TECHNICAL SCOPE FOR LAYING, TESTING AND COMMISSIONING OF STEEL PIPELINE NETWORK (LENGTH 5 TO 50 KMS)

DOCUMENT NO : GGL/TS/STEEL/18-19/002 Rev.01

Approved

Volume 2 of 2

(Technical Specification)

SCOPE OF WORK AND PROCESS

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1. OVERVIEW

1.1 PROJECT DESCRIPTION

Gujarat Gas Limited (GGL) *(hereinafter also referred as "owner" / "buyer")* is a GSPC Group Company, a Government of Gujarat undertaking and currently is India's largest City Gas Distribution Company with its presence spread across 41 districts in the state of Gujarat, Rajasthan, Madhya Pradesh, Haryana, Punjab, Maharashtra and Union Territory of Dadra & Nagar Haveli. GGL is committed to develop eco-friendly infrastructure and transportation fuel for public service in its operating areas as awarded by PNGRB from time to time.

This section of the document summarizes the technical requirements and the specifications for laying and/or installation, testing & commissioning of Steel pipeline length from 5 km to 50 km of varying pipeline diameter from 4" and above and associated terminal works including and not limited to the fabrication and installation of piping for extension of gas network and associated civil & electrical work as required for development of CNG and CGD network at various operation areas of GGL. This specification shall be read in conjunction with the Special Condition of Contract, General Conditions of Contract, Specification of Work, Drawing and any other documents forming part of this contract wherever the context so requires. Notwithstanding the sub-division of the documents into these separate sections and volumes every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.

Where any portion of the General Condition of Contract is repugnant, to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Condition of Contract and shall to the extent of such repugnancy, or variations, prevail.

Wherever it is mentioned in the specifications that the CONTRACTOR shall perform certain work or provide certain facilities, it is understood that the CONTRACTOR shall do so at his cost and the VALUE OF CONTRACT shall be deemed to have included cost of such performance and provisions, so mentioned.

It will be Contractor's responsibility to bring to the notice of Engineer-in-charge any irreconcilable conflict in the contract documents before starting the work(s) or making the supply with reference which the conflict exists.

The steel pipeline used for the aforesaid project shall be of 150/ 300/ 600 pressure class. The pipeline material used will be API 5L, PSL-2, Grade X52 to Grade X65, Carbon Steel ERW Pipe of double random length and of required wall thickness complying to the PNGRB T4S standard. In the absence of specifications covering any material, design of work(s) the same shall be performed/ supplied/ executed in accordance with Standard Engineering Practice covered in latest edition of ASME/ ANSI B31.8, API-1104, OISD-141 & respective OISD etc. and/ or Technical Specification which will be supplied to bidder at site during or prior to execution work or as per the instructions/ directions of the Engineer-in-charge, which will be binding on the Contractor.

1.2 DEFINITIONS

In the Bid/ Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires.

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1. **"GGL" or "OWNER"** or **"BUYER"** shall mean Gujarat Gas Limited (GGL), having its Registered Office at Gujarat Gas CNG Station, Section 5/C, Gandhinagar – 382 006, Gujarat, India

2. **"SELLER/ BIDDER/ CONTRACTOR"** shall mean the person or firm with whom PURCHASE ORDER/ CONTRACT is placed/ entered into by OWNER for supply of equipment, materials and services. The term **CONTRACTOR** includes its successors and assigns.

3. **"CONTRACT"** shall mean Purchase Order (PO)/ Contract and all attached exhibits and documents referred to therein and all terms and conditions thereof together with any subsequent modifications thereto.

4. **"CONTRACT PRICE"** shall mean the price payable to the **CONTRACTOR** under the PO/ Contract for the full and proper performance of his contractual obligations.

5. **"COMPLETION DATE"** shall mean the date on which the goods are successfully commissioned by the **CONTRACTOR** and handed over to the Owner.

6. **"COMMERCIAL OPERATION"** shall mean the condition of the operation in which the complete equipment covered under the Contract is officially declared by the Owner to be available for continuous operation at different load up to and including rated capacity.

7. **"DELIVERY"** terms shall be interpreted as per INCOTERMS - 2013 in case of PO/ Contract with a foreign Bidder and as the date of GR or as agreed, in the case of a PO/ Contract with an Indian Bidder.

8. **"DRAWINGS"** shall mean and include Engineering drawings, sketches showing plans, sections and elevations in relation to the PO/ Contract together with modifications and/ or revisions thereto.

9. **"ENGINEER"** shall mean the Engineer or Executive-in-Charge of the Project SITE nominated by OWNER at SITE.

10. **"FINAL ACCEPTANCE"** shall mean the Owner's written acceptance of the Works performed under the PO/ Contract after successful completion of performance and guarantee tests.

11. **"GOODS"** shall mean articles materials, equipment, design and drawings, data and other property to be supplied by **CONTRACTOR** to complete the contract.

12. **"THIRD PARTY INSPECTION AGENCY (TPIA)"** shall mean any person or outside inspection Agency nominated by OWNER to inspect equipment, stage wise as well as final, before dispatch, at **CONTRACTOR**'s works and on receipt at SITE as per terms of the PO/ CONTRACT.

13. **"INITIAL OPERATION"** shall mean the first integral operation of the complete equipment covered under the Contract with sub-systems and supporting equipment in service or available for service.

14. **"PERFORMANCE AND GUARANTEE TESTS"** shall mean all operational checks and tests required to Determine and demonstrate capacity, efficiency and operating characteristics as specified in the Contract Documents.

15. **"SERVICE"** shall mean erection, installation and testing, commissioning, provision of technical assistance, training and other such obligations of the **CONTRACTOR** covered under the Contract.

16. **"SITE"** shall mean the Project or designated area/ location or destination for which the Contract has been issued and where the equipment/ materials shall be erected.

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17. **"SPECIFICATIONS"** shall mean and include schedules, details, description, statement of technical data, performance characteristics, standards (Indian as well as International) as applicable and specified in the Contract.

18. **"SUB-CONTRACT"** shall mean order placed by the **CONTRACTOR**, for any portion of the contracted work, after necessary consent and approval of OWNER.

19. **"SUB-CONTRACTOR"** shall mean the person named in the CONTRACT for any part of the work or any person to whom any part of the CONTRACT has been sub-let by the SELLER with the consent in writing of the OWNER and will include the legal representatives, successors, and permitted assigns of such person.

20. **"START-UP"** shall mean the time period required to bring the equipment covered under the Contract from an inactive condition, when construction is essentially complete to the state of readiness for trial operation. The start-up period shall include preliminary inspection and check out of equipment and supporting subsystems, initial operation of the complete equipment covered under the Contract to obtain necessary pre-trial operation data, perform calibration and corrective action, shutdown inspection and adjustment prior to the trial operation period.

21. **"TESTS"** shall mean such process or processes to be carried out by the **CONTRACTOR** as are prescribed in the Contract or considered necessary by Owner or his representative in order to ascertain quality, workmanship, performance and efficiency of equipment or part thereof. TESTS ON COMPLETION shall mean such tests as prescribed in the Contract to be performed by the **CONTRACTOR** before the Works are taken over by the Owner.

22. **"CONSULTANT"** shall mean outside agency other than OWNER as authorized by the OWNER. The term includes successors, assigns of CONSULTANT.

23. The **"BID"** shall mean the Bid submitted by the **CONTRACTOR** for acceptance by **GGL**.

24. "**GGL's REPRESENTATIVE"** shall mean the person designated as such by the Gujarat Gas Limited and shall include his authorized nominee or agent, provided however that GGL's representative to be so designated by **GGL** may be one person for certain aspects of this agreement and another person for other aspects of work covered by this Bid/ Contract.

25. **"STORES"** shall mean the **GGL** stores located across its operating areas.

26. **"PERMANENT WORKS" or "WORKS"** shall mean and include all works to be executed in accordance with the Contract or part thereof as the case may be and shall include all extras, additional, altered or substituted works as required for the purpose of contract.

27. **"TEMPORARY WORKS"** shall mean all temporary works of every kind required in or about the execution, completion or modification of the works, which are not permanent.

28. **"APPROVED"** shall mean approved in writing including subsequent written confirmation of previous verbal approval and `Approval' means approved in writing including as aforesaid.

29. **"CONSTRUCTION EQUIPMENT"** means all appliances/ equipment and things of whatsoever nature for the use in or for the execution, operation, or modification of the work or temporary works but does not include materials or other things intended to form or to be incorporated into the WORK, or camping facilities.

30. **"MOBILIZATION"** shall mean establishment of sufficiently adequate infrastructure by the **CONTRACTOR** at site comprising of construction equipment, aids, tools tackles including setting of

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site offices & site camp with facilities such as power, water, communication etc., establishing manpower organization comprising of resident engineer, supervising personnel and an adequate strength of skilled, semi-skilled and unskilled workers, who with the so established infrastructure shall be in a position to commence execution of work at site (s), in accordance with the agreed time schedule of completion of work. MOBILIZATION shall be considered to have been achieved, if the **CONTRACTOR** is able to establish infrastructure as indicated above to commence work at all site (s)/ locations as per time schedule, where so warranted in accordance with agreed schedule of work implementation to the satisfaction of owner/ engineer – in-charge.

31. **"WORKING DAY"** means any day, which is not declared to be holiday or rest day by Owner.

32. **"SPREAD"** shall mean that combination of construction equipment including all necessary tugs, supporting work, barges and personnel as defined in the Contract and schedule of rates and prices, capable of performing specific portion of the work.

33. **"MECHANICAL COMPLETION"** means completion of the pipeline laying and installation work including clearing and grading the agricultural/ Govt. land for making ROW, Trenching, Stringing & Welding, Destructive and Non Destructive testing, Field joint Coating, Lowering, Crossing of other Under Ground Utilities, Padding, Backfilling & Compacting, Final Clean-up etc. of all facilities including pipeline work which may be included in scope of the work specification.

34. **"COMMISSIONING"** shall mean placing into service of the system including the plant(s), equipment(s), vessel(s), pipeline, machinery (ies), or any other section or sub-section of installation(s) pertaining to the work of the **CONTRACTOR** after successful testing and trial runs of the same.

35. **"GUARANTEE"** means the period and other conditions governing the warranty/ guarantee in respect of the work as detailed in section hereunder.

36. **"HSE"** means Health, Safety & Environment.

37. **"KICK-OFF MEETING'** means the first meeting between Contractor and GGL before starting of the project, where sharing of legal and contractual requirement, status of authority permission, reporting structure and project team by GGL and sharing of detailed project plan as per the completion timeline define in this tender document/ contract including mobilization of all required resources, sharing of contractor organization chart, site office and store location, reporting structure etc.

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2. SCOPE OF WORK AND TECHNICAL & HSE REQUIREMENT

2.1 SCOPE OF WORK

This specification covers the minimum requirements for the various activities to be carried out by **CONTRACTOR** for the Construction, Laying, Testing & Commissioning and/or Modification of the Steel Pipeline job for development of CGD network.

The following is a broad description of activities, which shall be included as part of this contract, as a minimum.

2.1.1 SUPPLY

a. Supply of fittings for all sizes, all hardware and consumables, including its installation and commissioning.

b. Supply of valves of size below 2" NB & installation of valves and associated items.

2.1.2 EXECUTION

a. Steel pipeline laying, testing and commissioning/ and or modification.

b. Installation of above ground/ underground pressure reduction station.

c. Installation of odorisation system.

d. Installation and commissioning of temporary cathodic protection system.

e. In-situ construction of valve chamber, supply & installation of pre-cast valve chambers.

f. Fabrication and installation of CGS.

g. Fabrication, installation testing and commissioning of CNG station piping.

h. Related equipment installation.

i. Execution of associated civil and electrical works etc.

2.1.3 STAKEHOLDER MANAGEMENT

a. Liaising with various authorities' pre-start of work.

b. Liaising with various authorities during execution of work.

c. Liaising with respective authority's post commissioning of work for retrieval of NOC, as applicable.

The scope of contract also includes end connectivity with existing live gas network by carrying out a shut down and providing support services for hot-tap on commissioned/ charged pipeline, as and when required/ demanded by the owner/ buyer.

Furthermore, it may comprise of following activities as required for **Steel Pipeline Laying, Testing & Commissioning and/or Modification of the Steel Pipeline job for development of CGD network,** as per the GGL approved procedures and guidelines, including, but not limited to, the following:

- Site familiarization, site visit as per project job requirement.
- Mobilization of equipment's, man-power, tools-tackles, consumables etc. required to complete each steel pipeline extension for development of CGD network.
- Issue & receipt of GGL supplied free issue material from **GGL** designated store or on site delivered directly from vendor as the case may be.

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- Procurement and supply of all type of material as per the scope of **CONTRACTOR** including pipes, valves, fittings and other project job related material and equipment as per **GGL** specifications and as per approved vendor is under scope of **CONTRACTOR**.
- Storage, Handling and Transportation of Pipes, Fittings, other project job related material and equipment.
- Stacking, Grading and Marker installation along the RoW.
- Survey for utility identification.
- Liaising with concerned authorities for pipeline construction and associated activities post receipt of principle permission and submission of NOC from concerned authority post completion of work
- Procedure qualifications, WPS, PQT & EQT etc.
- Pipe stringing and alignment along the RoW.
- Excavation of trial pits/ holes for utility identification and trenching.
- Protection of trench using Shoring, Step cut and Shuttering.
- Welding and NDT including Radiography.
- Field Joint Coating.
- Pipeline lying through horizontal directional drilling (HDD) method and backfilling.
- Hydro test, Cleaning, Swabbing and Pre-commissioning and Commissioning of Pipeline.
- Restoration of site to the satisfaction of concerned authority and/ or Engineer-In-Charge by deploying requisite equipment (including and not limited to road roller for compaction).
- Spreading quarry spoil including disposing off of surplus earth/ Bentonite and or all material that get rendered unusable.
- Supply and Installation of Paver Block.
- RCC work for Road repairing.
- Cold Field Bending/ Induction Bending of Pipes.
- Concrete Coating of Pipes.
- Crossings by horizontal directional drilling (HDD)/ Thrust boring including cased crossing.
- Hook up of pipeline at the battery limits, as per the requirements.
- Prefabrication & testing of valve assembly/ DRS.
- Installation of Valves, Insulation Joints and other equipment in the Pipeline.
- Station piping work at CGS and CNG stations as instructed by GGL in charge.
- Transportation, shifting, and Installation of DRS and Odourization systems.
- Fabrication and Installation of Steel structures such as Supports, Cross Over, ladders etc, as per site requirement.
- Civil work for supports at CGS, CNG & other locations, construction of valve chambers and civil work for DRS etc. as per site requirement and as instructed by GGL in charge.

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- Obtain working RoU for pipeline construction wherever required.
- Preparation of documents/ reports for each activity.
- Supply of Casing Pipe as per **GGL** Specification, wherever applicable by virtue of engineering practice or on insistence of the authority or RoU owner in whose jurisdiction the Steel Pipeline is being laid.
- Supply of piping material for all size.
- Supply of all types of Valves below 2" dia.
- Supply of all types of fittings & flanges (WNRF Flanges, Blind Flanges, Elbows, Bends, Tees, and Reducers etc.) for all sizes.
- Supply of all type and sizes of Studs, Nuts, Bolts, Gaskets etc.
- Supply and installation of various type of pipeline marker.
- Installation of Temporary Cathodic Protection including supply of all material and labor required for carrying out the job, as per **GGL** specification and requirement.
- Implementation of GGL HSE policy, HSE Management System, Life Saver and guideline in the project.
- Establish Camp at location for equipment, Material, civil labor and staff.
- Supply of Manpower, Machineries, Equipment and Consumables "Fit For Purpose".
- Certification of entire facilities and the resources (Machinery, tools and tackles, & equipment) by GGL/ TPI "Fit For Purpose".
- Man power deployed at the site, office, camp shall be medically fit.
- Man power deployed shall be trained in Basic safety, First aid and firefighting and shall be assessed for its knowledge and competency.
- Procure PPE's as per the GGL approved specifications and shall ensure use of all PPE while execution of work at site.
- Provide Fabricated Caution Board and the Barricades as per the GGL approved design.
- Preparations of detailed Risk register for Site Specific Risks along with Mitigation plan for entire pipeline route.
- Conduct (Daily) site specific risk assessment with mitigation plan as per GGL approved Formats.
- Site specific risk and Mitigation plan for entire pipeline route.
- Entire mitigation plan shall be reviewed by TPI and approved by GGL.
- Preparation and approvals of HSE Plan.
- Preparation and approvals of Project execution Plan as per time line agreed while bidding.
- Preparation and approval of resource deployment plan to complete the project in time.
- Preparation and get approval of HSE permit as per the GGL PTW Matrix – Safe Working Practice.
- Conduct Tool Box talks with all involved man power at each location for each activity and maintain record.

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- Assistance in Hot Tap activity in terms of supply of manpower, Tools & Tackles, Machinery.
- Compliance to rules and regulations of the law of the land.

The detail alignment, detailed route survey and soil investigation report for proposed routes shall be provided to the **CONTRACTOR** by **GGL** for cross country terrain, pipeline in outskirts of city and for pipeline within the city area.

The entire project shall be inspected and certified by a Third Party Inspection Agency (**TPIA**), to be appointed by **GGL**, from Material test certificates review, project execution, commissioning to certification as per ASME B 31.8 "Gas Transmission and Distribution Piping System" and "PNGRB standards" with any additional requirements as demanded by the regulator for PNGRB during execution of work. In the absence of specifications covering any material, design of work(s) the same shall be performed/ supplied/ executed in accordance with Standard Engineering Practice covered in latest edition of ASME/ ANSI B31.8, API-1104, PNGRB T4S, OISD-141 & respective OISD etc. and/ or Technical Specification which will be supplied to bidder at site during or prior to execution work or as per the instructions/ directions of the Engineer-in-charge, which will be binding on the Contractor.

The total length of steel pipeline laying expected shall be as per the business plan and size of the pipeline will vary from 4" NB to 12" NB depending upon the job requirements.

This specification shall be read in conjunction with the conditions of all specifications included in the BID.

CONTRACTOR shall, with due care and diligence, execute the work in compliance with all laws, by-laws, ordinances, regulations, etc. and provide all services and labor inclusive of supervision thereof. All materials, equipment, appliances, or other things (other than issued by **GGL**) of whatsoever nature required in or about the execution of the work, whether of a temporary or permanent nature shall be provided by the **CONTRACTOR**.

CONTRACTOR shall take full responsibility for the stability and HSE of all operations and methods involved in the work.

CONTRACTOR shall be deemed to have inspected and examined the work area and its surroundings and to have satisfied himself so far as practicable as to the form and nature thereof, including subsurface conditions, the extent and nature of work and materials necessary for the completion of the work and the means of access to the work area.

During the execution of work, **CONTRACTOR** should ensure that it should not obstruct any or all other activities performed by other agencies.

CONTRACTOR shall be deemed to have obtained all necessary information on subject as above mentioned as to risks, contingencies and all other circumstances, which may influence the work.

CONTRACTOR shall, in connection with the work, provide and maintain at his own cost, all lights, guards, fencing, watch, etc. when and where necessary or required by **GGL** or by any duly Constituted Authority for the protection of the work and properties for the safety and convenience of the public and/ or others.

Unless otherwise specified, all sections of this specification shall apply to all the specification referred in this Contract.

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2.2 MOBILIZATION

CONTRACTOR shall be required to mobilize the resources within 30 days post written intimation given by GGL Engineer In charge. In case where CONTRACTOR is already mobilized on site and a fresh/ renewal/ call out order contract is issued just to ensure continuity of the work then there is no separate Mobilization required. And all associated clause/ terms related to initial/ first mobilization shall not be applicable.

GGL will ensure availability of at least 70% of principle permissions from respective authorities at the time of kick off meeting. However, in specific cases where above mentioned permission status is not available to **CONTRACTOR** during kick off meeting, **CONTRACTOR** and **GGL** may agree to progress with the work, wherein Contractor thereafter shall do the follow up with the concerned authorities to get the permissions to execute the job in time. In such cases, contractor will hand over the demand notice to GGL and required payments will be paid by GGL to authority. Contractor shall obtain permits/ clearance from concerned authorities before actual commencement of the job at site including preparation and establishment of safety procedures for laying pipeline. After completion of work, Contractor shall obtain a certificate from the concerned authorities that the job has been completed as per their requirement and the area/ land has been restored to their satisfaction.

CONTRACTOR shall provide a list of machinery/ equipment that they intend to deploy during the Kick of Meeting and prior to mobilizing the same, it shall be pre-audited at his works/ site by **GGL** representative and/ or **TPA.**

CONTRACTOR shall be ready at all times post award of **CONTRACT** with required resources for pipeline execution and shall mobilize on allocation of job by **GGL**.

CONTRACTOR shall maintain following below mentioned resources as a minimum but not limited to following to complete the entire job

- All pipeline construction equipment, measuring equipment, testing equipment etc.
- Skilled, semi-skilled and unskilled manpower
- Vehicles for transportation of material and manpower
- Sufficient quantity of spares & consumables
- Required tools and tackles

2.3 TECHNICAL REQUIREMENTS FOR PIPELINE CONSTRUCTION

2.3.1 PIPELINE CONSTRUCTION

Requirement of Right of Way (R.O.W.) & Access Thereto

- **CONTRACTOR** shall, before starting any clearing operations, familiarize himself with all the requirements of the authorities having jurisdictions over the RoW for work along the pipeline route in connection with the use of other lands and roads for construction purpose.
- **CONTRACTOR** shall notify **GGL** and concern authority well in advance during work progress for crossing road, railway, other pipeline, cable, canal, river and other existing obstacles.
- **CONTRACTOR** shall not commence work on such crossing before having obtained approval from the **GGL** and necessary liaison with the concern authority. Priority in execution shall be given to crossings over the other laying. The crossing shall be carried out to meet at all times the

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requirements & the conditions of the permit issued by the authorities concerned. In absence of any specific requirements by authorities, **CONTRACTOR** shall comply with **GGL/ TPA's** instructions.

- The right of ingress and egress to the RoW shall be limited to points where such right of way intersects public roads. Arrangements for other access required by the **CONTRACTOR** shall be made by him at his own cost and responsibility but for such access the conditions of this specification shall also apply.
- Where the work on RoW is along with of an existing line, utility or facility, **CONTRACTOR** shall propose and provide methods to safe-guard the existing line or facility. No work is allowed in such area without **GGL**'s prior approval.
- Any additional surveys or permissions required (for Working RoU/ Space) and land/ RoW acquisition for Pipeline laying activity post issue of job order shall be carried out by the **CONTRACTOR** at his own cost and submit NOC to **GGL**.
- The **CONTRACTOR** is required to perform his construction activities within the width of Right-of-way set aside for construction of pipeline. Variation in this width caused by local conditions or installation of associated pipeline facilities shall be identified in the field.
- For the laying of pipe line within city limit and industrial estate, no specific ROW will be made available; **CONTRACTOR** shall use the roads available for general public for the construction purpose.
- The Right-of-way boundary lines shall be staked by the **CONTRACTOR** so as to prepare the strip for laying the pipeline. **CONTRACTOR** shall also establish all required lines and grades necessary to complete the work and shall be responsible for the accuracy of such lines and grading.

2.3.2 RESTRICTED RIGHT-OF-WAY

The route of Pipeline may run through various terrains with a restricted Right of Way of through or along cultivated fields, orchids, gardens, lawns, ditches, public roads, or obstacles distributaries canals. The **CONTRACTOR** shall only use such width as made available plus extra land by private negotiation with landowners with his own cost and no extra cost to **GGL** and shall perform the work at such places in a manner to compliance **GGL** HSE requirements so as to avoid harm to people, assets and the structures damage by the construction of the pipeline.

2.3.3 ROW MARKERS

Prior to clearing operations **CONTRACTOR** shall carry out following if required or instructed by **GGL**

- **CONTRACTOR** to take photograph of entire stretch to keep records of original conditions.
- Install Benchmarks, Intersection Points and other required survey monuments.
- Stake markers in the centerline of the pipeline at distances of maximum 100 meters for straight-line sections.
- Stake two RoW markers at least at every 250 meters.
- Set out a reference line with respect to pipeline centerline at a convenient location

2.3.4 CABLE LOCATOR/ GPR SURVEY

- CONTRACTOR to perform GPR survey for identification of underground utilities like electric cable, OFC cables, communication cables, water line etc. before commencement of trenching work.

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CONTRACTOR shall carry out the same with help of Ground Penetrating Radar OR cable locator as per the instructions by GGL/ EIC.

- **CONTRACTOR** shall arrange necessary equipment, man power, tools tackles and vehicle to perform the survey before executing any pipeline laying work. Equipment specification and accuracy shall match with IDS Italy. All equipment shall be fit for purpose and shall be calibrated. The same shall be reviewed and checked **TPIA**/ Engineer in charge before use. Frequency of same shall be as instructed by engineer in charge. Equipment shall be capable of identifying underground utilities at the depth of up to 2.5 mtr in normal cases and/ or up to the depth of proposed pipeline whichever is higher.
- GPR/ cable locator search shall be carried out for stretch up to 3 meter from proposed/ existing pipe centerline on both sides.
- **CONTRACTOR** shall prepare a drawing/ sketch showing minimum but not limited to type and depth of utility, size/ properties of utilities and proposed/ existing pipeline detail along with necessary reference points of actual site Dumpy level shall be used to define datum level with respect to ground level in the drawing. The same shall be submitted to **TPIA**/ engineer in charge before start of trenching work. In addition, **CONTRACTOR** shall carry out GIS mapping by taking differential coordinates of utilities, using GPS.
- **CONTRACTOR** shall consult and co-ordinate with concerned utility company before commencement as per instructions from Engineer in charge.

2.3.5 PROTECTION OF UNDERGROUND AND OVERHEAD STRUCTURES

CONTRACTOR shall obtain plans and full details of all existing and planned underground services, overhead lines from the **GGL**/ concerned authority having jurisdiction and shall ensure it by GPR survey whenever instructed by **GGL** or dig verifications/ trial pits & follow these plans closely at all time during the performance of work.

CONTRACTOR will not be entitled to any other claims for any new obstacles (underground utilities, pipes and cables) during the course of work execution. **CONTRACTOR** shall repair at his own cost any damages caused to existing facilities. **CONTRACTOR** shall execute the work in such a manner that the said structures, utilities, pipelines etc. are not disturbed/ damaged.

Despite all precaution should damage to those utilities/ structure whether or not shown in the drawing,

- **CONTRACTOR** must make repair or bear the cost of making good the same without delay to the satisfaction of the Engineer-in-charge and authority having jurisdiction
- If **CONTRACTOR** fails to repair the damage in reasonable time (agreed by authority/ COMPANNY) **GGL** reserves the right to have it repaired at the cost of **CONTRACTOR**.
- Claims/ Penalties notice received from authority shall be forwarded to **CONTRACTOR** by **GGL** for payment and receipt or NOC obtained from authority shall be submitted to **GGL**.
- **CONTRACTOR** shall be liable for any damage occurring to, or resulting from damage to other pipelines, underground structures/ utilities.
- In case the drawings are not available, **CONTRACTOR** shall dig out trial pits at no extra cost as per direction of **GGL**/ **TPA** to locate underground utilities.

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- Where the pipeline crosses other underground utilities/ structures, the **CONTRACTOR** shall manually excavate to a depth in such a manner that utilities/ structures are located.

  Temporary under pinning or any other type of support or other protective devices necessary to keep the interfering structure intact shall be provided by the **CONTRACTOR** at his own cost and shall be of such design as to ensure against their possible failure.

2.3.6 PROTECTION OF TRENCH (WHEREVER REQUIRED)

CONTRACTOR shall keep the trench in safe condition until the pipe is laid and no claim is to be made to the **GGL** by reason of its caving either before or after pipe is laid. Protection of Trench shall be done in accordance with **GGL** approved Excavation procedure/ guidelines using suitable methods like "V" shape, step cut or shoring and shuttering. **CONTRACTOR** shall de-water, if necessary, using well point system or other suitable systems, to excavate the trench and install the pipe, and backfill the trench in accordance with the specifications.

2.3.7 PROTECTION OF WORKING SITE

CONTRACTOR shall protect the site by hard barricading at city area/ public places or soft barricading like as Bamboo barricading/ cone/ caution tape at out skirts. The method of protection of work site shall be selected based on risk assessment and use of soft barricading shall be allowed considering the risk profile submitted by **CONTRACTOR**. Final decision of the type of barricading shall be decided by **GGL** engineer in charge.

CONTRACTOR shall provide barricading for protection of site until the pipe is laid. The same can be removed post consultation from GGL Engineer in Charge.

After completion of day time construction activities, an arrangement shall be done for flickering lights/ warning lights of suitable size at suitable locations right from the first day of execution along the construction site in case of working at or near traffic movement so as to prevent any accident. The cost of the same shall be borne by the **CONTRACTOR**. Also the same arrangement shall be continued in case of low light OR working during night time.

2.3.8 IDENTIFICATION OF PIPE

CONTRACTOR shall state pipe identification number on the top of pipe as given outside/ inside the pipe by pipe manufacturer for all pipes; **CONTRACTOR** shall also measure their length and state it on the pipes. Pipes to be bent shall be measured prior to bending. Identification (i.e. letter, number and length) shall be readable. All pipe identification numbers shall be recorded in respective progress report and pipe logbook.

Before a pipe length, pipe end, etc. is cut, the painted serial number shall be transferred by **CONTRACTOR** in the presence of **GGL/ TPIA** to either side of the joint which is to be made by cutting, and the changes shall be recorded in the above mentioned list stating the (new) length.

2.3.9 NIGHT CAPS

At the end of each day's work or every time when joining and welding operations are interrupted, pipe lowered in trench the open ends on the welded strings of pipes shall be capped with a securely closed metal/ plastic cap or plug as approved by **GGL/ TPIA** so as to prevent the entry of dirt, water or any foreign matter into the pipeline. The cost of the cap shall be borne by the **CONTRACTOR**. These covers shall not be removed until the work is to be resumed. The caps/ plugs used shall be

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mechanical type and shall not be attached to pipe by welding or by any other means, which may dent, scratch or scar the pipe.

2.3.10 CROSSINGS

For all crossings **CONTRACTOR** shall seek and obtain prior approval from **GGL** to lay the pipeline and shall carry out the crossing as per the instructions of the **GGL**/ concerned authorities.

Highways, Main roads, Main Gates of various industries roads and their verges and banks of water are not allowed to be used for loading, unloading or stacking of materials and/ or equipment. For secondary roads such loading, unloading is permitted only after prior approval from **GGL**.

CONTRACTOR is not allowed to close or divert roads or watercourses without prior approval from **GGL**. **CONTRACTOR** shall never unnecessarily hamper the users of the roads, buried services and/ or watercourses. The water flow shall not be obstructed.

GGL reserves the right to demand from the **CONTRACTOR** for individual crossings, a separate pretest and/ or a detailed report for approval, containing,

- Time Period
- Working method with equipment
- Test procedure
- Calculations of temporary works

The execution of the work may require working in deep trench requiring extensive excavation ensuring all the required safety to maintain trench in workable condition. The **CONTRACTOR** must plan, maintain minimum labor/ man power and necessary equipment as per the requirements of the job and execute the pipeline construction according to prescribed schedule. No extra costs shall be considered for such works. **CONTRACTOR** shall carry out immediate restoration of crossing location and require to intimate concern authority/ owner for site visit.

2.3.11 HORIZONTAL DIRECTIONAL DRILLING

- The laying of pipeline using Horizontal Directional Drilling (HDD) method shall have two-stage process. The first stage will consist of drilling a small diameter pilot hole along a designated directional path. The second stage involves enlarging this pilot hole to a diameter that will accommodate the carrier pipe and pulling carrier pipe back into the enlarged hole.
- The instrument shall be magnetic and accurate to survey the pilot hole during drilling additionally, some deviation from the designed drilled path may be experienced due to soil reaction. Therefore, anticipate a deviation in actual verses designed pilot hole course of +/- 0.5% of the horizontal and vertical directions drilled length. The error, when it is unacceptable, can be largely eliminated by re drilling after "punch out" in the right of way limits. Best drilling standards shall be followed to minimize the deflection as per the client's requirements. **CONTRACTOR** have to prepare and get approval of proposed bore profile indicating depth, existing utility and pulling calculation prior to start HDD operation.
- The same shall be done as per **GGL** approved technical specification, procedure and guidelines up to the satisfaction of **GGL/ TPIA.**
- On acceptance of drilling hole, a string on line pipe is pullback in the drilled hole utilizing the cranes/ side booms and pipe rollers to assure proper alignment and entry angle into the hole. The entry

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angle is calculated and included as part of this engineering and design package. Once the pipeline has been successfully pulled into the drilled hole, the pull head is removed from the pipe string. The drill rig will be demobilized and the job site secured. These activities are also a part of the Quality Assurance responsibilities of the Driller.

- Specification of HDD machine/ equipment, manpower, equipment calibration as well as HDD work is to be done as per the approved **GGL** Guidelines/ specifications.
- No extra costs shall be considered for such works.

2.3.12 PIPELINE MARKERS

CONTRACTOR shall supply and install the pipeline markers as per the **GGL** approved drawing attached in the bid, along the route as per the directions of **GGL**/ **TPIA**. The markers shall be fabricated and installed as per the approved job standards. Color coding of pipeline markers shall be as per approved job standards.

Pipeline Marker shall be installed as per the **GGL** approved specification and rate of same will be as per SOR.

2.3.13 INSTALLATION OF FITTINGS, VALVES, INSULATING JOINTS, SKID ASSEMBLIES

- **CONTRACTOR** shall do all work necessary at each of the installations to provide facilities, which are complete in all respects and ready for operations.
- Without limiting the generality thereon, the work required to complete the installations shall, where applicable, include all site surveys, site preparation, filling, grading, fencing, foundations, installation of skid, civil work, painting, installation of all electrical equipment's, and fixtures, piping, valves and fittings; mount all instruments and make all piping and electronic connections, etc.
- The **CONTRACTOR** at the locations as directed by the **GGL** shall install fittings, Valves and Insulating joints. **CONTRACTOR** shall obtain prior approval for procedure of joints from the **OWNER** before installation.
- Handling and installation of the insulating joints and valves shall be carried out with all required precautions for avoiding damage and excessive stresses and that the original pup length is not reduced.
- The insulating joints and the welded joints shall be protected by external coating. Insulating joints shall be electrically tested before welding into the pipeline. The electrical conductance test shall be carried out using a Megger. The tests shall be repeated after installation and welding of the joint into the pipeline to verify that the assembly is undamaged.

2.3.14 PIPELINE HYDROSTATIC TESTING

Hydrostatic test shall commence only after mechanical completion, i.e., all welds have been accepted and the pipeline has been laid and back filled according to the specifications for entire pipeline. However, Pre/ Post hydro testing shall be carried out for all major crossings as per **GGL** instruction. Pre hydro test will not be carried out for parallel HDD.

Testing of any pipe section shall be commenced only after acceptance of Pipe book by **TPIA**. Before testing pipeline cleaning shall be done using cleaning pig.

The same shall be done as per approved procedure and guidelines up to the satisfaction of **GGL/ TPIA.**

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2.3.15 PNEUMATIC TESTING-AS APPLICABLE, DRYING AND COMMISSIONING

After acceptance of hydrostatic test by **GGL/ TPIA**, **CONTRACTOR** shall de-water, clean, swab and dry the pipeline to standards of cleanliness and Pneumatic testing as well as dryness to be done as per approved procedure and the satisfaction of **GGL/TPIA**.

2.3.16 VALVE STATION & HOOK-UP

After satisfactory completion of hydro test of pipeline, valves and valve stations (including civil work) shall be installed to the satisfaction of the **GGL**. Similarly hook up shall also be carried out with pre-fabricated sections, NDT tested and hydro tested sections. All this pre-fabricated section shall be certified by **TPIA** along with pipe book. The golden joints for hooks shall be minimized. Only good performing qualified welder shall be used for golden joints. Golden joints shall be double NDT tested and certified by **TPIA**. Golden joints shall be identified/ highlighted in pipe book. The **CONTRACTOR** shall propose the method for installation/ hook up of underground valves stations depending on the methodology of carrier pipe installation (HDD or open cut methodology). The same shall be approved by **GGL/ TPIA** prior to installation/ hook up of underground valves stations.

The work of prefabrication and testing shall be carried out at workshop or made up site camp which is approved by **GGL** engineer in charge.

2.3.17 PRE-CAST RCC VALVE CHAMBER (WHEREVER REQUIRED)

The supply and Installation of pre-cast RCC valve chamber shall be carried out by **CONTRACTOR.** The pre-cast valve chamber shall have 25 Tonne of load carrying capacity in M25 concrete using TMT reinforcement steel as per relevant Indian standards. It shall include Supply, fabrication, excavation of pit, PCC 1:3:6 as a base, installation of precast chamber with necessary grouting and backfilling with good quality yellow soil or murrum, etc. complete with all respect shall be carried out by **CONTRACTOR**. It also includes all lifts, loading, unloading, transportation to the site etc. all complete in **CONTRACTOR** scope. Any elements that show soft corners or surfaces shall be rejected. The method of storage, handling and transportation shall be such as to preserve true and even edges and corners, any precast element which becomes chipped, marred or cracked before or during the process shall be rejected. Test certificate from the relevant third party accredited laboratory for testing of load carrying capacity and the same shall be submitted to GGL Engineer In-charge before installation at site.

2.3.18 PRESSURE REDUCTION STATION INSTALLATION & HOOK-UP

The fabrication, installation and Civil work for installation of pressure reduction system shall be carried out by **CONTRACTOR** as per the approved construction drawing to the satisfaction of the **GGL/ TPIA**. Similarly hook up shall also be carried out with pipeline. All this pre-fabricated section shall be certified by **TPIA**.

The work of prefabrication shall be carried out at workshop or site camp which is approved by engineer in charge/ **TPIA**.

2.3.19 TAR/ RCC/ PCC CUTTING AND SOIL HANDLING/ SHIFTING (WHEREVER REQUIRED)

CONTRACTOR shall cut the tar/ RCC/ PCC surface using power driven road cutter or pneumatic/ electrically operated breaker or by JCB as per the site requirement and as per instruction of local **authority/ GGL EIC**. The trench shall be further excavated using machine or manual means and soil will be transported to a dump yard arranged by **CONTRACTOR** for the city laying or as per the

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direction of engineer in charge. **CONTRACTOR** shall inform engineer in charge before starting of above activity.

2.3.20 SOIL SHORTAGE (WHEREVER REQUIRED)

If due to unforeseen circumstances, during backfilling and compacting there is not enough soil to fill the trench properly, or to install crown height as stipulated, **CONTRACTOR** shall supply the necessary backfill material at **CONTRACTOR**'s cost. This soil brought from outside shall be backfilled before the top - soil cover is replaced.

2.3.21 HOT TAP ASSISTANCE

CONTRACTOR shall provide assistance for site activities required for Carrying out Hot Tap operation.

CONTRACTOR scope for Hot Tap activity assistance includes but not limited to Loading, Transportation, Unloading of **GGL** supplied Hot Tap Materials and associated fittings, valves from **GGL** specified storage location to site. Mobilization of manpower and machinery to **GGL** work site for support to carry out Hot Tap operation. Supply of tools, Tackles, consumables and associated equipment etc. other than the hot tapping material and hot tapping machine

CONTRACTOR shall perform preliminary site activities like site clearing, trenching, testing, preparation of drawings, arrangement of additional storage, if any, fabrication for access to construction, fabrication, testing, pre-commissioning, commissioning, preparation of documents and hand over of same to GGL Engineer in charge.

CONTRACTOR shall perform all above site activities as per the detail scope of work of this document.

2.3.22 MATERIAL MANAGEMENT

SCOPE OF SUPPLY

MATERIALS TO BE SUPPLIED BY GGL AS FREE ISSUE

1. Carbon Steel 3LPE Coated line pipe of API-5L (PSL-2) Grade X52/ X65 for size 4” NB and above.
2. DRS/ DPRC/ CPRS.
3. Odorant System and its associated equipment.
4. All Types of Valves for size 2” NB and Above.
5. All sizes of Insulating joints.

MATERIALS TO BE SUPPLIED BY CONTRACTOR

The procurement and supply, in sequence and at the appropriate time, of all materials (permanent and Temporary) and consumables required for completion of the WORK as defined in the scope of work and tender, shall be entirely the **CONTRACTOR**’s responsibility.

The CONTRACTOR shall provide inspection of the items at vendors’ works by the reputed inspection agency and shall submit inspection reports of OWNER’s clearance. In case of pressure containing materials, contractor has to provide 3.2 certificates (as per EN10204) by the approved third party inspection agency without any extra cost to the owner. In addition to the same, OWNER reserves the right to inspect any material supplied by the contractor at any stage of manufacturing and delivery by themselves or through their representative. Contractor scope includes providing the intimation to the owner, for inspection at any stage. This intimation shall be given at least 10 days

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prior to the inspection. Any extra payment will not be release to the contractor due to this inspection.

The materials to be supplied are, but not limited to the following:

- Casing pipe for all sizes.
- Piping material for all sizes (seamless pipe for all size, piping supports materials, all type of hardware & consumables etc.)
- All types of valve for size below 2" NB.
- All types of fittings & flanges for all sizes.
- All types and sizes of stud, nuts, hardware and consumables.
- All type of pipeline markers and TCP material.
- Any other material other than **GGL** free issued material required for completion of project shall be supplied by **CONTRACTOR**.
- All types of vehicles, types of equipment, trailers for transportation, loading, unloading, stringing and all other associated material for handling & transportation of **GGL** supplied material.
- All welding machines, lifting equipment, instruments, transporting vehicles and consumables for welding such as oxygen, acetylene, inert gases and all types of electrodes, filler wire, solder wire, brazing rods, flux etc. for welding/ cutting and soldering purpose.
- All materials, equipment and instruments required for all types of tests such as radiography, Ultrasonic testing, magnetic particle and dye penetrate examination and any other tests as per requirement of **GGL**.
- All materials, equipment, instruments and consumables including primer calibrated pump required for external corrosion coating and concrete coating (where required) of field weld Joints.
- All materials, equipment, instruments and consumables required for repair of damaged Coating of line pipe.
- Casing pipes, insulators and end seals and materials for casing vents and drains as per Drawings, if applicable.
- All materials, equipment, instruments and consumables required for continuous concrete Coating/ Concrete slabs for providing anti-buoyancy to the pipeline, wherever required.
- All materials, equipment, instruments, temporary vehicles required for sand/ soft soil padding around pipeline, PVC warning mat, select approved quality backfill, bank stabilization of water crossings, etc.
- All materials, consumables and equipment related to blasting of rock for excavating trench or grading the Right-of-Way.
- All equipment and material for excavation.
- Corrosion inhibitor for water used for hydrostatic testing, including water for testing.
- All pigs for cleaning, gauging, filling, dewatering and swabbing of the pipeline.

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- All equipment, pumps, instruments, pipes, fittings and equipment, metallic blinds, temporary gaskets as required for filling, pressurizing and dewatering for hydrostatic testing, including pipe headers for air and hydro testing.
- All consumables, equipment (air compressors/ air dryers of suitable capacity), instruments for drying of pipeline includes pigs as required.
- All primer and paints for painting above ground piping. The primer and paints shall be industrial grade.
- All materials, equipment, instruments for lowering and back filling and tie-in of pipeline sections.
- All materials, equipment (including and not limited to road roller/ Mechanical compactor for compaction) required for repair/ restoration of pavements, roads, bunds, other structures affected/ damaged by **CONTRACTOR**'s construction activities. Materials shall be equivalent/ superior to those used for original construction of the facility.
- Bolts, nuts, washers, U bolts, clamps, clips, and gaskets for supports.
- Shims, wedges and packing plates (machined wherever required).
- All materials, equipment for civil and structural works, grouting etc.
- All safety tools/ tackles/ devices/ apparatus/ equipment, etc. including ladders and scaffolding as required.
- All materials for corrosion protection of buried piping, pipe-fittings, valves, casing pipes, etc.
- PVC warning mat & Protection of pipeline for HT Line crossing, foreign pipeline crossing with PVC mat or RCC, Krick cell.
- All materials, equipment for all types of pipeline markers.
- Nitrogen gas if required, for filling in the pipeline system for preservation. Nitrogen shall be industrial quality.
- All material and consumables required for TCP for the proposed pipeline.
- All other materials not specifically listed herein, but required for the execution of the WORK.
- The **CONTRACTOR** shall procure all the required material as per **GGL** approved Technical specifications. **CONTRACTOR** to procure all material as per the approved process to ensure that all material supplied/ used is as per **GGL** technical specification and Quality assurance plan. In case of any change/ deviation/ dispute from **GGL** requirements/ Technical specification, **CONTRACTOR** shall inform **GGL** in advance and take necessary approval, if required.
- The **CONTRACTOR** to refer vendor list approved by **GGL** for procurement of material.
- The **CONTRACTOR** shall procure and provide within the VALUE OF CONTRACT the whole of the materials required for the construction including steels, cement and other building materials, tools, tackles, construction plant and equipment for the completion and modification of the WORK except the materials which will be issued by the **GGL** and shall take his own arrangement for procuring such materials and transport thereof.
- Owning to the technical requirements or otherwise, **GGL** reserves the right to amend/ vary/ modify the material requirement and/ or specification at any time during the period of the **CONTRACT**. The

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financial implication, if any, would be mutually discussed and agreed for which **CONTRACTOR** would fully Co-operate with **GGL.**

- Completeness of the EQUIPMENT shall be the responsibility of the **CONTRACTOR**. Any equipment, fittings and accessories which may not be specifically mentioned in the specifications or drawings, but which are usual or necessary for the satisfactory functioning of the equipment (successful operation and functioning of the EQUIPMENT being **CONTRACTOR**'s responsibility) shall be provided by **CONTRACTOR** without any extra cost.
- The **CONTRACTOR** shall perform the necessary loading, unloading, hauling to points designated by the owner and storing if necessary of the material furnished by **CONTRACTOR**. The **CONTRACTOR** shall exercise care in handling, hauling, storing and distribution of such materials in order to avoid damage or deterioration of these materials.
- Materials excluding line pipe shall be stored in the sheltered storage. Such materials shall not be strung on the Right-of-way but shall be transported in conveyances for use only at the time of installation.
- **CONTRACTOR** shall ensure that all Pipes & valves and whenever applicable, other materials are fitted with suitable end covers.

2.3.23 HANDLING, HAULING & STORING OF MATERIALS

- The **CONTRACTOR** shall exercise utmost care in handling line pipe and other materials free issued by **GGL**. **CONTRACTOR** shall be fully responsible for all materials and their identification until such time that the pipes and other materials are installed in permanent installation. **CONTRACTOR** shall be fully responsible for arranging and paying for storage areas for the pipeline materials, however, method of storage shall be approved by **GGL/ TPIA**.
- **CONTRACTOR** shall check health of pipe for coating damage, thickness as per BOQ, Magnetization of pipes etc prior to installation. In case of any deviation in technical requirements of material **CONTRACTOR** is required to inform engineer in charge in writing and shall not accept the delivery unless same is approved by Engineer in charge. **CONTRACTOR** shall check marking of identification number and condition of material before receiving from **GGL** store and shall send Material Take Off report within two days after receiving material.
- **CONTRACTOR** It is prohibited to roll the pipes across the ground on the road surface, to lift up or move the pipes with cables, chains or other hard ropes and to bring the pipes into the contact with a naked flame, oil or bituminous products to prevent damage to the coating of pipes
- **CONTRACTOR** shall reimburse the **GGL** for the cost of replacement of all **GGL** supplied materials damaged during the period in which such materials are in the custody of the **CONTRACTOR**. It shall be **CONTRACTOR**'s responsibility to unpack any packing for the materials supplied by **GGL**.

2.3.24 WASTE MANAGEMENT

CONTRACTOR shall coordinate and carry out the disposal of any waste (Hazardous or otherwise) produced or occurring as a consequence of its operations pursuant to **CONTRACT.** All such disposals shall be in accordance with all legislations, GGL's norms and best practices, whether that shall be for Hazardous waste or non-hazardous waste. **CONTRACTOR** shall ensure that all necessary approvals or licenses are obtained and that any sub-contractors utilized for this purpose fully comply with such requirements. **CONTRACTOR** shall record & provide **OWNER** with a copy of each waste transfer/ disposal.

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The same shall be done as per approved procedure and guidelines up to the satisfaction of **GGL/ TPIA.**

2.3.25 MATERIAL RECONCILIATION

- **CONTRACTOR** shall submit account of material issued for job to be completed. **CONTRACTOR** shall return all the balance material at **GGL**'s store along with the necessary documents. Any discrepancies, if found in material account then cost of the same shall be deducted from **CONTRACTOR**'s final bill.
- **CONTRACTOR** shall submit account of material issued for job to be completed.
- **CONTRACTOR** shall submit material consumption statement on Monthly basis and on completion of each job order.
- At the time of reconciliation **CONTRACTOR** shall return total balance material for each of the projects being executed (even within the same location) that is issued to him by **GGL** for execution of work at his cost.
- **CONTRACTOR** shall return all the balance material at **GGL** designated store along with the necessary documents. Any discrepancies, if found in material/ instruments, equipment (issued by **GGL**) shortage/ damage then cost of the same shall be deducted from **CONTRACTOR**'s final bill as per rate decided by **GGL**.

RECONCILIATION OF GGL SUPPLIED MATERIALS

- Every month, the **CONTRACTOR** shall submit an account for all materials issued by **GGL** in the Performa prescribed by the Engineer-in-Charge. On Completion of the work, the **CONTRACTOR** shall submit "Material Appropriation Statement" for all materials issued by the **GGL** in the Performa prescribed by the Engineer-in-charge.
- The percentage allowance shall be accounted on the basis of final weld book chainage for main pipeline and erected/ approved fabrication drawings for station piping as mentioned below:

For underground pipeline network

All coated line pipes as per line pipe specifications enclosed elsewhere in the bidding document, shall be issued on linear measurement basis. Joints etc. shall be issued on number basis. All other piping materials shall be issued on number basis. All cut pieces of pipes measuring in length 4m to 9m, when returned to **GGL**'s designated storage points after beveling, shall be considered as serviceable material and **GGL** reserves full rights to re-issue the same to the **CONTRACTOR**s. All cut pieces of pipes measuring less than 4m will be treated as wastage/ scrap.

- **For the purpose of accounting of coated line pipes following allowances shall be permitted (maximum permissible limit).**

Unaccountable wastage: 0.10%

Scrap (all cut pieces of pipes measuring less than 4m): 0.3% (CONTRACTOR has to return scrap quantity to OWNER during reconciliation of materials.

Serviceable materials (all cut pieces of pipes measuring from 4m up to 9m): 0.5%

Unaccountable wastage/ scrap/ serviceable material shall be at actual as per site assessment subject to maximum as stated above.

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For above ground piping work

For the purpose of accounting of station piping, all cut pieces measuring in length of 1m and above when returned to **GGL**'s storage points after beveling, shall be treated as serviceable materials. All cut pieces of pipe measuring less than 1m will be treated as scrap.

For the purpose of station piping in case of free issued by GGL, following allowances shall be permitted (maximum permissible limit);

1. **Unaccountable wastage: 0.1%**
2. **Scrap (all cut pieces of pipes measuring less than 1m): 1.0%**
3. **Serviceable materials (all cut pieces of pipes measuring 1m and above): 2%**

Unaccountable wastage/ scrap/ serviceable material shall be at actual as per site assessment subject to maximum as stated above.

- All unused material/ scrap material shall be the property of the **GGL** and shall be returned by the **CONTRACTOR** category-wise at his cost to **GGL**'s designated store. **All the serviceable materials when returned to GGL should have details of Heat No.** In case the **CONTRACTOR** fails to do so/ or exceeds the limits of allowances specified above for scrap/ serviceable materials, then recovery for such quantities not returned by the **CONTRACTOR** will be done at the penal rate i.e. 125% of landed cost at the time of final bill/ closing of contract by Engineer-in-charge. The recovery shall be affected from the **CONTRACTOR**'s bill(s) or from any other dues of the **CONTRACTOR** to **GGL**. Upper limit for return of serviceable materials shall not be applicable for the individual project having total steel laying length of 2.5 kms and below.
- **CONTRACTOR** shall be responsible for the adjustment/ weightment/ measurement of the surplus materials to be returned to the store. **CONTRACTOR** shall also be responsible for suitable segregation of returned materials into separate stacks of serviceable and scrap materials.
- Wherever certain material is covered under **CONTRACTOR**'s scope of supply whether part or in full or any item of work covered under wherever certain material is covered under SOR, no allowance towards wastage/ scrap etc. shall be accounted for during execution stage.
- GGL shall not accept any surplus material supplied by contractor post completion of project.

2.3.26 WORK MANAGEMENT

Location of Site

The location of work site shall be provided in detail job order issued from time to time across **GGL** operation areas.

A. Scope of Work

The scope of work is defined in this bid document. The **CONTRACTOR** shall provide all necessary materials, equipment, tools & tackles, labor etc. and get it approved (Fit for Purpose) through **GGL/ TPIA** for execution and modification of the work till completion.

CONTRACTOR shall, with due care and diligence, execute the work in compliance with all laws, by-laws, ordinances, regulations, **GGL** Business Principal etc. and provide all services and labor inclusive of supervision thereof. All materials, equipment, appliances, or other things of whatsoever nature required in or about the execution of the work, whether of a temporary or permanent nature shall be provided by the **CONTRACTOR**.

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CONTRACTOR shall, in connection with the work, provide and maintain at his own cost, all lights, guards, fencing, watch, etc. when and where necessary or required by **GGL/ TPIA** or by any duly Constituted Authority for the protection of the work and properties for the safety and convenience of the public and/ or others.

B. Sub-contracting of Works

No part of **CONTRACT/ WORK** shall, in any manner of degree be transferred, assigned or submitted by the **CONTRACTOR** directly or indirectly to any person, firm or corporation whosoever, **without prior written approval from GGL.**

CONTRACTOR shall submit to **GGL** the details of sub-**CONTRACTOR** for the activity related to work covered in GGL guideline and BID including experience and skill of their manpower along with the bid to declare their intent for execution of work. After evaluation of the **SUBCONTRACTOR as per GGL Guideline**, **GGL** may give written consent to **SUBCONTRACTOR** for the execution of any part of the work at site, being entered in to by **CONTRACTOR**.

Consent for sub-contracting is not required for supply of manpower for civil, excavation and related works.

The **CONTRACTOR** shall be and shall remain solely responsible for the quality, proper and expeditious execution of the work and the performance of all the condition of the contract in all respect as if such subletting of sub-contracting had not taken place, and as if such work had been done directly by the **CONTRACTOR**.

If any **SUB-CONTRACTOR** work which in opinion of **GGL/ TPIA** is not in accordance with the contract documents, **GGL** may issue written notice to the **CONTRACTOR**, and the **CONTRACTOR** upon the receipt of such notice, shall terminate such subcontract.

C. Construction Equipment

The **CONTRACTOR** shall without prejudice to his overall responsibility to execute and complete the work as per specifications, time agreed in Job order, progressively deploy at site adequate equipment, tools and tackles and augment the same as decided by **GGL/ TPIA** depending on the exigencies of work so as to suit the construction schedule. All equipment shall be "FIT FOR USE". Audit/ Inspection of all equipment shall be carried out by **GGL** at **CONTRACTOR** place/ site prior to mobilize equipment.

D. Site Organization

Subject to the provisions in the Bid Document and without prejudice to **CONTRACTOR**'s liabilities and responsibilities to provide adequate qualified and skilled personnel on the work, **CONTRACTOR** shall deploy site organization and augment the same as decided by the Engineer-in-charge depending on the exigencies of work.

CONTRACTOR shall deploy necessary and competent man power required as per site activities including as minimum but not limited to following

- **Project Manager/ Engineer** who will be responsible to interact with **EIC/ TPIA** and authorized to attend review meetings, receive material, authorized to sign documents, claims and receive payments etc. Contractor shall employ a Project Manager/ Coordinator on his company roll.
- The Project Manager/ Coordinator authorized by contractor must have qualification of B.E. (Mech.)/ Diploma in Mech. Engineer with min. one/ three years of work experience respectively in gas

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Pipeline project. He shall be single point contact for all the works and must represent company in the Review meetings.

- **Project/ Project Planning Supervisor** who will be responsible for planning, execution, supervision of the project site activities and man power while maintaining a safe working environment ensuring compliance to applicable procedures and policies. The designated person must have diploma in mechanical engineering with min. 1 year of experience in relevant area.
- The **CONTRACTOR** will deploy his own supervisors as directed by **site engineers/ EIC**. These personnel will be reporting to the **EIC** for monitoring construction standards and for ensuring that all technical requirements are met for the job being carried out. The **CONTRACTOR'S** supervisor(s) shall have day-today liaison with the **EIC**, and will provide the **EIC** with technical reports and audits, and other management information as is required on work progress and construction quality standards.
- **Material Quality Assurance** who will be responsible and will look after quality and compliance of all material and consumables supplied by **CONTRACTOR** as per relevant standards and specifications. The designated person must have diploma in engineering with min. 1 year of experience in relevant area.
- **Quality inspector (Non-destructive testing)** who will be looking after quality aspect of various non-destructive testing required during project. The designated person must be certified for American Society for Non Destructive Testing Level-II.
- **Safety officer –** Degree/ diploma in engineering with min. 1 year of experience in relevant area or diploma in fire and safety/ industrial safety (Fresher or experienced).
- **Welder –** certification in line with API 1104 and/ or Boiler and Pressure Vessel Sec IX.
- **Fitter –** ITI qualification and/ or 3 years' relevant experience.
- **Rigger –** At least 1 year relevant experience and capable to read Hindi/ regional language of the area where deployed
- **Facilities (erection and commissioning) –** In addition to above following man power shall be deployed by **CONTRACTOR** in case of installation and commissioning of above ground and/ or underground facilities including but not limited to City Gate Station, Odorant stations, Pressure Reduction Stations (PRS), Metering and Regulating stations (MRS)
- **Electrical –** ITI Electrical and certification from electrical inspector
- **Instrumentation –** ITI Instrumentation (Technician)
- **Metering –** ITI Instrumentation/ electronics (Technician)
- **Odorant Handling –** Diploma in Engineering (Mechanical/ chemical)
- All construction work will be carried out as per direction of **EIC, and EIC** will be the primary point of contact between the **CONTRACTOR** and **OWNER** on site. All work will be issued and sanctioned through the **EIC. CONTRACTOR** shall ensure that technical quality standards are adhered to during work execution is carried out cost effectively and a good customer and public image is maintained for **OWNER**.
- The **CONTRACTOR'S** manager & supervisor shall have mobile phones to ensure that they can be contacted at all times. The **CONTRACTOR** will also nominate one person who can be contacted if

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necessary in odd hours, for the duration of the works. The **CONTRACTOR'S** supervisor will have access to transport at all times to allow them to visit sites and attend meetings with **OWNER**. The normal day-to-day issue of work instructions, communication will be between **EIC AND THE CONTRACTOR'S** supervisor and the Site Engineer.

- **Recruitment of Personnel by CONTRACTOR**

  The **CONTRACTOR** shall not recruit personnel of any category from among those who are already employed by other agencies working at the various sites of **GGL**. However, **CONTRACTOR** shall give priority and make maximum use of local workers available. If in any case **CONTRACTOR** wants to recruit personal of any category from among those who are already employed by other agencies working at the various sites of **GGL** than **CONTRACTOR** have to get No Objection Certificate from other agencies.

  CONTRACTOR man power mentioned above shall undergo all relevant safety and technical competency training as per the "Training Applicability Matrix" prior to deployment at site.

E. Water Supply

CONTRACTOR will have to make his own arrangements for supply of drinking water to his labor camps and for works.

F. Power Supply

It shall be the responsibility of the **CONTRACTOR** to provide electrical power supply to its equipment's at site. All the cabling, equipment, installations etc. shall comply in all respects with the latest statutory requirements and safety rules etc.

G. Land for CONTRACTOR's Field Office, Storage, Camp and Workshop

The **CONTRACTOR** shall at his own cost hire the facilities or provide land to construct all these temporary facilities including camp site for technical staff and for excavation workers, line pipe stockyard and provide suitable water supply and sanitary arrangements. **GGL** as a part of mobilization would audit the facilities with respect to HSE requirements.

a) Camp Site/ Land for
   - Suitable water supply and sanitary arrangements
   - Health and Hygienic conditions
   - First Aid facilities
   - Fence and security

b) Pipe yard/ Storage with
   - Secured Boundaries
   - Elevated or prevented against logging of water
   - Stable ground for stocking of line pipes and the vehicular movements
   - Stable approach for Movements of pipe loaded tailor
   - Support to avoid rolling over of pipe from pipe stack
   - Covering protection against Rain

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- Covering of end of pipe by night cap
- Free from passing over head electrical wire
- First Aid facilities

The **CONTRACTOR**s need to clearly separate out the camp yard and pipe yard for risk reduction purpose.

H. Information – Verification & Responsibility

The **CONTRACTOR** in fixing his rate shall be, for all-purpose, whatsoever reason may be, deemed to have himself independently obtained all necessary information for the purpose of preparing his BID as accepted and shall be deemed to have taken into account all contingencies as may arise due to such information or lack of same. Although, every endeavor has been made to provide correct and full information the correctness of the details given in the Bid Document to help the **CONTRACTOR** to take up the Bid is not guaranteed.

CONTRACTOR shall be deemed to have inspected and examined the work area and its surroundings and to have satisfied himself so far as practicable as to the form and nature thereof, including subsurface conditions, the extent and nature of work and materials necessary for the completion of the work and the means of access to the work area.

CONTRACTOR shall be deemed to have obtained all necessary information on subject as mentioned above as to risks, contingencies and all other circumstances, which may influence the work.

I. Work in Monsoon and De-Watering

The execution of the WORK may entail working in the monsoon and areas requiring extensive dewatering with ensuring all the required safety measures are taken to maintain site in workable condition. The **CONTRACTOR** must maintain a minimum labor force and necessary dewatering pump as may be required to Make the site safe for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rate will be considered for such Work during Monsoon period is subject to prior approval from **GGL** and availability of permission from the authority

Risk profile for work during monsoon shall be prepared, and get it approved from **GGL** prior to start of the work during monsoon. All the mitigation actions suggested in Risk profile shall be ensured by **CONTRACTOR**. No extra cost will be paid for such risk mitigation

J. Mechanization of Construction Activities

The **CONTRACTOR** shall without prejudice to his responsibility to execute and complete the work strictly as per the specifications, HSE Compliances and within the stipulated TIME PERIOD, mechanize the construction activities to the maximum extent by deploying all necessary construction equipment/ machinery in adequate numbers and capacities and commensurate with the extent of enhanced mechanization required to suit the construction schedule/ progress reviewed from time to time as per recommendation of **GGL/ TPIA**.

K. Work Responsibility

From the commencement to completion of the WORK, the **CONTRACTOR** shall take full responsibility for the all works including all temporary works and in case any damages, loss or injury to employees/ **TPI** shall happen to the WORK or to any part thereof or to any temporary works from any cause whatsoever, **CONTRACTOR** shall at his own cost repair and make in good order and in

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conformity in every respects with the requirement of the CONTRACT and **GGL**/ **TPIA**'s instruction. **CONTRACTOR** shall have public liability and property damage insurance.

2.3.27 INSPECTION

Action Where No Specification Is Issued

In the absence of specifications covering any material, design of work(s) the same shall be performed/ supplied/ executed in accordance with Standard Engineering Practice covered in latest edition of ASME/ ANSI B31.8, API-1104, OISD-141 & respective OISD etc. and/ or Technical Specification which will be supplied to bidder at site during or prior to execution work or as per the instructions/ directions of the Engineer-in-charge, which will be binding on the Contractor.

A. Tests and Inspection

- The **CONTRACTOR** shall carry out the various tests as enumerated in the technical specifications of this bid document and the technical documents that will be furnished to him during the performance of the work and no separate payment shall be made unless otherwise stipulated.
- All the tests either on the field or at outside laboratories, concerning the execution of the work and supply of materials by the **CONTRACTOR** shall be carried out by **CONTRACTOR** at his own cost.
- The work is subjected to inspection at all times by **TPIA**. The **CONTRACTOR** shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this bid, the technical documents and the relevant codes of practice furnished to him during the performance of the work.

B. Erection and Installation

The **CONTRACTOR** shall carry out required supervision and inspection as per Quality Assurance plans and furnish all assistance required by **GGL**/ **TPIA** in carrying out inspection work during this phase. **GGL** will have engineers, inspectors or other authorized representatives present who have free access to the work at all time. If **GGL**/ **TPIA**'s representative notifies the **CONTRACTOR**'s authorized representative not lower than a foreman of any deficiency, or recommends action regarding compliance with the specifications, and the HSE, the **CONTRACTOR** shall make every effort to carry out such instructions to complete the work conforming to the specifications. HSE requirements and approved drawings in the fullest degree consistent with best engineering practice.

2.3.28 LINE DRAWINGS AND PIPE BOOK

CONTRACTOR shall prepare Line Drawings of pipeline section showing as laid pipeline Reference measurement with respect to permanent structure, Direction change i.e. Horizontals and the Verticals, and chainage and submit it to **GGL**/ **TPIA** daily.

Further **CONTRACTOR** shall prepare a pipe book as per approved format and weld book along with the line diagram indicating pipe number, joint numbers and submit it to **GGL** after completion of each spread/ section before hydrostatic testing.

2.3.29 DOCUMENTATION

As –Built drawing shall be provided in standard template provided by **GGL** with all required information's. The following points shall be taken care to the preparation of as built drawings.

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- As laid drawings should be suitable scale and shall be submitted. The drawings shall be in layers according the AUTOCAD features category.
- Pipeline feature shall be shown as a continuous line, breaks only at joints, fittings, valves, tee point, etc. Diameter, Pipe material, length, and location of pipeline whether on the road or footpath, should be clearly indicated.
- Distance of pipeline from a permanent property/ structure should be provided at least for every 20 meters. If there is a change in alignment/ orientation and offset distances of the pipeline in between the above said 20 mtr, the same shall be clearly mentioned in the as laid. Gas objects shall be shown as block objects with respect to **GGL** defined symbols/ legend. As laid drawings shall be as per the approved legends provided by EIC.
- Details & offset distances from other utilities present (e.g. BSNL/ MTNL etc.) should be given in as laid drawing. The details (material, size &. Length) of additional protection provided to pipeline shall also be clearly indicated.
- Manual boring/ HDD or any other major crossing shall be highlighted
- Details of the valves & other fittings used (i.e. tees, elbows, etc.) should be shown with adequate information orientation & Offsets from permanent structures in the immediate vicinity.
- Technical deviations (if any) should be provided with reference to the buildings permanent structures around, and the same should be cited clearly with all the relevant details, including separate sketches/ Blowups/ sectioned drawings/ exploded view.
- Total as laid-length (size wise), bill of materials should be mentioned in each sheet.
- Specific remark should be provided where sufficient depth is not maintained.
- Complete details of nala crossings should be shown in a separate sketch.
- Names of roads, major landmarks and buildings should be mentioned appropriately for reference.
- Proper Chainage shall be mentioned on all the drawings to be referred with continuation reference.
- Direction of gas flow shall be indicated in each of the drawings.
- Location and type of marker shall be incorporated in network as-built drawing.
- Text on the as laid drawing should be clearly visible.
- As laid drawings shall be duly signed & stamped by area Owner or Owner's representative.
- **CONTRACTOR** to refer **GGL** guideline and templates for preparation of as-built drawings.
- Notwithstanding the provisions contained in standard specifications, upon completion of WORK, the **CONTRACTOR** shall complete all of the related drawings to the "AS BUILT" stage (including all vendor/ sub vendor drawings for bought out items) and provide the owner, the following.
- Two complete set of full size reproducible drawings (Soft Copies - Digital format, in latest available version/ informed by GGL of AutoCAD, in CDs or USB – 3 sets)
- One complete set of original size prints and a copy of the entire set (Hard Prints)
- Soft copies/ scan copies of all project documents in CDs or USB – 3 sets

"Hand Over Take Over Document"

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CONTRACTOR shall prepare and submit Hand over Take over Documents (2 Set) along with as built drawing one day before the commissioning as part of documentation.

Completion Document

The **CONTRACTOR** as a part of completion documents shall submit during and immediately after the construction in original, in hard binder as well as 3 set of CD as a minimum but not limited to the following;

A. Pipeline activities

- SOP generated from specifications for each activity approved by **GGL/ TPIA**.
- Progress Report of Various activity (Daily/ Weekly and Monthly)
- Inspection and Test reports of Various activity
- Testing, Flushing and Clearing Reports.
- Welding Procedure Qualification Report.
- Welder Qualification Report.
- Electrode Qualification Test Report.
- Radiographic Procedure Qualification.
- Pipe Book
- As built up drawings and alignment sheets.
- Certified Copy of material test certificates and consumables for Pipeline supplied by **CONTRACTOR**
- All the document mentioned in the Technical Specification
- Calibration Reports of all Testing Equipment's.
- Pre-commissioning report
- Commissioning checklist.
- Final closeout report

B. HSE activities

- Training/ HSE briefing records
- HSE Plan and Review Documents
- Records of SSRA & Tool Box talk
- Records of Closing of Non Conformities
- Site photos
- Final Closeout report
- Waste Disposal records

This shall as a minimum include but not limited to the following: -

C. Daily:

- Progress Report

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- Machinery deployed Report
- ROW Clearing Grading Report
- Stringing Report
- Trenching Report
- Line up & Welding Report
- Radiography Report
- Field joint Coating Report
- Lowering Report
- Tie in Report
- Backfilling Report
- Restoration Report
- Marker Installation Report
- Material take off report
- Welder Performance report
- Cold Field Bending Report
- Cased Crossing
- HDD Crossing
- Concrete Coating and Repair
- Weld Repair
- Dye Penetration Report
- Ultrasonic Testing
- Tie in Joints
- Painting report

D. <u>Inspection Report of critical activity.</u>

- Material take off Report
- Welder Performance Report
- Welding Parameter Conformance Report
- Field joint Coating/ Damage Report
- Summarized Progress Report.

E. <u>Weekly:</u>

- HSE Reports (Hazards, Near Miss, Accident, Training etc.)
- Progress on procurement activity (including material requisition status report)
- Progress Review Report

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- Planning for the next week
- Activity completed (Major Milestone)
- Resource Deployed Man – Machine
- Material Balance Report.

F. Monthly:

- Planned v/s Actual percentage progress/ progress curves
- Area of Concern/ problem/ hold ups, impact and recovery action plan
- Status against HSE Plan/ Monthly HSE performance Report
- Summary of Major events/ activity
- Construction Photographs

G. Testing, Flushing and Clearing reports:

a) All the reports of Hydrostatic Testing;

- Pigging and Cleaning report.
- Water filling.
- Air volume calculation.
- Thermal stabilization data report.
- Pressurization Report.
- Pressure Holding Data Report.
- Dewatering Report.

b) Swabbing and Drying Reports

c) Pneumatic Testing.

d) Nitrogen Purging Report

e) Commissioning Report

2.4 HEALTH, SAFETY AND ENVIRONMENT (HSE)

2.4.1 SCOPE AND APPLICATION

CONTRACTOR are the key stake holder and an integral part of **GGL** business. **CONTRACTOR'S** Quality, Health, Safety and Environment (QHSE) performance reflects on the **COMPANY'S** business performance and reputation. **GGL** has established QHSE Management Systems, Procedures & Guidelines to ensure compliance with **GGL's** QHSE requirements. These requirements apply to all jobs whilst conducting work for **GGL** including; Project, Construction, Operation & Maintenance, Field Operations and Services within any given contract or agreement.

The overall objective of QHSE management in contract/ agreement is to improve the company and **CONTRACTOR'S** QHSE performance in all aspects of activities. Active and on-going participation by both the **GGL** and **CONTRACTOR** is essential to achieve this objective.

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2.4.2 RESPONSIBILITIES

- It is responsibility of **GGL** management and staffs to ensure that all **CONTRACTORS** work under their direction & control are provided with relevant Integrated Management System (IMS) Policies, Procedures & Guidelines that describe the **GGL** requirements for undertaking work within the **COMPANY**. It is also the responsibility of **CONTRACTORS** to ensure that their staff are informed of and comply with **GGL's** requirement whilst working for the company.
- **GGL** HSE department provides advice and assistance on QHSE requirements across the complete spectrum of all work activities. Contract Owner (Department Head) and Contract Holder (Work in-charge) are responsible to ensure safe execution of work/ service include the following:
- Ensuring that the QHSE Policy, Procedures & Guidelines are known and understood by all **CONTRACTORS'** staff and work force
- Monitoring, Inspecting & Auditing execution of work, activities to ensure adherence to the QHSE compliance requirements
- The **CONTRACTORS'** will take the responsibility for implementation of **GGL's** QHSE Policy, Procedures, Guidelines and other requirements with the advice and support of the **GGL's** Contract Owner/ Contract Holder and HSE representative.
- **CONTRACTOR** to ensure that all aspects of QHSE are adequately addressed and implemented in accordance with the QHSE requirements and QHSE Management Plan, which shall include the management processes and activities to be implemented during the course of work.
- **CONTRACTOR** shall be responsible for ensuring that adequate HSE resources are put in place to enable satisfactory implementation of QHSE Management Plan.
- This responsibility also applies to ensure the Health and Safety of the people are directly and indirectly engaged/ involved whilst working or present at GGL's work area/ sites.

2.4.3 MOBILIZATION

- Post selection and awarding of **CONTRACT**, **GGL** shall arrange a kick-off meeting with **CONTRACTOR** where **GGL** team members Contract Owner (CO), Contract Holder (CH) & HSE representative) will discuss on QHSE Management aspects/ plan and requirements in order to make sure that **CONTRACTOR** and their team are fully understanding the expectation of **GGL**. During the meeting, QHSE Management Plan shall be discussed and agreed between **GGL & CONTRACTOR**.
- **CONTRACTOR** shall ensure that all tools, tackles, equipment, machineries & instruments are adequately deployed and are 'Fit for Purpose'. Pre mobilization checks/ inspection shall be carried out by **GGL** team for the same before the start of work.
- **GGL** emphasizes on the importance of the Health and Fitness of all staff/ work force deployed at **GGL** work sites. Contractor/ Service provider shall adhere to medical check-up as per the GGL Health check-up matrix (as applicable)
- A proper HSE orientation and training will be organized by GGL for the **CONTRACTOR** workforce before the start of work; under no circumstances should the **CONTRACTOR** commence the work unless they have undergone the HSE training (as applicable)
- **CONTRACTOR** shall ensure that all their staff/ work force is provided required Personal Protective Equipment (PPEs) as per GGL PPE matrix (as applicable)

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- **CONTRACTOR** shall ensure all required emergency arrangements like Medical treatment, FIRST AID box and Firefighting equipment (as applicable)

2.4.4 EXECUTION

- **CONTRACTOR** shall follow and comply with GGL ''Work Permit'' system
- During work execution and activities, **GGL** team will regularly monitor and evaluate the performance of the **CONTRACTOR** to identify the shortfalls and weaknesses and assist to improve the overall performance including QHSE performance through CPAR process (as applicable).
- We believe that everyone at GGL, Employees, Contractors, Service providers and Associates have the right to go home safely to their families.

  Remark: Issuance of MEMO against HSE non compliances including above mentioned defaults shall be decided by Contract Holder

QHSE Defaults and Penalties (As applicable)		
SN	**Description**	**Penalty amount**
1	LTI	Refer penalty matrix for further details
2	Non-compliance - HSE Engineer	
3	Un authorized work	
4	Work without PTW/ WA	
5	Non-compliance - Safety Training Card (STC)	
6	Non-compliance - Health Check up	
7	Non-compliance – PPEs	

2.4.5 QUALITY and HSE GUIDELINE (AS APPLICABLE)

- **CONTRACTOR** shall ensure that all staff/ work force comply with the requirements of the **GGL** HSE Management System, Quality policy, HSE policy, standard, procedures, guideline, plan & Life Savers at work site
- **CONTRACTOR** shall ensure issuance of Identity Card to their team members
- **CONTRACTOR** shall apply and obtain Permit to work (PTW/ WA) before start of the work
- **CONTRACTOR** shall arrange work related Personal Protective Equipment (PPEs) for their staff/ work force and ensure proper use during the execution of job
- **CONTRACTOR** shall carry out the work within the duty hours'/ office hours. No Work shall be carried out without permission of **GGL's** representative beyond the official duty hours unless otherwise agreed upon prior to start of work and recorded appropriately
- **CONTRACTOR** shall ensure that all tools, tackles, appliances, machines, vehicles, instruments or other equipment are Fit for Purpose and maintained safe working condition at all times and are used only by authorized and competent persons

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- **CONTRACTOR** shall ensure that all the QHSE requirements are properly discussed for any sub-contracted activities with **GGL**. No such activity shall be performed without clearance from **GGL** management
- **CONTRACTOR** shall ensure that all Hazards, near miss, accident, incident, injuries are reported promptly to **GGL**. Action arises due to reported Hazards, near miss, incident investigation; audit/ inspection shall be closed out as per agreed timelines with site in-charge
- **CONTRACTOR** shall deploy staff & work force trained, qualified and competent for the work and well aware of risks and mitigation action/s for the activities undertaken
- **CONTRACTOR** shall make necessary arrangements for safe custody of equipment, materials in stores/ warehouse and at site
- **CONTRACTOR** shall ensure safe transportation, storage and handling of materials to prevent any damage which may impair safe performance of the equipment/ material etc.
- **CONTRACTOR** shall initiate immediate actions to hospitalize injured person(s)
- **CONTRACTOR** shall ensure an injury free, incident free workplace and protect people from harm caused by work activities
- **CONTRACTOR** shall ensure use of seatbelts while driving four-wheeler and use of crash helmet for Two wheeler riders during job execution
- **CONTRACTOR** shall ensure Lock out and Tag out (LOTO) after de-energizing and double check before starting any jobs. In case of conducting job for the purpose of fault finding & monitoring of voltage & current it is to be considered live working and all PPE'S to be worn to avoid exposure of flash arc current
- **CONTRACTOR** shall take note that the use of open wires in sockets, use of wires with tape joints shall not be accepted at work site.
- **CONTRACTOR** shall ensure proper collection, storage and disposal of solid/ liquid waste as per **GGL** procedure and guideline
- **CONTRACTOR** staff/ work force shall not smoke or resort to misuse of drugs, medicines or alcohol while on duty.
- In case of any incident like fire, gas leakage etc. due to gross negligence of the **CONTRACTOR'S** staff/ work force, **GGL** reserves the right to impose penalty up to actual damage cost and or termination of work order depending upon the gravity of the situation.
- Any breach of the QHSE requirements shall be deemed by the **COMPANY** to be a material breach of the terms & condition of the contract. GGL shall be entitled to take appropriate actions including instructing the contractor to (a) remedy the breach; (b) suspend the work or (c) terminate the contract.
- All activities shall be carried out as per GGL's documented procedures and QHSE requirements, deviation from it shall be dealt with very strictly

2.4.6 GENERAL SAFETY REGULATION

- **CONTRACTOR** shall comply with all HSE related statutory requirements including labor laws relevant to the activities. Legal compliance matrix shall be prepared by **CONTRACTOR**.

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- In respect of all labor, directly or indirectly employed in the WORK for the performance of **CONTRACTOR**'s part of this agreement, the **CONTRACTOR** shall at his own expense arrange for all the safety provisions as per safety codes of Indian Standards Institution, The Electricity Act, the Mines Act and such other acts as applicable.
- **CONTRACTOR** shall maintain first aid facilities for its employees and those of its SUB-**CONTRACTOR**.
- **CONTRACTOR** shall adhere to safe construction practice and guard against hazards and unsafe working conditions and shall comply with **GGL/ TPIA**'s safety HSE standards (Refer to **GGL**'s Life saver)
- All critical incidents shall be reported promptly to **GGL**.
- **CONTRACTOR** shall carry out HSE Management. **CONTRACTOR** shall prepare the job Specific Risk Assessment after detail site survey and Mitigation Action Plan according to "Risk register". It will be approved by **GGL** Project in charge. The same will be displayed on site and will be discussed in daily tool box as projects progress.
- **CONTRACTOR** shall depute qualified and experienced HSE engineer to undertake HSE related activities of job.
- All necessary personal safety equipment as considered adequate as per approved PPE Matrix provided by **GGL** should be kept available for the use of the persons employed on the SITE and maintained in condition suitable for immediate use, and the **CONTRACTOR** shall take adequate steps to ensure proper use of equipment by those concerned.
- "**CONTRACTOR**" shall ensure that all the near misses occurred during execution of the contract are reported time to time to **GGL**. Any hazard spotted while on job shall be reported to **GGL** for further mitigation.
- The "**CONTRACTOR**" shall ensure that all the HSE requirements are properly discussed for any sub-contracted activities with the staff employed to do the sub-contracted activity. No such activity shall be performed without clearance from **GGL** Work In-Charge.
- "**CONTRACTOR**" shall strictly abide by the approved work permit system/ Permit to Work wherever applicable and explained by the **GGL** work in-charge.
- All personnel working in the project shall be trained & educated for Basic Safety awareness as per requirements of **GGL**. He/ She shall be well aware of risk and mitigation action/s for the activities undertaken.

2.4.7 HEALTH SAFETY & ENVIRONMENT (GENERAL)

The "**CONTRACTOR**" shall act as an independent "**CONTRACTOR**".

Before initiating activities against the order, "**CONTRACTOR**" and **GGL/ TPI** representative should ensure following:

- The employee only belongs to the **CONTRACTOR** are allowed for the work at site
- All the employee of **CONTRACTOR** is checked for "Medically fit".
- **CONTRACTOR** shall comply with all HSE life saver requirements.
- Deployed equipment, Machinery, tools & Tackles are inspected for "Fit for Use" before it sent to the site for performing the activities. Equipment "fit for use" shall be available with equipment at site and

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same shall be reviewed timely.

- **CONTRACTOR** shall prepare a separate HSE plan for execution of various activities at site. The same shall be approved by **GGL** before start of work.
- Site Specific Risk Assessment is done on daily basis and in case of change in site conditions
- Risk Mitigation plan for each risk is decided as per the OSHAS Risk register communicated by **GGL**.
- First aid facilities shall be maintained at each site, office, and store. Trained first aid provider shall be provided by **CONTRACTOR.**
- A Toolbox talk is conducted at each site/ activities with all the involved to updates them on each risk with required Mitigation action.
- **CONTRACTOR** shall erect and maintain barricade required in connection with this operation to guard the work site as directed by **GGL**.
- **CONTRACTOR** shall ensure proper disposal of solid/ liquid waste and shall ensure to follow the legal requirements associated with waste handling and shall maintain waste disposal record. If found appropriate, these requirements shall form part of the HSE orientation discussions held before commencement of the job.
- **CONTRACTOR** must ensure that tools, appliances, machines, vehicles or other equipment which are going to be used for the job are periodically inspected and maintained. The **CONTRACTOR** shall maintain records of these inspections and modification activities. **GGL** reserves the rights to verify these records and prohibit use of items not found fit for use.
- **CONTRACTOR** personnel shall not smoke or resort to misuse of drugs, medicines or alcohol while on duty. **CONTRACTOR** shall also ensure that in no case the ability of his employees to carry out their assigned duty is impaired by use of the substances mentioned herein.
- **CONTRACTOR** shall comply with all applicable statutory requirements.
- No child labor below 18 years of age shall be employed by the **CONTRACTOR** during the execution of job.
- Qualified employee If behave unsafely at site shall be disqualified for working at site
- The safe working practice Guideline for specific pipeline construction related activities is implemented during execution of projects.
- **CONTRACTOR** shall ensure that as a minimum, but not limited to, these guidelines shall be followed and ensured by its personnel/ sub-**CONTRACTOR** at work site/ office at all the times.

2.4.8 SAFE SYSTEMS OF WORK (GUJARAT GAS LIFE SAVERS)

Safe Systems of Work provide the foundations for safety in all of our activities, it is one of the most important and critical Life saver for our business. It covers almost all operations and affects everyone at **GGL**.

- No work is to proceed unless a risk assessment has been carried out.
- All persons must be trained and competent to carry out the intended task.
- Before starting work, an appropriate emergency plan must be established and tested.
- Daily site plan must be communicated to **GGL**.

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- Before starting work, check if permit to Work (PTW) is required.
- The PTW must have a detail scope of work, clearly identifying hazard and associated risk and control measures.
- The PTW must be issued by a competent authority.
- All relevant information should be communicated to all involved in the work through Tool Box talk before start of the work/ activities.
- PPE's must be as per risk assessment and as per any additional minimum site requirements
- Before working on isolated facilities, check that all electrical, process and mechanical isolations have been completed by the appropriate authorized person.
- Change to plant and equipment or procedures must place via an approved management of change procedure.
- If not sure about the task or ability to perform safely, stop the job and discuss it with Engineer In charge.
- Ensure adequate control in handover to normal operations.

2.4.9 SAFE WORKING PRACTICE - GUIDELINES

Some of the safe working practice guidelines for specific pipeline construction related activities are given in the following sections. **CONTRACTOR** shall ensure that as a minimum, but not limited to, these guidelines shall be followed and ensured by its personnel/ sub-**CONTRACTOR** at work site/ office at all the times.

1. Equipment

All the equipment present on the site, regardless of its purpose, must be kept in faultless condition and be suited to the work (Fit for Purpose) to be carried out.

Activity wise critical equipment shall be identified and list) will be prepared. Identified equipment will be checked through government approved and recorded.

The equipment must be regularly checked by an authorized person and any defect in the equipment must immediately be repaired and action taken report is filled Safety devices which were originally part of the equipment must never be removed or adapted without the express approval of the owner and/ or the engineer and after the submission of a clear written justification for the adjustment concerned.

The instruction for use and safety and health instruction must be made available upon simple request by the owner.

2. Working at Height

The work to be carried out at Height is evaluated shall be considered as working at height as per **GGL** approved guidelines/ procedures. The same shall have proper fall prevention systems viz. Scaffoldings, platforms etc. apart from the above all personnel shall be provided with safety harnesses as line of defense.

All scaffolds and ladders shall be inspected by Designated Competent person before allowing personnel to work at heights.

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It is ensured that the persons trained in working with safety belt, fall arrestor, scaffolding are allowed to work at height

A warning tape just below the work at height is provided and warning boards are displayed to restrict entry into that protected area. This is ensured to protect the injury to the person due to fall of object or person from height.

3. Electrical Safety on Site

Inspection

every electrical installation at site, including generators, distribution cabinets, etc will be inspected on site by a Recognized inspection agency before it is brought in to service; any defect must be reported immediately.

Cables and connections

Distribution panels must remain closed at all times during use. The connection to distribution panels may only be made using approved and waterproof plugs

The electrical cables for connection to the various users of site electricity shall be in impeccable condition and shall be protected in a sufficient manner. In places where traffic must run over the connecting cables, they must be buried with a protective sleeve. The same rules are applicable for the connections of the cables. Furthermore, they must be watertight.

All connections must be at least suitable for use in humid conditions.

Earthing

Both the central electrical site installation and any stand-alone generators will be fitted with proper Earthing for which the Earthing resistance will be checked before use.

Metal site shed and material containers will each be properly earthed to rule out the possibility of the structure becoming live.

The central electrical site installation will be equipped with a suitable earth switch with circuit-breaker.

Electrical tools

Electrical hand-tools must confirm to the stipulations of the regulations of the Country concerned, be in impeccable condition and be suitable for the work to be carried out. They must be properly earthed or double-insulated.

Welding transformer and generators must be equipped with a power limiter that will guarantee the prescribed safety current.

In closed area, tunnels, deep construction pit and damp crawling spaces, only tools with safety current may be use.

4. Working in confined space

As far as possible it is checked whether work can be carried out from outside, to avoid the entry in confined space.

If at all work is to be carried out in confined space **GGL** guidelines/ procedure shall be followed. Further, prior to start of the job, the hazards shall be identified, risk assessment shall be carried out,

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necessary control measures/ safety precautions specific to work site are finalized and methodology is worked out for safe completion of the job.

The precautions for work in confined space are mentioned in the permit which includes protection of trench, storage of execrated soil defined permit space, authorized entrants, the hazards of the permit space, elimination or control of hazards before entry to permit space, environment test, rescue and emergency arrangements, communication system, etc.

When testing for atmospheric hazards, test first for oxygen, then for Combustible gases and vapors, and then for toxic gases and vapors if applicable. Parameters for non-hazardous atmospheres shall be referred as per GGL approved Guideline for working in confined space.

It is ensured that work at confined spaces is carried out by deputing adequate manpower; working at confined space alone is prohibited.

If gas fumes, vapors can enter the space physical isolation of the valves of gas pipelines is ensured and in all cases check is made to ensure that isolation is perfect.

It is ensured that entrance to confined space is big enough so that the persons entering can enter/ climb in or out with equipment put on like self-breathing apparatus etc at ease and entrance provide easy access & egress in an emergency.

If required, mechanical ventilation shall be arranged to ensure that fresh air is available inside.

5. Road Safety and Driving Management

All vehicles used for transportation within **GGL** sites/ premises shall comply with the current RTO rules.

Seat belts shall be used by all passengers travelling by four wheelers and crash helmets shall be used for travelling by two wheelers.

6. Loading & Unloading of line Pipe

Supervisor in charge should ensure that no one remains in a position of danger in the course of loading/ unloading operation.

All lifting equipment/ gears shall be inspected and tested by competent personal as per statutory requirement and test certificate shall be available at work site. All critical safety aspects of equipment shall be checked by site supervisor before taking in use.

In no case transportation of material shall be allowed using Cranes except the shifting within site if approved by the engineer in charge. The shifting within site is only permitted on approval of mitigation actions based on site specific risk assessment approved by contract holder.

The crane operator shall be skilled and experienced. He must know and comply with the standard lifting hand signals and should have approved lifting plan at Site. Ensure compliance with **GGL** life saver requirements.

CONTRACTOR to follow GGL approved procedure and guidelines for lifting of material.

a. CONTRACTOR to ensure that lifting equipment selected for job has sufficient lifting capacity and reach to handle the intended load.

b. CONTRACTOR to use correct type of wire ropes based on usage. The wire ropes must be properly maintained to prevent ropes from snapping during operation.

c. Lifting equipment shall be equipped with appropriate safety devices which will stop, prevent the

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equipment from entering in to an unsafe mode of operation. Proper functioning of safety devices shall be ensured and shall never be by-passed during normal operation.

d. Consideration to be given for type of material, centre of gravity, method of rigging, type of ground, obstacles anticipated, lighting conditions and environment conditions during planning and execution of lifting operation.

e. Area affected during lifting operation shall be clearly demarked to inform and prevent persons who are not involved from entering in to the affected area.

f. Every person/s shall be adequately trained and competent to carry out respective function/ duty properly.

7. Stacking in tailor and transportation of line pipes

a. Driver should be trained and qualified for required job.

b. Pipe tailor should be inspected and made "Fit for use" by issuing Equipment

c. Pipes should be firmly supported from bottom and sides, and so secured that during trailer movement on rough road, pipe does not roll off.

d. Pipe should be protected from sides on the tailor by providing vertical supports and tied up with the Belts or chain with adequate protection/ Soft packing against the damage of coated line pipes.

e. Red light/ red flag signal shall be fitted at the outer most end of pipe stack to warn off the road traffic.

f. Care should be taken at turning, crossings, bridge etc.

g. While parking the trailer, traffic should not be affected.

8. Storing/ Stacking of line pipes at Yard/ Site

a. Pipes should be so firmly supported so that they do not roll off, and provide easy/ safe access for inserting slings for lifting. Open ends of pipes shall be capped with a securely closed metal/ plastic cap or plug as approved by **GGL/ TPIA**.

b. U grooved type wooden support with PE/ Rubber sheet shall be used for pipe stacking.

c. Sandbags or wooden chip bags should be provided as supports to avoid damage on the wrapping/ coating of pipe.

d. Pipes should not be stored on the road affecting traffic.

e. The stored pipes shall be fully covered with full barricading all along the sites to avoid unauthorized entry of any one.

f. Pipe size and crane lifting capacity to be kept in mind for lifting number of pipes in one operation.

g. During lifting of pipes, no one should be allowed to stand under the hanging load.

h. Pipes should be so firmly covered during monsoon to avoid corrosion of Pipes

9. Excavation and Backfilling of trench

a. Underground utilities should be referred before starting excavation and trial pit should be excavated first.

b. It is to wear safety shoes/ gumboots during manually excavation.

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c. Appropriate warning signboards to be displayed at work place ("road closed-work in progress" or "go slow-work in progress" boards).

d. Bypass road should be available before closing the road.

e. Trench shall be protected using shuttering/ shoring or any other appropriate protection method to prevent collapsing for the depth beyond 1.25 meter.

f. Any cable/ wire found during excavation should be considered as live and care to be taken accordingly.

g. Extra care should be taken for underground gas pipelines.

h. Care should be taken for unsafe electric/ telephone poles. Unsafe poles must be tied properly by ropes to protect them from falling, as electric pole can cause serious accident.

i. Trench should be excavated equally wide, i.e. from top to bottom. Never allow to make it broad from bottom side as cavity, which may collapse any time.

j. While using excavator, care should be taken for traffic on the road.

k. Temporary arrangement should be done at some locations on the trench for crossing/ walking facility with hand rails for public.

l. During monsoon, trench should not be kept open/ exposed.

m. After laying the pipeline, trench should be backfilled properly.

n. Follow **GGL** excavation procedure/ guidelines.

10. Laying/ Lowering of pipeline section in bore hole and trench:

Please refer all precautions mentioned in activity of loading and unloading of the pipes.

a. Lifting equipment like crane, hydra and moving parts etc. should not project towards the road, so as to endanger the traffic.

b. Appropriate warning signboards must be placed on both side of the equipment on the road to warn the traffic to avoid accident-collision.

c. Lifting equipment must be placed securely before lifting pipe section.

d. While using two or more lifting equipment to lift/ lower the pipe section, proper balancing is must. Approved lifting plan shall be available at site.

e. Signals to the operators shall be given by only one authorized person to avoid any confusion. However, STOP signal given by any one will be obeyed for emergency.

f. Overhead electric lines, poles, trees etc. must be watched during operation.

g. Unsafe poles in the trench must be tied with ropes before lifting pipe section.

h. No one shall stand or move under suspended load.

i. Unauthorized persons will not be allowed in restricted area.

j. Care shall be taken for moving parts of cranes.

k. Load should be lifted within the safe working load capacity of lifting equipment and tackles.

l. Instead of shifting lifted load by cranes, load should be lowered and change the suitable location

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of the cranes accordingly.

m. Lifting and lowering operation should be done slowly, without sudden jerks.

n. Entire operation shall be done under responsible person-in charge.

2.4.10 NDT TESTING

1. Dye Penetration test:

a. D.P. cleaning solvents, powder and dye chemicals are harmful to the health. Safety measures written by the manufacturer on the containers/ as per MSDS must be strictly followed.

b. Keep away from flame, fire and hot objects. Do not throw empty can in fire. Do not take internally and avoid smoking during use.

c. Safety goggles/ face shields, masks should be used for protection.

d. Appropriate warning signboards to be displayed at work place

2. Radiography (X-Ray) Test:

a. Since indiscriminate exposure to ionizing can produce biological damage to human body, strict control on human exposure to radiography is essential.

b. Radiography should be carried out during night to avoid public being unknowingly exposed to radiation. Affected area to be cordoned off and necessary warning signboards displayed.

c. No unauthorized personal movement to be permitted in this area.

d. Engineer of the section/ network and local people must be informed in advance about the work, to enable them to inform their persons to stay away.

e. Qualified operator and assistant must be equipped with survey/ dosi meter to measure radiation. Use of alcohol/ drug is strictly prohibited at work site.

f. Use the exact source of radiation. Do not use more powerful source.

g. When not in use the radiation source must be kept away from human presence and keep in safe place.

Appropriate warning signboards to be displayed at work place

3. Holiday detection test:

Sever electric shock is main hazard in the operation of holiday detection test.

a. Persons engaged in this operation must be trained and experienced. Defective instrument shall not be allowed. Appropriate hand gloves and safety shoes must be worn.

b. Test shall not be carried out in wet location and in rain.

c. No one should be allowed to sit on, cross or touch the pipe section during test.

d. The person holding instrument must be alert and watch the situation, to switch off the instrument in the case of emergency.

e. Specified insulated handle to push/ move the ring must be used.

f. Earthing of the equipment shall be ensured.

4. Pressure testing

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a. Standard fittings, instruments, hose, equipment shall be used and test certificates shall be available.

b. Calibrated pressure gauges to be used with appropriate range and gauges must be provided at all required safe locations before starting pressurizing. Appropriate warning signboards to be placed at work place.

c. All required valve keys must be available at work places.

d. During depressurizing and flushing care must be taken for overhead electric lines. Keep away as stones/ particles may cause injury.

e. During flushing, connected hose must be tied/ protected properly from whipping action due to pressure.

f. Communication system shall be established during flushing operation.

g. Permit to work shall be obtained as per **GGL** PTW matrix.

Appropriate warning signboards to be displayed at work place

5. Electric Welding and Gas cutting

Welding and gas cutting operation requires special skills and experience. It is always associated with fire & explosion hazards besides several injuries to personnel if proper care and safety procedures are not followed.

A. <u>Electric Welding:</u>

a. Welding on gas pipeline shall be done only by qualified welder approved by **GGL/ TPIA**.

b. Appropriate warning signs boards must be kept on suitable locations on the road to warn the traffic, in case of welding work on/ near road.

c. All persons engaged in welding and cutting operation shall wear appropriate dresses. The clothes should not be oily, greasy or damp. Avoid wearing pure terelene, nylon and other synthetic fibre clothing's. All persons engaged in welding/ cutting operation must wear appropriate safety appliances like welding hoods or shields, goggles, lather hand gloves, leather or apron, leg guard, safety shoes etc.

d. All combustible materials near and around the place within the reach of flying sparks to be removed, if not possible to be covered by asbestos free fire blanket or sheets. Fire extinguishers must be kept nearby, if hazard exists.

e. Ensure that the place where such job of welding/ cutting is to be done is safe and there is no danger of anything falling from the top as well as risk from traffic movement.

f. Use scaffoldings, full body safety harness shall be used as per **GGL**'s Working at Height Procedure.

g. Metal frames of electric welding machines shall be effectively earthed. All cables and connections must be in sound condition and safe from shock hazards.

h. Welding earth/ ground return circuit shall be provided direct on job end and never be used on steel bars, or pipe line containing flammable gas/ liquid or conduits carrying electrical conductors, which may generate sparks at loose contact surfaces.

i. Canvas screen/ hard barricading should be used wherever it is practicable while arc welding is to be done, for protection of fellow workers & general public from radiation hazards.

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j. In case of generating set, refuelling in running condition is not allowed. Switch off the set and then refuel. Avoid smoking.

k. Portable welding units must not be moved unless the power is shut off.

l. Electrode holder when not in use shall be placed on insulated hook. Live electrode shall not be left on welding shield, gloves or cables and should not be left unattended.

m. Arc weld rod size and amperage of the machine shall be left to the desecration of experienced, qualified welder and shall be within the limits of a required procedure.

n. The welding operation shall be adequately sheltered from wind. Work should be avoided on wet location/ rain.

o. After a welding job completed, the material/ work piece should be chalk marked 'HOT' to warn other workers.

p. Whenever welding is discontinued, machine shall be isolated by operating both switches on the machine and on the power supply line.

q. Ensure adequate fire extinguishers are available at site with trained personals in firefighting.

B. GAS CUTTING & HEATING OPERATION

a. Gas cutting/ heating work shall be done by skilled/ experienced person.

b. Before starting work, all hoses, blow pipe, torch, pressure regulators, gauges and all connections shall be checked thoroughly for any defects, leakage, by experienced person. Greasy or oil soaked hoses shall not be used.

c. No cutting/ heating job shall be carried out unless suitable regulator and pressure gauges are provided.

d. Only standard keys or spanners shall be used to open or close cylinder valves. During work leave key in position on the cylinders for use in emergency.

e. Oxygen cylinder valves and fittings shall never be handled with oily or greasy hands. Acetylene cylinder and accessories, hoses, torches etc. shall never be fitted with parts of copper or copper alloys to avoid forming of explosive compounds.

f. Hoses should be examined before use. Defective hoses shall never be used and replaced immediately.

g. Oxygen and fuel gas hoses shall not be interchanged. (Black or green hose for oxygen, while red or maroon hose for fuel gas).

h. Hoses should not rout over the shoulder or between the legs of persons engaged in works. Hoses shall be protected from falling sparks, flames or slag and damaging by sharp objects.

i. Hoses in use should be replaced when a flash back occurs as it may sustain unseen internal damage. While lighting torch, care shall be taken that flame should not affect any part of the body of self or fellow workers. Torch shall not be dropped during operation.

j. During work breaks torches must be extinguished and lighted torch shall never be left unattended.

k. In case of leakage developing in cylinder, same shall be removed immediately from the work to open & safe space.

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l. Cylinders should never be allowed to come in contact with live electric wires and shall be protected from sparks, flames, arc or slag falling from welding and cutting operations.

m. After completion of job, cylinder valve should be tightly closed, re-place the cap and store at the proper place.

n. Ensure flame arrestors/ NRVs on Oxygen & Acetylene cylinders.

o. Ensure adequate fire extinguishers are available at site with trained personals in firefighting.

6. Portable Power Tools

Electric shock and severe cut injuries are the main hazards, associated in operation of portable power tools like, grinding machine, drilling machines etc. Careless handling and poor modification of electric power tools contributes to accidents.

Following minimum safety precautions to be taken while using electric power tools

a. Only trained person should use it.

b. Always fit or disconnect accessories after removing the electric cord from power supply. Ensure that trigger/ on-off switch on the machine operates properly and it does not operate accidentally.

c. Defective power tool shall not be used.

d. Machine should not be used with direct power supply, without operating switch. Machine should have Three Pin Plug connection facility.

e. The user should wear appropriate dress & safety equipment like, safety goggles, face shields, safety shoes etc., for protection against flying metal chips.

f. Earthing/ grounding must be provided for electric tools.

g. Never start machine when its rotating component is in contact with work piece or any object. Ensure that the moving parts have come to a complete stop, before placing it on the floor.

h. Excess force during its use may break the disc/ tool resulting in accident.

i. Special care must be taken while using it in overhead position.

j. Power supply should be disconnected after completion of the job and tool should be stored in proper safe place.

k. Use double insulated portable power tools.

l. Use of grinding disc with correct speed rating. Never use disc whose validity is expired.

7. Hand Tools

Accidents by hand tools may cause effects like sprain in muscles or fracture of bones, puncture wounds & infection, falls, sever cut injuries, abrasions, loss of eye and other injuries, due to following main causes

a. Using wrong tools.

b. Using defective tools.

c. Using tools incorrectly.

d. Unsafe keeping/ carrying of tools.

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e. Failing to use proper dress/ personal protective equipment.

f. Improper modification& inspection.

All concerned supervisors/ personal of **CONTRACTOR** should take care about above causes of accidents.

2.4.11 SITE CLEANING/ RESTORATION

The **CONTRACTOR** shall take care for cleaning the work site from time to time for easy access to work site and also from safety point of view.

Work site should be always kept clean to the entire satisfactions of **GGL/ TPIA**. Before handing over any work to **GGL**, the **CONTRACTOR** in addition to other formalities to be observed as detailed in the document shall clear the site to the entire satisfaction of **GGL/ TPIA**.

The Contractors shall carry out the trench restoration and compaction as detail below

The space all around the pipes shall be cleared of all roots, grass, shrubs, rank vegetation, brushwood, tress, sapling, rubbish, debris, brick bats etc. Filling with excavated earth shall be done in regular horizontal layers each not exceeding 20 cm in depth. All lumps and clods exceeding 8 cm in any direction shall be broken. If the excavated material is not suitable for backfill, as determined by ENGINEER, suitable material shall be hauled in and utilized and the rejected material hauled away and disposed of. Backfill material shall be brought to approximately the optimum moisture content and then watered and consolidated with steel rammer or ½ tonne roller until maximum dry density is achieved as determined by the standard proctor Test as per IS 2720 (Part VII) or a higher value if one is required in particular circumstances. Roller shall not be used in the close proximity of other structures at the edges of the trench, roller shall be used minimum 1.5 meter away from the boundary of such structures. Where specified, top most layer shall be consolidated with 8.0 tonne power roller in case required and/or as specified by local authority.

The **CONTRACTOR** shall carryout restoration as per permission authority requirements mentioned in Permits and also as per the satisfaction of the nominated person of the authority at no extra cost to **GGL**.

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3. SPECIAL TERMS OF CONTRACT (STC) - TECHNICAL

3.1 GENERAL

a. Special Terms of Contract (STC) shall be read in conjunction with the Schedule of Rates, General Terms and Conditions of Contract, Material Specifications, Specifications of Work, Drawing and any other document forming part of this contract wherever the context so requires.

b. Wherever it is stated anywhere in this Bid document that such a supply is to be effected or such and such a work is to be carried out, it shall be understood that the same shall be effected/ carried out by the **CONTRACTOR** at his own cost, unless a different intention is specifically and expressly stated herein or otherwise explicit from the context.

c. The materials, design and workmanship shall satisfy the relevant Standards/ Codes, the job specifications contained herein and codes referred to. Where the job specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied. In the absence of any Standard/ Specifications/ Codes of practice for detailed specifications covering any part of the work covered in this Bid document, the instructions/ directions of **GGL/ TPIA** will be binding on the **CONTRACTOR**.

d. The **CONTRACTOR** shall acquaint himself with the access to the site, availability of local facilities such as railway sidings, transport facilities, material and labour and shall provide suitable allowance in his quotation. The **CONTRACTOR** quoted price shall take into account all expenses likely to arise in this regard.

e. The intending bidders shall be deemed to have visited the site and familiarized themselves thoroughly with the site conditions before submitting their bid. Non familiarity with the site conditions will not be considered a reason either for extra claims or for not carrying out work in strict conformity with drawings and specifications and HSE requirements.

f. In case of contradiction between referred Standard, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, Schedule of Rates, the following shall prevail in order of precedence.

- Letter of Acceptance along with Statement of Agreed Variations
- Schedule of Rates as enclosures to Letter of Acceptance
- Fax of Intent/ Letter of Intent
- Job/ Material Specifications with reference to SOR
- AFC drawings
- Technical Specifications
- Special Terms of Contract
- General Terms of Contract
- Indian Standards
- Other applicable Standards

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3.2 PROJECT SPECIFIC REQUIREMENT

3.2.1 PROJECT TIME PERIOD

3.2.1.1 Project time period include planning and scheduling of all activities starting from liaising & obtaining permission from concerned authority, material procurement, mobilization of man power and machinery to commissioning and completion of construction including station piping.

3.2.1.2 All project work shall be executed as per the time period suggested by **GGL** and as agreed by **CONTRACTOR** and **GGL** during kick off meeting. **CONTRACTOR** shall adhere to the agreed execution program. The same can be reviewed and changed based upon requirement as when needed in joint consultation with **GGL**. All balance permissions & free issue material required as per scope of contract shall be issued by GGL progressively.

3.2.1.3 **CONTRACTOR** shall complete all work as per the Scope of Work within Completion Time Period/ Maximum Project Timelines of the respective Project **OR** within **90 days** of receipt of last Permission/ Free Issue Material **GGL**, whichever is later.

3.2.1.4 **CONTRACTOR** shall refer SECTION-V: Special Terms of **CONTRACT** of the Tender Document for completion time period/ maximum project timelines of the respective project.

3.2.2 QUALITY ASSURANCE/ QUALITY CONTROL PROGRAM

CONTRACTOR shall strictly adhere to the Quality Assurance Plan agreed with the **GGL** as per **GGL** approved specifications, guidelines and procedure.

3.2.3 THIRD PARTY INSPECTION

During the execution of work, entire/ part activity shall be carried out under the "Third Party Inspection". The brief scope of **TPA** shall be as follows:

SR. NO.	ACTIVITY DESCRIPTION	PROPOSED SCOPE	FREQUENCY
[A] – Pipeline			
1	**Review of Documents;**		
1.1	Quality assurance and Material Test certificate (**CONTRACTOR** procured material)	Review	
1.2	Material Test certificate for consumables	Review	
	Instrument calibration	Review/ Witness	
1.3	Instrument Test certificate	Review	
1.4	WPS/ PQR, Drawings: Alignment sheet & cross sections	Witness & Review	
1.5	Verification of Measurement Sheet for Bill	Review	
2	**Pipeline Construction;**		

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SR. NO.	ACTIVITY DESCRIPTION	PROPOSED SCOPE	FREQUENCY
2.1	Trenching & Backfilling	Random Inspection	Daily
2.2	Welding & Laying	Random Inspection	Daily
2.3	Stringing & Hauling	Random Inspection	Daily
2.4	Field Joint Coating & Coating repair	Random Inspection	Daily
2.5	Special Installation	Random Inspection	Daily
2.6	Review of construction reports	Random Inspection	Daily
2.7	Railway, Canal and Major crossings	Witness ,Check, Review	Daily
3	**Destructive and Nondestructive test;**		
3.1	DP Test	Witness	Daily
3.2	Ultrasonic Test	Witness100% of total weld Inspection	Daily
3.3	Radiographic examination		Daily
3.4	All Destructive testing	Witness	
4	**Testing;**		
4.1	Approval of Pipe book	Review	
4.2	Hydro testing including pigging, final cleaning & drying	Witness	
4.3	Pneumatic Testing	Witness	
5	**Pre-commissioning**	Witness	
6	**Commissioning**	Witness	
7	**HSE Compliances**		
7.1	Site Specific Risk Assessment and ensuring risk mitigation plan in place	Witness	Daily
7.2	Tool Box Talk	Participation/ Briefing	Daily
7.3	Lesson Learnt Sharing	Briefing	As when required
7.4	Un Safe actions	Interventions	Daily
7.5	HSE Documentation/ Data	Verifications	Daily
[B] – Cathodic Protection			
1	**Approval of Documents;**		
1.1	TCP design basis document and detail design document	Approval	

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SR. NO.	ACTIVITY DESCRIPTION	PROPOSED SCOPE	FREQUENCY
1.2	Material and Equipment Specification and Data sheet	Approval	
1.3	Detail Bill of Material	Approval	
1.4	QA/QC Plan	Approval	
2	**Review of Documents;**		
2.1	Material Test certificate (**CONTRACTOR** issue material)	Review	
2.2	Material Test certificate for consumables	Review	
2.3	Instrument calibration Instrument Test certificate	Review/ Witness	
2.4	Drawings	Review	
2.5	Verification of Measurement Sheet for billing	Witness	
2.6	Bill	Review	
3	**Installation**		
3.1	TLP Unit	Random Inspection	Daily
3.2	TR Unit and Anode Bed	Witness	Daily
4	**Testing and Commissioning of TCP System**	Witness	

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However, above scope should be referred with approved QAP.

During the execution of work, entire/ part activity shall be carried out under the "Third Party Inspection". The brief scope of **TPA** shall be as follows:

1. **"Review"** means checking, identifying & certification of the documents for conformance of standards & specifications.
2. **"Witness"** means physical inspection & certification of activities for conformance of standards & specifications
3. "**Approved"** shall mean approved in writing including subsequent written confirmation of previous verbal approval and `Approval' means approved in writing including as aforesaid.
4. "**Prepared**" shall means collect information and documents, and reporting to the concern persons.
5. "**Perform**" shall means deliver/ execute actions to deliver the required level of performance

6. "**Certification**" shall mean ensures and confirm the quality parameter confirming to code, standards and the specifications

7. **CONTRACTOR** shall submit QA/QC procedure along with equipment/ instruments to be used for various activities e.g. Welding, Laying, Hydro Testing, Pigging, and Commissioning before starting of work and it shall be certified by **TPA** before commencement of job.

8. Cutting/ Welding of pipeline shall not be allowed after Hydro Testing/ Pigging operation. **CONTRACTOR** shall carry out additional work as and when asked by **GGL/ TPIA**.

3.2.4 WORK EXECUTION

The work requires a special skill and attention as majority work will be on live gas network. The **CONTRACTOR** is required to understand the full scope of work detailed in the bid. The **CONTRACTOR** is also required to keep sufficient equipment, skilled manpower to act on an emergency work that may arise while executing the hook up on live pipeline without any additional cost to **GGL**.

CONTRACTOR shall be prepared to work simultaneously in number of spreads with different crews for the activity of construction and modification to expedite the work for timely completion, without any additional cost to **GGL**.

CONTRACTOR has the option to demonstrate alternate method of mobilization at the Bidding stage itself so as to complete the work safely as per schedule. In either case, **CONTRACTOR** shall submit relevant "Job Execution Statement" along with resource allocation and planning before starting the contract. The same shall be properly supported with proposed manpower and equipment deployment chart.

3.2.5 EMERGENCY RESPONSE PLAN

In case of any injury or an accident at the site, the **CONTRACTOR** shall immediately inform the **GGL** Engineer of the incident and further take immediate steps to take the injured person(s) to any of the **GGL** nominated hospitals. The payment for such hospitalization/ medical treatment shall be borne by the **CONTRACTOR**.

3.3 PAYMENT CLAUSE

Terms of Payment

Basic and terms of payment shall be as under:

3.3.1 LAYING OF PIPELINE AND ASSOCIATED WORK

- **75% progressively on carrying out ROU survey, clearing and grading of RoU, pipeline stringing, trenching, pipeline welding/ tie – in, field joint coating, pipeline lowering, sand filling, backfilling of trench and restoration of site.
- 15% on hydro testing, dewatering, checking, drying & holding positive N2 pressure
- 10% after 3 months from **CONTRACT** closure date (i.e. Submission of As-Built drawings, Documents etc.) OR after commissioning of project, whichever is earlier including submission of NOC from authorities to **GGL** and final acceptance by **GGL**.

** This payment will be released on completion of lowering of pipeline and restoration of site and no intermediate stages will be accepted. Also this payment will be released upon completion of continuous stretch of 1000 Mtrs subject to the completion of entire scope of work as per the claimed payment stage from Zero Point (up-stream) to Last Claimed Point with exemption of critical crossing

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like River Crossing/ Railway Crossing or any length pending due to **GGL** Scope.

3.3.2 CROSSING (RAIL, ROAD AND RIVERS IDENTIFIED SEPARATELY WITH SOR)

- 90% on completion of all related work including post installation hydro testing and dewatering
- 10% on submission of NOC from authorities to GGL and final acceptance by GGL

3.3.3 FOR ALL SUPPLY ITEMS AND FOR ANY OTHER ITEMS

- 90% on supply including submission of test certificates, drawings (wherever applicable), **TPIA** inspection release note and final acceptance by GGL Engineer.
- 10% on installation, testing and commissioning

3.4 WARRANTY/ DEFECT LAIBILITY PERIOD

Warranty period for materials supplied and installed by **CONTRACTOR** for all the services executed under the above scope of work and defect liability period for all the services provided by **CONTRACTOR** shall be **12 (Twelve) months** from the date of completion of services as certified by **OWNER/ GGL/ ENGINEER IN CHARGE**.

3.5 PENALTY CLAUSE

Service Level, Penalty & Reward

The following critical parameter describes the system performance and service level expectations and requirements during the Implementation phase of contract. The service level includes target performance measures, unacceptable measures and the related penalties for not meeting required service levels.

Sr No	Parameter	Service Level Agreement	Penalty
1	Reportable Incident	Zero Incident	Rs. 20,000 per LTI*
2	Non deployment/ short fall of resources	Deployment of …. **1. Manpower** Site Supervisor, HSE QA/QC engineer, Qualified Welder at site throughout the project execution **2. Equipment** Lifting, trenching, pipe welding equipment/ machineries "Fit for Use" at site	Rs. 5,000 per month beyond absence of 7 days.

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3	Compliance to GGL Requirements	Performance rating less than 65% against CPAR	Following actions to be initiated against observation of noncompliance at site. • Warning letter to be issued. • If no improvement observed after issuing of warning letter, penalty to be imposed as below. ➢ First Instance Rs. 2500/- ➢ Second Instance Rs. 5,000/- within 3 months of first instance. ➢ Third Instance Rs. 10,000/- within 3 months after second instance. On reporting of any further incident, GGL will take action as deemed fit.
4	QHSE Penalties	Un Authorized Work	Rs. 10,000/- per day
		Working without PTW/ WA	Rs. 10,000/- per day
		Non – compliance – Safety Training Card	Rs. 1,000/- per Employee
		Non – Compliance – Health Check up	Rs. 2,000/- per Employee
		Non – Compliance – PPEs	Rs. 500/- per employee

***LTI (Loss time Injury)**

A disabling Occupational Injury which results from a work related activity or from a single instantaneous exposure in the work environment and that results in a person being unfit for work beyond the day of the incident. Where the injured party returns to work on the following day but subsequently has to take time off as a result of the injury this shall count as a Lost Time Injury.

CONTRACTOR shall read all above Special Terms of CONTRACT (STC) in conjunction with SECTION-V: Special Terms of CONTRACT (STC) of the tender document.

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4. LIST OF ENCLOSURES

- Annexure-1: Technical Specifications for Pipelines
- Annexure-2: Technical Specification for Piping
- Annexure-3: General Technical Specifications for Civil construction and allied works
- Annexure-4: Technical Specifications for Supply, Installation, Testing and Commissioning of various electrical items in GGL
- Annexure-5: List of Approved Vendors for supply of materials
- Annexure-6: Forms and Formats
- Annexure-7: Typical Drawings
- Annexure-8: Sub-Contractor Qualification criteria

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Approved

Approval Note : TECHNICAL SCOPE FOR LAYING, TESTING AND COMMISSIONING OF STEEL PIPELINE NETWORK (LENGTH 5 TO 50 KMS)
Approval Note Ref. No. : GGL/TS/STEEL/18-19/002 Rev.01
Proposed by : Priyanka Mittal
Proposed On: 19-Jun-2020

Approval details:

Action	Action By	Sign	Date	Remarks
Review	Harshil Shah		19/06/2020 12:28:06 PM	
Recommend	Dharmesh Sailor		19/06/2020 12:31:34 PM	
Approve	Nagendra Kishore Verma		19/06/2020 3:00:26 PM	

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Approved