

STANDARD MATERIAL SPECIFICATIONS

GENERAL

Materials to BS

- 001 Materials shall, so far as obtainable, used in the works shall comply with the requirements of the latest British Standard issued by the British Standard Institution and the Contractor shall produce all necessary certificates to substantiate this fact if so requested by the Consultants. Materials shall be of the best quality unless otherwise described.

Workmanship

- 002 Workmanship generally shall be of the highest standard obtainable and to the entire satisfaction of the Consultants, and in all cases where a British Standard 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.

New Materials

- 003 The whole of the materials used in the Works shall be new unless otherwise described and be approved by the Consultants.

Proprietary Materials

Materials specified of proprietary manufacture may be substituted by materials of different manufacture provided that such substitutions are in all respects equal to the original specification and that the consultant's prior written approval is obtained to all substitutions effected. All proprietary materials are to be used, fixed or applied in accordance with the manufacturer's written or printed instructions. Where materials are substituted at the Contractor's request, no upward variation in price will be obtained. However, where the substituted material costs less than the specified, a commensurate reduction in the unit rate shall be effected by the Consultants.

Conflicting descriptions or specifications

- 005 In the event of the detailed description of any measured item or group of items in the Bills of Quantities conflicting with the general specification clauses contained in these Preambles and Specifications, the detailed description of the measured work shall take precedence.
- 006 In the event of these Trade preambles conflicting with the provisions of any Specification drawing forming part of the Contract or with any specification notes on the Contract Drawings, then in either case the latter shall take precedence.

Preambles apply to all trades

- 007 The Trade Preambles 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 preambles apply equally to External Works.

Other Items

- 008 Throughout unless expressly stated otherwise all items which are lapped are measured net and the Contractor is to include in his prices for the additional material, labour, plant and overheads in the laps.
- 009 The works directed, selected, rejected, required, approved, satisfied (satisfactory), imply the Consultant's direction, selection, rejection, requirements, approval, and satisfaction.

- 010 The term 'plugged' shall mean plugging concrete or blockwork with proprietary plugs and screwing at no more than 900mm centres or securing with rivets fired from a cartridge hammer at not more than 1200mm centres or securing to dovetailed tantalised timber fillets cast into concrete. Timber plugs will not be allowed.
- 011 All work described as screwed is to be fixed with brass screws unless otherwise described.
- 012 It is possible that in a few instances items specified hereinafter have no counterpart in the measured work. In these cases, the particular items are to be ignored.
- 013 All pipe tubing sizes refer to the internal diameter of circular pipes tubing unless otherwise described.
014. in each section of these Trade Preambles. The Contractor is instructed to include various items in his rates as deviation from the method of measurement. These items are mainly labour which should have been measured or described in accordance with the Standard Method of Measurement of Building Works issued by the R.I.C.S. or N.I.Q.S., mentioned in the Conditions of Contract and which have been deemed to be included with other measured items for brevity.
015. Where two dimensions in a description are separated by a hyphen, e.g. 150-225mm this shall be assumed to mean 'over 150mm but not exceeding 225mm' etc
016. Where an item is written short it shall be deemed to mean that the item is 'extra over' the preceding item.

EXCAVATION AND EARTHWORKS

Generally

- 017 Before commencing work on the site the Contractor is to inform the Consultants and ascertain the extent of the site clearance required.
- 018 Materials arising from site clearance and excavations are to become the property of the Contractor except where otherwise provided. Remove from site as work proceeds. Where specified for re-use protect from damage, clean and overhaul. Burning on site will not be permitted. Keep all excavated vegetable soil separate from excavated sub-soil.
- 019 All black earth excavated shall be deposited in spoil for re-use as directed by the Consultants.
- 020 Should the Contractor excavate to a greater depth or width than shown on the Drawings, or instructed by the Consultants, he shall, at his own expense, fill such greater depth or Width of excavation with approved crushed rock laterite or approved hardcore well consolidated as later described or mass concrete not weaker than Grade 15 strength as specified under 'CONCRETE WORK' to the instructions of the Consultants.
- 021 The Contractor is to report to the Consultants when the excavations are ready to receive the concrete foundations and is to obtain his approval of the excavations before the concrete is deposited.

Excavations in rock

- 022 Should the presence of rock make excavation for foundations or foundations themselves unnecessary to the extent shown on the drawings the Consultants must be consulted before omitting excavations or foundations or any part thereof.
- 023 The term 'rock' shall mean any material met in the excavation which can only be removed, in the opinion of the Consultant, by means of wedges, compressed air or other kind of plant or explosives. 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 use of explosives will be allowed.
- 024 Rates for excavation in rock shall include for getting out and disposal of any additional material arising from 'overblast' and for additional filling in the weak concrete referred to above, occasioned thereby.
- 025 Should the Contractor consider that excavation at any point is in 'rock' he must notify the Consultant immediately in order that an inspection may be made, and a decision arrived at as to which category such excavation falls. Should the Contractor fail to give such notification the excavation should be deemed to be in normal ground and shall be valued accordingly.
- 026 Explosives are to be used only with written permission of the Consultant and then with utmost care by qualified men. Such explosives used in strict conformity with Local and other Authorities regulations and the Contractor must take all responsibility for any damage or annoyance caused by the use of explosives. He is to give all necessary notice, obtain all permits and pay all fees in connection therewith.

Filling

- 027 Backfilling around foundations and filling under floors and the like to make up level is to be selected material arising from the excavations unless otherwise described.
- 028 Laterite shall be approved rock laterite unless otherwise described and the contractor shall submit samples to the Consultant for approval stating the source of supply before delivery to site.
- 029 Sand for filling shall be free from salt and other deleterious impurities and the contractor shall submit samples to the Consultant for approval stating the source of supply before delivery to site.
- 030 Hardcore shall be approved selected broken bricks, concrete, sandcrete blocks or other clean, hard, dry materials passing at 75mm diameter ring and free from dust and dirt.
- 031 All filling shall be deposited in layers not exceeding 150mm thick well consolidated by ramming or rolling using water to assist consolidation if so directed.
- 032 The whole of the excavation work (including external works) shall be carried out so as to ensure the most economic 'balancing' of spoil, e.g. if surplus spoil results from the excavation of one portion of the work, that portion shall be excavated in good time to enable the surplus to be re-used elsewhere in positions where 'filling' is required. Similarly, spoil shall not be carted away from the site if it may later be required on site for filling purposes.

Anti-termite treatment

- 033 The Contractor shall destroy all ants, nest and vermin encountered during excavations.

- 034 "Dieldrex" anti-termite treatment shall consist of 'Dieldrex 20' Emulsion (manufactured by CON Oil) diluted with water at the rate of one litre of the emulsion to 80 liters of water and applied with a spray gun at the rate 10 litres of the diluted emulsion per square meter, all in accordance with the manufacturer's instructions.

Deviations from the Standard Method of Measurement

- 035 Prices for earthworks are to include for the following:
- a. excavating in whatsoever material may be met (except old foundations and rock, as previously defined) and for grubbing up and removing any drain pipes, roots and the like encountered.
 - b. Excavating work in or underwater of any description and/or working compressed air.
 - c. Any working space required.
 - d. work to curves.
 - e. Levelling, grading and consolidating by ramming or rolling bottom of excavations.
 - (f) Keeping excavations free from all water including general water, water below the water level in the ground and spring or running water.
 - g. Planking and strutting special shoring and temporary sheet steel filing
 - h. Levelling, grading and consolidating by ramming or rolling filling.
 - j. Blinding surface or filling with suitable small material as required to receiving concrete or surfacing.

CONCRETE WORK

The following references apply to work under this section BS 12; 882, 4466 and 4483, CP114, Part 2 1969.

Cement

General

- 036 All cement used in the works shall be ordinary Portland cement or Rapid Hardening Portland cement complying with BS 12 Sulphate resisting cement complying with BS 4027 shall be used where preferred by the Structural Engineer and Architect.

Payment

- 037 The Contractor shall not receive additional payment for the use of Rapid Hardening Portland cement unless he does so under specific instructions of the Structural Engineer and Architect.

Delivery to site

- 038 Cement shall be delivered to the site in approved sealed containers which are to be clearly marked with the name of the manufacturer. Loose cement or cement delivered in damaged or unsealed containers is to be immediately removed from site. Should any cement of a consignment fail or be found to be defective or not to comply in all respect with as 12, the Structural Engineer and Architect shall at their discretion be entitled to reject the whole or part of the consignment from which the defective cement was derived.

Storage

- 039 The contractor shall provide an adequate, waterproof, separate storage building for cement adjacent to the concrete mixing plant to protect the cement from damp or other deleterious influence. Such storage building shall either incorporate a damp proof course under the floor or shall have a timber floor raised at least 150mm clear off the ground.

Order of

- 040 Each consignment of cement shall be kept separately and the Contractor shall use the consignments in the order in which they were received. Cement shall be stored in drums or bags provided by the manufacturer and cement in drums or bags which have been opened shall be used immediately.

Test certificates

- 041 The Contractor shall supply to the Structural Engineer and Architect test certificates for each consignment of cement delivered to the site.

Not to be used

- 042 The Contractor shall not use in the Works any cement which has been affected by damp or other deleterious effects and shall remove any such cement from the site.

Aggregate

General

- 043 Aggregates shall be obtained from an approved source and shall comply with BS 882.

Source of supply

- 044 The Contractor shall include in his Tender full details of location of rivers or quarries from which he intends to obtain his aggregates. The Contractor shall also include details of any alternative sources of supply.

Grading of coarse aggregate

- 045 The grading of course aggregate shall be such that it is within the limits specified for the appropriate size of graded aggregate given in Table 1 of BS 882 Part 2.

Grading of fine aggregates

- 046 The grading of fine aggregates shall be within the grading limits of any of the Zones 1, 2, and 3 of Table 2 of BS 882 .Part 2.

Sample

- 047 The Contractor shall make allowances in his rates for sampling of aggregates.

Rates

- 048 The Contractor shall be deemed to have allowed in his tender rates and prices for the full and inclusive cost of all screening sampling, hauling, etc. of aggregates specified herein. The contractor shall include in his tender any variation in his rates should he use any aggregates from alternative sources of supply as specified herein.

Clay, silt and organic matter

- 049 The total quantity of clay and silt in the aggregates shall no exceed 4% by weight when determined by the Setting Test described in as 812. The quantity of impurities present shall not be such as to produce a reaction as dark as the standard solution when the organic impurities are determined by the method described in as 812.

Storage

- 050 The Contractor shall provide proper means of storing the aggregates at each point where concrete is made. The aggregates shall be kept separated at all times and suitable precautions shall be taken to prevent the aggregate from being contaminated by the ground or other foreign matter. The Contractor shall ensure that the aggregate does not aggregate in the storage heaps,
- 051 Heaps of the aggregate shall be capable of draining freely Wet aggregate shall not be used until it has drained, unless the Contractor measured the moisture content of aggregate continuously and adjust the amounts of aggregate and added water in each batch of concrete mixed to allow for the water contained in the aggregate. If necessary, to meet the requirements of this Clause the Contractor shall protect the heaps of aggregate against inclement weather, or the effects of the sun in order to comply with the requirements set out under concrete proportions.

Approval

- 052 Before preparing trial mixes as specified hereinafter the Contractor shall submit to the Structural Engineer and Architect for their approval, representative samples weighing about 10 kg of the coarse and fine aggregates that he proposes to use. No materials shall be delivered to the site until the Structural Engineer and Architect have given their approval for the representative samples to be use. It Is the Contractor's responsibility to ensure that the subsequent deliveries of aggregate conform to the grading analysis of the approved samples.

Water for concrete

- 053 Water used for mixing concrete shall be clean, fresh water, free from Injurious oils, chemicals, and vegetable matter or organic or other impurities.

Concrete Proportions

- 054 The following table indicates the classes of concrete and the proportions of the constituent materials which may be specified in the Works.

Nominal Size of Aggregate	Aggregate Cement Ratio	Water/ cement Ratio	Minimum cube slump test strength 1t 28 (mm) (n/mm ²)
40mm	9 to 1.65 to .70	15.00	11.50 40-1/5
20mm	6 to 1. 50 to .60	27.00	21. 00 25-75
20mm	4.5 to 1.40 to .50	30.00	25.50 25-75
10mm	4 .5 to 1.40 to .50	30.00	25.50 2<)-75

Slump shall be measured in accordance with BS 1881.

055. The Architect or Engineer may at their entire discretion request that batching of the aggregates is carried out by using a suitable weight-batching machine. if weight-batching is required, the Contractor will be provided with details of the equivalent proportions by weight and no extra will be paid to the Contractor in respect of weight batching.
- 056 Unless otherwise stated the coarse aggregate for concrete shall be. 19mm for 1:2:4 mix and 9.5mm for all precast work.
- 057 Where the proportions of the materials are determined by volumetric measurement the sand and stone shall not be packed more closely than by throwing in the usual way Into the boxes. Suitable and approved measuring boxes shall be used.

Mixing Concrete

- 058 The quantity of water used in the mixing of the concrete is to be sufficient to ensure the proper hydration of the cement and to bring the mass 10 a proper consistency and to a workable mix.
- 059 The aggregate shall be measured by volume in approved gauge boxes and the cement by weight. When cement is supplied in bags, the size of each batch of concrete mixed shall be such that a whole bag or bags are used in each mixing. The use of part of the contents of a bag will not be permitted.
- 060 Mixing shall be done in approved mechanical batch mixer. At the start of each day or the clearing out of the drum, the first batch shall be gauged with additional cement to cover losses in the mixing drum. The mixing of each batch shall continue for not less than 3 minutes after all the materials including the water have entered the mixing drum.
- 061 Concrete for reinforced work must be mechanically mixed. Where hand mixing is approved for other qualities of concrete, the fine and coarse aggregate is to be spread on a clean water-tight platform and the cement spread over it the whole is then to be turned over twice dry, afterwards thoroughly mix the appropriate quantity of water (from a hose) by turning it over until the ingredients cling together and until it is of even color and consistency.

062 The amount of water used shall be the minimum necessary to bring the mass to a plastic condition and should not exceed 29.5 liters to each 51 kg of cement for Types A and B concrete and 25 liters for Type C. In no case is the slump to exceed the maximum specified.

063 Water must not be added later to facilitate handling or other purposes,

Slump Test

064 The slump of concrete shall be measured regularly in accordance with the method given in as No. 1871 to give an approximate guide to the consistency and the Contractor shall supply and maintain the necessary apparatus on the site for carrying out such tests. The slump shall in no case exceed the following values:

Concrete in foundations, Ordinary ground floors and bed Surround to drainpipes	Max Slump (mm) 50
Reinforced concrete, hand compacted	100
Reinforced concrete, machine compacted	50
Floors of large sheds, etc. hand compacted	38
Floors of large shed, etc. machine compacted	25

Testing Concrete

065 Prices of concrete shall include for carrying out all costs in accordance with the requirement of BS Code of Practice 114 as and when required by the Architect or Engineer including supplying all test cubes, slump cones, etc. and paying all fees and charges incurred.

066 Unless otherwise stated the following shall be minimum crushing strengths on 150mm (6") test cubes of ordinary Portland cement

Minimum crushing strength N/mm² (lbs/sq.in)

Class of concrete	7 days after mixing	28 days after mixing
1:3:6 (20mm agg)	9.31 N/mm ²	12.4 N/mm ²
1: 2: 4 (20mm agg.)	15.51 N/mm ²	21 N/mm ²

067 One copy of the following information shall be supplied with each test cube and a further copy preserved on site.

1. Serial number of cube (to be marked on cube)
2. Position from which taken.
3. Date cast.

4. Time cast
5. Temperature
6. Type of coarse aggregate.
7. Type of fine aggregate.
8. Water/Cement ratio.
9. Type and batch of cement.
10. By whom taken.

068 Should any test cube fail to meet the minimum requirements for the Architect or Engineer, they may at their sole discretion, order the testing of those portions of the structure which they consider necessary either by means of loading tests or boycotting out from the finished work samples of concrete to be further tested or by such other means as may be determined by and be acceptable to them.

069 If the results of these tests are not satisfactory, the Architect or Engineer shall require the Contractor, at his own expense, to cut out or pull down all work shown to be defective and to replace it free of charge. Slump tests shall be taken as and when required and in no case shall the concrete tested have a slump that exceeds 50mm.

Placing Concrete

070 Concrete shall be used as soon as it has been mixed and shall be conveyed in and deposited directly in the work from proper metal concreting barrows, tricks and any other approved method. In all cases concrete shall not be left unused for a period longer than 30 minutes. Care shall be taken to prevent segregation and loss of ingredients.

It shall not be dropped into its final position from a height of more than 900mm nor shall it be deposited in water.

071 Only sufficient concrete shall be prepared as is required for immediate use and concrete shall be placed within 30 minutes of being mixed and once placed and

Consolidated shall not be disturbed. The use of "revived" concrete is prohibited. The concrete shall be deposited and efficiently tamped to ensure that it is dense and free from honeycombed patches.

072 Reinforced concrete shall be vibrated by use of an approved mechanical poker vibrator. Vibration shall be earned out only by competent operators and under proper supervision. Contact should not be made with reinforcement of formwork. Care must be taken to avoid segregation by excessive vibration.

073 Surfaces of concrete which are not intended to be covered with other materials, shall be levelled and floated whilst unset to a smooth finish at the levels or falls shown on the drawings. The floating shall be done in a manner which will not bring excess of latency to the surface of the concrete. The top face of a slab intended to be surfaced with mortar, granolithic or similar materials shall be left with a tamped finish and not trowelled smooth.

Protection

- 074 Curing of concrete shall be in accordance with the recommendations set out in the BS Code of Practice and all surfaces shall be kept continually wet after concreting and protected from the Sun and dry winds by covering with wet sack etc., for not less than one week.
- 075 Concrete is not to have weight put on it for one week after laying. During periods of heavy rainfall, surfaces of concrete just deposited are to be satisfactorily protected by sacking foil, etc.
- 076 Concrete floors, stairs, arises etc., shall be protected from damage by traffic etc., by covering with sand or timber strips or other approved means.

Reinforcement

- 077 Bars for reinforcement shall be:
- Mild steel bars complying with BS 785 Part 1, 1967, BS 4449 Hot rolled. High yield steel bars complying with BS 785 Part 1, 1967. BS 4449.
- Cold worked deformed steel bars complying with BS 1144. BS 4461.
- Mesh for reinforcement shall comply with BS 1221. All mesh shall be delivered in fiat sheets or rolls.
- 078 Reinforcement steel delivered to the site shall be clearly marked upon arrival and stacked so that each consignment and steel from different sources, can be distinguished easily.
- 079 The Contractor shall allow for providing such samples of reinforcement steel as the Architect or Engineer may from time to time require for the purpose of testing.
- 080 Should the tested samples of reinforcement steel from any consignment fail to comply in all respect with the relevant BS then the Architect or Engineer may at their sole discretion order the removal from the site of all steel from that consignment.
- 081 All reinforcement shall. Immediately prior to placing, be free from loose mill scale, loose rust, oil, grease, dirt or other foreign matter. Reinforcement is to be placed and secured in the exact position as indicated on the drawings and is to be securely wired with and including soft pliable mild steel wire of approved gauge at all inter-section and adequately supported in position in such manner that no movement takes place before the concrete has sot.
- 082 Unless otherwise directed on the drawings the minimum concrete cover to reinforcement bars (exclusive of plaster, rendering or other applied covering or decorative finish) shall be not less than the diameter of the bar or as follows, whichever is the greater:
- Main bars in column and beams 38mm
Main bars in floor slabs 13mm
Reinforced concrete in contact with earth 75mm
- Special precautions shall be taken by means of spacers, chairs or the like, temporary or permanent. To ensure that the steel has the exact amount of cover required.
- The insertion of bars into concrete already placed will not be permitted.
- 083 All bars are to be bent cold on the site in a suitable and approved bar bending machine and accurately shaped to the shapes and profiles strictly in accordance with the drawings.

Welding

084 Welding of reinforcement shall only be carried out with the Engineers approval.

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

Construction Joints

085 Construction joints shall be arranged in approved positions. Before recommending concreting after a break, the surface of the existing concrete shall be prepared by roughening with a stiff wire brush, wetted and treated with a cement sand grout in the same ratio as the cement and sand in the concrete mixture, immediately before the new concrete is placed against it.

086 Construction joints shall only be permitted in the following places:

In slabs and at mid-span at right angles to the reinforcement.

In columns at floor level

Construction Joints

087 Under no circumstances shall construction joints occur between the slab and the rib of the beam.

Precast Concrete

088 Precast concrete shall be (1:2:4-9.5mm) and the prices shall include for all casings and mould, hoisting, bedding or setting in position, pointing around if required, and rubbing down all exposed surfaces to a fair finish. The prices of precast concrete shall also include for any reinforcement used by the Contractor solely to reduce the risk of breakage during handling and for all jointing between precast units.

089 The tops of precast structural members shall be clearly marked.

090 Work measured as precast shall be executed precast; if the Contractor prefers to execute the work in situ he shall obtain the permission of the Architect and If such permission is given there shall be no adjustment of the Contract price in this respect.

Concrete Work Generally

091 The prices for all concrete work, including precast concrete shall include for the following:

1. Work in all sectional areas, bays, etc.; lengths and thicknesses.
2. Hoisting to any height.
3. Forming all necessary construction joints including - formwork to same.
4. Leaving surfaces ready for rendering of any description beds and backings.

5. Forming chases, grooves, notching, mortises, holes for pipes and the like and all other sundry labours and making good.
 6. Protection.
- 092 The prices for reinforced concrete shall include for filling into formwork and working around reinforcement and the use of vibrators.
- 093 Reinforced concrete work has been measured the net volumes and thickness required after vibration and the prices shall include for the loss of bulk due to vibration.
- 094 Concrete is not to be placed around any reinforcement until the formwork and reinforcement have been inspected and approved by the Architect or Engineer.

Generally

- 095 The prices for bar reinforcement are to include for bends, hooks, tying wire distance blocks, ordinary spacers and protection.
- 096 The prices for fabric reinforcement are to include for the following:
1. Cutting of any description, notching, bending, tying wire and distance blocks.
 2. The extra materials at laps, (unless otherwise stated the end laps be 380mm with 150mm side laps for square meshes).
 3. Protection.

Formwork

- 097 All formwork shall be true to line and of suitable thickness and sufficiently struttred and braced to be free from deflection under the load of concrete to be placed upon it. The joints shall be so tight as to prevent leakage of liquid cement. Formwork shall be so erected that in striking, the sides of beams may be exposed first and independently and the underside of slabs second and independently and underside of beams last.
- 098 All vertical supports shall be supported by folding wedges upon ample sole plates so that centering may be stuck without causing shock or jar to the structure.
- 099 The Contractor shall submit to, the Architect for his approval a sample of the type of wood with wrot and unwrot face such as he intends using for formwork.

External

- 100 The sawn formwork shall include for all matching and planning necessary to ensure accurate setting out. After removal of formwork the face of the exposed concrete shall be rubbed down immediately to remove fins or other irregularities
- 101 All measured items of formwork are for the temporary use and waste only of the formwork and supports unless otherwise stated.
- 102 Where "extra over for fair face" is measured to concrete surfaces, the Contractor shall assume that "sawn" formwork has been measured to those faces and when pricing the "fair face" item he shall allow for the extra cost of using lined formwork or for whatever other approved method he may adopt in finishing the concrete face perfectly smooth and even, free from board and joint marks and for taking special care when pouring and compacting the concrete forming such faces so that a dense smooth facets obtained. "Skimming" of such faces ...nil not be permitted.

- 103 Wrought formworks has been measured only where a specific finish other than "fair face" is required to the exposed concrete.
- 104 All formwork described as wrot shall be approved by the Architect before it is poured, and the Contractor shall notify the Architect when the formwork is in position ready for inspection. The prices for wrought formwork shall include for finishing all contact surfaces of the timber smooth and for selecting the timber for length and width to a regular pattern Joints between planks or members shall be planned or machined so that the concrete surface shall be smooth and free from joint marks when the formwork is struck.; The prices for wrought formwork shall include for any necessary rubbing down and polishing off required to achieve this finish. "Skimming" to the exposed faces ...nil is not permitted.
- 105 Surfaces of all forms in contact with concrete shall be treated with an approved non-staining lubricant to ensure that shuttering can be struck cleanly. The lubricant is to be applied to the forms before the erection of the reinforcement and care taken to prevent the lubricant the lubricant coming into contact with the reinforcement.
- 106 Before concrete is placed and before the application of the aforementioned lubricant all shuttering shall be thoroughly cleaned down and wetted.
- 107 Where surfaces of in-situ concrete are specified to be plastered, approved retarding compound is to be applied to the formwork in accordance with the manufacture (instructions either before or after erection. Immediately after the removal of the formwork on \A1ich the compound has been applied the concrete surfaces are to be with brushed to remove all loose material so as to form a key for plastering.
- 108 Formwork has not and IA1I1 not be measured to plain concrete poured against excavated surfaces unless specifically required by the Architect or Engineer in which case the Concrete is described as "filled into form".
- 109 No concentrated loads of any kind shall be placed upon any beam, slab or column after concreting without the permission of the Architect or Engineer
- 110 Formwork shall not be struck or removed until authorized by the Architect or Engineer and in no case sooner than the times indicated below:
- | | |
|----------------------------------|--------------------------|
| Sides of beams and columns | 2 days after concreting |
| Underside slab (struts left in) | 4 days after concreting |
| Underside beams (struts left in) | 7 days after concreting |
| Struts to slabs | 10 days after concreting |
| Struts to beams | 14 days after concreting |

Generally

The prices for all formwork are to include for the following:

1. Cutting of any description;
2. Notching, drill ions, borings, perforations and similar labours;
3. Spacer or distance pieces, sleeves, etc.
4. Strutting to any height and formwork to soffits of slabs of any thickness.
5. Protection.

BLOCKWORK

"Sandcrete" Blocks

- 111 The cement and sand for the "Sandcrete" blocks shall be as described "Concrete Work". The blocks shall be made generally in accordance with BS 2028 in an approved vibration type block making machine.
- 112 The block shall be made generally in accordance with BS 2028 in an approved vibration type block making machine
- 113 The sandcrete blocks generally are to be solid or hollow cored blocks made in approved machine and shall be composed of one part of cement to six of sand (50 kg. bag cement; 0.20 cu.m sand) mixed with just sufficient water to bind the mix under slight pressure. The mixture shall be well rammed and consolidated in the mould and shall be made into blocks within half an hour of the water being added to the mix.

Curing of Blocks

- 114 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 14 days and allowed to dry out.
- 115 No blocks are to be built into any part of the building until they have matured in the manner described for at least 21 days.
- 116 All blocks to be used in the works shall have attained a minimum compressive strength of 3.5N/mm² (500 lb/sq. in) (including any core) fourteen days after manufacture and the Contractor is to allow for provision of samples and carrying out tests to determine the compressive strength as directed. If any samples fail to reach the prescribed strength the Architect may reject the batch which contained the samples and if so, rejected the Contractor shall break up or remove from the site the whole batch as directed.
- 117 The blocks generally shall be 450mm long, 230mm deep and of the thickness slated. Blocks of special sizes and shapes shall be solid unless otherwise stated. All blocks shall be cast true to shape, even in size, smooth faced and free from flaws blow holes and with clean and sharp arises. All blocks shall be carefully handled. Blocks with broken arises shall not be used.

Mortar

- 118 The mortar used shall be composed of cement and sand (1:6) and an approved plasticiser to give a strength equal to the strength of the blocks. (This prevents Drying shrinkage and ensure even moisture movement).
- 119 The mortar shall be used within one hour of mixing. Mortar shall not be used or mixed with any other mortar after it has begun to set nor shall any mortar of any kind from a previous day's mixing be used.
- 120 A proper stage shall be provided to receive the mortar when made.
- 121 Blocks shall be laid in stretcher bond with 10mm joints properly bedded and with the joints flushed up as the work proceeds.

- 122 The blockwork shall be carried up in a uniform manner. No portion shall be raised more than 1 m above another at any time. The work shall be carried up course by course and the height of four courses when laid shall be 950mm for 225mm sandcrete blocks.
- 123 All blockwork is to be properly bedded and jointed with courses level, perpends and quoins kept perfectly true and square and all work properly bonded together and carefully levelled through every second course and angles plumbed as the work proceeds. All comers, cross wall junctions and reveals shall be properly bonded. Special care shall be taken that all vertical joints are filled with mortar.
- 124 All blocks shall be well wetted before being laid or built, on and shall be watered from time to time to prevent rapid drying out.
- 125 Any defective blocks found in the work shall be cut out and replaced by sound ones at the Contractor's expense

Fair faced blockwork

- 126 The joints of blockwork specified to be finished fair face shall be laid perfectly flush with neat struck joints. All irregularities are to be made good and the face finished fair.

Cavity Walls

- 127 Cavity walls are to be built with the cavity between the two skins free of mortar droppings. The price shall include for metal ties (at 450mm centres vertically and 900mm centres horizontally) to bind the skins together.

Metal Windows and door frames

- 128 Build in lugs of metal windows and door frames into blockwork including filling solid with cement mortar and pointing one side in mastic.

Clay Bricks, Blocks and Facing Tiles

- 129 Clay bricks, blocks and facing tiles are to be manufactured by Clay Industry (Nigeria) Limited or any other approved manufacturer and are to be laid in accordance with the manufacturer's recommendations.
- 130 The facing tiles are to be laid in stretcher bond and pointed with neat raked joints.

Generally

- 131 The prices of blockwork and brickwork are to include for the following and for making good.

1. Raking out joints to both faces to provide a key for plaster unless otherwise specified.
2. Cutting of any description.
3. Cutting or forming grooves, chases, mortices and sinkings.
4. Building in ends of steel sections.
5. Cutting and pinning ends of all lintels, steps, timbers, tubular rails, brackets, steel section and the like.

6. Raking out for and pointing flashings and skirtings.
- 7 Bedding plates and bedding and pointing all timber frames.
8. Keeping cavities between block linings clear of mortar, rubbish. etc.
9. Labour to eaves filling.
10. Cutting or leaving all holes for pipes and the like.
11. Extra for using solid blocks at tops and ends of hollow block walling
- 12 Protection

ROOFING

- 132 Corrugated aluminium sheeting shall be QUEENSWAY, Alumaco or other approved. Unless otherwise stated the sheeting shall be of 22 SWG and with stucco mill finish.

Corrugated Roof Sheeting

- 133 The sheets are to be correctly mitred and laid at least 225mm end lap and one and a half corrugation side laps. Exposed edges of laps to face away from prevailing winds.
- 134 All courses to be laid with corrugations in straight lines from eaves to ridge, the mitred corners of sheet to be properly weathered by the overlapping corrugations of the sheets above. All fixing holes to be drilled and not punched and made in the crown of the corrugation and all cutting to be neatly done by hand saw.
- 135 Ridges generally to be fitted with approved pattern close fitting type ridge capping. Ends of ridge capping to be closed by means of approved finals.
- 136 Hips are to be covered with two-piece adjustable hip coverings, edges turned down, and scribed (on site) to corrugations.
- 137 Valley gutters to be 20 SWG aluminium 450 mm wide dressed to shape under roof sheeting
- 138 Ridges, hips, valleys, flashings, capping etc, are to be lapped minimum 150mm at end.
- 139 The sheeting with its fittings etc to be properly fixed where and as required by means of hook bolts, seam bolts and drive screws with slotted heads. The bolts and screws to be galvanised of approved pattern or aluminium and of the dimensions and shapes required to suit the purlins etc to which the sheeting is to be fixed. Bolts and screws will not be less than 6mm diameter for small corrugation sheeting. All bolts and screws to have galvanized steel diamond washers, or lead cup shaped washers bedded on felt asbestos, composition washer or plastic washers and no fixings are to be nearer than 38mm to the edge of a sheet.
- 140 All sheeting and accessories to be fixed in accordance with the manufacturer's recommendations, and in a manner to permit slight movement in the roof structure without damage to the roof covering.

- 141 Where plastic seals are particularly required to the laps in the roof covering, the laps shall be sealed with an approved bituminous mastic as recommended by the manufacturers unless otherwise specified.
- 142 The prices for all sheeting are to include for cutting of any description, bedding and pointing at caves, verges and the and forming small openings and perforations for pipes etc.
- 143 The prices for ridging, caves, filler pieces, verges and the like, are to include for bedding in approved mastic and fixing and lapping in accordance with the manufacturer's instructions.
- 144 Aluminum flashings and cappings to be Supper Purity to BS 1470 coated in bitumen on underside before fixing. Flashings are to be lapped minimum 150mm at ends.
- 145 Prices for flashings are to include mitred angles and returned ends.

Protection

- 146 The prices for all roof covering are to include for protection.

CARPENTRY AND JOINERY

- 147 Quality of Timber - All timbers to be approved quality well-seasoned, dry, free from defects and to comply with BS 1860 and the nomenclature laid down in BS 881.
- 148 For carpentry work timber shall be Mahogany. Obeche, Alara, Agba or other approved and shall comply with BS 1860.
- 149 For Joinery work the timber shall be Mahogany, African Walnut, Iroko, Agba or other approved and shall comply with as 1186 part 2 section 1 and 2. It shall be free from defects, selected for grain and colour.
- 150 Preservation of limber - timber preservative shall be organic solvents type of non-staining solution type BS 1282. The later is to be used on timber in contact with plaster or other decorated surfaces and where the timber is required to receive both wood preservative and painted finish. The backs of door, window and louvre frames and all timber to be embedded in blockwork, masonry and concrete are to be treated. The preservative is to be applied after the timber is cut to size and shape. Structural timbers are to be treated as required. If off-site preservative treatment is carried out certification to be presented to Architect and if on site prior notification required to Architect.
- 151 Wrought face - All exposed faces of timber are to be wrought unless specifically shown otherwise. Sizes of wrat timber stated in the Bills of Quantities are finished sizes.
- 152 Preparation. 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 in such manner that air will circulate freely between, All framed \«lrk is to be cut out and framed together as soon as possible, after the detailed drawings are received, but not glued or wedged until ready for fixing.

- 153 The joinery work is to be cut out and skeleton framed and stacked on site immediately the Contractor is given possession of the Site and detailed 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 ones before being wedged up.
- 154 Fixing The fixing and framing of timber generally hereafter described is to include for the provision of all necessary glue, nails, screws and other fixing of adequately secure the timber in an approved method and as may be directed.
- 155 Framing Carpentry work is to be properly framed up in a workmanlike manner. Plates shall be halved at corners and joints in the length of purlins, rafters and the like shall be scarfed and spiked for a length at least three times the depth of the timber and the joint wrapped with hoop iron. Scarfed joints shall be made over a point of bearing wherever possible. Wall plates shall be bedded perfectly level with halved joints and dovetailed lapped joints at all angles. They are to be secured to walls with 13mm ragbolts at 1.2m centres.
- Fabrication
- 156 All joinery work is to be accurately set out, framed and executed in accordance with the detail drawings and finished in a proper and workmanlike manner.
- 157 All work shall be wrought and finished with a clean, smooth and even surface and all exposed external angles to frames, etc, shall be "arris rounded".
- 158 Allow for keeping the whole of the Joinery work clean for staining or polishing until such time as the Architect requirements regarding decorative treatment are known.
- 159 All glued joints shall be properly feather-tongued and all mouldings to formings shall be properly mitred at angles wherever required. .
- 160 Adhesives shall be in accordance with BS 1203 for plywood and BS 1204 for other wood, both internal and external use and to be grade W.B.T.
- 161 All members described as plugged are to be fixed with hardwood or other approved plugs or compound. The plugs shall be at such intervals as will provide adequate fixing, to the approval of the Architect.

Flush Doors

- 162 Flush Doors shall be constructed in accordance with the materials requirements of BS 459, Part 2 and shall be covered both sides with 6mm external quality plywood and hardwood lipped all round. Skeleton framed doors are to have sufficient solid blocks for fixing ironmongery.
- 163 Unless otherwise stated flush doors shall have hardwood skeleton framed core.

Plywood and Blockboard

- 164 Plywood and Blockboard shall be of the best quality, faced both sides with mahogany and obtained from an approved manufacturer.

Generally

165 The prices for all joinery work (of any sectional area) shall include for the following:

1. Timber in any length.
2. All Labours.
3. Joints of any descriptions.
4. Grounds, blocks and backings necessary for fixing.
5. Pellating.
6. Selecting timber for polishing or any other finish.
7. Priming back before fixing to concrete or blockwork.
8. Protection.

Ironmongery

Fittings to comply with appropriate British Standards as follows:

BS No.	Fittings etc	BS No.	Fittings etc
455	Locks and latches	1331	Building hardware
1210	Wood screws	1494	Fixing accessories
1227	Hinges		

- 166 All articles of ironmongery to be soundly and strongly made, well finished, and equal in quality to first grade 'stock pattern' articles.
- 167 Ironmongery is to be fixed with screws of the same metal and finish as the fitting. All screws damaged when driving are to be withdrawn and replaced with undamaged ones.
- 168 The prices for ironmongery fixed, or for "fixing only" shall include for the supply of matching screws and for protection. The prices shall also include for the temporary removal of all ironmongery before painting and afterwards re-fixing.
- 169 All locks and other fittings are to be oiled and adjusted and left in perfect working order.
- 170 Unless otherwise described all interior locks are to be provided with two keys and exterior locks with three keys. No two locks shall be capable of being operated by the same key, except master key if specified.
- 171 Prior to the handing over of the Works, or any section of the Works, the Contractor shall fit wooden tabs to each set of keys, clearly showing to which lock they belong and all the sets of keys shall be delivered to the Architect mounted on a suitable plywood keyboard.

STRUCTURAL STEELWORK AND METALWORK

- 172 Mild steel shall comply with BS 449 and BS 4360, part 2.

- 173 Strutting and staying - The contractor will be responsible for the safety of the steel structure and he must take the necessary precautions by properly strutting and staying the steelwork during erection, and when fixed to maintain its correct position throughout the progress of the works.
- 174 All steelwork, except steelwork which is to be embedded in concrete or on which welding is to be carried out on site, will normally be painted one coat of primer at work before dispatch; after erection one further coat of primer to be applied after touching up original coat where necessary
- 175 Metal Door Frames - Door frame to be 18 gauge sheet steel dipped in one coat best anti-corrosive paint, fitted with two five-knuckle steel hinges, three rubber buffers in rebate of lock jamb. Frames to be as manufactured by Messrs Critall Hope Nigeria Limited or other approved.
- 176 Metal Windows - are to be of standard gauge Aluminium profiles and silver anodized obtained from an approved manufacturer.
- 177 Windows are to be pre-glazed, rustproof and supplied with coupling transomes, coupling mullions as required and all necessary hinges, fasteners, locks, catches, stays etc.
- 178 All windows are to be handled with care, stacked on edge under cover on level bearers and supported evenly against a wall or vertical bearers until required for incorporation in the buildings. Moveable parts are to be oiled and left in working order.

Generally

- 179 Holes in metal for fixings are to be drilled clean and burrs removed. All counter-sinking is to be concentric and to correct depths.
- 180 Bolts shall be fitted with washers under nuts and with tapered washers under heads and nuts Where such bear on a tapered surface. The threaded portion of each bolt shall project through the nut at least two threads.
- 181 Iron, both cast and wrought, is to be of approved quality, free from all defects and castings, etc and perfectly true to shape, clean and sharp:
- 182 Welding shall be carried out in accordance with BS 1856. Welded joints, angles etc., shall be deemed to include for grinding to a smooth finish unless otherwise described.
- 183 Fixing metal windows and door frame shall be deemed to include for building in or cutting and pinning in lugs to blockwork or concrete jambs, head and sills as necessary, bedding in cement mortar and pointing one side with tropical mastic applied with a gun.
- 184 The prices of steel work and metalwork are to include for the following:
1. Hoisting to the heights required.
 2. Priming before fixing.
 3. All labours in drilling holes, bends, ramps. etc
 4. Welding at all joints and intersections.
 5. Protection.

PLUMBING AND ENGINEERING INSTALLATION

Pipe work Generally

- 185 The whole of the plumbing is to be carried out strictly in accordance with the requirements of the Local Authority and to the approval of the Architect.
- 186 Pipe sizes shown on the drawings and in the Bills of Quantities are nominal inside diameter unless otherwise noted.
- 187 All pipes shall be cut accurately to measurements taken on site and fixed without springing or forcing, properly clear of all windows, doors, and other openings. Pipe nipples shall be cut evenly, threads cleaned, burrs removed and ends reamed to full inside bore. Installation shall be in such a way to permit free expansion and contraction without causing damage or misalignment and to permit complete drainage of piping system. Pipe connections shall not be made smaller than equipment connections.
- 188 Where changes in pipe sizes occur, only reducing fittings, properly installed in straight lines, shall be used..
- 189 Unions shall be used to connect the service to sanitary fittings or other equipments and shall be installed in long runs of piping as directed, to permit convenient disassembly for alterations or repairs. Unions must be accessible after building is completed.
- 190 Galvanised mild steel pipes shall be to BS 1387 with screw and socket fittings to BS 1740. Pipes above ground shall be Class 'A' and pipes underground shall be Class 'C'.
- 191 Asbestos cement pipes shall be (i.e. coated) bitumen dipped and shall conform to BS 582. Joints shall be with PC 4 jointing compound or where approved by the Architect in gaskin and tarred into socket and finished neatly externally.
- 192 Cast Iron pipes and fittings and accessories shall be in accordance with BS 437 and BS 1130 with spigot and socket joints in tarred gaskin and molten lead.
- 193 Polythene tubes shall be to BS 1972 normal gauge. Fittings to be compression jointed and as BS 864 Type A.
- 194 Asbestos cement pressure pipes shall be to BS 485 with simple joints or jointed with detachable cast iron flanges, wrought iron t50lts and nuts and rubber rings. All fittings to be of cast iron to BS 78.
- 195 Pitch fibre pipes shall be to BS 2760 and jointed with loose couplers in accordance with manufacturer's instructions.
- 196 Copper water pipes shall be light gauge copper tubes to BS 659 with capillary or compression fittings to BS 8674 Copper pipes buried under ground shall be to BS 1386.
- 197 PVC pipes shall be from approved manufacturer and fittings with spigot type sockets and rubber sealing rings.

Ancillaries

- 198 Valves cocks, etc, are to be high pressure quality suitable for use with mains supply. Any fittings working noisily or otherwise unsatisfactorily shall be removed and replaced at the Contractor's expense.
- 199 The rates for measured items of Plumbers work shall include for setting out.
200. The prices for all pipe work shall include for the following:
1. Fixing with clips or holderbats to background of any nature at appropriate centres or running in chase in walls or floors etc, of any nature.
 2. All labours, made bends, bedded ends, fittings and the like (except fittings to cast iron pipes)
 3. Connection to fittings, etc.
- 201 Fixings only Sanitary fittings shall include assembling, plugging and screwing, bedding and pointing, all jointing components, connecting valves, overflows, anti-syphonage and drain pipes as appropriate, fixing traps and providing all necessary adaptors and all joints. All sanitary fittings shall unless otherwise specified be White "Armitage shanks" or an approved equivalent.

ELECTRICAL INSTALLATIONS

Generally

- 202 The Electrical Installation is to be executed in accordance with standards and rules set out in:
- a. The current Electrical Wiring Regulations Laws of the Federation of Nigeria.
 - b. The Regulation of the Institution of electrical Engineers and (relevant) British Standards Specifications and is to be to the approval of the Architect/Electrical Engineer.

All conduiting shall be 20mm diameter heavy gauge PVC conduits concealed in walls and ceilings to BS 1972 including all conduit boxes, locknuts, couplers, bends reducers etc. All cabling for power distribution and lighting shall be PVC insulated colour coded cables to BS 6004 of 9169 drawn into conduits. All power points and switches shall be flush "MK" or "Tenby" or any other approved equivalent. Lighting points shall be "PHILIPS", "THORN" or other approved.

- 203 The Contractor shall make all necessary applications and pay all charges in connection therewith, to ensure that the connection or connections of the electricity supply is effected in good time so as not to delay completion of the Works. The nett cost of all fees and connection charges thus incurred will be added to the Contract Sum.
- 204 When pricing the "attendance" item billed in connection with the Electrical installation the Contractor shall allow for cutting or leaving all holes, chases and the like and for making good all work affected. This allowance shall be made in addition to the obligations described elsewhere in connection with P.C. and "attendance" items.

Testing

- 205 Allow for testing the entire Electrical Installation on completion.

- Protection
- 206 The price for "attendance" on the Specialists executing the Installation shall include for protection.

PLASTER WORK AND OTHER FLOOR, WALL AND CEILING FINISHES

In-situ Finishings

Cement

- 207 The cement is to be as previously described under "Concrete Work"

Sand

- 208 The sand is to be thoroughly washed free from all organic, clay or other deleterious material and is to be sieved and graded. The grading is to comply with the following table:

B.S. Sieve	% by weight passing B.S. Sieve
5mm	100
No. 7	90-100
No. 14	70-100
No. 25	40-80
No. 52	5-40
No. 100	0-10

- 209 Plasticiser is to be Barolin C or other approved and used strictly in accordance with the manufacturer's instructions.

Rendering

- 210 Internal and external renderings shall be of one coat not less than 15mm thick or as described and shall consist of one part of cement to four parts of sand by volume and shall be finished fair and smooth with wood float.
- 211 Immediately before applying the renderings, the wall surfaces shall be thoroughly wetted with clean water.
- 212 All arrises and angles in wall rendering are to be finished straight and true and all arrises to reveals or openings are to be slightly rounded. Renderings shall be kept damp for at least seven days, No re-tempering will be allowed.
- 213 The mixes for renderings shall be used within two hours after mixing. No re-tempering will be allowed.
- 214 The prices for all cement and sand rendering shall include for the incorporation of a suitable and approved plasticiser.
- 215 In-situ Terrazzo paving shall not be less than 19mm and shall be laid while the screed base is still plastic. It shall consist of 1 part coloured cement to 2 parts of marble chips,

The chips shall be graded from 22mm down to 3mm and shall contain no dust or fine material. It shall be laid and executed in bays not exceeding 1m² including the use of ebonite strips. It shall be ground with an approved abrasive stone and all holes made good in matching cement. It shall then be ground to a smooth finish and later polished

by machine using lead pads or other approved method to produce a highly polished surface. The price shall include for free colour selection of cement and marble chips.

Generally

- 216 The prices for in-situ finishings of any description including beds and backings shall include for the following and for all making goods.
1. Applying to any type of base, including preparation, of base and any necessary dubbing out.
 2. Work in isolated areas not exceeding one square metre, isolated columns and work in panels or bays of all sizes where a permanent joint filler is incorporated.
 3. Labour to all edges, ends, angles, ramps, arrises and the like and dishing around gullies, outlets and the like.
 4. Work at all heights
 5. Extra labour working up to frames and the like.
 6. Making good around pipes, brackets, dowels floors springs and the like.

Tile Slab or Block Finishes

- 217 Where room dimensions are not an exact multiple of the tile, slab or block dimensions used for the ceiling walls or floors, they shall be so cast that equal margins occur at both or all sides of the rooms as the case may be.

Precast Terrazzo

- 218 Precast terrazzo tiles shall have a top finish at least 19mm thick cast in conjunction with a cement and sand backing. The terrazzo finish and backing shall be mixed at the same time and the whole moulded in steel mould pressure 3.5 N/mm² (5001b/sqin) and properly cured before used. It shall consist of properly graded aggregate as described for insitu terrazzo. The prices shall include for free. colour selection by the Architect/S.O.

Precast Concrete Slabs

- 219 Precast concrete slabs to be in accordance with BS 368. natural colour laid in cement mortar (1:4) and jointed and pointed with similar material.

Glazed Wall Tiling

- 220 The white glazed tiling shall be glazed ceramic tiles in accordance with B.S 1281, bedded and pointed in cement mortar (1 :3) or in an approved adhesive, pointed in white matching cement and cleaned down on completion.

Generally

221 The prices for tiles, slab or block finishings to floors or walls shall include the following and for all making good:

1. Laying on and preparing any type of base.
2. Work in isolated areas not exceeding one square metre and work in bays of panels of all sizes where a permanent joint filler is incorporated.
3. Laying simple pattern and work at any height.
4. Dishing around gullies, outlets and the like.
5. Angles and ends on skirtings.
6. Cutting of any description and cutting and fitting around pipes, brackets, dowels, floor springs and the like.
7. All bedding, jointing and pointing.

BEDS AND BACKINGS

222 Bed and backings shall consist of one part cement to four parts sand by volume unless otherwise described.

Protection

223 The prices for all floor, wall and ceiling finishing, shall include for protection.

GLAZING

Glass

224 All glass shall be free from flaws, waves, scratches and other defects and shall be of uniform thickness in accordance with B.S. 952.

225 Sheet glass shall be "ordinary glazing" quality 5mm thick except where otherwise described.

226 Patterned glass shall be of 6mm thickness and approved type except where otherwise described. Louvre blades shall be 5mm thick of clear sheet or obscured glass. Blades are to have rounded and polished edges.

PAINTING AND DECORATING

Paints Generally

227 The prices for paint work are to allow for selection by the Architect of any colours and freedom for him to specify the products of any paint manufacturer represented in Nigeria.

228 All paints and distempers shall be delivered on site intact and in the manufacture (s drums or tins and shall be mixed and applied strictly in accordance with the manufacturer's recommendations.

Knotting

229 Knotting is to be an approved patent knotting or 'shellac' and to conform to B.S. 1336.

Stopping

230 Stopping is to be a stiff white and lead putty or other approved patent filler tinted approximately to the tint of the undercoat.

Painting Generally

- 231 All surfaces shall be prepared to the satisfaction of the Architect before any priming or decorating is carried out.
- 232 All surfaces are to be primed with the correct primer for the type of surface in accordance with the manufacturer's instructions.
- 233 Wood work to be painted shall be primed on all surfaces before fixing.
- 234 Any work fixed in inaccessible positions is to receive the full number of coats before fixing.

Painting Generally

- 235 Metal delivered to the site primed is to be thoroughly inspected when received on site and all unsatisfactory priming removed and the surface prepared and primed with primer. Damaged priming is to be touched up after preparation.
- 236 A further inspection of the priming is to be carried out after the metal work has been erected and defective areas prepared and primed. The painting is to be done in a good and workmanlike manner and finished to tints chosen by the Architect/S.O.. Each undercoat shall be rubbed down with glass paper and cleaned down before the application of the following coat. No paint is to be applied to any surface on which there is the slightest moisture. Decorations shall not be applied to render surfaces for at least a month or until the contractor has satisfied the Architect that the walls in multi-colours and cutting in edges in flush surfaces.
- 237 The prices for painting and decorations shall include for the removal of door and window furniture, switch covers and the like before preparatory processes are commenced and for refixing on completion. Prices shall also include for work in multi-colours and cutting in edges in flush surfaces.
- 238 The prices for painting metal windows and doors shall include for painting the opening edges.

Protection

- 239 The prices for painting and polishing shall include for protection.

EXTERNAL WORK

Site Clearance

- 240 The prices for site clearance shall include for completely clearing away all bush, scrub, debris, shrubs and vegetation and removing from site to a tip provided by the Contractor.

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

242 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.

Roads and Drives

243 Roads and drives shall be of cast insitu concrete as described under the concrete section.

Grassing

244 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 and replacing all dead roots until the area is evenly covered with a healthy growth.

Vegetation

245 Vegetable soil shall be approved black earth free from stones, weeds, roots and other such items.

Drainage

246 Trenches for Drains, etc

Trenches for drains and service pipes, etc, are to be excavated in straight lines to the correct depths and gradients. Trench bottoms shall be well rammed and consolidated before laying pipes.

247 All linear items of trenches for pipes or drains, etc, shall include for excavation for any type of pipe, planking and strutting, return filling the excavated material, well ramming and consolidating, and carting away all surplus soil to a tip provided by the Contractor.

Pipes Generally

248 All pipes shall be laid with sockets pointing up the gradient of the trench.

249 The prices for pipe work shall include for building in ends at manholes and the like and pipes in branches not exceeding 3m long.

Testing of Drains

250 The Contractor shall notify the Architect when the drains are ready for testing and no trenches are to be filled in until the drains have been tested.

251 Allow for testing the drains in sections, with the water test or by other means when laid and again on completion of the Contract. If the drains do not pass the test or are

found to be out of alignment the whole of the defective length shall be taken out and relayed or replaced at the Contractor's expense and the drains retested until they are satisfactory.

Protection

The prices for all drainage work shall include for protection.