

PART 2: EMPLOYER'S REQUIREMENTS
Section VII Vol. II – TECHNICAL SPECIFICATION

**CHAPTER 5: INSTALLATION AND
CONSTRUCTION**

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1. REQUIREMENTS

1.1 GENERAL REQUIREMENTS

The Contractor shall comply with all Enactments in executing the Works, including but not limited to all statutory provisions on occupational health and safety.

The Contractor shall co-ordinate with Other Contractors in the execution of the Works. The Contractor shall also co-ordinate and co-operate with all Relevant Authorities in the execution of the Works.

The installation of all equipment shall be undertaken at all times by suitably trained and competent employees of the Contractor, to the satisfaction of the Employer's Representative.

Only appropriate tools, plant, equipment, and vehicles shall be used. Installation of all equipment shall be in accordance with the Construction and Installation Plan described in the GS. Installation of all equipment shall conform to the best industry practices. Precautions shall be undertaken to ensure the safety of personnel and equipment for all installation works.

The Contractor shall, prior to starting any installation and construction work, identify any possible hazards, and implement measures of eliminating and/or controlling such potential hazards, in line with safe working practices.

The Contractor shall ensure that all areas of work are sufficiently illuminated for the works to be undertaken and that a safe system of work is employed for all activities.

The Contractor shall operate a robust system for the control of persons entering or working upon the site.

The system shall include as a minimum:

- a. register of all employees,
- b. personal identification, with photograph,
 - levels of competency,
 - date of expiry,
 - date of issue,
 - signature; and
- c. Register of all visitors.

The Contractor shall co-operate, at all times, with the Employer's Representative and Other Contractors to ensure that the Site is protected from unauthorized admission, either willfully or otherwise. The Contractor shall make due provision for the safe access and egress to the Site of Works for its staff and subcontractors. This access shall be maintained such that it is free of all hazards and is in a safe condition throughout the duration of the Works.

1.2 SPECIFIC REQUIREMENTS

The installation and construction work pertaining to this Contract shall include, but not be limited to the following: -

- Finalization of the Construction and Installation Program
- Survey on Site and review the technical requirements shown in this Specification and the Employer's Drawings.

- Production of the calculation sheets and installation drawings for Site installation.
- Production of specific site designs and drawings based on typical designs and drawings supplied
- Installation in accordance with the finalized installation drawings.
- Co-ordination with Other Contractors.
- Submission of the installation reports and records including colour photographs showing the, progress of works and the quality of the materials and workmanship taken by the Contractor, in the presence of Employer's representative
- Testing and commissioning, as per finalized protocol and program.
- Production of as built drawings, documents, calculation sheets, and records.

1.3 CONSTRUCTION AND INSTALLATION PLAN

The Contractor shall undertake installation work in stages as shown in the detailed installation program. Installation, testing and commissioning of later stages shall not impact revenue operation of earlier stages.

As a minimum, the detailed Construction and Installation Plan shall include but not be limited to all the activities described in clause 1.1 of this PS and clause 3.6.1 of the GS and all other activities covered in this contract, installation details and methods of all activities, equipment and tools to be used for installation, safety issues, supervision, temporary land occupation needed and the vehicles to be used for installation.

1.3.1 Manual Handling

To facilitate handling of equipment during installation and maintenance thereafter, the Contractor shall closely co-ordinate and interface with station contractor, Viaducts contractor, track contractor, depot Contract and Signaling & Telecommunications Contractor for installation of the material handling equipment as below:

- a. Travelling hoists and unloading jib cranes for traction substations.
- b. Any other handling arrangement in order to ensure smooth handling of Substation equipment, from point of receipt at site to the final point of installation

The work of installation of the hoists and jib cranes shall be closely coordinated with Viaduct and Station Building and track contractors, who will have to design the structures, Install the beams at appropriate locations and provide the hoists and jib cranes.

The entire material handling plan for receiving substation, auxiliary main substation traction substation and auxiliary substation for movement of bulky item such as transformers, 220 kV/132 kV/66 kV, 33kV switchgear cable drums shall be carefully planned.

1.4 WORKS AREA

The Contractor will be given temporary work sites on or around the land/site for RSS and additional site if required and available. The Contractor shall comply with the requirements specified in Chapter 17 of the GS in relation to the use of works sites allocated to the Contractor.

1.5 TEMPORARY WORKS

The design of the Temporary Works shall be submitted to the Employer's Representative for review. All Temporary Works shall be removed on completion of the Section, or as directed by the Employer's Representative. All Temporary Works shall be clearly distinguishable from the Permanent Works.

1.6 CONSTRUCTION PLANT AND EQUIPMENT

The Contractor shall provide for himself the required number of sets Construction Plant & Equipment, for Construction.

If possible and available an area of approx.1000 sqm will be given to the Contractor at one suitable location, for his office and godown. In addition, the Contractor will be permitted to use the Substation sites for storage of materials, equipment etc, and also for a small site office, till the Substations are ready for commissioning.

1.7 SITE SUPERVISION AND SAFETY ISSUES

The Contractor shall set up a Site supervision system, which shall be part of the overall safety, system assurance and quality management system. Details of Health and Safety requirements at Site are described in Chapter 18 of the GS.

The Contractor shall adopt an appropriate quality management system throughout the entire Site installation period to ensure that the System performance requirements as specified in this PS are achieved.

The Contractor shall provide sufficient number of suitably experienced supervisors and skilled workers to ensure that the progress and quality of the work, both on Site and in the Contractor's workshops, are maintained to the satisfaction of the Employer's Representative.

Supervisors shall have a minimum of five years' previous experience in a supervisory capacity on similar projects and all the skilled workers including linesmen electricians fitters and craftsmen, shall have a minimum of two years' previous experience in installation of similar systems. Supervisors and Skilled Workers utilized for HV cable jointing shall possess adequate technical expertise and experience and their deployment is subject to approval by the Employer.

The Contractor's supervision system shall be responsible not only for the supervision of the concerned system installation but also for the supervision of the installation of the primary fixing system (mast foundation), the earth mats and systems, etc. The supervisors shall work on a full-time basis during the entire installation process.

The Contractor shall maintain a set of drawings at each project site which accurately reflect the current status of field changes. The Contractor shall obtain letter of no objection from the Employer's Representative for any such changes. The Contractor shall prepare final drawings showing the as built configuration. These drawings shall be developed in a logical format to facilitate routine system maintenance and troubleshooting. All drawings and details shall be endorsed by the Contractor.

The Employer's Representative reserves the right to undertake, at any time, checks on the proficiency of the Contractors staff, licensing and all associated documentation. Should any of the Contractors staff be found incompetent or unlicensed he shall be removed from the site until their Competency has been established.

1.8 INSTALLATION OF CABLES

The Contractor shall co-ordinate with the Civil Contractors wherever necessary, for the installation of cables in cable galleries, trenches, ducts, troughs, risers and other locations.

The cable system shall, during installation, be fully protected from mechanical damage and be generally accessible at all points for inspection along its entire route. Suitable cable markers shall be provided for

covered cables upon completion of installation. Should it prove necessary to cut any cable during installation, all cut ends shall be properly sealed.

The maximum pulling force of any cable during installation shall not exceed the design force of cables. For pulling, the Contractor shall use dynamometer for ensuring maximum pulling force. The Contractor shall use cable rollers for spreading cables. These should not be pulled and scratched on road/rough surfaces. The cable drums should be mounted on cable drum jacks of suitable height and capacity before taking out the cable for installation.

All cables shall be installed in the formed cable trenches, shafts, hangers, trays, and brackets. The minimum recommended bending radius of the cables shall be adhered to during installation. All materials used for termination, jointing and installation of cables in confined spaces shall have flame retardant, low smoke, halogen free characteristics.

1.9 WORKMANSHIP

All the installation shall be carried out according to the instructions shown in this Specification and Employer's Drawings.

All assemblies of equipment and their components and parts shall be completely interchangeable if they are of similar type. The style and procedure of the workmanship shall be consistent throughout the Works.

Unless otherwise specified, the Employer's Representative shall decide the final colors for all paint work and other finishes to be applied to any part of the Works. All parts, which are subject to, wear or damage by dust shall be completely enclosed in dust proof housings.

Cable manufacturer's guideline on cable laying, handling, storage, terminations, jointing etc. should be followed as per site conditions.

2. PROGRAMME REQUIREMENT

2.1 GENERAL

The date of commencement of commercial services, hereinafter referred to as Revenue Operation Date (ROD), for the various Corridors, are mentioned in clause A1 of ITT:

Accordingly, the both the RSS's and augmentation work shall be commissioned by January 2026 to meet the target dates fixed for Revenue operation of earliest corridor.

In addition to the requirements specified in the General Specification, the Contractor shall program the Works in accordance with a pre-determined sequence to meet various Key Dates and Access Dates so as to meet the Target Dates of commercial opening.

2.2 CHANGE IN KEY DATES (KD) AND ACCESS DATES (AD)

The bidders attention is invited to the various Key Dates described in the Table 1, Part 3 Section IX PCC. It is essential that the Contractor shall achieve the identified work by the specified Key Date mentioned against it, failing which Liquidated Damages shall become leviable as set out in the Contract. The Employer will, on his part, make all efforts to provide to the Contractor access to information as well as to various locations at stations/track/viaduct, in stages, in order to plan/execute his activities for time-bound completion of his obligations under the Contract, as per the Access Dates mentioned in the subsequent paragraphs. If, however, due to any reasons, the Employer is not in a position to provide access or shared access, as per the stated Access Dates, the Employer, in these circumstances, will inform the Contractor, in writing, about the proposed revised Access Date, at least 30 days before the scheduled Access Date. The Contractor shall suitably make necessary changes in his Work Program and shall ensure that, irrespective of the revised Access Dates, the concerned Key Dates are adhered to. Nothing extra will be paid to the contractor on this account.

2.3 KEY DATES

The work includes a number of stages. These stages, which are inter-related with, and essential to the completion of the Site Development, Design verification, Construction, Supply, Installation, Testing and Commissioning of Receiving Cum Traction Sub Station and Auxiliary Main Sub Station and associated cabling works for BI-RIDE, are to be achieved by the Key Dates. The Key Dates indicated in the schedule of Key Dates are mentioned in terms of the time period reckoned from the commencement of the works, and the deliverables for each Key Date shall be achieved by the midnight of the day mentioned.

If the identified work is not achieved by the stated Key Dates, liquidated damages may become applicable as set out in the Contract.

Description of each Key Date is as detailed below:

2.3.1 Key Date Section A: C2: Works at Soldevanahalli Depot (Including) to Chikkabanavara station (including) to Yeshwanthpura Station (including): Priority Section

2.3.2 Key date KD-A-01: Submission of Technical Proposal of Major Equipment of RSS, ASS, OHE like 220 kV EHV cables, Traction Transformer, Auxiliary Main Transformer, Dry type Auxiliary Transformer, 33 kV Cables, Panels etc. including preliminary design.

Achievement: Preparing & submitting the detailed technical program and proposal of major equipment including drawings and submit the same for employer/engineer approval.

2.3.3 Key date KD-A-02: Completion of Cable route survey from GSS to RSS

Achievement: Preparing & submitting the detailed technical program and proposal for laying the HT cable from the supply authority to the RSS. Submitting the detailed fault level & current carrying calculations. Preparation of Cable route from GSS to RSS as per survey and approved drawings

Interfacing Agencies: PWD, PMC, RCD, NHAI, KPTCL, BESCO and other Relevant Contractors/Agencies.

2.3.4 Key date KD-A-03: Obtaining NONO (Notice of No Objection) for Shop drawings / Working drawings.

Achievement: Obtaining Notice of No objections on the technical proposal/ Shop drawings / Working drawings/technical calculations/design reports from Employer/ Engineer for OHE/RSS/ASS/SCADA.

2.3.5 Key Date KD-A-04: Manufacture, FAT & Delivery to Site - 220 kV EHV cables, jointing kits & its accessories - Soladevanahalli Depot RSS and Mathikere RSS

Achievement: Obtaining NONO for QAP, Issuance of manufacturing clearance, conducting factory inspection as per approved QAP, obtaining dispatch instructions from Employer/ engineer and delivery to the site as per approved method statement.

2.3.6 Key Date KD-A-05: Manufacture, FAT & Equipment Delivery to Contractors Store - ASS, 33 kV Cables and OHE, Soladevanahalli Depot RSS and Mathikere RSS etc.

Achievement: Obtaining NONO for QAP, Issuance of manufacturing clearance, conducting factory inspection as per approved QAP, obtaining dispatch instructions from Employer/ engineer and delivery to the site as per approved method statement.

2.3.7 Key Date KD-A-06: Commissioning of Gas insulated (GIS) RSS at Soladevanahalli Depot RSS - Including laying of 220 kV EHV cabling from GSS to RSS & Completion of RSS Building Construction - Structural & Architectural works

Achievement: Completion of all the Installation and commissioning of all equipment, gantry structures, panels, and other equipment of the RSS, including Completion of the Cable laying, termination and all other related works of the HT cable laying for the RSS, approval of the detailed fault level & current carrying calculations and Completion of all Civil works like foundation, trenches, laying of pipes, building works (except final floor finishing), boundary wall etc.

Interfacing Agencies: Traction contractors, Local authorities, PWD, PMC, RCD, NHAI, KPTCL, BESCOM and other Relevant Contractors/ Agencies.

2.3.8 Key Date KD-A-07: Commissioning of Gas insulated (GIS) RSS at Mathikere RSS - Including laying 220 kV EHV cabling from GSS to RSS & Completion of RSS Building Construction - Structural & Architectural works

Achievement: Completion of all the Installation and commissioning of all equipment, gantry structures, panels, and other equipment of the RSS, including Completion of the Cable laying, termination and all other related works of the HT cable laying for the RSS, approval of the detailed fault level & current carrying calculations and Completion of all Civil works like foundation, trenches, laying of pipes, building works (except final floor finishing), boundary wall etc.

Interfacing Agencies: Traction contractors, Local authorities, PWD, PMC, RCD, NHAI, KPTCL, BESCOM and other Relevant Contractors/ Agencies.

2.3.9 Key Date KD-A-08: Commissioning of ASS in, Shettyhalli, Myadarahalli, Chikkabanavara, Yeshwanthpura stations and Soladevanahalli Depot including 33 kV cabling.

Achievement: Commissioning of Auxiliary Sub stations, after completing erection of all equipment's at various ASSs, as per specifications in the GS and PS of this Tender for achieving these Key Dates.

Interfacing Contractors: Relevant Contracts / Agencies

2.3.10 Key Date KD-A-09: Traction energization on Soldevanahalli Depot (Including) to Chikkabanavara station (including) to Yeshwanthpura Station (including)

Achievement: Charging of traction overhead equipment on 25kV, after completing all OHE, earthing and bonding, Return Conductors, safety works and all other connected works, in the various sections.

Interfacing Contractors: Track work Contractor, Signaling Contractor and other relevant Contracts/Agencies.

2.3.11 Key Date KD-A-10: Acceptance of Integrated testing and commissioning of power supply system in Soldevanahalli Depot (Including) to Chikkabanavara station (including) to Yeshwanthpura Station (including) along with SCADA before Revenue Service.

Achievement: Completion of all testing (including acceptance tests) and Commissioning of Receiving Substation cum Traction Substation and Auxiliary Main substation and installation, Auxiliary Substation and Overhead equipment of all necessary equipment as per tender specifications and building works (final floor finishing).

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.12 Key Date KD-A-11: Achieve Operational Acceptance & Obtaining Taking Over Certificate of Soldevanahalli Depot (Including) to Chikkabanavara station (including) to Yeshwanthpura Station (including) for Revenue Service

Achievement: Completion of all necessary finishing works. This stage can be achieved after completion of all the above stages and FOTS (Fiber Optics) by the telecommunication Contractor and Energization of Substation and service trials.

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

After completion of all works and satisfactory trial running of system. Supply of as-built drawings and training and supply of manual documents as laid down in the specifications, will also be required to be completed in time including approval of the commissioner of Metro Railway Safety. Interfacing Agencies: Traction Contractor and other Relevant Contractors/ Agencies.

2.3.13 Key Date Section B: C2: Works from Yeshwanthpura Station - Lower Level (including) to Benniganahalli Station (including):

2.3.14 Key date KD-B-01: Submission of Technical Proposal of Major Equipment of RSS, ASS, OHE like 220 kV EHV cables, Traction Transformer, Auxiliary Main Transformer, Dry type Auxiliary Transformer, 33 kV Cables, Panels etc. including preliminary design.

Achievement: Preparing & submitting the detailed technical program and proposal of major equipment including drawings and submit the same for employer/engineer approval.

2.3.15 Key date KD-B-02: Obtaining NONO for Shop drawings / Working drawings.

Achievement: Obtaining Notice of No objections on the technical proposal/ Shop drawings / Working drawings/technical calculations/design reports from Employer/ Engineer for OHE/RSS/ASS/SCADA.

2.3.16 Key Date KD-B-03: Manufacture, FAT & Equipment Delivery to Contractors Store - ASS, 33 kV Cables and OHE etc.

Achievement: Obtaining NONO for QAP, Issuance of manufacturing clearance, conducting factory inspection as per approved QAP, obtaining dispatch instructions from Employer/ engineer and delivery to the site as per approved method statement.

2.3.17 Key Date KD-B-04: Commissioning of ASS in Mathikere, Hebbal, Nagawara, Kanaka Nagar, Banaswadi, Seva Nagar, Kasturi Nagar and Benniganahalli stations including 33 KV cabling.

Achievement: Commissioning of Auxiliary Sub stations, after completing erection of all equipment's at various ASSs, as per specifications in the GS and PS of this Tender for achieving these Key Dates.

Interfacing Contractors: Relevant Contracts / Agencies

2.3.18 Key Date KD-B-05: Traction energization on Yeshwanthpura station – Lower Level - (including) to Benniganahalli Station (including).

Achievement: Charging of traction overhead equipment on 25kV, after completing all OHE, earthing and bonding, Return Conductors, safety works and all other connected works, in the various sections.

Interfacing Contractors: Track work Contractor, Signaling Contractor and other relevant Contracts/Agencies.

2.3.19 Key Date KD-B-06: Acceptance of Integrated testing and commissioning of - Yeshwanthpura station – Low level - (including) to Benniganahalli Station (including) along with SCADA before Revenue Service.

Achievement: Completion of all testing (including acceptance tests) and Commissioning of Receiving Substation cum Traction Substation and Auxiliary Main substation and installation, Auxiliary Substation

and Overhead equipment of all necessary equipment as per tender specifications and building works (final floor finishing).

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.20 Key Date KD-B-07: Achieve Operational Acceptance & Obtaining Taking Over Certificate of Yeshwanthpura station – Low level - (including) to Benniganahalli Station (including) for complete section Revenue Service

Achievement: Completion of all necessary finishing works. This stage can be achieved after completion of all the above stages and FOTS (Fiber Optics) by the telecommunication Contractor and Energization of Substation and service trials.

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.21 Key Date KD-B-08: Achieve Operational Acceptance & Obtaining Taking Over Certificate of Yeshwanthpura station – Low level - (including) to Benniganahalli Station (including) for complete section Revenue Service

Achievement: Completion of all necessary finishing works. This stage can be achieved after completion of all the above stages and FOTS (Fiber Optics) by the telecommunication Contractor and Energization of Substation and service trials.

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.22 Key Date KD-F-01: Project completion and Handing Over - Corridor - 2 including submission of as-built drawings, Training of Employer's staff, Planning of Maintenance and Operation & Maintenance manuals along with complete maintenance schedule etc.

After completion of all works and satisfactory trial running of system. Supply of as-built drawings and training and supply of manual documents as laid down in the specifications, will also be required to be completed in time including approval of the commissioner of Metro Railway Safety.

Interfacing Agencies: Traction Contractor and other Relevant Contractors/ Agencies.

2.3.23 Key Date Section C: C4: Works from Heelalige Station (including) to Benniganahalli Station (excluding):

2.3.24 Key date KD-C-01: Submission of Technical Proposal of Major Equipment of RSS, ASS, OHE like 220 kV EHV cables, Traction Transformer, Auxiliary Main Transformer, Dry type Auxiliary Transformer, 33 kV Cables, Panels etc. including preliminary design.

Achievement: Preparing & submitting the detailed technical program and proposal of major equipment including drawings and submit the same for employer/engineer approval.

2.3.25 Key date KD-C-02: Completion of Cable route survey from GSS to RSS

Achievement: Preparing & submitting the detailed technical program and proposal for laying the HT cable from the supply authority to the RSS. Submitting the detailed fault level & current carrying calculations. Preparation of Cable route from GSS to RSS as per survey and approved drawings

Interfacing Agencies: PWD, PMC, RCD, NHAI, KPTCL, BESCO and other Relevant Contractors/Agencies.

2.3.26 Key date KD-C-03: Obtaining NONO for Shop drawings / Working drawings.

Achievement: Obtaining Notice of No objections on the technical proposal/ Shop drawings / Working drawings/technical calculations/design reports from Employer/ Engineer for OHE/RSS/ASS/SCADA.

2.3.27 Key Date KD-C-04: Manufacture, FAT & Delivery to Site - 220 kV EHV cables, jointing kits & its accessories - Benniganahalli RSS and Yelahanka RSS.

Achievement: Obtaining NONO for QAP, Issuance of manufacturing clearance, conducting factory inspection as per approved QAP, obtaining dispatch instructions from Employer/ engineer and delivery to the site as per approved method statement.

2.3.28 Key Date KD-C-05: Manufacture, FAT & Equipment Delivery to Contractors Store - ASS, 33 kV Cables, OHE, Benniganahalli RSS and Yelahanka RSS.

Achievement: Obtaining NONO for QAP, Issuance of manufacturing clearance, conducting factory inspection as per approved QAP, obtaining dispatch instructions from Employer/ engineer and delivery to the site as per approved method statement.

2.3.29 Key Date KD-C-06: Commissioning of Gas insulated (GIS) RSS at Benniganahalli - Including laying of 220 kV EHV cabling from GSS to RSS & Completion of RSS Building Construction - Structural & Architectural works

Achievement: Completion of all the Installation and commissioning of all equipment, gantry structures, panels, and other equipment of the RSS, including Completion of the Cable laying, termination and all other related works of the HT cable laying for the RSS, approval of the detailed fault level & current carrying calculations and Completion of all Civil works like foundation, trenches, laying of pipes, building works (except final floor finishing), boundary wall etc.

Interfacing Agencies: Traction contractors, Local authorities, PWD, PMC, RCD, NHAI, KPTCL, BESCOM and other Relevant Contractors/ Agencies.

2.3.30 Key Date KD-C-07: Commissioning of ASS in Heelalige, Singena Agrahara, Huskur, Ambedkar Nagar, Carmelaram, Belandur, Marathahalli, Doddanakundi, Kaggadasapura Stations including 33 KV cabling.

Achievement: Commissioning of Auxiliary Sub stations, after completing erection of all equipment's at various ASSs, as per specifications in the GS and PS of this Tender for achieving these Key Dates.

Interfacing Contractors: Relevant Contracts / Agencies

2.3.31 Key Date KD-C-08: Traction energization on Heelalige Station (including) to Benniganahalli Station (excluding).

Achievement: Charging of traction overhead equipment on 25kV, after completing all OHE, earthing and bonding, Return Conductors, safety works and all other connected works, in the various sections.

Interfacing Contractors: Track work Contractor, Signaling Contractor and other relevant Contracts/Agencies.

2.3.32 Key Date KD-C-09: Acceptance of Integrated testing and commissioning of Heelalige Station (including) to Benniganahalli Station (excluding) along with SCADA before Revenue Service.

Achievement: Completion of all testing (including acceptance tests) and Commissioning of Receiving Substation cum Traction Substation and Auxiliary Main substation and installation, Auxiliary Substation and Overhead equipment of all necessary equipment as per tender specifications and building works (final floor finishing).

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.33 Key Date KD-C-10: Achieve Operational Acceptance & Obtaining Taking Over Certificate of Heelalige Station (including) to Benniganahalli Station (excluding) for Revenue Service

Achievement: Completion of all necessary finishing works. This stage can be achieved after completion of all the above stages and FOTS (Fiber Optics) by the telecommunication Contractor and Energization of Substation and service trials.

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

After completion of all works and satisfactory trial running of system. Supply of as-built drawings and training and supply of manual documents as laid down in the specifications, will also be required to be completed in time including approval of the commissioner of Metro Railway Safety. Interfacing Agencies: Traction Contractor and other Relevant Contractors/ Agencies.

2.3.34 Key Date Section D: C4: Works at Benniganahalli Station (including) to Rajankunte Station (including):**2.3.35 Key date KD-D-01: Submission of Technical Proposal of Major Equipment of RSS, ASS, OHE like 220 kV EHV cables, Traction Transformer, Auxiliary Main Transformer, Dry type Auxiliary Transformer, 33 kV Cables, Panels etc. including preliminary design.**

Achievement: Preparing & submitting the detailed technical program and proposal of major equipment including drawings and submit the same for employer/engineer approval.

2.3.36 Key date KD-D-02: Completion of Cable route survey from GSS to RSS

Achievement: Preparing & submitting the detailed technical program and proposal for laying the HT cable from the supply authority to the RSS. Submitting the detailed fault level & current carrying calculations. Preparation of Cable route from GSS to RSS as per survey and approved drawings

Interfacing Agencies: PWD, PMC, RCD, NHAI, KPTCL, BESCOM and other Relevant Contractors/Agencies.

2.3.37 Key date KD-D-03: Obtaining NONO for Shop drawings / Working drawings.

Achievement: Obtaining Notice of No objections on the technical proposal/ Shop drawings / Working drawings/technical calculations/design reports from Employer/ Engineer for OHE/RSS/ASS/SCADA.

2.3.38 Key Date KD-D-04: Manufacture, FAT & Equipment Delivery to Contractors Store - ASS, 33 kV Cables and OHE etc.

Achievement: Obtaining NONO for QAP, Issuance of manufacturing clearance, conducting factory inspection as per approved QAP, obtaining dispatch instructions from Employer/ engineer and delivery to the site as per approved method statement.

2.3.39 Key Date KD-D-05: Commissioning of Gas insulated (GIS) RSS at Yelahanka - Including laying of 220 kV EHV cabling from GSS to RSS & Completion of RSS Building Construction - Structural & Architectural works.

Achievement: Completion of all the Installation and commissioning of all equipment, gantry structures, panels, and other equipment of the RSS, including Completion of the Cable laying, termination and all other related works of the HT cable laying for the RSS, approval of the detailed fault level & current carrying calculations and Completion of all Civil works like foundation, trenches, laying of pipes, building works (except final floor finishing), boundary wall etc.

Interfacing Agencies: Traction contractors, Local authorities, PWD, PMC, RCD, NHAI, KPTCL, BESCO and other Relevant Contractors/ Agencies.

2.3.40 Key Date KD-D-06: Commissioning of ASS in Channasandra, Horemavu, Hennur, Thanisandra, R.K Hegde Nagar, Jakkur, Yelahanka, Muddanahalli, Rajankunte Stations including 33 KV cabling.

Achievement: Commissioning of Auxiliary Sub stations, after completing erection of all equipment's at various ASSs, as per specifications in the GS and PS of this Tender for achieving these Key Dates.

Interfacing Contractors: Relevant Contracts / Agencies

2.3.41 Key Date KD-D-07: Traction energization on Benniganahalli Station (excluding) to Rajankunte (including).

Achievement: Charging of traction overhead equipment on 25kV, after completing all OHE, earthing and bonding, Return Conductors, safety works and all other connected works, in the various sections.

Interfacing Contractors: Track work Contractor, Signaling Contractor and other relevant Contracts/Agencies.

2.3.42 Key Date KD-D-08: Acceptance of Integrated testing and commissioning of - Benniganahalli station (excluding) to Rajankunte Station (including) along with SCADA before Revenue Service.

Achievement: Completion of all testing (including acceptance tests) and Commissioning of Receiving Substation cum Traction Substation and Auxiliary Main substation and installation, Auxiliary Substation and Overhead equipment of all necessary equipment as per tender specifications and building works (final floor finishing).

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.43 Key Date KD-D-09: Achieve Operational Acceptance & Obtaining Taking Over Certificate of Benniganahalli station (excluding) to Rajankunte Station (including) for Revenue Service

Achievement: Completion of all necessary finishing works. This stage can be achieved after completion of all the above stages and FOTS (Fiber Optics) by the telecommunication Contractor and Energization of Substation and service trials.

Interfacing Agencies: Traction contractors and other Relevant Contractors/ Agencies.

2.3.44 Key Date KD-F-02: Project completion and Handing Over - Corridor - 4 including submission of as built drawings, Transfer of Technology, Training of Employer's staff, Planning of Maintenance and Operation & Maintenance manuals along with complete maintenance schedule etc.

After completion of all works and satisfactory trial running of system. Supply of as-built drawings and training and supply of manual documents as laid down in the specifications, will also be required to be completed in time including approval of the commissioner of Metro Railway Safety.

Interfacing Agencies: Traction Contractor and other Relevant Contractors/ Agencies.

2.4 ACCESS DATES

The Contractor will require access to information as well as to various locations at station/track/viaduct, etc., in stages, in order to plan his activities for time-bound completion of his obligations under the Contract.

The dates on which such access becomes available are indicated in terms of the time period reckoned from the Commencement of the Works and shall mean guaranteed access by the midnight of the last day of the week mentioned.

The Access Dates are defined in **Annexure-1 of Part `A' Table 2**, Part 3 Section IX PCC.

3. SCHEDULES

3.1 SCHEDULE OF KEY DATES AND ACCESS DATES

Please refer to the Table 1&2, in **Annexure-1 of Part `A**, Part 3 Section IX PCC.