			7,276,095.00
	2E - EXTERNAL WALLS	2/14			8,522,650.00
	2F - WINDOWS AND EXTERNAL DOORS,	2/15			12,012,500.00
	2G - INTERNAL WALLS	2/16			7,255,850.00
	2H - INTERNAL DOORS.	2/17			12,070,000.00
	BILL NO.2 - GROUP ELEMENT 2 - SUPERSTRUCTURE TO BILL NO.2 MAIN SUMMARY				148,416,045.00

Item	Description	Qty	Unit	Rate	Amount
	ELEMENT 3A INTERNAL WALL FINISHINGS				
	<u>IN-SITU FINISHINGS</u>				
	<u>15mm cement and sand (1:3) smooth rendering with "impermo" or approved equal water proof additive on:-</u>				
A	Walls		m ²	1,500.00	Rate only
B	Walls in narrow with 100 - 200mm wide	-	m	300.00	Rate only
	<u>15mm cement and sand (1:3) smooth rendering on:</u>				
C	Walls	3,682	m ²	1,200.00	4,418,400.00
D	Walls in narrow width not exceeding 100mm wide.	347	m	120.00	41,640.00
E	Ditto 100 - 200mm wide	1,104	m	240.00	264,960.00
F	Prepare and apply one skim coat of gypsum plaster on rendered walls sanded smooth	3,938	m ²	950.00	3,741,100.00
	<u>TILE, SLAB AND BLOCK FINISHINGS</u>				
	<u>6mm approved size glazed ceramic tiles (p.c. N4,250/m² ex-store) laid to approved pattern on screeded backing (measured separately bedded and jointed in cement mortar and pointed in coloured cement on:-</u>				
G	Tiling to wall	427	m ²	6,000.00	2,562,000.00
H	Tiling to reveal 100-200mm wide including rounded edge.	-	m	1,200.00	1,200.00
J	Tiling to end of wall 100mm wide.	-	m	600.00	600.00
	<u>Beds and Backings</u> <u>Cement and Sand (1:3)</u>				
K	15mm screeded backing	427	m ²	1,200.00	512,400.00
L	Ditto in narrow width 100-200mm wide.	-	m	240.00	240.00
M	Ditto end of wall 100mm wide.	-	m	1,200.00	1,200.00
	To collection				11,543,740.00

Item	Description	Qty	Unit	Rate	Amount
A	<u>Internal Wall Finishings Cont'd</u> <u>Prepare and apply one mist coat and three full coats of "Luxol" or approved emulsion paint on rendered:-</u> Walls	3,938	m ²	1,250.00	4,922,500.00
	To collection				4,922,500.00
	<u>COLLECTION</u> Page 2/19 Page 2/20				11,543,740.00 4,922,500.00
	BILL NO.2 - ELEMENT 3A - INTERNAL WALL FINISHINGS TO GROUP ELEMENT 3 SUMMARY				16,466,240.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 3B</u> <u>INTERNAL FLOOR FINISHINGS</u>				
	<u>Tiling Works</u>				
	<u>10mm approved size fully vitrified tiles (p.c. N6,500/m² ex-store) laid to approved pattern on screeded bed (measured separately) and bedded and jointed in cement mortar and pointed in white cement on:-</u>				
A	Tiling to floors	1,623	m ²	9,300.00	15,093,900.00
B	Ditto to falls in ramp	92	m ²	9,300.00	855,600.00
C	Tiling to skirting 100mm wide.	3,913	m	930.00	3,639,090.00
D	10mm approved size non-slip ceramic tiles (pc N4,250/m ²) on screeded bed (measured separately)	55	m ²	6,000.00	330,000.00
	<u>Bed s and Backings</u> <u>Cement and Sand (1:3)</u>				
E	42mm screeded bed.	1,678	m ²	1,800.00	3,020,400.00
F	42mm ditto to falls in ramp	92	m ²	1,800.00	165,600.00
G	15mm screeded backing not exceeding 100mm wide.	3,913	m	120.00	469,560.00
	<u>Vinyl flooring (provisional)</u>				
H	2mm thick flexible PVC commercial flooring (obtainable from fittings finishes Tel: 0803 303 2615, 0803 381 8101) laid with approved adhesive on and including self levelling screed.	-	m ²	25,000.00	Rate only
	BILL NO.2 - ELEMENT 3B - INTERNAL FLOOR FINISHINGS TO GROUP ELEMENT 3 SUMMARY				23,574,150.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 3C</u>				
	<u>INTERNAL CEILING FINISHINGS</u>				
	<u>IN-SITU FINISHINGS</u>				
	<u>15mm cement and sand (1:3) smooth rendering on:</u>				
A	Horizontal soffit of concrete slab.	389	m ²	1,200.00	466,800.00
B	Prepare and apply one skim coat of gypsum plaster on rendered concrete surfaces sanded smooth	389	m ²	1,200.00	466,800.00
	<u>Suspended Ceiling</u>				
C	"Armstrong" suspended ceiling consisting 600x600mm mineral fibre acoustic tiles with exposed aluminium grids on and including galvanized steel adjustable hangers fixed to concrete or steel structures	1,234	m ²	7,000.00	8,638,000.00
	<u>Prepare and apply one mist coat and three full coats of 'Luxol' or approved emulsion paint on rendered:</u>				
D	Concrete soffit	389	m ²	1,250.00	486,250.00
	BILL NO.2 - ELEMENT 3C - INTERNAL CEILING FINISHINGS TO GROUP ELEMENT 3 SUMMARY				10,057,850.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELEMENT 3D</u>				
	<u>EXTERNAL WALL FINISHINGS</u>				
	<u>15mm cement and sand (1:3) smooth external rendering with "Impermo" or approved equal waterproof additive on:</u>				
A	Walls	1,418	m ²	1,500.00	2,127,000.00
B	Planter walls	32	m ²	1,500.00	48,000.00
C	Planter walls in narrow widths not exceeding 100mm wide.	43	m	150.00	6,450.00
	<u>Prepare and apply one mist coat and three full coats of 'Luxol' or approved emulsion paint on:</u>				
D	Rendered walls and other surfaces	1,454	m ²	1,250.00	1,817,500.00
E	Prepare and apply approved weather proof sealant on surfaces of Rammed Earth Walls	-	m ²	1,250.00	Rate only
	BILL NO.2 - ELEMENT 3D - EXTERNAL WALL FINISHINGS TO GROUP ELEMENT 3 SUMMARY				3,998,950.00

Item	Description	Qty	Unit	Rate	Amount
<u>ELEMENT 3E</u>					
<u>EXTERNAL FLOOR FINISHINGS</u>					
<u>Tiling Works</u>					
<u>10mm approved size fully vitrified tiles (p.c. N6,500/m² ex-store) as before described on:-</u>					
A	Tiling to floors	130	m ²	9,300.00	1,209,000.00
B	Tiling to entrance steps riser 150mm wide.	11	m	1,395.00	15,345.00
C	Tiling to entrance steps tread 275mm wide including chamfered edge.	9	m	2,560.00	23,040.00
D	Tiling to skirting 100mm wide.	24	m	930.00	22,320.00
<u>Beds and Backings</u>					
<u>Cement and Sand (1:3)</u>					
E	42mm screeded bed	130	m ²	1,800.00	234,000.00
F	15mm screeded backing not exceeding 300mm wide.	4	m ²	1,200.00	4,800.00
G	25mm screeded bed on tread not exceeding 300mm wide.	3	m ²	1,500.00	4,500.00
BILL NO.2 - ELEMENT 3E - EXTERNAL FLOOR FINISHINGS TO GROUP ELEMENT 3 SUMMARY					1,513,005.00

Item	Description	Qty	Unit	Rate	Amount
	<p align="center"><u>BILL NO.2 - GROUP ELEMENT 3 - INTERNAL AND EXTERNAL FINISHINGS</u></p>				
	<p align="center"><u>SUMMARY</u></p>				
		<u>PAGE</u>			
	3A - INTERNAL WALL FINISHINGS	2/20			16,466,240.00
	3B - INTERNAL FLOOR FINISHINGS	2/21			23,574,150.00
	3C - INTERNAL CEILING FINISHINGS	2/22			10,057,850.00
	3D - EXTERNAL WALL FINISHINGS	2/23			3,998,950.00
	3E - EXTERNAL FLOOR FINISHINGS	2/24			1,513,005.00
	<p align="center">BILL NO.2 - GROUP ELEMENT 3 - INTERNAL AND EXTERNAL FINISHINGS TO BILL NO.2 MAIN SUMMARY</p>				55,610,195.00

Item	Description	Qty	Unit	Rate	Amount
	<u>MECHANICAL INSTALLATIONS</u>				
	<u>Include the P.C sum of N20,000,000.00 for mechanical installations comprising the followings to be executed complete by a Domestic/Nominated sub-contractor</u>				20,000,000.00
A	Sanitary Appliances and accessories				
B	Hot and Cold Water Supply				
C	Soil, waste/Rain water and vent pipes Installations				
D	Fire Hose reel and fighting equipments				
E	<u>Add for profit</u>		4%		800,000.00
F	Allow for Attendances		sum		400,000.00
G	Allow provisional sum of N500,000.00 for builder's work in connection with mechanical installations to be expended as directed by the Architect		sum		500,000.00
	MECHANICAL INSTALLATIONS TO GROUP ELEMENT 4 SUMMARY				21,700,000.00

Item	Description	Qty	Unit	Rate	Amount
	<u>AIR-CONDITIONING AND VENTILATION INSTALLATIONS</u>				
	<u>Include the P.C sum of N45,000,000.00 for Air-conditioning and ventilation installations comprising the followings to be executed complete by a Domestic/Nominated sub-contractor</u>				45,000,000.00
A	Split/Package units				
B	Condensate and Refrigerant pipeworks and electrical cabling.				
C	Extractor fans.				
D	<u>Add</u> for profit		4%		1,800,000.00
E	Allow for Attendances		sum		900,000.00
G	Allow provisional sum of N750,000.00 for builder's work in connection to be expended as directed by the Architect		sum		750,000.00
	AIR-CONDITIONING AND VENTILATION INSTALLATIONS TO GROUP ELEMENT 4 SUMMARY				48,450,000.00

Item	Description	Qty	Unit	Rate	Amount
	<u>ELECTRICAL INSTALLATIONS</u>				
	<u>Include the P.C sum of N65,000,000.00 for Electrical installations comprising the followings to be executed complete by a Domestic/Nominated sub-contractor</u>				65,000,000.00
A	Wiring of points (Conduiting)				
B	Accessories				
C	Luminaires				
D	LV Control and Protection				
E	Fire Alarm System.				
F	Cabling				
G	Telephone System.				
H	Lightning Protection				
J	Security/Surveillance System				
K	<u>Add for profit</u>		4%		2,600,000.00
L	Allow for Attendances		sum		1,300,000.00
M	Allow provisional sum of N1,000,000.00 for builder's work in connection to be expended as directed by the Architect		sum		1,000,000.00
	ELECTRICAL INSTALLATIONS TO GROUP ELEMENT 4 SUMMARY				69,900,000.00

Item	Description	Qty	Unit	Rate	Amount
	<p style="text-align: center;"><u>BILL NO.2 - GROUP ELEMENT 4</u> SERVICES</p> <p style="text-align: center;"><u>SUMMARY</u></p> <p>MECHANICAL INSTALLATIONS</p> <p>AIR-CONDITIONING AND VENTILATION INSTALLATIONS</p> <p>ELECTRICAL INSTALLATIONS</p>	<p><u>Page</u></p> <p>2/26</p> <p>2/27</p> <p>2/28</p>			<p>21,700,000.00</p> <p>48,450,000.00</p> <p>69,900,000.00</p>
	<p>BILL NO.2 - GROUP ELEMENT 4 - SERVICES TO BILL NO.2 MAIN SUMMARY</p>				<p>140,050,000.00</p>

Item	Description	Qty	Unit	Rate	Amount
	<u>BILL NO.2- BUILDING</u>				
	<u>MAIN SUMMARY</u>				
		<u>Page</u>			
	<u>ELEMENT 1</u> - SUBSTRUCTURE	2/4			29,926,650.00
	<u>GROUP ELEMENT 2</u> - SUPERSTRUCTURE	2/18			148,416,045.00
	<u>GROUP ELEMENT 3</u> -INTERNAL AND EXTERNAL FINISHINGS	2/25			55,610,195.00
	<u>GROUP ELEMENT 4</u> - SERVICES	2/29			140,050,000.00
	BILL NO.2 - BUILDING TO GENERAL SUMMARY				374,002,890.00

Item	Description	Qty	Unit	Rate	Amount
BILL NO.3					
<u>EXTERNAL WORKS</u>					
<u>Site Clearance</u>					
A	Clear site of under growth and grub up bushes etc. burn and clear away from site	10,000	m2	120.00	1,200,000.00
B	Cut down small tree grub up root and cart away from site	-	No	1,500.00	Rate only
C	Ditto over 600 but not exceeding 900mm girth	-	No	900.00	Rate only
D	Ditto over 900 but not exceeding 1200mm girth	-	No	1,000.00	Rate only
<u>Drainage</u>					
E	Septic tank size 2500x1500x1800mm deep internally and 2 No. Attached manhole size 450 x 450 x 450mm deep internally constructed of 150mm plain in-situ concrete bed and 230mm solid block walls and 100m precast concrete baffle 600mm high and 1.05m long set 75mm into either wall, the two attached manhole having 230mm (average) concrete benching and with 100mm diameter half round channel formed in same, septic tank having 50mm (average) cement and sand screeded floor trowelled to falls rendered smooth (1:3) and covered with 100mm precast concrete cover slab reinforced with 10mm diameter high tensile bars reinforcement both ways at convenient centres including all necessary excavation and disposal etc.	2	No.	300,000.00	600,000.00
F	Soakaway pit size 2000 x 2000 x 1500mm deep internally constructed of 230mm hollow block laid on side on 675 x 230mm concrete (20N/mm ²) foundation for a height 900mm the top constructed of 230mm solid blockwork and capped slab reinforced with 10mm diameter high tensile bar reinforcement both ways at convenient centres, support at mid span with one 230x230mm concrete beam 2.25m long reinforced with 4No. 12mm diameter high tensile bar and 10mm stirrups at 250mm centres and with 150mm layer of broken stones and rubbles in bottom of soakaway for a width of 600mm depth of 1.13m including all formwork, excavation, backfilling and ramming and disposal of surplus excavated material.	2	No.	250,000.00	500,000.00
G	Manhole size 450 x 450 x 450mm (average) internally including all necessary covers benching etc.	20	No.	20,000.00	400,000.00
H	Include the provisional sum of N300,000.00 for pipe runs to be expended as directed by the Architect.		sum		300,000.00
J	Include provisional sum N15,000,000.00 for Driveways, Parkings, Pavings and Landscaping to be expended as directed by the Architect				15,000,000.00
K	Include provisional sum of N18,500,000.00 for site stormwater drainage channels to be expended as directed by the Architects				18,500,000.00
BILL NO.3-EXTERNAL WORKS TO GENERAL SUMMARY					36,500,000.00

<u>GENERAL SUMMARY</u>				
<u>Page</u>				
1/20	BILL NO.1 - GENERAL CONDITIONS AND PRELIMINARIES			18,950,000.00
,2/30	BILL NO.2 - BUILDING			374,002,890.00
3/1	BILL NO.3 - EXTERNAL WORKS			36,500,000.00
				429,452,890.00
	Add: for Insurance against liability for injury to persons and property as Condition of Contract Clause 18			
	Add:for insurance against inability for injury to persons and property as Conditions of Contract Clause 19			
	Include the provisional sum of <u>N250,000.00</u> (Two hundred and fifty thousand naira only) for Insurance in accordance with Clause 19.2.1 of the Conditions of Contract.			250,000.00
	<u>ADD</u> for insurance for the works against fire etc as Conditions of Contract Clause 20			250,000.00
	<u>ADD</u> for Water for the works			900,000.00
	SUB-TOTAL - 1			430,852,890.00
	Allow for Contingencies to be expended in whole or in part or to be omitted entirely from the contract (5%)			21,542,644.50
	SUB-TOTAL - 2			452,395,534.50
	<u>ADD</u> Value Added Tax (VAT) - 5%			22,619,776.73
	TOTAL CARRIED TO FORM OF TENDER.			475,015,311.23

DAYWORKS

The Contractor is to insert below, the percentage he required to be added on "Labour " and "Materials" for works valued under Clause 11.5.1.4 of Conditions of Contract.

Percentage shall be held to apply only to work authorized to be carried out on daywork during the currency of the contract.

Those quoted at (i) will be held to apply to such dayworks as are executed prior to the certified date of practical completion, those quoted at (ii) will be held to apply to such dayworks are executed during the maintenance period.

In bringing work to account as Daywork the following rules will be applied:-

1. The percentages to be added to "Labour" and "Materials" shall be deemed to include:-
 - (a) For the use and repair and sharpening of tools, and for ordinary plant, stagings, tarpaulins and other coverings and for similar items which may be in use generally (Except mechanically operated plant, for which rates have been specified in Clause 6 (see page D/2)
 - (b) For all insurances, establishment charges and profit
 - (c) For all emoluments and expenses payable by the Contractor to work people engaged upon or in connection with the works and current at the date of Tender and for all bonuses, incentive and other payments and all other obligations and liabilities of the Contractor in connection with works
2. The net amount of wages to which the percentage will be applied will be calculated on the authorized basic rates
3. The net amount of wages to which the percentage will be applied will be limited to the Wages of personnel employed by the Contractor in actual manual labour whether skilled or unskilled.
4. The time for working gangers (i.e. men actually working with their hands) will be allowed at the rate of the men they are supervising. Whether craftsmen or labourers.

DAYWORKS (cont'd)

- 5. The cost of materials to which the percentage will be applied, will be the market prices of materials ruling at the date of execution of the daywork. Cash discount not exceeding 5% will be retained by the Contractor. All trade discounts will be allowed to the Employer

- 6. Payment for mechanically operated plant used in Daywork will be at the rates approved for Plant, Vehicles & Equipments, by the Federal Ministry of Works.

The rate shall be deemed to include establishment charges and profit and all other costs and charges in connection with the hire of mechanically operated plant, except operators, whose time will be brought to account under "Labour"

No percentage will be applied to amounts paid for mechanically operated plant.

LABOUR

ADD to the net amount of wages paid to workmen when employed on daywork in accordance with the rules and for the matters above mentioned.

- (i) Percent10..... %

- (ii) Percent10..... %

MATERIALS

ADD To the cost of materials used in daywork, in accordance with the rules and for the matters above mentioned.

- (i) Percent10..... %

- (ii) Percent10..... %

SCHEDULE OF BASIC PRICES
(TO BE COMPLETED BY TENDERERS)

The Contractor has stated below, the rates of labour and market prices of materials current at the date of tender.

The list of materials shall be restricted to those, which are individually important elements of the Contract.

Receipts, invoices, wages sheets, time sheets, labour and material allocation schedules specifying activities performed or for which used must be furnished in support of any adjustments. Only the net fluctuation in prices will be taken into account. Any difference between the basic prices payable, which are due to purchasing in small quantities or any other cause other than genuine market fluctuation will not be the subject of adjustment.

Materials not listed will not be subject to adjustment.

LABOUR

The rates shall be those published by the National Joint Industrial Council (NJIC) for each category of workforce based on the approval of the Federal Government of Nigeria.

Labourers	₦ 2,000.00 per day (All-in)
Artisans (non-trade tested)	₦ 2,500.00 per day (All-in)
Artisans (trade tested)	₦ 3,000.00per day (All-in)

MATERIAL	BASIC PRICES AND UNIT (DELIVERED TO SITE)	SOURCE OF SUPPLY
Cement	₦2,600/bag	OPEN MARKET
Sharp sand	₦35000/20ton	“
Soft sand	₦36000/20ton	“
Laterite filling	₦1,500/m3	“
Granite	₦6,000/ton	“
Reinforcements	₦220,000/ton	“
Block 9”	₦200/no	“
Block 6”	₦180/no	“
Marine board	₦9,000/sheet	“
1x12x12	₦1,200/Length	“
2x3	₦450/Length	“

Should it become manifest, after the signing of the contract, the basic price inserted by the contractor was not the current market price of the material at the date of tender, the error shall be corrected and any price fluctuation shall be dealt with as if the true current market price has been inserted in lieu of the erroneous basic price.

We declare that our various rates and prices are based on the above schedule of basic prices and will, if required, provide evidence of the prices shown.

CONTRACTOR’S SIGNATURE:.....

DATE:.....

APPENDIX "A"
LIST OF PRIME COST AND PROVISIONAL SUMS

ITEM	DESCRIPTION	PROVISIONAL SUM	P.C. SUM
2/4/D	Additional Foundation Works	2,500,000.00	-
2/9/D	Ultraspan galvanized steel roof trusses	-	11,500,000.00
2/9/J	Steel Trellis	17,500,000.00	-
2/26	Mechanical Installations	-	20,000,000.00
2/26/G	Builder's work with Mechanical Installations	500,000.00	-
2/27	A/C and Ventilation Installations	-	45,000,000.00
2/27/G	Builder's work with A/C Installations	750,000.00	-
2/28	Electrical Installations		65,000,000.00
2/28/M	Builder's work with electrical Installations	1,000,000.00	-
3/1/H	Drainage pipe runs	300,000.00	-
3/1/J	Driveway etc.	15,000,000.00	
3/1/ k	Stormwater drainage channels	18,500,000.00	
GS/1	Insurance clause 19.2.1	250,000.00	-
GS/1	Contingencies	21,542,644.50	
		77,842,644.50	141,500,000.00
		Total	₦219,342,644.50