THE FUTURE OF PUNJAB POLICE

PUNJAB SAFE CITIES AUTHORITY
PSCA Headquarters, Qurban Lines Lahore, Pakistan.
042-99 05 16 05-8
042-111-11-77-22
042-99203026
www.psca.gop.pk

CORRIGENDUM

This is with reference to Tender Notice published in national newspapers under IPL #9811, dated 1st October, 2022, with the following title;

"REDO/RESTORATION OF DAMAGES ALONG MULTAN ROAD, LAHORE

PSCA has added detailed drawings in the bidding Document and the Performance Guarantee shall be Five percent (5%) of the total value of the Contract. The last date for submission of bids and all other terms & conditions of bidding documents shall remain unchanged.

For obtaining any further information or clarifications, please feel free to contact at *procurement@psca.gop.pk*

Contact: (+92) (42) (99051605-7) Website: *www.psca.gop.pk*

Punjab Safe Cities Authority
The Future of Punjab Police
PPIC3 Centre Qurban Police Line Lahore, Pakistan

BIDDING DOCUMENT
(ADDENDUM)

FOR

REDO/RESTORATION OF DAMAGES ALONG MULTAN ROAD, LAHORE

Tender No: PSCA/11/21 October/22

PUNJAB SAFE CITIES AUTHORITY

Date: 21 October, 2022

DISCLAIMER

1. This request for bidding documents has been prepared by the Punjab Safe Cities Authority ("PSCA")/ procuring agency. This request constitutes no commitment on the part of the PSCA to enter into any arrangements with any bidder in respect of this proposed procurement or otherwise.
2. The information contained in these bidding documents or as may be subsequently provided to bidder (whether verbally or in documentary or any other form) by or on behalf of the PSCA, on the terms and conditions set out in these bidding documents, are indicative only and are provided solely to assist in a preliminary assessment of the proposed procurement. Moreover, each Bid (including each lot- if any) shall be evaluated in accordance with the prescribed Technical/ Financial Criteria provided in the Bidding Documents.
3. These bidding documents do not constitute an agreement; its sole purpose is to provide interested bidders with information that may be useful for them in preparing their bids pursuant to these bidding documents.
4. These bidding documents may not be appropriate for all persons and it's not possible for PSCA to consider the objectives and particular needs of each party which reads or uses these bidding documents.
5. The assumption, assessment, statements and information contained in theses bidding documents may not be complete, accurate and adequate or correct for the purposes of any or all bidders.
6. Each bidder shall, therefore, conduct its own due investigation and analysis, check the accuracy, adequacy, correctness, reliability and completeness of the assumption, assessments, statements and information contained in these bidding documents and seek independent professional advice on any or all aspects of these bidding documents, as deemed appropriate. However, PSCA not under obligation to consider any such advice or opinion.
7. All information submitted in response to this bidding documents becomes the property of the procuring agency (PSCA), including all business information and proprietary data submitted with all rights of communication and disclosures.
8. The PSCA shall not be responsible for non-receipt or missing or delay of any correspondence/ bid etc., sent by the post / courier / email / fax by the bidder.
9. No decision shall be based solely on the basis of the information provided for any statements, opinions or information provided in these bidding documents.
10. While submitting a proposal in response to these bidding documents, each bidder certifies that he/it understands, accepts and agrees to the disclaimers set forth above.
11. Nothing contained in any provision of these bidding documents or any statements made orally or in writing by the person or party/Bidders/Contractor shall have the effect of negating or suspending any of the disclaimers set forth herein.
12. PSCA reserves the right to withdraw it or cancel this bidding process or any part thereof, or to vary any of its term at any time during the completion of this process & Contract milestone or termination of such Contract signed between the successful Bidder & PSCA without incurring any financial obligation in connection therewith.
13. PSCA has also right to rectify any arithmetical or typo mistake at any time of this process.

INVITATION FOR BIDS

Punjab Safe Cities Authority, Lahore (PSCA) invites sealed bids from eligible bidders for:

REDO/RESTORATION OF DAMAGES ALONG MULTAN ROAD, LAHORE

Interested eligible bidders can obtain detailed bidding documents which are available in the office of PSCA by depositing tender fee of **Rs. 5000/- (non-refundable)** in favor of **"**Chief Operating Officer Punjab Safe Cities Authority", Account# PK07BPUN6580045845500064 (Bank of Punjab) having NTN: 7129125-0 and may also be downloaded from the website of Punjab Safe Cities Authority (**www.psca.gop.pk)** & PPRA (**www.ppra.punjab.gov.pk**).

Sealed and completed bids in accordance with the requirement of the bidding documents must be reached in this office on or before **PST 1130** hours on **October 25, 2022** which **shall be opened on the same date** in the presence of bidder's representative (who chose to attend) at **PST 1200** hours in the office of PSCA.

For obtaining any further information or clarifications, please feel free to contact at *procurement@psca.gop.pk*

Contact: (+92) (42) (99051605-7) Website: *www.psca.gop.pk*

Punjab Safe Cities Authority
The Future of Punjab Police
PPIC3 Centre Qurban Police Line Lahore, Pakistan

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Punjab Safe Cities Authority

Part- I (Section I)
INSTRUCTIONS TO BIDDERS (ITB)

A. Introduction

1. Punjab Safe Cities Authority & This Project

1.1. Punjab Safe Cities Authority (PSCA) has been established and functioning in Police Qurban Lines Lahore.

1.2. PSCA has sufficient funds for this project, subject to the approval of the competent authority.

1.3. PSCA intends to Redo/Restoration of Damages along Multan Road, Lahore as per requirements of PSCA.

2. Eligible Bidders/ Services Providers

2.1. This Invitation for Bids is open to all Bidder(s)/ Contractor except as provided hereinafter and the Bidder/Contractor must meet the requirements as described in this bidding Document.

2.2. Government-owned enterprises/entities may participate only if they are legally and financially authorized for that purpose.

2.3. Bidders/Contractor shall not be under a declaration of blacklisting by any Government department or Punjab Procurement Regulatory Authority (or any PPRA) or Courts or involved in any corrupt practice or facing such case anywhere or declared bankrupt/ defaulter.

2.4. Each Bidders/Contractor is allowed to submit only one bid for either individually or as a partner /firm etc. In case a bidder/Contractor submits more than one bid his/its all bids shall be rejected.

2.5. Bidder may not participate through its authorized agent or sub-contractor.

2.6. Joint Venture is allowed as in case of a Joint Venture (JV)/ Consortium:

2.6.1. All partners to the Consortium/JV shall be jointly and severally liable; and

2.6.2. Consortium/JV partner must be represented by its Lead Partner and such representative/lead partner must be authorized from all the partners in writing/duly stamped.

2.6.3. The lead partner shall be responsible to provide all authorization documents/evidence on behalf of all JV partners such as Consortium/JV signatory authorization or legal status of all JV partners. It is proposed that the Consortium/JV should have valid NTN/registration in FBR for the purpose of withholding taxes of Consortium/JV.

2.6.4. Lead partner and its Consortium/JV partners should meet the requirements.

2.6.5. The Foreign Applicant/bidder is entitled only in a Consortium/JV arrangement with a domestic partner, in accordance with applicable laws.

2.6.6. An Applicant/ bidder shall be registered in an eligible country.

2.6.7. An Applicant/bidder shall be deemed to be registered in an eligible country, if the Applicant/ bidder has got its registered head office in that country; or is constituted, incorporated, or registered or deemed to be registered under the prevailing Acts/laws and operates in conformity with the provisions of the laws of that country.

2.6.8. Bid submitted by a consortium/ Joint Venture (JV) shall include the Joint Venture Agreement (on Stamp paper of amounting PKRs. 1,200) entered into by all partners. Any member of the JV shall not be allowed to withdraw itself from JV/Consortium or shall not be excluded by the other members/Lead Partner etc. after submitting the application and if it is essential to replace any partner of JV/ Consortium it shall only could be done with the prior approval of the PSCA on solid reasons and justifications and in such eventuality the partner shall be replaced with the same range/profile company/partner or higher of the member to be replaced but in no case lower to that.

2.6.9. In case the bid filed through JV/ Consortium, if JV/ Consortium (any partner of JV/ Consortium) indulged in fraudulent practice or attempt to such

fraudulent practice all JV partners/Consortium shall be blacklisted/debarred.

2.6.10. In case any partner of JV has been debarred/ blacklisted by any Procuring Agency than the application of such JV shall be rejected whether it is at any stage and such debarment shall equally be applicable in case of each partner.

2.6.11. Specific technical experience/ past performance of JV partners or its key staff cannot be aggregated to fulfil minimum qualification requirement e.g. if it is required that the applicant must have past experience of business/establishment for 10 years, the JV partners shall not be allowed to combine the partners' experience of (7) year for one firm (JV partner) and (3) year of second firm (JV partner), with a view to reaching the total 10-year experience.

3. Scope of Services

3.1. PSCA intends to Redo/Restoration of Damages along Multan Road, Lahore **(Section IV).**

3.2. Bidders/Contractor shall appoint focal Person for this project to coordinate with Punjab Safe Cities Authority and all relevant departments.

3.3. The Bidders/Contractor may visit the site at its own risk and cause if he desired so.

4. Cost of Bidding

4.1. The Bidders/Contractor shall bear all costs associated with the preparation and submission of its bid, and the PSCA will, in no case, be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. The Bidding Documents

5. Content of Bidding Documents

5.1. The services required, bidding procedures, and contract terms are prescribed in the bidding documents. In addition to the Invitation for Bids, the bidding documents include:

a. Instructions to Bidders/Contractor (ITB);
b. Bid Data Sheet (duly signed & stamped)
c. Specification of Bids;
d. Preparation of Bids;
e. Price Schedule;
f. Bid Submission Form;

g. Bid evaluation Criteria;
h. Technical & Financial Bids;
i. Performance Security Form;
j. Services/Goods Delivery time or completion time/schedule, Payment milestone;
k. Contract Forms;
l. General Conditions of Contract (GCC);
m. Special Conditions of Contract (SCC);
n. Any other/subsequent from if any;

5.2. The Bidders/Contractor is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at the Service Provide/Bidder's risk and may result in the rejection of its bid.

6. Clarification of Bidding Documents

6.1. A prospective Bidders/Contractor requiring any clarification of the bidding documents may notify the PSCA in writing or by email at the Punjab Safe Cities Authority's address seven (07) calendar days before to the closing date and time of the bids or as per decision of PSCA.

6.2. Pre-bid meeting may be called by the PSCA at its own or to clarify the bidding document. But it is the sole discretion of the PSCA which can't be claim by any bidder /Contractor as a right.

7. Amendment of Bidding Documents

7.1. At any time prior to the deadline for submission of bids, PSCA, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidders/Contractor, may modify the bidding documents by amendment.

7.2. All prospective Bidders/Contractor that have submitted the bidding documents will be notified of the amendment in writing or by email, and will be bidding on them.

7.3. In order to allow prospective Bidders/Contractor reasonable time to incorporate the amendment (if any) in account to preparing their bids, the PSCA, at its discretion, may extend the deadline for the submission of bids.

C. Preparation of Bids

8. Language of Bid

8.1. The bid prepared by the Bidders/Contractor, as well as all correspondence and documents relating to the bid exchanged by the Bidders/Contractor and the PSCA

shall be written in English language specified in the Bid Data Sheet. Supporting documents and printed literature furnished by the Bidders/Contractor may be in same language.

8.2. In case of any other language, the authentic copy of the translation & translated document (duly notarized) shall be enclosed and is case of any ambiguity the true contract / copy shall be prevailed.

9. Documents Comprising the Bid

9.1. The bid prepared by the Bidders/Contractor shall comprise the following components:

(a) A Bid Form and a Price Schedule completed in accordance with relevant ITB Clauses and evaluation criteria;

(b) Documentary evidence established in accordance with relevant ITB Clause that the Bidders/Contractor is eligible to bid and is qualified to perform the contract if its bid is accepted;

(c) Documentary evidence established in accordance with relevant ITB Clause that the services to be supplied by the Bidders/Contractor are conform to the bidding documents; and

(d) Bid security furnished in accordance with relevant ITB Clause or any other information required by PSCA.

10. Bid Form

10.1. The Bidders/Contractor shall complete the Bid Form and the appropriate Price Schedule furnished in the bidding documents, indicating the services provided and delivery of any items regarding the provision of services. Nevertheless, in case of Lot- wise procurement, the bidders are required to submit their bids (Technical or/and Financial) separately against each lot and combined/joined bids shall not be considered, if otherwise not allowed.

11. Bid Prices

11.1. The Bidders/Contractor shall fill up the Performa provided in the bidding document as required.

11.2. Prices quoted by the Bidders/Contractor shall be fixed during the Bidders/Contractor's performance of the contract and not subject to variation on any account, unless otherwise specified in the Bid Data Sheet. A bid submitted with an **adjustable price/Optional quotation** will be treated as non-responsive and rejected.

12. Bid Currencies

12.1. Prices shall be quoted in **Pak Rupees** unless otherwise specified in the Bid Data Sheet.

13. Documents Establishing Bidder's Eligibility and Qualification

13.1. Pursuant to relevant ITB Clause, the Bidders/Contractor shall furnish, as part of its bid, documents establishing the Bidders/Contractor's eligibility to bid and its qualifications to perform the contract if its bid is accepted.

13.2. The documentary evidence of the Bidders/Contractor's eligibility to bid shall establish to the PSCA satisfaction that the Bidders/Contractor, at the time of submission of its bid, is eligible as defined under relevant ITB Clause.

13.3. The documentary evidence of the Bidders/Contractor's qualifications to perform the contract if its bid is accepted shall establish to the PSCA satisfaction:

(a) That if a Bidders/Contractor is a firm / company or organization has a valid certificate from Government entity in respect of its registration / renewal.
(b) That the Bidders/Contractor has the financial, technical, managerial and production capability necessary to perform the contract;
(c) That the Bidders/Contractor meets the qualification criteria listed in the Bid Data Sheet.

14. Conformity to Bidding Documents

14.1. Pursuant to relevant ITB Clause, the Bidders/Contractor shall furnish, as part of its bid, documents establishing the eligibility and conformity to the bidding documents of all services and any goods of works related to such services, which the Bidders/Contractor proposes to supply under the contract.

14.2. Documentary evidence of the eligibility of the Services Provider inform of literature, letter, work plan, scope of work etc.

15. Bid Security

15.1. Pursuant to relevant ITB Clause, the Bidders/Contractor shall furnish, as part of its bid, a bid security in the amount specified in the Bid Data Sheet.

15.2. The bid security shall be in Pak. Rupees as per bid data sheet or as required by PSCA.

15.3. Unsuccessful Bidders/Contractors' bid security will be discharged or returned as promptly as possible the expiration of the period of bid validity prescribed by the PSCA pursuant to relevant ITB Clause as per PPRA rules 2014 (amended). The bid security of successful Bidder(s)/Contractor shall be released after receiving of valid performance guarantee and/or contract signing.

15.4. The bid security is required to protect the PSCA against the risk of Bidder(s)/Contractor's conduct which would warrant the bid security's forfeiture under the followings:

(a) Save as clause 20 of ITB below, if a Bidder/Contractor withdraws its bid during the period of bid validity period specified on the Bid Form or do not participate in the process after submitting his bid; or

(b) In the case of a successful Bidder(s)/Contractor, if the Bidder(s)/Contractor(s) fails;

I. to sign the contract in accordance with requirements

II. to furnish performance guarantee in accordance with relevant ITB Clause.

III. to submit its bid in accordance with the conditions of knock out clause / basic requirement or in case of any false information or submission a fake documents or in case of any illegal / fraudulent practice.

16. Period of Validity of Bids

16.1. Bids shall remain valid for the period specified in the Bid Data Sheet after the date of bid opening prescribed by the Punjab Safe Cities Authority, pursuant to relevant ITB Clause. A bid valid for a shorter period shall be rejected by the PSCA.

16.2. In exceptional circumstances, the PSCA may solicit the Bidders/Contractor's consent to an extension of the period of validity as provided in PPRA Rules 2014 amended time to time.

D. Submission of Bids

17. Sealing/ Signing & Marking of Bids

17.1. The Bidders/Contractor shall seal the bid(s)/ lot wise (if applicable) **(technical and financial) in separate envelopes** after duly marking each page and stamping, signing of the bid(s) (each pages) and then separately in an **outer envelope**. The Bidders/Contractor than

pack the both envelopes in main envelope with clear name, address of the Bidder & PSCA and tender title.

18. Deadline for Submission of Bids

18.1. Bids received by the PSCA at the address specified must no later than the time and date specified in the Tender.

18.2. PSCA may, at its discretion, extend this deadline for the submission of bids by amending the bidding documents in accordance with applicable laws.

19. Late Bids

19.1. Any bid received by the PSCA after the deadline for submission of bids prescribed by the PSCA pursuant to said ITB Clause will be rejected and returned unopened to the Bidders/Contractor .

20. Withdrawal of Bids

20.1. The Bidders/Contractor may withdraw its bid after the bid's submission, provided that written notice of such withdrawal should receive in the office of PSCA prior to two days of the deadline prescribed for submission of bids.

20.2. The Bidders/Contractor's withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of said ITB Clauses. A withdrawal notice may also be sent by email, but followed by a signed confirmation copy, postmarked no later than the two days prior to deadline for submission of bids (That request/mail shall reach in PSCA within – in office hours- before the day stated above).

E. Opening and Evaluation of Bids

21. Process of Procurement

21.1. The whole process of bid, such as bid opening, evaluation, announcement, contract management and execution provided/ described in these bidding documents shall be followed which is not contrary with the process of "**SINGLE STAGE TWO ENVELOP"**, provided in Punjab Procurement Rules, 2014 (amended to date).

22. Opening of Bids by the Punjab Safe Cities Authority

22.1. PSCA will open all received bids in the presence of Contractor/bidders' representatives who choose to attend, at the time, on the date, and at the place specified in the Bid Data Sheet. The Contractor/bidders' representatives with authorization letter and Original Identity Card who are present shall sign an attendance sheet evidencing their presence.

22.2. The Contractor/Bidders' names, bid modifications or withdrawals, attachment / missing of requisite bid security and such other details will be

announced at the opening time. No bid shall be rejected at bid opening (after opening the bids), except late bids, which shall be returned unopened to the Contractor/Bidder or bids without bidding fee, once the bids are opened it shall be evaluated accordingly.

22.3. The bid without required documents/ documentary evidences, unsigned or unstamped documents or deficient in any manner may not be considered for the evaluation. Evaluation of submitted proposal will be made on the basis of provided documents only and PSCA may forfeit the bid security in such eventuality if submitted bids are deficient or legally incorrect.

23. Preliminary Examination

23.1. PSCA will preliminary examine the received bids/ lot wise (if applicable) to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bid document fee has paid and bids are generally in order.

23.2. PSCA may waive any minor informality, nonconformity, or irregularity in a bid which does not constitute a material deviation or change the substance of the bid, provided such waiver does not prejudice or affect the relative ranking of any Bidders/Contractor .

23.3. At the stage of preliminary examination (after opening of the bids) no bid shall be returned or rejected except stated above.

24. Clarification of Bids

24.1. During evaluation of the bids/prior the signing of the contract, PSCA may, at its discretion, ask the Bidders/Contractor for a clarification of its bid or any related documents submitted by him (bidder). The request for clarification and the response shall be in writing, and no change in the prices or substance of the bid shall be sought, offered, accepted or permitted.

24.2. PSCA, during evaluation of the bids/prior the signing of the contract may also ask for the following clarification among others:

a. Request for any technical information deemed essential for the development of the solution design ,proposal or document.

b. Familiarize themselves with the works/services to be performed in accordance with the Inquiry documents.
c. Request the locations coordinates and Point of Contact (POC) from the concern office.
d. Familiarize themselves with the working conditions, applicable laws and regulations, labor conditions, environmental aspects and all other conditions that can affect timely delivery of required service.
e. Make his own arrangement and inquiries with regards to transportation of own staff and equipment.
f. Ask to the bidder / Contractor for test report from any lab or institution at the bidder's cost or ask for submitting the fee for such test or examine the performance of the machine/equipment at PSCA office or anywhere.
g. Any other certificate or exercise or action or test that PSCA deems necessary for the said project.

24.3. PSCA, at any level prior and after the contract execution may ask for the following Inspections & Tests:

a. PSCA or its representative shall have the right to assign any team to inspect and/or to test the services to confirm their conformity to the Contract specifications. PSCA shall notify the Bidders/Contractor in writing the details of Point of Contact (POC) for this purpose.
b. The inspections and tests may be conducted on any premises. If conducted on the premises of the Bidders/Contractor , all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge.
c. If any inspected or tested services fail to conform to the Specifications, PSCA may reject the services, and the Bidders/Contractor shall either replace the rejected services or make alterations necessary to meet specification requirements free of cost to PSCA.
d. Any other action may be taken by PSCA to inspect or test.

24.4. The Bidders/Contractor to present the proposed solution/methodology (if any) within three (03) days or as and when required after the submission of bid.

25. Qualification & Evaluation of Bids

25.1. In the absence of prequalification, PSCA will determine to its satisfaction whether the Bidders/Contractor is qualified to perform the contract satisfactorily, in

accordance with the Evaluation Criteria prescribed for such procurement/ lot wise (if applicable).

25.2. The determination will take into account the Bidders/Contractor 's financial, technical, and service capabilities. It will be based upon an examination of the documentary evidence of the Bidders/Contractor 's qualifications submitted by the Bidders/Contractor , pursuant to ITB relevant Clause(s), as well as such other information, as the PSCA deems necessary and appropriate.

25.3. PSCA will **technically evaluate** and compare the bids, which have been determined to be substantially responsive, as per Technical Specifications/ Requirement/ Evaluation criteria.

25.4. Technical responsive bidders shall be intimated accordingly and the technical disqualified/ irresponsive bidder may collect their financial bid subject to submitting an application to PSCA with the contents that he/it is satisfied with the technical results announced by PSCA and shall not object to this process before any legal forum/court.

25.5. If any technically disqualified bidder showed his/its dissatisfaction on the technical evaluation report/ results its financial bid(s) shall be retained and shall be returned accordingly.

25.6. PSCA shall only **financially evaluate** those bid/ bids, which are declared technically responsive, and the quoted price shall be inclusive of all prevailing taxes and duties, if otherwise not mentioned.

25.7. Arithmetical errors may be rectified if PSCA desired on the following basis.

a. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected.
b. If the Bidders/Contractor does not accept the correction of the errors, its bid will be rejected, and its bid security shall be forfeited.
c. If there is a discrepancy between words and figures, the amount in words will prevail.

25.8. PSCA may consider a single bid if it is responsive.

25.9. Financial evaluation bid shall be free from all computational errors.

26. Announcement of Evaluation of Bids

26.1. PSCA shall announce the evaluation report through email/ fax/ letter or any other way and also follow the guidelines of the government in this regard.

27. Contacting the Punjab Safe Cities Authority

27.1. No Bidders/Contractor shall contact the PSCA on any matter relating to its bid, from the time of the bid opening to the time evaluation report is made public. If the Bidders/Contractor wishes to bring additional information or has grievance to the notice of the Punjab Safe Cities Authority, it shall do so in writing.

27.2. Any effort by a Bidders/Contractor to influence the PSCA during bid evaluation, or bid comparison may result in the rejection of the Bidders/Contractor 's bid and forfeiting of its bid security and its blacklisting.

F. Award of Contract

28. Award Criteria

28.1. Subject to relevant ITB Clause, PSCA will award the contract to the successful Contractor/ Bidder(s) whose bid has been determined to be substantially responsive in accordance with the evaluation criteria and has been determined to be the lowest evaluated bid as defined in Punjab Procurement Rules 2014.

28.2. In case if more than one Contractor/ Bidder quotes the same cost/equal (lowest bid) the PSCA may ask only to those lowest Contractor/ Bidders at once to submit their financial bids again or opt any other option under intimation to all such bidders.

29. Punjab Safe Cities Authority's Right to Vary Quantities at Time of Award

29.1. PSCA reserves the right at the time of contract awarding to add/delete/change/review terms and conditions or add / delete any items or scope of services etc. the Scope of services originally specified in the Schedule of Requirements or payment milestone without any change in unit price in accordance with prevailing rules & regulations.

30. Punjab Safe Cities Authority's Right to Accept or Reject All Bids

30.1. PSCA reserves the right to reject all bids, or any lot in case of more than one lot and to annul the bidding process at any time prior to contract award. In such rejection, PSCA shall incur no liability, solely or by virtue of its invoking the clause of rejection towards the bidder(s)/Bidders/Contractor or any obligation to inform the Bidders/Contractor or bidders the grounds for the rejection of bids.

31. Notification of Award

31.1. Prior to the expiration of the period of bid validity, PSCA will notify the successful Contractor/Bidder in writing by registered letter or by email, that its bid has been accepted subject to verification of the performance

guarantee (if any). However, such acceptance shall not be termed as a contract or the Contractor(s) / bidder(s) cannot make any claim or consider as a vested right on this ground/ only on the basis of advance acceptance letter.

31.2. The notification of award will constitute the formation of the Contract subject to receipt of a valid Performance Guarantee (if any) duly verified by the concern bank.

32. Signing of Contract

32.1. After notifications to the successful Contractor/ Bidder that its bid has been accepted, the successful bidder/Contractor will send the same notification to PSCA after signing and stamping within a week or before. Subsequently, the stamp paper for the Contract shall be provided by the bidder/ Contractor within seven (07) days (or extendable date or as per requirement by the PSCA). The same contract may be registered as per applicable laws and the contractor shall pay any registration fee / charges.

32.2. Prior to that signing of the contract the successful Bidders/Contractor may discuss any issue regarding the contents of the contract with PSCA. Nevertheless, there shall be no variation or amendment in the proposed contract without prior approval or consent of PSCA. However, no amendment, variation shall be allowed that violate the principles of procurement.

32.3. The Stamp Duty on the contract of the same shall be imposed as per the "The Stamp Act, 1899" that shall be paid by the bidder/ Contractor.

32.4. If the successful Bidders/Contractor fails to submit the model contract in the prescribed time period as mentioned above, the next lowest evaluated Bidders/Contractor (whose bid is responsive and acceptable) may be issued a letter of acceptance. In such case, the bid security of the former Bidders/Contractor shall be forfeited in addition to any other legal action.

33. Commencement of the Contract

33.1. The Contract shall be commenced after its signing subject to confirmation the performance guarantee (if any) from the concern bank if otherwise not provided anywhere.

34. Integrity Pact

34.1. PSCA may require from the bidder /Contractor (qualified) for submission of an integrity pact in addition to that appended herewith in these bidding documents, and including the confirmation of its beneficial owners / contractor.

35. Performance Guarantee

35.1. Within Seven (07) days or as per requirement of PSCA of the receipt of notification of award from the Punjab Safe Cities Authority, the successful Bidders/Contractor shall furnish the performance guarantee (if required) in accordance with the Conditions of Contract, on the Performance Guarantee Form provided in the bidding documents, or in another form acceptable to the Punjab Safe Cities Authority. PSCA may issue Advance Letter of Acceptance (ALOA) to the successful bidder containing the requirement of performance guarantee. However, such ALOA shall not be declared a Contract or create any right for contract.

35.2. Failure of the successful Bidder / Contractor to comply with the requirement of relevant ITB Clauses or any other requirement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security/black listing, in which event or on any other action deems appropriate, the PSCA may make the award to the next lowest evaluated Bidders/Contractor or call for new bids. The Performance Guarantee may be released after the completion of deliverables/ project on the satisfaction/ completion certificate/ note by the concerned unit of PSCA. Moreover, PSCA may ask the Bidders/Contractor for signing/ submission of indemnity bond at the time of releasing of performance guarantee to the contractor.

36. Corrupt or Fraudulent Practices

36.1. PSCA requires that Bidders/Contractor, observe the highest standard of ethics during the procurement and execution of agreement/ contract(s). For the purposes of this provision, the terms set forth in PPRA Rules/ Act or any other Law(s)/ Rule(s) of the Pakistan for corrupt or fraudulent practices shall be applicable:

36.2. PSCA will bar a firm/ company, in accordance with prevailing Blacklisting procedures under Punjab Procurement Rules 2014 in any case if deems so.

36.3. Furthermore, Bidders/Contractor shall be aware of the provision stated in General Conditions of Contract.

37. Grievance Redressal Committee

37.1. In case of any dis-satisfaction or objection against the evaluation report, the aggrieved Bidders/Contractor may approach to the Grievance Redressed Committee (GRC) that shall be notified by the PSCA for the purpose to address the grievance within 10 days after the announcement of the final evaluation (after technical & financial evaluation) report as provided in PPRA Rules 2014 amended. Nevertheless, the technically

disqualified/ irresponsive bidder cannot object its technical ineligibility at the stage of the announcement of final evaluation report/results i.e after technical & financial evaluation of the bid(s).

37.2. In case, if the bid of any Bidder/Service Provide is declared technically irresponsive or disqualified by the technical evaluation committee of PSCA such Bidders/Contractor can file its technical rejection grievance within three (03) days after such announcement to GRC of PSCA. After three (03) days, his technical rejection grievance shall not be considered/ received and straightforwardly rejected.

38. Resolution of Disputes

38.1. Punjab Safe Cities Authority (through its COO) and the Bidders/Contractor shall make every effort to resolve amicably by direct informal negotiation or any disagreement or dispute arising between them under or in connection with the Contract within thirty (30) days.

38.2. In case of any objection thereafter, the matter may be referred for decision / arbitration in accordance with Arbitration Act 1940.

39. General Guidelines for the Bidders/ Contractor

39.1. In case of any illness/ injuries/ causality resulting from any accident to the staff of Contractor; PSCA shall not take any responsibility for the same toward compensation, medical care or meeting any/all medical expenses incurred for the same.

39.2. In case of any labor dispute regarding the employees of Bidders/Contractor PSCA; shall not facilitate to the Bidders/Contractor or wait for its resolution. However, in no case the schedule work/ services shall be disturbed and the Bidders/Contractor en sure its completion within timeframe and such circumstances never be treated as force majeure.

39.3. In no case PSCA shall be responsible for the conduct/ behavior/ action of the Bidders/Contractor or its employees toward the breach of any law of the land.

Section-II

Bid Data Sheet

The following specific data for the required services shall complement, supplement, or amend under the provisions provided in the Instructions to Bidders (ITB) Part One. Wherever there is a conflict in any matter (words or figures) in these bidding documents, the provisions/ detail provided herein shall prevail over those..

Introduction
PUNJAB SAFE CITIES AUTHORITY
Name of Project: Redo/Restoration of Damages along Multan Road, Lahore
For clarification purposes, the Employer's address is: ***PSCA – Qurban Police Lines, Lahore. Phone # : 042-99051605-7*** and **Email**: *procurement@psca.gop.pk* Requests for clarification shall be received by the PSCA seven (07) calendar days before to the closing date the bids.
Language of the bid – English
Bid Price and Currency
The price quoted against each bid (lot- if applicable) shall be delivered duty paid at the following locations in accordance with the Schedule of Requirements including all payment taxes.
The price shall be in **Pak Rupees (including all taxes)** and shall be fixed subject to verification.
Preparation and Submission of Bids
EVALUATION CRITERIA:
Eligibility Criteria: (Mandatory Requirements):
The bidder has to fulfil all mandatory requirements detailed below, in order to **Technically Qualify** for the assignment. The interested Bidders/Contractor has to provide documentary evidence(s) against the below mentioned requirements: **a.** Legal Status of the bidder (s) (Incorporation Certificate (*showing its location and the date of registration and original ID card etc*), Partnership Deed or Form C/D (whichever is applicable) Affidavit/Undertaking on non-judicial stamp paper of Rs. 100 in case of Sole Proprietorship) **b.** Proof of valid Income Tax Registration (NTN) **c.** Proof of valid Punjab Sales Tax Registration (STR). **d.** Proof of valid Professional Tax Certificate (2022-23)/ [*In case; Professional Tax Certificate is applied for current financial year i.e. 2022-2023 then receipt shall be attached along with 2021-2022 Professional Tax Certificate].* **e.** Required Bid Document Fee. **f.** Bid Security attached with Technical Bid/proposal. **g.** Audited Financial Statement for the last 03 years 2019-2022 (Apr-2019 till March 2022) or Bank Statement for the last year from 1st July, 2021 to 30th June, 2022. (Signed & stamped). **h.** Past relevant experience in projects of similar nature. **i.** PEC registration of minimum C4 category. **j.** Signed & stamped bidding document and all attachments (all type of appendices & statements).

k. Authority Letter from the Bidder Company for authorizing the relevant person to represent the company on Firm letter head along with CNIC copy. **l.** Submission of undertaking of legal duly stamped (PKRs. 100/=one hundred Rupees) and signed that the firm, company, is not blacklisted or involve in any corrupt or illegal practice or banned or declared ineligible / blacklisted by any procuring agency/PPRA/throughout the country/internationally.
Amount of Bid Security: The required bid security is **PKRs. 1,500,000/-** that is not more than 5% of the estimated cost in accordance with the Punjab Procuring Rules 2014. The Estimated Cost is Rs. **88,004,856/-**. Bids shall be in the prescribed format, sealed and accompanied by the Bid Security in the form of Call Deposit Receipt (CDR) in favor of **"Chief Operating Officer Punjab Safe Cities Authority", Account# PK07BPUN-6580045845500064 (Bank of Punjab)** having NTN: 7129125-0 having its **validity 180 days** from the date of opening of bid that shall be **annexed with the technical proposal (bid).**
Bid Validity Period: 180 days after the date of opening of bids/ extendable period**.**
Bids must be accompanied by unit price and total price, if applicable.
Deadline for **Bid Submission**: **October 25, 2022** no later than **1130 Hours**
Time, Date, and Place for **Bid Opening: October 25, 2022** at **1200 Hours** PSCA Office. However, in case of said bid opening/ closing date, the office is close due to public holiday etc. the next working day shall be considered as the bid submission/ opening date and there would be no change in the time as provided above.

Bid Evaluation
Criteria for bid evaluation, lowest price offered by the technically qualified/ responsive Bidders inclusive of all taxes.
Contract Award
The Bidder whose bid found the Lowest Evaluated Bid as per requirement of these documents, may call for the execution of the contract by PSCA. The terms and conditions of the Contract shall be decided, at the stage of signing of Contract as per the requirement of Bidding documents/ or PSCA requirement. The percentage for quantity/number/item increase or decrease and the scope of services may be reviewed as per the requirement of PSCA at the time of signing of contract keeping in view the parameter of applicable laws/rules.

Note:

1. Original CNIC, in case the owner of the firm/company attend the Bid Opening and the valid authorization letter from the bidder to its representative is required in order to attend the bid opening meeting on bidder's behalf and original card or any other legal proof of the bidder/representative.
2. To qualify, the bidder is required to pass/comply the Evaluation Criteria (Technically + financially).
3. Supporting Evidence shall be provided for each criterion (where applicable/ required).
4. PSCA has right to delete / add / review / any terms and condition or item / quantity or scope of work at its own level at any time in accordance with applicable laws.

Section-III
EVALUATION CRITERIA

<table>
<tr><th>Sr. #</th><th>Description</th><th>Max. Marks</th><th>Marking Criteria</th><th>Documents Required</th></tr>
<tr><td>1.</td><td>Number of Years of Existence of Firm</td><td>10</td><td>• 04 Years or more = 10 Points
• 03 Years = 09 Points
• 02 Years = 08 Points
• 01 Years = 05 Points</td><td>1. Certificate of Incorporation/Partnership deed, Form C/D/ NTN Certificate

Signed & Stamped Supportive Documents</td></tr>
<tr><td>2.</td><td>Experience of Similar Nature Projects / Assignments amounting to PKR 20 Million each.</td><td>30</td><td>• 05 Projects or more = 30 Points
• 04 Projects = 20 Points
• 03 Projects = 15 Points
• 02 Projects = 10 Points
• 01 Project = 05 points</td><td>Purchase Order/Work Order/Contract/ Completion Certificate or relevant document against the projects.</td></tr>
<tr><td>3.</td><td>FINANCIAL CAPABILITIES:

Financial Capabilities of the firm in order to enable him to technically qualify for this tender</td><td>10</td><td><table><tr><th><u>Description</u></th><th><u>Marking Criteria</u></th></tr><tr><td>Aggregate turnover during last three (03) years should be more than PKR 100 Million. (Mandatory)</td><td>05 Marks</td></tr><tr><td>Current Bank Statement with Positive balance for more than PKR 10 Million.
Or
Available Credit Line (available portion) to finance the project amounting to PKR 50 Million. (Mandatory)</td><td>05 Marks</td></tr></table></td><td>1. Financial Statements

All Supporting Documents

(Signed & Stamped)

1. Bank Statement
2. Credit Facility Letter

All Supporting Documents

(Signed & Stamped)</td></tr>
<tr><td colspan="2">Total Marks =50</td><td colspan="3">Minimum Passing Marks = 30</td></tr>
</table>

Section IV
Scope of Services

Civil Work Required for Restoration of OFC Route from Thokar to Manga Mandi			
Sr. No.	**Description**	**Quantity**	**Units**
	OFC Trench Works		
1	OFC trench works in normal soil including provision and laying of warning tape and reinstatement as per approved cross sections, complete in all respects	11,551	M
2	OFC trench works in concrete including provision and laying of warning tape and reinstatement as per approved cross sections, complete in all respects	1,135	M
3	OFC trench works in asphalt including provision and laying of warning tape and reinstatement as per approved cross sections, complete in all respects	708	M
4	OFC trench works in tuff tile including provision and laying of warning tape and reinstatement as per approved cross sections ,complete in all respects	3,427	M
5	OFC trench works across (asphalt /concrete) the road including provision and laying of warning tape and reinstatement as per approved cross sections ,complete in all respects	284	M
6	Manual bore (100mm dia) along/across the road, complete in all respects	1,509	M
7	HDD for 2/3 pipes (40 mm)/thrust Bore (100mm dia) along/across the road, complete in all respects	565	M
8	Providing, laying, cutting, jointing and testing HDPE (High Density Polyethylene) pipe (40mm) working pressure pipe in trenches, complete in all respects	40,742	M
9	Providing and laying P.C.C (15 cm) wih ratio of (1:2:4),including placing ,compaction and finishing complete in all respects (In case of under depth)	3,364	M
10	Providing, laying, cutting and jointing 2" dia. G.I Pipe, 2.9mm thick (11 gauge), complete in all respects	5,589.86	M
11	Providing and placing precast R.C.C handhole as per approved drawing,complete in all respects	85	Each
12	Providing and placing precast R.C.C(1:2:4) route marker as per approved drawing,complete in all respects	85	Each
	Power Trench Works		
1	Trench works normal soil including providing and laying of warning tape, placing of bricks and reinstatement as per approved cross sections, complete in all respects	311	M

2	Trench works concrete including providing and laying of warning tape, placing of bricks and reinstatement as per approved cross sections, complete in all respects	106	M
3	Trench works in tuff tile including providing and laying of warning tape, placing of bricks and reinstatement as per approved cross sections, complete in all respects	201	M
4	Trench works across the road (asphalt /concrete) including provision and laying of warning tape,and reinstatement as per approved cross sections, complete in all respects	84	M
5	Providing, laying, cutting, jointing and testing HDPE (High Density Polyethylene) pipe (40mm) working pressure pipe in trenches, complete in all respects	702	M
6	Providing, laying, cutting and jointing 2" dia. G.I Pipe, 2.9mm thick (11 gauge), complete in all respects	84	M

Punjab Safe Cities Authority

Sr.	Item	Quantity	Unit
1	Provision Laying and Splicing of 96F	17000	M
2	Provision Laying and Splicing of 48F	12000	M
3	Provision Laying and Splicing of 16F	25000	M
4	Provision Laying and Splicing of 4f	1500	M
5	Provision and Installation of 16f Joint	70	No
6	Provision and Installation of 48f Joint	30	No
7	Provision and Installation of 96f Joint	30	No
8	Provision and Installation of Cable Trays	35	No

Punjab Safe Cities Authority

Section-IV

i. SCHEDULE OF REQUIREMENTS

TABLE 1 **DELIVERY SCHEDULE**

Sr. No.	Delivery Time Period
1	The Contractor shall be required to complete the project within Six (06) months from the signing of the contract or as per agreement if contrary to above time period

Punjab Safe Cities Authority

Section-IV

ii. PAYMENT SCHEDULE

Sr. #	Milestone	Payment (upto %age of contract price)
1	Execution of 25% infrastructure Works including Trenches for Fiber, HDPE Pipe Laying, GI Pipe Laying, HDD, Hand Holes etc.	20.0%
2	Execution of total 50% infrastructure Works including Trenches for Fiber, HDPE Pipe Laying, GI Pipe Laying, HDD, Hand Holes etc.	20.0%
3	Execution of total 75% infrastructure Works including Trenches for Fiber, HDPE Pipe Laying, GI Pipe Laying, HDD, Hand Holes etc.	20.0%
4	E2E Jointing, Splicing and Termination of fiber and power cables, E2E Testing.	40.0%

Punjab Safe Cities Authority

Section VI

1. Bidding Forms

a. BID SUBMISSION FORM

Date: _____
No: _____

To
[PUNJAB SAFE CITIES AUTHORITY]

Having examined the bidding documents including Addenda Nos. *[ ]*, the receipt of which is hereby duly acknowledged and affirmed in to, we, the undersigned, offer to render *[Project Title]* in conformity with the said bidding documents for the sum of *[total bid amount in words and figures]* *against each bid (lot- if any)* or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, we ensure to provide the services in accordance with the delivery schedule specified in the Schedule of Requirements, and, prior to execution of the contract no right accrue.

If our Bid is accepted, we will obtain the **guarantee of a bank in a sum equivalent to 10% percent of the Contract Price** for the due performance of the Contract, in the form prescribed/ required by the PUNJAB SAFE CITIES AUTHORITY.

We agree to abide by this Bid for a period of 180 days from the date fixed for Bid opening or as required by PSCA under relevant clauses of the Instructions to Bidders, and it shall remain binding upon us and shall be accepted at any time before the expiration of that period.

We further affirmed that all the information/documents attached with the bidding document/bid are genuine/original/true copies and no document/information is fabricated or bogus.

Until a formal Contract is prepared, signed and executed, this Bid, together with the written acceptance thereof and notification of award, issued by PSCA (if any) shall constitute a binding Contract between us.

In any case of doubt and at any stage of procurement process or thereafter for the verification purpose the Punjab Safe Cities Authority (PSCA) has right to seek the clarification from the undersigned and call any document / record to authenticate/verification of the submitted document from undersigned or any institution. Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and address of agent	Amount and Currency	Purpose of Commission or gratuity
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if none, state "none")

We understand and no objection that PSCA is not bound to accept the lowest or any received bid and may cancel the process at any time.

Dated this _____ day of _____ 20_____.

_____ _____
[Signature] *[In the capacity of]*
Duly authorized to sign Bid for and on behalf of _____

b. UNDERTAKING

I _____ S/O _____ CNIC #_____ resident of _____ on behalf of (Name of bidder/Contractor/JV/ Consortium) address _____ being its _____(designation) declares solemnly on oath that all the information/ documents deposited/ attached with the bidding documents are true and genuine.

The bidder/ undersigned has read and understand all the terms & conditions of the bidding document/ amendments etc and accept each and every condition thoroughly.

The bidder/company/ undersigned has no objection on any term & conditions of the entire bidding documents and shall never challenge these term & conditions after submitting of my / our bid before any court/forum. I/ we / undersigned shall follow the instructions of PSCA regarding this bidding process till the completion of this assignment.

All above contents are true and correct to the best of my knowledge and behalf.

Notarized this _____ day of 20_____

Signature: _____

Stamp: _____

Note: Bidder/Contractor is required to fill this undertaking and submit with your bid and in case of failure bid shall be rejected straight forward.

Punjab Safe Cities Authority

1. PRICE SCHEDULE

Civil Work Required for Restoration of OFC Route from Thokar to Manga Mandi					
Sr. No.	**Description**	**Quantity**	**Units**	**Unit Price**	**Total Price**
OFC Trench Works					
1	OFC trench works in normal soil including provision and laying of warning tape and reinstatement as per approved cross sections, complete in all respects	11,551	M		
2	OFC trench works in concrete including provision and laying of warning tape and reinstatement as per approved cross sections, complete in all respects	1,135	M		
3	OFC trench works in asphalt including provision and laying of warning tape and reinstatement as per approved cross sections, complete in all respects	708	M		
4	OFC trench works in tuff tile including provision and laying of warning tape and reinstatement as per approved cross sections ,complete in all respects	3,427	M		
5	OFC trench works across (asphalt /concrete) the road including provision and laying of warning tape and reinstatement as per approved cross sections ,complete in all respects	284	M		
6	Manual bore (100mm dia) along/across the road, complete in all respects	1,509	M		
7	HDD for 2/3 pipes (40 mm)/thrust Bore (100mm dia) along/across the road, complete in all respects	565	M		
8	Providing, laying, cutting, jointing and testing HDPE (High Density Polyethylene) pipe (40mm) working pressure pipe in trenches, complete in all respects	40,742	M		

9	Providing and laying P.C.C (15 cm) wih ratio of (1:2:4),including placing ,compaction and finishing complete in all respects (In case of under depth)	3,364	M		
10	Providing, laying, cutting and jointing 2" dia. G.I Pipe, 2.9mm thick (11 gauge), complete in all respects	5,589.86	M		
11	Providing and placing precast R.C.C handhole as per approved drawing,complete in all respects	85	Each		
12	Providing and placing precast R.C.C(1:2:4) route marker as per approved drawing,complete in all respects	85	Each		
	Power Trench Works				
1	Trench works normal soil including providing and laying of warning tape, placing of bricks and reinstatement as per approved cross sections, complete in all respects	311	M		
2	Trench works concrete including providing and laying of warning tape, placing of bricks and reinstatement as per approved cross sections, complete in all respects	106	M		
3	Trench works in tuff tile including providing and laying of warning tape, placing of bricks and reinstatement as per approved cross sections, complete in all respects	201	M		
4	Trench works across the road (asphalt /concrete) including provision and laying of warning tape,and reinstatement as per approved cross sections, complete in all respects	84	M		
5	Providing, laying, cutting, jointing and testing HDPE (High Density Polyethylene) pipe (40mm) working pressure pipe in trenches, complete in all respects	702	M		
6	Providing, laying, cutting and jointing 2" dia. G.I Pipe, 2.9mm thick (11 gauge), complete in all respects	84	M		

Punjab Safe Cities Authority

Cable Details					
Sr.	**Item**	**Quantity**	**Unit**	**Unit Price**	**Total Price**
1	Provision Laying and Splicing of 96F	17000	M		
2	Provision Laying and Splicing of 48F	12000	M		
3	Provision Laying and Splicing of 16F	25000	M		
4	Provision Laying and Splicing of 4f	1500	M		
5	Provision and Installation of 16f Joint	70	No		
6	Provision and Installation of 48f Joint	30	No		
7	Provision and Installation of 96f Joint	30	No		
8	Provision and Installation of Cable Trays	35	No		
Total (*inclusive of all Applicable Taxes*) **OFC Trench Works + Power Trench Works + Cable Details**					

Note:

1. The Bidder/Contractor shall quote for complete required goods/ works or services with installation & commissioning and incomplete bid shall not be considered. A lump-sum price shall be calculated to financially evaluate the bid.
2. Lowest Evaluated bid price (lump-sum) shall be considered.
3. The Bidders/Contractor is required to complete the price schedule carefully and in case of any discrepancy or multiple price, the bid shall not be considered.
4. In case of discrepancy between unit price and total, the unit price shall prevail.
5. All prices must be included with all prevailing taxes.

Punjab Safe Cities Authority

6. The Payment shall be made as per actual delivery and after the issuance of satisfactory delivery note/certificate from the concerned officer of PSCA.
7. The Successful Bidder/contractor may claim the Bill after complete delivery of services.
8. Client/PSCA has the right to change in the quantities of the required item or cancel the bid at any point of time
9. The Bidder/Contractor is required to fill-up this Performa and submit to PSCA and sealed it separately in an envelope (lot wise-if applicable). Alternative or other than this Performa or incomplete Performa shall not be acceptable..
10. In case other than this Performa used issued by the bidder for financial bid such bid / offers shall not be considered.
11. In case of any discrepancies / differences between unit price and total price, the unit price shall prevail and grand total shall be considered according to unit price.

Grand total in words _____

Date _____

Signature of authorized person
Name: _____
(Company Seal)

_____

In the capacity of

Duly authority by

Note: No cutting or overwriting is allowed. Any cutting or overwriting or incomplete informatory request will lead to rejection of this bid/offer (financial).

Punjab Safe Cities Authority

Part-II (Section I)
1. CONTRACT FORM

THIS AGREEMENT made the _____ day of _____ 20_____ between PSCA (hereinafter called "the Employer/Client") of the one part and *[name of Bidders/Contractor]* of (hereinafter called "the Contractor") of the other part:

WHEREAS the PSCA invited bids for the services and viz., *[brief description of services]* and has accepted a bid by the Bidders/Contractor for the supply of those items in the sum of *[contract price in words and figures]* (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this contract words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and construed as integral part of this Contract, viz.:
   a. The Bid Form and the Price Schedule submitted by the Bidder;
   b. The Schedule of Requirements;
   c. The Scope of Services;
   d. The General Conditions of Contract;
   e. The Special Conditions of Contract; and
   f. The PSCA Notification of Award.
   g. The clarifications provided to the Bidders/Contractor
3. The Client hereby covenants to pay the Bidders/Contractor in consideration of the provision of the services and the remedying of defects therein, 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.
4. The Client may add, delete, and review any condition or clause of the contract at the time of signing with mutual consent without affecting the substance of the bid process/price. The contract may be extended for a reasonable period with the consent of the parties.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, sealed, delivered by _____ the _____ (for the PUNJAB SAFE CITIES AUTHORITY)

Signed, sealed, delivered by _____ the _____ (for the Bidders/Contractor /Bidder).

Section II
General Conditions of Contract

1. Definitions 1.1. In this Contract, the following terms shall be interpreted as indicated:

a. "Applicable Laws/ Rules" means the laws/ Rules of Islamic Republic of Pakistan/Punjab, as they may be issued and enforced from time to time.

b. "Authority" means Punjab Safe Cities Authority, Lahore

c. "Bidders " means who accept all the terms & conditions of these bidding documents and submit its bid and participate as a competitor in the process of this procurement

d. "Bid" means a tender or an offer, in response to this invitation by a person, consultant, firm, company or an organization, consortium/ joint venture (if allowed) expressing his or its willingness to undertake to complete this project/ procurement/ task at a price decided between the parties accordingly.

e. "Bid Security" means the bank guarantee or other form of security submitted by a bidder together with a bid to secure the obligations of the bidder participating in a bidding proceedings

f. "Blacklisting" means debarring the Bidders/Contractor to participate in any procurement process on any ground provided in the document and uploaded its status on PPRA website or any other procurement site of the country/ world as blacklisted.

g. "Conflict of Interest" means

i. where a Bidders/Contractor could be perceived as providing biased professional advice to a procuring agency to obtain an undue benefit for himself or those affiliated with him;
ii. receiving or giving any remuneration directly or indirectly in connection with the assignment except as providing in the contract;
iii. any engagement in consulting or other procurement activities of a Bidders/Contractor that conflicts with his

role or relationship with the procuring agency;

iv. where an official of procuring agency engaged in the procurement process has a financial or economic interest in the outcome of the process of procurement, in a direct or an indirect

h. "Contract" means the agreement entered into between the PSCA and the Contractor/Contractor, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

i. "Contract Price" means the price payable to the Bidders/Contractor under the Contract for the full and proper performance of its contractual obligations.

j. "Competent Authority" means the officer(s) empowered to approve the bidding process and the contract on behalf of PSCA.

k. "Company" means a company registered or deemed to be register under companies Act, 2018 or under any other authority or foreign company registered in Pakistan.

l. "Contractor" means a legally established professional firm/ company/ or entity that may provide(s) the goods or services to the client under the contract

m. "Corrupt & Fraudulent Practices" includes the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official or the supplier or Bidders/Contractor in the procurement process or in contract execution to the detriment of the procuring agencies; or misrepresentation of facts in order to influence a procurement process or the execution of a contract, collusive practices among bidders (prior to or after bid submission) designed to establish bid prices at artificial, non-competitive levels and to deprive the procuring agencies of the benefits of free and open competition and any request for, or solicitation of anything of value by any public official in the course of the exercise of his duty. ; it may include any of the following:

i. Coercive practice by impairing or harming or threatening to impair or harm, directly or

indirectly, any party or property of the party to influence the action of the party to achieve a wrongful gain or to cause a wrongful loss to another party;

ii. Collusive practice by arrangement between two or more parties to the procurement process or contract execution, designed to achieve with or without the knowledge of the procuring agency to establish prices at artificial, noncompetitive levels for any wrongful gain;

iii. Offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the acts of another party for wrongful gain;

iv. Any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to misleads, a party to obtain a financial or other benefit or to avoid an obligation;

v. Obstructive practice by harming or threatening to harm, directly or indirectly, person or their property to influence their participation in a procurement process, or affect the execution of a contract or deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements before investigators in order to materially impede an investigation or making false statements before investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or acts intended to materially impede the exercise of inspection and audit process;

n. "Day" means calendar day and "Year" means calendar year if otherwise not provided.

o. "Employer/Client" means the PSCA that signs the contract for the services/goods with the selected/qualified Contractor.

p. "Firm" means a firm register or deemed to be register with the office of registrar.

q. "GCC" means the General Conditions of Contract contained in this section.

r. "Goods" means required goods as mentioned in Technical Specifications or any other related item, material or goods required under the contract.

s. "Contractor" a person or company that underwrites an insurance risk; the party in an insurance contract undertaking to pay compensation.

t. "Lot" means a collection or group of objects, items, things, desirables, works, services, or set of things required by procuring agency through this process of procurement/ bidding documents and evaluated (technically & financially) separately as per the prescribed evaluation criteria.

u. "Performance Guarantee" means the bank guarantee or other form of security submitted by the Bidders/Contractor to secure obligations under the contract in accordance with the requirement in the bidding document

v. "Province" means Punjab Province.

w. "SCC" means the Special Conditions of Contract.

x. "Contractor" means a legally established professional firm/ company or entity that may provide/provides the services to the client under the contract

y. "Supplier" means a legally established professional firm/ company/ or entity that may provide/provides the goods or services to the client under the contract

z. "Services" means the work to be performed by the firm/company or entity pursuant to the contract.

aa. "PPRA Rules means the Punjab Procurement Rules 2014 amended to date or any other instructions of the Government relating to the procurement process.

bb. "Punjab Safe Cities Authority" means the organization hiring the services/the Employer/Client/PSCA.

cc. "The Project Site," where applicable, means the place or places named in SCC or directed by the PSCA.

dd. "Working Day" mean day when office is not closed due to any public notified holiday

ee. "Work" means all such work required or may be required by PSCA through this process of Procurement/Contract.

2.Application

2.1 These General Conditions shall apply to the extent that provisions of other parts of the Contract do not supersede them.

3. Scope of Services

3.1. Bidders/Contractor shall be required to complete the assignment and provide all related services to PSCA as per description and requirement mentioned Section IV of the bidding document(s)

4. Use of Contract Documents and Information; Inspection and Audit

4.1 The Contractor/ Bidder shall not, without prior written consent of PSCA, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the PSCA in connection therewith, to any person other than a person employed by the PSCA in the performance of the Contract.

4.2 The Contractor/ Bidder shall permit the PSCA to inspect the Contractor/ Bidder's accounts and records relating to the performance of the Contractor/ Bidder and to have them audited by auditors appointed by the PSCA, if so required.

5.Performance Guarantee

5.1 Within seven (7) days of receipt of the notification of Contract award, the successful Bidders/Contractor shall furnish to the PSCA the performance security in the amount specified in SCC before the execution of the contract.

5.2 The proceeds of the performance guarantee shall be payable to the PSCA as compensation for any loss resulting from the Contractor's failure to complete its obligations under the Contract.

5.3 The performance security shall be denominated in the currency of the Contract acceptable to the PSCA and shall be in a form of:

a. Bank guarantee or an irrevocable letter of credit issued by a reputable bank located in Punjab, in the form provided in the bidding documents or another form acceptable to the Punjab Safe Cities Authority.

5.4 The performance security will be discharged by PSCA and returned to the Bidders/Contractor not later than thirty (30) days following the date of completion of the Contractor's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in SCC.

5.5 The Performance security shall be verified promptly from the concerned bank prior to signing the contract and in case of its non-confirmation, PSCA has right to blacklisting such Bidders/Contractor s.

6. Transportation

6.1 The Bidders/Contractor is required to provide the desired services connected with the technical specifications as per the contract or required by PSCA or requirement to complete the assignment on a specified place of destination and such related costs shall be included in the Contract Price and cannot be claimed separately in addition to the contractual price.

7. Contractor's Responsibilities

7.1 Bidders/Contractor shall ensure the delivery of the goods in accordance with the terms of the contract after approval of PSCA.

7.2. All terms & conditions provided in Part-1 of this bidding document, especially regarding Eligibility of Bidders shall be mutatis mutandis applicable in GCC Section.

8. Payment & Prices

8.1 The method and conditions of payment to be made to the Bidders/Contractor under the Contract or the payment milestone.

9. Change Orders

9.1 PSCA at any time, by a written order given to the Bidders/Contractor , may make any changes within the general scope of the contract in any one or more notwithstanding anything contrary to prevailing Laws / Rules.

10. Contract & its Commencements

10.1 No variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

10.2 The contract shall be commenced after verification of the Bank guarantee submitted by the Bidders/Contractor from the concerned bank if otherwise not provided.

11. Delays in the Contractor's Performance

11.1 Delay in provision of goods by the Bidders/Contractor in accordance with the time schedule prescribed by the PSCA in the Schedule of Requirements shall not be tolerated and in such default penalty for delaying goods shall be imposed **@ 0.2% per day of the total contract amount with total cap of 10% of the total value of the Contract.** Moreover, any penalty may be imposed by PSCA in case of any default by the Bidders/Contractor in addition to initiating legal action against such defaulter. PSCA has also right to stop its pending payment or forfeit its guarantee/security submitted to PSCA in this procurement or any other contract.

11.2 PSCA focal person shall conduct visit to the sites in order to monitor progress. The Bidders/Contractor shall not obstruct visit of PSCA focal person and provide the reasonable facility to such person.

12. Termination for Default

12.1 PSCA, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Bidders/Contractor , may terminate this Contract in whole or in part:

(a) If the Bidders/Contractor fails to perform the services within the period(s) specified in the Contract, or within any extension thereof granted by the PSCA pursuant to GCC relevant Clause or

(b) If the Bidders/Contractor fails to perform any other obligation(s) under the Contract.

(c) If the Bidders/Contractor , in the judgment of the PSCA has engaged in corrupt or fraudulent practices in competing for or in executing the Contract. For the purpose of this clause: "Corrupt practice" means that defined in PPRA Rules 2014 or Act 2009 amended to date. However, PSCA shall follow the prevailing rules and law in case of termination of the contract, if required.

12.2 In the event PSCA terminates the Contract in whole or in part, PSCA may procure, upon such terms and in such manner as it deems appropriate goods similar to those undelivered, and such additional costs shall be payable by the Bidders/Contractor . However, the Bidders/Contractor shall continue performance of the Contract to the extent not terminated.

13. Force Majeure

13.1 Notwithstanding anything contrary provided in the provisions of GCC Clauses, the Bidders/Contractor shall not be liable for forfeiture of its performance security, liquidated damages, or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

13.2 For purposes of this clause, "Force Majeure" means an event beyond the control of the Bidders/Contractor and not involving the Contractor's fault or negligence and not foreseeable.

13.3 If a Force Majeure situation arises, the Bidders/Contractor shall promptly notify the PSCA in writing of such condition and the cause thereof. Unless otherwise directed by the PSCA in writing, the Bidders/Contractor shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. The benefit of Force Majeure shall be in favor of client (PSCA) if it happened anytime.

14. Termination for Insolvency

14.1 PSCA may at any time terminate the Contract by giving written notice to the Bidders/Contractor if the Bidders/Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Bidders/Contractor , provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Punjab safe cities authority.

15. Termination for Convenience

15.1 PSCA, by written notice to the Bidders/Contractor or without such notice, may terminate the Contract, in total or in part, at any time before the accomplishment of the contract for its convenience. In case of issuing the notice of termination, PSCA shall specify that the termination is for the PSCA convenience, to what extent/ or whole of the contract with the Bidders/Contractor is terminated, and the date upon which such termination becomes effective. In case of such termination the provided performance or rendered services before the period of such termination may be considered by PSCA if satisfied.

15.2 All enabling Laws of the land including clauses of PPRA Laws / Rules / Regulations shall be strictly followed in process of procurement or black listing or contract management etc.

16. Resolution of Disputes

16.1 PSCA /through its Chief Operating Officer (COO) and the Bidders/Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract within thirty (30) days.

16.3 In case of any objection therefore, the matter may be referred for adjudication / arbitration in accordance with arbitration Act 1940.

17. Governing Language

17.1 The Contract shall be written in the language English. The version of the Contract written in the specified language shall govern its interpretation. All correspondence and other documents pertaining to the Contract/ process which are exchanged by the parties shall be written in the same language. In case of any other language the authenticated translation dully attested may be added with bid and, In case of any ambiguity the language of original documents shall prevails.

18. Applicable Law

18.1 The Procurement process & Contract shall be commenced and competed in accordance with the applicable laws of Islamic Republic of Pakistan/ Punjab.

19. Notices

19.1 Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by fax or by email or any other modern devices (accepted by PSCA) and confirmed in writing to the other party's address specified in the bidding document and construed its receiving if not responded.

20. Taxes & Duties

20.1 Bidders/Contractor shall be entirely responsible for all taxes, duties, license fees, etc., incurred until discharging of the contracted services Punjab safe cities authority.

21. Corrupt or Fraudulent Practices

21.1 PSCA requires that Bidders/Contractor s, the highest standard of ethics during the procurement and execution of contracts. For the purposes of this provision, the terms set forth in PPRA Rules /Act shall be applicable:

(a) PSCA will bar a firm/company/individual bidders/Bidders/Contractor /consultants or what so ever named, in accordance with Blacklisting procedures under Punjab Procurement Rules 2014 in any case if deems so.

21.2 Furthermore, Bidders/Contractor shall be aware of the provision stated in the General Conditions of Contract.

22.Blacklisting Mechanism

22.1. PSCA may, under the applicable Law (s) for a specified period, debar a Bidders/Contractor from participating in any public procurement process of PSCA, if the bidder or Bidders/Contractor has:

(a) acted in a manner detrimental to the public interest or good practices;

(b) consistently failed to perform his obligation under the contract;

(c) not performed the contract up to the mark;

(d) Indulged in any corrupt practice.

22.2 If PSCA debars a Bidders/Contractor , the procuring agency:

(a) shall forward the decision to the Punjab Procurement Regulatory Authority (PPRA) for publication on the website of the PPRA; and

(b) May request the PPRA to debar the bidder or Bidders/Contractor for procurement of all procuring agencies.

22.3 PSCA has right to take any legal action against the bidder/ company if he is found involve in corrupt practice in addition to blacklisting.

23. Delivery Of Goods

23.1 The authorized person of PSCA shall issue a satisfactory performance certificate/ Goods receipt Note to the Bidders/Contractor on the delivery of goods entrusted to him through the contract by PSCA.

23.2 On basis of this Goods receipt Note the Bidders/Contractor shall claim the payment/ charges from the PSCA.

23.3 After issuing of Goods receipt Note the contract deems to be terminated subject to any other condition such as warrantee, guarantee or performance mentioned in the contract.

Punjab Safe Cities Authority

Section III
Special Conditions of Contract

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract.

1. Definitions

a) The PSCA: *The procuring agency*
b) The country: *Islamic Republic of Pakistan*
c) The Contractor/Contractor: *Whose bid is responsive technically/financially & lowest evaluated acceptable to PSCA.*

2. Performance Guarantee

The amount of performance security, i.e. (Which shall be within 10% of the contract price) in the shape of non-recourse, irrevocable and unconditional bank guarantee from scheduled bank of Pakistan/ having setup in Punjab on the prescribed format attached with the bidding document shall be submitted by the winner/ lowest evaluated bidder to PSCA after issuing of the letter of acceptance with in seven (7) working days (in official hour). In case of fail to deposit the required performance security with in prescribed time/ extended time in writing, PSCA has the right to reject the bid of such bidder and forfeit his bid security in addition to initiate other legal action against him. The performance security may be released after the completion of the satisfactory services as per the contract or as per the satisfaction of PSCA.

Moreover, PSCA may ask the Bidders/Contractor for signing/ submission of indemnity bond at the time of releasing of performance guarantee to the contractor.

3. Bid Validity

The bid validity time period is 180 days from the date of opening of bid (s). In case of any extreme reason PSCA may extend the bid validity period for the same period as per applicable Law (s). In case of any fraud, false document or discrepancy PSCA reserves the right to initiate a legal proceeding including blacklisting of Bidders/Contractor as per procurement procedure/PPRA Rules 2014 (amended).

4. Payment Mechanism:

The contractor/ Bidders/Contractor shall be paid by PSCA against invoice after successful completion of following milestones:-

Sr. #	Milestone	Payment (upto %age of contract price)
1	Execution of 25% infrastructure Works including Trenches for Fiber, HDPE Pipe Laying, GI Pipe Laying, HDD, Hand Holes etc.	20.0%
2	Execution of total 50% infrastructure Works including Trenches for Fiber, HDPE Pipe Laying, GI Pipe Laying, HDD, Hand Holes etc.	20.0%
3	Execution of total 75% infrastructure Works including Trenches for Fiber, HDPE Pipe Laying, GI Pipe Laying, HDD, Hand Holes etc.	20.0%
4	E2E Jointing, Splicing and Termination of fiber and power cables, E2E Testing.	40.0%

In case of any mala fide, deceptive and fraudulent tactics used in delaying/suspension of the said delivery of goods, the Client reserves the right to forfeit Performance Guarantee as per relevant provision of bidding document and takes necessary Legal Action against the Bidders/Contractor as per applicable laws.

5. Termination

PSCA has the right to scrape the procurement process at any stage before the signing of the contract or to terminate the contract as per his convenience without prior notice or by written notice of seven (7) days. The duration of the contract shall be decided at the time of contract signing.

Note: PSCA has right to add/incorporate/ delete any condition/any item at the time of signing of the contract but not contrary to any applicable law (s)/and/or with the consent of the Bidders/Contractor and/ or may review any terms and condition/clause of the bidding documents within the parameters of existing laws. However, the cost of the tender/ items shall not be changed in case

PERFORMANCE SECURITY FORM

To:

[*Client Address*]

WHEREAS *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. *[Reference number of the contract]* dated _____ 20_____ to supply *[description of services] (*hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Bidders/Contractor shall furnish you with a bank guarantee by a reputable bank for the sum specified therein as security for compliance with the Contractor's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Bidders/Contractor a guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Contractor, up to a total of *[amount of the guarantee in words and figures],* and we undertake to pay you, upon your first written demand declaring the Bidders/Contractor to be in default under the Contract and without cavil or argument, any sum or sums within the limits of *[amount of guarantee]* as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the _____ day of _____20_____.

Signature and seal of the Guarantors

_____

[Name of bank or financial institution]

_____

[Address]

_____

[Date]

Punjab Safe Cities Authority

Joint Venture/ Consortium Agreement
(Applicable to Joint Venture/Consortium Only)

Annex-I

(Shall be a Formal Joint Venture/Consortium agreement on a Stamp Paper of value PKR 1,200)

To: Punjab Safe Cities Authority, Lahore

[*Name and address of the Leading Member firm]* who for the purpose of this Agreement shall hereinafter called "Lead Member"

[*Name and address of the all Member firms*]

Who, for the purpose of this Agreement shall hereinafter called "Member". They hereby declare:

i. That we (all Consortium/JV partners) will legalize a Consortium/JV in case the Contract is awarded to their JV
ii. That all Consortium/JV partners have nominated_____(*name of the Lead member*) as the Lead Member of the Joint Venture.
iii. That all Consortium/JV partners authorized Mr. /Ms.__(*Name of the person who is authorized to act as the Representative on behalf of the Joint Venture*) to act as the Consortium/Joint Venture's Representative in the name and on the behalf of all Joint Venture partners.
iv. That all members of the Consortium/Joint Venture shall be liable jointly and severally for the execution of the Contract or any other assignment or project related work/ services or consequences of any such action of the lead partner.
v. That this Consortium/Joint Venture is constituted for the project titled "Restoration of PSCA's Civil, OFC, Traffic, IPNV and Power Infrastructure".
vi. That after submitting of this application (through Consortium/JV) for pre-qualification in said project/procurement of this Joint Venture/Consortium shall not be modified in its composition or constitution until the completion of Contract without the prior consent of the Employer/PSCA.
vii. The Consortium/JV (all partners) are under obligation, undertake and acknowledged that in case of any wrong entry or providing false intimation or forged document all the Consortium/JV partners shall be blacklisted or any other legal action may be initiated against them (all Consortium/JV partners) by the PSCA

1. Signed for and on behalf of [*Name of the Lead Member]*
   Signature _____
   Name _____
   Designation: _____
   Date _____
   Seal _____
2. Signed for and on behalf of [*Name of the Member*]
   Signature _____
   Name _____
   Designation: _____
   Date _____
   Seal _____

UNDERTAKING

FOR

NON-DISCLOSURE OF INFORMATION

1. With reference to goods/services/works required by Punjab Safe Cities Authority (PSCA) for _____,

   it is hereby asseverated & acknowledged that the confidential/sensitive or any other restricted information provided/acquired by PSCA during the period of our contract period shall be solely used for the intended purpose only. The undersigned Bidders/Contractor shall be under obligation not to share any confidential data or such data/information prohibited by PSCA with any person/ kinsman during or after the completion/termination of my contract agreement/assignment.

2. If there is a requirement for sharing of any information/data etc., related to PSCA with any other person, authority, department, entity or public or private institution, company etc., the undersigned Bidders/Contractor shall not share any information/data without prior permission from the competent authority of PSCA, for such purpose.

3. In case of any breach related to non-disclosure of data, undersigned Bidders/Contractor shall be bound to accept the responsibility and to pay any damages/loss determined by Chief Operating Officer of PSCA or any other penalty imposed by PSCA. Moreover, PSCA reserves the right to initiate any legal proceedings against the undersigned before the Court of Competent Jurisdiction and in such case the undersigned shall bear all the expenditures borne by the PSCA in relation to the Court proceedings.

4. The above undertaking is correct and true to the best of my knowledge and belief. We have read and understood the above contents and accepted/signed the same without any duress, undue influence or pressure, coercion and with my free consent.

Signatures_____ Name _____

(INTEGRITY PACT)

Beneficial Owner

Contract No: _____ **Dated:** _____

Contract Value: _____

Contract Title: _____

[Name of Contractor] 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/ Punjab (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 Contractor] 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 / Punjab 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 from GoP, except that which has been expressly declared pursuant hereto.

[Name of Contractor] 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 Contractor] 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.

[Name of Contractor] confirm and solemn on oath that I/ we have never been a part of any business with procuring agency other than as a contractor accordingly and I /we are the original benefited owner for this contract . I / we affirm that no other sleeping or unidentified person within or outside the procuring agency is / are the beneficiary for this procurement / Contract.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Contractor] 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 Contractor] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever from GoP.

Name of Buyer:	Name of Seller/Contractor: .....
Signature:	Signature: .....
[Seal]	[Seal]

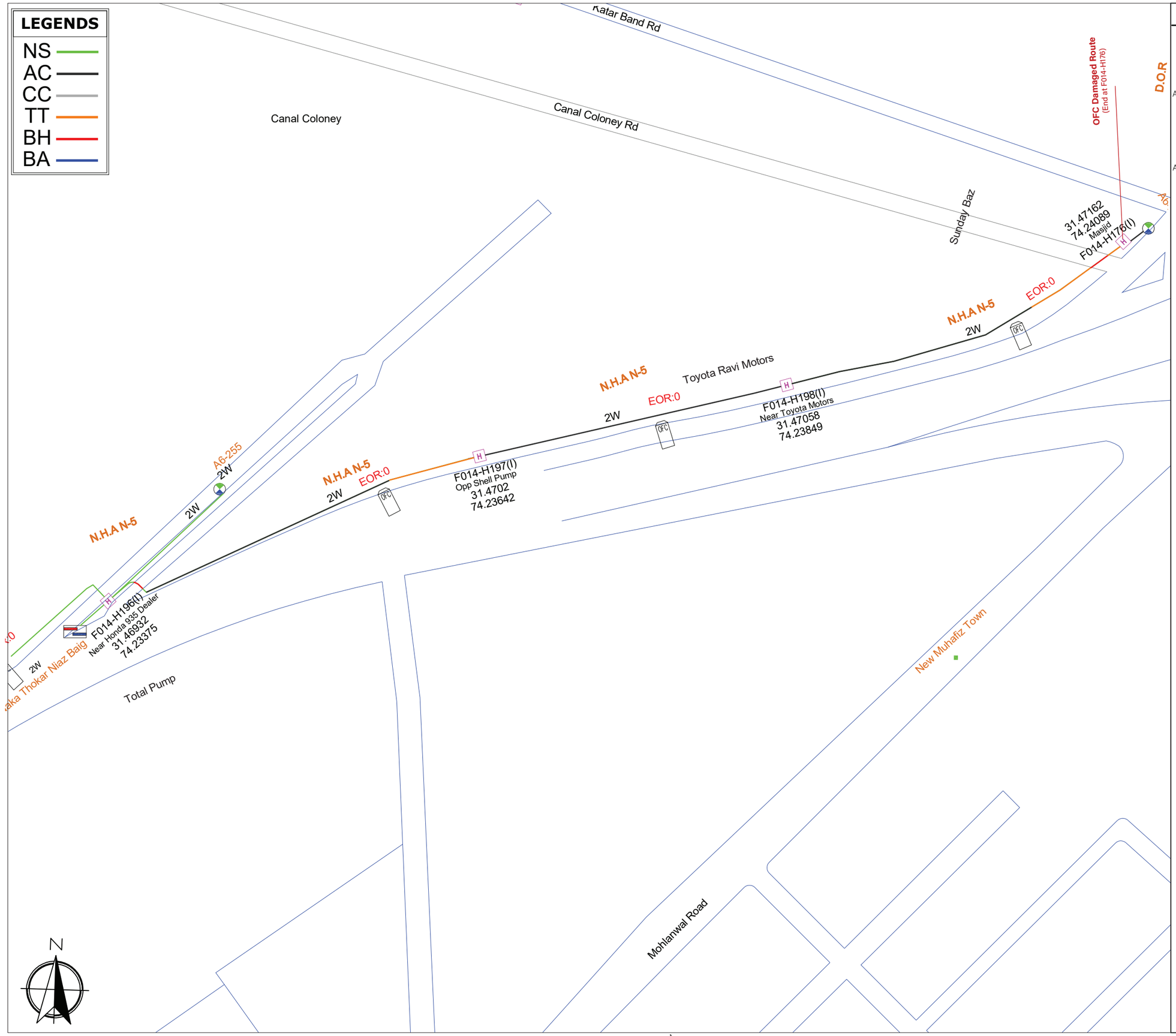
Punjab Safe Cities Authority

DOCUMENT CHECKLIST

Bidder should provide these and other documents if mention in the bidding documents

SR. #	DOCUMENTS REQUIRED	ATTACHED
	TECHNICAL PROPOSAL	
1.	Bidding Forms	
2.	Legal Status of the bidder (Incorporation Certificate- *showing its location and the date of registration etc.*-, partnership deed & Form C/D (as applicable) Affidavit and any other valid supporting document in case of sole proprietorship)	
3.	Proof of valid Income Tax Registration (NTN)	
4.	Proof of valid Punjab Sales Tax & General Sales Tax	
5.	Proof of valid Professional Tax Certificate. FY (2022-23) In case; Professional Tax Certificate is applied for current financial year i.e. 2022-2023 then receipt shall be attached along with 2021-2022 Professional Tax Certificate	
6.	Bidding Document Fee – Evidence shall be pasted outside of the main envelope, the evidence shall be presented at the time of bid submission	
7.	Bid Security (Original) attached with Technical Bid/proposal	
8.	Signed & stamped bidding document and all attachment documents	
9.	Submission of undertaking of legal duly stamped (PKRs. 100/=one hundred Rupees) and signed that the firm, company, is not blacklisted or involve in any corrupt or illegal practice or banned or declared ineligible / blacklisted by any procuring agency/PPRA	
10.	The valid authorization letter from the bidder to its representative to attend the bid opening meeting on bidder's behalf and original identity card or any other legal proof of the bidder/representative.	
11.	Proof of Relevant Experience & Financial Capability	
12.	Undertaking for Non-Disclosure of Information	
13.	All other supporting Documents as required under Evaluation Criteria.	
	FINANCIAL PROPOSAL	
14.	Price Schedule	

Note; this Check list is made only for the use of bidder to check/ confirm its/ their documents attachment, which is not the part of the bidding documents. In case of any conflict between check list and bidding documents the words or figures/ statement given in bidding documents shall prevail.



LEGENDS

- New HandHole I, II, III, IV etc.
- New ManHole
- A001–H1 MH/HH No.
- New Aerial Steel Pole
- New Aerial Concretel Pole
- Exixting Steel Aerial Pole
- Existing Concrete Aerial Pole
- A001–P1 Aerial Pole No.
- Aerial Route
- 2W Duct Ways
- New Duct
- Existing Duct
- MDC/DRC/DHQ/P.S.
- IPNV Site
- JTMS Site
- RLMS Site
- Traffic Signal
- VMS Site
- LTE Site
- Route Marker
- Railway
- Bridge
- Green Belt
- Buildings
- Tree
- Mosque/Masjid
- Pavement
- Paint Route Marker

ABBREVIATIONS

NS	Normal Soil	MS	Markable Soil
HR	Hard Rock Area	MT	Mini Trench
TT	Tuff Tiles/footway	MIC	Micro Trench
CC	Concrete Cutting	FS	Free Stone
AC	Asphalt Cutting	GS	Lawn Grass
BG	Bore with GI	WB	WallMountBracket
BH	Bore with HDPE		
HDD	Horizontal Directional Drilling		
BA	Bridge Attachment		
WAG	Wall Attachment G.I		
WAP	Wall Attachment PVC		
WACG	Wall Attachment Corrugated GI		
WACP	Wall Attachment Corrugated PVC		
SWG	Sewer Cross with GI		
SWH	Sewer Cross with HDPE		
GP	GI Proteciton in Trench		
PCC	Fix 1:2:4 Concrete to Protect		
EOP	Edge of Pedestrain		
EOR	Edge of Roadway		

SUBMITTED BY

REV.	DATE	NAME	SIGNATURE

APPROVED BY

REV.	DATE	NAME	SIGNATURE

PROJECT NAME

PPIC3 Project

DRAWING TILE

OSP As-built Design

I-Site Civil ID

SA-CW-OSP014-new-L

Civil Section Name

Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO

32
34 35

TOTAL SHEET

35/44

N

LEGENDS

NS
AC
CC
TT
BH
BA

Lahore -Iskamabad Mc

(M-2)

City Traffic Police Line

National Highway

Shahpur Interchange

Metro Cash & Carry

Total Pump

Hardees

Gourmet

N.H.A N-5

VMS-Naka Thokar Niaz Baig

Naka Thokar Niaz Baig

F014-H196(II)
Near Honda 125 Dealer
31.46932
74.23375

31.46852
74.23227
Opp. KFC
F014-H193(OP)

31.46793
74.23142
Police Chowki
F014-H192(I)

F014-H191(II)
Near Overhead Bridge
31.46648
74.22949

F014-H189(I)
Jinnah Terminal
31.46437
74.22664

F014-FH196(I)
Corner Motorway Chowk
31.46509
74.22767

F014-H200A(I)
31.46317
74.22480

A6-255
A6-599
A6-354
A6-336

2W
EOR:0
EOR:1
EOR:2

LEGENDS

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- New ManHole
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BH	Bore with HDPE		
HDD	Horizontal Directional Drilling		
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WAG	Wall Attachment G.I		
WAP	Wall Attachment PVC		
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WACP	Wall Attachment Corrugated PVC		
SWG	Sewer Cross with GI		
SWH	Sewer Cross with HDPE		
GP	GI Proteciton in Trench		
PCC	Fix 1:2:4 Concrete to Protect		
EOP	Edge of Pedestrain		
EOR	Edge of Roadway		

SUBMITTED BY

REV.	DATE	NAME	SIGNATURE

APPROVED BY

REV.	DATE	NAME	SIGNATURE

PROJECT NAME
PPIC3 Project

DRAWING TILE
OSP As-built Design

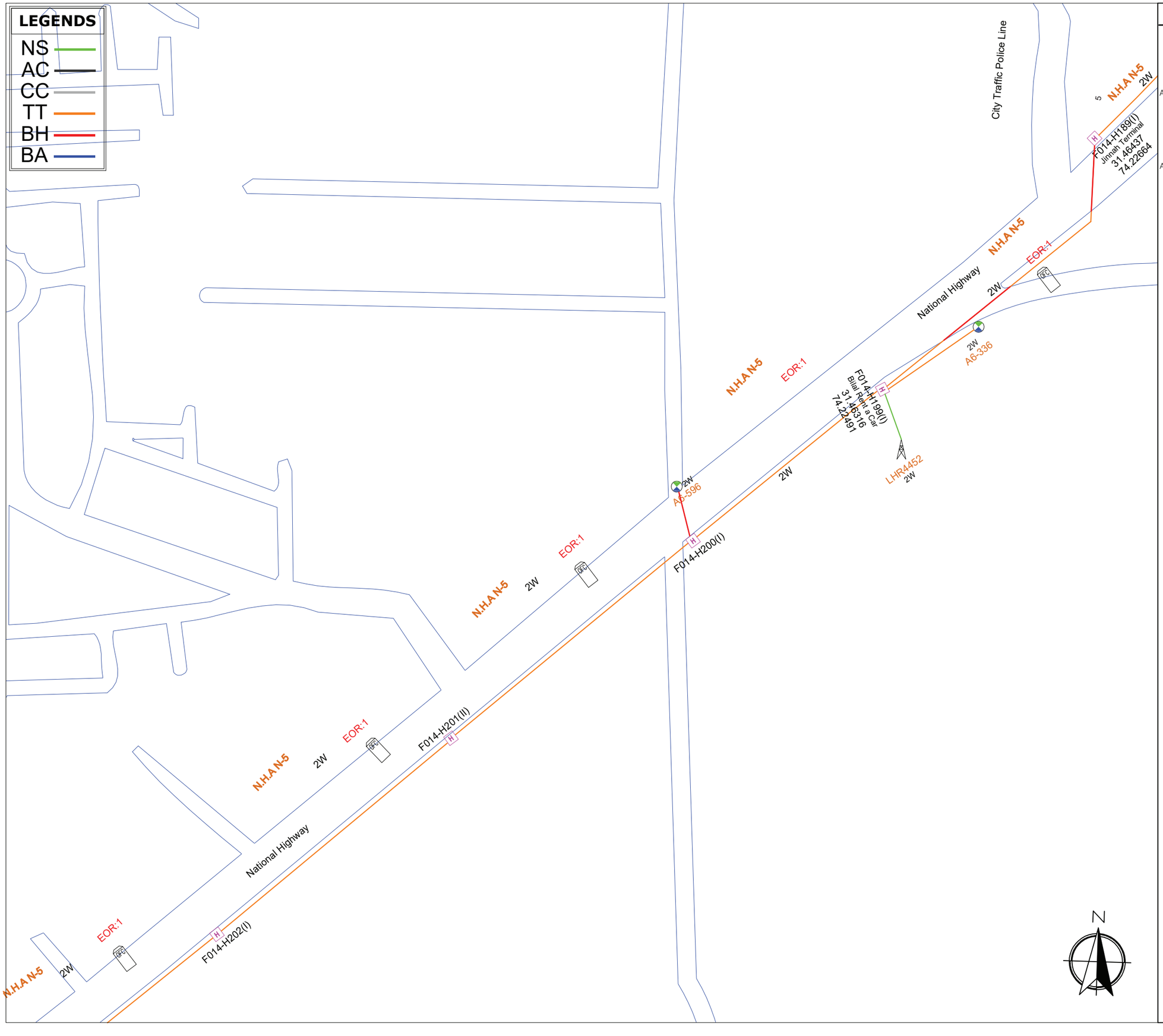
I-Site Civil ID
SA-CW-OSP014-new-L

Civil Section Name
Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO

33
34 35

TOTAL SHEET
34/44



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- A001–P1 Aerial Pole No.
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- 2W Duct Ways
- New Duct
- Existing Duct
- MDC/DRC/DHQ/P.S.
- IPNV Site
- JTMS Site
- RLMS Site
- Traffic Signal
- VMS Site
- LTE Site
- Route Marker
- Railway
- Bridge
- Green Belt
- Buildings
- Tree
- Mosque/Masjid
- Pavement
- Paint Route Marker

ABBREVIATIONS

NS	Normal Soil	MS	Markable Soil
HR	Hard Rock Area	MT	Mini Trench
TT	Tuff Tiles/footway	MIC	Micro Trench
CC	Concrete Cutting	FS	Free Stone
AC	Asphalt Cutting	GS	Lawn Grass
BG	Bore with GI	WB	WallMountBracket
BH	Bore with HDPE		
HDD	Horizontal Directional Drilling		
BA	Bridge Attachment		
WAG	Wall Attachment G.I		
WAP	Wall Attachment PVC		
WACG	Wall Attachment Corrugated GI		
WACP	Wall Attachment Corrugated PVC		
SWG	Sewer Cross with GI		
SWH	Sewer Cross with HDPE		
GP	GI Proteciton in Trench		
PCC	Fix 1:2:4 Concrete to Protect		
EOP	Edge of Pedestrain		
EOR	Edge of Roadway		

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REV.	DATE	NAME	SIGNATURE

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PROJECT NAME

PPIC3 Project

DRAWING TILE

OSP As-built Design

I-Site Civil ID

SA-CW-OSP014-new-L

Civil Section Name

Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO	TOTAL SHEET
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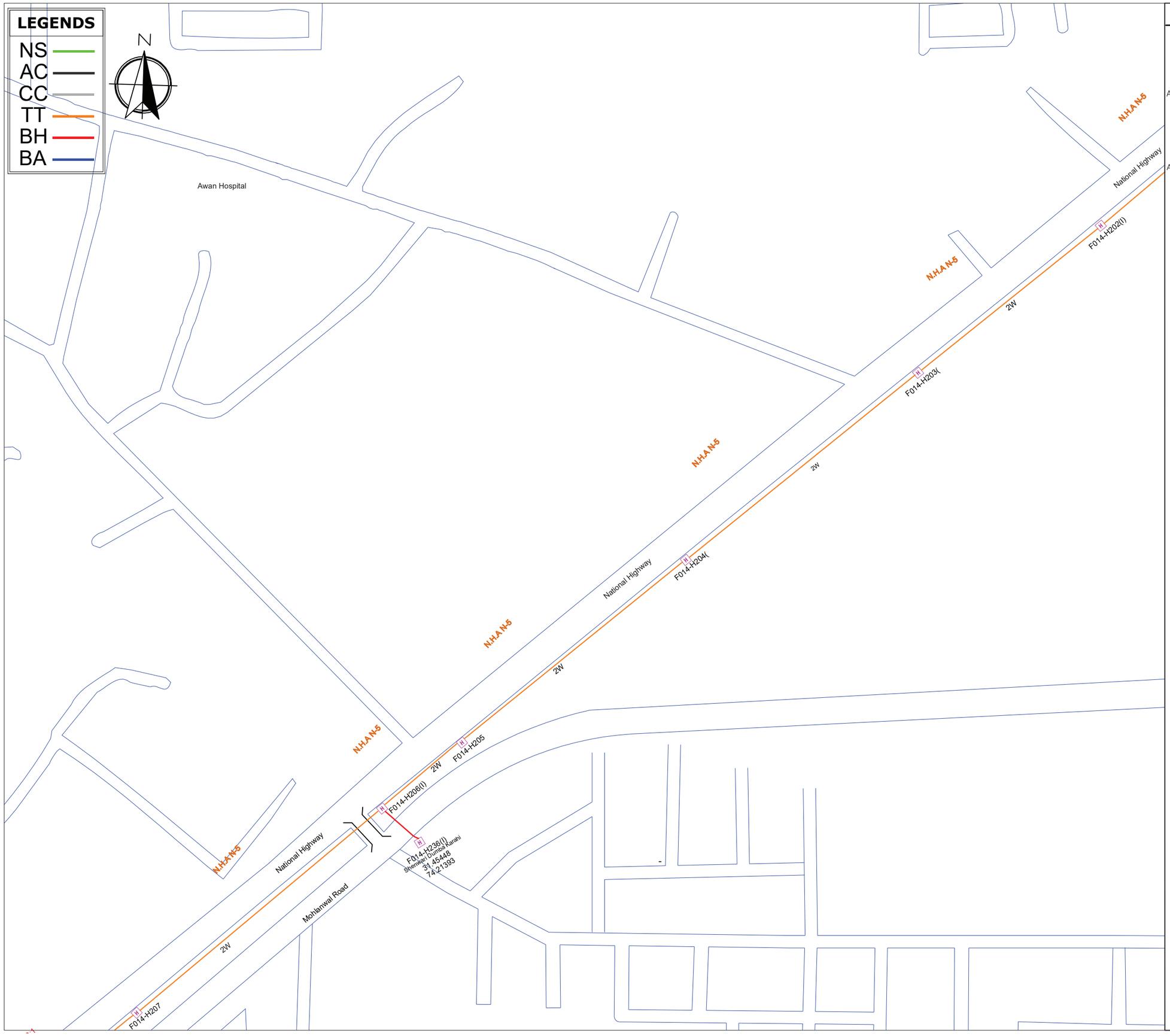

LEGENDS

- New HandHole I, II, III, IV etc.
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- New Aerial Concretel Pole
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Civil Section Name

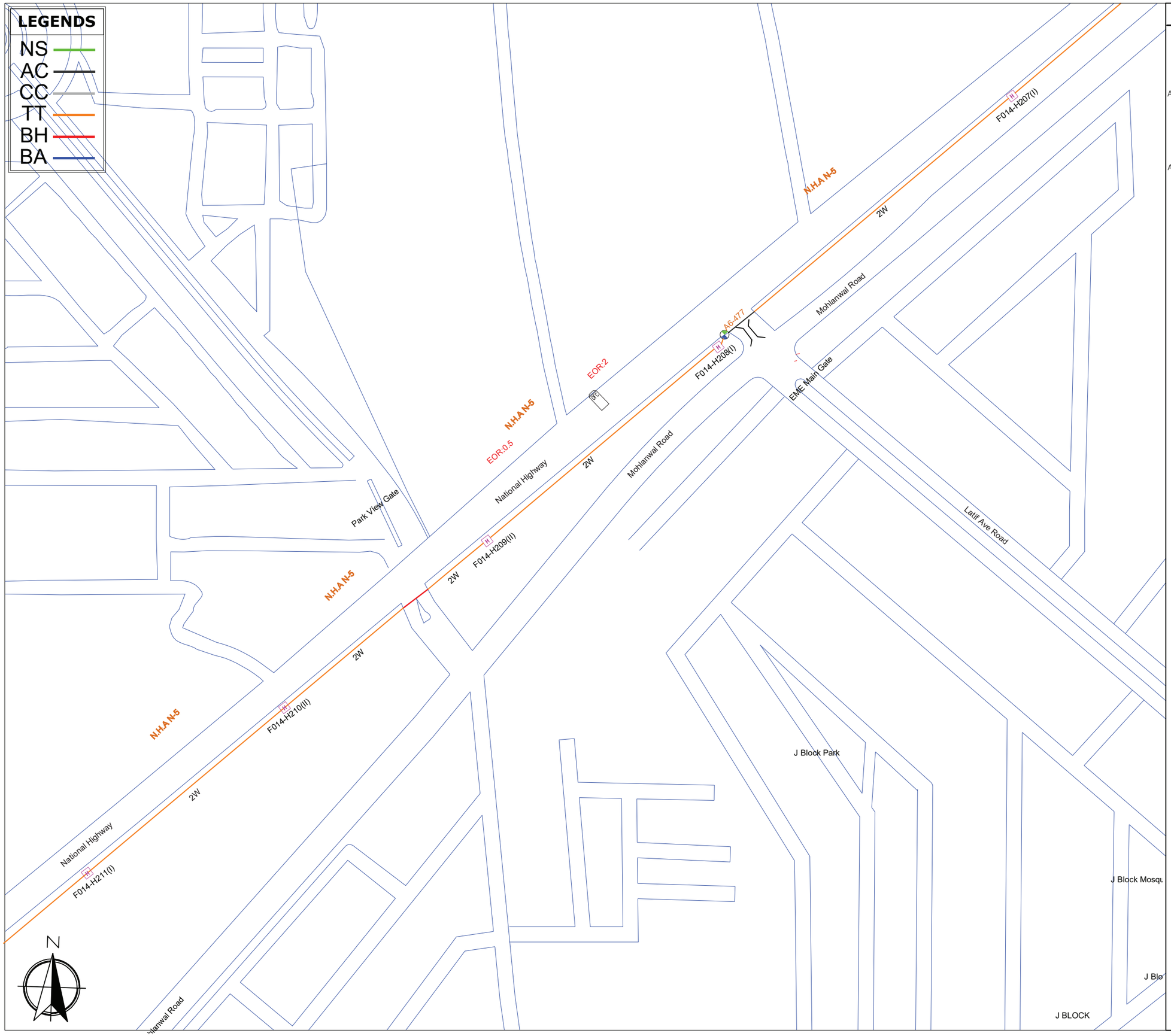
Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO

37 36 38

TOTAL SHEET

37/44



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PROJECT NAME

PPIC3 Project

DRAWING TILE

OSP As-built Design

I-Site Civil ID

SA-CW-OSP014-new-L

Civil Section Name

Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO

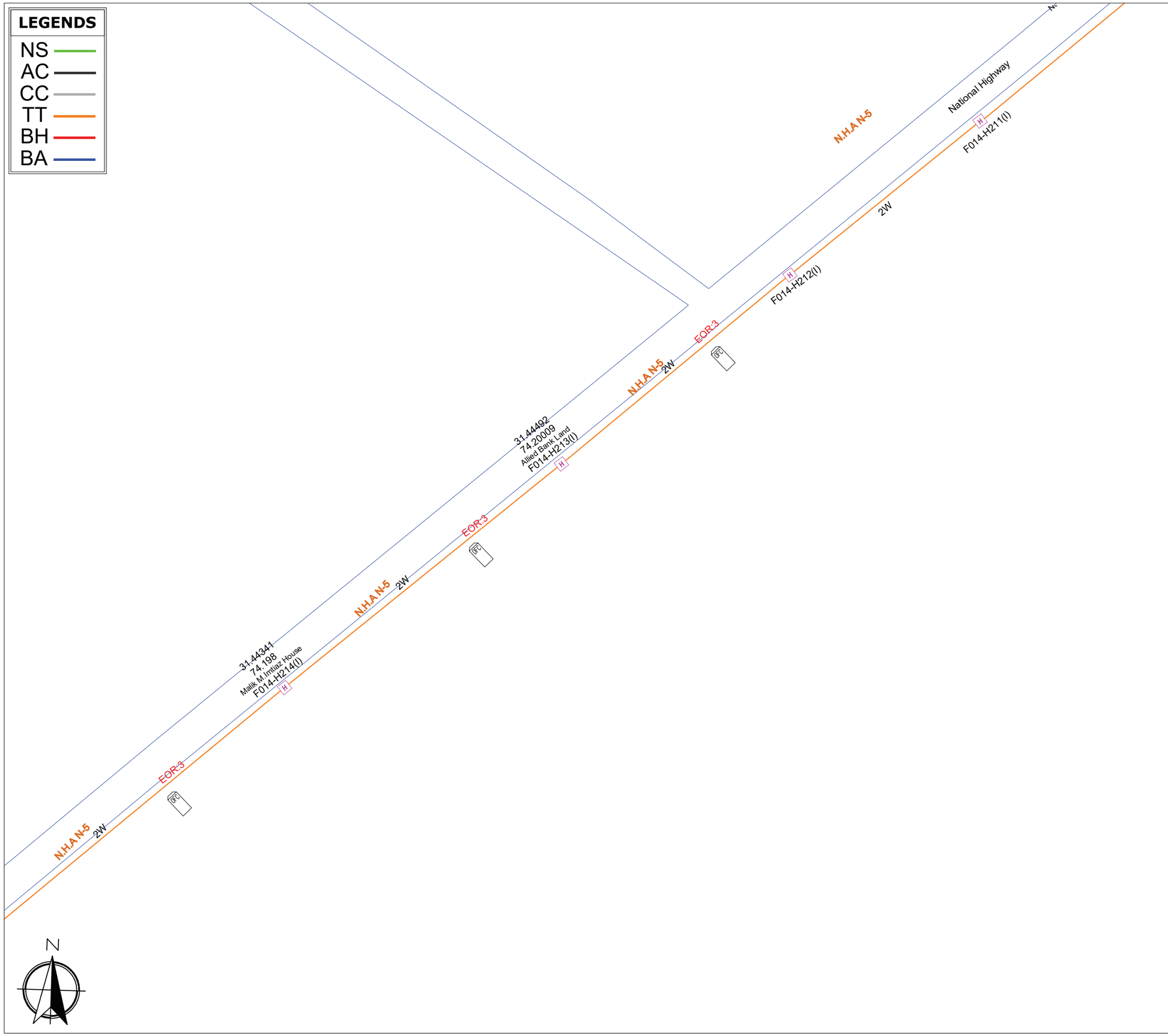
37
38
39

TOTAL SHEET

38/44

LEGENDS

NS
AC
CC
TT
BH
BA



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PROJECT NAME
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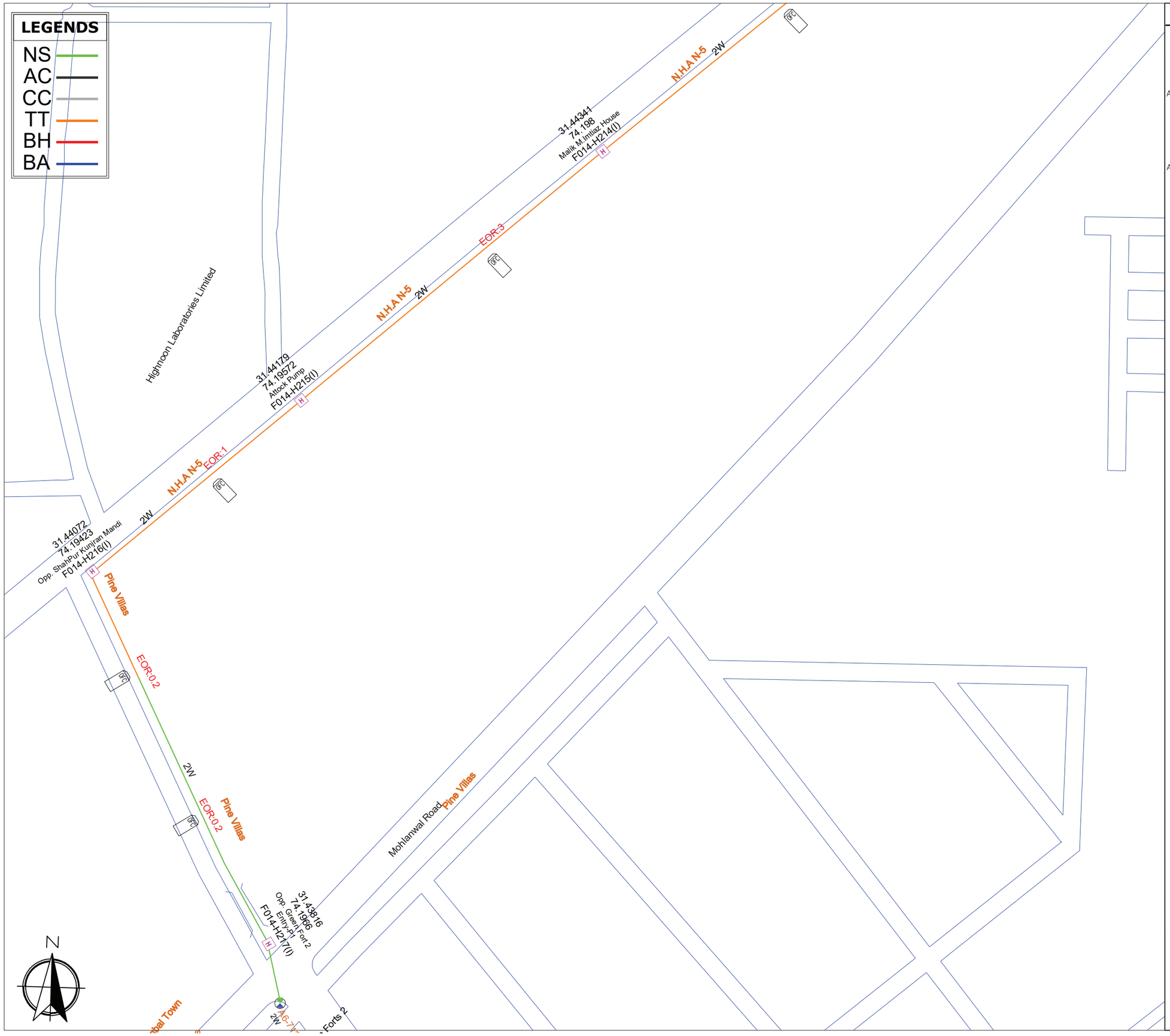
I-Site Civil ID
SA-CW-OSP014-new-L

Civil Section Name
Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO: 38, 40, 39

TOTAL SHEET
39/44



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OSP As-built Design

I-Site Civil ID

SA-CW-OSP014-new-L

Civil Section Name

Khayaban-e-Amin to Thokar Niaz Baig to Highnoon Laboratory LTD Multan Road

SHEET NO	TOTAL SHEET
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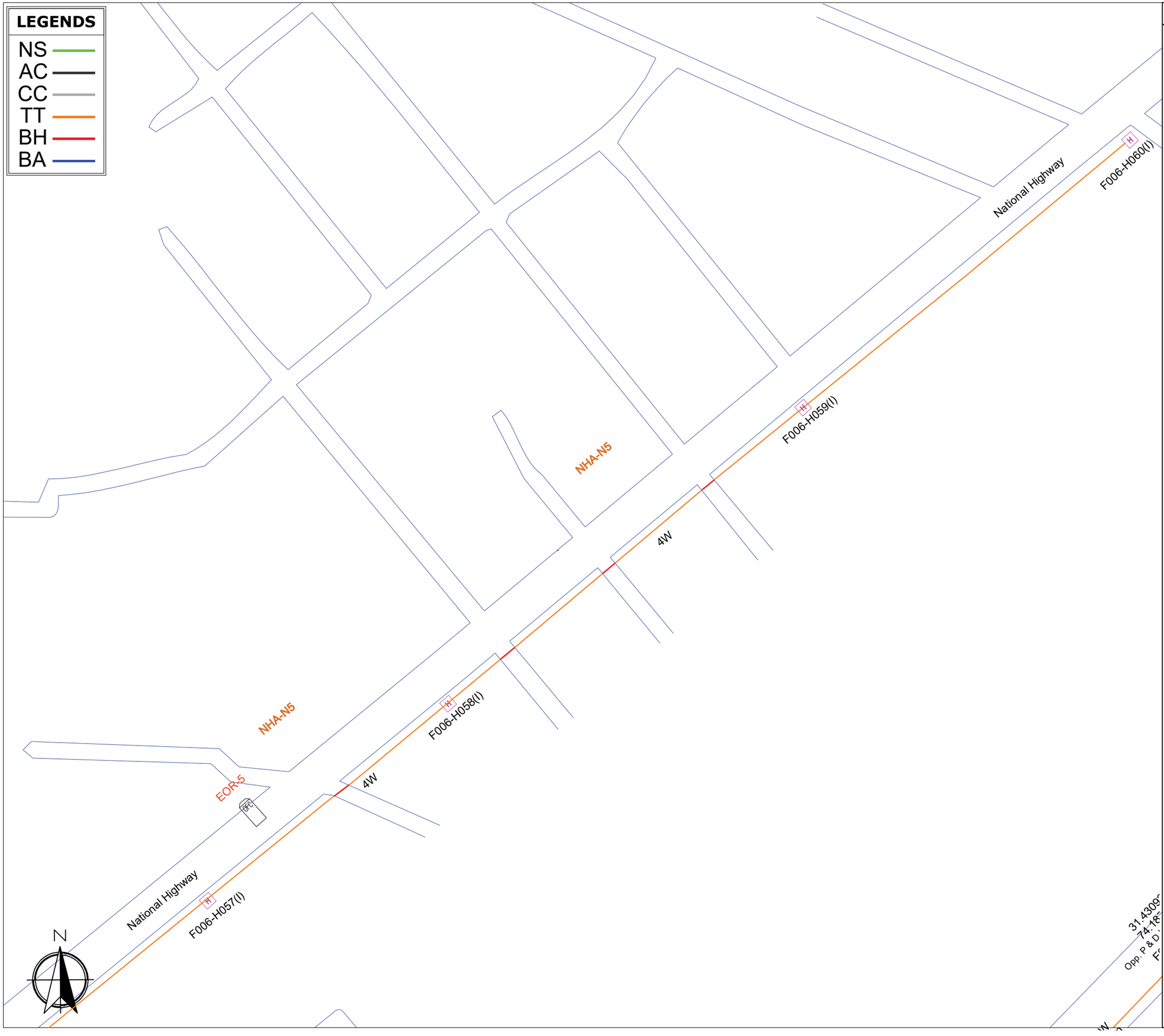

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PPIC3 Project

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OSP As-built Design

I-Site Civil ID

SA-CW-OSP006-new-L

Civil Section Name

Chung PS to Sunder Indstrial State PS

SHEET NO	TOTAL SHEET
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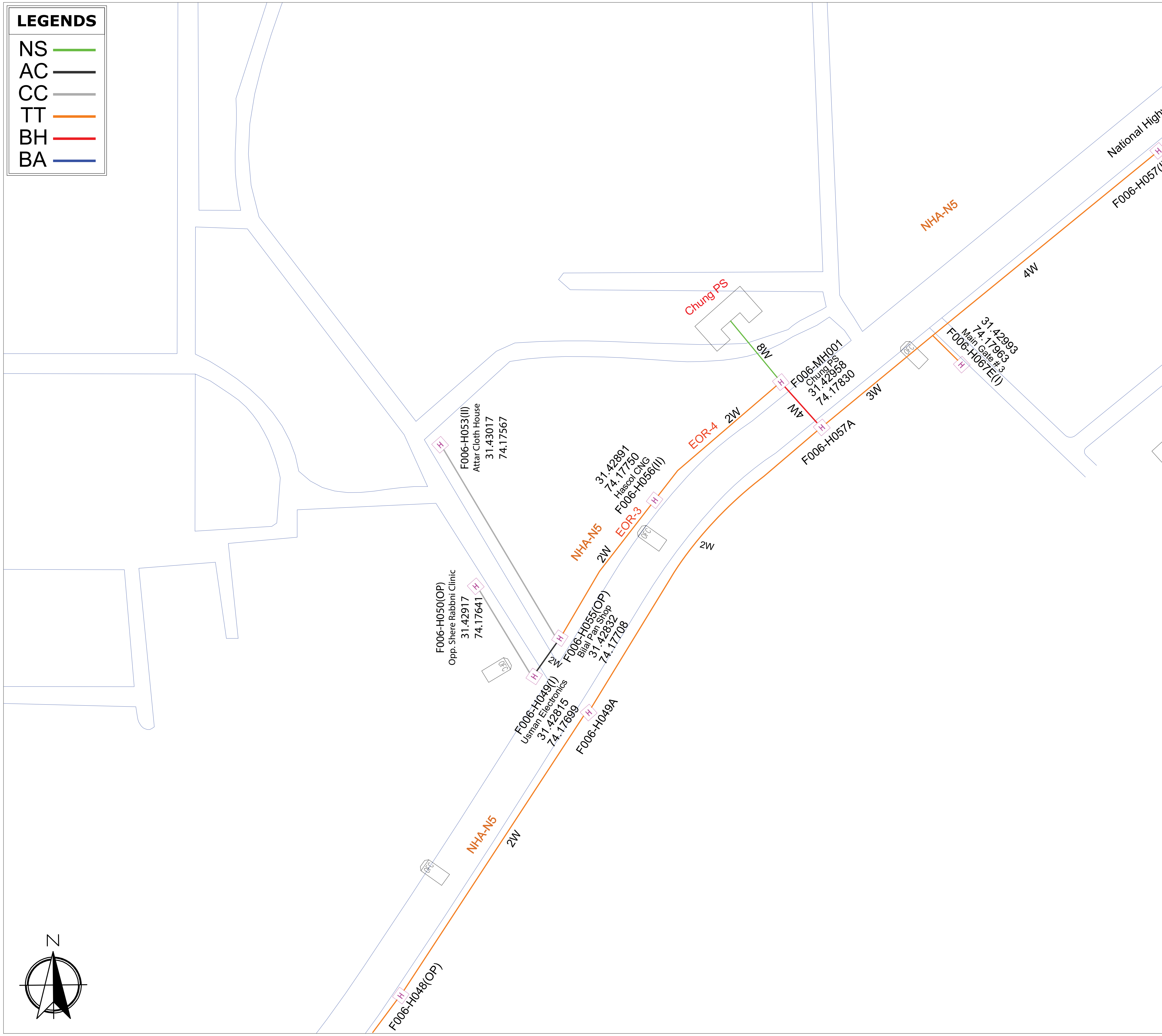

LEGENDS

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PROJECT NAME
PPIC3 Project

DRAWING TILE
OSP As-built Design

I-Site Civil ID
SA-CW-OSP006-new-L

Civil Section Name
Chung PS to Sunder Indstrial State PS

SHEET NO	TOTAL SHEET
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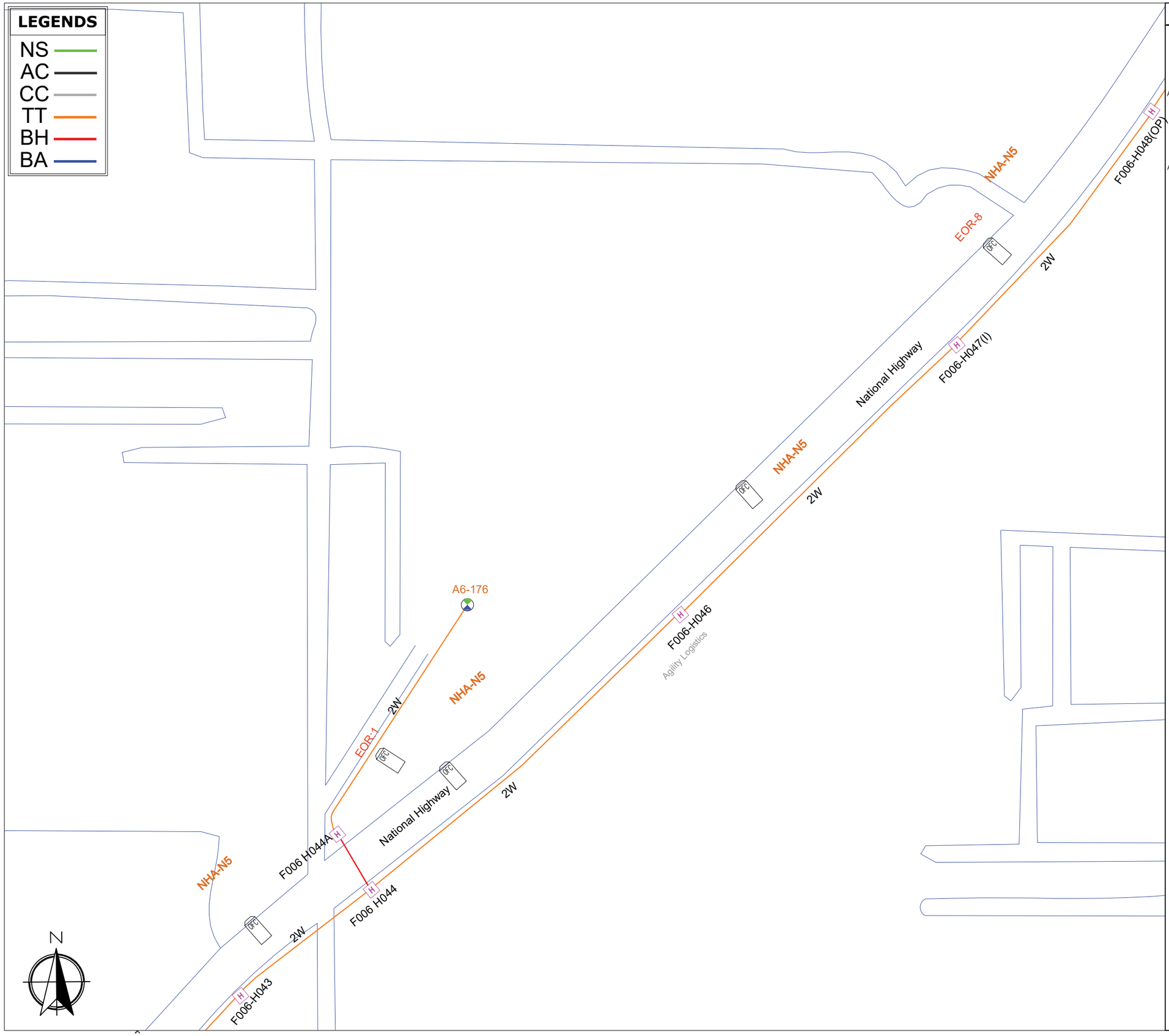

LEGENDS

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- A001–H1 MH/HH No.
- New Aerial Steel Pole
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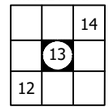
SHEET NO



TOTAL SHEET

13/27

LEGENDS

NS
AC
CC
TT
BH
BA

EOR-1

F006-H043(I)

2W

F006-H042(I)

F006-H041(I)

2W

2W

F006-H040(I)

N

LEGENDS

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Chung PS to Sunder Indstrial State PS

SHEET NO

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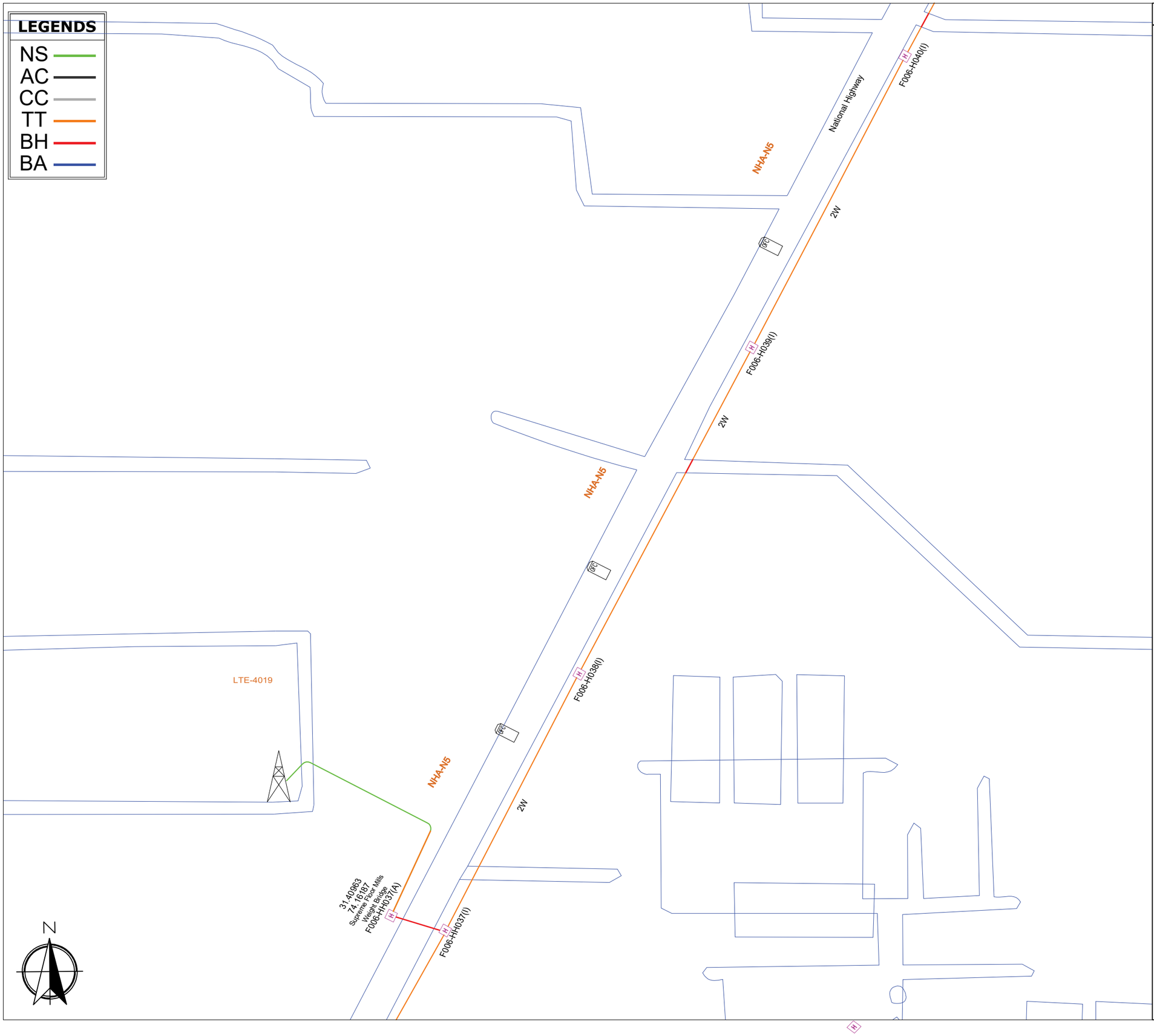
TOTAL SHEET

12/27



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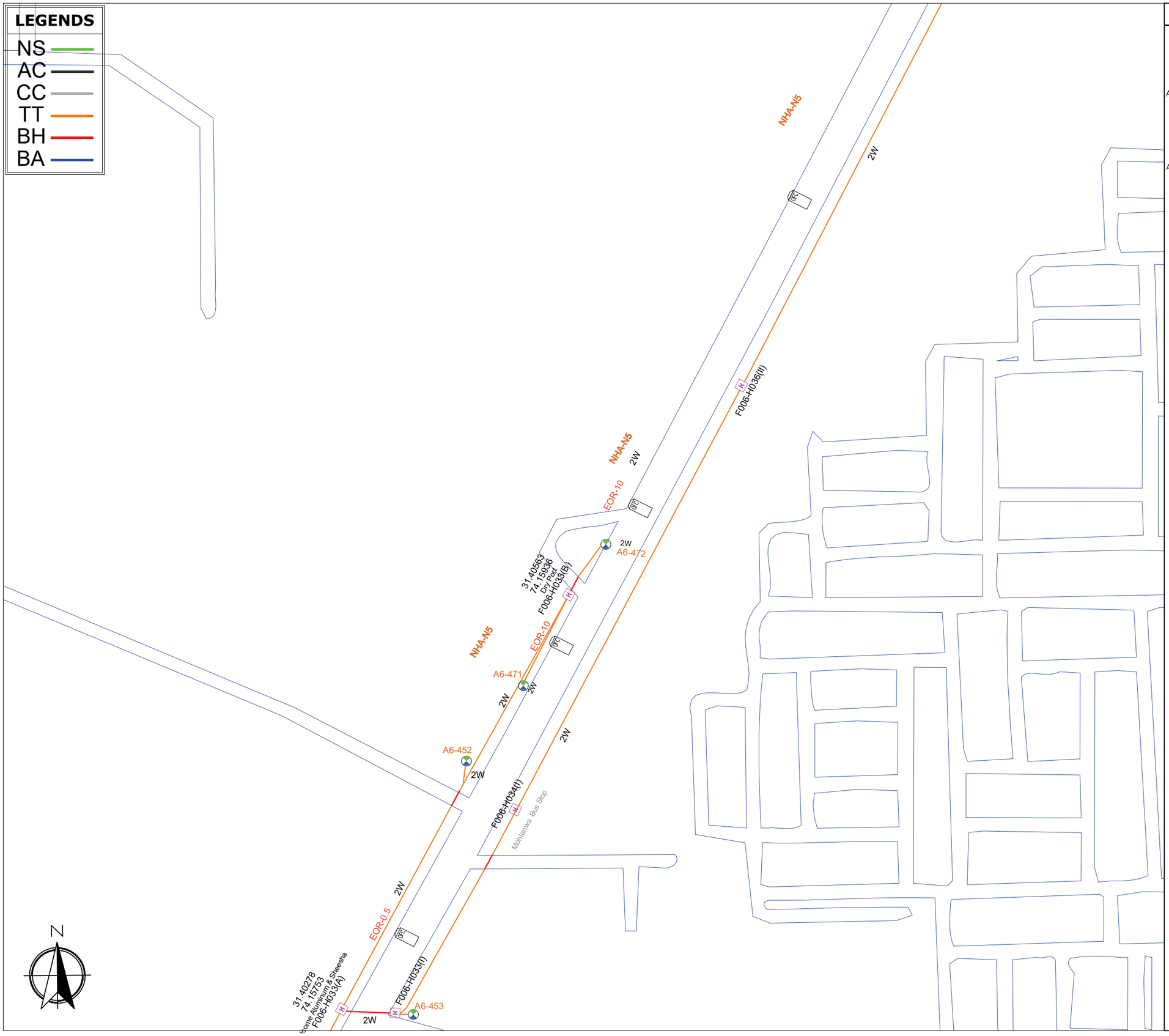
11	11/27
10	



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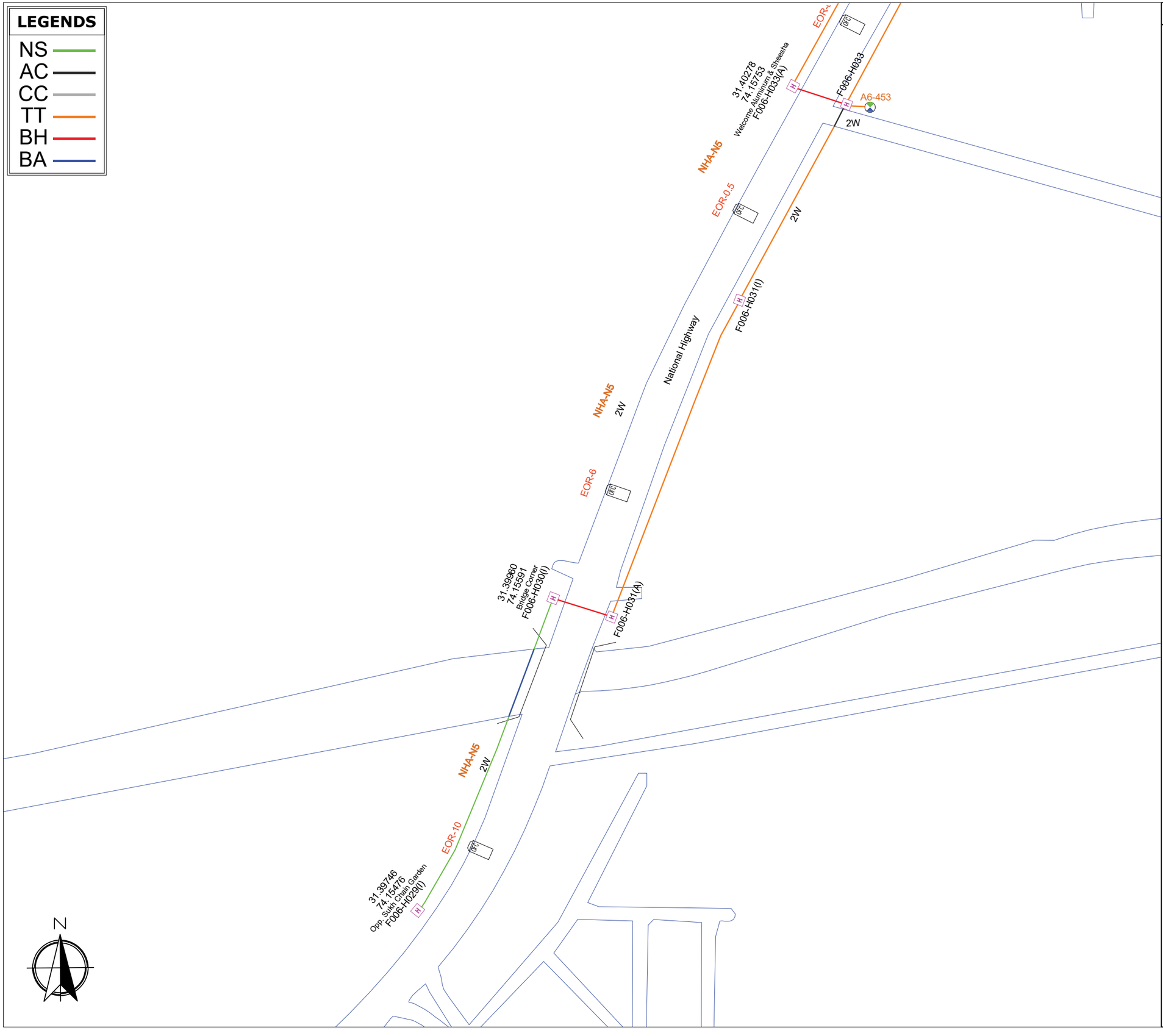
SHEET NO	TOTAL SHEET
11 / 10 / 09	10/27

LEGENDS

NS
AC
CC
TT
BH
BA



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- MDC/DRC/DHQ/P.S.
- IPNV Site
- JTMS Site
- RLMS Site
- Traffic Signal
- VMS Site
- LTE Site
- Route Marker
- Railway
- Bridge
- Green Belt
- Buildings
- Tree
- Mosque/Masjid
- Pavement
- Paint Route Marker

ABBREVIATIONS

NS	Normal Soil	MS	Markable Soil
HR	Hard Rock Area	MT	Mini Trench
TT	Tuff Tiles/footway	MIC	Micro Trench
CC	Concrete Cutting	FS	Free Stone
AC	Asphalt Cutting	GS	Lawn Grass
BG	Bore with GI	WB	WallMountBracket
BH	Bore with HDPE		
HDD	Horizontal Directional Drilling		
BA	Bridge Attachment		
WAG	Wall Attachment G.I		
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WACP	Wall Attachment Corrugated PVC		
SWG	Sewer Cross with GI		
SWH	Sewer Cross with HDPE		
GP	GI Proteciton in Trench		
PCC	Fix 1:2:4 Concrete to Protect		
EOP	Edge of Pedestrain		
EOR	Edge of Roadway		

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PROJECT NAME

PPIC3 Project

DRAWING TILE

OSP As-built Design

I-Site Civil ID

SA-CW-OSP006-new-L

Civil Section Name

Chung PS to Sunder Indstrial State PS

SHEET NO	TOTAL SHEET
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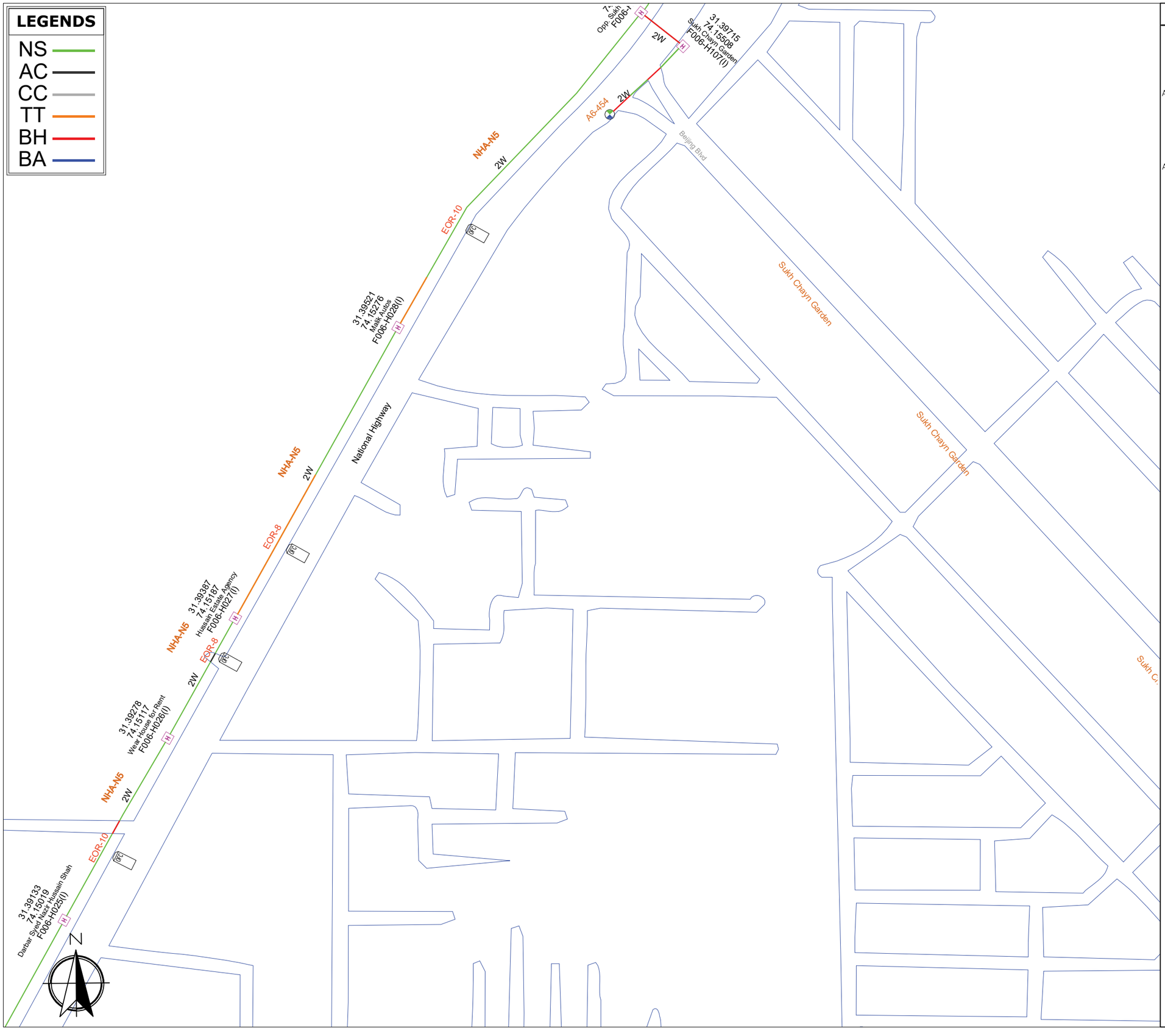

LEGENDS

- New HandHole I, II, III, IV etc.
- New ManHole
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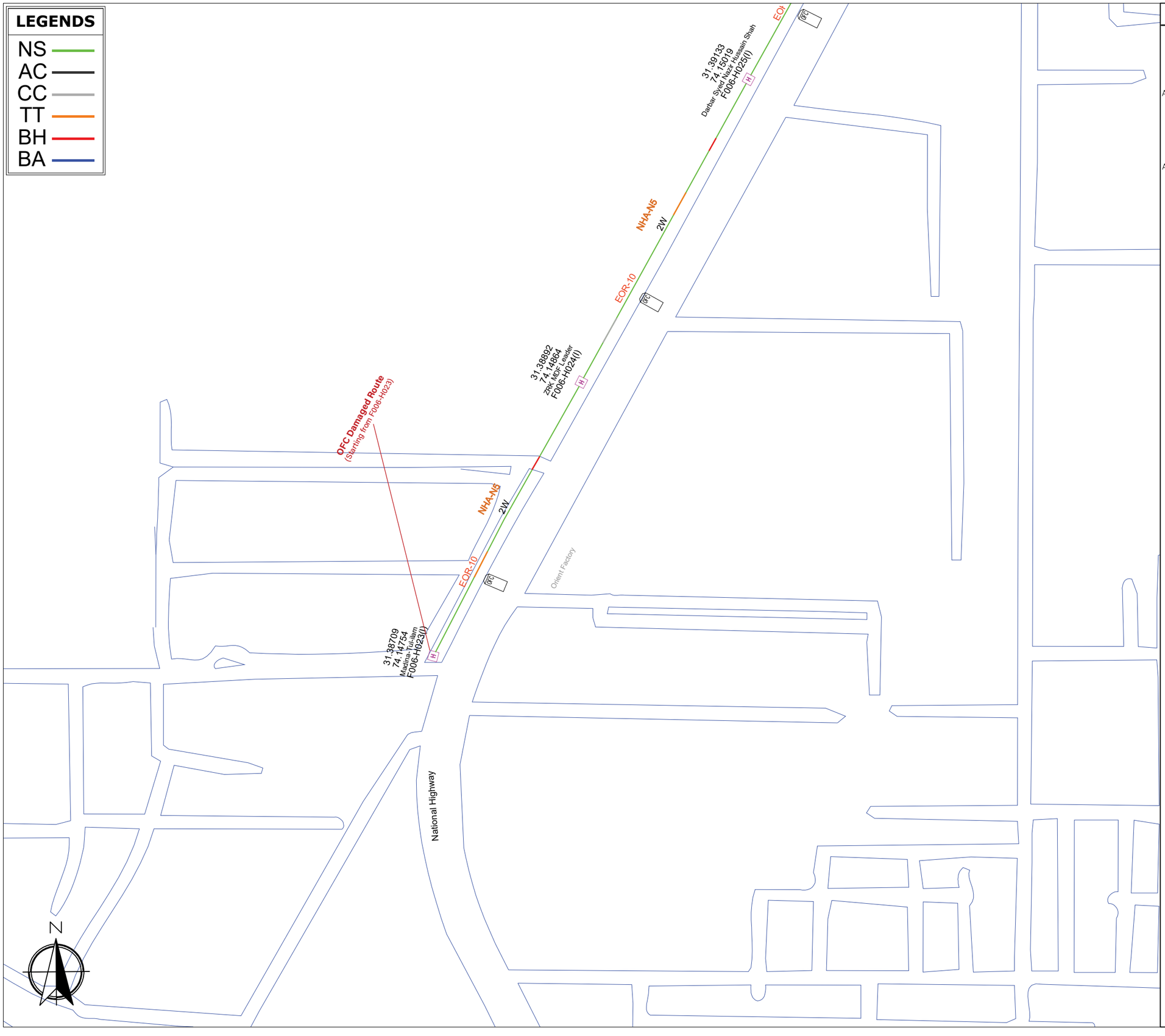
09 / 08 / 07 / 24	08/27

LEGENDS

NS
AC
CC
TT
BH
BA



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Civil Section Name
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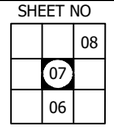
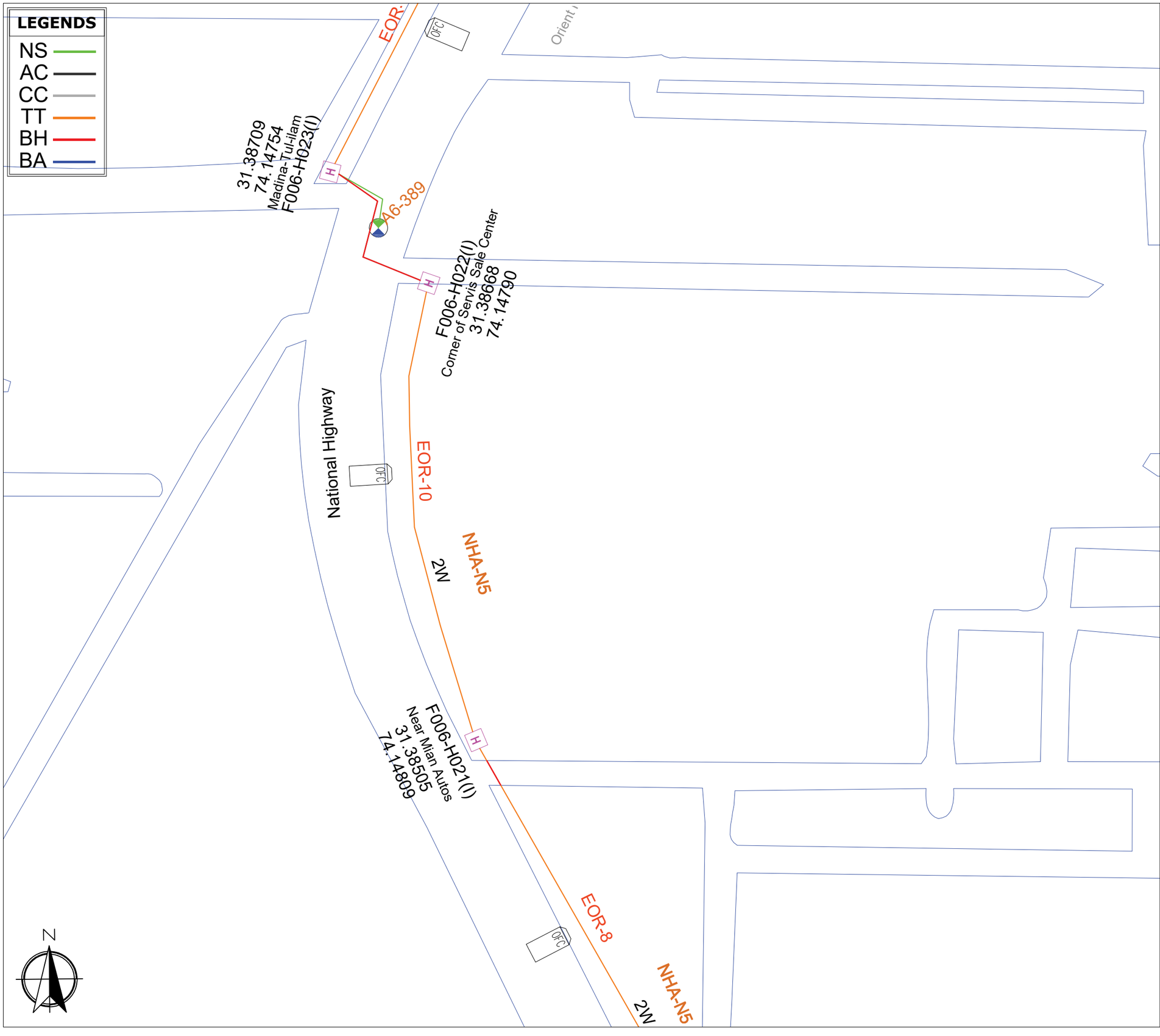


TOTAL SHEET
07/27



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I-Site Civil ID

SA-CW-OSP006-new-L

Civil Section Name

Chung PS to Sunder Indstrial State PS

SHEET NO	TOTAL SHEET
01	01/04

LEGENDS

NS
AC
CC
TT
BH
BA

EOR-10
2W
NHA-N5
A6-132
2W
31.37260
74.15144
DDFC (Pvt) Ltd.
F006-H014(I)
Bahria Town
Bahria Town
Bahria Town
NHA-N5
3W
EOR-10
National Highway
31.37088
74.15117
Opp. Eastern Motor Works
F006-H013(I)
N

LEGENDS

- New HandHole (II, III, IV etc.)
- New ManHole
- A001–H1 MH/HH No.
- New Aerial Steel Pole
- New Aerial Concretel Pole
- Exixting Steel Aerial Pole
- Existing Concrete Aerial Pole
- A001–P1 Aerial Pole No.
- Aerial Route
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- New Duct
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EOR	Edge of Roadway		

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REV.	DATE	NAME	SIGNATURE

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PROJECT NAME

PPIC3 Project

DRAWING TILE

OSP As-built Design

I-Site Civil ID

SA-CW-OSP006-new-L

Civil Section Name

Chung PS to Sunder Indstrial State PS

SHEET NO

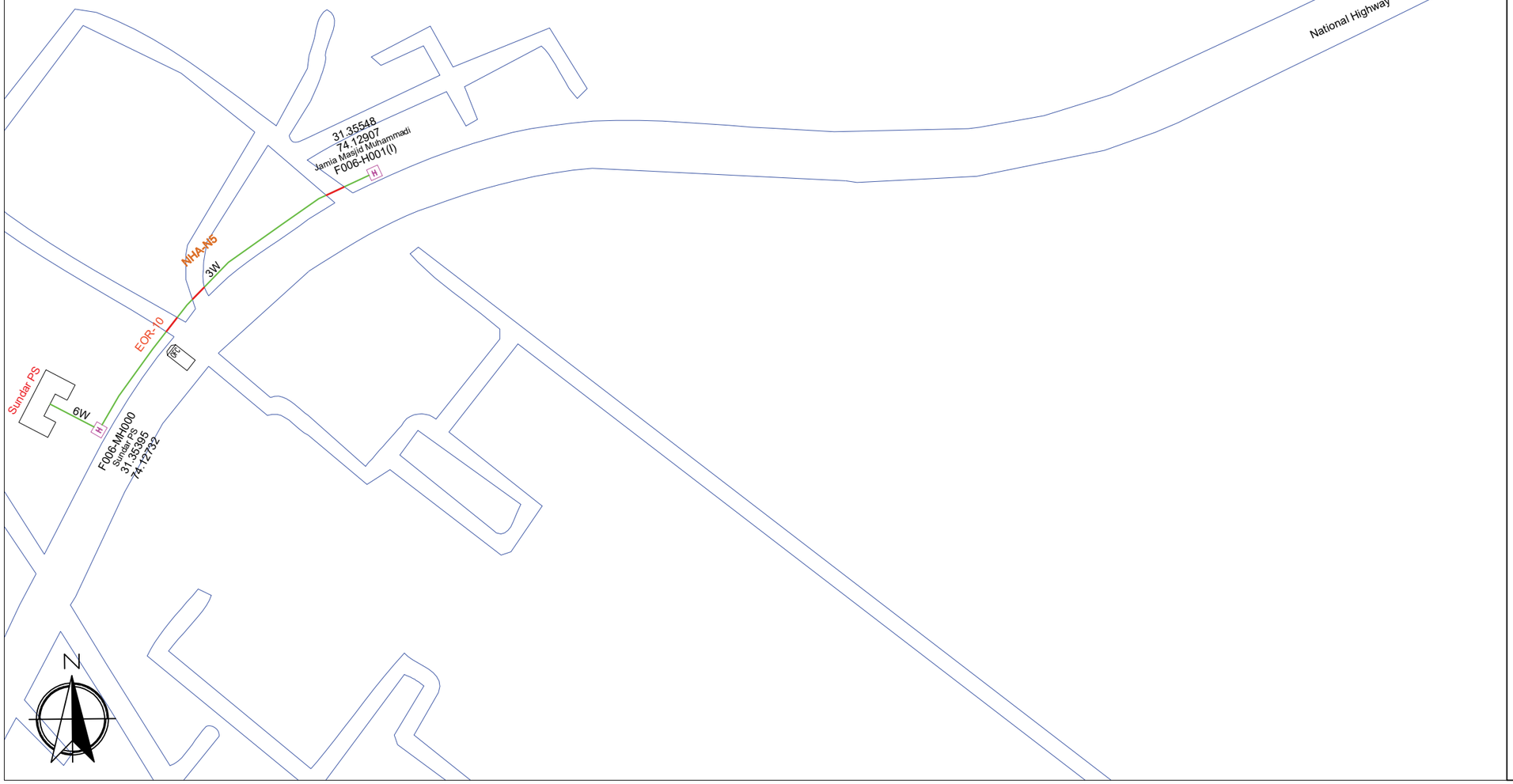
	05	
	04	27
03		

TOTAL SHEET

04/27

LEGENDS

NS
AC
CC
TT
BH
BA



LEGENDS

- H — New HandHole I, II, III, IV etc.
- M — New ManHole
- A001–H1 MH/HH No.
- New Aerial Steel Pole
- New Aerial Concretel Pole
- Exixting Steel Aerial Pole
- Existing Concrete Aerial Pole
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HDD Horizontal Directional Drilling
BA Bridge Attachment
WAG Wall Attachment G.I
WAP Wall Attachment PVC
WACG Wall Attachment Corrugated GI
WACP Wall Attachment Corrugated PVC
SWG Sewer Cross with GI
SWH Sewer Cross with HDPE
GP GI Proteciton in Trench
PCC Fix 1:2:4 Concrete to Protect
EOP Edge of Pedestrain
EOR Edge of Roadway

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PROJECT NAME
PPIC3 Project

DRAWING TILE
OSP As-built Design

I-Site Civil ID
SA-CW-OSP006-new-L

Civil Section Name
Chung PS to Sunder Indstrial State PS

SHEET NO 02 (01)

TOTAL SHEET
01/27

LEGENDS

- New HandHole I, II, III, IV etc.
- New ManHole
- A001-H1 MH/HH No.
- New Aerial Steel Pole
- New Aerial Concretel Pole
- Exixting Steel Aerial Pole
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PCC	Fix 1:2:4 Concrete to Protect		
EOP	Edge of Pedestrain		
EOR	Edge of Roadway		

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PROJECT NAME

PPIC3 Project

DRAWING TILE

OSP As-built Design

I-Site Civil ID

SA-CW-OSP004-new-L

Civil Section Name

Sunder PS to Manga Mandi PS Multan Road

SHEET NO	TOTAL SHEET
02, 01	01/08

LEGENDS

NS
AC
CC
TT
BH
BA

F004-H021
Opp. Ittefaq Group
31.33834
74.11661

F004-H020
Opp. Shell Pump
31.33626
74.11515

N.H.A N-5
2W
245m
EOR.10
National Highway
Canal Bank R

N

LEGENDS

- H — New HandHole II, III, IV etc.
- M — New ManHole
- A001-H1 — MH/HH No.
- New Aerial Steel Pole
- New Aerial Concretel Pole
- Exixting Steel Aerial Pole
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PROJECT NAME
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DRAWING TILE
OSP As-built Design

I-Site Civil ID
SA-CW-OSP004-new-L

Civil Section Name
Sunder PS to Manga Mandi PS Multan Road

SHEET NO: 07 / 06 / 05

TOTAL SHEET
06/08

LEGENDS

NS
AC
CC
TT
BH
BA

RUR4421

F004-H024
Outside Tower
31.34455
74.12102

2W

N.H.A N-5

2W

EOR:10

F004-H023
Near Daewoo Terminal
31.34248
74.11967

National Highway

N.H.A N-5

N

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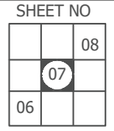


TOTAL SHEET
07/08

Optical Fiber Cable

Manual

Punjab Safe Cities Authority

Qurban Lines, Lahore

Table of Contents

1 Optical Fiber Cable Planning

Route planning is the first step for OSP work, it gives the general routes base on which further work can be carried on. However, before route planning, site locations should first be finalized and locked to avoid frequently revision due to site changes.

After all site locations finalization, draft route planning can be done base with the assistance of map software tools (Google Earth), the planning principal will be considering the transmission requirement and the safety, feasibility and economy for OSP work.

Preliminary survey by qualified OSP engineer will be required to verify and adjust the planned routes, the purpose of survey is to find out the most feasible OSP routes between sites, and to find out possibly less difficult routes which easy to implement and easy to get ROW. The draft route plan should be continually adjusting until its perfection.

These planning are very important for next step; it is the basic guidance for next detail survey and design. Customer representative should also join the survey to make sure the routes selection is basing on mutually understanding. And the finalized route map should be plot on map (e.g. Google Map) and should submit to customer for approval. Only after approval, detail survey and design can be started.

The OFC cores for core network which connects MDC, DRC, DHQ should no less than 96 Fibers; the cores for aggregation network which connects aggregation nodes (police office) should be no less than 48 Fibers; the cores for access network which connects camera nodes /LTE-A sites should be no less than 16 Fibers.

1.1 OFC route survey

The survey activities are to guarantee the transmission quality and the safe, reliable, economical and reasonable cable line, and also the easiness of construction and maintenance. Qualified supervisor should be arranged to guide the survey activities.

Optical cable route will commonly be chosen to be in the steady and level zone. It will keep away as much as possible from the lakes, swamp and floodwater storage area, go through ponds or canals as less as possible. In mountain areas, it will go along the zones of smooth topography and less rock and keep away from the places such as escarpment, donga, land slope, mud-rock flow and the possible flood damage or run-off soil areas. If it is unavoidable, the reasonable protection measure is needed. For various conditions, the reasonable solutions will be taken according to the actual condition.

Detail survey will be conduct as per approved route plan, and should contain the following:

- Row information
- Road/Street name
- Proposed OFC Route with distance from side of road, etc.

- Road surface information /soil type
- Route distance
- Surrounding information land marks
- Hand hole location
- Indication of obstacle (if any) and solution.
- Collection of any other information during survey necessary for Implementation.
- Fill survey forms during survey as per actual site information.
- Collect photographs of key observations for future reference

1.2 OSP civil route design

OSP Civil route design will be AutoCAD format, and should include:

- The construct route of this project.
- The civil work type, e.g. ducts, aerial, attachment, etc.
- The street name/ location where the work is to be performed.
- Color highlights to show the demanded right-of-way
- A vicinity map including geographic Information with showing the routes, total layout and locations of all manholes that will be included in the project, and the surrounding area of the work.
- Legend showing the symbols used on the plans and the color-coding used to mark the plan.
- A clearance distance of the minimum vertical (while crossing) and the horizontal (while in parallel) distance to the nearest affected utility and/or right-of-way object.
- For any crossing, which might create a potential conflict including but not limited to, cable crossings over or under large storm pipes, culverts, electrical lines, water, transmission lines and other affected utilities, an individual section view must be submitted if provided the underground services information by the authorities.
- Any proposed work in the vicinity of a bridge or box culvert must include a section showing the distance from all features of the structure.
- Show distance of proposed cable from the roadway.
- Identify the proposed cable installation method on each plan sheet such as hand, machine trenching, or directional bore, attachments. G.I pipe. etc.
- Soil conditions.
- Surface conditions e.g. concrete pavement, asphalt, tuff tiles. etc.

- No additional distance scope out of design should be conducted without prior approval of employer.
- The OFC cables should be laid in the same duct/trench when they are aligning along the same road. Each 40/33 HDPE pipe can accommodate 2 cables which should be pulled together as per designed route.
- Coordination should be documented between the OSP, LAN and LTE-A designs to ensure that single points / paths of failure within the overall design have been identified and mitigated (by use of an alternative communications path / method if needed)

The OSP civil route design template is attached at Annex 3.

1.3 OFC single line diagram (SLD)

The OFC SLD should include:

- Sites/Pole name and ID
- Cable ID(Link ID)
- The HH number and location where has joint closure
- ODF rack fiber termination sequence
- The OFC cable type and cores
- Total OFC length between each two core sites
- The OFC length between each two adjacent joint
- The joint closures number and its location (coordinates)
- The splicing sequence of fiber in joints
- The link loss budget calculated at 1310nm and 1550nm for singlemode fiber cable links.
- Indicate the length and type of cable proposed for installation on each page.
- Additional cores/fiber tubes can be added into the same/upper layer cable for conveniently access the lower layer nodes. In order to assure minimum influence to the upper layer fibers, the un-cut technology with un-cut tools will be used to distribute out these additional fibers without cutting any upper layer's fiber cores.

The OSP OFC SLD design template is attached at Annex 3.

1.4 OFC link loss budget calculation

All components such as additional connectors, and splices along with cable attenuation, should be taken into account in calculating the loss. The maximum length of any optical path between two fibre optic repeaters must be calculated separately, and depends on the total loss in all components used in the path, including fibre optic cable, optical connectors, and splices.

Required parameters to be included in the link losses calculation:

Link losses	dB (Maximum loss)
Cable loss (for standard G.652-D SMF,@1310nm)	0.4dB/km
Cable loss (for standard G.652-D SMF,@1550nm)	0.3dB/km
Splice loss (for standard SMF)	0.1dB
Connectors loss	0.5dB

1.5 OFC drum plan

In order to reduce the waste of OFC during implementation and guide OFC cutting and distribution, a drum plan should be made base on the section length and OFC type. The drum plan will show the assignment to each OFC drum manufactured.

2 OSP Civil Work

2.1 Excavation and backfilling

Cable installation along Road way shall strictly observe the following requirements:

- When the cables route is at the outside of road, then the trench should reach to 1.5m except obstructed by underground services, pipelines, facilities, big rocks etc. (Employer's approval required on all the obstruction which affecting depth to reach 1.5m).
- Standard depth for conduit laid in the concreted area/pavement/footway or roadway, routes in a pavement/footway should be 450mm and in a concreted area/roadway should be 600mm.
- In order to maintain a smooth bottom of trench to avoid a bumpy pipe shape, the level of the bottom trench should be maintained to a same depth level in the section between two adjacent hand holes.
- Excavation and backfilling duration should be less or equal to 3 days. Excavation notification to the other utilities operators should be done at least 5 days before commencement.
- The area around the manhole shall be compacted. Upon final acceptance of the conduit/duct system all manholes shall be free of debris.

- Reserve at least the horizontal distance of 1 meter between the existing underground utilities and the new cable, and if not possible provide an appropriate duct protection and make informed the network provider of existing utility five days before excavation.
- Comply with all provisions and guidelines established by the local authorities.
- Place the barriers and road signs required by current laws during excavation works.
- If the excavation must remain open or the road will be otherwise obstructed during the night or under low-visibility conditions, road signs shall be complemented by lighting devices of the color, shape and size stipulated by the traffic code.
- Trenches should be backfilled to the original state and backfill shall be strong enough to support reasonable stresses.
- Put an identification sign (marker) stated by these guidelines to illustrate your cable route.
- The following operations shall be carried out after excavating the trench:
- Remove spoils from the sides of the excavation (Spoil must be transported to authorized disposal sites in accordance with local authority requirements.)
- Remove adjacent paving materials which were damaged as a result of excavation.
- Fulfill the cleaning conditions required by local authority.
- The following guideline shall be carried out in the trenching;
- All crossings are to be made perpendicular to the roadway.
- Any cables should be protected with appropriate ducts along the whole crossing length.

Trenches along road networks shall be sufficiently deep to provide appropriate fiber cable protection and shall be placed at least 1.5m away from the edge of pedestrian walkways or storm drainages along paved roads. In case of unavailability of the required clearance distance due to the soil or terrain condition; the request for shorter clearance shall be accompanied by pit test result approved by an engineer in charge of infrastructure from concerned institutions where the installation work will be conducted.

In the absence of pedestrian walkways, the cable must be located at a minimum distance of 2.5 meters off the roadway. In case of unavailability of the required clearance distance due to the soil or terrain condition; the request for shorter clearance shall be accompanied by pit test result approved by an engineer in charge of infrastructure from concerned institutions where the installation work will be conducted.

All telecommunications ducts shall be separated from cables for electrical supplies. High voltage cables shall have a standard minimum clearance of 450mm.

Road surfaces where cable crossings have been installed shall be restored to its original state in compliance with local authorities' specifications.

No cable installation will be permitted in a ditch line. Cable installations will be permitted along the back of the ditch line only.

Where there is cable crossings big roads, ducting shall be of galvanized steel pipes buried deep enough for protection from vehicular or pedestrian traffic stresses. But when there is no enough space to dig a long enough pit to insert Galvanized pipe in the bore hole, then the HDPE pipe should be used with prior approval of the Employer. For small roads and narrow streets crossing, HDPE pipe can be used with prior approval of the Employer.

Trenchless or no-dig technique used for long section OFC installation should be divided into shorter sections of the work length accordingly to the characteristics of the machines and the design requirements.

In case of impossible crossing with trenchless techniques due to the soil condition that avoids the use of guided boring/directional drilling machine; an additional request for road crossing by digging accompanied by soil test result approved by an engineer in charge of infrastructure from concerned institutions where the installation work is conducted is required.

Any person conducting trenchless excavation shall take all reasonable steps necessary to protect and support underground utility lines. These steps shall include, but are not limited to the following:

- The excavator should verify that all utility lines in the area are marked.
- The excavator shall ensure that bore equipment stakes are installed at a safe distance from marked utility lines
- The excavator shall ensure that sufficient clearance is maintained between the bore path and any underground utility lines during pullback.
- The excavator shall give special consideration to water, electricity and sewer systems within the area that cannot be located accurately.
- The excavator shall ensure that the drill head locating device is functioning properly and within its specification.
- In case of damages of any existing infrastructure, the applicant shall negotiate the way to restore the damages caused in a period of two weeks from the declaration of damages; if the negotiations fail, the provisions stipulated the Law will be applied.
- Detail excavation and backfilling as per the design in this guide lines

2.2 Manhole/Handhole

2.2.1. Manholes/Handhole shall be covered by a lid which is water penetration protected on which the size and the depth of the Manhole/Handhole are written.

2.2.2. Manhole/Handhole lids shall be labeled with text: “PPIC3”

2.2.3. Manholes/Handhole should be located outside of sidewalks and roadways if there is enough space for installation. In case there is no enough space outside and the man/hand hole installed on footway/road way edge, the top should level to ground surface.

2.2.4. Manholes/Handhole must be located a minimum of 2 meters off the edge of pedestrian way, and 3m from the off of the roadway if there is no space reserved for pedestrian way. In case of unavailability of the required clearance distance due to the soil or terrain condition; the request for shorter clearance shall be accompanied by pit test result approved by an engineer in charge of infrastructure from concerned institutions where the installation work will be conducted.

2.2.5. Manholes/Handhole shall not be located in the ditch line.

2.2.6. Manhole/Handhole can be pre-cast RCC structure, in case someplace is very congested and no enough space for RCC pre-cast Handhole, brick and mortar Handhole can be constructed on site.

2.2.7. The manhole inner size is W*L*D=1.2MX1.8M*0.9M, the Hand hole inner size is W*L*D=0.9M*0.9M*0.9M. Manhole is used in front of the exchange room. For normally routes on the routes handhole will be used.

2.2.8. For Pre-cast manhole/handhole, below is the requirement:

2.2.8.1. Concrete Ratio =1:1.5:3, target strength >3000 PSI (as per MH/HH design)

2.2.8.2. In case of Cube Test not done or result in failure the Pulse Velocity Test should be done

2.2.8.3. Steel Bar=10 mm (min) used every 4 inches horizontally & vertically

2.2.8.4. Thickness of Walls=4inches

2.2.8.5. Entry holes should be made in advance in four walls

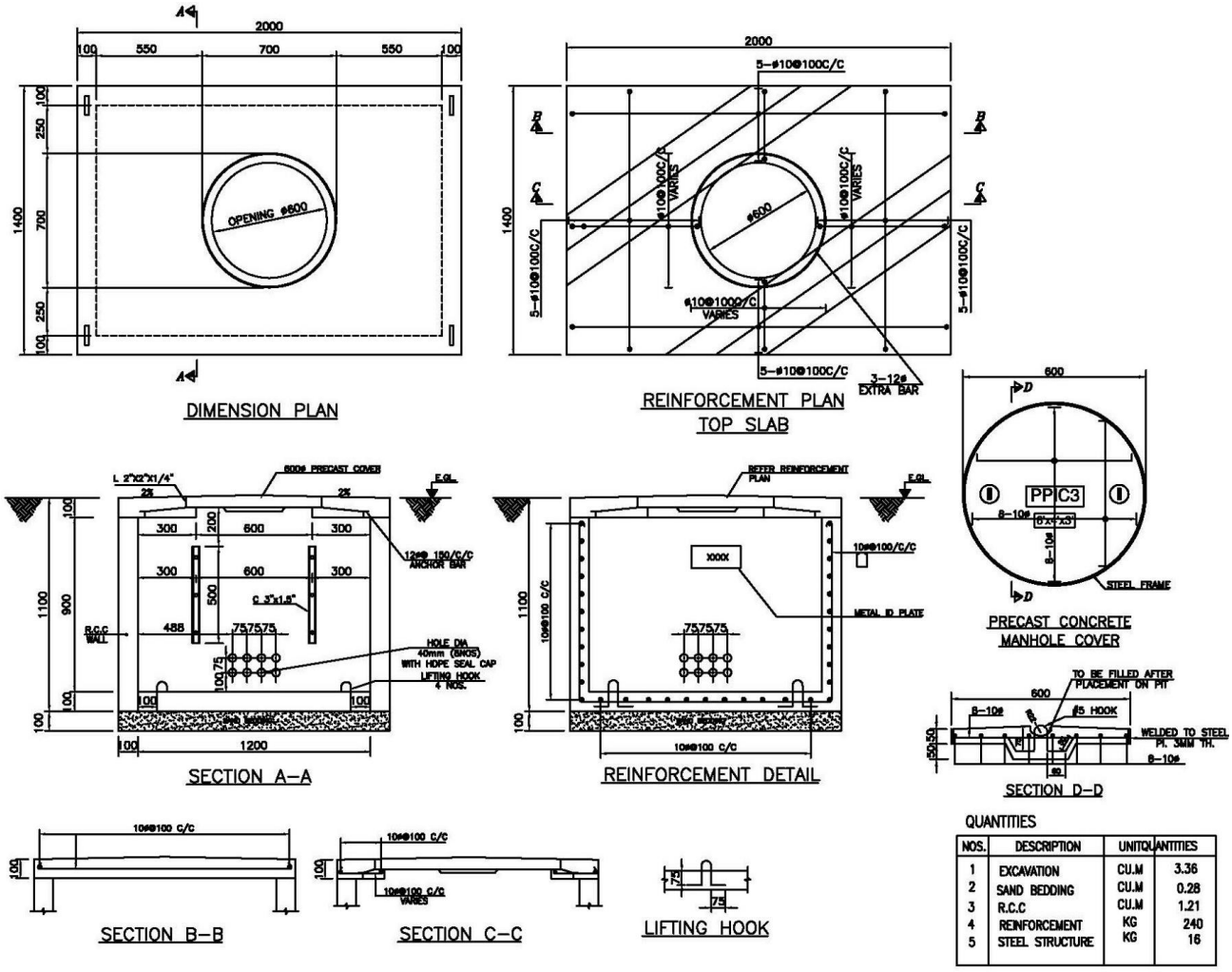
2.2.8.6. Slab and cover should be same strength of material, which will be used for covering the manhole and handhole.

2.2.8.7. A factory serial number should be graved inside of the wall of handhole

2.2.9. Pre-cast handhole can be transported by truck, and crane should be used to load/un-load. The handhole pit should be leveled at the bottom.

2.2.10. For the brick and mortar man/handhole, the brick wall thickness should be 230mm, and the mortar should cover both inside and outside with at least 5mm thickness. The same type of RCC cover lid as pre-cast man/handhole can be used for cast-on –site man/handhole.

2.2.1 PRECAST MANHOLE DETAILS



QUANTITIES

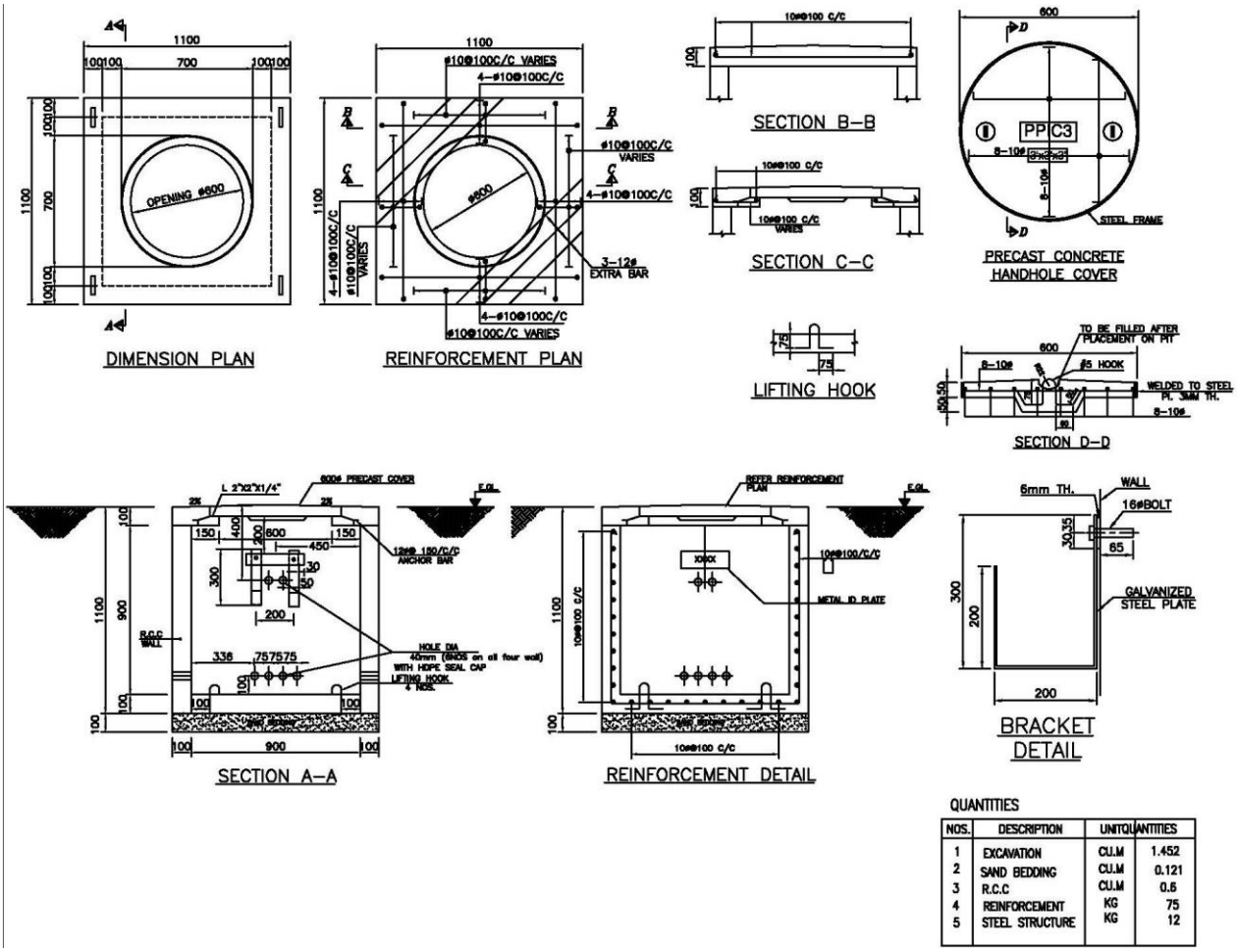
NOS.	DESCRIPTION	UNIT	QUANTITIES
1	EXCAVATION	CU.M	3.36
2	SAND BEDDING	CU.M	0.28
3	R.C.C	CU.M	1.21
4	REINFORCEMENT	KG	240
5	STEEL STRUCTURE	KG	16

NOTES:

1– ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2– WATER IS NOT ENCOUNTERED (ASSUMED) BELOW E.G.L.
3– ALL REINFORCED CONCRETE CYLINDER STRENGTH SHOULD BE AT LEAST 21 N/mm2.(3000 PSI)HAVING MIX RATIO 1:1.5:3.
4– ALL REINFORCEMENT BAR SHALL BE COLD WORKED DEFORMED BARS CONFIRMING TO A.STM SPECIFICATION A615, GRADE 60 (FY 60,000 Psi).
5– CLEAR COVER REINFORCEMENT
   b. WALL = 50 mm
   c. SLAB = 50 mm
6– CEMENT WITH C_3A(4%~8%) SHALL BE USED FOR ALL CONCRETE WORK.
7– PROPER DEWATERING ARRANGEMENT SHOULD BE DONE BEFORE CONSTRUCTION.

8- ANY LOOSE FILL, WET SOFT LOOSE PATCH UNDER THE PIT SHOULD BE REPLACED BY WELL COMPACTED GRANULAR MATERIAL.
9- THE BED OF MANDHOLE/PIT SHOULD BE LEVELLED & SAND BEDDED.
10- F.G.L IS EQUAL TO R.L /E.G.L.
11- THERE SHOULD BE A ENGRAVED FACTORY SERIAL NUMBER INISDE OF MANHOLE/ WALL .
12- MANHOLE SHALL BE PROVIDED ON SIDE / EDGE OF ROAD OR ON FOOT WAY.

2.2.2 PRECAST NORMAL HANDHOLE DETAILS



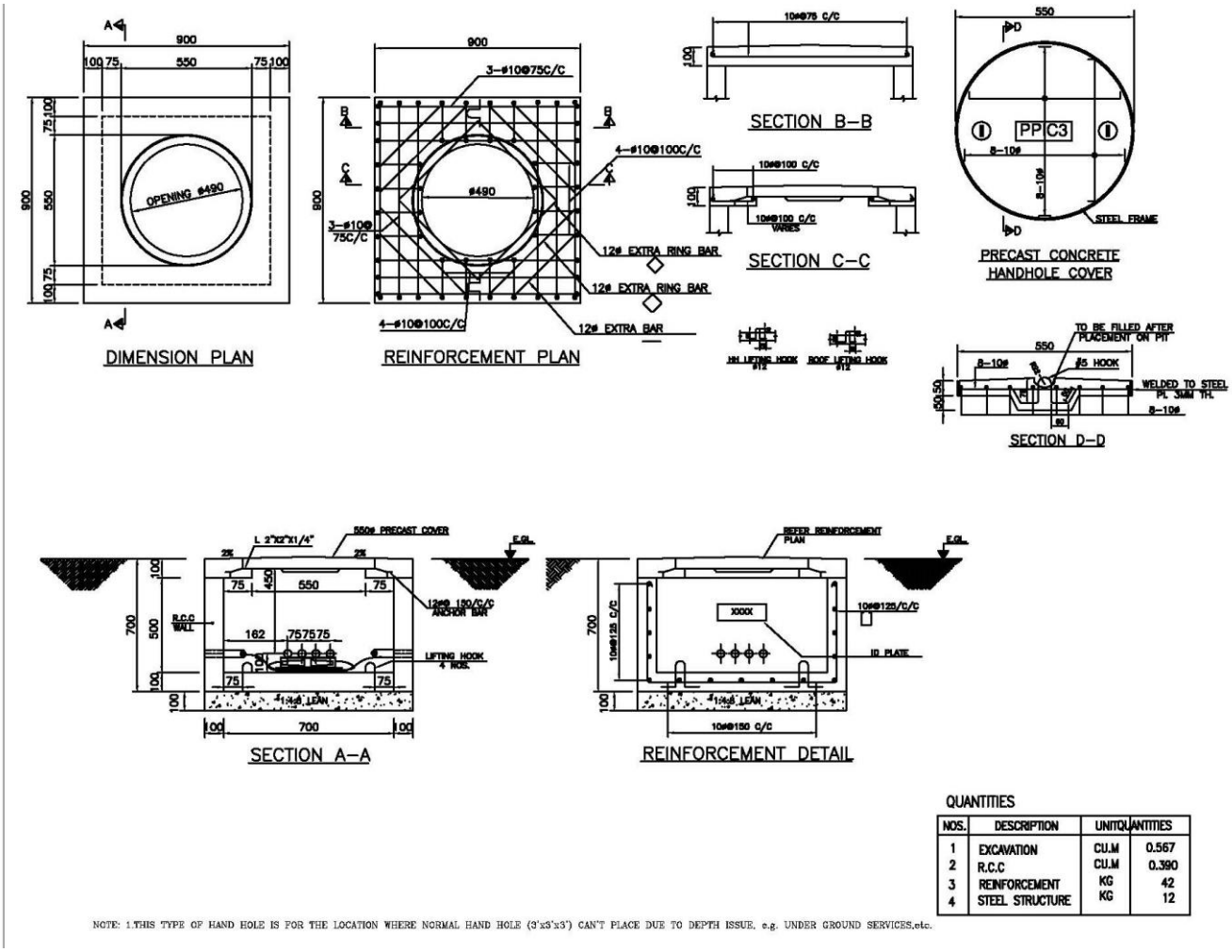
QUANTITIES

NOS.	DESCRIPTION	UNIT	QUANTITIES
1	EXCAVATION	CU.M	1.452
2	SAND BEDDING	CU.M	0.121
3	R.C.C	CU.M	0.6
4	REINFORCEMENT	KG	75
5	STEEL STRUCTURE	KG	12

NOTES:
1- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2- WATER IS NOT ENCOUNTERED (ASSUMED) BELOW E.G.L.
3- ALL REINFORCED CONCRETE CYLINDER STRENGTH SHOULD BE AT LEAST 21 N/mm2.(3000 PSI)HAVING MIX RATIO 1:1.5:3.
4- ALL REINFORCEMENT BAR SHALL BE COLD WORKED DEFORMED BARS CONFIRMING TO A.STM SPECIFICATION A615, GRADE 60 (FY 60,000 Psi).

5- CLEAR COVER REINFORCEMENT
   b. WALL = 50 mm
   c. SLAB = 50 mm
6- CEMENT WITH C_3A(4%~8%) SHALL BE USED FOR ALL CONCRETE WORK.
7- PROPER DEWATERING ARRANGEMENT SHOULD BE DONE BEFORE CONSTRUCTION.
8- ANY LOOSE FILL, WET SOFT LOOSE PATCH UNDER THE PIT SHOULD BE REPLACED BY WELL COMPACTED GRANULAR MATERIAL.
9- THE BED OF HANDHOLE/PIT SHOULD BE LEVELLED & SAND BEDDED.
10- F.G.L IS EQUAL TO R.L /E.G.L.
11- THERE SHOULD BE A ENGRAVED FACTORY SERIAL NUMBER INISDE OF HANDHOLE/ WALL .
12- HANDHOLE SHALL BE PROVIDED ON SIDE / EDGE OF ROAD OR ON FOOT WAY.

2.2.3 TYPE-II PRECAST HANDHOLE DETAILS



QUANTITIES

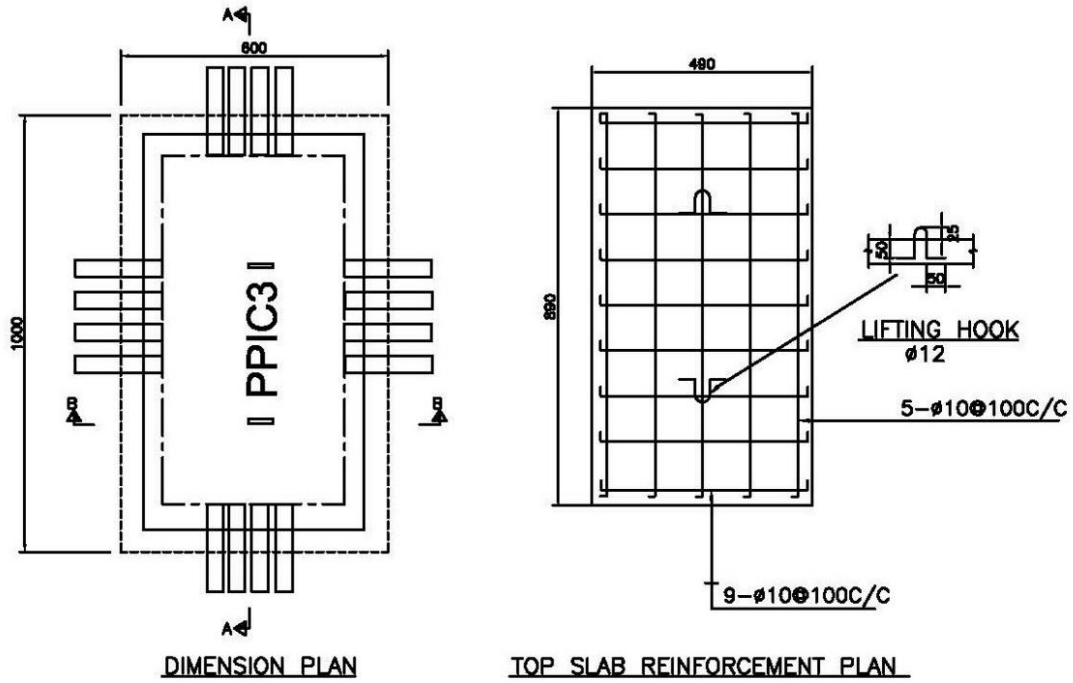
NOS.	DESCRIPTION	UNIT	QUANTITIES
1	EXCAVATION	CU.M	0.567
2	R.C.C	CU.M	0.390
3	REINFORCEMENT	KG	42
4	STEEL STRUCTURE	KG	12

NOTE: 1.THIS TYPE OF HAND HOLE IS FOR THE LOCATION WHERE NORMAL HAND HOLE (3'x3'x3') CAN'T PLACE DUE TO DEPTH ISSUE, e.g. UNDER GROUND SERVICES,etc.

NOTES:

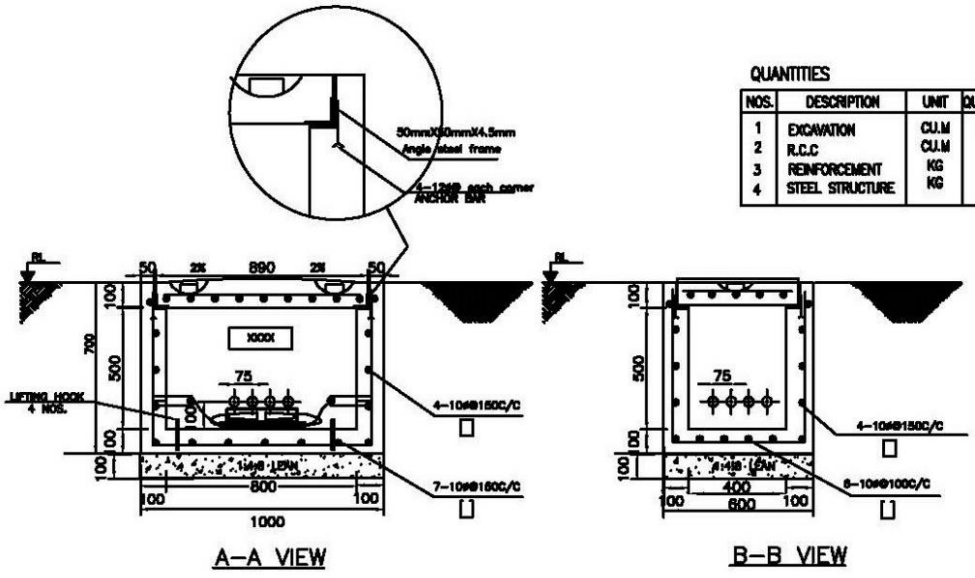
1- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2- WATER IS NOT ENCOUNTERED (ASSUMED) BELOW E.G.L.
3- ALL REINFORCED CONCRETE CUBE STRENGTH SHOULD BE AT LEAST 3750 PSI HAVING MIX RATIO 1:1.5:3.
4- ALL REINFORCEMENT BAR SHALL BE HOT ROLLED STEEL BARS CONFIRMING TO A.STM SPECIFICATION A615, GRADE 60 (FY 60,000 Psi).
5- CLEAR COVER REINFORCEMENT
   b. WALL = 50 mm
   c. SLAB = 50 mm
6- ORDINARY PORTLAND CEMENT(OPC) SHALL BE USED FOR ALL CONCRETE WORK.
7- PROPER DEWATERING ARRANGEMENT SHOULD BE DONE BEFORE CONSTRUCTION.
8- ANY LOOSE FILL, WET SOFT LOOSE PATCH UNDER THE PIT SHOULD BE REPLACED BY WELL COMPACTED GRANULAR MATERIAL.
9- THE BED OF HANDHOLE/PIT SHOULD BE LEVELLED
10- F.G.L IS EQUAL TO R.L /E.G.L.
11- THERE SHOULD BE A FACTORY SERIAL NUMBER INISDE OF HANDHOLE/ WALL .
12- HANDHOLE SHALL BE PROVIDED ON SIDE / EDGE OF ROAD OR ON FOOT WAY.
13- OFC CABLE WILL BE LOOP AT THE BOTTOM AND JOINT BOX WILL BE PLACED IN MIDDLE IF ANY
14- SURFACE FLATNESS DEVIATION OF 8MM ALLOWED
15- BASIC AXIS OFFSET DEVIATION OF 10MM ALLOWED EMBEDDED PART AXIS OFFSET DEVIATION OF 5MM ALLOWED
16- NO MAJOR CELL HOLES
17- LEAN CONCRETE CYLINDER 28 DAYS STRENGTH NOT LESS THAN 1500PSI
18- THE SUPPORTING SOIL BENEATH LEAN SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR DENSITY
19- THE ANGLE IRON STRENGTH PREFER TO BE A-36 STANDARD, AND WELD PREFER AS PER E60XX STANDARD

2.2.4 TYPE-III PRECAST HANDHOLE DETAILS



QUANTITIES

NOS.	DESCRIPTION	UNIT	QUANTITIES
1	EXCAVATION	CU.M	0.420
2	R.C.C	CU.M	0.3
3	REINFORCEMENT	KG	27
4	STEEL STRUCTURE	KG	16



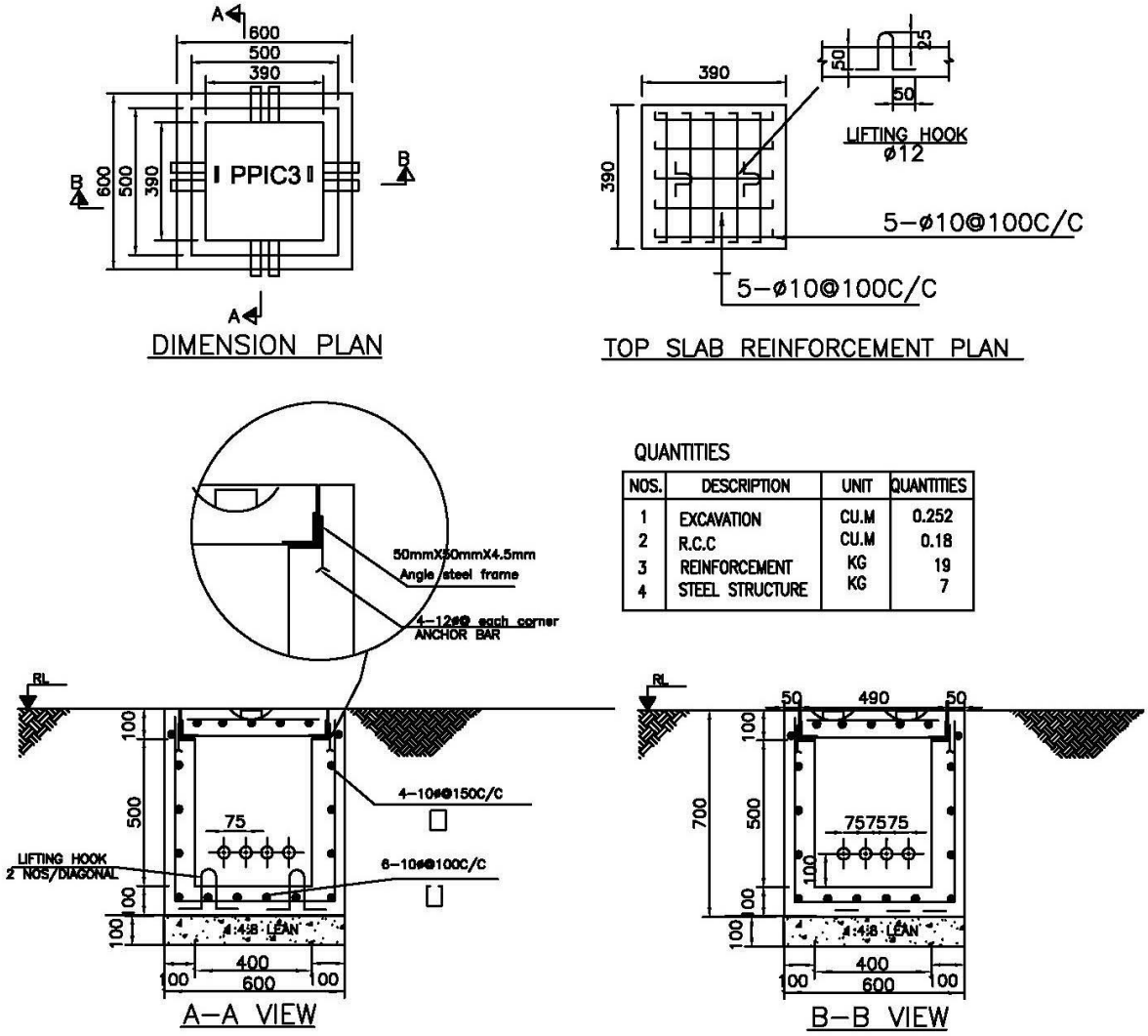
NOTE: 1.THIS TYPE OF HAND HOLE IS FOR THE LOCATION WHERE IS VERY NARROW, AND ALSO HAVING DEPTH ISSUE, NORMAL HAND HOLE (3'x3'x3') CAN'T BE PLACED.

NOTES:

1– ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2– WATER IS NOT ENCOUNTERED (ASSUMED) BELOW E.G.L.
3– ALL REINFORCED CONCRETE CUBE STRENGTH SHOULD BE AT LEAST 3750 PSI HAVING MIX RATIO 1:1.5:3.
4– ALL REINFORCEMENT BAR SHALL BE HOT ROLLED STEEL BARS CONFIRMING TO A.STM SPECIFICATION A615, GRADE 60 (FY 60,000 Psi).
5– CLEAR COVER REINFORCEMENT
   b. WALL = 50 mm
   c. SLAB = 50 mm

6- ORDINARY PORTLAND CEMENT(OPC) SHALL BE USED FOR ALL CONCRETE WORK.
7- PROPER DEWATERING ARRANGEMENT SHOULD BE DONE BEFORE CONSTRUCTION.
8- ANY LOOSE FILL, WET SOFT LOOSE PATCH UNDER THE PIT SHOULD BE REPLACED BY WELL COMPACTED GRANULAR MATERIAL.
9- THE BED OF HANDHOLE/PIT SHOULD BE LEVELLED
10- F.G.L IS EQUAL TO R.L /E.G.L.
11- THERE SHOULD BE A FACTORY SERIAL NUMBER INISDE OF HANDHOLE/ WALL .
12- HANDHOLE SHALL BE PROVIDED ON SIDE / EDGE OF ROAD OR ON FOOT WAY.
13- OFC CABLE WILL BE LOOP AT THE BOTTOM AND JOINT BOX WILL BE PLACED IN MIDDLE IF ANY
14- SURFACE FLATNESS DEVIATION OF 8MM ALLOWED
15- BASIC AXIS OFFSET DEVIATION OF 10MM ALLOWED EMBEDDED PART AXIS OFFSET DEVIATION OF 5MM ALLOWED
16- NO MAJOR CELL HOLES
17- LEAN CONCRETE CYLINDER 28 DAYS STRENGTH NOT LESS THAN 1500PSI
18- THE SUPPORTING SOIL BENEATH LEAN SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR DENSITY
19- THE ANGLE IRON STRENGTH PREFER TO BE A-36 STANDARD, AND WELD PREFER USE E60XX ELECTRODE

2.2.5 TYPE-VI PRECAST HANDHOLE DETAILS



QUANTITIES

NOS.	DESCRIPTION	UNIT	QUANTITIES
1	EXCAVATION	CU.M	0.252
2	R.C.C	CU.M	0.18
3	REINFORCEMENT	KG	19
4	STEEL STRUCTURE	KG	7

NOTE: 1.THIS TYPE OF HAND HOLE IS FOR THE LOCATION WHERE IS VERY NARROW AND CONGESTED, AND ONLY FOR RELAY OF FIBER PULLING
2.THIS TYPE OF HAND HOLE IS ONLY FOR PULLING CABLE PURPOSE.

NOTES:

1- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2- WATER IS NOT ENCOUNTERED (ASSUMED) BELOW E.G.L.
3- ALL REINFORCED CONCRETE CUBE STRENGTH SHOULD BE AT LEAST 3750 PSI HAVING MIX RATIO 1:1.5:3.
4- ALL REINFORCEMENT BAR SHALL BE HOT ROLLED STEEL BARS CONFIRMING TO A.STM SPECIFICATION A615, GRADE 60 (FY 60,000 Psi).
5- CLEAR COVER REINFORCEMENT
   b. WALL = 50 mm
   c. SLAB = 50 mm
6- ORDINARY PORTLAND CEMENT(OPC) SHALL BE USED FOR ALL CONCRETE WORK.

7- PROPER DEWATERING ARRANGEMENT SHOULD BE DONE BEFORE CONSTRUCTION.
8- ANY LOOSE FILL, WET SOFT LOOSE PATCH UNDER THE PIT SHOULD BE REPLACED BY WELL COMPACTED GRANULAR MATERIAL.
9- THE BED OF HANDHOLE/PIT SHOULD BE LEVELLED
10- F.G.L IS EQUAL TO R.L /E.G.L.
11- HANDHOLE SHALL BE PROVIDED ON SIDE / EDGE OF ROAD OR ON FOOT WAY.
12- SURFACE FLATNESS DEVIATION OF 8MM ALLOWED
13- BASIC AXIS OFFSET DEVIATION OF 10MM ALLOWED EMBEDDED PART AXIS OFFSET DEVIATION OF 5MM ALLOWED
14- NO MAJOR CELL HOLES
15- LEAN CONCRETE CYLINDER 28 DAYS STRENGTH NOT LESS THAN 1500PSI
16- THE SUPPORTING SOIL BENEATH LEAN SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR DENSITY
17- THE ANGLE IRON STRENGTH PREFER TO BE A-36 STANDARD, AND WELD PREFER USE E60XX ELECTRODE

2.3 Road cutting

When in the place where the bore/drilling to cross road is not possible because the soil too hard. Or at those place where there is no any space for excavation at side of road. Road cuts will be allowed on prior approval of the relevant authority and Employer.

The cutting should use cutter and should try to make the cutting width as narrow as possible to fulfill the pipe laying in required depth. The width of the cut should be maintained straight. The cut width should be less than 10cm and the depth should be less than 30cm. When the cutting is on main fast track roads, additional GI pipe should be laid to protection the HDPE pipes. When the cut is on service roads or other residential region roads, HDPE pipes can be directly laid in the trench. The cut should be done as night to avoid traffic jam issue. And warning lights and traffic control must be provided. After pipe laid, same excavated materials should be filled back into the trench. And on top of the trench, 5cm thickness asphalt concrete or 1:2:4 concrete should be poured to seal the surface as per road authorities' requirements. For convenience, we call above method as "mini-trench"

Another technique, "micro-trench" technique can also be used when crossing asphalt road once provided with professional machineries. With the machine, the trench can be minimized to 1-2cm width, and the depth will be less than 30cm.Micro ducts with diameter only 1-2cm will be laid in the trench. Similar backfill method as above mentioned will be performed.

2.4 Reinstatement

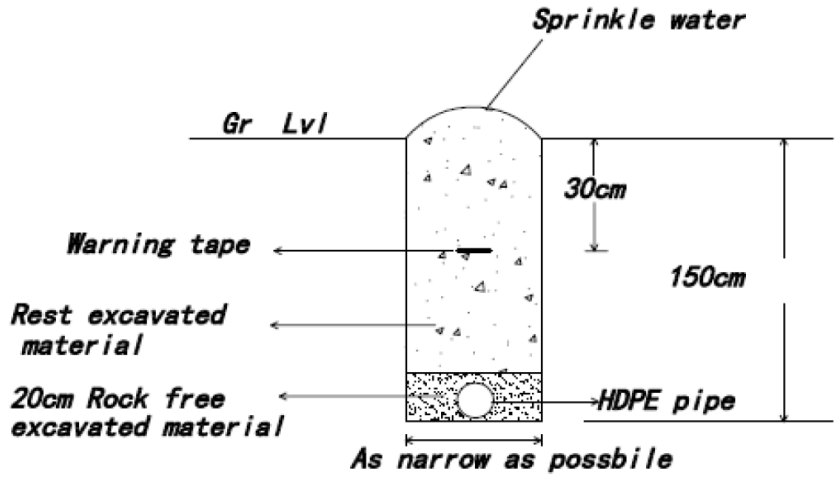
All the trenches should be reinstated back to original and as per the approve design by the concern Authority. When the excavation is on the concrete/asphalt/pavement, 90% compaction need be done

before re-instatement the surface to prevent settlement. Debris should be removed after the work. Trench should not be backfilled with the debris to avail the 90% of compaction.

Cable installation along Road way shall strictly observe the following requirements for the following trench sections:

- Normal soil surface/Markable soil surface
- Concreted surface at side of road/ inside of important building boundary
- Asphalt cutting along normal asphalt road
- Tuff Tiles on footpath
- Road cut perpendicular cross asphalt road with Mini-trench on main fast track Main Roads
- mini-trench
- Road cut cross asphalt roads by normal trench

2.4.1 Normal soil surface/Markable soil surface



Normal soil surface/Markable soil surface

Note:

1.If depth can't reach design depth due to underground services, after vet by PSCA

1.1 Backfill and reinstate as per sketch as per above sketch If Depth >2ft

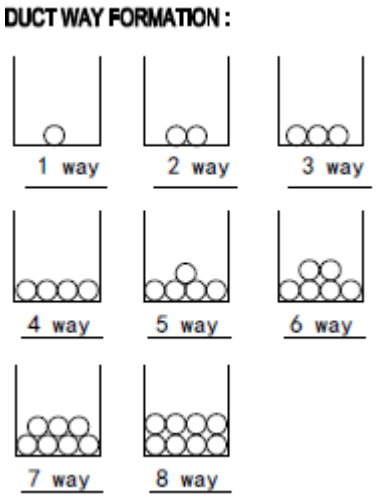
1.2 Pour extra 15cm PCC If 1ft<Depth<2ft, then backfill and reinstate as per sketch

1.3 Put GI protection+15cm PCC If Depth<1 ft

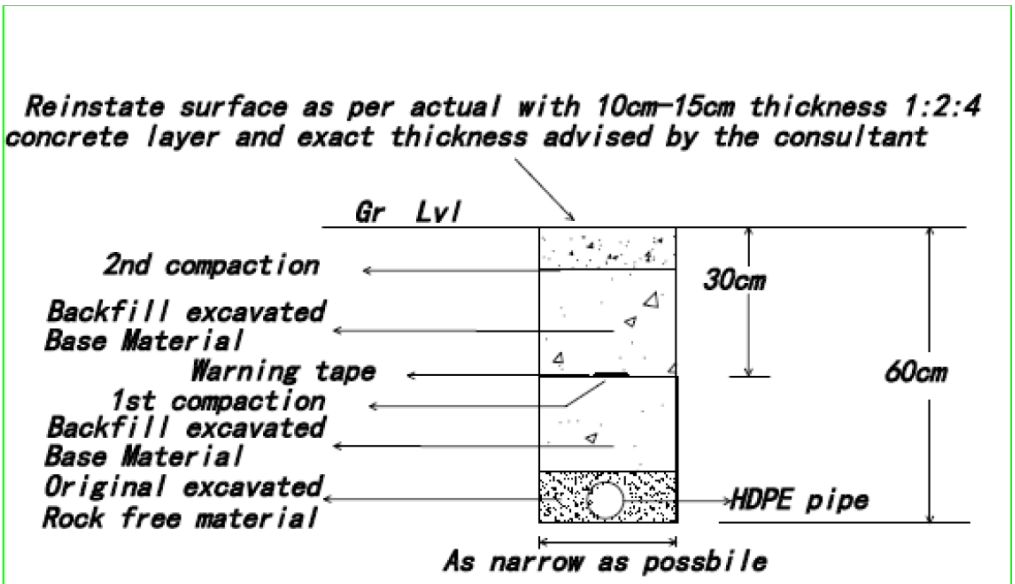
2. If settles, put extra soil on the top

General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.



2.4.2 Concreted surface at side of road/ inside of important building boundary



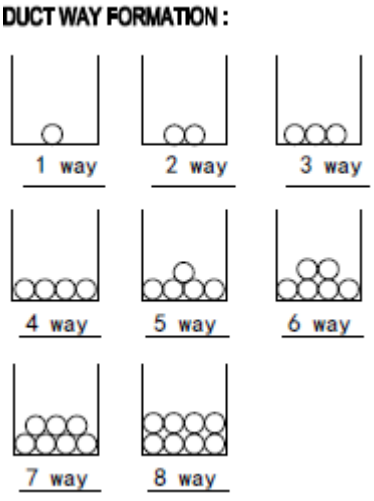
Concreted surface at side of road/ inside of important building boundary

Note:

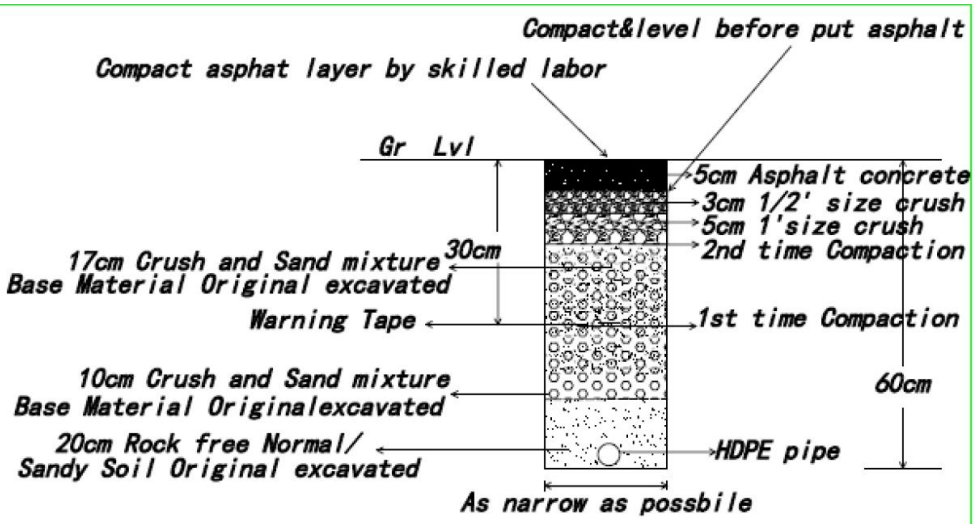
1. Cutter is mandatory to cut the surface in a straight smooth mode
2. Soil underground shall be excavated layer by layer and placed along trench seprately so that can be placed back layer by layer as per orlginal sequence
3. Must compact layer by layer to avoid settlement.
4. If depth can't reach design depth due to underground services, after vet by PSCA
   - 4.1 Backfill and reinstate as per sketch as per above sketch If Depth >1ft
   - 4.2 Pour extra 15cm PCC if $\frac{1}{2}$ ft<Depth<1ft, then backfill and reinstate as per sketch
   - 4.3 Put GI protection+10cm PCC If Depth<=$\frac{1}{2}$ ft

General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.



2.4.3 Asphat cutting along normal asphalt road



Asphat cutting along normal asphalt road

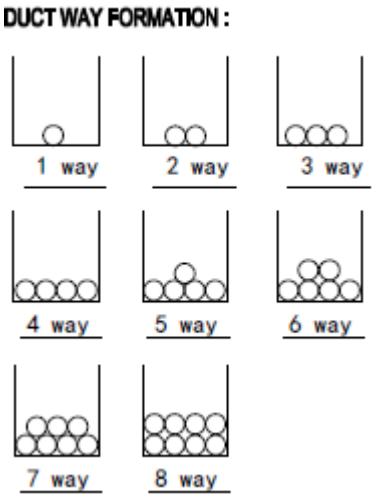
Note:

1. Cutter is mandatory to cut the surface in a straight smooth mode
2. Soil underground shall be excavated layer by layer and placed along trench seprately so that can be placed back layer by layer as per original sequence
3. Must compact layer by layer to avoid settlement.
4. If depth can't reach design depth due to underground services, after vet by PSCA

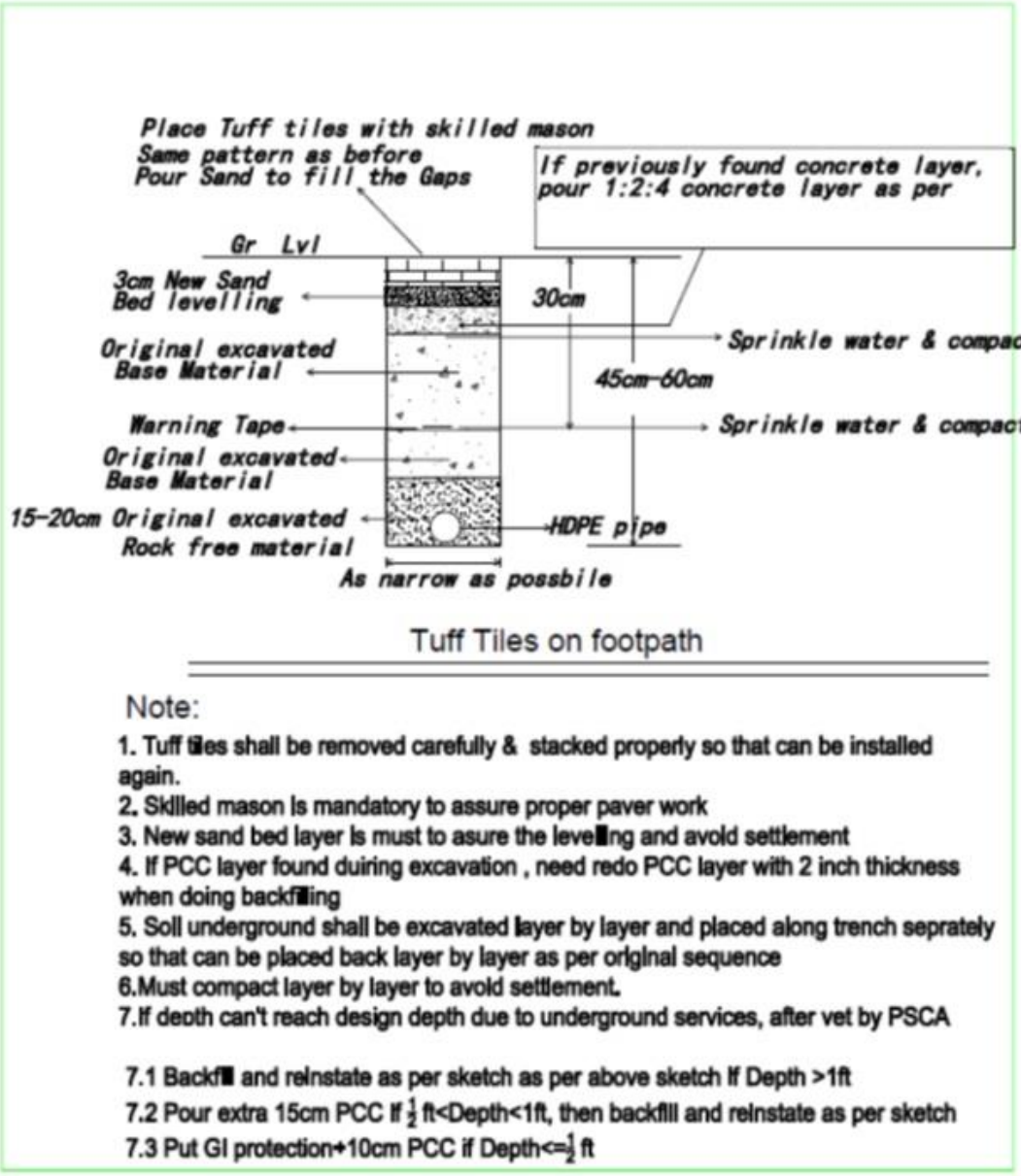
4.1 Backfill and reinstate as per sketch as per above sketch if Depth >1ft
4.2 Pour extra 15cm PCC if $\frac{1}{2}$ ft<Depth<1ft, then backfill and reinstate as per sketch
4.3 Put GI protection+10cm PCC if Depth<=$\frac{1}{2}$ ft

General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.

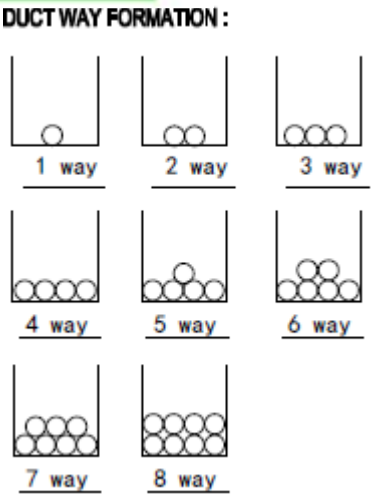


2.4.4 Tuff Tiles on footpath

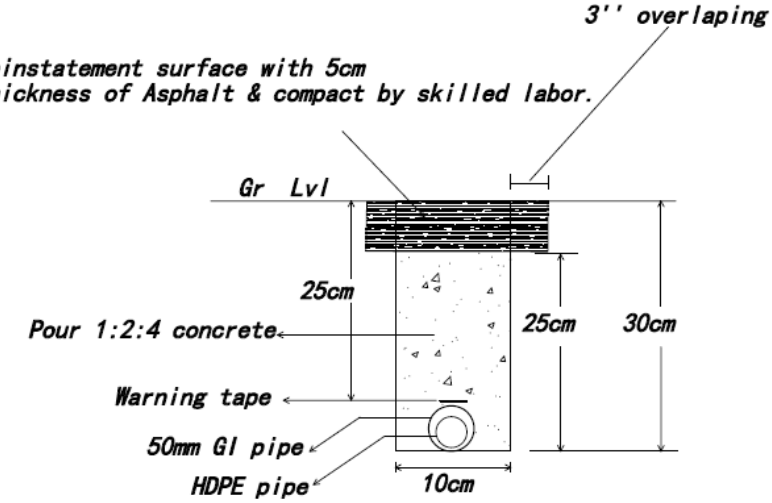


General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.



2.4.5 Road cut perpendicular cross asphalt road with Mini-trench on main fast track Main Roads



Road cut perpendicular cross asphalt road with Mini-trench on main fast track Main Roads

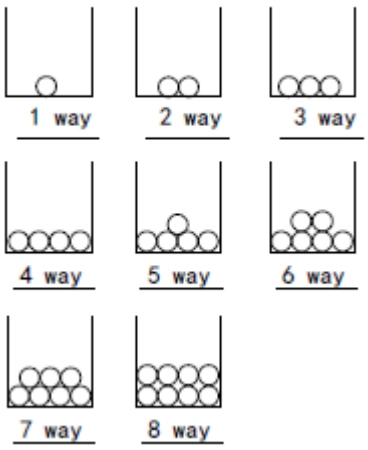
Note:

1. Cutter is mandatory to cut the surface in a straight smooth mode
2. Trench bottom shall be cleaned for laying pipe properly
3. 1:2:4 concrect shall be mixed and poured and pre-caution measures shall be taken to avoid people step in it before cured.
4. Top asphalt layer shall be poured and compact to same level by skilled labor.

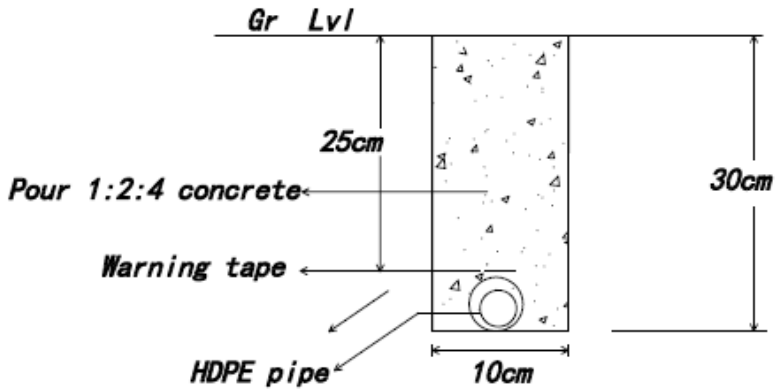
General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.

DUCT WAY FORMATION :



2.4.6 Road cut cross roads other than main road fast tracks by mini-trench / Or along the very congested Roads (e.g. Ashura City area) where normal trench can't work



Road cut cross roads other than main raod fast tracks by mini-trench / Or along the very congested Roads(e.g. Ashura Walled City area) where normal trench can't work

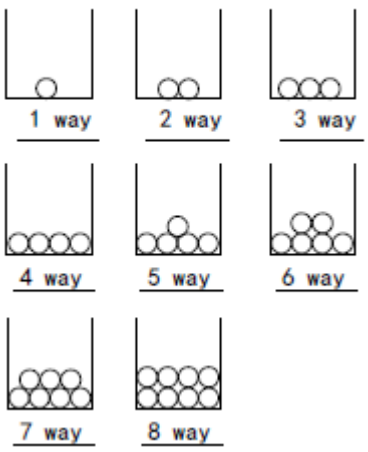
Note:

1. Cutter is mandatory to cut the surface in a straight smooth mode
2. Trench bottom shall be cleaned for laying pipe properly
3. 1:2:4 concrect shall be mixed and poured and some pre-caution measures shall be taken to avoid people step in it before curing.

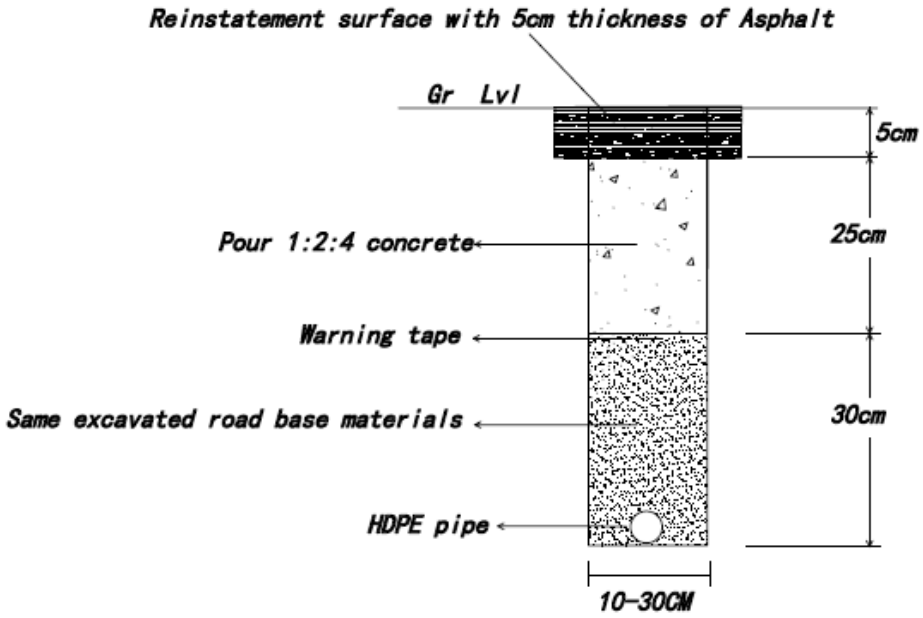
General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.

DUCT WAY FORMATION :



2.4.7 Road cut cross asphalt roads by normal trench



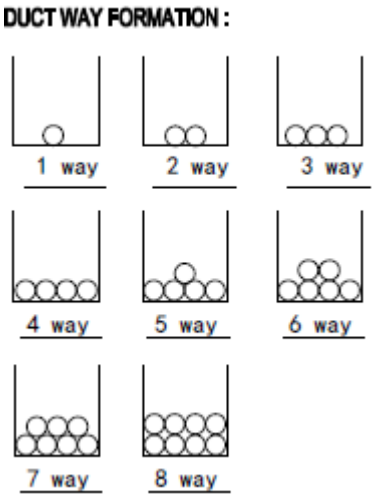
Road cut cross asphalt roads by normal trench when allowed by road authorities

Note:

1. Cutter is mandatory to cut the surface
2. Trench bottom shall be cleaned for laying pipe properly
3. 1:2:4 concrect shall be mixed and poured on site
4. Pre-caution measures shall be taken to assure traffic safety

General Notes

- Similar depth level in section between two hand holes shall be maintained to avoid bumpy pipe shape to smooth the cable pulling.
- Trench alignment shall try best to avoid zig zag shape to smooth the cable pulling.
- During the excavation and backfill, reinstatement, standing-by inspection shall be done on site by PSCA representative and bidders representative to verify the quality and quantity and record the inspection result on checklist (trench & Quality).
- After work completion, debris shall be removed.



2.5 Laying Pipe

The pipe should be laid straight at the center of the trench. And the pipe should not twist, squeeze or break. Couplers are must when doing the pipe junction work.

All new duct installations shall be provided on the basis of the number of conduits required for cable installation based on a 40% fill ratio, an additional spare conduit shall be provided on each new route.

Mandrel testing of all new ducts shall be completed prior to installation of cables.

Conduits allocated for cable installation as part of the PPIC3 building installation shall be sub-ducted to maximize cable installation density and to ensure ease of cable installation without snagging. Sub-duct sizes shall be calculated by the contractor based on the fiber optic design and submitted to the client for approval prior to installation. Approved sub-duct products include any combination of solid wall smooth bore sub-duct and flexible fabric multi-cell product. All conduits shall be provided with a draw rope in preparation for cable installation, the rope shall be replaced whenever a cable is installed.

2.6 Horizontal Directional Drilling (HDD)

HDD bore can be used at that place where manual bore can't accomplish the work. Test pits will be done first to check the underground facilities. The depth of drilling should be calculated first. The length of HDD is as per the underground curve length.1 In very simple terms, HDD is a drilling process where a drill head is steered underground. This method is adopted by all companies but habitually, subcontracted to specialists.

HDD is the preferred method to cross roads, highways, railway lines, Rivers and all other services that may prove to be too dangerous or costly to cross using conventional methods like trenching and/or ploughing.

The depth of any hole drilled for the installation of a new service, must be at least 800mm below surface of the road, or as per client spec.

In what follows, a brief overview on the 3 installation stages:

a. Pilot drilling

b. Reaming the initial pilot hole

c. Pulling back the duct in the reamed hole

The course of the drill is monitored and can be controlled as rods progress following an upward sloping path, before emerging at an intended point.

The drill head is then removed and replaced with a back reamer, ± 20% larger than the duct or cable to be pulled into the hole.

The duct is attached to a swivel connection on the back reamer. The drill-rods and reamer are rotated and pulled through the hole, enlarging it and pulling-in the duct at the same time. The whole operation is carried out with pressurized drilling mud, which both carries away the spoil and supports the hole.

Rigs capable of drilling up to 300 meters in one drill are available and various sizes of ducts can be installed with this equipment.

At river crossings the distance between the bottom of the water and the drilling hole should be 10-times the diameter of the pipe and not less than 3m.

Soil removal during the drilling process is the responsibility of the contractor.

If the accuracy of the drilling is not specified in the wayleave, the area in which the drilling may wander should not exceed a 40mm diameter around the predetermined axis.

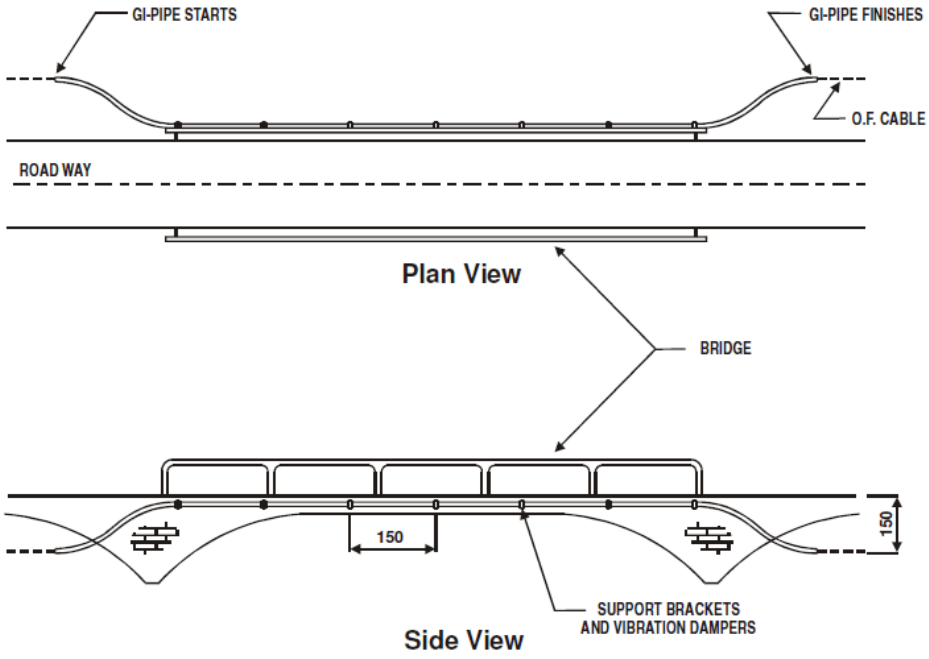
As always, the location and depth of underground services must be pre-determined before drilling can commence - as sudden deviations are not possible to bypass obstacles.

2.7 Manual bore

Manual bore can be used for crossing road where the soil condition is suitable for manually drilling. When crossing gates/ private lands where the owner not allowing excavation, manual bore can be performed and HDPE pipes can be fixed through the bored holes. For those small roads where no heavy vehicle passes, HDPE pipe can be used in the bore. For those bore performed under the big road/ highway/rail way etc. G.I pipe can be used to protect cable. The depth of all kind of manual bore should be same depth as the trench depth before and after bore.

2.8 Bridge /Nulla Attachment

If bridge construction that does not have a pipe or channel, then GI Pipe should be attached to a solid and suitable section of bridge structures. Attachments required to secure the GI-Pipe have to be designed to suite the structure of the bridge.

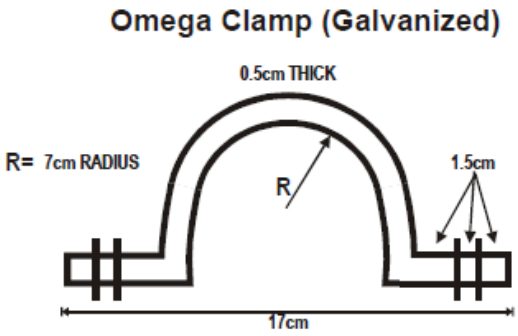


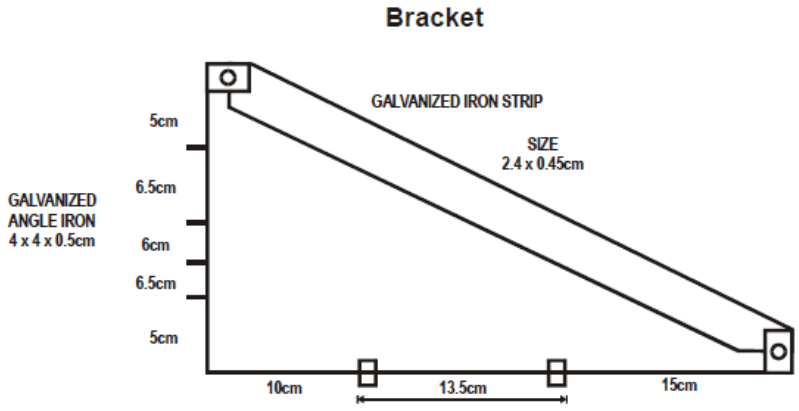
Note: All dimensions are in cm.

Figure 3-1 Attachment on bridge

When crossing short bridge/nulla(<20M), can use omega clamp (galvanized) directly fix the pipe, when laying more than 1 pipe or bridge/nulla length is long (>20M), brackets should be used. Below is the specification for omega clamps and brackets.

When using GI pipe for bridge attachment, pre-bend GI is required at the start and end point of the attachment to extend the GI into underground.

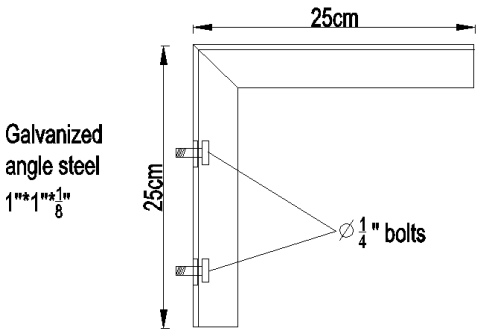




2.9 Wall Attachment

In the scenario where especially in some important building /yard, where the owner or authorities in charge are not allowing any excavation in their premise. Flexible OFC laying way is allowed in these cases.

When using duct type OFC, cable can be laid by wall attachment with PVC/ Corrugated PVC pipe/Corrugated GI pipe on the building / side wall to reach the site. The clamps should be fixed at every 1m interval. And at the turning point, corrugated PVC pipe is using to keep the bending diameter of OFC.



Wall mount brackets for aerial cable

When fixing an "8" figure or ADSS aerial cable along the wall, below" L" type galvanized steel brackets can be used to fix on the wall and attach the cable on the bracket.

2.10 Cross through channel

When there is channel available on the bridge for cable laying, the channel can be utilized prior to employer's approval.

The following steps shall be followed:

- Remove all dirt and stone in channel
- Excavate normal trench approaching the channel.
- Install GI-Pipe from excavated trench through the channel to the trench on the other side of the bridge
- Secure the GI-Pipe Pipe in the channel.
- Back fill the remaining section of the trench including cable and marking tape.

2.11 Cross through sewer

The trenchless techniques after consulting the relevant institutions are only allowed by Bidder for road crossing OFC installation. The installation of optical cables inside sewer ducts is compulsory wherever the ducts are available.

For the use of inside sewer ducts, the sewer assessment is much needed and the following information shall escort the permit application:

- Applicable sewer pipe diameter
- Position in the sewer
- Maintenance feasibility of the sewer

- Risk of blockage
- Upgrading of the optical network
- Maximum number of cables and fibers
- Flexibility of the optical network
- Access to optical network
- Cable type

2.12 Entry into building

Ducts leading into buildings shall be sealed against the entry of gas, water and vermin.

2.13 PCC protection

Detail PCC protection rules as per the design attached in ANNEX1-G01.

2.14 G.I protection

Detail GI protection rules as per the design attached in ANNEX1-G01.

2.15 HDPE pipe

Duct Size: 63mm

Outer diameter: 53mm

Inner dia 55mm

Wall Thickness: 4mm

Standard Lengths of Coils: 125M/250M/1000 M

The HDPE pipe should be red color

The HDPE pipe should be printed with text “PPIC3” and manufacturer name at 1m interval. And the pipe length count number should be printed on the pipe with 1m interval.

All installed ducts shall be smooth.

The raw material can be original.

2.16 HDPE Lab Tests:

Mentioned below are the Mandatory Lab Tests for HDPE Pipe:

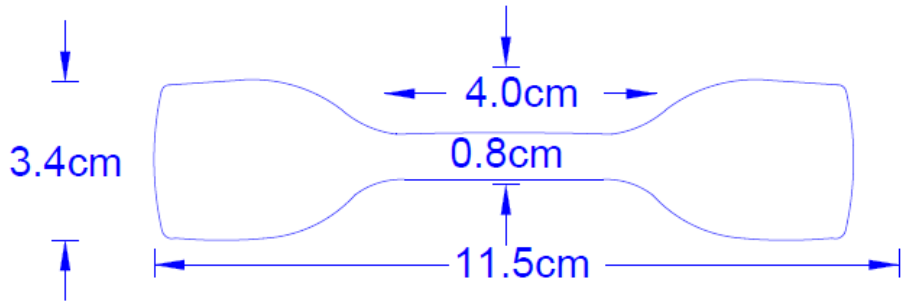
1. Density
2. Tensile Strength
3. Impact Test
4. Material evaluation in terms of identification of base polymer

5. Elongation Test

Whenever one of the batch of HDPE ready for dispatch from the manufacture, the batch size is depending on the delivery plan of the requirement. For example, if planned to dispatch 40KM one time, and then the FAT will be for 40KM.

The batch size should be no less than 10KM.

2 Nos of HDPE pipe with length of 2.5 feet and 5 Nos of below type specimen need be provided together for Lab Testing :



During the on-going Civil Work, PSCA can collect samples without any intimation from the field and will take sealed samples to Laboratory for Testing. If the Test will be failed the Manufacturer will be black listed.

If the factory manufacture big bunch ready for one time FAT (e.g 30KM,50KM like this), will arrange in-factory inspection.

When HDPE is ready, Bidder will request Consultant /PSCA to go to factory to do the joint FAT of pipes. Below checklist will be filled in factory after inspection. In this time, if the factory has own laboratory, consultant can choose also do a lab test in their factory.

HDPE FACTORY INSPECTION CHECKLIST

FACTORY NAME	Subcon Company:	Factory Location:

NO	Description	Specification sheet	Inspection Method	Remarks
1	HDPE Outer Diameter-	☐Yes ☐No	Measure with vernier caliper	
2	HDPE Inner Diameter-	☐Yes ☐No	Measure with vernier caliper	
3	HDPE Thickness =	☐Yes ☐No	Measure with vernier caliper	
4	Printing on the PIPE as per Specification	☐Yes ☐No	Visual Check	
5	Is HDPE Partially Damage/Bend on it.	☐Yes ☐No	Visual Check	
6	HDPE Pipe color as per specification	☐Yes ☐No	Visual Check	
7	HDPE Pipe wall smooth	☐Yes ☐No	Touch Check	

HDPE QUANTITY DETAIL

Date	
HDPE QTY inspected(coil X Length of per coil) :	
Sub con Rep (Name)	Sub con Rep (Signature)
Bidder QC Engineer (Name)	BidderQC Engineer (Signature)
Bidder Site Engineer (Name)	Bidder Site Engineer (Signature)
Customer Rep (Name)	Customer Rep (Signature)

Inspection Sheets

These inspections sheets are for reference

Sr. NO	NAME OF THE TEST	STANDARD REQUIREMENTS	RESULT (Plasco)	REMARKS
1	SUPERFICIAL APPEARANCE	All sides/end of the pipe should be cleaned when viewed with necked eye.There should not be any damage on pipe.	All sides are smooth, clean and shiny.	Satisfactory
2	DENSITY	0.93 to 0.946 gm/cm³ As per ISO 1183	0.94 gm/cm³	Satisfactory
3	Wall Thickness	Standard W.T W.T Min:3.5mm Max: 3.6mm	3.48 mm (Avg)	Satisfactory
4	Outside Dia (mm)	According to Standard Min—40mm	40.01 mm (Avg)	Satisfactory
5	Elongation at Break	As per ISO 527, At 23°C it should be more than 350%	706%	Satisfactory
6	Tensile Strength	As per ISO 527 and Borouge HDPE Data Sheet ≤ 23 MPa	25.5 N/Sq mm	Satisfactory
7	Marking	As Detail Given in referred clauses	Present	Ok

2.17 PVC pipe

PVC pipe diameter should be no less than 1-1/2''

Color: Red

2.18 G.I pipe

G.I pipe using should be 50mm (inner diameter) galvanized steel pipe. The wall thickness should be 3±0.5mm.

2.19 Corrugated PVC pipe

Corrugated PVC pipe diameter should be no less than 1-1/2''. Corrugated PVC pipe will be used at last mile connectivity inside the Building areas.

2.20 Corrugated G.I. pipe

Corrugated G.I pipe diameter should be no less than 1-1/2''. Corrugated G.I Pipe will be used along the Bridge Attachments or outside at Building entry points along the wall.

2.21 Warning tape

Visible tape marking shall indicate the bidder/project name and cable depth. It shall be placed along the trenches 30 cm below ground surface.

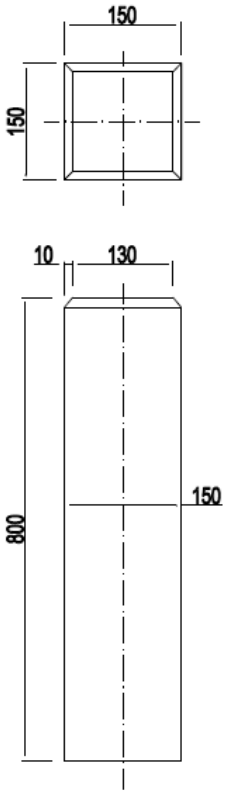
A suitable red PVC tape 0.35 mm thick and 100 mm wide shall be placed for indicating the excavators of the presence of optical fiber cable. The translation of "WARNING! O.F. CABLE" in Urdu language and project name "PPIC3" shall be printed on the tape in black letters 6 cm high and 2 cm wide at each one meter interval. The color shall be red and tape shall be 200 to 250 meter in continuous length.

2.22 Route Marker

Surface markers to indicate the route of the cables shall be planted by the road sides. These markings shall be placed at intervals of between 100m to 300m.

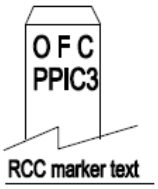
The marker is made by concrete, its shape is rectangular parallelepiped, its size is 15cm*15cm*80cm. The concrete mix ratio is 1:2:4. The steel bar is grade 40 dia.= 5mm. The steel frame is made by 4 column steel bar and 4vertical rectangle steel.

The top 30cm of marker should be painted with RED painting. And a text of "OFC PPIC3" should be graved and painted with black color. The marker should be buried in 50cm depth; 30cm should be above the ground. The interval of marker should be 100-300m as per site actual situation.



The Bar Configuration Drawing

S/N	Dimension	dia.(mm)	Length.(mm)	Qut.(pcs)
1	750	5	750	4
2	100 / 100	5	400	4
sketch drawing	175 175 175 175 / 25 25			



Main Materials Table

Sr	Steel bar(kg)	Normal Cement	Sand	Rubble	Φ0.7mm steel wire
1	Grade40 Φ5.0mm	(kg)	(kg)	Φ2-2.5cm (kg)	(kg)
2	0.75	6.2	12.4	24.8	0.025

NOTE:

1. The side with text should be faced to road.
2. The top 30cm of marker should be painted with red painting.
3. Arial type Text of "OFC PPIC3" should be graved and painted with black color. Text Heigh=50mm
4. The marker should be buried in 50cm depth; 30cm should be above the ground.
5. The concrete mix ratio is 1:2:4

Remark: If the RCC marker can't install due to the route is on pavement or asphalt , try divert forward or backward, If still not possible ,then may exempt prior to customer agree .

3 OFC Cable Work

3.1 Optical fiber specification

All fiber optic cores shall be standards compliant ensuring splice compatibility with standards compliant fiber core of the same type from different manufacturers.

All OSP fiber optic cable shall be single mode fibre cable. All ISP fibre optic cable, for example within the data center shall be OM3 multimode fiber cable unless a technology being proposed specifically requires single mode connectivity in which case the dedicated system cabling shall be installed as required.

Optical performance for standard (ITU-T G652-D) Single Mode Fibers

PARAMETER	REQUIREMENT
Attenuation coefficient at 1310 nm	≤ 0.4 dB/km
Attenuation coefficient at 1550 nm	≤ 0.3 dB/km
Optical discontinuities at 1310 and1550 nm	< 0.1 dB
Chromatic dispersion between 1285and 1330 nm	≤3.5 ps/nm·km
Chromatic dispersion at 1550	≤ 18 ps/nm· km
Cable cutoff wavelength	≤1260 nm

Optical Performance for Multimode fibers (ITU-T G651.1)

PARAMETER	REQUIREMENT
Attenuation coefficient at 850 nm	≤3.0 dB/km
Attenuation coefficient at 1300 nm	≤0.7 dB/km
Optical discontinuities at 1310 and 1550 nm	< 0.1 dB
Bandwidth Distance Product at 850 nm	≤1500 MHz.km
Bandwidth Distance Product 1300 nm	≤2000 MHz.km

3.2 OFC specification

Duct cable

The cables must be circular in cross section and free from pinholes, joints, repairs and other defects. Materials used in the construction of the cable shall not affect the physical or optical properties of the fibers and shall be compatible with each other.

The cable drum length can be 2km and 4km.

Cable sheath marking must include the manufacturer name, fiber optic core type, cable part number and meter marking. The text “PPIC3” should also be printed every 1 meter. The format example is like below:

PPIC3- FACTORY NAME-G.652D-48F-1888M

Each fibre core must be distinguishable from other fibre cores by means of color coding ink visible throughout the design life of the cable (as Defined by TIA-598D).

When the OFC enter into TE room, the cable will be protected by corrugated G.I pipe.

COLOR CODING OF FIBERS

Fiber Color	Fiber 1	Fiber 2	Fiber 3	Fiber 4	Fiber 5	Fiber 6	Fiber 7	Fiber 8
	Blue	Orange	Green	Brown	Grey	White	Red	Black
	Fiber 9	Fiber10	Fiber11	Fiber12				
	Yellow	Violet	Pink	Aqua				
Tube Color	Tube 1	Tube 2	Tube 3	Tube 4	Tube 5	Tube 6	Tube 7	Tube 8
	Blue	Orange	Green	Brown	Grey	White	Red	Black
	Tube 9	Tube10	Tube11	Tube12				
	Yellow	Violet	Pink	Aqua				

CHARACTERISTICS OF OFC

Characteristics	16 Fiber	48 Fiber	64 Fiber	96 Fiber	144Fiber
Number of Tubes	02	04	06	08	12
Number of Fiber per Tube	12 and 4	12	12	12	12
Final Cable Dia., mm	11.0 ±5%	12.0 ±5%	12.0 ±5%	13.8 ±5%	14.7 ±5%
Jelly Filled	Yes	Yes	Yes	Yes	Yes
Tensile Strength, Newton	2500	3000	3000	3000	3000
Cable Weight, Kg (Approx.) /Km	95	110	125	150	190
Tube material	PBT				
Filler material	Medium density polyethylene				

Moisture barrier	Both side polyester coated water swell able tape
CSM type	Fiber Reinforced Plastic
Strength member	CSM + Aramid Yarn
Outer sheathing material	High Density Polyethylene
Sheath thickness	2-mm +/- 10% average, min. at any point +/- 20%

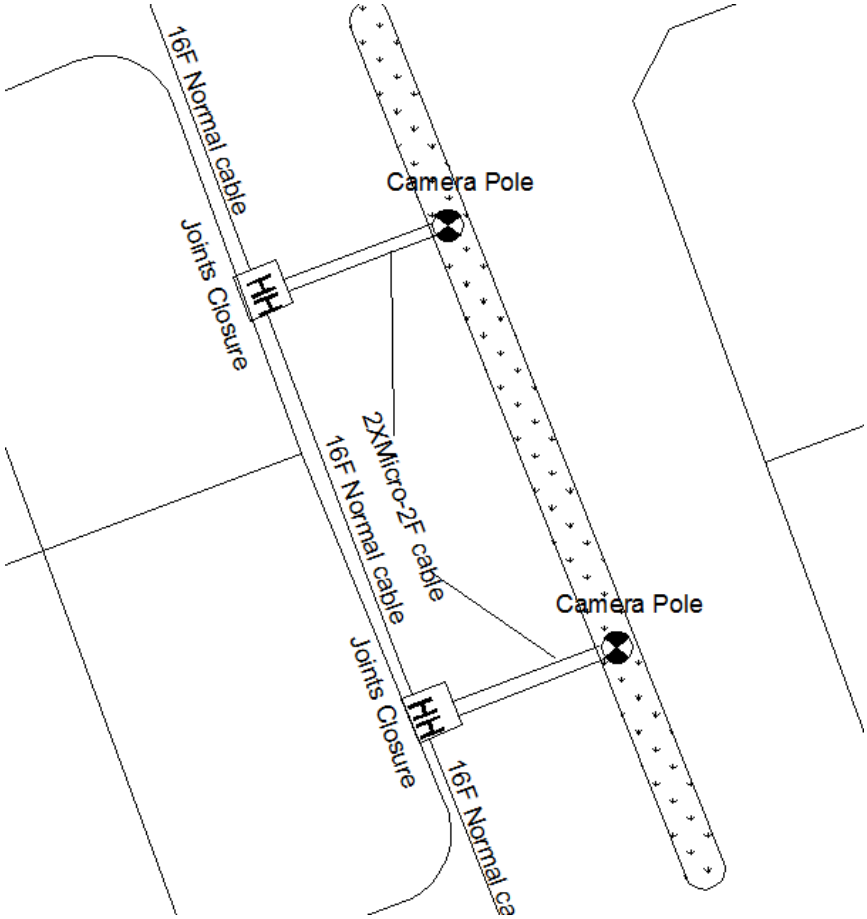
MECHANICAL PROPERTIES OF THE CABLE

Crush strength	2000 N/10 cm for 10 minute, as per IEC 794-1-E3
Temperature cycling 794-1-F1	-10 to +70 °C 02 cycles, as per IEC
Water penetration	24 hours, as per IEC 794-1-F5
Impact	5 points, as per IEC 794-1-E4
Repeated bending	50 cycles, as per IEC-794-1-E6
Torsion	2 cycles, as per IEC 794-1-E7

Beside above normal optical fiber cable, 2F outdoor micro cable also will be used for the last drop into camera poles. A joint closure will be added on the 16F access ring in the nearest hand hole and 2 pieces of 2F micro cable will be laid from the camera pole cabinet down along the camera pole body and finally reach to the joint closure. An un-cut joint will be made in the joint closures. Only the working fiber (normally is 2 fiber) will be cut and spliced with the 2 micro cable, the rest un-used fiber on the 16F cable will be continued without any cutting. These un-used fibers will work as spare fibers for future additional camera pole's connection. Normally the distance from the camera pole to this joint closure point should be less than 100M(for this joint HH to Pole section which is less than 100M, the pipe can be 1 way duct because many situation of this part need cut through road with mini-trench which not allowing too much pipe , and also because there will be no additional fiber expansion for this joint HH to pole short part.)In this case, the joint closure is likely a fiber distribution point which is supporting any new camera poles appeared nearby. This is also good for future camera expansion as well because new camera poles can be added by accessing to nearest joint closures. Or just by adding extra joint closures along the 16F cable can give access point to any new camera poles appeared along the route, no any 16F ring cable re-route needed.

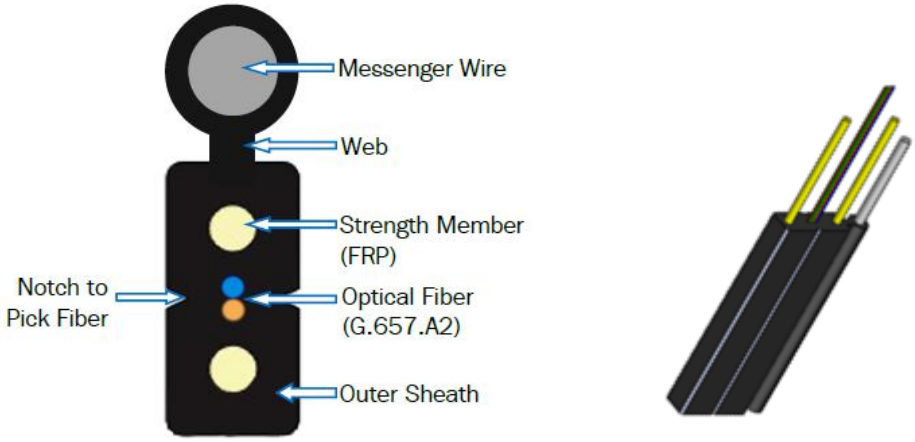
This is because micro cable has less diameter and much better bending resistance character. It can adapt the camera pole body shape. Another reason is that, normally OSP and camera site are not working in a same

progress, and camera pole location can be changed during implementation due to permission or underground facilities issues, however OSP ducts and OFC rings must be provided in advance. Above solution can resolve this issue in a very good way. Below photo shows a typical scenario of this methodology.



Below is the micro cable specification, it can be used in duct or aerial:

"Optical cable,Outdoor/indoor drop,Self-supporting ,Non-metal,Dry core,Cores,G.657 A2 ,5.0mm*2.0mm "



MICRO CABLE SPECIFICATION:

Character		Detail
Fiber	Cores	2
	Color	Blue, Orange
	Type	G.657.A2
Strength member	Material	Robust Strength Members of FRP
	Dia（mm）	0.5
	Qty	2
Steel wire	Material	Steel
Sheath	Material	Sheath of UV Resistant Jacketing Compound
	Color	Black
Cable Size（H×W）（mm）		（2.0±0.2）×（5.0±0.2）
Cable weight（kg/km）		18
Minimum bending diamter（mm）	Static(Rip off steel wire)	7.5
	Dynamic	30

OPTICAL FIBER PERFORMANCE

Characteristics	Units	Specified Values
		G.657.A2
Attenuation at 1310nm	dB/Km	≤ 0.35
Attenuation at 1550nm	dB/Km	≤ 0.20
Dispersion at 1288-1339nm	ps/nm.km	≤ 18.0
Dispersion at 1550nm	ps/√km	≤ 23.0
Cable Cut-off Wavelength	λcc	≤ 1260nm

OPTICAL FIBER PHYSICAL CHARACTERISTICS

Characteristics	Units	Specified Values
		G.657.A2
Mode Field Diameter at 1310nm	μm	8.6 ± 0.4
Core Clad Concentricity	μm	≤ 0.5
Cladding Diameter	μm	125 ± 0.7
Coating Diameter	μm	245 ± 5

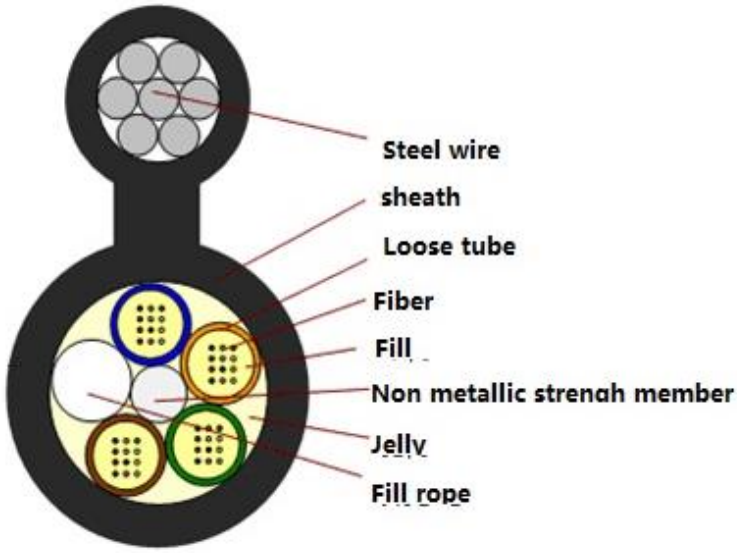
MECHANICAL & ENVIRONMENTAL CHARACTERISTICS

Tensile Load (N)	Uncabled Fibre Macrobending Loss (G.657.A2) (Rip off Messenger Wire)				Temperature Range
	Radius (mm)	Number of turns	Max. at 1550nm (dB)	Max. at 1625nm (dB)	
500	15	10	0.03	0.1	-10°C to +70°C at 100% humidity
	10	1	0.1	0.2	
	7.5	1	0.5	1.0	

Aerial cable

For aerial cable, cable or ADSS cable is applicable.

Cable type: Optical cable, Outdoor self-supporting aerial, stranded loose tube, Non-metallic strength member, Filling compound, PE sheath, Ripcord. The suspension wire type: 7 x 0.6 mm; The tensile strength is 3500N. The cable specification and formation will be same as duct cable except the suspension wire part.



For ADSS cable: can use the type designed for span distance of less than 100M.

3.3 OFC drum test

Each cable drum delivered shall include a test certificate from the manufacturer, the Cable Contractor shall complete drum tests of each drum delivered prior to installation to validate the manufacturer testing. All manufacturer test certificates shall be retained for inclusion within the administration scheme documentation. The drum number and manufacturing batch number shall be recorded in the administration scheme with the unique cable identifier reference for every cable installed.

Drum test means OTDR test on 1310nm&1550nm for each fiber of all drum of cable. The attenuation and fiber length of each core should be recorded in a form as test report.

3.4 OFC distribution

OFC cable should be distributed as per drum plan; the related information i.e batch number, drum number and the location/section assigned should be recorded in administration scheme.

3.5 OFC cable laying

Any OFC joint shall be housed inside the Man/handhole.

The pulling of the cable shall be hand assisted at each Manhole or Hand hole. The cable shall not be crushed or forced around a sharp corner. Sufficient slack shall be left at each end of the cable to allow proper cable termination. In the joint handhole, 10M slack should be looped on each side. In normal handhole where no joint, 2M slack should be kept in each handhole.

All ducts shall be installed with a pulling rope when installed. A replacement rope shall be installed whenever a new cable is installed to the duct.

For any unforeseen reason, the bidder may rent/lease exiting OFC infrastructure till the completion of PPIC3 dedicated OFC network.

3.6 OFC cable jointing

Check the line sequence of optical fiber, accord with A end to joint B end type to do junction.

The junction environment must be clean, the junction part and tool material also must be clean, to ensure the junction quality and sealing performance of sleeve.

In optical preparing, strictly prohibit using blade to wipe off coat or use fire to make end section. Professional peel tools and un-cut tools should be provided.

For jelly filled type optical cable it should use special cleanser to wipe off stuff, strictly prohibit using petrol to clean it.

It should accord with installation technique of junction sleeve to denude cable jacket, and not damage other parts of cable.

3.7 OFC cable termination in cabinet

At the end node, the cable need terminate in the cabinet as per the installation manual. The cable should be fixed in the entry. If the cabinet supports un-cut method, the un-cut tubes/fibers should be properly looped.

3.8 OFC tagging

Every cable shall be individually labeled in every chamber by the Cable Contractor in accordance with the administration scheme identifying origin, destination and unique cable reference.

The cable shall be tagged at each manhole and chamber. The label should be made by white PVC material. Its size is not less than10mm*80mm*2mm. And the label text format is “PPIC3- Cable ID SR.NO. /fiber cores” should be printed with black ink. The label should have two small holes on both end and will be tied on the cable with cable tie. For the naming principle, please refer the Annex 3. SLD template. Each cable’s start and end point with ID and cable type will be provided in SLD.

Below is an example format of tagging:

○ PPIC3 SA-OFC-OSP001 / 96F ○

For detail naming principle, please refer to Annex 2.

3.9 ODF fibre termination

The cable should be terminated on ODF rack as per design.

3.10 Duct Rodding

Rodding is used to clear the duct passage and install the pulling rope, using fiberglass pushrods. An alternative is to use air-blowing device.

a) Push the rod into the duct until the front end of the rod reaches the adjacent HH / MH.

b) Attach the pulling rope to the end of the rod at the adjacent HH / MH.

c) Next, pull the rod and pulling rope back through the duct

If the air pressure method is preferred, the pulling rope will be blown through the duct until it reaches the adjacent HH / MH.

3.11 Duct Testing and Cleaning

To clean the duct, attach a cylindrical brush or close-fitting mandrel and a second rope to one end of the installed pull rope and pull this through the duct.

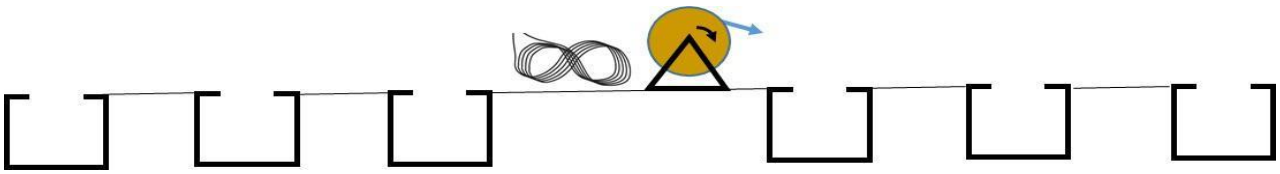
If the cable sample or mandrel cannot pass through the duct, consult with the Client on whether to switch to an alternative duct or to repair the designated duct.

3.12 Centre-Pulls and Back-feeding

One is often more hopeful than optimistic to install a whole drum of cable in one operation, when faced with hauling a long length of cable. Lubrication helps but more than often, does not completely resolve this issue. To assist with alleviating this issue, specialized techniques, such as Centre-Pulls and/or Back-feeding, can be used and applied with either the manual pull or winch methods.

Centre-Pulls

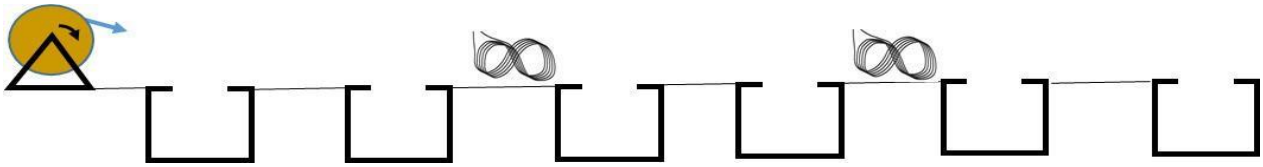
- Communication, directed by a team leader with team members positioned at each HH / MH is essential, for that the pulling action to be achieved in a synchronized manner. Communication via the use of either a walkie-talkie or two-way radio is desirable.



- In a centre-pull operation, set up the cable reel near the centre of the duct run to be pulled.
- To avoid cable rubbing against drum flanges keep the drum level - orientate the drum so that natural payoff direction is towards the pulling direction. Always use cable jacks or a cable trailer to lift the drum during the hauling process.
- Align the cable drum so that the cable can be routed from the top of the reel into the duct in as straight a path as possible.
- Make use of a flexible cable guide – placed between the HH / MH lid and duct to be used. 6 Ensure that there is a swivel between the cable sock and the hauling rope.
- Pull the cable in one direction to the intended HH / MH.
- Uncoil the remaining cable in a figure-eight configuration.
- Flip-over the figure-eight so that the pulling-eye end of the cable is on top. As mentioned previously, this can be accomplished by 3-installers, one at each end of the eight, and one at the centre.
- Pull the exposed end of the cable in the opposite direction to complete the pull. Hand-feeding of the cable paying off from the figure-eight is required.
- A warning marker (coloured tape or similar material) may be attached to the pull-line at ± 10m in front of the pulling grip to alert observers at HHs / MHs that the cable is approaching.
- Place an end cap on all bare cable ends in HHs / MHs, to prevent moisture and/or dirt intrusion.

Back-feeding

In a nutshell, back-feeding is used to provide a series of shorter, lower-tension pulls in one direction – utilizing figure-weighting, where necessary.



Pulling Tension

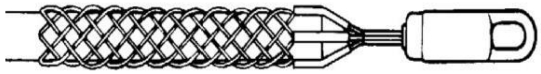
The maximum allowable pulling tension on fibre cable can vary and is dependent on the cable construction. The maximum tension for a particular cable can be found on the cable spec sheet. 2 Except for short runs or hand-pulls, tension must be monitored.

A dynamometer is to be used to monitor tension in the pull-line. The use of a breakaway swivel can be used to ensure that the maximum tension of the cable is not exceeded and should be used as a fail-safe rather than a primary means of monitoring tension. Cable lubricant is recommended for most fibre optic cable pulls as a means of lowering pulling tension.

Pulling a new fibre optic cable over an existing one is never recommended due to the possibility of entanglement.

Pulling Grips

Pulling grips provide effective coupling of pulling loads to Kevlar strength members or cable jackets. On cables with no Kevlar strength members, a wire mesh pulling grip and swivel can be used during cable pulls. A swivel must always be fitted between the hauling rope and cable sock to prevent the cable from being twisted by the hauling rope. When removing a pulling grip, 3-5 meters of adjacent cable must be cut-off and discarded.



Hauling Rope

An 8mm polyester or polyaramid pull rope must to be used for optical fibre cables that are to be pulled in by hand. When using a hauling winch, a 12,5mm or thicker polyester or polyaramid rope must be used as hauling rope. Ski-ropes manufactured from nylon are not suitable, as their stretch factor is too high and they can potentially cut into ducts. Steel hauling rope or galvanized wire must never be used as they can damage ducts and/or cables.

Duct Fill Ratios for hauling

Fill ratios are calculated by comparing the area of an inner diameter cross-section of the inner-duct to the outer diameter cross-section area of the fibre optic cable. For optimum hauling performance, it is recommended that the cable-to-duct diameter fill ratio does not exceed 40%.

3.13 OFC cable testing

After OFC cable laid and terminated, OTDR testing and OLTS testing should be performed for all the terminated fiber cores. The test should be performed at 1310nm&1150nm in bi-direction at **"EVERY FIBER CORE"**. The test result should be recorded in a test report form.

OSP acceptance procedure

OSP Civil Work Completion Inspection

The installation project should be considered as completed after validation of inspection report.

Routine on-site inspection and testing should be performed during the construction especially for those concealed work which can't be inspected after completion of the civil work.

For OSP civil work, OSP Civil Work Completion Inspection/Test can be performed during civil work for every Hand hole to handhole distance, usually it is about 100-300m. Due to the requirement from ROW authorities, the trench may not be able to keep open for long time. Prompt inspection from all related parties is required. OSP civil work checklist should be countersigned on site after inspection.

Below are the routine civil work inspection criteria:

1) The route is as per design/route plan

2) Trench depth should as per specification

3) Pipes/warning tape is as per specification

4) Man/handhole is as per specification

The work process (work flow) and the inspection checklists are attached in Annex4.

OFC Completion Test

After pulling and splicing of one section OFC cable, the routine Link wise OFC testing can be performed.

The work process (work flow) and the inspection checklists are attached in Annex4.

Test Reports for Routine Quality

Routine quality tests are the tests conducted on a regular basis, such as every cable drum to assure that manufactured items conform to specification and that the manufacturing process is under control.

In order to assure the quality of purchased cable, CONTRACTOR is required to supply Routine Quality test results/ reports as specified in this document.

Long Term Minimum Bending Radius

CONTRACTOR shall state the minimum bending radius that their fiber can sustain for 40 years' life. The minimum bending radius shall be at least 35 mm.

Loss at Small Bending Radii

In order to gain further information about the fibers bending characteristics, CONTRACTOR shall also provide graphs of bending diameter in "mm vs. attenuation (dB/Loop) for loop diameter of 100mm to 10mm in 5mm steps at 1310nm and 1550 nm wavelengths. These results are for information only and shall not be used for acceptance or rejection.

No jointed fibers are allowed in cable purchased according to this specification.

Splicing During Installation

The manufacturer shall propose splicing instruments tools and work methods to allow splices to be made in the field with an average splice loss per slice of 0.02dB for the SM cable. Maximum value of splice loss shall not exceed 0.05 dB for SM fiber.

Identification of Cable

Identification of the cable shall be repeated at maximum intervals of 300 mm. An identification tape placed longitudinally within the cable. It shall be durably marked with PSCA the manufacturer's name or trademark and the year of manufacture of the cable.

Test Reports for Quality Check

Test reports for routine quality check shall be submitted and approved in writing by the Consultant. The test reports shall clearly show which cable drums are included.

Report Contents

All reports submitted shall include the following details:

i). Manufacturers name

ii). Project number

iii). Date of delivery

iv). Fiber optic cable code

v). Identification of cable drums

The report shall include all test results in the same order as specified and shall be cross-referenced to the relevant clause in this section.

Testing Frequency

The frequency of routine quality tests required by PSCA may be categorized as follows:

i). According to the Manufacturer's Sampling Plan

ii). Every production batch or 10 drums

iii). Every cable drum

In addition to the test results required by PSCA, CONTRACTOR is responsible to ensure that the cable complies with this specification. Therefore, CONTRACTOR shall perform all additional tests necessary at appropriate frequencies to ensure the delivery of compliant cable.

Additional Requirements

CONTRACTOR shall submit the following test results according to the specifications.

Central Strength Member

Full details of the strength member including materials used, ultimate breaking strength and Young's modulus. Type of central strength sheath, if used, shall be provided.

Routine Quality Tests

Test Results to be provided according to the manufacturers, Sampling Plan

i). The fiber manufacture shall be identified

ii). Unless agreed otherwise the following fiber tests shall be performed on a sampling basis

a) Mode field diameter

b) Mode field concentricity error

c) Cladding diameter

d) Cladding non circularity

e) Coating diameter

f) Zero dispersion wavelength

g) Chromatic dispersion

h) PMD

Test Results to be Provided for Each Drum

Optical Transmission Tests on Assembled Cable

i). Attenuation coefficient in dB/Km on individual fibers at 1310 nm and 1550 nm of each drum in the assembled cable delivery length.

ii). Average attenuation of each drum length.

iii). For each individual fiber in each cable drum CONTRACTOR shall supply an optical time domain reflectometer (OTDR) trace at 1550 nm. If there are any irregularities or point losses, then a 1310 nm trace shall also be provided

Test Records

The manufacturer shall have ready availability of test records for a period of not less than five years of all tests required by these specifications in a format which identifies individual drums and is readily readable.

Cable Drum Lengths

Cable shall be supplied either in nominal lengths of 4000m specified prior to delivery.

The delivered lengths shall not be shorter than the nominal or specified length. However,5% drums could be accepted at 10% discount if length variation is within 5% of nominal length.

Each length of cable shall be wound on a separate drum.

Cable Drums

- The drums shall be sufficiently strong and constructed so as to prevent damage to the cable

during shipment and handling.

- The diameter of the drum barrel shall be large enough to prevent damage to the cables during reeling and unreeling. The diameter of the barrel shall not be less than 40 times the diameter of the cable.
- Lags or other suitable means of protection shall be applied to the drums to prevent damage to the cables during shipment and storage.
- Nails and staples use in the construction of the drums must not be placed in a position where they can damage the cables.
- The drums shall be non-returnable, unless agreed otherwise.
- The drum size shall be suitable for the size and length of the cable.
- The spindle hole shall allow the use of a 75 mm diameter spindle without handing.
- The drum size including lags shall not exceed 2.72 meters in diameter and 1.5 meters in width.
- For testing purposes, the inner end of the cable shall be recessed into a slot in the drum flange and protected by a metal cover firmly secured to the flange.
- A minimum length of 1m of cable at the inner end shall be accessible.
- The cable ends shall be securely fastened so as not to protrude beyond any portion of the drum and to prevent the cable from becoming loose during transport.

Drum Markings

Flange Marking

Details given below shall be distantly marked in a weatherproof material on both outer sides of the drum flanges:

i). PSCA

ii). Arrow showing the direction the drum shall be rolled

iii). Country of origin

iv). The label “CAUTION-OPTICAL FIBER CABLE – NOT TO BE LAID FLAT”

v). Manufacturer’s name or trademark

vi). A mark indicating the location of the inner end of the cable if located internally

3.14 OFC cable handling

Following steps shall be adopted prior to Cable installation.

Cable ends shall be sealed.

Exposed Cable shall be protected from public traffic.

Obstructions shall be anticipated by surveying.

Maximum recommended pull given by the manufacturer shall be observed to avoid the Cable damage. It is compulsory to use "Fused Swivel" on the pulling eye when the pipe is very straight, in case the pipe has bending due to geographic factors or underground obstacles then swivel can be avoided.

Minimum bend radius of OFC given by the manufacturer shall be observed to avoid attenuation due to macro bends and possible damage to Cable and Fibers. If minimum bending radius is not given, then a common practice in the industry to get the radius is by applying the following simple formula. i.e. "20 x dia. of Optical Fiber cable" See Figure 4-2.

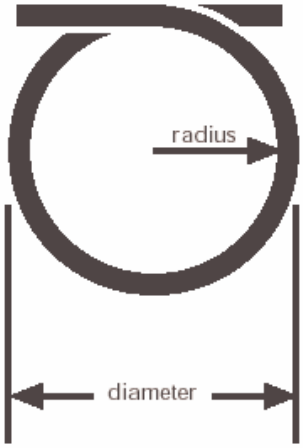


Figure 4-2 Minimum Bending Radius

Loading, unloading and moving of Optical Fiber Cable shall be done properly. Forklift shall pick the reel up with the flat side of the reel facing the driver. See Figure 4-3.

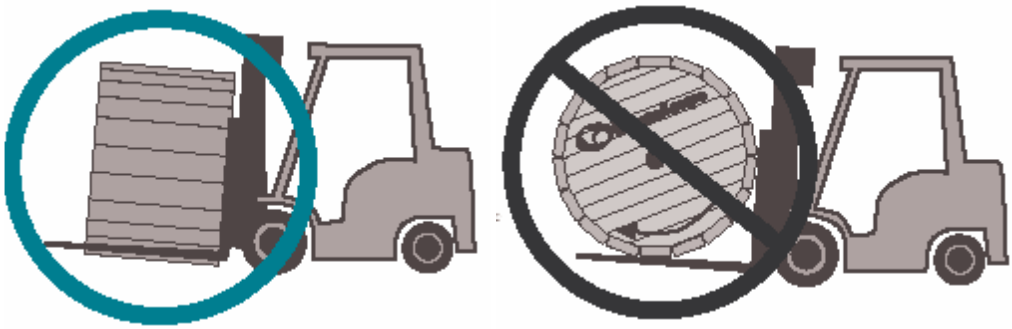


Figure 4-3 Cable Lifting

Cable drums shall always be carried on their flanges. See Figure 4-4.

Figure 4-4 Cable Carrying

Cable drums shall be rolled in direction of arrow. See Figure 4-5.

Figure 4-5 Cable Rolling

Use of nails shall be avoided on drums of cable because of varying flange thickness. See Figure 4-6

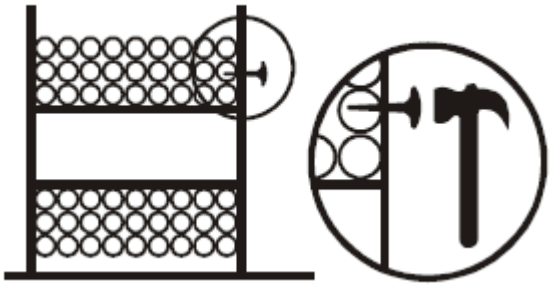


Figure 4-6 Avoid use of Nails

Bars shall always be used through the center to lift the cable drums instead of hooks to avoid accidents. See Figure 4-7.

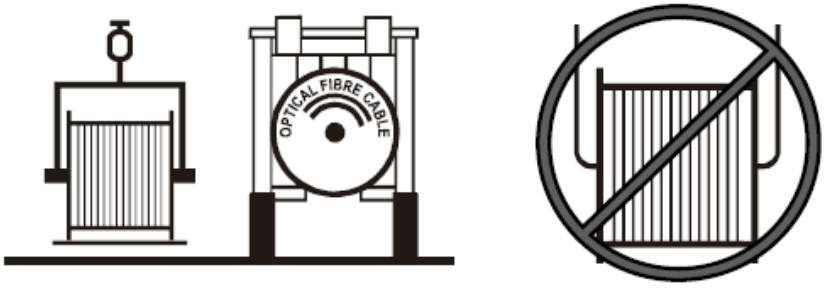


Figure 4-7 Cable Drum Lifting

Cable Drums shall not be pushed while weight still on ground or truck tray. See Figure 4-8.

Figure 4-8 Cable Drum Pushing

An appropriate stopping device shall be available to stop the rolling drums on uneven sloping ground. See Figure 4-9.

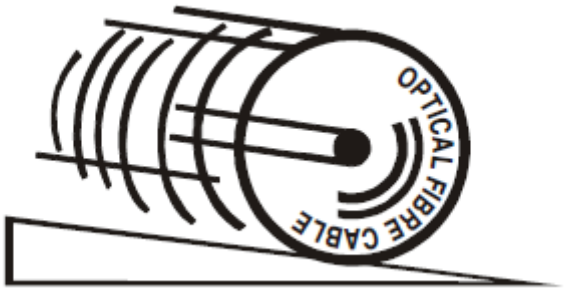


Figure 4-9 Cable Drum Pushing

Cable drums shall be restrained to restrict movement during sudden stop/start to avoid serious injury or property damage. See Figure 4-10.

Figure 4-10 Cable Drum Loading

Cable drums shall be lowered gently onto the ground or transport tray. See Fig.11.

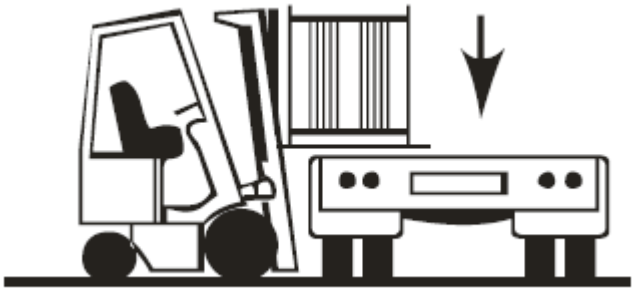


Figure 4-11 Cable Drum Handling/Placing

Cable drum shall be protected from rubbing or damage by adjusting the load or using separators. See Fig.12.

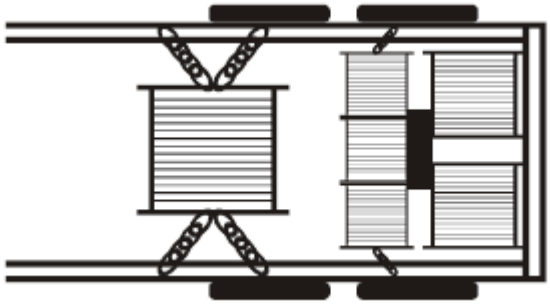


Figure 4-12 Cable Protection on the Trunk

Impact force loading shall be avoided and cable drums shall not be dropped. See Figure 4-13.

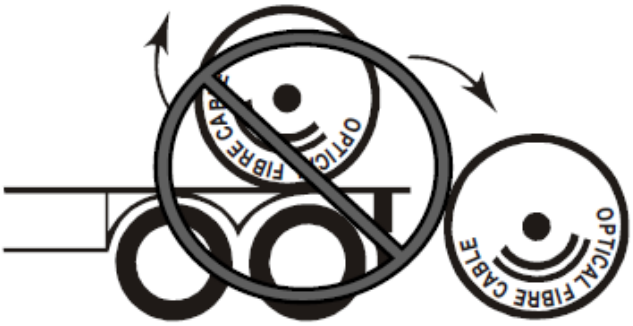


Figure 4-13 Loading/Unloading of Cable Drum

Cable drums shall be rolled On/Off manually. See Fig 14 (a & b).

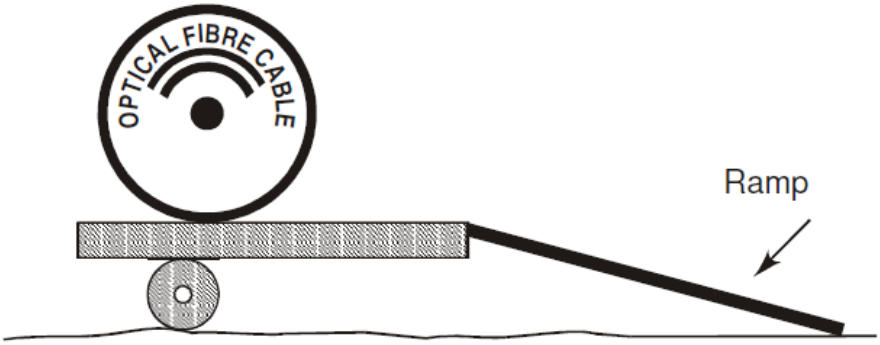


Figure 4-14 (a) Rolling on/off of Cable Drum

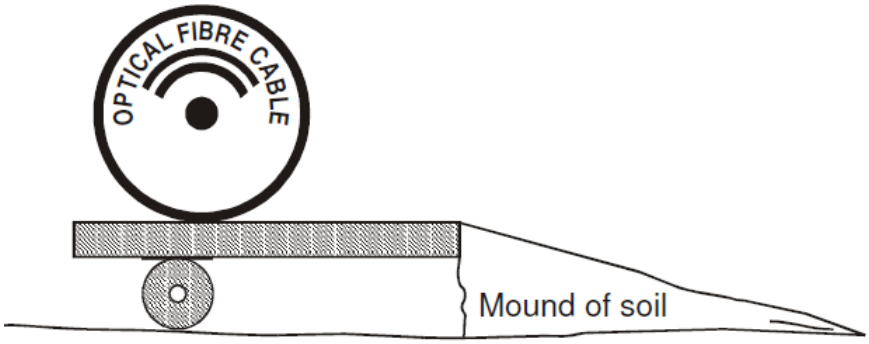
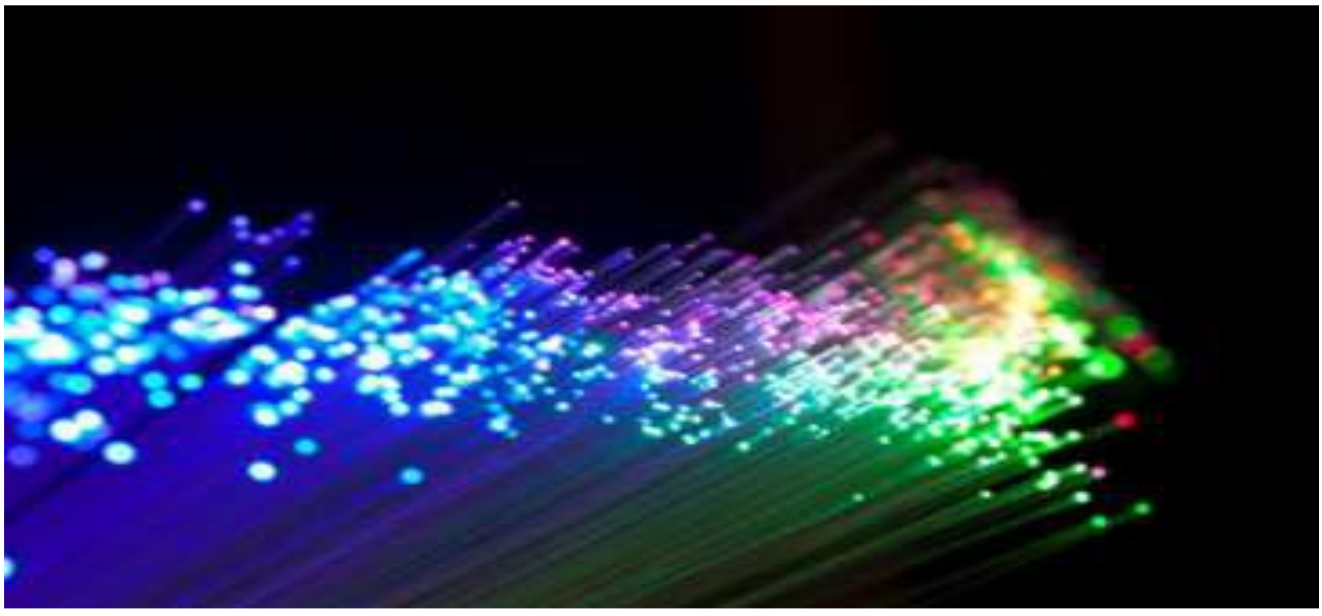


Figure 4-14 (b) Rolling on/off of Cable Drum



3.15 **Factory Acceptance Tests for Optical Fiber Cable:**

In order to carry out a testing of Fibre Optic Cable, mentioned below Tests are Mandatory :

1. Temperature Cycling Test

2. Longitudinal Water Penetration Test
3. Torsion Test
4. Kink Test
5. Cable Tensile Strength Test
6. Repeated Bending Test
7. Impact Strength Test
8. Optical Attenuation Test
9. Physical Inspection and verification of all cables construction as per specifications.

All the tests should witnessed as per the **IEC 60794-1** standards.

The entire testing should be performed on random sampling basis.

Optical Time Domain Reflectometer (OTDR) Testing should performed on all finished cables and selected fibres on sampling basis and should found satisfactory.

Cable attenuation test results should have verified at 1330 nm and 1550nm wavelengths.

OLTS test is to be conducted once the cable is laid.

It is Optical Distribution Frame (ODF) to ODF testing through pig tails and patch cords. The purpose of this test is to establish point to point connectivity and continuity.

The OTDR test mentioned above is a replacement of this test.

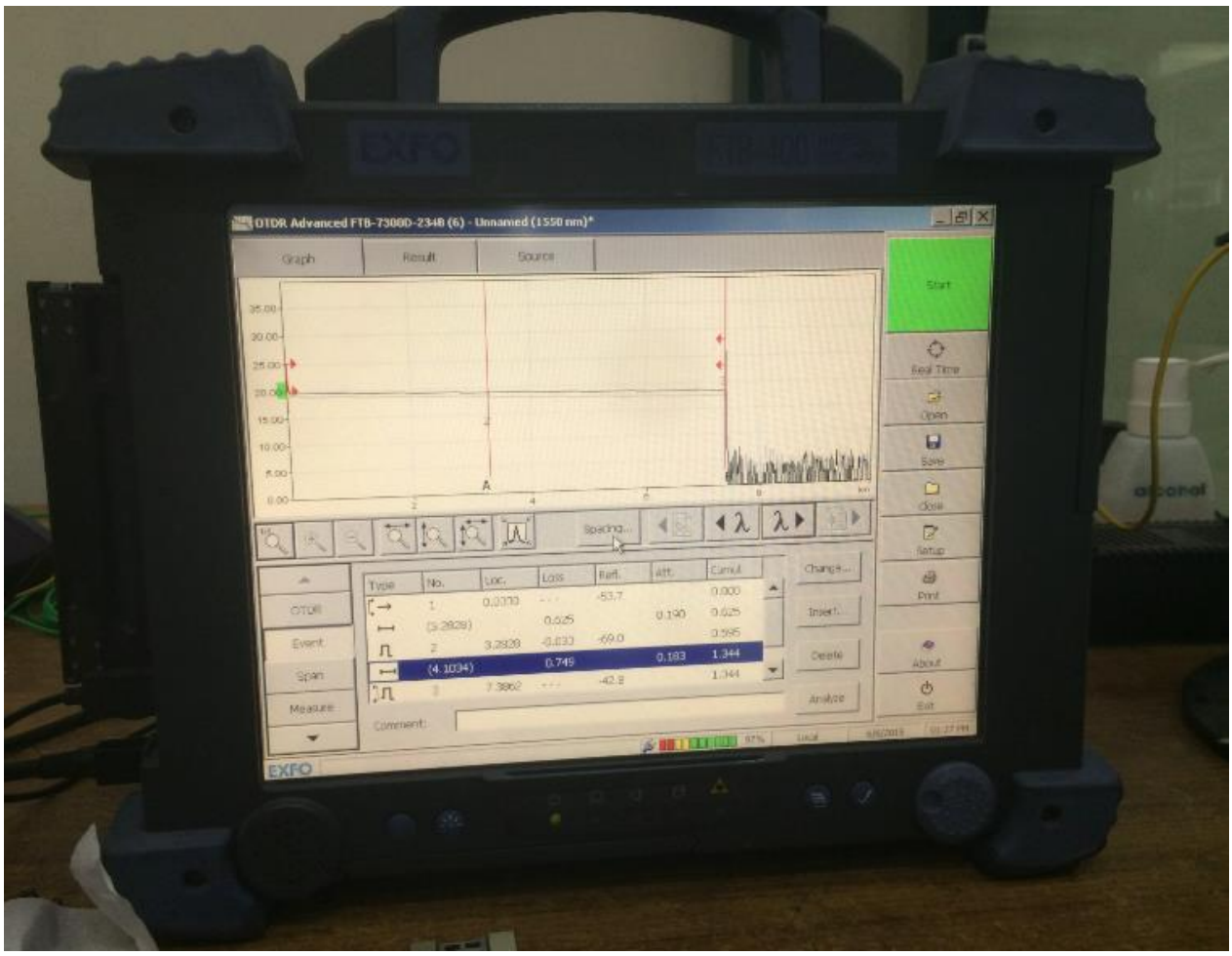
When OFC manufactured for one batch (e.g.100KM, 200KM), bidder will offer consultant to go factory do FAT

Consultant will go for the FAT.

Consultant bidder and customer, Factory all parties will perform the factory test as per the agreed test items and will finally generate FAT report and publish to all shake holders. In that report will record all the test results vetted by all parties and also will record all the drum No. of cable which has been tested.

After the report published and granted pass. OFC will be allowed to dispatch to site.


JDSU
-11.25
JDSU
1550nm


EXFO
OTDR Advanced FTB-7300D-234B (6) - Unnamed (1550 nm)*
Graph
Result
Source
Start
Real Time
Open
Save
Close
Setup
Print
About
Exit
Spacing...
OTDR
Event
Span
Measure
Type
No.
Loc.
Loss
Refl.
Att.
Cumul.
Change...
Insert
Delete
Analyze
Comment:
EXFO

4 Final As-Built reporting

The as-built drawings and documents shall identify the actual route and other information such as the cable/pipe/Man/Handhole type and length/dimensions. These drawings and documents are typically the construction detail sheets/drawings that have been corrected to reflect any changes during construction. As-Built drawing can follow the same format as the design drawings. And As-built drawing shall record all deviations, removals and additions with respect to the original scope.

Referring to the schedule agreed, the bidder shall provide an accomplishment report to the employer within 5working days and an as-built documentation containing the following information not later than 15 working days from the accomplishment of the installation works:

- Position of the installed pipes;
- locations of installed cables;
- Soil conditions;
- Network loss link budget
- OTDR traces for each link, soft copy by USB drive or e-mail. (the format of this trace should be same as the file format copy out from the OTDR instruments)

And after the submission, employer should verify all the documents/drawing and grant takeover certification for the completed sections. Takeover certification document should include below information:

- Civil Section / OFC Link name and ID
- Section route length
- Section OFC length
- Contract Number
- Customer full name
- Signatures
- Date

5 Environmental Considerations for Optical Fiber Cable laying

It is the Contractor and/or Client's responsibility to prepare a site-specific Environmental Management Plan (EMP). And, as ever, each site is unique and therefore the environmental issues to be considered will vary from site to site.

5.1.1 Environmental Control Officer (ECO)

A good place to start with, is the appointment of an Environmental Control Officer (ECO).

In order for all to sleep easily at night, without having to furrow the brow much with care, the ECO shall:

a. Prior to work commencing, the contractor shall unravel the requirements of the EMP to team members, to ensure understanding and conformity

b. Visit the site periodically

c. Review and approve all areas that have been rehabilitated by the Contractor

d. Keep a record of findings

e. Attend relevant project meetings

- Produce a monthly report, for the client, with commentary on compliance and/or non-compliance
- Keep an Incident Log of non-compliance
- Maintain a record of complaints from the public and communicate this to the client
- Where necessary, issue a non-compliance report to the Contractor
- Where serious environmental infringements have occurred, introduce a Temporary Work Stoppage
- Liaise with the appointed Occupational Health and Safety Officer of the client

5.1.2 The Contractor's Environmental Management Plan (EMP) must include

In what follows, is a brief summary of what an EMP might contain, but is not limited to:

a. Statement of Commitment

b. List of activity-specific environmental issues related to your site and their likely impact

c. Incorporating the above, write a series of simple work instructions to ensure compliance

d. Determine the actions required to manage each work instruction

e. A list of tangible contingency and mitigating actions to be implemented if required

f. Provide training to staff and create awareness

g. An organizational chart setting out respective roles and responsibilities

h. Monitoring and Reporting

5.1.3 Contractor Responsibilities

- Be familiar with and comply with the procedures contained in the EMP.
- Ensure that all personnel are trained, qualified and experienced enough, to undertake their work in an environmentally responsible manner.
- Create an awareness of the Environmental work requirements and the need for them amongst the workforce.

- Procedural briefings to be given before personnel carry out key activities for the first time.
- Ensure that personnel who have formal responsibilities under this plan, are trained in the requirements of this EMP.
- Undertake daily site inspections to monitor environmental performance and compliance.
- Immediately notify the ECO in the event of infringements.
- Notify the ECO and in advance of any activity he has reason to believe that may potentially have an adverse environmental impact.
- It is desirable for Environmental matters to be included as a standard agenda item at all project meetings.

5.1.4 A few Activity-specific Guideline Examples

In what follows, are a few activities based examples an EMP must contain, but is not limited to:

Water

- Storm water must be contained in the storm water system to avert flooding.
- Measures must be implemented to distribute storm water as evenly as possible to fend-off soil erosion.
- Material from any stockpile must not be allowed to spill or be washed into a gutter or drain.
- The execution of any work shall not block and subsequently unsettle the existing overland water flow or the existing system of drains.
- No person Shall, without prior written permission release water onto a public road.
- No person Shall, without prior written permission raise the water level of a river, stream or dam which can spill-over onto a public road.
- Any water that is present in a trench shall be pumped out before backfilling.
- Water shall be pumped into the storm water system and never into a sewer manhole.
- No work shall be carried out within 32m of any natural water source without permission from the ECO.

Dust / Air Pollution

- Where necessary, issue workers with washable dust masks for protection against dust inhalation.
- Dust shall be controlled onsite, especially when windy.
- Minimize or even cease activity during periods of high wind.
- Dampen surfaces to prevent dust from becoming airborne.

- Cover materials being transported with plastic sheeting or a tarpaulin to prevent them from flying off the vehicle. Dampening of the transported material may also be necessary.
- Cover onsite stockpiles with plastic sheeting or tarpaulins during high wind.
- Regular maintenance of generators, compressors, etc., is essential for controlling exhaust emissions.

Noise Pollution

- Contractors must abide by the National Noise laws.
- Develop a noise mitigation plan before starting with construction.
- The level of noise and the duration thereof must be agreed upon and monitored.
- Examples of noise: Jack hammers, concrete saws, bulldozers, trucks, generators, compressors, pneumatic tools, power tools, etc.
- When talking to someone 1m away and you have to shout to make yourself heard, then noise levels are definitely too high.
- Hand-held sound meters are lightweight, easy to operate and relatively inexpensive.

- Hearing protection shall be worn at all times when noise levels are suspected of equalling or exceeding 85 dBA.

5.1.5 Noise PPE:

- Use disposable earplugs only once
- Keep reusable earplugs clean
- Earmuffs must be a good fit

Where possible, restrict construction work to weekdays and limit work hours from 08:00 to 17:00.

Should an extension of the work hours be required, the adjacent property owners shall be informed in writing 2-days in advance of any proposed overtime activities.

Whenever practical, noise levels identified as exceeding 85 dBA, Noise MUST be reduced by using mufflers, barriers, etc. or the following actions must be implemented once the source of the noise has been ascertained:

- Replacement or adjustment of the worn or loose parts
- Balancing unbalanced equipment
- Lubrication of the moving parts

- Use of properly shaped and sharpened cutting tools

Trees

- Trees shall not be cut or trimmed unless consent is obtained in writing from the owner or the relevant authority.
- Cutting shall be confined to what is absolutely necessary.
- Tree roots exposed in the way of the trenching shall not be cut unless absolutely unavoidable.

Archaeology and Cultural Heritage

Even with no designated sites of archaeological sensitivity being identified along a route, the Contractor will be required to have measures in place to deal with potential finds protected by the Natural Heritage. Construction in the vicinity of a finding must be stopped and under no circumstance may any artefacts be disturbed or removed from the site

Environmentally Sensitive Areas (ESA)

- An ESA is a type of designation for an agricultural area which needs special protection because of
- its landscape, wildlife or historical value.
- Such designated areas shall be dubbed “no go” areas and access to, or work in such areas, shall be carefully controlled by the ECO.

Concrete / Cement

- Concrete shall not be mixed directly on the ground.
- All visible remains of excess concrete shall be removed and disposed at an approved disposal site.
- Cement shall be stored in a dry place, protected from rain and raised off the floor.

6 Standard Operating Procedure for Daily Site Execution

Based on Master Execution plan with Drawings a daily planned execution plan align with sub-contractors is submitted by Contractor. To Consultant and Employer.

Plan is submitted till night for the very next day activities

Number of Sites		Sub con	Site ID	(Tentative) Total Distance	Distance (M)	Plan(M)	New Excavation	ROW Authority	Manpower(Tentative)
Implementation Manager	Site Engineer			HH	D-L	**4642**	Road		
			SA-CW-OSP003	11--12	218	50			50
				10--11	200	200			
				7--8	250	250			
				20--21	275	275			
				60--61	54	54			
				61--62	206	50			
				63--64	192	192			
			SA-CW-OSP005	179--ipnv	206	50			
				73--74	258	50			

Once Plan is submitted in night before execution day, Consultant review and allocate consultant site supervision resources and respond back to contractor while keeping Employer informed. i.e

Number of Sites		Sub con	Site ID	(Tentative) Total Distance	Distance (M)	Plan(M)	New Excavation	ROW Authority	Manpower (Tentative)	Consultant Rep.
Implementation Manager	Site Engineer			HH	D-L	**4642**	Road			
				11--12	218	50				
				10--11	200	200				
				7--8	250	250				
				20--21	275	275				
				60--61	54	54			50	
				61--62	206	50				
				63--64	192	192				
			SA-CW-OSP005	179--ipnv	206	50				
				73--74	258	50				

Consultant, Contractor and subcontractor representatives get deploy at sites for site execution along with drawings for relevant section and work authorization letter Copy and get in Touch with Management offices teams for reporting.

Teams check work execution details as per design, Labor Resources, EHS Requirements to be deployed, Quality of work as per Design specifications.

A Daily Execution Check list is filled as per site work done and signed off by subcontractor, contractor and consultant's site representatives.

Samples of Checklist are as per below.

i.e.

Same Details are summed up for all the site executed area's and summary is reported to Management of Contractor, Consultant and Employer on Daily Basis.

All Further Details are as per Daily Plans, Design Drawings, Daily Site Checklists and Reporting Summaries.



7 Methodology and Implementation of Environment Health & Safety

General Health and Safety Guidelines

There is little doubt that an approach that minimizes or better still, eliminates possible accidents or incidents is highly advantageous.

Responsibility of Management:

It is the responsibility of management to ensure that all team members and supervisors are trained and familiar with applicable safe working practices, and that they take immediate and decisive action when safe and approved work methods are not followed.

Responsibility of Supervisors:

It is the responsibility of the supervisors to ensure that each member of his team wears the required PPE and to ensure that the work area is protected by the use of the necessary signs, cones, flashing lights, traffic control personnel, etc. Personal protective equipment (PPE) refers to protective clothing, hard hats, safety glasses, or other garments or equipment designed to protect the wearer's body from injury. On top of this, practice safe and approved work methods, as generally outlined in this Manual.

Each Party must at all times comply with health and the safety legislation, regulations and guidelines, which must include, but is not limited to:

1. A competent person shall, before the commencement of any construction work, perform a risk assessment which shall be written into the health and safety plan to mitigate risks and shall include:

   a. Activity-specific hazard and risk identification.

   b. Assess and evaluate each identified hazard and risk and rank them i.e. high, medium or low.

   c. The best way to protect people is to eliminate the hazard or risk and second best, minimize it.

2. All areas used by the public shall be maintained free from debris or equipment that may constitute slipping, tripping, or any other hazard.

3. Adhere to all the health and safety management plan procedures.

4. Develop and obtain approval for a Traffic Management Plan (TMP).
5. Report and record all Work Site accidents, incidents and property damaged.
6. Establishing safe air space requirements prior to the use of lifting and construction equipment.
7. All personnel shall be required to wear the following personal protective equipment (PPE):
    a. Protective overall (at all times).
    b. As a general rule, steel-toed safety boots should be worn at all times.
    c. Hard hat (when performing work that requires the use thereof).
    d. Safety glasses (when performing work that requires the use thereof).
    e. Work gloves help prevent cuts and bruises from sharp or rough edges on pipe/ducts and other objects.
    f. Wear high-visibility vests (at all times).
8. The contractor shall ensure that all necessary guards, protective structures and warning signs are used to protect both workers and third parties. All necessary barriers and fences shall be erected to guide pedestrians and traffic around the work area.
9. A first aid box will be provided and allocated to a trained, certified first aider. Every injury occurring on site must be treated and recorded.
    a. Should an injury require professional medical treatment, the supervisor in charge must complete an accident report.
    b. Ensure that the first aid kit is available and accessible, correctly stocked and a register exists to account for used/missing items.
10. All employees, management personnel and visitors shall undergo induction training carried out by the Site Manager or a designated deputy before going onto site for the first time. Inductions records shall be kept on site for the duration of the project.

7.1 Typical Table of Contents for a Site Safety File

1. Notification of Construction Work
2. Letter of Good Standing
3. Organogram
4. Health & Safety Policy
5. Health & Safety Plan
6. Environmental Policy

7. Environmental Plan

8. Waste Management Plan

9. Fall Protection Plan

10. Emergency Plan

11. Emergency Contact Numbers

12. List of Sub Contractors

13. 37.2 & 5.3.b Legal Agreement

14. Appointments

15. Certificates of Competency

16. Risk Assessments

17. Induction Records

18. Toolbox Talks

19. Inspection Registers

20. Visitors Register

21. Complaints Register

22. Site Diary

23. Weekly Statistics

24. Safety Minutes

25. Audit Template

26. Vehicle List

27. Incident Records

28. Client's SHE Specification

29. Public Liability Insurance

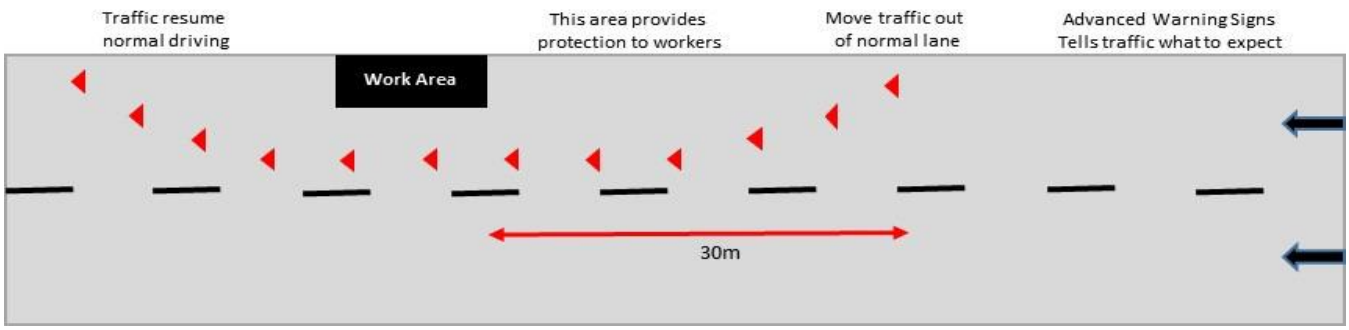
7.2 Traffic Management Plan

- No work should commence on a public roadway without first obtaining a wayleave from the road authority concerned.
- It is the responsibility of the supervisor/s to ensure that each member of his crew wears the required PPE and to ensure that the work area is protected by the use of the various signs, cones, flashing lights, traffic control personnel, etc.

- Traffic movement shall be inhibited as little as possible. Should this be unavoidable, alternative access to routes must be made available.
- Work carried out on busy roads, should be restricted to outside the following periods; from 06:30 to 09:00 and 15:30 to 18:00, to ensure the free flow of traffic during peak hours.
- Roads shall be kept free of debris or equipment.
- Excavated materials unsuitable for re-use shall be removed from site as soon as possible.
- Where cyclists and/or pedestrians are likely to be present, their need for safe and convenient passage must be considered and sufficient, safe crossings shall be planned for.
- Create 'no go' zones around hazardous areas and implement safe work distances.
- Choose signs with messages clearly indicating the actions drivers or pedestrians are required to take.
- Where necessary, traffic control persons shall be used to provide positive guidance to motorists.
- Remember that the visibility of hazards/workers can be greatly diminished in darkness and/or poor weather conditions.

Selecting Signs

- Choose signs that are appropriate; signs that accurately describe the work situation.
- Start with general sign messages at the beginning of the work zone. Then use signs with more specific messages, stating what action should be taken, closer to the actual work area.
- The overall effect of signs should be to make drivers aware of what they are approaching and what action(s) will be required of them.
- Drive through checks should be made every so often, both at night and day, to ensure that signs are properly located to allow adequate driver response time.
- Use only signs that appear in the local Road Traffic Signs Manual.
- Signs must be kept clean and well maintained if they are to be effective.



Flagging PPE and Communication

1. A high-visibility reflective vest
    a. A white hard hat
    b. Steel-toed safety boots
    c. Full length pants or coveralls - no shorts
    d. During rainy weather, highly visible rainwear
2. When two flaggers are used, they can communicate verbally or visually if they are close enough to each other. It is desirable to appoint one of the flaggers as the coordinator. Where the end of a one-lane section is not visible from the other end, the flaggers must communicate via two-way radio. The safety of workers and the travelling public, while passing through the construction area, depends on the efficient actions of flag persons.
3. A Warning Flag Signal may also be used to warn a road user to proceed slowly, and be alert of a hazard in or adjacent to the roadway ahead.
4. 4 A good, active flag person can be as effective as any other means of drawing attention to a hazard in the roadway.

7.3 Pre-Excavation Procedures

A fibre installation project is a major undertaking. Responsibility for the oversight of everything from detailed implementation plans to community relations, ensuring sufficient materials are ordered in a timely manner to safety and environmental concerns, means an intense amount of pre-work and ongoing coordination for the life of a project.

1. As an unfaltering believer in a pre-build survey: The verification of details contained in pre-build drawings, will ensure that potential problem areas are uncovered before the contemplated work kicks-off and potentially save one a lot of trouble later.

2. Using the information available on the pre-build drawings, walk the pegged out route by foot, to determine the following:
   - Verify the soil classification/s by digging a pilot hole every 1km (hard, intermediate, soft)
   - If the soils or soil properties are not what were expected as noted in the contract, the client
   - must immediately be consulted
   - Check and verify above and below ground utility locations
   - Note changes in gradient and/or direction
   - Identify all obvious landmarks where the route changes direction (take photos)
   - Take photos of all obstacles along the route
   - Verify HH / MH positions
   - Note road / rail crossings
   - Record crossings with other services
   - Record the presence of structures near the trench
   - Double-check the recorded details on the return journey
   - The route is typically marked using lime

Pre-Excavation Survey Equipment and Tools

1. Digital camera and spare batteries.
2. GPS with tracking function and spare batteries.
3. DCP tester.
4. Tape measure.
5. Measuring wheel.
6. Clip board, note book and stationary.
7. Route drawing/s from the client.
8. Reflector jacket.
9. Personal Identification.

7.4 **Mandatory Health and safety equipment detail:**

Double Caution Tape

Reflective Cones

Safety Boards/Banners/Flexes

Safety Helmets

Reflective Jackets

7.5 Corrective Measures for EHS

- Consultant authorized to stop work, until completion of relevant safety measures.
- Relevant Authorities to inform PSCA to immediately stop the work if Health and Safety Measures not adopted.
- Bidder will deploy extra inspection teams to check the quality of Health and safety measures.
- If corrective measures are not taken as per the SOP, Bidder will penalize the sub-contractor with fines and provide evidence. Consultant to supervise.
- Final Step would be taken by the authority to blacklist the sub-contractors and initiate the legal action.

SOP for EHS

SITE TYPE	HEALTH –SAFETY MEASURES	DURATION
Trenches (Fiber and Power)	1- Cordon off area with double caution tapes on all sides during the work till backfilling. 2- Safety Boards/ Banners during work till backfilling. 3- Double Reflective Cones (every 7-10 meters) from excavations till Backfill. 4- Site Debris clearance/ removal and no debris should be on roads during the civil work. 5- Reinstatement Time.	Excavation and Backfilling (2-3 Days) Site Debris Clearance (Within 2 Days After Backfilling) Reinstatement time (7-10 Days) TOTAL ACTIVITY TIME = 7-10 Days

1-Hand holes 2-Outlet Pits (Camera Foundation)	1- Cordon off area with double caution tapes on all sides during the work till Hand hole installation and concrete. 2- Safety Boards/ Banners during work till backfilling. 3- Reflective Cones from excavations till Backfill. 4- Site Debris clearance/ removal and no debris should be on roads during the civil work. 5- Reinstatement Time.	Excavation and Installation (3 Days) Site Debris Clearance (Within 1 Days After Installation) TOTAL ACTIVITY TIME = 3-4 Days
Road Bores	1- Cordon off area with double caution tapes on all sides during the work till Bore Completion. 2- Safety Boards/ Banners during work till backfilling. 3- Reflective Cones from excavations till Backfill. 4- Site Debris clearance/ removal and no debris should be on roads during the civil work. 5- Reinstatement Time.	TOTAL ACTIVITY TIME = 5-8 Days (Depends upon Site condition)

7.6 Quality Management Plan (QMP)

This brief QMP Outline is provided for informational purposes only. A QMP describes the overall policies, program, responsibilities, procedures, and the means of ensuring that all executed work will be in conformance with the relevant client specification/s.

Quality Control (QC) versus Quality Assurance (QA) - the difference?

Think of QC as something such as doing periodic checks to see if the pool is sparkling clean, whereas QA aim to make certain that the pool owner does the following; maintain the pH level, scoop-out debris, clean-out the strainer basket, brush the walls, run the pool pump long-enough, backwash regularly, etc.

At its simplest, QC is testing or checking-out a service or product, to make sure that it's OK. The intent is to spot anything that is not-OK, and then to immediately fix it.

QA fertilizes OK on the principle that quality can be improved by looking 'deeper into things'. It is aimed at delving into how not-OK can be eliminated.

Quality Control Officer

- The contractor's Project Manager (PM) is generally appointed to be responsible for the implementation of a contractor's QMP.
- He or she is also responsible for advising and directing site personnel in order for them to understand and carry out their responsibilities diligently.
- Good communication is critical to the success of a project.

The QMP describes and defines:

- Participant roles and responsibilities.
- QC controls to be applied.
- QC documentation and specifications to be utilised.

QMP customarily contains 4-phases:

- Preparatory phase before construction.
- Commencement of construction.
- Inspection and testing to deliver untroubled quality compliance and workmanship.
- Final acceptance of work.

The responsibilities of personnel who manage quality, routinely include:

- Ensuring that all staff has undergone the appropriate training and certification for the types of construction activities they will be performing.
- Perform QC inspections of on-going construction work for the duration of the project.
- Identify, evaluate, and document quality problems.
- Initiate action to prevent the occurrence of non-conforming work.
- Recommend or initiate quality improvement solutions.
- Stop the work when non-conforming work is identified, until the deficiency is corrected.

Maintain a Non-Conformance Report (NCR) log.

Training

- All personnel on a project, will be made aware of the quality requirements to their position.
- Personnel will be trained to ensure that they possess the necessary skills and knowledge to execute their work.

- At the start of their job on a project, all employees will receive an orientation on their individual roles and responsibilities.

Goals, Objectives and Performance Monitoring

- Progress against established project targets will be reported at weekly team meetings and will include:
- Are Health and Safety conditions being maintained?
- Are environmental standards being maintained?
- Are cost objectives and targets being met?
- Are quality standards being maintained?
- Are progress targets being met?

Review and Reporting

The project team will hold weekly meetings, to review performance to date and to plan in detail the remaining activities. Minutes will be taken and actions required recorded.

Equipment Inspection and Maintenance

Site staff will maintain maintenance schedules of the equipment on site and calibration records will be maintained.

7.7 Document Control

- As-build documents must be kept current.
- Hard copies of quality files will be kept in agreed locations and will be readily identifiable.
- The PM will ensure that quality handover documents are approved and forwarded to the client in accordance with an agreed handover process.

Non-Conformance

- All instances of non-compliant actions, damage or non-conforming products shall be reported to the PM.

  The PM will detail the nature and cause of the non-compliance, the action (agreed upon) to rectify the issue and any further actions that are proposed to be taken to prevent a recurrence

7.8 Complains Handling Civil Works

Name	Contact No	Email ID
Whatsapp Group Name: Complaint Cell		

SOPs/SLAs FOR COMPLAINT CELL

Complaints/Escalations on daily basis will be handled by Single Point of Contact (SPOC) from bidder regarding the OSP Work for Optical Fiber Cable Laying and Civil Work for Field Sites.

Mentioned below will be the major responsibilities of the designated SPOC:

- Escalations/Complaints shall be shared on:
  - WhatsApp (Group Name)
  - Emails
  - Letters from PSCA, Consultant, Other Government Authorities
- Escalations/Complaints shall be responded on:
  - WhatsApp (Pictures of Before and after Status)
  - Emails (Report along with Before and after pictures)
  - Reply to the Letters from PSCA, Consultant, Other Government Authorities along with the before and after Pictures

SLA and responsible for Complaints regarding the Civil Work for Field Sites:

Sr. No	Category	SPOC	Responsible	SLA	Remarks
1	EHS Compliance		Consultant	2 ~ 3 Hours	In case of any unforeseen circumstances time can be increased.
2	CW Issues (OP Issues / 90% Compaction & Backfilling / Proper Reinstatement / Grounding Issue		Implementation Manger of bidder	6 ~ 12 Hours	
4	Debris Removal(Pole Foundation/ Bore & Trench)		Implementation Manger of bidder	8 ~ 10 Hours	
5	Trench / Bore Issues(Open Trench / Backfilling / Reinstatement)		Implementation Manger of bidder	24 Hours	

SLA responsible for Complaints regarding the OSP Work for Optical Fiber Cable Laying:

Sr. No	Category	SPOC	Responsible	SLA	Remarks
1	EHS Compliance		Consultant	2~ 3 hrs	In case of any unforeseen circumstances time can be increased.
2	Open Pits for Hand Hole		Implementation Manger of bidder	36 hrs	
3	Reinstatement along the Hand Hole		Implementation Manger of bidder	16~ 20 hrs	
4	Extra HDPE Pipe		Implementation Manger of bidder	8~ 10 hrs	
5	Debris removal		Implementation Manger of bidder	8 ~ 10 hrs	
6	Open Pits for Cable Pulling		Implementation Manger of bidder	36 hrs	
7	Trench reinstatement-Tuff Tiles<200m		Implementation Manger of bidder	48 hrs	
8	Trench reinstatement-Normal Soil <200m		Implementation Manger of bidder	48 hrs	
9	Trench reinstatement-Asphalt<500m		Implementation Manger of bidder	5-6 days	
10	Trench reinstatement-Concrete<200m		Implementation Manger of bidder	2-3 days	
11	Trench reinstatement-RCC<200m		Implementation Manger of bidder	2-3 days	

8 Breach of Optical Fiber Cable Procedures:

8.1 **Legal Action**

The abovementioned Standard Operating Procedures (SOPs) are to be strictly followed and any violation by any party in this regard shall amount to the breach of the SOPs. The breach of any clause of these SOPs shall amount to legal action under the Civil Laws and any criminal act or criminal negligence shall be dealt under the criminal law of Pakistan.

The Government of Punjab reserves the right to initiate legal proceedings against any breach of these SOPs, as the equipment data and information is sensitive for the security of citizens. All sensitive data, information and equipment is the property of Government of Punjab.