

**BIDDING DOCUMENTS**  
**CIVIL HOSPITAL KARACHI**  
**HEALTH DEPARTMENT**  
**GOVERNMENT OF SINDH**

**Contract No:- MW – X - 0223**

Supplying, Installation, Testing, Commissioning & Maintenance  
(During Maintenance Period) of  
**Internal Glass Partitioning & Miscellaneous Works** for the project  
“Shaheed Mohtarma Benazir Bhutto Accident, Emergency  
& Trauma Centre and Ancillary Services Complex  
at Civil Hospital Karachi”

**VOLUME-I**

**INSTRUCTIONS TO BIDDERS, SALIENT FEATURES  
/ TERMS & CONDITION OF THE TENDER,  
ESSENTIAL REQUIREMENTS / EVALUATION  
CRITERIA, FORM OF AGREEMENT, SCOPE OF  
WORK AND SPECIFICATIONS**



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ARCHITECTS - ENGINEERS - PLANNERS - INTERIOR DESIGNERS - MANAGEMENT CONSULTANTS

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**INSTRUCTIONS  
TO  
TENDERER**

## INSTRUCTIONS TO TENDERERS

### A. GENERAL

#### IT.1 Scope of Tender

- 1.1 The Employer as defined in the Tendering Data hereinafter called “the Employer” wishes to receive tenders for the construction and completion of works as described in these Tender Documents, and summarized in the Tendering Data hereinafter referred to as the “Works”.
- 1.2 The successful tenderer will be expected to complete the Works within the time specified in Appendix-A to Tender.

#### IT.2 Source of Funds

- 2.1 The Employer has applied for or received a loan or credit from the source (s) indicated in the Tendering Data in various currencies towards the cost of the project specified in the Tendering Data and it is intended that part of the proceeds of this loan / credit will be applied to eligible payments under the Contract for which these Bidding Documents are issued.

#### IT.3 Eligible Tenderers

- 3.1 This Invitation to Tender is open to all tenderers meeting the following requirements:
  - a. Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the Works.
  - b. Duly prequalified / registered with the Employer

#### IT.4 One Tender per Tenderer

- 4.1 Each tenderer shall submit only one tender either by himself, or as a partner in a joint venture. A tenderer who submits or participates in more than one tender (other than alternatives pursuant to Para IT.16) will be disqualified.

#### IT.5 Cost of Tendering

- 5.1 The tenderer shall bear all costs associated with the preparation and submission of their respective tenders and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.

#### IT.6 Site Visit

- 6.1 The tenderers are advised to visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. All cost in this respect shall be at the tenderer’s own expense.
- 6.2 The Tenderers and any of their personnel or agents will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the tenderers, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.

## **B. TENDER DOCUMENTS**

### **IT.7 Documents Comprising the Tender**

- 7.1 The Tender Documents are those stated below, and should be read in conjunction with any Addenda issued in accordance with Clause IT.9.
01. Instruction to Tenderers.
  02. Tendering Data
  03. Conditions of Contract, Part-I - General Conditions.
  04. Conditions of Contract, Part II-A - Conditions of Particular Application.
  05. Conditions of Contract, Part II-B - Conditions of Particular Application.
  06. Specifications - Special Provisions.
  07. Specifications - Technical Provisions.
  08. Forms of Tender & Appendices to Tender.
  09. Bill of Quantities.
  10. Form of Tender Security/Earnest money.
  11. Form of Agreement.
  12. Forms of Performance Security/Bond and Mobilization Advance Guarantee/Bond.
  13. Drawings.
  14. Addendum –In case it is issued.
- 7.2 The tenderers are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of tender submission will be at the Tenderers own risk. Pursuant to Clause IT.26, tenders which are not substantially responsive to the requirements of the Tender Documents will be rejected.

### **IT.8 Clarification of Tender Documents**

- 8.1 Any prospective tenderer requiring any clarification (s) in respect of the Tender Documents may notify the Employer in writing at the Employer's address indicated in the Invitation to Tenderers. The Employer will respond to any request for clarification which he receives earlier than 28 days prior to the deadline for submission of tenders.

Copies of the Employer's response will be forwarded to all purchasers of the Tender Documents, including a description of the enquiry but without identifying its source.

### **IT.9 Amendment of Tender Documents**

- 9.1 At any time prior to the deadline for submission of tenders, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective tenderer, modify the Tender Documents by issuing addendum.
- 9.2 Any addendum thus issued shall be part of the Tender Documents pursuant to Sub-Para 7.1 hereof and shall be communicated in writing to all purchasers of the Tender Documents. Prospective tenderers shall acknowledge receipt of each addendum in writing to the Employer.
- 9.3 To afford prospective tenderers reasonable time in which to take an addendum into account in preparing their tenders, the Employer may extend the deadline for submission of tenders in accordance with Clause IT.20

## **C. PREPARATION OF TENDERS**

### **IT.10 Language of Tender**

- 10.1 The tender and all correspondence and documents related to the tender exchanged by a

tenderer and the Employer shall be in the bid language stipulated in the Tendering Data and conditions of Particular Application. Supporting documents and printed literature furnished by the tenderers may be in any other language provided the same are accompanied by an accurate translation of the relevant parts in the English language, in which case, for purposes of evaluation of the tender, the English translation shall prevail.

#### **IT.11 Documents Accompanying the Tender**

##### **11.1 Each tenderer shall;**

- (a) submit a written power of attorney authorizing the signatory of the tender to act for and on behalf of the tenderer; and
- (b) update the information indicated and listed in the Tendering Data and previously submitted with the application for prequalification, and continue to meet the minimum criteria set out in the prequalification documents which as a minimum, would include the following :
  - (i) Evidence of access to financial resources;
  - (ii) Financial predictions for the current year and the two following years including the effect of known commitments;
  - (iii) Work commitments since prequalification;
  - (iv) Current litigation information; and
  - (v) Availability of critical equipment.

##### **11.2 Tenders submitted by a joint venture of two or more firms shall comply with the following requirements;**

- (a) the tender and in case of a successful tender, the Form of Agreement shall be signed so as to be legally binding on all partners;
- (b) one of the joint venture partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;
- (c) the partner-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of works as per the terms and Conditions of Contract and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the joint venture.
- (d) all partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under (b) above as well as in the Form of Tender and in the Form of Agreement (in case of a successful tender); and
- (e) a copy of the agreement entered into by the joint venture partners shall be submitted with the tender stating the conditions under which it will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint venture, and any other information necessary to permit a full

appraisal of its functioning. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture partner without prior written consent of the Employer.

- 11.3 Tenderers shall also submit proposals of work methods and schedule, in sufficient detail to demonstrate the adequacy of the Tenderers', proposals to meet the technical specifications and the completion time referred to in Sub-Clause 1.2 hereof.

#### **IT.12 Tender Prices**

- 12.1 Unless stated otherwise in the Tender Documents, the Contract shall be for the whole of the Works as described in Sub-Clause 1.1 hereof, based on the unit rates and / or prices submitted by the tenderer.
- 12.2 The tenderers shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by a tenderer will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities.
- 12.3 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to the deadline for submission of tenders shall be included in the rates and prices and the total Tender Price submitted by a tenderer.

Additional / reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed / deducted as per Sub-Clause 70.2 of the Conditions of Particular Application - Part IIA.

- 12.4 The rates and prices quoted by the tenderers are subject to adjustment during the performance of the Contract in accordance with the provisions of Clause 70 of the Conditions of Contract. The tenderers shall furnish the prescribed information for the price adjustment formulae in Appendix-C to Tender, and shall submit with their tenders such other supporting information as required under the said Clause.

#### **IT.13 Currencies of Tender and Payment**

- 13.1 The unit rates and the prices shall be quoted by the tenderer entirely in Pak rupees. A tenderer expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as the "Foreign Currency Requirements") shall indicate the same in Appendix-B to Tender. The proportion of the Tender Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the currency of the Tenderer's home country or, (ii) at the tenderer's option, entirely in Pak rupees provided always that a tenderer expecting to incur expenditures in a currency or currencies other than those stated in (i) and (ii) above for a portion of the foreign currency requirements, and wishing to be paid accordingly, shall indicate the respective portions in his tender.
- 13.2 The rates of exchange to be used by the tenderer for currency conversion shall be the TT&OD Selling Rates published by the State Bank of Pakistan prevailing on the date 28 days prior to the deadline for submission of tenders.  
For the purpose of payments, the exchange rates used in tender preparation shall apply for the duration of the Contract.

#### **IT.14 Tender Validity**

- 14.1 Tenders shall remain valid for the period stipulated in the Tendering Data after the



Date of Tender Opening specified in sub-clause IT.23.

- 14.2 In exceptional circumstances, prior to expiry of the original tender validity period, the Employer may request that the tenderers extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing. A tenderer may refuse the request without forfeiting his Tender Security. A tenderer agreeing to the request will not be required or permitted to modify his tender, but will be required to extend the validity of his Tender Security for the period of the extension, and in compliance with Clause IT.15 in all respects.

#### **IT.15 Tender Security/Earnest money**

- 15.1 Each tenderer shall furnish, as part of his tender, a Tender Security/Earnest money in the amount stipulated in the Tendering Data in Pak Rupees or an equivalent amount in a freely convertible currency.
- 15.2 The Tender Security shall be, at the option of the tenderer, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank of Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank of Pakistan in favour of the Employer valid for a period 28 days beyond the Tender Validity date.
- 15.3 Any tender not accompanied by an acceptable Tender Security/Earnest money shall be rejected by the Employer as non-responsive.
- 15.4 The tender securities of unsuccessful tenderers will be returned as promptly as possible, but not later than 28 days after the expiration of the period of Tender Validity.
- 15.5 The Tender Security of the successful tenderer will be returned when the tenderer has furnished the required Performance Security and signed the Agreement.
- 15.6 The Tender Security may be forfeited:
- (a) if the tenderer withdraws his tender during the period of Tender Validity;
  - (b) if the tenderer does not accept the correction of his Tender Price pursuant to Sub-Clause 27.2 hereof; or
  - (c) In the case of successful tenderer, if he fails within the specified time limit to:
    - (i) furnish the required Performance Security
    - (ii) Sign the Agreement.

#### **IT.16 Alternate Proposals by Tenderer**

- 16.1 Should any tenderer consider that he can offer any advantages to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his tender to be submitted in strict compliance with the Tender Documents, submit any Alternate Proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Form of Tender shall be that which represents complete compliance with the Tender Documents.
- 16.2 Alternate Proposal(s), if any, of the lowest evaluated responsive tenderer only may

be considered by the Employer as the basis for the award of Contract to such tenderer.

#### **IT.17 Pre-Tender Meeting**

- 17.1 The Employer may, on his own motion or at the request of any prospective tenderer(s), hold a pre-tender meeting to clarify issues and to answer any questions on matters related to the Tender Documents. The date, time and venue of pre-tender meeting, if convened, is as stipulated in the Tendering Data. All prospective tenderers or their authorized representatives shall be invited to attend such a pre-tender meeting.
- 17.2 The tenderers are requested to submit questions, if any, in writing so as to reach the Employer not later than one week before the proposed pre-tender meeting.
- 17.3 Minutes of the pre-tender meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Tender documents. Any modification of the Tender documents listed in Sub-Clause 7.1 hereof which may become necessary as a result of the pre-tender meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IT.9 and not through the minutes of the pre-tender meeting.
- 17.4 Absence at the pre-tender meeting will not be a cause for disqualification of a tenderer.

#### **IT.18 Format and Signing of Tender**

- 18.1 Tenderers are particularly directed that the amount entered on the Form of Tender shall be for performing the Contract strictly in accordance with the Tender Documents.
- 18.2 All appendices to Tender are to be properly completed and signed.
- 18.3 No alteration is to be made in the Form of Tender nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the tender may be rejected.
- 18.4 Each tenderer shall prepare by filling out the forms completely and without alterations one (1) original and number of copies, specified in the Tendering Data, of the documents comprising the tender as described in Clause IT.7 and clearly mark them "ORIGINAL" and "COPY" as appropriate. In the event of discrepancy between them, the original shall prevail.
- 18.5 The original and all copies of the tender shall be typed or written in indelible ink (in the case of copies, Photostats are also acceptable) and shall be signed by a person or persons duly authorized to sign on behalf of the tenderer pursuant to Sub-Clause 11.1(a) hereof. All pages of the tender shall be initialed and stamped by the person or persons signing the tender.
- 18.6 The tender shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the tenderer, in which case such corrections shall be initialed by the person or persons signing the tender.
- 18.7 Tenderers shall indicate in the space provided in the Form of Tender their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their tenders and the Contract is to be sent.

18.8 Tenderers should retain a copy of the Tender Documents as their file copy.

## **D. SUBMISSION OF TENDERS**

### **IT.19 Sealing and Marking of Tenders**

19.1 Each tenderer shall submit his tender as under:

- (a) ORIGINAL and each copy of the Tender shall be separately sealed and put in separate envelopes and marked as such.
- (b) The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in Sub- Clause 19.2 hereof.

19.2 The inner and outer envelopes shall;

- (a) be addressed to the Employer at the address provided in the Tendering Data;
- (b) bear the name and identification number of the contract as defined in the tendering Data, and;
- (c) provide a warning not to open before the time and date for bid opening, as specified in the Tendering Data.

19.3 In addition to the identification required in Sub- Clause 19.2 hereof, the inner envelope shall indicate the name and address of the tenderer to enable the tender to be returned unopened in case it is declared “late” pursuant to Clause IT.21

19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Tender.

### **IT.20 Deadline for Submission of Tenders**

20.1 (a) Tenders must be received by the Employer at the address specified no later than the time and date stipulated in the Tendering Data.

- (b) Tenders with charges payable will not be accepted, nor will arrangements be undertaken to collect the tenders from any delivery point other than that specified above. Tenderers shall bear all expenses incurred in the preparation and delivery of tenders. No claims will be entertained for refund of such expenses.

- (c) Where delivery of a tender is by mail and the tenderer wishes to receive an acknowledgment of receipt of such tender, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed tender package.

- (d) Upon request, acknowledgment of receipt of tenders will be provided to those making delivery in person or by messenger.

20.2 The Employer may, at his discretion, extend the deadline for submission of tenders by issuing an amendment in accordance with Clause IT.9, in which case all rights and obligations of the Employer and the tenderers previously subject to the original

deadline will thereafter be subject to the deadline as extended.

#### **IT.21 Late Tenders**

- 21.1 (a) Any tender received by the Employer after the deadline for submission of tenders prescribed in Clause IT.20 will be returned unopened to such tenderer.
- (b) Delays in the mail, delays of person in transit, or delivery of a tender to the wrong office shall not be accepted as an excuse for failure to deliver a tender at the proper place and time. It shall be the tenderer's responsibility to determine the manner in which timely delivery of his tender will be accomplished either in person, by messenger or by mail.

#### **IT.22 Modification and Withdrawal of Tenders**

- 22.1 Any tenderer may modify or withdraw his tender after tender submission provided that written notice of the modification or withdrawal is received by the Employer prior to the deadline for submission of tenders.
- 22.2 The notice for modification or withdrawal of any tender shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IT.19 with the outer and inner envelopes additionally marked "MODIFICATION" or "WITHDRAWAL", as appropriate.
- 22.3 No tender may be modified by a tenderer after the deadline for submission of tenders.
- 22.4 Withdrawal of a tender during the interval between the deadline for submission of tenders and the expiration of the period of tender validity specified in the Form of Tender may result in forfeiture of the Tender Security in pursuance to Clause IT.15.

### **E. TENDER OPENING AND EVALUATION**

#### **IT.23 Tender Opening**

- 23.1 The Committee will open the tenders, including withdrawals and modifications made pursuant to Clause IT.22, in the presence of tenderers' representatives who choose to attend, at the time date and location stipulated in the Tendering Data.  
  
The tenderers' representatives who are present shall sign a register evidencing their attendance.
- 23.2 Envelopes marked "WITHDRAWAL" shall be opened and read out first. Tenders for which an acceptable notice of withdrawal has been submitted pursuant to Clause IT.22 shall not be opened.
- 23.3 The tenderer's name, total Tender Price and price of any Alternate Proposal(s), any discounts, tender modifications and withdrawals, the presence or absence of Tender Security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening of tenders.

#### **IT.24 Process to be Confidential**

- 24.1 Information relating to the examination, clarification, evaluation and comparison of tender and recommendations for the award of a contract shall not be disclosed to tenderers or any other person not officially concerned with such process. Any effort by a tenderer to influence the Employer's processing of tenders or award decisions may result in the rejection of such tenderer's tender.

## **IT.25 Clarification of Tenders**

- 25.1 To assist in the examination, evaluation and comparison of tenders, the Employer may, at his discretion, ask any tenderer for clarification of his tender, including breakdowns of unit rates. The request for clarification and the response shall be in writing but no change in the price or substance of the tender shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the tenders in accordance with Clause IT.28.

## **IT.26 Examination of Tenders and Determination of Responsiveness**

- 26.1 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender (i) meets the eligibility criteria; (ii) has been properly signed; (iii) is accompanied by the required Tender Security; and (iv) is substantially responsive to the requirements of the Tender Documents.
- 26.2 A substantially responsive tender is one which conforms to all the terms, conditions and specifications of the Tender Documents, without material deviation or reservation. A material deviation or reservation is one (i) which affect in any substantial way the scope, quality or performance of the Works; (ii) which limits in any substantial way, inconsistent with the Tender Documents, the Employer's rights or the tenderer's obligations under the Contract; or (iii) adoption whereof would affect unfairly the competitive position of other tenderers presenting substantially responsive tenders.
- 26.3 If a tender is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

## **IT.27 Correction of Errors**

- 27.1 Tenders determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:
- (a) where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and
  - (b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.
- 27.2 The amount stated in the Form of Tender will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the tenderer, shall be considered as binding upon the tenderer. If the tenderer does not accept the corrected Tender Price, his tender will be rejected, and the Tender Security shall be forfeited in accordance with Sub- Clause 15.6(b) hereof.

## **IT.28 Evaluation and Comparison of Tenders**

- 28.1 The Consultant (NSA) will evaluate and compare only the tenders determined to be substantially responsive in accordance with Clause IT.26 and the same will be put before the Committee for approval.

- 28.2 In evaluating the tenders, the Employer will determine for each tender the evaluated Tender Price by adjusting the Tender Price as follows:-
- (a) making any correction for errors pursuant to Clause IT.27
  - (b) excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Daywork.
  - (c) making an appropriate adjustment for any other acceptable variation or deviation.
- 28.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in tender evaluation.
- 28.4 If the tender of the successful tenderer is seriously unbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the tenderer to produce detailed price analyses for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in Clause IT.32 be increased at the expense of the successful tenderer to a level sufficient to protect the Employer against financial loss in the event of default of the successful tenderer under the Contract.

## **F. AWARD OF CONTRACT**

### **IT.29 Award**

- 29.1 Subject to Clause IT.30 and IT.34, the Employer will award the Contract to the tenderer whose tender has been determined to be substantially responsive to the Tender Documents and who has offered the lowest evaluated Tender Price, provided that such tenderer has been determined to be eligible in accordance with the provisions of Clause IT.3.

### **IT.30 Employer's Right to Accept any Tender and to Reject any or all Tenders**

- 30.1 Notwithstanding Clause IT.29, the Employer reserves the right to accept or reject any tender, and to annul the tendering process and reject all tenders, at any time prior to award of Contract, without thereby incurring any liability to the affected tenderers or any obligation to inform the affected tenderers of the grounds for the Employer's action.

### **IT.31 Notification of Award**

- 31.1 Prior to expiration of the period of Tender Validity prescribed by the Employer, the Employer will notify the successful tenderer in writing ("Letter of Acceptance") that his tender has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract called the "Contract Price").
- 31.2 Upon furnishing by the successful tenderer of a Performance Security, the Employer will promptly notify the other tenderers that their tenders have been unsuccessful.

### **IT.32 Performance Security**

- 32.1 The successful tenderer shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Tendering Data and the Conditions of Contract within a period of 28 days after the receipt of Letter of Acceptance.
- 32.2 Failure of the successful tenderer to comply with the requirements of Clause IT.32 or IT.33 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security.

**IT.33 Signing of Agreement**

- 33.1 Within 14 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful tenderer the Form of Agreement provided in the Tender Documents, incorporating all agreements between the parties.
- 33.2 The formal Agreement between the Employer and the successful tenderer shall be executed within 14 days of the receipt of Form of Agreement by the successful tenderer from the Employer.

**IT.34 General Performance of the Bidders**

The Employer reserves the right to obtain information regarding performance of the Bidders on their previously awarded contracts/works. The Employer may in case of consistent poor performance of the Bidder as reported by the employers of the previously awarded contracts, interalia, rejects his bid and/or refer the case to the Pakistan Engineering Council. Upon such reference, PEC may in consultation with the Contract Data Cell established in the office of the Auditor General of Pakistan, take such action as may be deemed appropriate under the circumstances of the case including black listing of such Bidder and debarring him from participation in future bidding for similar works.

# **TENDERING DATA**



## TENDERING DATA

The information in this section is complementary to, amends or supplements the provisions in the Instruction to Tenderers, Whenever there is conflict the provisions herein shall take precedence over those in the Instruction to Tenderers.

Reference to Instruction to Tenderers	Tendering Data
<b>IT-1</b> 1.1	<b>Scope of Tender</b> The Work under this Contract comprises:  Construction of Shaheed Mohtarma Benazir Bhutto Accident, Emergency & Trauma Centre And Ancillary Services Complex at Civil Hospital, Karachi.  Sub Head - Supply, Installation, Testing Commissioning and Maintenance (During Maintenance Period) of Internal Glass Partitioning & Miscellaneous Works. Contract No. MW - X - 0223
1.1 b	<b>Name and Address of Employer:</b> Project Director Near O.P.D. Block Civil Hospital <b>KARACHI</b>
<b>IT-2</b> 2.1	<b>Source of Funds</b> Delete the text and substitute:  The Employer has arranged the funds from the source of Federal Government of Pakistan & Provincial Government of Sindh towards the cost of the project specified in the Tendering Data and it is intended that part of the proceeds of this amount will be applied to eligible payments under the Contract for which these Bidding Documents are issued.
<b>IT-3</b> 3.1	<b>Eligible Tenderers</b>  Delete the text of para (a) & (b) and substitute as follows:  a). Duly registered with the Pakistan Engineering Council (PEC) in the relevant discipline of Works and licensed in the category relevant to the value of Works.

<p><b>IT-6</b></p> <p>6.3</p>	<p><b>Site Visits</b></p> <p>Add the following paragraph:</p> <p>The Tenderer or his authorized representative shall visit and inspect the site of works including the areas and surroundings to be used for Contractor's Camp, on his own responsibility and at his own expense, and obtain all the information from his own sources which may be necessary for the purpose of preparing the Tender. The Employer may assist but will not take any responsibility of the supply or correctness of the information.</p> <p>The Tenderer shall, before submitting his Tender, satisfy himself in all respects including the following:</p> <ul style="list-style-type: none"> <li>a). The existing facilities in the vicinity of the Site of Work, the hydrological and climatologically conditions, the form and nature of the site work.</li> <li>b). The quantities and nature of the work and materials necessary for completion of the works.</li> <li>c). The means of access to the Site of Work and exit from the Site.</li> <li>d). The available accommodation on land for Contractor's Camp within or outside the site of Work.</li> <li>e). All necessary information as to risks, contingencies and other circumstances, which may influence or affect the Tender.</li> <li>f). The type and nature of soil existing in area of work.</li> <li>g). The existing conditions at Site.</li> </ul> <p>Each Tenderer shall also enquire and satisfy himself as to the sources, the quantity of supply, the sufficiency of and the means of obtaining and transporting all plant, material, labor, fuel, water, electricity and other matters or things required for or in connection with the works.</p> <p>In preparing the Tender, Tenderer shall also consider his obligation to adequately store and secure all materials and maintain existing facilities and all Temporary Works during the period of their usage.</p> <p>The Tenderer must make local inquiries as to the physical and other conditions prevailing at the site and obtain his own information on all matters and things that may in any way influence him in making a Tender and fixing the rates in the Bill of Quantities. He must also</p>
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	<p>satisfy himself as to the risks, obligations and responsibilities to be undertaken in accordance to the Contact to be entered into by him should his Tender be accepted.</p> <p>The Tenderer shall make his own investigations, enquiries and assessments, on all matters, of all conditions of existing construction at the site and its vicinity, to his satisfaction before submitting his tender.</p>
<b>IT-7</b>	<b>Documents Comprising the tenders</b>
7.1	The Tender documents are those stated in 7.1 and should be read in conjunction with any addenda issued in accordance with clause-IT-9.
<b>IT-8</b>	<b>Clarification of Tender Documents</b>
	Add the following:
8.2	<p>The tenderer shall also send copy of clarification required to the consultant at the address indicated in Tender documents.</p> <p>Time limit for clarifications is 10 days instead of 28 days prior to the deadline for submission of tender.</p>
<b>IT-10</b>	<b>Tender Language</b>
10.1	English
<b>IT-12</b>	<b>Tender Price</b>
12.3	<p>Add the following:</p> <p>a). The tenderer, by the act of submitting a tender, acknowledges that he has inspected the site of works and determined the general characteristics and conditions. The employer will not assume any responsibility for information, interpretations and deduction the tenderer may make from the information furnished by the employer or the engineer. No verbal agreement or conversation with any officer, employee or agent of the employer or the engineer either before, during or after the execution of the contract, shall affect or modify any of the terms or obligations contained in the contract.</p> <p>b). The attention of the tenderers is drawn to the fact that local regulations require special formalities to be complied with in connection with the ordering, purchasing and importing of</p>

	<p>materials from outside Pakistan. Tenderer will be deemed to have obtained full information about all such matters and to have allowed in his tender for all delays, additional costs and financing charges that may arise directly or indirectly therefrom.</p> <p>c). Any neglect or failure on the part of the tenderer to obtain reliable information on the spot or else where upon the foregoing or any other matters affecting the execution and completion of the works, the rates, total amounts and the contract shall not relieve the tenderer whose tender is accepted from any risks or liabilities or from the responsibility of completing and handing over the works.</p> <p>d). The rates and prices set down by the tenderer against all the items in the bill of quantities are to be full inclusive value of the finished work described there under and shall be deemed to include all costs of performing the works including all taxes and duties, profits and costs of accepting the general risks, liabilities and obligation of every kind set forth or implied in the contract.</p>
<b>IT-13</b> 13.1	<p><b>Currency of Tender:</b> Deleted the text and substitute:</p> <p>The unit rates and the prices shall be quoted by the tenderer entirely in Pak Rupees. A tenderer expecting to incur expenditures in other currencies for inputs to the works supplied from outside the employer's country shall bear all costs and risk for arranging the requirements of such currencies through his own resources.</p>
13.2	Delete the text
<b>IT-14</b> 14.1	<p><b>Tender Validity</b> Period of Tender Validity is 90 (Ninety) days after the date of tender opening</p>
<b>IT-15</b> 15.1	<p><b>Tender Security/Earnest Money</b> Amount of tender security/earnest money shall be 1% of the tendered cost in Pak Rupees.</p>
15.2	<p>The tender security/earnest money shall be in the form of pay order or a Bank Draft issued by a scheduled bank of Pakistan or from a Foreign Bank duly counter guaranteed by a Schedule Bank of Pakistan in favour of the Employer, valid for a period of 28 days beyond the Tender validity date.</p>

<b>IT-16</b> 16.1 & 16.2	<b>Alternate Proposals by Tenderers</b> Delete the text and substitute:  Alternate proposals by Tenderers are not invited. Tenderers will only quote for the tender design.
<b>IT-17</b>  17.1	<b>Pre-Tender Meeting</b>  The Pre-tender meeting will be held as follows: If notified.  Venue: Office of the Project Director Near O.P.D. Block Civil Hospital <b>KARACHI</b>  Date: Any date & time if notified by the Employer/Consultant. Time: ..... Phone: 021-32765470, 99216191, 34532349, 34532324 0300-2127819
17.2	Add at the end of the Para following: Errors, Omissions & Queries  The Tenderer shall notify “the Consultant” of any inconsistencies, errors and omissions found in the Tender Documents OTHER THAN DESIGN, prior to the 15 days of Tender opening date. Withholding of any such information which will later materially affect the contract price during construction may be considered as sufficient grounds for rejection of Tender. All queries shall be directed to Project Director and a copy to be endorsed to Consultant i.e. Naqvi & Siddiquie Associates (Pakistan):  Project Director Near O.P.D. Block Civil Hospital <b>KARACHI</b>  The Employer is not responsible for any verbal communications or instructions to the Tenderers or accuracy of the Tender Documents.
<b>IT-18</b>  18.4	<b>Format and Signing of Tender</b>  Number of copies of the Tender to be completed and returned shall be: One Original with addendums if. Along with the Tender drawings.

18.5	<p>Delete the last sentence of this para from “All page” ..... to ..... “the tender” and substitute with the following:</p> <p>All pages of the tender including appendices, addendum, corrigendum, clarifications, supplementary information as are issued shall be initialed and stamped by the person or persons signing the tender.</p>
18.6	<p>Delete the text and substitute:</p> <p>The tender shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the Tenderer, in which case such corrections shall be initialed by the person or person signing the tender. Each correction shall be separately signed and stamped. Overwriting, erasures, use of whitening fluid, corrections is not permitted. Non compliance of these instructions may be construed as sufficient ground to render the tender non-responsive.</p>
18.7	<p>At the end of this para, add the following:</p> <p>Tender shall be prepared and submitted on the form of “the Tender provided. All blank spaces must be filled in and completed form must be without interlineations or alteration of the original wording. Tenders with incomplete and/or unsigned Form of Tender may be rejected/considered Non Responsive. The Tenderer shall stamp and sign each page of Tender Documents for the purpose of identification and acknowledgement of acceptance thereof.</p> <p>The Tenderers must conform in all respects to the Tender Documents.</p>
<b>IT-19</b>  19.2 (a)	<p><b>Sealing and Making of Tender</b></p> <p>Employer address for the purpose of tender submission shall be:</p> <p>Office of the Project Director Near O.P.D. Block Civil Hospital <b>KARACHI</b></p>
19.2 (b)	<p><b>Identification number of Contract:</b> As indicated in the Notice Inviting Tender</p>

<b>IT-20</b>	<b>Deadline for submission of Tender:</b>
20.1	As notified in the Notice for issuance of Tender or as amended.
<b>IT-23</b> 23.1	<b>Tender Opening:</b> The Venue and time for tender opening shall be: Venue: Board Room Administration Block, 2nd Floor Civil Hospital <b>KARACHI</b>
	Submission Time : Will be notified in the newspaper Opening Time : Will be notified in the newspaper  Date : as notified in the Notice Inviting Tender or as amended as per Contract Phone No. 0300-2127819, 021-32765470, 99216191
<b>IT-24</b> 24.2	<b>Process to be Confidential</b>  Add the following sub-para:  Documents submitted by Tenderers in connection with the Tender for above named works will be treated as confidential and will not be returned.
<b>IT-26</b>	<b>Examination of Tenders and Determination of Responsive</b> Add the following text in sub -para 26.1  v) Continue to meet the minimum criteria set out for prequalification
<b>IT -28</b> 28.4	<b>Evaluation and Comparison of Tenders</b> In the text of sub- clause 28.4 in the sixth line, after the words “ the Employer may” take action under sub-clause 28.5 or may”
28.5	Add the following sub-para A bid with highly inflated or unworkable rates of any BOQ items may be considered non-conforming and rejected. The Employer/ Consultant may also disqualify such Tenderer from participating in the subsequent tenders who submits such, unbalanced and/or unworkable rates of major items of work.

<b>IT 29</b>	<b>Award of Contract</b> Add the following sub-para
29.2	The Work will be awarded to the bidder after approval of the Committee members.
<b>IT 31</b>	<b>Notification of Award</b>
31.1	At the end of this para add the following The notification of award will constitute the formation of Contract with successful Tenderers.
<b>IT-32</b>	<b>Performance Security:</b>  In the third line of this sub-clause, delete "28 days" and substitute "15 days".
32.3	Add the following sub-para 32.3  The Performance Security provided by successful bidder shall be in the form of irrevocable & acceptable Insurance Guarantee of 10% of contract Value issued by a scheduled bank of Pakistan in favor of Employer valid for a period till 14 days after the issue of defect liability certificate.
<b>IT-33</b>	<b>Signing of Agreement</b>
33.1	Delete "14 days" and Substitute "7 days"
33.2	Delete "14 days" and Substitute "7 days"
Add the following sub-Clause 35 to 42	
<b>IT-35</b>	<b>Contract Documents</b>
35.1	The documents which will be included in the Contract are listed in the Form of Contract Agreement set out in these Tender Documents.



<p><b>IT-36</b></p> <p>36.1</p>	<p><b>Sufficiency of Tender</b></p> <p>Each Tenderer shall be deemed to have satisfied himself fully, before submitting the tender, as to all aspects of the works, correctness and sufficiency of his tender and of rates and prices stated in the bills of quantities, which rates and prices shall, except in so far as it is otherwise expressly provided in the Contract, cover all his obligations under the contract and all matters and things necessary for the proper completion of the works.</p> <p>Objections, excuses or claims made by the Tenderer after submission of his Tender to the Employer shall not be entertained.</p>
<p><b>IT-37</b></p> <p>37.1</p>	<p><b>Substitution of Codes &amp; Standards</b></p> <p>Codes and Standards other than those referred to in the specification may not be accept provided the Engineer is satisfied that the proposed Codes and Standard are equivalent or better than those specified. If any of these alternative Codes and Standards are proposed to be used, it must be clearly stated in the Form of the Tender. The general intent of the Specifications must be maintained any specification not present or missing in the document shall be covered from latest BSS ASTM Specifications. The decision of the Engineer as to whether alternative Codes and Standards fulfill the requirement of prescribed standard and codes, at all times, shall be final.</p>
<p><b>IT-38</b></p> <p>38.1</p>	<p><b>Sub-Contractors</b></p> <p>Any sub-contractor subject to the acceptance of the Employer/Engineer and the sub-contract shall be subject to the same General Conditions of Contract. A list, as set forth in <u>Appendix-"I" showing the name and address and credentials of each proposed Sub-contractor, the type of work to be sub-let and the reason for sub-letting</u> shall be submitted with the Tender. Overall responsibility of all works, whether parts of its subcontracted or not, shall rest with the Tender.</p>
<p><b>IT-39</b></p> <p>39.1</p>	<p><b>Taxes &amp; Duties</b></p> <p>The Tenderer shall obtain all information as to Pakistan Income Tax, Sales Tax, Salaries Tax, Professional Tax, Company Tax, Municipal Octrois, Levies and any other taxes imposed by the local bodies, export and import duties, import surcharge, Iqra surcharge, etc. and</p>

	necessary permits and confirm the requirements thereof at his own responsibility and include all such cost in his tendered price. The quoted rate shall also include the cost of accepting the general and other risks/liabilities and obligations set forth or implied in the Contract.
<b>IT-40</b> 40.1	<b>Insurance</b> The Tenderer shall estimate the amounts required to provide the insurance from approved insurance as specified in the Conditions of Contract Part-I & Part-II and the Tender Price shall be deemed to include all such amounts.
<b>IT-41</b> 41.1	<b>Alterations</b> No alteration and addition shall be made in the form of the Tender, BOQ and the accompanying documents and if any such alterations/addition is made or if the BOQ are not properly filled in, or if these instructions are not fully complied with, the Tender will be rejected.

## **EVALUATION CRITERIA**

## TECHNICAL EVALUATION CRITERIA

### MANDATORY REQUIREMENTS

1. **Certificate of Registration with Income Tax, Sales Tax Departments**
2. **Affidavit regarding Blacklisting & Litigation**
  - The bidder should submit an affidavit that firm has never been blacklisted by any government, semi-government department or any other organization.
  - The bidder should submit an affidavit that firm is not involved in Litigation with any government, semi-government department or any other organization.

### QUALIFYING MARKS – 70

#### **DOCUMENTARY EVIDENCE MUST BE ATTACHED.**

S.NO.	DETAILS	MAXIMUM MARKS
1.	<b><u>Establishment of Firm since</u></b> More than three years – 05 marks More than five years - 10 marks (As per attached Proforma “A”)	10
2.	<b><u>Major Institution Served during last year</u></b> a. Less than 5 institution – 10 marks b. More than 5 institution – 20 marks (As per attached Proforma “B”)	20
3.	<b><u>Previous Performance of similar works</u></b> a. More than 3 years – 30 marks b. Up to 3 years – 20 marks (As per attached Proforma “C”)	30
4.	<b><u>Man Power Requirement</u></b> 1. Must have proper well established workshop (Procurement Committee may visit the same) 2. Must have certified technical staff (Certificates must be attached) with other staff (at least 30 persons) on ledger (List of persons be attached) (Less than 30 persons will disqualify the firm from participating in the tender).	10 (05 marks for each)
5.	<b><u>Bank Certificate</u></b> Bank Certificate that the bidder can perform business upto Rs.25.000 million or above.	10
6.	<b><u>Financial Soundness of the Firm</u></b> The bidder should submit following: a. Bank Statement for last 3 years with Bank Letter b. Audited Balance Sheet & Income Tax Returns for last 3 years	20 (10 marks for each)
		<hr/> <b>TOTAL 100 MARKS</b> <hr/>

**ESTABLISHMENT OF FIRM**

1.	Name of Firm:			
2.	Head Office Address:			
3.	Regional Office Address:			
4.	Telephone:		Mobile: Fax: E-mail:	
5.	NTN Number: (Attach copy)			
6.	GST Number: (Attach copy)			
7.	Year of Establishment from the date of Registration of NTN (more than five years minimum)			

**MAJOR INSTITUTION SERVED DURING LAST YEAR***(Use separate sheet for each work)*

1.	Name of Institution:
2.	Address of Institution:
3.	Name of Contract:
4.	Place of Execution / City:
5.	Letter of Award No.
6.	Value of Contract:                      Pak Rupees
7.	Date of Award: <div style="text-align: right;">(Proof)</div>
8.	Date of Completion: <div style="text-align: right;">(Proof)</div>
9.	Duration of Contract:

**PREVIOUS PERFORMANCE OF SIMILAR WORKS***(Use separate sheet for each work)*

1.	Name of Contract:
2.	Place of Execution / City:
3.	Name of Employer:
4.	Address of Employer:
5.	Letter of Award No.
6.	Value of Contract:                      Pak Rupees
7.	Date of Award: <div style="text-align: right;">(Proof)</div>
8.	Date of Completion: <div style="text-align: right;">(Proof)</div>
9.	Duration of Contract:

## **SALIENT FEATURES**



## **SALIENT FEATURES / TERMS & CONDITION OF THE TENDER**

1.	Name of Work & Address	:	Supply, Installation, Testing, Commissioning and Maintenance (during maintenance period) of <b>Internal Glass Partitioning &amp; Miscellaneous Works</b> . for the project Shaheed Mohtarma Benazir Bhutto Accident, Emergency & Trauma Centre and Ancillary Services Complex at Civil Hospital Karachi
2.	Type of Contract	:	Pakistan Rupees – Item rate Contract with no escalation and inclusive of custom clearance etc. in case imported
3.	Time & Date of issue of Tenders	:	From the date of appearance in Newspapers.
4.	Place of Issuance of Tender	:	Office of the Project Director Shaheed Mohtarma Benazir Bhutto Accident, Emergency & Trauma Centre and Ancillary Services Complex near OPD-Block Civil Hospital Karachi.
5.	Date of pre-bid meeting	:	In case requested by bidders or informed by Project Director.
6.	Method of opening of Tender	:	It will be Single Stage One Envelope system as per SPPRA-Rules 2010.
7.	Date & Time of Submission of Tenders	:	As published in newspapers
8.	Date & Time of Opening of Tenders	:	As published in newspapers
9.	Venue of submission & opening of Tenders	:	Board Room situated at Second Floor of the Administration Block of Civil Hospital Karachi.
10.	Validity of Tenders	:	90 days from the date of opening of Tenders.
11.	Amount of Earnest Money/Bid Security	:	1% of the Contract value in shape of pay-order / Call Deposit from schedule Bank to be submitted alongwith Tender.
12.	Time of Completion.	:	Three Months (The progress of work shall however be duly coordinated with Civil & other works at site.)
13.	Date of start.	:	One week from the date of Work-Order / Supply Order.
14.	Certificate of completion.	:	Will be issued by Project Director after the work is finally completed in all respect and date of maintenance will commence from that date.
15.	Contract Agreement.	:	The Contract shall enter & execute a formal Agreement as per the “Form” annexed with such modification as may be necessary, by the Project Director.
16.	Stamp Paper requirement for Agreement.	:	- Rs. 0.30% of the Contract Value or as prescribed by Government Laws.
17.	Terms of Payment to Contractor	:	As per work done
18.	Release of Earnest Money/Bid Security of 2%	:	To un-successful bidders, after work is awarded. Earnest Money will be released to successful bidder after work is awarded but after 5% Security Deposit is deposited.

19.	Security Deposit	:	10% Security Deposit in the shape of two pay orders (5% each) will be submitted by Contractor with Project Director which will be released as per item 21. Bank Guarantee of equal amount will also be acceptable.
20.	MAINTENANCE AND DEFECT LIABILITY PERIOD.	:	12 MONTHS AFTER THE WORK IS COMPLETED AND COMPLETION CERTIFICATE ISSUED BY PROJECT DIRECTOR AFTER HIS SATISFICATION.
21.	Release of Security Deposit of 5%	:	After completion of maintenance or Defect Liability period of 12 months as under:- <ol style="list-style-type: none"> <li>1. After satisfactory completion of maintenance period of Six Months – 5%</li> <li>2. After satisfactory completion of maintenance period of after 12 months – 5%</li> </ol>
22.	Liquidated Damages due to late completion of work.	:	0.1% of the Contract Value per calendar day, subject to maximum of 10% of the Contract Price at the time of award of work.
23.	VARIATION IN CONTRACT PRICE.	:	NO VARIATION IN PRICE SHALL BE ALLOWED ON ANY GROUND INCLUDING CURRENCY FLUCTUATION/VARIATION OR WHATSOEVER.
24.	Discrepancy.	:	If there is any discrepancy between Salient Features of Tender/Bidding Documents and respective contents mentioned elsewhere, Salient Features / Terms & Conditions and Additional Terms & Conditions of Tender will govern.
25.	Taxes.	:	All taxes will be deducted as per prevalent laws of country.
26.	Approved makes.	:	As per specifications.
27.	Maintenance.	:	<ul style="list-style-type: none"> <li>• Maintenance cost for “Sound Proofing Works for Generators Room” satisfactorily for Twelve months from date of completion shall be undertaken by the Contractor (Maintenance includes all Parts &amp; Labour, etc. with sufficient staff, during maintenance period).</li> </ul>
28.	Default in Preventive Maintenance, Breakdown and Emergency Calls.	:	<ul style="list-style-type: none"> <li>• In case of default by the Contractor with respect to maintenance, break down and emergency calls, the same will be carried out within 24 hours by Department and the cost so incurred will be deducted from the Retention Money.</li> </ul>
29.	In case of Imported Items	:	<ul style="list-style-type: none"> <li>• The Contractors shall include DDP price of the Equipments with installation &amp; Commissioning cost while quoting the cost.</li> <li>• It should also include cost during maintenance period including the parts and maintenance staff.</li> </ul>

**SPECIAL FEATURES  
TO  
BIDDERS**

## **SPECIAL FEATURES TO BIDDERS**

1. **Shaheed Mohtarma Benazir Bhutto Accident, Emergency & Trauma Centre and Ancillary Services Complex at Civil Hospital Karachi** invites sealed bids on single stage one envelopes system as per Sindh Public Procurement Rules 2010 (Amended 2013) from Suppliers/Contractors for Supply, Installation, Testing, Commissioning and Maintenance (during maintenance period) of **Internal Glass Partitioning & Miscellaneous Works**. for the project Shaheed Mohtarma Benazir Bhutto Accident, Emergency & Trauma Centre and Ancillary Services Complex at Civil Hospital Karachi.
2. Bidders are required to check that Tender Documents issued to them are complete in all respects as per Summary of contents related to Instructions to Bidders, Salient Features, Evaluation Criteria, Form of Agreement, Form of Bid, BOQ/Specifications/Scope of Work, Drawings etc.
3. Bidders should examine carefully the Summary of Contents. They should visit and inspect the site at their own expense and responsibility and obtain all necessary information prior to submitting the Tender. Any detail/specification missing in the document should be obtained from the office of the Project Director before bidding. Once the Tender is submitted, it will be assumed that no further clarification was required.
4. The rates to be inserted in the Bill of Quantities shall be deemed to include all costs of whatsoever description and expenses necessary for the Operation & Running of the Equipment/system together with all risks, taxes, liabilities and obligations, specific or implied, in the Tender Documents. Arithmetical errors, if any shall be corrected and Tender price amended accordingly.
5. No authorized alteration may be made in the Tender documents. If any such alteration is made, tender may be liable for rejection.
6. Any clarification, revision, addition or deletion, in the Tender documents may be made by the Project Director before the submission and opening of Tender in the form of Addendum/Corrigendum. This will be made only by formal Addendum/Corrigendum issued by the Project Director and will become part of the Contract/Tender Documents. Each Addendum shall be signed by the Bidder and returned with other Tender Documents.
7. The entire Tender Documents, listed duly priced, signed & stamped on each page and completed must reach at designated place in due time and dates as defined in the salient features of the Tender.
8. The Contractors whose Tender is accepted, by the Procurement Committee, will be required to enter into a Contract Agreement as defined in the Form of Agreement.

9. All manufactured and other items should be used in the work in accordance with the instructions, specifications in the Tender Document and also in accordance with generally accepted norms of good workmanship.
10. The Tender documents referred to above constitute a part of this Tender and comprise of the following documents:
  - a) Instructions to bidders.
  - b) Salient Features / Terms & Condition of the Tender
  - c) Evaluation Criteria.
  - d) Form of Agreement.
  - e) Form of Bid
  - f) Financial Proposals (Scope of Work / Specification / Bill of Quantities).
  - g) The Addendum (if any).
  - h) The Drawings (if any).
11. The Contractors are required to submit the Site Organization Chart, Methodology & Work Schedule alongwith Tender Documents.

**FORMS**

## **FORM OF AGREEMENT**

1. THIS AGREEMENT made this \_\_\_\_\_ day of \_\_\_\_\_ Between Messrs. Project Director “Shaheed Mohtarma Benazir Bhutto, Accidents, Emergency & Trauma Centre and Ancillary Services Complex at Civil Hospital Karachi” being hereinafter called the “OWNER” which expression shall, wherever the context so permits, mean and include its successors in interest, executors, administrators, liquidators, nominees and assignees of the ONE PART, and Messrs. \_\_\_\_\_ hereinafter called the “CONTRACTOR”, which expression shall, wherever the context so permits, mean and include its heirs, successors in interest, executors, administrators, liquidators, nominees and assignees of the OTHER PART.

**WHEREAS:**

- a. The Owner had invited tenders from various contractors for *Supply, Installation, Testing, Commissioning and Maintenance (during maintenance period) of Internal Glass Partitioning & Miscellaneous Works for the project Shaheed Mohtarma Benazir Bhutto, Accident, Emergency & Trauma Centre and Ancillary Services Complex at Civil Hospital Karachi* in accordance with the requirements, drawings, plans and instructions prepared by the owner, and contained in the tender documents issued by the Owners.
- b. In response to the invitation of the Owner, the Contractors have tendered their quotations and rates and have offered to carryout the supply, completion and maintenance of the aforesaid project and facilities in accordance with the requirements, conditions of contract, documents, standard quality, plans, drawings and instructions of the Owner.
- c. The Owner is willing and agreeable to accept the aforesaid quotation, rates and offer of the Contractor on the various terms and conditions specified herein and in the documents listed is Clause-1, below.

NOW THEREFORE, THIS AGREEMENT WITNESSETH and in consideration of the mutual covenant and condition set forth herein, the parties hereto, do hereby agree, undertake and declare as under:-

1. The Following documents, hereinafter called “Contract Documents” shall be deemed to form, read and construed as an integral part of this Agreement:-
  - a. Tender documents including Addendum.
  - b. Contractor’s bid letter No. \_\_\_\_\_ dated \_\_\_\_\_.
  - c. Relevant Correspondence.
  - d. Letter of Award No. \_\_\_\_\_ dated \_\_\_\_\_.
2. Notwithstanding anything contained to the contrary or in conflict with the provisions of this agreement in any of the documents mentioned in Clause – 1, above, the provisions of this agreement shall prevail and the documents mentioned above shall be deemed to have been amended to the extent of inconsistency found therein, by the provisions of this Agreement, In case of inconsistency between any of the documents referred to herein, the later documents shall prevail and the tender documents shall be construed to have been amended to that extent.

3. In consideration of the Contractors supply, completing and maintaining the work, as described heretofore, in conformity in all respects with provisions of this contract to the entire satisfaction of the owner, and the Contractor acting, abiding and performing his duties and obligations strictly in accordance with the terms and conditions herein and documents of the contract mentioned hereinabove, the Owner shall pay to the Contractor amount as per contract documents listed above.
4. This contract shall not be transferable or assignable in whole or part of any of the parties hereto, provided that the Owner may assign his rights and obligations in whole or in part to any other Company which shall be entirely owned Company belonging to the same Group of the Companies as the Owner, In such an event such other Company shall be entitled to act as Owner under this contract.

IN WITNESS WHEREOF the parties hereto, acting through their respective representative, have caused this agreement to be signed, sealed and delivered in their respective names on the day and the year first mentioned hereinabove.

---

**SIGNED, SEALED AND DELIVERED**  
**In the name and for and on**  
**Behalf of the Owner / PROJECT DIRECTOR**

**NAME:** \_\_\_\_\_

**DESIGNATION:** \_\_\_\_\_

**WITNESS:**

**1. NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**2. NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

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**SIGNED, SEALED AND DELIVERED**  
**In the name and for and on**  
**Behalf of the CONTRACTOR**

**NAME:** \_\_\_\_\_

**DESIGNATION:** \_\_\_\_\_

**WITNESS:**

**1. NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**2. NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_



**PERFORMANCE SECURITY**

KNOW ALL MEN BY THESE PRESENT that

---

Name and Address of Contractor

---



---

As Principal (hereinafter called the \*Contractor) \_\_\_\_\_  
 \_\_\_\_\_ (Name Title and Address of Surety)

As  
 Surety(hereinafter called the Surety ) are held and firmly bound unto \_\_\_\_\_

---

Name and Address of Employer

\_\_\_\_\_ as Oblige (hereinafter called the Employer) in the amount of Rupees  
 \_\_\_\_\_ (Rs. \_\_\_\_\_) for the payment of which sum well and truly to be made  
 the Contractor and the Surety bind themselves their successors and assigns jointly and severally  
 firmly by these presents.

WHEREAS the Contractor has entered into a written Contract Agreement with the Employer  
 dated the \_\_\_\_\_ day of \_\_\_\_\_ 200\_\_\_\_\_  
 for \_\_\_\_\_

(Name of Works)

in accordance with the plans and specification and amendments thereto to the extent herein  
 provided for are by reliance made part hereof and are hereinafter referred to as the Contract.

NOW THEREFORE the Condition of this obligation is such that if the Contractor shall promptly  
 and faithfully perform the said Contract (Including and amendments thereto) then this obligation  
 shall be null and void otherwise it shall remain in full force and effects

WHENEVER the Contractor shall be and declared by the Employer to be in default under the  
 Contract, the Employer having performed the Employer's obligations thereunder, the Surety may  
 promptly remedy the default or shall promptly.

- 1) Complete the Contract in accordance with its terms and Conditions or
- 2) Obtained a bid or bids for submission to the Employer for completing the contract in  
 accordance with its terms and conditions and upon determination by the Employer and  
 the Surety of the lowest responsive bidder arrange for a contract between such bidder  
 and the Employer and make available as work progress(even though there should be  
 default or succession of default under the contract or contracts of completion arranged  
 under this paragraph) sufficient funds to pay the cost of completion less the ba.... The  
 Contract Value. But not exceeding. Including other costs and damages for which the  
 Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The  
 terms " Balance of the contract Value" as used in this paragraph. Shall mean the total  
 amount payable by the Employer to the Contractor.

- 3) Pay the Employer the amount required by the Employer to complete the contract in accordance with its terms and conditions up to a total not exceeding the amount of this Security.

The Surety shall not be liable for a sum greater than the specified penalty of this security

Any suit under this Security must be instituted before the issue of the Taking Over Certificate.

No right of action shall accrue on this Security to or for the sue of any person or corporation other than the Employer named herein or the heirs executors administrators or successors of the Employer.

Signed by on \_\_\_\_\_  
Date  
On behalf of \_\_\_\_\_  
The Security  
By \_\_\_\_\_  
Name  
In the Capacity of \_\_\_\_\_  
Designation  
In the presence of \_\_\_\_\_  
Witness

# MOBILIZATION ADVANCE GUARANTEE

Guarantee No \_\_\_\_\_ Date \_\_\_\_\_  
WHEREAS \_\_\_\_\_ (hereinafter called the Employer has entered into a Contract for \_\_\_\_\_

Particulars of Contract  
With \_\_\_\_\_ (hereinafter called the Contractor

AND WHEREAS the Employer has agreed to advance to the Contractor at the Contractor's request and amount of Rupees \_\_\_\_\_Rs, \_\_\_\_\_)  
Which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS the Employer has asked the Contractor to furnish guarantee for performance of his obligations under the said Contract.

AND WHEREAS \_\_\_\_\_  
Insurance Company acceptable to the Employer

(hereinafter called " guarantor:" at the request of the Contractor and in consideration of the Employer agreeing to make the above advance to the contractor has agreed to furnish the said Guarantee.

NOW HEREOFRE the Guarantor hereby guarantees that the Contractor shall use the advance fro the purpose of above mentioned Contract and if he fails and commits default in fulfillments of any of his obligations for which the advance payment is made the Guarantor shall be liable to the Employer for payment not exceeding the aforementioned amount.

Notice in writing of any default of which the Employer shall be the sole and final judge on the part of the Contractor shall be given by the Employer to the Guarantor and on such first written demand payment shall be made by the Guarantor of all sums then due under this Guarantee without any objection.

This Guarantee shall remain in force until the advance is fully adjusted against payments from the Interim Payment Certificates of the Contractor or until \_\_\_\_\_date  
whichever is earlier.

The Guarantor's liability under this Guarantee shall not in any case exceed the sum of Rupees \_\_\_\_\_  
Rs. \_\_\_\_\_)

This Guarantee shall remain valid up to the aforesaid date and shall be null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payment from Interim Payment Certificates of the Contractor Provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payments is not fully adjusted .

**MG-2**

**GUARANTOR**

1. Signature \_\_\_\_\_
2. Name \_\_\_\_\_
3. Title \_\_\_\_\_

Witness

1. \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

2. \_\_\_\_\_  
Name Title & Address

\_\_\_\_\_  
**Corporate Guarantor (Seal)**

# APPENDIX

**SPECIAL STIPULATIONS**

**Clause**  
**Conditions of Contract**

1.	Amount of Performance Guarantee	10.1	10% of Contract Price stated in the Letter of Acceptance in the form of bond from Insurance Company or Bank Guarantee of Schedule Bank of Pakistan approved by Project Director, Shaheed Mohtarma Benazair Bhutto Accident, Emergency & Trauma Centre and Ancillary Services Complex at Civil Hospital KARACHI.
2.	Mobilization Advance (Interest Free)	60.12	10% of Contract Price amount as stated in the Letter of Acceptance. The same will be deducted from subsequent Running Bills of the Contractors @ 10% per bill.
3.	Time of Furnishing Programme	14.1	Within 7 (Seven) days from the date of receipt of Letter of Acceptance.
4.	Minimum amount of Third Party Insurance.	23.2	Rs.500,000/- (Rupees Five Hundred Thousand only) per occurrence, number of occurrences unlimited.
5.	Secured Advance	60.11	May be allowed upto 65% of actual cost of materials (Not quoted prices) only subject to the approval. This would not be right of Contractor but may be considered.
6.	PPRA/PEC Rules & Regulations		Any deviation in the Contract Terms & Conditions, the rules & regulations of PPRA / PEC Bidding documents would prevail.

**GENERAL CONDITIONS  
OF  
CONTRACT**

## **PART I - GENERAL CONDITIONS**

### **DEFINITIONS AND INTERPRETATION**

- Definitions**      **1.1.**      In the Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them, except where the context of otherwise requires:
- a) (i)      "Employer" means the person named as such in Part II of these Conditions and the legal successors in title to such person, but not (except with the consent of the Contractor) any assignee of such person.
  - (ii)      "Contractor" means the person whose tender has been accepted by the Employer and the legal successors in title to such person, but not (except with the consent of the Employer) any assignee of such person.
  - (iii)      "Subcontractor" means any person named in the Contract as a Subcontractor for a part of the Works or any person to whom a part of the Works has been subcontracted with the consent of the Engineer and the legal successors in title to such person, but not any assignee of any such person.
  - (iv)      "Engineer" means the person appointed by the Employer to act as Engineer for the purposes of the Contract and named as such in Part II of these Conditions.
  - (v)      "Engineer's Representative" means a person appointed from time to time by the Engineer under Sub-Clause 2.2.
  - b) (i)      "Contract" means these Conditions (Parts I and II), the Specification, the Drawings, the Bill of Quantities, the Tender, the Letter of Acceptance, the Contract Agreement (if completed) and such further documents as may be expressly incorporated in the Letter of Acceptance or Contract Agreement (if completed).
  - (ii)      "Specification" means the specification of the Works included in the Contract and any modification thereof or addition thereto made under Clause 51 or submitted by the Contractor and approved by the Engineer.
  - (iii)      "Drawings" means all drawings, calculations and technical information of a like nature provided by the Engineer to the Contractor under the Contract and all drawings, calculations, samples, patterns, models, operation and maintenance manuals and other technical information of a like nature submitted by the Contractor and approved by the Engineer.
  - (iv)      "Bill of Quantities" means the priced and completed bill of quantities forming part of the Tender.
  - (v)      "Tender" means the Contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance.



- (vi) "Letter of Acceptance" means the formal acceptance by the Employer of the Tender.
- (vii) "Contract Agreement" means the contract agreement (if any) referred to in Sub-Clause 9.1.
- (viii) "Appendix to Tender" means the appendix comprised in the form of Tender annexed to these Conditions.
- c) (i) "Commencement Date" means the date upon which the Contractor receives the notice to commence issued by the Engineer pursuant to Clause 41.
- (ii) "Time for Completion" means the time for completing the execution of and passing the Tests on Completion of the Works or any Section or part thereof as stated in the Contract (or as extended under Clause 44) calculated from the Commencement Date.
- d) (i) "Tests on Completion" means the tests specified in the Contract or otherwise agreed by the Engineer and the Contractor which are to be made by the Contractor before the Works or any Section or part thereof are taken over by the Employer.
- (ii) "Taking-Over Certificate" means a certificate issued pursuant to Clause-48.
- e) (i) "Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract.
- (ii) "Retention Money" means the aggregate of all monies retained by the Employer pursuant to Sub-Clause 60.2(a).
- f) (i) "Works" means the Permanent Works and the Temporary Works or either of them as appropriate.
- (ii) "Permanent Works" means the permanent works to be executed (including Plant) in accordance with the Contract.
- (iii) "Temporary Works" means all temporary works of any kind (other than Contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defects therein.
- (iv) "Plant" means machinery, apparatus and the like intended to form or forming part of the Permanent Works.
- (v) "Contractor's Equipment" means all appliance and things of what so ever nature (other than Temporary Works) required for the execution and completion of the Works and the remedying of any defects therein, but does not include Plant, materials or other things intended to form or forming part of the Permanent Works.
- (vi) "Section" means a part of the Works specifically identified in the Contract as a Section.

- (vii) "Site" means the places provided by the Employer where the Works are to be executed and any other places as may be specifically designated in the Contract as forming part of the Site.
- g) (i) "Cost" means all expenditure properly incurred or to be incurred, whether on or off the Site, including overhead and other charges properly allocable there to but does not include any allowance for profit.
- (ii) "Day" means calendar day .
- (iii) "Foreign Currency" means a currency of a country other than in which the Works are to be located .
- (iv) "Writing" means any hand-written, type-written, or printed communication, including telex, cable and facsimile transmission.

**Headings and  
Marginal Notes**

- 1.2** The headings and marginal notes in these Conditions shall not be deemed part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.

**Interpretation**

- 1.3** Words importing persons or parties shall include firms and corporations and any organization having legal capacity.

**Singular and Plural**

- 1.4** Words importing the singular only also include the plural and vice versa where the context requires.

**Notices, Consents,  
Approvals,  
Certificates and  
Determinations**

- 1.5** Wherever in the Contract provision is made for the giving or issue of any notice, consent, approval, certificate or determination by any person, unless otherwise specified such notice, consent, approval, certificate or determination shall be in writing and the words "notify". "certify" or "determine" shall be construed accordingly. Any such consent, approval, certificate or determination shall not unreasonably be withheld or delayed.

**ENGINEER AND ENGINEER'S REPRESENTATIVE**

**Engineer's Duties  
and Authority**

- 2.1**
- (a) The Engineer shall carry out the duties specified in the Contract.
  - (b) The Engineer may exercise the authority specified in or necessarily to be implied from the Contract, provided, however, that if the Engineer is required, under the terms of his appointment by the Employer, to obtain the specific approval of the Employer before exercising any such authority, particulars of such requirements shall be set out in Part-II of these Conditions. Provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Engineer.

		(c)	Except as expressly stated in the Contract, the Engineer shall have no authority to relieve the Contractor of any of his obligations under the Contract.
<b>Engineer's Representative</b>	<b>2.2</b>		The Engineer's Representative shall be appointed by and be responsible to the Engineer and shall carry out duties and exercise such authority as may be delegated to him by the Engineer under Sub-Clause 2.3.
<b>Engineer's Authority to Delegate</b>	<b>2.3</b>		<p>The Engineer may from time to time delegate to the Engineer's Representative any of the duties and authorities vested in the Engineer and he may at any time revoke such delegation. Any such delegation or revocation shall be in writing and shall not take effect until a copy thereof has been delivered to the Employer and the Contractor.</p> <p>Any communication given by the Engineer's Representative to the Contractor in accordance with such delegation shall have the same effect as though it had been given by the Engineer. Provided that:</p> <p>(a) any failure of the Engineer's Representative to disapprove any work, materials or Plant shall not prejudice the authority of the Engineer to disapprove such work, materials or Plant and to give instructions for the rectification thereof;</p> <p>(b) if the Contractor questions any communication of the Engineer's Representative he may refer the matter to the Engineer who shall confirm, reverse or vary the contents of such communication.</p>
<b>Appointment of Assistants</b>	<b>2.4</b>		The Engineer or the Engineer's Representative may appoint any number of persons to assist the Engineer's Representative in carrying out of the duties under Sub-Clause-2.2. He shall notify to the Contractor the names, duties and scope of authority of such persons, Such assistants shall have no authority to issue any instructions to the Contractor save in so far as such instructions may be necessary to enable them to carry out their duties and to secure their acceptance of materials, Plant or workmanship as being in accordance with the Contract, and any instructions given by any of them for those purposes shall be deemed to have been by the Engineer's Representative.
<b>Instructions in Writing</b>	<b>2.5</b>		Instructions given by the Engineer shall be in writing, provided that if for any reason the Engineer considers it necessary to give any such instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Engineer, whether before or after carrying out of the instruction, shall be deemed to be an instruction within the meaning of this Sub-Clause, Provided further that if the Contractor, within 7 (Seven) days, confirms in writing to the Engineer any oral instruction of the Engineer and such confirmation is not contradicted in writing within 7 (Seven) days by the Engineer, it shall be deemed to be an instruction of the Engineer.

**Engineer to Act  
Impartially**

The provisions of this Sub-Clause shall equally apply to instructions given by the Engineer's Representative and any assistants of the Engineer or the Engineer's Representative appointed pursuant to Sub-Clause-2.4.

**2.6** Wherever, under the Contract, the Engineer is required to exercise his discretion by:

- (a) giving his decision, opinion or consent, or
- (b) expressing his satisfaction or approval, or
- (c) determining value, or
- (d) otherwise taking action which may affect the rights and obligations of the Employer or the Contractor.

he shall exercise such discretion, impartially within the terms of the Contract and having regard to all the circumstances. Any such decision, opinion, consent, expression of satisfaction, or approval, determination of value or action may be opened up, reviewed or revised as provided in Clause 67.

### **ASSIGNMENT AND SUBCONTRACTING**

**Assignment of  
Contract**

**3.1** The Contractor shall not, without the prior consent of the Employer (which consent, notwithstanding the provisions of Sub-Clause 1.5, shall be at the sole discretion of the Employer), assign the Contract or any part thereof, or any benefit or interest therein or hereunder, otherwise than by:

- (a) a charge in favour of the Contractor's bankers of any monies due or to become due under the Contract, or
- (b) assignment to the Contractor's insurers (in cases where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable.

**Subcontracting**

**4.1** The Contractor shall not subcontract the whole of the Works. Except where otherwise provided by the Contract, the Contractor shall not subcontract any part of the Works without the prior consent of the Engineer. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any Subcontractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen.

Provided that the Contractor shall not be required to obtain such consent for:

- (a) the provision of labour, or
- (b) the purchase of materials which are in accordance with the standards specified in the Contract, or
- (c) the subcontracting of any part of the Works for which the Subcontractor is named in the Contract.

**Assignment of  
Subcontractors'  
Obligations**

- 4.2** In the event of a Subcontractor having undertaken towards the Contractor in respect of the work executed, or the goods, materials, Plant or services supplied by such Subcontractor, any continuing obligation extending for a period exceeding that of the Defects Liability Period under the Contract, the Contractor shall at any time, after the expiration of such Period, assign to the Employer, at the Employer's request and cost, the benefit of such obligation for the unexpired duration thereof.

**CONTRACT DOCUMENTS**

**Language/s and Law 5.1**

There is stated in Part-II of these Conditions:

- (a) the language or languages in which the Contract documents shall be drawn up and
- (b) the country or state the law of which shall apply to the Contract and according to which the Contract shall be construed.

If the said documents are written in more than one language, the language according to which the Contract shall be construed and interpreted is also stated in Part II of these Conditions, being therein designated the "Ruling Language".

**Priority of Documents 5.2**

The several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows:

- (1) The Contract Agreement (if completed);
- (2) The Letter of Acceptance;
- (3) The Tender;
- (4) Part-II of these Conditions;
- (5) Part-I of these Conditions; and
- (6) Any other documents forming part of the Contract.

**Custody and Supply of  
Drawings and  
Documents**

- 6.1** The Drawings shall remain in the sole custody of the Engineer, but two copies thereof shall be provided to the Contractor free of charge. The Contractor shall make at his own cost any further copies required by him, Unless it is strictly necessary for the purposes of the Contract, the Drawings, Specification and other documents provided by the Employer or the Engineer shall not, without the consent of the Engineer, be used or communicated to a third party by the Contractor. Upon issue of the Defects Liability Certificate, the Contractor shall return to the Engineer all Drawings, Specification and other documents provided under the Contract.

The Contractor shall supply to the Engineer four copies of all Drawings, Specification and other documents, submitted by the Contractor and

approved by the Engineer in accordance with Clause-7, together with a reproducible copy of any material which cannot be reproduced to an equal standard by photocopying. In addition the Contractor shall supply such further copies of such Drawings. Specification and other documents as the Engineer may request in writing for the use of the Employer, who shall pay the cost thereof.

**One Copy of Drawings  
to be Kept on Site**

- 6.2** One copy of the Drawings, provided to or supplied by the Contractor as aforesaid, shall be kept by the Contractor on the Site and the same shall at all reasonable times be available for inspection and use by the Engineer and by any other person authorized by the Engineer in writing.

**Disruption of Progress**

- 6.3** The Contractor shall give notice to the Engineer, with a copy to the Employer, whenever planning or execution of the Works is likely to be delayed or disrupted unless any further drawing or instruction is issued by the Engineer within a reasonable time. The notice shall include details of the drawing or instruction required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.

**Delays and Cost of  
Delay of Drawings**

- 6.4** If, by reason of any failure or inability of the Engineer to issue, within a time reasonable in all circumstances, any drawing or instruction for which notice has been given by the Contractor in accordance with Sub-Clause-6.3, the Contractor suffers delay and/or incurs costs then the Engineer shall, after due consultation with the Employer and the Contractor, determine:

- (a) any extension of time to which the Contractor is entitled under Clause 44, and
- (b) the amount of such costs, which shall be added to the Contract Price, and shall notify the Contractor accordingly, with a copy to the Employer.

**Failure by Contractor  
to Submit Drawings**

- 6.5** If the failure or inability of the Engineer to issue any drawings or instructions is caused in whole or in part by the failure of the Contractor to submit drawings Specification or other Documents which he is required to submit under the Contract, the Engineer shall take such failure by the Contractor into account when making his determination pursuant to Sub-Clause 6.4.

**Supplementary  
Drawings and  
Instructions**

- 7.1** The Engineer shall have authority to issue to the Contractor, from time to time such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Work and the remedying of any defects therein. The Contractor shall carry out and be bound by the same.

**Permanent Works  
Designed by  
Contractor**

- 7.2** Where the Contract expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall submit to the Engineer, for approval.
- (a) such drawings, specification, calculations and other information as shall be necessary to satisfy the Engineer as to the suitability and

adequacy of that design and

- (b) operation and maintenance manuals together with drawings of the Permanent Works as completed, in sufficient detail to enable the Employer to operate, maintain, dismantle, reassemble and adjust the Permanent Works incorporating that design. The Works shall not be considered to be completed for the purposes of taking over in accordance with Clause-48 until such operation and maintenance manuals, together with drawings on completion, have been submitted to and approved by the Engineer.

**Responsibility  
Unaffected by  
Approval**

- 7.3** Approval by the Engineer, in accordance with Sub-Clause-7.2, shall not relieve the Contractor of any of his responsibilities under the Contract.

**GENERAL OBLIGATIONS**

**Contractor's  
General  
Responsibilities**

- 8.1** The Contractor shall, with due care and diligence, design (to the extent provided for by the Contract), execute and complete the Works, remedy any defects therein in accordance with the provisions of the Contract. The Contractor shall provide all superintendence, labour, materials, Plant, Contractor's Equipment and all other things, whether of a temporary or permanent nature, required in and for such design, execution, completion and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract.

**Site Operations  
and Methods of  
Construction**

- 8.2** The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and methods of constructions, provided that the Contractor shall not be responsible (except as stated hereunder or as may be otherwise agreed) for the design or specification of Permanent Works or for the design or specification of any Temporary Works not prepared by the Contractor. Where the Contract expressly provides that part of the Permanent Works shall be designed by the contractor, he shall be fully responsible for that part of such Works, not with standing any approval by the Engineer.

**Contract Agreement 9.1**

- The Contractor shall, if called upon so to do, enter into and execute the Contract Agreement, to be prepared and completed at the cost of the Employer, in the form annexed to these Conditions with such modification as may be necessary.

**Performance Security 10.1**

- If the Contract requires the Contractor to obtain security for his proper performance of the Contract he shall obtain and provide to the Employer such security within 28 days after the receipt of the Letter of Acceptance, in the sum stated in the Appendix to Tender. When providing such security to the Employer, the Contractor shall notify the Engineer of so doing. Such security shall be in such form as may be agreed between the Employer and the Contractor. The institution providing such security shall be subject to the approval of the Employer. The cost of complying with the requirements of this Clause shall be borne by the Contractor, unless the Contract otherwise provides.

**Period of Validity of  
performance Security 10.2**

The performance security shall be valid until the Contractor has executed and completed the Works and remedied any defects therein in accordance with the Contract. No claim shall be made against such security after the issue of the Defects Liability Certificate in accordance with Sub-Clause-62.1 and such security shall be returned to the Contractor within 14 days of the issue of the said Defect Liability Certificate.

**Claims under  
Performance Security 10.3**

Prior to making a claim under the performance security the Employer shall, in every case, notify the Contractor stating the nature of the default in respect of which the claim is to be made.

**Inspection of Site 11.1**

The Employer shall have made available to the Contractor, before the submission by the contractor of the Tender, such data on hydrological and sub-surface conditions as have been obtained by or on behalf of the Employer from investigations undertaken relevant to the Works but the Contractor shall be responsible for his own interpretation thereof.

The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself (so far as is practicable, having regard to considerations of cost and time) before submitting his Tender, as to:

- (a) the form and nature thereof, including the sub-surface conditions,
- (b) the hydrological and climatic conditions,
- (c) the extent and nature of work and materials necessary for the execution and completion of the Works and the remedying of any defects therein, and
- (d) the means of access to the Site and the accommodation he may require and, in general, shall be deemed to have obtained all necessary information subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Tender.

The Contractor shall be deemed to have based his Tender on the data made available by the Employer and on his own inspection and examination, all as aforementioned.

**Sufficiency of Tender 12.1**

The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Tender and of the rates and prices stated in the Bill of Quantities, all of which shall, except in so far as it is otherwise provided in the contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, Plant or services or of contingencies for which there is a Provisional Sum) and all matters and things necessary for the proper execution and completion of the Works and the remedying of any defects therein.



**Adverse Physical  
Obstructions or  
Conditions**

**12.2** If, however, during the execution of the Works the Contractor encounters physical obstructions of physical conditions, other than climatic conditions on the Site, which obstructions or conditions were, in his opinion, not foreseeable by an experienced contractor, the Contractor shall forthwith give notice thereof to the Engineer, with a copy to the Employer. On receipt of such notice, the Engineer shall, if in his opinion such obstructions or conditions could not have been reasonably foreseen by an experienced contractor, after due consultation with the Employer and the Contractor, determine:

- (a) any extension of time to which the Contractor is entitled under Clause-44, and
- (b) the amount of any costs which may have been incurred by the Contractor by reason of such obstructions or conditions having been encountered, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the employer, such determination shall take account of any instruction which the Engineer may issue to the Contractor in connection therewith, and any proper and reasonable measures acceptable to the Engineer which the Contractor may take in the absence of specific instructions from the Engineer.

**Work to be in  
Accordance with  
Contract**

**13.1** Unless it is legally or physically impossible, the Contractor shall execute and complete the Works and remedy any defects therein in strict accordance with the Contract to the satisfaction of the Engineer. The Contractor shall comply and adhere strictly to the Engineer's instructions on any matter, whether mentioned in the Contract or not, touching or concerning the Works. The Contractor shall take instructions only from the Engineer or, subject to the provisions of Clause-2, from the Engineer's representative.

**Programme to be  
Submitted**

**14.1** The Contractor shall, within the time stated in Part-II of these Conditions after the date of the Letter of Acceptance, submit to the Engineer for his consent a programme, in such form and detail as the Engineer shall reasonably prescribe, for the execution of the Works. The contractor shall, whenever required by the Engineer, also provide in writing for his information a general description of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.

**Revised Programme**

**14.2** If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the programme to which consent has been given under Sub-Clause-14.1, the Contractor shall produce, at the request of the Engineer, a revised programme showing the modifications to such programme necessary to ensure completion of the Works within the Time for Completion.

**Cash Flow Estimate  
to be Submitted**

**14.3** The Contractor shall, within the time stated in Part-II of these Conditions after the date of the Letter of Acceptance, provide to the Engineer for his information a detailed cash flow estimate, in quarterly period, of all payment to which the Contractor will be entitled under the Contract and the

		Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer.
<b>Contractor not Relieved of Duties or Responsibilities</b>	<b>14.4</b>	the submission to and consent by the Engineer of such programmes or the provision of such general descriptions or cash flow estimates shall not relieve the Contractor of any of his duties and responsibilities under the Contract.
<b>Contractor's Superintendence</b>	<b>15.1</b>	<p>The Contractor shall provide all necessary superintendence during the execution of the Works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor, or a competent and authorized representative approved of by the Engineer, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the Works, Such authorized representative shall receive, on behalf of the Contractor, instructions from the Engineer or, subject to the provisions of Clause-2, the Engineer's Representative.</p> <p>If approval of the representative is withdrawn by the Engineer, the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned, after receiving notice of such withdrawal, remove the representative from the Works and shall not thereafter employ him again on the Works in any capacity and shall replace him by another representative approved by the Engineer.</p>
<b>Contractor's Employees</b>	<b>16.1</b>	<p>The Contractor shall provide on the Site in connection with the execution and completion of the Works and the remedying of any defects therein</p> <p>(a) only such technical assistants as are skilled and experienced in their respective callings and such foremen and leading hands as are competent to give proper superintendence of the Works, and</p> <p>(b) such skilled, semi-skilled and unskilled labour as in necessary for the proper and timely fulfilling of the Contractor's obligations under the Contract.</p>
<b>Engineer at Liberty to Object</b>	<b>16.2</b>	The Engineer shall be at liberty to object to and require the Contractor to remove forthwith from the Works any person provided by the Contractor who, in the opinion of the Engineer, misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence on site is otherwise considered by the Engineer to be undesirable, and such person shall not be again allowed upon the Works without the consent of the Engineer. Any person so removed from the Works shall be replaced as soon as possible.
<b>Setting-out</b>	<b>17.1</b>	<p>The Contractor shall be responsible for:</p> <p>(a) the accurate setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing.</p> <p>(b) the correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of the Works, and</p>

- (c) the provision of all necessary instruments, appliances and labour in connection with the foregoing responsibilities.

If, at any time during the execution of the Works, any error appears in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required so to do by the Engineer, shall at his own cost, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer, in which case the Engineer shall determine an addition to the Contract Price in accordance with Clause-52 and shall notify the Contractor accordingly, with a copy to the Employer.

The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all benchmarks, sign-rails, pegs and other things used in setting-out the Works.

**Boreholes and  
Exploratory  
Excavation**

- 18.1** If, at any time during the execution of the Works, the Engineer requires the Contractor to make boreholes or to carry out exploratory excavation, such requirement shall be the subject of an instruction in accordance with Clause-51, unless an item or a Provisional Sum in respect of such work is included in the Bill of Quantities.

**Safety, Security and  
protection of the  
Environment**

- 19.1** The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:
- (a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons, and
  - (b) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
  - (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

**Employer's  
Responsibilities**

- 19.2** If under Clause-31 the Employer shall carry out work on the Site with his own workmen he shall, in respect of such works:
- (a) have full regard to the safety of all persons entitled to be upon the Site, and
  - (b) keep the Site in an orderly state appropriate to the avoidance of danger to such persons.

If under Clause-31 the Employer shall employ other contractors on the Site he shall require them to have the same regard for safety and avoidance of danger.

#### **Care of Works 20.1**

The Contractor shall take full responsibility for the care of the Works and materials and Plant for incorporation therein from the Commencement Date until the date of issue of the Taking-Over Certificate for the whole of the Works, when the responsibility for the said care shall pass to the Employer. Provided that:

- (a) if the Engineer issues a Taking-Over Certificate for any Section or Part of the permanent Works the Contractor shall cease to be liable for the care of that Section or part from the date of issue of the Taking-over Certificate, when the responsibility for the care of Section or part shall pass to the Employer, and
- (b) the Contractor shall take full responsibility for the care of any outstanding Works and materials and Plant for incorporation therein which he undertakes to finish during the Defects Liability Period until such outstanding Works have been completed pursuant to Clause-49.

#### **Responsibility to Rectify Loss or Damage**

- 20.2** If any loss or damage happens to the Works, or any part thereof, or material or Plant for incorporation therein, during the period for which the Contractor is responsible for the care thereof, from any cause whatsoever, other than risks defined in Sub-Clause-20.4, the Contractor shall, at his own cost, rectify such loss or damage so that the permanent Works conform in every respect with the provisions of the Contract to the satisfaction of the Engineer. The Contractor shall also be liable for any loss or damage to the Works occasioned by him in the course of any operations carried out by him for the purpose of complying with his obligations under Clause-49 and 50.

#### **Loss or Damage Due to Employer's Risks**

- 20.3** In the event of any such loss or damage happening from any of the risks defined in Sub-Clause-20.4 or in combination with other risk, the Contractor shall, if and to the extent required by the Engineer, rectify the loss or damage and the Engineer shall determine an addition to the Contract Price in accordance with Clause-52 and shall notify the Contractor accordingly, with a copy to the Employer. In the case of a combination of risk causing loss damage any such determination shall take into account the proportional responsibility of the Contractor and the Employer.

#### **Employer's Risk**

- 20.4** The Employer's risks are:
- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
  - (b) rebellion, revolution, insurrection, or military or usurped power, or civil war
  - (c) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio activity toxic explosive, or other hazardous

properties of any explosive nuclear assembly or nuclear component thereof,

- (d) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speed,
- (e) riot, commotion or disorder, unless solely restricted to employees of the Contractor or of his Subcontractors and arising from the conduct of the Works,
- (f) loss or damage due to the use or occupation by the Employer of any Section or part of the Permanent Works, except as may be provided for in the Contract,
- (g) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor's responsible,
- (h) any operation of the forces of nature against which an experienced contractor could not reasonably have been expected to take precautions.

**Insurance of Works  
and Contractor's  
Equipment**

**21.1** The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause-20, insure:

- (a) the Works, together with materials and Plant for incorporation therein, to the full replacement cost
- (b) an additional sum of 15 percent of such replacement cost, or as may be specified in Part-II of these Conditions, to cover any additional cost of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatever nature
- (c) the Contractor's Equipment and other things brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

**Scope of Cover 21.2**

The insurance in paragraphs (a) and (b) of Sub-Clause-21.1 shall be in the joint names of the Contractor and the Employer and shall cover:

- (a) the Employer and the Contractor against all loss or damage from whatsoever cause arising, other than as provided in Sub-Clause-21.4, from the start of work at the Site until the date of issue of the relevant Taking-Over Certificate in respect of the Works or any Section or part thereof as the case may be, and

- (b) the Contractor for his liability:
  - i) during the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of the Defect Liability Period, and
  - ii) for loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clause-49 and 50.

**Responsibility for  
Amounts not  
Recovered**

- 21.3** Any amounts not insured or not recovered from the insurers shall be borne by the Employer or the Contractor in accordance with their responsibilities under Clause-20.

**Exclusions**

- 21.4** There shall be no obligation for the insurances in Sub-Clause-21.1 to include loss or damage caused by

- (a) war, hostilities (where war be declared or not), invasion, act of foreign enemies,
- (b) rebellion, revolution, insurrection or military or usurped power, or civil war,
- (c) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component thereof,
- (d) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds.

**Damage to Persons  
and Property**

- 22.1** The Contractor shall, except if and so far as the Contractor provides otherwise, indemnify the Employer against all losses and claims in respect of:
- (a) death of or injury to any person, or
  - (b) loss of or damage to any property (other than the Works), which may arise out of or in consequence of the execution and completion of the Works and the remedying of any defects therein, and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof in relation thereto subject to the exceptions defined in Sub-Clause-22.2.

**Exceptions**

- 22.2** The "exceptions" referred to in Sub-Clause 22.1 are:

- (a) the permanent use or occupation of land by the Works, or any part thereof,
- (b) the right of the Employer to execute the Works, or any part thereof, on, over, under, in or through any land,

- (c) damage to property which is the unavoidable result of the execution and completion of the Works, or the remedying of any defects therein, in accordance with the Contract,
- (d) death of or injury to persons or loss of or damage to property resulting from any act of negligence of the Employer, his agents, servants or other Contractors, not being employed by the Contractor, or in respect of any claims, proceedings, damages, cost, charges and expenses in respect thereof or in relation thereto or, where the injury of damage was contributed to by the Contractor, his servants or agents, such part of the said injury or damage as may be just and equitable having regard to the extent of the responsibility of the Employer, his servants or agents or other contractors for the injury or damage.

**Indemnity by  
Employer**

- 22.3** The Employer shall indemnify the Contractor against all claims, proceedings damage, costs, charges and expenses in respect of the matters referred to in the exceptions defined in Sub-Clause-22.2.

**Third Party Insurance  
(including Employer's  
Property)**

- 23.1** The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause-22, insure, in the joint names of the contractor and the Employer, against liabilities for death of or injury to any person (other than as provided in Clause-24) or loss of or damage to any property (other than the Works) arising out of the performance of the Contract, other than the exceptions defined in paragraphs (a), (b) and (c) of Sub-Clause-22.2.

**Minimum Amount  
of Insurance**

- 23.2** Such insurance shall be for at least the amount stated in the Appendix to Tender.

**Cross Liabilities**

- 23.3** The insurance policy shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Employer as separately insured.

**Accident or Injury  
to Workmen**

- 24.1** The Employer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or any Subcontractor, other than death of injury resulting from any act or default of the Employer, his agents or servants. The Contractor shall indemnify and keep indemnified of the Employer against all such damages and compensation, other than those for which the Employer is liable as aforesaid, and against all claims, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

**Insurance Against  
Accident to  
Workmen**

- 24.2** The Contractor shall insure against such liability and shall continue such insurance during the whole of the time that any persons are employed by him on the Works, Provided that, in respect of any persons employed by any Subcontractor, the Contractor's obligations to insure as aforesaid under this Sub-Clause shall be satisfied if the Subcontractor shall have insured against the liability in respect of such persons in such manner that the Employer is indemnified under the policy, but the Contractor shall require such

**Evidence and  
Terms of Insurance**

Subcontractor to produce to the Employer, when required, such policy of insurance and the receipt for the payment of the current premium.

- 25.1** The Contractor shall provide evidence to the Employer prior to the start of work at the Site that the insurance required under the Contract have been effected and shall, within 84 days of the Commencement Date, provide the insurance policies to the Employer, When providing such evidence and such policies to the Employer, the Contractor shall notify the Engineer of so doing, Such insurance policies shall be consistent with the general terms agreed prior to the issue of the Letter of Acceptance. The Contractor shall effect all insurance for which he is responsible with insurance and in terms approved by the Employer.

**Adequacy of  
Insurance**

- 25.2** The Contractor shall notify the insurers of changes in the nature, extent or programme for the execution of the Works and ensure the adequacy of the insurance at all times in accordance with the terms of the Contract and shall, when required, produce to the Employer the insurance policies in force and the receipts for payment of the current premiums.

**Remedy on  
Contractor's  
Failure to Insure**

- 25.3** If the Contractor fails to effect and keep in force any of the insurance required under the Contract, or fails to provide the policies to the Employer within the period required by Sub-Clause-25.1, then and in any such case the Employer may effect and keep in force any such insurance and pay any premium as may be necessary for that purpose and from time to time deduct the amount so paid any monies due or to become due to the Contractor, or recover the same as a debt due from the Contractor.

**Compliance with  
Policy Conditions**

- 25.4** In the event that the Contractor or the Employer fails to comply with conditions imposed by the insurance policies effected pursuant to the Contract, each shall indemnify the other against all losses and claims arising from such failure.

**Compliance with  
Statutes Regulations**

- 26.1** The contractor shall conform in all respects, including by the giving of all notices and the paying of all fees, with the provisions of:
- (a) any National or State Statute, Ordinance, or other Law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution and completion of the Works and the remedying of any defects therein, and
  - (b) the rules and regulations of all public bodies and companies whose property or right are affected or may be affected in any way by the Works,

and the Contractor shall keep the Employer indemnified against all penalties and liability of every kind for breach of any such provisions, Provided always that the Employer shall be responsible for obtaining any planning, zoning or other similar permission required for the Works to proceed and shall indemnify the Contractor in accordance with Sub-Clause-22.3



<b>Fossils</b>	<b>27.1</b>	<p>All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall, as between the Employer and the Contractor, be deemed to be absolute property of the Employer. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing or damaging any such article or thing and shall, immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with the same. if, by reason of such instructions, the Contractor suffers delay and/or incurs costs then the Engineer shall, after due consultation with the Employer and the Contractor, determine:</p> <p>(a) any extension of time to which the Contractor is entitled under Clause-44, and</p> <p>(b) the amount of such costs, which shall be added to the Contract Price,</p> <p>and shall notify the Contractor accordingly, with a copy to the Employer.</p>
<b>Patent Rights</b>	<b>28.1</b>	<p>The Contractor shall save harmless and indemnify the Employer from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected right in respect of any Contractor's Equipment, materials or Plant used for or in connection with or for incorporation in the Works and from and against all damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, except where such infringement results from compliance with the design or Specification provided by the Engineer.</p>
<b>Royalties</b>	<b>28.2</b>	<p>Except where otherwise stated, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials required for the Works.</p>
<b>Interference with Traffic and Adjoining Properties</b>	<b>29.1</b>	<p>All operations necessary for the execution and completion of the Works and the remedying of any defects therein shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with:</p> <p>(a) the convenience of the public, or</p> <p>(b) the access to, use and occupation of public or private roads and footpaths to or of properties whether in the possession of the Employer or of any other person.</p> <p>The Contractor shall save harmless and indemnify the Employer in respect of all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of, or in relation to, any such matters insofar as the Contractor is responsible therefore.</p>
<b>Avoidance of Damage to Roads</b>	<b>30.1</b>	<p>The Contractor shall use every reasonable means to prevent any of the roads or bridges communicating with on the routes to the Site from being damaged or injured by any traffic of the Contractor or any of his Subcontractors and,</p>

in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of materials, Plant, Contractor's Equipment or Temporary Works from and to the Site shall be limited, as far as reasonable possible, and so that no unnecessary damage or injury may be occasioned to such roads and bridges.

**Transport of  
Contractor's  
Equipment or  
Temporary Works**

**30.2** Save insofar as the Contract otherwise provides, the Contractor shall be responsible for and shall pay cost of strengthening any bridges or altering or improving any road communicating with or on the routes to the Site to facilitate the movement of Contractor's Equipment or Temporary Works and the Contractor shall indemnify and keep indemnified the Employer against all claims for damage to any such road or bridge caused by such movement, including such claims as may be made directly against the Employer, and negotiate and pay all claims arising solely out of such damage.

**Transport of  
Materials or Plant**

**30.3** If, notwithstanding Sub-Clause-30.1, any damage occurs to any bridge or road communicating with or on the routes to the Site arising from the transport of materials or Plant, the Contractor shall notify the Engineer with a copy to the Employer, as soon as he becomes aware of such damage or as soon as he receives any claim from the authority entitled to make such claim. Where under any law or regulation the haulier of such materials or Plant is required to indemnify the road authority against damage the Employer shall not be liable for any costs, charges or expenses in respect thereof or in relation thereto. In other cases the Employer shall negotiate the settlement of and pay all sums due in respect of such claim and shall indemnify the Contractor in respect thereof and in respect of all claims, proceedings, damages, cost, charges and expenses in relation thereto Provided that if and so far as any such claim or part thereof is, in the opinion of the Engineer, due to any failure on the part of the Contractor to observe and perform his obligations under Sub-Clause-30.1, then the amount, determined by the Engineer, after due consultation with the Employer and the Contractor, to be due to such failure shall be recoverable from the Contractor by the Employer and may be deducted by the Employer from any monies due or to become due to the contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer. Provided also that the Employer shall notify the Contractor whenever a settlement is to be negotiated and, where any amount may be due from the Contractor, the Employer shall consult with the Contractor before such settlement is agreed.

**Waterborne Traffic**

**30.4** Where the nature of the Works is such as to require the use by the Contractor of waterborne transport the foregoing provisions of this Clause shall be construed as though "road" included a lock, dock, sea wall or other structure related to a waterway and "vehicle" included craft, and shall have effect accordingly.

**Opportunities for  
Other Contractors**

**31.1** The Contractor shall, in accordance with the requirements of the Engineer afford all reasonable opportunities for carrying out their work to:

- (a) any other contractors employed by the Employer and their workmen,

- (b) the workmen of the Employer, and
- (c) the workmen of any duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any contract which the Employer may enter into in connection with or ancillary to the Works.

**Facilities for  
Other Contractors**

**31.2** If, however, pursuant to Sub-Clause 31.1 the Contractor shall, on the written request of the Engineer:

- (a) make available to any such other Contractor, or to the Employer or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or
- (b) permit the use, by any such, of Temporary Works or Contractor's Equipment on the Site, or
- (c) provide any other service of whatsoever nature for any such, the Engineer shall determine an addition to the Contract Price in accordance with Clause-52 and shall notify the Contractor accordingly, with a copy to the Employer.

**Contractor to  
Keep Site Clear**

**32.1** During the execution of the Works the Contractor shall keep the Site reasonably free from all unnecessary obstruction and shall store or dispose of the Contractor's Equipment and surplus materials and clear away and remove from the Site any wreckage, rubbish or Temporary Works no longer required.

**Clearance of Site  
on Completion 33.1**

Upon the issue of any Taking-Over Certificate the Contractor shall clear away and remove from that part of the Site to which such Taking-Over Certificate relates all Contractor's Equipment, Surplus material, rubbish and Temporary Works of every kind, and leave such part of the Site and Works clean and in a workmanlike condition to the satisfaction of the Engineer. Provided that the Contractor shall be entitled to retain on Site, until the end of the Defects Liability Period, such materials, Contractor's Equipment and Temporary Works as are required by him for the purpose of fulfilling his obligations during the Defects Liability Period.

**LABOUR**

**Engagement of  
Staff and Labour**

**34.1** The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

**Returns of Labour  
and Contractor's  
Equipment**

**35.1** The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such information respecting Contractor's Equipment as the Engineer may require.

**MATERIALS, PLANT AND WORKMANSHIP****Quality of  
Materials Plant  
and Workmanship**

- 36.1** All materials, Plant and workmanship shall be
- (a) of the respective kinds described in the Contract and in accordance with the Engineer's instructions, and
  - (b) subjected from time to time to such test as the Engineer may require at the place of manufacture, fabrication or preparation, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such place.

The Contractor shall provide such assistance, labour, electricity, fuels, stores, apparatus and instruments as are normally required for examining, measuring and testing any materials or Plant and shall supply samples of materials, before incorporation in the Works, for testing as may be selected and required by the Engineer.

**Cost of Sample 36.2**

All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract.

**Cost of Tests**

- 36.3** The cost of making any test shall be borne by the Contractor if such test is
- (a) clearly intended by or provided for in the Contract, or
  - (b) particularised in the Contract (in cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfill) in sufficient detail to enable the Contractor to price or allow for the same in his Tender.

**Cost of Tests not  
Provided for**

- 36.4** If any test required by the Engineer which is
- (a) not so intended by or provided for, or
  - (b) (in the cases above mentioned) not so particularised, or
  - (c) (though so intended or provided for) required by the Engineer to be carried out at any place other than the Site or the place of manufacture, fabrication or preparation of the materials or Plant tested,

shows the materials, Plant or workshop not to be in accordance with the provisions of the Contract to the satisfaction of the Engineer, then the cost of such test shall be borne by the Contractor, but in any other case Sub-Clause-36.5 shall apply.

**Engineer's Determination  
where Tests not  
Provided for**

- 36.5** Where, pursuant to Sub-Clause-36.4, this Sub-Clause applies the Engineer shall, after due consultation with the Employer and the Contractor, determine:

- (a) any extension of time to which the Contractor is entitled under Clause-44, and
- (b) the amount of such costs, which shall be added to the Contract Price and shall notify the Contractor accordingly, with a copy to the Employer.

#### **Inspection of Operations**

- 37.1** The Engineer, and any person authorized by him, shall at all reasonable times have access to the Site and to all workshops and places where materials or Plant are being manufactured, fabricated or prepared for the Works and the Contractor shall afford every facility for and every assistance in obtaining the right to such access.

#### **Inspection and Testing**

- 37.2** The Engineer shall be entitled, during manufacture, fabrication or preparation to inspect and test the materials and Plant to be supplied under the Contract. If materials or Plant are being manufactured, fabricated or prepared in workshops or places other than those of the Contractor, the Contractor shall obtain permission from the Engineer to carry out such inspection and testing in those workshops or places, Such inspection or testing shall not release the Contractor from any obligation under the Contract.

#### **Dates for Inspection and Testing**

- 37.3** The Contractor shall agree with the Engineer on the time and place for the inspection or testing of any materials or Plant as provided in the Contract. The Engineer shall give the Contractor not less than 24 hours notice of this intention to carry out the inspection or to attend the tests. If the Engineer, or his duly authorized representative, does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Engineer, proceed with the test, which shall be deemed to have been made in the presence of the Engineer. The Contractor shall forthwith forward to the Engineer duly certified copies of the test readings. if the Engineer has not attended the test, he shall accept the said readings as accurate.

#### **Rejection**

- 37.4** If, at the time and place agreed in accordance with Sub-Clause-37.3, the materials or Plant are not ready for inspection or testing or if, as a result of the inspection or testing referred to in this Clause, the Engineer determines that the materials or Plant are defective or otherwise not in accordance with the Contract, he may reject the materials or Plant and shall notify the Contractor thereof immediately. The notice shall state the Engineer's objections with reasons. The Contractor shall then promptly make good the defect or ensure that rejected materials or Plant comply with the Contract. If the Engineer so requests, the tests of rejected materials or Plant shall be made or repeated under the same terms and conditions. All costs incurred by the Employer by the repetition of the tests shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer and may be deducted from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

#### **Independent Inspection**

- 37.5** The Engineer may delegate inspection and testing of materials or Plant to an independent inspector. Any such delegation shall be effected in accordance with Sub-Clause-2.4 and for this purpose such independent inspector shall

be considered as an assistant of the Engineer. notice of such appointment (not being less than 14 days) shall be give by the Engineer to the Contractor.

**Examination of Work  
before Covering up**

**38.1**

No part of the Works shall be covered up or put out of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any such part of the Works which is about to be covered up or put out of view and to examine foundations before any part of the Works is placed thereon. The Contractor shall give notice to the Engineer whenever any such part of the Works or foundations is or are ready or about to be ready for examination and the Engineer shall, without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such part of the Works or of examining such foundations.

**Uncovering and  
Making Openings**

**38.2**

The Contractor shall uncover any part of the Works or make opening in or through the same as the Engineer may from time to time instruct and shall reinstate and make good such part. If any such part has been covered up or put out of view after compliance with the requirement of Sub-Clause-38.1 and is found to be executed in accordance with the Contract, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of the Contractor's costs in respect of such of uncovering, making openings in or through, reinstating and making good the same, which shall be added to the Contract Price and shall notify the Contractor accordingly, with a copy to the Employer. In any other case all costs shall be borne by the Contractor.

**Removal of Improper  
Work Materials or  
Plant**

**39.1**

The Engineer shall have authority to issue instructions from time to time, for:

- (a) the removal from the Site, within such time or times as may be specified in the instruction, of any materials or Plant which, in the opinion of the Engineer, are not in accordance with the Contract,
- (b) the substitution of proper and suitable materials or Plant, and
- (c) the removal and proper re-execution, notwithstanding any previous test thereof or interim payment thereof, of any work which, in respect of:
  - (i) materials, Plant or Workmanship, or
  - (ii) design by the Contractor or for which he is responsible,

is not, in the opinion of the Engineer, in accordance with the Contract.

**Default of Contractor  
in Compliance 39.2**

In case of default on the part of the Contractor in carrying out such instruction within the time specified therein or, if none, within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

## S U S P E N S I O N

- Suspension of Work      40.1**      The Contractor shall, on the instructions of the Engineer, suspend the progress of the Works or any part thereof for such time and in such manner as the Engineer may consider necessary and shall, during suspension, properly protect and secure the Works or such part thereof so far as is necessary in the opinion of the Engineer. unless such suspension is
- (a)      otherwise provided for in the Contract, or
  - (b)      necessary by reason of some default of or breach of contract by the Contractor or for which he is responsible, or
  - (c)      necessary by reason of climatic conditions on the Site, or
  - (d)      necessary for the proper execution of the Works or for the safety of the Works or any part thereof (save to the extent that such necessity arises from any act or default by the Engineer or the Employer or from any of the risks defined in Sub-Clause-20.4),  
Sub-Clause 40.2 shall apply.
- Engineer's  
Determination  
following Suspension      40.2**      Where, pursuant to Sub-Clause-40.1, this Sub-Clause applies the Engineer shall, after due consultation with the Employer and the Contractor, determine:
- (a)      any extension of time to which the Contractor is entitled under Clause-44, and
  - (b)      the amount, which shall be added to the Contract Price, in respect of the cost incurred by the Contractor by reason of such suspension,
- and shall notify the Contractor accordingly, with a copy to the Employer.
- Suspension Lasting  
more than 84 Days      40.3**      If the progress of the Works or any part thereof is suspended on the written instructions of the Engineer and if permission to resume work is not given by the Engineer within a period of 84 days from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of Sub-Clause-40.1, the Contractor may give notice to the Engineer reacquiring permission, within 28 days from the receipt thereof, to proceed with the Works or that part thereof in regard to which progress is suspended. if, within the said time, such permission is not granted, the Contractor may, but is not bound to elect to treat the suspension, where it affects part only of the Works, as an omission of such part under Clause-51 by giving a further notice to the Engineer to that effect, or, where it affects the whole of the Works, treat the suspension as an event of default by the Employer and terminate his employment under the Contract in accordance with the provisions of Sub-Clause-69.1, whereupon the provisions of Sub-Clause-69.2 and 69.3 shall apply.

**COMMENCEMENT AND DELAYS****Commencement of Work**

- 41.1** The Contractor shall commence the Works as soon as is reasonably possible after the receipt by him of a notice to this effect from the Engineer, which notice shall be issued within the time stated in the Appendix to Tender after the date of the Letter of Acceptance. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

**Possession of Site and Access Thereto**

- 42.1** Save insofar as the Contract may prescribe:
- (a) the extent of portions of the Site of which the Contractor is to be given possession from time to time, and
  - (b) the order in which such portions shall be made available to the Contractor and subject to any requirement in the Contract as to the order in which the Works shall be executed, the Employer will, with the Engineer's notice to commence the Works, give to the Contractor possession of:
  - (c) so much of the Site, and
  - (d) such access as, in accordance with the Contract, is to be provided by the Employer as may be required to enable the Contractor to commence and proceed with the execution of the Works in accordance with the programme referred to in Clause-14, if any, and otherwise in accordance with such reasonable proposals as the Contractor shall, by notice to the Engineer with a copy to the Employer, make. The Employer will, from time to time as the Works proceed, give to the Contractor possession of such further portions of the Site as may be required to enable the Contractor to proceed with the execution of the Works with due dispatch in accordance with such programme or proposals, as the case may be.

**Failure to Give Possession**

- 42.2** If the Contractor suffers delay and/or incurs costs from failure on the part of the Employer to give possession in accordance with the terms of Sub-Clause-42.1, the Engineer shall, after due consultation with the Employer and the Contractor, determine:
- (a) any extension of time to which the Contractor is entitled under Clause-44, and
  - (b) the amount of such costs, which shall be added to the Contract Price,

and shall notify the Contractor accordingly, with a copy to the Employer.

**Way leaves and Facilities**

- 42.3** The Contractor shall bear all costs and charges for special or temporary way leaves required by him in connection with access to the Site. The Contractor shall also provide at his own cost any addition facilities outside the Site required by him for the purposes of the Works.



**Time for Completion 43.1** The whole of the Works and, if applicable, any Section required to be completed within a particular time as stated in the Appendix to Tender, shall be completed in accordance with the provisions of Clause-48, within the time stated in the Appendix to Tender for the whole of the Works or the Section (as the case may be), calculated from the Commencement Date, or such extended time as may be allowed under Clause-44.

**Extension of Time  
for Completion 44.1**

In the event of

- (a) the amount or nature of extra or additional work, or
- (b) any cause of delay referred to in these Conditions, or
- (c) exceptionally adverse climatic conditions, or
- (d) any delay, impediment or prevention by the Employer, or
- (e) other special circumstances which may occur, other than through a default of or breach of contract by the Contractor or for which he is responsible,

being such as fairly to entitle the Contractor to an extension of the Time for Completion of the Works, or any Section or part thereof, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of such extension and shall notify the Contractor accordingly, with a copy to the Employer.

**Contractor to Provide  
Notification and Detailed  
Particulars 44.2**

Provided that the Engineer is not bound to make any determination unless the Contractor has

- (a) within 28 days after such event has first arisen notified the Engineer with a copy to the Employer, and
- (b) within 28 days, or such other reasonable time as may be agreed by the Engineer, after such notification submitted to the Engineer detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

**Interim Determination  
of Extension 44.3**

Provided also that where an event has a continuing effect such that it is not practicable for the contractor to submit detailed particulars within the period of 28 days referred to in Sub-Clause-44.2(b), he shall nevertheless be entitled to an extension of time provided that he has submitted to the Engineer interim particulars at intervals of not more than 28 days and final particular within 28 days of the end of the effects resulting from the event. On receipt of such interim particulars, the Engineer shall, without undue delay, make an interim determination of extension of time and on receipt of the final particulars, the Engineer shall review all the circumstances and shall determine an overall extension of time in regard to the event. In both such cases the Engineer shall, notify the Contractor accordingly, with a copy to the Employer. No final review shall result in a decrease of any extension of time already determined by the Engineer.

**Restriction on  
Working Hours 45.1**

Subject to any provision to the contrary contained in the Contract, none of the Works shall, save as hereinafter provided, be carried on during the night or on locally recognized days of rest without the consent of the Engineer,

except when work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer. Provided that the provisions of this Clause shall not be applicable in the case of any work which it is customary to carry out by multiple shifts.

- |  |             |   |
|--|-------------|---|
| <b>Rate of progress</b>                | <b>46.1</b> | If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Works or any Section is at any time, in the opinion of the Engineer, too slow to comply with the Time for Completion, the Engineer shall so notify the Contractor who shall thereupon take such steps as are necessary, subject to the consent of the Engineer, to expedite progress so as to comply with the Time for Completion. The Contractor shall not be entitled to any additional payment for taking such steps. If as a result of any notice given by the Engineer under this Clause, the Contractor considers that is necessary to do any work at night or on locally recognized days of rest, he shall be entitled to seek the consent of the Engineer so to do. Provided that if any steps, taken by the Contractor in meeting his obligations under this Clause, involve the Employer in additional supervision costs, such cost shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer. |
| <b>Liquidated Damages for Delay</b>    | <b>47.1</b> | If the Contractor fails to comply with the Time of Completion in accordance with Clause-48, for the whole of the Works or, if applicable, any Section within the relevant time prescribed by Clause-43, then the Contractor shall pay to the Employer the relevant sum stated in the Appendix to Tender as liquidated damages for such default and not as a penalty (which sum shall be the only monies due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant Time for Completion and the date stated in a Taking-Over Certificate of the whole of the Works or the relevant Section, subject to the applicable limit stated in the Appendix to Tender. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligation and liabilities under the Contract.  |
| <b>Reduction of Liquidated Damages</b> | <b>47.2</b> | If, before the Time for Completion of the whole of the Works or, if applicable any Section, a Taking-Over Certificate has been issued for any part of the Works or of a Section, the liquidated damages for delay in completion of the remainder of the Works or of that Section shall, for any period of delay after the date stated in such Take-Over Certificate, and in the absence of alternative provisions in the Contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works or Section, as applicable. The provisions of this Sub-Clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof.   |
| <b>Taking-Over Certificate</b>         | <b>48.1</b> | When the whole of the Works have been substantially completed and have satisfactorily passed any Test on Completion prescribed by the Contract, the Contractor may give a notice to that effect to the Engineer, with a copy to the   |

Employer, accompanied by a written undertaking to finish with due expedition any outstanding work during the Defects Liability Period. Such notice and undertaking shall be deemed to be a request by the Contractor for the Engineer to issue a Taking-Over Certificate in respect of the Works. The Engineer shall within 21 days of the date of delivery of such notice either issue to the Contractor, with a copy to the Employer, a Taking-Over Certificate, stating the date on which, in his opinion, the Works were substantially completed in accordance with the Contract, or give instructions in writing to the Contractor specifying all the work which, in the Engineer's opinion, is required to be done by the Contractor before the issue of such Certificate. The Engineer shall also notify the Contractor of any defect in the Works affecting substantial Completion that may appear after such instructions and before completion of the Works specified therein. The Contractor shall be entitled to receive such Taking-Over Certificate therein. The Contractor shall be entitled to receive such Taking-Over Certificate within 21 days of completion, to the satisfaction of the Engineer, of the Works so specified and remedying and defect so notified.

**Taking-Over of  
Sections or Parts**

**48.2** Similarly, in accordance with the procedure set out in Sub-Clause -48.1, the Contractor may request and the Engineer shall issue a Taking-Over Certificate in respect of:

- (a) any Section in respect of which a separate Time for Completion is provided in the Appendix to Tender, or
- (b) any substantial part of the Permanent Works which has been both completed to the satisfaction of the Engineer and, otherwise than as provided for in the Contract, occupied or used by the Employer, or
- (c) any part of the Permanent Works which the Employer has elected to occupy or use prior to completion (where such prior occupation or use is not provided for in the Contract has not been agreed by the Contractor as a temporary measure).

**Substantial  
Completion of Part**

**48.3** If any part of the Permanent Works has been substantially completed and has satisfactorily passed any Test on Completion prescribed by the Contract, the Engineer may issue a Taking-Over Certificate in respect of that part of the Permanent Works before completion of the whole of the Works and, upon the issue of such Certificate, the contractor shall be deemed to have undertaken to complete with due expedition any outstanding work in that part of the Permanent Works during the Defects Liability Period.

**Surfaces Requiring  
Reinstatement**

**48.4** Provided that a Taking-Over Certificate given in respect of any Section or part of the Permanent Works before completion of the whole of the Works shall not be deemed to certify completion of any ground or surfaces requiring reinstatement unless such Taking-Over Certificate shall expressly so state.

**DEFECTS LIABILITY****Defects Liability Period**

**49.1** In these Conditions the expression "Defects Liability Period" shall mean the defects liability period named in the Appendix to Tender, calculated from:

- (a) the date of substantial completion of the Works certificated by the Engineer in accordance with Clause-48, or
- (b) in the event of more than one certificate having been issued by the Engineer under Clause-48, the respective dates so certified

and in relation to the Defect Liability Period the expression "the Works" shall be construed accordingly.

**Completion of Outstanding Work and Remediating Defects**

**49.2** To the extent that the Works shall, at or as soon as practicable after the expiration of the Defects Liability Period, be delivered to the Employer in the condition required by the Contract, fair wear and tear excepted, to the satisfaction of the Engineer, the Contractor shall:

- (a) complete the work, if any, outstanding on the date stated in the Taking-Over Certificate as soon as practicable after such date and
- (b) execute all such work of amendment, reconstruction, and remediating defects, shrinkages or other faults as the Engineer may, during the Defects Liability Period or within 14 days after its expiration, as a result of an inspection made by or on behalf of the Engineer prior to its expiration, instruct the Contractor to execute.

**Costs of Remediating Defects**

**49.3** All work referred to in Sub-Clause-49.2(b) shall be executed by the Contractor at his own cost if the necessity thereof is, in the opinion of the Engineer, due to:

- (a) the use of materials, Plant or workshop not in accordance with the Contract, or
- (b) where the Contractor is responsible for the design of part of the Permanent Works, any fault in such design, or
- (c) the neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the contractor's part under the Contract.

If, in the opinion of the Engineer, such necessity is due to any other cause, he shall determine an addition to the Contract Price in accordance with Clause-52 and shall notify the Contractor accordingly, with a copy to the Employer.

**Contractor's Failure to Carry Out Instructions**

**49.4** In case of default of the Contractor in carrying out such instruction within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and if such work which, in the opinion of the

Engineer, the Contractor was liable to do at his own cost under the Contract, then all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

**Contractor to Search 50.1**

If any defect, shrinkage or other fault in the Works appears at any time prior to the end of the Defect Liability Period, the Engineer may instruct the Contractor with copy to the Employer, to search under the directions of the Engineer for the cause thereof. Unless such defect, shrinkage or other fault is one for which the Contractor is liable under the Contract, the Engineer shall, after due consultation with the Employer and the Contractor, determine the amount in respect of the costs of such search incurred by the Contractor, which shall be added to the Contract Price and shall notify the Contractor accordingly, with a copy to the Employer. If such defect, shrinkage or other fault is one for which the Contractor is liable, the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case remedy such defect, shrinkage or other fault at his own cost in accordance with the provisions of Clause-49.

**ALTERATIONS, ADDITIONS AND OMISSIONS**

**Variations**

**51.1** The Engineer shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose or if for any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:

- (a) increase or decrease the quantity of any work included in the Contract,
- (b) omit any such work (but not if the omitted work is to be carried out by the Employer or by another contractor),
- (c) change the character or quality or kind of any such work,
- (d) change the levels, lines, position and dimensions of any part of the Works.
- (e) execute additional work of any kind necessary for the completion of the Works,
- (f) change any specified sequence or timing of construction of any part of the Works.

No such variation shall in any way vitiate or invalidate the Contract, but the effect, if any, of all such variations shall be valued in accordance with Clause-52, Provided that where the issue of an instruction to vary the Works is necessitated by some default of or breach of contract by the Contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the Contractor.

**Instructions for  
Variations**

- 51.2** The Contractor shall not make any such variation without an instruction of the Engineer. Provided that no instruction shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an instruction given under this Clause, but is the result of any quantities exceeding or being less than those stated in the Bill of Quantities.

**Valuation of  
Variations**

- 52.1** All variations referred to in Clause-51 and any additions to the Contract Price which are required to be determined in accordance with Clause-52 (for the purposes of this Clause referred to as "varied work"), shall be valued at the rates and prices set out in the Contract if, in the opinion of the Engineer, the same shall be applicable. If the Contract does not contain any rates or prices applicable to the varied work, the rates and price in the Contract shall be used as the basis for valuation so far as may be reasonable, failing which, after due consultation by the Engineer with the Employer and the Contractor, suitable rates or prices shall be agreed upon between the Engineer and the Contractor. In the event of disagreement the Engineer shall fix such rates or prices as are, in his opinion, appropriate and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on-account payment to be included in certificates issued in accordance with Clause-60.

**Power of Engineer  
to Fix Rates**

- 52.2** Provided that if the nature or amount of any varied work relative to the nature of amount of the whole of the Works or to any part thereof, is such that, in the opinion of the Engineer, the rate or price contained in the Contract for any item of the Works is, by reason of such varied work, rendered inappropriate or inapplicable, then, after due consultation by the Engineer with the Employer and the Contractor, a suitable rate or price shall be agreed upon between the Engineer and the Contractor. In the event of disagreement the Engineer shall fix such other rate or price as is, in his opinion, appropriate and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or price to enable on-account payment to be included in certificates issued in accordance with Clause-60.

Provided also that no varied work instructed to be done by the Engineer pursuant to Clause-51 shall be valued under Sub-Clause-52.1 or under this Sub-Clause unless, within 14 days of the date of such instruction and, other than in the case of omitted work, before the commencement of the varied work, notice shall have been given either:

- (a) by the contractor to the Engineer of his intention to claim extra payment or a varied rate or price, or
- (b) by the Engineer to the Contractor of his intention to vary a rate or price.

**Variations Exceeding  
15 percent**

- 52.3** If, on the issue of the Taking-Over Certificate for the whole of the Works, it is found that as a result of:
- (a) all varied work valued under Sub-Clauses-52.1 and 52.2, and

- (b) all adjustments upon measurement of the estimated quantities set out in the Bill of Quantities, excluding Provisional sums, day works and adjustments of price made under Clause-70,

but not from any other cause, there have been additions to or deductions from the Contract Price which taken together are in excess 15% of the "Effective contract Price" (which for the purposes of this Sub-Clause shall mean the Contract Price, excluding Provisional Sums all allowance for dayworks, if any) then and in such event (subject to any action already taken under any other Sub-Clause of this Clause), after due consultation by the Engineer with the Employer and the Contractor, there shall be added to or deducted from the Contract Price such further sum as may be agreed between the Contractor and the Engineer or, failing agreement, determined by the Engineer having regard to the Contractor's Site and general overhead costs of the Contract. The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer. Such sum shall be based only on the amount by which such additions or deductions shall be in excess of 15% of the Effective Contract Price.

## Daywork

**52.4** The Engineer may, if in his opinion it is necessary or desirable, issue an instruction that any varied work shall be executed on a daywork basis. The contractor shall then be paid for such varied work under the terms set out in the daywork schedule included in the Contract and at the rates and Prices affixed thereto by him in the Tender.

The Contractor shall furnish to the Engineer such receipts or other vouchers as may be necessary to prove the amounts paid and, before ordering materials, shall submit to the Engineer quotations for the same for his approval.

In respect of such of the Works executed on a daywork basis, the Contractor shall, during the continuance of such work, deliver each day to the Engineer an exact list in duplicate of the names, occupation and time of all workmen employed on such work and a statement, also in duplicate, showing the description and quantity of all materials and Contractor's Equipment used thereon or therefor other than Contractor's Equipment which is included in the percentage addition in accordance with such daywork schedule. One copy of each list and statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor.

At the end of each month the Contractor shall deliver to the Engineer a priced statement of the labour, materials and Contractor's Equipment, except as aforesaid, used and the Contractor shall not be entitled to any payment unless such lists and statements have been fully and punctually rendered. Provided always that if the Engineer considers that for any reason the sending of such lists or statements by the Contractor, in accordance with the foregoing provision, was impracticable he shall nevertheless be entitled to authorize payment for such work, either as daywork, on being satisfied as to the time employed and the labour, materials and Contractor's Equipment used on such work, or at such value therefor as shall, in his opinion, be fair and reasonable.

## PROCEDURE FOR CLAIMS

<b>Notice of Claims</b>	<b>53.1</b>	Notwithstanding any other provision of the Contract, if the Contractor intends to claim any additional payment pursuant to any Clause of these conditions or otherwise, he shall give notice of his intention to the Engineer, with a copy to the Employer, within 28 days after the event giving rise to the claim has first arisen.
<b>Contemporary Records</b>	<b>53.2</b>	Upon the happening of the event referred to in Sub-Clause-53.1, the Contractor shall keep such contemporary record as may reasonably be necessary to support any claim he may subsequently wish to make, Without necessary admitting the Employer's liability, the Engineer shall, on receipt of a notice under Sub-Clause-53.1, inspect such contemporary records and may instruct the Contractor to keep any further contemporary record as are reasonable and may be material to the claim of which notice has been given. The Contractor shall permit to the Engineer to inspect all records kept pursuant to this Sub-Clause and shall supply him with copies thereof as and when the Engineer so instructs.
<b>Substantiation of Claims</b>	<b>53.3</b>	Within 28 days, or such other reasonable time as may be agreed by the Engineer, of giving notice under Sub-Clause-53.1, the Contractor shall send to the Engineer an account giving detailed particulars of the amount claimed and the grounds upon which the claim is based. Where the event giving rise to the claim has a continuing effect, such account shall be considered to be an interim account and the Contractor shall, at such intervals as the Engineer may reasonable require, send further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. In cases where interim accounts are sent to the Engineer, the Contractor shall send a final account within 28 days of the end of the effects resulting from the event. The Contractor shall, if required by the Engineer so to do, copy to the Employer all accounts sent to the Engineer pursuant to this Sub-Clause.
<b>Failure to Comply</b>	<b>53.4</b>	If the Contractor fails to comply with any of the provisions of this Clause in respect of any claim which he seeks to make, his entitlement to payment in respect thereof shall not exceed such amount as the Engineer or any arbitrator or arbitrators appointed pursuant to Sub-Clause-67.3 assessing the claim considers to be verified by contemporary record (whether or not such records were brought to the Engineer's notice as required under Sub-Clause-53.2 and 53.3).
<b>Payment of Claims</b>	<b>53.5</b>	The contractor shall be entitled to have included in any interim payment certified by the Engineer pursuant to Clause-60 such amount in respect of any claim as the Engineer, after due consultation with the Employer and the Contractor, may consider due to the Contractor provided that the Contractor has supplied sufficient particulars to enable the Engineer to determine the amount due. If such particulars are insufficient to substantiate the whole of the claim, the Contractor shall be entitled to payment in respect of such part of the claim as such particulars may substantiate to the satisfaction of the Engineer. The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer.



## CONTRACTOR'S EQUIPMENT TEMPORARY WORKS AND MATERIALS

### Contractor's Equipment, Temporary Works and Materials; Exclusive Use for the Works

- 54.1** All Contractor's Equipment, Temporary Works and materials provided by the Contractor shall, when brought on to the Site, be deemed to be exclusively intended for the execution of the Works and the Contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the Site to another, without the consent of the Engineer, Provided that consent shall not be required for vehicles engaged in transporting any staff, labour, Contractor's Equipment, Temporary Works, Plant or materials to or from the Site.

### Employer not Liable for Damage

- 54.2** The Employer shall not at any time be liable, save as mentioned in Clauses-20 and 65, for the loss of or damage to any of the said Contractor's Equipment. Temporary Works or materials.

### Customs Clearance

- 54.3** The Employer will use his best endeavors in assisting the Contractor, where required, in obtaining clearance through the Customs of Contractor's Equipment, materials and other things required for the Works.

### Re-export of Contractor's Equipment

- 54.4** In respect of any Contractor's Equipment which the Contractor has imported for the purposes of the Works, the Employer will use his best endeavors to assist the Contractor, where required, in procuring any necessary Government consent to the re-export of such contractor's Equipment by the Contractor upon the removal thereof pursuant to the terms of the Contract.

### Conditions of Hire of Contractor's Equipment

- 54.5** With a view to securing, in the event of termination under Clause-63, the continued availability, for the purpose of executing the Works, of any hired Contractor's Equipment, the Contractor shall not bring on to the Site any hired Contractor's Equipment unless there is an agreement for the hire thereof (which agreement shall be deemed not to include an agreement for hire purchase) which contains a provision that the owner thereof will, on request in writing made by the Employer within 7 days after the date on which any termination has become effective, and on the Employer undertaking to pay all hire charges in respect thereof from such date, hire such Contractor's Equipment to the Employer on the same terms in all respects as the same was hired to the Contractor save that the Employer shall be entitled to permit the use thereof by any other contractor employed by him for the purpose of executing and completing the Works and remedying any defects therein, under the terms of the said Clause-63.

### Costs for the Purpose of Clause-63

- 54.6** In the event of the Employer entering into any agreement for the hire of Contractor's Equipment pursuant to Sub-Clause-54.5, all sums properly paid by the Employer under the provisions of any such agreement and all costs incurred by him (including stamp duties) in entering into such agreement shall be deemed for the purpose of Clause-63, to be part of the cost of

executing and completing the Works and the remedying of any defects therein.

**Incorporation of Clause  
in Subcontracts 54.7**

The Contractor shall, where entering into any subcontract for the execution of any part of the Works, incorporate in such subcontract (by reference or otherwise) the provisions of this Clause in relation to Contractor's Equipment, Temporary Works or materials brought on to the Site by the Subcontractor.

**Approval of Materials  
not Implied 54.8**

The operation of this Clause shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to therein nor shall it prevent the rejection of any such materials at any time by the Engineer.

### MEASUREMENT

**Quantities 55.1**

The Quantities set out in the Bill of Quantities are the estimated quantities for the Works, and they are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfillment of his obligations under the Contract.

**Works to be  
Measured 56.1**

The Engineer shall, except as otherwise stated, ascertain and determine by measurement the value of the Works in accordance with the Contract and the Contractor shall be paid that value in accordance with Clause-60. The Engineer shall, when he requires any part of the Works to be measured, give reasonable notice to the Contractor's authorized agent, who shall:

- (a) forth with attend or send a qualified representative to assist the Engineer in making such measurement, and
- (b) supply all particular not required by the Engineer.

Should the Contractor not attend, or neglect or omit to send representative then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of such part of the Works. For the purpose of measuring such permanent Works as are to be measured by records and drawings, the Engineer shall prepare records and drawings as the work proceeds and the Contractor, as and when called upon to do in writing, shall, within 14 days, attend to examine and agree such records and drawings with the Engineer and shall sign the same when so agreed. If the Contractor does not attend to examine and agree such records and drawings, they shall be taken to be correct. If, after examination of such records and drawings, the Contractor does not agree the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor, within 14 days of such examination, lodges with the Engineer notice of the respects in which such records and drawings are claimed by him to be incorrect. On receipt of such notice, the Engineer shall review the records and drawings and either confirm or vary them.

**Method of  
Measurement 57.1**

The Works shall be measured net, notwithstanding any general or local custom, except where otherwise provided for in the Contract.

**Breakdown of  
Lump Sum Items**

- 57.2** For the purpose of statements submitted in accordance with Sub-Clause-60.1 the Contractor shall submit to the Engineer, within 28 days after the receipt of the Letter of Acceptance, a breakdown for each of the lump sum items contained in the Tender. Such breakdowns shall be subject to the approval of the Engineer.

**PROVISIONAL SUMS****Definition of  
"Provisional Sums"**

- 58.1** "Provisional Sum" means a sum included in the Contract and so designated in the Bill of Quantities for the execution of any part of the Works or for the supply of goods, materials, Plant or services or for contingencies, which sum may be used, in whole or in part, or not at all, on the instructions of the Engineer. The Contractor shall be entitled to only such amounts in respect of the works, supply or contingencies to which such Provisional Sums relate as the Engineer shall determine in accordance with this Clause. The Engineer shall notify the Contractor of any determination made under this Sub-Clause, with a copy to the Employer.

**Use of  
Provisional Sums**

- 58.2** In respect of every Provisional Sum the Engineer shall have authority to issue instructions for the execution of work or for the supply of goods, materials, Plant or services by:
- (a) the Contractor, in which case the Contractor shall be entitled to an amount equal to the value thereof determined in accordance with Clause-52,
  - (b) a nominated Subcontractor, as hereinafter defined, in which case the sum to be paid to the Contractor therefor shall be determined and paid in accordance with Sub-Clause-59.4.

**Production of  
Vouchers**

- 58.3** The Contractor shall produce to the Engineer all quotation, invoices, vouchers and accounts or receipts in connection with expenditure in respect of Provisional Sums, except where work is valued in accordance with rates or prices set out in the Tender.

**NOMINATED SUBCONTRACTORS****Definition of  
"Nominated  
Subcontractors"**

- 59.1** All specialists, merchants, tradesmen and other executing any work or supplying any goods, materials, Plant or services for which Provisional Sums are included in the Contract, who may have been or be nominated or selected or approved by the Employer or the Engineer, and all persons to whom by virtue of the provisions of the Contract the Contractor is required to subcontract shall, in the execution of such work or the supply of such goods, materials, Plant or services be deemed to be subcontractors to the Contractor and are referred to in this Contract as "nominated Subcontractors".

**Nominated  
Subcontractors;  
Objection to  
Nomination**

**59.2** The Contractor shall not be required by the Employer or the Engineer, or be deemed to be under any obligation, to employ any nominated Subcontractor against whom the Contractor may raise reasonable objection, or who declines to enter into a subcontract with the Contractor containing provisions:

- (a) that in respect of the work, goods, materials, Plant or services the subject of the subcontract, the nominated Subcontractor will undertake towards the Contractor such obligations and liabilities as will enable the Contractor to discharge his own obligations and liabilities towards the Employer under the terms of the Contract and will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection therewith, or arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities, and
- (b) that the nominated Subcontractor will save harmless and indemnify the Contractor from and against any negligence by the nominated Subcontractor, his agents, workmen and servants and from and against any misuse by him or them of any Temporary Works provided by the Contractor for the purposes of the Contractor and from all claims as aforesaid.

**Design Requirements to  
be Expressly Stated**

**59.3** If in connection with any Provisional Sum the services to be provided include any matter of design or specification of any part of the Permanent Works or of any Plant to be incorporated therein, such requirement shall be expressly stated in the Contract and shall be included in any nominated Subcontract. The nominated Subcontract shall specify that the nominated Subcontractor providing such services will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection with any failure to perform such obligations or to fulfill such liabilities.

**Payments to Nominated  
Subcontractors**

**59.4** For all work executed or goods, materials, Plant or services supplied by any nominated Subcontractor, the Contractor shall be entitled to:

- (a) the actual price paid or due to be paid by the Contractor, on the instructions of the Engineer, and in accordance with the subcontract;
- (b) in respect of labour supplied by the Contractor, the sum, if any, entered in the Bill of Quantities or, if instructed by the Engineer pursuant to paragraph (a) of Sub-Clause-58.2, as maybe determined in accordance with Clause-52;
- (c) in respect of all other charges and profit, a sum being a percentage rate of the actual price paid or due to be paid calculated, where provision has been made in the Bill of Quantities for a rate to be set against the relevant Provisional Sum, at the rate inserted by the

Contractor against that item or, where no such provision has been made, at the rate inserted by the Contractor in the Appendix to Tender and repeated where provision for such is made in a special item provided in the Bill of Quantities for such purpose.

**Certification of Payments  
to Nominated  
Subcontractors**

**59.5**

Before issuing, under Clause-60, any certificate, which includes any payment in respect of work done or goods, materials, Plant or services supplied by any nominated Subcontractor, the Engineer shall be entitled to demand from the Contractor reasonable proof that all payments less retention, included in previous certificates in respect of the work or good, materials, Plant or services of such nominated Subcontractor have been paid or discharged by the Contractor. If the Contractor fail to supply such proof then, unless the Contractor

- (a) satisfies the Engineer in writing that he has reasonable cause for withholding or refusing to make such payments and
- (b) produces to the Engineer reasonable proof that he has so informed such nominated Subcontractor in writing,

the Employer shall be entitled to pay to such nominated Subcontractor direct, upon the certificate of the Engineer, all payments, less retention, provided for in the nominated Subcontractor, which the Contractor has failed to make to such nominated Subcontractor and to deduct by way of set-off the amount so paid by the Employer from any sums due to become due from the Employer to the Contractor.

Provided that, where the Engineer has certified and the Employer has paid direct as aforesaid, the Engineer shall, in issuing any further certificate in favour of the Contractor, deduct from the amount thereof the amount so paid; direct as aforesaid, but shall not withhold or delay the issue of the certificate itself when due to be issued under the terms of the contract.

**CERTIFICATES AND PAYMENT**

**Monthly Statements    60.1**

The Contractor shall submit to the Engineer after the end of each month six copies, each signed by the Contractor's representative approved by the Engineer in accordance with Sub-Clause-15.1, of a statement, in such form as the Engineer may from time to time prescribe, showing the amounts to which the Contractor considers himself to be entitled up to the end of the month in respect of

- (a) the value of the Permanent Works executed
- (b) any other items in the Bill of Quantities including those for Contractor's Equipment, Temporary Works, dayworks and the like
- (c) the percentage of the invoice value of listed materials, all as stated in the Appendix to Tender, and Plant delivered by the Contractor on the Site for incorporation in the Permanent Works but not incorporated in such Works

- (d) adjustments under Clause-70
- (e) any other sum to which the Contractor may be entitled under the Contract.

**Monthly Payment**      **60.2**      The Engineer shall, within 28 days of receiving such statement, certify to the Employer the amount of payment to the Contractor which he consider due and payable in respect thereof, subject:

- (a) firstly, to the retention of the amount calculated by applying the Percentage of retention stated in the Appendix to Tender, to the amount to which the Contractor is entitled under paragraphs (a), (b), (c) and (e) of Sub-Clause-60.1 until the amount so retained reaches the Limit of Retention Money stated in the appendix to Tender, and
- (b) secondly, to the deduction, other than pursuant to Clause-47, of any sums which may have become due and payable by the Contractor to the Employer

Provided that the Engineer shall not be bound to certify any payment under this Sub-Clause if the net amount thereof, after all retention and deductions, would be less than the Minimum Amount of Interim Certificates stated in the Appendix to Tender.

Notwithstanding the terms of this Clause or any other Clause of the Contract no amount will be certified by the Engineer for payment until the performance security, if required under the Contract, has been provided by the Contractor and approved by the Employer.

**Payment of Retention Money**      **60.3**      (a) Upon the issue of the Taking-Over Certificate with respect to the whole of the Works, one half of the Retention Money, or upon the issue of a Taking-Over Certificate with respect to a Section or part of the Permanent Works only such proportion thereof as the Engineer determines having regard to the relative value of such Section or part of the Permanent Works, shall be certified by the Engineer for payment to the Contractor.

(b) Upon the expiration of the Defects Liability Period for the Works the other half of the Retention Money shall be certified by the Engineer for payment to the Contractor. Provided that, in the event of different Defects Liability Periods having become applicable to different Sections or parts of the Permanent Works pursuant to Clause-48, the expression "expiration of the Defects Liability Period" shall, for the purposes of this Sub-Clause, be deemed to mean the expiration of the latest of such periods.

Provided also that if at such time, there shall remain to be executed by the Contractor any work ordered, pursuant to Clause-49 and 50, in respect of the Works, the Engineer shall be entitled to withhold certification until completion of such work of so much of the balance of the Retention Money as shall, in the opinion of the Engineer, represent the cost of the work remaining to be executed.

**Correction of  
Certificates**

- 60.4** The Engineer may by any interim certificate make any correction or modification in any previous certificate which shall have been issued by him and have authority, if any work is not being carried out to his satisfaction, to omit or reduce the value of such work in any interim certificate.

**Statement at  
Completion**

- 60.5** Not later than 84 days after the issue of the Taking-Over Certificate in respect of the whole of the Works, the Contractor shall submit to the Engineer a Statement on Completion with supporting documents showing in detail, in the form approved by the Engineer,
- (a) the final value of all work done in accordance with the Contract up to the date stated in such Taking-over Certificate
  - (b) any further sums which the Contractor considers to be due and
  - (c) an estimate of amounts which the Contractor considers will become due to him under the Contract.

Estimated amount shall be shown separately in such Statement at Completion. The Engineer shall certify payment in accordance with Sub-Clause-60.2

**Final Statement**

- 60.6** Not later than 56 days after the issue of the Defect Liability Certificate pursuant to Sub-Clause-62.1, the Contractor shall submit to the Engineer for consideration a draft final statement with supporting documents showing in detail, in the form approved by the Engineer,
- (a) the value of all work done in accordance with the Contract and
  - (b) any further sums which the Contractor considers to be due to him under the Contract.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed (for the purposes of these Conditions referred to as the "Final Statement").

**Discharge**

- 60.7** Upon submission of the Final Statement, the Contractor shall give to the Employer, with a copy to the Engineer, a written discharge confirming that the total of the Final Statement represents full and final settlement of all monies due to the Contractor arising out of or in respect of the Contract. Provided that such discharge shall become effective only after payment due under the Final Certificate issued pursuant to Sub-Clause-60.8 has been made and the performance security referred to in Sub-Clause-10.1, if any has been returned to the Contractor.

**Final certificate**

- 60.8** Within 28 days after receipt of the final Statement, and the written discharge, the Engineer shall issue to the Employer (with a copy to the Contractor) a Final Certificate stating

- (a) the amount which in the opinion of the Engineer, is finally due under the Contract, and
- (b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled under the Contract, other than Clause-47, the balance, if any due from the Employer to the Contractor or from the Contractor to the Employer as the case may be.

**Cessation of****Employer's Liability 60.9**

The Employer shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contract or execution of the Works, unless the Contractor shall have included a claim in respect thereof in his Final Statement and (except in respect of matters or things arising after the issue of the Taking-Over Certificate in respect of the whole of the Works) in the Statement at completion referred in Sub-Clause-60.5

**Time for Payment****60.10**

The amount due to the Contractor under any interim certificate issued by the Engineer pursuant to the Clause, or to any other term of the Contract, shall, subject to Clause-47, be paid by the Employer to the Contractor within 28 days after such interim certificate has been delivered to the Employer, or, in the case of the Final Certificate referred to in Sub-Clause-60.8, within 56 days, after such Final Certificate has been delivered to the Employer. In the event of the failure of the Employer to make payment within the times stated, the Employer shall pay to the Contractor interest at the rate stated in the Appendix to Tender upon all sums unpaid from due date by which the same should have been paid. The provisions of this Sub-Clause are without prejudice to the Contractor's entitlement under Clause-69.

**Approval only by Defect****Liability Certificate 61.1**

Only the Defects Liability Certificate, referred to in Clause-62, shall be deemed to constitute approval of the Works.

**Defects Liability  
Certificate****62.1**

The Contract shall not be considered as completed until a Defects Liability Certificate shall have been signed by the Engineer and delivered to the Employer with a copy to the Contractor, stating the date on which the Contractor shall have completed his obligations to execute and complete the Works and remedy any defects therein to the Engineer's satisfaction. The Defects Liability Certificate shall be given by the Engineer within 28 days after the expiration of the Defects Liability Period, or if, different defects liability periods shall become applicable to different Sections or part of the Permanent Works, the expiration of the latest such period, or as soon thereafter as any works instructed, pursuant to Clauses-49 and 50, have been completed to the satisfaction of the Engineer. Provided that the issue of the Defect Liability Certificate shall not be a condition precedent to payment to the Contractor of the second portion of the Retention Money in accordance with the conditions set out in Sub-Clause-60.3.

**Unfulfilled****Obligations****62.2**

Notwithstanding the issue of the Defect Liability Certificate the Contractor and the Employer shall remain liable for the fulfillment of any obligation incurred under the provisions of the Contract prior to the issue of the Defect Liability Certificate which remains unperformed at the time such Defect Liability Certificate is issued and, for the purposes of determining the nature



and extent of any such obligation, the Contract shall be deemed to remain in force between the parties to the Contract.

## R E M E D I E S

### **Default of Contractor 63.1**

If the Contractor is deemed by law unable to pay his debts as they fall due or enters into voluntary or involuntary bankruptcy, liquidation or dissolution (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or becomes insolvent, or makes an arrangement with, or assignment in favour of, his creditors, or agrees to carry out the Contract under a committee of inspection of his creditors, or if a receiver, administrator, trustee or liquidator is appointed over any substantial part of his assets, or if, under any law or regulation relating to reorganization, arrangement or readjustment of debts proceedings are commenced against the Contractor or resolutions passed in connection with dissolution or liquidation or if any steps are taken to enforce any security interest over a substantial part of the assets of the Contractor, or if any act is done or event occurs with respect to the Contractor or his assets which under any applicable law has a substantially similar effect to any of the foregoing acts or events, or if the Contractor has contravened Sub-Clause 3.1, or has an execution levied on his goods, or if the Engineer certifies to the Employer; with a copy to the Contractor, that, in his opinion, the Contractor:

- a) has repudiated the Contract, or
- b) without reasonable excuse has failed
  - i) to commence the Works in accordance with Sub-Clause 41.1, or
  - ii) to proceed with the Works, or any Section thereof, within 28 days after receiving notice pursuant to Sub-Clause 46.1, or
- c) has failed to comply with a notice issued pursuant to Sub-Clause 37.4 or an instruction issued pursuant to Sub-Clause 39.1 within 28 days after having received it, or
- d) despite previous warning from the Engineer, in writing, is otherwise persistently or flagrantly neglecting to comply with any of his obligations under the Contract, or
- e) has contravened Sub-Clause 4.1,

then the Employer may, after giving 14 days notice to the Contractor, enter upon the Site and the Works and terminate the employment of the Contractor without thereby releasing the Contractor from any of his obligations or liabilities under the Contract, or affecting the rights and authorities conferred on the Employer or the Engineer by the Contract, and may himself complete the Works or may employ any other contractor to complete the Works. The Employer or such other contractor may use for such completion so much of the Contractor's Equipment. Temporary Works and materials as he or they may think proper.

**Valuation at Date of Termination**

**63.2** The Engineer shall, as soon as may be practicable after any such entry and termination by the Employer, fix and determine ex-parte, or by or after reference to the parties or after such investigation or enquiries as he may think fit to make or institute, and shall certify:

- a) what amount (if any) had, at the time of such entry and termination, been reasonably earned by or would reasonably assured to the Contractor in respect of work then actually done by him under the Contract, and
- b) the value of any of the said unused or partially used materials, any Contractor's Equipment and any Temporary Works.

**Payment after Termination**

**63.3** If the Employer terminates the Contractor's employment under this Clause, he shall not be liable to pay to the Contractor any further amount (including damages) in respect of the Contract until the expiration of the Defects Liability Period and thereafter until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any) and all other expenses incurred by the Employer have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sum or sums, if any, as the Engineer may certify would have been payable to him upon due completion by him after deducting the said amount. If such amount shall exceed the sum which would have been payable to the Contractor shall, upon demand, pay to the Employer the amount of such excess and it shall be deemed a debt due by the Contractor to the Employer and shall be recoverable accordingly.

**Assignment of Benefit of Agreement**

**63.4** Unless prohibited by law, the Contractor shall, if so instructed by the Engineer within 14 days of such entry and termination referred to in Sub-Clause 63.1 assign to the Employer the benefit of any agreement for the supply of any goods or materials or services and/or for the execution of any work for the purposes of the Contract, which the Contractor may have entered into.

**Urgent Remedial Work**

**64.1** If, by reason of any accident, or failure, or other event occurring to in or in connection with the Works, or any part thereof, either during the execution of the Works, or during the Defects Liability Period, any remedial or other work is in the opinion of the Engineer, urgently necessary for the safety of the Works and the Contractor is unable or unwilling at once to do such work, the Employer shall be entitled to employ and pay other persons to carry out such work as the Engineer may consider necessary. If the work or repair so done by the Employer is work which, in the opinion of the Engineer, the Contractor was liable to do on his own cost under the Contract, then all costs consequent thereon or incidental thereto shall, after due consultation with the Employer and the Contractor be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly with a copy to the Employer. Provided that the Engineer shall as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof.

## SPECIAL RISKS

### No Liability for Special Risks

**65.1** The Contractor shall be under no liability whatsoever in consequence of any of the special risks referred to in Sub-Clause 65.2, whether by way of indemnity or otherwise for or in respect of:

- a) destruction of or damage to the Works, save to work condemned under the provisions of Clause-39 prior to the occurrence of any of the said special risks or
- b) destruction of or damage to property, whether of the Employer or third parties, or
- c) injury or loss of life.

### Special Risks

**65.2** The special risks are:

- a) the risks defined under paragraphs (a), (c) (d) and (e) of Sub-Clause 20.4 and
- b) the risks defined under paragraphs (b) of Sub-Clause 20.4 insofar as these relate to the country in which the Works are to be executed.

### Damage to Works by Special Risks

**65.3** If the Works or any materials or Plant on or near or in transit to the Site, or any of the Contractor's Equipment, sustain destruction or damage by reason of any of the said special risks, the Contractor shall be entitled to payment in accordance with the Contract for any Permanent Works duly executed and for any materials or Plant so destroyed or damage and, so far as may be required by the Engineer or as may be necessary for the completion of the Works, to payment for:

- a) rectifying any such destruction or damage to the Works, and
- b) replacing or rectifying such materials or Contractor's Equipment

and the Engineer shall determine an addition to the Contract Price in accordance with Clause 52 (which shall in the case of the cost of replacement of Contractor's Equipment include the fair market value thereof as determined by the Engineers and shall notify the Contractor accordingly, with a copy to the Employer.

### Projectile, Missile

**65.4** Destruction, damage, injury or loss of life caused by the explosion or impact whenever and wherever occurring, of any mine bomb, shell, grenade, or other projectile, missile, ammunition, or explosive of war, shall be deemed to be a consequence of the said special risks.

### Increased Costs arising from Special Risks

**65.5** Save to the extent that the Contractor is entitled to payment under any other provision of the Contract, the Employer shall repay to the Contractor any costs of the execution of the Works (other than such as may be attributable to the cost of reconstructing work condemned under the provisions of Clause 39 prior to the occurrence of any special risk) which are howsoever attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject, however, to the provisions in

this Clause hereinafter contained in regard to outbreak of war, but the Contractor shall, as soon as any such cost comes to his knowledge forthwith notify the Engineer thereof. The Engineer shall, after due consultation with the Employer and the Contractor, determine the amount of the Contractor's costs in respect thereof which shall be added to the Contract Price and shall notify the Contractor accordingly, with a copy to the Employer.

<b>Outbreak of War</b>	<b>65.6</b>	If, during the currency of the Contract, there is an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise materially affects the execution of the Works, the Contractor shall, unless and until the Contract is terminated under the provisions of this Clause continue to use his best endeavors to complete the execution of the Works. Provided that the Employer shall be entitled, at any time after such outbreak of war, to terminate the Contract by giving notice to the Contractor and upon such notice being given, the Contract shall, except as to the rights of the parties under this Clause and to the operation of Clause 67, terminate but without prejudice to the rights of either party in respect of any antecedent breach thereof.
<b>Removal of Contractor's Equipment on Termination</b>	<b>65.7</b>	If the Contract is terminated under the provisions of Sub-Clause 65.6 the Contractor shall with all reasonable dispatch remove from the Site all Contractor's Equipment and shall give similar facilities to his Sub-Contractors to do so.
<b>Payment if Contract Terminated</b>	<b>65.8</b>	<p>If the Contract is terminated as aforesaid, the Contractor shall be paid by the Employer insofar as such amounts or items, have not already been covered by payment on account made to the Contractor for all work executed prior to the date of termination at the rates and prices provided in the Contract and in addition:</p> <ul style="list-style-type: none"> <li>a) the amounts payable in respect of any preliminary items referred to in the Bill of Quantities so far as the work or service comprised therein has been carried out or performed and a proper proportion of any such items which have been partially carried out or performed.</li> <li>b) The cost of materials, Plant or goods reasonably ordered for the Works which have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery, such materials, Plant or goods becoming the property of the Employer upon such payments being made by him.</li> <li>c) A sum being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Works insofar as such expenditure has not been covered by any other payments referred to in this Sub-Clause.</li> <li>d) Any additional sum payable under the provisions of Sub-Clause 65.3 &amp; 65.5.</li> <li>e) Such proportion of the cost as may be reasonable, taking into account payments made or to be made for work executed, of removal of Contractor's Equipment under Sub-Clause 65.7 and, if</li> </ul>

required by the Contractor, return thereof the Contractor's main plant yard in his country of registration or to other destination, at no greater cost.

- f) The reasonable cost of repatriation of all the Contractor's staff and workmen employed on or in connection with the Works at the time of such termination.

Provided that against any payment due from the Employer under this Sub-Clause, the Employer shall be entitled to be credited with any outstanding balances due from the Contractor for advances in respect of Contractor's Equipment, materials and Plant and any other sums which, at the date of termination, were recoverable by the Employer from the Contractor under the terms of the Contract. Any sums payable under this Sub-Clause shall, after due consultation with the Employer and the Contractor, be determined by the Engineer who shall notify the Contractor accordingly, with a copy to the Employer.

### **RELEASE FROM PERFORMANCE**

#### **Payment in Event of Release from Performance**

- 66.1** If any circumstance outside the control of both parties arises after the issue of the Letter of Acceptance which renders it impossible or unlawful for either party to fulfill his contractual obligations, or under the law governing the Contract the parties are released from further performance, then the sum payable by the Employer to the Contractor in respect of the work executed shall be the same as that which would have been payable under Clause-65 if the Contract had been terminated under the provisions of Clause-65.

### **SETTLEMENT OF DISPUTES**

#### **Engineer's Decision**

- 67.1** If a dispute of any kind whatever arises between the Employer and the Contractor in connection with, or arising out of, the Contract or the execution of the Works, whether during the execution of the Works or after their completion and whether before or after repudiation or other termination of the Contract including any dispute as to any opinion, instruction, determination, certificate or valuation of the Engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause, No later than the eighty-fourth day after the day on which he received such reference the Engineer shall give notice of his decision to the employer and the Contractor. Such decision shall state that it is made pursuant to this Clause.

Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Works with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided in an amicable settlement or an arbitral award.

If either the Employer or the Contractor be dissatisfied with any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before the eighty-fourth day after the day on which he received the reference then either the Employer or the Contractor may, on or before the seventieth

day after the day on which he received notice of such decision, or on or before the seventieth day after the day on which the said period of 84 days expired, as the case may be, give notice to the other party, with a copy for information to the Engineer, of his intention to commence arbitration, as hereinafter provided as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to Sub-Clause-67.4, no arbitration in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notification of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the seventieth day after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor.

#### **Amicable Settlement 67.2**

Where notice of intention to commence arbitration as to dispute has been given in accordance with Sub-Clause-67.1, arbitration of such dispute shall not be commenced unless an attempt has first been made by the parties to settle such dispute amicably. Provided that, unless the parties otherwise agree, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of intention to commence arbitration of such dispute was given, whether or not any attempt at amicable settlement thereof has been made.

#### **Arbitration**

##### **67.3**

Any dispute in respect of which:

- (a) the decisions, if any, of the Engineer has not become final and binding pursuant to Sub-Clause-67.1, and
- (b) amicable settlement has not been reached within the period stated in Sub-Clause-67.2

shall be finally settled, unless otherwise specified in the Contract, under the Rules of Conciliation and Arbitration of the international Chamber of Commerce by one or more arbitrators appointed under such Rules. The said arbitrator/s shall have full power to open up, review and revise any decision, opinion, instruction, determination, certificate or valuation of the Engineer related to the dispute.

Neither party shall be limited in the proceedings before such arbitrator/s to the evidence or arguments put before the Engineer for the purpose of obtaining his said decision pursuant to Sub-Clause-67.1. no such decision shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator/s any matter whatsoever relevant to the dispute.

Arbitration may be commenced prior to or after completion of the Works, provided that the obligations of the Employer, the Engineer and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the Works.

**Failure to Comply with  
Engineer's Decision 67.4**

Where neither the Employer nor the Contractor has given notice of intention to commence arbitration of a dispute within the period stated in Sub-Clause-67.1 and the related decision has become final and binding, either party may, if the other party fails to comply with such decision, and without prejudice to any other right it may have, refer the failure to arbitration in accordance with Sub-Clause-67.3. The provisions of Sub-Clauses-67.1 and 67.2 shall not apply to any such reference.

## **NOTICES**

**Notice to Contractor 68.1**

All certificates, notices or instructions to be given to the Contractor by the Employer to the Engineer under the terms of the Contract shall be sent by post, cable, telex or facsimile transmission to or left at the Contractor's principal place of business or such other address as the Contractor shall nominate for that purpose.

**Notice to Employer  
and Engineer 68.2**

Any notice to be given to the Employer or to the Engineer under the terms of the Contract shall be sent by post, cable, telex or facsimile transmission to or left at the respective address nominated for that purpose in Part-II of these Conditions.

**Change of Address 68.3**

Either party may change a nominated address to another address in the country where the Works are being executed by prior notice to the other party, with a copy to the Engineer, and the Engineer may do so by prior notice to both parties.

## **DEFAULT OF EMPLOYER**

**Default of Employer 69.1**

In the event of the Employer:

- (a) failing to pay to the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause-60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, or
- (b) interfering with or obstructing or refusing any required approval to the issue of any such certificate, or
- (c) becoming bankrupt or, being a company, going into liquidation, other than for the purpose of a scheme of reconstruction or amalgamation, or
- (d) giving notice to the Contractor that for unforeseen reasons, due to economic dislocation it is impossible for him to continue to meet his contractual obligations

the contractor shall be entitled to terminate his employment under the Contract by giving notice to the Employer, with a copy to the Engineer. Such termination shall take effect 14 days after the giving of the notice.

**Removal of Contractor's Equipment 69.2**

Upon the expiry of the 14 days' notice referred to in Sub-Clause-69.1, the Contractor shall, notwithstanding the provisions of Sub-Clause-54.1, with all reasonable dispatch, remove from the Site all Contractor's Equipment brought by him thereon.

**Payment on Termination 69.3**

In the event of such termination the Employer shall be under the same obligations to the Contractor in regard to payment as if the Contract had been terminated under the provisions of Clause-65, but, in addition to the payment specified in Sub-Clause-65.8, the Employer shall pay to the Contractor the amount of any loss or damage to the Contractor arising out of or in connection with or by consequence of such termination.

**Contractor's Entitlement to Suspend Work 69.4**

Without prejudice to the Contractor's entitlement to interest under Sub-Clause-60.10 and to terminate under Sub-Clause-69.1, the Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause-60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend work or reduce the rate of work

If the Contractor suspends work or reduces the rate of work in accordance with the provisions of this Sub-Clause and thereby suffers delay or incurs cost the Engineer shall, after due consultation with the Employer and the Contractor determine.

- (a) any extension of time to which the Contractor is entitled under Clause-44, and
- (b) the amount of such costs, which shall be added to the Contract Price.

and shall notify the Contractor accordingly, with a copy to the Employer.

**Resumptions of Work 69.5**

Where the Contract suspends work or reduces the rate of work, having giving notice in accordance with Sub-Clause-69.4, and the Employer subsequently pays the amount due, including interest pursuant to Sub-Clause-60.10, the Contractor's entitlement under Sub-Clause 69.1 shall, if notice of termination has not been given, lapse and the Contractor shall resume normal working as soon as is reasonably possible.

**CHANGES IN COSTS AND LEGISLATION****Increase or Decrease of Cost 70.1**

There shall be added to or deducted from the Contract Price such sums in respect of rise or fall in the cost of labour and/or materials or any other matters affecting the cost of the execution of the Works as may be determined in accordance with Part-II of these Conditions.



**Subsequent  
Legislation**

- 70.2** If, after the date 28 days prior to the latest date for submission of tenders for the Contract there occur in the country in which the Works are being or are to be executed changes to any National or State Statute, Ordinance, Decree or other Law or any regulation or bye-law of any local or other duly constituted authority or the introduction of any such State Statute, Ordinance, Decree, Law regulation or bye-law which causes additional or reduced cost to the Contractor other than under Sub-Clause-70.1 in the execution of the Contract, such additional or reduced cost shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be added to or deducted from the Contract Price and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

**CURRENCY AND RATES OF EXCHANGE****Currency  
Restrictions**

- 71.1** If, after the date 28 days prior to the latest date for submission of tender for the Contract, the Government or authorized agency of the Government of the country in which the Works are being or are to be executed imposes currency restrictions and/or transfer of currency restrictions in relation to the currency or currencies in which the Contract Price is to be paid, the Employer shall reimburse or any loss or damage to the Contractor arising there from, without prejudice to the right of the Contractor to exercise any other right or remedies to which he is entitled in such event.

**Rates of Exchange**

- 72.1** Where the Contract provides for payment in whole or in part to be made to the Contractor in foreign currency or currencies, such payment shall not be subject to variations in the rate or rates of exchange between such specified foreign currency or currencies and the currency of the country in which the Works are to be executed.

**Currency  
Proportions**

- 72.2** Where the Employer has required the Tender to be expressed in a single currency but with payment to be made in more than one currency and the Contractor has stated the proportions or amounts of other currency or currencies in which he requires payment to be made, the rate or rates of exchange applicable for calculating the payment of such proportions or amount shall, unless otherwise stated in Part-II of these Conditions be those prevailing, as determined by the Central Bank of the country in which the Works are to be executed, on the date 28 days prior to the latest date for the submission of tenders for the Contract, as has been notified to the Contractor by the Employer prior to the submission of tenders or as provided for in the Tender.

**Currencies of Payment  
for Provisional Sums**

- 72.3** Where the Contract provides for payment in more than one currency, the proportions or amounts to be paid in foreign currencies in respect of Provisional Sums shall be determined in accordance with the principles set forth in Sub-Clause-72.1 and 72.2 as and when these sums are utilised in whole or in part in accordance with the provisions of Clause-58 and 59.

## **REFERENCE TO PART-II**

As stated in the Foreword at the beginning of this document, the FIDIC Conditions comprise both Part-I and Part-II, Certain Clauses, namely Sub-Clause-1.1 paragraph (a)(i) and (iv), 5.1 (part), 14.1, 14.3, 68.2 and 70.1 must include addition wording in Part-II for the Conditions to be complete. Other Clause may require additional working to supplement Part-I or to cover particular circumstances or the type of work (dredging is an example).

Part-II Conditions of Particular Application with guidelines for the preparation of Part-II are printed in a separately bound document.

**PART 11 A - CONDITIONS OF PARTICULAR APPLICATION**  
**(Mandatory Provisions not to be Amended / Substituted)**

**1.1 Definitions**

- (a) (i) The Employer is Project Director, Near O.P.D. Block, Civil Hospital, Karachi
- (a) (iv) The Engineer Naqvi & Siddiquie Associates (Pakistan), B-1 & B-2, EOBI House (Ex-Awami Markaz), Main Shahrah-e-Faisal, Karachi-75350

Add the following paragraph:

- (a)(vi) “Bidder or Tenderer” means any person or persons, company, corporation, firm or joint venture submitting a Tender.
- (b)(v) Add the following at the end of the paragraph:  
 The word “Tender” is synonymous with “Bid” and the word “Tender Documents” with “Bidding Documents”.

Add the following paragraph:

- (b)(ix) “Programme” means the programme to be submitted by the Contractor in accordance with Sub-Clause 14.1 and any approved revisions thereto.
- (e)(i) Delete the text and substitute:  
 “Contract Price” means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works subject to such additions thereto or deductions there from as may be made and remedying of any defects therein in accordance with the provisions of the Contract.

**2.1 Engineer's Duties and Authority**

- (b) Delete the text and substitute:  
 The Engineer shall obtain the specific approval of the Employer before carrying out his duties in accordance with the clauses specified in Part-IIB.

If in the opinion of the Engineer an emergency occurs affecting the safety of life or of the Works or of adjoining property, the Engineer may, without recourse to the provisions as set out in the above paragraph, and without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause-52 and shall notify the Contractor accordingly, with a copy to the Employer.

**2.2 Engineer's Representative**

Add the following paragraph:

The Employer shall ensure that the Engineer's Representative is a professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)

Add the following Sub-Clause:

**2.7 Engineer not Liable**

Approval, reviews and inspection by the Engineer of any part of the Works does not relieve the Contractor from his sole responsibility and liability for the supply of materials, plant and equipment for construction of the Works and their parts in accordance with the Contract and neither the Engineer's authority to act nor any decision made by him in good faith as provided for under the Contract whether to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any of their representatives or employees or any other person performing any portion of the Works.

**5.1 Language(s) and Law**

- (a) The Contract Documents, shall be drawn up in the English language.
- (b) The Contract shall be subject to the Laws of Islamic Republic of Pakistan.

**5.2 Priority of Contract Documents**

Delete the documents listed at (1) to (6) of the Sub-Clause and substitute:

- (1) The Contract Agreement (if completed);
- (2) The letter of Acceptance;
- (3) The Tender;
- (4) The Conditions of Particular Application – Part II-B;
- (5) The Conditions of Particular Application – Part II-A;
- (6) The General Conditions – Part-I;
- (7) The Drawings;
- (8) The Specifications;
- (9) The priced Bill of Quantities;
- (10) Addendum if any;
- (11) \_\_\_\_\_;
- (12) \_\_\_\_\_;

In case of discrepancies between drawings, those of larger scale shall govern unless they are superseded by a drawing of later date regardless of scale. All Drawings and Specifications shall be interpreted in conformity with the Contract and these Conditions. Addendum, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract.

Add the following Sub-Clauses:

#### **6.6 Shop Drawings**

The Contractor shall submit to the Engineer for review 3 copies of all shop and erection drawings applicable to this Contract as per provision of relevant Sub-Clause of the Contract.

Review and approval by the Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and that the Engineer's review or approval shall not relieve the Contractor of any of his responsibilities under the Contract.

#### **6.7 As-Built Drawings**

At the completion of the Works under the Contract, the Contractor shall furnish to the Engineer 6 copies and one reproducible of all drawings amended to comply with the Works as built. The price of such Drawings shall be deemed to be included in the Contract Price.

#### **10.1 Performance Security**

Delete the text and substitute:

The Contractor shall provide Performance Security to the Employer in the prescribed form. The said Security shall be furnished or caused to be furnished by the Contractor within 28 days after the receipt of the Letter of Acceptance. The Performance Security shall be of an amount not less than 10% of the Contract Price stated in the Letter of Acceptance. Such Security shall be in the form of either (a) bank guarantee from any Scheduled Bank of Pakistan or (b) bank guarantee from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank of Pakistan or (c) Bond from an insurance company acceptable to the Employer.

The cost of complying with requirements of this Sub-Clause shall be borne by the Contractor.

Add the following Sub-Clause:

#### **10.4 Performance Security Binding on Variations and Changes**

The Performance Security shall be binding irrespective of changes in the quantities or variations in the Works or extensions in Time for Completion of the Works which are granted or agreed upon under the provisions of the Contract.

#### **14.1 Programme to be Submitted**

The programme shall be submitted within 42 days from the date of receipt of Letter of Acceptance, in such form as specified in Part II-B

#### **14.3 Cash Flow Estimate to be Submitted**

The detailed Cash Flow Estimate shall be submitted within 21 days from the date of receipt of Letter of Acceptance

Add the following Sub-Clause:

#### **14.5 Detailed Programme and Monthly Progress Report**

- a) For purposes of Sub-Clause 14.1, the Contractor shall submit to the Engineer detailed programme for the following:
- (1) Execution of Works;
  - (2) Labour Employment;
  - (3) Local Material Procurement;
  - (4) Material Imports, if any; and
  - (5) Other details as required by the Engineer.
- (b) During the period of the Contract, the Contractor shall submit to the Engineer not later than the 8<sup>th</sup> day of the following month, 10 copies each of Monthly Progress Reports covering:
- (1) A Construction Schedule indicating the monthly progress in percentage;
  - (2) Description of all work carried out since the last report;
  - (3) Description of the work planned for the next 56 days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing;
  - (4) Monthly summary of daily job record;
  - (5) Photographs to illustrate progress ;and
  - (6) Information about problems and difficulties encountered, if any, and proposals to overcome the same.
- (c) During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be made available to the Engineer as and when requested. The daily record shall include particulars of weather conditions, number of men working, deliveries of materials, quantity, location and assignment of Contractor's equipment.
- Add the following Sub-Clauses:

#### **15.2 Language Ability of Contractor's Representative**

The Contractor's authorised representative shall be fluent in the English language.

#### **15.3 Contractor's Representative**

The Contractor's authorised representative and his other professional engineers working at site shall register themselves with the Pakistan Engineering Council.

The Contractor's authorised representative at Site shall be authorised to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract.

Add the following Sub-Clauses:

#### **16.3 Language Ability of Superintending Staff of Contractor**

A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the English language.

**16.4 Employment of Local Personnel**

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour from sources within Pakistan.

Add the following Sub-Clauses:

**19.3 Safety Precautions**

In order to provide for the safety, health and welfare of persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the Safety Requirements of the Government of Pakistan with such modifications thereto as the Engineer may authorise or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose.

The Contractor shall make, maintain and submit reports to the Engineer concerning safety, health and welfare of persons and damage to property, as the Engineer may from time to time prescribe.

**19.4 Lighting Work at Night**

In the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night-work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer's Representative.

**20.4 Employer's Risks**

The Employer's risks are:

Delete the text and substitute:

(a) insofar as they directly affect the execution of the Works in Pakistan:

- (i) war and hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, revolution, insurrection, or military or usurped power, or civil war,
- (iii) ionizing radiations, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof,
- (iv) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
- (v) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors and arising from the conduct of the Works;

- (b) loss or damage due to the use or occupation by the Employer of any Section or part of the Permanent Works, except as may be provided for in the Contract.
- (c) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible; and
- (d) any operation of the forces of nature (insofar as it occurs on the Site) which an experienced contractor:-
  - (i) could not have reasonably foreseen, or
  - (ii) could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measures:-
    - (a) prevent loss or damage to physical property from occurring by taking appropriate measures, or
    - (b) insure against.

#### **21.4 Exclusions**

Delete the text and substitute:

There shall be no obligation for the insurances in Sub-Clause 21.1 to include loss or damage caused by the risks listed under Sub-Clause 20.4 paras (a) (i) to (iv).

Add the following Sub-Clause:

#### **25.5 Insurance with National Insurance Corporation of Pakistan**

The Contractor shall be obliged to place all insurances relating to the Contract (including, but not limited to, the insurances referred to in Clauses 21, 23 and 24) with National Insurance Corporation of Pakistan.

Add the following Sub-Clause:

#### **31.3 Co-operation with other Contractors**

During the execution of the Works, the Contractor shall co-operate fully with other contractors working for the Employer at and in the vicinity of the Site and also shall provide adequate precautionary facilities not to make himself a nuisance to local residents and other contractors.

Add the following Sub-Clauses:

#### **34.2 Rates of Wages and Conditions of Labour**

The Contractor shall pay rates of wages and observe conditions of labour not less favourable than those established for the trade or industry where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable than the general level of wages and conditions observed by other employers whose general circumstances in the trade or in industry in which the Contractor is engaged are similar.



**34.3 Employment of Persons in the Service of Others**

The Contractor shall not recruit his staff and labour from amongst the persons in the services of the Employer or the Engineer; except with the prior written consent of the Employer or the Engineer, as the case may be.

**34.4 Housing for Labour**

Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such housing accommodation and amenities as he may consider necessary for all his supervisory staff and labour, employed for the purposes of or in connection with the Contract including all fencing, electricity supply, sanitation, cookhouses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities. On completion of the Contract, unless otherwise agreed with the Employer, the temporary camps or housing provided by the Contractor shall be removed and the Site reinstated to its original condition, all to the approval of the Engineer.

**34.5 Health and Safety**

Due precautions shall be taken by the Contractor, at his own cost, to ensure the safety of his staff and labour at all times throughout the period of the Contract. The Contractor shall further ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.

**34.6 Epidemics**

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for purpose of dealing with and overcoming the same.

**34.7 Supply of Water**

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer or his representative, adequate supply of drinking and other water for the use of his staff and labour.

**34.8 Alcoholic Liquor or Drugs**

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his Subcontractors, agents, staff or labour.

**34.9 Arms and Ammunition**

The Contractor shall not give, or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

**34.10 Festivals and Religious Customs**

The Contractor shall in all dealings with his staff and labour have due regard to all recognised festivals, days of rest and religious and other customs.

**34.11 Disorderly Conduct**

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst staff and labour and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.

**34.12 Compliance by Subcontractors**

The Contractor shall be responsible for compliance by his Subcontractors of the provisions of this Clause.

Add the following Sub-Clauses:-

**35.2 Records of Safety and Health**

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.

**35.3 Reporting of Accidents**

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.

Add the following Sub-Clause:

**36.6 Use of Pakistani Materials and Services**

The Contractor shall, so far as may be consistent with the Contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services, available in Pakistan provided such materials, supplies, plant, equipment and services shall be of required standard.

**41.1 Commencement of Works**

Delete the text and substitute:

The Contractor shall commence the Works on Site within the period named in Appendix to Tender from the date or receipt by him from the Engineer of a written Notice to Commence. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

**47.1 Liquidated Damages for Delay**

In the fifth line of the Sub-Clause, delete the words “ and not as a penalty”

Add the following paragraphs at the end of the Sub-Clause:-

The liquidated damages for each day of delay in completion of the whole of the Works, or if applicable any Section, shall be as given in Appendix to Tender, subject to a maximum of 10% of the Contract Price stated in the Letter of Acceptance.

Add the following Sub-Clause :-

**47.3 Bonus for Early Completion of Works**

The Contractor shall in case of earlier completion for either whole or part(s) of the Works pursuant to Clause 48.1 and 48.2(a) respectively of the General Conditions of Contract, be paid bonus up-to a limit and at a rate equivalent to 50% of the relevant limit and rate of liquidated damages prescribed under Clause 47.1 above.

**48.2 Taking Over of Sections or Parts**

For the purposes of para (a) of this Sub-Clause, separate Times for Completion shall be as indicated in Part IIB.

**51.2 Instructions for Variations**

At the end of the first sentence, after the word “Engineer”, add the words “in writing”.

**52.1 Valuation of Variations**

In the tenth line, after the words “ Engineer shall” add the following:-

Within a period not exceeding one-eighth of the completion time subject to a minimum of 56 days from the date of disagreement whichever is later.

**53.4 Failure to Comply**

Delete this Sub-Clause in its entirety

**54.5 Conditions of Hire of Contractor’s Equipment**

Add the following paragraph

The Contractor shall, upon request by the Engineer at any time in relation to any item of hired Contractor’s Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.

**59.4 Payments to Nominated Sub-Contractors**

For the purposes of this Sub-Clause, provisions made by the Employer in Part II-B shall apply.

**60.1 Monthly Statements**

In the first line after the word “shall”, add the following:

“on the basis of the joint measurement of work done under Clause 56.1,”

In Para (c) delete the words “the Appendix to Tender” and substitute “ Sub-Clause 60.11 (a)(6) hereof”.

**60.2 Monthly Payments**

In the first line, substitute “28” by “14”.

**60.10 Time for Payment**

Delete the text and substitute:

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other terms of the Contract, shall , subject to Clause 47, be paid by the Employer to the Contractor within 14 days in the case of local currency and within 42 days in the case of foreign currency, after such Interim Payment Certificate has been delivered to the Employer, or, in the case of the Final Certificate referred to in Sub Clause 60.8, within 28 days in the case of local and within 56 days in case of foreign currency, after such Final Payment Certificate has been delivered to the Employer. In the event of the failure of the Employer to make payment within the times stated, the Employer shall pay to the Contractor compensation at the rate of 8% per annum, upon all sums unpaid from the date by which the same should have been paid. The provisions of this Sub-Clause are without prejudice to the Contractor’s entitlement under Clause 69.

Add the following Sub-Clauses:

**60.11 Secured Advance on Materials**

- a) The Contractor shall be entitled to receive from the Employer Secured Advance against an indemnity bond acceptable to the Employer of such sum as the Engineer may consider proper in respect of non-perishable materials brought at the Site but not yet incorporated in the Permanent Works provided that:
  - (1) the materials are in accordance with the Specifications for the Permanent Works;
  - (2) Such materials have been delivered to the Site and are properly stored and protected against loss or damage or deterioration to the satisfaction of the Engineer but at the risk and cost of the Contractor;
  - (3) The Contractor’s records of the requirements, orders, receipts and use of materials are kept in a form approved by the Engineer , and such records shall be available for inspection by the Engineer;
  - (4) The Contractor shall submit with his monthly statement the estimated value of the materials on Site together with such documents as may be required by the Engineer for the purpose of valuation of materials and providing evidence of ownership and payment therefore;
  - (5) Ownership of such materials shall be deemed to vest in the Employer and these materials shall not be removed from the Site or otherwise disposed of without written permission of the Employer; and

- (6) The sum payable for such materials on Site shall not exceed 75 % of the (i) landed cost of imported materials, or (ii) ex-factory / ex-warehouse price of locally manufactured or produced materials , or (iii) market price of other materials.
- (b) The recovery of Secured Advance paid to the Contractor under the above provisions shall be effected from the monthly payments on actual consumption basis.

#### **60.12 Financial Assistance to Contractor**

Financial assistance shall be made available to the Contractor by the Employer by adopting any one of the following three Alternatives, as stated in Part-II B.

##### **Alternative One: Mobilization Advance**

- a) An interest-free Mobilization Advance up to 10 (Ten) % of the Contract Price stated in the Letter of Acceptance shall be paid by the Employer to the Contractor in two equal parts upon submission by the Contractor of a Mobilization Advance Guarantee for the full amount of the Advance in the specified form from a Scheduled Bank of Pakistan or an insurance company acceptable to the Employer:
  - (1) First part within 14 days after signing of the Agreement or date of receipt of Engineer's Notice to Commence, whichever is earlier; and
  - (2) Second part within 42 days from the date of payment of the first part, subject to the satisfaction of the Engineer as to the state of mobilization of the Contractor.
- b) This Advance shall be recovered in instalments; first instalment at the expiry of third month after the date of payment of first part of Advance and the last instalment two months before the date of completion of the Works as per Clause 43 hereof.

The schedule of recovery of the Mobilization Advance shall be as given in Part-II B.

**Alternative Two: Mobilization/ Demobilization Cost** Mobilization Cost shall be paid to the Contractor as a part of the priced Bill of Quantities. This cost shall not exceed 10 % of the Tender Price and shall be paid to the Contractor as follows:

- (i) 80 % of the Mobilization Cost shall be paid for mobilization at Site. This payment shall be in three stages as follows:
  - Stage I: 20 % of mobilization cost upon obtaining and furnishing of Performance Security and insurance policies and construction of camp and housing facilities as required under the Contract;

Stage II: 30 % of mobilization cost upon providing & installing preliminary requirements of Contractor's equipment, materials and temporary structures for the commencement of Works to the satisfaction of the Engineer and achieving 3 % value of the Works (excluding payment under Stage-I);

Stage III: 30 % of mobilization cost upon providing balance Contractor's Equipment to complete full requirement for the entire work and after achievement of progress to the extent of 6 % value of the Works (excluding payments under Stages I and II); and

- (ii) 20 % of Mobilization Cost shall be paid for operation and maintenance of the constructed facilities and for demobilization as per schedule of payment to be submitted by the Contractor in accordance with Clause 57.2 and approved by the Engineer.

#### Alternative Three: Materials Supplied by Employer

The Employer shall supply to the Contractor materials, like cement, steel, bitumen or any other material whichever deemed necessary to complete the project; and the cost thereof shall be recovered from the Contractor through monthly statements on the basis of actual consumption.

The list of materials, quantities and rates to be charged to the Contractor shall be as given in Part II-B

### **63.1 Black Listing of Contractors**

Add the following para at the end of the Sub-Clause:

Provided further that in addition to the action taken by the Employer against the Contractor under this Clause, the Employer may also refer the case of default of the Contractor to Pakistan Engineering Council for punitive action under the Construction and Operation of Engineering Works Bye-Laws 1987, as amended from time to time.

### **65.2 Special Risks**

Delete the text and substitute:

The Special Risks are the risks defined under Sub-Clause 20.4 paras a (i) to (v).

### **67.3 Arbitration**

In the sixth to eight lines, delete the words "shall be finally settled ..... appointed under such Rules" and substitute the following:

shall be finally settled under the provisions of the Arbitration Act, 1940 as amended or any statutory modification or re-enactment thereof for the time being in force.

Add the following paragraph:  
The place of arbitration is stated in Part-II B.

#### **68.1 Notice to Contractor**

Add the following paragraph:

For the purposes of this Sub-Clause, the Contractor shall, immediately after receipt of Letter of Acceptance, intimate in writing to the Employer and the Engineer by registered post, the address of his principal place of business or any change in such address during the period of the Contract.

#### **68.2 Notice to Employer and Engineer**

For the purposes of this Sub-Clause, the respective address are:

- a) The Employer: Project Director, Near O.P.D. Block, Civil Hospital, Karachi
- b) The Engineer: Naqvi & Siddiquie Associates (Pakistan), B-1 & B-2, EOBI House (Ex-Awami Markaz), Main Shahrah-e-Faisal, Karachi-75300

#### **70.1 Increase or Decrease of Cost**

Add the following paragraphs”

- (a) The Contractor is deemed to have quoted rates and prices given in the Contract on the basis of labour wages/ out-goings and prices of certain specified materials and equipment prevailing on the date 28 days prior to the date of opening of the Tender. Applicable Basic Prices and method of calculating price adjustment is given in Appendix to Tender.
- (b) During the currency of the Contract the Contractor shall be paid compensation for additional payments/expenses to which he may be exposed on account of changes/additions in the rates or quantum of such wages/ out-goings and prices of materials brought about by any changes in the fiscal policies of any Federal/Provincial Government, Local Body and/or Government-controlled/owned Corporation or Company, applicable to the Contract. Similarly, the Contractor shall be liable to pay to the Employer any saving which he may make on such wages/out-goings and prices of materials because of any change in the aforesaid fiscal policies.
- (c) Adjustment shall be allowed only for the quantities of materials specified in Appendix to Tender (except High Speed Diesel) which have actually been incorporated in the Permanent Works during the corresponding period of increase or decrease.

- (d) Adjustment shall be allowed for the Specified Materials and Labour according to Notes (1) and Note (2) respectively in the Appendix to Tender
- (e) All claims for additional payments under this Clause shall be lodged by the Contractor with the Engineer within such reasonable time from the date of occurrence of the event which, according to the Contractor, entitles him to such additional payments by the Employer but in no case after the expiry of 28 days thereof. Such claims shall invariably be supported with all necessary/relevant/material details and particulars required for proper verification thereof and the Engineer shall be entitled to require the Contractor to provide such further details/information as may be so required for due and effective verification of such claims.
- (f) The Engineer shall verify and certify for payment, if any, all claims lodged by the Contractor under this Clause within a period not exceeding 28 days from the date on which the same are submitted by the Contractor as aforesaid.
- (g) The Employer shall make payment against the certification of the Engineer made pursuant to para (f) above along with the monthly payment/any other payment falling due immediately after the date of such certification.
- (h) In case the Employer is entitled to recover from the Contractor any sum or sums under this Clause arising from any decrease in the said wages / out-goings and prices for materials, the provisions of this Clause shall mutatis mutandis apply to such recoveries by the Employer.
- (i) If the Contractor fails to complete the Works within the Time for Completion prescribed under Clause 43, adjustment of prices thereafter until the date of completion of the Works shall be made using either the indices or prices relating to the prescribed time for completion, or the current indices or prices, whichever are more favourable to the Employer, provided that if extension of time is granted pursuant to Clause 44 the above provision shall apply only to adjustments made up to the expiry of such extension of time.
- (j) Provisions contained in this Sub-Clause shall be incorporated in the Sub-contract/s by the Contractor.

#### **71.1 Currency Restrictions**

Delete this Sub-Clause in its entirety:

Add the following Sub-Clause:

#### **73.1 Payment of Income Tax**

The Contractor, Subcontractors and their employees shall be responsible for payment of all their income tax, super tax and other taxes on income arising out of the Contract and the rates and prices stated in the Contract shall be deemed to cover all such taxes.



Add the following Sub-Clause:

**74.1 Bribery and Collusion**

- (1) The Employer shall be entitled to terminate the Contract and recover from the Contractor the amount of any loss resulting from such termination if the Contractor shall have offered or given to any person any gift or consideration of any kind as an inducement or reward for doing, or forbearing to do, any action in relation to obtaining, or in the execution of the Contract or any other contract the Employer, or for showing favour to any person in relation to the Contract or any other contract with the Employer, or if any of the like acts shall have been done by any person employed by the Contractor or acting on his behalf (whether with or without the knowledge of the Contractor), or if the Contractor shall have come to any agreement with another contractor or number of contractors whereby an agreed quotation or estimate shall be offered as a bid to the Employer by one or more Contractors.
- (2) In the event of such termination, the Contractor shall:
  - (a) proceed as provided in Sub-Clause 65.7 hereof; and
  - (b) be paid by the Employer as provide in Sub-Clause 65.8 hereof, provided that any loss referred to in Sub-Clause (1) of this Sub-Clause shall first be deducted.

Add the following Sub-Clause:

**75.1 Termination of Contract for Employer's Convenience**

The Employer shall be entitled to terminate the Contract at any time for the Employer's convenience after giving 56 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor :

- (a) shall proceed as provided in Sub-Clause 65.7 hereof; and
- (b) shall be paid by the Employer as provided in Sub-Clause 65.8 hereof.

Add the following Sub-Clause:

**76.1 Liability of Contractor**

The Contractor or his Subcontractors or assigns shall follow strictly, all relevant labour laws including the Workmen's Compensation Act and the Employer shall be fully indemnified for all claims, damages etc. arising out of any dispute between the Contractor, his Subcontractors or assigns and the labour employed by them.

Add the following Sub-Clause:

**77.1 Joint and Several Liability**

If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfilment of the terms of the Contract

and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.

Add the following Sub-Clause:

**78.1 Details to be Confidential**

The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the prior consent in writing of the Employer or the Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the decision of the Engineer whose award shall be final.

## PART-II B CONDITIONS OF PARTICULAR APPLICATIONS

Add the following to sub-clause 1.1(a)

### 1.1 Definitions

- (v) The Engineers Representatives means the Resident Engineer appointed by the Engineer and duly approved by the Employer.

### 2.1 Engineers Duties & Authorities

Add the following to sub-clause 2.1(b) at the beginning of the second paragraph in Part-II A.

“Notwithstanding the obligations, as set out above to obtain approval”

Add the following after 1<sup>st</sup> Paragraph

### 2.1 (b) Sub-Clause

- a. Approving Subcontracting of any part of the Work under Clause-4.
- b. Certifying additional cost determined under Clause 12;
- c. Suspension of work under Clause 40;
- d. Determining an extension of time under Clause 44;
- e. Taking over certificate under Clause 48;
- f. Issue a variation under Clause 51 except in an Emergency situation, as reasonably determined by the Engineer.
- g. Revision / fixing rates or prices under Clause 52;
- h. Issuing the Defects Liability Certificate under Clause 62;
- i. Certifying additional payment under Clause 65;

Add the following Sub-clause

### 2.7 Engineer not Liable

Paragraph given in Part-II-A, treat as Sub-clause a & add the following as (b)

- b). The Employer shall take all necessary steps to ensure that the Engineer shall appoint a Representative and sufficient qualified staff to perform the Engineer's duties under the Contract in a timely manner.

### 6.7 As Built Drawing

Add the following text at the beginning of this clause in Part-II A

“During the course of execution of contract the contractor shall prepare and submit the As-Built Drawings of the work completed from time to time for Engineer's Approval.

### 6.8 Shop Drawing

Prior to execution of work the shop drawing to be submitted by the Contractor of each & every item for its approval. No work shall be carried out without the approval of shop drawings.

Add the following sub clause

### 8.3 Temporary Works

Sufficient details, drawing and calculations pertaining to Temporary Works to demonstrate the adequacy of the Temporary Works shall be submitted by the Contractor not less than 14 days before the work on the erection of any such Temporary Works commences on the Site.

Add the following sub –clause

**8.4 Specialists Suppliers and Subcontractors**

Where the Works required the incorporation of proprietary articles manufactured by specialist suppliers, or portions of the work involving design or specification matters to be carried out by specialist subcontractors, the Contractor shall be fully responsible for the outcome in the use of such proprietary articles and for such design and specification executed by specialist subcontractors.

**9.1 Contract Agreement**

Substitute the work ‘Employer’ in the third line of this para by “Contractor” in Part-I.  
At the following at end of paragraph Part -I

The Contractor shall at its cost submit to the Employer photocopies of six(6) sets of the Contract Documents in bound form, duly initialed and stamped by the Employer, and the contractor for the use of the employer and the Engineer. Such submission shall be made within 7 days of signing of the Form of Contract Agreement by the Employer and Contractor.

**10.1 Performance Security**

Delete the text of Sub-Clause 10.1 & Substitute as follows

The Contractor shall provide Performance Security to the Employer in the prescribed form. The said Security shall be furnished or caused to be furnished by the Contractor within seven (7) days after the receipt of the Letter of Acceptance. The Performance Security shall be.

- a) in an amount equal to ten percent (10%) of the Contract Price stated in the Letter of Acceptance, in the form of a guarantee from the following insurance company:
  - (i) National Insurance Corporation of Pakistan
  - (ii) Adamjee Insurance Company
  - (iii) Eastern Federal Union Insurance Company
  - (iv) New Jubilee Insurance Company.

The Cost of Complying, with requirements of this Sub-Clause shall be borne by the Contractor.

**10.2 Period of Validity of Performance Security**

Second line is modified to read the following

“Completed the work, remedied any defect therein and maintained the utility services in accordance with the”

In the fifth line, of 14 days’ is substituted by “28 days”.

**10.4 Performance Security Bidding on Variations and Change**

Add the following after 1<sup>st</sup> paragraph

The performance security shall be get renewed for the revised/extended period of completion of work upon written instruction by the Engineer/ Employer.

**14.1 Programme to be Submitted.**

In the first line of this Sub-Clause in Part-II-A, substitute “42” with “7”

In the third line, the text reading ‘as the Engineer shall reasonable prescribe’ is deleted and substituted by “as acceptable to the Engineer”.

The Programme shall be Submitted within the time stated in Appendix ‘A’ to Tender and furnished in the form of a bar chart and shall clearly indicate the following:

- a) The sequence of each activity, the proposed start and completion dates of each activity, the rate of progress and the cumulative quantity or percentage of work expected to be achieved on each activity by the end of each month.
- b) The time allocated for work by others, including those of the Employer and by utility undertakings;

**14.3 Cash Flow Estimate to be submitted**

In the first line of this sub-clause in Part –II- A, substitute “21 with 7”.

**14.5 Detailed Programme and Monthly Progress Report**

Delete the Text and Substitute in Sub-clause Part II-A

- (a) For purposes of Sub-Clause 14.1, the Contractor shall submit to the Engineer detailed programme on a computerized network

analysis in accordance with Sub-Clause 8.2 of the Special Provisions, for the following:

- (2) Construction Schedule
- (3) Deployment of Contractor
- (4) Labour Employment
- (5) Local Material Procurement
- (6) Material Imports, if any ; and
- (7) Other details as required by the Engineer.

- (b) During the period of the Contract, the Contractor shall submit to the Engineer Weekly (3 copies) and Monthly (6 copies) progress reports in the format specified by the engineer from time to time. The Weekly progress report shall be submitted on every Monday and the Monthly Report not later than the 8<sup>th</sup> day of the following month. One copy each of the above reports will also be transmitted to the designated offices by e-mail. The progress reports shall at least cover;

**WEEKLY PROGRESS REPORT**

1. Actual Progress
2. Materials Status
3. Payments
4. Schedule for next week
5. Other Information about problems and difficulties encountered, if any, and proposal to overcome the same.

**MONTHLY PROGRESS REPORT**

- i. A Construction Schedule indicating the monthly progress in percentage;
- ii. Description of all work carried out since the last report;
- iii. Description of the work planned for the next 56 days sufficiently detailed to enable the Engineer to determine his programme of inspection and testing;
- iv. Monthly summary of daily job record;
- v. Photographs to illustrate progress; and
- vi. Information about problems and difficulties encountered, if any, and proposal to overcome the same.
- vii. Site Plan with classification of Works to be completed;
- viii. Salient contractual and project information
- ix. List of important meetings;
- x. Details of tests & results performed.

**15.2 Contractor's Representative**

The following paragraph is added

The Contractor's authorized representative and its other professional engineers working at the Site shall be registered with the Pakistan Engineering Council.

The Contractor's authorized representative at site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the work as per the contract.

Add the following to sub-clause

**15.4 Provision of In-House Drawings Review / Check Capabilities of the Contractor.**

The contractors are required to associate qualified and experienced technical experts to ensure in-house drawing review capability to deal with technical problems during construction and shall give prompt notice to the Engineer of any error, omission, fault or other defects in design or specifications of the work. The final responsibility of practically and technical adequacy of construction rests with the Contractor.

**21.1 Insurance of Work and Contractor's Equipment**

In para (a) of this clause, in the first line, after the word "Plant"; Add the following works: "Whether Provided by the Contractor or the Employer", and the date of commencement shall be treated as notified there-in.

**38.1 Examination of Work before Covering up**

In the third line, the word measure is substituted by 'check'. In the second last line, the word measuring is substituted by "checking".

**39.3 Engineer's Decision Final**

The following paragraph is added

Any decision of the Engineer under Sub-Clause 39.1 shall be final and conclusive.

**51.1 Variations**

Add the following para at the end of this-clause in Part-I:

The approval/finalization of rates of all variations shall not relive the Contractor of his obligations under the Contract. The Contractor shall neither stop the work nor slow down progress of the works in awaiting the approval of rates of all variations.

Add the following sub-clause in part-I:

**52.3 Variations Exceeding 15 per cent**

Sub- Clause is deleted in its entirety

**52.5** For determining purpose of the varied work item the percentage of 25% including Income Tax etc. shall be added as contractor's overhead & profit to the total gross prices of all material, plant, sundries, labours etc.

**53.1 Variations Exceeding 15 per cent**

Sub-Clause is deleted in its entirety

**53.4 Failure to Comply**

Sub-Clause is deleted in its entirety.

**60.1 Monthly Statements**

Sub-Clause 60.1 of the General Condition of Contract is deleted and the following Sub-Clause 60.1 is substituted therefore.

The Contractor shall submit to the Engineer after the end of each month, four (4) copies, each signed by the Contractor's representative approved by the Engineer in accordance with Sub-Clause 15.1, of a statement, in a tabulated form approved by the engineer, showing, showing the amounts to which the Contractor considers himself to be entitled. The statement shall include the following items, as applicable, which shall be taken into account in the sequence listed.

- a) The value of the Works executed up to the end of the month in question, based on the sum of the amount for each completed component of the Works set out in Table 1. No amount shall be included for partially completed components.
- b) The actual value certified for payment for the Works executed up to the end of the previous month, based on the percentage stated in sub-paragraph (a) above;
- c) The estimated contract value of the Works for the month in question, obtained by deducting (b) from (a);

- d) Not used
- e) The value of any variations executed up to the end of the month in question, less the amount certified in the previous Interim Payment Certificate;
- f) Amount approved in respect of Day work executed up to the end of the month in question, less the amount for day work certified in the previous Interim Payment Certificate;
- g) Any amounts reflecting changes in cost and legislation, pursuant to Clause 70;
- h) Any amount to be withheld for retention, determined by applying the percentage of retention stated in the Appendix A to Tender, to the amount due under paragraph 60.1(c), (e), (f) and (g), until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Appendix to Tender;
- i) Any amounts to be added to deducted for the advance payment or repayments in accordance with Sub-Clause 60.11;
- j) Not used
- k) any other additions or deductions which may have become due in accordance with the Contract or otherwise.

**60.2 Monthly Payments**

Opening paragraph and sub-paragraphs (a) and (b) are deleted and the following is substituted therefore:

The Engineer shall, within fifteen (15) days of receiving a statement, issue to the Employer an Interim Payment Certificate certifying the amount of payment to the Contractor which the Engineer considers due and payable in respect of such statement, subject to the deduction, other than pursuant to Clause 47, of any sums which may have become due and payable by the Contractor to the Employer.

The Engineer shall not be bound to issue and Interim Payment Certificate if the Contractor has not submitted the progress reports in accordance with paragraph (b) of Clause 14.5 and such information as shall be mutually agreed in writing between the Employer and the Contractor.

**60.3 Payment of Retention Money**

The Following is added at the beginning of the Sub-Clause

When the retention money has reached fifty percent (50%) of the limit of retention money stated in the Appendix A to Tender, the Engineer shall certify and the Employer shall make payment of half (50%) of the limit of retention money to the Contractor if he submits to the Employer, an acceptable bank guarantee from a scheduled bank of Pakistan in an amount equal to the payment.

The guarantee shall be valid until the Contractor has executed and completed the Works and remedied any defects therein, as specified in the Contract, and shall be returned to the Contractor accordingly. This release of retention money shall be in lieu of the release of the second half of the retention money under sub-paragraph (b) Sub-Clause 60.3.



**60.6 Final Statement**

The Following sentence is added at the end:

The quantities given in the Bill of Quantities, shall not be re-measured.

“The Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement”

**60.12 Read as follows:**

a) Last line of **Clause 60.12(a)** read as Schedule Bank of Pakistan acceptable to the Employer.

a:2) First line read as 30 days instead of 42 days.

Delete the text and read as follows:

b) Mobilization Advance shall be recovered from running bills by **deducting 10 (Ten)%** from each running bill including extra/additional works amount (if any). If the whole amount not recovered from running bills, shall be recovered the balance amount of **Mobilization Advance** from **Pre-Final Bill**.

Delete the text of alternative two and alternative three.

**60.13 Withholding of Payment**

a) The Employer may withhold the whole or a part of any payment invoiced by the contractor if it is necessary in the opinion of the employer to protect himself against losses on account of the following reason.

- i. Defective work not rectified.
- ii. Non-fulfillment of any demand and due guarantee.
- iii. Claims of third parties raised against the employer caused through fault of the contractor in connection with the works.
- iv. Damages caused by the contractor or his personnel or any sub-contractor, to the Employer, or to a third party on the site.
- v. Non-fulfillment of the contract by the contractor.

b) After the reasons for withholding of payments have been eliminated to the satisfaction of the Employer and the engineer, payments to the contractor will be undertaken by the Employer without delay.

**70. Changes in Cost and Legislation**

Delete the whole text of this Clause.

**72.2 Currency Proportions**

Sub-Clause 72.1 is deleted in its entirety.

Add the following sub-clause

**73.2 Cost Inclusive of Duties and Taxes**

The rates and prices stated in the priced Bill of Quantities shall be deemed to include every element of duty or tax livable on or in relation to production, import, purchase, sale, delivery and transportation of materials and to the bringing thereof to the Site and no such duty or tax shall be separately reimbursable.

**73.3 Income Tax Provision in Sub-Contracts**

Provisions to the like effect as those contained in this clause shall be incorporated by the Contractor in all sub-contracts.

Add the following sub Clauses

**74.2 Details to be Confidential**

The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the previous consent in writing of the employer or the Engineer. If any dispute arises as to necessity of any publications or disclosure for the purpose of the Contract the same shall be referred to the decision of the Employer whose award shall be final.

Add the following sub clause

**76.2 Coordination of Work at Site**

The Contactor shall take cognizance that during the execution of the project, other Contractors will be working concurrently on this site or adjacent to the site.

All works of his responsibility shall be coordinated by the Contractors so as to give the necessary facilities to other Contactors or their workmen or any other employees, who execute or supervise any work on the Site.

The Contractors shall ensure that the necessary safety precautions will be observed and interferences shall be avoided especially for the work executed side-by-side by different Contractors.

Due consideration must be given to permit access to sections of the work as required by other contractors for the execution of their works. With a view to coordinate the works the Engineer's Representative may from time to time direct the order of the work to be carried out.

Allowances for coordination of work at site shall be made by the contractors his prices & programming.

Add the Following sub Clauses.

**77.2 Liability of Contractor**

The Contractor or his Sub-Contractor or assigns shall follow strictly all relevant labour laws including the Workman's Compensation Act and the Employer shall be fully indemnified for all claims, damages etc., arising out of any dispute in between Contractor (s), his Sub-Contractor or assigns and the Labour employed by them.

Add the Following sub clause

**79.1 Precaution for Pollution**

Precautionary measures and facilities shall be provided by the Contractor at his won cost in carrying out the Work including dumping and disposal of spoils in sea river and other areas, in the manner approved by the Engineer to prevent environmental pollution.

Add the following sub clause:

**80.1 Government and other Regulation in Pakistan**

The operation proceeding and other activities in Pakistan of the Contractor and his sub-contractors in connection with the works shall be conducted in strict accordance with the requirement and provisions of all laws, decrees, orders, rules and regulations of the Government and other Authorities from time to time in force which are applicable to the Works,

The Contractors and his Sub-Contractors shall be at all time during the execution and maintenance of the work comply with all municipal and local bye-laws, regulations, rules and orders from time to time in force which are applicable to the works.

Add the following sub clause:

**81.1 State of Emergency**

In additional to his other responsibilities under the Contract the Contractor shall comply with any police or Military regulations, orders or instructions in force in the area of the Works due to State of Emergency.

Add the following sub Clause:

**82.1 Contractor to Keep Engineer & Staff fully Informed**

The Contractor shall keep the Engineer registered with PEC & staff fully informed, as to all matters connected with the Works and the progress thereof, including any modification in the procedure for carrying out the Works, dispatch and delivery to the Site of material and plant, moving of items of plant and such like matters.

Add the following clause.

**83.1 Personal Liabilities**

Neither any member of the Employer's staff, nor the Engineer nor any member of his staff, nor the Engineer's Representative, nor any member or officer of the Pakistan or Sindh Government shall be in any way personally liable for the act or obligations under the Contract, or answerable for any default or omission on the part of the Employer in the observance of the provision of the contract or performance of any of the act matters or things which are herein contained.

Add the following sub clause.

**84. Freight Charges, etc.**

The Contractor shall pay all freight charges and expenses in connection with the transporting of materials, Plant and other things form the port of importation to the Site and from the Site to the port of exportation.

Add the following sub clauses:

**85.1 Accidents**

The Contractors shall within 24 hours of the occurrence of any accident at or about the site or in connection with the execution of the Work report such accident to the Engineer and the Employer.

**86.1 Laboratory Test and Testing**

All, testing including collection of samples shall be performed by an approved testing agency as proposed by the Engineer and at no extra cost to the Employer.

**86.2 Payment**

Payment shall constitute full compensation for all of furnishing necessary labour, materials, equipment and its maintenance and incidentals, for the proper completion of the work, as directed by the Engineer. The cost of provision of laboratory equipments, maintenance and its staff as indicated above shall be deemed to be covered within quoted rates of other items of Bill of Quantities.

**87. Transport Facilities**

**87.1** The contractor shall be responsible to provide transport facility free of cost to the Client/Consultant representative/Engineer etc. whenever needed/required to /from the site etc.

# **SPECIFICATIONS**



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## **SPECIFICATIONS FOR BRICK WORK AND BLOCK WORK**

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### **1. SCOPE OF WORK**

The work under this Section of the Specifications consists of furnishing all labour, materials, necessary equipment, services, miscellaneous and necessary items required to satisfactorily complete all masonry work, related work indicated on drawings, specified herein or both.

### **2. MATERIALS**

#### **a) SAND FOR MORTAR**

It shall be sand of approved source conforming to general specifications laid down for concrete work under separate Section but passing 4.5 mm sieve. It shall comply with B.S. 1200 Table 1, shall be approved by the Engineer/Consultants before use and shall be adequately protected from contamination. It shall be obtained from the same source throughout so that there is no change of colour of mortar.

Sand shall withstand satisfactorily the following test. A sample of sand shall be mixed with water (in the proportion of one part sand, to parts water) for one minute in a cylindrical glass jar with a flat base. It shall then be set aside for two hours for the contents to settle and at the end of this period, the top layer of fine materials shall not exceed 5% of the volume of solid matter in the jar. The water remaining from the test shall show no evidence of sewage, organic or chemical contamination.

The sand for fine joint work and pointing shall pass a 1.5 mm sieve and shall be obtained in sufficient quantity to enable materials of approved colour to be used for the whole of the work.

#### **b. CONCRETE BLOCKS (SOLID)**

These shall be machine made blocks, even, true and square in shape, the ingredients of the block shall be 1:3:6 using double chan bajri as coarse aggregate unless otherwise specified or required. Cement, sand aggregates shall conform to the Specifications laid down in the Concrete Section. Due care shall be taken regarding proper mixing of concrete. Hand mixing of concrete for block making



is not to be allowed. Concrete shall be mixed at the speed at which the blocks are being made. Any concrete left over after 30 minutes of mixing water shall be rejected and shall not be used in block making. The blocks shall be kept wet for at least 10 days after casting. Under no circumstances shall the blocks be allowed to be used before they are completely dry. The strength of the blocks shall conform to the Specifications laid down under Concrete Section.

3. **MORTAR**

It shall consist of one part Ordinary Portland Cement as previously described to 6 parts of sand as specified herein and mixing shall be done on clean hard platform as much as required for immediate use with only sufficient quantity of water to produce mortar of workable consistency. If quantity of work to be done is large, or if directed by the Engineer the mixing shall be done by mechanical mixers.

The Contractor shall permit samples of mortar to be taken from time to time for testing. Retempering of mortar shall not be permitted. All mortar shall be mixed in quantities sufficient for only 30 minutes work, and this shall be rigorously enforced.

4. **CONCRETE BLOCK WORK**

All block work shall be built in a systematic bond to the dimensions, thickness and heights and in the positions indicated on drawings, or as directed by the Engineer. No more bats shall be used than are necessary to complete the bond. The thickness of joints shall not exceed 9 mm. The joints shall be filled solid and the courses shall be taken level and the work in plumb. The walls must be carried up regularly and no portion of the work be left more than 1M lower than any other.

The block work shall not be started unless the blocks are completely dry, and shall be laid dry. The block walls shall not be wetted after the work is complete, but the work shall be shaded from direct sun.

5. **BONDING**

Wherever block work abuts concrete columns it shall be anchored thereto by means of dovetail flat bars as approved by the Engineer at every third course vertically. These bars shall be left in the columns. With the dovetail ends in the columns properly spaced and secured in position during concreting. Similarly all partition walls shall be properly bonded at intersections by extending alternate courses of masonry into the other partitions or in a method acceptable to the Engineer.



6. **MISCELLANEOUS**

The Contractor shall coordinate fully with other Sections of the trade or with other specialist contractors.

Before closing up any pipe, duct or similar inaccessible space or shafts with block work, the Contractor shall remove rubbish and sweep out the areas to be enclosed. Contractor shall take special care in getting built-in items such as door frames, hold-fasts, miscellaneous metal works, sleeves, anchors, supports, jambs etc. etc. and see that they are true, plumb and in level.

He shall provide chases and openings required under other Sections as to size and locations shown in drawings. Special care shall be taken in building block work into door frames, and see that the frames are square and in plumb. The hold-fasts shall be grouted solid and not built in between the courses.

The Contractor shall also see that electric conduits are buried sufficiently deep and properly grouted.

The Contractor shall be fully responsible for damage of any nature to the work to be left more than 1M lower than any other.

Surfaces of masonry being worked on shall be properly protected at all times. At the time of rain, if work is left incomplete, the tops of masonry shall be covered with waterproof membrane, securely held in position.

7. **TESTING**

All materials and samples shall be subject to standard testing and if found below the recognized standard specifications such as BSS or its equivalent shall be rejected. Rejected materials shall be removed from the site immediately.

8. **SAMPLES**

Samples of all kinds of materials to be used on the job shall be submitted to the Engineer and to be approved by him.





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## **SPECIFICATIONS FOR PLASTERING**

### **1. SCOPE OF WORK**

1.01 The work covered under this section of specification consists of furnishing all materials, labour, plant, appliances and performing all operations in connection with the installation of plaster complete in strict accordance with the Drawing, BOQ as directed by the Engineer/Consultants.

(a) Smooth finish cement plaster for internal and external surfaces using 1:4 (one part of cement and four part of fine specified sand) of required thickness shown on the drawings or as directed by the Engineer. Plaster surfaces shall include walls, columns, ceiling jambs, returns reveals backs of recesses and jambs and heads of windows and doors and other soffits etc or as directed by the Engineer.

(b) Rough cast plaster for external surfaces using shall be 1:3 (One part of white cement and three part of specified Marble powder) of required thickness, shall be applied over the precast corrugated panels by hand operated machine as shown on the drawing or as directed by the Engineer, Plaster surfaces shall include walls columns, jambs etc.

### **2. MATERIALS**

#### **2.01 Cement**

It shall be ordinary portland cement (gray/ white) complying with B.S.12 and shall be stored as specified in the concrete sections.

#### **2.02 Sand**

It shall be conforming to grading in accordance with B.S.1198 and 1199. It shall be free from deleterious matter, likely to adversely affect the hardening strength or appearance of plaster or to cause corrosion.

#### **2.03 Marble Powder**

It shall be of white marble powder as per standard specification and as desired by the Engineer/Consultants.

#### **2.04 Pigment**

Oxide pigment or any other approved pigment suitable for cement and external use



2.05 B.S.S.  
**Water**

It shall be of the qualities as specified in the Section 'Concrete'.

2.06 **Expanded Metal Beads**

These shall be of standard make and of approved quality. To be provided as per BOQ/ Drawings and as directed by the Engineer.

3. **PROPORTIONING AND MIXING**

- 3.01 All the ingredients for plastering shall be proportioned by volume, as indicated on the Drawings or directed by the Engineer.

Plaster ingredients shall be thoroughly mixed either by hand on a clean cement concrete platform or by a mechanical mixer, as directed by the Engineer.

- 3.02 Frozen caked or lumped materials shall not be used. Mechanical mixers, mixing boxes, platforms and tools shall be cleaned after mixing each batch and kept free from mortar of previous mixes. Plaster mortar shall be thoroughly mixed with the proper amount of water until uniformity in colour and consistency is obtained retempering will not be permitted and all mortar which has begun to stiffen shall be discarded.

4. **PREPARATION AND APPLICATION**

- 4.01 Before the plaster work is commenced, the contractor shall see that all the conduits for electrical works, ducts, drain pipes, sanitary pipes, brackets, built in cupboards, doors, windows and ventilators and all other fixtures on wall, ceiling and columns or elsewhere required have been fixed in position. Chiselling of cement plaster shall not be permitted under any circumstances. Smooth concrete surfaces shall be made rough prior to commencement of plastering.

- 4.02 Block walls shall be kept damp for at least 24 hours before applying plaster.

- 4.03 Prior to commencement of plastering on block walls, the surface to be plastered shall be treated with cement and sand slurry (One part cement and one part sand by volume). The slurry shall be applied with a stiff brush upon surfaces which have previously been well wetted. This treatment of slurry should be allowed to dry out for 24 hours, before applying plaster. The rates for plaster work includes such slurry



treatment.

- 4.04 The minimum thickness of plaster shall be 1/2 inch. Where the specified thickness is more than 1/2 inch. Plastering shall be done in two coats. The first coat should be roughed before the finishing coat is applied. The finished surface of plaster work shall be smooth even and true to plumb.
- 4.05 Rough Cast Machine Spray plaster shall be applied on precast corrugated tiles on walls or wherever specified and shown on the drawings. Apply Tyrolean/Rough cast with hand operated splitter-dash machine spread to the required thickness. Mortar for Rough Cast shall be 1:3 (one part of white cement and three parts of marble powder). Spreading of mortar shall be done in such a way so that the texture of approved quality remain through out the same on all surfaces. Prior to commencement the surfaces of its application must be well wetted.

5. **CURING**

All the plaster work shall be cured for at least 10 (ten) days by sprinkling water so as to keep all the plaster surfaces damp throughout.

6. **MEASUREMENT AND PAYMENT**

- 6.01 Measurement for payment will be made as the actual area of the plastered surfaces excluding jambs, junctions, corners, edges or thicker plaster required due to any unevenness.
- 6.02 Payment for plastering shall be made at the applicable unit price per square meter bid in the Bill of Quantities. The amount bid shall be full payment for the work specified herein as plastering including related item, such as expanded metal (on C.C. R.C.C. joints and metal beads on corners) as directed by Engineer/Consultants.



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## **SPECIFICATIONS FOR ALUMINIUM DOORS AND WINDOWS**

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### **1. SCOPE**

- 1.01 The work covered in this section comprises of the following:
- 1.02 Fixing in position aluminium doors, windows, sky lights, frames of partitions complete with metal ware, fixtures as shown in the drawings, and specified in these specifications and the Bill of Quantities and of a make approved by the Consultants.
- 1.03 Fixing plate glass glazing of specified quality to doors, windows, sky lights and partition walls.

### **2. MATERIALS**

#### **2.01 Aluminium Sections and Plates**

The aluminium section for windows shall be extruded from aluminium alloy of composition 6063-T5(50S-T5). H-9 (99% Al, 0.5% Mg, and 0.5% Si) or approved equivalent. The aluminium plates and sheets shall be of the same composition. For doors it shall be alloy HE9 WOP (Box Sections) or approved equivalent.

Iron mongery, fittings and locks shall be of brass, stainless steel and aluminium as shown on the drawings or as approved by the Consultants.

#### **2.02 Glazing**

The clear plate glass shall conform to latest revised B.S. 952, Special type of glazing such as toughened glass, armour plate glass tinted glass, wired glass and coloured glass shall be of approved make and of sizes specified on the drawings and specifications.

The supplier shall indicate to the Manufacturer that the latest and approved method of jointing employed in the manufacture of high class work viz. mechanical jointing, reinforced with concealed welding shall be used in the manufacture of doors and windows. The workmanship of metal doors and windowsshall conform to applicable provisions of B.S. 990: 1970.



2.03 **Fixing**

The fixing of Doors and Windows to concrete or block openings shall be carried out in approved method as indicated in the drawings or as directed by the Engineer/Consultants. Provision of necessary groove or rebate and holdfasts in the concrete shall be made in the formwork and no holing or drilling shall be allowed in the exposed concrete finishes. These shall be erected in position either the building structure is completed and by using proper holdfasts as shown on drawings or counter sunk bolts and screws as per site requirements.

The sizes of windows indicated on the drawings are approximate only, and the actual sizes required shall be determined by measuring the opening to receive the windows.

3. **SHOP DRAWINGS**

Contractor shall prepare shop drawings on the basis of drawings provided by the Consultants to all Aluminium work such as doors, windows and curtain wall etc. to be carried out on the project. These drawings will show clearly the sizes, method of fixing, jointing and the anchorages to be used in the process, and the Contractor shall get approval in writing from the Consultants well in time before the actual start of the work.

4. **GLAZING**

4.01 The work of fixing glazing to doors, windows, sky lights shall be carried out with the type and special quality of glass specified for each door and window and as indicated in the drawings or as directed by the Consultants.

4.02 Plate glass shall be best quality transparent/polished, glass conforming to applicable requirements of latest revised B.S. 952 "Glass for Glazing" and as specified hereinunder clear plate glass 6mm thick.

4.03 The actual sizes of glass for windows shall be determined by measuring the frames to receive the glass. All glass shall be factory labelled on each pane and the label shall not be removed until finally approved by the Engineer/Consultants. Glass will be fixed with best quality mastic compound of approved make suitable for thick glass, tinted glass or with bead or moulding as directed or as shown on the drawings or specified lining and weather-proof brush joints for opening surfaces shall be provided where indicated. Glass shall be protected against damage. After inspection, label and paint spots shall be removed from the glass and glass shall be



washed clean. Damaged or broken glass shall be removed and replaced before acceptance.

5. **GLASS CURTAIN WALLING**

Aluminium box sections for curtain walls shall be as specified in the drawings and in specifications relating to Aluminium sections and plates, and GLAZING (item 11.02.01 to 11.02.02 in this section). The curtain walling system shall be of approved proprietary make, and shall be installed complete with glazing, gasket, expansion sleeves or other approved proprietary methods for expansions. The Contractor shall undertake full responsibility for the structural soundness of the installation. The glass size shall be 6 mm thick toughened plate tinted glass. Measurement and payment shall be as in item 11.05 and 11.05.01 below.

6. **MEASUREMENT AND PAYMENT**

- 6.01 Payment for doors, windows and sky lights partition walls will be made by measuring clear opening area in block work or concrete in Sq.Mt. Rates for all the items under this section shall cover the cost of furnishing all the materials, labour scaffoldings and appliances at site and performing all operations in connection with their installation in accordance with instructions of the Consultants. It is particularly mentioned that the rates for fixing doors and windows etc. shall include fixing of all ironmongery fittings such as locks, peg stays, handles, push plate, kicking plates, door closers, etc. as specified and indicated on the drawings and BOQs including fixing of glazing.
- 6.02 The rate shall cover the cost of furnishing all materials, labour and scaffoldings, mastic compounds, rubber lining, and appliances at site and performing all operations in accordance with the instructions of the Consultants and specifications.
- 6.03 The wastage due to breakages, cutting to sizes and replacement during maintenance period shall not be paid for separately but the rates shall be deemed to be inclusive of all these costs.



## SPECIFICATIONS FOR GLASS AND GLAZING

1.
  - a. **Glazing**: The work under the section pertains to glazing of steel or Aluminium wooden doors, window w and ventilators.
  - b. **Sheet Glass**: Sheet glass shall be 5 mm thick of local manufacture free from flaws, scratches and blemishes. The glass shall be fixed by deodar wood head to steel windows and by P.V.C. beading to Aluminium windows.
  - c. **Laminated safety glass (imported)**: The glass shall be tinted of approved colour having a thick mess of 6 mm conforming to ASTM & ANSI-Z-97-1-1975 standard.
  - d. **Plate Glass**: Plate glass shall be 6 mm unless or more as shown on the drawings. The glass shall be of Japan make clear glass locally available.
2. **WORKMANSHIP**

The glass panes shall be cut uniformly to fit the rebates with a clearance of 1/16".

Plate glass shall be set in rebates with rubber bending cushions and shall be fixed by deodar glazing beads. The glass shall be fixed to wooden sashes by nails at not more than 4" spacing.

In steel sashes 1/16" thick low carbon spring steel clips shall be fixed at a spacing not more than 6". Alternatively the glass may be fixed by screw instead of clips at the sole discretion of the Engineer Incharge. In case of Aluminium doors and windows the glass shall be fixed as under:

### INSTALLATION

Glazing shall be done in weather proof and water proof manner. of work schedule requires glazing work to be done at temperature below 40 degree F. Proper grade of glazing compound (sealant) as certified by the manufacturer shall be applied according to manufacturer's direction with work fully guaranteed.

Remove glazing beads completely, perform glazing operation, set back in correct location and do not mark beads, screw and the like.

Glass shall be cut accurately to fit the openings as specified herein before and set in with equal bearings on entire pane perimeter. Glazing surface shall be clean, dry, completely dust free before commencing application of glazing materials.



Glazing of exterior such shall be glazed inside and shall be performed as under:

- a. Set polybutene tape against fixed fin of window frame. Apply tape so that exposed top edge is squeezed out slightly beyond sight line of sash.
- b. Set glass against polybutene tape on neoprene setting blocks set at quarter points.
- c. Fill sill opening area under glass edge full with polysulphide sealant.
- d. Run bed bead of polysulphide sealant completely around perimeter of glass pane. Bead must maintain 1/4" contact on glass and very good contact to frame.
- e. Set material bead in approved manner.
- f. Insert, required, proper size neoprene shims to centre the glass.
- g. Void formed between exterior metal bead and glass shall be filled properly with polysulphide sealant.
- h. Cut off at sight line tape squeezed out above sight line of sash.

### 3. PROTECTION AND CLEANING

#### a. **Protection**

Care shall be used in handling windows ventilators during transportation and at the Site. Windows shall be stored under cover. After installation, windows shall be protected from construction hazards that will interfere with their operation or damage their appearance or finish. The methods used for protection shall be subject to the approval by the Engineer/Consultants.





## SPECIFICATIONS FOR FLOOR AND FLOOR FINISHES

### 1. SCOPE

- 1.01 The work covered by this section of the specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with the installation of cement concrete floors and floor finishes including bases, skirting, complete in strict accordance with this section of the specifications and the applicable drawings and subject to the terms and conditions of the contract.

### 2. MATERIALS

#### 2.01 Cement

Cement shall be ordinary portland cement conforming to BS 12 or PS 232.

#### 2.02 Sand

All fine sand shall be obtained from Malir River or its equivalent the grading shall conform to BS 882 Grading Zone 1 and 2 and shall be graded as follows:

(a) Percentage (by weight) passing

B.S. Sieve -----	Grading Zone 1 -----	Grading Zone 2 -----
3/8" (9.53 mm)	100	100
3/16 (4.765 mm)	90-100	90-100
No. 7	65-95	75-100
No. 14	30-70	55-90
No. 25	15-34	35-99
No. 52	5-20	8-30



No. 100

0-10

0-10

2.03 **Coarse Aggregate**

Coarse aggregates shall be crushed or un-crushed gravel or crushed stone comprising of angular or rounded in shape and shall have granular or crystalline or smooth (but not glassy) non powdery surface free from friable, flaky and laminated pieces, mica and shall and all such matters as may be injurious to concrete. All coarse aggregate shall conform to BS No. 882 and shall be graded as follows:

<b>B.S. Sieve</b> -----	<b>Passing by weight</b> -----
1" (25.4 mm)	100
3/4" (19.05 mm)	90-100
3/8" (9.53 mm)	20- 55
3/16" (4.765mm)	0- 10

The aggregates shall be stored on properly constructed paving and bins as directed by the Engineer.

There shall be a physical partition between the stock piles of coarse and fine aggregates. If required aggregates shall be washed and screened to the satisfaction of the Engineer. Sieve analysis of all the aggregates to be used in the works shall be carried out as and when required by the Engineer. All aggregate shall be subject to the approval of the Engineer.

Any aggregates not found to be of the specified/ approved standard shall be rejected by the Engineer and all such rejected material shall have to be removed from site without delay.

Floors, sub-base or base constructed with rejected aggregates shall be dismantled and rebuild at the expense of the Contractor.

2.04 **Stone Ballast**

Stone Ballast to be used as soling shall comprise of strong, hard, durable stone of the approved size free from impurities. Quarry sap, dust, dirt and solubility characteristics. The stone shall be obtained from approved quarries and shall be sound, free from laminations and weak cleavages.



2.05 **Water**

Water used for mixing concrete, curing or any other operation of the works specified herein shall be fresh, clean and free from organic or inorganic matters in solution or suspension. Only water of the approved quality shall be used for all construction purpose.

2.06 **Terrazzo Tiles**

Terrazzo Tiles shall be first grade, mechanically compressed type conforming to BS-531. Tiles shall be 12"x12"x1" with a topping of 3/4" thickness composed of 1:2 cement white/grey marble chips in size 1/4" to 3/4" the base being 1:2 cement mortar. The colour, quality of size of chips shall be as per Engineer's direction.

2.07 **Cleaning Compound**

The compound used for cleaning of terrazzo shall be an approved neutral chemical cleaner free from acid and strong alkalies or other material that will effect the colour or otherwise damage the terrazzo and shall not effect the conductivity of terrazzo floors.

2.08 **Marble Chips**

Marble chips shall have an abrasive hardness of not less than 16 as determined by the test of wear resistance in National Bureau of Standards Report BMS 98. Size shall vary from 3/8" to 3/4".

3. **CEMENT CONCRETE FLOORING**

3.01 The materials for C.C. flooring shall be the same as already specified under the item of RCC work.

(a) **Composition of Concrete**

Concrete shall be composed of Portland Cement, sand coarse aggregates and water, all well mixed and brought to the proper consistency. The Contractor shall mix the ingredients as shown on the drawings.

The proportions of the various ingredients shall be determined from time to time during the progress of the work and tests shall be made to samples of the aggregates and the resulting concrete as and when required. The mix proportions and appropriate water- cement ratio will be determined on the

basis of the production of concrete having required strength.

**(b) Mixing Concrete**

The concrete ingredients shall be mixed in a batch mixer for not less than 1-1/2 minutes after all ingredients, except the full amount of water, are in the mixer. The Engineer reserves the right to increase the mixing time when the charging and mixing operations fail to produce a concrete batch throughout which the ingredients are uniformly distributed and the consistency is uniform. The concrete shall be uniform in composition and consistency from batch to batch except when changes in composition or consistency are required. Water shall be added prior to, during and following the mixer charger operations. Excessive over mixing requiring the addition of water to preserve the required concrete consistency will not be permitted. The concrete ingredients shall be mixed by volumetric measurement in purpose made boxes approved by the Engineer/Consultants.

**4. APPROVED MATERIAL AND WORKMANSHIP**

The Contractor shall submit for approval of the Engineer, materials as specified herein or any other materials used in floors, before the delivery of the materials is made to the site of work. The work shall strictly be performed under instruction of the manufacturer's instructions and as approved by the Engineer/Consultants.

**5. INSTALLATION OF TILE FLOORING**

- 5.01 The base shall be prepared by laying cement concrete of specified grade and of thickness shown on the drawings, or specified in the Bill of Quantities. The C.C. floor will be laid over well compacted stone metal, blinded with sand to fill all voids.
- 5.02 The terrazzo tiles will be laid to the required levels and grades over a setting bed of cement or lime concrete, comprising of one part of cement or lime and four part of sand by volume. The thickness of cement or lime concrete shall be as per Bill of Quantities.
- 5.03 The cement concrete chequered tiles shall be laid on concrete base complete as per instructions laid down on the drawings and as directed by the Engineer/Consultants.
- 5.04 The curing period of the setting bed shall be as directed by the Engineer. As large an area of setting bed shall be spread at one time as can be covered with tiles before the



mortar has set. Surplus mortar shall be removed. The thickness of setting bed in any space shall not be less than 1/2".

- 5.05 Floor and wall surfaces to receive the tiles shall be thoroughly cleaned of all dirt, dust, oil and other objectionable matters. Tiles shall be laid out from the centre line of each space in an outward direction and the pattern should be symmetrized with minimum number of cut tiles.

Joints between the tiles shall be of uniform width. Tiles shall be cut with a suitable cutting tool and rough edges shall be rubbed smooth. Tiles shall be laid to the straight edges.

- 5.06 After seven days the terrazzo tile floors shall be machine ground to a true even surface using various grades of abrasive stones as required and directed by the Engineer/ Consultants. After the first grinding the floor shall be grouted with the same colour and tint composition as used for its manufactured. The grout shall be of the consistency of thick cream and shall be brushed pressed over the floor to fill in the joints and after 72 hours the grouting coat shall be removed by grinding till a smooth and even surface is obtained. Area and portion of the floor inaccessible for the grinding machine shall be ground and rubbed by hand. The final gloss shall be given by polishing the surface to the satisfaction of the Engineer/Consultants.
- 5.07 Joints between the tiles shall be minimum width. Tiles shall be cut with an approved cutting tool and rough edges shall be rubbed smooth. Tiles shall be laid to straight edges.
- 5.08 The tile floor should be kept wet for at least 72 hours and no one should be allowed to walk on the tiles during that period.
- 5.09 Freshly placed concrete floor shall be protected to prevent loss of water by covering with damp Hessian, waterproof paper, damp sand or other approved material, and shall be kept constantly damp for a period of four days or longer after concreting as directed by the Engineer/ Consultants. The concrete shall be allowed to dry out slowly over a period of three days after wet curing is completed.

## **6. GRINDING AND POLISHING OF FLOOR**

- 6.01 The complete terrazzo floor shall be kept moist for 6 days there-after and protected from extreme of temperature.

The floor shall than be machine ground, using electrical or mechanical grinding to a true even surface using No.24 grit followed by a No. 80 grit or finer abrasive stone until the marble chips are evenly exposed. After the grinding the floor shall be



thoroughly cleaned using neutral cleaning materials. The floors shall then be grouted with same cement and colour composition as specified for the matrix. The grout shall be to the consistency of cream and shall be brushed over the floor to eliminate all imprisoned air. It shall be cured for 72 hours.

After 72 hours the grout shall be removed by grinding with 180 or 240 grit stones or other abrasives. If the surface still needs grouting, it shall be done similarly a second time and removed after 72 hours. The grinding should be adequate in as much as that the surface should show 70% of its area in exposed aggregates, evenly distributed and conforming in appearance to the approved samples. Small area in inaccessible portions which cannot be reached by machine shall be applied in strict accordance with manufacturer's directions.

The floor shall then be machine buffed. The use of acid in any form for any purpose will not be permitted.

7. **TERRAZZO WORK CAST IN SITU FOR SKIRTING**

White/grey cement shall be as specified in the Bill of Quantities. The work shall consist of a wearing surface of thickness as specified in Bill of Quantities of the grinding and polishing, of marble chips and cement, (of the specified colour) laid over a layer of cement sand mortar (1:3) of the specified thickness shall be applied on the wall for skirting and terrazzo topping of the specified thickness be applied over the base in the ratio 1:2 (one part of cement and two part of marble chips) grinding, rubbing and polishing etc. Complete as per drawings.

8. **MEASUREMENT AND PAYMENT**

The superficial area will be measured in square Meter for all items of work in this section except terrazzo skirting will be paid in Running Feet.



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## **SPECIFICATIONS FOR MARBLE WORK/SAW CUT STONE FLOORING**

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1. **SCOPE**

Work under this section generally includes marble/saw cut stone work in flooring, skirting and marble tiles on columns, wherever required on the drawings or B.O.Q.

2. **CONFORMITY TO WEST PAKISTAN SCHEDULE OF RATES VOL. I, PART II**

Except as otherwise specified, all marble work shall be erected in conformity with West Pakistan Schedule of Rates Vol-I, Part-II No. 24.6 "Marble Flooring" as applicable to the work shown on the drawings and as specified.

3. **MATERIAL**

3.01 **Saw cut stone tile.**

Saw cut stone tile shall be of Terbela Saw cut stone, cut and finished to specified size and thickness of such quality, colour and pattern as approved by the Consultants.

3.02 **Marble Tiles.**

Marble tiles shall be of Malaghori Marble, cut and finished to specified size and thickness of such quality, colour and pattern as approved by the Consultants.

3.03 **Cement.**

Cement shall conform to as given under "Concrete Work".

3.04 **Sand.**

Sand shall be as specified under section "Plaster"

3.05 **Joint Filler.**

Joint Filler shall be white or coloured marble tile grout which shall bond to dry tile, shall be non-shrinking, stain resistant, permanent in colour and shall not inhibit fungus or bacterial growth. It shall be colourless and non-toxic, of smooth consistency for easy preparation and neat rapid installation. Grout shall be water resistant.



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4. **SAMPLES AND TESTS**

Consultant's approval shall be sought for all materials to be used for work and same type of material will be used throughout the work specified. If the Consultants require any material to be tested, this shall be got done by the Contractor on his own cost from any approved Laboratory.

5. **SHOP DRAWINGS**

The Contractor shall prepare shop drawings on the basis of drawings produced by the Consultants for all the Saw Cut flooring work to be carried out on the project. These drawings will show clearly the sizes, method of fixing, jointing and the anchorage to be used in the process and the Contractor shall get approval in writing from the Consultants well in time before the actual start of work.

6. **WORKMANSHIP**

- 6.01 Before laying Saw Cut slabs the surface of the base shall be clean and free of dirt, dust, oil, grease or other objectionable matter. Setting beds and slabs shall be installed with their respective surfaces to true planes, level or pitched to off-sets as required by the drawings, so that the surface of the completed work will be at the elevations and grades shown. Retempering of mortar will not be permitted.
- 6.02 All Saw Cut Stone slabs shall have a true plane surface and shall be accurately sawn, truly square at edges to the full thickness. All slabs for floors shall have an average thickness of 1" Marble tiles on columns and/or skirting shall be of 1/2" and 3/8" thick respectively.
- 6.03 Joints between marble slabs/Saw Cut Stone shall be of uniform width and the same as slab installed. No joints shall be more than 1/16 of an inch in thickness. Fractional changes in dimensions without varying the uniformity of joint widths will be permitted. Slabs shall be laid over cement sand bedding mortar 1:3 of specified thickness. Marble tile on skirting and/or columns shall be solidly backed with mortar.
- 6.04 The marble work shall be protected from the effects of weather. During the progress of the work and for 10 days after laying, the floor shall be kept watered. No weight shall be brought on the surface tile 7 days have elapsed after the completion of laying. When properly set the floor shall be rubbed with carborundum blocks of coarse, medium and fine grade fixed in power driven floor grinder, and washed off thoroughly with running water during each process. After the smoothing process has been completed and the surface has dried a final gloss shall be given by wax polishing the surface as specified to the satisfaction of the Engineer/Consultants.





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7. **MEASUREMENT AND PAYMENT**

- 7.01 The work under this section shall be measured and paid by superficial area on which work has been carried out under the respective items of the Bill of Quantities. The unit of measurement for walls/columns facing shall be per square meter. And for skirting unit rate shall be in running meter. The unit rate shall include the cost of furnishing all the materials, labour, scaffolding, appliances, tools and performing all operations in accordance with specifications drawings and instructions of the Architect for satisfactory completion and finishing of the work.
- 7.02 No separate payment shall be made for producing samples of workmanship, tests to be carried out, preparation of working drawings, protection and maintenance of marble work as specified and the rates for constructed items shall be deemed to be inclusive of all such costs and charges.

## **SPECIFICATIONS FOR CERAMIC TILE WORK**

### **1. SCOPE**

The work covered by this section comprises of fixing in position glazed ceramic tiles on internal walls and floors wherever required on the drawings or Bill of Quantities.

### **2. CONFORMITY TO BRITISH STANDARDS AND CODE OF PRACTICE**

Except as otherwise specified the following British Standards and Code of Practice shall be applicable to materials and fixing methods for ceramic tile work.

- i) British Standard 1281: 966 "Glazed Ceramic Tiles and Tile Fittings for Internal Wall".
- ii) British Standard C.P. 212 for fixing methods and workmanship.

### **3. JOINT FILLER**

Joint Filler shall be white or coloured ceramic tile grout which shall bond to dry tile, shall be non-shrinking, stain resistant, permanent in colour, and shall not inhabit fungus and bacterial growth. It shall be odourless and non-toxic, of smooth consistency for easy preparation and neat rapid installation, and shall contain non metallic material. Grout shall be water resistant and shall not wash out under water.

### **4. ADHESIVES**

Adhesives for ceramic tiling as specified in the British Code of Practice C.P. 212 and of approved make and branch shall be used.

### **5. SAMPLES AND TESTS**

The samples shall be furnished in sized and colours and adequate in number for testing in the Laboratory as and when ordered by the Engineer/Consultants.

### **6. SHOP DRAWINGS**

The Contractor shall prepare shop drawings on the basis of drawings produced by the consultants for all the ceramic tile work to be carried out on the project. These drawings will show clearly the sizes, method of fixing, jointing and the anchorage to be used in the process and the Contractor shall get approval in writing from the Consultants well in time before the actual start of the work.

## 7. WORKMANSHIP

- 7.01 Surface to receive the ceramic tiling shall be clean and free of dirt, dust, oil, grease or other objectionable matter. Setting beds and tile shall be installed with their respective surfaces to true plumb/ planes, levels or pitched to off-sets as required by the drawings, so that the surface of the completed tiling work will be at the elevations and grades shown. retempering of mortar will not be permitted. Tiles shall be laid out from the centre lines of each space outward and adjustments made along well, partitions and borders, if any, so as to symmetrize the pattern with a minimum of cut tiles.
- 7.02 Joints between the tiles shall be of minimum and uniform width and the same as the tile installed. Fractional changes in dimensions without varying the uniformity of joint widths will be permitted. Tile shall be cut with a suitable cutting, tool and rough edges shall be rubbed smooth. Cut tile misfits shall be laid to the straight edges. Straight edges shall be accurately set to the lines established and reset at suitable intervals to keep the joints parallel over the entire area.
- 7.03 Scratch coats for application as foundation coats shall be not less than 1/4" thick and shall be composed by volume of 1 part grey portland cement to 4 parts dry sand, mixed with the minimum amount of water necessary to produce a workable mass. Mortar for scratch coats shall be used within one hour after mixing and retempering will not be permitted. Scratch coats shall be applied in sufficient quantity and with sufficient pressure to cover the entire area and to form good keys, shall be deeply scored or scratched and across-scratched, shall be protected and kept moist during the curing period, scratch coats shall be thoroughly damp-cured, and an interval or not less than 24 hours not more than 48 hours shall be permitted between application of scratch coats and application of float coats.
- 7.04 Joints shall be straight, level perpendicular and of even width throughout. Vertical joints shall be maintained plumb for the entire height of the tile work. Each tile shall be brought to true level and plane by uniformly applied pressure under a straight edge or rubber faced block. Tiles that are out of true plane or misplaced shall be removed and reset, damaged or defective tile shall be replaced. The tile shall be installed as follows:
- "Wall tile shall be set by trowelling a skim coat of neat Portland cement on the floor coat or by applying a skim coat to the back of each tile unit and immediately floating the tile into place. After tile has set, remove paper using a minimum of water. Replace damaged tiles".
- 7.05 After the tiles have been thoroughly set, joints shall be grouted full with a plastic mix of neat white or coloured water proof portland cement immediately after a suitable area of tile has been set. The joints shall be struct flush and excess mortar shall be cut off and wiped from the face of the tile. Interstices or depressions in the mortar joints after grout has been cleaning from the surface shall be roughened at

once begins to harden. The skirting and coves shall be solidly backed with mortar.

8. **MEASUREMENT AND PAYMENT**

The ceramic tile work under this section shall be measured and paid by superficial area on which tile work has been carried out under respective items of the Bill of Quantities. The unit of measurement shall be per square meter. The rate for ceramic work shall cover the cost of furnishing all material, labour, scaffolding, appliances, tools and plants and performing all operations in accordance with specifications, drawings and instructions of the Engineer/Consultants for satisfactory completion and finishing of the work. No separate payment shall be made for producing samples of workmanship, tests to be carried out, preparation of working drawings, protection and maintenance of ceramic tile work as specified and the rates for construction items shall be deemed to be inclusive of all such costs and charges.



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## **SPECIFICATIONS FOR SPLIT/ PORCELAIN TILES WORK**

### **1. SCOPE OF WORK**

The work covered by this section of the specification consists of furnishing all plant, labour, equipment appliances and materials and in performing all operations in connection with the installation of Split Clay Tiles on floors, Internal and external walls, stair case and wherever required on the drawings or specified in the Bill of Quantities.

### **2. GENERAL**

- 2.01 Ceramic split tiles according to this Standard shall be weather proof and corrosion-resistant components of high mechanical strength for wall coverings and floor coverings. They shall be made in a variety of dimension, types & colours, both unglazed & glazed.
- 2.02 The raw material for ceramic split tiles shall be clays with mineral aggregates. The basic mix to be extruded in the plastic conditions mostly in the form of double tiles which shall be then dried and fired.
- 2.03 After firing, the double tiles shall be split into single tiles. The resulting ribs on the rear, usually of dovetail form, provide for secure adhesion.
- 2.04 Ceramic Split Tiles shall be supplied in 15 quality grades. The 1st quality corresponds to the best commercial quality and is designated as "1st grade".
- 2.05 The range of application of this Standard also cover split tile accessories, such as: External angles, skirtings, cover skirtings, windows sill tiles and other special parts.
- 2.06 Only those structural ceramic products which meet the quality requirements laid down in Section 3.2 shall be allowed to be designated as split tile accessories and special according to this Standard.

### **3. QUALITY REQUIREMENTS**

Ceramic Split tiles shall be tested according to Section 4.

- 3.01 Types, dimensions and surface condition.



3.02 Length and Width:

Length and width deviations from the nominal dimensions shall be permissible up to (+,-)1%.

3.03 **Thickness:**

Within a consignment deviations from the average thickness of the tile delivered shall be permissible upto (+,-)10%.

3.04 **Straightness Of Sides:**

Any deviation from the straightness, referred to the length of the side, shall not exceed 0.5%.

3.05 **Rectangularity:**

Any angular deviation shall not exceed 1 degree, i.e.  $\tan 1 \text{ deg.} = 0.0175$ .

3.06 **Flatness of Surfaces:**

Centre curvature, edge curvature and warpage of the surface shall not exceed 0.5% of the length of the corresponding diagonal.

3.07 **Surface Condition:**

The face side shall be free from body cracks, glazing cracks (hair cracks) and blisters. Split tiles with glazes which tend to form glazing cracks (hair cracks) shall be marked by the manufacturer.

Defects affecting the face side of glazed or unglazed split tiles, e.g. minor spelling on edges and corners, pores and pinholes shall be permissible provided that they shall not be obtrusive when viewed under the test conditions described in Section 4.2.6.

Irregularities affecting the face side of split tiles with colour shaded body which is either unglazed, glazed or only partly covered with glaze do not count as defects.



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#### 4. **PHYSICAL AND CHEMICAL PROPERTIES.**

##### 4.01 **Water absorption:**

The water absorption capacity of split tiles with grey-white or light coloured body shall on average not exceed 3% by weight.

##### 4.02 **Modules of rupture:**

When tested according to Section 3.02 the average value shall not be less than 20N/mm sq. and the smallest individual value not less than 17N/mm sq.

##### 4.03 **Scratch hardness of surface:**

###### 1. Scratch hardness of glaze

The scratch hardness shall not be less than 5 on the Mohs scale (appetite).

- i) Finish Face side glazed or unglazed. Condition of face side and colour to be agreed when ordering.

###### 2. Scratch hardness of body of unglazed split tiles

The scratch hardness shall not be less than 6 on the Mohs scale (feldspar).

##### 4.04 **Thermal Expansion:**

The permitted liner coefficient of thermal expansion between 20 and 100 deg. C in K<sup>-1</sup> is  $4 \times 10^{-6}$  K<sup>-1</sup> to  $8 \times 10^{-6}$  K<sup>-1</sup>.

##### 4.05 **Thermal shock resistance:**

Split tiles according to this Standard must be resistant to thermal shock.

##### 4.06 **Frost resistance:**

Split tiles according to this Standard must be frost resistant. Colour-fastness and light-fastness:

The colours of split tiles according to this Standard must be light fast No. colour changes shall be detectable after exposure to ultraviolet radiation for 28 days



4.07 **Resistance of glaze to acids and alkalis:**

The glaze of split tiles according to this Standard must be resistant to acids and alkalis, with the exception of hydrochloric acids and its compounds.

When testing according to Section 4.08 no macroscopically visible change in the glazing shall be found to occur. Minor colour changes or film formation shall be permissible.

4.08 **Acid resistance of unglazed split tiles:**

Unglazed split tiles according of this standard must be acid resistant, with the exception of hydrochloric acid and its compounds.

When testing for acid resistance according to Section 4.09 the microscopic surface examination shall not reveal any visible changes apart from staining and discolouration.

When testing the acid resistance of unglazed split tiles for use in acid-proof tile work according to Section 4.10, the relative weight loss shall not exceed 4%.

Split tiles for lining with brick for chemical apparatus and tanks according to DIN 28 060 and DIN 28 061 must meet the requirements of DIN 28 062, August 1967 edition, Table 1 No. 1.1.2 and No. 1.1.3.

4.09 **Alkali resistance of unglazed split tiles:**

Unglazed split tiles according to this Section shall be alkali resistant, with the exception of hot solutions and cold solutions having a concentration of more than 20%.

When testing the alkali resistance, the microscopic surface shall not reveal any visible change with the exception of staining and discolouration.

4.10 **Resistance to surface abrasion of split tiles for floor coverings.**

The split tiles to be tested must meet the requirements of the stated abrasion class.

5. **TESTING**

5.01 **Sampling:**

The split tiles to be tested must represent the average of those manufactured or





supplied. The samples shall therefore be taken in an evenly distributed manner.

5.02 **Testing of Shapes, Sizes and Surface Condition:**

Number of samples: 10

The sizes are to be stated to the nearest 0.1mm.

5.03 **Length and Width:**

The measurement shall be taken with a sliding gauge according to DIN 862.

The dimensions shall be determined on the individual split tiles by taking the arithmetic mean of pairs of measurements each time.

5.04 **Thickness:**

The thickness of split tiles is measured at the right angles to the ribs on the rear at both ends of the long sides across the ribs, using a sliding gauge according to DIN 862, the jaw length of which must be at least equal to the width of split tile. The thickness of a split tile is taken as the arithmetic mean of the two measured values.

5.05 **Straightness of sides:**

The measurements shall be made with a rule having a length at least equal to that of the side to be measured.

The deviation from straightness is to be stated in % referred to the length of the side concerned.

5.06 **Rectangularity:**

The rectangularity shall be tested at all corners of each sample.

In the event of deviations from rectangularity, the tangent of the angular deviation shall be stated each time.

5.07 **Flatness of Surface:**

The measurement is made on the face side of the split tiles examined, diagonally in both directions.

The maximum deviation from flatness in %, referred to the length of the corresponding diagonal, shall be stated.



5.08 **Surface Condition:**

For the assessment of defects of the face side, the samples shall be illuminated with a glare-less light source having a luminous intensity of 3001x(Lux) and viewed perpendicularly to the tile surface from a distance of 1.50m.

5.09 **Evaluation:**

The testing according to Section 4.2 is deemed to be passed if all samples meet the requirements laid down in Section 3.1.

6. **TESTING OF PHYSICAL AND CHEMICAL PROPERTIES.**

6.01 **Water absorption:**

Number of samples : 10

Testing according to DIN51056, September 1959 edition, Section 5.2, subject to the condition that the storage in water and the cooling period of the sample after boiling is two hours.

6.02 **Modules of rupture:**

Number of samples : 10

Testing according to DIN 51 090

6.03 **Scratch hardness of surface:**

Number of Samples : 5

Testing according to Mohs (non-standardized method)

A sharp-edged mineral, starting with hardness grade 1 on the Mohs scale, shall be drawn with light pressure across the surface the split tile to be tested. The hardness to be stated is that the highest grade at which the surface of the split tile resists scratching.



6.04 **Thermal expansion:**

Number of samples : 2

Testing according to DIN 51 045 Part 1 and Part 28 (at present circulating as drafts).

The dilatometer method used shall be stated.

6.05 **Thermal shock resistance:**

Number of samples : 5

The samples shall be immersed in a container with boiling water, the weight of the water being three times the weight of the samples. After immersion, the water level shall be at least 20mm above the samples. The samples remain in the container until the water comes to the boil again, and in any case for least 10 minutes. Following this, the samples are quenched immediately in water having the temperature of melting ice. The cooling period in the container with cold water is 5 minutes. The weight of the water in this case also shall be three times the sample weight.

This alternation from hot to cold shall be carried out ten times. After each quenching test the sample shall be examined for macroscopically visible change.

The test is deemed to be passed in after ten-fold quenching the samples exhibit no cracks, exfoliation or spalling.

6.06 **Frost resistance**

Number of samples : 5

Testing according to DIN 52 104, November 1942 edition section C.

6.07 **Colour-fastness and light fastness**

Number of samples : 5

Testing according to DIN 51 094.

6.08 **Resistance of glaze to acids and alkalis**

Number of samples : 5 per test solution.

Testing according to DIN 51 092.

**6.09 Acid resistance of unglazed split tiles for wall coverings and floor coverings.**

Number of samples : 5

Testing according to DIN : 5

**6.10 Acid resistance of unglazed split tiles for acid-proof tile work.**

Number of samples : 3

Testing according to DIN 51 102 Part 2.

**6.11 Alkali resistance for unglazed split tiles.**

Number of samples : 5

Testing according to DIN 51 091

**6.12 Resistance to surface abrasion**

Number of samples : 5

A standard is in course of preparation.

**7. MEASUREMENTS AND PAYMENTS**

The superficial area will be measured in square feet for all items of work in this section as specified in the Bill of Quantities.

Description	EN Standard EN176 for BI Tiles		ISO Standard ISO 136006 for Bia Tiles	
	Method No.	Requirement	Method No.	Requirement
<i>Dimensions &amp; Deviations</i>				
<i>Length &amp; Width</i>				
<i>Deviation from work size</i>	EN98	$\pm 0.6\%$	Part-2	$\pm 0.8\%$
<i>Deviation from average size</i>	EN98	$\pm 0.5\%$		$\pm 0.5\%$
<i>Thickness</i>	EN98	$+5.0\%$	Part-2	$\pm 5.0\%$
<i>Straightness of Sides</i>	EN98	$\pm 0.5\%$	Part-2	$\pm 0.5\%$
<i>Rectangularity</i>	EN98	$\pm 0.6\%$	Part-2	$\pm 0.6\%$
<i>Edge Curvature</i>	EN98	$\pm 0.5\%$	Part-2	$\pm 0.5\%$
<i>Centre Curvature</i>	EN98	$\pm 0.5\%$	Part-2	$\pm 0.5\%$
<i>Warpage</i>	EN98	$\pm 0.5\%$	Part-2	$\pm 0.5\%$
<b>Surface Quality</b>	EN98	$+95\%$	Part-2	$+95\%$
<b>Water Absorption</b>	EN99	Avg. $\leq 3\%$	Part-3	Avg. $\leq 0.5\%$



<b>Modules of Rupture</b>	EN100	27 N/mm <sup>2</sup>	Part-4	35 N/mm <sup>2</sup>
<i>Breaking Strength</i>	-	-	Part-4	1300N
<b>Mohs Scratch Hardness</b>	EN101	≥ 6	Not in ISO	Not in ISO
<b>Deep Abrasion Resistance</b>	EN102	205mm <sup>3</sup> Max	Part-6	175mm <sup>3</sup> Max
<b>Thermal Expansion</b>	EN103	9x10 <sup>60</sup> C <sup>1</sup> Max	Part-8	TMA*
<b>Thermal Shock</b>	EN104	Pass/Fail	Part-9	TMA*
<b>Chemical Resistance</b>	EN106	Min. B	Part-13	Min. UB
<b>Frost Resistance</b>	EN202	Pass/Fail	Part-12	Pass/Fail
<b>Coefficient of Restitution</b>	Not in EN	Not in EN	Part-5	TMA*
<b>Slip Resistance</b>	Not in EN	Not in EN	Part-17	
1. <i>Inclined Platform</i>	-	-	Part-17	TMA*
2. <i>Dynamic Coefficient</i>	-	-	Part-17	TMA*
3. <i>Pendulum</i>	-	-	Part-17	TMA*
<b>Stain Resistance</b>	-	-	Part-14	TMA*

## 8. MEASUREMENTS AND PAYMENTS

The superficial area will be measured in square feet for all items of work in this section as specified in the Bill of Quantities.



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## **SPECIFICATIONS FOR CARPENTRY, JOINERY & HARDWARES**

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### **1. SCOPE**

The work under this Section generally includes:

- 1.01 Wood work in wooden doors, wooden panelling, wooden handrails and other works as specified and required in the Bill of Quantities.
- 1.02 Providing and fixing hardware and accessories as provided.

### **2. CONFORMITY TO STANDARDS**

Except as otherwise specified, work under this Section shall conform to relevant British Standards as applicable to work.

### **3. MATERIALS**

#### **3.01 Timber**

Timber shall conform to the applicable requirements of B.S. 2286 'Quality of timber and Workmanship in Joinery' Part I - 'Quality of Timber'. Where teak wood is mentioned in the Specifications, Bill of Quantities and Drawings, it shall be best quality Burmah Teak wood. Deodar wood where specified and wood core for flush doors shall be of best quality well seasoned Deodar wood as approved by the Engineer/Consultants. Timber shall be well seasoned, uniform in substance and colour, free from large or dead knots, cross grains, wind shades, cracks or other blemishes. The fibre shall be straight and smooth and shall not give dull appearance.

#### **3.02 Ply Wood**

Ply wood shall conform to the applicable requirements of B.S. 1445 'British made Plywood' for workmanship and quality. Unless otherwise specified or shown on the drawing, the thickness of the plywood shall be 6 mm and shall be teak veneered for all exposed faces.

#### **3.03 Formica**

It should be of required shade and pattern and of best quality as approved by the Consultants.



### 3.04 Flush Doors

Flush doors shall conform to B.S. 459 'Flush Wooden Doors' and code of Practice C.P. 151 Part I 'Flush Wood Doors'.

### 3.05 Hardware and Accessories

Hardware shall be of best quality and make or approved by the Consultants. Their sizes, materials and number shall be detailed in the drawings and Bill of Quantities and as approved by the Consultants.

Fixing accessories shall conform to the following requirements and applicable British Specifications in particular:

B.S. 325	-	Black Counter Sunk and Washers
B.S. 916	-	Bolts, Screws and Nuts.
B.S. 1202	-	Wire Nails and Cut Nails for Building Purpose.
B.S. 1220	-	Wood Screws.
B.S. 1494	-	Fixing Accessories for Building Purposes.

### 3.03 Hardware and Fittings

#### WEIGHTS FOR TEN NOS. ARTICLES IN KG (Including weight of necessary screws)

SIZE IN MILLIMETRES					
	100 Brass	150 Brass	200 Brass	300 Brass	450 Brass
1. Bolts tower	1.17	1.42	2.14	3.97	--
2. Bolts Al-drop - (Plate thickness 16 to 18 gauge)		-	7.69	11.58	16.54

Tolerance in weight 10%



**SCHEDULE OF HARDWARE FOR DOORS** *(To be as directed by the Engineer/Consultants for 1st class performance).*

SR Door Type Hinges butt Flush Bolt No 125mm brass		Rim Lock	Knob
1. Balance 8	Bolt brass flush with brass shoots straight with sunk side or knot 20mm wide & fixed with sockets or let into any material (length lock 150 mm (2)	150mm with two bolts & two levers with two keys. Yale or equivalent (1) or ALPHA "W" lock	20mm Iron Japanned with screw bolts and nut as for front doors but chromium plated (1)
2. Unbalanced panel door 8	do	do	do
SR Door Type Hinges butt flush bolt No 125mm brass		Rim Lock	Knob
3. Panel door 4	do	do	do
4. Unbalanced Solid Core door 4	do	do	do
5. Solid Core 4	Wrought iron tower bolts with bright sheets and fixed sockets or let into any material but chrom. plated (length 200 mm (1)	Cylindrical lock "Alpha "W" or equivalent lockable from both sides inner and outer (1)	Nil
6. Solid core door with louvers 4	do	do	do
7. Solid core door with glass 4	do	do	do
8. Solid core glass 4	do	do	do
9. Solid core partition door. 4	do	do	do





- 3.04 Brass fittings are to be furnished and oxidized on exposed surfaces. Aluminium fittings are to be anodized on exposed surfaces. Chromium plated fittings are to be best quality of their respective kind and shall have a base coat of brass or copper all as approved. Brass oxidized fittings are to be fixed with brass screws.

**WEIGHTS FOR TEN NOS. ARTICLES IN KG**

(including weight of necessary screws)

SIZE IN MILLIMETRES				
	50 Brass	75 Brass	100 Brass	125 Brass
Hinges Butt	0.39	0.85	1.42	2.27

**Tolerance in weight 10%**

- 3.11 All other fittings shall be best available of its kind as required and approved by the Engineer. Samples shall be submitted to the Engineer/Consultants free of cost for his approval. All fittings such as holdfasts, hinges, tower bolts, locks, door stoppers, door closers shall be included in the rates of items for doors and joinery and no separate payment shall be made on this account.

**SPECIFICATIONS FOR ALUMINIUM COMPOSITE PANEL CLADDING**

*1*  
*GENERAL*

*1.1*  
*References*

1. The Conditions of Contract, Bill of Quantities, Drawings as may be listed in the table of contents, shall be included in and made part of this Contract.

*1.2*  
*Scope of Work*

1. Furnish all labor, materials, tools, equipments and services necessary to complete all Aluminum composite panels and related components indicated on the project drawings and as specified herein.
2. The work of this section consists of the following general categories of work;
  - a) Aluminium Composite Panel (ACP) façade.
  - b) Exterior Colum Covers: Rectangular and Square
3. Metal stud framing and furring as required for the support of the panel wall is to be supplied and installed under this Contract.
4. Programme and sequence of execution to be submitted and approval to be obtained prior to execution of work.

*1.3*  
*Submittals*

1. Shop Drawings: Submit complete shop drawings with all engineering calculations of all work of this section for approval including large scale details of construction and showing method of installation and attachment to the building's supporting structure including anchorage, accessories, etc.
2. Submit samples of typical Aluminum composite panels, of type thickness and finish specified.
3. Submit manufacturer's certificate regarding origin and country of manufacture.
4. Submit panel manufacturer's product data, consisting of complete product description and specification.

5. Submit panel system fabricator's installation manual, indicating the procedures to be followed by the contractor / panel system installer in forming, sealing and installing the attachment system.
6. Submit methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
7. Submit warranty documents specified herein.

#### 1.4

#### *Performance*

This is a performance specification: Panel systems that are not in compliance with the required performance standards listed herein are unacceptable. Note: The listing of a product name, system, or panel system fabricator does not constitute approval unless all performance criteria are met.

1. Aluminum Composite panel shall be the product of approved manufacture only. The country of origin / manufacturing shall be USA, Europe or Japan only. Product of any other origin / manufacturing country will not be accepted.
2. The contractor is required to submit the manufacture's certificate confirming the origin and country of manufacture prior to the shipment of material.
3. At the time of submission of tender the contractor is required to submit for Engineer's approval the name (s) of manufactures together with the name (s) of country of original manufacturing of the product (s) he intends to use in the works.
4. Provide a composite building panel system which has been pre-tested by an independent testing laboratory to provide specified resistance to air and water infiltration and structural deflection, when installed, Systems that are not pre-tested and certified by an independent laboratory prior to bid are unacceptable. The use of a panel manufacturer's generic tests reports in unacceptable; the tests must be for the specific system submitted by the panel system engineer and fabricator.
5. Structural Deflection: Deflection of perimeter framing members shall not exceed L/175 of span length or 3/4" inches, whichever is less; or there shall be no permanent set in excess of 0.100 inches.
6. Performance Test Standards:
  - a) Static Air infiltration (ASTM E283-84) at 10.0 psf (63.3 mph wind and 1.92" H<sub>2</sub>O). Air infiltration shall not exceed .06 cfm per square foot for the fixed wall.
  - b) Static Water Infiltration (ASTM E331-83) at 15.0 psf(77.5 mph wind and 2.88" H<sub>2</sub>O) wit a water spray rate of five (5) gallons per hour per

square foot minimum for 15 minutes, no uncontrolled water infiltration on room side.

c) Structural performance (ASTM E330) shall be tested in accordance with a design pressure of 50 psf. Deflection limitations as listed previously (1.04.B). After initial test, test at 150% of design pressure. No permanent deformation exceeding L/1000 or failure to structural members allowed.

d) Fire Performance Characteristics:

Provide test report on the panel material in accordance with the following:

- a) ASTM-E84
- b) ASTM-E108, Modified
- c) ASTM-E162

e) Expansion & Contraction:

The Aluminum Composite Panel System shall be capable of withstanding expansion and contraction of components caused by a surface building temperature range from 0 C to 85 C without buckling, sealed joint failure, stress on panel system, anchors, fasteners, etc. or reduction in performance.

### 1.5

#### *Quality Assurance*

1. The panel system fabricator shall be approved by the ACP manufacturer.
2. Provide ACP from one of the following.
  - a) ALUCO BOND PLUS Germany
  - b) ALPOLIC / Fr. Japan
  - c) REYNO BOND France
3. Panel system fabricator and contractor/panel system installer shall have as adequate experience to the satisfaction of Project Manager/Engineer. In the event of contrary to above, the involvement of panel manufacturer during fabrication and/or installation will be provided by contractor/panel system installer, at no additional cost to the satisfaction of Project Manager/ Engineer.
4. The panel system fabricator will prepare the shop drawings in accordance with their standard published product data and criteria established by others. The contractor / panel system installer shall be responsible to verify the information contained therein including all dimensions.

In the interest of maintaining job schedules, the panel system fabricator will fabricate all of the materials from the approved set of shop drawings. If field verification of dimensions is required, the contractor / panel system installer shall be responsible to supply these dimensions to the panel system fabricator prior to

engineering/fabricating of the materials. Discrepancies found during field verification shall be corrected by the contractor / panel system installer, at no cost, to the panel system fabricator.

**1.6**

***Product Delivery, Storage & Handling***

1. All materials under this section shall be packaged, boxed wrapped, or otherwise protected to assure complete protection from damage during shipment.
2. Material shall be stored in interior spaces or above ground under protective and ventilated covers and protected from exposure to harmful weather conditions.
3. The contractor / panel system installer shall be responsible for proper storage and handling. Extra protective measures shall be taken to assure that panel edges are secured from damage at all times.

**1.7**

***COORDINATION***

1. The contractor / panel system installer responsible for the work of this section shall coordinate the work of this section with work of other trades affecting. Or affected by, this work to assure the steady progress of all the work of the contract.
2. Before proceeding with installation, the contractor / panel system installer shall be required to inspect all project conditions affecting the work of this section to assure that all such conditions and work are suitable to satisfactorily receive the work of this section.

**1.8**

***WARRANTY***

1. The Aluminium composite material manufacturer (sheet stock) will provide its standard product warranty minimum 20 years.
2. The panel system or fabricator will warrant that the system it supplies will be free from defects in materials and workmanship for a period of ten (10) years from the date of Substantial Completion of Works.

**2**

***PRODUCTS***

**2.1**

***PRODUCT COMPOSITION / MATERIALS***

1. Aluminum composite Panel is to be composed of a noncombustible mineral-filled core sandwiched between two skins of 0.5mm thick Aluminium alloy.

**1. SCOPE**

The extent of the panel system work is indicated on the drawings and in these specifications. The work includes the design, supply, fabrication and installation of ALPOLIC/fr aluminium composite material (ACM)/ panel cladding with all necessary sub-structures, mechanical fixings, hardware and fittings to provide a complete installation, in total conformity with the requirements and intent of the drawings and specification herein.

Panel system requirements include ALPOLIC/fr composite panels with an engineered certified fixing system including matching copings, flashings, fixing hardware, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete watertight installation.

**2. INSTALLER QUALITY ASSURANCE**

The fabrication and installation shall be carried out by such a specialist who has a minimum of 5 years experience in façade manufacturing and installation with ALPOLIC/fr panels and be licensed to the local building authority to do such facade construction and contracting. The specialist is to show the evidence of an accreditation certificate upon tendering.

**3. DESIGN CRITERIA**

ALPOLIC/fr cladding shall be designed and installed as a watertight cassette panel system mechanically fix and installed as individual panels as indicated by the grid layout on the architectural drawings. All sub frames, fixing and joint details shall be designed to perform to the expected structural and thermal loads and movements.

All proprietary fixings including top hats are as per manufacturer's/ distributor's specification. Each panel shall be fastened using extruded aluminium angle brackets with compatible, system engineered and approved fixing hardware. All fastening is to be concealed within the panel joints leaving the exposed panel face clean of fixings. A 12mm minimum construction joint shall be provided between all cladding panels and elements.

All construction joints shall be sealed to conceal fixings and form a watertight seal. The sealer shall be a silicone sealant designed for ACM panel joint seal application and carry a sealant manufacturer's warranty for at least 10 years. The sealant shall be applied to the manufacturer's specification.

Any Horizontal cladding areas shall have a fall away from the vertical façade areas with a slope of 1:15 (5 degrees approx) with the intention of avoiding water pooling.

Based on a surface gloss finish of G30 (30% according to the Gardner Scale), the panel surface shall not have any imperfections such as buckles, creases, oil canning

and other surface defects when viewed at any position but not less than at an angle of 15 degrees to the true plane of the panel, with natural lighting of incident of not less than the same angle.

The composite panel cladding shall be designed to meet or exceed specified performances required for the prevailing local weather conditions.

- 3.1 Design Wind Loading : 100 M/h (N/m<sup>2</sup>) positive and negative. No cladding element shall sustain permanent deformation or failure under loading equivalent 1.2 times the design wind pressure specified. Deflection of any aluminium frame shall not exceed 1/150 of the clear span.
- 3.2 Expansion and Contraction. Panels shall be fabricated and installed as to provide for all expansion and contraction of the components. Changes in temperature due to climatic conditions shall not cause harmful buckling, opening of joints, undue stress on fastening and anchors, noise of any kind or other defects.
- 3.3 Flatness. With a gloss of 30% according to GARDNER Scale, the cladding surface taken individually shall not have any irregularities such as oil canning, waves, buckles and other imperfections when viewed at any position but not less than at an angle of 15 degrees to the true plane of the panel, with natural lighting of incident of not less than the same angle.

#### **4. MATERIAL AND FINISHES**

##### **4.1 ALPOLIC/fr Aluminium Composite Panel**

All cladding panels shall be 4.0 mm thick ALPOLIC/fr aluminium composite panel comprising of a fire retardant (fr) mineral filled core. The cladding panel must meet the standard of Class B and a burning/ flaming droplets result must be d0 when tested to EN 13501-1.

Aluminium panel skin shall be 0.5mm thick 3105 alloy with a recycled content of the aluminium skin to be > 50% post consumer material as well as > 35% secondary production fragments.

The 0.5 mm (3105-H14) aluminium skins shall also consist of a corrosion resistant primer on the inner surfaces facing the core material to prevent possible corrosion. The reverse side shall consist of a polyester base coat or a service coating to protect against corrosive environments.

##### **4.2.1 Principal Properties**

- (a) 0.2% proof stress of aluminium skin (ASTM E8) MPa or N/mm<sup>2</sup> = 150 or greater.
- (b) Dent (impact) test by Du-pont method steel ball weight 0.30 kg at 300 mm = No greater than 0.5 mm

- (c) Tensile strength (ASTM E8) MPa or N/mm<sup>2</sup> to be 29 for 6 mm thick panel; 49 for 4 mm thick
- (d) Delamination strength (climbing drum peel test ASTM D1781) shall be 100 mmN/mm or greater.
- (e) Panel sheet weight if 4mm shall be 7.6 kg/m<sup>2</sup> or if 6mm to be 10.9 kg/m<sup>2</sup>.

#### **4.3 Surface Finish**

The cladding panel face shall be factory prefinished by the ACM manufacturer with a Lumiflon-based fluorocarbon coating applied through a "Die Coating" process with a smooth, fine coating and without directional lines for solid and metallic colours. The coating finish shall have a manufactures warranty for 10 years and delivered with the panel warranty at completion.

The paint process shall be a factory applied three-coat system, consisting of a primer, topcoat and clear coat with a minimum thickness of 28 micron.

The paint surface is to meet the following standards;

- (a) A minimum Pencil Hardness of "H" (ASTM D3363-92a).
- (b) Salt Spray ASTM D-B117-90- 4,000 hrs - 100%
- (c) Colour retention (ASTM D 2244-93) shall achieve a maximum rating of 5 units after 4,000 hours.
- (d) Gloss retention (ASTM D 523-89) shall be a minimum of 70% after 4,000 hours.
- (e) Chalk resistance (ASTM D 4214-89) maximum rating of 8 units after 4,000 hours.

The finished surface shall be protected with a factory-applied self-adhesive peel-off protective film, tested to withstand at least 6 months exposure to local weather conditions without losing the original peel-off characteristic or causing stains or other damages.

#### **4.4 Colour/ Gloss**

The surface shall consist of "Fluoro-polymer" based fluoro-carbon with finishes of Metallic or selection by the Architect. Colours and gloss level on the surface finish shall be subject to the architect's final request/ selections and as detailed in the exterior colour schedule.

### **5. FIXINGS**

- 5.1 Panels and system shall be installed using fasteners, including concealed screws, nuts, bolts and others for those connecting aluminium to aluminium or aluminium to steel shall be of non- magnetic stainless steel.



- 5.2 Blind rivets used for fastening aluminium to sub-frame shall be of aluminium alloy with stainless steel mandrel.
- 5.3 All fixing anchors, brackets and similar attachments used in the erections, shall be of aluminium, non-magnetic stainless steel, zinc coated steel, or hot dip zinc galvanised steel.
- 5.4 Where two surfaces of dissimilar materials come into contact, the surfaces shall be insulated with a layer of PVC or Polyethylene tape.

## **6. FABRICATION**

- 6.1 A set of shop drawings are to be submitted to the architect before fabrication seeking approval.
- 6.2 All cladding panels shall be factory-fabricated and assembled in compliance with the manufacturer's technical data sheets/ manual and such works shall be performed under experienced factory supervision and control.
- 6.3 All panels shall be machined using tools and equipment recommended and approved by the ACM sheet manufacturer. After folding into cassettes, an extruded aluminium profile shall be fixed to the minimum 25mm deep return bend using Ø 5mm blind rivets.
- 6.4 Rivets shall be properly positioned not less than 10mm from the edge of the ALPOLIC/fr panel, and the distance between rivets shall not exceed 500mm.
- 6.5 Fabricated corners of the ALPOLIC/fr panels shall be as per manufacturer's technical manual.
- 6.6 Panels shall be designed and manufactured to withstand the specified wind load. If reinforcement stiffeners are required they are to be applied in strict conformance to the manufacturer's specification. The ends of the stiffener shall be mechanically joined to the panel sub-frame and any chemical bonding process shall meet the manufactures fabrication specification.
- 6.7 Panels shall be erected in accordance with an approved set of shop drawings.
- 6.8 Finished panels shall be stored and transported to site in vertical position, face-to-face resp. back-to-back, with adequate protection to prevent scratches and dents.
- 6.9 The factory applied protective peel-off foil shall only be removed after the panels have been installed on site.

## **7. INSTALLATION**

- 7.1 Panels shall be stored on site in vertical position, face-to face resp. back-to back-, with adequate protection to prevent scratches and dents.
- 7.2 Do not install component parts that are observed to be defective, including warped, bowed, dented, scratched, and broken members.

- 7.3 Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for re-fabrication, if possible, or for replacement with new parts.
- 7.4 Fixing of the cladding structure to the building structure shall be by approved methods in strict accordance to the specification and approved shop and/or erection drawing.
- 7.5 All component parts shall be installed level, true to line with uniform joints and reveals. Maximum deviation for vertical member: 3mm max. in a 5.200m run and 5mm max. in 11.00m run. Maximum deviation for horizontal members: 3mm max. in 8.500m run. Maximum offset from true alignment between the abutting members shall not exceed 1.0mm. The tolerance of the width of the joints between two panels shall be maximum  $\pm 2$ mm.
- 7.6 Cladding panels shall be left protected by the factory applied peel-off foil as long as possible. Under no circumstances shall the peel-off foil on individual panels be partially removed and left exposed to weathering.
- 7.7 Before handing over of the completed cladding, all peel-off foil shall be removed. Panels which were exposed to weathering without peel-off foil shall be cleaned in accordance with manufacturer's recommendation.
- 7.8 A Manufacturer's Warranty shall be issued for 10 years, including the full costs of replacement / re-installation by the manufacturer if a warranty problem is to occur. This warranty is to be issued by the ACM manufacturer and not the ACM material reseller or distributor.

The surface is to be finished with a high –performance Lumiflobased fluorocarbon coating, and the back with wash coating or service coating. Lumiflon-based fluorocarbon paints are to be applied in manufacturer’s continuous coil coating lines. The Lumiflon-based fluorocarbon coating to be complied with the “specification for coated coil for exterior building applications” issued by both the ECCA (European Coil Coating Association) and the AAMA (American Architectural Manufactures Association).

The back of Panel should have polyester-based wash coating or service coating to protect it from possible corrosion problems.

The surface is to be protected with a self-adhesive peel –off protective film. According to weathering tests under normal outdoor conditions, the protective film will with stand six months’ exposure without losing its original peel-off characteristic or causing stains or other damages.

- 2. Panel finish/color to be as selected by the architect from the composite panel manufacturer’s standard paint color charts, or custom color subject to limitation of minimum required quantity by panel manufacturer.

2.2

*PANEL SYSTEM PERFORMANCE REQUIREMENTS*

1. The panel system is to be of a rout and return configuration utilizing a continuous Aluminum extrusion attachment system.
2. The attachment system shall allow for removal of any individual panel within the erected system for damage replacement or access to structure behind the panel, with disturbing adjacent panels. The removed panel must be put into the original tested attachment system.
3. Detail and fabricate panels to the sizes, configurations and layouts as shown on the approved shop drawings. Panel system fabricator's shop drawings will provide for flat panel surfaces within the tolerance and performance requirements of the panel manufacturer.
4. Fabricate all materials in accordance with the approved shop drawings. However, if field measurements are required, they will be supplied to the panel fabricator. All schedules will be based on the later occurrence, shop drawing approval or approval of field measurements.
5. Grain pattern of anodized and metallic finished Aluminum facing sheets to run in same direction, unless otherwise specified.
6. Panels shall be marked to coordinate with the approved shop drawings.
7. Provide protective film on exposed panel faces and leave in place during fabrication.

3

*EXECUTION*

3.1

*PREPARATION*

1. Contractor / panel system installer shall examine all surfaces and conditions which the work of this section is to be applied and notify, in writing, of any defects which would be detrimental to proper installation and alignment of the work. No work shall be erected until all discrepancies have been resolved. Application of materials constitutes acceptance of sub-surfaces and conditions.

3.2

*INSTALLATION*

1. Install composite metal panel system in accordance with the panel system fabricator's approved shop drawings and as illustrated in the fabricator's panel system "installation Instruction Manual".

2. Erect and securely anchor all panels plumb, level, square and true to line in accordance with approved shop drawings. Metal grain of panels to be installed in same direction on anodized and metallic finished material, unless otherwise noted on the approved shop drawings.
3. Tolerances: Maximum deviation from vertical and horizontal alignment of erected panels shall not exceed 3mm per 3600 length of any member, or 6mm in any total run in any line.
4. Use concealed fastening system of non-corrosive type fasteners as recommended by the panel systems manufacturer. These fasteners to occur under all sealant joints. No exposed, visible fasteners are permitted.
5. Provide for necessary structural movement as per relevant BSI/ACI/ASTM Standards.
6. Remove Protective film from panel faces immediately upon completion of panel installation.

### 3.3

#### *PANEL ATTACHMENT SYSTEM*

1. Attachment system includes:
  - a) Fabricated composite metal panels.
  - b) Attachment System.
  - c) Protective film one (1) side of panels.
  - d) Stud framing members required for panel systems support.
2. Attachment System to freely allow thermal movement of each panel.
  - a) Fasteners into or attached to panels are not permitted.
  - b) Metal to metal sliding joints are not permitted.
  - c) Panels to use a continuous perimeter extrusion in a rout and return configuration.

#### 3. Designed System

The designed system is a wet sealed weather tight system without weeps. The building envelope system is such that it prevents conditioned air from reaching the interior panel surface and forming condensation.

#### 4. Panel Removal

- a) Panels are to be removable from the exterior without disturbing adjacent panels and are to be reinstalled with the original installation method, so the tested performance is assured.

5. Panel Protection

- a) Panels to be covered with a protective film during fabrication and erection
- b) Film is to be removed immediately after panel installation.

6. Fasteners

- a) Fasteners exposed to atmosphere to be stainless steel equal.

7. Installation

- a) Panel installation to be performed by workers experienced with commercial panel installation.
- b) Sealant to be installed by the same work men as above or independent caulking contractor as required.
- c) Repair or replace damaged installed products.

3.4

*CLEAN-UP*

- 1. Upon completion, remove temporary coverings and protection of adjacent works areas. Clean installed products in accordance with manufacturer's instruction prior to final acceptance of work.

Remove and legally dispose off all trash and debris resulting from operations of this section.

**SPECIFICATIONS FOR CURTAIN WALL**  
**& STRUCTURAL GLAZING**

**1**

**GENERAL**

**1.1**

**REFERENCES**

1. The Conditions of Contract, Bill of Quantities, Drawings as may be listed in the table of contents, shall be included in and made part of this Contract.

**1.2**

**SCOPE OF WORK**

1. Furnish all labor, materials, tools, equipments and services necessary to complete all Curtain wall and related components indicated on the project drawings and as specified herein.
2. Sealant for a complete curtain wall system shall be a part of this section. Sealant type to be as recommended by the curtain wall system fabricator, supplied and installed by the contractor/curtain wall system installer under this Contract. Color to be selected by architect from manufacturer's standard color selector card. All surface to be primed per recommendations and instructions of sealant manufacturer prior to sealant installation.
3. Programme and sequence of execution to be submitted and approval to be obtained prior to execution of work.

**1.3**

**DESIGN REQUIREMENT**

1. Self-supporting 2 ways structural curtain wall with structural glazed vertical mullions and captured horizontal mullions with pressure plate and covers. Horizontal site lines to be no less than as per Architectural Drawings or otherwise specified. Curtain wall system shall be suitable to accommodate double glass with overall thickness of 24mm (6 + 12 + 6) Glass to be supported at the exterior of the system with the exterior face of the glass no more than as per Architectural Drawings.

2. Aluminum Section

- 2.1 Curtain Walls section will be 2 ½" x 5 ¾" x 3mm thick with approved section and approved quality/manufacture.
- 2.2 Anodized/Powder Coated Aluminum section to be provided to accommodate/fix the glass/glazing as per drawings, specification, bill of quantities or as directed by the Engineer.

*1.4*

*SUBMITTALS*

- 1. Submit complete shop drawings with all Engineering Calculations of all work of this section for approval including large scale details of construction and showing method of installation and attachment to the building's supporting structure.
- 2. Submit samples of typical Aluminum curtain wall sections, glazing, etc., of type, thickness and finish specified.
- 3. Submit curtain wall sections & glazing manufacturer's product data, consisting of complete product description and specification.
- 4. Submit curtain wall system fabricator's installation manual, indicating the procedures to be followed by the contractor / curtain wall system installer in forming, sealing and installing the attachment system.
- 5. Submit methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
- 6. Submit warranty documents specified herein.

*1.5*

*PERFORMANCE*

This is a performance specification: Curtain Wall systems that are not in compliance with the required performance standards listed herein are unacceptable. Note: The listing of a product name, system, or curtain wall system fabricator does not constitute approval unless all performance criteria are met.

1. Provide the manufacturer's stock curtain wall system, adapted to the application indicated, that complies with performance requirements specified as demonstrated by testing the manufacturer's corresponding stock systems according to test methods indicated.

2. Performance Test Standards:

- a) Air infiltration shall be no more than 0.06 CEM per sq. ft. of fixed area at 6.24 PSF pressure differential per ASTM E283-84 as per Drawings, Specification and bill of Quantities or as directed by the Engineer.
- b) System shall meet a water test with no uncontrolled leakage at 15 psf pressure differential with a water rate of 5 gallons/hr/sq. ft. when tested in accordance with ASTM E331-86.
- c) Structural performance: Design, engineer, fabricate, and install the glazed Aluminium curtain wall system to withstand the effects of a wind load of 50 psf acting inward and outward, normal to the plane of the wall, when tested in accordance with ASTM E 330, with no material failures or permanent deformation of structural members.

Structural test pressure shall be equal to 150 percent of the inward and outward acting design wind pressures.

Deflections: The curtain wall system shall be capable of withstanding building movements including wind loading and of performing within the following limitations:

- I. Deflection of framing members perpendicular to the plane of the wall, shall not exceed  $L/175$  of its clear span.
- II. Deflection of members parallel to the plane of the wall, when carrying its full dead load, shall not exceed an amount that will reduce glass bite by less than 75 percent of the design dimension and shall not reduce edge clearance between itself and the panel, glass, or other fixed member immediately below to less than an inch.



- d) Thermal movements: The glazed curtain wall system shall be capable of withstanding expansion and contraction of components caused by an ambient air temperature range from 0 C to 50 C without buckling, stress on glass, edge seal failure, excess stress on curtain wall structure, anchors and fasteners or reduction in performance.  
Maximum surface temperature for the exposed face will not exceed 85 C.
- e) Condensation Resistance Factor (CRF) will be determined in accordance with AAMA Specification 1503.1 – 1988 procedure. Text unit 6' 0" x 6' 8" using two equal size lites of 1" insulating glass units composed of two nominal "clear lites with a nominal " air space and an aluminum spacer system. The thermal transmittance coefficient (U Value) will be determined in accordance with ASTM C236-89 and AAMA 1503.1- 1988.
- f) Sealant performance requirements as per relevant ASTM/BSI Standards.

#### **1.6**

#### **QUALITY ASSURANCE**

1. The curtain wall system fabricator shall be approved by the curtain wall sections manufacturer.
2. Curtain Wall system fabricator and contractor/curtain wall system installer shall have a adequate experience, to the satisfaction of Project Manager/engineer. In the event of contrary to above, the involvement of manufacturers during fabrication and for installation will be provided by contractor/curtain wall system installers at no additional cost, to the satisfaction of project Manager / Engineer.
3. The contractor / curtain wall system installer shall be responsible for a complete, sealed and weather-tight installation.

4. The curtain wall system fabricator will prepare the shop drawings in accordance with their standard published product data and criteria established by others. The contractor / curtain wall system installer shall be responsible to verify the information contained therein including all dimensions.

In the interest of maintaining job schedules, the curtain wall system fabricator will fabricate all of the materials from the approved set of shop drawings. If field verification of dimensions is required, the contractor / curtain wall system installer shall be responsible to supply these dimensions to the curtain wall system fabricator prior to engineering/fabrication of the materials. Discrepancies found during field verification shall be corrected by the contractor / curtain wall system installer, at no cost, to the curtain wall system fabricator.

#### *1.7*

#### *PRODUCT DELIVERY, STORAGE & HANDLING*

1. All materials under this section shall be packaged, boxed, wrapped, or otherwise protected to assure complete protection from damage during shipment.
2. Materials shall be stored in interior spaces or above ground under protective and ventilated covers and protected from exposure to harmful weather conditions.
3. The contractor / curtain wall system installer shall be responsible for proper storage and handling. Extra protective measures shall be taken to assure that edges are secured from damage at all times.

#### *1.8*

#### *COORDINATION*

1. The contractor / curtain wall system installer responsible for the work of this section shall coordinate the work of this section with work of other trades affecting, or affected by this work to assure the steady progress of all the work of the contract.

2. Before proceeding with installation, the contractor / curtain wall system installer shall be required to inspect all project conditions affecting the work of this section to assure that all such conditions and work are suitable to satisfactorily receive the work of this section.

**1.9**

**WARRANTY**

1. The Aluminium curtain wall sections manufacturer (sheet stock) will provide its standard product warranty.
2. The panel system or fabricator will warrant that the system it supplies will be free from defects in materials and workmanship for a period of ten (10) years from the date of Substantial Completion of Works.

**2**

**PRODUCTS**

1. Aluminium

Extrusions shall be 6063 – T% alloy and temper (STM B221 alloy G.S. 10A- T). Fasteners, where exposed, shall be Aluminium, stainless steel or approved equipment in accordance with relevant BSI/ASTM Standards.

2. Sealant

Sealant of only approved manufacturer's shall be used for curtain wall. The approved manufacturer's are.

M/s. WACKER	-	GERMANY
M/s. DOW CORNING	-	BELGIUM
M/S. RHONE POULNCE	-	FRANCE

In order to ensure that genuine quality of sealant is being used the contractor will be required to submit the invoices and import documents before the delivery of material at site.

### 3. Expansion Anchors

Expansion Anchor of appropriate type and size shall be used for fixing of M.S. brackets. The expansion anchors of only the following approved manufactures shall be used.

M/s. Hilti	-	Liechtenstein
M/s. Spit	-	France
M/s. Fischer	-	Italy
M/s. Rawl Plug	-	U.K.

In order to ensure that only genuine quality of expansion anchors are being used the contractor will be required to submit the invoices and import documents before the delivery each consignment at site.

### 4. APPROVED ALUMINIUM PROFILES MANUFACTURER:

Provide the aluminium profiles from one of the following approved Manufacturers

M/s. Gulf Extrusion	-	U. A. E.
M/s. Balenco	-	Bahrain
M/s. Alupco	-	Saudi Arabia
M/s. Napco	-	Oman

3

#### *EXECUTION*

##### *3.1*

#### *PREPARATION*

1. Contractor / curtain Wall system installer shall examine all surfaces and conditions which the work of this section is to be applied and notify, in writing, of any defects which would be detrimental to proper installation and alignment of the work. No work shall be erected until all discrepancies have been resolved. Application of materials constitutes acceptance of sub-surfaces and conditions.

**3.2**

**INSTALLATION**

1. install curtain wall system in accordance with the curtain wall system fabricator's approved shop drawings and as illustrated in the fabricator's curtain wall system " Installation Instruction Manual"

Curtain wall system installation to be performed by workers experienced with commercial installation.

Sealant to be installed by same workmen as above or independent caulking contractor as required.

2. Erect and securely anchor all curtain wall section plumb, level, square and true to line in accordance with approved shop drawings.
3. Contractor / Curtain wall system installer to prime surface as recommended by sealant manufacturer. Install sealant with approved sealing materials, in accordance with sealant manufacturer's recommendations. Finished sealant joints to have clean edges.
4. Sealant Joints
  - a) Vertical joint width shall not be more than 1 ¼".
5. Protection
  - a) Protect installed products finish surface from damage during construction.
6. Repair or replace damaged installed products.

**3.3**

**CLEAN – UP**

1. Upon completion, remove temporary coverings and protection of adjacent works area. Clean installed products in accordance with manufacturer's instruction prior to final acceptance of work.

Remove and legally dispose off all trash and debris resulting from operations of this section.

## **SPECIFICATION FOR GLASS**

### **1 GENERAL**

#### **1.1 DESCRIPTION**

**1. Work included:**

The work covered under this section of the Specifications consists of furnishing all labour, equipment and providing glass, gaskets, sealants, compounds and accessories required for performing all operations in connections with the installation and setting of glass, glazing complete in every respect in accordance with the Drawings or as directed by the Engineer. The scope of this section of specifications is covered with detailed specification as laid down herein.

Curtain Wall Glass 6 mm thick imported clear glass.

Doors & Windows 5 mm thick clear imported glass.

#### **1.2 QUALITY ASSURANCE**

**1. Qualification of installers:**

Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall completely familiar with the requirements of this Work, and personally direct installation performed under this Section of these specifications. Installation of glass shall be performed only by skilled glaziers.

- a) The glazier must examine the framing and glazing channel surfaces, backing, removable stop design, and the conditions under which the glazing is to perform. Do not proceed with the glazing until unsatisfactory conditions have been corrected in a manner acceptable to the glazier.

b) Weather Conditions:

Do not proceed with installation of liquid sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.

**1.3**

**SUBMITTALS**

1. Within 30 days after issuance of Letter of Intent (LOI), and before any glazing is delivered to Job site, submit three samples of each glass type (1ft x 1ft), three samples of glazing accessories i.e. Sealants, gaskets, etc.
2. Contractor shall also submit printed material manufacturer's installation instructions for specified glazing gaskets, compounds sealants and accessories including description of required equipment, procedures and precautions to be observed.

**1.4**

**PRODUCT HANDLING**

1. Protection:

Protect glass and glazing materials before, during, and after installation and protect installed work and materials of other trades.

2. Delivery materials in manufacturer's original, unopened containers clearly labeled with manufacture's name and address, material, brand, type class and rating as applicable. Store the materials in original unopened containers, with labels intact, protected from ground contact and from the elements.

Handle the materials in a manner to prevent breakage of glass and damage to surfaces, and shall exercise exceptional care to prevent edge damage to glass.

3. Replacements:

In the event of damage, immediately make repairs and replacements to approval of Engineer, at no additional cost to Employer.

**2**

**PRODUCTS**

**2.1**

**GLASS**

1. Glass shall bear the label of its manufacturer, be clear, free of scratches and distortion-free of first quality from approved source / manufacturer conforming to BSI / ASTM/ Federal Specification USA and follow the recommendations of FGMA, AAMA, SIGMA and IGMAC.

**2.2**

**GLAZING ACCESSORIES**

1. Glazing accessories shall be new, first quality of their respective kinds, and subject to the approval of Engineer.
  - a) Sealant as per relevant BSI/ASTM/ASI Standards.
  - b) Compression glazing strips and weather stripping as per relevant BSI/ASTM Standards.

**2.3**

**OTHER MATERIALS**

1. Materials and methods not specifically described but required for proper installation of glass, shall be provided by Contractor subject to prior approval of Engineer, at no additional cost to Employer.

**3**

**EXECUTION**

**3.1**

**SURFACE CONDITIONS**

1. Inspection:
  - a) In the event of discrepancy, immediately notify Engineer.
  - b) Do not proceed with installation in areas of discrepancy until they have been fully resolved.



3.2  
GLAZING

1. Exterior Glazing

- a) Set glass in a true plane, tight and straight, on setting blocks at quarter points, firmly anchor to prevent ratting and looseness, with edges cleanly cut. Do not nip or seam edges. Rebates and grooves shall be clean, dry and unobstructed at the time of glazing.
- b) Edge clearance shall be equal all around each panel and not less than 1/8 in (3mm).
- c) Apply sealant cap bead both side of glass, tool smooth, remove excess.
- d) Glazing shall be weather tight and watertight.
- e) Glazing work shall comply with the recommendations of the glass and glazing materials manufacturers.
- f) Examine each piece of glass and discard and replace glass with edge damage or face imperfection.
- g) Clean glazing channels and other framing members indicated to remove glass. Remove coating which are not firmly bounded to the substrate, remove lacquer from metal surfaces wherever elastomeric sealants are to be used. Wherever recommended by the sealer manufacturers.
- h) Trim and clean excess glazing materials from surrounding surface immediately after installation and eliminate stains and discolorations.
- i) Cure glazing sealants and compounds in compliance with manufacturer's instructions, to obtain high early bond strength internal cohesive and surface durability.
- j) No glazing shall be considered complete until and unless paint and other stains have been removed from the surface of the glass.

- k) While glass operation is in progress great care shall be taken to avoid breakage or damage to the glass and adjoining glazing. The contractor shall make good at his own cost, all glass broken by his workmen while cleaning or carrying out other operations. On the completion of the glazing work, all glass that has been set by the contractor shall, if it becomes loose, within the maintenance period, be refixed at contractor's expense.
- l) In the event that any panel is cut short so that the clearance exceeds the required dimension and renders the gaskets loose, the panel shall be replaced by the contractor.
- m) Compression glazing strips and weather stripping shall be of suitable size and shape to fit tightly between the glass and window/door sections are confined to corners of glass panes, and no joint are visible on any side of the glass panes, and no joint are visible on any side of the glass pane after completion of installation.

#### **3.4**

##### ***CLEANING UP AND PROTECTION***

1. Upon completion of glazing, thoroughly clean glass surfaces, correct imperfections, replace damaged glass, and leave labels on the glass until they have been inspected and approved by engineer. Remove labels immediately thereafter and clean glass.

Remove all smears, labels and excess glazing sealant, leave clean inside and outside and free from scratches. The contractor shall be responsible for the protection of installed glass. Before final acceptance, damaged or broken glass shall be removed and replaced with new glass at no additional expense to the employer.

All glazing surface shall be washed clean both inside and outside prior to final acceptance by the Engineer.

#### **4**

##### ***MEASUREMENT AND PAYMENT***

1. General: No Payment shall be made for the works involved within the scope of this section of specification unless otherwise specifically stated in the Bill of Quantities or herein.

The cost there of shall be deemed to be included in the quoted unit rate of the relevant item of the Bill of Quantities.

The unit rate shall include the cost of glazing, sealants beads, tapes, gaskets, labour, manpower, equipment, etc. and compound for fixing the glass, all hardware fitting as per manufacturer's recommendations or as shown on the drawings. Payment shall constitute full compensation for all the works related to the item.

## **Architectural Specification**

### **PART 1 – GENERAL**

#### **1.1 SUMMARY**

A. The Tensioned Fabric Structure Manufacturer (hereafter referred to as “TFS Manufacturer”) shall be responsible for the design, engineering, fabrication, supply and installation of the work specified herein. The intent of this specification is to have single source responsibility for the above functions.

B. Performance Requirements: The TFS Manufacturer shall be responsible for the configuration, fabrication and erection of the tensioned membrane structure. All materials provided shall be new and unused.

C. Erection of the complete system shall be the responsibility of the same firm designing and manufacturing the building.

D. The fabric structure shall be a cable and/or frame supported tensioned membrane structure. The fabric shall have low elongation characteristics under tension and shall assume an anticlastic configuration. Structures that have designs incorporating fabric in a flat or mono-axially curved configuration at any location in the roof will not be acceptable.

E. Provide a structure as shown in the drawings and described in this specification. Foundations and anchoring for the structure shall be the responsibility of General Contractor or the TFS Manufacturer.

#### **1.2 SUBMITTALS**

A. Data: Manufacturer product data, including specifications and installation instructions for each component of the TFS. Include laboratory test reports and other data, where applicable.

B. Engineering drawings: 11” x 17”, dimensioned drawings for the TFS signed and sealed by a licensed civil or structural engineer. Include plan view, elevations, details, sections, connections, and anchorage/footings.

C. Samples: Fabric, 8 ½” x 11” minimum

D. Structural calculations: Signed and sealed by a registered structural or civil engineer specializing in TFS design and engineering.

D. Structural calculations: Signed and sealed by a registered structural or civil engineer specializing in TFS design and engineering.

### **1.3 QUALITY ASSURANCE**

1. Have been in continuous operation as a professional fabric Tension Structure manufacturer for a minimum of five years prior to this contract.
2. Hold a valid general contractor's license for a minimum of two years.
3. Welder Qualifications: The personnel manufacturing the metal awning frames must be certified welders.
4. Provide written Welding Procedure Specifications.
5. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where project is located and who is experienced in providing engineering services for installing Tensioned Fabric Structures similar to those indicated for this project and with a record of successful in service performance.
6. Hold daily Safety Tail Gate Meetings before start of installation work.
7. When forklifts are used at the job site, the operator must be Fork Lift Operation Trained.
8. The Tension Structure fabricator must provide proof of full-time Quality Assurance manager.
9. The Tension Structure manufacturer must provide proof of workers compensation insurance coverage.
- 10 TFS Manufacturer is required to be a current member of a professional trade association, i.e., Lightweight Structures Association.

### **1.4 WARRANTY**

- A. Warrant frame materials and workmanship against defects for a period of 1 year from date of substantial completion of the work. membrane structure will meet all applicable codes.
- C. The structureB. Warrant fabric materials and workmanship against defects for a period of 4 to 7 years (depending on selected and approved fabric), on a prorated basis, from the date of substantial completion of the work and/or offer the same warranty offered by the fabric mill that manufactured or supplied the fabric.

### **1.5 DESIGN**

- A. The structural design shall comply with applicable codes and regulations. Details for the fabric structure shall include:

- a. Large deflection numerical shape generation that will insure a stable, uniformly stressed, three dimensionally curved shape that is in static equilibrium with the internal prestress forces and is suitable to resist all applied loads.
- b. Large deflection finite element method structural analysis of the membrane system under all applicable wind, seismic and snow loads.
- c. Finite element method structural analysis of the support frame system.
- d. 1. Based on the structural calculations as defined in this section, prepare structural design drawings defining the complete structure, precise interface geometry determination, reaction loads imposed on foundations, anchoring loads, connection details, interfaces and seam layouts.
- 2. Structural calculations for the fabric structure shall include:
  - a. Large deflection numerical shape generation that will insure a stable, uniformly stressed, three dimensionally curved shape that is in static equilibrium with the internal prestress forces and is suitable to resist all applied loads.
  - b. Large deflection finite element method structural analysis of the membrane system under all applicable wind, seismic and snow loads.
  - c. Finite element method structural analysis of the support frame system.
  - d. Member sizing calculations of all primary structural members.
  - e. Connection design including bolt, weld and ancillary member sizing.

## 1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire resistance ratings for Tensioned Fabric Structure covering.
- B. EPP's include products that have low VOC content, high recycled content, and are manufactured, fabricated, or extracted within 500 miles of the construction site.

## 2.2 MATERIALS

### ARCHITECTURAL FABRIC MEMBRANE MATERIALS:

- 1. PVC (Polyvinyl Chloride) :
  - a. Raw Material: Polyester
  - b. Construction: PVC/PVDF Coated Polyester

- c. Tensile Strength: to meet requirements of engineer
- d. Light Transmission: 8% - 14%, depending on required strength
- e. Coe. Color: White f. Expected Service Life: 10 Years (Warranty is 5 Years)

**2. HDPE (High Density Polyethylene)E (High Density Polyethylene)**

- a. Mesh fabric made from UV stabilized HDPE
- b. Fire Retardancy: NFPA 701
- c. Sewn with PTFE thread in a zig-zag stitch to prevent failure under tension
- d. Color: As approved by architect/owner from available selection
- f. Expected Service Life: 10 Years (Warranty 5 Years)

**2.3 STRUCTURAL STEEL FRAMING**

1. Structural frame shall be fabricated from structural steel using standard shapes. The steel shall be minimum ASTM A36 for standard profiles and A500 Grade B for structural tubes.
2. The fabrication of the steel shall be in accordance with guidelines set forth in the AISC steel design manual and the AWS code of structural welding. All welds shall be in accordance with manufacturers design and performed prior to shipping. No welding shall be performed in the field unless authorized in writing by the Owner or Owner's representative.
3. The structural members shall be fabricated in as large segments as possible to minimize field joints.
4. All segments of the assembly will be welded or stamped with the appropriate part number in a manner that will still be visible after powder coating is applied.
5. Grind all corners and sharp edges.
6. The steel shall be polyester powder painted to a minimum of 3 mils.
7. Steel will require abrasive blasting and primer before application of the polyester powder paint finish.



**INTERNAL GLASS PARTITIONING & MISCELLANEOUS WORKS FOR  
SHAHEED MOHTARMA BENAZIR BHUTTO ACCIDENT, EMERGENCY &  
TRAUMA CENTRE AND ANCILLARY SERVICES COMPLEX AT CIVIL HOSPITAL, KARACHI.**

**ABSTRACT OF COST**

1.	Part - "A"	....	Rs. _____
2.	Part - "B"	....	Rs. _____
3.	Part - "C"	....	Rs. _____
Total Cost of Project			Rs. _____

(Rupees \_\_\_\_\_)

Date: \_\_\_\_\_

\_\_\_\_\_  
Signature & Seal of Contractor





**INTERNAL GLASS PARTITIONING & MISCELLANEOUS WORKS FOR  
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**(BILL OF QUANTITIES)**

S. No	Description	Unit	Qty.	Rate	Amount
<b><u>PART - "A"</u></b>					
1.00	Skilled & non-skilled labour for dismantling, cutting cheisling upto 3" to 12" wide and 3" to 8" thick any surface at any height of 15 storied building such ceramic tile work, marble, granite work, plain cement, R.C.C. work including cutting steel bars etc. using required apparatus cutter, grinder, manual cheisler hammer including all charges i.e. Water, Electricity, part of apparatus T&P etc. wherever required and making good after completion the cheisling, cutting etc. cover with rough plaster or construct with wire mesh as per specification & instruction of Client / Consultant complete in all respect.	Sft.	2,300		
2.00	<b><u>BLOCK MASONRY:</u></b>  Providing & laying first class solid 1:3:6 ratio block masonry set in cement mortar 1:4 in straight or curved wall including scaffolding, raking out joints and curing etc. at any height and any floor complete in all respect as per design, specifications and as directed by Client /				
	a) 6" thick	Sft.	900		
	b) 4" thick	Sft.	1,250		
3.00	<b><u>PLASTERING &amp; RENDERING:</u></b>  Applying cement plaster on Columns, Beams, Walls etc. straight using mortar tag at more than 5'-0" wide area or curved surfaces upto any height including curing scaffolding, cutting using corner beads with specialized mesh at corners mortar should be prepared on metal sheet or thick plastic sheet etc. complete as per drawing complete in all respect as approved by Engineer/Consultant.	Sft.	1,050		
	<b><u>FLOORING / TILE:</u></b>  Laying 16" x 16" or any size (approved by Client / Consultant) China make Porcelain Matt finish Tiles with 2-1/2" thick base floor in 1:6 cement sand mortar including cutting, wastage and jointing fill by matching colour at any floor & any height new and repair work edges should be align and leveled complete in all respect as per design & specification and direction by Client / Consultant.	Sft.	4,700		



S. No	Description	Unit	Qty.	Rate	Amount
<b>4.00</b>	<b><u>DOOR FRAME</u></b> Providing & fixing 5" and 7" wide 16 SWG galvanized metal frame align with the reference wall comprising M.S. Hold Fast 8" length 4 Nos. each side and S.S. 6" hinges with S.S. 4" screw, pouring concrete 1:2:4 at hollow part of the frame, matching colour at any height any floor as per design, specification and direction by Client / Consultant complete with all respect. 5" wide 7" wide	Rft. Rft.	124 103		
<b>5.00</b>	Supplying & installation of 4'-0" wide Iron Staircase at Helipad platform to roof level 176' - 0" to 204' - 0" comprising 3" x 6" x 1/8" and 2" x 4" x 1/8" "U" type angle iron clad chequered plate on tread and riser over the foudation of anchor bolt & 1/4" thick M.S. 10" x 10" plate as per site requirement along with 3'-0" high 2" dia MS pipe 16 gauge railing including welding, nut bolt tighteners, red oxide primer surface colour as per drawing & specification and direction by Client / Consultant complete in all respect all charges lifting, elevating, placement at any floor any height should be included.	Sft.	350		
<b>6.00</b>	Providing & fixing of natural anodized/ Powder Coated aluminum 2 way structural curtain wall system using 4" x 2" section with top hung concealed with attached with 4 bar friction stay heavy duty. Including M.S. Brackets, joiners, N.V. rubber gasket, Nickel plated screws, galvanized bolts & nuts, (imported silicone sealent and Hilti or Fischer expansion bolts) with 6mm thick clear imported glass (distortion free) at any height any floor a) Curtain Wall	Sft.	290		
<b>7.00</b>	Providing & fixing of imported aluminum Composite Panel <b>ALPOLIC</b> fire rated cladding Mitsubishi Japan origin 4mm thick in Metallic G30% finish. Including local aluminum base framing with Nickel plated screws, Galvanized nuts, bolts, washers & aluminum rivets at any height any floor .	Sft.	340		
<b>8.00</b>	Supplying & installation at 204' level helipad moveable railing as per drawing and specification along with complete mechnism consisting of 2" dia, 1-1/2" dia, 3/4" dia 16 gauge S.S. pipe of 304 grade along with 3" x 2" S.S. plate embeded in slab 1"□ 16 gauge mesh welded with includig grinding, welding, cleaning making good any concrete surface complete with all respects as per directions by Client / Consultant.	Sft.	1,200		



S. No	Description	Unit	Qty.	Rate	Amount
9.00	Providing & installation of locally fabricated of Stainless Steel or Granite recessed type drinking water Fountain along with push type faucet, 1½" dia Stainless Steel waste fitting, Stainless Steel Bottle Trap and waste pipe of 1½" dia. Complete installation in wall at any floor and height, making connection to chilled water and drain pipe. Complete in all respects as per directions of Engineer Incharge.	Nos.	34		
10.00	Making & applying lane marking at parking area on different floor at any height any floor of various direction according to parking management rule approx. area 33000 Sft. (For more or less area payment adjusted from total amount) in all respect as per instructions of the Client / Consultant.	Job	1		
11.00	Providing & fixing of deluxe model Aluminium glazed wall and swing door single leaf double leaf action (exclusive S.S. push plate and Aluminium rail) in 4" x 2mm section in natural anodized finish. Including door lock, floor hinge, 8mm thick clear tempered glass and silicon sealant both side. Glazed wall Door	Sft. Sft.	1,800 520		
12.00	Providing & fixing of single glazed Aluminium top and central hung openable window in 4" x 2mm section in Powder coating RAL finish. Including S. S. friction stay and 5mm thick clear glass (non tempered) color and section complete in all respect at any height any floor as per instruction by Client / Consultant.	Sft.	2,500		
13.00	Supply and fixing of wood plastic composite(WPC) door and as per designs, colours and sizes with all fittings, at any height and floor. Complete in all respect and as per drawings and instructions of the Engineer/Architect. <b><u>DOORS</u></b>	Sft.	985		
14.00	Supply and fixing of wood plastic composite(WPC) windows as per designs, colours and sizes with all fittings, at any height and floor. Complete in all respect and as per drawings and instructions of the Engineer/Architect. <b><u>WINDOWS:</u></b>	Sft.	1,930		
15.00	Supply and fixing of wood plastic composite(WPC) ventilators as per designs, colours and sizes with all fittings, at any height and floor. Complete in all respect and as per drawings and instructions of the Engineer/Architect. <b><u>VENTILATOR</u></b>	Sft.	2,700		



S. No	Description	Unit	Qty.	Rate	Amount
16.00	Making & installation 8 mm thick Acrylic Plastic Sheet as per graphical design along with fly proofing aluminum wire mesh screwed with 1" wide 2 mm thick aluminum strip upon 1½" square aluminum pipe with aluminum rowel bolt 4" long the installation / erection applied upto 15 storied high building at window and ventilator opening complete with all respect colour and instruction as per drawing & instruction of Client / Consultant.	Sft.	3,700		
17.00	Providing & fixing Iron Grill at any floor any height for external surface of SMBB Trauma Centre Hospital as per drawings and specificaiton comprising 1" x 1/2" square pipe including welding, grinding, cleaning along with wire mesh (Fly proofing) Enamel paint as per instruction. Prior to paint prepare surface by two coat red oxide making good after drilling for fixing (Plastering & paint at out surface) complete with all respect as per direction of Client / Consultant.	Sft.	3,700		
18.00	Providing & fixing 2" x 2" S/S Angle at edges of wall corner with Screw 3" including drilling rowel plug and making good complete with all respect as per instruction by the Client / Consultant.	Rft.	3,500		
19.00	Supplying of iron rate cage local made as per instruction by Client / Consultant.	Nos.	50		
20.00	Supplying of iron rate catcher local / imported make as per Manufacturer specification.	Nos.	50		
<b><u>PART - "B"</u></b>					
21.00	Supplying & fixing of branded bathroom accessories at any height any floor . The description of accessories are as under:-				
21.01	Tissue holder for 6" wide tissue paper for single roll plastic body white colour.	Nos.	100		
21.02	Same as above for double roll.	Nos.	40		
21.03	Toilet paper louver dispenser plastic body with or without push louver.	Nos.	50		
21.04	Air blower hand dryer of S/S or colour coated body.	Nos.	30		
21.05	Towel Rail 3' metal colour coated	Nos.	50		
21.06	Towel Ring metal white colour coated.	Nos.	50		
21.07	Liquid soap bottle (750 ml) plastic body white color.	Nos.	50		



S. No	Description	Unit	Qty.	Rate	Amount
22.00	<b><u>PIPING WORKS FOR LAUNDRY MACHINES:</u></b> Supplying, fixing and operation of piping works for Laundry Machines at Trauma Centre 13th Floor at level ( ) installation, testing etc. comprising following items with all respects according to drawing, specification and the instruction of Client / Consultant.				
22.01	<b><u>Main Steam Line Dia 4" from Heder to Laundry Area (Overhead).</u></b> - MS Sch-40 including bends, tees, flanges, rock wool and SS cladding / jacketing.	Rft.	150		
22.02	<b><u>Condensate Line Dia 3" from Machines' out-let to Blow Down Tank (Trenched).</u></b> - MS Sch-40 including bends, tees, flanges, rock wool and pinto sheet cladding / jacketing.	Rft.	150		
22.03	<b><u>Main Water Supply Lines (Hot - Cold) Dia 3" to Laundry Area (Overhead).</u></b> - GI Medium gauge including bends, tees, flanges.	Rft.	300		
22.04	<b><u>Main Drain Line Dia 10" from Machines' out-let to Drain pit (Trenched).</u></b> - PVC Medium gauge including bends, tees, unions.	Rft.	150		
22.05	<b><u>Main Air Line Dia 2" from Compressor to Laundry Area (Overhead).</u></b> - MS Sch-40 including bends, tees, flanges.	Rft.	150		
22.06	<b><u>Connecting Utilities to Flatwork Ironer (L50-250).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	1		
22.07	<b><u>Connecting Utilities to Pneumatic Press (LV-800).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	1		
22.08	<b><u>Connecting Utilities to Rotating Press (KP-516).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	1		
22.09	<b><u>Connecting Utilities to Medical Barrier Washer (MB-66).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	2		
22.10	<b><u>Connecting Utilities to Tumbler Driver (D-55).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	2		



S. No	Description	Unit	Qty.	Rate	Amount
22.11	<b><u>Connecting Utilities to Washer Extractor (FS-55).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	1		
22.12	<b><u>Connecting Utilities to Washer Extractor (FXB-180).</u></b> - Including supply, fitting, fixing of all accessories as mentioned in Schematics.	Job	1		
22.13	<b><u>Supply and installation of stainless steel 2000 Lit Feed Water Tank.</u></b> - Dia 4 Ft. Length 5.5 Ft. Stainless Steel Tank by 4mm thick sheet.	Job	1		
22.14	<b><u>Supply and installation of stainless steel Blow Down Tank.</u></b> - Dia 2 Ft. and Height 3 Ft. Stainless Steel Tank by 3mm thick sheet. - Including all accessories and internal steam drop mechism.	Job	1		
22.15	<b><u>Supply and installation of Compressor.</u></b> - Halli (Italian) technical specification available in brochure.  - Including Air Reservoir Tank, Valves and etc.	Job	1		
<b>23.00</b>	<b>COLD &amp; HOT WATER SUPPLY SYSTEM</b>				
	<b>Polypropylene Piping for Cold &amp; Hot Water inside the Toilets</b>				
23.01	Providing, fixing, jointing, testing poly propylene pipe as per BS 5174 or DIN 8028 including specials fittings such as socket, tees, elbows bends, reducer plug and union etc) supported on wall or buried in walls or suspended from roof slab as per specifications including colour tagging complete in all respect, providing sleeve in wall at any height any floor .				
I	20 mm Ø	Rft.	170		
II	25 mm Ø	Rft.	90		
III	32 mm Ø	Rft.	60		
IV	40 mm Ø	Rft.	140		
V	50 mm Ø	Rft.	155		
VI	63 mm Ø	Rft.	85		
VII	75 mm Ø	Rft.	200		
VIII	82 mm Ø	Rft.	160		



S. No	Description	Unit	Qty.	Rate	Amount
<b>24.00</b>	<b>TOILET FITTING AND ACCESSORIES</b> Fixing European type water closet with coupled flushing cistern at any height any floor , including all accessories and fittings, waste and traps, CP flexible pipe, including seat and cover, tee stop cock with check nut, thimble, all joints to service and drains plugging and screwing as necessary to the structure. CLAYTON FIONA WC4503 / LCD3004D / PORTA HD9	Nos.	10		
<b>25.00</b>	Providing and fixing Asian type water closet with low Down flushing cistern at any height any floor complete with all accessories and fittings waste and traps, CP flexible pipe, including tee stop cock with check nuts, all joints plugging and screwing as necessary to the structure. CLAYTON ORIENTAL 11 WC 644 II C/W 3010 AHL / PORTA HD13	Nos.	4		
<b>26.00</b>	<b>WASH BASIN</b> Providing and fixing wash basin with half pedestal at any height any floor with all accessories such as, tee stop cock with check nuts, CP flexible pipe, waste pipe, waste coupling, bracket set, etc. Complete including bottle trap, and mixing valve, silicon sealant, all joint to service and drain, plugging and screwing as necessary to the structure. CLAYTON EAGLE WB 1066 / SR 1703 / PORTA HDLP 203H	Nos.	24		
<b>27.00</b>	<b><u>CHILLED DRINKING WATER GENERATING &amp; DISPENSING SYSTEM</u></b>				
27.01	Manufacturing and supply of pre-piped, pre-wired IME model CWW-300V-60, drinking water system using primary chilled water source at 7OC inlet with an outlet of 12OC to heat exchanger drinking chelled water shall be at 55OF / 12.8OC.	Set	1		
27.02	System shall have a recovery rate of 200USGPH of water from 86OF inlet and 55OF outlet secondary water and generally as per general arrangement drawing and specification & as per instruction of Client / Consultant.	Set	1		
<b>28.00</b>	<b>REVERSE OSMOSIS (R.O.) SYSTEM</b>				
28.01	Providing, Installation, Testing/Commissioning, Operating and maintenance for 6-months from the date of commissioning, packaged type Reverse Osmosis Plant based on brackish/sub-soil/ KWSB water feed of max. 10,000 PPM, ZTDS. The system to be designed for immediate deployment under numerous conditions wherever purified drinking water is crucial, can produce more uninterrupted hours of pure water production in the harshest of envoirement's and from a wide range of available water sources. The system shall be provide with instrumentation to monitor, pre-treatment of feed waters, backwashing of filters, and system flushing, as well as numerous safety features to enhance the operators standard of living.  The Reverse Osmosis Plant Designing parameters for this project shall be as follows:				



S. No	Description	Unit	Qty.	Rate	Amount
	<ul style="list-style-type: none"> <li>- Permeate Production: 10,000 GPD</li> <li>- System Recovery : 43%</li> <li>- Feed Water Design Temperature: 22° C -28° C</li> <li>- Feed Water Requirements: 27.5 – 30 (US) GPM at R.O. Pre-Filtration</li> <li>- Membrane Manufacturer : Flimtec DOW - USA</li> <li>- Number of Pass: 1</li> <li>- Number of Vessels: As required by manufacturer</li> <li>- Elements Per Vessel: 3 each, 8.00"x 40.00"</li> <li>- Feed Water Source: Brackish/sub-soil/ KWSB water</li> <li>- Feed Water Fouling Index (SDI): &lt; 5</li> <li>- Feed Water Turbidity: &lt; 1 NTU</li> </ul> <p>The installation at 13th floor all lifting, rigging charges are included.</p>	Job	1		
<b>29.00</b>	<b><u>POWERED DRAIN CLEANER MACHINE</u></b>				
29.01	<p>Supplying of Powered drain cleaner machine including the cost of all accessories and tools as mentioned below.</p> <p>a) K-400 Drum machine. For 1-1/2"(30mm)- 4" (110mm) drain lines.</p> <p>b) 10mm Cable best for 40mm -75mm lines.</p> <p>c) 12mm Cable best for 75mm – 110mm lines.</p> <p>d) Integrated transport cart.</p> <p>e) Integrated telescopic handle.</p> <p>f) Cable control system.</p> <p>g) "Solid core" cable uses tough 10mm-12mm integral wound solid core cable that is rugged and kink resistant.</p> <p>h) Auto feed.</p> <p>i) Drum capacity= 30.5M. of 10mm diameter Cable and 22.5M. of 12mm Diameter cable.</p> <p>j) Motor= 380 watts/230V Motor spins cable at 165 RPM.</p> <p><b><u>TOOLS</u></b></p> <p>a) Straight auger 125mm long.</p> <p>b) Bulb Augers. 30 &amp; 22mm O.D (One each).</p> <p>c) 'C' cutter 35mm</p> <p>d) Funnel Auger 80 mm.</p> <p>e) Spiral Cutters. (32mm, 40 mm &amp; 45mm) One each.</p> <p>f) 4" Blade cutters. (25 mm, 35mm &amp; 45mm) One each.</p> <p>g) Chain knocker. 50 mm</p> <p>h) Drop Head 110 mm long.</p> <p>i) Tool set 10 mm, including 4- accessories as per manufacturer's recommendations.</p> <p><b><u>ACCESSORIES</u></b></p> <p>a) Drain Cleaning gloves, Leather.</p> <p>b) Drain cleaning gloves PVC.</p> <p>c) Pin key for 1/2" and 3/8" Cables.</p>				





S. No	Description	Unit	Qty.	Rate	Amount
	d) Auto-feed Assembly. e) Drain Assembly. f) 3/8"x 1/2" tool adaptor. g) 3/8"x1/2" Drop head adaptor. h) Coupling 1/2" drop head tool. i) Guide Hose. j) Trap leader.  Complete with all respect as per Manufacturer's specification.	Nos.	2		
<b><u>PART - "C"</u></b>					
<b>30.00</b>	<b><u>LED LIGHTS:</u></b>				
30.01	Providing, fixing, testing & commissioning of complete LED light fixtures along allied accessories such as Chain, Rod, Screw direction of Manufacturer etc. complete in all respect at any height any floor as per drawing, specification and instruction of Client / Consultant.				
30.02	Panel light 35 Watts, size 300 x 1200 x 90 mm colour temperature 4000 K recessed mounted.	Nos.	1,100		
30.03	Panel light 35 Watts, size 300 x 1200 x 60 mm colour temperature 4000 K surface mounted.	Nos.	400		
30.04	Down light 18 Watts, size 200 x 39 mm colour temperature 4000 K surface mounted round shape.	Nos.	650		
30.05	Bed head light 18 Watts, size 1200 x 25 mm wall mounted.	Nos.	450		
30.06	Emergency light (Rechargeable) fixture imported with 1 x 3 Watt wall mounted.	Nos.	95		
30.07	Panel light 18 Watts, size 200 x H 13 Cutout 180 round shape, colour temperature 4000 K Recessed mounted.	Nos.	345		
30.08	Spot light fixture adjustable, complete with 7 Watts LED Lamp.	Nos.	150		
30.09	Emergency "Exit Sign Light" with high intensity LED and 3 hours battery back up.	Nos.	199		
30.10	Pole mounted light with 1 x 120 Watts LED, SPD with driver.	Nos.	12		
30.11	TCW-215 pacific 2 x 18 Watts Colour temperature 4000 K wall mounted / surface mounted.	Nos.	391		



S. No	Description	Unit	Qty.	Rate	Amount
31.00	Supply & erection of grey pointed of street light MS Pole 5 mm thick of size 122, 100 and 50 mm dia for mounting of street light buried 1200 mm deep in foundation to the depth with 1:2:4 cement concrete with graded stone.	Nos.	3		
32.00	<p>Providing, installation, testing and commissioning of UDB - DC1 &amp; UDB - DC - 2 1.5 mm thick sheet steel fabricated wall mounted Recessed (Flash) type suitable for 3 Phase, 415 Volts, 4 Wire 50 Hz, A/C system as per following configuration.</p> <p><b>INCOMING:</b></p> <p>75 Amps Tp 25 KA MCCB 3 Phase indication lamps with fuse 75 Amps Tp COS 1 - 0 - 2 2 - 75 Amps Tp line up terminal Neutral bar, Earth bar.</p> <p><b>OUTGOING:</b></p> <p>9 - 16 Amps SP 6 KA MCB 9 - 25 Amps SP 6 KA MCB 1 - 32 Amps Tp 10 KA MCB</p>	Nos.	3		
33.00	<p>Providing, installation, testing and commissioning of DB - AC 1.5 mm thick sheet steel fabricated wall mounted Recessed (Flash) type suitable for 3 Phase, 415 Volts, 4 Wire 50 Hz, A/C system as per following configuration.</p> <p><b>INCOMING:</b></p> <p>150 Amps Tp 10 KA MCCB 3 Phase indication lamps with fuse 3 - CT 100/5 Amps 1 - Digital Ammeter Scaled 0-100 Amps with PSS 1 - Digital Ammeter 0 - 500 Volts with PSS Bus bar capacity = 140 Amps at 50°C Neutral and Earth bar</p> <p><b>OUTGOING:</b></p> <p>1 - 60 Amps Tp 10 KA MCB 12 - 25 Amps SP 6 KA MCB 9 - 16 Amps SP 6 KA MCB</p>	Nos.	1		
34.00	<p>Providing, fixing, testing and commissioning of DB - DC 1.5 mm thick sheet steel fabricated wall mounted Recessed (Flash) type suitable for 3 Phase, 415 Volts, 4 Wire 50 Hz, A/C system as per following configuration.</p> <p><b>INCOMING:</b></p> <p>40 Amps Tp 10 KA MCCB 3 Phase indication lamps with fuse 40 Amps Tp COS 1 - 0 - 2 2 - 40 Amps Tp line up terminal Neutral and Earth bar</p>				

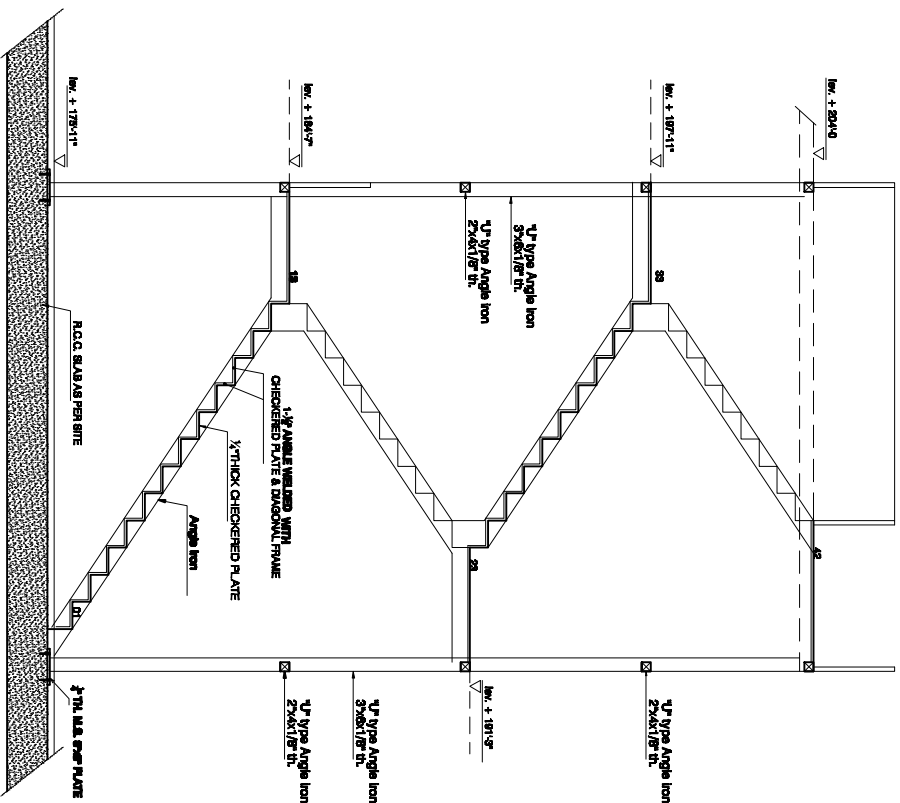


S. No	Description	Unit	Qty.	Rate	Amount
	<b>OUTGOING:</b>				
	9 - 16 Amps SP KA MCB				
	6 - 25 Amps SP KA MCB				
	1 - 32 Amps Tp 10 KA MCB	Nos.	1		
35.00	Providing and wiring of one or first light controlled through one switch wired 3 x 1.5 mm, 1 Core Cu/ PVC insulated cable 25 mm dia PVC conduit complete with all respect (i.e. Ceiling rose pre junction box, flexible PVC conduit below ceiling rose and light fixture.	Nos.	100		
36.00	Providing and wiring of A/C etc. with 3 x 2.5 mm, 1 Core Cu/ PVC insulated cable in 25 mm dia PVC conduit concealed in slab / wall as required.	Nos.	40		
37.00	Providing, fixing and connecting of Clipsal MK make gang switches fixed in suitable size PVC back boxes recessed in wall or surface on wall as required.				
37.1	10 Amps Switch Two Gang	Nos.	30		
37.2	10 Amps Switch Four Gang	Nos.	30		
37.3	10 Amps Switch Three Gang	Nos.	30		
38.00	<b>LIGHTING PROTECTION SYSTEM:</b>				
38.01	Providing & installation of active earth technology system (Earth Resistance of less than One Ohm) Model No. VP 10 x 38 S straight shaft system, comprising of 1.5" dia 10 feet long electroplated copper electrode (Filled with soil conditioner) - Earth Conductivity Enhancement Compound (Primary) - Earth Conductivity Enhancement Compound (Secondary) - Brass nut bolt with washer etc. - Including Inspection Chamber made of 10" dia x 12" PVC pit with C. I. Powder coated cover.	Nos.	4		
38.2	Providing & installation, Testing & Commissioning of lightening arrestor terminal as per drawing complete in all respect.	Nos.	12		
38.3	Providing, Laying & connecting of copper strips 32mm x 3mm thick with pre-coated.	Mtrs.	655		
38.4	Providing, Laying & connecting of earth terminal block size of 2" x 10" x 1/4" thick fixed to wall with grouting bolts provided with copper nuts to connect incoming & outgoing earthing conductor complete in all respect.	Nos.	4		
38.5	Providing, Laying & connecting of earthing lead of 2 x 95mm of standard bare copper conductors in 50mm dia PVC class "d" conduit between earth terminal block and earth point complete in all respect.	Mtrs.	600		

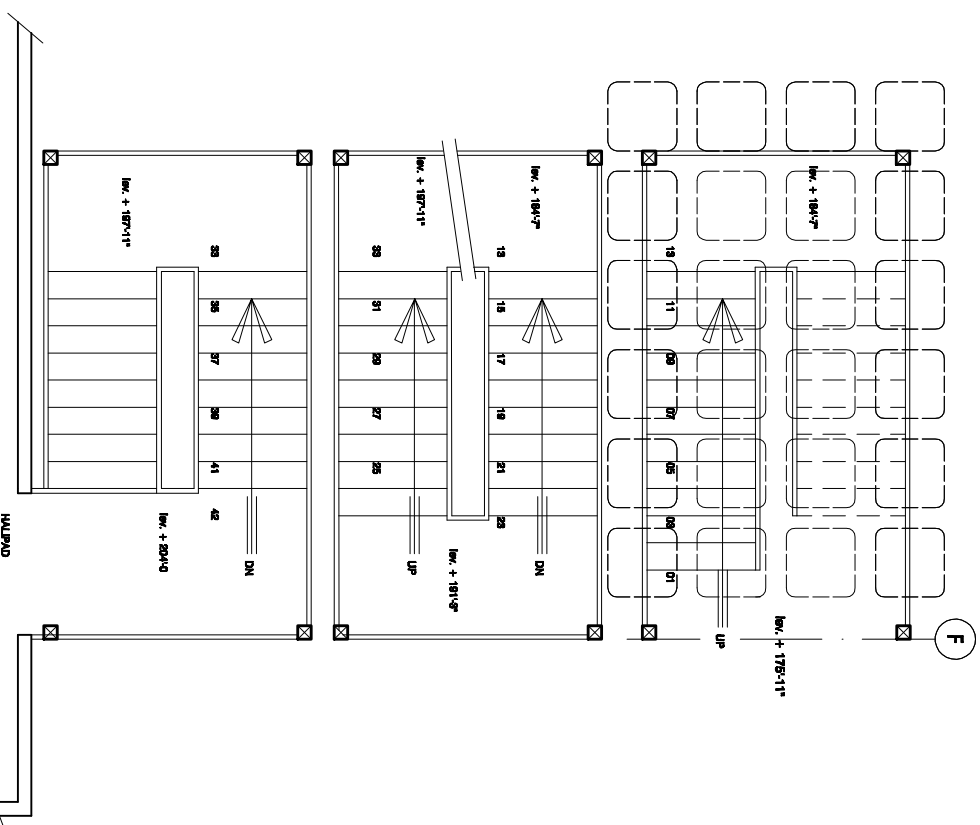


S. No	Description	Unit	Qty.	Rate	Amount
<b>39.00</b>	<b><u>FM 200 FIRE SUPPRESSION SYSTEM</u></b>				
39.01	Providing, installation, testing & commissioning of FM 200 (700 Sft.) two different location Fire Suppression System with control panel maintenance-free battery supervised alarm and detection lines. Ionization and optical smoke detectors at 200 Sft./ detector spacing in each of three areas (above false ceiling) including wiring and hardware, relay panel for shut down of AHU and activation of fire dampers on supply and return air duct and start/ stop of exhaust fan manual discharge station, manual abort station / alarm horn / bell flasher, required amount of FM 200 Cylinder discharge heads valves nozzle assembly, mounting hardware exhaust / purging system with damper etc. including complete wiring, piping in data room nameplates instruction sign etc. & integrity listing for data room. a) CCTV Room b) BMS Room	No.	1		
<b>40.00</b>	Supplying & fixing of Airconditioners at any floor and any height upto 15 storied building upto 30' to 50' long condenser pipe fixing bracket for outer with paint complete with all respect as per instruction by the Client / Consultant. Split Unit 1.5 Ton Split Unit 2 Ton Floor Standing Unit 2 Ton	Nos. Nos. Nos.	6 6 8		
<b>41.00</b>	Supplying of padestal fan metal body Pakistan make Millat / Royal / Pak 18" / 24" size color as per instruction by Client / Consultant.	Nos.	60		
<b>42.00</b>	Supplying & fixing of bracket fan metal body Pakistan make Millat / Royal / Pak 18" / 24" size at any height any floorcolor as per instruction by Client / Consultant.	Nos.	60		





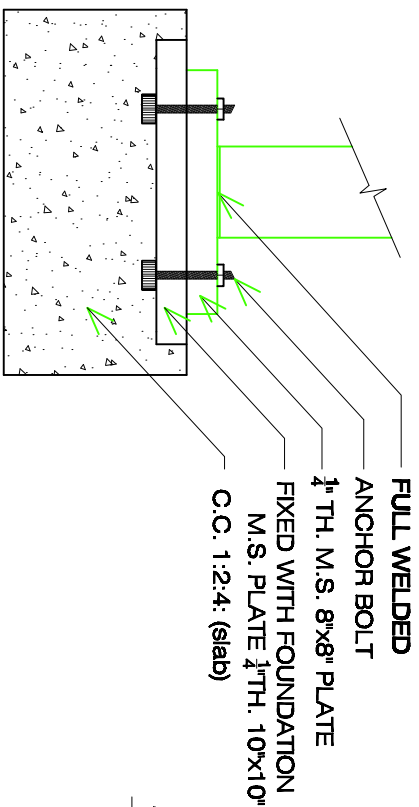
**SECTION OF STAIR CASE**  
from lev. +175'-11" to lev. + 204'-0



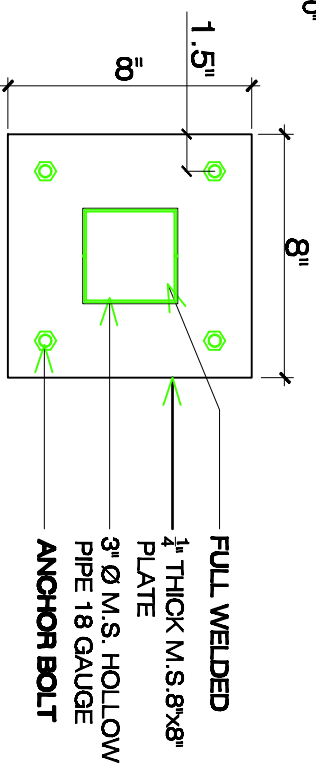
**PROJECT:**  
**PROPOSED PLAN OF**  
**SHAHEED MOHTARIMA BENAZIR BHUTTO**  
**ACCIDENT, EMERGENCY & TRAUMA CENTER.**  
**AT CIVIL HOSPITAL KARACHI**

**DWG. TITLE:**  
**SECTION OF STAIR CASE**  
**FOR HELPAD**  
**TRAUMA CENTRE**


**CONSULTANT:**  
**MAQI AND SIDDIQUE ASSOCIATES**  
**ARCHITECTS ENGINEERS PLANNERS**  
**5-126, ELOAL ROUTE (EX. KARACHI AVENUE) BUREAU FRONT KARACHI.**  
**PHONE: 4832241 - 4832249 FAX: (01-41)4832416.**  
**DESIGNED BY:**  
**DATE:**  
**10-04-2016**  
**SCALE:**  
**3/8" = 1'-0"**  
**DWG. NO.**  
**0223**  
**AR-08-a**



DETAIL "A"



DETAIL "B"

<b>PROJECT:</b> <b>PROPOSED PLAN OF</b> <b>SHAHEED MOHTARMA BENAZIR BHUTTO</b> <b>ACCIDENT, EMERGENCY &amp; TRAUMA CENTER.</b> <b>AT CIVIL HOSPITAL KARACHI</b>		<b>DWG. TITLE:</b> <b>DETAIL SECTION</b> <b>(STAIR CASE)</b>		<b>JOB TITLE:</b> <b>TRAUMA CENTRE</b>		<b>CONSULTANT:</b>  <b>NAQVI AND SIDDIQUE ASSOCIATES</b> <b>ARCHITECTS ENGINEERS PLANNERS</b> <b>B-122, E.O.A. HOUSE (DC ARMY MARKET) GINERVA PARK, KARACHI.</b> <b>PHONE: 46822841 - 46822846 FAX: (91-21)4682444.</b>		<b>JOB NO.</b>  <b>0223</b>	
<b>DESIGNER:</b> <b>ALI HUSSAIN</b>		<b>DATE:</b> <b>10-04-2016</b>		<b>SCALE:</b> <b>3/8" = 1'-0"</b>		<b>DWG. NO.</b>  <b>AR-00-5</b>			
<b>TENDER DRAWING</b>									