

Specifications

Scope of Work for the Interpretation Centre to be constructed at Telescope, St. Andrew's

1.0 GENERAL

The scope of works details the requirements and specifications for the installation of a new Interpretation Centre.

1.1 General Scope of Works for Contractor

1. The Contractor will report to the Client's designated Project Coordinator and must supply all labor, tools, materials and equipment required to carry out works in accordance with the specifications and requirements outlined in this bidding document.
2. A work plan, which shall include a waste management plan, health and safety plan, and method statement must be developed and presented to the client's engineer/ project coordinator for review and approval.
3. The Contractor shall provide monthly progress reports and coordinate and facilitate weekly on-site meetings and inspections as required or as requested by the client's representative. It is the contractor's responsibility to provide secretarial services for the recording of all site meeting and for distribution of said meeting minutes.
4. The contractor is responsible for all site preparation, mobilization and logistics of all works.
5. The Contractor will liaise closely with the client's Project Coordinator and Social and Communications Specialist in order to ensure that affected communities are consulted, informed and forewarned of planned site activities in a timely manner. The communities are to be given opportunities to ask questions and kept informed of the nature, timing/duration, extent of activities and likely short, medium and long-term impacts on them. These consultations should be documented by the Project Coordinator and a log kept of all such communications.
6. The client will provide the contractor with all required technical specifications of materials, civil and infrastructural works, Bills of Quantities, engineering drawings, proposed designed layouts except those that would be supply by the manufacture for construction of specific items.

7. The contractor shall develop and submit as-built drawings including a maintenance manual for the affective maintenance and management of all erected structures. These as-built drawings and maintenance manual will form part of a construction completion report.
8. It shall be the responsibility of contractor to get each drawing approved by the Client's Engineer-in-Charge at least seven days prior to work commencement, with all the changes / rectifications as suggested / marked by the Client.
9. The Contractor is responsible for the preparation of Detailed Quality Assurance System plans/procedures and its subsequent submission for review and approval by the Client's Engineer/ Project Coordinator prior to commencement of work. The required competent man power, machinery, tools and equipment's, etc. required to execute the work as per the Approved Quality assurance plan shall be the responsibility of contractor. Due daily records will be maintained by contractor throughout the work period as per the instructions of the Client's Engineer.
10. In addition to ensuring that supplied and erected structures are free from defects and inadequate workmanship; and that all testing requirements are met and satisfied.

2.0 SPECIFIC SCOPE OF WORKS, MATERIALS AND DESIGN SPECIFICATIONS

1. The construction of 446 Sq. Ft. of building / interpretation center housing a conference room, a male toilet, a female toilet, an open area for visitors and displays and a reception area will be constructed using 4" and 6" concrete blocks and a reinforced concrete roof.

SPECIFICATIONS FOR REINFORCED CONCRETE CONSTRUCTION

General

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

Definition

- B The following terms whenever used in the specification shall be taken to have the meanings assigned to them below:
- C " Plain Concrete" shall mean concrete used in members made with a structural grade of concrete listed, but not containing steel reinforcement.

- D “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.
- E “Satisfactory” shall mean to the satisfaction of the Project Manager
- F “Approved” shall mean approved by the Project Manager representatives.
- G “Required” shall mean required by the terms of this specification, or any other contract document.
- H “Passed by the Project Manager’s representative” shall mean accepted as complying with specification requirements as far as can be judged from visual inspection.
- I “Current issue” shall mean latest issued at the date of the tender invitation
- J “Failure to comply with this specification” shall mean failure to comply satisfactorily with all requirements of this specification.

Responsibility

- K No approval or acceptance by the Project Manager or his representative 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, durability and appearance of the finished concrete works.

PLAIN CONCRETE

- A Plain concrete works shall comply with the relevant requirements for reinforced concrete

MATERIALS

General

- B All materials in the works shall comply in all respects to the best standard available locally based on the relevant standard except for any deviations specifically authorized in subsequent clauses of this specification.
- C The constituent materials of concrete shall be cement, aggregates and water. No admixtures to this concrete shall be permitted without the prior approval of the Project Manager.

Cement

- D Cement shall be ordinary Portland Cement complying with B.S. 12: 1991. All cement shall be delivered to site in bulk, cement lorries of approved design or in sealed bags.
- E Minimum cement content of concrete shall be 350kg/m³ for all work below ground level and 250 kg/m³ for all work above ground level. Maximum cement content of concrete shall not exceed 550kg/m³.
- F No rebaggage cement will be permitted to be brought on to the site. On no account shall a change in the type of source of supply be permitted during the course of construction and every endeavor shall be made to ensure that the colour of the cement is constant throughout the contract except with the permission of the Project Manager.

Aggregate

- G Aggregate shall comply with the recommendation of BS 99\882:1992. In special circumstance a deviation from BS 882: 1992 in respect of grading of aggregate may be accepted, subject to the prior approval of the project manager.
- H The nominal maximum sizes of coarse aggregate shall be 20mm, except where otherwise directed by the Project Manager

Water

Water to be used in the Works shall be clean and free from all harmful matter, in suspension or solution that would have adverse effects on setting, hardening and strength of Portland Cement. A continuous supply of water shall be available during all mixing, placing and curing operations.

Reinforcement

- A. Mild steel reinforcement shall be hot rolled mild steel with a specified characteristic strength of 250N/mm² complying with B.S. 785 or approved equivalent. Hot rolled high yield steel shall have a specified characteristic strength of 410N/mm² and comply with B.S. 4449 or approved equivalent. Cold rolled high yield steel shall have specified characteristic strength of 460N/mm² for bars up to and including 16mm diameter and 425N/mm² for bars exceeding 16mm in diameter. Cold rolled high yield steel shall comply with B.S. 4483 or approved equivalent. Only twisted cold marked high yield reinforcement shall be used in the reinforcement.

Admixture

- B Admixtures for improving the concrete may be permitted but only after the Contractors have satisfied the Project Manager that it will be to his advantage. Use of the admixtures shall be made only on the written permission of the Project Manager and in any case the permission to use the same shall not be construed to mean that extra will be paid.

Concrete Densifier and Chemical Hardener

- C Surface hardener to be LIQUI-HARD Concrete Densifier and Chemical Hardener as supplied by INTERCHEM LIMITED of 9th Avenue South, Barataria (868 638 3801) or any equal and approved by Project Manager applied by either manual sprayer, soft bristle broom or mechanical scrubber to the concrete surface as per manufacturer's specification.

Storage

- D All cements shall be approved in a weather proof shed of adequate size having a raised dry floor, or in silos of approved design.
- E Aggregates shall be stored on hard paved areas with adequate dividing walls, or in approved container, to prevent mixing of different types of aggregate and be kept clean and free from contamination.
- F Cements 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.
- G Reinforcement shall be stored in racks clear of the ground.
- H Where materials are to be stored in suspended floors or roofs the Contractor shall ensure that such storage will not overload or distort the structural frame.

Rejected

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

TESTS

General

- A Before the commencement of the Contract, the Contractor shall submit to the Engineer, for his approval, the name of the Testing Authority he proposes to employ.
- B the Contractor shall provide all equipment necessary to carry out all tests on site specified or described in this specification, and he shall make and provide for all necessary arrangements for the delivery of all sample and test pieces to be tested by the approved Testing Authority.
- C The Contractor shall provide for maintaining all testing equipment on site in proper working order to the satisfaction of the Engineer.
- D The Contractor shall provide for sending copies of all tests results to the Engineer.
- E The Contractor will bear the cost of all tests specifically required in this specification.
- F The Contractor will not be paid for any special tests called for by the Engineer in consequence of any failure by the Contractor to comply with this specification.
- G The Contractor will be paid, at rates to be agreed, for any other special tests called for by the Engineer unless the tests results show failure by the Engineer to comply with this specification.
- H The Contractor shall state his source of cement to be used on the site and verify that these are of the relevant B.S.
- I The manufacturer's certificates of test including compressive strength tests, carried out in accordance with B.S. 12 for Portland 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 a 22.68kg sample of each type of cement he intends to use to the approved Testing Authority.

Aggregates

- J Samples of aggregates to be used shall be supplied to the Project Manager and the source identified for approval by the Project Manager.
- K All sampling and testing of aggregates shall be carried out in accordance with the relevant recommendations of B.S. 882:1992
- L At the commencement of the contract, the Contractor shall deliver to the Approved Testing Authority for inspection and analysis, 3 separate samples of each type of aggregate the 3 sample shall be taken at the proposed source of supply at intervals of not less than one day. For fine aggregates the samples shall be 22.68 kg weight each and for coarse aggregates, the samples shall be 45.36 kg weight each.

Mixing plant

- D Weight batching plant shall be checked weekly in the presence of the Project Manager's representative. The checking shall be carried out with approved weights provided by the Contractor for this purpose.
- E The water gauge of the concrete mixer shall be inspected and tested daily when concreting is in progress.
- F If any fault in the mixing plant is detected by these tests or otherwise, the fault shall be rectified to the satisfaction of the Project Manager's representative before further use is made of the equipment.

Concrete tests

- G Concrete test cube shall be made, cured and tested and the results recorded, in accordance with the recommendations of the current issue of B.S. 1881, unless specifically modified in subsequent clauses of the specification.
- H The test specimens shall be 150mm cubes made in steel moulds of approved design. The test cubes shall be made from typical batches of concrete as directed by and in the presence of the Project Manager's representative without prior notice.
- J Slump test or compaction factors tests of the mixed concrete shall be carried out at regular intervals and the results recorded and kept on the site.

CONCRETE

Concrete Mixes

D For structural concrete mixes made with Ordinary Portland Cement, the average 28 day works strength shall be not less than specified in the table below:

E The following concrete mixes shall be required.

b. Grade	c. 28 Days Works Strength in N/mm²	d. Proportion	e. Fine Aggregate	f. Coarse Aggregate
g. Plain h. Concrete	i. No j. Strength	l. 1:8 m. n.	o. - p. q.	r. 37mm s. all-in t.
u. 20 v.	w. 20 x.	y. 1:2:4 z.	aa. 100 – bb. 4mm	cc. 5mm- dd. 19mm
ee. 25 ff.	gg. 25 hh.	ii. 1:1 ½ : 3 jj.	kk. 100 – ll. 4mm	mm. 5mm - 19mm
nn. 30 oo.	pp. 30 qq.	rr. 1:2:2 ss.	tt.	uu.

Mix Proportions

F Mix proportions shall be designed by the Contractor for each structural concrete mix listed in the table:

G The concrete mixes shall be designed to have target mean strength which exceeds the required characteristic strength by the following margins:

vv. Grade 20	ww. 10N/mm ²
xx. Grade 25	yy. 13N/mm ²
zz. Grade 30	aaa. 15N/mm ²

H A reduction in the current margin specified above may be permitted subject to the following:

- (i) The Contractor shall satisfy the Project Manager that the standard of supervision and concrete control to be exercised on site for the duration of the structural works, justifies such a reduction.
- (ii) The average strength of the concrete used in the works shall be assessed accordingly to the statistical method, applied to works cube tests results.
- (iii) Trial mixes are made from each three separate batches of concrete which are prepared and four cube tests obtained from each batch.

The trial mix proportions will be approved provided that:

- (a) The mixes have sufficient workability to allow concrete to be placed and properly compacted by the methods to be used on site.
- (b) The average strength of the mix cubes tested at 28 days exceeds the specified characteristic strength by the current margin less 3.5N/mm^2

Tests at an earlier age may be permitted provided that satisfactory age-strength relationships have been established by experiment.

- A The mixes shall be designed to have sufficient workability to allow concrete to be placed and properly compacted by the methods to be used on site.
- B Complete calculations for the mix proportions and the information and assumptions on which they are based shall be submitted to the Project Manager, for each mix listed in the table, before the cubes for the preliminary strength tests are made.

Preliminary strength

- C Preliminary strength cube test shall be carried out to check the calculated proportions for each structural concrete mix.
- D Preliminary cubes shall be made for each mix from the three samples of aggregate and samples of cement sent to the approved Testing Authority. From each samples of aggregate 6 cubes shall be made, 3 for test at seven days and 3 for test at twenty eight days.
- E Each set of cubes at 28 days shall be accepted as satisfactory if, either all three cubes have a crushing strength greater than the preliminary design strength, or the strength or the average strength of the three cubes is greater than the preliminary design strength and the difference between the greatest and the least is not more than 20% of that average.
- F If for any mix in the table, the result in one test of three cubes tested at 28 days fall below this requirement, the mix shall be rejected, the proportions revised and the testing procedure repeated.
- G For each structural concrete mix, the 28 day preliminary strength shall be calculated as the average of the cubes tested at 28 days and the 7 day preliminary strength shall be calculated as the average of all the cubes tested at 7 days.

H Results for all preliminary tests shall be sent to the Project Manager as soon as they are available.

Work strength

- A Compliance with the specified characteristic strength shall be judged by test made on concrete cubes at 28 days. Test at an earlier age may be accepted provided that satisfactory age-strength relationships have been established by experiment.
- B The minimum rate of sampling shall be for every 20m² or every 20 batches of concrete supplied whichever is the lesser volume. No variation in this sampling rate will be permitted without the prior approval of the Project Manager.
- C Four cubes shall be made from each sample for testing at 28 days or at an earlier age approved by the Project Manager.
- D The samples where practicable shall be taken at the point of discharge from the mixer or in the case of ready-mixed concrete, at the point of discharge from the delivery vehicle.
- E Each set of four cubes tested at 28 days shall be accepted as satisfactory provide that:-
- (a) The average strength determined from any group of four consecutive test cubes exceed the specified characteristic strength by not less than 0.5 X the current margin.
 - (b) Each individual test result is greater than 85% of the specified characteristic strength.
- F If at any time the mean strength or the standard deviation fails to satisfy the requirements given above, the Project Manager shall be notified immediately and action shall be taken, as the Engineer shall direct
- G In all cases, an estimate of the corresponding 28 day strength may be obtained from the 7 day cube tests by assuming the ratio of 28 to 7 day strengths to be the same as that obtained from the average strengths of the tests for the trial mixes.
- H Results of all works cube tests and test analysis shall be kept on site and copies shall be sent to the Project Manager as soon as the results are available. All records of work cube tests shall indicate clearly which part of the structure each sample of concrete represents.

Works test failure

- I If any set of 7 day sub tests results indicate a low 28 day strength to be expected, the Project Manager shall be notified immediately and no props shall be removed from the affected part of the structure until the cause is determined.
- J If any set of 28-day cube results fall below the specified strength, the Engineer shall be notified immediately and the cause of the failure investigated.
- K The extent of the area of the structure affected shall be as defined by the Project Manager
- L All costs of and all charges in consequences of the course of action the Contractor is directed to follow, shall be borne by the contractor

Site Control

- A The water-cement ratio determined in the calculation of proportions for each mix shall be accurately maintained. The amount of water in each batch shall be controlled by direct measurement and due allowance shall be made for water content of the aggregate as determined by the daily test.
- B A slump of 75mm to 100mm or a compaction factor of 0.92 shall be used as a guide to the workability of the mixed concrete.
- C If a change in the grading of any aggregate is unavoidable, the proportions of all structural concrete mixes affected shall be revised to take account of the altered grading.

Ready-mixed Concrete

- D Permission must be obtained, and the name of the supplier submitted before the used of ready mixed concrete. Permission must also be obtained to change the supplier of ready-mixed concrete and also to revert back to site mixed concrete. The Concrete must be discharged into the formwork within 1 hour of mixing. All the requirements for site mixed concrete, previously given must be complied with, except for the time of discharge. Any ready mixed concrete that has not been deposited within 1 hour of mixing shall not be used and shall be removed form site. If required to do so, certificates showing batching records of the ready mixed concrete shall be produced by the contractor. Experienced ready mix truck drivers only will be allowed to deliver the ready mixed concrete and they, when told to mix up by the Contractor's Supervisor, will discharge into the mixer drum the exact amount of water required in accordance with previous clauses of this specification. The amount of water in the mix can only be changed on the Authority of the Project Manager.
- E Although testing is sometimes performed by the ready mixed concrete supplier, the Contractor must carry out his own testing in accordance with the requirements of the site mixed concrete. The concrete cubes shall be tested for strength by an independent authority and the results submitted to the Project Manager without delay.

REINFORCEMENT

General

- F Reinforcement bending schedules will be provided listing the cut length, diameter or size, bending dimensions and location of each bar in the works
- G Before the bars are cut to length the Contractor must check:-
- (i) That reinforcement schedules are provided for each part of the structure sufficiently in advance of his concreting programme.
 - (ii) That each schedule includes the correct quantities of reinforcement as detailed on the drawing to which it relates.
 - (iii) That the grades of reinforcement given in each schedule corresponds to those shown on the relevant drawing.

General (Cont'd)

- A The Contractor shall submit test certificates to show that he reinforcement complies with the specification.
- B The Project Manager shall be notified of any errors disclosed by these checks.
- C The Contractor shall be responsible for all delays and charges arising directly from failure to comply with these requirements.

Bending

- D 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. Bars shall be bent hot.
- E The minimum diameter of former to be used when high tensile bar shall be six times the bar diameter. The bar diameter shall be the diameter of the largest circle that can be inscribed in the cross section of the bar.

Cleaning

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

Placing

- G All reinforcement shall be accurately placed, securely fixed and adequately maintained in the positions shown on the drawings.
- H The concrete cover of the reinforcement detailed on the drawings shall be maintained by use of approved methods, biscuits on fairface work.

- I The Contractor shall supply and fix all necessary chairs required to maintain the reinforcement in the correct position. The spacing of chairs and the diameter of bars used in their manufacturer shall be agreed with the Project Manager. The weight of mild steel used for chairs not included in the reinforcement bending schedule will be paid for at the appropriate rate in the specification.
- J All laps of fabric and all intersections of bars shall be securely connected with malleable iron wire of suitable size or by another approved method. The wire is to be arranged with ends bent away from the formwork so that the concrete cover is not reduced by more than the diameter of the wire.
- K No metal part of any device used for connecting bars or for maintaining reinforcement in the correct position shall remain permanently within the specified minimum concrete cover to the reinforcement.
- L The concrete cover to reinforcement shall be as detailed on the structural drawings.

Welding

- A Welding of steel reinforcement is not required for structural purposes. No welding of reinforcement for fixing shall be put in hand without the written permission of the Project Manager.
- B Welding of cold worked high tensile steel reinforcement will not be permitted.

Formwork

- C Before construction commences the Contractor shall notify the Project Manager of the general method and system of formwork he proposes to use for all the main structural members.
- D Formwork and its supporting member shall be sufficiently strong to carry the works and all incidentals loading. The props and lateral supports shall be sufficiently closely spaced to prevent displacement or visible deflection of the shutters under the weight or hydraulic pressure of the wet concrete.
- E Methods of fixing and locating formwork which result in holes through the concrete when the formwork is removed, shall not be used.
- F No metal part of an device for maintaining formwork in the correct location shall remain permanently within the specified concrete cover the main reinforcement.
- G The use of concrete retarders or similar preparation to the formwork surfaces shall be subject to the prior approval of the Project Manager.

Mortices, holes, chases in concrete

- H Fixing blocks, ends of brackets, bars, bolts etc shall be cast in the concrete at the time of placing and all mortices, holes, apertures, chases, groves etc., shall be accurately set out in the formwork as the concrete is placed. No part of the concrete works shall be cut

away for any such item, or for any other reason, without the Project Manager's permission.

- I The Contractor shall obtain from all sub contractors complete information of their requirements regarding conduits, pipes, fixing blocks or boxes, holes any other other items to be cast or formed in the 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.
- J 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 sub-contractor's requirements relating to concrete members are approved by the Project Manager before the work is commenced.
- K At the commencement of the Contract, the Contractor shall supply all sub contractors with written copies of the items under this heading of the specification.

Propping

- A The vertical propping to all formwork shall be carried down sufficiently far to provide the necessary support without damage, overstress or displacement of any part of the construction.
- B Structural 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.
- C Structural props for beams and slab shall be positioned to divide the clear span of each member into equal lengths. The number of props provided in each span shall be at least one for clear spans of 6.00m or under at least two for clear spans over 6.0m and less than 12.00m. for two way spanning slabs, structural props as specified above shall be provided for each direction of span. For slabs spanning in one direction only, the spacing of props in the direction perpendicular to the span shall not exceed half the span. All members with spans exceeding 12.00m shall be propped to the Project Manager's satisfaction.

Beam and slab formwork

- D All formwork to soffits shall be constructed so that it can be removed without disturbing the structural props.
- E Unless otherwise detailed on the drawings the formwork of all floor beams and slabs shall be constructed with an upward camber giving a rise at mid span of 3mm for each 3.00m of span. For roof beams and slabs the formwork shall be campered to give rise at mid span of 6mm for each 3.00m of span.

Final Preparation

- F The internal faces of the formwork may be coated with an approved preparation to prevent adhesion to the concrete of 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.
- G Immediately before the concrete is placed in any section of the formwork, the interior of that section shall be completely cleared of all extraneous material.
- H Each section of the formwork to structural members shall be inspected and passed by the Project Manager's representative immediately before the concrete is placed in that section. At least 24 hours notice shall be given when such an inspection is required.

Exposed concrete faces

- I Unless otherwise specified all concrete faces to be exposed in the finished works shall be left as struck with a fair face, true to line and level within the specified tolerances for the works.
- J After inspection, all superfluous fins and similar projection shall be carefully removed. No render or other applied finish shall be used to obtain a fair face to the concrete.
- K 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.

Exposed concrete faces (cont'd)

- A All finished works which the Project Manager shall judge inferior in any part 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.

Formwork to produce a board marked finish

- B Formwork of romr lining to consist of approved rough textured softwood boards seasoned a moisture content of not more than 25% and not less than 18%
- C Arrange boards of varying textures and uniform 100mm width alternating the thickness by 10mm to give indentation to the surfaces and a uniform overall pattern. Assemble boards to prevent penetration of grout between them and soak reassembled forms with clean water before erecting and keep damp until concrete is placed.
- D Obtain approval for use nad type of release agent.

- E Do not use cover spacers without approval. Formwork ties to occur in a regular pattern in positions agreed with the Project Manager.
- F The finish is to be left as struck. Making good will not normally be permitted.

Formwork to produce a ribbed finish

- G Ribbed concrete finish shall be achieved using timber moulds to achieve the profiles shown on the drawings.
- H The ribs shall be 50mm deep x 50mm wide (extreme) splayed 6mm from back to front on either face and shall be true, plumb and align exactly on each side of the other.
- I The concrete shall be finished fair as described elsewhere.
- J Obtain approval for use and type of agent release.
- K Formwork ties shall occur in a regular pattern in position agreed with the Project Manager and filled with concrete to match surrounding works. The making good of holes for ties shall be finished 6mm recessed from the general recessed surface of the ribbing.

CONSTRUCTION JOINTS AND EXPANSION JOINTS

Position of construction joints

- L The Contractor shall ensure that all construction joints are arranged to minimize the effect of shrinkage of the concrete. Generally the distance between construction joints in walls and slab shall not exceed 9 metres.
- M The position of all joints shall be agreed with the Project Manager before the work is commenced.
- N Concrete placing shall be carried out continuously between consecutive construction joints.

Position of Construction joints (cont'd)

- A Construction joints between different grades of concrete and between concrete mixes using different cements shall be made and positioned as the Project Manager will direct.

Treatment of construction joints

- B All construction joints other than horizontal joint shall be formed with proper stop boards and the stop boards shall be fixed vertically unless otherwise directed. All joints shall be joggled.
- C All Construction joints shall be hacked and all laitance and honeycombed concrete removed from the contact face before the adjacent section is poured. Where an adjacent face of the concrete is to be exposed in the finished works, hacking of the contact face shall be terminated 12mm away from the face to be exposed. Air and water jetting

immediately after striking stop ends may be used instead of hacking subject to the prior approval of the Project Manager. All loose materials shall be removed from contact face immediately after hacking or jetting has been completed.

- D When work is to be resumed at a construction joint, it shall be swept clean and treated with a 2:1 sand/cement slurry or approved bonding agent before starting the new pour. The approved bonding agent shall be vandex super or equal applied at the rate of 1 kilogramme per square meter.
- E At vertical joints the fresh concrete shall be placed directly against the hacked and treated contact face.

Expansion joints

- F Expansion joints shall be positioned and formed in accordance with the details shown on the drawings.
- G All expansion joints shall be filled with an approved compressible material and joint sealant unless otherwise indicated on the drawings.

Mixing

- H Concrete shall be mixed in an 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.
- I The volume of mixed materials in each batch shall not exceed the rated capacity of the mixer. Each batch of concrete shall be completely discharged before the mixture drum is re-charged.
- J The mixer drum shall be thoroughly washed out whenever mixing ceases.

Transporting

- A Concrete shall be transported as rapidly as possible from the mixer to its final position without segregation or loss of any of the ingredients.
- B 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
- C Runs or gangways for concrete transporters and mains runs for foot traffic shall not be supported or allowed to bear on the fixed reinforcement.

Placing

- D Concrete shall be placed while still sufficiently plastic for adequate compaction without segregation or loss of any of the ingredients.

- E At all times when reinforced concrete is being placed, a competent steel fixer shall be in continuous attendance on the concretors, he shall adjust and correct the position of any reinforcement, which may be displaced.
- F 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. These records shall be available at all times for inspection by the Project Manager.

Compacting

- G Concrete shall be thoroughly compacted during placing and shall be carefully worked around all reinforcement and embedded fixtures and into the sides and corner of the formwork, using a heavy duty poker type vibrator with minimum frequency of 12MHE. The Contractor shall have standby vibrators on site during pours.

Curing

- H All surfaces of freshly placed structural concrete shall be covered with an approved material and kept constantly wet for 7 days except that for concrete made with rapid hardening cement the minimum curing period shall be 3 days. Degradable clear plastic curing coating may be used with prior written approval by the Project Manager or his representative.
- I Soffits and side form left in position will be regarded as effective in keeping those surfaces wet.
- J The Contractor shall notify the Project Manager of the system and method of curing he proposes to use for all structural concrete members before the works are commenced.

STRIKING OF FORMWORK

- K The structure shall not be distorted, damaged or overloaded in any way by the removal of the formwork form concrete members.
- L The responsibility of the safe removal of any part of the formwork or strutting shall rest with the Contractor.

Record of temperatures

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

Minimum striking times

- B The minimum striking times for removing formwork to structural members shall be determined from the table below. The times are given in days, where each day is to be 24 hours duration. Before the formwork is removed from any structural member the

Contractor shall ensure that the concrete in that member has attained sufficient strength for striking to proceed.

Location	Minimum Time O.P.C Concrete
Slab soffits (structural props left in)	4
Beams soffits (structural props left in)	6
Slab structural props	10
Beam structural props	14

CONCRETE IN WATERTIGHT CONSTRUCTION

General

- C All work required to be watertight in the finished works will be so indicated in the drawings
- D The Contractor shall include in his rates for any waterproofing additives he proposed to use but the use of such additives shall be subject to the prior approval of the Project Manager
- E Where in the opinion of the Project Manager damp patches or leakage of water in the finished works are due to incorrect placing or inadequate compaction of the allowance for shrinkage, the affected works shall be made good at the Contractors expense.

Water-bars

- F Where shown on the drawings, water-bars of approved materials, make and design shall be incorporated in construction joints in concrete in water tight construction. Water-bars shall be jointed in an approved manner.
- G Before commencing the works, the Contractor shall obtain the Project Manager's approval of the methods to be used to support and maintain the water-bars in the correct locations while the concrete is placed.

Pricing

- A Prices for Concrete Works shall include:-
 1. All Consideration arising from the specification
 2. Where concrete is cast in earth cuts (i.e not described as filled into formwork) for any additional concrete over the size stated or shown necessitated by the irregularity of the surfaces retaining the concrete.

3. Cutting, bends, hooks, tying wire, distance blocks and ordinary spacers for reinforcement.
4. All cleaning and oiling of forms and making good of exposed concrete surface after removal of formwork eg cutting off projecting fins, filling out small voids and brushing to exposed aggregate.
5. Where formwork is described as “wrought” or “dressed” for producing a fair face finish either by lining the formwork with suitable material and/or filling in voids etc.; and rubbing down to a smooth finish to the Project Manager approval.
6. Transporting concrete, hoisting or lowering, placing in position, working around reinforcement where necessary and curing.
7. Formwork including all temporary supports and strutting, notches, overlaps and passing at angles, easing, striking and removing.
8. Precast units including hoisting and fixing in position and bedding, jointing and pointing where necessary in cement mortar similar to that used in adjoining work.

BLOCKWORK

Cement and water

- A Cement and water shall be as described under “CONCRETE WORK”

Sand

- B Sand shall be clean fine plastering sand, free from salt, organic matter, clay, loam, dirt or other deleterious matter.

Plasticizer

- C Plasticizer shall be “Rendaplas” or approved equal and used in accordance with the manufacturer’s instructions.

Mortar

- D Mix mortar for blockwork of cement and sand (1:3) mixed on site in a similar manner to concrete including a plasticiser additive at the rate of 0.142 litres of plasticiser to every bag of cement and use within one hour of mixing. Mortar, which has commenced to set, is not to be knocked up again to re-use.
- E Mortar shall be mixed by placing one half of the water and sand in the operating mixer then adding the cement, plasticiser and the remainder of sand and water. After all the ingredients are in the batching mixer, they shall be mechanically mixed for not less than three minutes. Hand mixing shall not be employed unless specifically approved. Mortar should be retempered to maintain high plasticity but shall not be used after 1 1/2 hours from the initial mixing time.

Clay blocks

- F Hollow clay blocks shall conform to B.S. 3921: 1985 of first quality good, hard and well burnt, true to shape and size, ribbed and scored for plaster, unless otherwise described.

Concrete blocks

- G Concrete blocks shall conform to B.S. 6073 Part 1: 1981 of first quality good, sound, hard and well cured and true to shape and size of the types described with surfaces free from laitance and honeycombing. Blocks must be selected free from any fault with whole, even and sharp arises. Blocks are to be smooth or rough finish as indicate on the drawings and even in feature and colour throughout.
- H Load bearing blocks shall have an average crushing strength (average of 5 units) of not less than $7N/mm^2$ measured over the gross area. Concrete masonry units shall be tested in accordance with A.S.T.M C 140. The contractor shall allow for testing 5 random units, prior to commencement of the job. The units shall be selected in the presence of the manufacturer's representative and the Project Manager's representative.

Concrete blocks (cont'd)

- A No dimensions shall differ by more than 3mm from the specified standard dimension. “Standard Dimension” refer to the manufacturer’s designated dimensions and are not to be confused with “nominal dimension” of modular size units which are equal to the standard dimensions plus 10mm thickness of one standard mortar joint
- B Minimum face shell thickness and web thickness shall be as specified below:-

Nominal Unit Width	Minimum face shell	Web thickness
150mm	25mm	25mm
200mm	31mm	25mm
250mm	35mm	28mm
300mm	38mm	28mm

- C Measurement shall be the average of 5 units taken at the thinnest point.

Laying blocks

- D At the time of laying, all masonry units shall be free of excessive dirt and dust. Proper masonry units shall be used to provide a minimum of cutting. Where cutting is necessary, shall be neat and true. Where masonry is to be bonded to a concrete beam or footing, the concrete surfaces shall be clean with a laitance removed. Unless otherwise, blocks are to be laid in uniform courses with regular bond.
- E Units shall be laid to preserve the unobstructed vertical continuity of the cells to be filled. Such cells shall be not less than 50mm X 75mm clear.
- F Grouted cells are to be kept clear of all overhands, mortar droppings and other material. Cleanout holes shall be provided for each pour by leaving out every other unit in the bottom course of this section being poured. These cleanouts shall be sealed after inspection.
- G Mortar joints shall be straight, clean and uniform in thickness and shall be tooled as shown on the plans. Joints shall be tooled in a manner which compacts the mortar, pressuring the excess mortar out the joint rather than dragging it out. The mortar shall be well bonded to the block at the edges. Tooling shall be done when the mortar is partially set but still sufficiently plastic to bond. Where walls are to receive plaster or water-proofing agent, the joints shall be struck flush. Joints which are not tight at the time of tooling shall be raked out, pointed and then tooled. If it is necessary to move a unit after it has once been set in place, the unit shall be removed from the wall, cleaned and set in fresh mortar. Joints shall be 10mm thick unless specified otherwise and shall have full coverage on face shells, webs and vertical ends.
- H Where reinforcement is used in horizontal mortar joints, the thickness of the joints shall be at least twice the thickness of the diameter of the reinforcement. Alternatively, block cells can be notched twice the rod diameter and fully bedded in mortar.

- I When hot, dry weather exists, units shall be wetted with a light fog spray, but not immersed into any vessel. The work shall be carried up course by course and no portion shall be raised more than four courses at any time. All perpend and quoins shall be kept strictly true and square and carefully leveled through every second course. Build cross walls at the same time with main walls and properly bond together.

Concrete blocks (cont'd)

- A Thoroughly wet clay blocks before laying
- B Tool joints of exposed blockwork which is not plastered for a depth of 20mm before the mortar has set to form an even joint and leave the edges of blocks well defined and sharp.

Grouting

- C Where vertical reinforcement is specified or described, the reinforced cells are to be grouted for the full height of wall.
- D Grout shall consist of concrete mix 21N/mm². Sufficient water shall be added to make a workable mix that will flow into all the parts of the masonry cell without separation or segregation. The slump of the grout should be in the region of 75mm-100mm. Grout shall be placed before any initial set occurs and in no case more than 1 ½ hours after water has been first added. Admixtures may be used subject to prior approval of the Engineer.
- E Grout shall develop a minimum compressive strength of 21N/mm² at 28 days when tested as follow:
- F Grout shall be placed in a cell of a hollow concrete block of the type being grouted. The prism of grout so formed shall be separated and tested in compression in the same way as concrete test cubes except that any rough surface may require to be capped. For ease in separating the prism, the cell may be lined with porous paper. A minimum of ten preliminary tests will be required plus at least two tests for each day on which grouting is undertaken.
1. Grout shall be placed to a height of more than 1 block course at one time and there shall be a minimum interval of 60 minutes between pours. When work is stopped for one hour or longer, the horizontal construction joint shall be formed by stopping all tiers at the same elevation with the grout 38mm below the top. Grout shall be compacted with a suitable pencil vibrator.
 2. The final pour where a block wall is constructed to about a fixed soffit shall be carried out through a chute fixed to the side of the wall so that grout may be poured up to soffit level. The resultant surplus may be removed and cleaned off as soon as the grout has reached an initial set. After grouting, walls shall be hosed down to clean off scum and stains. No grout shall be placed until such time as the masonry mortar has sufficiently hardened to prevent blow outs.”

- G Where the top of the grouted wall is exposed, it shall be kept moist for curing purposes for at least three days after pouring.

Water-proofing

- H Water-proofing of bedding courses to blockwall shall be Vandex Premix or approved equal applied in a continuous solid layer in accordance with the manufacturer's instructions and of sufficient depth to equal that of the blockwork regular course joints.
- I Where an alternative waterproofing agent is to be utilized, the Contractor will first seek the written approval of the Project Manager

Water-proofing (cont'd)

- A The Contractor shall submit details of the alternative procedure he intends to follow and the manufacturer's instruction.
- B All surfaces are to be properly prepared, checked and approved by the Project Manager before application of the waterproofing compound

Reinforcement

- C Block walls generally shall have "Brickforce" reinforcement laid in the joints after every third course of blockwork in addition to any rod reinforcement as shown on Project Manager's drawings.
- D When a foundation dowel does not line up with a vertical core, it shall not be sloped more than one horizontal in six vertical. Vertical reinforcement shall be held in position at the top and bottom and at intervals not exceeding 192 diameters of reinforcement. Vertical reinforcing steel shall have minimum clearance of 6mm from the masonry and not less than one bar between bars.
- E Wire reinforcement shall be completely embedded in mortar. Wire reinforcement shall be lapped a minimum of 22mm at splices and shall contain at least one cross wire of each piece of reinforcement in the lapped distance.
- F Overlapping horizontal wire reinforcement is to be used at all block corners and wall junction together with ties to framing concrete columns and vertical faces.
- G Where blockwork and concrete are joined with flush faces to be rendered finished, the joint is to be covered by stapled galvanized chicken wire or equal with 150mm overlap each side of the joint.

Chases and opening

- H No chases and openings whatsoever shall be allowed without written permission from the Project Manager. Should chasing be necessary, they shall not be deeper than one-half the wall's thickness. No horizontal chase or the horizontal projection of a diagonal chase shall exceed 1.20m. Where openings are approved, they shall have lintels of reinforced

concrete and such lintels shall have a bearing of 200mm minimum at each end. All such chases to be filled solid with mortar and flushed fair on completion.

- I Block opening to receive joinery are to be exact dimensions within a tolerance agreed with the joiner that can be easily absorbed by the rough ground scribed to the opening.

Pricing

J Pricing for blockwork shall include:-

1. All consideration arising from the specification.
2. All rough cutting, cutting and pinning up at top of walls, cutting at ends and around openings, cutting a bonding at intersection and building off beams and plates filling exposed ends with mortar and forming and filling reveals.
3. All labours implied by the use of reinforcement where described as reinforced.

CARPENTRY AND JOINERY

Timber generally

- A Timber shall be sound with reasonably straight grain and at least 95% heartwood free from warp waney edges, post holes beetle, splits, fringes, decay, infestation or other deformation and from sign of rot. Worm and beetle and shall not contain large, loose or dead knot, sapwood, shakes or other defects to such an extent or so situated in the piece as to render it insufficient in strength or stiffness for the work to be done.
- B Timber, which is in the opinion of the Project Manager inferior in quality or condition or is not suitable for requirements of this work shall not be used. No piece of exceptionally light wood shall be permitted. Samples of materials shall be submitted to the Project Manager for his approval before the start of the operations.
- C Unwrought timber shall be sawn full to the dimensions stated, except that occasional variations in sawing are permitted. No variations in sawing shall be more than 5mm under the stated dimension when this is less than 200mm or more than 6mm under the stated dimension when this is more than 200mm.
- D Timber specified “dressed” on one or both opposite sides, shall be more than 12mm less than the nominal dimension, unless stated to be “actual dimension”. Timber shall be held to be dressed” by machine unless otherwise stated.

Pitch pine

- E Pitch pine shall be best imported quality of mature growth, free from gross defects, air seasoned and having a minimum density of 0.578kg/cubic meter at 25% moisture content.

Plywood

F Plywood shall conform to B.S.6566:1985 Grade 2 Veneer bonded with “weather and boil proof” synthetic resin adhesive unless otherwise described and shall be protected against infestation by the powder post beetle and like insect pests.

Teak

G Teak shall be prime quality, selected for appearance and left clean for oiling 100% free from sap.

Mahogany

H Mahogany shall be Honduras type local mahogany and of prime quality.

Treated timber

I All timber is to be vacuum/pressure impregnated with “Wolmanised” preservative to a dry salt net retention of 8.009kg of “Wolmanol” per cubic metre of timber. Where timber is cross cut bored after treatment all surfaces exposed should be liberally treated with “Wolmanol” certificate of conformity with this specification.

Exposed faces

A Timber which is to be exposed in the finished work shall be ‘dressed’ unless otherwise described

Standards

B The following British Standards shall apply insofar as they refer:-

Isometric block hexagon bolts, screws and nuts	BS4190
Nails	BS1202
Wood screws	BS1210
Workmanship and Maintenance	BSCP 112: Part2
Preservative Treatment for constructional Timber	BSCP 98

Natural finish

C When natural finish or staining clear polish or varnishing is specified, the timber in adjacent pieces shall be matched or uniform or symmetrical in colour and grain.

Shrinkage

D Arrange, joint and fix all joinery work in such a manner that shrinkage in any part and in any direction shall not impair the strength and appearance of the finished work and shall not cause damage to adjoining material or structure.

Moisture content

- E The moisture content of timber as delivered for the work shall not be more than 15 percent for joiner's work, nor shall this content be allowed to increase whilst work is in progress.

Joints

- F The Contractor shall perform all necessary tenoning, grooving, matching, tonguing, housing rebating and all other works necessary for the correct jointing. He shall provide all metal plates, screws, nails and other fixing that may be ordered by the Project Manager or that may be necessary for the proper execution of the works unless otherwise stated on the drawing.
- G All joints are to be type specified or as is most appropriate in the circumstances. The joints shall be designed and secured so that the stresses to which they are subjected may be either resisted or compensated. Loose joints are to be made where provision must be made for shrinkage or other movements acting other than in the direction of the stresses of fixing of loading.
- H Glued joints are to be used where provision need not be made for shrinkage or other movement in the connection and here sealed joints are required. All glued joints shall be cross tongued or otherwise reinforced.
- I All nails, sprigs, etc and other joinery works shall be accurately scribed to fit the contours or any irregular surface against which they may be required to form a close butt connection.

Screws

- A All screws shall be non-corrosive, pre drilled and countersunk with dowel filling or matching timber.

Nails

- B All Nails used shall be galvanized wire nails driven into pre-bored holes not exceeding $\frac{4}{5}$ of the nail diameter.

Bolt holes

- C Bolt holes shall be large enough to permit easy access for the bolt but may not exceed $D + \frac{d}{16}$ for 4mm whichever is the larger, where D is the bolt diameter.

Tolerance

- D All structural timbers shall be sawn timbers to the section given on the drawings. Permissible tolerance on cross section dimension will be +6mm and -3mm with no allowance for wane.

- E Provided reasonable tolerance at all connections between joinery work and the building carcass so that any irregularities, settlement or other movements shall be adequately compensated for.

Fabrication

- F Joinery work shall be carried out by a competent craftsman. The Contractor shall check the exact dimensions of masonry openings to ensure that the rough grounds can absorb the tolerances of exact dimensions.
- G Free-standing or independent joinery shall be dimensioned from the Project Manager's drawings. Any discrepancies shall be brought to the attention of the Project Manager in writing before fabrication is commenced. Allowance shall be made for the production of prototype joinery units for testing and written approval by the Project Manager.
- H Put in hand all joinery work immediately on commencement of the Works and store in a dry place and put together without wedging up for the inspection and approval of the Project Manager. Care shall be taken in fabrication to avoid excessive wetting or drying of the timber.
- I Where joinery works are shown built in or erected in position before the surrounding or enclosing works of the main building carcass have been carried out, it shall be the responsibility of the Contractor to ensure that the works are set plumb and shall not be damaged or be displaced by subsequent operations.
- J Where necessary, the joinery shall be temporarily braced and encased. Provide and secure suitable anchors or other fixing so that these may be "built in" to the carcass while it is being constructed. The anchorage connections shall be constructed so that they shall permit settlements in the building carcass without stressing or otherwise loading the joinery works. No fixing of temporary strutting into the finished joinery will be allowed.
- K Joinery works shall not be fixed in position until after all floors, walls and ceiling surfaces have been formed and constructed unless otherwise specified.

Fixing

- A All fixing, plates, shoes or straps shown on the drawings shall be neatly formed of mild steel plate drilled and welded as necessary. Prior to erection, all mild steel components shall be wire brushed and prime with one coat of red lead zinc chromate primer. All surfaces in contact with the wood shall be painted with a further two coats of bituminous paint.

Shop drawings

- B Shop drawings shall be produced for all joinery work for review and approval by the Project Manager.

Ironmongery

- C Provide samples of all ironmongery not included in the Ironmongery Schedules for selection by the Project Manager without charge.
- D Carefully wrap and protect all ironmongery until completion of the work and replace any which may be defaced or damaged without charge as the Project Manager shall direct. Oil all locks and adjust and leave in perfect working order on completion and properly label all keys and deliver up in accordance with the Project Manager's instructions.
- E Fix all ironmongery with screws of the same metal and finish as the fitting themselves. Remove and replace with new ones all screws damaged when driven by the turn screw or from any other cause.
- F Remove all ironmongery when painting or carrying out other works likely to damage the fittings and replace on completion.

Pricing

- G Prices for Carpentry/Joinery shall include:-
 1. All consideration arising from the specification
 2. Pre finished built in joinery fitting including all frames, legs, bolts, screws, straps, spacer blocks, etc ironmongery and decoration.

FLOOR, WALL AND CEILING FINISHINGS

General

Cement, sand, water and plasticiser.

- A Cement and water shall be as described under "CONCRETE WORK"
- B Sand and plasticiser shall be as described under " BLOCKWORK"

FLOOR / DRIVEWAY

Brushed concrete finish

- C A brushed concrete finish shall be produced for the driveway by sweeping the surface of concrete with a bass broom so as to leave visible lines in a roughly parallel configuration on the concrete when it has finally hardened.

Tiles

- A Ceramic tiles for floor shall conform to B.S. 6431:1983

- B Glazed ceramic tiles for walls shall conform to B.S. 6431:1983
- C Tiles shall be set out so as to avoid or minimize unsightly cutting, to establish the position of movement joints and to maintain straight joints
- D Apply a thin bed or an approved adhesive to a consistent thickness on floors and walls to receive tiles. Fix tiles before any surface drying of the adhesive occurs. After the tiles have been firmly fixed apply grouting material mixed to a consistency recommended by the manufacturer to as large an area as can be worked before hardening commences. Work well into joints until they are completely filled and when grout has set, remove surplus and tool joints to required profile. At all exposed edges rounded edge tiles shall be used without mitering corner tiles.
- E Tiles shall be fixed by competent tillers approved by the Project Manager
- F The Contractor shall allow in his price for constructing a sample panel for walls and floor tiles, each sample of approximately 16ft² for the approval of the Project Manager. Subsequently, the standard of workmanship approved, shall be the standard by which the works shall be executed.

Beds

- G Mix for beds shall be in the proportion of one part of cement to three parts of sand.
- H Thoroughly brush clean surfaces to receive beds of all foreign matter. Provide an adequate bond between beds and concrete either by using an approved concrete bonding agent or by well hacking, wetting and applying cement grout immediately prior to laying beds.
- I Lay beds to thicknesses and with surface finish as described.
- J Fill joints or cracks with an approved plastic material and finish flush with surface.
- K Prime chalky or dusty surfaces to receive tiles with a primer recommended by the tile manufacturer.

Levels

- L Ensure that the levels of floors and paving within any area and between adjoining areas are constant unless specifically described or shown to be otherwise. Make up for any variations in the thickness of floor and paving finishings and irregularities in the surface of the structural base by adjusting the thickness of the screed as necessary.

Protection

- M Protect all premoulded floor finishings from walking or other disturbances for five days after laying
- N Wet all in-situ floor finishings and keep damp for at least seven days after laying by thickly covering with hessian or polythene membrane kept moist by frequent sprinkling with water.

Protection (cont'd)

- A Cover all floors up to the completion of the Works with a temporary covering. On completion of the Works, clean off temporary coverings, remove all stains, mortar splashes etc. from the floors and leave perfect for handing over.

WALLS

Rendering Work and Backing

Rendering

- B Mix rendering of cement and sand, in the proportion of one part cement and five parts sand and lay to the thickness described with a plasticier added in strict accordance with the manufacturer's instructions.
- C Proportion materials by measure and not by estimation and proper approved measuring boxes must be provided for this purpose. Make up mix on site in a closeboard wood platform with upstand edges and thrice turn over mix while water is being added through a rose director and use immediately thereafter.
- D Where approved mechanical batch mixers are employed, rotate each batch in the drum at least two minutes and use immediately thereafter.
- E Thoroughly wash out all platforms and mixers at the cessation of work each day and as necessary during the working hours.
- F Mix only quantities which can be used at once and reject rendering which has begun to set before being required.
- G Carefully float all work and finish to the stated thickness with surfaces perfectly flat to stand the straight edge every way, free from all cracks, blisters, or after effect and leave perfectly clean.
- H "Throw" all rendering and plaster on to the wall and give the minimum of working to ensure a plumb and even finish. Use only wood floating unless otherwise described.
- I Where possible complete each section of walling in one operation, but where this is not possible the existing edge shall be well hacked and wetted before recommencing operations. Throughout the whole of the works order sufficient sand to prevent any variation between the quality and colour of different renderings.
- J Allow for preparing and wetting all surfaces prior to commencement of all operations, for any additional thickness required in dubbing out and for working round and behind pipes with their connections and fixtures.

Backing

K Mix and apply backing as described under “Beds”

CEILING

Gypsum

A Gypsum sheets shall be manufactured to BS 1230: 1970. The fixing system shall be hot dipped zinc coated mild steel sections to BS 292:076 and BS 2989:1975 using the paraclip fixing system.

Storage and handling of materials

B Store materials in dry conditions. If storing on concrete, boards should be supported by timber platforms. Carry boards on edges to prevent breakage.

Workmanship

C Fix main supporting channels at 410 mm centers using wire ties on plugs and screws to backgrounds as is required. Fix intermediate suspension members to main support with approved plasterboard screws. Fix sheets to suspension system with staggered joints. Joints in sheeting shall be taped with jointing tape and filled with jointing compound.

D The entire surface should be sanded and left smooth for decoration.

Pricing

E Prices of Floor, Driveway, Wall and Ceiling Finishings shall include:-

1. All considerations arising from the specification
2. All preparatory work to the surfaces to be treated
3. Producing material samples and preparing sample panels of finished work as and when directed by the Project Manager

Glazing

General

A Glass shall be obtained from an approved manufacturer and shall conform to B.S. 952 Part 1: 1978. All glass shall be delivered in proper containers with maker's name, guarantee, type of glass and thickness or weight of glass attached to the outside of the container.

Sheet glass

B Sheet glass shall be selected glazing quality of the weights or thicknesses stated.

C Float glass and plate glass shall be of the thickness stated and be perfectly flat and true.

Wired glass

D Wired glass shall be of the thickness stated, be polished Georgian and be perfectly flat and true.

Putty

E Putty for glazing metal frames shall be that supplied or recommended by the metal windows manufacturers

Glazing

F All float glass louver blades shall have ground and polished long edges.

G Cut glass to sizes required as measured on site with a clearance on all sizes to allow for flexible 4mm spacers and bedding blocks all set plumb, square and level in alignment with other work and glazing. Metal frames to have back putty and peg with neat front putty kept below the sight lines. Timber frames to be stet and watertight with approved non-hardening electrometric caulking compound.

H Glazed door glass to be set with spacers as above and secured with wash leather or equal strips to prevent rattling.

PAINTING AND DECORATING

General

A All materials used, unless otherwise stated, shall be anti-fungus. Wherever available environmental benign water based paints and primers free from toxic solvents and lead free will be used.

- B Supply paints on site in sealed cans and all mixing etc., shall be in accordance with the manufacturers instructions. No paint is to be thinned.
- C Produce vouchers as and when required by the Engineer to prove to his satisfaction that all materials supplied are genuine and as specified herein.

Preparation and application

- D Thoroughly dust and clean down all surfaces to be painted cut out cracks, stop holes and clean steelwork rust in accordance with approved practice
- E Apply paint by brush, roller or spray with the minimum of dilution
- F Strain the prepared paint free from skins and similar impurities immediately before application.
- G Allow to dry and well rub down each coat of paint before the next is applied and no two successive coats shall be to the same tint.
- H No paint shall be applied to a damp surface and no external painting shall be carried out during wet weather.
- I On account to allow employees to washings or painting materials into sanitary fittings or drainage systems, so provide a suitable receptacle outside the building to receive same.

Brand name

Surfaces shall be prepared and paint supplied strictly in accordance with the written recommendations of the Manufacturer.

Masonry and hardboard surfaces

- A Prepare masonry surfaces for painting by allowing to dry for as long as possible and removing all mortar splashes by rubbing with a pumice or flat stone and thoroughly brushing to remove dust.
- B Prime surface with one coat of emulsion and allow to dry. Fill all cracks, holes etc with patent filler which shall be allowed to set before sanding to a smooth finish before the application of subsequent coats of emulsion paint.
- C Surfaces which are selected for a textured finish shall, after preparation as described for general masonry surfaces, be treated with an etching solution in accordance with the manufacturer's recommendation and finished with a single coat of texture emulsion paint

Woodwork

- D Prepare surfaces of woodwork for painting by sanding smooth and cleaning free of dust. Treat knots and resin pockets with one coat of knotting varnish to prevent bleeding and allow to dry. Apply one coat of wood primer and one coat of oil paint after which all

cracks, holes etc shall be filled with anti-fungus putty, which shall be allowed to set before sanding to a smooth finish before the application of subsequent coats of oil paints.

Metalwork

- E Prepare surfaces of metalwork for painting by removing dirt, grease etc with an approved solvent and rust and scale by wire brushing, chipping etc allowing to dry
- F Paint metal surfaces with one coat of primer and tow coats of oil paints allowing at least one hour drying between coats.

Pricing

G Pricing for Painting and Decorating shall include:-

1. All consideration arising from the specification
2. Varying colour in individual rooms or areas in accordance with the Engineer's colour scheme
3. Preparing fairly large sample panels of finishing colours as and when directed by the Engineer

All preparatory work to the surfaces to be pa

4.0 Project Duration

It is expected that is project will last for duration of six (6) months as follows:

Drawings

No.	Description of Drawings	Amount
A-01	Floor plan	1
A-02	Roof plan	1
A-03	Electrical plan	1
A-04	Elevations	1
A-04a	Elevations	1
A-05	Building section	1
S-01	Foundation plan	1
S-02	Ground beam plan	1
S-03	Suspended beam plan	1
S-04	Foundation details	1
S-05	Ring beam, door opening and wall detail	1
S-06	Roof slab reinforcement plan and details	1
R-01	Septic tank and soak way pit	1