

ಬೆಂಗಳೂರು ಸಂಯೋಜಿತ ರೈಲು ಮೂಲಸೌಲಭ್ಯ
ಅಭಿವೃದ್ಧಿ ಉದ್ಯಮ ನಿಯಮಿತ (ಬಿ-ರೈಡ್)

BENGALURU INTEGRATED RAIL INFRASTRUCTURE DEVELOPMENT ENTERPRISE LIMITED (Bi-RIDE)

Bi-RIDE

NAME OF WORK:

CORRIDOR 2: PACKAGE – 1

NAME OF WORK: Construction of Elevated Viaduct (including Ramps) of length 7.795 Km (-0.675km to Ch -0.050km & Ch 11.230km to Ch 16.755km & Ch: 16.755km to Ch 18.400km) and RoR (Ch: (-) 0+100, 12+400, 16+612 to 16+709) including Double Decker Viaduct (Rail cum Road Flyover) from Ch. 14+562.903 to Ch. 15+680.447, Double Decker Station at Mathikere, Entry /Exit structure, Ramp for Road Flyover, Y-loop ramp, BSTP Viaduct ramp at Bennigenahalli, Hebbal, Shettyhalli, FOB's , Multi Model Integration works, part work up to substructure for Corridor-1 (Ch:16+900 to 18+055 (from P 192 / UP 192 to C1-P10)) at Yeshwanthpur and other related infrastructural works of Elevated section in between Bennigenahalli to Shettyhalli of Corridor-2 of Bengaluru Suburban Transport Project (BSTP)..

BID DOCUMENT

SECTION 8A EMPLOYERS' REQUIREMENT 2 GENERAL INFORMATION AND SCOPE OF WORK

SECTION - VIIIA

EMPLOYER'S REQUIREMENT - 2

GENERAL INFORMATION AND SCOPE OF WORK

**EMPLOYER'S REQUIREMENTS
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SECTION VIII - VOL-2 **EMPLOYER'S REQUIREMENTS**

Name of Work:

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EMPLOYERS REQUIREMENT - SCOPE OF WORK

1. INTRODUCTION

These Employer's Requirements are divided into four sections as follows:

- (a) General: these apply throughout the Contract.
- (b) Functional: these include the specific core requirements for the design and performance of the Works.
- (c) Design: these apply in respect of requirements relating to the design of the Permanent Works.
- (d) Construction: these apply in respect of other requirements relating to the construction of the Works.

2. DEFINITIONS AND INTERPRETATIONS

In addition to the words and expressions defined in the General Conditions of Contract (GCC), further following words and expressions shall have the meaning assigned to them except where the context otherwise requires:

"As-Built Drawings": means those drawings produced by the Contractor and endorsed by him as true records of construction of the Permanent Works and which have been agreed with the Engineer.

"Combined Services Drawings" (CSD): means drawings showing the locations, layouts and sizes of all services including those of other contractors coordinated so as to eliminate all clashes.

"Construction Phase": has the meaning identified in Clause 4 of the Employer's Requirements - General.

"Good for Construction Drawings" (GFC): means those drawings referred to in Clause 2(B) of the Employer's Requirements - Design in respect of which a Notice has been issued.

"Construction Specification": means those parts of the Standard Outline Specification which relate to construction.

"Definitive Design Submission": means the submission of documents which comprise the whole or parts of the proposed Definitive Design and for which the Contractor seeks a Notice.

"Design Manual": means the manual to be prepared and submitted by The Contractor as part of the Definitive Design and as described in the Employer's Requirements Design.

"Design Package": has the meaning identified in Clause 2(5) of the Employer's Requirements - Design.

"Design Phase": has the meaning identified in Clause 4 of the Employer's Requirements - General.

"Design Criteria": means those parts of the Standard Outline Specification which relate to design.

"Final Design": has the meaning identified in Clause 3(5) of Employer's Requirements -Design.

"Notice": means a Notice of No Objection.

"Particular Specification": means the combined specifications prepared by the Contractor in CSI format which combines the Employers Design Criteria, the Employer's Outline Construction Specifications and those parts of the Contractor's Technical Proposals which specify standards for design and construction which are developed during the Design Phase.

"Preliminary Design": means the submission of documents which comprise the initial stage of the design phase. **"Railway Envelope"**: means the zone or zones within the Works containing the track work and equipment necessary for the operation of the railway.

"Services, Electrical, Mechanical Drawings"(SEM): means those drawings produced by the contractor executing the service works showing the locations, sizes and details for openings in structural elements for mechanical and electrical facilities and other related contracts.

"Standard Outline Specification": means the Design Criteria and the Outline Construction Specifications that specify standards issued by the Employer for development by the Contractor for design and construction.

"Specification": has the meaning identified in Clause 5 of the Employer's Requirements -General. **"Structure Gauge"**: means the profile related to the designed normal coordinated axis of the track into which no part of any structures or fixed equipment may penetrate.

"Working Drawings": comprise the GFC Drawings and such other drawings and documents, such as bar bending schedules and manufacturing drawings, as are necessary to amplify the GFC Drawings for construction purposes and endorsed as required by the Engineer.

3. **RELEVANT DOCUMENTS**

The Design Criteria shall be read in conjunction with the General Conditions of Contract (GCC), the Particular Conditions of Contract (PCC), the Employer's Requirements, the Drawings and any other document forming part of the Contract.

In the event of a conflict between the Employer's Requirements and any Design Criteria, the Design criteria shall prevail.

In the event of a conflict between any Design Criteria and any other standards or specifications quoted, the requirement of the Design Criteria shall prevail.

Notwithstanding the precedence specified above the Contractor shall always immediately seek advice from the Engineer in the event of conflicts in Specifications among various standards.

The order of precedence is:

- i. Design Criteria
- ii. Employer's Requirements
- iii. Indian and other International Standards referenced herein.
- iv. Indian and other International Standards

4. **Deleted**

5. **SPECIFICATIONS**

In accordance with the provisions of these Employer's Requirements, the Contract Specification contained in the Contract shall be developed during the design stage and submitted as part of the Definitive Design Submission. When the Specification has received a Notice of No Objection from the Engineer it shall become the Particular Specifications and shall take precedence over the other Specifications for construction purposes.

6. **SPECIFICATIONS IN METRIC AND IMPERIAL UNITS**

- (1) The Contract shall utilize the SI system of units. Codes and Standards in imperial units shall not be used unless the Engineer has given his consent.
- (2) Conversion between metric units and imperial units shall be in accordance with the relevant Indian Standards.

7. WORKS PROGRAMME

- (1) The Key Dates are defined in **Contract Key Dates of PCC**.
- (2) The Contractor shall prepare and submit its Works Programme and three-month rolling programmes and the detailed requirements to these Employer's Requirements.
- (3) In compiling its Works Programme and in all subsequent updating and reporting, the Contractor shall make provision for the time required for coordinating and completing the design, testing, commissioning and integrated testing of the Works, including, inter alia, design co-ordination periods during which the Contractor shall co-ordinate its design with those of Designated Contractors, the review procedures, determining and complying with the requirements of all Government Departments and all others whose consent, permissions, authority or license is required prior to the execution of any work.
- (4) The Works Programme shall take full account of the Design Submission Programme.

8. MONITORING OF PROGRESS

- (1) The contractor shall submit to the site Engineer three copies of a Monthly-Progress Report (MPR), as described in Employer's requirements describing the progress and current status of the Works. The MPR shall address the matters set out in the Works Programme.
- (2) The MPR shall be submitted by the end of each calendar month. It shall account for all works actually performed from twenty sixth day of the last month and up to twenty fifth day of the current month.
- (3) The MPR shall be divided into two sections. The first section shall cover progress and current status relating to design and the second section shall cover progress and current status relating to construction.
- (4) A monthly meeting to monitor & review the progress of the project shall be convened by the Engineer and chaired by the Employer's nominated official(s). Contractor's site Representative & Designer Representative of Contractor and site agent of all interfacing contractors shall also attend the meeting. The Employer's representative may also be present in the meeting.
- (5) The Employer/Engineer/both may also conduct progress review meetings on alternate day/periodical/weekly /bi-weekly/monthly intervals depending upon the requirements or urgency of works. In these review meetings Contractor's Supplier/Sub-Contractor/Designer etc. also may be called as per the requirements.

9. QUALITY ASSURANCE

The Contractor shall establish and maintain a Quality Assurance System in accordance with **Appendix-3 / Annexure VII - 1 of Employer Requirements** for design and construction procedures and the interfaces between them. This Quality Assurance system shall be applied without prejudice to, or without in any way limiting, any Quality Assurance Systems that the Contractor already maintains.

10. DIGITAL DELIVERY OF THE PROJECT AND SOFTWARE SUPPORT

(A) DIGITAL DELIVERY

K-RIDE envisages digitization of BIM (Building Information Model). The Designer and Contractor should be familiar with operations of a digital project platform enabling a fully integrated solution for employer & contractors.

The Contractor will be required to work on a digital delivery for built assets based on international standards and methodologies including:

- i. PAS 1192-2/2013 - "Specification for information management for the capital/delivery phase of construction projects using building information modeling"
- ii. PAS 1192-3 2014 - "Specification for information management for the operational phase of assets using building information modeling"
- iii. AIA Document E203TM-2013, Building Information Modeling and Digital Data Exhibit

- iv. CIC BIM Protocol 2013
- v. BIM Forum LOD Specification 2013
- vi. Software packages that may be considered to specify and integrate the system solution that will support the Digital Project Office may include Oracle, SAP, Microsoft Dynamics, CMiC, RiB AG, Autodesk, Bentley, Trimble, Synchro etc.

(B) SOFTWARE SUPPORT

- (1) The Contractor shall provide full support to the Employer and the Engineer for all computer programs provided by the Contractor under the Contract.
- (2) The Contractor shall submit a software support plan at least 90 days before commencement of software installation. This plan shall require the Contractor to provide all changes, bug fixes, updates, modifications, amendments, and new versions of the program as required by the Engineer.
- (3) The Contractor shall provide all tools, equipment, manuals and training necessary for the Employer and the Engineer to maintain and re-configure all the software provided under the Contract.
- (4) The Contractor shall submit all new versions to the Employer for review at least 2 weeks prior to their installation. New Versions of any program shall not result in any non-conformance with the Specification or degrade the operation of the System. The Contractor shall:
 - i. Ensure that all new versions are fully tested and validated on the simulation and development system prior to installation.
 - ii. Ensure that all new versions are fully tested and commissioned once installed on the Site.
 - iii. Deliver to the Employer/Engineer any new version, together with the updated Operation and Maintenance Manuals.
- (5) The Employer / Engineer shall not be obliged to use any new version and -that: shall not relieve the Contractor of any of its obligations. Any effect upon the performance or operation of the computer-controlled system that may be caused by a new version shall be brought to the Employer's and Engineer's attention including updating the files to suit new version.
- (6) Within 14 days of the installation of any software into the Permanent Works by the Contractor, the Contractor shall submit to the Employer/Engineer for retention by the Employer/Engineer two backup copies (2 copies of the software one for Engineer and one for Employer) of the software, which shall include, without limitation:
 - i. All licenses in favour of Employer for their use.
 - ii. All source and executable code;
 - iii. All design documentation relating to the software; and
 - iv. Any specified development tools required for maintenance of the software, including, but not limited to, editors, compilers and linkers.
- (7) When a fault is discovered within delivered software or documentation, the Contractor shall take necessary steps to rectify errors or faults at the earliest.
- (8) The Contractor shall provide written details as to the nature of the proposed correction to the Engineer.
- (9) The Contractor shall notify the Employer promptly of any fixes or patches that are available to correct or patch faults.
- (10) The Contractor shall detail any effect such fixes or patches are expected to have, upon the applications.
- (11) The Contractor shall provide training for the Employer's staff to enable the Employer to make proper

use of any software and its new versions.

11. CO-ORDINATION WITH DESIGNATED AND OTHER CONTRACTORS' GENERAL

- (1) The Contractor is responsible for detailed co-ordination of his design and construction activities with those of the Designated Contractors, Civil Contractors, Utility Agencies, Statutory Authorities, Private Service Providers, Developers, Consultants, and other Contractors whether or not specifically mentioned in the contract, that may be working on or adjacent to the site for the purpose of the Project. For the purpose of this Specification, all of the above parties shall be referred to as Interfacing Contractors. The Contractor shall note that there are other contractors, consultants, etc. which the Employer will engage from time to time with whom the Contractor shall have to similarly co-ordinate. Such co-ordination responsibilities of the Contractor shall include the following:
 - (a) To provide all information reasonably required by the Interfacing Contractors in a timely and professional manner to allow them to proceed with their design or construction activities, and specifically to meet their contractual obligations.
 - (b) To ensure that the Contractor's requirements are provided to all other Interfacing contractors before the cut-off dates to be identified in the Interface Management Plan (IMP).
 - (c) To obtain from the Interfacing Contractors information reasonably required to enable the Contractor to meet the design submission dates as identified in **Annexure-VII-3 of Employers' Requirement**.
 - (d) Where the execution of the work of the Interfacing Contractors depends upon the site management or information to be given by the Contractor, the Contractor shall provide to such Interfacing Contractors the services or correct, and accurate information required to enable them to meet their own programme or construct their work.
 - (e) To co-ordinate access and delivery routes, and to ensure that all provisions for access and delivery of Plant is coordinated with and reflected in the Interfacing Contractor's Delivery Route Drawings. The Interfacing Contractors shall ensure that all Plants are delivered at the time agreed to allow openings left in the structure for such delivery to be sealed in accordance with the Contractor's programme.
 - (f) To co-ordinate with the Interfacing Contractors on attendance.
 - (g) To attend regular co-ordination meetings convened by the Engineer with the Interfacing Contractors. The Contractor shall conduct separate meetings with the Interfacing Contractors as necessary to clarify particular aspects of the interfacing requirements of the Works. The party who convenes the meeting shall prepare minutes recording all matters discussed and agreed at the meeting.
- (2) To ensure that copies of all correspondence, drawings, meeting, minutes, programmes, etc. relating to the Contractor's co-ordination with the Interfacing Contractors are issued to all concerned parties and four (4) copies issued to the Employer/Engineer no later than two (2) calendar days from the date of such correspondence and meetings. The Contractor, shall in carrying out his co-ordination responsibilities, raise in good time and provide sufficient information for the Engineer to decide on any disagreement between the Contractor and the interfacing Contractors as to the extent of services or information required to pass between them. If such disagreement cannot be resolved by the Contractor despite having taken all reasonable efforts, then the decision of the Engineer shall be final and binding on the Contractor.
- (3) Where an Interfacing Contract is yet to be awarded the Contractor shall proceed with the coordination activities with the Engineer until such time when the Interfacing Contractor is available. The Contractor shall provide the Interfacing Contractor with all information necessary to enable the Interfacing

Contractor to follow-on and proceed with their coordination.

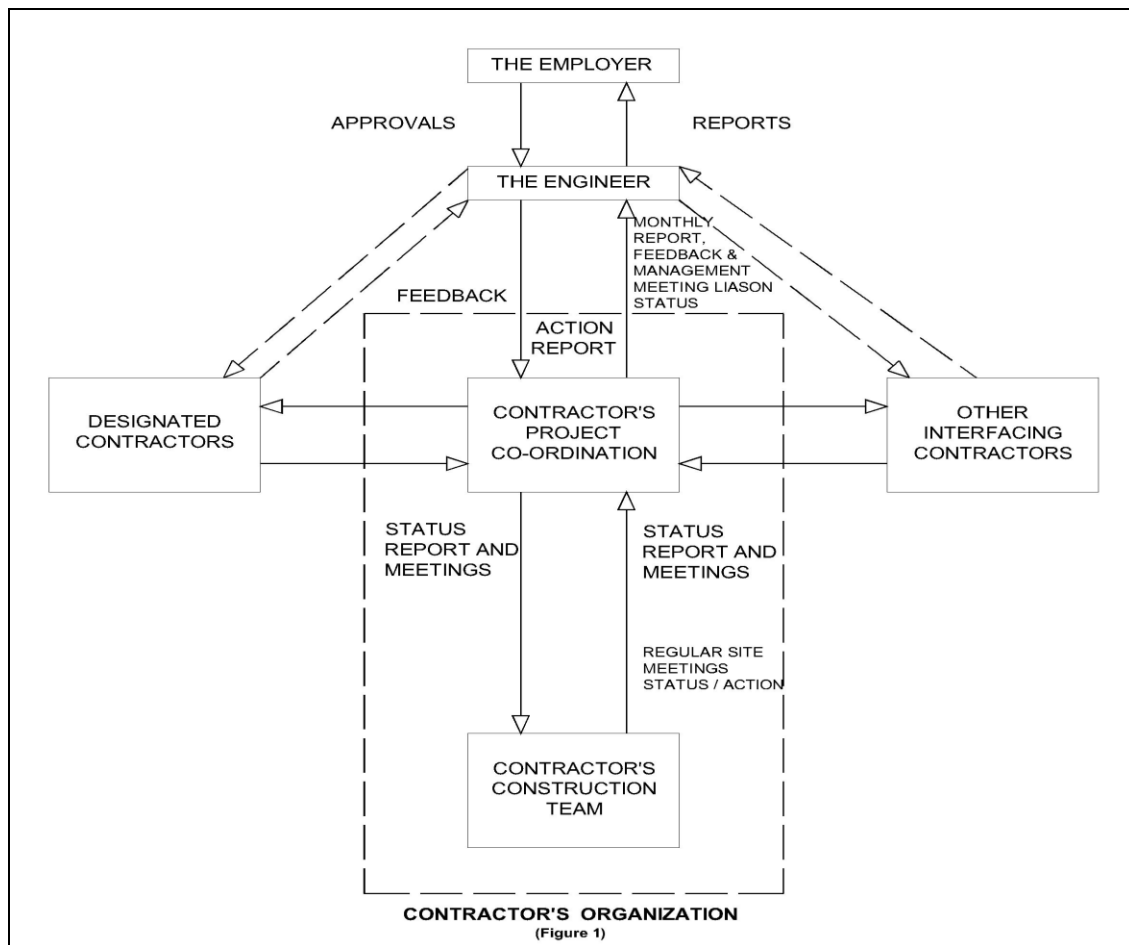
- (4) The Contractor shall note that the information exchange is an iterative process requiring the exchange and update of information at the earliest opportunity and shall be carried out on a regular and progressive basis so that the process is completed for each design stage by the cut-off dates.
- (5) The Contractor shall co-ordinate with the Engineer on all matters relating to works that may affect the Operation & Maintenance of the already operational Section corridor of the Employer in general. Such work shall be subject to the rules and regulations imposed by the Employer.

12.0 DEDICATED CO-ORDINATION TEAM

- (1) The Contractor shall establish a dedicated co-ordination team, led by a Chief Co-Ordinator in Bangalore reporting to the Contractor's Site Agent (Team Leader). The primary function of the team is to provide a vital link between the Contractor's design and construction teams and the Interfacing Contractors.
- (2) The Chief Co-Ordinator shall assess the progress of the co-ordination with Interfacing Contractors by establishing lines of communications as indicated in the co-ordination model shown in Figure 1 and promote regular exchange and updating of information so as to maintain the Contractor's programme.
- (3) The complexity of the Project and the importance of ensuring that work is executed within time limitations require detailed programming and monitoring of progress so that early programme adjustments can be made in order to minimise the effects of potential delays.
- (4) The Chief Co-ordinator in conjunction with the Interfacing Contractors shall identify necessary provisions in the Works for plant, equipment and facilities of the Interfacing Contractors. These provisions shall be allowed by the Contractor in his design of the Works.
- (5) During the course of the contract, information will be obtained in a number of ways. These may include direct inspection, regular site meetings, the obtaining of progress reports and the use of turn round document to obtain design and programme data. Turn round document shall be issued to the Interfacing Contractors to be returned giving the current positions on their programme.

13.0 CONSTRUCTION INTERFACE

- (1) Construction interface will be necessary throughout the duration of the Works commencing from the time the Contractor mobilizes to the Site to the completion of the Works. Construction interface will overlap design interface, involving cast-in and buried items such as pipes for electrical and mechanical services, supports, brackets, plinths, ducts, service buildings if arising, openings, cableways, trenches etc. that are to be incorporated at the early stage of the construction up to provision of attendance during the testing and commissioning stage.
- (2) The Contractor shall ensure that there is no interference with the Works of the Interfacing Contractors and shall maintain close co-ordination with them to ensure that his work progresses in a smooth and orderly manner. The Contractor shall carry out and complete the Works, or any part thereof, in such order as may be agreed by the Engineer or in such revised order as may be requested by the Engineer from time to time. The Contractor shall, unless otherwise provided, be liable for and shall indemnify the Employer against all costs, charges, expenses, and the like resulting from failure of the Contractor to co-ordinate the Works as specified.
- (3) For effective document/record control consisting of Design reports and GFCDs to make the design interface more efficient.



14. CONTRACTOR'S PROJECT ORGANISATION

- (1) The Contractor shall have a competent team of Managers, Engineers, Technical staff etc so as to complete the work satisfactory as per various requirements of the contract.
- (2) A control room with round the clock radio communication or telephone switch board links with all safety offices, works sites, site offices, batching plants, casting yards, workshops, fabrication yard, off site offices, Engineers site office, Resident Engineer's office, testing labs etc shall be maintained and manned round the clock. Residences of all senior project team members shall also be linked with the control room. Vehicles for emergency use should be on stand-by at the control room around the clock.
- (3) The designations of the various project organizations team members shall be got approved by the Engineer before adoption so as to avoid any duplication of the designations with those of the Employer or the Engineer.

15. TECHNOLOGY TRANSFER

- (1) The Contractor shall ensure that all local contractors and sub-contractors engaged in the works are given training, guidance, and the necessary opportunity for transfer of technology in various areas of construction such as instrumentation, safety, quality assurance, viaduct etc.

16. MAINTENANCE REPORT

- (1) The Maintenance Report shall be submitted as part of the Definitive Design and shall include full details of the long-term inspection and maintenance operations for each major component of viaduct.
- (2) For each area an inspection checklist shall be supplied giving inspection frequency, items to be inspected, criteria for acceptance, criteria for remedial works and details of the remedial works, including proposed materials and method statements. The recommended regular maintenance regime of each area shall also be given including cleaning methods and frequency for different Surfaces; removal of leakage borne salts from concrete surfaces; cleaning of drainage channels, sumps and pipes; repainting of metallic items.
- (3) A long-term monitoring regime shall also be included covering items such as
 - i. Viaduct
 - ii. Differential movement at viaduct / station junctions or other areas identified in the design.
 - iii. Loss of prestress in the girders with passage of time.
- (4) All instruments necessary to carry out the inspections and monitoring that are identified in their port shall be provided by the Contractor within the lump sum tender price.

SECTION-B

EMPLOYER'S REQUIREMENTS – FUNCTIONAL

OBJECTIVE

The objective of the contract is, construction, completion, testing and commissioning of the permanent works by the Contractor (including without limitation, construction, and removal of the Temporary Works) and the rectification of defects appearing in Permanent Works in the manner and to the standards and within the time stipulated by the Contract. In full recognition of this objective, and with full acceptance of the obligations, liabilities and risks which may be involved, the Contractor shall undertake the execution of the Work.

1. GENERAL

1. The Construction and performance of the Permanent Works shall comply with the specific core requirements contained in these Employer's Requirements-Functional.
2. The Construction of the Permanent Works shall be developed in accordance with these Employer's Requirements - Functional, the Contractor's Technical Proposals and the other requirements of the Contract.
3. The Permanent Works shall be constructed to the highest standards available using proven up-to-date good Engineering practices. The Specification shall in any case not specify standards which, in the Engineer's opinion, are less than or inferior to those described in the Design Basis Report (Design Criteria) and Technical/Construction Specifications contained in the Tender Documents. Construction shall be carried out employing the procedures established by the Contractor in his Quality, Safety Health and Environmental management plans.
4. The Contractor shall be responsible for obtaining all necessary approvals from the relevant Public/Government/Local/Statutory or any agencies in the construction of the works.

2. CO-ORDINATION/CO-OPERATION WITH OTHER CONTRACTORS & AGENCIES (EXTERNAL/INTERNAL)

- i. In addition, the Contractor shall be required to carry out various miscellaneous works as per interfacing requirements. The contractor shall carry out necessary co-ordination with various system contractors pertaining to traction power supply, signalling, telecommunication etc. for keeping provisions pertaining to cut outs, shafts, concealed conduits, other conduits, fixtures, inserts clearances etc. all complete.
- ii. Earthing and lightning protection measures wherever required.
- iii. The track supporting structure will support ballast less track (long welded rail) which will be laid later by a separate contractor. Arrangements required for provision of such ballast less track will have to be incorporated in the deck, in consultation with the Engineer. Where the ballast less track concrete is to be laid on the top of the deck slab, as directed by the Engineer, contractor will make suitable arrangements for proper keying up further concrete layers /or casting blocks which will form part of track work to be done by a separate contractor.
- iv. The contractor shall cooperate with the other contractors appointed by the employer so that the work proceeds smoothly to the specifications of the Engineer. The contractor shall plan & execute the works with proper intimation to the other contractors.
- v. NOC & Approval of schemes of diversion of utilities from the concerned regulatory / statutory /Local authority is the responsibility of the contractor.
- vi. The contractor shall attend regular coordination meetings convened by the employer / engineer for interface and adhere to the decisions taken in the meeting.
- vii. Access will be provided to the staff of the other Contractor appointed by the employer for

carrying out their works and bringing materials and equipment at the site. However, the security of materials and Equipment's brought at the site will be the responsibility of the respective Contractors.

- viii. The contractor shall, in carrying out his coordination responsibility, raise in good time and provide sufficient information for the employer to decide on any disagreement with other contractor. If the contractor despite having taken all reasonable efforts cannot resolve such disagreement, then the decision of the Engineer shall be final and binding on the contractor.

3. TRAFFIC MANAGEMENT

The Contractor shall make the detailed traffic diversion plans in consultation with Bangalore Traffic Police. The work is to be executed with proper liaison with Bangalore Traffic Police. Necessary assistance will be given by K-RIDE. The scheme should be such that preferably two lanes limiting to minimum of one lane of traffic in each direction of the road should be available for the smooth flow of traffic. The Contractor should inspect the site. The Contractor shall also strengthen the road where the diversions are planned by widening, repairing to the road surface etc.

4. STRUCTURES

The construction of structures will have to be planned in such a manner that they do not obstruct or interfere with the existing roads/railways and other utilities. Where work is required to be carried out at locations adjacent to such roads/railways, utilities, structures, monuments etc. suitable safety and protection arrangements will have to be ensured for which nothing extra will be payable. It should be ensured that no damage is caused to any such elements and engineer/employer shall be indemnified against such damage at no extra cost.

Any other item of work as may be required to be carried out for completing the construction of elevated structure of specified length including all necessary interfaces works with station and system Contractors in all respects in accordance with the provisions of the Contract and/or to ensure the structural stability and safety during and after construction are included in the scope.

4.1 REFERENCE TO THE STANDARD CODES OF PRACTICE

All Standards, Technical Specifications and Codes of practice referred to shall be latest editions including all applicable official amendments and revisions. The Contractor shall make available at site all relevant Indian Standard Codes of practice and IRS & IRC Codes as applicable.

4.1.1 Wherever Indian Standards do not cover some particular aspect of design/ construction, relevant British/German Standards will be referred to. The Contractor shall make available at site such standard codes of practice.

4.1.2 In case of discrepancy among Standard codes of practice, Technical Specifications, and provisions in sub clauses of NIT, the order of precedence will be as below:

- i) Provision in ITT and Employers Requirements
- ii) Technical Specifications provided in the tender doc, (Order of priority IRS, IS, IRC codes)
- iii) MORTH Specification for road & Bridges
- iv) CPWD specifications
- v) Standard Codes of Practice

In case of discrepancy among Standard Codes of Practice, the order of precedence will be IRS, IS, IRC, BS, DIN, FIP, AASHTO, ASTM.

4.2 DIMENSIONS

4.2.1 As regards errors, omissions and discrepancies in Specifications and Drawings, relevant clause of Particular Conditions of Contract will apply.

4.2.2 The levels, measurements and other information concerning the existing site as shown on the conceptual / layout drawings are believed to be correct, but the Contractor should verify them for himself and also examine the nature of the ground as no claim or allowance whatsoever will be entertained on account of any errors or omissions in the levels or strata turning out different from what is shown on the drawings.

4.3 ASSOCIATED WORKS

Works to be performed shall also include all general works preparatory to the construction and works of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meaning of the drawings adopted and technical specifications, to best Engineering standards and orders that may be issued by the Employer/Engineer from time to time, compliance by the agency with all Conditions of Contract, supply of all materials, apparatus, plants, equipment, tools, fuel, water, strutting, timbering, transport, offices, stores, workshop, staff, labour and the provision of proper and sufficient protective works, diversion, temporary fencing, lighting and watching required for the safety of the public and protection of works on adjoining land; first -aid equipment, sanitary accommodation for the staff and workmen, effecting and maintenance of all insurances, the payment of all wages, salaries, fees, royalties, duties or the other charges arising out of the erection of works and the regular clearance of rubbish, clearing up, leaving the site perfect and tidy on completion.

4.4 CONSTRUCTION OF CASTING & DUMPING YARDS.

No land for casting yard or offices/laboratories etc. will be provided by the employer. However, the employer will give the necessary assistance required for seeking permissions but without any responsibility for the same. Contractor should make his arrangements at his own cost which is deemed to be included in Lump sum price in **Schedule-A, B & C**

Satisfactory tyre washing arrangements of each, and every vehicle shall be made by the contractor for the vehicles leaving the depot to avoid the spillage on the connecting roads.

4.5 TIME SCHEDULE & MONITORING OF PROGRESS

- (i) The agency shall submit with the tender "Time Schedule" for completion of various portions of works. This schedule is to be within the overall completion period of months. The detailed programme in the form of a quantified bar chart or CPM network shall include all activities starting design to completion.
- (ii) In compiling its Works Programme and in all subsequent updating and reporting, the contractor shall make provision for the time required for co-coordinating- and completing the design, testing, commissioning, and integrated testing of the Works, including, inter alia, design co-ordination periods during which the Contractor shall co-ordinate its design with those of Designated Contractors, the review procedures, determining and complying with the requirements of all Government Departments and all others whose consent, permissions, authority or license is required prior to the execution of any work.
- (iii) The Contractor shall submit to both the Employer & Engineer Four copies of a Monthly Progress Report (MPR), describing the progress and current status of the Works. The MPR shall address the matters set out in the Works Programme.
- (iv) The MPR shall be submitted by the end of each calendar month. It shall account for all works actually performed from twenty sixth day of the last month and up to twenty fifth day of the current month.
- (v) A monthly / biweekly meeting to monitor the progress of the project shall be convened by the Engineer, Contractor's site agent and site agent of all interfacing contractors shall attend the meeting. The Employer may also be present in the meeting.

4.6 UTILITIES

Utility identification at foundation locations will be done by the contractor and in case utility (ies) is encountered or obligatory requirement is to be met out; the contractor shall modify the span configuration at such location to save the utility (ies) or to meet obligatory requirements within the accepted price. No payment shall however be made for supporting the utilities during course of work. Any other utilities shifted by the contractor as directed by Engineer/Employer, will be paid separately under **Schedule-C**.

The utilities are to be diverted with proper liaison and approval of the utility owning agencies. The utilities which are not diverted but require supporting, proper supporting is to be done so that they are not damaged along their branches. Precautions to be taken while handling the utilities are mentioned as under.

- (i) Utilities must not be damaged at any cost. If due to some reason or the other, mishap occurs, it should be rectified immediately by the Contractor at his own cost under intimation of Engineer / Employer.
- (ii) Till rectification of the damaged trunk sewers, the Contractor shall arrange substitute arrangement for sewage pumping and its disposal as per directions of Engineer. Similar arrangement is to be done for other utilities.
- (iii) The manholes of Trunk/Sewers should not be covered under the foundation as these may create hindrances to the annual de-silting/cleaning of sewer lines.
- (iv) Sufficient distance of foundation from outer edge of Trunk / Sewers is kept in view of further maintenance/Safety of Trunk/Sewers.
- (v) The covers of manholes be saved from heavy machinery movement to avoid any accident/Slippage of malba in manholes etc into the Trunk /Sewers which may cause blockage of lines. In case of damage of manhole cover & frame the same shall be replaced immediately by the Contractor at his own cost.
- (vi) Manholes of the trunk sewer should be kept freely accessible for cleaning and removal of blockages and malba should not be dumped over these manholes.
- (vii) Branch sewer connections which are connected with the trunk sewers should also be taken care of. If the same are damaged, the same should be restored immediately on priority.
- (viii) NOC & Approval of schemes of Diversion of Utilities from the concerned regulatory / statutory / Local Authority will be got done by contractor. However, necessary assistance will be provided by K-RIDE.

These are only indicative for one of the utilities only. Similarly, necessary precautions which are specified from time to time by the utility owning agencies shall also be followed. The Central verge/footpath furnishings which are to be dismantled be handed over to the concerned department in their stores at contractor's own cost.

4.7 INSPECTION

Engineer / Employer may appoint an independent agency to ensure the quality checking of design, supply, fabrication, erection, and construction of all the work under 'scope of work'. The contractor shall ensure complete co-operation with the agencies to perform their work satisfactorily. In addition, Engineer / Employer also reserves the right to undertake quality check and inspection directly by itself.

5. Deleted

6. CLEARANCES

- (1) The Permanent Works shall not infringe the Structure Gauge. Extra clearances shall be provided on

curved alignment as per the Schedule of Dimensions (SOD)/Design Basis Report (DBR).

- (2) The Permanent Works shall provide for the installation by the Designated Contractors of operating equipment for the railway/BSRP and without infringement of the Structure Gauge.
- (3) Railway clearances:
Various clearances shall be provided as per the schedule of dimensions approved for the Engineer / Employer.
- (4) Construction limits:
 - (a) The limits of land for the Works will be given to successful tenderer. The Contractor shall design the Works to be contained totally within these limits, respecting the regulations concerning construction and property boundaries of the local authorities such as BMRCL, BDA, BBMP, SWR, BWSSB, BESCOM, DULT etc., In the event that the Contractor, having used its best endeavours, is unable to design the permanent works and utilities to be contained totally within these limits, then the Employer will obtain the necessary additional land or the Contractor may be required to redesign the structure as instructed by Engineer.
 - (b) The limits of land will be given to successful tenderer but for general guidance it is 4.5 m on either side of the center line in Viaduct portion and limits of the land for At-Grade portion as per the Tender drawing. However, the permission for barricading etc. will be given depending upon the preparedness of the contractor, issues concerning traffic department etc. as is the usual practice. It may undergo changes after final survey and the Contractor shall make any adjustments necessary to the design to acknowledge the changes to the limits as then defined. Site will be made available progressively depending upon the requirement.
 - (c) The approval for viaduct, major bridges, minor bridges, ROB's, RUB drawings from railway to be obtained by the contractor. The necessary assistance will be provided by Engineer / Employer.

7. Deleted

8. DURABILITY AND MAINTENANCE

- (1) The Permanent Works shall be constructed such that, if maintained reasonably and in accordance with the Contractor's statement of maintainability contained in the Contract, they shall endure in a serviceable condition throughout their minimum lives
- (2) The permanent Works shall be constructed so as to minimize the cost of tenancy whilst not compromising the performance characteristics and ride quality of the railway.
- (3) Restoration of roads, utilities and other services dislocated during construction is the responsibility of the contractor.
- (4) Survey, instrumentation, ground treatment, ground and building monitoring, risk analysis, settlement prediction, preventive and corrective actions is the responsibility of the contractor.
- (5) Traffic management along the worksite including works connected with traffic management is the responsibility of the contractor.
- (6) Reinstatement of services (such as street lighting, signalling system, bus stand, footpath including kerb stone, boundary wall, horticulture work and any other work to bring the site to original position) within barricading area as per current standards with new materials (except electrical/signal post which may be reused if they are usable).
- (7) The contractor shall be responsible for obtaining relevant certificates or clearance from local civic authorities.
- (8) The contractor shall be responsible for obtaining approval by all relevant civic authorities having

jurisdictional authority wherever required.

9. OPERATIONAL REQUIREMENTS

- (1) Particular attention shall be paid to locations where flooding could damage the railway. In particular Construction of surface water drainage systems including plinths and ducts shall be avoided in the vicinity of traction substations to obviate any risk of flooding of electrical equipment areas.
- (2) During construction the contractor shall be responsible for providing and maintaining adequate flood protection to ensure protection of the works.

10. ENVIRONMENTAL CONSIDERATIONS

All provisions and conditions contained in the conditions of contract on safety, health & environment and Section-8C of the tender document shall be strictly complied with. Bidders should note that any stipulations specified by the funding agency in relation to environment, social, health and safety (eshs) shall be complied in all respect. Such stipulations will be uploaded along with as addendum in due course of bid process.

11. URBAN PLANNING FUNCTIONAL REQUIREMENTS

1. Requests for temporary power supplies for the construction of the works must be submitted by the contractor to the concerned authorities. Alternatively separate power supplies may be arranged by the Contractor independent of concerned electricity distribution/ transmission authority subject to compliance with all necessary statutes.
2. In addition, a number of agencies are involved in the reinstatement works, permanent road accesses, temporary road accesses, refuse collection accesses, street lighting, traffic management and fire hydrant positions. The Contractor is responsible for obtaining the approvals for these other works.
3. The Contractor is responsible for obtaining the approval of applications from the above authorities for the design and construction of works. The Employer may provide assistance in order to obtain any permission on clearances.

12. TRAFFIC MANAGEMENT

The Contractor shall carry out the Works so as to minimize disruption to road and pedestrian traffic. The Contractor shall prepare his traffic management plan based on his proposed construction methodology in co-ordination with Engineer and in conjunction with Bangalore Traffic Police. He shall comply strictly with the approved plan during construction of his works. The design shall provide for temporary road decking wherever necessary to provide minimum no. of traffic lanes as agreed with Bangalore Traffic Police.

13. MISCELLANEOUS

The Contractor shall note that the Commissioner for Railway Safety (CRS) will inspect the Works from time to time for the purpose of determining whether the Bangalore Suburban Rail Corridor Project complies in terms of operational and infrastructural safety in accordance with the Laws of India. The contractor shall note that CRS approval is mandatory for commissioning the system. Notwithstanding other provisions of the Contract, the Contractor shall ensure that the Works comply with the requirements of CRS in terms of construction to the drawings and shall assist the representatives of CRS in carrying out their inspection duties and also comply with their instructions regarding rectifying any defects and making good any deficiencies.

14. STANDARDS

- (1) Equipment, materials, and systems shall be designed, manufactured and tested in accordance with the latest issue of International and/or National codes and standards. The Contractor shall submit hard copies in original to the Employer/ Engineer of all codes and standards used for the work.

- (2) Reference to standards or to materials and equipment of a particular manufacturer shall be regarded as followed by the words "or equivalent". The Contractor may propose alternative standard materials, or equipment that shall be equal to or better than those specified. If the Contractor for any reason proposes alternatives to or deviations from the specified standards or desires to use materials or equipment not covered by the specified standards, the Contractor shall apply for the consent of the Engineer. The Contractor shall state the exact nature of the change, the reason for making the change and relevant specifications of the materials and equipment in the English language. The decision of the Engineer in the matter of quality will be final. No compensation or extra money shall be paid.

SECTION C

EMPLOYER'S REQUIREMENTS -DESIGN

DELETED

SECTION D**EMPLOYER'S REQUIREMENTS -CONSTRUCTION****1. CONTRACTORS SUPERINTENDENCE**

- (1) The Contractor shall submit a Staff Organization Plan in accordance with the ITT/Employer's Requirement. This plan shall be updated and resubmitted whenever there are changes to the staff. The plan shall show the management structure and state clearly the duties, responsibilities, and authority of each staff member.
- (2) The site agent and his associates/supervisors shall have experience and qualification appropriate to the type and magnitude of the Works. Full details shall be submitted of the qualifications and experience of all proposed staff to the Engineer for his approval.

2. CHECKING OF THE CONTRACTOR'S TEMPORARY WORKS DESIGN

The Contractor shall, prior to commencing the construction of the Temporary Works, submit a certificate to the Engineer signed by him certifying that the Temporary Works have been properly and safely designed and checked and that the Contractor has checked the effect of the Temporary Works on the Permanent Works and has found this to be satisfactory. The contractor to obtain the approval for designs and drawings of temporary structures from Railways and CRS. The necessary assistance will be given by Engineer / Employer.

3. THE SITE

- (1) Works Areas are those areas identified in **Annexure-1 to these Employer's Requirements** and on the Drawings.

No land shall be made available by the employer for casting yard, site offices, and site laboratories. Contractor shall make his own arrangements at his own cost. In case the Railway land is arranged adjacent to near to railway track for casting of Segmental Box/U-Girders & for initial erection and launching activity temporarily, the necessary land rent / lease charges shall be levied as per Railway guidelines /K-RIDE norms and the same will be deducted from RA bills of the Contractor.

USE OF THE SITE

- (2) The Site or Contractor's Equipment shall not be used by the Contractor for any purpose other than for carrying out the Works in the scope of this contract, except that, with the consent in writing of the Engineer, the Site or Contractor's Equipment such as batching and mixing plants for concrete and bituminous materials may be used for the work in connection with other contracts under the Employer.
- (3) Rock crushing plant shall not be used on the Site.
- (4) The location and size of each stockpile of materials, including excavated materials, within the Site shall be as permitted by the Engineer. Stockpiles shall be maintained at all times in a stable condition.
- (5) Entry to and exit from the Site shall be controlled and shall be only available at the locations for which the Engineer has given his consent.

ACCESS TO THE SITE

- (6) The Contractor shall make its own arrangements, subject to the consent of the Engineer, for any further access required to the Site.
- (7) In addition, the Contractor shall ensure that access to every portion of the Site is continually available to the Employer and Engineer.
- (8) Following the handover of the Railway Envelope, (as defined in the Employer's Requirements- General), to the Employer, the Employer will control the Railway Envelope and will be responsible for all matters relating to security and safety therein. Access to the Railway Envelope by the Contractor shall be in accordance with any procedure's requirements and conditions.

ACCESS TO OUTSIDE THE SITE

- (9) The Contractor shall be responsible for ensuring that any access or egress through the Site boundaries are controlled such that no disturbance to residents or damage to public or private property occur as a result of the use of such access or egress by its employees and sub-contractors.

SURVEY OF THE SITE

- (10) A survey shall be carried out of the Site to establish its precise boundaries and the existing ground levels within it. This survey shall include a photographic survey sufficient to provide a full record of the state of the Site before commencing the work with particular attention paid to those areas where reinstatement will be carried out later on. The survey shall be carried out before the site clearance wherever possible and in any case prior to the commencement of work in any Works Area. The survey shall be carried out by the Contractor and agreed with the Engineer.

BARRICADES AND SIGN BOARDS

- (11) The Contractor shall erect barricades and gates around its areas of operations to prevent entry by unauthorized persons to his Works Areas and necessary identity cards /permits should be issued to workers and staff by the contractor. The Contractor shall submit proposal for barricades of the complete perimeter of all works areas to the Engineer. The safety barricading as per Drawing No. K-RIDE/ BSRP/ C4/TD/BD/04/01&02 with Contractor's material labour including foundation works are required adjacent to IR tracks along the alignment for ensuring the safety of running trains. The temporary barricades of 2m heights of line MS sheets 16 gauge as per K-RIDE drawing are required to be provided near to IR/BSRP boundary. Painting of the barricades shall be carried out to the design and colours as directed by the Engineer and the Contractor shall carry out re- painting of the entire barricades on an annual basis. No work shall be commenced in any Works Area until the Engineer has been satisfied that the barricades installed by the Contractor are sufficient to prevent, within reason, unauthorized entry.
- (12) Project signboards shall be erected within four (4) weeks, or such other period as the Engineer has given his consent, after the date of commencement of the Works. The types, sizes and locations of project signboards shall be agreed with the Engineer before manufacture and erection. Other advertising signs shall not be erected on the Site. The cost of these signboards is included in quoted price.
- (13) The consent of the Engineer shall be obtained before hoardings, fences, gates, or signs are removed. Hoardings, fences, gates, and signs which are to be left in positions after the completion of the Works shall be repaired and repainted as instructed by the Engineer.
- (14) Hoardings, barricades, gates, and signs shall be maintained in clean and good order by the Contractor until the completion of the Works, whether such hoardings, fences, gates, and signs have been installed by the Contractor or by others and transferred to the Contractor during the period of the Works. All the fencing, hoardings, gates, and signs etc. shall be mopped minimum once in a week and washed monthly.
- (15) All hoardings, barricades, gates, and signs installed by the Contractor shall be removed by the Contractor upon the completion of the Works, unless otherwise directed by the Engineer.
- (16) Hoarding/ barricades can be reused after removing from one place to other locations / sites provided they are in good condition and approved by Engineer.
- (17) Damage/worn-out barricades /hoarding shall be replaced by contractor within 24 hours. Engineer's decision regarding need for replacement shall be final and binding and if no action is taken by contractor, the Engineer may get it repaired through other agency and the cost of any repairs will be deducted by the Engineer from any payment due to the contractor.

CLEARANCE OF THE SITE

- (18) All Temporary Works which are not to remain on the Site after the completion of the Works shall be removed prior to completion of the Works or at other times instructed by the Engineer. The Site shall be cleared and reinstated to the lines and levels and to the same condition as existed before the Works started except as otherwise stated in the Contract.

4. SURVEY

- (1) While doing the survey work, the fact that similar work will have to be done once again on the completed earth work in formation for fixing up the longitudinal levels of the installed P. Way should be kept in view.
- (2) The Contractor to fix alignment reference points at regular intervals all along the alignment. The contractor along with the Engineer should verify the details of these alignment pillars. If any mistakes are detected in these details, the same should be indicated to the Engineer before starting any work. These detected mistakes should be corrected by the Contractor in consultation with the Engineer. These corrections should be got approved from the Engineer.
- (3) The Contractor shall relate the construction of the Works to the Site Grid. To facilitate this, survey reference points have to be established by the contractor and benchmarks in the vicinity of the Site.
- (4) Before the Contractor commences the setting out of the Works, the Contractor shall satisfy itself that there are no conflicts and shall establish and provide all subsidiary setting out points, monuments, towers, and the like which may be necessary for the proper and accurate setting out and checking of the Works.
- (5) The Contractor shall carefully protect all the survey reference points, bench marks, setting out points, monuments, towers and the like from any damages and shall maintain them and promptly repair or replace any points damaged from any causes whatsoever. The Contractor shall regularly recheck the position of all setting out points, bench marks and the like to the satisfaction of the Engineer.
- (6) The survey reference points will become the responsibility of the Contractor. The Contractor shall, by annual or more frequent review, ensure that these survey points continue to remain consistent with the benchmarks.

5. SAFETY, HEALTH, AND ENVIRONMENTAL REQUIREMENTS

The Contractor shall comply with in the conditions stipulated in the Conditions of contracts on Safety, Health & Environment (SHE) including ESMP plan attached with SHE manual.

5.1 TRAINING OF CONTRACTOR'S EMPLOYEES/STAFF/WORKERS: -

Contractor shall provide a training/workshop on safety, Health & Environment (SHE) to all its workers/staff/employees/subcontractors of at least 2 weeks (96hrs.) at the time of induction. Before postings of any his workers/staff/employees/subcontractors, the contractor shall give a certificate that the said person had undergone the requisite SHE training. Non-compliance of the above will invoke penalties as per condition of contract on SHE, **Section-8C** of Tender document.

In case of any mishap/ accident-causing death/injury to public or damage to public/private property or damage to public/private vehicles or damage to railway property, the employer, will impose a penalty to the contractor as deemed fit and appropriate in addition to the cost of damage caused due to the mishap/accident.

5.2 USE OF "TRACTOR TRANSMISSION TYPE" PICK AND CARRY HYDRA CRANE: -

"Tractor Transmission type" Pick and Carry Hydra crane - 1st Generation model is prohibited at BSRP works, Contractor shall mobilize "Truck Transmission type" pick and carry hydra crane - 2nd Generation model only.

6. OTHER SAFETY MEASURES**SITE SAFETY, HEALTH & ENVIRONMENT PLAN**

- (1) The Contractor shall, within 60 days of the date of Notice to Proceed, prepare and submit to the Engineer for review his proposed safety, Health and Environment plan which shall contain as a minimum those items set out in Conditions of Contract on Safety, Health & Environment Plan.

FIRE REGULATIONS AND SAFETY

- (2) The Contractor shall provide and maintain all necessary temporary fire protection and firefighting facilities on the Site during the construction of the Works and shall comply with all requirements of the Bangalore

Fire Services Department. These facilities may include, without limitation, sprinkler systems and fire hose reels in temporary site buildings, raw water storage tanks and portable fire extinguishers suitable for the conditions on the Site and potential hazards.

- (3) The Contractor shall submit details of these facilities to the Engineer for review prior to commencement of work on the Site.
- (4) If, in the Engineer's opinion, the use of naked lights may cause a fire hazard, the Contractor shall take such additional precautions and provide such additional firefighting equipment (including breathing apparatus) as the Engineer considers necessary. The term "naked light" shall be deemed to include electric arcs and oxyacetylene or other flames used in welding or cutting metals.
- (5) Oxyacetylene burning equipment will not be permitted in any confined space; Burning equipment of the oxpropane type shall be used.

HAZARD AND RISK ASSESSMENTS

- (6) The Contractor shall, prior to the commencement of any operation carry out a detailed hazard and risk assessment. The results of such assessments shall be recorded, and the records kept for inspection by the Engineer.
- (7) The Contractor shall produce detailed method statements for all medium and high-risk operations and shall submit them to the Engineer for his consent prior to commencement of any task to which they relate.
- (8) The Contractor shall produce and implement a Permit to Work system for all high-risk operations. The Permit to Work system shall be submitted to the Engineer for consent before application.

EXPLOSIVES

- (9) Explosives shall not be used without prior written consent of the Engineer. Before consent to blasting is granted, the Contractor shall prepare a Specification as to the size of charge, the method of firing and any other restrictions that may be imposed from time to time.
- (10) Where the Engineer has consented to the use of explosives, the Contractor shall be responsible for obtaining the requisite licences and permits for complying with all statutory requirements for blasting.
- (11) The storage, transportation and use of explosives shall at all times be governed by the Explosives Acts and such other statutory regulations which may be applicable and as imposed by the Statutory Authority.

LAUNCHING GIRDER/ LAUNCHING CRANE

- (12) No Launching Girder or Launching Crane shall be used without written consent of the Engineer.
- (13) The Contractor shall prepare a detailed specification for the operation of Launching Girder and submit it to the Engineer for review and approval.

STANDBY EQUIPMENT

- (14) The Contractor shall provide adequate stand-by equipment to ensure the safety of personnel, the Works, and the public. These measures shall include as a minimum the following: -
 - (a) stand-by pumping and generating equipment for the control of water;
 - (b) stand-by equipment and spares for illumination of the Works; and
 - (c) stand-by generating equipment and equipment for the lighting for the works.

CO-OPERATION

- (15) The Contractor shall provide full co-operation and assistance in all safety surveillance carried out by the Engineer or the Employer. Any breaches of the Site Safety Plan or the statutory regulations or others disregard for the safety of any persons may be the reason for the Engineer to exercise his authority to require the site agent's removal from the Site.

7. CARE OF THE WORKS

- (1) Any error in the execution of work leading to redesign work shall be duly compensated by the

contractor as per the decision of Engineer. Any error attributable to the construction including failure to locate underground utilities shall attract penalties.

- (2) Unless otherwise permitted by the Engineer all works shall be carried out in dry conditions.
- (3) The works, including materials for using in the works, shall be protected from damage due to water. Water on the site and water entering the site shall be promptly by temporary drainage or pumping system or by other methods capable of keeping the works free of water. Silt and debris shall be removed by traps before the water is discharged and shall be disposed of at a location or locations to which the engineer has given his consent.
- (4) The discharge points of the temporary systems shall be as per the consent of the engineer. The contractor shall make all arrangements with and obtain the necessary approval from the relevant authorities for discharging water to drains, watercourses etc. The relevant work shall not be commenced until the approved arrangements for disposal of the water have been implemented.
- (5) The methods used for keeping the works free of water shall be such that settlement of, or damage to, new and existing structure does not occur. Measures shall be taken to prevent flotation of new and existing structures.

PROTECTION OF THE WORKS FROM WEATHER

- (6) Work shall not be carried out in weather conditions that may adversely affect the Works unless proper protection is provided to the satisfaction of the Engineer.
- (7) Permanent Works, including materials for such Works, shall be protected from exposures of weather conditions that may adversely affect such Permanent Works or materials.
- (8) During construction of the Works storm restraint systems shall be provided where appropriate. These systems shall ensure the security of the partially completed and ongoing stages of construction and in all weather conditions. Such storm restraint systems shall be installed as soon as practicable and shall be compatible with the Right of Access or other access around or through- out the Site.
- (9) The contractor shall at all-time programme and order progress of the work and make all protective arrangements such that the works can be made safe in the event of storms.

PROTECTION OF THE FINISHED WORKS

- (10) The finished works shall be protected from any damage that could arise from any activities on the adjacent site/ works.

8. DAMAGE AND INTERFERENCE

- (1) Work shall be carried out in such a manner that there is no damage to or interference with:
 - (a) watercourses or drainage systems; (b) utilities; (c) structures (including foundations), roads, including street furniture, or other properties; (d) public or private vehicular or pedestrian access; (e) monuments trees, graves, or burial grounds other than to the extent that is necessary for them to be removed or diverted to permit the execution of the Works. Heritage structures shall not be damaged or disfigured on any account. The Contractor shall inform the Engineer as soon as practicable of any items which are not stated in the Contract to be removed or diverted but which the Contractor considers need to be removed or diverted to enable the Works to be carried out. Such items shall not be removed or diverted until the consent of the Engineer to such removal or diversion has been obtained.
- (2) Items which are damaged or interfered with as a result of the Works and items which are removed to enable work to be carried out shall be reinstated to the satisfaction of the Engineer and to at least the same condition as existed before the work started. Any claims by Utility Agencies due to damage of utilities by the Contractor shall be borne by the Contractor.

UTILITIES

- (3) Please refer Employer's Requirement –Functional

STRUCTURES, ROADS, AND OTHER PROPERTIES

- (4) The Contractor shall immediately inform the Engineer of any damage to structures, roads or other properties.

ALTERNATIVE ACCESS

- (5) Alternative access shall be provided to all premises if interference with the existing access, public or private, is necessary to enable the Works to be carried out. The arrangements for the alternative access shall be as agreed by the Engineer and the concerned agency. Unless agreed otherwise, the permanent access shall be reinstated as soon as practicable after the work is complete and the alternative access shall be removed immediately as it is no longer required, and the ground surfaces reinstated to the satisfaction of the Engineer. Proper signage and guidance shall be provided for the traffic / users regarding diversions.

REMOVAL OF GRAVES AND OTHER OBSTRUCTIONS

- (6) If any graves and other obstructions are required to be removed in order to execute the Works and such removal has not already been arranged for, the Contractor shall draw the Engineer's attention to them in good time to allow all necessary arrangements and authorizations for such removal, and it shall not itself remove them unless the Engineer has given consent.

PROTECTION OF THE ADJACENT STRUCTURES AND WORKS

- (7) The Contractor shall take all necessary precautions to protect the structures or works being carried out by others adjacent to and, for the time being, within the Site from the effects of vibrations, undermining and any other earth movements or the diversion of water flow arising from its work.

9. WORK ON ROADS**(1) TRAFFIC MANAGEMENT PLAN**

The Contractor shall develop a detailed Traffic Management Plan for the work under the contract. The purpose is to develop a Traffic Management Plan to cope with the traffic disruption as a result of construction activities by identifying strategies for traffic management on the roads and neighbourhoods impacted by the construction activities. The Contractor shall implement the Traffic Management Plan throughout the whole period of the Contract.

PRINCIPLES FOR TRAFFIC MANAGEMENT

The basis for the Plan shall take into consideration four principles:

- a. to minimize the inconvenience of road users and the interruption to surface traffic through the area impacted by the construction activities;
- b. to ensure the safety of road users in the impacted area;
- c. to facilitate access to the construction site, and to maintain reasonable construction progress.
- d. to ensure traffic safety at each construction site.

INTEGRATED TRAFFIC MANAGEMENT PLAN

The Contractor shall prepare an integrated plan showing the arrangements to be made for accommodating road and pedestrian traffic, at individual construction sites and continuously along the alignment, to smooth traffic operations and for the safety of both construction workers and road users. The Plan shall consider different measures such as:

- i. Proper phasing and timing of traffic signals;
- ii. Modifications to intersection geometry;
- iii. Changes in lane usage;
- iv. parking prohibitions;
- v. relocation of bus stops;
- vi. reducing width of footpaths and median

- vii. right turn prohibition;
- viii. work site access management;
- ix. minimizing the duration of any road closure;
- x. reversible lane operations;
- xi. modification of roadway alignment affected by the construction, which shall be in conformance with the requirements and regulations defined by the relevant authorities; and may include widening of roads, Construction of temporarily new road etc.
- xii. other traffic engineering measures as may be applicable.

(2) MITIGATION OF TRAFFIC DISTURBANCES

The Contractor shall manage the vehicular and pedestrian Right of Access during the period of construction. The Contractor shall take account of the need to maintain essential traffic requirements, as these may influence the construction process.

The Contractor shall include local traffic diversion routes and assess traffic impacts caused by the construction in the affected areas. Signage layout shall be included to ensure that adequate motorist information will be provided for traffic diversions.

Where it becomes necessary to close a road or intersection, or supplementary lanes are required to satisfy the traffic demands, traffic diversion schemes to adjacent roadways shall be developed with quantitative justifications. The Contractor shall co-ordinate with all relevant authorities.

Other considerations include:

- i. The minimum lane widths for fast traffic and mixed traffic shall follow the regulations of the different authorities.
- ii. Any roads or intersections that have no alternative access shall not be fully closed for construction.
- iii. Emergency access to all properties shall be maintained at all times.
- iv. Access to business premises and property shall be maintained to the extent that normal activities are not seriously disrupted.
- v. Minimum footpath width shall be 1.5 m, unless otherwise indicated. The footpath shall be separated from vehicle traffic and not necessarily immediately adjacent to vehicle traffic;
- vi. Where existing footbridges and underpasses are demolished or closed, provisions shall be made for pedestrian crossing to minimise the conflicts between a traffic lanes.
- vii. Construction traffic shall be separated from other traffic wherever possible;
- viii. Any traffic related facilities (bus stops, parking, etc.) which are affected by the construction works shall be maintained or relocated to appropriate locations;
- ix. Motorists, pedestrians, workmen, plant and equipment shall be protected from accident at all times;
- x. Roadway designs, traffic management schemes, and installation of traffic control devices shall be in conformance with the requirements and regulations defined by the relevant authorities. And
- xi. Where applicable, utility diversions shall be incorporated in the traffic management plan.

(3) APPROVAL FOR TEMPORARY TRAFFIC ARRANGEMENTS AND CONTROL

The Contractor shall make all arrangements with and obtain the necessary approval from the transport authorities and the Police Department for temporary traffic arrangements and control on public roads. In the event that the Contractor, having used its best endeavours, fails to secure the necessary approval from the transport authorities and the Traffic Police Department for temporary traffic arrangements and control on public roads, then the Employer will use its best endeavours to assist the Contractor to secure such approval but without responsibility on the part of the Employer to do so.

(4) TEMPORARY TRAFFIC ARRANGEMENTS AND CONTROL

- i. Temporary traffic diversions and pedestrian routes shall be surfaced and shall be provided where work

on roads or footpaths obstruct the existing vehicular or pedestrian access. The relevant work shall not be commenced until the approved temporary traffic arrangements and control have been implemented.

- ii. Temporary traffic arrangements and control for work on public roads and footpaths shall comply with the requirements of the Traffic Police. Copies of documents containing such requirements shall be kept on the Site at all times.
- iii. Temporary traffic signs, including road marking, posts, backing plates and faces, shall comply with the requirements the traffic police and should be in accordance with the requirements of Ministry of Surface Transport. All overhead traffic management signs that are fixed to bridges and gantries shall be illuminated at night. Pedestrian routes shall be illuminated at night to a lighting level of not less than 50 lux.
- iv. Adequate number of traffic guards, supervisors and in charge shall be deployed for smooth regulation of traffic.
- v. Temporary traffic arrangements and control shall be inspected and maintained regularly, both by day and night. Lights and signs shall be kept clean and legible. Equipment which are damaged, dirty, incorrectly positioned or not in working order shall be repaired or replaced promptly.

(5) PARTICULARS OF TEMPORARY TRAFFIC ARRANGEMENTS AND CONTROL

The following particulars of the proposed temporary traffic arrangements and control on public roads shall be submitted to the Engineer for consent at least 28 days before the traffic arrangements and control are implemented:

- (a) details of traffic diversions and pedestrian routes;
- (b) details of lighting, signage, guarding and traffic control arrangements and equipment;
- (c) any conditions or restrictions imposed by Traffic Police or any other relevant authorities, including copies of applications, correspondence, and approval.

Where concrete barriers are used to separate flows of traffic, the barriers shall be in a continuous unbroken line. No gaps shall be left between any section of the barrier.

Site perimeter fencing and barriers along the roadway, shall have flashing amber lights positioned on the top of them every 50 meters apart and at every abrupt change in location. Directly below the flashing light shall be fixed, in the vertical position, a white fluorescent, with a waterproof cover.

(6) USE OF ROADS AND FOOTPATHS

Public roads and footpaths on the Site in which the work is not being carried out shall be maintained in a clean and passable condition.

1. Measures shall be taken to prevent the excavated materials, silt or debris from entering gullies on roads and footpaths, entry of water to the gullies shall not be obstructed.
2. Surfaced roads on the Site and leading to the Site shall not be used by tracked vehicles unless protection against damage is provided.
3. Contractor's Equipment and other vehicles leaving the Site shall be loaded in such a manner that the excavated material, mud or debris will not be deposited on roads. All such loads shall be covered or protected to prevent dust being emitted. The wheels of all vehicles shall be washed, when necessary, before leaving the Site to avoid the deposition of mud and debris on the roads.

(7) REINSTATEMENT OF PUBLIC ROADS AND FOOTPATHS

1. Temporary diversions, pedestrian access, and lighting, signing, guarding and traffic control

equipment shall be removed immediately when they are no longer required. Roads, footpaths, and other items affected by temporary traffic arrangements and control shall be reinstated to the same condition as existed before the work started or as permitted by the Engineer immediately after the relevant work is complete or at other times permitted by the Engineer.

2. The contractor shall submit his design for the reinstatement to the relevant authorities and obtain their prior approval to carrying out the work. Reinstatement works shall include:

- i. Parking bays
- ii. Footpath and kerbs
- iii. Road Signage
- iv. Street Lighting
- v. Landscaping
- vi. Traffic Lights and Control Cable
- vii. Road painting

10. SITE ESTABLISHMENT: SITE LABORATORIES

- (1) The Contractor shall provide, erect, and maintain in a clean, stable and secure condition a laboratory, equipped for the routine testing of concrete, soil and rock samples and for the storage and curing of concrete cubes or cylinders only. This laboratory shall be located at the Contractor's principal work site or at a location agreed to by the Engineer. Detailed requirements for this laboratory are set out in **Appendix 14 / Annexure VIII -1 Employers' Requirement.**

(2) CONTRACTOR'S SITE ACCOMMODATION

The Contractor shall provide and maintain its own site accommodation at locations consented to by the Engineer. Offices, sheds, stores, mess rooms, garages, workshops, latrines and other accommodation on the Site shall be maintained in a clean, stable and secure condition. Living accommodation shall not be provided on the Site. The Contractor shall comply with the requirements of **Appendix 13 / Annexure VIII –1 Employers' Requirement.**

(3) LATRINES AND WASH PLACES

The Contractor shall provide latrines and wash places for the use of its personnel and all persons who will be on the Site. The size and disposition of latrines and wash places shall accord with the numbers and dispositions of persons entitled to be on the Site, which may necessitate their location on structures and, where necessary there shall be separate facilities for males and females. The capacities and layout shall be subject to approval of the Engineer. The Contractor shall arrange regular disposal of effluent and sludge in a manner that shall be in accordance with local laws/ regulations.

- (4) The Contractor shall be responsible for maintaining all latrines and wash places on the Site in a clean and sanitary condition and for ensuring that they do not pose a nuisance or a health threat. The Contractor shall also take such steps and make such provisions as may be necessary or directed by the Engineer to ensure that vermin, mosquito breeding etc. are at all times controlled.

(5) SITE UTILITIES AND ACCESS

(a) The Contractor shall be responsible for providing water, electricity, telephone, sewerage and drainage facilities for contractor's site offices, structures and buildings and for all site laboratories in accordance with **Appendix 14 / Annexure VIII – 1 of Employer's Requirement** to these Employer's Requirements and all such services that are necessary for satisfactory performance of the Works. The Contractor shall make all arrangements with and obtain the necessary approval from the relevant civil and utility authorities for the facilities.

(b) The contractor shall be responsible for provision of power supply for his works including for launching girder and the like. The Employer cannot guaranty provision of adequate, continuous power supply however assistance will be given in obtaining the necessary permissions for site generators and the like.

- (6) Access roads and parking areas shall be provided within the Site as required and shall be maintained in a clean, acceptable, and stable condition. For lengths of roadway longer than 100 m and heavy commercial vehicle are to ply the Contractor shall provide paved surfacing of adequate thickness and quality to the satisfaction the Engineer.

SUBMISSION OF PARTICULARS

- (7) The following particulars shall be submitted to the Engineer for his consent not more than thirty (30) days after the date of commencement of the Works:
- (a) drawings showing the formation works and the layout within earmarked area for the Contractor's offices, project signboards, principal access and other major facilities required early in the Contract, together with all service utilities;
 - (b) drawings showing the details to be included on the project signboards and diversion boards.
- (8) Drawings showing location of stores, storage areas, concrete batching plants and other major facilities and their access roads/paths shall be submitted to the Engineer for his consent as early as possible but in any case, not less than twenty-eight (28) days prior to when such facilities are intended to be constructed on the Site.

11. SECURITY

- (1) The Contractor shall be responsible for the security of the site for the full time the site is in its possession, except for the specific case of the Railway Envelope after handover to the Railway Operator. It shall set up and operate a system whereby only those persons entitled to be on the Site can enter the Site. To this end, the Contractor shall with the consent of Engineer provide the specific points only at which entry through the security fence can be affected, and shall provide gates and barriers at such points of entry and whereby maintain a twenty-four (24) hours security guard, and such other security personnel and patrols elsewhere as may be necessary to maintain security.
- (2) The Contractor shall maintain all site boundary fences in first class condition and shall so arrange site boundary fences at all access drainage points of work areas that its use of such access points etc., are not restricted by the system or method of achieving the required security measures. Notices shall be displayed at intervals around the Site to warn the public of the dangers of entering the Site.
- (3) During the progress of the Works the Contractor shall maintain such additional security patrols over the areas of the Works as may be necessary to protect its own and its subcontractor's work and equipment.
- (4) In order to operate such a security system, it will be necessary to institute the issue of unique passes to personnel and vehicles entitled to be on the Site, and which may need to be separately identifiable according to the shifts being worked on Site. The Contractor shall at the outset determine, together with the Engineer, a system, and the design of passes to suit the requirements of the foregoing and to suit the methods of work to be adopted by the Contractor. The Contractor shall at all times ensure that the Engineer has an up-to-date list of all persons entitled to be on the Site at any time. The contractor shall also introduce a system of issue passes to any outsider or person/vehicles belonging to agencies other than employer/ Engineers who may have to visit the site in connection with work.
- (5) The Contractor shall liaise with the Designated Contractors and the contractors responsible for the adjacent and other interfacing contracts and ensure that coordinated security procedures are operated, in particular in respect of vehicles permitted to pass through the Site and/or the adjacent sites.
- (6) Security and checking arrangements as felt necessary shall be provided with advice and help of Police.
- (7) Contractor's as well as his Subcontractor's employees and representative shall wear Identification Badges (cards), uniforms, helmets, safety shoes/gum boots & other safety/protection wear as directed by Engineer, and to be provided by the Contractor. Badges shall identify the Contractor/ Subcontractor and show the employee's name and number and shall be worn at all times

while at site.

- (8) All vehicles used by the Contractor/ Subcontractor shall be clearly marked with the Contractor's / Sub Contractor's name or identification mark.
- (9) The Contractor shall co-ordinate and plants the security of both the works under this Contract and the works of other engaged in adjacent and interfacing contractor's and requiring access to the site. In order to operate such a security system, it will be necessary to institute the issue of unique passes to personnel and vehicles entitled to be on the Site, system of separately identifiable according to the shifts being worked on Site. The Contractor shall at the outset determine, together with the Engineer, a system including the design of passes to suit the requirements of the foregoing and to suit the methods of works to be adopted by the Contractor. The Contractor shall at all times ensure that the Engineer has an up-to-date list of all persons entitled to be on the Site at any time. The Contractor shall also introduce a system for issue of passes to any outsider or persons/ vehicles belonging to agencies other than Employer/ Engineer who may have to visit the site in connection with work.

12. TESTING - GENERAL

- (1) The Contractor shall provide and perform all forms of testing procedures applicable to the Works and various components and the interfacing of the Works with the other Contract works and shall conduct all necessary factory, site, and acceptance tests.
- (2) All testing procedures shall be submitted at least thirty (30) days prior to conducting any Test. The Testing procedures shall show unambiguously the extent of testing covered by each submission, the method of testing, the Acceptance Criteria, the relevant drawing (or modification) status and the location.
- (3) The testing Procedures shall be submitted as required, by the contractor during the duration of the contract to reflect the changes in system design or the identification of additional testing requirements.
- (4) The Engineer shall have the facilities for monitoring all tests and have access to all testing records. Ample time shall be allowed within the testing programmes for necessary alterations to equipment, systems and designs to be undertaken, together with re-testing prior to final commissioning.
- (5) All costs associated with the Testing shall be borne by the Contractor, unless otherwise specified, including the services of any specialized personnel or independent assessors. The Contractor shall also bear any expenses incurred due to resetting caused by defects or failure of equipment to meet the requirements of the Contract in the first instance.
- (6) Unless agreed in writing by the Engineer, the personnel engaged on testing shall be independent of those directly engaged in the design or installation of the same equipment.
- (7) All testing equipment shall carry an appropriate and valid calibration label.

BATCHES SAMPLES AND SPECIMENS

- (8) A batch of material is a specified quantity of the material that satisfies the specified conditions. If one of the specified conditions is that the material is delivered to the Site at the same time, then material delivered to the Site over a period of a few days may be considered as part of the same batch if in the opinion of the Engineer there is sufficient proof that the other specified conditions applying to the batch apply to all of the material delivered over the period.
- (9) A sample is a specified quantity of material that is taken from a batch for testing, and which consists of a specified amount, or a specified number of pieces or units, of the material.
- (10) A specimen is the portion of a sample that is to be tested.

SAMPLES FOR TESTING

- (11) Samples shall be of sufficient size and in accordance with relevant Standards to carry out all specified tests.

- (12) Samples taken on the Site shall be selected by, and taken in the presence of, the Engineer and shall be suitably marked for their identification. An identification marking system should be evolved at the start of works in consultation with the Engineer.
- (13) Samples shall be protected, handled, and stored in such a manner that they are not damaged or contaminated and such that the properties of the sample do not change.
- (14) Samples shall be delivered by the Contractor, under the supervision of the Engineer, to the specified place of testing. Samples on which non-destructive tests have been carried out shall be collected from the place of testing after testing and delivered to the Site or other locations instructed by the Engineer. '
- (15) Samples which have been tested may be incorporated in the Permanent Works provided that:
 - (a) the sample complies with the specified requirements;
 - (b) the sample is not damaged; and
 - (c) the sample is not required to be retained under any other provision of the Contract.
- (16) Additional samples shall be provided for testing if in the opinion of the engineer:
 - (a) material previously tested no longer complies with the specified requirements; or
 - (b) material has been handled or stored in such a manner that it may not comply with the specified requirements.

TESTING

The Contractor shall be responsible for all on-site and off-site testing and for all in-situ testing. All appropriate laboratory tests shall be carried out in the Contractor's laboratory, unless otherwise permitted or required by the Engineer. Where the laboratory is not appropriately equipped and/or staffed for some tests, or if agreed to by the Engineer, tests may be carried out in other laboratories. All materials required approval of Engineer after 3rd party test at approved or reputed laboratory at the discretion of engineer.

Authority & Engineer in charge may recommend any test pertain to work or material to any laboratory of repute if they are accredited for the relevant work to a standard acceptable to the Engineer. The cost of such tests shall be borne by contractor.

- (17) In-situ tests shall be done in the presence of the Engineer.
- (18) Equipment, apparatus and materials for in-situ tests and laboratory compliance tests carried out by the Contractor shall be provided by the Contractor. The equipment and apparatus shall be maintained by the Contractor and shall be calibrated before the testing starts and at regular intervals as permitted by the Engineer. The equipment, apparatus, and materials for in situ tests shall be removed by the Contractor as soon as practicable after the testing incomplete.
- (19) The Contractor shall be entitled in all cases to attend the testing carried out in the Employer's or other laboratories, to inspect the calibration certificates of the testing machines and to undertake the testing on counterpart samples. Testing of such samples shall be undertaken in laboratories complying with Clause 12 above and particulars of the laboratory proposed shall be submitted to the Engineer for consent prior to the testing.
- (20) Attendance on tests, including that by the Engineer, Contractor, and Designer, shall be as laid down in the Quality Assurance procedures.

COMPLIANCE OF BATCH

- (21) The results of tests on samples or specimens shall be considered to represent the whole batch from which the sample was taken.

- (22) A batch shall be considered as complying with the specified requirements for a material if the <2 results of specific tests for of the specified properties comply with the specified requirements for the properties.
- (23) If additional tests are permitted or required by the Engineer but separate compliance criteria for the additional tests are not stated in the Contract, the Engineer shall determine if the batch complies with the specified requirements for the material on the basis of the results of all tests, including the additional tests, for every property.

RECORDS OF TESTS

- (24) Records of in-situ tests and laboratory compliance tests carried out by the Contractor shall be kept by the Contractor on the Site and a report shall be submitted to the Engineer within seven (7) days, or such other time stated in the Contract or in the Quality Assurance Programme, after completion of each test. In addition to any other requirements, the report shall contain the following details:
- (a) material or part of the works checked
 - (b) location of the batch from which samples were taken or location of the part of the works.
 - (c) place of testing;
 - (d) date and time of tests;
 - (e) weather conditions in the case of in-situ tests;
 - (f) technical personnel supervising or carrying out the tests;
 - (g) size and description of samples and specimens;
 - (h) method of sampling;
 - (i) properties tested;
 - (j) method of testing;
 - (k) readings and measurements taken during the tests;
 - (l) test results, including any calculations and graphs;
 - (m) specified acceptance criteria; and
 - (n) other details stated in the Contract.
- (25) Reports of tests shall be signed by the site agent or his assistant, or by another representative authorized by the Contractor.
- (26) If requested, records of tests carried out by the Employer's staff or by the Engineer shall be given to the Contractor.

13. RECORDS

DRAWINGS PRODUCED BY THE CONTRACTOR

- (1) Drawings produced by the Contractor including drawings of site layouts, Temporary Works, etc. for submission to the Engineer shall generally be to ISO A1 size. They shall display a title block with the information as detailed in **Appendix - 9 / Annexure VIII - 1 of Employers' Requirement** to these Employer's Requirements. The number of copies to be submitted to the Employer / Engineer shall be as stated in the Contract, or as required by the Employer / Engineer.

PROGRESS PHOTOGRAPHS

- (2) The Contractor shall provide monthly progress photographs which have been properly recorded to show the progress of the works to the Employer / Engineer. The photographs, of not less than 72 in number, shall be taken on locations agreed with the Employer / Engineer to record the exact progress of the Works. Two sets of photographs shall be provided on Memory Device with two sets of colour prints of 175 mm x 125 mm size.
- (3) The Contractor shall mount each set of each month's progress photographs in a separate album of a type to which the Engineer has given his consent and shall provide for each photograph two typed self-adhesive labels, one of which shall be mounted immediately below the photograph and one on the back of the photograph. Each label shall record the location, a brief description of the progress recorded and the date on which the photograph was taken.

- (4) All photographs shall be taken by a skilled photographer whose name and experience shall be submitted to the Engineer for consent and approval received. Processing shall be carried out by a competent processing firm to the satisfaction of the Engineer.
- (5) The Contractor shall ensure that no photography is permitted on the Site without the agreement of the Engineer. Contractor should be aware of the legal regulations and conditions with regard to Photography in 'RESTRICTED AREA' in Bangalore.

RECORDS OF WAGE RATES

- (6) The Contractor shall keep monthly records of the average, high and low wage rates for each trade/tradesman employed on the Site and records shall be made available to the Engineer during inspection.

14. MATERIALS

- (1) Materials and goods for inclusion in the Permanent Works shall be new unless the Engineer has consented otherwise. Preference shall be given to local materials where available. Approved Manufacturers/Suppliers of few important items have been given in **Appendix 15 & 16 / Annexure VIII -1 of Employers' Requirement**. These materials shall be procured only from these manufacturers/Suppliers. Under special circumstances provision of sub para 4 below may be invoked.
- (2) Certificates of tests by manufacturers which are to be submitted to the Engineer shall be current and shall relate to the batch of material delivered to the Site. Certified true copies of certificates may be submitted if the original certificates could not be obtained from the manufacturer.
- (3) Parts of materials which are to be assembled on the Site shall be marked to identify the different parts.
- (4) Materials which are specified by means of trade or proprietary names may be substituted by materials from a different manufacturer which has received the consent of the Engineer provided that the materials are of the same or better quality and comply with the specified requirements.
- (5) Samples of materials submitted to the Engineer for information or consent shall be kept on the Site and shall not be returned to the Contractor or used in the Permanent Works unless permitted by the Engineer. The samples shall be used as a mean of comparison which the Engineer shall use to determine the quality of the materials subsequently delivered. Materials delivered to the Site for use in the Permanent Works shall be of the same or better quality as the samples which have received consent.

PROVISION AND DISPOSAL OF EARTHWORKS MATERIALS

- (6) The Contractor shall be responsible for the provision of all classes of earthworks material required for the Works, whether sourced from the excavations within the Contract or obtained from any other sources, which are located outside the Site, for which the Engineer has given the consent.
- (7) For fill or dumping sites, the Contractor shall prepare a land plan with details of surface drainage requirements, final formation levels, spreading and compaction of the fill during dumping acceptable to the Engineer. The Contractor shall also provide security for such sites.
- (8) All excavated material, excluding waste material, bentonite/polymer fluid and bentonite/polymer contaminated material shall be disposed of at the appointed site only. This material shall be placed and compacted in accordance with the Construction Specification for Earth Works or as otherwise directed by the Engineer's Representative. The disposal of waste material shall be the full responsibility of the Contractor and these materials shall be disposed of by the Contractor at an approved location. No dumping sites will be provided by the Employer.
- (9) Rock deposited as fill material at the dumpsites shall be capable of compaction with single pieces no larger than 300mm.

15. PROVISIONS FOR DESIGNATED CONTRACTORS

- (1) The contractor shall make all reasonable provision to accommodate the fastenings and fixings of the

designated contractors. Such provisions will be notified by the designated contractors during design interface stage. The contractor shall take a lead in developing the interface management Plan (IMP) with respect to the other contracts having interfacing with the works under the scope of present contract. The IMP will be prepared in conjunction with the other designated contractor to cover all aspects of the implementation of the interface works required. The IMP will define the interface works necessary to complete all the works under this contract.

16. RESTORATION OF AREAS DISTURBED BY CONSTRUCTION.

Unless otherwise directed by the engineer, any area disturbed by the construction activity, either inside or outside the project Right of Access, shall be reinstated as follows:

All areas affected by the construction work shall be reinstated to their original condition, with new materials, including but not necessarily limited to, sidewalks, parking lots, access roads, and adjacent roads, properties, and landscaping. Grass cover shall be provided for any bare earth surface areas, along with proper provisions for surface drainage.

17. CONTRACTORS LABOUR CAMPS

- (1) The employer will not provide living accommodation for use of the contractor or any of his staff or labour employed on the works. Living accommodation shall not be established on any land provided to the contractor by the employer for the works.
- (2) Provisions of Labour Camps.

The contractor, shall, at his own expense make adequate arrangements for the housing, supply of drinking water and provisions for bathrooms, latrines, and urinals, with adequate water supply for his staff as well as for workman employed on the works directly or through subcontractors at the locations authorized by engineers. No labour camp shall be allowed at work site or any unauthorized place.

The contractor at his own cost shall maintain all camp site in a clean and sanitary conditions, the contractor shall obey all health and sanitary rules and regulations and carry out at his cost all health and sanitary measures, that may from time to time be prescribed by the local/medical authorities and permit inspection of all health and sanitary arrangements at all times by the employer, the employer and the staff of the local municipality or the other authority concerned. Should the contractor failed to provide adequate health and sanitary arrangement these shall be provided by the Employer and the cost will be recovered from the contractor.

The contractor shall, at his own cost, provide first-aid and medical facilities at the labour camp and at work sites on the advice of the medical authority consistent with the strength of the contractor's staff and workman, employed directly or through subcontractors.

The contractor shall at his own cost, provide the following minimum requirements for meeting the fire hazards.

- i. Portable fire extinguishers
- ii. Manual fire alarms
- iii. Water supply for use by the fire service.

The contractor at his own cost shall provide necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers. He should also ensure that electrical installations done by trained electricians. These installations shall be maintained, and daily maintenance record must be made available for inspection by the engineer.

(3) CAMP DISCIPLINE

The contractor shall take requisite precautions, use his best endeavours to prevent any riotous or unlawful behaviour by or amongst his workmen, others, employed directly or through sub- contractors. These precautions shall be for the preservation of the peace and protection of the inhabitants and the security of the property in the neighbourhood of the Works. In the event of the Employer requiring the

maintaining of a Special Police Force at or in the vicinity of the site, during the tenure of the work, the expenses thereof shall be borne by the contractor and if paid by the Employer, shall be recoverable from the contractor.

The sale of alcoholic drinks or other intoxicating drugs or beverages upon the work, in any labour camp, or in any of the buildings, encampments or tenements, own or occupied by, or with the control of, the contractor or any of his personnel employed on the work directly or through sub-contractors shall be forbidden, and the contractor shall exercise his influence and authority to secure strict compliance with this condition. The contractor shall also ensure that no labour or employees are permitted to work at the site in an intoxicated state or under the influence of drugs.

The contractor shall remove from his camp such labour and their families, as refuse protective inoculation and vaccination when called upon to do so by the Engineer on the advice of his Medical Authority. Should Cholera, Plague or any other infectious disease break out, the Contractor shall at his own cost burn the huts, bedding, cloths and other belongings of or used by the infected parties. The contractor shall promptly erect new heads on healthy sides as required by the Employer. Within the time specified by the Employer, failing which the work may be done by the Employer and the cost recovered from the Contractor.

(4) LABOUR ACCOMODATION

The contractor shall provide living accommodation that is equal to or exceeds the minimum criteria established in the following sub-sections, needed to house his staff as well as workers employed directly or through sub-contractor. The buildings shall be constructed so as to have a minimum life of not less than the length of contract.

- (a) The roof shall be watertight and laid with suitable non-flammable materials. permissible for residential use under local regulation and for which the consent of the Engineer has been obtained.
- (b) Each hut shall have suitable ventilation. All doors, windows, and ventilators shall be provided with security leaves and fasteners. Back-to-back units may be avoided.
- (c) The minimum height of each unit shall be 2.1m and shall have separate cooking place.
- (d) Suitable number of common toilets / bathrooms shall be provided.

(5) WATER SUPPLY

The contractor shall provide an adequate supply of water for the use of labours in the camp. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand post and where the supply is from wells or river, tanks that may be of metal or masonry shall be provided. The contractor shall also at his expense make arrangements for the provision and laying of water pipelines from the existing mains wherever available and shall pay for all the fees and charges thereof.

(6) DRAINAGE

The contractor shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy. Surface water shall be drained away from the paths and roads and shall not be allowed be allowed to accumulate into ditches or ponds where mosquitoes can breed.

(7) SANITATION

The contractor shall make arrangements for conservancy and sanitation in the labour camps according to the rules and regulations of the Local Public Health and Medical Authorities.

The contractor shall provide a sewerage system that is adequate for the number of the residents in the camp, and which meets the requirements of the Municipal Authorities.

SECTION E

GENERAL PLANNING CRITERIA

PURPOSE AND SCOPE

The purpose of this Appendix is to include other criteria and requirements not included elsewhere that are necessary for the full development and Detailed Design of Viaduct.

OUTLINE DESIGN CRITERIA FOR VIADUCT PORTION

1. GENERAL

- 1.1 This Outline Design Criteria and the Appendices hereto provide minimum standards which are to govern the design of the Permanent Works.
- 1.2 The Outline Design Criteria shall be read in conjunction with the other contract documents including the Outline Construction Specifications.
- 1.3 The Design of the Permanent Works shall comply with codes of practice and standards current at the time of submission of Tender Documents, Regulations made and requirements issued by the Indian Government and by relevant utility companies shall be followed and specified.
- 1.4 Alternative or additional codes, standards and specifications proposed by the Contractor shall be internationally recognized codes and shall be equivalent to or better than, Indian Standards subject to being, in the opinion of the Engineer, suitable for incorporation into the Specifications.

2. CODES AND STANDARDS

Design and loading requirements for the structures shall be not less than the following Indian Standards and Codes of Practice, together with all applicable amendments.

Where other standards and codes of practice are referred to in the text of other Appendices then the designer is expected to apply those Standards and Codes of Practice unless the designer can show that an economic case exists for use of an Indian Standard. However, preferences of codes will be as follows: -

- i. IRS
- ii. IS
- iii. IRC
- iv. AASHTO

INDIAN RAILWAY STANDARDS (IRS)

- IRS - Bridge Rules for loading (Min. of Railway) IRS- Code of practice for Steel bridges.
- IRS - Code of practice for plain, reinforcement and pre-stressed concrete for general Bridge construction, latest revision.
- IRS - Code of practice for the design of substructures and foundation of bridges.

INDIAN ROADS CONGRESS (IRC) STANDARDS (WITH LATEST REVISIONS, ADDENDUM & CORRECTIONS)

- IRC 5: 1985 Standard Specifications and Code of Practice for Road Bridges, Section I
 - General Features of Design
- IRC 6: 2000 Standard Specifications and Code of Practice for Road Bridges, Section II
 - Loads and Stresses

IRC 10:	1961	Recommended Practice for Borrow pits for Road Embankments Constructed by Manual Operation
IRC 19:	1977	Standard Specifications and code of Practice for Water Bound Macadam
IRC 21:	2000	Standard Specifications and code of Practice for Cement Concrete (PCC& RCC)
IRC 22:	2008	Standard Specifications and Code of Practice for Road Bridges, Section VI – Composite Construction for Road Bridges
IRC 24:	2010	Standard Specifications and Code of practice for Road Bridges, Section V – Steel Road Bridges
IRC 36:	2010	Recommended Practice for the Construction of Earth Embankments for Road Works
IRC 37:	1984	Guidelines for the Design of Flexible Pavement
IRC 45:	1972	Recommendations for Estimating the Resistance of Soil below the maximum Scour Level in the Design of Well Foundations of Bridges
IRC 48:	1972	Tentative Specifications for Bituminous surface Dressing using Pre-coated Aggregates
IRC 75:	1979	Guidelines for the Design of High Embankments
IRC 78:	2014	Standard Specifications and Code of Practice for Road Bridges, Section VII (Parts 1 and 2), foundations and Substructure.
IRC 83:	1999	Standard Specifications and code of practice for Road Bridges, Section IX
IRC 83:	2002	Standard Specifications & Code of Practice for Road Bridges, Part-III Pot, Pot-Cum-PTFE, Pin and Metallic Guide Bearings
IRC 87:	2011	Guidelines for the Design and Erection of False Work for Road Bridges
IRC 112:	2011	Code of Practice for Concrete Road Bridges
1RC: SP 11	1958	Handbook of quality Control for Construction of Roads and Runways.
1RC: SP 65	2018	Guidelines for the Design and Construction of Segmental Bridges.
1RC: SP 71	2006	Guidelines for the Design and Construction of Precast Pre tensioned Girders.

IS: CODES: NATIONAL BUILDING CODE

SP 7:	2015	Bureau of Indian Standards
1S 73:	1992	Paving Bitumen
1S 215:	1995	Road Tar
1S 217:	1988	Cutback Bitumen
1S 226:	1975	Structural steel (standard quality)
1S 269:	2013	Spec s for Ordinary and low heat Portland Cement
1S 278:	1978	Galvanised steel barbed wire for fencing
1S 280:	1978	Mild Steel wire for general engineering purposes
1S 281:	2009	Mild Steel siding door bolts for use with Padlocks
1S 383:	1970	Coarse and fine aggregates
1S 432:	1982	Mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement
	(Part 1)	Mild steel and medium tensile steel bars
	(Part 2)	Hard-drawn steel wire
1S 455:	1989	Portland slag cement
1S 456:	2000	Code of practice for plain and reinforced concrete
1S 457:	1957	Code of practice for general construction of plain and reinforced concrete for dams and other massive structures
1S 460:	1985	Test sieves

IS 515:	1959	Natural and manufactured aggregates for use in mass concrete
IS 516:	1959	Method of test for strength of concrete
IS 650:	1991	Standard sand for testing cement
IS 800:	2007	Code of practice for general construction in steel structures
IS 814:	1991	Covered electrodes for manual metal arc welding of carbon and carbon manganese steel
IS 815:	1974	Classification coding of covered electrodes for metal arc welding of structural steel
IS 823:	1964	Code of procedure for manual metal arc welding of mild steel
IS 875:	1987	Code of practice for design loads (other than earthquake) for buildings and structures (Parts I, II, IV & V)
IS 875:	2015	Code of practice for design loads (other than earthquake) for buildings and structures (Parts III)
IS 1077:	1992	Common burnt, clay building bricks
IS 1080:	1986	Design and construction of shallow foundation in soil (other than raft ring and shell)
IS 1161:	1998	Steel tubes for structural purposes
IS 1239:	1990	Mild steel tubes, tubular and other wrought steel fittings
	(Part 1) 2004	Mild steel tubes
	(Part 2) 1992	Mild steel tubular and other wrought steel pipe fittings
IS 1322:	1993	Bitumen felts for water proofing and damp-proofing
IS 1343:	2012	Code of practice for Pre-stressed Concrete
IS 1364:	1992	Hexagon Head bolts, screws & nuts of product grades A & B (Part I)
IS 1489:	1991	Portland Pozzolana Cement
IS 1732:	1989	Dimensions for round and square steel bars for structural and general engineering purposes
IS 1785:	1983	Plain hard-drawn steel wire for pre-stressed concrete
	(Part 1)	Cold-drawn stress – relieved wire
	(Part 2)	As drawn wire

IS 1786:	2008	High strength deformed steel bars and wire for concrete reinforcement
IS 1791:	1985	Batch type concrete mixers
IS 1834:	1984	Hot applied sealing compound for joint in concrete
IS 1838:	1983	Pre-formed fillers for expansion joint in concrete pavements and structures (non-extruding and resilient type)
	(Part 1)	Bitumen impregnated fiber
IS 1888:	1982	Method of load tests on soils
IS 1892:	1979	Code of practice for sub surface investigations for foundations
IS 1893: Part I	2001	Criteria for earthquake resistant design of structures
IS 1893: Part II	2014	Criteria for earthquake resistant design of structures
IS 1893: Part III	2014	Criteria for earthquake resistant design of structures
IS 1893: Part IV	2005	Criteria for earthquake resistant design of structures
IS 1904:	1986	Design and construction of foundations in soils General Requirements
IS 1905:	1987	Code of practice for Structural use of unreinforced Masonry
IS 1977:	1976	Low Tensile Structural steel
IS 2062:	2006	Steel for general structural purposes
IS 2090:	1983	High tensile steel bards used in pre-stressed concrete
IS 2116:	1980	Sand for masonry mortars (first revision)
IS 2119:	1980	Code of practice for construction of brick-cum-concrete composite
IS 2386:	1963	Methods of test for aggregate for concrete
	(Part 1)	Particle size and shape
	(Part 2)	Estimation of deleterious materials and organic impurities
	(Part 3)	Specific gravity, density, voids, absorption, and bulking
	(Part 4)	Mechanical properties

INFORMATION AND SCOPE OF WORK

	(Part 5)	Soundness
	(Part 6)	Measuring mortar properties of fine aggregates
	(Part 7)	Alkali aggregate reactivity
	(Part 8)	Petrography examination
IS 2430:	1986	Methods of sampling of aggregate for Concrete
IS 2502	1963	Code of Practice for Bending and Fixing of Bars for Concrete Reinforcement
IS 2751:	1979	Recommended practices for welding of mild steel plain and deformed bars used for reinforced construction
IS 2911:	2010	Code of practice for design and construction of pile foundations
	(Part 1)	Concrete piles 3
	Section 1	Driven cast-in-situ concrete piles
	Section 2	Bored cast-in-situ concrete piles
	Section 3	Driven precast concrete piles
	Section 4	Bored precast concrete piles
	(Part 3)	Under-reamed piles
	(Part 4)	Load test on piles
	(2013)	
IS 2950:	1981	Code of practice for design and construction of raft foundations.
IS 3812:	2003	Fly ash for use as pozzolana and admixture
IS 3955:	1967	Code of practice for design and construction of well foundations
IS 4000:	1992	High Strength Bolts in Steel Structures- Code of Practice (First Revision)
IS 4082:	1996	Recommendations on stacking and storage of construction materials at Site
IS 4138:	1977	Safety code for working in compressed air
IS 4326:	1993	Earthquake resistant design and construction of buildings – code of Practice
IS 4656:	1968	Form vibrators for concrete
IS 4736:	1986	Hot-dip zinc coating on mild steel tubes
IS 4826:	1979	Hot-dipped galvanized coatings – round steel wires
IS 4925:	1968	Concrete batching and mixing plant

IS 4926:	1976	Ready mixed concrete
IS 4923:	1997	Hollow steel sections for structural use -specification
IS 4968:	1976	Method for sub surface sounding for soils
IS 5525:	1969	Recommendations for detailing of reinforcement in reinforced concrete works
IS 5529:	1985	Code of practice for in-situ permeability tests
IS 5640:	1970	Method of test for determining aggregate impact value of soft coarse Aggregate
IS 5816:	1970	Method of test for splitting tensile strength of concrete cylinders
IS 5889:	1994	Vibratory plate compactor
IS 5892:	1970	Concrete transit mixers and agitators
IS 6003:	1983	Specification for indented wire for pre-stressed concrete
IS 6006:	1983	Specification for uncoated stress relieved strands for pre-stressed concrete
IS 6403:	1981	Code of practice for determination of bearing capacity of shallow foundations
IS 6603:	1972	Stainless steel bars and flats
IS 6911:	1992	Stainless steel plate, sheet and strip
IS 7205:	1974	Safety codes for erection of structural steel work
IS 7293:	1974	Safety code for working with construction machinery
IS 7320:	1974	Concrete slump test apparatus
IS 7861:	1975	Code of practice for extreme weather concreting
	(Part 1)	For Hot Weather
	(Part 2) 1981	For Cold Weather
IS 7969:	1975	Safety code for handling and storage of building materials
IS 8009	1976	Calculation of settlement of shallow foundations

IS 8041:	1990	Rapid - hardening Portland cement
IS 8112:	1989	43 grade ordinary Portland cement
IS 8142:	1994	Method of test for determining setting time of concrete by penetration resistance
IS 8500:	1991	Structural steel-micro alloyed (medium and high strength qualities)
IS 9013:	1978	Method of making, curing and determining compressive strength of accelerated cured concrete test specimens
IS 9103:	1979	Admixtures of concrete
IS 9284:	1979	Method of test for abrasion resistance of concrete
IS 9417:	1989	Recommendations for welding cold worked bars for reinforced concrete Construction
IS 9595:	1996	Recommendations for metal arc welding of carbon and carbon manganese steels
IS 10262:	1982	Recommended guidelines for concrete mix design
IS 10379:	1982	Code of practice for field control of moisture and compaction of soils for embankment and sub-grade
IS 11384:	1985	Code Of Practice for Composite Construction in Structural Steel and Concrete
IS 12070:	1987	Code of Practice for Design and Construction of Shallow Foundations on Rocks
IS 12269:	2013	53 grade ordinary Portland cement
IS 12894:	2002	Fly ash line bricks
IS 13920:	2016	Ductile detailing of Reinforced Concrete Structures subjected to Seismic Forces
IS 14268:	1995	Uncoated Stress Relieved Low relaxation Seven-ply Strands for Prestressed Concrete
IS 14593:	1998	Design And Construction of Bored Cast-In-Situ Piles Founded on Rocks-Guidelines.
		IS 15658 : Precast Blocks

FOREIGN STANDARDS**FOREIGN STANDARDS**

ASTM	D-297	Methods for Rubber Product Chemical Analysis ASTM D-395 Compression set of vulcanized rubber
ASTM	D-412	Tension testing of vulcanized rubber ASTM D-429 Adhesion of vulcanized rubber metal
ASTM	D-573	Accelerated ageing of vulcanized rubber by the oven method
ASTM	D-624	Tear resistance of vulcanized rubber
ASTM	D-797	Young's Modulus in flexure of elastomer at normal and subnormal temperature
ASTM	D-1149	Accelerated Ozone cracking of vulcanized rubber
ASTM	D-1559	Test for resistance to plastic flow of bituminous mixtures using Marshall Apparatus
ASTM	D-2166	Test methods for Unconfined Compressive Strength of Cohesive Soils
ASTM	0-2172	Extraction, quantitative, of bitumen from bituminous paving mixtures
ASTM	0-2240	Indentation hardness of rubber and plastic by means of a Durometer
ASTM	0-2434	Test methods for permeability of Granular Soils
ASTM	0-30B0	Method for direct shear test of soils under consolidated drained condition
ASTM	E-11	Specification for wire cloth sieve for testing purpose

AASHTO OM 57-80	Materials for embankments and sub-grade
AASHTO OM 147-67	Materials for aggregate and soil (1980) base and surface courses
AASHTO M 282-80 (ASTM: D 3406)	Joints sealants, not poured, elastomeric type, for Portland cement cure rate pavements
AASHTO LRFD	Bridge Design Specification

Note: - The above list is not exhaustive and shall be augmented during detailed design and construction of the viaduct.

OTHER PUBLICATIONS

Indian Standard Handbook on Steel sections Part I

Indian Railways Manual on Design and Construction of well and pile foundations.

UIC/772 - R The International Union of Railways Publication. IEC International Electromechanical Commission

UIC/772 -2R The Code for usage of Rubber Bearings for Rail Bridges

The provision of UIC-774-3 in relation to rail-structure interaction is well known and is being used in many rail-based structures.

ACI CODE -318-19: Building code requirements for structural concrete.

FIP -Recommendations for the acceptance of post-tensioning systems.

The design relating to fire safety and escape shall be in accordance with the requirements of NBC/NFPA 130 Standard for Fixed Guide way Systems.

SCHEDULES

SITE OF THE PROJECT

1 THE SITE

1. Site of the BSRP includes the land, buildings, structures as described.
2. Access and RUC shall be arranged progressively, as per **Section VIII, Employer Requirement Vol-2, Annexure 2.**
3. An inventory of the Site including the land, buildings, structures, trees, and any other immovable property on, or attached to. The Site inventory details shall be prepared jointly by the Authority's Representative and the Contractor, and such inventory shall form part of the contract.
4. The alignment plans, L-sections, and cross sections of the BSRP are specified in Tender Drawings.
5. The status of the environment clearances and forest clearances obtained or awaited is given in **Section VIII, Employer Requirement Vol-2, Annexure 4.**

ANNEXURE- I

SCHEDULE OF SITE**1. SITE**

The Site of the BSRP comprises the section commencing from km 08/427 to 10/038 i.e., the KSR Bengaluru City - Yelahanka section. The land and other structures comprising the Site are described below:

2. ROUTE LENGTH

The route length of Corridor-2 of BSRP Project comprises the section as described below (Dead end of yard to dead end of yard):

Sl. No	Name of location from	Name of location to	Start Chainage (km)	End Chainage (km)	Length (km)	Remarks
1	BENNIGANAHALLI	KASTURINAGAR	-0.675	-0.050	0.625	
2	Hebbal	Yeshwanthpur	11.230	16.755	5.525	
3	YESHWANTPUR	SHETTIHALLI	16.755	18.400	1.645	

The above schedule of work is covered in Item Rate Contract and Contractor shall complete all the works as per GFC drawings, Employer's Requirement, Technical specification, GAD's, Plan & Profile, duly ensuring safety, Quality, EHS. The statement of works executed by previous Contractor as Annexure 1A and also highlighted in attached GAD's of various structures.

ANNEXURE – 1A**Statement of Part Works executed by earlier Contractor in Corridor-2.**

Statement of Work executed by Previous Contractor in Casting Yard for Pier cap							
Sl No.	Pier	Structure ID	Unit	Measurements in Mtr.			
				L	B	D	Qty
1	PSC Pier Cap	2	Nos	9.8	2.7		1
2	PSC Pier Cap	2	Nos	9.8	2.7		1
3	PSC Pier Cap	4	Nos	9.8	2.7		1
4	PSC Pier Cap	5	Nos	9.8	2.7		1
5	PSC Pier Cap	6	Nos	9.8	2.7		1
6	PSC Pier Cap	7	Nos	9.8	2.7		1
7	PSC Pier Cap	9	Nos	9.8	2.7		1
8	PSC Pier Cap	10	Nos	9.8	2.7		1
9	PSC Pier Cap	11	Nos	9.8	2.7		1
10	PSC Pier Cap	12	Nos	9.8	2.7		1
11	PSC Pier Cap	13	Nos	9.8	2.7		1
12	PSC Pier Cap	15	Nos	9.8	2.7		1
13	PSC Pier Cap	16	Nos	9.8	2.7		1
14	PSC Pier Cap	17	Nos	9.8	2.7		1
15	PSC Pier Cap	18	Nos	9.8	2.7		1
16	PSC Pier Cap	19	Nos	9.8	2.7		1
17	PSC Pier Cap	20	Nos	9.8	2.7		1
18	PSC Pier Cap	21	Nos	9.8	2.7		1
19	PSC Pier Cap	22	Nos	9.8	2.7		1
20	PSC Pier Cap	23	Nos	9.8	2.7		1
21	PSC Pier Cap	24	Nos	9.8	2.7		1
22	PSC Pier Cap	25	Nos	9.8	2.7		1
23	PSC Pier Cap	26	Nos	9.8	2.7		1
24	PSC Pier Cap	27	Nos	9.8	2.7		1
25	PSC Pier Cap	28	Nos	9.8	2.7		1
26	PSC Pier Cap	29	Nos	9.8	2.7		1
27	PSC Pier Cap	30	Nos	9.8	2.7		1
28	PSC Pier Cap	31	Nos	9.8	2.7		1
29	PSC Pier Cap	32	Nos	9.8	2.7		1
30	PSC Pier Cap	33	Nos	9.8	2.7		1
31	PSC Pier Cap	34	Nos	9.8	2.7		1
32	PSC Pier Cap	35	Nos	9.8	2.7		1
33	PSC Pier Cap	36	Nos	9.8	2.7		1
34	PSC Pier Cap	37	Nos	9.8	2.7		1
35	PSC Pier Cap	38	Nos	9.8	2.7		1

RCC Pier Cap							
1	RCC Pier Cap	5	Nos	4.65	2.7		1
2	RCC Pier Cap	6	Nos	4.65	2.7		1
3	RCC Pier Cap	9	Nos	4.65	2.7		1
4	RCC Pier Cap	11	Nos	4.65	2.7		1
5	RCC Pier Cap	14	Nos	4.65	2.7		1

Dowels

SI no	Description	Dia of steel	No of shear key/Pedestal	No of Bars for each shear key/pedestal	Length of bar in Mtr
1	35 nos PSC pier cap shear key portion dowels	25	2	16	1.0
2	35 nos PSC pier cap bearing pedestal dowels	16	8	16	1.0
3	05 nos RCC pier cap bearing pedestal dowels	16	4	14	1.0

Statement of Quantity Executed by previous Contractor in Casting yard for (U-Girder)							
SI No.	Pier		Structure ID		Unit	Measurements in Mtr. (Qty)	
	From	To					
1	P50	P51	D/T	UG31	Nos	31m Straight span	1
2	P60	P61	U/T	UG 50	Nos	31m Straight span	1
3	P59	P60	U/T	UG 48	Nos	31m Straight span	1
4	P60	P61	D/T	UG49	Nos	31m Straight span	1
5	P4	P5	U/T	UG8	Nos	31m Straight span	1
6	CP30	P31	U/T	UG97	Nos	31m curve span	1
7	P63	P64	U/T	UG56	Nos	31m Straight span	1
8	Cp30	P31	U/T	UG84	Nos	31m curve span	1
9	UP214	UP215	U/T	UG105	Nos	31m curve span	1
10	P54	P55	D/T	UG37	Nos	31m Straight span	1
11	P56	P57	D/T	UG41	Nos	31m Straight span	1
12	P03	P04	D/T	UG05	Nos	31m Straight span	1
13	CP24	CP25	U/T	UG24	Nos	31m Straight span	1
14	CP23	Cp24	D/T	UG21	Nos	31m Straight span	1
15	P53	P54	D/T	UG35	Nos	31m Straight span	1
16	P52	P53	D/T	UG33	Nos	31m Straight span	1
17	CP23	CP24	U/T	UG22	Nos	31m Straight span	1
18	P56	P57	U/T	UG42	Nos	31m Straight span	1

19	P04	P05	D/T	UG07	Nos	31m Straight span	1
20	UP211	UP212	U/T	UG107	Nos	31m curve span	1
21	P40	P41	D/T	UG129	Nos	28m curve span	1
22	P41	Cp42	D/T	UG135	Nos	28m curve span	1
23	P44	P45	U/T	UG139	Nos	28m curve span	1
24	P40	P41	U/T	UG130	Nos	28m curve span	1
25	CP42	CP43	D/T	UG133	Nos	28m curve span	1
26	CP43	CP44	U/T	UG138	Nos	28m curve span	1
27	CP39	CP40	U/T	UG131	Nos	28m curve span	1
28	CP42	CP43	U/T	UG136	Nos	28m curve span	1
29	CP43	CP44	D/T	UG140	Nos	28m curve span	1
30	CP39	P40	D/T	UG132	Nos	28m curve span	1
31	P41	CP42	U/T	UG134	Nos	28m curve span	1
32	P44	CP45	D/T	UG137	Nos	28m curve span	1
33	CP45	Cp46	U/T	UG141	Nos	28m curve span	1
34	Cp46	CP47	D/T	UG142	Nos	28m curve span	1
35	CP46	CP47	U/T	UG143	Nos	28m curve span	1
36	CP45	CP46	D/T	UG144	Nos	28m curve span	1
37	P31	P32	D/T	UG 111	Nos	31m curve span	1
38	P29	CP30	U/T	UG100	Nos	31m curve span	1
39	P29	CP30	D/T	UG98	Nos	31m curve span	1
40	P31	P32	U/T	UG110	Nos	31m curve span	1
41	P59	P60	D/T	UG47	Nos	31m Straight span	1
42	CP30	P31	D/T	UG99	Nos	31m curve span	1
43	P76	P77	D/T	UG112	Nos	31m curve span	1
44	UP213	UP214	U/T	UG108	Nos	31m curve span	1
45	P28	P29	U/T	UG92	Nos	31m curve span	1
46	UP215	UP216	U/T	UG109	Nos	31m curve span	1
47	UP212	UP213	U/T	UG106	Nos	31m curve span	1
48	P03	P04	U/T	UG06	Nos	31m Straight span	1
49	P07	P08	D/T	UG11	Nos	31m Straight span	1
50	CP22	CP23	U/T	UG20	Nos	31m Straight span	1
51	CP22	CP23	D/T	UG19	Nos	31m Straight span	1
52	P57	P58	U/T	UG44	Nos	31m Straight span	1
53	P48	P49	U/T	UG28	Nos	31m Straight span	1
54	P07	P08	U/T	UG12	Nos	31m Straight span	1
55	UP216	UP217	U/T	UG77	Nos	31m Straight span	1
56	P06	P07	D/T	UG09	Nos	31m Straight span	1
57	P08	P09	D/T	UG115	Nos	28m curve span	1
58	P18	P19	U/T	UG82	Nos	31m curve span	1
59	UP210	UP211	U/T	UG76	Nos	31m Straight span	1
60	CP26	CP27	U/T	UG83	Nos	31m curve span	1
61	P62	P63	U/T	UG54	Nos	31m Straight span	1
62	UP209	UP210	U/T	UG75	Nos	31m Straight span	1
63	P28	P29	D/T	UG90	Nos	31m curve span	1

64	P18	P19	U/T	UG14	Nos	31m Straight span	1
65	CP26	CP27	D/T	UG81	Nos	31m curve span	1
66	P75	P76	D/T	UG65	Nos	31m Straight span	1
67	P62	P63	D/T	UG53	Nos	31m Straight span	1
68	P27	P28	U/T	UG91	Nos	31m curve span	1
69	P52	P53	U/T	UG34	Nos	31m Straight span	1
70	P58	P59	U/T	UG46	Nos	31m Straight span	1
71	P50	P51	U/T	UG32	Nos	31m Straight span	1
72	P21	CP22	D/T	UG17	Nos	31m Straight span	1
73	P18	P19	D/T	UG13	Nos	31m Straight span	1
74	P33	P34	U/T	UG120	Nos	28m curve span	1
75	P32	P33	D/T	UG119	Nos	28m curve span	1
76	P17	P18	D/T	UG116	Nos	28m curve span	1
77	P33	P34	D/T	UG117	Nos	28m curve span	1
78	P17	P18	U/T	UG113	Nos	28m curve span	1
79	P32	P33	U/T	UG118	Nos	28m curve span	1
80	P09	P10	U/T	UG87	Nos	25m curve span	1
81	P11	P12	D/T	UG95	Nos	25m curve span	1
82	P14	P15	U/T	UG101	Nos	25m curve span	1
83	P10	P11	U/T	UG85	Nos	25m curve span	1
84	P12	P13	D/T	UG93	Nos	25m curve span	1
85	P11	P12	U/T	UG96	Nos	25m curve span	1
86	P12	P13	U/T	UG94	Nos	25m curve span	1
87	P13	P14	U/T	UG104	Nos	25m curve span	1
88	P10	P11	D/T	UG88	Nos	25m curve span	1
89	P09	P10	D/T	UG86	Nos	25m curve span	1
90	P13	P14	D/T	UG102	Nos	25m curve span	1
91	P14	P15	D/T	UG103	Nos	25m curve span	1
92	P57	P58	D/T	UG43	Nos	31m Straight span	1
93	UP219	UP220	U/T	UG80	Nos	31m Straight span	1
94	UP217	UP218	U/T	UG78	Nos	31m Straight span	1
95	P172	P173	U/T	UG70	Nos	31m Straight span	1
96	P173	P174	D/T	UG72	Nos	31m Straight span	1
97	P48	P49	D/T	UG27	Nos	31m Straight span	1
98	UP218	UP219	U/T	UG79	Nos	31m Straight span	1
99	P55	P56	D/T	UG39	Nos	31m Straight span	1
100	P49	P50	U/T	UG30	Nos	31m Straight span	1
101	CP25	CP26	U/T	UG26	Nos	31m Straight span	1
102	CP24	CP25	D/T	UG23	Nos	31m Straight span	1
103	P76	P77	U/T	UG68	Nos	31m Straight span	1
104	P54	P55	D/T	UG38	Nos	31m Straight span	1
105	P73	P74	D/T	UG61	Nos	31m Straight span	1
106	P61	P62	D/T	UG51	Nos	31m Straight span	1
107	P06	P07	U/T	UG10	Nos	31m Straight span	1
108	UP208	UP209	U/T	UG74	Nos	31m Straight span	1

109	UP207	UP208	U/T	UG73	Nos	31m Straight span	1
110	P53	P54	U/T	UG36	Nos	31m Straight span	1
111	P61	P62	U/T	UG52	Nos	31m Straight span	1
112	P57	P58	U/T	UG89	Nos	31m curve span	1
113	P21	CP22	U/T	UG18	Nos	31m Straight span	1
114	P35	PP36	U/T	UG124	Nos	28m curve span	1
115	PP37	PP38	D/T	UG125	Nos	28m curve span	1
116	P34	P35	U/T	UG121	Nos	28m curve span	1
117	PP36	PP37	D/T	UG127	Nos	28m curve span	1
118	P74	P75	D/T	UG63	Nos	31m straight span	1
119	P71	P72	U/T	UG58	Nos	31m straight span	1
120	P55	P56	U/T	UG40	Nos	31m straight span	1
121	P72	P73	U/T	UG60	Nos	31m straight span	1
122	P73	P74	U/T	UG62	Nos	31m straight span	1
123	P75	P76	U/T	UG66	Nos	31m straight span	1
124	PP36	PP37	D/T	UG128	Nos	28m curve span	1
125	P34	P35	D/T	UG123	Nos	28m curve span	1
126	PP37	PP38	U/T	UG126	Nos	28m curve span	1
127	P35	PP36	D/T	UG122	Nos	28m curve span	1
128	P71	P72	D/T	UG47	Nos	31m Straight span	1
129	P58	P59	D/T	UG45	Nos	31m Straight span	1
130	P173	P174	D/T	UG71	Nos	31m Straight span	1
131	P63	P64	D/T	UG55	Nos	31m Straight span	1
132	P75	P76	D/T	UG64	Nos	31m Straight span	1
133	P76	P77	D/T	UG67	Nos	31m Straight span	1
134	P172	P173	D/T	UG69	Nos	31m Straight span	1
135	P08	P09	U/T	UG114	Nos	28m curve span	1
136	P19	P20	D/T	UG15	Nos	31m Straight span	1
137	P19	P20	U/T	UG16	Nos	31m Straight span	1

U-Girder Reinforcement cage details

1	P80	P81	U/T	UG145	Nos	28m Straight span	1
2	P80	P81	D/T	UG146	Nos	28m Straight span	1
3	P81	P82	U/T	UG147	Nos	28m Straight span	1
4	P81	P82	D/T	UG148	Nos	28m Straight span	1

Statement of Quantity Executed by previous Contractor in Casting Yard for (I-Girder)

SI No.	Pier		Structure ID	Unit	Measurements in Mtr. Qty			
	From	To						
1	P156	P157	IG 01	Nos	20.7	0.81	1.55	1
2	P156	P157	IG 02	Nos	20.7	0.81	1.55	1
3	P156	P157	IG 03	Nos	20.7	0.81	1.55	1
4	P156	P157	IG 04	Nos	20.7	0.81	1.55	1
5	P157	P158	IG 06	Nos	20.7	0.81	1.55	1
6	P157	P158	IG 07	Nos	20.7	0.81	1.55	1
7	P157	P158	IG 08	Nos	20.7	0.81	1.55	1
8	P158	P159	IG 09	Nos	20.7	0.81	1.55	1
9	P158	P159	IG 10	Nos	20.7	0.81	1.55	1
10	P158	P159	IG 11	Nos	20.7	0.81	1.55	1
11	P158	P159	IG 12	Nos	20.7	0.81	1.55	1
12	P164	P165	IG 13	Nos	20.7	0.81	1.55	1
13	P164	P165	IG 14	Nos	20.7	0.81	1.55	1
14	P164	P165	IG 15	Nos	20.7	0.81	1.55	1
15	P164	P165	IG 16	Nos	20.7	0.81	1.55	1
16	P165	P165-1	IG 17	Nos	20.7	0.81	1.55	1
17	P165	P165-1	IG 18	Nos	20.7	0.81	1.55	1
18	P165	P165-1	IG 19	Nos	20.7	0.81	1.55	1
19	P165	P165-1	IG 20	Nos	20.7	0.81	1.55	1
20	P165-1	P165-2	IG 21	Nos	20.7	0.81	1.55	1
21	P165-1	P165-2	IG 22	Nos	20.7	0.81	1.55	1
22	P165-1	P165-2	IG 23	Nos	20.7	0.81	1.55	1
23	P165-1	P165-2	IG 24	Nos	20.7	0.81	1.55	1
24	Bpp4	Bpp5	IG 25	Nos	17.75	0.81	1.55	1
25	Bpp4	Bpp5	IG 26	Nos	17.75	0.81	1.55	1
26	Bpp4	Bpp5	IG 27	Nos	17.75	0.81	1.55	1
27	Bpp1	Bpp2(CR2)	IG 28	Nos	20.75	0.81	1.55	1
28	Bpp1	Bpp2(CR2)	IG 29	Nos	20.75	0.81	1.55	1
29	Bpp1	Bpp2(CR2)	IG 30	Nos	20.75	0.81	1.55	1
30	Bpp1	Bpp2(CR2)	IG 31	Nos	20.75	0.81	1.55	1
31	Bpp1	Bpp2(CR4)	IG 32	Nos	20.394	0.81	1.55	1
32	Bpp1	Bpp2(CR4)	IG 33	Nos	20.394	0.81	1.55	1
33	Bpp1	Bpp2(CR4)	IG 34	Nos	20.394	0.81	1.55	1
34	Bpp1	Bpp2(CR4)	IG 35	Nos	20.394	0.81	1.55	1
35	Bpp2	Bpp3(CR4)	IG 36	Nos	20.388	0.81	1.55	1
36	Bpp2	Bpp3(CR4)	IG 37	Nos	20.388	0.81	1.55	1
37	PP193	PP193A	IG-0	Nos	20.75	0.81	1.55	1

-Girder Reinforcement cage details

1	Bpp2	Bpp3(CR4)	IG 38	Nos	20.388	0.81	1.55	1
2	Bpp2	Bpp3(CR4)	IG 39	Nos	20.388	0.81	1.55	1

Statement of work executed by previous Contractor for piling works

S.no	D.O.C	Structure	Part of Structure		Grade of Concrete	Pile/Circular Pier			Pile Depth (m)	2003.89906 DWG Qty
						Dia (m)	Foundation Level	Cut off level		
1	25-Jul-24	Pile	C2	BA1/1	M35 P	1.2	879.467	893.138	13.671	17.14
2	01-Aug-24	Pile	C2	BA1/2	M35 P	1.2	879.760	893.138	13.378	16.81
3	27-Jul-24	Pile	C2	BA1/3	M35 P	1.2	879.550	893.138	13.588	17.05
4	23-Jul-24	Pile	C2	BA1/4	M35 P	1.2	879.732	893.138	13.406	16.84
5	30-Jul-24	Pile	C2	BA1/5	M35 P	1.2	878.951	893.138	14.187	17.73
6	08-Sep-24	Pile	C2	BA1/6	M35 P	1.2	879.476	893.138	13.662	17.13
7	09-Sep-24	Pile	C4	BA1/1	M35 P	1.2	881.505	893.138	11.633	14.84
8	21-Aug-24	Pile	C4	BA1/2	M35 P	1.2	881.767	893.138	11.371	14.54
9	27-Aug-24	Pile	C4	BA1/3	M35 P	1.2	880.626	893.138	12.512	15.83
10	23-Aug-24	Pile	C4	BA1/4	M35 P	1.2	879.189	893.138	13.949	17.46
11	10-Sep-24	Pile	C4	BA1/5	M35 P	1.2	876.979	893.138	16.159	19.95
12	12-Sep-24	Pile	C4	BA1/6	M35 P	1.2	876.544	893.138	16.594	20.45
13	15-Jul-24	Pile	C2	BPP1/1	M35 P	1.2	880.826	893.138	12.312	15.61
14	06-Jul-24	Pile	C2	BPP1/2	M35 P	1.2	880.800	893.138	12.338	15.64
15	10-Jul-24	Pile	C2	BPP1/3	M35 P	1.2	880.702	893.138	12.436	15.75
16	12-Jul-24	Pile	C2	BPP1/4	M35 P	1.2	881.630	893.138	11.508	14.70
17	09-Jul-24	Pile	C2	BPP1/5	M35 P	1.2	883.578	893.138	9.560	12.50

18	19-Jul-24	Pile	C2	BPP1/6	M35 P	1.2	881.634	893.138	11.504	14.69
19	17-Jul-24	Pile	C2	BPP1/7	M35 P	1.2	880.502	893.138	12.636	15.97
20	21-Jul-24	Pile	C2	BPP1/8	M35 P	1.2	880.687	893.138	12.451	15.76
21	10-Oct-24	Pile	C4	BPP1/1	M35 P	1.2	877.555	893.138	15.583	19.30
22	24-Aug-24	Pile	C4	BPP1/2	M35 P	1.2	874.960	893.138	18.178	22.24
23	01-Sep-24	Pile	C4	BPP1/3	M35 P	1.2	876.538	893.138	16.600	20.45
24	30-Aug-24	Pile	C4	BPP1/4	M35 P	1.2	877.291	893.138	15.847	19.60
25	03-Sep-24	Pile	C4	BPP1/5	M35 P	1.2	877.660	893.138	15.478	19.19
26	11-Oct-24	Pile	C4	BPP1/6	M35 P	1.2	877.445	893.138	15.693	19.43
27	07-Oct-24	Pile	C4	BPP1/7	M35 P	1.2	877.934	893.138	15.204	18.88
28	04-Oct-24	Pile	C4	BPP1/8	M35 P	1.2	878.140	893.138	14.998	18.64
29	28-May-24	Pile	C2	BPP2/1	M35 P	1.2	880.710	893.138	12.428	15.74
30	18-May-24	Pile	C2	BPP2/2	M35 P	1.2	880.560	893.138	12.578	15.91
31	25-May-24	Pile	C2	BPP2/3	M35 P	1.2	880.531	893.138	12.607	15.94
32	29-Jun-24	Pile	C2	BPP2/4	M35 P	1.2	883.432	893.138	9.706	12.66
33	23-May-24	Pile	C2	BPP2/5	M35 P	1.2	880.544	893.138	12.594	15.93
34	01-Jun-24	Pile	C2	BPP2/6	M35 P	1.2	880.632	893.138	12.506	15.83
35	03-Jul-24	Pile	C2	BPP2/7	M35 P	1.2	883.908	893.138	9.230	12.12
36	04-Jun-24	Pile	C2	BPP2/8	M35 P	1.2	881.314	893.138	11.824	15.06
37	14-Oct-24	Pile	C4	BPP2/1	M35 P	1.2	879.050	893.138	14.088	17.61
38	01-Oct-24	Pile	C4	BPP2/2	M35 P	1.2	879.430	893.138	13.708	17.19
39	04-Oct-24	Pile	C4	BPP2/3	M35 P	1.2	879.993	893.138	13.145	16.55
40	07-Oct-24	Pile	C4	BPP2/4	M35 P	1.2	880.285	893.138	12.853	16.22
41	27-Oct-24	Pile	C4	BPP2/5	M35 P	1.2	881.259	893.138	11.879	15.12
42	25-Nov-24	Pile	C4	BPP2/6	M35 P	1.2	881.435	893.138	11.703	14.92

43	29-Oct-24	Pile	C4	BPP2/7	M35 P	1.2	880.103	893.138	13.035	16.42
44	21-Oct-24	Pile	C4	BPP2/8	M35 P	1.2	879.281	893.138	13.857	17.35
45	20-Jun-24	Pile	C2	BPP3/1	M35 P	1.2	884.794	893.138	8.344	11.12
46	14-Jun-24	Pile	C2	BPP3/2	M35 P	1.2	884.176	893.138	8.962	11.82
47	06-Jul-24	Pile	C2	BPP3/3	M35 P	1.2	885.195	893.138	7.943	10.67
48	18-Jun-24	Pile	C2	BPP3/4	M35 P	1.2	885.367	893.138	7.771	10.48
49	27-Jun-24	Pile	C2	BPP3/5	M35 P	1.2	886.422	893.138	6.716	9.28
50	28-Jun-24	Pile	C2	BPP3/6	M35 P	1.2	884.722	893.138	8.416	11.21
51	30-Nov-24	Pile	C4	BPP3/1	M35 P	1.2	883.298	893.138	9.840	12.81
52	27-Nov-24	Pile	C4	BPP3/2	M35 P	1.2	884.441	893.138	8.697	11.52
53	28-Nov-24	Pile	C4	BPP3/3	M35 P	1.2	884.824	893.138	8.314	11.09
54	13-Nov-24	Pile	C4	BPP3/4	M35 P	1.2	885.065	893.138	8.073	10.82
55	05-Dec-24	Pile	C4	BPP3/5	M35 P	1.2	884.407	893.138	8.731	11.56
56	01-Dec-24	Pile	C4	BPP3/6	M35 P	1.2	883.654	893.138	9.484	12.41
57	13-Jul-24	Pile	C2	BPP4/1	M35 P	1.2	886.010	893.138	7.128	9.75
58	08-Jul-24	Pile	C2	BPP4/2	M35 P	1.2	885.975	893.138	7.163	9.79
59	25-Jul-24	Pile	C2	BPP4/3	M35 P	1.2	886.113	893.138	7.025	9.63
60	11-Jul-24	Pile	C2	BPP4/4	M35 P	1.2	885.660	893.138	7.478	10.15
61	23-Jul-24	Pile	C2	BPP4/5	M35 P	1.2	885.970	893.138	7.168	9.79
62	27-Jul-24	Pile	C2	BPP4/6	M35 P	1.2	886.105	893.138	7.033	9.64
63	05-Nov-24	Pile	C4	BPP4/1	M35 P	1.2	884.451	893.138	8.687	11.51
64	26-Sep-24	Pile	C4	BPP4/2	M35 P	1.2	885.275	893.138	7.863	10.58
65	22-Sep-24	Pile	C4	BPP4/3	M35 P	1.2	885.800	893.138	7.338	9.99
66	19-Sep-24	Pile	C4	BPP4/4	M35 P	1.2	885.745	893.138	7.393	10.05
67	31-Oct-24	Pile	C4	BPP4/5	M35 P	1.2	884.368	893.138	8.770	11.61

68	03-Nov-24	Pile	C4	BPP4/6	M35 P	1.2	884.801	893.138	8.337	11.12
69	10-Aug-24	Pile	C2	BPP5/1	M35 P	1.2	885.695	893.138	7.443	10.11
70	30-Jul-24	Pile	C2	BPP5/2	M35 P	1.2	885.665	893.138	7.473	10.14
71	16-Sep-24	Pile	C2	BPP5/3	M35 P	1.2	885.927	893.138	7.211	9.84
72	01-Aug-24	Pile	C2	BPP5/4	M35 P	1.2	886.000	893.138	7.138	9.76
73	13-Sep-24	Pile	C2	BPP5/5	M35 P	1.2	885.931	893.138	7.207	9.84
74	19-Sep-24	Pile	C2	BPP5/6	M35 P	1.2	885.996	893.138	7.142	9.77
75	05-Sep-24	Pile	C4	BPP5/1	M35 P	1.2	885.222	893.138	7.916	10.64
76	20-Aug-24	Pile	C4	BPP5/2	M35 P	1.2	885.150	893.138	7.988	10.72
77	28-Aug-24	Pile	C4	BPP5/3	M35 P	1.2	885.416	893.138	7.722	10.42
78	23-Aug-24	Pile	C4	BPP5/4	M35 P	1.2	885.559	893.138	7.579	10.26
79	03-Sep-24	Pile	C4	BPP5/5	M35 P	1.2	885.998	893.138	7.140	9.76
80	09-Sep-24	Pile	C4	BPP5/6	M35 P	1.2	884.523	893.138	8.615	11.43
81	25-Sep-24	Pile	C2	BPP6/1	M35 P	1.2	884.906	893.138	8.232	11.00
82	20-Sep-24	Pile	C2	BPP6/2	M35 P	1.2	885.950	893.138	7.188	9.82
83	26-Sep-24	Pile	C2	BPP6/3	M35 P	1.2	885.506	893.138	7.632	10.32
84	23-Sep-24	Pile	C2	BPP6/4	M35 P	1.2	885.168	893.138	7.970	10.70
85	27-Sep-24	Pile	C2	BPP6/5	M35 P	1.2	885.275	893.138	7.863	10.58
86	29-Sep-24	Pile	C2	BPP6/6	M35 P	1.2	885.431	893.138	7.707	10.40
87	07-Sep-24	Pile	C4	BPP6/1	M35 P	1.2	885.264	893.138	7.874	10.59
88	12-Aug-24	Pile	C4	BPP6/2	M35 P	1.2	886.075	893.138	7.063	9.68
89	19-Aug-24	Pile	C4	BPP6/3	M35 P	1.2	885.955	893.138	7.183	9.81
90	16-Aug-24	Pile	C4	BPP6/4	M35 P	1.2	886.095	893.138	7.043	9.65
91	05-Sep-24	Pile	C4	BPP6/5	M35 P	1.2	886.080	893.138	7.058	9.67
92	11-Sep-24	Pile	C4	BPP6/6	M35 P	1.2	885.317	893.138	7.821	10.53

93	29-Jun-24	Pile	C2	BPP7/1	M35 P	1.2	884.533	893.138	8.605	11.42
94	27-Jun-24	Pile	C2	BPP7/2	M35 P	1.2	882.753	893.138	10.385	13.43
95	02-Jul-24	Pile	C2	BPP7/3	M35 P	1.2	886.107	893.138	7.031	9.64
96	25-Jun-24	Pile	C2	BPP7/4	M35 P	1.2	884.543	893.138	8.595	11.41
97	10-Jul-24	Pile	C2	BPP7/5	M35 P	1.2	886.027	893.138	7.111	9.73
98	12-Jul-24	Pile	C2	BPP7/6	M35 P	1.2	885.979	893.138	7.159	9.78
99	11-Sep-24	Pile	C4	BPP7/1	M35 P	1.2	885.374	893.138	7.764	10.47
100	10-Aug-24	Pile	C4	BPP7/2	M35 P	1.2	886.132	893.138	7.006	9.61
101	16-Aug-24	Pile	C4	BPP7/3	M35 P	1.2	886.127	893.138	7.011	9.62
102	13-Aug-24	Pile	C4	BPP7/4	M35 P	1.2	885.778	893.138	7.360	10.01
103	09-Sep-24	Pile	C4	BPP7/5	M35 P	1.2	885.855	893.138	7.283	9.92
104	14-Sep-24	Pile	C4	BPP7/6	M35 P	1.2	885.786	893.138	7.352	10.00
105	18-Jun-24	Pile	C2	BPP8/1	M35 P	1.2	884.877	893.138	8.261	11.03
106	16-Jun-24	Pile	C2	BPP8/2	M35 P	1.2	884.650	893.138	8.488	11.29
107	11-Jun-24	Pile	C2	BPP8/3	M35 P	1.2	884.446	893.138	8.692	11.52
108	07-Jun-24	Pile	C2	BPP8/4	M35 P	1.2	884.026	893.138	9.112	11.99
109	15-Jun-24	Pile	C2	BPP8/5	M35 P	1.2	883.405	893.138	9.733	12.69
110	09-Jun-24	Pile	C2	BPP8/6	M35 P	1.2	884.280	893.138	8.858	11.70
111	04-Sep-24	Pile	C4	BPP8/1	M35 P	1.2	886.138	893.138	7.000	9.61
112	29-Jul-24	Pile	C4	BPP8/2	M35 P	1.2	885.682	893.138	7.456	10.12
113	26-Jul-24	Pile	C4	BPP8/3	M35 P	1.2	885.797	893.138	7.341	9.99
114	01-Aug-24	Pile	C4	BPP8/4	M35 P	1.2	885.661	893.138	7.477	10.14
115	05-Sep-24	Pile	C4	BPP8/5	M35 P	1.2	886.077	893.138	7.061	9.67
116	12-Sep-24	Pile	C4	BPP8/6	M35 P	1.2	886.018	893.138	7.120	9.74
117	15-Apr-24	Pile	C2	BPP9/1	M35 P	1.2	883.907	893.138	9.231	12.13

118	08-May-24	Pile	C2	BPP9/2	M35 P	1.2	882.230	893.138	10.908	14.02
119	14-May-24	Pile	C2	BPP9/3	M35 P	1.2	880.975	893.138	12.163	15.44
120	15-May-24	Pile	C2	BPP9/4	M35 P	1.2	882.182	893.138	10.956	14.08
121	12-May-24	Pile	C2	BPP9/5	M35 P	1.2	880.283	893.138	12.855	16.22
122	18-Apr-24	Pile	C2	BPP9/6	M35 P	1.2	880.835	893.138	12.303	15.60
123	06-May-24	Pile	C2	BPP9/7	M35 P	1.2	877.291	893.138	15.847	19.60
124	02-May-24	Pile	C2	BPP9/8	M35 P	1.2	882.008	893.138	11.130	14.27
125	14-Jul-24	Pile	C4	BPP9/1	M35 P	1.2	885.848	893.138	7.290	9.93
126	18-Jul-24	Pile	C4	BPP9/2	M35 P	1.2	885.598	893.138	7.540	10.22
127	16-Jul-24	Pile	C4	BPP9/3	M35 P	1.2	885.604	893.138	7.534	10.21
128	08-Aug-24	Pile	C4	BPP9/4	M35 P	1.2	885.072	893.138	8.066	10.81
129	02-Aug-24	Pile	C4	BPP9/5	M35 P	1.2	885.700	893.138	7.438	10.10
130	17-Jul-24	Pile	C4	BPP9/6	M35 P	1.2	885.807	893.138	7.331	9.98
131	30-Jul-24	Pile	C4	BPP9/7	M35 P	1.2	884.842	893.138	8.296	11.07
132	28-Jul-24	Pile	C4	BPP9/8	M35 P	1.2	885.921	893.138	7.217	9.85
133	20-Jul-24	Pile	C2	BPP10/1	M35 P	1.2	882.552	893.138	10.586	13.66
134	16-May-24	Pile	C2	BPP10/2	M35 P	1.2	881.867	893.138	11.271	14.43
135	27-May-24	Pile	C2	BPP10/3	M35 P	1.2	882.167	893.138	10.971	14.09
136	20-Jun-24	Pile	C2	BPP10/4	M35 P	1.2	884.237	893.138	8.901	11.75
137	11-Jul-24	Pile	C2	BPP10/5	M35 P	1.2	886.060	893.138	7.078	9.69
138	21-May-24	Pile	C2	BPP10/6	M35 P	1.2	883.828	893.138	9.310	12.22
139	06-Jul-24	Pile	C2	BPP10/7	M35 P	1.2	885.876	893.138	7.262	9.90
140	17-Jul-24	Pile	C2	BPP10/8	M35 P	1.2	885.661	893.138	7.477	10.14
141	14-Aug-24	Pile	C4	BPP10/1	M35 P	1.2	885.554	893.138	7.584	10.26
142	11-Aug-24	Pile	C4	BPP10/2	M35 P	1.2	885.519	893.138	7.619	10.30

143	17-Aug-24	Pile	C4	BPP10/3	M35 P	1.2	885.011	893.138	8.127	10.88
144	12-Aug-24	Pile	C4	BPP10/4	M35 P	1.2	884.772	893.138	8.366	11.15
145	20-Aug-24	Pile	C4	BPP10/5	M35 P	1.2	884.049	893.138	9.089	11.97
146	27-Aug-24	Pile	C4	BPP10/6	M35 P	1.2	884.470	893.138	8.668	11.49
147	21-Aug-24	Pile	C4	BPP10/7	M35 P	1.2	886.126	893.138	7.012	9.62
148	23-Aug-24	Pile	C4	BPP10/8	M35 P	1.2	885.948	893.138	7.190	9.82
149	14-Sep-24	Pile	C2	BPP11/1	M35 P	1.2	886.078	893.138	7.060	9.67
150	24-Jul-24	Pile	C2	BPP11/2	M35 P	1.2	886.076	893.138	7.062	9.68
151	01-Aug-24	Pile	C2	BPP11/3	M35 P	1.2	885.824	893.138	7.314	9.96
152	28-Jul-24	Pile	C2	BPP11/4	M35 P	1.2	885.709	893.138	7.429	10.09
153	20-Sep-24	Pile	C2	BPP11/5	M35 P	1.2	885.960	893.138	7.178	9.81
154	23-Sep-24	Pile	C2	BPP11/6	M35 P	1.2	885.481	893.138	7.657	10.35
155	18-Sep-24	Pile	C2	BPP11/7	M35 P	1.2	885.810	893.138	7.328	9.98
156	21-Sep-24	Pile	C2	BPP11/8	M35 P	1.2	886.119	893.138	7.019	9.63
157	16-Nov-24	Pile	C4	BPP11/2	M35 P	1.2	885.651	893.138	7.487	10.16
158	19-Nov-24	Pile	C4	BPP11/3	M35 P	1.2	885.762	s893.138	7.376	10.03
159	18-Nov-24	Pile	C4	BPP11/4	M35 P	1.2	881.668	893.138	11.470	14.66
160	22-Nov-24	Pile	C4	BPP11/5	M35 P	1.2	884.092	893.138	9.046	11.92
161	Yet to cast	Pile	C4	BPP11/1		1.2				
162		Pile	C4	BPP11/6		1.2				
163		Pile	C4	BPP11/7		1.2				
164		Pile	C4	BPP11/8		1.2				

Statement works executed by previous contractor (Pile cap)							
SI No.	Pile cap ID	Structure ID	Unit	Measurements in Mtr.			Qty (cum)
				L	B	D	
1	C2-BA1	Elevated Station	Nos	8.80	5.20	1.80	82.368
2	C2-BPP1	Elevated Station	Nos	12.40	5.20	1.80	116.064
3	C2-BPP2	Elevated Station	Nos	12.40	5.20	1.80	116.064
4	C2-BPP3	Elevated Station	Nos	8.80	5.20	1.80	82.368
5	C2-BPP4	Elevated Station	Nos	8.80	5.20	1.80	82.368
6	C2-BPP5	Elevated Station	Nos	8.80	5.20	1.80	82.368
7	C2-BPP6	Elevated Station	Nos	8.80	5.20	1.80	82.368
8	C2-BPP7	Elevated Station	Nos	8.80	5.20	1.80	82.368
9	C2-BPP8	Elevated Station	Nos	8.80	5.20	1.80	82.368
10	C2-BPP9	Elevated Station	Nos	12.40	5.20	1.80	116.064
11	C2-BPP10	Elevated Station	Nos	12.40	5.20	1.80	116.064
12	C2-BPP11	Elevated Station	Nos	12.40	5.20	1.80	116.064
13	C4-BA1	Elevated Station	Nos	8.80	5.20	1.80	82.368
14	C4-BPP1	Elevated Station	Nos	12.40	5.20	1.80	116.064
15	C4-BPP2	Elevated Station	Nos	12.40	5.20	1.80	116.064
16	C4-BPP3	Elevated Station	Nos	8.80	5.20	1.80	82.368
17	C4-BPP4	Elevated Station	Nos	8.80	5.20	1.80	82.368
18	C4-BPP5	Elevated Station	Nos	8.80	5.20	1.80	82.368
19	C4-BPP6	Elevated Station	Nos	8.80	5.20	1.80	82.368
20	C4-BPP7	Elevated Station	Nos	8.80	5.20	1.80	82.368
21	C4-BPP8	Elevated Station	Nos	8.80	5.20	1.80	82.368
22	C4-BPP9	Elevated Station	Nos	12.40	5.20	1.80	116.064
23	C4-BPP10	Elevated Station	Nos	12.40	5.20	1.80	116.064
24	C4-BPP11	Elevated Station	Nos	12.40	5.20	1.80	
Total Qty (cum)							2197.73

Statement works executed by previous contractor (Pier)

Sl No.	Pier ID	Pier executed Structure ID	Unit	Balance steel qty at site (MT)	Remarks of GC Engineer
1	C2-BA1	Elevated Station	Nos	0.815	Partially completed
2	C2-BPP1	Elevated Station	Nos	1.039	Partially completed
3	C2-BPP2	Elevated Station	Nos	0.883	Partially completed
4	C2-BPP3	Elevated Station	Nos	0.921	Partially completed
5	C2-BPP4	Elevated Station	Nos	0.931	Partially completed
6	C2-BPP5	Elevated Station	Nos	0.915	Partially completed
7	C2-BPP6	Elevated Station	Nos	0.906	Partially completed
8	C2-BPP7	Elevated Station	Nos	0.920	Partially completed
9	C2-BPP8	Elevated Station	Nos	0.909	Partially completed
10	C2-BPP9	Elevated Station	Nos	0.904	Partially completed
11	C2-BPP10	Elevated Station	Nos	0.906	Partially completed
12	C2-BPP11	Elevated Station	Nos	1.026	Partially completed
13	C4-BA1	Elevated Station	Nos	0.561	Partially completed
14	C4-BPP1	Elevated Station	Nos	0.772	Partially completed
15	C4-BPP2	Elevated Station	Nos	0.909	Partially completed
16	C4-BPP3	Elevated Station	Nos	0.913	Partially completed
17	C4-BPP4	Elevated Station	Nos	0.905	Partially completed
18	C4-BPP5	Elevated Station	Nos	0.924	Partially completed
19	C4-BPP6	Elevated Station	Nos	0.921	Partially completed
20	C4-BPP7	Elevated Station	Nos	0.904	Partially completed
21	C4-BPP8	Elevated Station	Nos	0.917	Partially completed
22	C4-BPP9	Elevated Station	Nos	0.915	Partially completed
23	C4-BPP10	Elevated Station	Nos	0.922	Partially completed
Total				20.64	

Statement of work executed by previous Contractor							
SI No.	Chainage	Structure ID	Unit	Measurements in Mtr.			
				L	B	D	Qty
1	11+339	P1 Pile - (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
2	11+370	P2 Pile - (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
3	11+401	P3 Pile - (4 Nos)	Mtr	24.34		1.2	24.34
			Mtr	24.34		1.2	24.34
			Mtr	24.34		1.2	24.34
			Mtr	24.34		1.2	24.34
		P3 Pile Cap	Cum	5.50	5.5	1.8	54.45
		P3 Crash Barrier	Cum				0.00
4	11+432	P4 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P4 - Pile Cap	Cum	5.2	5.2	1.8	48.67
		P4 - Pier	Cum	5.682		1.8	14.45
		P4 Crash Barrier	Cum				3.081
		P4 - Pier Cap Erection	Nos				1.0
5	11+463	P5 - Pile (4 Nos)	Mtr	25.93		1.2	25.93
			Mtr	25.93		1.2	25.93
			Mtr	26.1		1.2	26.1
			Mtr	25.93		1.2	25.93
		P5- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P5 - Pier	Cum	5.727		1.8	14.57
		P5 Crash Barrier	Cum				3.081
		P5 - Pier Cap Erection	Nos				1.0

6	11+494	P6 - Pile (4 Nos)	Mtr	25.80		1.2	25.80
			Mtr	25.85		1.2	25.85
			Mtr	27.00		1.2	27.00
			Mtr	25.80		1.2	25.80
		P6- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P6 - Pier	Cum	4.151		1.8	10.56
		P6 Crash Barrier	Cum				3.081
		P6 - Pier Cap Erection	Nos				1.0
7	11+525	P7 - Pile (5 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P7 Pile cap	Cum				0.0
8	11+556	P8 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P8- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P8 - Pier	Cum	3.966		1.8	10.09
		P8 Crash Barrier	Cum				3.081
9	11+585	P9 - Pile	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P9- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P9 - Pier	Cum	4.988		1.8	12.69
		P9 Crash Barrier	Cum				3.081
10	11+610	P10 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P10- Pile Cap	Cum				64.42
		P10 - Pier	Cum				0.0
		P10 Crash Barrier	Cum				0.0
11	11+635	P11 - Pile (4 Nos)	Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0
			Mtr	21.61		1.2	21.61

			Mtr	23.0		1.2	23.0
		P11- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P11 - Pier	Cum	5.404		1.8	13.74
		P11 Crash Barrier	Cum				3.081
12	11+660	P12 - Pile (5 Nos)	Mtr	23.0		1.2	23.0
			Mtr	21.7		1.2	21.7
			Mtr	22.50		1.2	22.50
			Mtr	23.43		1.2	23.43
			Mtr	27.0		1.2	27.0
		P12 Pile cap	Cum				0.0
13	11+685	P13 - Pile - 4 Nos	Mtr	21.5		1.2	21.5
			Mtr	21.5		1.2	21.5
			Mtr	21.5		1.2	21.5
			Mtr	23.0		1.2	23.0
		P13 Pile cap	Cum				0.0
14	11+710	P14 - Pile (4 Nos)	Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0
		P14- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P14 - Pier	Cum	4.923		1.8	12.52
		P14 Crash Barrier	Cum				3.081
15	11+735	P15 - Pile (5 Nos)	Mtr	25.0		1.2	25.0
			Mtr	22.3		1.2	22.3
			Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0
			Mtr	27.2		1.2	27.2
		P15- Pile Cap	Cum				93.0
		P15 - Pier	Cum	6.099		1.8	15.51
		P15 Crash Barrier	Cum				3.081
16	11+760	P16 - Pile (4 Nos)	Mtr	22.34		1.2	22.34
			Mtr	22.72		1.2	22.72
			Mtr	22.17		1.2	22.17
			Mtr	22.40		1.2	22.40
		P16- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P16 - Pier	Cum	6.029		1.8	15.33
		P16 Crash Barrier	Cum				0.00
17	11+785	P17 - Pile (4 Nos)	Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0
			Mtr	23.0		1.2	23.0

			Mtr	23.0		1.2	23.0
		P17- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P17 - Pier	Cum	3.514		1.8	8.94
		P17 Crash Barrier	Cum				0.00
18	11+813	P18 - Pile (4 Nos)	Mtr	27.5		1.2	27.5
			Mtr	27.3		1.2	27.3
			Mtr	28.0		1.2	28.0
			Mtr	27.5		1.2	27.5
		P18- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P18 - Pier	Cum	2.5		1.8	6.36
		P18 Crash Barrier	Cum				0.00
19	11+844	P19 - Pile (5 Nos)	Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
		P19- Pile Cap	Cum				92.0
		P19 - Pier	Cum	3.426		1.8	8.71
		P19 Crash Barrier	Cum				0.00
20	11+875	P20 - Pile (5 Nos)	Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
			Mtr	27.5		1.2	27.5
		P20- Pile Cap	Cum				88.0
		P20 - Pier	Cum	3.253		1.8	8.27
		P20 Crash Barrier	Cum				0.00
21	11+897	P21 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
22	11+928	P22 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	30.0		1.2	30.0
			Mtr	27.0		1.2	27.0
		P22 Pile Cap	Cum				0.0
23	12+266	P33 - Pile (3 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0

			Mtr	27.0		1.2	27.0
24	12+294	P34 - Pile (3 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P34 Pile Cap	Cum				0.0
25	12+321	P35 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P35 Pile Cap	Cum				0.0
26	12+459	P40 - Pile (4 Nos)	Mtr	19.18		1.2	19.18
			Mtr	18.25		1.2	18.25
			Mtr	16.87		1.2	16.87
			Mtr	18.026		1.2	18.026
		P40 Pile Cap	Cum				0.0
27	12+487	P41 - Pile	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P41- Pile Cap	Cum	5.2	5.2	1.8	48.67
		P41 - Pier	Cum	9.443	2	2.2	41.55
		P41 Crash Barrier	Cum				0.00
28	12+865	P54 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P54 Pile cap	Cum				0.0
29	12+897	P55 - Pile (4 Nos)	Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
			Mtr	27.0		1.2	27.0
		P55 Pile cap	Cum	5.2	5.2	1.8	48.67
		P55 Pier	Cum				0.0
		P55 Crash Barrier	Cum				0.0

30	13+675	P81 - Pile (4 Nos)	Mtr	34.0		1.2	34.0
			Mtr	34.0		1.2	34.0
			Mtr	34.0		1.2	34.0
			Mtr	34.0		1.2	34.0
31	13+704	P82 - Pile (1 No)	Mtr	34.0		1.2	34.0
32	13+838	P87 - Pile (1 No)	Mtr	34.0		1.2	34.0
33	14+062	P96 - Pile (1 No)	Mtr	31.0		1.2	31.0
34	14+084	P97 - Pile (2 Nos)	Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0
35	14+268	P104 - Pile (2 Nos)	Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0
36	14+300	P105 - Pile (2 Nos)	Mtr	34.0		1.2	34.0
			Mtr	34.0		1.2	34.0
37	16+500	P181/11 - Pile (6 Nos)	Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
38	16+528	P181/12 - Pile (6 Nos)	Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
39	16+556	P182 - Pile (6 Nos)	Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
			Mtr	33.0		1.2	33.0
40	16+575	PP183 LHS - Pile (4 Nos)	Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0

			Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0
41	16+575	PP183 RHS - Pile (4 Nos)	Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0
			Mtr	31.0		1.2	31.0

Statement of work executed by previous contractor Wherever Pile cap is completed the pier reinforcement are exposed, and in some cases partial pier is completed and balance Steel is exposed, same shall be noted.							
SI No.	Chainage	Structure ID	Unit	Measurements in Mtr.			
				L	B	D	Qty
1	16+828	UP 191 - Pile (4 nos)	Mtr	31.00		1.2	31.00

			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
2	16+854	UP192 - Pile (4 nos)	Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
3	17+028	UP201 - Pile (6 nos)	Mtr			1.2	0.00
			Mtr			1.2	0.00
			Mtr			1.2	0.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
4	17+175	UP 205 - Pile (6 nos)	Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
5	17+206	UP206 - Pile (4 nos)	Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
6	17+237	UP207 - Pile (4 nos)	Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
		UP 207 Pilecap	Cum	4.40	4.4	1.5	28.80
		UP 207 Pier	Cum	7.382		1.8	18.78
		UP 207 Piercap					
7	17+268	UP208 - Pile (4 nos)	Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
		UP 208 Pilecap	Cum	4.40	4.4	1.5	28.80
		UP 208 Pier	Cum	8.669		1.8	22.05
		UP 208 Piercap Erection	Nos				1.00
		UP 208 Piercap stitch	Cum	0.50	0.75	1.5	1.86
		UP 208 Pedestal	Nos				4.00

		U GIRDER erection	Nos	UP 208- UP 209			1.00
8	17+299	UP209 - Pile (4 nos)	Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
		UP 209 Pilecap	Cum	4.40	4.4	1.5	28.80
		UP 209 Pier	Cum	8.235		1.8	20.94
		UP 209 Piercap Erection	Nos				1.00
		UP 209 Piercap stitch	Cum	0.50	0.75	1.5	1.86
		UP 209 Pedestal	Nos				4.00
		U GIRDER erection	Nos	UP 209- UP 210			1.00
9	17+330	UP210 - Pile (4 nos)	Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
		UP 210 Pilecap	Cum	4.465	4.507	1.5	29.95
		UP 210 Pier	Cum	8.571		1.8	21.80
		UP 210 Piercap erection	Nos				1.00
		UP 210 Piercap stitch	Cum	0.50	0.75	1.5	1.86
		UP 210 Pedestal	Nos				4.00
10	17+361	UP211 - Pile (4 nos)	Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
			Mtr	25.20		1.0	25.20
		UP 211 Pilecap	Cum	4.501	4.622	1.5	30.97
		UP 211 Pier	Cum	10.097		1.8	25.68
		UP 211 Piercap erection	Nos				1.00
		UP 211 Piercap stitch	Cum	0.50	0.75	1.5	1.86
		UP 211 Pedestal	Nos				
11	17+392	UP212 - Pile (4 nos)	Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
		UP 212 Pilecap	Cum	4.70	4.7	1.5	32.90
		UP 212 Pier	Cum	14.078		1.8	35.81
12	17+423	UP213 - Pile (4 nos)	Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70

13	17+454	UP214 - Pile (4 nos)	Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
			Mtr	27.70		1.0	27.70
		UP 214 Pilecap	Cum	4.40	4.4	1.5	28.80
		UP 214 Pier	Cum	13.671		1.8	34.77
		UP 214 Piercap erection	Nos				1.00
		UP 214 Piercap stitch	Cum	0.50	0.75	1.5	1.86
		UP 214 Pedestal	Nos				4.00
14	17+485	UP215 - Pile (4 nos)	Mtr	24.20		1.0	24.20
			Mtr	24.20		1.0	24.20
			Mtr	24.20		1.0	24.20
			Mtr	24.20		1.0	24.20
		UP 215 Pilecap	Cum	4.40	4.4	1.5	28.80
		UP 215 Pier	Cum	13.240		1.8	33.67
		UP 215 Piercap	Nos				1.00
		UP 215 Piercap stitch	Cum	0.50	0.75	1.8	2.24
		UP 215 Pedestal	Nos				4.00
15	17+516	UP216 - Pile (4 nos)	Mtr	24.20		1.0	24.20
			Mtr	24.20		1.0	24.20
			Mtr	24.20		1.0	24.20
			Mtr	24.20		1.0	24.20
		UP 216 Pilecap	Cum	4.70	4.7	1.5	32.90
		UP 216 Pier	Cum	13.310		1.8	33.85
		UP 216 Piercap Erection	Nos				1.00
		UP 216 Piercap stitch	Cum	0.50	0.75	1.5	1.86
16	17+547	UP217 - Pile (4 nos)	Mtr	26.20		1.0	26.20
			Mtr	26.20		1.0	26.20
			Mtr	26.20		1.0	26.20
			Mtr	26.20		1.0	26.20
		UP 217 Pilecap	Cum	4.70	4.7	1.5	32.90
		UP 217 Pier	Cum	13.317		1.8	33.87
		UP 217 Piercap erection	Nos				1.00
		UP 217 Piercap stitch	Cum	0.50	0.75	1.5	1.86
17	17+578	UP218 Pile (6 nos)	Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
			Mtr	26.20		1.0	26.20
			Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
			Mtr	26.20		1.0	26.20
		UP 218 Pilecap	Cum	10.70	4.7	1.8	90.17

		UP 218 Pier Starter	Cum	1.200		1.8	3.05
18	17609.02	UP219 - Pile (4 nos)	Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
		UP 219 Pilecap	Cum	4.70	4.7	1.5	32.90
		UP 219 Pier	Cum	15.063		1.8	38.31
		UP 219 Piercap	Nos				1.00
		UP 219 Piercap stitch	Cum	0.50	0.75	1.5	1.86
19	17+640	UP220 - Pile (4 nos)	Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
			Mtr	27.00		1.0	27.00
		UP 220 Pilecap	Cum	4.40	4.4	1.5	28.80
		UP 220 Pier	Cum	16.134		1.8	41.04
		UP 220 Piercap	Nos				1.00
		UP 220 Piercap stitch	Cum	0.50	0.75	1.5	1.86
20	17+671	UP221 - Pile (4 nos)	Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
		UP 221 Pilecap	Cum	4.70	4.7	1.5	32.90
		UP 221 Pier	Cum	16.223		1.8	41.26
21	16+830	DP191 Pile (6 nos)	Mtr			1.2	0.00
			Mtr			1.2	0.00
			Mtr	31.00		1.2	31.00
			Mtr			1.2	0.00
			Mtr			1.2	0.00
			Mtr			1.2	0.00
22	16+855	DP192 Pile (6 nos)	Mtr			1.2	0.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
23	17+148	DP204 - Pile (4 nos)	Mtr	34.00		1.2	34.00
			Mtr			1.2	0.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
24	17+166	DP205 - Pile (4 nos)	Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00
			Mtr	34.00		1.2	34.00

			Mtr	34.00		1.2	34.00	
25	17+197	DPP206 LHS - Pile (8nos)	Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	0.00		1.2	0.00	
			Mtr	0.00		1.2	0.00	
26	17+197	DPP206 RHS- Pile (8 nos)	Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	0.00		1.2	0.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	0.00		1.2	0.00	
			Mtr	0.00		1.2	0.00	
			Mtr	0.00		1.2	0.00	
27	17+228	DPP207 LHS- Pile (4 nos)	Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
28	17+228	DPP207 RHS-Pile (6 nos)	Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	0.00		1.2	0.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
29	17+259	CDP208 - Pile (6 nos)	Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
			Mtr	31.00		1.2	31.00	
		CDP 208 Pilecap		Cum	9.10	5.5	1.8	89.58

		CDP 208 Pier	Cum				
30	17+290	CDP209 - Pile (6 nos)	Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
		CDP 209 Pilecap	Cum	9.10	5.5	1.8	89.58
		CDP 209 Pier	Cum	2.20	2	5.090	22.40
31	17+318	CDP210 - Pile (6 nos)	Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
		CDP 210 Pilecap	Cum	9.10	5.5	1.8	89.58
		CDP 210 Pier	Cum	2.20	2	5.169	22.74
32	17+349	DPP211 LHS- Pile (4 nos)	Mtr	0.00		1.2	0.00
			Mtr	0.00		1.2	0.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
33	17+349	DPP211 RHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP 211 RHS Pilecap	Cum	5.20	5.2	1.8	48.33
		DPP 211 RHS Pier	Cum	2.20	2	0.6	2.64
34	17+380	DPP212 LHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP 212 LHS Pilecap	Cum	5.50	5.5	1.8	54.11
		DPP 212 LHS Pier	Cum	2.20	2	0.6	2.64

35	17+380	DPP212 RHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP 212 RHS Pilecap	Cum	5.20	5.2	1.8	48.33
		DPP 212 RHS Pier	Cum	2.20	2	0.6	2.64
36	17+411	DPP213 LHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
37	17+411	DPP213 RHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP 213 RHS Pilecap	Cum	5.50	5.5	1.8	54.11
		DPP 213 RHS Pier	Cum	2.20	2	5.202	22.89
38	17+442	DPP214 LHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP 214 LHS Pilecap	Cum	5.20	5.2	1.8	48.33
		DPP 214 LHS Pier	Cum	2.20	2	5.003	22.01
39	17+442	DPP214 RHS -Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP 214 RHS Pilecap	Cum	5.20	5.2	1.8	48.33
		DPP 214 RHS Pier	Cum	2.20	2	5.175	22.77

40	17+473	DPP215 LHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP215 LHS Pilecap	Cum	5.50	5.5	1.8	54.11
		DPP215 LHS Pier	Cum	2.20	2	5.186	22.82
41	17+473	DPP215 RHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP215 RHS Pilecap	Cum	5.20	5.2	1.8	48.33
		DPP215 RHS Pier	Cum	2.20	2	5.197	22.87
42	17+504	DPP216 LHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
43	17+504	DPP216 RHS- Pile (4 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		DPP216 RHS Pilecap	Cum	5.50	5.5	1.8	54.11
		DPP216 RHS Pier	Cum	2.20	2	5.158	22.70
44	17+535	CDP217 - Pile (6 nos)	Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
45	17+566	DP218 - Pile (4 nos)	Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00

			Mtr	33.00		1.0	33.00
46	17+597	DP219 - Pile (4 nos)	Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
		DP219 Pilecap	Cum	4.70	4.7	1.5	32.90
		DP219 Pier	Cum				
47	17+628	CDP220 - Pile (4 nos)	Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	31.13		1.0	31.133
		CDP220 Pilecap	Cum	4.70	4.7	1.5	32.90
		CDP220 Pier	Cum				
48	17+659	CDP221 - Pile (6 nos)	Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
			Mtr	33.00		1.0	33.00
49	16+944	P192 - Pile (6 nos)	Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
50	16+971	P191 - Pile (6 nos)	Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
			Mtr	31.00		1.2	31.00
51	17+154	P204 - Pile (8 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00

			Mtr	33.00		1.2	33.00
52	17+172	P205 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
53	17+285	P209 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
54	17+316	P210 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr			1.2	0.00
			Mtr	33.00		1.2	33.00
55	17+533	P217 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		P 217 Pilecap	Cum	8.80	5.2	1.8	81.86
		P 217 Pier	Cum	2.60	2.4	0.6	3.74
56	17+564	P218 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		P218 Pilecap	Cum	8.80	5.2	1.8	81.86
		P218 Pier	Cum	2.60	2.4	5.177	32.30
57	17+595	P219 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00

			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		P219 Pilecap					
58	17+626	P220 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
		P220 Pilecap	Cum	8.80	5.2	1.8	81.86
		P220 Pier	Cum	2.60	2.4	5.084	31.72
59	17+657	P221 - Pile (6 nos)	Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00
			Mtr	33.00		1.2	33.00

ANNEXURE - 2**RIGHT OF ACCESS TO THE SITE****TIME FOR ACCESS TO THE SITE**

Access to site and RUC will be given progressively, generally taking into account the approved programme of works.

A major portion of the land required for execution of works is Railway land and the same is available along the alignment. The remaining land or portion of land near to the Railway boundary is under acquisition and is expected to be acquired soon.

After award of the work, The Engineer shall grant the Contractor right of access to, and /or possession of, the Site progressively for the completion of Works. Such right and possession may not be exclusive to the Contractor. The Contractor will draw / modify the schedule for completion of Works according to progressive possession / right of such sites.

If any delay in access to, and possession of the site, the extension of time as per relevant clause of contract shall be given for the delay of affected portion of the works.

The Contractor shall bear all costs and charges for special and/or temporary rights-of-way which he may require, including those for access to the Site. The Contractor shall also indicate extra railway land or Govt land or private land, if any required, beyond what is shown in the tentative tender drawing with the view to achieve best fit alignment for improved operational efficiency. On review by Engineer and Employer, the Contractor will be advised with the approved Horizontal/Vertical alignment for permanent works. Additional land, if needed by the Contractor beyond the Right of Access for movement of machinery etc., shall have to be arranged by the contractor at his own cost.

In case any operation connected with traffic necessitates diversion, obstruction or closure of any road, railway or any other Right of Access, the proposal shall be developed by the contractor for review for the approval of the Engineer/Employer and the consents and approval of the concerned authorities shall be obtained well in advance by the Contractor.

Provided that if it is found necessary for the Contractor to move one or more loads of heavy constructional plants and equipment, materials or pre-constructed units or parts of units of work over roads, highways, bridges on which such oversized and overweight items that are not normally to be moved, the contractor shall obtain prior permission from the concerned authorities.

Payments for complying with the requirements, if any, for protection or strengthening of the roads, highways or bridges shall be made by the contractor and such expenses shall be deemed to be included in his quoted contract price.

ANNEXURE - 3
ALIGNMENT PLANS (GAD)

The proposed alignment plan of the BSRP line is attached, for reference in Section 11

ANNEXURE – 4

TREE CUTTING AND FOREST CLEARANCES

Forest clearances: The permission for obtaining tree cutting/translocation is obtained from BBMP and Forest Department.

The tree cutting and disposal shall be arranged by the contractor and the scope is inclusive of the same. The applicable permits / permissions for felling of tress / Translocation shall be arranged by Employer.

ANNEXURE - 5

DELETED

ANNEXURE - 6
APPLICABLE PERMITS

1 APPLICABLE PERMITS

1.1 The Contractor shall obtain, as required under Applicable Laws, the following Applicable Permits:

- (a) Permission of the State Government for extraction of boulders from quarry;
- (b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;
- (c) Licence for use of explosives;
- (d) Permission of the State Government for drawing water from river/reservoir;
- (e) Licence from inspector of factories or other competent Authority for setting up batching plant;
- (f) Clearance of Pollution Control Board for setting up batching plant;
- (g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
- (h) Permission of Village Panchayats and State Government for borrow earth; and
- (i) Any other permits or clearances required under Applicable Laws.
- (j) Fire NOC from Karnataka State Fire and Emergency Services Department
- (k) Traffic Diversion NOC/permission from Bangalore police commissioner /Deputy commissioner Traffic Police

ANNEXURE – 7**PROVISIONAL CERTIFICATE**

- 1 I/We, (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated (the "**Agreement**"), for construction of the section (km to km) in the State of in- BSRP (the "**BSRP Project**") on Design and Construction basis through (Name of Contractor), hereby certify that the Tests in accordance with the Agreement have been undertaken to determine compliance of the BSRP Project with the provisions of the Agreement.
- 2 Certain minor works are incomplete, and these are not likely to cause material inconvenience to the Users of the BSRP Project or affect their safety or the movement of rail traffic in any manner. These works have been specified in the Punch List appended hereto, and the Contractors have agreed and accepted that they will complete all such works in the time and manner set forth in the Agreement.
- 3 In view of the foregoing, I/We am/are satisfied that the BSRP Project from km to km can be safely and reliably placed in service of the Authority for railway freight and passenger traffic, subject to authorisation by the Commissioner of Railway Safety in accordance with Applicable Laws. In terms of the Agreement, the BSRP Project is hereby provisionally declared fit for entry into operation on this the day of 20.....

ACCEPTED, SIGNED, SEALED

AND DELIVERED

For and on behalf of

CONTRACTOR by:

(Signature)

SIGNED, SEALED AND

DELIVERED

For and on behalf of

AUTHORITY's ENGINEER by:

(Signature)

ANNEXURE - 8

COMPLETION CERTIFICATE

- 1 I/We, (Name of the Authority's Engineer), acting as the Authority's Engineer, under and in accordance with the Agreement dated (the "**Agreement**"), for construction of thesection (km to km) of in the State of in- BSRP (the "**BSRP Project**" for Construction basis through (Name of Contractor), hereby certify that the Tests in accordance with the Agreement have been successfully undertaken to determine compliance of the BSRP Project with the provisions of the Agreement, and the authorisation by the Commissioner for Railway Safety under Applicable Laws has been obtained.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Railway Project have been completed, and the BSRP Project is hereby declared fit for entry into operation on this the day of 20...
 - i) The test on completion of civil works shall also include the integrated testing. The objective of the contract is the Design and construction, testing and commissioning of the permanent works, construction and removal of the Temporary Works and the rectification of defects appearing in Permanent Works by the contractor in the manner stipulated by the Contract.
 - ii) The completion certificate is as per railway standard format. Please refer Cl.30.6 at page 161, para 12 and para 2 . The format can be altered as per the contract conditions. The tender conditions prevail.

SIGNED, SEALED AND DELIVERED

For and on behalf of the Authority's Engineer by:

(Signature)

(Name)

(Designation)

(Address)