



PROJECT MANAGEMENT UNIT (PMU)  
BRT ORANGE LINE  
TRANSPORT AND MASS TRANSIT DEPARTMENT  
GOVERNMENT OF SINDH

**CONTRACT PACKAGE #01/BRT ORANGE LINE**

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**Construction of Water Trunk Main from Town  
Municipal Administration (TMA) to Board Office  
Chowrangi**

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**BIDDING AND CONTRACT DOCUMENT**

VOLUME-I

**INSTRUCTIONS TO BIDDERS  
BIDDING DATA  
FORM OF BID & APPENDICES TO BID  
CONDITIONS OF CONTRACT  
BILL OF QUANTITIES  
TECHNICAL SPECIFICATIONS**

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# **INSTRUCTIONS TO BIDDERS**

## **INSTRUCTIONS TO BIDDERS**

*(Note: These Instructions to Bidders along with Bidding Data will not be part of the Contract and will cease to have effect once the contract is signed.)*

### **A. GENERAL**

#### **IB.1 Scope of Bid**

- 1.1 The Employer as defined in the Bidding Data hereinafter called "the Employer" wishes to receive bids for the construction and completion of works as described in these Bidding Documents, and summarised in the Bidding Data hereinafter referred to as the "Works".
- 1.2 The successful bidder will be expected to complete the Works within the time specified in Appendix-A to Bid.

#### **IB.2 Source of Funds**

- 2.1 The Employer has applied for/received a loan/credit from the source (s) indicated in the Bidding Data in various currencies towards the cost of the project specified in the Bidding 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.

#### **IB.3 Eligible Bidders**

- 3.1 This Invitation for Bids is open to all bidders 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 / enlisted with the Employer.

#### **IB.4 One Bid per Bidder**

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

#### **IB.5 Cost of Bidding**

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

#### **IB.6 Site Visit**

- 6.1 The bidders 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 bid and entering into a contract for construction of the Works. All cost in this respect shall be at the bidder's own expense.
- 6.2 The bidders 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 bidders, 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. BIDDING DOCUMENTS**

### **IB.7 Contents of Bidding Documents**

7.1 The Bidding Documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.

1. Instructions to Bidders.
2. Bidding Data.
3. General Conditions of Contract, Part-I (GCC).
4. Particular Conditions of Contract, Part-II (PCC).
5. Specifications – Special Provisions.
6. Specifications - Technical Provisions.
7. Form of Bid & Appendices to Bid.
8. Bill of Quantities (Appendix-D to Bid).
9. Form of Bid Security.
10. Form of Contract Agreement.
11. Forms of Performance Security and Mobilization Advance Guarantee/Bond.
12. Drawings.

7.2 The bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of bid submission will be at the Bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

### **IB.8 Clarification of Bidding Documents**

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

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

### **IB.9 Amendment of Bidding Documents**

9.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the Bidding Documents by issuing addendum.

9.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub-Clause 7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer.

9.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20

## **C. PREPARATION OF BIDS**

### **IB.10 Language of Bid**

10.1 The bid and all correspondence and documents related to the bid exchanged by a bidder and the Employer shall be in the bid language stipulated in the Bidding Data and Particular Conditions of Contract. Supporting documents and printed literature furnished by the bidders may be in any other language provided the same are accompanied by an accurate translation of the relevant parts in the bid language, in which case, for purposes of evaluation of the bid, the translation in bid language shall prevail.

## **IB.11 Documents Accompanying the Bid**

### 11.1 Each bidder shall:

- (a) submit a written power of attorney authorizing the signatory of the bid to act for and on behalf of the bidder;
- (b) update the information indicated and listed in the Bidding 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 alongwith average annual construction turnover;
  - (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.

and

- (c) furnish a technical proposal taking into account the various Appendices to Bid specially the following:

Appendix-E to Bid	Proposed Construction Schedule
Appendix-F to Bid	Method of Performing the Work
Appendix-G to Bid	List of Major Equipment
Appendix-K to Bid	Organization Chart for Supervisory Staff and other pertinent information such as mobilization programme etc;

### 11.2 Bids submitted by a joint venture of two (2) or more firms shall comply with the following requirements:

- (a) the bid and in case of a successful bid, the Form of Contract 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 Sub-Para (b) above as well as in the Form of Bid and in the Form of Contract Agreement (in case of a successful bid); and
- (e) a copy of the agreement entered into by the joint venture partners shall be submitted with the bid 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 partners without prior written consent of the Employer.

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

#### **IB.12 Bid Prices**

- 12.1 Unless stated otherwise in the Bidding 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 bidder.

- 12.2 The bidders 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 bidder 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 bids shall be included in the rates and prices and the total Bid Price submitted by a bidder.

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 General Conditions of Contract Part-I.

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

#### **IB.13 Currencies of Bid and Payment**

- 13.1 The unit rates and the prices shall be quoted by the bidder entirely in Pak rupees. A bidder 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 Bid. The proportion of the Bid Price (excluding Provisional Sums) needed by him for the payment of such Foreign Currency Requirements either (i) entirely in the currency of the Bidder's home country or, (ii) at the bidder's option, entirely in Pak rupees provided always that a bidder 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 bid.

- 13.2 The rates of exchange to be used by the bidder for currency conversion shall be the TT&OD Selling Rates published or authorized by the State Bank of Pakistan prevailing on the date 28 days prior to the deadline for submission of bids.

For the purpose of payments, the exchange rates used in bid preparation shall apply for the duration of the Contract.

#### **IB.14 Bid Validity**

- 14.1 Bids shall remain valid for the period stipulated in the Bidding Data after the Date of Bid Opening specified in Clause IB.23.

- 14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period which shall in no case be more than the original bid validity period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiting his Bid Security. A bidder agreeing to the request will not be

required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.15 in all respects.

**IB.15 Bid Security**

- 15.1 Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in the Bidding Data in Pak Rupees or an equivalent amount in a freely convertible currency.
- 15.2 The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan or from a foreign bank duly counter guaranteed by a Scheduled Bank in Pakistan or bond from an insurance company having atleast AA rating from PACRA/JCR in favour of the Employer valid for a period 28 days beyond the Bid Validity date.
- 15.3 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.
- 15.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than 28 days after the expiration of the period of Bid Validity.
- 15.5 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security and signed the Contract Agreement.
- 15.6 The Bid Security may be forfeited:
  - (a) if the bidder withdraws his bid except as provided in Sub-Clause 22.1;
  - (b) if the bidder does not accept the correction of his Bid Price pursuant to Sub-Clause 27.2 hereof; or
  - (c) In the case of successful bidder, if he fails within the specified time limit to:
    - (i) furnish the required Performance Security; or
    - (ii) sign the Contract Agreement.

**IB.16 Alternate Proposals by Bidder**

- 16.1 Should any bidder 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 bid to be submitted in strict compliance with the Bidding 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 Bid shall be that which represents complete compliance with the Bidding Documents.
- 16.2 Alternate Proposal(s), if any, of the lowest evaluated responsive bidder only may be considered by the Employer as the basis for the award of Contract to such bidder.

**IB.17 Pre-Bid Meeting**

- 17.1 The Employer may, on his own motion or at the request of any prospective bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of pre-bid meeting, if convened, is as stipulated in the Bidding Data. All prospective bidders or their authorized representatives shall be invited to attend such a pre-bid meeting.
- 17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than seven (7) days before the proposed pre-bid meeting.

17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any

modification of the Bidding Documents listed in Sub-Clause 7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.

17.4 Absence at the pre-bid meeting will not be a cause for disqualification of a bidder.

#### **IB.18 Format and Signing of Bid**

18.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.

18.2 All appendices to Bid are to be properly completed and signed.

18.3 No alteration is to be made in the Form of Bid 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 bid may be rejected.

18.4 Each bidder shall prepare by filling out the forms completely and without alterations one (1) original and number of copies, specified in the Bidding Data, of the documents comprising the bid as described in Clause IB.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 bid 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 bidder pursuant to Sub- Clause 11.1(a) hereof. All pages of the bid shall be initialed and stamped by the person or persons signing the bid.

18.6 The bid 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 bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

18.7 Bidders shall indicate in the space provided in the Form of Bid their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent.

18.8 Bidders should retain a copy of the Bidding Documents as their file copy.

#### **D. SUBMISSION OF BIDS**

##### **IB.19 Sealing and Marking of Bids**

19.1 Each bidder shall submit his bid as under:

(a) ORIGINAL and each copy of the Bid 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 Bidding Data;

(b) bear the name and identification number of the contract as defined in the Bidding

Data; and

- (c) provide a warning not to open before the time and date for bid opening, as specified in the Bidding 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 bidder to enable the bid to be returned unopened in case it is declared "late" pursuant to Clause IB.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 Bid.

**IB.20 Deadline for Submission of Bids**

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

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

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

- (d) Upon request, acknowledgment of receipt of bids 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 bids by issuing an amendment in accordance with Clause IB.9, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will thereafter be subject to the deadline as extended.

**IB.21 Late Bids**

21.1 (a) Any bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 will be returned unopened to such bidder.

- (b) Delays in the mail, delays of person in transit, or delivery of a bid to the wrong office shall not be accepted as an excuse for failure to deliver a bid at the proper place and time. It shall be the bidder's responsibility to determine the manner in which timely delivery of his bid will be accomplished either in person, by messenger or by mail.

**IB.22 Modification, Substitution and Withdrawal of Bids**

22.1 Any bidder may modify, substitute or withdraw his bid after bid submission provided that the modification, substitution or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.

22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.

22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with Sub-Clauses 22.1 and 27.2.

- 22.4 Withdrawal of a bid during the interval between the deadline for submission of bids and the expiration of the period of bid validity specified in the Form of Bid may result in forfeiture of the Bid Security in pursuance to Clause IB.15.

**E. BID OPENING AND EVALUATION**

**IB.23 Bid Opening**

- 23.1 The Employer will open the bids, including withdrawals, substitution and modifications made pursuant to Clause IB.22, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the Bidding Data. The bidders' representatives who are present shall sign a register evidencing their attendance.
- 23.2 Envelopes marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.22 shall not be opened.
- 23.3 The bidder's name, total Bid Price and price of any Alternate Proposal(s), any discounts, bid modifications, substitution and withdrawals, the presence or absence of Bid Security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening of bids.
- 23.4 Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with the Sub-Clause 23.3.

**IB.24 Process to be Confidential**

- 24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report which shall be done at least ten (10) days prior to issue of Letter of Acceptance. The announcement to all Bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the bids evaluated. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the rejection of such bidder's bid. Whereas any bidder feeling aggrieved may lodge a written complaint not later than fifteen (15) days after the announcement of the bid evaluation report; however mere fact of lodging a complaint shall not warrant suspension of the procurement process.

**IB.25 Clarification of Bids**

- 25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of his bid, 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 bid 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 bids in accordance with Clause IB.28.

**IB.26 Examination of Bids and Determination of Responsiveness**

- 26.1 Prior to the detailed evaluation of bids, the Employer will determine whether each bid is substantially responsive to the requirements of the Bidding Documents.
- 26.2 A substantially responsive bid is one which (i) meets the eligibility criteria; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; and (iv) conforms to all the terms, conditions and specifications of the Bidding 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 Bidding Documents, the Employer's rights or the bidder's obligations under the Contract; or (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.3 If a bid 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.

#### **IB.27 Correction of Errors**

27.1 Bids 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 Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid Security shall be forfeited in accordance with Sub- Clause 15.6(b) hereof.

#### **IB.28 Evaluation and Comparison of Bids**

28.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Clause IB.26.

28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

- (a) making any correction for errors pursuant to Clause IB.27;
- (b) excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Daywork; and
- (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 Bid evaluation.

28.4 If the Bid of the successful bidder 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 bidder 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 IB.32 be increased at the expense of the successful bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the Contract.

### **F. AWARD OF CONTRACT**

#### **IB.29 Award**

29.1 Subject to Clauses IB.30 and IB.34, the Employer will award the Contract to the bidder whose bid has been determined to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price, provided that such bidder has been determined to be eligible in accordance with the provisions of Clause IB.3 and qualify



pursuant to Sub-Clause IB 29.2.

- 29.2 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:

Provided that such qualification shall only be laid down after recording reasons therefor in writing. They shall form part of the records of that bid evaluation report.

**IB.30 Employer's Right to Accept any Bid and to Reject any or all Bids**

- 30.1 Notwithstanding Clause IB.29, the Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidders or any obligation except that the grounds for rejection of all bids shall upon request be communicated to any bidder who submitted a bid, without justification of grounds. Rejection of all bids shall be notified to all bidders promptly.

**IB.31 Notification of Award**

- 31.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder in writing ("Letter of Acceptance") that his Bid 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 No Negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted, however, Employer may have clarification meetings to get clarify any item in the bid evaluation report.
- 31.3 The notification of award and its acceptance by the bidder will constitute the formation of the Contract, binding the Employer and the bidder till signing of the formal Contract Agreement.
- 31.3 Upon furnishing by the successful bidder of a Performance Security, the Employer will promptly notify the other bidders that their Bids have been unsuccessful and return their bid securities.

**IB.32 Performance Security**

- 32.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Bidding 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 bidder to comply with the requirements of Sub-Clause IB.32.1 or Clauses IB.33 or IB.35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

**IB.33 Signing of Contract 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 bidder the Contract Agreement in the form provided in the Bidding Documents, incorporating all agreements between the parties.
- 33.2 The formal Agreement between the Employer and the successful bidder shall be executed within 14 days of the receipt of the Contract Agreement by the successful bidder from the Employer.

**IB.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 any Bidder as reported by the employers of the previously awarded contracts, interalia, reject his bid and/or refer the case to the Pakistan Engineering Council (PEC). Upon such reference, PEC in accordance with its rules, procedures and relevant laws of the land 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.

**IB.35 Integrity Pact**

The Bidder shall sign and stamp the Integrity Pact provided at Appendix-L to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding Rupees ten million. Failure to provide such Integrity Pact shall make the bidder non-responsive.

**IB.36 Instructions not Part of Contract**

Bids shall be prepared and submitted in accordance with these Instructions which are provided to assist bidders in preparing their bids, and do not constitute part of the Bid or the Contract Documents.

## **BIDDING DATA**

## BIDDING DATA

Instructions to Bidders  
Clause Reference

**1.1 Name and address of the Employer:**

1.1 Name of the Project & Summary of the Works:

**Brief Description of Works**

Providing & Laying of existing main water trunk of various diameter from BRT Orange line dedicated corridor to other location.

2.1 Name of the Borrower/Source of Financing/Funding Agency:

**Employer's own sources**

2.1 Amount and type of financing: **Not Applicable**

8.1 Time limit for clarification:

**5 days** prior to the dead line for submission of bids.

10.1 Bid language:

**English**

11.1 (b) Prequalification Information to be updated:

DELETE Para (b) in its entirety.

11.1(c) Furnish Technical Proposal:

**The bidder to submit a technical proposal in sufficient detail to demonstrate the adequacy of the bid in meeting requirements for timely completion of the Works.**

**13.1** Delete the text of this sub-clause and replace with following:

Bidders to quote rates entirely in Pak. Rupees.

**13.2** Delete this sub-clause in its entirety.

14.1 Period of Bid Validity:

**90 days**

15.1 Amount of Bid Security:

**Lump sum amount of Rupees 1.5 million**

15.2 Form of Bid Security:

**Bid Security in the form of Bank draft/Pay Order/Deposit at Call from scheduled bank in Pakistan having AA rating of Karachi branch in favour of Project Director Orange line.**

15.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than 28 days after the submission of performance security of the lowest bidder.

17.1 Venue, time, and date of the pre-Bid meeting:

**A pre-bid meeting will be held, if required, the venue, time and date to be notified by the Employer.**

18.4 Number of copies of the Bid to be completed and returned:

**One original and one copy**

19.2(a) Employer's address for the purpose of Bid submission:

**As notified by Employer in Notice Inviting Tenders.**

19.2(b) Name and Number of the Contract:

Construction of Water Trunk Main from TMA to Board office Chowrangji, Contract Package #01/BRT/Orange Line.

20.1(a) Deadline for submission of bids:

**As notified by Employer in Notice Inviting Tenders.**

23.1 Venue, time, and date of Bid opening:

Venue: **As notified by Employer in Notice Inviting Tenders**

Time: **As notified by Employer in Notice Inviting Tenders**

Date: **As notified by Employer in Notice Inviting Tenders**

32.1 Standard form and amount of Performance Security acceptable to the Employer:

**Amount equal to 10% of the Contract Price in the form of Bank Guarantee from any scheduled bank in Pakistan having AA rating of Karachi branch within a period of 7 days after the receipt of Letter of Acceptance.**

### **IB.33 Signing of Contract Agreement**

33.1 Within 07 days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send the successful bidder the Contract Agreement in the form provided in the Bidding Documents.

33.2 The formal Agreement between the Employer and the successful bidder shall be executed within 07 days of the receipt of the Contract Agreement by the successful bidder from the Employer.

**FORM OF BID  
AND  
APPENDICES TO BID**

## FORM OF BID AND APPENDICES TO BID

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## FORM OF BID

### CONSTRUCTION OF WATER TRUNK MAIN FROM TMA TO BOARD OFFICE CHOWRANGI

To:

**Project Director  
BRT Orange Line (PMU)  
6<sup>th</sup> Floor, Civic Center, Gulshan-e-Iqbal,  
Karachi.**

Gentleman,

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract. Specifications, Drawings and Bill of Quantities and Addenda Nos. \_\_\_\_\_ for the execution of the above-named Works, we, the undersigned, offer to execute and complete such Works and remedy any defects therein in conformity with the Conditions of Contract. Specifications, Drawings, Bill of Quantities and Addenda for the sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) or such other sum as may be ascertained in accordance with the said conditions.
2. We understand that all the Appendices attached hereto form part of this Bid.
3. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of Rupees \_\_\_\_\_ (Rs. \_\_\_\_\_) drawn in your favour or made payable to you and valid for a period of \_\_\_\_\_ days beginning from the date Bids are opened.
4. We undertake, if our Bid is accepted, to commence the Works and to complete the whole of the Works comprised in the Contract within the time stated in Appendix-A to Bid.
5. We agree to abide by this Bid for the period of \_\_\_\_\_ days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.



7. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other bidder for the Works.

8. We understand that you are not bound to accept the lowest or any Bid you may receive.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_

Signature: \_\_\_\_\_

in the capacity of \_\_\_\_\_ duly authorized to sign Bids for and on behalf of

\_\_\_\_\_  
(Name of Bidder in Block Capitals)  
(Seal)

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Witness:

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Address. \_\_\_\_\_  
\_\_\_\_\_

Occupation \_\_\_\_\_

**SPECIAL STIPULATIONS****Clause  
Conditions of Contract**

1.	Engineer's Authority to issue Variation in emergency	2.1	2% of the Contract Price stated in the Letter of Acceptance.
2.	Amount of Performance Security	10.1	10% of Contract Price stated in the Letter of Acceptance.
3.	Time for Furnishing Programme	14.1	Within 7 days from the date of receipt of Letter of Acceptance.
4.	Minimum amount of Third Party Insurance	23.2	3% of Contract Price per occurrence with number of occurrences unlimited.
5.	Time for Commencement	41.1	Within 07 days from the date of receipt of Engineer's Notice to Commence which shall be issued within seven (07) days after signing of Contract Agreement.
6.	Time for Completion	43.1, 48.2	Three (03) calendar months from the date of receipt of Engineer's Notice to Commence.
7.	Amount of Liquidated Damages	47.1	0.10% (one tenth of one percent) of Contract Price for each day of delay in completion of the Works subject to a maximum of 10% of Contract Price stated in the Letter of Acceptance.
8.	Defects Liability Period	49.1	365 days from the effective date of Taking Over Certificate.
9.	Percentage of Retention Money	60.2	5% of the amount of Interim Payment Certificate.
10.	Limit of Retention Money	60.2	5% of Contract Price.
11.	Minimum amount of Interim Payment Certificates (Running Bills)	60.2	10% of Contract Price for first IPC and 15% of Contract Price for subsequent IPCs.
12.	Time of Payment from delivery of Engineer's Interim Payment Certificate to the Employer.	60.10	15 days

**FOREIGN CURRENCY REQUIREMENTS**

Not Applicable

**PRICE ADJUSTMENT UNDER CLAUSE 70  
OF CONDITIONS OF CONTRACT**

**Not Applicable**

**BILL OF QUANTITIES**

- A. Detailed Bill of Quantities is attached at the end of this document.

## BILL OF QUANTITIES

### B. Daywork Schedule

We understand and agree that for execution of any work on the basis of Daywork the written order of the Engineer is required.

The Contractor will be paid for work in respect of which he is directed by written order of the Engineer to perform as Daywork, on the basis and at the rates and prices set forth herein.

#### Workmen:

Workmen hours and other costs towards dayworks shall be paid in Pak Rupees only, in accordance with the following schedule:

<u>S.NO.</u>	<u>Type of Workmen</u>	<u>(First Class)</u>	<u>Rate per hour</u> <u>(Rupees)</u>
1.	Carpenter	"	127.00
2.	Mason	"	145.00
3.	Plumber/Fitter	"	127.00
4.	Electrician	"	127.00
5.	Mechanic	"	127.00
6.	Welder	"	127.00
7.	Painter	"	127.00
8.	Black smith/fixer	"	127.00
9.	Machine Operator	"	127.00
10.	Semi skilled	"	100.00
11.	Un skilled	"	91.00

(1) The above hourly rates include percentage addition of 45% to cover the Contractor's profit, overhead charges, superintendence and insurance; all allowances of workmen and other clerical and office work, the use, repair and sharpening of tools, the use of consumable stores and electrical power; the use of non-mechanical plant and scaffolding, the use of water, lighting and appliances of all descriptions; supervision by Contractor's staff, foremen, gangers, and all other incidental charges whatsoever.

(2) The Contractor shall carry out all Day Work, within normal working hours unless the Engineer has given written approval to the contrary. Payment of workmen employed on Day Work performed outside normal working hours will be made at overtime rate only if the Engineer has given such approval. Rate for overtime shall be the rate indicated above plus 50% increase for overtime work.

#### Materials:

Materials to be supplied for Daywork which are actually incorporated into the Works shall be paid for at the invoiced price for locally procured materials of local or foreign origin delivered to Site plus surcharge of 30% for cartage and handling from source to site, wastage and Contractor's overhead and profit.

Any payment made for Daywork shall be final.

**Plant:**

Any plant used for Daywork shall be charged at the hire rates entered by us in Appendix "G" to the Form of Tender or if not listed herein, at comparable rates.

The hire rate of construction plant and equipment entered in Appendix 'G' shall be applicable only for work done on the basis of Daywork provisions.

**PROPOSED CONSTRUCTION SCHEDULE**

Pursuant to Sub-Clause 43.1 of the General Conditions of Contract, the Works shall be completed on or before the date stated in Appendix-A to Bid. The Bidder shall provide as Appendix-E to Bid, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of the whole of the Works and parts of the Works may meet Employer's completion targets in days noted below and counted from the date of receipt of Engineer's Notice to Commence (Attach sheets as required for the specified form of Construction Schedule):

<u>Description</u>	<u>Time for Completion</u>
a) Whole Works	Three (03) Calendar months



**METHOD OF PERFORMING THE WORK**

[The Bidder is required to submit a narrative outlining the method of performing the Work. The narrative should indicate in detail and include but not be limited to:

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.
2. Mobilization in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.
3. The method of executing the Works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.]

**LIST OF MAJOR EQUIPMENT – RELATED ITEMS**

[The Bidder will provide on Sheet 2 of this Appendix a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the Works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications.]

LIST OF MAJOR EQUIPMENT

Owned Purchased or Leased	Description of Unit (Make, Model, Year)	Capacity HP Rating	Condition	Present Location or Source	Date of Delivery at Site	Period of Work on Project
1	2	3	4	5	6	7
a. Owned						
b. To be Purchased						
c. To be arranged on Lease						

## CONSTRUCTION CAMP AND HOUSING FACILITIES

The Contractor in accordance with Clause 34 of the Conditions of Contract shall provide description of his construction camp's facilities and staff housing requirements.

The Contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the Contractor's construction camp.

The Bidder shall list or explain his plans for providing these facilities for the service of the Contract as follows:

1. Site Preparation (clearing, land preparation, etc.).
2. Provision of Services.
  - a) Power (expected power load, etc.).
  - b) Water (required amount and system proposed).
  - c) Sanitation (sewage disposal system, etc.).
3. Construction of Facilities
  - a) Contractor's Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
  - b) Warehouses and Storage Areas (area required, type of construction and layout).
  - c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.).
4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity).
5. Other Items Proposed (Security services, etc.).

### LIST OF SUBCONTRACTORS

I/We intend to subcontract the following parts of the Work to subcontractors. In my/our opinion, the subcontractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the Contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

<b>Part of Works (Give Details)</b>	<b>Subcontractor (With Complete Address)</b>
1	2

**ESTIMATED PROGRESS PAYMENTS**

Bidder's estimate of the value of work which would be executed by him during each of the periods stated below, based on his Programme of the Works and the Rates in the Bill of Quantities, expressed in thousands of Pakistani Rupees:

<b>Quarter/ Year/ Period</b>	<b>Amounts (1,000 Rs.)</b>
<b>1</b>	<b>2</b>
1 <sup>st</sup> Month	
2 <sup>nd</sup> Month	
3 <sup>rd</sup> Month	
<b>Bid Price</b>	

**ORGANIZATION CHART  
FOR THE  
SUPERVISORY STAFF AND LABOUR**

(INTEGRITY PACT)

**DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.  
PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN  
CONTRACTS WORTH RS. 10.00 MILLION OR MORE**

Contract No. \_\_\_\_\_

Dated \_\_\_\_\_

Contract Value: \_\_\_\_\_

Contract Title: \_\_\_\_\_

..... [name of Supplier] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan (GoP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoP through any corrupt business practice.

Without limiting the generality of the foregoing, [name of Supplier] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

[name of Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of Supplier] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Supplier] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.

Name of Buyer: .....

Name of Seller/Supplier: .....

Signature: .....

Signature: .....

[Seal]

[Seal]



# **FORMS**

**BID SECURITY  
PERFORMANCE SECURITY  
CONTRACT AGREEMENT**

**BID SECURITY**  
**(Bank Guarantee)**

Security Executed on \_\_\_\_\_  
(Date)

Name of Surety (Bank) with Address: \_\_\_\_\_  
(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address \_\_\_\_\_

Penal Sum of Security Rupees . \_\_\_\_\_ (Rs. \_\_\_\_\_)

Bid Reference No. \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto

\_\_\_\_\_ (hereinafter called the 'Employer') in the sum stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying Bid dated \_\_\_\_\_ for Bid No. \_\_\_\_\_ for \_\_\_\_\_ (Particulars of Bid) to the said Employer; and

WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum from a Scheduled Bank in Pakistan or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the Employer, conditioned as under:

- (1) that the Bid Security shall remain in force up to and including the date 28 days after the deadline for validity of bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived;
- (2) that the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and
- (3) that in the event of failure of the successful Bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to Clause 15.6 of the Instruction to Bidders for the successful Bidder's failure to perform.

NOW THEREFORE, if the successful Bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a formal Contract with the said Employer in accordance with his Bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Surety shall forthwith pay the Employer the said sum upon first written demand of the Employer (without cavil or argument) and without requiring the Employer to prove or to show grounds or reasons for such demand, notice of which shall be sent by the Employer by registered post duly addressed to the Surety at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Bidder) has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated above, or has defaulted in fulfilling said requirements and the Surety shall pay without objection the said sum upon demand from the Employer forthwith and without any reference to the Principal (Bidder) or any other person.

IN WITNESS WHEREOF, the above bounden Surety has executed the instrument under its seal on the date indicated above, the name and seal of the Surety being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

SURETY (Bank)

WITNESS:

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

\_\_\_\_\_

Corporate Secretary (Seal)

2. \_\_\_\_\_

\_\_\_\_\_

Name, Title & Address

Signature \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Corporate Guarantor (Seal)

**FORM OF PERFORMANCE SECURITY**  
**(Bank Guarantee)**

Guarantee No. \_\_\_\_\_  
Executed on \_\_\_\_\_  
Expiry date \_\_\_\_\_

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with address: \_\_\_\_\_  
(Scheduled Bank in Pakistan)

Name of Principal (Contractor) with  
address: \_\_\_\_\_  
\_\_\_\_\_

Penal Sum of Security (express in words and figures) \_\_\_\_\_  
\_\_\_\_\_

Letter of Acceptance No. \_\_\_\_\_ Dated  
\_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the \_\_\_\_\_ (hereinafter called the Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance for \_\_\_\_\_ (Name of Contract) for the \_\_\_\_\_ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 49, Defects Liability, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, \_\_\_\_\_ (the Guarantor), waiving all objections and defences under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract which payment will be

effected by the Guarantor to Employer's designated Bank & Account Number.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above-bounden Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

	_____ Guarantor (Bank)
Witness:	
1. _____	Signature _____
_____	Name _____
Corporate Secretary (Seal)	Title _____
2. _____	
_____	_____
Name, Title & Address	Corporate Guarantor (Seal)

## FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the \_\_\_\_\_ day of \_\_\_\_\_ (month) 20\_\_\_\_ between

\_\_\_\_\_ (hereafter called the "Employer") of the one part and \_\_\_\_\_ (hereafter called the "Contractor") of the other part.

WHEREAS the Employer is desirous that certain Works, viz \_\_\_\_\_ should be executed by the Contractor and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW this Agreement witnesseth as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents after incorporating addenda, if any, except those parts relating to Instructions to Bidders shall be deemed to form and be read and construed as part of this Agreement, viz:
  - (a) The Contract Agreement;
  - (b) The Letter of Acceptance;
  - (c) The completed Form of Bid;
  - (d) Special Stipulations (Appendix-A to Bid);
  - (e) The Particular Conditions of Contract – Part II;
  - (f) The General Conditions – Part I;
  - (g) The priced Bill of Quantities (Appendix-D to Bid);
  - (h) The completed Appendices to Bid (B, C, E to L);
  - (i) The Drawings;
  - (j) The Specifications.
  - (k) \_\_\_\_\_ (any other)
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor

\_\_\_\_\_  
(Seal)

Signature of Employer

\_\_\_\_\_  
(Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

\_\_\_\_\_  
(Name, Title and Address)

Witness:

\_\_\_\_\_  
(Name, Title and Address)

# **PART-I: GENERAL CONDITIONS OF CONTRACT**

## **PART-1**

### **GENERAL CONDITIONS OF CONTRACT**

The General Conditions of Contract (Part-1) shall be based on the FIDIC “Conditions of the Contract for Works of Civil Construction, Part-1 General Conditions” Fourth Edition (1987) Reprinted in 1988, with editorial amendments, Reprinted in 1992 with further amendments. These Conditions of Contract are published by the “FEDERATION OF INTERNATIONALE DES INGENIEURS-CONSEILS” (FIDIC), FIDIC Secretariat, P.O. Box 86, 1000 Lausanne 12, Switzerland, e-mail: [fidic.pub@fidic.org](mailto:fidic.pub@fidic.org) – [FIDIC.org/bookshop](http://FIDIC.org/bookshop).

The prospective Bidders are required to obtain copy of the above mentioned Conditions of Contract directly from Head Office of FIDIC, on the address indicated above against payment of their usual charges. However, a copy of the aforesaid FIDIC Conditions of Contract is available in the Office of the National Engineering Services Pakistan (Pvt.) Limited (NESPAK), 13<sup>th</sup> Floor, NICL Building, Abbasi Shaheed Road, Karachi, Pakistan, which can be seen on any working day during office hours if so desired for ready reference.

The successful Bidder after award of work shall have to provide two (02) copies of the said FIDIC Conditions of Contract for Works of Civil Construction, one in original obtained from the publishers for incorporation of the same in the Contract Agreement of the Work.



## **PART-II: PARTICULAR CONDITIONS OF CONTRACT**

## PART II - PARTICULAR CONDITIONS OF CONTRACT

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## PART II - PARTICULAR CONDITIONS OF CONTRACT

### 1.1 Definitions

- (a) (i) The Employer is Project Management Unit (**PMU**), BRT Orange Line, Transport & Mass Transit Department, Government of Sindh.
- (a) (iv) The Engineer is competent person appointed by the Employer, and notified to the Contractor,. Provided always that except in cases of professional misconduct, the outgoing Engineers is to formulate his certifications/recommendations in relation to all outstanding matters, disputes and claims relating to the execution of the Works during his tenure.

The following paragraph is added:

- (a)(vi) "Bidder or Tenderer" means any person or persons, company, corporation, firm or joint venture submitting a Bid or Tender.
- (b)(v) The following is added at the end of the paragraph:

The word "Tender" is synonymous with "Bid" and the word "Tender Documents" with "Bidding Documents".

The following paragraph is added:

- (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) The text is deleted and substituted with the following:

"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 therefrom 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

With reference to Sub-Clause 2.1(b), the following provisions shall also apply;

The Engineer shall obtain the specific approval of the Employer before carrying out his duties in accordance with the following Clauses:

- (i) Consenting to the sub-letting of any part of the Works under Sub-Clause 4.1 "Subcontracting".
- (ii) Certifying additional cost determined under Sub-Clause 12.2 "Not Foreseeable Physical Obstructions or Conditions".
- (iii) Any action under Clause 10 "Performance Security" and Clauses 21,23,24 & 25 "Insurance" of sorts.
- (iv) Any action under Clause 40 "Suspension".
- (v) Any action under Clause 44 "Extension of Time for Completion".
- (vi) Any action under Clause 47 "Liquidated Damages for Delay" or Payment of Bonus for Early Completion of Works (PCC Sub-Clause 47.3).
- (vii) Issuance of "Taking Over Certificate" under Clause 48.
- (viii) Issuing a Variation Order under Clause 51, except:

- a) in an emergency\* situation, as stated herebelow, or
  - b) if such variation would increase the Contract Price by less than the amount stated in the Appendix-A to Bid.
- (ix) Fixing rates or prices under Clause 52.
  - (x) Extra payment as a result of Contractor's claims under Clause 53.
  - (xi) Release of Retention Money to the Contractor under Sub-Clause 60.3 "Payment of Retention Money".
  - (xii) Issuance of "Final Payment Certificate" under Sub-Clause 60.8.
  - (xiii) Issuance of "Defect Liability Certificate" under Sub-Clause 62.1.
  - (xiv) Any change in the ratios of Contract currency proportions and payments thereof under Clause 72 "Currency and Rate of Exchange".

\* (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 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**

The following paragraph is added:

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)

The following Sub-Clauses 2.7 and 2.8 are added:

## **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.

## **2.8 Replacement of the Engineer**

"If the Employer intends to replace the Engineer, the Employer shall, not less than 14 days before the intended date of replacement, give notice to the Contractor, of the name, address and relevant experience of the intended replacement Engineer. The Employer shall not replace the Engineer with a person against whom the Contractor raises reasonable objection by notice to the Employer, with supporting particulars."

## **4.1 Sub-Contracting**

Add “/sublet” after ‘sub-contract’ in first and second line of Sub-Clause 4.1 of General Conditions of Contract Part-I.

Add “/sub-letting” after word ‘sub-contracting’ occurring in first line of para (c), Sub-Clause 4.1 of General Conditions of Contract Part-I.

### **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**

The documents listed at (1) to (6) of the Sub-Clause are deleted and substituted with the following:

- (1) The Contract Agreement (if completed);
- (2) The Letter of Acceptance;
- (3) The completed Form of Bid;
- (4) Special Stipulations (Appendix-A to Bid);
- (5) The Particular Conditions of Contract – Part II;
- (6) The General Conditions – Part I;
- (7) The priced Bill of Quantities (Appendix-D to Bid);
- (8) The completed Appendices to Bid (B, C, E to L);
- (9) The Drawings;
- (10) The Specifications;

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.

The following Sub-Clauses 6.6 and 6.7 are added:

### **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 conform with the Works as built. The price of such Drawings shall be deemed to be included in the Contract Price.

### **9.1 Contract Agreement**

Read “Contractor” in place of ‘Employer’ occurring in 2<sup>nd</sup> line of Sub-Clause 9.1 of General Conditions of Contract Part-I.

### **10.1 Performance Security**

The text is deleted and substituted with the following:

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 equal to 10% of the Contract Price stated in the Letter of Acceptance. Such Security shall be in the form of bank guarantee from any Scheduled Bank in Pakistan located at Karachi or endorsed by the Head/Regional office of the respective bank located at Karachi.

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

The following Sub-Clause 10.4 is added:

**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 07 days from the date of receipt of Letter of Acceptance, which shall be in the form of:

- i) a Bar Chart identifying the critical activities.

**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

The following Sub-Clause 14.5 is added:

**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 15 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.

The following Sub-Clauses 15.2 and 15.3 are added:

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

The Contractor's authorised representative shall be fluent in the English language. Alternately an interpreter with ability of English language shall be provided by the Contractor on full time basis.

**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.

The following Sub-Clauses 16.3 and 16.4 are added:

**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. If the Contractor's superintending staff are not fluent in English language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

**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.

The following Sub-Clauses 19.3 and 19.4 are added:

**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 with the following:

- (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.

Add the following para (d) and (e) after para (c) of Sub-Clause 21.1 of Part-I.

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

### **(d) General Requirements**

The Contractor shall insure with any one of the insurance companies approved for this purpose by the Employer. The insurance policies shall be in the joint names of the Employer, and the Contractor against all loss or damages as stated in the General Conditions of Contract Part I and as stated herein. Notwithstanding the responsibilities of the Contractor for indemnities and insurances as described in Sub-Clauses 21 to 24 of General Conditions of Contract Part I, the Contractor before commencing work on Site, must discuss fully with the Engineer and the Employer the insurance coverage provided under any general policies which are to be applied to this Contract to ensure that there are no contingencies left uncovered and to reduce, as far as practicable, duplication of coverage. Should any areas of omission be discovered that are not covered by definition of responsibilities set out in these conditions, the addition or reduction in premiums required to give such insurance coverage will be paid by the Contractor. Such policies shall be obtained by the Contractor with consent of the Employer.

The Contractor shall be responsible for deductibles and losses/damages not covered by insurances other than the excepted risks.

The insurance losses shall not affect the Employer's or the Contractor's rights and obligations under the Contract.

The Contractor shall be responsible for compliance by his sub-contractors of insurances specified in these Sub-Clauses. Before each sub-contractor starts work, the Contractor shall provide the Employer proof that the sub-contractor(s) are covered by insurances specified herein for the Contractor.

All policies shall state that:

- i) The Employer shall receive at least 30 days written notice of intended Cancellation or change affecting coverage.
- ii) The Contractor is fully protected so as to provide full indemnity to Employer in respect of liability against losses or damages assumed by the Contractor under the Contract.
- iii) The inclusion of more than one insured shall not affect the rights of any other insured.
- iv) If a loss occurs the Contractor and the Employer shall be paid in relation of their share of the loss.
- v) The Insurer has no subrogation rights against any person, corporation, or organization including directors, officers, employees, servants agents thereof which:
  - is an insured under the policy or
  - is Controlled by, Owned by, or associated with an insured, or
  - is a sub-contractor on the works, or has, before or a loss occurs, been released from liability by an insured.

Hold harmless provisions: The Employer, the Engineer and the Contractor shall be indemnified against all losses.

Employer use or occupancy: If the Employer uses or occupies all or part of the works during the life of the insurance policy, the Contractor shall ensure that the policy continues in full force and the Employer shall pay any resulting extra cost of insurance.

Loss Procedure: If a loss occurs the Contractor shall, on behalf of the Employer and himself negotiate the value of the loss with the insurer. Unless directed otherwise by the Engineer, when agreement is reached the Contractor shall repair all damages and the Employer shall pay him in accordance with the Engineer's Certificates for that part of the repairs which is the Employer's responsibility.

If directed by the Engineer, instead of carrying out repairs, the Contractor shall pay to the party suffering the loss that part of the agreed value of the loss which is the Contractor's responsibility.

The provisions of this Sub-Clause 21.1(d) shall be applicable to other insurance covered by Sub-Clauses 22, 23 and 24 of General Conditions of Contract Part-I.

(e) **Automobile Liability Insurance:**

The Contractor shall also provide automobile liability insurance of all licensed vehicles owned, hired and operated by the Contractor and the risk insured shall be bodily injury, death of person and property damage or loss.

#### **21.4 Exclusions**

The text is deleted and substituted with the following:

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).

#### **25.1 Evidence and Terms of Insurances**

Delete the 84days in third line and replaced it with 30days

The following Sub-Clause 25.5 is added:

#### **25.5 Insurance Company**

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 any of the following insurance company operating in Pakistan and acceptable to the Employer :

- Adamjee General Insurance Company
- New Jubilee Insurance Company
- Eastern Federal General Insurance Company

Costs of such insurances shall be borne by the Contractor.

The following Sub-Clause 31.3 is added:

#### **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.

The following Sub-Clauses 34.2 to 34.12 are added:

#### **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, these facilities shall be handed over to the Employer or if the

Employer so desires, 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, and 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.

The following Sub-Clauses 35.2 and 35.3 are added:

#### **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.

The following Sub-Clause 36.6 is added:

### **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**

The text is deleted and substituted with the following:

The Contractor shall commence the Works on Site within the period named in Appendix-A to Bid from the date of 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.

### **48.2 Taking Over of Sections or Parts**

For the purposes of para (a) of this Sub-Clause, separate Times for Completion shall be provided in the Appendix-A to Bid "Special Stipulations".

Add the following Sub-Clause after Sub-Clause 49.4 of Part-I.

### **49.5 Extension of Defects Liability Period**

The provisions of this Sub-Clause shall apply to all replacements or renewals of plant and equipment carried out by the Contractor to remedy defects and damage as if the replacements and renewals had been taken over on the date they were completed. The Defects Liability Period for the Works shall be extended by a period equal to the period during which the Works cannot be used by reason of a defect or damage. If only a part of the Works is affected the Defects Liability Period shall be extended only for that part. In neither case shall the Defects Liability Period extend beyond two (2) years from the date of taking over.

### **51.2 Instructions for Variations**

At the end of the first sentence, after the word "Engineer", the words "in writing" are added.

### **52.1 Valuation of Variations**

In the eighth line of Sub-Clause 52.1 of Part-I after the words "suitable rates or prices" add the following "using a markup of 25% to cover Contractor's overheads and profit including all taxes".

In the tenth line, after the words "Engineer shall" the following is added:

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.

Add the following para at the end of the Sub-Clause 52.1 of Part-I.

The approval / finalization of rates of all variations shall not relieve 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.

#### **53.4 Failure to Comply**

This Sub-Clause is deleted in its entirety.

#### **54.5 Conditions of Hire of Contractor's Equipment**

The following paragraph is added:

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.

Add the following of Sub-Clause after Sub-Clause 54.8 of Part I.

#### **54.9 Vesting of Contractor's Plant, Equipment Temporary Works and Materials**

##### **(a) Definitions**

For the purpose of Sub-Clause 54.

- i) The expression "Construction Plant" shall be deemed to exclude vehicles engaged in transporting any labour equipment or materials to or from the site.
- ii) The expression "Essential Hired Plant" shall mean all Constructional Plant, Equipment Temporary Works and materials of Temporary Work the withdrawal of which in the event of termination under Sub-Clause 63 hereof might (having regard to the methods of construction employed prior to the termination) endanger the safety or stability of or result in serious disturbance to the execution of any part of the Works and which are held by the Contractor under any agreement for hire thereof.
- iii) The expression "Hired Plant" shall mean any Constructional Plant, Equipment, Temporary Works (other than essential hired plant) held by the Contractor under any agreement for hire thereof.
- iv) The expression "Agreement for Hire" shall be deemed not to include an agreement for hire purchase with an option to purchase or for conditional sale either of which is herein referred to as an "agreement for the purchase".
- v) The expression "Hire Purchase Plant" shall mean any Constructional Plant, Equipment, Temporary Works held by the Contractor under an agreement for hire purchase thereof.
- vi) The expression "owner" mean the owner of the plant and equipment of any Hire Purchase Plant.

##### **(b) Vesting of Certain Plant**

All Constructional Plant, Equipment, Temporary Works and material owned by the Contractor or by any company in which the Contractor has a controlling interest shall when brought on to the site (or in the case of hire purchase plant upon becoming the property of the Contractor) shall be and shall be deemed to become the property of the Employer.

(c) Conditions of Hire of Certain Plant

With a view to securing in the event of termination Sub-Clause 63 hereof the continued availability for the purpose of executing the Works of any essential hired plant and equipment the Contractor shall not bring on to the Site any essential hired plant unless the agreement for hire thereof contains a provision that the owner will on request in writing made by the Employer within 7 days after the date on which any such termination has become effective and on the Employer undertaking to pay all hire charges in respect thereof 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 it for the purposes of completing the works under the terms of Sub-Clause 63 hereof.

(d) Costs for purpose of Sub-Clause 63

In the event of the Employer entering into any agreement for hire of essential hired plant pursuant to the provisions of Sub-Clause 54.8(c) all sums properly paid by the Employer under the provisions of any such agreement and all expenses incurred by it (including stamp duties) in entering into such agreement shall be deemed for the purpose of Sub-Clause 63 hereof to be part of the cost of completing the Works.

(e) Contractor's Certificate as to Hiring Provisions

The Contractor shall upon request made by the Engineer at any time in relation to any item of essential hired plant forthwith notify to the Engineer in writing the name and address of the owner and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements of Sub Sub-Clause 54.8(c) hereof. The Contractor shall also upon request as aforesaid give a like notification (but without certificate) in regard to any hire purchase plant.

(f) Hire Purchase Payment by the Employer

The Employer shall in order to avoid seizure by the owner of any hire purchase plant be entitled to pay to such owner the amount of any overdue installment or other sum payable optionally or otherwise under any Agreement of hire purchase and in the event of his doing so any amount so paid by him shall be debt due from the Contractor to the Employer and may be deducted by the Employer from any moneys due or that may become due to the Contractor under the Contract or may be recovered by the Employer from the Contractor at law.

(g) Irrevocability of Certain Plant etc.

No Constructional Plant, Equipment Temporary Works or materials or any part thereof shall be removed from the site without the written consent of the Engineer which consent shall not be unreasonably withheld where the same is no longer immediately required for the purposes of completion of the Works but the Employer will permit the Contractor the exclusive use of all such Constructional Plant, Equipment, Temporary Works and materials in and for the completion of the Works until the occurrence of any event which gives the Employer the right to expel the Contractor from the site and proceed with the completion of the Works.

(h) Revesting and Removal of Plant

Upon the removal with the consent of the Engineer of any such Constructional Plant Equipment, Temporary Works or materials as have been deemed to have become the property of the Employer under Sub-Clause 54.8(b) the property therein shall be deemed to revest in the Contractor and, upon completion of the Works the property in the remainder of such Constructional Plant, Equipment, Temporary Works and materials as aforesaid shall subject to the provisions of Sub-Clause 63 be deemed to revest in the Contractor who shall remove the same together with any essential hired

plant or hire purchase plant. If the Contractor shall fail to remove any Constructional Plant, Equipment, Temporary Works or materials as aforesaid or any essential hire plant or hire purchase plant within such reasonable time after completion of the Works as may be allowed by the Engineer then the Employer may:

- i) sell any such Constructional Plant, Equipment, Temporary Works and materials as aforesaid, and
- ii) return at the Contractor's expenses to the person firm or company from whom any Essential Hired Plant or any Hire Purchase Plant was held by the Contractor such essential hired plant or hire purchase plant, and after deducting from any proceeds of sale, the costs, charges and expenses of and in connection with such sale and return as aforesaid shall pay the balance (if any) to the Contractor but to the extent that the proceeds of any sale are insufficient to meet all such cost, charges and expenses the excess shall be a debt due from the Contractor to the Employer and shall be deductible or recoverable by the Employer accordingly as aforesaid.

(j) Liability for loss or injury to plant

The Employer shall not at any time be liable for the loss of or injury to any of the Constructional plant, Temporary Works or materials which have been deemed to become the property of the Employer under Sub-Clause 54.8(b) hereof save as mentioned in Sub-Clause 20 hereof.

(k) Incorporation of Sub-Clause in Sub-Contracts

The Contractor shall when entering into any sub-contract for the execution of any part of the Works incorporate in such sub-contract (by reference or otherwise) the provisions of this Sub-Clause in relation to Constructional Plant, Temporary Works and materials. Essential Hired Plant and Hire Purchase Plant to be brought on the Site by the sub-contractor.

(l) Approval of Materials etc., not implied

The operation of sub Sub-Clause 54.8(b) hereof 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 materials at any time by the Engineer.

The following Sub-Clauses 59.4 & 59.5 are added:

**59.4 Payments to Nominated Subcontractors**

The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with Clause 58 [Provisional Sums], except as stated in Sub-Clause 59.5 [Certification of Payments].

**59.5 Certification of Payments & Nominated Subcontractors**

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

- a) submits reasonable evidence to the Engineer, or
- b) i) satisfies the Engineer in writing that the Contractor is reasonably entitled to



- ii) withhold or refuse to pay these amounts, and submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement,

then the Employer may (at his sole discretion) pay direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

#### **60.1 Monthly Statements**

In the first line after the word "shall", the following is added:

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

In Para (c) the words "the Appendix to Tender" are deleted and substituted with the words "Sub-Clause 60.11 (a)(6) hereof".  
(in case Clause 60.11 is applicable)

#### **60.2 Monthly Payments**

In the first line "28" is substituted by "14".

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

The text is deleted and substituted with the following:

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 15 days 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 after such Final Payment Certificate has been delivered to the Employer; Provided that the Interim Payment shall be caused in 42 days and Final Payment in 56 days in case of foreign funded project.

The following Sub-Clause 60.11 and 60.12 are added:

#### **60.11 Not Responsibility of the Engineer**

Nothing in the Contract shall place any responsibility on the Engineer for any payments to the Contractor for or with regard to the Works or in respect to his fulfillment of any other obligation under the Contract.

#### **60.12 Withholding of Payment**

- (a) The Employer may withhold the whole or a part of any payment requested by the Contractor if it is necessary in the opinion of the Employer to protect himself against losses on account of the following reasons.
  - i) Defective work not rectified.
  - ii) Non-fulfillment of any due demand and guarantee.
  - iii) Claims of third parties raised against the Employer caused through the 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.

### **63.1 Default of Contractor**

The following para is added 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**

The text is deleted and substituted with the following:

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

### **67.3 Arbitration**

In the sixth to eight lines, the words “shall be finally settled ..... appointed under such Rules” are deleted and substituted with 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.

The following paragraph is added:

The place of arbitration shall be **Karachi**, Pakistan.

### **68.1 Notice to Contractor**

The following paragraph is added:

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 addresses are:

a) The Employer :

Project Management Unit (**PMU**), BRT Orange Line  
Transport and Mass Transit Department  
Government of Sindh,  
6<sup>th</sup> Floor, Civic Center, Gulshan-e-Iqbal, Karachi.

b) The Engineer:

TO BE NOMINATED AND INFORMED

**70.1 Increase or Decrease of Cost**

Sub-Clause 70.1 is deleted in its entirety.

The following Sub-Clauses 73.1, 73.2, 74.1, 75.1, 76.1, 77.1, 78.1, 79.1 and 80.1 are added:

**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 including Sindh Sales tax on Services.

**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 leviable on or in relation to the 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.

**74.1 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.

**75.1 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.

**76.1 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.

**77.1 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.

#### **78.1 Precaution for Pollution**

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

#### **79.1 Coordination of Work at Site**

The Contractor shall take cognizance that during the execution of the project. Other Contractors will be working concurrently on this site.

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

The Contractor shall ensure that the necessary safety precautions will be observed and interferences shall be avoided especially for the works 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 Employer'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 in his prices & programming.

#### **80.1 Integrity Pact**

If the Contractor or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Appendix-L to his Bid, then the Employer shall be entitled to:

- (a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Subcontractors, agents or servants;
- (b) terminate the Contract; and
- (c) recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants.

The termination under Sub-Para (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clauses 63.1 to 63.4 and the payment under Sub-Clause 63.3 shall be made after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.

# **BILL OF QUANTITIES**

## **BILL OF QUANTITIES**

### **A. Preamble**

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract.
3. The rates and prices entered in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract include all costs of Contractor's plant, labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore 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 deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. Unit rate against each item in the Bill of Quantities shall be written legibly both in words and figures. This is mandatory.
6. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works.
7. General directions and description of work and materials are not necessarily repeated nor summarised in the Bill of Quantities. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the priced Bill of Quantities.
8. Provisional sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clause 58.2 of Part I, General Conditions of Contract.
9. Any arithmetic errors in computations or summations will be corrected by the Employer as follows:-
  - a) where there is a discrepancy between amount in figures and in words, the amount in words will govern; and
  - b) where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern.
10. The items mentioned in the Bill of Quantities consist of furnishing all plant, labour, equipment, machinery, appliances, materials, fittings, fixtures, fabrication, erection and installation required for completing the items/works. The work shall be done in accordance with the Bill of Quantities, Technical Specifications, Drawings and directions of the Engineer complete in all respect.

11. The "Ref Sec." indicates the specifications section number which as a whole or part (depending upon the Engineer's discretion) of these specifications are to be followed during execution of item of work in accordance with the applicable drawings.
12. Complete description of items of works in the Bill of Quantities, general directions, conditions and limitations of works, location and place of works, applicable methods, means to be adopted, type and quality of materials, use of tools, plant, and machinery are not necessarily mentioned in the Bill of Quantities. These shall be referred to in accordance with the Technical Specifications and Drawings.
13. The tenderer may ensure himself of the correctness of quantities and application of the individual items of works as per the Drawings, Technical Specifications and Contract Documents.
14. Notwithstanding provision of Clause 51 of the General Conditions of Contract, no claim for extra payment will be admissible on account of anticipated profit or variation in overheads expenditure for the works not actually performed nor will any adjustment in the unit rate set forth in the Bill of Quantities be made because of any increase or decrease in the quantities indicated therein.
15. Unless otherwise stated in the text of the Priced Bill of Quantities, the quantities have to be measured and paid in accordance with the measurement and payment of works clauses given in the relevant specifications or in accordance with implied meaning of the specifications. Any special method of measurement used as stated in text of Priced Bill of Quantities is limited to the concerned items only.
16. The rates quoted in the rate column are full value of unit prices as shown in unit column and are firm and final and shall be full compensation for the works involved as per Drawings, Specifications and Contract Conditions.

**Construction of Water Trunk Main from Town Municipal Administration (TMA) to Board Office  
Chowrangi**

**BILL OF QUANTITIES**

BASED ON COMPOSITE SCHEDULE OF RATES 2012

S. No.	Description	Unit	Qty.	Rate	Amount (Rs.)
<b><u>SCHEDULE ITEMS</u></b>					
<b><u>EARTH WORKS</u></b>					
1	3/1	Excavation for pipe line in trenches and pits in soft soil including trimming and dressing sides to true alignment and shape levelling of beds of trenches to correct level and grade cutting joints holes and disposal of surplus earth within a one chain as directed by Engineer incharge providing fence guard light flag and temporary crossing for non vehicle traffic where ever required lift upto 5 ft (1.52 m) and lead upto on chain (30.5m).			
	a)	Upto 2 m	Cu.m	5,000	
2	3/A16	Add for additiona lift of every 1 chain or part there of in item No. 1 to 15 (A & B) for excavation for pipe line and storage tank trenches and pits.			
	b)	2 to 5 m	Cu.m	11,600	
3	3/24	Refilling the excavatec stuff in trenches 6" thick layer i/c watering ramming to full compaction etc. complete.			
			Cu.m	14,900	
<b><u>PLAIN AND REINFORCED CONCRETE</u></b>					
4	4/6(i)	Class 'C' plain cement concrete using ordinary Portland cement in thrust block.			
			Cu.m	10	
<b><u>STEEL PIPES &amp; PIPE FITTINGS</u></b>					
5	11/H1	Black steel M.S pipes (spiral welded) including fittings of the following diameters conforming to API 5L grade X-42 as shown on the drawings or as directed by the			
	a)	825 mm (wall thickness 7.9 mm)	Rm	950	
	b)	600 mm (wall thickness 7.1 mm)	Rm	970	
6	11/G1	Black steel M.S pipes (straight welded) including fittings of the following diameters conforming to API 5L grade X-42 as shown on the drawings or as directed by the Engineer.			
	a)	450 mm (wall thickness 6.4 mm)	Rm	360	
	b)	400 mm (wall thickness 6.4 mm)	Rm	70	
	c)	375 mm (wall thickness 6.4 mm)	Rm	1,000	



**Construction of Water Trunk Main from Town Municipal Administration (TMA) to Board Office  
Chowrangi**

**BILL OF QUANTITIES**

BASED ON COMPOSITE SCHEDULE OF RATES 2012

S. No.	Description	Unit	Qty.	Rate	Amount (Rs.)
	d) 300 mm (wall thickness 6.4 mm)	Rm	190		
	e) 200 mm (wall thickness 5.6 mm)	Rm	100		
	f) 150 mm (wall thickness 5.6 mm)	Rm	300		
	g) 100 mm (wall thickness 5.6 mm)	Rm	160		
7	3/10 Providing & fixing 0'-9" long. 3/8" thick MS neck to existing MS pipe or to a split collar tee having a total weight as mentioned against each item It included the cost of fabrication and welding to the split collar tee.				
	a) 450 mm	No.	1		
	b) 400 mm	No.	1		
	c) 375 mm	No.	1		
	d) 300 mm	No.	4		
	e) 200 mm	No.	3		
	f) 150 mm	No.	4		
	g) 100 mm	No.	4		
8	3/9A Providing & fixing MS split collar Tee on PRCC pipe of different size having width mentioned against each item to size suit the size of connection fabricated with 3/8" thick MS plate excluding the cost of the net including cost of 3/4" thick MS square baron both ends 4 nos. 3/4" thick MS flanged with a total weight mentioned against each item it also includes the cost of nuts and bolts rubber packing labour and sealing materials and all tools and plants.				
	a) 300 mm	No.	1		
	b) 200 mm	No.	1		
	c) 150 mm	No.	1		
	d) 100 mm	No.	1		
9	3/5B Providing & fixing M.S bend fabricated with 3/8" thick M.S plate having an outer length and total weight as mentioned against each item.				

**Construction of Water Trunk Main from Town Municipal Administration (TMA) to Board Office  
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**BILL OF QUANTITIES**

BASED ON COMPOSITE SCHEDULE OF RATES 2012

S. No.	Description	Unit	Qty.	Rate	Amount (Rs.)
	a) 825 mm	No.	1		
	b) 600 mm	No.	6		
	c) 450 mm	No.	2		
	d) 375 mm	No.	1		
	e) 300 mm	No.	1		
<b><u>PROVIDING, EXTERNAL &amp; INTERNAL COATING OF M.S PIPES</u></b>					
10	11/11 Externally bitumen (asphalt) coating 3 layers with fiber glass 5 mm thick to black steel of MS pipes and internally CC lining 8mm thick for the following.				
	a) 825 mm (wall thickness 7.9 mm)	Rm	1,000		
	b) 600 mm (wall thickness 7.1 mm)	Rm	1,020		
	c) 450 mm (wall thickness 6.4 mm)	Rm	380		
	d) 400 mm (wall thickness 6.4 mm)	Rm	70		
	e) 375 mm (wall thickness 6.4 mm)	Rm	1,040		
	f) 300 mm (wall thickness 6.4 mm)	Rm	200		
	g) 200 mm (wall thickness 5.6 mm)	Rm	100		
	h) 150 mm (wall thickness 5.6 mm)	Rm	300		
	i) 100 mm (wall thickness 5.6 mm)	Rm	170		
11	1/J1 Cast iron cover & frame of following size:				
	a) 600 x 600 mm (heavy duty)	kg.	1,260		
12	16/1b RCC cover & frame of following size:				
	a) 600 x 600 mm	No.	6		
<b><u>DOUBLE SURFACE</u></b>					
13	4/17B Providing Surface Dressing 2nd coat on new or existing surface with 25 lbs betumin and 3.50 cft of bajri of required size i/c cleaning the road surface rolling etc., complete (rate includes all cost of material T & P and carriage upto 3 chains)	Sq.m.	2,798		

**Construction of Water Trunk Main from Town Municipal Administration (TMA) to Board Office  
Chowrangi**

**BILL OF QUANTITIES**

BASED ON COMPOSITE SCHEDULE OF RATES 2012

<b>S. No.</b>	<b>Description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount (Rs.)</b>
<b><u>NON SCHEDULE ITEMS</u></b>					
	Ref. Spec. No. 1100				
14	NS Fine sand bedding material obtained from outside source.	Cu.m	725		
<b><u>VALVE CHAMBERS</u></b>					
	Ref. Spec. No. 5225				
15	NS Valve chamber of the following sizes comprising earthworks, plain cement concrete, Class 'B' reinforced cement concrete, steel reinforcement, etc. complete in all respect as shown on the drawings.				
	a) 1500 x 1500 mm	No.	4		
	b) 2000 x 2000 mm	No.	2		
<b><u>CAST IRON &amp; RCC COVER WITH FRAMES &amp; LADDER RUNGS</u></b>					
	Ref. Spec. No. 5233				
16	NS M.S. ladder rungs 20mm dia.	No.	350		
<b><u>VALVES AND APPURTENANCES</u></b>					
	Ref. Spec. No. 5220				
17	NS Cast iron flanged gate valve of the following diameter as per BS 5163 or equivalent, PN-10 of Western European or Japan origin.				
	a) 825 mm	No.	2		
	b) 600 mm	No.	3		
	c) 450 mm	No.	1		
<b><u>AGGREGATE SUB-BASE &amp; AGGREGATE BASE COURSE</u></b>					
	Ref. Spec. No. 2410				
18	NS 300mm thick aggregate subbase course. (Vol. III part-VI, P/3 Highway Works, earth work item no 11)	Cu.m.	839		
19	NS 200mm thick aggregate base course. (Vol. III part-VI, P/5 Highway Works, item no. 13(b))	Cu.m.	560		
<b>Total Amount</b>					_____
<b>Carried over to Summary of Cost</b>					=====

## **SPECIFICATIONS**

# SPECIFICATIONS

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## SECTION - 0100

### GENERAL REQUIREMENT

#### 01 GENERAL

The Conditions of Contract shall form an integral part of these General Requirements.

The Contractor shall notify all sub-contractors of the provisions of the Conditions of Contract and the General Requirement of this Specification.

The arrangement and divisions of these Specifications is not to be construed as establishing the limits of responsibility of sub-trades.

The Contractor is responsible for delineating the scope of Sub-Contracts and for coordinating all the Works.

All works shall be carried out in accordance with the following specifications, supplemented by detailed specifications contained in the following sections. Any inconsistencies or ambiguities shall be brought to the notice of the Engineer for his clarification/decision. Decision and direction of the Engineer, in all such cases, shall be final and binding.

The Contractor shall make himself thoroughly familiar with the site conditions, foresee any and all problems likely to be encountered during execution of the works, and shall be able and ready to solve them effectively. Proposals for solutions to the problems shall be submitted to the Engineer for approval before proceeding with the work.

#### 02 APPLICABLE CODES AND STANDARDS

In the absence of other Standards being required by the Contract Documents, all work and materials shall meet the requirement of the Uniform Building Code of the United States, and/or applicable American Society for Testing Materials (ASTM) American Association of State Highway and Transportation Officials (AASHTO) Specifications and the latest American Concrete Institute Manual of Concrete Practice and American Institute of Steel Construction (AISC) Manual relevant to the Works except in cases where the Pakistan Building Code requires a higher standard. In such cases the Pakistani Code shall govern. Where the abbreviations listed below are used, it refers to the latest code, standards, or publication of the following organizations:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASA	American Standard Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Material
AWS	American Welding Society
BSI	British Standards Institute
BSICP	British Standard Institute Code of Practice
PCA	Portland Cement Association
PSQCA	Pakistan Standard & Quality Control Authority
UBC	Uniform Building Code

Should the Contractor, at any time and for any specific reasons, wish to deviate from the above standards or desires to use materials or equipment other than those provided for by the above standards, then he shall state the exact nature of the change giving the reasons for making the change and shall submit complete specifications of the materials

and descriptions of the equipment for the Engineer's approval, whose decisions shall be conclusive and binding upon the Contractor.

**03 CODES, STANDARDS, CERTIFICATES**

The Contractor shall supply and have at his site office:

Copies of all latest editions of codes and standards referred to in these specifications by number, or equivalent codes and standards approved by the Engineer.

Catalogues and published recommendations from manufacturers supplying products and materials for the project.

The Contractor shall provide manufacturer's or supplier's certificates to the Engineer for all products and materials which must meet the requirements of a specific code or standard as stated in these Specifications.

**04 UNITS OF MEASUREMENTS**

The International System of Units (SI) shall be used throughout this Project.

**05 MANUFACTURER'S RECOMMENDATIONS**

Installation of manufactured items shall be in accordance with procedures recommended by the manufacturer or as approved by the Engineer.

**06 EXISTING CONDITION AT SITE**

Drawings and information pertaining to existing project conditions are furnished for reference.

Neither the Employer nor the Engineer warrants the adequacy or correctness of these.

**07 PROTECTION AND PRECAUTIONS**

The Contractor and his sub-contractors shall afford all necessary protection to existing structures and will be required to make good at his own expense any damage done to such structures through his own or his representatives or subcontractors' fault and negligence.

The Contractor and his sub-contractors shall afford all necessary protection to existing roads in the area. He will clear and make good at his own expense any damage to or debris on these roads through his own fault and negligence. He must at all time ensure the free and normal flow of traffic and shall not cause obstruction to the traffic system. The Contractor and his sub-contractors shall provide and maintain necessary protection and precautionary measures such as warning signs, warning lamps and barricades etc. to prevent accidents.

The Contractor shall promptly correct all such damage to original condition at no additional expense to the Employer.

The Contractor shall cooperate with trades performing work under other Contracts as necessary for completion.

**08 SETTING OUT OF WORK**

Establish all boundaries, markers, levelling stakes and bench marks on the site to adequately set out all work. Verify all data and their relationship to established and Engineer's survey control points and public bench-marks and report discrepancies to the Engineer.

Permanently mark the necessary controls for distance and elevation sufficient to serve throughout the Contract and protect these control points adequately against damage and displacement.

Project setting out is for the use of all trades; each trade is responsible for the layout of its own work.

**09 SEQUENCE OF CONSTRUCTION**

The Contractor shall submit his proposal for approval of the Engineer the sequence of Construction, prior to starting the works. The works shall be executed as per approved sequence of construction.

**10 LINES AND LEVELS**

Survey control points will be established by the Engineer. The Contractor shall be responsible for verifying these and shall be responsible for all requirements necessary for the execution of any work to the locations, lines, and levels specified or shown on the drawings, subject to such modifications as the Engineer may require as work progresses.

**11 PARTIAL POSSESSION**

Whenever, as determined by the Employer any portion of work performed by the Contractor is in a condition suitable for use, the Employer may take possession of or use such portion.

Such use by the Employer shall in no instance be construed as constituting final acceptance, and shall neither relieve the Contractor of any of his responsibilities under the Contract, nor acts a waiver by the Employer of any of the conditions thereof, provided that the Contractor shall not be liable for the cost of repairs, re-work, or renewals which may be required due to ordinary wear and tear resulting from such use. However, if such use increase the cost or delays to the completion of remaining portions of work, the Contractor will be entitled to an equitable adjustment.

If, as a result of the Contractor's failure to comply with the provision of the Contract, such use proves to be unsatisfactory, the Employer will have the right to continue such use until such portion of the work can, without injury to the Employer, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary for such work to comply with the Contract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve months unless otherwise mutually agreed upon in writing between the parties.



**12 EXISTING SERVICES**

The Contractor shall search for, find, locate and protect any wiring, cable, duct, pipework, etc., within or immediately adjoining the site area.

The Contractor shall take full responsibility for safety of existing service lines, utilities and utility structures uncovered or encountered during excavation and construction operations.

The Contractor shall take full responsibility for damaging any such service lines, utility/utility structure and any cost and/or expense that arises or issues from any such damage shall be borne directly by himself. Should any damage to any such service occur the Contractor shall forthwith take remedial action, initiate safety precautions, install temporary services and carryout repair all at his own cost and expense and inform the Engineer and notify all relevant authorities.

Existing utilities which are to remain in service for or after the works are to be determined by the Contractor. If any existing service lines, utilities and utility structures which are to remain in service are uncovered or encountered during these operations, they shall be safeguarded, protected from damage, and supported.

**13 PLANT AND EQUIPMENT**

The Contractor shall submit a detailed list of plant and equipment which he shall undertake to bring to the site to carry out the work. The list shall satisfy the Engineer as to type, size and quantity. The list shall include for each piece of equipment the type, manufacturer, model, identification number and year of manufacture. The Contractor shall provide on the site of the work at his cost all of the equipment listed and all subsequent equipment required for approval of the detailed programme of work and such equipment which may be directed by the Engineer. The Contractor shall supply all plant and equipment necessary for the construction of each phase of the work and it must be on site, inspected and approved by the Engineer.

**14 CONSTRUCTION AREA AND ACCESS**

The Contractor shall confine his operations to the areas that are actually required for the Works and shall fence the area accordingly. Arrangements for access roads, storage areas and routes for haulage of materials are to be made by the Contractor at his own cost, subject to the approval of the Engineer.

**15 STORAGE & HANDLING FACILITIES**

The Employer will provide the Contractor possible space within or nearby the area of site of works for the storage of plant, equipment and materials and for Contractor's temporary office, during the currency of the Contract. In case the adjacent area as required by the Contractor is not available within the Project boundary for storage of plant, equipment and machines then the Contractor shall arrange at his own expense possible space for storage of plant, equipment and machines at his own cost and expense. On no account shall such temporary installations conflict/interfere with any of the permanent installations, services and any operational function of Employer. The handling and storage of all plants, equipment and materials at site shall be the sole responsibility of the Contractor and at no risk and cost to the Employer.

The Contractor shall protect all material against corrosion, mechanical damage or deterioration during storage and erection on site. The protection methods shall be to the approval of the Engineer.

**16 TEST LABORATORY AND TESTING**

- 16.1 Testing, except as otherwise specified herein, shall be performed by an approved testing agency as proposed by the Contractor and at no extra cost to the Employer. The Engineer may require all testing to be carried out under his supervision only.
- 16.2 If suitable and adequate material testing laboratory is not available in the vicinity, then the Contractor shall provide and maintain a materials testing laboratory in the vicinity of the Contractor's Camp and the laboratory shall have sufficient working area and shall be equipped with all necessary facilities including a suitable store room.
- 16.3 The Contractor shall supply and maintain to the satisfaction of the Engineer or his representative complete testing equipment, apparatus, tools, gauges, instruments, etc. in sufficient number and adequate for all tests to be carried out as specified in these specifications. Valid calibration certificates of gauges / instruments / equipment shall be provided by the Contractor.
- 16.4 The Contractor, after the approval by the Engineer for the source of cement and steel shall make available at the site sufficient stock of the materials in advance in order to allow sample testing for quality control prior to use.
- 16.5 The quality control testing shall be performed by the Contractor's competent personnel in accordance with a site testing and quality control programme to be established by the Contractor and approved by the Engineer or his Representative. The Contractor shall keep a complete record of all quality tests performed on site and submit the same to the Engineer. All quality control and related tests shall be carried out in accordance with applicable standards and codes.

**17 CONSTRUCTION & CHECKING AT SITE**

The Contractor shall submit to the Engineer in due time for approval and discussion, his proposals and plans as to the method and procedure to be adopted for the temporary and permanent works involved.

The submitting to these suggestions and arrangements, and the approval thereof by the Engineer shall not relieve the Contractor of his responsibilities and duties under the Contract.

The carrying out of all work included in the Contract is to be supervised by a sufficient number of qualified representatives of the Contractor and full facilities and assistance are to be afforded by the Contractor for the Engineer or his Representative to check & examine the execution of the work.

The Engineer reserves the right to inspect all parts of the works but may at his discretion waive inspection on certain items. This shall in no way absolve the Contractor from his responsibilities. This particularly applies to the checking of materials, the accurate setting out of foundations, and to the levelling, setting and aligning of the various parts, and to the proper fitting and adjustment of manufactured and finished materials and fixtures in position.

If the Engineer or his Representative find that the work progress is slow in such a way that the works or parts thereof will not be completed in the time specified, then he shall order the Contractor to work overtime or in shifts and the Contractor shall comply. These arrangements will be free of all financial encumbrances and at no additional costs to the Employer.

In the event of night work, the Contractor shall provide sufficient and adequate lighting to the satisfaction of the Engineer or his Representative and shall supply the necessary manpower for satisfactory continuation of the work after normal hours.

**18 BAR BENDING SCHEDULE**

Bar bending (reinforcement bars) schedule of all drawings shall be prepared by the Contractor and submitted in triplicate to the Engineer for approval.

**19 DRAWINGS**

19.1 Bidding Drawings: Bidding Drawings shall not be used as a basis for fabrication or construction but may be used as a basis for placing preliminary order for materials, subject to corrections based on the future issue of Drawings as provided under sub-clause 19.2 Drawings Issued for Construction. Bidding Drawings are subject to be modified and supplemented by additional detail by the Engineer.

19.2 Drawings Issued for Construction: After Award of Contract, Tender Drawings shall be placed by Drawings Issued for Construction including supplementary Specifications as may be necessary. Such drawings and specifications shall be construed to be included in the expression Custody of Drawings under Sub-Clause 6.1 of General Conditions of Contract Part I. Drawings Issued for Construction may include some of the Tender Drawings with or without modification and additional drawings as required to express design intent in greater detail. Such drawings may also be modified from time to time. Drawings Issued for Construction will be the drawings from which shop, fabrication, erection, installation, concrete placing, formwork, or other construction detail drawings shall be prepared by the Contractor. The work shall be executed in conformity with Drawings Issued for Construction. The Contractor shall prepare a schedule of Drawings Issued for Construction of various parts of the Works based on Construction programme approved by the Engineer for issuance to the Contractor from time to time.

19.3 Study of Drawings: The Contractor shall study all Drawings Issued for Construction carefully as soon as practicable after receipt thereof, and any errors discovered shall promptly be brought to the knowledge of the Engineer for his instructions.

19.4 Copies of Drawing: Drawings will be issued to the Contractor free of charge as follows:

Drawings Issued for Construction - Two copies as specified in sub-clause 6.1 Custody of Drawings, of General Conditions of Contract - Part I Volume I.

19.5 Drawings to be furnished by the Contractor:

(a) Shop Drawings.

All shop drawings required for the work including all kinds of fabrication, field erection, installation, placement and layout drawings shall be furnished by the Contractor for approval of the Engineer. If additional detail drawings are necessary to complete any part of the work, such including reinforcing steel, drawings shall be prepared by the Contractor and submitted to the Engineer for approval. All drawings shall be complete and shall be submitted in due time and in logical order to facilitate proper coordination.

## (b) Lift and placement Drawings.

At least thirty calendar days prior to starting construction of any concrete lift or other placement, the Contractor shall submit lift or other placement drawings to the Engineer for approval. Lift or other placement drawings shall be submitted for each lift or other placement of concrete to be placed. These drawings shall be to such scale as to clearly show all recesses, openings, and embedded parts, including embedded structural steel, mechanical and electrical items, reinforcement placement in each lift in sufficient detail for proper execution of the work.

## (c) Construction Plant Layout Drawings.

Three prints of drawings, showing the layout of construction plant and equipment the Contractor proposes to use on the work, shall be submitted by the Contractor for review to the Engineer. The drawings shall show the locations of the principal components of the construction plant, offices; storage areas and yards which the Contractor proposes to construct or use at the site of the work and elsewhere. The drawings shall also show the unloading facilities for materials and equipment at the work site.

19.6 **Submissions and Approvals:**

- (a) Except as otherwise specified, three copies of each drawing for approval or review shall be furnished to the Engineer. Within thirty calendar days after receipt, the Engineer will send one copy to the Contractor marked Approved, Approved/Except as Noted, or Returned for Correction. The notations Approved and Approved/Except as Noted will authorize the Contractor to proceed with the fabrication of the materials and equipment covered by such drawings subject to the corrections, if any, indicated thereon. Drawings returned for correction will be resubmitted for approval in the same manner as for new drawings. Every revision made during the life of the Contract shall be shown by number, date and subject in a revision block.
- (b) Upon receipt of prints which have been Approved or Approved Except as Noted, the Contractor shall furnish three prints plus one reproducible of each drawing to the Engineer. If revisions are made after a drawing has been approved, the Contractor shall furnish 3 additional prints and one reproducible subsequent to each approved revision.
- (c) Shop drawings to be prepared by a Sub-contractor shall be submitted in the same manner as (a) & (b) above but they will be submitted through the Contractor.
- (d) All of the applicable requirements of this Clause with reference to drawings to be prepared by the Contractor, including Sub-contractors, shall apply equally to catalogue cuts, illustrations, printed specifications, or other data submitted for approval.
- (e) Any work done on Contractor's drawings shall be at the Contractor's risk. The Engineer will have the right to request any additional details and to require the Contractor to make any changes in the drawings which are necessary to conform to the provisions and intent of design and specifications without additional cost to the Employer. The approval of the drawings 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. Approval by the Engineer of the Contractor's drawings shall not be held to relieve the Contractor of his obligation to meet all the

requirements of the Specifications or of his responsibility for the correctness of the Contractor's drawings or of his responsibility for correct fit of assembled parts in final position or of his responsibility for the adequacy of method of construction.

20 **AS-BUILT DRAWINGS**

The Contractor shall, at all times, keep on the site one copy of all drawings and approved samples together with copies of all building, mechanical, electrical and public safety codes and relevant standards applicable to the works. All such material shall be made available to the Engineer.

In addition, the Contractor shall, at all times, keep on site a separate set of prints on which shall be noted neatly, accurately and promptly as the work progresses all significant changes between the work shown on the drawings and that which is actually constructed. The sub-Contractors shall each keep on site, at all times, a separate set of prints of the drawings showing their parts of the work on which shall be noted, neatly accurately and promptly as work progresses the exact physical location and configuration of the works as actually installed, including any revisions or deviation from the Contract Documents.

At the completion of the works, the Contractor shall at his expense, supply to the Engineer six copies and one reproducible copy of all drawings alongwith CD containing all as built drawings amended to comply with the work "As Built". The Contractor shall provide in the same format as the original drawings, any additional drawing required to record the work.

21 **RESTORATION AND CLEANING**

The Contractor shall do regular cleaning and clean away all rubbish and excess materials that may accumulate from time to time on completion and before handing over. Upon completion of the works he shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stock piles of excess or waste materials, or any other vestiges of construction, unless otherwise directed by the Engineer. The works and site shall be left in a clean and satisfactory state for immediate use and occupation. Care shall be taken not to use any cleaning materials which may cause damage to the surface to be cleaned.

22 **PROTECTION OF THE WORKS**

The Contractor shall whenever necessary cover up and protect the works from weather and damage by his own or other workmen performing subsequent operation. He shall provide all necessary dust sheets, barriers and guard rails and clear away the same at completion.

The Contractor shall take all proper steps for protection at all places on or about the works which may be dangerous to his workmen or any other person or to traffic. The Contractor shall provide and maintain warning signs, warning lamps and barricades as necessary.

23 **PRODUCT DATA**

Manufacture's standard schematic drawings shall be modified or deleted to indicate only information which is applicable to the project. Such standard information shall be supplemented to provide all additional applicable information.

Manufacturer's catalogue sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive literature shall be clearly marked to identify pertinent materials products or models. Dimensions and required clearances shall be indicated. Shop performance characteristics and capacities shall be noted.

## 24 **SAMPLES**

- 24.1 The Contractor shall furnish for approval of the Engineer with reasonable promptness all samples as directed by the Engineer or specifically called for in these Specifications. The Engineer shall check and approve such samples with reasonable promptness for compliance with the requirements of Contract Documents. All work shall be in accordance with approved samples.
- 24.2 Duplicate final approved samples, in addition to any required for the Contractor's use, shall be furnished to the Engineer, one for office use and the other for the Site.
- 24.3 Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for consideration of the sample submitted.
- 24.4 Each sample shall be properly labeled with the name and quality of the material, manufacturer's name, name of the project, the Contractor's name and the date of submission, and the Specifications Article number to which the sample refers.
- 24.5 The manufacturer's installation directions shall be provided with each sample. The Contractor shall pay all transportation costs and deliver samples to the Engineer's office, Site or testing laboratory as directed by the Engineer.

Samples will not be returned unless return is requested at the time of submission; all packing and transportation costs for the return of samples shall be paid by the Contractor.

- 24.6 Samples shall be of adequate size and number to permit proper evaluation of the material by the Engineer. Where variations in colour, texture, dimensions or other characteristics are to be expected, the Contractor shall submit samples showing the maximum range of variation. Materials exceeding the range of variation of the approved samples shall not be used on the Work.
- 24.7 If both Shop Drawings and samples are required for the same item, the Engineer may require both to be submitted before approving either.
- 24.8 No acceptance or approval of any Shop Drawings or sample, or any indication or directions by the Engineer on any Shop Drawings shall constitute an authorization for any increase in the Contract Sum.

## 25 **PRODUCT QUALITY AND HANDLING**

Suppliers of local and foreign products and installations specified shall have been regularly engaged in the business of manufacturing, fabricating, installing and / or servicing work required for a period not less than 5 years. In addition, the Engineer may request as appropriate a:

- list of similar installations that describes project, scope and date of completion.
- complete literature, performance data, and technical data.
- list of services record within Pakistan.

- location of service office from which this installation could be maintained.

For the actual fabrication, installation, and testing of the specified work, use only thoroughly trained and experienced workmen completely familiar with the items required and with the manufacturers recommended methods of installation. In acceptance or rejection, no allowance will be made for the lack of skill on the part of workmen.

Use all means necessary to protect materials before, during and after installation and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacement necessary for approval and at no additional cost to the Employer.

## 26 **INSPECTION & TESTS REPORTS**

All equipment and materials furnished under these specifications and all work performed in connection therewith will be subject to rigid inspection by the Engineer or the Engineer's Representative. Acceptance of equipment and material or the waiving off inspection thereof shall in no way relieve the Contractor of his responsibility for meeting the requirements of the Contract.

The Contractor shall furnish the Engineer with certified true copies of test reports of all materials used in the manufacture and fabrication of all equipment and material including metal work, steel pipes, fire bricks etc. The result of these tests shall be in such form as to show compliance with the applicable Specifications, standards and codes for the material used.

## 27 **ACCIDENT PREVENTION, PROTECTIVE EQUIPMENT**

The Contractor shall comply and enforce compliance by all his sub-Contractors with the highest standards of safety and accident prevention in accordance with international standards and in compliance with all applicable laws, ordinances and statutory provisions in Pakistan.

All requisite barriers, fences, warning signs, lights and other safety precautions as required for the protection of persons and property on or adjacent to the site shall be provided at the Contractor's cost.

All warning signs shall be in two languages, English and Urdu, and shall at all times be maintained in a clean and legible condition, to the satisfaction of the Engineer.

Trash shall be removed at frequent intervals to the satisfaction of the Engineer.

## 28 **TEMPORARY FACILITIES**

The Contractor shall provide, erect or install, maintain, alter as necessary and remove on completion except as otherwise directed by the Engineer all temporary facilities and services including access roads as described hereinafter and/or in the Contract Document.

The Contractor's temporary site office shall be available for use not later than one month after the date of the site handing over.

Installation of temporary services at the site shall be given priority over all other construction at the site.

### 28.1 Temporary Road

The Contractor shall prepare and maintain such temporary roads as may be necessary, from the site to the nearest road and also within the site. Such roads shall be positioned strictly in accordance with the Engineer's instructions and the Contractor shall reduce or control any dust nuisance by spraying with water as directed. The Contractor shall satisfy himself as to the locations and nature of the proposed access routes to the site and shall be responsible for preventing any damage whatsoever to adjacent property and vegetation and keeping the access road free from debris at all times.

### 28.2 Temporary Services

#### 28.2.1 Temporary Water Supply

The Contractor shall supply in sufficient quantity all necessary potable and other water for construction purposes for all trades at point within a reasonable distance of the work. He shall make arrangements and pay charges for water service installation, maintenance and removal thereof, and pay the costs of water for all trades.

When the permanent water supply and distribution system has been installed, it may be used as the source of water for construction purposes provided that the Contractor obtains the written approval of the Engineer and the Employer and assumes full responsibility for the entire water distribution system and pays all charges/costs for operation and maintenance of the system mutually agreed between the Employer and the Contractor.

Temporary pipe lines and connections from the permanent service line, whether outside or within the area of site of works but necessary for the use of Contractor and his sub-contractor shall be installed, protected and maintained at the expense of the Contractor.

At completion of the work or at such time as the Contractor makes use of the permanent water supply installation, the temporary water services equipment and piping shall be removed by the Contractor at his own expense.

#### 28.2.2 Temporary Electricity

The Contractor shall make all the necessary arrangements for a temporary electricity service, pay all expense in connection with the installation, operation and removal thereof and pay the costs of electricity consumed by all trades.

In the event that the site can not be connected to a local electricity network or where the available power is insufficient the Contractor has to make his own provision and maintain such installation.

A temporary lighting system shall be furnished, installed and maintained by the Contractor as required to satisfy the minimum requirements for safety and security. The temporary lighting system shall afford adequate general illumination to all building areas. Adequate outdoor lighting shall be provided to illuminate staging trenches and the like to the satisfaction of the Engineer and general illumination throughout adequate for watchmen and emergency personnel.



Temporary equipment and wiring for power and lighting shall be in accordance with the applicable provisions of governing codes. Temporary wiring shall be maintained in a safe manner and utilised so as not to constitute a hazard to persons or property.

When the permanent electrical power and lighting systems are in an operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor obtains the written approval of the Engineer and the Employer and assumes full responsibility for the entire power and lighting system and pays all charges/costs for operation and maintenance of the system mutually agreed between the Employer and the Contractor.

Approval, license etc. if required under local laws will be obtained by the Contractor on his own responsibility and cost.

At completion of construction work, or at such time as the Contractor makes use of permanent electrical equipment and devices, temporary electricity services shall be removed by the Contractor as his own expense.

#### 28.2.3 Waste Disposal

The Contractor shall make such temporary provisions as may be required in order to dispose of any chemicals, fuels, grease, bituminous materials, waste and soil waste and the like without causing pollution to either the site or the environment. Disposal of any materials, wastes, effluents, garbage, oil, grease, chemicals and the like shall be in areas specified by the concerned local authority proposed by the Contractor and subject to the approval of the Engineer. If any waste material is dumped in unauthorized areas the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed off as directed by the Engineer and replaced with suitable fill material compacted and finished with topsoil all at the expense of the Contractor.

#### 28.2.4 Fire Protection

The Contractor shall provide and maintain adequate fire protection in the form of barrels of water with buckets, fire bucket tanks, fire extinguishers, or other effective means ready for instant use, distributed around the project and in and about temporary inflammable structures during construction of the works.

Gasoline and other flammable liquids shall be stored in and dispensed from safety containers approved by the Engineer and storage shall not be within building.

Torch-cutting and welding operations performed by the Contractor shall have the approval of the Engineer before such work is started and a chemical extinguisher is to be available at the location where such work is in progress.

The Contractor shall follow the instructions and specifications of the Civil Defence Department and or other local authority.

#### 28.2.5 Telephone

The Contractor shall immediately after receiving the Letter of Acceptance take the necessary steps to obtain a mobile and landline telephone on site. He shall be responsible for all installation and connection charges and periodic mobile and landline telephone accounts. The telephone shall be made available to the Engineer for the due performance of his duties at all times and free of charge during construction and defects liability period.

### 29 **CONSTRUCTION SCHEDULE**

A Construction schedule shall be maintained in accordance with the provisions of the General Conditions of Contract.

The schedule shall be accompanied with sufficient data and information including all necessary particulars of constructional plant, equipment machinery, temporary Works, arrival of plant, equipment at site and their installation, method of operation, work forces employed, etc., for an activities of the Works.

Should the Engineer consider any alteration or addition in the programme and time schedule, the Contractor shall conform thereto without any cost to the Employer.

Whenever necessary and wherever the progress of the actual work shows departure, the programme and time schedule shall be undated and submitted to the Engineer for his approval.

### 30 **NOTIFICATION TO THE ENGINEER**

The Engineer's Representative shall be notified daily in writing of the nature and location of the Works the Contractor intends to perform the next day so as to enable necessary inspection and measurement to be carried out. The Engineer may, if necessary, direct that longer notice be given of certain operations.

### 31 **NIGHT WORK**

When work is done at night the Contractor shall maintain from sunset to sunrise such lights on or about his work and plant as the Engineer may deem necessary for the proper observations of the work and the efficient prosecution hereof.

### 32 **WEATHER**

No work is to be undertaken when, in the opinion of the Engineer, the weather is so unsuitable that proper protection of the work cannot be ensured.

### 33 **CO-ORDINATION WITH OTHER CONTRACTORS / KW&SB**

The Contractor shall make all necessary coordination with other Contractor(s) / KW&SB and shall make sure that all embedding components such as pipes, steel bases etc. (as required for completion of electrical works) are properly, accurately and timely installed.

The Contractor shall inform the other contractor(s) the schedule of any construction activity well in advance giving him sufficient time to finish his part of job, before any

compaction/concreting etc. The Contractor shall get the signature of the authorized representation of the other contractor(s) before carrying out any construction activity.

If any part of existing or new electrical and utility works is damaged or has to be dismantled or redone due to negligence/omissions/incorrect position of the embedding etc. on part of the Contractor, all such losses/expensed shall be borne by the Contractor.

All expenses incurred for the above works including coordination are deemed to be covered in his tendered cost and no separate/extra payment shall be paid against such item.

#### 34 **SURVEY INSTRUMENTS**

All the instruments, equipment, stakes and other material necessary to perform all work shall be provided by the Contractor. The survey work shall be carried out by competent staff consistent with the current practices. The Contractor shall maintain on site surveying instruments in perfect working conditions to enable the Engineer to check lines and level at all times.

Survey instruments and equipment shall include but not limit to the following:

- Electronic Total Station
- Electronic Data Recorder
- Disto Laser Meter
- Precision Level Invert Staff
- Automatic Levels
- Power level
- Compass, steel tape, ranging poles

#### 35 **WEEKLY PROGRESS REPORT AND PHOTOGRAPHS**

35.1 During the continuance of the Contract, the Contractor shall submit weekly progress reports on forms as approved by the Engineer. Such weekly reports shall show the actual progress completed as of date of the report plotted against the schedule as given by the Contractor at the start of work and shall be broken down so as to indicate status of all activities associated with mobilization design, material procurement, manufacture, surveys works, tests with regard to the agreed contract programme.

35.2 The Employer and the Engineer reserve the right to coordinate the schedules of this Contractor and other Contractors working at the Site, and to adjust and/or change any and all such schedules as required during the course of construction in order to achieve a coordinated project in harmony with the Employer's completion date.

35.3 Commencing after the first week of construction, and continuing every week until completion, the Contractor shall take and submit photographs to the Engineer's Representative, to show progress of his work and completion of each structure or major feature.

#### 36 **CONTRACTOR TO NOTIFY DELAYS ETC.**

Any delay which will affect the completion of Works shall be detailed by the Contractor who shall state the action he is taking for effective completion of the Contract programme.

The Contractor shall submit a report in respect of the various sections of the Works, the equipment in use or held in readiness, a return of labour and supervisory staff, and details of any matters arising which may generally affect the progress of the work.

The Contractor shall give a summary of the detailed progress report giving the position with regard to the agreed Contract programme.

The progress reports shall be set out in a format to the approval of the Engineer, and forwarded promptly so that on receipt the information contained therein is not more than 21 days out of date.

If during execution of the Contract, the Employer considers the progress position of any section of the work to be unsatisfactory, or for any other reason relating to the Contract, he will be at liberty to convene a meeting and the Contractor's Representatives are to attend such meeting.

The Contractor's Site Office shall prepare and submit 6 copies of a weekly progress report to the Employer and Engineer's Site Office. This report shall summarize site activities and record and details where difficulties in maintaining the agreed programme are being experienced or are likely to cause subsequent delay.

The Contractor's Site Office shall also prepare and submit to the Engineer's Site Office 2 copies of Daily Activity Report summarizing the main activities to be undertaken each day, noting special activities such as tests, alignment checks, etc. The Contractor shall be responsible for expediting the delivery of all material and equipment to be provided by him and his subcontractors.

### 37 **PHOTOGRAPHS**

As soon as work commences on Site, the Contractor shall provide photographs (at least 10 to 12) of the works from positions to be selected by the Engineer. Each photographic print shall not be less than 297mm x 210mm and shall bear a printed description, a serial number and the date when taken.

The negatives of all photographs shall be held at the Contractor's Site Office, numbered and handed over to the Employer at the completion of the Contract.

### 38 **FACILITIES FOR THE ENGINEER**

#### 38.1 **Site Office**

The Contractor shall provide and maintain well furnished one 40 feet long container for Engineer's Site Office.

The Engineer's site office shall be furnished and equipped with new and unused furniture, equipment, air-conditioners, electrical fittings etc., as per the list given below and as per requirement of site or as directed by Engineer.

1.	Wooden office table with drawers and side racks	2 (Two) No.
2.	Office Chairs	2 (Two) No.
3.	Wooden sitting visitors chairs with arms (standard size)	4 (Four) No.
4.	Steel filing cabinet (standard size)	2 (Two) No.
5.	Split AC Unit (1-1/2 tonne) with stabilizer	1 (one) No.

- |     |  |             |
|-----|--|-------------|
| 6.  | Water Dispenser with all accessories and maintenance   | 1 (One) No. |
| 7.  | Small Size Refrigerator 5 cft with stabilizer  | 1(one) No.  |
| 8.  | Electric Kettle  | 1 (One) No. |
| 9.  | Internet connection (wireless), Three MB   | 1(one) No.  |
| 10. | Intel 4 <sup>th</sup> generation core i5 3.1 Ghz,,4GB ddr3,500 GB hard drive, DVD & CD writer, Built-in Intel high definition graphic card, 8 channel surround sound support, gigabit LAN support, Speakers, Samsung or View Sonic 20" LED monitor along with Keyboard, mouse.UPS etc. | 1(one) No.  |
| 11. | Laser Printer/Scanner/Copier/Raf (HP Laser Jet Pro MFP M225dn) or latest approved equivalent model)  | 1(one) No.  |
| 12. | Computer table   | 1(one) No.  |
| 13. | Mobile Telephone Model Nokia Asha 303 or equivalent with Connections with prepaid card amount max: Rs. 1000/= per month.   | 1(One) No.  |

If any equipment, furniture and installations become unserviceable for any reason whatsoever the Contractor shall promptly replace the same as and when directed by the Engineer. The Engineer's Site office with fittings, fixtures and all other equipment/accessories shall be maintained and operated for the entire duration of construction period as well as for the duration of subsequent defects liability period.

The Site Office including fittings, fixtures, furniture, furnishing and all other equipment/accessories shall be the property of the Contractor on completion of the Contract.

### 38.2 Transport

The Contractor shall provide, operate and maintain brand new, one (1) 1000cc Suzuki Cultes Car VXRi Euro-II AC fitted for the exclusive use of the Engineer's site supervision team to meet his transportation needs for the entire duration of actual construction period as well as for the duration of subsequent defects liability period. The use of such transport facility shall be under the control of the Engineer, and the Contractor shall be wholly responsible for providing at all times satisfactory operating services for the Engineer. The Contractor shall furnish, supply and provide, as may be necessary without specific direction of the Engineer, all fuels (400 liters/month), lubricants, tires and other supplies, all maintenance, repairs and running costs and suitably qualified drivers at all times.

Prior to Ordering the Vehicle, the Contractor shall furnish to the Engineer for approval, detailed specification, name of manufacturer and model no. of the vehicle to be supplied. These data shall be presented within one week from the date of Engineer's Order to proceed with the works and the vehicle shall be furnished to the Engineer upon approval within two weeks from the date of Engineer's Order to supply the Vehicle.

The vehicle shall be right hand drive, and shall be brand new, properly serviced and ready for use. The Contractor shall provide vehicle to replace any such motor vehicle that is temporarily or permanently rendered unserviceable for any reason or declared to be beyond repair by the Engineer, at no additional cost to the Employer. The vehicle shall become the property of the Contractor on completion of the Contract.

Failure of the Contractor to provide and maintain Engineer's facilities and transport, shall make him liable to bear actual cost of office, furniture, equipment & vehicle and up to Rs. 150,000/- per month on account of maintenance, which will be deducted from the Contractor's monthly payment statements for the entire Contract period or till such time that transport as stipulated above is provided by him

### 39. **FACILITIES FOR THE EMPLOYER**

#### 39.1 **Transport**

The Contractor shall provide, operate and maintain brand new, one (1) 1000cc Suzuki Cultus Car VXRi Euro-II with A.C. fitted for the exclusive use of the Employer's site supervision team to meet his transportation needs for the entire duration of actual construction period as well as for the duration of subsequent defects liability period. The use of such transport facility shall be under the control of the Employer, and the Contractor shall be wholly responsible for providing at all times satisfactory operating services for the Employer. The Contractor shall furnish, supply and provide, as may be necessary without specific direction of the Employer, all fuels (400 liters/month), lubricants, tires and other supplies, all maintenance, repairs and running costs and suitably qualified drivers at all times.

Prior to Ordering the Vehicle, the Contractor shall furnish to the Employer for approval, detailed specification, name of manufacturer and model no. of the vehicle to be supplied. These data shall be presented within one week from the date of Engineer's Order to proceed with the works and the vehicle shall be furnished to the Employer upon approval within two weeks from the date of Employer's Order to supply the Vehicle.

The vehicle shall be right hand drive, and shall be brand new, properly serviced and ready for use. The Contractor shall provide vehicle to replace any such motor vehicle that is temporarily or permanently rendered unserviceable for any reason or declared to be beyond repair, at no additional cost to the Employer. The vehicle shall become the property of the Contractor on completion of the Contract.

Failure of the Contractor to provide and maintain Employer's transport, shall make him liable to bear actual cost of vehicle and up to Rs. 100,000/- per month on account of maintenance, which will be deducted from the Contractor's monthly payment statements for the entire Contract period or till such time that transport as stipulated above is provided by him

#### 40.0 **MEASUREMENT AND PAYMENT**

No separate payment shall be made for the works involved within the scope of this section of specifications unless otherwise specifically stated in the Bill of Quantities or herein. The cost thereof shall be deemed to have been included in the quoted unit rate of other items of the Bill of Quantities.

\*\*\* End of Section 0100 \*\*\*

## SECTION - 0120

### CONTRACTOR'S CAMP

#### 1. SCOPE

The work to be done under this item consists of construction, erection, installation and maintenance of the Contractor's Project Site Offices or main camp and the Contractor's sub-camps or temporary camps, if any, and shall include all offices, shops, warehouses, and other operational buildings; all housing and related facilities including accommodations for the Contractor's personnel.

#### 2. GENERAL

The location of the Contractor's camps, including all buildings, utilities and facilities therefor, and of the camps or establishments of all persons/parties in the vicinity operating or associated with the Contractor shall be subject to approval of the Engineer.

The work to be done under this item will terminate upon the actual Completion Date. However, if directed by the Engineer or the Employer, the Contractor shall continue such work to the extent required by the Contractor's personnel during the period of maintenance. No compensation shall be paid for the continued operation and maintenance of the Contractor's Camps during the period of maintenance.

Upon completion of the Works, or at such time within the period of maintenance as directed by the Engineer, the Contractor shall remove all buildings utilities and other facilities from the Site and restore all camp areas to a neat and clean condition.

Contractor shall protect the environmental interests and HSE regulations at camp and works sites during execution of the contractual work.

#### 3. CODES AND STANDARD

The construction, operation and maintenance of all camps of the Contractor shall comply with all applicable provisions of current Pakistan Labour Camp Rules.

#### 4. MAINTENANCE

The Contractor shall furnish, make arrangements for, and carry out proper and adequate maintenance of the Contractor's Camp areas at such camp to provide a neat, well-kept camp in all respects with pleasant and healthy surroundings and conditions for all occupants of their camp.

Adequately equipped and properly staffed portable first aid stations or dispensaries shall be provided by the Contractor at camps and other strategic locations to administer first aid treatment at any time required and free of charge to all persons on the Site, including employees of the Engineer and the Employer.

#### 5. MEASUREMENT AND PAYMENT

No separate payment shall be made for the works involved within the scope of this section of specifications unless otherwise specifically stated in the Bill of Quantities or herein. The cost thereof shall be deemed to have been included in the quoted unit rate of other items of the Bill of Quantities.

\*\*\* End of Section 0120 \*\*\*

**SECTION - 0130**  
**STAKE-OUT SURVEY**

**1. SCOPE**

Under this item the Contractor shall make the stakeout survey for construction purposes with competently qualified men, consistent with the current practices. The work shall proceed immediately upon the award of the contract and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer fully informed as to the progress of the stakeout survey. The scope of this section of specifications is covered by detailed specifications as laid down herein.

**2. MATERIAL AND EQUIPMENT**

All instruments, equipment, stakes and other material necessary to perform all work shall be provided by the Contractor. These instruments and equipment shall be available to Engineer at all times for the purpose of checking the work of the Contract.

All stakes used shall be of a type approved by the Engineer, clearly and permanently marked so as to be legible at all times. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times. Any existing stakes or markers defining property lines and survey monuments which may be disturbed during construction shall be properly tied into fixed reference point before being disturbed and accurately reset in their proper position upon completion of the work.

**3. CONSTRUCTION**

The Contractor shall trim trees, bushes and other interfering objects, not consistent with the plan, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stake-out survey crew and the Engineer's survey crew. The exact position of all work shall be established from control points, which are shown on the plans or modified by the Engineer. Any error, apparent discrepancy in or absence of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc. throughout the life of the contract. Damaged, destroyed or inaccessible reference points, bench marks or stakes shall be replaced by the Contractor. Existing or new control points that will be or are destroyed during construction shall be re-established and all reference ties recorded thereon shall be furnished to the Engineer. All stakeout survey work shall be referenced to the centerlines shown on the Plans. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work shall be kept neatly and made available to the Engineer upon request and furnished to the Employer upon Contract completion.

The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor and any necessary correction to the work shall be immediately made. Such checking by the Engineer shall not relieve the Contractor of any of his responsibilities for the accuracy or completeness of his work.

Reference points, base lines, stakes and benchmarks for borrow pits shall be established by the Contractor.

All required right-of-way and easement limits shall be established, staked and referenced by the Contractor concurrent with the construction stakeout survey.



The Contractor shall place at least two offset stakes or references at each centre lines station and at such intermediate stations as the Engineer may direct. From computations and measurements made by the Contractor, these stakes shall be clearly marked with the correct centre line, station number, offset and cut or fill so as to permit the establishment of the true centre line location during construction. He shall locate and place all cut, fill, slope, line grade or other stakes and points as the Engineer may direct to be necessary for the proper progress of the work.

4. **PAYMENT OF WORK**

No separate payment shall be made for the Works involved within the scope of this section of Specifications unless otherwise specifically stated in the Bills of Quantities or herein.

The cost thereof shall be deemed to have been included in the quoted unit rate of other items of the Bills of Quantities.

\*\*\* End of Section 0130 \*\*\*

## SECTION - 0150

### CLEARING AND GRUBBING

#### 1. SCOPE

The clearing and grubbing shall consist of clearing the designated area of all trees, down timber, snags, bush, other vegetation, rubbish and all other objectionable material, and shall include grubbing stumps, roots, and matted roots, and disposal of all spoil material resulting from the clearing and grubbing. It shall also include the removal and disposal of structures that protrude, encroach upon, or otherwise obstruct the work, except when otherwise provided for on the plans or directed by the Engineer to be saved. The scope of this section of specifications is covered with detailed specifications laid down herein.

#### 2. LIMIT OF AREA

##### 2.1 Location of Works

The Engineer will define the limit of areas where clearing and grubbing is to be done. Normally it will include all land within the right of way and all other construction area including ditches, detours, minor road crossings and other areas shown on the plans or as specified or as directed by the Engineer. The Engineer will designate the fences, structures and debris and trees and bushes to be cleared where grubbing is not required. It shall not include clearing and grubbing of borrow or other pit areas from which material is secured. It shall include the leveling or removal of all bunds or mounds within the right of way unless otherwise directed by the Engineer.

##### 2.2 Grubbing and Cutting

All roots and stumps within the limits of the site shall be grubbed and excavated unless otherwise specified or approved by the Engineer.

##### 2.3 Disposal

All wood and bush shall be burned or otherwise disposed off within fifteen (15) days after cutting or felling unless otherwise approved. No tree trunks, stumps or other debris shall be left within Site unless approved in writing by the Engineer. The location of disposal areas shall be within or outside the limits of the project or as approved in writing by the Engineer and shall be acquired by the Contractor at his own expense. Any useable material shall remain the property of the Employer.

##### 2.4 Protection and Restoration

The Contractor shall prevent all damage to pipes, conduits, wires, cables or structures above or below ground. No land monuments, property markers, or official datum points shall be damaged or removed until the Engineer has witnessed or otherwise referred their location and approved their removal. The Contractor shall so control his operations as to prevent damage to trees and shrubs, which are to be preserved. Protection may include fences and boards lashed to trees to prevent damage from machine operations. The Contractor shall protect the environmental interests / conditions of the areas of camp and work site. The existing covered or open benchmarks should be relocated as directed by the Engineer. In the event that anything specified herein to be saved and protected is damaged by the Contractor; such damages shall immediately be repaired or replaced by the Contractor at his own cost to the satisfaction of the Engineer. All areas cleared and grubbed must be approved by the Engineer or Engineer's Representative before the start of cleaning operations.

3. **MEASUREMENT AND PAYMENT**

No separate payment shall be made for the works involved within the scope of this section of specifications unless otherwise specifically stated in the Bill of Quantities or herein.

The cost thereof shall be deemed to have been included in the quoted unit rate of other items of the Bill of Quantities.

\*\*\* End of Section 0150 \*\*\*

**SECTION – 0200****DISMANTLING WORKS****1. SCOPE**

The work covered by this Section of the Specifications consists of furnishing all plant, labour, equipment, appliances and performing all operations in connection with demolition/ dismantling and removal of existing asphalt concrete road, pavement, kerbs, medians, foundations, with accessories and concrete/ block masonry structures including disposal of demolished/ dismantled and removed material to designated places. Whole work shall be done in accordance with these specifications and as directed by the Engineer.

**2. PROCEDURES**

The Engineer will define the limits where demolition/ dismantling and removal activity is to be done and shall approve the procedures/methods to be adopted by the Contractor. The Contractor shall layout the boundaries/limits for Engineer's checking and approval before commencing dismantling work.

Whole work shall be performed in an orderly manner and the Contractor shall take all necessary precautions and expedients to prevent damages to the adjacent structures, installed equipment/machinery, pipes, conduits, any other installation etc. Any damage caused to the structures and installations due to negligence of the Contractor during demolition/ dismantled and removal operations shall be repaired/replaced by the Contractor at his cost and to the satisfaction of the Engineer.

The location(s), width and depth of test pits/trenches for locating the utilities shall be as per direction of the Engineer and a comprehensive report shall be submitted with detailed description and drawings of all utilities which includes but not limited to location, type, levels/depth and materials.

**3. DEMOLITION OF PAVEMENTS AND CONCRETE/ MASONRY WORKS**

The Contractor shall demolish road pavement and concrete / masonry / flooring works to the line and depth as shown on the Drawings or as directed by the Engineer. Explosives shall not be used to remove the plain and reinforced cement concrete or any other material whatsoever. Mechanically operated brakers, concrete saws, chipping hammers or other approved methods shall be employed for cutting. Care shall be taken that existing services and structures are not damaged. It shall be the responsibility of the Contractor to replace at his cost any services, Structures damaged by the Contractor due to his negligence during cutting operations or thereafter until the whole of cut parts/areas are restored to original condition to the satisfaction of the Engineer.

#### 4. **REMOVAL OF EXISTING SERVICES/ UTILITIES**

The Contractor shall mark all the services/ utilities falling within the right of way. After getting approval from the Engineer and relevant department(s), the Contractor shall remove all such services/ utilities as per the requirement/ specifications of the relevant department whose utilities/ services are being removed/ shifted.

#### 5. **DISPOSAL**

All debris materials resulting from demolition / dismantling works shall be disposed off to places designated by the Engineer in the manner of disposition required and directed by the Engineer.

All useable materials resulting from demolition and removal shall remain the property of the Employer and shall be stacked at designated places.

The Contractor shall segregate the useable materials as directed by the Engineer and stack at designated places.

#### 6. **MEASUREMENT AND PAYMENT**

##### 6.1 **General**

Except otherwise specified herein or elsewhere in the Contract Documents no measurement and payment will be made for the under mentioned items related to this section. The cost thereof shall be deemed to have been included in the quoted unit rate of the items of the Bill of Quantities under this section.

6.1.1 Temporary diversion and safety measures, Demarkation / layouts etc.

6.1.2 Loading, unloading, transportation and disposal of demolished/ dismantled/ removed/ useable material to the place designated by the Engineer.

6.1.3 Permissions/approvals, if required, from the relative department and information to the stack holders.

6.1.4 Stacking of all useable material to the place designated by the Engineer.

6.1.5 Repair / finishing of adjacent component of dismantled structure.

6.1.6 Restoration of pavement(s) to its original condition as per drawings and relevant specifications.

## **6.2 Pavement(s)**

### **6.2.1 Measurement**

Measurement of acceptably completed works of demolition of existing pavement(s) will be made on the basis of actual area in Square metre of pavement(s) demolished, as shown on the Drawings or as directed by the Engineer.

### **6.2.2 Payment**

Payment will be made for acceptable measured quantity of demolition of existing pavement(s) on the basis of unit rate per square metre quoted in the Bill of Quantities & shall constitute full compensation for all the works related to the item.

## **6.3 Concrete and Block Masonry**

### **6.3.1 Measurement**

Measurement of acceptably completed works of demolition of existing Concrete and Block Masonry will be made on the basis of actual volume in Cubic metre of concrete and block masonry demolished, as shown on the Drawings or as directed by the Engineer.

### **6.3.2 Payment**

Payment will be made for acceptable measured quantity of demolition of existing Concrete and Block Masonry on the basis of unit rate per Cubic metre quoted in the Bill of Quantities & shall constitute full compensation for all the works related to the item.

## **6.4 Curbstone and Edge Stone**

### **6.4.1 Measurement**

Measurement of acceptably completed works of demolition of existing curbstone and edge stone will be made on the basis of actual linear length in metre of curbstone and edge stone demolished, as shown on the Drawings or as directed by the Engineer.

### **6.4.2 Payment**

Payment will be made for acceptable measured quantity of demolition of existing pavement(s) on the basis of unit rate per running metre quoted in the Bill of Quantities & shall

constitute full compensation for all the works related to the item.

## SECTION - 2410

### AGGREGATE SUB-BASE COURSE AND AGGREGATE BASE COURSE

#### 1.0 SCOPE

The work under this section of specifications consists of furnishing of all materials, plant, labour, equipment, appliances and performing all operations in connection with supply and construction of Aggregate Sub-Base Course and Aggregate Base Course complete in all respects in accordance with the specifications and in conformity with the lines, grades, thickness and cross-sections shown on the drawings and/or as directed by the Engineer.

#### 2.0 MATERIALS

##### 2.1 Aggregates

##### A. Source of Materials

All aggregates for use in the laying of the base course and sub-base course shall be obtained only from source approved by the Engineer. The actual quarry pits or gravel deposits shall be in all cases approved by the Engineer.

The Contractor shall determine the location, suitability and quantity of material available before tendering as well as the cost and the amount of work required to crush, screen and the length of haulage to the job site. The Contractor shall also satisfy himself and make an estimate of the overburden that must be removed from any quarry site and the cost of handling such overburden. He shall include all costs in his Tender price.

The Contractor shall provide to the Engineer, within thirty (30) days prior to the scheduled beginning of construction with a complete statement of the origin and composition of all stone and/or gravel aggregates to be used on the project. All material shall comply with the specified requirements for the various aggregates.

The location and the manufacture of aggregates which must meet the requirements of the Specifications is the sole responsibility of the Contractor to manufacture such aggregates at the rates and in the quantities required to complete the work within the specified Time Schedule.

The approval of the Contractor's crushing and screening plant & equipment by the Engineer shall in no way relieve the Contractor of responsibility of producing aggregates which meet the Specifications and in the quantities required for the completion of the work within the specified Time Schedule.

No aggregate producing equipment shall be put into operation prior to the approval of the equipment by the Engineer. If after the equipment is put into operation it fails to perform as proposed, the Contractor shall provide additional approved equipment or replace the original equipment with more suitable equipment, as may be directed by the Engineer.

The Contractor shall commence crushing and screening of aggregates for base course, concrete, or as otherwise may be required, immediately after the



occupancy of the Project Laboratory by the Engineer and/or immediately after the Contractor receives approval of his aggregate sources.

**B. Testing**

In order to ascertain the properties of all aggregate materials, the Contractor shall submit for approval by the Engineer, test certificates from an approved testing laboratory for all materials intended for incorporation in the work prior to commencement of work.

Representative samples for such testing shall be taken by the Contractor, at his expense, in the presence of the Engineer, and duplicate samples shall be submitted to the Engineer for future reference.

The Contractor may, if approved by the Engineer, conduct the necessary tests in the Project Laboratory. The tests shall be conducted in the presence of the Engineer by the Contractor's Materials Engineer. The qualifications of the Contractor's Materials Engineer must be submitted to and approved by the Engineer prior to any testing operations.

This testing, whether performed at an approved testing laboratory, or in the Project Laboratory, shall be solely the Contractor's responsibility and will be at the Contractor's expense.

**C. Approval and Inspection**

All sources of material shall be approved by the Engineer prior to procuring or processing material from such sources. Test certificates obtained or performed by the Contractor at his expense are intended to assist the Contractor in his estimate of the location, extent and quantities which will comply with the Specifications when properly processed, and will in no way obviate the need for further testing by the Engineer. Only materials from approved sources shall be processed for incorporation into the work. Approval of specific sources of materials shall not be construed as final approval and acceptance of materials from such sources.

All processed material shall be tested and approved before being stored on the site or incorporated in the work and may be inspected and tested at any time during the progress of their preparation and use. Questionable materials, pending laboratory testing and subsequent approval, shall not be unloaded and incorporated with materials previously approved and accepted. If however, the grading and quality of the material delivered to the site do not conform to the grading and quality as previously inspected and tested, or do not comply with the Specifications, the Engineer reserves the right to reject such materials at the site of the work. Only materials conforming to the requirements of the Specifications shall be used in the work.

Samples must meet all test requirements as specified under the Specifications. The Contractor shall permit the Engineer or his designated representative to inspect any and all materials used or to be used, at any time during or after its preparation, or while being used during the process of the work or after the work has been completed. All such materials not complying with the required Specifications, whether in place or not, shall be rejected and shall be removed promptly from the work. The Contractor shall supply, or arrange with any producers or manufacturers to supply all necessary material, labour, tools and equipment for such inspection.

## D. Storage

Materials shall be stored so as to ensure preservation of their specified quality and fitness for the work. They shall be placed on hard, clean surfaces and, when required by the Engineer, they shall be placed under cover. Stored materials shall be located so as to facilitate prompt inspection and control. Private property shall not be used for storage purposes without written consent of the owner.

The centre of the storage area shall be elevated and sloped to the sides so as to provide proper drainage of excess moisture. The material shall be stored in such a way as to prevent segregation and coning to ensure proper control of gradations and moisture. Coarse aggregate storage piles shall be built-up in layers not exceeding one (1) metre. The height of a stockpile shall be limited to a maximum of five (5) metres.

The equipment and methods used for stockpiling aggregates and for removing from the stockpiles must be approved by the Engineer and shall be such that no detrimental degradation of the aggregate will result and no appreciable amount of foreign material will be incorporated into the aggregate.

The stockpile sites shall be prepared by clearing and smoothing and must be approved by the Engineer. Prior to any stockpiling of aggregates, cross sections of the stockpile site shall be taken at control points established for use in determining the quantity of subsequently stockpiled material.

## 2.2 Aggregate Sub-Base

All sub-base materials shall be free from dirt, organic matter, shale or other deleterious matter and shall be of such quality that it will bind readily to form a firm, stable sub-base.

Material for sub-base shall consist of well-graded gravel with sand and silt, conforming to the following requirements:

AASHTO Sieve	Percent Passing
2 inch (50mm)	100
1 inch (25.9mm)	55-85
3/8" (9.5mm)	40-70
# 4 (4.75mm)	30-60
# 10 (2.0mm)	20-50
# 40 (0.075mm)	10-30
# 200	5-15

The coefficient of uniformity  $D_{60}/D_{10}$  shall be not less than 3 where  $D_{60}$  and  $D_{10}$  are the particle diameters corresponding to 60% and 10% respectively, passing (by weight) in a grain size envelope curve.

Physical Requirements: All sub-base aggregates shall conform to the following physical requirements.

- Liquid Limit (AASHTO T 89)	25 maximum
- Plasticity Index (AASHTO T 90)	6 maximum
- Sand Equivalent (AASHTO T 176)	25 minimum
- Loss by Abrasion (AASHTO T 96)	40 maximum

- CBR value (AASHTO T-193) 40% (at a density 98% of MDD determined according to AASHTO T-180 method D).

### 2.3 Aggregate Base Course

Materials shall conform to the requirements for the "Aggregate Base Course" specified. All base course shall consist of clean, tough, durable, sharp angle fragments free of any excess of thin or elongated pieces, and reasonably free of soft, disintegrated or decomposed stone, dirt or other deleterious matter.

Crushed gravel or stone fragments for base courses shall consist of the product obtained by crushing gravel that, if directed by the Engineer, has first been screened in such a manner that not less than ninety (90) percent of the material to be crushed is retained on a one-quarter (1/4) inch sieve. The amount of crushing shall be regulated so that at least eighty (80) percent by weight, of the pieces retained on the No. 4 sieve have at least one (1) mechanically fractured face. Material retained on # 4 sieve shall consist of at least 90% by weight shall be crushed particles, having a minimum of two fractured faces.

- Gradation: Coarse materials for base courses shall be crushed rock or crushed gravel conforming to the following grading requirements:

AASHTO Sieve	Percent Passing
2 in. (50.8 mm)	100
1 1/2 in. (38.1 mm)	35 - 70
1 in. (25.4 mm)	0 - 15
1/2 in. (12.7 mm)	0 - 5

Fine materials for base course shall be quarry screenings or natural material and of suitable binding quality as approved by the Engineer. The material shall be free from foreign or organic matter, dirt, shale, clay and clay lumps, or other deleterious matter and shall conform to the following requirements:

AASHTO Sieve	Percent Passing
3/8 in. (9.5 mm)	100
No. 4	85 - 100
No. 100	10 - 30
Plasticity Index (AASHTO 90)	6 maximum
Sand Equivalent (AASHTO 176)	30 minimum

The combined material shall consist of a mixture of all aggregate uniformly graded from coarse to fine to conform to the following gradation requirements:

AASHTO Sieve	Percent Passing
2 in. (50.8 mm)	100
1 1/2 in. (38.1 mm)	60 - 90
1 in. (25.4 mm)	42 - 77
3/4 in. (19.0 mm)	35 - 70
1/2 in. (12.7 mm)	25 - 60
No. 4	15 - 40
No. 10	10 - 26
No. 40	5 - 15
No. 200	2 - 9

Acceptance: When the stationary plant method is used, the aggregate will be accepted immediately following mixing, based on periodic samples taken from the pug mill output.

Physical Requirements: All base course aggregates shall conform to the following physical requirements:

Loss of Sodium Sulfate Soundness

Test (AASHTO 104) 10 percent maximum

Loss of Magnesium Sulfate Soundness

Test (AASHTO 104) 12 percent maximum

Loss by Abrasion Test (AASHTO 96) 30 percent maximum

Thin and Elongated Pieces, by Weight  
(larger than 25 mm, thickness less  
than 1/5 length) 5 percent

Friable Particles (AASHTO T112) 0.25 percent maximum

When the aggregate is a total aggregate, it may be accepted at the crusher. Acceptance of the material by the Engineer does not constitute acceptance of the base course, only that the material is approved for use in the base course.

### 03. EXECUTION

#### 3.1 Aggregate Sub-Base Course

##### A. Method of Construction

- a) Preparing Under Lying Course : Before any sub-base material is placed, the underlying course shall be prepared and conditioned as specified. The course shall be checked and accepted by the Engineer before placing and spreading operation are started. If the subgrade or underlying course is prepared and left for a longer period of time, it should be prepared again and checked for compaction before placing sub base layer.
- b) Spreading: Sub-base aggregates shall be spread on underlying course which has been approved by the Engineer.

Sub-base aggregate shall be spread on the sub-grade in layers not exceeding 150 mm compacted depth. Spreading shall be done by means of approved mechanical spreaders, distributing the material to the required width and loose thickness. Where the required sub-base thickness is greater than 150 mm, the material shall be placed in layers of equal thickness, in no case shall a layer be less than 75 mm thick. Under no circumstances shall sub-base be dumped in a pile on the sub-grade.

The material shall be handled so as to avoid segregation. Segregated materials shall be remixed until uniform. Suitable precautions shall be taken to prevent rutting of the sub-grade during the spreading of the sub-base material. No hauling or placement of material will be permitted when, in the judgment of the Engineer, the weather or road conditions

are such that the hauling operations will cause cutting or rutting of the sub-grade or cause contamination of the sub-base material.

- c) **Compaction:** The moisture content of the sub-base material shall be adjusted prior to compaction, by watering with approved sprinkler trucks or by drying out, as directed by the Engineer, to that extent required to obtain the specified density. The sub-base shall be compacted to one-hundred (100) percent of the maximum dry density as determined according to AASHTO T-180 Method D / ASTM D1557, or to ninety (90) percent of the relative density in accordance with ASTM D 2049, as deemed appropriate by the Engineer. In place density of aggregate base course shall be determined by AASHTO T-191 or ASTM D 1556 or as directed by the Engineer. For all the materials, the field density thus obtained shall be adjusted to account for oversize particles (retained on 19mm sieve), as directed by the Engineer. Also for adjustment of any material retained on 4.75mm sieve, AASHTO method T-224 shall be used.

The moisture content directed by the Engineer shall be the optimum moisture content determined from the moisture-density test performed in the laboratory on sub-base material, or as otherwise directed by the Engineer after compaction trials as specified in subparagraph A (d) of this section. The sub-base aggregate shall be compacted by means of approved compaction equipment progressing gradually from the outside towards the centre with each succeeding pass uniformly overlapping the previous pass. Rolling shall continue until the entire thickness of each layer is thoroughly and uniformly compacted to the specified density.

Rolling shall be accompanied by sufficient blading, in a manner approved by the Engineer, to ensure a smooth surface free from ruts or ridges and having the proper section and crown.

Any areas inaccessible to normal compaction equipment shall be compacted by means of mechanical tampers until satisfactory compaction is obtained.

Each layer of sub-base course must be completely compacted and approved by the Engineer prior to the delivery of materials for a succeeding layer of sub-base.

- d) **Compaction Trials:** If directed by the Engineer, prior to the commencement of the sub-base or aggregate base operations, the Contractor shall construct trial lengths, not to exceed one-hundred (100) metres. The materials used in the trials shall be that approved for use as sub-base or aggregate base and the equipment used shall be that according to the Contractor's approved detailed program of work.

The object of these trials is to determine the adequacy of the Contractor's equipment, the loose measurements necessary to result in the specified compacted layer depths, the field moisture content, and the relationship between the number of compaction passes and the resulting density of the material.

The Contractor may proceed with sub-base and aggregate base work only after the methods and procedures established in the compaction trial have been approved by the Engineer.

- e) **Finishing:** The Contractor shall program his operations to avoid the drying out of the sub-base during construction. If any layer of sub-base material, or part thereof, is permitted to dry out after compaction, or does

not conform to the required density or finish, the Contractor shall, at his own expense, rework, water or recompact the material, as directed by the Engineer, to the density specified, before the next layer of sub-base or base course is super imposed thereon.

Immediately prior to the placing of the first layer of base course on the sub-base the final layer of sub-base shall be at the specified density and to the required grade and section. In order to maintain these requirements-while placing the next course, it may be necessary to water and reshape the surface of the sub-base, which work shall be at the Contractor's expense.

The surface of the finished sub-base will be tested with a three (3) metre straight edge at selected locations. The variation of the surface from the testing edge of the straightedge between any two (2) contacts with the surface shall at no point exceed six (6) millimeters when placed on or parallel to the centerline or six (6) millimeters when placed to the centerline of the roadway. The sub-base shall be compacted to the thickness and cross section as shown on the plans and shall not vary by more than six (6) millimeters from the required elevation. Not more than 30 % of the levels picked at equal intervals, shall be higher than the design levels for sub base course. All humps and depressions and thickness deficiencies exceeding the specified tolerances shall be corrected by removing the defective work or by adding new material as directed by the Engineer.

- f) Testing for Compaction: The frequency of in place density testing for accepting the compacted area shall be one density test in every 200 sq. metre. This frequency of tests may be reduced with the prior approval of the Engineer.

### 3.2 **Aggregate Base Course**

#### A. **Method of Construction**

- a) Combining Aggregate and Water: Aggregate for base course shall be combined into a uniform mixture and water added either in a central mixing plant or by watering and mixing of windrows in a manner approved by the Engineer, before final placement of the material. When binder is to be added, it may be combined with the aggregate base by thoroughly mixing separate windrows of binder and aggregate base or it may be combined in the central mixing plant. Adding binder by spreading it over the aggregate windrow will not be permitted.

The moisture to the aggregates shall be that required, as designated by the Engineer, to obtain the specified density thereby preparing an aggregate completely ready for compaction after spreading on the underlying course. In no case will the wetting of aggregates in stockpiles or trucks be permitted.

- b) Spreading: Unless otherwise specified, aggregate for base courses shall be delivered to the designated areas, as specified on the drawings, as a uniform mixture and shall be placed on the existing prepared underlying course in a uniform layer or layers not exceeding one hundred and fifty (150) millimeters in compacted depth, including any binder that is to be blended on the base. Spreading shall be done by means of approved self-propelled spreader box distributing the material to the required width and loose thickness. When the required base thickness is greater than one hundred-and fifty (150) millimeters the material shall be spread in layers of equal thickness.

The material shall be so handled, as to avoid segregation. If an aggregate spreader causes segregation in the material, or leaves ridges or other objectionable marks on the surface which cannot be eliminated easily or prevented by adjustment of the spreader operation, the use of such spreader shall be discontinued and the spreader replaced. All segregated materials shall be removed and replaced with well graded material. No "skin" patching shall be permitted.

No hauling or placement of material will be permitted when, in the judgment of the Engineer, the weather or road conditions are such that hauling operations will cause cutting or rutting of the underlying course surface or cause contamination of the base course material.

- c) Compaction: If directed by the Engineer, prior to starting the aggregate base operation, the Contractor shall construct trial lengths. Immediately after placing, the base course material shall be compacted. The material shall be compacted to a density of not less than one-hundred (100) percent of Maximum Density as determined according to ASTM D 1557 or AASHTO T-180.

In place density of aggregate base course shall be determined by AASHTO T-191 or ASTM D 1556 or as directed by the Engineer. For all the materials, the field density thus obtained shall be adjusted to account for oversize particles (retained on 19mm sieve), as directed by the Engineer. Also for adjustment of any material retained on 4.75mm sieve, AASHTO method T-224 shall be used.

The per cent of density shall also be adjusted to compensate for the weight and volume of aggregate larger than the aggregate used in the compaction control test where applicable.

Rolling shall be continued until the entire thickness of each layer is thoroughly and uniformly compacted to the density specified. The final rolling of the completed base course shall be done with a self-propelled roller. Rolling shall be accompanied by sufficient blading in a manner approved by the Engineer, to ensure a smooth surface, free from ruts or ridges and having the proper section and crown. When additional water is required it shall be added in the amount and manner approved by the Engineer. Each layer of base course must be completely compacted by the Contractor and approved by the Engineer prior to the delivery of materials for a succeeding layer.

If the material for the base course is laid and compacted in more than one (1) layer, the Contractor shall plan and coordinate the work in such a manner that the previously placed and compacted layers be allowed ample time for drying and development of sufficient stability before Vehicles hauling materials for the succeeding layers, or other heavy equipment are permitted on the base. Prior to placing the succeeding layers of material, the top of the under layer shall be made sufficiently moist to ensure bond between the layers. The edges and edge slopes of the base course shall be bladed or otherwise dressed to conform to the lines dimensions shown on the plans and present straight, neat and workmanlike lines and slopes as free of loose material as practicable.

The Contractor shall also plan the work and handle the various operations so that the least amount of water will be lost by evaporation from uncompleted surfaces. If the Contractor delays placing of succeeding layers of base course material to the extent that additional

water must be applied to prevent raveling or excessive dripping, the application of such water shall be at the Contractor's expense and will not be considered as the basis for a claim for additional compensation. Water shall be applied at such times and in such quantities as directed by the Engineer, and the Engineer shall have full authority to require the suspension of all other work on the project to insure the proper maintenance of previously compacted material. If after the base is compacted, any areas are above or below proper grade and true elevations, such area shall be loosened and after having had additional materials added or excess material removed, as the case may require, shall be reconstructed as described herein. If after the base is compacted, any areas fail to meet the specified density and gradation requirements, they shall be loosened or removed as directed by the Engineer and reconstructed as described before.

- d) **Maintenance of Base Course:** Following the construction of the aggregate base, the compacted base course shall be maintained by the Contractor at his expense. The Contractor shall blade, broom and otherwise maintain the base, keeping it free from raveling, and other defects until such time as the bituminous prime or other surface is applied. Water shall be applied at such time and in such quantities as directed by the Engineer.

The Engineer shall determine when the surface of the base course is in the proper condition to permit the bituminous prime and/or surfacing to be applied. If the Contractor chooses not to apply the bituminous prime and/or surfacing at that time, he must continue to maintain the surface of the base course, including the application of necessary water, at his expense until such time as the bituminous prime and/or surfacing is applied. Any additional expense incurred by the Contractor because of his failure to apply the bituminous prime and/or surfacing when so permitted by the Engineer will not be considered as the basis for a claim for additional compensation.

e) **Finishing:** The surface of the finished base will be tested with a three (3) metre straight edge at selected locations. The variation of the surface from the testing edge of the straightedge between any two (2) contacts with the surface shall at no point exceed five (5) millimeters when placed on or parallel to the centerline or five (5) millimeters when placed to the centerline of the pavement. The base shall be compacted to the thickness and cross section as shown on the plans and shall not vary by more than five (5) millimeters from the required elevation. Not more than 30 % of the levels picked at equal intervals, shall be higher than the design levels for base course. All humps and depressions and thickness deficiencies exceeding the specified tolerances shall be corrected by removing the defective work or by adding new material as directed by the Engineer.

f) **Testing for Compaction:** The frequency of in-place density testing for accepting the compacted area shall be one density test in every 200 sq. metre. This frequency may be reduced with the prior approval of the Engineer.

#### 04. **MEASUREMENT AND PAYMENT**

##### 4.1 **General**

Except otherwise specified herein or elsewhere in the Contract Document, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bills of Quantities. The cost thereof



shall be deemed to have been included in the quoted unit rates of the respective items of the Bills of Quantities.

- 4.1.1 All sampling and testing of aggregates in the lab or at the project site.
- 4.1.2 Mockup specimen strip of sub-base course and base course.
- 4.1.3 Providing and spraying water.
- 4.1.4 Any losses of material which may result from shrinking, compaction, foundation settlement, wastage, over flow, erosion or any other causes.
- 4.1.5 Rolling and compaction.
- 4.1.6 Reworking in case the layer is disturbed before placement of subsequent layer

#### 4.2 **Measurement**

Measurement of acceptably completed works of Aggregate sub-base course and aggregate base course will be made on the basis of actual volume in cubic metre of aggregate sub-base course and aggregate base course laid & compacted in position to the line, level & grade as shown on drawings or as directed by the Engineer.

#### 4.3 **Payment**

Payment will be made for acceptable measured quantity of compacted Aggregate sub-base course and aggregate base course on the basis of unit rate per cubic metre quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

## SECTION - 5220

### VALVES AND APPURTENANCES

#### 1.0 SCOPE

The work to be done under this section of the specifications includes furnishing all plant, labour, equipment, appliances, materials and performing all operations required in connection with supply, installation, testing and commissioning of valves and appurtenances as specified herein, as shown on the drawings and as directed by the Engineer.

#### 2.0 GENERAL

Valves and appurtenances shall be of renowned manufacturers of Western European or Japan origin.

Material of valves and appurtenances shall be suitable for installation on pipelines.

Service ratings of the valves and appurtenances shall be as specified herein, on the drawings or in the contract document but shall not be less than 10 bars for potable water system and 16 bars for firefighting system.

Valve ends shall be of appropriate class, material and type of the pipe/fittings to which they are to be joined.

Valves and appurtenances shall be installed in positions as shown on the drawings or as directed by the Engineer.

Before installation the interior of valves and appurtenances shall be cleaned of all foreign materials and greased. Damaged paints shall be retouched.

Before installation and after commissioning valves and appurtenances shall be subjected to test pressure which shall be not less than 1-1/2 times the working pressure or the service pressure of the valves and appurtenances, whichever is higher and that no leakage shall be permitted during the test.

Valves and appurtenances shall be adequately supported and labeled.

Manufacturer's literature and operation manual for valves and appurtenances shall be provided.

#### 3.0 CAST IRON GATE VALVES

Cast iron gate valves shall have flanged ends and wheel handle and shall conform to B.S.5163 "Specifications for Double Flanged Cast Iron Wedge Gate Valves for Waterworks purposes". Flanges shall be drilled to B.S. 4504 Part 1. Valves shall be rated for a working/service pressure of 10 bars for water supply system and 16 bars for firefighting system. Valves shall close in clockwise direction.

The valve parts shall be of the following materials.

- Valve body shall be of cast iron.

- Flanges shall be of cast iron.
- Shaft shall be of stainless steel.
- Disc shall be of stainless steel with bronze trim.
- Seat shall be of cast iron with bronze trim.

Valve parts in contact with water shall be of corrosion resistant material, free from toxic substances and shall not foster microbiological growth or impart taste, odour, turbidity or colour to the water.

Inside surfaces of valves shall be enameled and outside surfaces shall be epoxy coated.

#### **4.0 INSTALLATION OF VALVES**

Valves shall be installed either in chambers or above grade on line as shown on the drawings and as directed by the Engineer. Before installation, the interior surfaces of valves shall be cleaned of all foreign matters, inspected to ensure that all components are sound and in working condition and tested to 1-1/2 times the working pressure or the service pressure whichever is greater. After installation, valves shall be securely anchored, tested, retouched where paints have been damaged and labeled.

#### **5.0 MEASUREMENT AND PAYMENT**

##### **5.1 General**

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost therefore shall be deemed to have been included in the quoted unit rate of the respective items of the Bill of Quantities.

- Jointing arrangement of pipe on both ends of valves, including gaskets, nuts, bolts etc.
- Valves and appurtenances supports and anchors
- Keys for operation of valves
- Steel embedded parts and label plates
- Manufacturer's literature and operation manual for valves and appurtenances
- Painting of valves and appurtenances

##### **5.2 Measurement**

Measurement of acceptable completed works of all types of valves will be made on the basis of actual number of valves provided and installed in position as shown on the drawings, and as directed by the Engineer.

##### **5.3 Payment**

Payment for the acceptable measured quantity of all types of valves will be made on the basis of unit rate per number quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

\*\*\* End of Section 5220 \*\*\*

## SECTION - 5225

### VALVE CHAMBERS

#### 1.0 SCOPE

The work to be done under this section of specifications includes all plant, labour, equipment, appliances, materials and in performing all operations required in connection with construction, valve chambers including fixing C.I. cover and frame, ladder rungs, etc. complete as specified herein as shown on the drawings, or as directed by the Engineer.

#### 2.0 APPLICABLE SECTIONS OF SPECIFICATION

The following specification sections except for sub-sections regarding measurement and payment shall be followed for carrying-out civil works associated with this section:-

<u>S.No.</u>	<u>Description</u>	<u>Section No.</u>
1.	Earth Work	1100
2.	Form Work	2100
3.	Reinforcement	2200
4.	Plain and Reinforced Concrete	2300
5.	Block Masonry	4100
6.	Cast Iron Covers with Frames and ladder rungs	5233

#### 3.0 CONSTRUCTION

Manholes and valve chambers shall be of reinforced cement concrete top, walls and base slab shall be of R.C.C. of the sizes, thickness, and class of concrete as shown on the drawings. The work of excavation, backfilling, disposal of surplus/rejected earth, plain and reinforced cement concrete, formwork, reinforcement, etc. are to be done under this section and shall be executed in accordance with the specifications as stated above. The C.I. frame and ladder rungs shall be well set in place at the time of pouring of concrete.

#### 4.0 MEASUREMENT AND PAYMENT

##### 4.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement will be made for the under mentioned specified works related to the relevant items of the Bills of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bills of Quantities.

a) Earth work, formwork plain and reinforced concrete reinforcement and steel embedded parts, steel pipe sleeves with packing and sealant, PCC valve supports concrete benching etc.

b) Installation of C.I. cover with frame, gratings and ladder rungs.

#### 4.2 **Measurement**

Measurement of acceptably completed works of valve chambers will be made on the basis of actual number of valve chambers as shown on the drawings and or as directed by the Engineer.

#### 4.3 **Payment**

Payment will be made for acceptable measured quantity of valve chambers on the basis of unit rate per number as quoted in the Bills of Quantities & shall constitute full compensation for all the works related to the item.

## SECTION 5233

### CAST IRON COVERS WITH FRAMES & LADDER RUNGS

#### 1.0 SCOPE OF WORK

The work to be done under this section of the specifications consists of furnishing all plant, labour, equipment, appliances, materials and performing all operations required in connection with the installation of RCC & C.I. cover with frame, gratings and ladder rungs, complete as specified herein, as shown on the drawings and or as directed by the Engineer.

#### 2.0 CAST IRON COVERS WITH FRAME

Cast iron cover and frame shall be of the sizes and duty as specified on the drawings. The specified size means the clear opening. The cover shall be complete with frame. Top of cover shall be roughened in an approved pattern. Locking and latching arrangement shall also be provided. The frame shall be well set in place at the time of pouring of concrete. The cover shall tightly fit in the frame. It shall be airtight and water-tight. The duty, weight, test and working load for 600mm circular or square C.I. cover and frame shall be as follows: -

Class/Duty of Cover and Frame	Gross* Weight (Approx.)	Peak or Test Load	Services Working Load
Extra Heavy Duty	-----	900 KN	300 KN
Heavy Duty	225-285 Kg	400 KN	135 KN
Medium Duty	130-140 Kg	50 KN	17 KN
Light Duty	70-80 Kg	10 KN	3.5 KN

\* The column of gross weight is indicative only for the duty of manhole. The Contractor shall ensure that the manhole is rated for above mentioned test load irrespective of the weight.

#### 3.0 LADDER RUNGS

Galvanized steel ladder rungs shall be fabricated to the size specified on the drawings or as directed by the Engineer. The galvanized mild steel ladder rungs shall be fitted by approved fittings at locations shown on the drawings or as directed by the Engineer.

#### 4.0 **CAST IRON GRATING AND FRAME**

All cast iron grating and frame shall be of the sizes and duty as specified on the drawings. The specified size means the clear opening. Cast iron grating shall be complete with frame. They shall be of heavy-duty type (200-230kg) to resist heavy traffic loads. The casting shall be sound and free from all defects. The frame shall be set in place at the time of pouring of concrete. Opening in gratings shall be in an approved pattern.

#### 5.0 **RCC COVER WITH FRAME**

RCC cover and frame shall of sizes as specified on the drawings. The specified size means the clear opening. The cover shall be complete with frame. Top of cover shall be specified reinforced concrete on steel frame as shown on drawing the outer frame shall be cast iron and shall well set in place at the time of pouring of concrete. The cover shall be air-tightened and water tight.

#### 6.0 **MEASUREMENT AND PAYMENT**

##### 6.1 **General**

Except otherwise specified therein or elsewhere in the contract documents, no separate measurement and payment will be made for the under-mentioned works related to the relevant BOQ items but shall not be limited to the following. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective items of the Bills of quantities:

- Lock and key
- Applying bituminous paint

##### 6.2 **Measurement**

Measurement of acceptable completed work of cast iron cover with frame and RCC cover with frame will be made on the basis of actual number of cover with frame provided and installed in position as shown on the drawings or as directed by the Engineer.

Measurement of acceptably completed works of ladder rungs will be made on the basis of actual number of ladder rungs provided and installed in position as shown on the drawing or as directed by the Engineer.

##### 6.3 **Payment**

Payment for the acceptably measured number of C.I. cover with frame RCC cover & frame and ladder rungs shall be made on the basis of unit rate per number quoted in the bills of quantities and shall constitute full compensation for all the works related to the item.

## **Project Management Unit (PMU)**



TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH

**BRTS ORANGE LINE**

# **Construction of Water Trunk Main from Town Municipal Administration (TMA) to Board Office Chowrangji BIDDING AND CONTRACT DOCUMENTS VOLUME - II**

**BIDDING DRAWINGS**

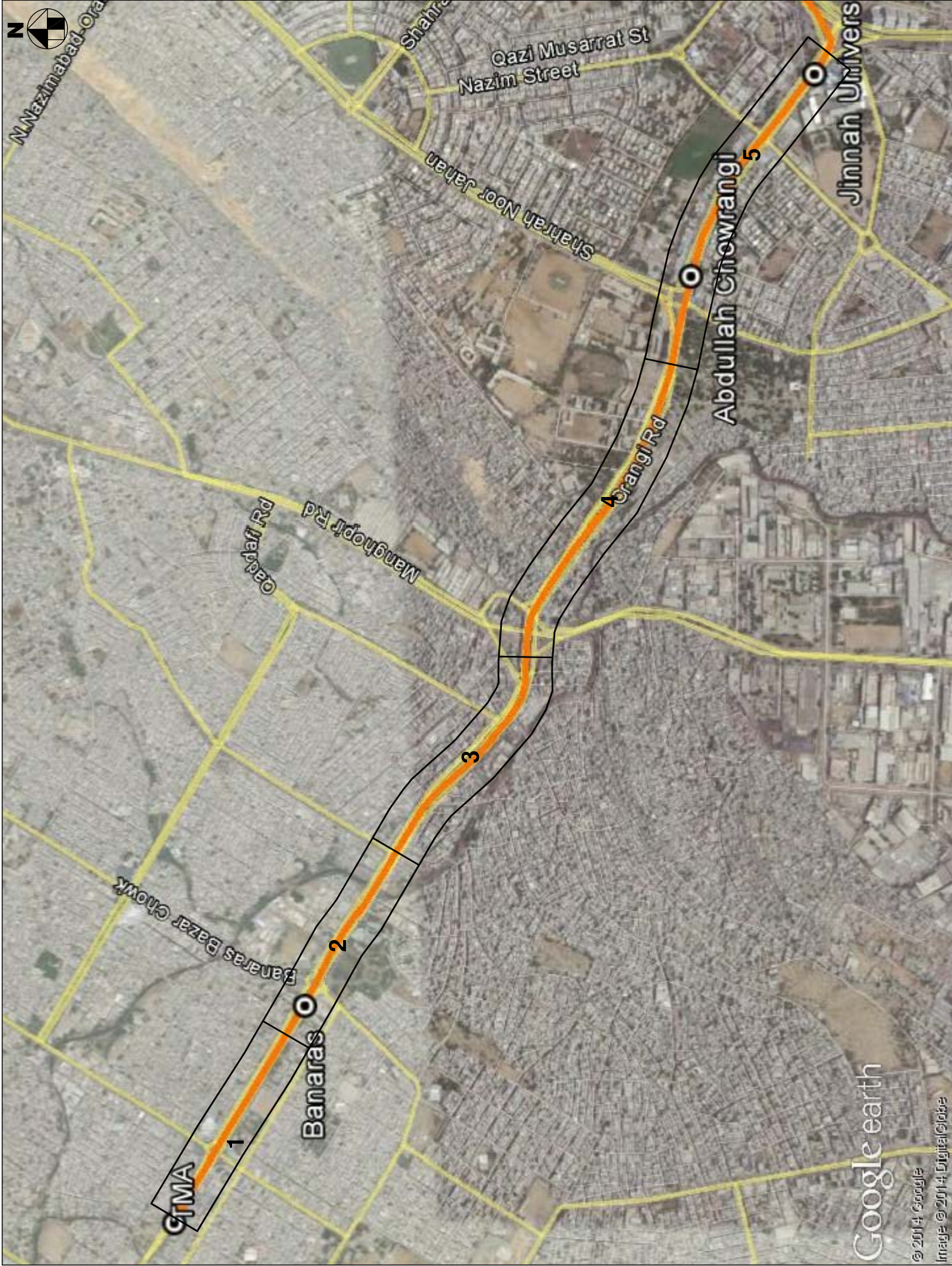
**AUGUST, 2015**



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## LIST OF DRAWINGS

### A - General Drawings

S.NO:	DRAWING NO.	TITLE
1	33026/50P/BD/OLC001	LIST OF DRAWINGS & INDEX PLAN
2	33026/50P/BD/OLC002	SYMBOLS AND ABBREVIATIONS

### B - Water Supply Drawings

3	33026/50X/BD/OLC003	WATER SUPPLY LAYOUT PLAN (SHEET - 1)
4	33026/50X/BD/OLC004	WATER SUPPLY LAYOUT PLAN (SHEET - 2)
5	33026/50X/BD/OLC005	WATER SUPPLY LAYOUT PLAN (SHEET - 3)
6	33026/50X/BD/OLC006	WATER SUPPLY LAYOUT PLAN (SHEET - 4)
7	33026/50X/BD/OLC007	WATER SUPPLY LAYOUT PLAN (SHEET - 5)
8	33026/50P/BD/OLC008	EXISTING & PROPOSED CROSS SECTIONS (SHEET - 1)
9	33026/50P/BD/OLC009	EXISTING & PROPOSED CROSS SECTIONS (SHEET - 2)
10	33026/50P/BD/OLC010	EXISTING & PROPOSED CROSS SECTIONS (SHEET - 3)
11	33026/50X/BD/OLC011	MISCELLANEOUS DETAILS



**KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH**



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REV.	DATE	DESCRIPTION
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DRAWN	MAZHAR A.K
DESIGNED	FAISAL
CHECKED	
APPROVED	

**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowranghi**

TITLE		SCALE
LIST OF DRAWINGS & INDEX PLAN		N.T.S
DATE	DWG. No.	REVISION
AUG, 2015	33026/50P/BD/OLC001	0



**SYMBOLS**

TRAVERSE POINTS	
BENCH MARK	
METALLED ROAD	
TRACK	
LOW TENSION POWER LINE	
CULVERT	
BUILDING	
HUT	
NALA	
CONTOUR	
SPOT ELEVATION	
CLEAR HEIGHT	
SEWERAGE MANHOLE	
TRAFFIC SIGN BOARD	
GATE	
HI TENSION POWER LINE	
PYLON	
DRAINAGE INLET	
HYDRANT	
PIPELINE	
CABLE	
FENCE	
WATER LINE	
NRL ( OIL PIPE LINE)	
LAND TO BE ACQUIRED	
DEDICATED BRT CORRIDOR (AT-GRADE) SAPERATED BY CEMENT BARRIER & STEEL GRILL	
SEMI DEDICATED BRT CORRIDOR (AT-GRADE) SAPERATED BY ROAD STUDS	
BRT STATION	
GREEN BELT	
FOOTPATH	
PROPOSED WIDENING FOR MIX TRAFFIC LANES	

**ABBREVIATIONS**

ALIGN	ALIGNMENT	M / m	METER
BOP	BEGINNING OF PROJECT	M.H	MAN HOLE
B.M	BENCH MARK	mm	MILLIMETERE
CL	CENTER LINE	N	NORTHING, NORTH
CHN	CHAINAGE	NO	NUMBER
CURVE LEN.	VERTICAL CURVE LENGTH	N.T.S	NOT TO SCALE
D	DEPTH	P	OFFSET OF T. LINE
DA	DEGREE OF CURVE (BY ARC)	PC	POINT OF HORIZONTAL CURVE
DC	DEGREE OF CURVE (BY CHORD)	PGL	PROFILE GRADE LINE
DEG	DEGREE	PI	POINT OF HORIZONTAL INTERSECTION
DIA	DIAMETER	PR	POINT OF ROTATION
DIM	DIMENSION	R	RADIUS OF HORIZONTAL CURVE
DWG	DRAWING	R.O.W	RIGHT OF WAY
E	EASTING, EAST,EXTERNAL DISTANCE	STA,STN	STATION
EL/ELEV.	ELEVATION	T	TANGENT LENGTH OF HORIZONTAL CURVE
EOP	END OF PROJECT	T.P	TELEPHONE POLE
H/HOR.	HORIZONTAL	V	VERTICAL
I	DEFLECTION ANGLE (HORIZONTALCURVE)	VPI	VERTICAL POINT OF INTERSECTION
IC	CIRCULAR DEFLECTION ANGLE	VPC	VERTICAL POINT OF CURVATURE
IL	INVERT LEVEL	VPT	VERTICAL POINT OF TENGANCY
K	RATIO OF CURVE LENGTH TO ABSOLUTE VALUE OF CHANGE IN GRADES	W.C	WATER COURSE
KM	KILOMETER	W.TANK	WATER TANK
L	LENGTH OF HORIZONTAL CURVEL/SPIRAL	PC	PILE CAP
LP	LOW POINT		
F.R.L	FINISHED ROAD LEVEL		
I.L	INVERT LEVEL		
	UNDERGROUND GAS LINES		
	UNDERGROUND WATER LINES		



**KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH**

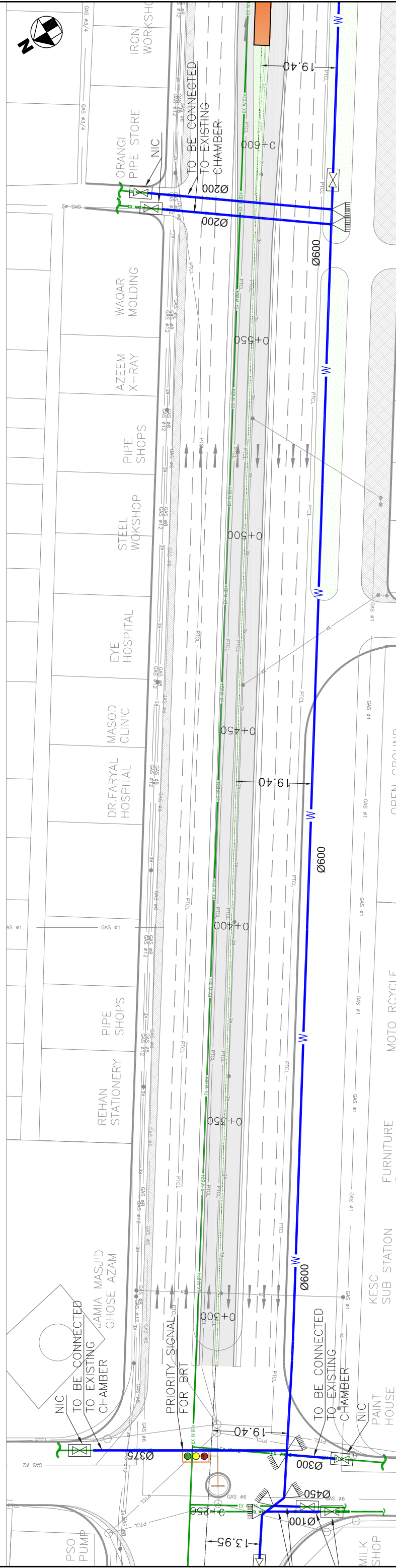
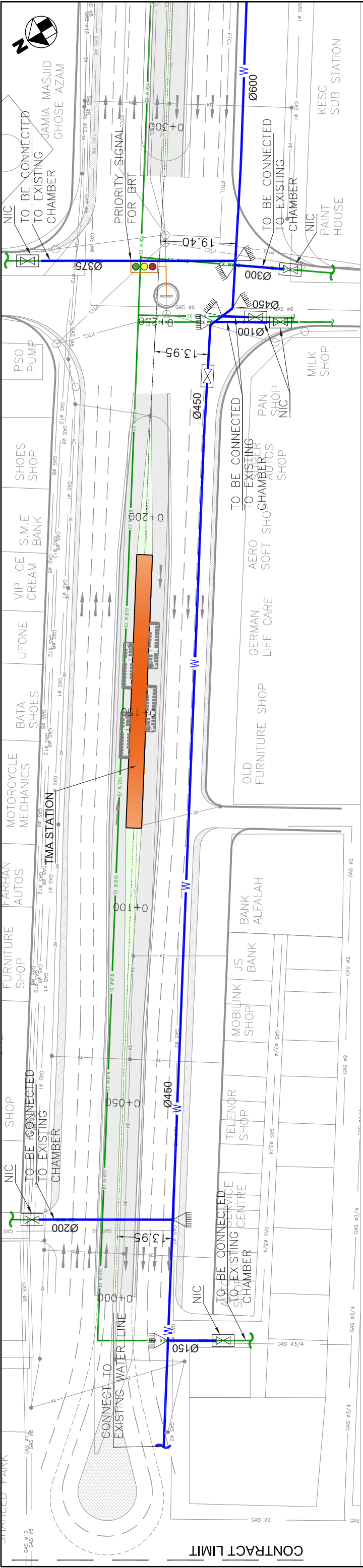
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DRAWN	
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**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowrangri**

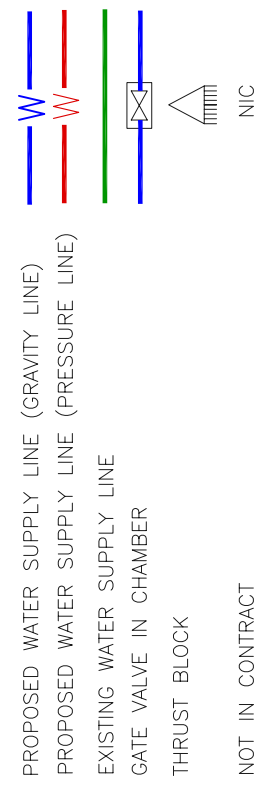
TITLE	SYMBOLS & ABBREVIATIONS	
SCALE		
DATE	DWG. No.	REVISION
AUG,2015	33026/50P/BD/OLC002	0



**NOTES:**

- 1- PIPE DIAMETERS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
- 2- THE WATER SUPPLY PIPE SHALL BE LAID BELOW FGL AS PER DETAILS SHOWN IN DRAWING NO.33026/50X/BD/OLC011.
- 3- FOR RELATIVE LOCATION OF SERVICES/WATER SUPPLY LINES REFER ROAD SECTIONS.
- 4- IF INTERFERENCE IS FOUND IN RELATIVE CROSSING OF SERVICES AT JUNCTION/ INTERSECTIONS CONTRACTOR WILL PREPARE SHOP DRAWINGS AS PER ACTUAL CONDITION OF SITE SHOWING DETAILS WITH RESPECT TO LEVELS FOR APPROVAL PRIOR TO EXECUTION. SHOP DRAWING SHALL ALSO BE COORDINATED AS PER REQUIREMENT OF KW&SB
- 5- FOR DETAILS OF THRUST BLOCK, VALVE CHAMBER, TRENCH DETAIL ETC. REFER DRAWING NO.33026/50X/BD/OLC011.
- 6- THE CONTRACTOR SHALL EXCAVATE PILOT TRENCHES AS INSTRUCTED BY THE ENGINEER FOR CONFIRMATION OF LOCATION OF EXISTING UTILITIES PRIOR TO EXCAVATION FOR NEW PIPE LINE

**LEGEND:-**



NOT IN CONTRACT



**KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH**

**NEE PAR**  
NATIONAL ENGINEERING SERVICES  
PAKISTAN (PVT) LIMITED  
13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi  
P.O. BOX 5772, Karachi Pakistan  
Tel. Ph. +92-21-99090000 Fax +92-21-35651994  
E-mail: nespakhh@gmail.com

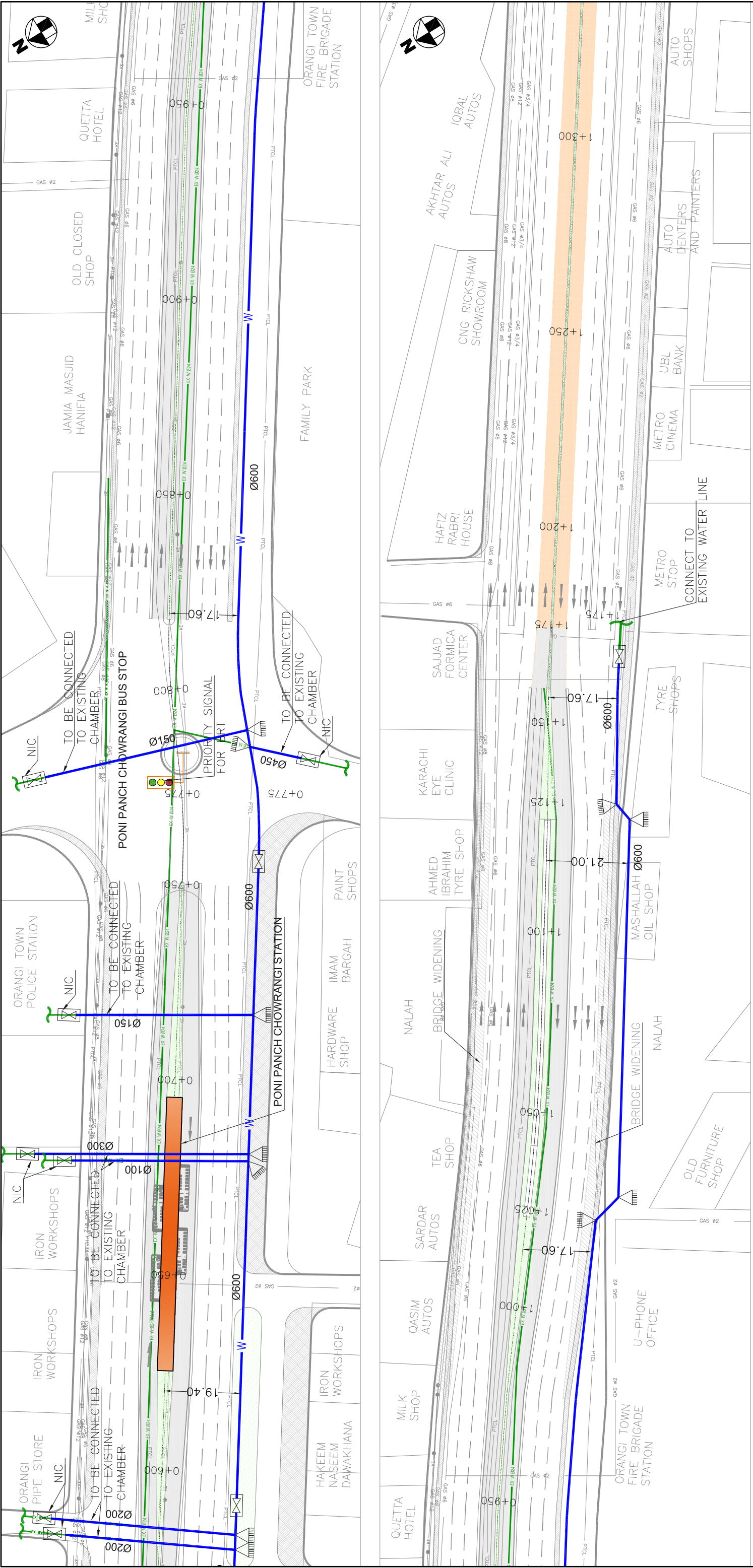
REV.	DATE	DESCRIPTION
04		
03		
02		
01		
0	AUGUST,2015	ISSUED FOR BIDDING

DRAWN	M.BABAR
DESIGNED	NIDA
CHECKED	SHAHEEN SAIF
APPROVED	

**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowranghi**

TITLE	SCALE
WATER SUPPLY LAYOUT PLAN (SHEET - 1)	1:1000
DATE	REVISION
AUG,2015	0
DWG. No.	
33026/50X/BD/OLC003	





**NOTES:**

- 1- PIPE DIAMETERS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
- 2- THE WATER SUPPLY PIPE SHALL BE LAID BELOW FGL AS PER DETAILS SHOWN IN DRAWING NO.33026/50X/BD/OLC011.
- 3- FOR RELATIVE LOCATION OF SERVICES/WATER SUPPLY LINES REFER ROAD SECTIONS.
- 4- IF INTERFERENCE IS FOUND IN RELATIVE CROSSING OF SERVICES AT JUNCTION/ INTERSECTIONS CONTRACTOR WILL PREPARE SHOP DRAWINGS AS PER ACTUAL CONDITION OF SITE SHOWING DETAILS WITH RESPECT TO LEVELS FOR APPROVAL PRIOR TO EXECUTION. SHOP DRAWING SHALL ALSO BE COORDINATED AS PER REQUIREMENT OF KW&SB
- 5- FOR DETAILS OF THRUST BLOCK, VALVE CHAMBER, TRENCH DETAIL ETC. REFER DRAWING NO.33026/50X/BD/OLC011.

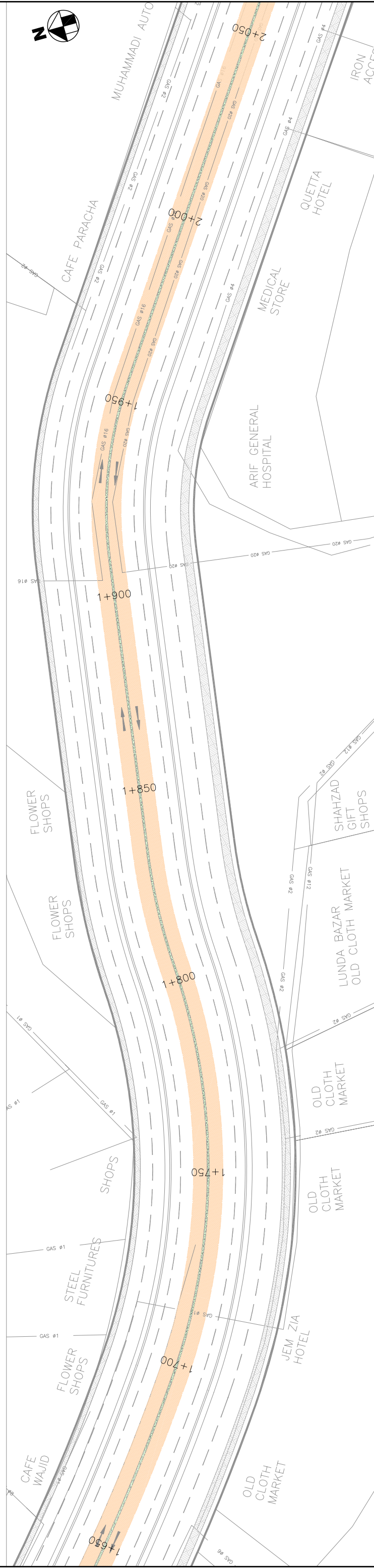
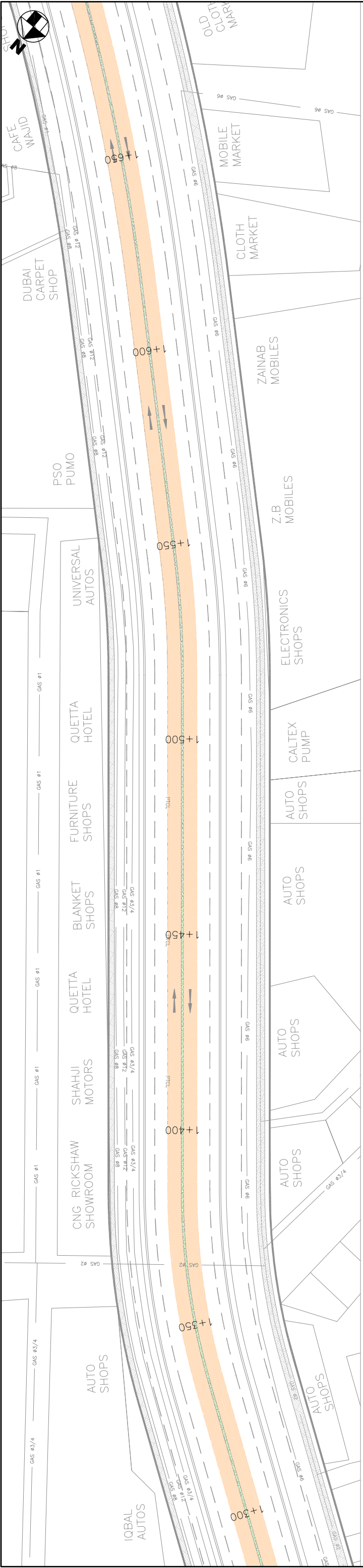
- 6- THE CONTRACTOR SHALL EXCAVATE PILOT TRENCHES AS INSTRUCTED BY THE ENGINEER FOR CONFIRMATION OF LOCATION OF EXISTING UTILITIES PRIOR TO EXCAVATION FOR NEW PIPE LINE

**LEGEND:-**

- PROPOSED WATER SUPPLY LINE (GRAVITY LINE)
- PROPOSED WATER SUPPLY LINE (PRESSURE LINE)
- EXISTING WATER SUPPLY LINE
- GATE VALVE IN CHAMBER
- THRUST BLOCK
- NOT IN CONTRACT
- NIC

	<b>KARACHI MASS TRANSIT CELL, TRANSPORT AND MASS TRANSIT DEPARTMENT, GOVERNMENT OF SINDH</b>			<b>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED</b> 13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi P.O. BOX 5772, Karachi Pakistan Tel. Ph. +92-21-99090000 Fax +92-21-35651994 E-mail: nespakhh@gmail.com		04 03 02 01 0	REV. DATE ISSUED FOR BIDDING AUGUST, 2015	M.BABAR NIDA SHAHEEN SAIF	CONSTRUCTION OF WATER TRUNK MAIN FROM TOWN MUNICIPAL ADMINISTRATION (TMA) to Board Office Chowranghi	TITLE WATER SUPPLY LAYOUT PLAN (SHEET - 2)	SCALE 1:1000
	KARACHI MASS TRANSIT CELL, TRANSPORT AND MASS TRANSIT DEPARTMENT, GOVERNMENT OF SINDH			NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED 13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi P.O. BOX 5772, Karachi Pakistan Tel. Ph. +92-21-99090000 Fax +92-21-35651994 E-mail: nespakhh@gmail.com		0 AUGUST, 2015	ISSUED FOR BIDDING AUGUST, 2015	M.BABAR NIDA SHAHEEN SAIF	CONSTRUCTION OF WATER TRUNK MAIN FROM TOWN MUNICIPAL ADMINISTRATION (TMA) to Board Office Chowranghi	TITLE WATER SUPPLY LAYOUT PLAN (SHEET - 2)	SCALE 1:1000





**NOTES:**

- 1- PIPE DIAMETERS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
- 2- THE WATER SUPPLY PIPE SHALL BE LAID BELOW FGL AS PER DETAILS SHOWN IN DRAWING NO.33026/50X/BD/OLC011.
- 3- FOR RELATIVE LOCATION OF SERVICES/WATER SUPPLY LINES REFER ROAD SECTIONS, IF INTERFERENCE IS FOUND IN RELATIVE CROSSING OF SERVICES AT JUNCTION INTERSECTIONS CONTRACTOR WILL PREPARE SHOP DRAWINGS AS PER ACTUAL CONDITION OF SITE SHOWING DETAILS WITH RESPECT TO LEVELS FOR APPROVAL PRIOR TO EXECUTION. SHOP DRAWING SHALL ALSO BE COORDINATED AS PER REQUIREMENT OF KW&SB
- 5- FOR DETAILS OF THRUST BLOCK, VALVE CHAMBER, TRENCH DETAIL ETC. REFER DRAWING NO.33026/50X/BD/OLC011.

- 6- THE CONTRACTOR SHALL EXCAVATE PILOT TRENCHES AS INSTRUCTED BY THE ENGINEER FOR CONFIRMATION OF LOCATION OF EXISTING UTILITIES PRIOR TO EXCAVATION FOR NEW PIPE LINE

**LEGEND:-**



**KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH**

**NEP PAR**  
NATIONAL ENGINEERING SERVICES  
PAKISTAN (PVT) LIMITED  
13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi  
P.O. BOX 5772, Karachi Pakistan  
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E-mail: nepakkh@gmail.com

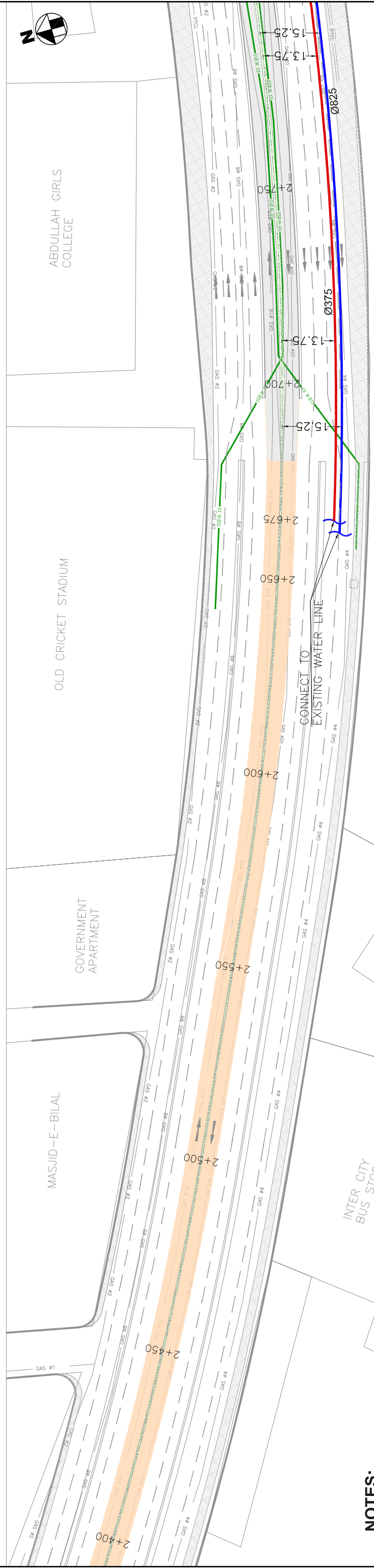
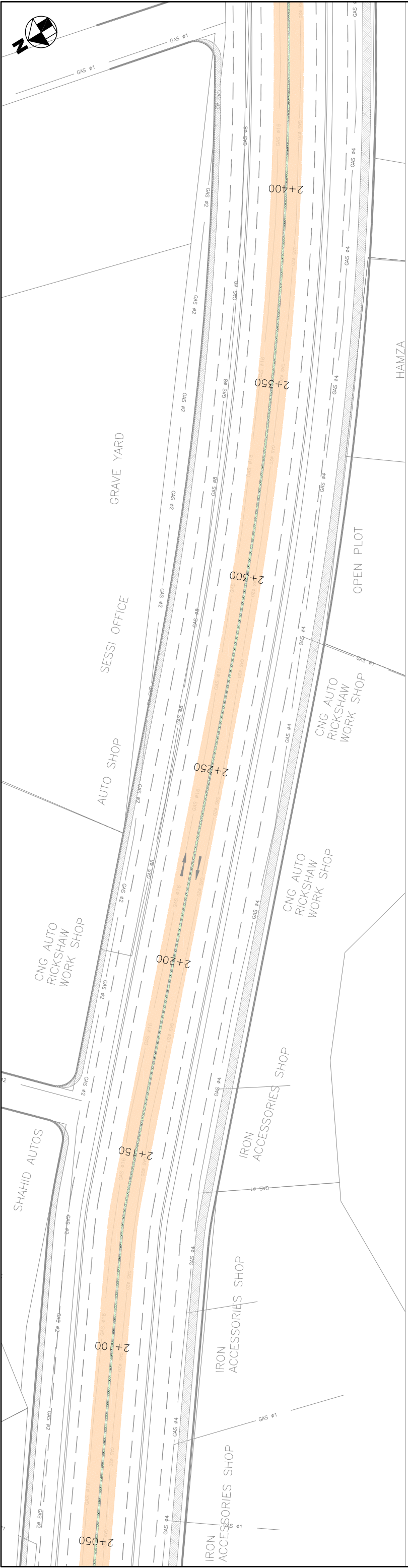
REV.	DATE	DESCRIPTION
04		
03		
02		
01		
0	AUGUST,2015	ISSUED FOR BIDDING

DRAWN	M.BABAR
DESIGNED	NIDA
CHECKED	SHAHEEN SAIF
APPROVED	

**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowranghi**

TITLE	SCALE
WATER SUPPLY LAYOUT PLAN (SHEET - 3)	1:1000
DATE	REVISION
AUG,2015	0
DWG. No.	
33026/50X/BD/OLC005	

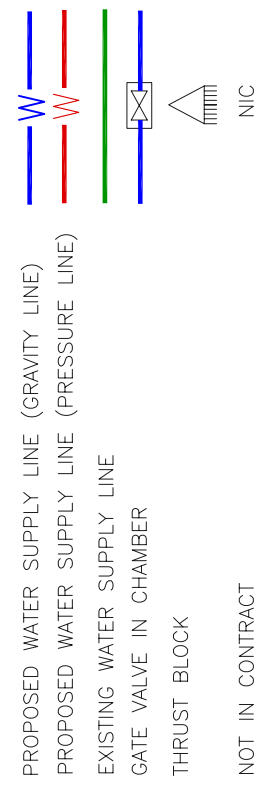




**NOTES:**

- 1- PIPE DIAMETERS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
- 2- THE WATER SUPPLY PIPE SHALL BE LAID BELOW FGL AS PER DETAILS SHOWN IN DRAWING NO.33026/50X/BD/OLC011.
- 3- FOR RELATIVE LOCATION OF SERVICES/WATER SUPPLY LINES REFER ROAD SECTIONS,
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**LEGEND:-**



**KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH**

**NEE PAR**  
NATIONAL ENGINEERING SERVICES  
PAKISTAN (PVT) LIMITED  
13th, Floor, N.I.C Building, Abbasi Shaheed Road, Karachi  
P.O. BOX 5772, Karachi Pakistan  
Tel. Ph. +92-21-99090000 Fax +92-21-35651994  
E-mail: nespakhh@gmail.com

REV.	DATE	DESCRIPTION
04		
03		
02		
01		
0	AUGUST,2015	ISSUED FOR BIDDING

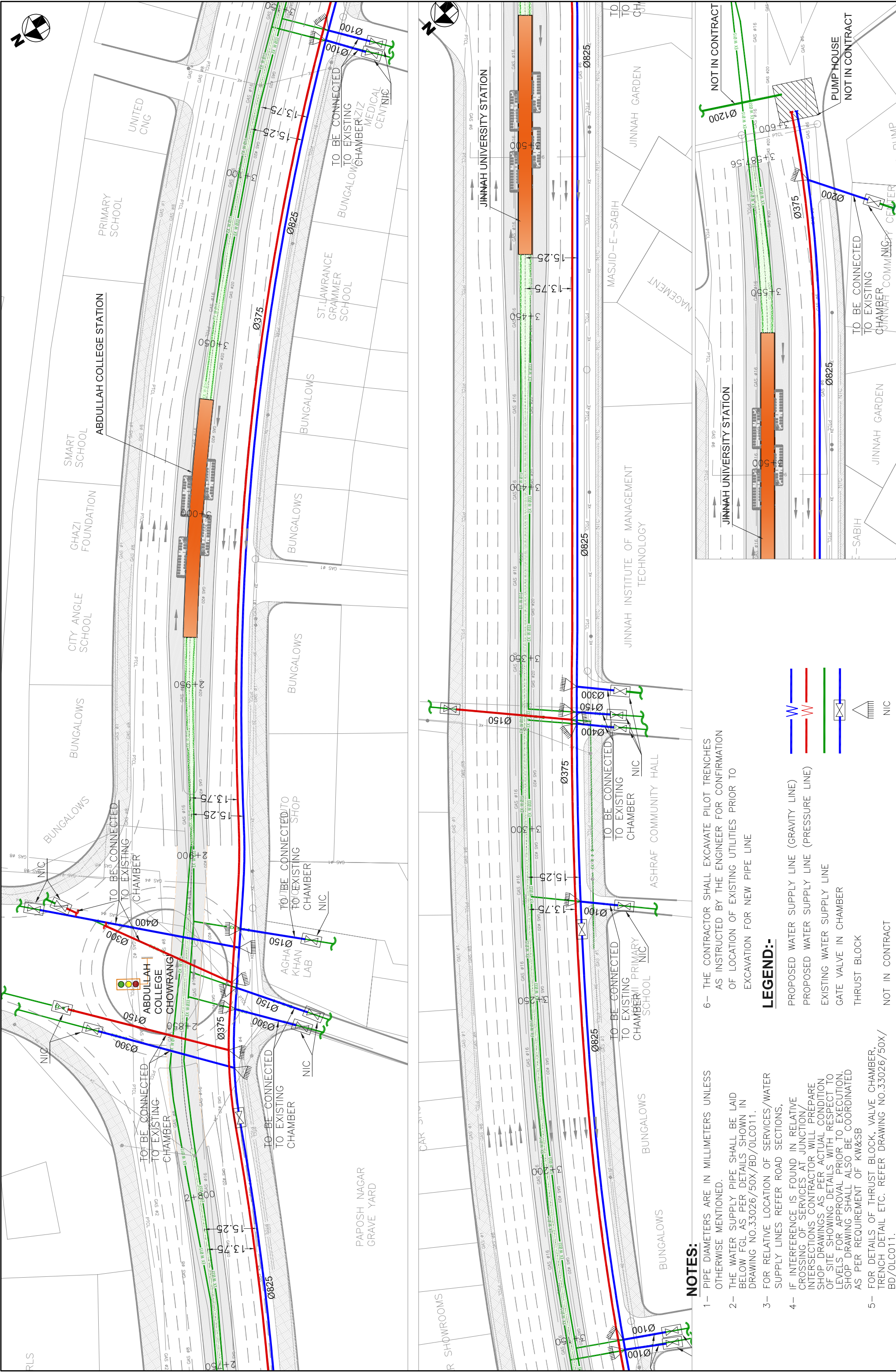
DRAWN	M.BABAR
DESIGNED	NIDA
CHECKED	SHAHEEN SAIF
APPROVED	

**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowrangli**

DATE	DWG. No.	REVISION
AUG,2015	33026/50X/BD/OLC006	0

TITLE: WATER SUPPLY LAYOUT PLAN (SHEET - 4)  
SCALE: 1:1000





**NOTES:**

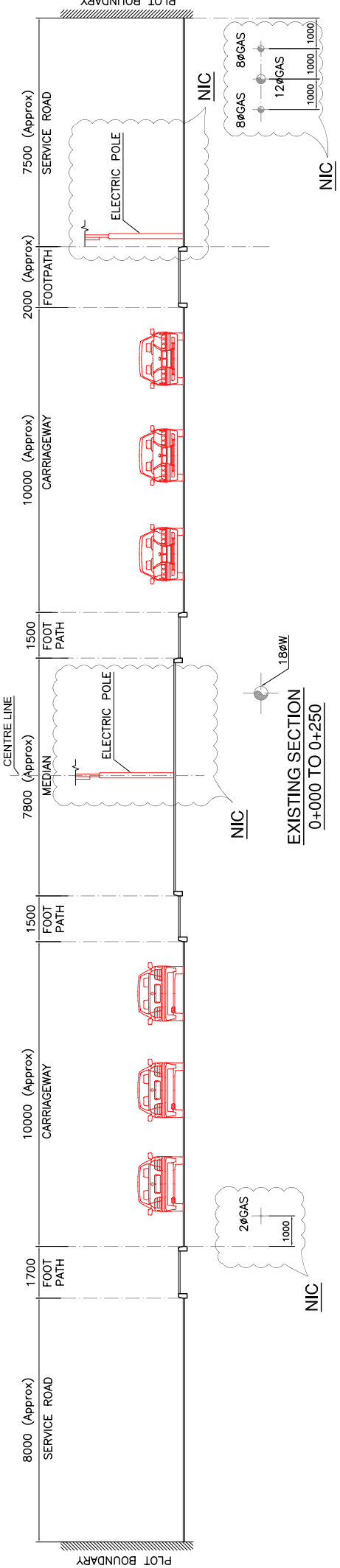
- 1- PIPE DIAMETERS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
- 2- THE WATER SUPPLY PIPE SHALL BE LAID BELOW FGL AS PER DETAILS SHOWN IN DRAWING NO.33026/50X/BD/OLC011.
- 3- FOR RELATIVE LOCATION OF SERVICES/WATER SUPPLY LINES REFER ROAD SECTIONS,
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- 5- FOR DETAILS OF THRUST BLOCK, VALVE CHAMBER, TRENCH DETAIL ETC. REFER DRAWING NO.33026/50X/BD/OLC011.

**LEGEND:-**

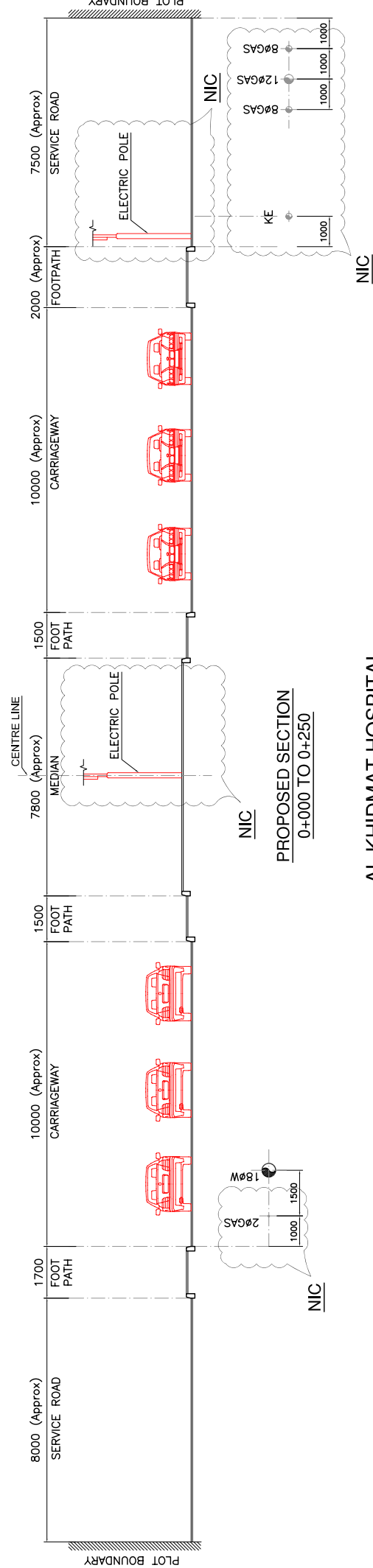
- PROPOSED WATER SUPPLY LINE (GRAVITY LINE)
- PROPOSED WATER SUPPLY LINE (PRESSURE LINE)
- EXISTING WATER SUPPLY LINE
- GATE VALVE IN CHAMBER
- THRUST BLOCK
- NOT IN CONTRACT

6- THE CONTRACTOR SHALL EXCAVATE PILOT TRENCHES AS INSTRUCTED BY THE ENGINEER FOR CONFIRMATION OF LOCATION OF EXISTING UTILITIES PRIOR TO EXCAVATION FOR NEW PIPE LINE

	<p><b>KARACHI MASS TRANSIT CELL, TRANSPORT AND MASS TRANSIT DEPARTMENT, GOVERNMENT OF SINDH</b></p>	<p><b>NES PAR</b> NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED 13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi P.O. BOX 5772, Karachi Pakistan Tel. Ph. +92-21-99090000 Fax +92-21-35651994 E-mail: nespakhh@gmail.com</p>	<p>04 03 02 01 0</p>	<p>REV. DATE</p>	<p>ISSUED FOR BIDDING AUGUST, 2015</p>	<p>DESCRIPTION</p>	<p>APPROVED SHAHEEN SAIF</p>	<p>CHECKED SHAHEEN SAIF</p>	<p>DESIGNED NIDA</p>	<p>M.BABAR NIDA</p>	<p>CONSTRUCTION OF WATER TRUNK MAIN FROM TOWN MUNICIPAL ADMINISTRATION (TMA) to Board Office Chowranghi</p>	<p>TITLE</p>	<p>WATER SUPPLY LAYOUT PLAN (SHEET - 5)</p>	<p>SCALE 1:1000</p>
	<p>DATE AUG, 2015</p>	<p>DWG. No. 33026/50X/BD/OLC007</p>	<p>REVISION 0</p>											

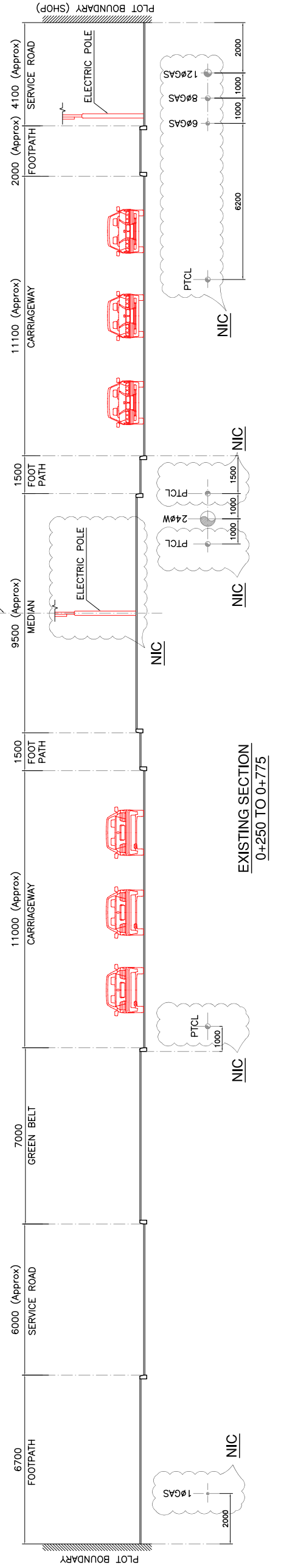


EXISTING SECTION  
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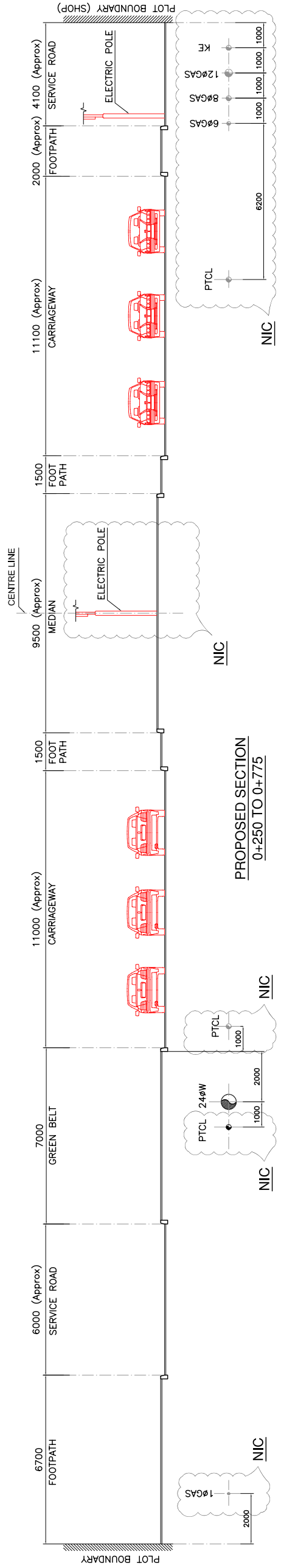


PROPOSED SECTION  
0+000 TO 0+250


AL KHIDMAT HOSPITAL



EXISTING SECTION  
0+250 TO 0+775

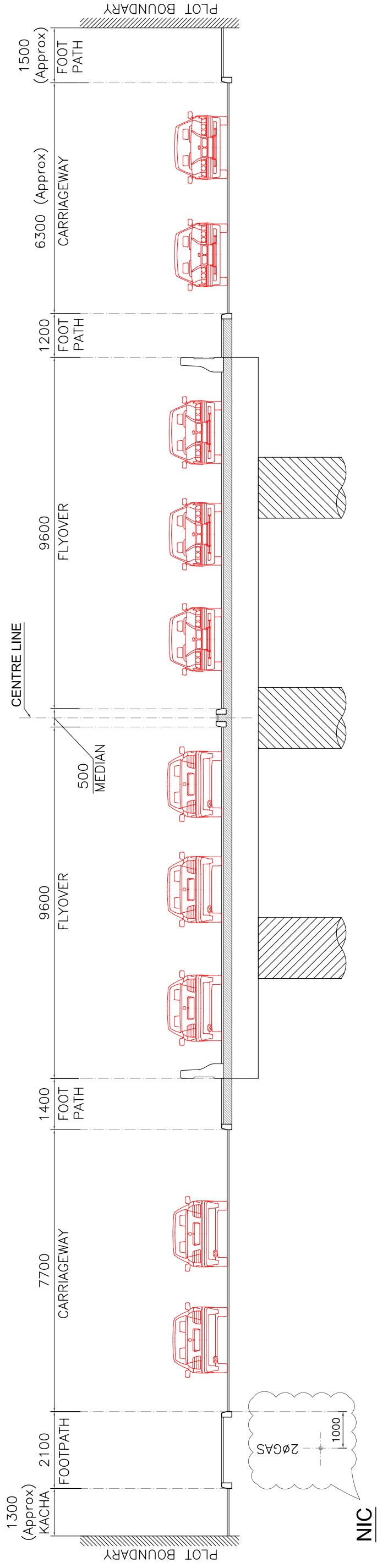


PROPOSED SECTION  
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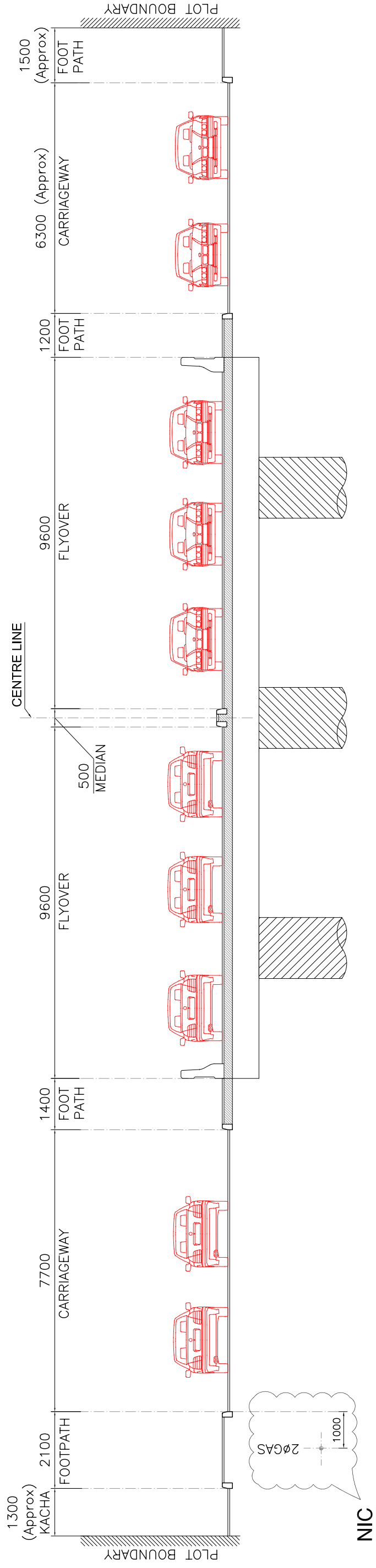
 <p>KARACHI MASS TRANSIT CELL, TRANSPORT AND MASS TRANSIT DEPARTMENT, GOVERNMENT OF SINDH</p>	<p>NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED 13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi P.O. BOX 5772, Karachi Pakistan Tel. Ph. +92-21-99090000 Fax +92-21-35651994 E-mail: nespakhh@gmail.com</p>		<p>04</p>	<p>04</p>	<p>MAZHAR A.K FAISAL</p>	<p>CONSTRUCTION OF WATER TRUNK MAIN FROM TOWN MUNICIPAL ADMINISTRATION (TMA) to Board Office Chowranghi</p>	<p>EXISTING &amp; PROPOSED CROSS SECTIONS (SHEET-1)</p>	<p>SCALE 1:100</p>
	<p>03 02 01 0</p>	<p>03 02 01 0</p>	<p>DESIGNED CHECKED APPROVED</p>	<p>ISSUED FOR BIDDING</p>	<p>AUGUST, 2015</p>	<p>DATE AUG, 2015</p>	<p>DWG. No. 33026/50P/BD/OLC008</p>	<p>REVISION 0</p>



# BACHA KHAN BRIDGE



**EXISTING SECTION**  
**1+175 TO 2+675**



**PROPOSED SECTION**  
**1+175 TO 2+675**



KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH

**NEE PAR**  
NATIONAL ENGINEERING SERVICES  
PAKISTAN (PVT) LIMITED  
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Tel. Ph. +92-21-99090000 Fax +92-21-35651994  
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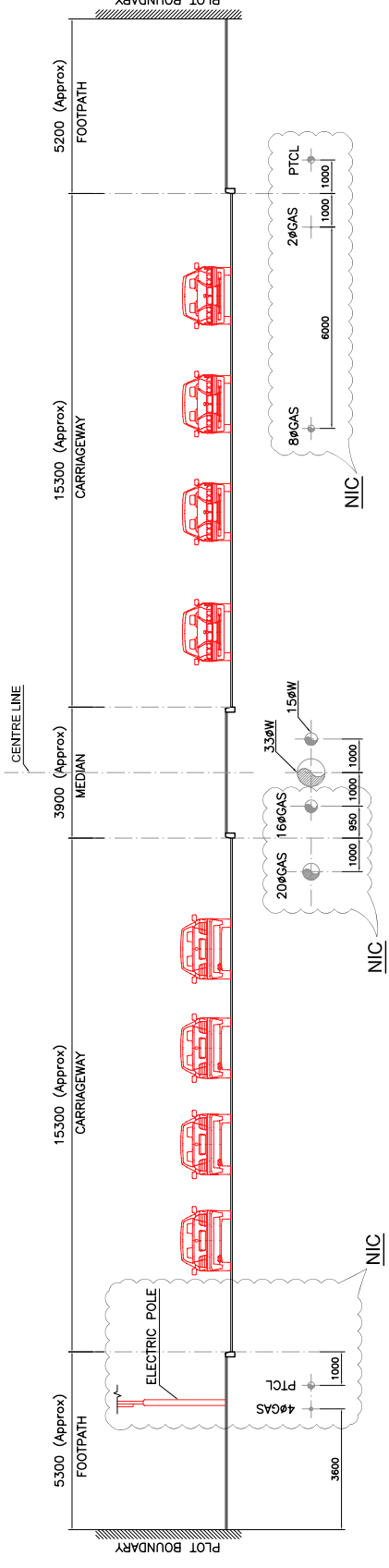
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01		
0	AUGUST, 2015	ISSUED FOR BIDDING

DRAWN	MAZHAR A.K
DESIGNED	FAISAL
CHECKED	
APPROVED	

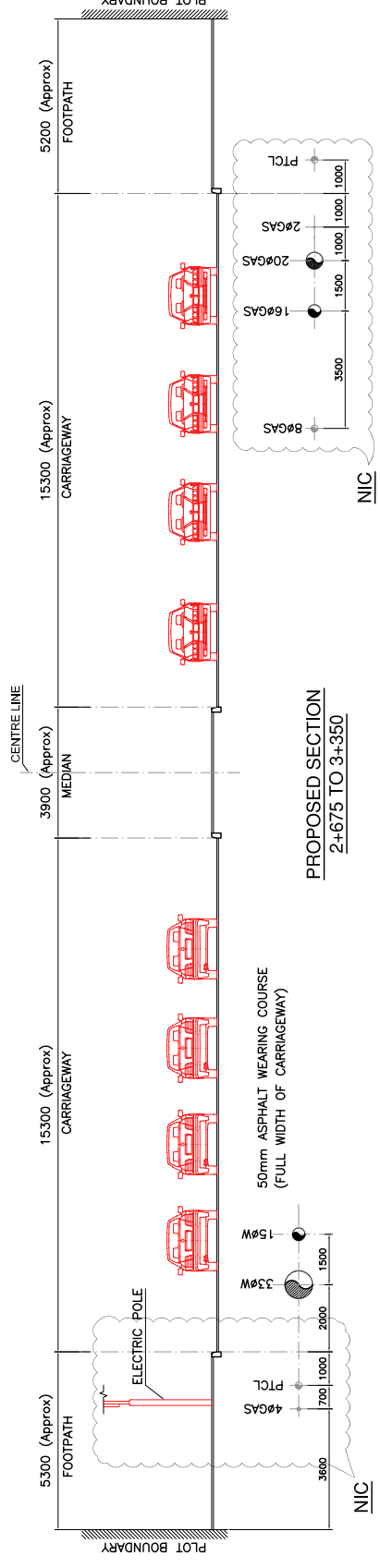
CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowranghi

TITLE	EXISTING & PROPOSED CROSS SECTIONS (SHEET-2)	SCALE
DATE	DWG. No.	REVISION
AUG, 2015	33026/50P/BD/OLC009	0

**ABDULLAH CHOWFRANGI**

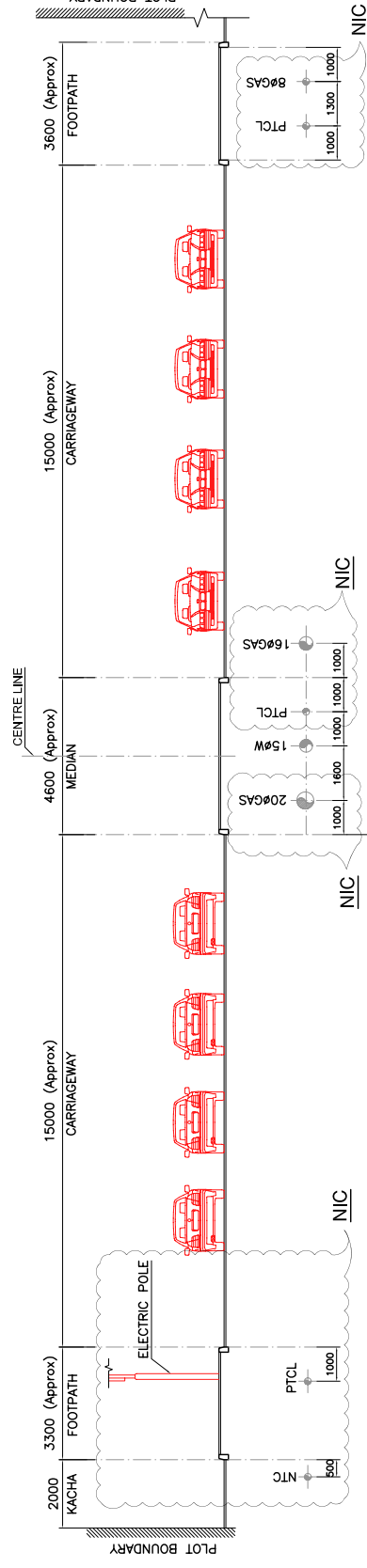


**EXISTING SECTION  
2+675 TO 3+350**

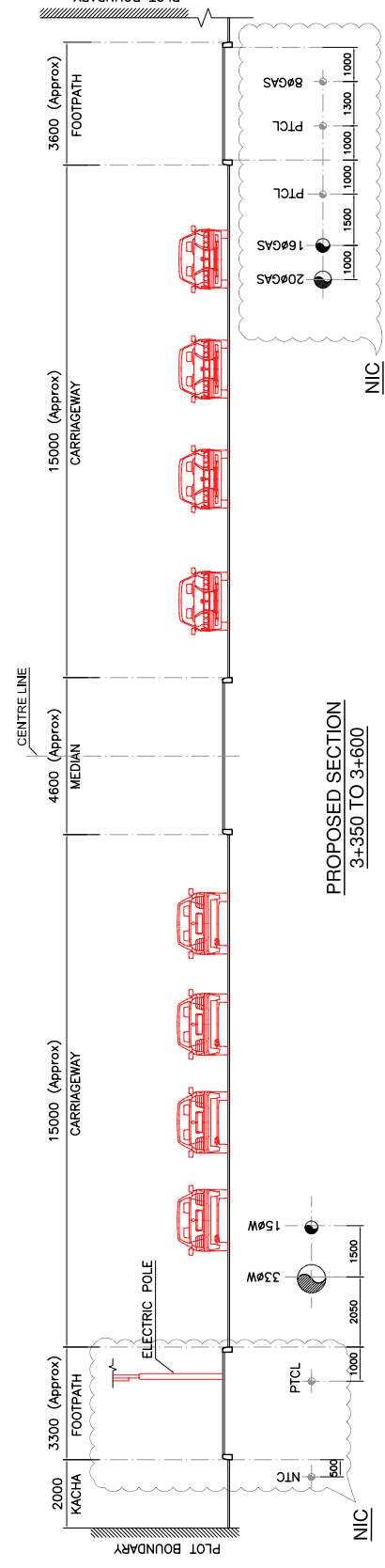


**PROPOSED SECTION  
2+675 TO 3+350**

**JINNAH UNIVERSITY**



**EXISTING SECTION  
3+350 TO 3+600**



**PROPOSED SECTION  
3+350 TO 3+600**



**KARACHI MASS TRANSIT CELL,  
TRANSPORT AND MASS TRANSIT  
DEPARTMENT,  
GOVERNMENT OF SINDH**

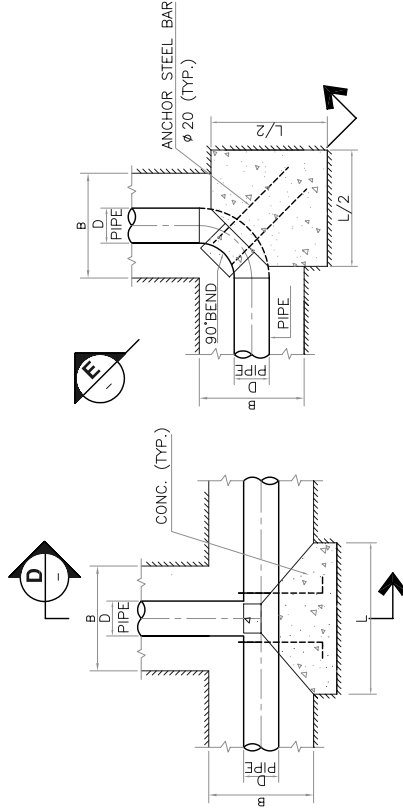
**NATIONAL ENGINEERING SERVICES  
PAKISTAN (PVT) LIMITED**  
13th Floor, N.I.C Building, Abbasi Shaheed Road, Karachi  
P.O. BOX 5772, Karachi Pakistan  
Tel. Ph. +92-21-99090000 Fax +92-21-35651994  
E-mail: nespakhh@gmail.com

REV.	DATE	DESCRIPTION
04		
03		
02		
01		
0	AUGUST, 2015	ISSUED FOR BIDDING

DRAWN	MAZHAR A.K
DESIGNED	FAISAL
CHECKED	
APPROVED	

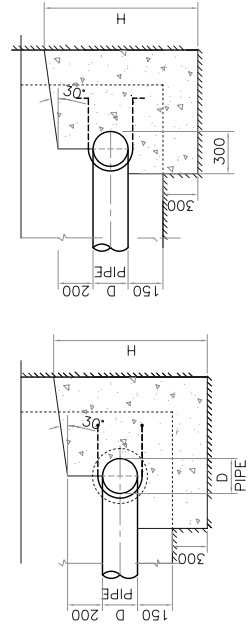
**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowranghi**

TITLE	SCALE
EXISTING & PROPOSED CROSS SECTIONS (SHEET-3)	1:100
DATE	DWG. No.
AUG, 2015	33026/50P/BD/OLC010
REVISION	REVISION
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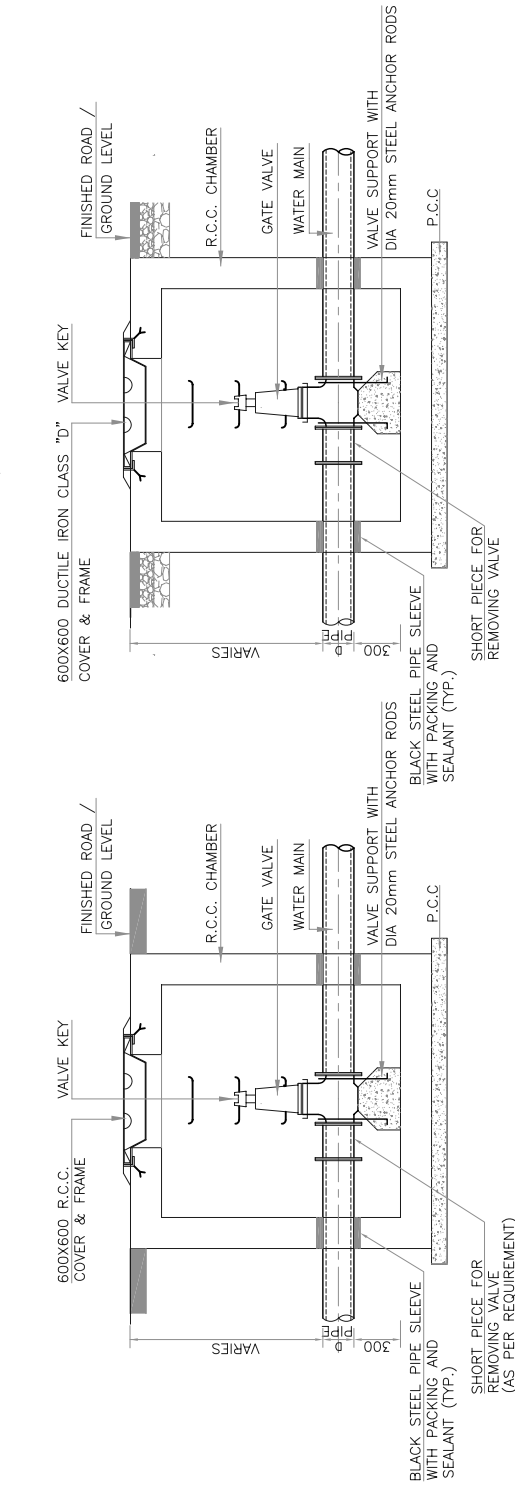
**PLAN-HORIZONTAL TEE**

**PLAN-BEND 90°**



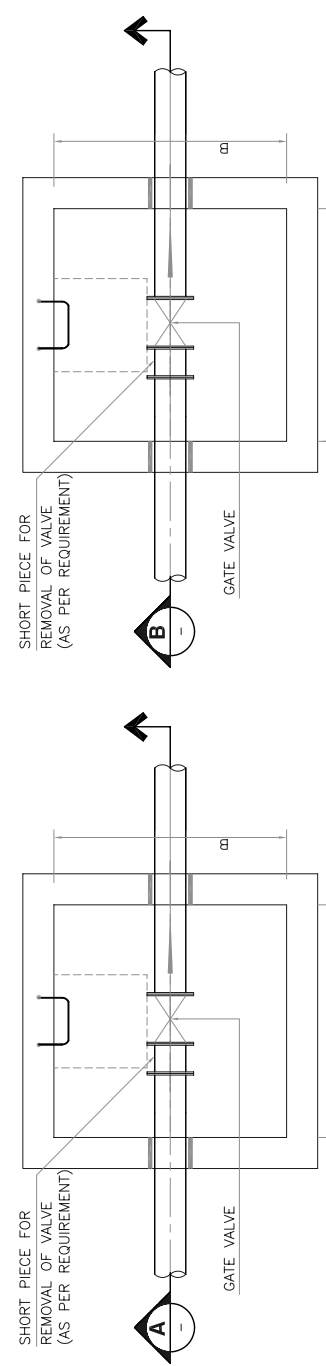
**SECTION D**

**SECTION E**



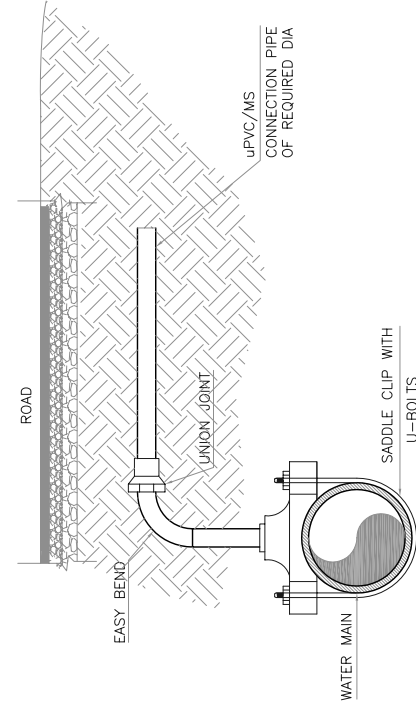
**SECTION A IN NON-TRAFFIC AREA**

**SECTION B IN TRAFFIC AREA**

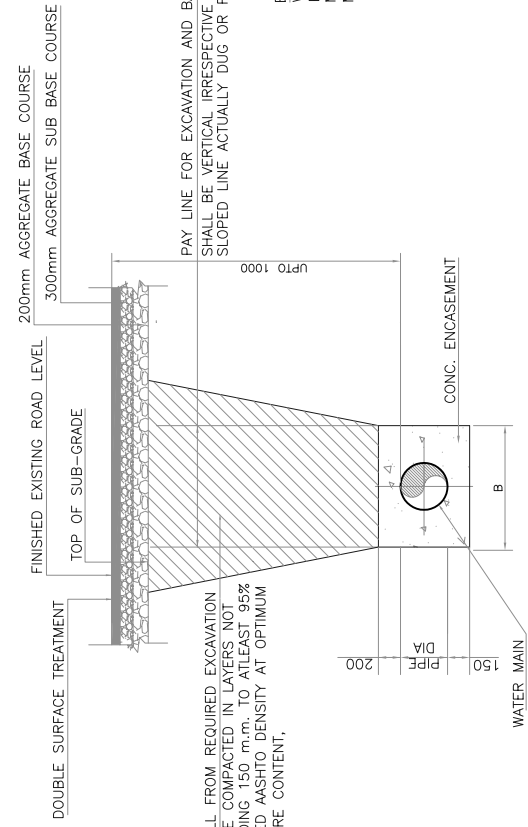


**PLAN - GATE VALVE IN CHAMBER (IN NON-TRAFFIC AREA)**

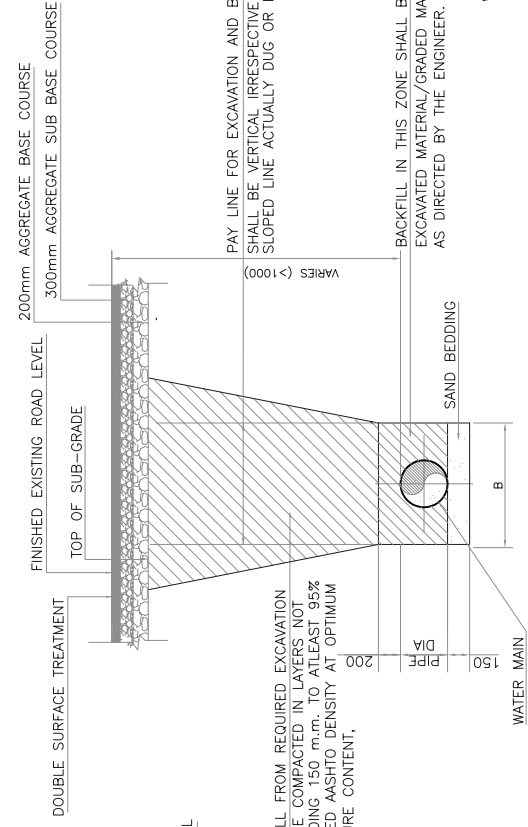
**PLAN - GATE VALVE IN CHAMBER (IN TRAFFIC AREA)**



**DETAIL OF SERVICE CONNECTION**



**IN TRAFFIC AREA**



**IN TRAFFIC AREA**

**IN NON TRAFFIC AREA**

**NOTE**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.
2. ALL LEVELS ARE IN METERS WITH RESPECT TO S.O.P DATUM.
3. ALL PIPE SIZES ARE IN MILLIMETERS UNLESS OTHERWISE MENTIONED.

**THRUST BLOCKS BEARING SURFACE DIMENSIONS**

NOMINAL DIA OF FITTINGS (mm.)	DIMENSIONS (mm)												
	BEND						TEE OR DEAD END						
	90°		45°		22 1/2°		1 1/2°		L		H		
800-900	1400	1250	1300	1200	1250	1050	1100	1050	1100	1400	1250		
600-800	1200	1050	1100	1000	1050	950	900	900	1200	1050	950		
400-500	900	850	800	800	800	750	750	700	1050	950	750		
300-400	800	750	700	700	700	650	650	600	900	750	650		
250-300	750	700	650	650	650	600	600	550	850	700	600		
200-250	700	650	600	600	600	550	550	500	800	650	550		
100-150	650	600	550	550	550	500	500	450	750	600	500		

**TYPICAL DIMENSIONS OF VALVE CHAMBER**

S.NO.	DIAMETER OF VALVE (mm.)	DIMENSION (mm.)	
		L	B
1.	75-200	1000	1000
2.	250-375	1200	1200
3.	400-600	1500	1500
4.	650-850	2000	2000

**TRENCH WIDTHS**

NOMINAL PIPE DIA (mm.)	TRENCH WIDTH (B) (mm.)
100-200	800
250-350	1000
400-600	1200
>600	1500



**KARACHI MASS TRANSIT CELL,  
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**NES PAK**  
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E-mail: nespakhh@gmail.com

REV.	DATE	DESCRIPTION	M. BABAR	DESIGNED	CHECKED	APPROVED
04			NIDA			
03			SHAHEEN SAIF			
02						
01						
0	AUGUST, 2015	ISSUED FOR BIDDING				

**CONSTRUCTION OF WATER TRUNK  
MAIN FROM TOWN MUNICIPAL  
ADMINISTRATION  
(TMA) to Board Office Chowranghi**

TITLE	SCALE
MISCELLANEOUS DETAILS	N.T.S

DATE	DWG. No.	REVISION
AUG, 2015	33026/50P/BD/OLC011	0