



BHARAT ALUMINIUM COMPANY LIMITED

KORBA, CHHATTISGARH

BALCO Township Project

TECHNICAL ANNEXURE

FOR

Construction services

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A. Article: 1 SCOPE OF WORK

- I. The scope of WORK, to be executed by the CONTRACTOR under this CONTRACT, shall include any and all kind of works, supplies and services needed for construction and maintenance (till ACCEPTANCE CERTIFICATE is issued) of Civil, related steel work and other enabling works required for all buildings pertaining to Township being constructed at BALCO, Korba, Chhattisgarh:
 - i. Comprehensive Design & Engineering, Layout planning of the entire new township.
 - ii. Design including Structural design, MEP works, Road network, Electrical works, Landscaping, STP, Drainage network and all other facilities required for new Township
 - iii. Tree cutting/relocation and associated permits
 - iv. Demolition of existing old structures
 - v. Civil, MEPF works of the two residential towers in S+9 configuration
 - vi. Roads and Drains
 - vii. All associated Civil infrastructure and signages
 - viii. Landscaping
 - ix. Obtaining all statutory approvals including Local body approvals, Environmental clearance (EC), CTE, CTO etc
- II. The WORK shall be executed strictly in accordance with the SPECIFICATIONS and scheduled items and DRAWINGS. In case of any modifications / variations required as per any new / revised drawing which results in change in technical character of the WORK, Owner shall issue a variation notice and new drawings to the Contractor.
- III. The scope of WORK shall include but not limited to mobilization and supply of labour (of every description), material (including all sort of consumables, rebar steel and other related steel), water, tools, tackles, fixtures, transportation, workmanship, etc., and as necessary for the proper and successful execution of WORK to the satisfaction of the OWNER / ENGINEER. The CONTRACTOR shall make his own arrangement for cement, stone, ballast, stone chips, sand, bricks and all other building material, and also the auxiliaries such as binding wire, nails, timber, side connections, etc. required for the execution of WORK, unless issued by BALCO under Free Issue Material. Make for rebars, steel, cement etc. shall be of reputed make approved by BALCO.

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IV. The scope of WORK shall also include the following:


1) STRUCTURAL WORKS.

Notes / Risk Factors/ Assumptions for the project

- SBC for the structure assumed 275KN/sqm and excavation depth is at 2.5-3 mts in absence of geotechnical investigation report.
- Foundation to be assumed as raft foundation. If pile is required, then will be paid extra.
- Soil stabilization or engineered soil for SBC achievement to arrive at suitable foundation system as per geo-technical advice shall be additional cost as per actuals. (If required)
- As per soil strata condition and if any water channel or stream if found during geo technical investigation. The treatment for weak soil strata and if any special treatment for soil shall be additional cost as per actuals.

Inclusions:


- Earth work – Excavation in all kinds of soil of desired depths as per design, backfilling, disposal of excess earth to a desired location, Antitermite treatment in totality etc. Any dewatering or Slush removal etc.
- Soling - As per geotechnical advice.
- PCC (M15) – Below Foundation, Grade slab, UG, STP, Etc., Landscape (M10) Wherever necessary.
- Reinforcement Concrete Grades – For Columns - M45, M30 for foundation, beams, slab, UG Tank, STP, OHT and all other elements.
- Shuttering –Aluminium shuttering system (Mivan type), Doka with jack supporting and H frame scaffolding system wherever applicable.
- Grade of Steel – 550D (Primary steel -Tata, JSW, SAIL, JINDAL)
- Structural Steel – (Grade FE250, FE350). -Fabrication of MS structure as per design if any.
- The construction includes all sunk, chejja projections, canopy, bands, upstands and architectural features etc.

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- Demolition of existing structure, recycling of usable materials and disposal of malwa is included.
- OHT Tank & UG sump- Food grade epoxy waterproofing with or without protection as per requirement. Asian epoxy, tri block etc.
- Infra works –Gate, water features, Road, Etc.,
- Water proofing currently assumed 4.0m water head below ground level for
 - a) Raft treatment, if retaining wall required tanking treatment, tank external has to be Membrane water proofing.
 - b) Waterproofing of wet areas and terraces and protection of waterproofing as per best industry practices likes PU coating crystallization etc. Insulation and protection of waterproofing work at terrace is inclusive.

2) ARCHITECTURAL WORKS INCLUSIONS

- **Masonry** - Masonry of AAC Blocks / Fly ash blocks wherever required. Fly ash will be provided free of cost at single point. All working drawings will be provided by us, any value engineering will be welcomed.
- **External Walls** - 200mm thick block walls or MIVAN (Thickness as per design) as per Client
- **Plastering** - Cement mortar /Gypsum plaster.
- Wall Plaster - Internal & external plaster with use of polyester fibre-Recron 3S and chicken wire mesh wherever required.
- Flooring / Skirting - VDF / Antistatic vinyl / Granite / IPS / Screed / Vitrified /Antiskid vitrified / ceramic / wooden flooring / Laminated wooden flooring / Engineered wooden flooring / Sports Vinyl / Terracotta tiles - Tiling of sizes 600X600 or as per schedule or as finalized by Designer/ Engineer In charge.
- **External Cladding** - Sandstone / Granite wherever
- **Dado** - Granite for lift lobby / Ceramic/Glazed tiles for toilets & kitchen


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- **Doors** - 2-hour Fire rated doors for common areas /Aluminium Doors/ Ventilators/ Engineered wooden door with veneer/ Engineered wooden door with waterproof enamel paint /Flush laminated doors,
- **Windows / Structural Glazing** - UPVC windows / Aluminium glazed windows / Low-e glass / DGU.
- **Railing** - MS railing for staircase/ Entrance Steps and SS railings of 304 grade for Balcony.
- **Paint** - Painting with Acrylic emulsion/ plastic paint/ distemper/ enamel paint/Weather shield emulsion texture paint/column guards paint, parking paint as per finishing schedule. All surfaces should be smooth or to be made smooth after grinding or plastered to eliminate undulations.
- **False ceiling** - Calcium silicate false ceiling for toilets and Gypsum board false ceiling for entrance lobbies with use of standard sections of Gyproc of Saint Gobain or equivalent.
- Modular kitchen with glossy laminate finish cabinets. Kitchen counter should be 18mm thick granite slab.
- Chimney with 4 burner electric ignition with glass-built hob.
- Wooden furnishings- Wardrobe in Bedrooms.
- Elevators- Supply, installation, and commissioning of lifts.

3) ELECTRICAL


Inclusions - For 2BHK

- Distribution Boards,
- Submains
- Circuit mains
- Conduits- All conduiting in wall/ ceiling is considered concealed and FRLS PVC heavy duty conduits
- Point wiring- All internal wiring should be copper wiring and done with standard colour code or as per design.
- Switches and sockets

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- Earthing system
- TV/ Telephone and internet system
- CCTV system for common areas
- 15% of Emergency lighting system including inverter with 90 minutes battery backup for common areas
- LT cables
- Cable trays
- Lightning protection system
- Light fixtures for the common areas.
- HT Switchgear, RMU, HT Cable from HT panel to Transformer & Termination.
- Fixed deposit to Electricity Supply Company (EB), Power Sanction and lesioning charges.
- Supply, installation and commissioning of oil type outdoor transformer, Earthing system, Earth Strips, infra related substation work, danger boards, shock treatment chart, cable route markers, Fencing, gate, Fire buckets and gravel. LT Cables and Terminations from transformer yard to each tower metering panel, LT metering panel.
- All Civil related works for infra , Landscape light fixtures/ External light fixture and street pole, Fiber Optic Cable from service provider to communication, External Entry Signage and Building Signages, Solar panels.
- CCTV for Periphery of campus and boom barrier for infra-areas
- Supply, installation and commissioning of Acoustically enclosed DG sets and its Control cabling system, Exhaust System and Earthing system
- External lighting and electrical works
- OFC cables and Hume pipes related to Networking/communication system.
- Light fixtures and fans inside the units.

4) PHE

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INCLUSIONS.

- Sanitary Fixtures & C P Fittings

Toilet fixtures like European WC wall mounted with flush valve / concealed cistern, under counter washbasin, CP fittings, slotted / Perforated floor drain, Towel rail, soap dish, Towel ring etc. The fittings should be Hindware / Jaguar / Kohler/ Rocca etc. or equivalent on approval.

- Internal & Shaft Water supply & Drainage Pipes
- Terrace Floor Water Supply Pipes & Rainwater Pipes
- Terrace Booster Pumps & Dewatering Pumps (As per design requirement)
- Solar Hot Water System
- Water Filters / Ro Provision only.
- Installation Of PNG / LPG Line.


Pipes shall be as follows

- Water supply- CPVC- Sch 80 Pipes & Fittings
 - Waste & rainwater-UPVC
 - RCC pipes- NP3 or NP4
 - Double Walled Corrugated Pipes & Fittings
- Connection to nearest water line say 100m. Construction of UG tank (if required) and installation of booster pump for potable water supply / Flush water system as per design requirement for OHT at terrace floor level.
 - Geyser provision only.
 - Installation of AC drain piping as per design requirement.
 - External Storm Water Management / Disposal System
 - External Water Supply & Drainage Systems
 - Ug Sump & Pump Room Details
 - Rainwater Harvesting Pits or Ground water recharge pits as per authority requirement.
 - Electrical Panels & Cables. Incoming electrical feeder for PHE system equipment's.

5) FIRE

Residential

- Hydrant Down comer system (Internal Hydrant, FHC)

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- Terrace booster pump with panel
- Hydrant accessories internal FHC shaft all floor level (Internal)
- Manual Fire alarm
- Two-way talk back system (Telephone Jack) (residential places)
- Fire extinguishers
- Fire Signages as per statutory requirements
- PAVA system (Common area within building).
- External hydrant system
- Gas suppression system

6) INFRA WORKS

- 7m wide Peripheral Road
- Construction of Peripheral RCC drain of size 600mm X 600mm.
- Open Parking as per design
- All required signages.
- Minimum landscape around the towers.
- Tree transplantation/removal permission and execution
- Construction of boundary wall

V. Other terms of contract are broadly summarised as below:


- Building Plan approval will be provided by the owner. The Tower configuration is S+9.
- All approvals related to construction and coordination with local authorities are in the scope of construction partner.
- Timeline for completion of Two lakh sqft construction is 18 months including mobilization.
- Land space on as is where is basis will be given free of cost for batching plant, site office and stores. Labour camp to be made outside of Township boundary by Construction Partner.
- Water will be provided free of cost at one point within the township.
- Electricity connection will be given at one-point on free basis within the Township.
- Base rates of following items are as below. Any escalation or de-escalation will be
 - calculated on actual basis. The rates must be get approved by Vedanta before

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- placing of these orders.
- Steel of Fe 550- Rs 65000/ton. The list of MAKE for Steel Items shall be SAIL / JINDAL / TATA / ESSAR / ESL.
- Cement OPC 43 / 53 - Rs 320/ bag
- Built Up area calculation will be done as per industry practice.
- For any dispute court of jurisdiction will be Korba, Chhattisgarh.

B. Article 2: SPECIFICATIONS

- I. The SPECIFICATIONS shall mean, collectively, all the terms, guidelines ,procedures and stipulations contained or referred to in the SCHEDULE OF ITEMS, DRAWINGS, sketches and written / oral instructions (to be subsequently confirmed in writing) of the ENGINEER (that shall be issued progressively to suit the construction schedule) pertaining to the method /manner of performing and / or the quality of WORK to be performed and / or material to be furnished and shall include all such amendments, revisions, removals or additions as may be made during the execution of WORK.
- II. Unless mentioned otherwise, the latest BIS (Bureau of Indian Standards) specifications and codes of practice for respective items of WORK, with all amendments currently applicable at the time of signing of the CONTRACT, shall be deemed as applicable. In case where BIS specifications have not yet been published, corresponding British Standard specifications shall be applicable. If any Chinese standard is mentioned, the CONTRACTOR shall take prior confirmation and approval from the ENGINEER before following the same.
- III. The data given to the CONTRACTOR, prior to the execution of WORK, is as exact as could be secured and its accuracy is not guaranteed. Exact locations, distances and levels shall be governed by SITE conditions.
- IV. The SPECIFICATIONS and DRAWINGS, as provided / to be provided, for the execution of WORK, are obligatory on the CONTRACTOR for his acceptance.
- V. CHANGE IN SPECIFICATIONS
 - a. Any minor change in SPECIFICATIONS, as found essential by OWNER, for coordinating the execution of WORK with other trades / third party / agency

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engaged by the OWNER, shall be accepted by the CONTRACTOR without any additional cost to the OWNER.

VI. DEPARTURE FROM SPECIFICATIONS


- a. Should the CONTRACTOR wish to depart from the provisions as detailed in SPECIFICATIONS, such departure shall be listed in a separate schedule with full particulars and reasons for the same and shall be approved by ENGINEER. Unless this is done, the CONTRACTOR shall be deemed to comply with the SPECIFICATIONS.

C. Article 3: MATERIALS

- I. MATERIAL TO BE SUPPLIED BY THE CONTRACTOR
- II. The CONTRACTOR shall provide all materials, whether mentioned in the CONTRACT or otherwise, that is required for the proper, satisfactory and complete execution of civil and required WORK.
- III. All materials, being provided by the CONTRACTOR, shall be in conformity with the SPECIFICATIONS laid down or referred. Any item not covered by these, shall conform to the Indian Standard specifications with due approval of the ENGINEER. The CONTRACTOR shall, if required by the ENGINEER, furnish proof to ENGINEER's satisfaction that the material so complies.
- IV. The CONTRACTOR shall, at his own expense and without delay, provide, to the ENGINEER, samples of the material he proposes to use in the WORK. The ENGINEER shall, within a reasonable time after getting the samples or within such further period as intimated to the CONTRACTOR in writing, inform the CONTRACTOR whether the samples are approved by him or not. If samples are not approved, the CONTRACTOR shall forthwith arrange to procure fresh samples complying with the required SPECIFICATIONS, for approval of the ENGINEER.

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- V. All materials, being provided by the CONTRACTOR, shall be inspected and certified by the ENGINEER, from time to time, either at the source of supply or at SITE or both, if the ENGINEER considers it necessary. The CONTRACTOR shall provide all facilities for such inspection free of cost. Notwithstanding any inspection at the source, the ENGINEER shall have liberty to reject any material brought to SITE that does not conform to the SPECIFICATIONS and the CONTRACTOR shall replace the same without any extra cost and time to the OWNER.
- VI. The material shall be tested as per testing procedures specified or referred to in the CONTRACT. In case no specific testing procedure is mentioned or referred, then tests, as per standard practice, shall be conducted. The CONTRACTOR shall maintain, at SITE, a fully equipped testing laboratory for carrying out such tests at no extra cost. If SITE lab facilities are not adequate, then services of any outside reputed laboratory, as approved by the ENGINEER, shall be utilized with all cost being borne by the CONTRACTOR.
- VII. All jobs entailing more than one process shall be subject to inspection and approval at each stage thereof and the CONTRACTOR shall give due notice in writing to the ENGINEER or his authorized representative when each stage is ready. On receipt of such notice, the ENGINEER shall be entitled to appraise the quality and extent thereof and reject the same if it does not conform to the SPECIFICATIONS.
- VIII. The cement used in the work shall be of approved quality OPC/PPC/PSC as approved by engineer in-charge
- IX. Any material, item, fitting, fixture, etc., that has been rejected by the ENGINEER, shall be removed from the SITE within 48 hours of issue of instructions to this effect. Failing which, the ENGINEER shall have the right to get these removed at CONTRACTOR's risk and cost and the CONTRACTOR shall have no claim whatsoever in this regard.


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X. Reconciliation of reinforcement steel and other steel shall be submitted by the bidder along with all the bills and payment shall be made based on the drawing weight.

XI. MATERIAL TO BE SUPPLIED BY THE OWNER.

XII. Though supply of reinforcement steel/TMT bar and related structural steel for civil work is the responsibility of the contractors, BALCO reserves the right to procure the same, if it so decides, at its own expense and issue the same to the CONTRACTOR, free of cost, for consumption in the WORK:


- a. Reinforcement Steel i.e. Mild Steel Rounds & / or High Yield Strength Deformed Bars (HYSD)Fe-550, hereinafter termed as TMT bars.
- b. Reinforcement bars shall be issued in random lengths, on weight basis and as stocked in BALCO's stores. However, in case of any deviations in the diameter of Reinforcement bars from the DRAWINGS separate accounting has to be done for the same. Reconciliation of Reinforcement bars shall be made as per the theoretical consumption computed from DRAWINGS except for Laps and Chairs which shall be done on actual basis, to be duly certified by ENGINEER.
- c. The CONTRACTOR will have no right, of whatsoever nature, on the Free Issue Material issued to him (for consumption in the WORK) and all the rights on the propriety of such material will vest only with the OWNER. All such material shall be used by the CONTRACTOR exclusively for the construction WORK for which these are issued and on no account the material shall be taken out of the OWNER's premises by the CONTRACTOR without prior and due permission. The CONTRACTOR hereby agrees that he shall, under no circumstances, exercise lien over such Free Issue Material.
- d. If the Free Issue Material, which is issued to the CONTRACTOR, is lost and / or damaged while in custody of the CONTRACTOR and / or damaged or lost in transit or for whatsoever reason after the issue, the cost of such material will be recovered from the CONTRACTOR at market value plus 20% towards overheads and procurement cost.

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- e. On reconciliation of the Free Issue Material, the excess material / wastage shall be deposited by the CONTRACTOR, free of cost, to a designated place, as informed by the OWNER.
- f. Unloading of Free Issue Material from rail/road transport (within OWNER's premises) and its subsequent handling as required while moving it from point of unloading / OWNER's stores to SITE / CONTRACTOR's storage yard shall be in CONTRACTOR's scope.
- g. The CONTRACTOR shall consume the Free Issue Material on First in First out (FIFO) basis. This principle, besides ensuring quality, shall also be used whenever any lot of material is to be valued in monetary terms.

XIII. STORAGE OF MATERIAL

- a. The CONTRACTOR shall maintain sufficient stock of all material required by him for the proper and speedy execution of WORK.
- b. The CONTRACTOR shall, at his own expense, provide suitable sheds and storage yards, in such places and in such numbers as, in the opinion of the ENGINEER, are needed, for orderly and proper storage of material, either supplied by the OWNER or as brought by the CONTRACTOR for the WORK, to prevent damage due to rain, wind, direct exposure to sun etc. as also from theft, pilferage etc. He shall obtain prior approval, in writing, from the ENGINEER for erection of such sheds and storage yards before undertaking construction. Storage and safe custody, including protection against theft and pilferage, of all material with the CONTRACTOR, including Free Issue Material, shall be the responsibility of the CONTRACTOR.
- c. Steel shall be stored stack wise so as to tie them together and lessen the danger of toppling over. For extra safety during monsoon or when it is expected to store the cement for an unusually long period, the cement stock shall be enclosed completely in polythene sheet or any other suitable waterproofing material. The sheet will be closed on the top of the stack. Care should be taken that the polythene sheet is not damaged any time during use

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XIV. WASTAGE / SCRAP GENERATION LIMITS FOR FREE ISSUE MATERIAL

a. Reinforcement Bars


- i. Maximum wastage (including rolling margin) of 4% (four percent) shall be allowed. Out of this, 1% (One) will be invisible and balance shall be returned to OWNER as scrap.
- ii. The criteria for prime steel: Steel with length above 2 M length shall be considered prime steel.

b. Structural Steel

- i. Maximum wastage (including rolling margin) of 4% (four percent) shall be allowed. Out of this, 1% (one) is invisible wastage in the form of cutting losses, losses due to grinding, skew cuts in gussets etc. and balance shall be returned to OWNER as scrap.
- ii. The criteria for prime steel:
 - For long products - cut pieces not less than 2 M in length
 - For flat products – cut pieces having both sides greater than 1 M,
OR
 - if any side is less than 1 M but greater than 0.5 M and area is greater than 1 SQM

c. RECONCILIATION OF FREE ISSUE MATERIAL


- i. CONTRACTOR shall submit, on monthly basis, reconciliation statement showing issue v/s consumption status of Free Issue Material.

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- ii. All the surplus Free Issue Material / scrap shall be returned by the CONTRACTOR to OWNER at his designated place within township premises, at no additional cost to the OWNER.
- iii. In case actual consumption exceeds theoretical consumption plus allowable wastage limit then recovery shall be made from CONTRACTOR for the excess consumed Free Issue Material at the rate of landed cost to OWNER plus 20% towards overheads and procurement cost.

D. Article 4 :TOOLS, TACKLES AND MACHINERY


- I. All the tools, tackles, machinery and consumables required for the WORK will have to be arranged and deployed by the CONTRACTOR whether specifically mentioned in the CONTRACT or otherwise. Agency to establish Concrete Batching plants of minimum 30 cum/ Hour capacity in adequate numbers.
- II. In order to facilitate issue of exit gate passes for material and EQUIPMENT to be taken out after completion of WORK, the CONTRACTOR shall, prior to taking such things inside, submit a list of EQUIPMENT and all other material to the OWNER / ENGINEER that he is taking inside the OWNER's premises.
- III. The CONTRACTOR shall submit to the ENGINEER, a monthly statement, showing the EQUIPMENT deployed at SITE for the purpose of WORK, and additional EQUIPMENT in the course of shifting or to be shifted or to be required during the ensuing month or months and all such further information / particulars as it may be necessary or required to enable the ENGINEER to satisfy himself that the CONTRACTOR has taken necessary measures for the execution of WORK in accordance with the CONTRACT.

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- IV. After completion of WORK or termination of CONTRACT, the CONTRACTOR shall promptly dismantle, at his own cost, distribution and other facilities he may have erected and shall also remove the same within a reasonable time, but not exceeding one month, fixed by the ENGINEER. On his failure to do so, the OWNER shall be entitled to remove them at the risk and cost of the CONTRACTOR or may retain the same, without paying any additional cost to the CONTRACTOR and it shall be deemed that the CONTRACTOR has relinquished his rights, title and interest on such property and the OWNER shall become absolute owners thereafter of the said property.

E. Article 5: CONSTRUCTION WATER AND POWER


- a. The OWNER shall provide power supply (440V, 3 phase, 50 HZ) at one point within the township premises near the work place, free of cost. Further distribution of power from the point of supply shall be arranged by the CONTRACTOR at his own cost. The CONTRACTOR, at his cost, will also arrange for suitable meters, fuses, switches, ELCBs, etc required for safe and secure use of these utilities. The metering shall be done at the source point. OWNER shall not be responsible for any loss of time on account of non-availability of power from grid.
- b. Construction Water shall be provided at one point within the township boundary. At Batching Plant site Agency has to make his own arrangement. Any tapping/hook up required for the construction water shall be in the scope of contractor.
- c. In all cases of temporary disruption / interruption of power supply, where uninterrupted power / supply is required for proper and satisfactory execution of the WORK, the CONTRACTOR shall keep necessary standby arrangements (diesel generators of appropriate capacities in order to ensure uninterrupted execution of WORK. The maintenance and operation of such standby arrangements, including supply of consumables, shall be the responsibility of the CONTRACTOR and the related cost is deemed as built-in in the respective item rates. No claim

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on account of such standby arrangements shall be entertained irrespective of the period of their use

F. Article 6 :WORKMANSHIP AND QUALITY CONTROL

- I. The WORK to be done under the CONTRACT or that may be necessary to be done in order to form and complete any part thereof shall be executed by exercising that degree of skill, diligence and prudence which would be reasonably and ordinarily be expected from a skilled and experienced CONTRACTOR and most substantial workman like manner, with material of the best and approved quality. The material and workmanship should confirm to the particulars contained in or implied by the SPECIFICATIONS and as referred to in and represented by the DRAWINGS or in such other additional particulars, instruction and documents as may be found requisite to be given during the execution of the WORK and to the entire satisfaction of the ENGINEER.
- II. The CONTRACTOR shall submit their quality assurance plan, within 30 days of EFFECTIVE DATE OF CONTRACT, clearly stating the stages of inspection and methods of inspection etc.
- III. OWNER or its duly authorized representative shall have, at all reasonable times, access to the CONTRACTOR's facilities within the OWNER's premises and shall have the power to examine, inspect and call for tests for material and / or workmanship during the execution of WORK. Such tests shall be carried out by the CONTRACTOR wholly at his expense. Such inspection and test shall not absolve and relieve the CONTRACTOR of its responsibility to carry out and complete the WORK in accordance with the DRAWINGS and SPECIFICATIONS as is provided to the CONTRACTOR or discharging any of its contractual obligations.
- IV. FOR MATERIAL
- V. The OWNER shall have full powers to require the material, being used in WORK, to be tested by any independent agency at CONTRACTOR's expense in order to prove their soundness and adequacy. Such inspection and test shall not absolve and relieve the CONTRACTOR of its responsibility to carry out and complete the WORKS in accordance with the DRAWINGS and SPECIFICATIONS as is provided to the CONTRACTOR or discharging any of its contractual obligations.

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- VI. It shall be the responsibility of the CONTRACTOR to submit necessary samples and obtain prior approval of the ENGINEER in respect of all material, fittings, fixtures and any other item as decided by the ENGINEER. One such approved sample of each shall be kept with the ENGINEER at SITE for future reference.
- VII. Test cubes of 150x150x150 mm size of concrete of all grades shall be made by the CONTRACTOR at his cost under the supervision of the representative of the ENGINEER from the batches of concrete as and when required by ENGINEER, and sent to the SITE laboratory / any other laboratory to be named by the ENGINEER for testing. All testing of concrete shall be done in accordance with IS: 456 and entirely at the cost of CONTRACTOR.
- VIII. Only properly graded stone chips, approved by the ENGINEER, shall be used for concrete work.
- IX. The fittings or fixtures shall confirm to SPECIFICATIONS and shall have prior approval of the ENGINEER.
- X. If the CONTRACTOR desires to substitute any material or item, he must secure the approval of the ENGINEER, in writing, of any such substitution well before making such substitution. Material designated in SPECIFICATIONS, or in the SCHEDULE OF ITEMS, as “equal or other approved” shall be considered as coming under the provision of this clause as substitutions and no such material shall be used until specific approval of the ENGINEER has been received in writing.
- XI. All standard tests, which are performed for quality control, shall be done with proper maintenance of records.

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XII. The SPECIFICATIONS prescribe various tests at specified intervals for ascertaining the quality of the WORK done. If the tests prove to be unsatisfactory, the ENGINEER shall have liberty to order the CONTRACTOR to redo the WORK done in that period and / or to order such alterations for strengthening that may be necessary or both at the cost of the CONTRACTOR. The CONTRACTOR shall be bound to carry out such orders failing which the rectification / redoing will be done by the ENGINEER through other agencies and the cost so incurred shall be recovered from the CONTRACTOR. Such rectification/redoing by the ENGINEER through any other agency and recovery of cost shall be in addition to any other right the OWNER may have against the CONTRACTOR


XIII. WORKMANSHIP AND TESTING

a. Mixing of all graded concrete ingredients shall be done in batching plants. Wherever batching plant mixing is not possible / feasible, mechanical mixers shall be used after taking approval from ENGINEER.

XIV. WORK shall be carried out in such a manner so as not to interfere with effects like vibration etc., or retard or disturb the existing structure's foundations, the progress of operation and maintenance of the existing plant or of other works being executed by other agencies.

XV. Compaction of concrete in the structures shall, as a rule, be carried out by means of mechanical vibrations.


XVI. The CONTRACTOR shall leave necessary holes / recesses in the foundations, plinths, walls, RCC roofs and similar works, where and as required by the ENGINEER, for passage of pipes, cables, wires, etc. and make good later.

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- XVII. Foundation bolts, inserts, jigs, fixtures, etc. shall be fixed into concrete at time along with the original casting to the accuracy indicated in the DRAWINGS. Any frame of irrecoverable nature, because it is required to be left in the concrete for this job, has been taken into account while quoting this item. The levels of foundation tops as also the surfaces of other concrete casts shall be to the accuracy indicated in the DRAWINGS and / or required for the erection of structures, equipment on fixtures without chipping, plastering and other rectifications. No extra plaster or grout etc. shall be allowed for securing a base of load bearing structure and equipment. In any case, the cost of all rectifications including re-doing, if required, will be to CONTRACTOR's account.
- XVIII. The CONTRACTOR shall be responsible for the true and perfect setting out of the WORK and for the correctness of the positions, levels, dimensions and alignment of all parts of the WORK. All measurements shall comply with the dimensions noted on the DRAWINGS and / or as directed. If at any time during the progress of WORK, any error shall appear or arise in the position, levels, dimensions, or alignments of any part of the WORK, the CONTRACTOR, on being required to do so by the ENGINEER, shall rectify, at his own expense, such errors to the satisfaction of the ENGINEER notwithstanding that he may have been assisted by the ENGINEER in setting out the same earlier.

G. Article 7: GUARANTEE/ DEFECT LIABILITY PERIOD

- I. Jobs carried out by the CONTRACTOR shall be guaranteed against defective material and / or workmanship for a Defect Liability Period as detailed below.
- II. DEFECT LIABILITY PERIOD
- The Defect Liability Period shall be 12 months from the date of issue of COMPLETION CERTIFICATE by the ENGINEER .
- III. To the extent that the WORK shall, at the expiry of the Defect Liability Period, be delivered to the OWNER in as good and perfect condition (fair, wear and tear expected) to the satisfaction of the ENGINEER as that in which they were at the commencement of the Defect Liability Period, the CONTRACTOR shall execute all such work of repair, amendments, reconstruction, rectification and making good all defects, imperfection,

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shrinkages or other faults as may be required by the OWNER / ENGINEER, in writing, during the Defect Liability Period or within 14 days after its expiration as a result of an inspection made by or on behalf of the ENGINEER prior to its expiration.

- IV. All such works shall be carried out by the CONTRACTOR at his own expense which in the opinion of the OWNER are due to the use of material or workmanship not in accordance with the SPECIFICATIONS or due to neglect or failure on the part of the CONTRACTOR.


- VII. If the CONTRACTOR fails to do any such work as aforesaid required by the OWNER within a fortnight, the OWNER shall be entitled to carry out such work by his own workmen or by deploying other agency at CONTRACTOR's risk and cost. OWNER shall be entitled, without prejudice to any other right that the OWNER may have, to deduct from the CONTRACTOR the actual cost thereof plus incidental cost (20% of actual cost) and may recover the same from any money due or has to become due to the CONTRACTOR.

- VIII. In the event of any accident or failure occurring or being likely to occur, in the opinion of the ENGINEER, or if some job requires immediate attention either during the WORK or the Defect Liability Period, the ENGINEER may direct the CONTRACTOR, by written notice, to take necessary remedial actions and if the CONTRACTOR fails to take action as directed by the ENGINEER within 3 days of such notice, the OWNER may, without prejudice to any other right that the OWNER may have, get the job done by its own workmen or deploying any other agency, at CONTRACTOR's risk and cost.

H. Article 8: PAYMENTS

- I. FOR MEASUREMENTS AND CERTIFICATION FOR PAYMENT ON UNIT RATE BASIS

- II. Unless otherwise specified, the mode of measurement shall be according to IS: 1200 except for excavation where it shall be as per approved excavation plan or site measurement, whichever is lower.

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- III. All lap lengths in reinforcement bars shall be as per DRAWINGS / approved Bar Bending Schedule and the measurements of reinforcement, for the purpose of payment as well as reconciliation, shall include cranks, hooks, chairs, laps etc. Fixtures, stays, jigs, inserts shall not be taken as reinforcement.


- IV. Measurements shall be taken jointly by the ENGINEER or his authorized representative and by the CONTRACTOR or his authorized representative from time to time and at such intervals as in the opinion of the ENGINEER shall be proper, having regard to the progress of the WORK.

- V. Before taking final measurement of any WORK, the ENGINEER or the person deputed by him for the purpose shall give a reasonable notice to the CONTRACTOR. If the CONTRACTOR fails to attend or send an authorized representative for measurement after such a notice or fails to countersign or to record the objection within a week from the date of measurement, then in any such event the measurements taken by the ENGINEER or by the persons deputed by him shall be taken to be the correct measurement of the WORK and shall be final and binding on the CONTRACTOR and no claim whatsoever shall thereafter be entertained regarding the accuracy and classification of measurement.

- VI. The CONTRACTOR shall, without extra charges, provide assistance with every appliance, labour, and things necessary for measurement.


- VII. The CONTRACTOR shall provide, at all times during the progress of WORK and also during the Defect Liability Period, proper means of access with ladders, gangways, etc., and the necessary attendants to move and arrange things as directed for the inspection or measurement of WORK by the ENGINEER or his representative.

- VIII. No work shall be covered up or put out of view by the CONTRACTOR without the approval of the ENGINEER or his authorized representative and the CONTRACTOR shall accord full

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opportunity for examination and measurement by the ENGINEER. The CONTRACTOR shall give reasonable notice of not less than 2 days but not more than 4 days in any case, in writing to the ENGINEER or his representative whenever any WORK or material is intended to be covered up in the earth, in bodies or walls or otherwise to be placed beyond the reach of measurement so that the work may be inspected and approved by the ENGINEER or that correct dimensions may be taken before being so covered up. The ENGINEER or his representative shall, without unreasonable delay, unless he considers it to be unnecessary and advise the CONTRACTOR accordingly, attend for the purpose of examining and measuring such work or material intended to be covered up. In the event of the failure of the CONTRACTOR's to give such notice, such WORK / material shall be uncovered, if required by the ENGINEER or his representative at the CONTRACTOR's expense.

- IX. The CONTRACTOR shall uncover any part of the WORK and / or make openings in or through the same as the ENGINEER from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the ENGINEER. If any such part has been covered up or put out of view after being approved by the ENGINEER and is subsequently found that uncovering is to be executed in accordance with the CONTRACT, the expenses of uncovering and or making openings in or through reinstating and making good the same shall be borne by the OWNER. In any other case all such expenses shall be borne by the CONTRACTOR.
- X. Carrying out / taking of joint measurements along with the OWNER's representative and / or getting the measurements of the various items included in any bill shall be the sole responsibility of the CONTRACTOR. Failure to get such measurements verified may entail non-payments for such items for which the CONTRACTOR himself shall be solely responsible and so also for all consequences following there from.
- XI. The submission of bills by the CONTRACTOR for the WORK done shall be on the basis of theoretical weights of steel schedules.
- XII. Contractor shall prepare inspection protocols for completion of each activities and same shall be submitted along with all RA bills/milestone bills as applicable with due approval of concerned Engineer In-charge or BALCO authorised third party Engineer.

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I. Article 9 :TIME FOR PERFORMANCE

I. COMMENCEMENT OF WORK


- a. The Commencement date of work shall be same as the EFFECTIVE DATE OF CONTRACT.
- b. The OWNER / ENGINEER shall provide to CONTRACTOR so much work front initially required in order to enable him to commence and continue the WORK and shall, from time to time as the WORK proceeds, give the CONTRACTOR the use of such further portions of the SITE as the ENGINEER may from time to time consider proper and adequate. Phased delivery in the manner aforesaid of the use of SITE or any other facilities to be accorded to the CONTRACTOR shall not entitle the CONTRACTOR to any claims whatsoever.

II. TIME FOR COMPLETION

- a. The completion period shall be inclusive of all the lead time required for engineering procurement of raw materials / items, manufacturing, inspection, testing, packing and any other activity whatsoever required including transportation and / or erection, testing, commissioning – **Contract Duration 12 months.**
- b. Contractor shall submit a detailed completion schedule

J. Article 10 GENERAL OBLIGATIONS

I. INSPECTION OF SITE


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- a. CONTRACTOR to confirm prior to quoting satisfied himself regarding the correctness of the geological and hydrological data provided prior to finalization of CONTRACT including the nature of the sub-soil, climatological conditions, dimensions, levels, character and nature of all roads, existing drains, sewers, water supply and other main connections. CONTRACTOR further confirms that he has inspected the SITE and surrounding, the means of access thereto and to have generally obtained his own information on all matters and things which can in any way influence the CONTRACT as also the working conditions, accessibility to SITE, availability of labour and EQUIPMENT and such other relevant conditions which may affect the execution and completion of the WORK. The CONTRACTOR further confirms that he is aware of and has familiarized himself with all applicable laws relating to execution of the WORK. No claims for extra work or misunderstanding or error or incorrect information on the above mentioned points or of any other inaccuracies in DRAWINGS or in SPECIFICATIONS or other records or claim of any other nature shall be entertained nor shall the CONTRACT be nullified in consequence of any such misunderstanding, incorrect information or inaccuracies.

II. DAILY DIARY REGISTER

- a. A daily diary register, with serialized pages, (with updated stock statement for Free Issue Material) will be maintained at SITE. The CONTRACTOR or his representative will furnish it every day at 09.00 hrs to ENGINEER. The diary will be written up every day and shall contain details of WORK for the preceding day, plan for current day, constraints to WORK progress, if any, and other progress related noting and shall be jointly signed by the ENGINEER and the CONTRACTOR. A work instruction book, serially numbered in the format to be prescribed by the ENGINEER will also be kept in the ENGINEER's office at SITE and all day to day instructions to the CONTRACTOR will be written in that book. The CONTRACTOR or his representative shall report at 09.00 hrs., on every day to see these instructions and sign them at the bottom as a token of his having seen them.


III. WEEKLY PROGRESS REPORTS

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- a. The CONTRACTOR or his representative shall supply all information regarding progress of WORK, including status of procurement of construction material, construction schedule, SITE photographs, bar charts, etc. as required by the ENGINEER for compiling weekly progress reports. This information shall be supplied before 09.00 hrs. on every Monday, in respect of the preceding week and the planning for the next week.

IV. CONTRACTOR'S SITE OFFICE AND AMENITIES

- a. The OWNER shall, for the duration of the execution of WORK, make available at SITE, free of charge, land for construction of CONTRACTOR's field offices, workshop, stores, assembly / fabrication yard, etc., that are required for execution of the CONTRACT. The responsibility for levelling and hard facing of the ground and construction of temporary roads, offices, buildings, providing proper sanitation facilities as per plan approved by the ENGINEER lie with and shall be done by the CONTRACTOR at his own cost.
- b. The contractor shall make his own arrangements for putting up the concrete batching plant and their labour colony outside the plant limits.
- c. Unless otherwise directed, the CONTRACTOR shall, within 4 weeks of the completion of the CONTRACT, remove the temporary constructions and hand over to the OWNER the space made available to him, under clause 14.5.1, in a clean and tidy condition, failing which the ACCEPTANCE CERTIFICATE shall not be issued.
- d. The OWNER may, without assigning any reason, also ask the CONTRACTOR to vacate the land and/or shift their temporary works constructed on the land


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allotted to them to some other nearby allocated land. Major financial implications if any shall be mutually settled depending on the merit of the case.

- e. The CONTRACTOR shall not allow his workmen to put up any unauthorized hutments or tea shops etc. on the OWNER's property.
- f. The CONTRACTOR shall not allow any visitors on the WORK except with the prior approval of the ENGINEER.
- g. The CONTRACTOR shall at his own cost provide night watchmen / security guards at all parts of the WORK as required by the ENGINEER. He shall also keep all open trenches, excavations or other dangerous places properly covered / protected and sufficiently lighted between sunset and sunrise and shall provide and fix proper fencing boards and temporary bridges to protect and assist the normal traffic. The CONTRACTOR shall also, at his own cost, erect temporary fences on the SITE wherever required by the ENGINEER.
- h. In case the CONTRACTOR fails to maintain above requirements, the OWNER may, as deemed necessary, get this done departmentally or by other agencies and recover the cost from the payments due or becoming due to the CONTRACTOR.

V. EMPLOYMENT OF EFFICIENT AND COMPETENT STAFF

- a. The CONTRACTOR should employ full time Civil Engineers having a experience of not less than seven years and Supervisor Engineers having a experience of not less than eight years of for similar WORK.
- b. In the event, ENGINEER is of the opinion that the CONTRACTOR is not employing sufficient number of staff and workmen for execution of WORK, as is necessary for the proper completion of the WORK within the time prescribed, the CONTRACTOR shall forthwith, on receiving NOTICE to this effect, arrange additional staff and labour (at his own expense) specified by the ENGINEER within seven days of being so required and failure to comply with instructions shall entitle the OWNER to terminate the CONTRACT under article 18.

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VI. IDENTIFICATION BADGES / PASSES


- a. The CONTRACTOR shall provide each of his employee including labour, with identification badge at his cost. The CONTRACTOR shall display the badges on their person so that the badges are clearly visible for checking by the gateman as they enter the premises of OWNER. The badges shall be serially numbered. The CONTRACTOR's initials shall be printed above with an identification number on the badge.
- b. The CONTRACTOR should immediately notify the OWNER if any of the badges are lost and a new one issued in its place, or when badges are carried away by discharged labour. No employee of the CONTRACTOR without a badge will be permitted to enter the SITE, except in such cases where special permission of the OWNER is obtained.

VII. CONTRACTOR'S CO-ORDINATION


- a. If during the course of the CONTRACT, other works of the OWNER or of OWNER's other contractors are also in progress within the same area / SITE , the CONTRACTOR shall work in harmony with all others and in the best overall interest of the OWNER.

VIII. SAFETY REGULATIONS

- a. During the execution of WORK, unless otherwise specified, the CONTRACTOR shall, at his own cost, provide the materials for and execute all shoring, timbering and strutting work necessary for the stability and safety of all structures, excavations and other works and shall ensure that no damage, injury or loss is caused or is likely to be caused to any person or property.

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- b. The CONTRACTOR shall be responsible to take all precautions to ensure the safety of the public, whether on public or OWNER's property, and shall post such look out men as may be required in the opinion of the ENGINEER,
- c. The CONTRACTOR must take sufficient care while moving / handling / installing EQUIPMENT, so that they do not cause any damage to the property of the OWNER or the public or other contractors working in the area and particularly to structures, buildings, overheads wires and cables & pipes (laid underground or otherwise). In the event of any damage(s) resulting to any property etc., as aforesaid, the OWNER shall be entitled to recover, from CONTRACTOR, the cost of such damages, including eventual loss of working hours as estimated by the OWNER. CONTRACTOR shall replace / repair all damages caused to building, equipment etc., on completion of WORK to bring the building / equipment to original condition.
- d. In case of dismantling / demolition, the CONTRACTOR shall take necessary care not to damage the existing structure / materials while executing the proposed WORK, and any damage, if caused, should be rectified by the CONTRACTOR at his cost so as to restore the structure / materials as they existed earlier.
- e. During execution of the CONTRACT at SITE, the CONTRACTOR shall follow the following safety rules and regulations:
 - i. CONTRACTOR shall take all safety precautions and provide adequate supervision by competent persons in order to do the job safely and without damage to plant, personnel, equipment and the environment.
 - ii. CONTRACTOR shall not start the job without reporting to Fire & Safety Department and obtaining written induction and safety rulebook.
 - iii. OWNER would take necessary shut downs wherever there are hazards of gases, electricity, moving machinery etc. based on the prior intimation by CONTRACTOR. CONTRACTOR shall ensure proper safety measures before sending workers to such locations.

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- iv. CONTRACTOR shall provide safety appliances like safety shoes, helmets, Hand gloves ,Nose mask, Goggles etc. to his workers depending on working conditions as advised by Fire and Safety department.
- v. It will be CONTRACTOR'S responsibility to borrow the specific items as stated above from Fire & Safety department.
- vi. In case of any accident (fatal or otherwise) at SITE, CONTRACTOR shall immediately inform the ENGINEER about the details. He shall simultaneously take the injured person(s) to Plant Medical Unit for treatment. In no case, CONTRACTOR is allowed to take injured persons directly to his own doctors.
- vii. CONTRACTOR shall abide by all the statutory provisions including the provisions of Factories Act, Chhattisgarh Factories Rules, Workmen Compensation Act, Payment of Wages Act, Minimum Wages Act, Contract Labour (Regulation) Act etc. and keep the OWNER indemnified of provisions of the above acts and rules.
- viii. In case ENGINEER observes that CONTRACTOR is not performing satisfactorily to the stipulated safety requirements, he is authorized to stop the WORK and ask CONTRACTOR to comply / rectify the defects / discrepancies if any. CONTRACTOR shall not proceed with the WORK until he has complied with such directions to the satisfactions of ENGINEER.
- ix. CONTRACTOR shall be fully responsible for accidents caused due to his or his agents' or workmen's negligence or carelessness in regard to the observance of the safety requirements or otherwise and shall be liable to pay compensation for injuries and shall indemnify the OWNER if any claim is lodged against the OWNER in the cases mentioned above.

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x. Owner shall levy penalty (in addition to the compensation payable by the CONTRACTOR to the affected party) as follows for safety violations by the CONTRACTOR:

- A committee (OWNER’s representatives) consisting of the head of the safety department and head of the department supervising the CONTRACT will assess the penalty amount giving due regard to all the circumstances, in particular the nature and gravity of the violation. After issuing a notice to CONTRACTOR to show cause why the amount specified therein shall not be imposed as a penalty and considering the cause shown by CONTRACTOR, if any, the committee shall pass final orders which shall then, be final and binding on CONTRACTOR. The penalty amount shall be recoverable from any running bill without any further reference to CONTRACTOR.
- Wherever work at height, hot jobs, confined space entry, line electrical equipment etc. is involved CONTRACTOR must obtain height passes and safety work permit from safety department.
- It shall be the sole responsibility of the CONTRACTOR to ensure all safety measures by giving proper prior notice etc. And obtaining prior permission from concerned local authorities as per local bye-laws or directions issued by them, all at his own cost. No claim of the CONTRACTOR in these regard shall be entertained.

b. ACCESS TO SITE

- i. During the progress of WORK, the CONTRACTOR shall keep the SITE reasonably free from all unnecessary obstruction. The existing roads or water courses or pipes, electrical lines and conduits shall not be blocked, cut through, altered, except with the permission of the ENGINEER in writing.
- ii. All operations necessary for the execution of the WORK and for the construction of any temporary work shall, so far as compliance with the requirements of the CONTRACT permits, be carried on so as not to interfere unnecessarily or improperly with the

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convenience of the public or the access to the use and occupation of public or private roads, including approach roads from the main road and footpaths, and of properties whether in the possession of the OWNER or any person.

- iii. During progress of WORK in any street or thorough-fare, the CONTRACTOR shall make adequate provision for the passage of traffic, for securing safe access to all premises approached from such street or thorough-fare and for any drainage, water supply or means of lighting or telephone etc. which may be interrupted by reason of the execution of the WORK and shall erect and maintain at his own cost diversions, barriers, lights, and other safeguards as prescribed by the ENGINEER for warning or regulation of traffic and shall provide the necessary watchmen to prevent accidents. The WORK, in such cases, shall be executed day and night , if so ordered by the ENGINEER and with such vigor so that the traffic may be impeded for as short a time as possible. No claim for extra payment shall be entertained by the OWNER in this regard.
- iv. All compensation claimed for any unauthorized closure, cutting through alteration, diversion, obstruction to such roads or water courses etc., shall be recoverable from the CONTRACTOR by deduction from any sums which may become due to him in terms of the CONTRACT or otherwise according to law.
- v. The OWNER / ENGINEER and his representative(s) shall have uninterrupted access to the situation at all times.
- vi. Trees designated by the ENGINEER shall be protected from damage during the course of WORK, where necessary such trees shall be protected by means of temporary fencing without any extra cost to the OWNER.

c. SITE DRAINAGE

- i. All water, which may accumulate on the SITE during the progress of WORK, or in trenches and excavation pits, shall be removed promptly from the SITE to the satisfaction of the ENGINEER and at the CONTRACTOR's expenses, at a designated point as directed by the ENGINEER.

d. HOUSEKEEPING

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- i. It is essential that the SITE be kept in an orderly and neat manner at all times. Stacking of materials, arrangement of fabrication yards, shades, water tank for construction, equipment etc. shall be free from hazard and easy to survey and inspect. The ENGINEER shall have the right to get such WORK done as is necessary to ensure proper maintenance of the SITE at the CONTRACTOR's cost, in case the CONTRACTOR fails to comply with the requirements.

e. URGENT WORKS

- f. If any urgent work (in respect where of the decision of the ENGINEER shall be final and binding) becomes necessary for safety of the WORK or personnel and the CONTRACTOR is unable or unwilling to carry it out, the OWNER, on due advise from ENGINEER, shall have right to employ other agencies he may consider expedient. All expenses incurred by the OWNER shall be recoverable from the CONTRACTOR and be adjusted or set off against any sum payable to him.

Annexures:

Contractor to refer following attachments for General Guidelines on safety, civil and electrical constructions as below.

Attachment 1: General Township Layout

Attachment 2: HSE & Sustainability Guidelines

Attachment 3: Electrical Guidelines

Attachment 4: Civil & Structural Guideline

Attachment 5: Balco Design safety manual.