

General Condition of Contract

for

Construction of Ro-Ro Yard at Pipavav AT APM TERMINALS, PIPAVAV

Construction of Ro-Ro Yard at Pipavav AT APM TERMINALS, PIPAVAV

GENERAL REQUIREMENTS

<u>Table of Contents</u>	<u>Page</u>
A100 SUMMARY	1
A101 GENERAL	1
A101.1 Application	1
A101.2 Abbreviations and Acronyms	1
A101.3 Definitions.....	2
A101.4 Reference Standards.....	2
A101.5 Contract Drawings	2
A102 EXISTING PORT FACILITIES.....	2
A103 WORK COVERED BY CONTRACT DOCUMENTS.....	3
A103.1 General.....	3
A103.2 Deleted	3
A103.3 Deleted	3
A103.4 Deleted	3
A103.5 Deleted	3
A104 MULTIPLE CONTRACT SUMMARY	3
A104.1 Summary of Works by Others.....	3
A104.2 Contract Interfaces and Rights of Access.....	3
A105 SITE AND WORK RESTRICTIONS	4
A105.1 General.....	4
A105.2 Sea state and Weather Forecasting	4
A105.3 Ground Conditions.....	4
A105.4 Access to Site	4
A105.5 GPPL Port Operations	5
A105.6 Permissions and Permits	5
A200 ADMINISTRATIVE REQUIREMENTS.....	5
A201 PROJECT MANAGEMENT AND COORDINATION.....	5
A201.1 Project Coordination Meetings	5
A201.2 Multiple Contract Coordination Meetings	6
A201.3 Weekly Site Meetings	6
A201.4 Contractors Emergency Contact Details	7
A202 CONSTRUCTION PROGRESS DOCUMENTATION.....	7
A202.1 Detailed Construction Sequence and Methodology	7
A202.2 Contract Programme.....	7

A202.3	Submittals Schedule	9
A202.4	Construction Progress Reporting	10
A202.5	Periodic Work Observation	11
A202.6	Photographic Documentation.....	11
A203	SUBMITTAL PROCEDURES	12
A203.1	General.....	12
A203.2	Requests for Information	12
A204	REGULATORY REQUIREMENTS.....	12
A204.1	Permits, Permissions and Statutory Approvals.....	12
A205	HEALTH AND SAFETY REQUIREMENTS.....	14
A205.1	General.....	14
A205.2	Health and Safety Manager	15
A205.3	Health and Safety Management Plan	15
A205.4	Training.....	17
A205.5	Mandatory Port of Pipavav Employer's Induction Programme.....	17
A205.6	Personal Protective Equipment	17
A205.7	Substances Hazardous to Health.....	18
A205.8	Use of Nuclear Gauges	18
A205.9	Safety Audits	18
A205.10	Incidents and Accidents.....	19
A206	ENVIRONMENTAL REQUIREMENTS	19
A206.1	General.....	19
A206.2	Construction Environmental Management Plan (CEMP).....	20
A206.3	Project Specific Environmental Requirements.....	22
A206.4	Protection of Marine Environment	22
A206.5	Protection of Land Environment.....	22
A206.6	Control of Soil Erosion, Sedimentation and Water Pollution	23
A206.7	Introduced Organisms.....	24
A206.8	Pollution from Batching Plants	24
A300	QUALITY MANAGEMENT	25
A301	QUALITY MANAGEMENT SYSTEM REQUIREMENTS	25
A301.1	General.....	25
A301.2	Project Quality Plan (PQP).....	26
A301.3	System Element Procedures.....	26
A301.4	Hold Points & Witness Points	26
A301.5	Documentation	27
A301.6	Inspection and Test Plans (ITP's)	27

A301.7	Sampling and Testing	27
A301.8	Storage of Samples	29
A301.9	Inspection	29
A301.10	Identification and Traceability	29
A301.11	Records.....	30
A301.12	Non-conformance	30
A301.13	Surveillance and Audit.....	30
A301.14	Subcontractors.....	31
A400	TEMPORARY FACILITIES AND CONTROLS	31
A401	GENERAL	31
A401.1	Contractors Site Establishment Plan	31
A402	TEMPORARY UTILITIES	32
A402.1	General.....	32
A403	CONSTRUCTION FACILITIES.....	32
A403.1	Contractor's Site Compound.....	32
A403.2	First Aid Facilities	32
A403.3	Sanitary Facilities	33
A403.4	Provision of Field Laboratory	33
A404	TEMPORARY WORKS AND CONSTRUCTION AIDS.....	35
A404.1	General.....	35
A405	VEHICULAR ACCESS AND PARKING	36
A405.1	Contractors Site Access Management Plan.....	36
A406	TEMPORARY BARRIERS AND ENCLOSURES.....	37
A406.1	General.....	37
A407	TEMPORARY CONTROLS	38
A407.1	General.....	38
A408	PROJECT IDENTIFICATION.....	38
A408.1	General.....	38
A500	PRODUCT/MATERIALS REQUIREMENTS	38
A501	COMMON REQUIREMENTS	38
A501.1	General.....	38
A501.2	Approval of Manufacturers and Suppliers	39
A501.3	Samples.....	39
A501.4	Alternatives or Equivalent.....	40
A501.5	Delivery, Storage and Handling Requirements.....	40
A502	TESTS AND STANDARD OF ACCEPTANCE.....	40
A502.1	General.....	40

A502.1	Testing and Approval of Material	41
A502.2	Sampling of Materials.....	41
A502.3	Rejection of Materials not conforming to the Specifications	41
A502.4	Testing and Approval of Plant and Equipment.....	41
A600	PROJECT EXECUTION	41
A601	EXAMINATION AND PREPARATION	42
A601.1	Construction Work Method Statements	42
A601.2	Construction and Progress Survey.....	43
A601.3	Protection of Existing Port Infrastructure	44
A602	EXECUTION	46
A602.1	General.....	46
A602.2	Radio Communications	46
A602.3	Construction Plant and Equipment.....	46
A602.4	Repair Methods	47
A603	CLEANING AND WASTE MANAGEMENT	47
A603.1	Site Maintenance.....	47
A603.2	Construction Waste Management and Disposal.....	48
A604	PROTECTING INSTALLED CONSTRUCTION.....	49
A604.1	Use of Surfaces by Construction Traffic	49
A605	COMPLETION PROCEDURES.....	49
A605.1	General.....	49
A605.2	Preliminary Inspection of the Works at Completion	49
A605.3	Inspection of the Works at Completion.....	50
A606	SUBMITTALS AT COMPLETION.....	50
A606.1	Operation and Maintenance Data	50
A606.2	Final Site Survey	50
A606.3	As-Built Drawings	51
A606.4	Warranties.....	51
A606.5	Project Record Documents	51

Appendices

Appendix A100/1	Site Geotechnical Investigation Data
Appendix A100/2	APMT Guidelines on Corruption and Fraud
Appendix A100/3	Civil Construction Safety Guidelines
Appendix A100/4	Contractors Safety Guidelines

Appendix A100/5	Project HSE Specification
Appendix A100/6	Third Party Code of Conduct
Appendix A100/7	Consequence Management
Appendix A100/8	Contract Labour Compliance

A100 SUMMARY

A101 GENERAL

A101.1 Application

A101.1.1 The Specifications shall apply to all Works which are required to be executed under the Contract or otherwise directed by the Engineer.

A101.1.2 The Specifications must be read in conjunction with the Conditions of Contract, Technical Specification, Bill of Quantities, Drawings and other documents forming the Contract documents.

A101.2 Abbreviations and Acronyms

A101.2.1 The following abbreviations shall have the meaning as set forth below:

AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute Committee
ASCE	American Society of Civil Engineer
ASTM	American Society for Testing and Materials
BS	British Standard published by British Standards Institution
CD	Chart Datum for the Port of Pipavav
CEMP	Construction Environmental Management Plan
CWMS	Construction Work Method Statement
GPPL	Gujarat Pipavav Port Limited
HAT	Highest Astronomical Tide
HAZID	Hazard Identification
HSE	Health, Safety and Environment
IR	Industrial Relations
IRC	Indian Roads Congress
IS	Indian Standard published by the Bureau of Indian Standards
ISO	International Standards Organisation
ITP	Inspection and Test Plan
LAT	Lowest Astronomical Tide
LPG	Liquefied Petroleum Gas
MBMA	Metal Building Manufactures Association
NCR	Non-Conformance Report
OSCP	Oil Spill Contingency Plan
PQP	Project Quality Plan
QA	Quality Assurance
QC	Quality Control
RL	Reduced Level
RTG or RTGC	Rubber Tyred Gantry Crane
UCS	Unconfined Compressive Strength

A101.2.2 The Contractor shall use the above abbreviations and nomenclature on its documentation.

A101.3 Definitions

A101.3.1 The words like Contract, Contractor, Engineer, Drawings, Employer, Government, Works and Site used in this Specification shall be considered to have the meaning as understood from the definitions of these terms given in the Conditions of Contract.

A101.3.2 The following definitions and abbreviations shall be in addition to definitions and abbreviations that appear elsewhere in the Contract.

“Approved” Means accepted by the Engineer in writing, but such acceptance shall not relieve Contractor of its obligations under the Contract

“Port of Pipavav” The site identified on the drawings.

“Harbour Master” Means any person who is appointed, or deemed to be appointed, from time to time under and for the purposes of administering Indian and local laws and regulation for the Port, including the area where the Site or the Works is situated.

A101.4 Reference Standards

A101.4.1 The Work covered by this Specification shall comply with the latest editions and revision notes of Indian standard or British standard or other recognised International Standards.

A101.4.2 The latest edition of all Standards till 30 (thirty) days before the final date of submission of the tender, shall be adopted. The Contractor shall maintain a copy of the latest editions of the Standards, Laws and Codes applicable to the work to be undertaken on site.

A101.4.3 The Contract Documents reference a number of codes, standards and guidelines. In some cases, these documents may be in disagreement or conflict. Where conflicts or omissions are identified, the Contractor shall notify the Engineer who shall make a determination and advise the Contractor accordingly. The Engineer’s determination will generally adopt the most conservative or stringent requirement.

A101.5 Contract Drawings

A101.5.1 The responsibility for preparation of design and drawings is with the Contractor for this contract.

A102 EXISTING PORT FACILITIES

A102.1.1 The existing port facilities at the site are as shown in the Drawings and in general include the following;

- Berths 1 - 4 and associated approach bridges, yard and stockpile areas and conveyors. Berths 1-3 are generally used for the loading, unloading and storage of coal and other bulk/break bulk cargo. Berth 4 is used for handling containers;
- Existing Bulk Liquid Jetty and associated approach bridge and pipelines used for the loading and unloading of bulk liquid cargos including liquefied petroleum gas;

- Freight rail sidings and port access roads; and
- Associated offices, warehouses and container freight station facilities.

A103 WORK COVERED BY CONTRACT DOCUMENTS

A103.1 General

A103.1.1 The Works under this Contract are for the construction of Construction of Ro-Ro Yard at Pipavav, India.

A103.1.2 The following major items but not limited are to be constructed under this Contract.

- a) RORO Yard Construction
- b) Precast pavement
- c) Toilet Block & Offices
- d) In/Out Gate
- e) Electrical works
- f) High Mast
- g) Fencing
- h) Fire Fighting
- i) Sewage & Storm Drain
- j) Raw Water supply network
- k) Other utilities and miscellaneous works

A103.1.3 The Works shall be carried out by the Contractor in accordance with Design & Drawing approved by the Employer.

A103.2 Deleted

A103.3 Deleted

A103.4 Deleted

A103.5 Deleted

A104 MULTIPLE CONTRACT SUMMARY

A104.1 Summary of Works by Others

A104.1.1 The works to be carried out under this Contract, may be carried out by others under separate contracts.

A104.2 Contract Interfaces and Rights of Access

A104.2.1 The work being carried out by others under separate Contracts is interdependent with the works to be carried out under this Contract. Accordingly, restrictions shall be imposed on the timing and nature of Rights of Access to the Site granted to the Contractor for the execution of the works under this Contract.

A104.2.2 The locations and layouts of the defined Contract Site Portions are shown on the Drawings. Rights of access to the various Site Portions shall be granted by the Engineer to suit progress on Site. It is anticipated that these

will be in line with the dates and conditions specified in the Tender Document and subject to the requirements and conditions this Specification.

- A104.2.3 The Contractor shall remain responsible for the overall sequencing and programming of his works and shall make due allowance for these requirements and shall clearly state all assumptions made in this regard in his Tender submission.

A105 SITE AND WORK RESTRICTIONS

A105.1 General

- A105.1.1 Information given in this section relating to the Site shall be read in conjunction with the relevant provisions of the Conditions of Contract.

A105.2 Sea state and Weather Forecasting

- A105.2.1 The Contractor shall subscribe to the Indian Meteorological Department weather forecasting service for the coastal area around Port of Pipavav.

A105.3 Ground Conditions

- A105.3.1 Relevant site geotechnical investigation data obtained by others is provided in Appendix A100/1.

- A105.3.2 Other existing geotechnical data for the site is identified (but not contained) within the documents provided in Appendix A100/1 and is available for viewing at the Employers offices upon request.

- A105.3.3 Borehole data indicated are only represented as accurate for the exact location where the borings were made. No warranty expressed or implied is given for data contained in the Technical Information made available to the Contractor with the Tender Documents.

- A105.3.4 The Contractor shall undertake additional test for satisfy himself as to the character of the materials to be penetrated and shall assume all responsibility and risk involved therein. The cost of additional test are included in contract price.

A105.4 Access to Site

- A105.4.1 The Port of Pipavav is located in Saurashtra in the state of Gujarat, India. The port is located in a tidal inlet on the south west side of the Gulf of Khambat, approximately 152 nautical miles northwest of Mumbai at latitude 20° 54'N and longitude 71° 30' E. Marine access is from the South through the Western Channel. The port is connected to National Highway 8E via the existing 10km long access road. The nearest railway station / airport are at Bhavnagar, approximately 150km from Pipavav.

- A105.4.2 The location of the works, general Site particulars and access to the Site are as shown on the Drawings. Road access to the site is via. the existing Port access road off National Highway 8E. The Contractor shall be responsible for establishing his temporary access road within the designated Site Portion as shown on the Drawings and subject to the restrictions on Right of Access for this Site Portion as specified in Clause A104. The Contractor shall submit details of any temporary works associated with the construction and operation of his temporary access road as part of his Site Establishment

Plan and Site Access Management Plans as specified in Clause A400 of this Specification.

- A105.4.3 Access to the Site and all of the Contractor's works shall be subject to compliance with GPPL Port access and security requirements as specified in Appendix A100/10.

A105.5 GPPL Port Operations

Port Operations have Priority

- A105.5.1 The Site is located within a working port and the operations of the port shall have priority over all and any marine or land-based construction works / operations unless otherwise directed by the Harbour Master or by GPPL port operations personnel.

- A105.5.2 The Contractor shall plan all work in advance and in consultation with the port management team including the Harbour Master and GPPL port operations personnel. The Contractor shall have contingency plans in place that allow the Contractor to efficiently relocate any land or marine plant to areas that are not affected by port operations. This is deemed to be included in the Contractors prices and programme.

A105.6 Permissions and Permits

- A105.6.1 The Contractor shall obtain all required permissions and permits from local/state authority as per Law.

The Contractor shall verify the site and local working environment and fully conversant with local challenges like compliance of local laws and swift synchronisation with local communities, dealing with local administrations etc. shall be singularly responsible for execution of all works inside and outside the port boundary by coordinating with the local community and authorities as required for successful completion of the project

- A105.6.2 The Contractor shall ensure that all plans and procedures developed in accordance with the requirements of the Contract are integrated with those of the port operations at Port of Pipavav and to the satisfaction of the Port Operation.

- A105.6.3 The Contractor shall make all arrangements with and obtain the necessary approvals from the Relevant Authorities as directed by the Engineer for temporary traffic arrangements and control.

- A105.6.4 The Contractor's operations may involve work during mobilisation, repairs and maintenance, or demobilisation near LPG, cargo, coal, fuel and bunkering berths and terminal areas. The Contractor shall comply with all of the Employer's or Port's Operations Manual and regulations pertaining to those areas and obtain the necessary permits.

A200 ADMINISTRATIVE REQUIREMENTS

A201 PROJECT MANAGEMENT AND COORDINATION

A201.1 Project Coordination Meetings

A201.1.1 The Contractor's Representative shall attend regular meetings as required by the Engineer to coordinate and manage the interface between the Works under this Contract and adjacent port operations (landside and marine). The frequency of such meetings may vary depending on the nature of the interface and associated Works, however the Contractor should anticipate that meetings will be held at least fortnightly. throughout the duration of the Contract.

A201.1.2 The Contractor shall be responsible for establishing and maintaining direct lines of communication with the relevant parties for the day to day coordination of his construction activities with existing landside

A201.2 Multiple Contract Coordination Meetings

A201.2.1 The Contractor's Representative shall attend regular meetings as required by the Engineer to coordinate and manage the interface between the Works under this Contract and Works by others under the separate Contracts as identified elsewhere in the Contract. The frequency of such meetings may vary depending on the nature of interface and associated Works, however the Contractor should anticipate that meetings will be held at least weekly on average throughout the duration of the Contract.

A201.2.2 The Contractor shall be responsible for establishing and maintaining direct lines of communication with the relevant parties for the day to day coordination of his construction activities with any associated Works by others.

A201.3 Weekly Site Meetings

A201.3.1 The Contractor's Representative shall attend Weekly Site Meetings to be chaired by the Engineer to discuss the progress of the Works and other relevant matters. The Weekly Site Meeting agenda shall be as determined by the Engineer but will typically include but not be limited to:

- Adoption of Previous Minutes;
- Outstanding Matters;
- Health and Safety;
- Quality Assurance;
- Interface Coordination & Special Business;
- Progress of the Works
- Programme Milestones, Achievements and Slips;
- Plant and Equipment;
- Survey and Clearance of the Works;
- Sea state Conditions;
- Contractual Matters;
- Progress Payment Claims and Payments;
- Other Business

A201.3.2 When required by the Engineer, specialist meetings covering occupational health and safety; environmental management and quality shall be held independently of the weekly meeting with the Contractor's specialist

personnel in attendance. Any unresolved issues arising from these supplementary meetings shall be included and form part of the weekly meeting.

A201.3.3 Daily contact and informal discussions shall also be held each day between the Engineer and the Contractor's Representative.

A201.3.4 Additional results of discussions between the Engineer and the Contractor shall be conveyed to the Contractor's surveyors and HSE staff and advisers and the Contractor's section heads and shall also occur in order to distribute agreed reviews of the forthcoming day's and short-term programme and any specific issues arising at that time.

A201.4 Contractors Emergency Contact Details

A201.4.1 Prior to commencement of construction Works the Contractor shall provide to the Engineer, and all other relevant government agencies, the 24-hour contact telephone number of two (2) persons with authority over the Works during the construction period. The persons shall have authority to take immediate action to shut down any activity, or to effect any emergency measures as directed by the Engineer or any other relevant government agencies.

A202 CONSTRUCTION PROGRESS DOCUMENTATION

A202.1 Detailed Construction Sequence and Methodology

A202.1.1 The Contractor shall be responsible for scheduling, actions, personnel, materials and any other thing necessary to achieve completion of the whole of the Works within the Time for Completion and subject to the restrictions on the granting of Right of Access to the Site and use as specified in Section A104.

A202.1.2 At the same time as submission of the detailed time programme (in accordance with Clause 8.3 of the Conditions of Contract), the Contractor shall, submit to the Engineer for approval, the Detailed Construction Sequence and Methodology including mechanical equipment proposed to be used, sequence of various activities and the overall schedule from start to end of the project.

A202.1.3 The Detailed Construction Sequence and Methodology shall be consistent with the overall sequencing of the construction methodology submitted in the Contractor's Tender and shall provide additional details of the Contractor's proposed method of construction and sequence of work.

A202.1.4 The Works shall be planned such that proper site safety, drainage and free flow of traffic is maintained at all times and the Contractors works sequence and scheduling shall conform with any additional construction sequence or phasing requirements and shall include due allowance for all inspection, testing and document review requirements nominated on the Drawings and/or elsewhere in this Specification.

A202.2 Contract Programme

General

- A202.2.1 The Contractor shall submit detailed time programmes to the Engineer in accordance with the requirements of Clause 8.3 of the Conditions of Contract and subject to the additional requirements of this Specification.
- A202.2.2 The work programme shall be submitted in both A1 hard copy and MS Project electronic format in the form of a Critical Path Method (CPM), GANTT Chart or other form approved by the Engineer.
- A202.2.3 The work programme shall be consistent with the overall sequencing of the programme submitted in the Contractor's Tender and shall provide additional details of the Contractor's proposed method of construction and sequence of work including but not limited to the following:
- (i) All major activities;
 - (ii) Time required for gaining any permits, permissions or approvals as may be required under the Contract;
 - (iii) Time required for the submission and approval of materials, procurement of critical materials and equipment, fabrication of special products/equipment etc;
 - (iv) All activities of the Employer that are likely to affect the progress of the Works etc.;
 - (v) All logical dependencies between the major activities;
 - (vi) The time and sequence required for executing the Works broken down into activities not exceeding one month;
 - (vii) Dependencies between items of work as normally identified in Critical Path Analysis methods in precedence GANTT form;
 - (viii) The minimum duration of each item of work;
 - (ix) All relevant time, site or other restraints including those imposed by the Tender Documents;
 - (x) Milestones with their dates;
 - (xi) The sequence of activities that form the critical path for the completion of the project;
 - (xii) The proposed human resources and plant for each item of work on the critical path;
 - (xiii) Interfaces with Works by others;
 - (xiv) Any work to be subcontracted with the name of the subcontractor identified;
 - (xv) Points of interface between the Contractor and the Engineer;
 - (xvi) All contract milestones, including inspections, contract acceptances and testing;
 - (xvii) Each separable portion of the Works if applicable.
 - (xviii) Total float on all activities and the Critical Path;
- A202.2.4 The overall programme duration shall take account of statutory holidays and any other applicable construction industry or corporate holidays.
- A202.2.5 The base unit of measurement of activity duration will be one calendar day. The Contractor shall specify the normal weekly hours to be worked for all labour and major items of plant.

- A202.2.6 The Contractor shall show, on the Activity/Time Chart, the critical path, indicate which activities shall be undertaken on a twenty-four (24) hour per day basis and show the time for each activity in sufficient detail to enable an assessment to be made of the progress of the activities and toward completion of the Works.
- A202.2.7 If the Engineer is of the opinion that the detailed programme submitted by the Contractor does not enable the Engineer to readily evaluate the Contractor's progress, the Contractor shall, upon being so notified by the Engineer, continue to submit amendments of the detailed programme until the said programme is approved by the Engineer. If so required by the Engineer, the Contractor shall amplify or further breakdown any part of the Construction Programme.
- A202.2.8 At such time the programme is approved in writing by the Engineer, it shall become and thereafter be referred to as the approved Contract Programme. The Contractor shall adhere to and perform the Works in accordance with the approved Contract Programme unless otherwise agreed in writing by the Engineer.
- A202.2.9 The Contractor acknowledges that the Engineer will rely upon the approved Contract Programme in co-ordinating other work at the Site.

Contract Programme Updates

- A202.2.10 The Contractor shall update the programme throughout the contract period to reflect the actual progress of the Works on site.
- A202.2.11 The Engineer may, from time to time, direct the Contractor to supply to the Engineer with an updated Contract Programme. The Contractor shall within two (2) days after the receipt of such a direction (or a direction given pursuant to Clause 8.3 of the Conditions of Contract) shall supply to the Engineer an updated Contract Programme and shall continue to submit amendments of the Contract Programme until it is approved by the Engineer. The Contractor shall comply with the approved updated Contract Programme when so approved by the Engineer.

Revision of Contract Programme

- A202.2.12 The Contractor may from time to time submit a revised Contract Programme with the purpose of reorganisation of the execution of the Works so as to enable the Contractor to complete the Works in the shortest practicable time. The revised Contract Programme must first be approved by the Engineer and if and when such approval in writing is given the Contractor shall comply with the revised Contract Programme.

Effect of Acceptance or Approval of Contract Programme

- A202.2.13 The acceptance or approval by the Engineer of a Contract Programme or revision thereof shall not relieve the Contractor of its obligation to complete the Works within the Contract Time for Completion and will not give rise to a variation under the Contract.

A202.3 Submittals Schedule

- A202.3.1 The Contractor shall submit all specified documentation in accordance with the requirements of the Contract including the additional submission requirements detailed in this Specification.

A202.4 Construction Progress Reporting

- A202.4.1 During the performance of the Works, the Contractor shall submit to the Engineer, progress reports as defined in this Specification and to the format required by the Engineer in both hard copy and in a digital format until the Contractor has completed all work known to be outstanding at the completion date stated in the Taking-over Certificate for the Works.

Daily Site Records

- A202.4.2 The Contractor shall maintain daily records of the number of each class of the Contractor's Personnel and of each type of Contractors Equipment on the Site along with brief description of the actual construction activities undertaken each day.

- A202.4.3 These records shall be kept in the form of separate pro-forma Daily Site Record Forms corresponding to each day throughout the Works. The Contractor shall agree the format of the Daily Site Record Form with the Engineer prior to the commencement of Works on site.

- A202.4.4 The Contractor shall present the Daily Site Record Form to the Engineer (or delegated representative) each day for agreement. Once agreed, the Contractor and the Engineer shall both sign the Daily Site Record Form and each shall retain hardcopy of the signed form for record purposes.

- A202.4.5 The Contractor shall note that the requirements of this Clause are separate from and additional to the requirements of Clause 6.10 of the Conditions of Contract regarding records of the Contractors Personnel and Equipment.

Weekly Progress Reports

- A202.4.6 The Contractor shall submit at the end of each week to the Engineer a Weekly Progress Report summarising significant progress or problems encountered during the preceding week in respect to all parts of the Works under the Contract.

- A202.4.7 The Contractor shall agree the format and content of the Weekly Progress Reports with the Engineer prior to the commencement of Works on site.

- A202.4.8 The Weekly Progress Report shall include a copy of the current approved Contact Programme outlining progress to date for the major items of the Works, including a statement of the Contractor's programme for the following week and without restricting the generality of the foregoing, shall include reasoned and detailed comments in respect to:

- (i) Activities or items completed during the week, including dates of completion;
- (ii) Activities or items scheduled for completion during the week but not completed (showing details of intended remedial action and comments as to likely effects on the works programme);
- (iii) Changes to the critical path;
- (iv) Activities or items re-scheduled or re-estimated by the Contractor;

- (v) Additional or deleted activities or items;
- (vi) Anticipated slippage or problems and proposed mitigation measures;
- (vii) Future up-to-date target dates for the finalization of the items;
- (viii) Changes to the work programme duration.

A202.4.9 The Weekly Progress Report shall also include details of Safety Statistics, External and Internal Inspections Audits and Reports, Drills, Incidents and Near Misses and a summary of man hours worked and shall contain the approved Daily Site Record Forms applicable to that week as a separate appendix.

Monthly Progress Reports

A202.4.10 In addition to the Weekly Progress Reports, the Contractor shall submit at the end of each month to the Engineer an overall Monthly Progress Report summarising the contents of the submitted Weekly Progress Reports for that month in respect to all parts of the Works under the Contract. The submission of the Monthly Progress Report shall be subject to the requirements of Clause 4.21 of the Conditions of Contract and the additional requirements of this Specification.

A202.4.11 The Contractor shall agree the format and content of the Monthly Progress Reports with the Engineer prior to the commencement of the Works on site. The format and content of the Monthly Progress Report shall be similar to that of the Weekly Progress Reports but with commentary and details of progress given in a monthly rather than weekly context. Copies of the site progress photos for the month shall be provided in a separate appendix.

A202.5 Periodic Work Observation

A202.5.1 Unless specified otherwise elsewhere in this Specification, the Contractor shall give the Engineer not less than 24 hours notice in writing of the intended time for commencement of any construction activities to enable the Engineer to make his arrangements for the inspection of operations on the Site.

A202.5.2 The Contractor shall also give the Engineer not less than 7 days notice in writing of the commencement of any preparation, construction or manufacturing activity occurring at a location not within the site of any article or material to be used in the Works, whether by the Contractor or any Subcontractor stating the time and place of the Works such that the Engineer may make his arrangements for the supervision or inspection of such Works.

A202.6 Photographic Documentation

A202.6.1 The Contractor shall arrange to take colour photographs throughout the Works for the purposes of recording the overall progress of the Works and recording details of each aspect of the Works or as otherwise directed by the Engineer. The photographs shall be of acceptable quality and shall be taken by a professionally competent person with a digital camera having resolution in excess of 10 Megapixels and able to record the date of photographs taken in the prints.

A202.6.2 The Contractor shall submit to the Engineer weekly 6No. CD/DVD's each containing the electronic files of each photograph taken as both a)

uncompressed, full resolution files and b) compressed, reduced resolution files suitable for attachment to email (i.e. <1MB per file). The Engineer shall select the photographs to be retained and the Contractor shall mount two hardcopy prints of each selected photograph in albums of acceptable quality. The albums shall be kept by the Contractor and produced to the Engineer upon request and shall be handed over to the Engineer at the completion of the Works. Compact disc containing the electronic files for the selected photographs shall be supplied each week. Each photograph in the album shall be suitably captioned and the electronic files appropriately named.

- A202.6.3 The Contractor shall take aerial photographs of the site every three months. The photographs shall cover all of the areas of the site. The photographs shall be of high quality and shall be taken by a professionally competent person with a digital camera having resolution in excess of 10 Megapixels and able to record the date of photographs taken in the prints. Aerial photographs shall be submitted to the Employer as both electronic format and three sets of high quality prints at A3 size.

A203 **SUBMITTAL PROCEDURES**

A203.1 **General**

- A203.1.1 All Communications submitted by the Contractor as defined in the Conditions of Contract shall have a unique sequential reference number to facilitate tracking of the Contractors submissions and correspondence by the Engineer.

A203.2 **Requests for Information**

- A203.2.1 Where the Contractor requires additional information or clarification in order to carry out the Works, or where he identifies any ambiguity or inconsistency in the Contract Documents (for instance pursuant to the Conditions of Contract), he shall immediately submit to the Engineer a Request for Information.
- A203.2.2 The Request for Information shall be a pro-forma document with a description of the information required, identification of the relevant references in the Contract documents and the date by which response from the Engineer is required. The format of the pro-forma Request for Information form shall be agreed with the Engineer prior to the Works.
- A203.2.3 The Request for Information forms shall be provided with a sequential number or reference to facilitate tracking by the Engineer.

A204 **REGULATORY REQUIREMENTS**

A204.1 **Permits, Permissions and Statutory Approvals**

- A204.1.1 The Contractor shall comply with all statutory obligations and regulations of any relevant Authority including GPPL, and Department or Division of the Indian Government or their representatives, statutory authorities or services or utility providers or any other relevant body or organisation with authority or jurisdiction in India relating to the execution of the Works.
- A204.1.2 Where any conflict arises between the requirements of the various relevant authorities, the more stringent shall apply subject to the agreement of the relevant authorities.

- A204.1.3 The Contractor shall allow sufficient time in his programme for the issue of any statutory notices including those to port users by the relevant Authorities which may be required prior to the commencement of the relevant Works. The Contractor shall provide the Engineer with evidence that the relevant Authorities have been notified of the proposed Works in accordance with relevant regulations and ordinances.
- A204.1.4 The Contractor shall give notice to the relevant Authorities at least one month in advance of commencement of any new activity and shall keep the relevant Authorities regularly informed of the Works. The Contractor shall liaise with the relevant Authorities to give all information on working areas, types of plant and durations of activities, deemed necessary by the relevant Authorities. The Contractor shall if required also advise the relevant Authorities on completion of each and every separate activity. In particular, at least one months notice shall be given to the relevant Authorities for the removal or relocation of any navigation or mooring buoys affected by the Works.
- A204.1.5 The Contractor shall identify the permissions and submissions that are required by the regulatory Authorities for the performance of the Works. Where required, the Contractor shall prepare and submit to the relevant Authorities for their endorsement details of the proposed construction sequence and methods to be employed on the Works and an action plan as required in the Contract. No construction work shall be commenced prior to the endorsement and approval of the relevant submissions by relevant Authorities. In this respect the Contractor shall note that the relevant Authorities' requirements may include the submission of the following for their approval at least one month in advance of the commencement date of the Works;
- detailed plans of the Works showing the proposed overall limits of the working area(s) and the space requirements of each of the operations;
 - information on the type and operating frequency of all proposed electronic positioning systems;
 - proposed means of communication to be established between the relevant Authorities and marine plant;
 - the name of the person(s) in charge of the Works who can be contacted by the relevant Authorities on a 24-hour basis and means and procedures to contact them;
 - the proposed schedule of all Works carried out under the Contract indicating the different types of operations, their number, duration, space requirements and phasing;
 - a full description of the method for all work activities including the number and type of plant / craft to be employed, together with a complete list of vessels and craft to be used for all types of marine Works, and
 - details of weather conditions in which operations would cease and all working marine craft would be removed from the working area.
- A204.1.6 HSE, are the responsibility of the Contractor. All correspondence between the Contractor and relevant Authorities including all submissions shall be copied to the Engineer. All environmental permitting issues will be dealt through GPPL.

A205 **HEALTH AND SAFETY REQUIREMENTS**

A205.1 **General**

A205.1.1 The Contractor shall comply with all health and safety requirements of the Contract including all statutory requirements, the GPPL Health and Safety Requirements set out at Appendix A100/4 & A100/5 and any reasonable direction issued by the Employer's safety department or authorised personnel of the Employer as may be issued from time to time.

A205.1.2 All works shall be carried out in a safe manner and free from any danger and shall comply with all APMT standard.

The Tenderer shall strictly comply with "**Contractors Safety Guidelines**", "**Consequence Management**" and "**Project HSE Specification**" (in electronic copy provided) and all other local regulations which may be in force from time to time. Tenderer shall strictly follow up Port security rules. Tenderer shall arrange and responsible for all securities of their work site, workers, staffs, materials etc in port area. Tenderer shall responsible for taking necessary permission for the execution of work from respective state/central government authority as required.

1.1 All workers and staffs of Tenderer and Tenderer's sub-Tenderers shall wear safety boots, safety helmets, visibility jackets, safety harnesses at work site and when working at heights during working hours. If any person of the Tenderer fails to maintain PPE requirements, GPPL will fine Rs. 5000/- per occurrence at sole discretion of GPPL. Minimum PPE requirements for all Tenderer personnel at site are Helmet, F. L. Jacket and Safety shoes with steel toe.

1.2 The working hour of individual persons/workers/staffs of Tenderer and Tenderer's sub – Tenderers shall not permit more than 8 hours per day at work site. If Tenderers shall fails to follow up GPPL will fine Rs 10000/- per incident. If Tenderer shall working in 24 hours or in night hour in shifts, the Tenderers shall arrange adequate lighting arrangement and precautions, safety equipments, tools & tackles etc his own cost.

1.3 Tenderers shall strictly follow up vehicle running speed in the port area as under.

- Outside Custom bonded area – 40 km per hour
- Inside Custom bonded area – 30 km per hour
- Jetty and container yard area – 20 km per hour

1.4 If Tenderers shall fails to follow up above speed limit in port area GPPL will fine Rs 5000/- per incident. All the vehicles and equipments used for this work the Tenderers shall comply all applicable rules & regulations.

- 1.5 Chewing and spitting of tobacco, gutka, mava, liquor or any such substances are strictly prohibited in Port area. If any person of the Tenderer found chewing tobacco, he will be sacked from the site and Rs. 5000/- will be fined to the Tenderer.
- 1.6 Staff /workers of Tenderers and his sub-Tenderers shall violations of port safety and security rules, GPPL will fine Rs. 30,000/- for non-compliance report, Rs. 20,000/- near miss report, Rs 10,000/- Observation report per occurrences and Rs. 5,000/- Without PPE per persons.
- 1.7 Tenderers shall submit risk assessment of this work & taken approval from HSSE Department GPPL before execution of work.
- 1.8 Tenderers shall arrange and fix metal barricading surrounding worksite for safety in his risk and cost.
- 1.9 Tenderer shall arrange diversion as per site condition including all required necessary arrangement like manpower, equipments, material etc.
- 1.10 Tenderer shall arrange and fix proper metal scaffolding for staging for the work as per APMT Guidelines and conform the latest IS standard.

A205.2 Health and Safety Manager

- A205.2.1 The Contractor shall have in place a qualified locally experienced and proactive Health and Safety Manager approved by the Engineer prior to commencing the Works. The Contractor's Health and Safety Manager shall be fluent in both English and Hindi (written and spoken). The officer so designated shall be made known to all employees by the posting of his name, designation and photograph in prominent positions on Site. Provision shall be made to provide adequate communication with all members of the work force.
- A205.2.2 The Health and safety Manager shall have full written authority from the Contractor to stop work in the event that he deems necessary.

A205.3 Health and Safety Management Plan

- A205.3.1 The Contractor shall prepare and submit for approval a Health and Safety Management Plan complying with the requirements of the Contract and with all Indian and local laws and regulations and which shall be implemented throughout the Works. The plan shall describe the responsibilities and procedures for all aspects of the safety management on the Works and shall be capable of regular audit throughout the course of the Works.
- A205.3.2 The Contractor shall ensure its Health and Safety Management Plan meets the requirements of Appendix A100/4 & A100/5 and in addition include:

- Safety Policy Statement of Senior Management and a project responsibility matrix;
- Normal protocols for personnel requiring access into and out of Port operational areas e.g. coal, container and LPG terminals of the site;
- Emergency plans for all identifiable potential incidents such as fires, foundering, oil spills and the like;
- Requirements for routine internal safety audits;
- Drills frequency and type. Drills shall be separated into those required for statutory or insurance purposes and additional drills proposed for the Works. Vessels and crew training shall meet the safety requirements of the Contract and of all Indian and Local Government statutory authorities and bodies;
- Emergency evacuation procedures, lifeboat and evacuation drills;
- Certification of crane drivers, in full compliance with Indian requirements;
- the implementation of a procedure for random drug and alcohol testing of all of its employees and staff throughout the execution of the Works to the satisfaction of the Employer. The Contractor shall initiate a Drug and Alcohol Clearance Certificate procedure. Such a certificate must be issued by an appropriate medical authority to each employee before he or she commences work on the site, and the certificate shall be re-validated following any leave period. The Contractor's personnel shall be subject to the Drug and Alcohol Search Procedure set out in Appendix A100/4 & A100/5;
- Job Hazard Analysis. The Contractor shall provide written working procedures, directions including Job Hazard or Job Safety Analysis (JHA/JSA) and undertake drills on all equipment in order to ensure the safe and timely execution of the Works. JHA/JSA, procedure revisions and drills shall be ongoing during the course of the Works according to a programme approved by the Engineer and set out in the Health and Safety Management Plan;
- Fire fighting and emergency breathing apparatus,
- Hazardous materials register and storage;
- Project specific Contractor's site safety inductions for Contractor's Personnel, Employer's Personnel Visitors;
- Any onshore or offshore activities which cannot be undertaken 24 hours per day due to safety or other constraints;
- Accident / Near Miss investigation procedures;
- Competency testing;
- Employee training;
- Tool Box Meetings, Work Area Inspections; Signage, First Aid facilities and trained personnel;
- Equipment lock out procedures;
- Confined space access procedures;
- Auditing frequency;
- Reporting;

- An appendix containing individual Emergency Response Plans for each vessel and which can be used as a quick reference stand alone document by Marine Agencies, Port Control Office and the crews on the Contractor's vessels and work areas in the event on an incident or emergency; and
- Contractors Anti-Child Labour Policy or statement.

A205.4 Training

- A205.4.1 All personnel shall be suitably qualified, experienced and trained by the Contractor for the equipment or duty that they are engaged on.
- A205.4.2 Prior to their employment, all labour and staff shall be given a health check and the Contractor shall keep health certificates of all employees. Workers shall be screened for drug abuse and persons addicted to drugs shall not be employed.
- A205.4.3 A sufficient number of the Contractor's employees who speak the language of the Country shall be fully qualified in first aid so that first aid will be immediately available in case of accident at any time and at any place throughout the Site and any off-site camps, housing or other facility. The persons so designated shall be made known to all employees by the posting of their name, designation and photograph in prominent positions on Site.

A205.5 Mandatory Port of Pipavav Employer's Induction Programme

- A205.5.1 The Contractor's personnel, including the personnel of any lower tiered Contractors or suppliers, shall undergo the Employer's induction programme to the satisfaction of the Contractor. The programmes will be conducted by the Employer at no charge to the Contractor. The Contractor shall make all necessary allowance for the time required for all persons to undergo the Port of Pipavav Employer's Induction Programme. Attendance at the Induction Programme shall be registered by the Contractor and only those personnel that have attended the programme shall be admitted on to the Site. This Induction is in addition to any Site Induction programme that shall be implemented by the Contractor for the Site in accordance with the Contractor's Health and Safety Plan.
- A205.5.2 The cost of all Contractor's personnel's time and expenses to attend the inductions is for the Contractor's account and shall be deemed to be included in the Contract price.

A205.6 Personal Protective Equipment

- A205.6.1 The Contractor shall provide all employees and visitors to the site with Personnel Protective Equipment (PPE), which shall include but not be limited to hard hats, personal self-inflating floatation devices during over-water transportation, construction work and vessel to vessel transfers, safety glasses, safety boots, sun screen lotion, conspicuous work clothing or high visibility vests and the like. Specific PPE shall be provided by the Contractor to all specialist trade employees irrespective of whether they are direct employees or contract service providers.
- A205.6.2 The Contractor shall ensure that PPE is worn by all personnel on site as appropriate and in accordance with the requirements of the approved Health and Safety Management Plan.

A205.6.3 Failure of the Contractor to supply and/or ensure that PPE is used may give rise to an Instruction from the Engineer to cease work in the affected areas of the Works until the situation is remedied to the satisfaction of the Engineer. In this event, the costs of all stoppage and any delays shall be to the account of the Contractor.

A205.7 Substances Hazardous to Health

A205.7.1 The Contractor shall not use or generate any material in the Works which are hazardous to the health of persons, animals or vegetation. Where it is necessary to use some substances which can cause injury to the health of workers, the Contractor shall provide protective clothing or other appliances for security of his workers.

A205.8 Use of Nuclear Gauges

A205.8.1 Nuclear gauges shall be used only where permitted by the Engineer. The Contractor shall provide the Engineer with a copy of the regulations governing the safe use of nuclear gauges he intends to employ and shall abide by such regulations.

A205.9 Safety Audits

A205.9.1 The Contractor's Head Office personnel qualified and experienced to do so, shall undertake audits of the site management performance and project operations during the Works in order to evaluate the degree of compliance of the Contractor's site operations to the Contract requirements for Health and Safety as set out in Appendix A100/4 & A100/5.

A205.9.2 Audits shall be undertaken by an audit team. The audit team shall consist of the Contractor's Head Office Representative (team leader), a Representative of the Employer and an independent specialist experienced in the type of audit being undertaken. The independent audit representative shall be approved or appointed by the Employer and paid for by the Contractor. An audit agenda based on the Contractor's commitments will be prepared and agreed prior to the audit.

A205.9.3 Any audit shall follow the normal procedure for this type of activity with an Entry Meeting, the Audit and a Close Out Meeting where preliminary findings will be discussed direct with the Contractor's project staff. An audit report shall be prepared and agreed by the audit team. Non-compliances shall be actioned by the Contractor.

A205.9.4 Contractor shall routinely audit the use of training aids and drills and provide training and direction to the project management staff and to all masters and crews

A205.9.5 The Contractor's head office personnel shall arrange regular audits of all project management personnel against documented company procedures and Indian Occupational Health and Safety Law and Regulations.

A205.9.6 The Employer shall be entitled to hold a Health and Safety audit of the Contractors safety procedures and the practices on site at any time with no notice. The contractor shall provide all required assistance to the Employer in this respect including access to appropriate information, site areas and personnel. The costs of this assistance shall be borne by the Contractor and no delays shall be attributable to such audit activities.

A205.10 Incidents and Accidents

A205.10.1 Incident and Accident reporting and statistics shall be undertaken to the relevant Indian Standard, Employer's and Contractor's requirements.

A205.10.2 The Contractor shall send, to the Engineer, details of any accident on or about the Site or in connection with the execution of the Works, as soon as practicable and, in any event within 24 hours after its occurrence. The Contractor shall also report such accident to the appropriate Authority whenever such report is required by the Laws. In the case of any fatality or serious accident, the Contractor shall in addition notify the Engineer immediately by the quickest available means.

A205.10.3 If an accident results in an injury to an employee or damage to equipment or release of hydrocarbons from the vessel or requires evacuation of personnel from floating equipment, oil spill clean-up, subsequent hospitalisation of any individual or major repairs to equipment the Contractor shall arrange for a qualified independent third party investigation and report. The third party investigator shall be approved by the Employer.

A205.10.4 A preliminary report shall be prepared and submitted to the Engineer within 24 hours and a detailed report shall be submitted within seven (7) calendar days of the occurrence of the accident or incident. Should any construction activity need to stop work for:

- The duration of the investigation, attendance of witnesses etc;
- Modifications to safety plan, Job Safety/Hazard Analysis;
- Modification and validation of work procedures;
- Government Agency inspections and procedures;
- Any other reason;

then all costs associated with the delay shall be for the Contractor's account.

A205.10.5 The Contractor's attention is drawn to the likelihood that any downtime resulting through loss of life, limb or other serious accident or incident may be considered as prima facie evidence that the Contractor's Works and Safety Management Plan and or Environmental Management Plan procedures and recruitment and training system are inadequate and or deficient. The Employer and other Agencies may require a complete reworking and independent audit of the Contractor's safety system and Job Safety Analysis sub elements and environmental protection procedures. The cost of such delays and reworking of procedures caused by such activities will be to the Contractor's account.

A206 ENVIRONMENTAL REQUIREMENTS

A206.1 General

A206.1.1 The Contractor shall take all precautions for safeguarding the environment during the course of the construction of the Works. He shall abide by all laws, rules and regulations in force governing pollution and environmental protection that are applicable in the area where the Works are situated.

A206.1.2 The Contractor shall observe and comply with all environmental requirements (including all applicable laws, regulations and any requirement of any relevant Authority and any directions of the Engineer), the

requirements of the Environmental Clearance for the permanent Works as held by the Employer and any other requirements that apply to the Site or the Port area generally.

A206.1.3 The Contractor shall apply for and obtain an Environment Permit from the relevant Indian Authorities for the construction Works before commencing work on site.

A206.1.4 Once obtained, the Contractor shall submit evidence of the Permit for the Construction Works to the Engineer for record. The acceptance of this submission by the Engineer shall constitute a HOLD POINT (as defined in Section A300) on the commencement of any construction Works on site.

A206.2 Construction Environmental Management Plan (CEMP)

A206.2.1 The Contractor shall prepare a project specific Construction Environmental Management Plan (CEMP) that meets all applicable environmental requirements (including all applicable laws, regulations and any requirement of any relevant Authority and any directions of the Engineer) that apply to the Site or the Port area generally. The CEMP shall be consistent with all Government Agency project requirements and the Employer's commitments.

A206.2.2 The CEMP shall document the Contractor's auditable compliance with the Contract Requirements and the Employer's environmental policy and obligations set out and shall ensure;

- (i) The application of best practice environmental management for the Contract Works;
- (ii) The implementation of the Employer's environmental obligations as outlined in the project Environmental Impact Assessment (EIA);
- (iii) Compliance of the Works with all relevant and applicable environmental legislation; and
- (iv) That the environmental risks associated with the Works are properly managed.

A206.2.3 The Contractors CEMP shall include but not be limited to the following elements;

- (i) Background
 - (a) Introduction – brief description of the project background and parties involved.
 - (b) Project Description – definition of the nature and scope of the Works including location, construction activities, timing and schedule.
 - (c) CEMP Context – description of how the CEMP fits into the overall planning and environmental approval process and relationship with the Contractors environmental management systems.
 - (d) CEMP Objectives – project specific objectives of the CEMP relating to general site management, special site features and best practice environmental management.

- (e) Environmental Policy – provision or reference to the Contractors environmental policy.
- (ii) Environmental Management
 - (a) Environmental Management Structure and Responsibility – organisational structure, definition of roles and responsibilities and details of personnel responsible for environmental management.
 - (b) Approval and Licensing Requirements – regulatory framework for the project including clearances approvals/consents/licenses, relevant legislation and responsible parties.
 - (c) Reporting – description of environmental reporting requirements for the Works, including a list of all reports to be generated, responsible parties and document control procedures.
 - (d) Environmental Training – description and content of environmental training/inductions to be carried out for site personnel.
 - (e) Emergency Contacts and Response – details of emergency contact persons who can be contacted 24hours a day, 7 days a week and who have authority to stop or direct works in the event of an environmental incident.
- (iii) Implementation
 - (a) Risk Assessment – identification and assessment of actual and potential environmental risks associated the proposed construction activities.
 - (b) Environmental Management Activities and Controls – specification of all environmental management activities, mitigation and control measures to be employed to prevent or minimise environmental impacts including identification or responsible parties, minimum performance requirements and associated monitoring requirements.
 - (c) Environmental Control Plans or Maps – plan(s) showing locations of environmentally sensitive areas, waterways and drains, works areas or other storage areas or stores, control measures and monitoring locations.
 - (d) Environmental Schedules – copies of all forms, reports or registers to be used for the purpose of the environmental management of the Works.
- (iv) Monitoring and Review
 - (a) Environmental Monitoring – description and specification of monitoring requirements of all environmental management activities and controls including details of recording and assessment of monitoring results.
 - (b) Environmental Auditing – description of schedule, scope and procedures for periodic auditing (both internal and external) of the CEMP's implementation and effectiveness.
 - (c) Corrective Action – description of procedures for dealing with identified non-compliances with environmental management controls as well as environmental incidents.

- (d) CEMP Review – description of procedures for periodic review of the CEMP including how often such reviews will be carried out and how any changes are to be communicated to the workforce and responsible parties.

A206.2.4 The Contractor shall submit the CEMP to the Engineer within 14 days of the Contract Commencement Date. The Engineer and Employer will review the CEMP and will issue comments (if any) to be incorporated by the Contractor.

A206.2.5 The resolution of such comments on the CEMP submission to the satisfaction of the Engineer and the subsequent acceptance of the CEMP by the Engineer shall constitute a HOLD POINT (as defined in Section A300) on the commencement of any site Works under the Contract.

A206.2.6 The Contractor shall be fully responsible for the implementation of the approved CEMP throughout the Works and shall be responsible for all monitoring and testing works as required to demonstrate compliance to the requirements of the CEMP.

A206.3 Project Specific Environmental Requirements

A206.3.1 The Contractor is required to comply with the project specific requirements as set out at site and as may be amended by Government directive from time to time throughout the execution of the Works. In addition, the following other environmental requirements as identified in this Section shall be addressed as part of the Contractors CEMP and adhered to throughout the Works.

A206.4 Protection of Marine Environment

A206.4.1 Under no circumstances shall material including construction debris from the Works under the Contract be allowed to pollute, or fall into any river, creek or the waters of the Port. All such material shall be promptly recovered and removed by the Contractor at no cost to the Employer. Floating debris within the site arising from any source shall be collected and disposed of by the Contractor at regular intervals agreed by the Engineer. Floating debris shall be prevented from dispersing outside the project site limit.

A206.4.2 The Contractor shall keep the Employer indemnified against the cost of any clean-up due to pollution of the marine environment or any pollution.

A206.4.3 The Employer may, at his discretion, undertake Port seabed clearance surveys to ensure compliance with this paragraph. Should any material be found, the Contractor shall, without delay, remove such material at his own cost. The Contractor shall bear the cost of subsequent Port seabed clearance surveys to ensure that such material has been removed to the Engineer's satisfaction.

A206.5 Protection of Land Environment

A206.5.1 The Contractor will be held responsible for and shall keep the Employer indemnified against the cost of all damage caused by his construction traffic (whether his own, or that of his sub-contractors and/or suppliers) or workmen's vehicles, plant and the like and shall provide such facilities as are necessary to ensure that material including construction debris, rubbish or any other type of waste is not carried out from the Site onto any roads, public thoroughfares or adjoining property and shall promptly remove such

material should it be carried out from the Site and clean up to the satisfaction of the Engineer.

A206.6 Control of Soil Erosion, Sedimentation and Water Pollution

- A206.6.1 The Contractor shall carry out the Works in such a manner that soil erosion is fully controlled, and sedimentation and pollution of natural water courses, ponds, tanks and reservoirs is avoided. Prior to the start of the relevant construction, the Contractor shall submit to the Engineer for approval his schedules for carrying out temporary and permanent erosion/sedimentation control Works as are applicable. He shall also submit for approval his proposed method of erosion/sedimentation control on borrow pits and his plan for disposal of waste materials. Work shall not be started until the erosion/sedimentation control schedules and methods of operations for the applicable construction have been approved by the Engineer.
- A206.6.2 The Contractor may be directed to provide immediate permanent or temporary erosion and sedimentation control measures to prevent soil erosion and sedimentation that will adversely affect construction operations, damage adjacent properties, or cause contamination of nearby streams or other water courses, lakes, reservoirs etc. Such work may involve the construction of temporary berms, dikes, sediment basins, slope drains and use of temporary mulches, fabrics, mats, seeding or other control devices or methods as necessary to control erosion and sedimentation.
- A206.6.3 The Contractor shall be required to incorporate all permanent erosion and sedimentation control features into the project at the earliest practicable time as outlined in his accepted schedule to minimize the need for temporary erosion and sedimentation control measures.
- A206.6.4 Temporary erosion/sedimentation and pollution control measures will be used to control the phenomenon of erosion, sedimentation and pollution that may develop during normal construction practices but may neither be foreseen during design stage nor associated with permanent control feature on the Project. Water Quality Management
- A206.6.5 Water quality issues associated with the Works are required to be managed by the Contractor. These relate to protection of the marine ecosystem, protection of recreational and aesthetic values, and protection of unique species in the waters surrounding Port of Pipavav.
- A206.6.6 The Contractor shall set out water quality monitoring and testing procedures in the CEMP and shall be responsible for carrying out all testing required to monitor the compliance of the Contractor's operations with the identified minimum performance requirements as specified in the CEMP.
- A206.6.7 High levels of water turbidity are to be avoided at all times. In the event that levels of turbidity are caused by construction activities exceed the estimates indicated in the CEMP the Contractor is to advise the Engineer immediately. Action requirements will be confined to the Engineer advising the relevant agencies of adverse water quality and the Contractor shall modify its operations to mitigate any effects. In the event mitigation is not feasible the contributing construction activities will be required to standby until conditions change.

A206.6.8 The Contractor's work methods shall minimize the turbidity created by all marine construction activities. In developing work methods that minimise water turbidity the Contractor shall take into account:

- Reduction in light penetration;
- Blanketing by fine particles;
- Generation of rock flour resulting from the disintegration of rock and rocklike material.

A206.6.9 The Contractor shall provide silt curtains during all kind of work that may affect the water bodies as identified in the CEMP. The Contractor shall be responsible for designing, agreeing with the Engineer, installing and properly maintaining the silt curtains throughout the duration of the above Works. The Contractor shall, not later than 3 weeks before the commencement of the relevant Works, submit details of silt curtains to be used, including dimensions, exact locations and method of installation and removal, to the Engineer for approval.

A206.6.10 The Contractor shall carry out regular inspections to ensure that the silt curtains are adequately moored and marked to avoid any danger to marine traffic. The Contractor shall promptly repair any damage to the silt curtains to the satisfaction of the Engineer.

A206.6.11 The Contractor shall be responsible for re-positioning of the silt curtains to suit the construction programme.

A206.7 Introduced Organisms

A206.7.1 To minimise risk of introduction of exotic marine organisms to Port of Pipavav as a result of the Works, the Contractor is required to ensure that all floating plant arrives with non-fouled hulls and has performed adequate hopper washing and ballast water exchanges in full accordance with Indian Quarantine Service - ballast water management requirements prior to arrival at Port of Pipavav and any specific quarantine requirements of India.

A206.7.2 Prior to the Contractor mobilising any vessel from a foreign port or other Indian Port a risk assessment concerning the possible introduction of exotic marine organisms will be undertaken by the Contractor and if considered necessary an inspection of hull fouling and vessel compartments such as chain lockers will be undertaken and monitoring for compliance with the ballast water management requirements will be conducted at the port of departure.

A206.7.3 Any vessels not meeting the requirements of the Contract will not be permitted into India or Port of Pipavav until it is cleaned, re-inspected and passed as clean.

A206.7.4 In order to prevent foreign entrained organisms that may be present in the ballast water of vessels from being discharged in Indian Waters, all of the Contractor's vessels imported from abroad shall comply with the current revision of the Indian Quarantine Service's "Controls on the Discharges of Ballast Water and Sediments from Ships entering India from Overseas".

A206.8 Pollution from Batching Plants

- A206.8.1 Concrete batching plants shall be located sufficiently away from habitation, agricultural operations or industrial establishments. The Contractor shall take every precaution to reduce the levels of noise, vibration, dust and emissions from his plant and shall be fully responsible for any claims for damages caused to the owners of property, fields and residences in the vicinity. Dust and Debris
- A206.8.2 The Contractor must take all reasonable steps to minimise dust nuisance during the construction of the Works.
- A206.8.3 All existing port roads, highways and other roads used by vehicle of the Contractor or any of his sub-contractors or suppliers of materials or plant, which are being used by traffic, shall be kept clean of all dust/mud or other extraneous materials dropped by the said vehicles or their tyres. Similarly, all dust/mud or other extraneous materials from the Works spreading on these roads shall be immediately cleared by the Contractor.
- A206.8.4 Clearance shall be effected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and cleaning equipment, and all dust, mud and other debris shall be removed entirely from the road surface. Additionally, if so directed by the Engineer, the road surface shall be hosed or watered using suitable equipment
- A206.8.5 Any structural damage caused to the existing roads by the Contractor's construction equipment shall be made good without any extra cost.
- A206.8.6 Compliance with the foregoing will not relieve the Contractor of any responsibility for complying with the requirements of all relevant authorities in respect of the roads used by him.

A300 **QUALITY MANAGEMENT**

A301 **QUALITY MANAGEMENT SYSTEM REQUIREMENTS**

A301.1 General

- A301.1.1 The Contractor shall be responsible for all quality management in the planning and execution of the Works. The quality management shall cover all the stages of work such as setting out, selection of materials, selection of construction methods, selection of equipment and plant, deployment of personnel and supervisory staff, quality control testing, etc.
- A301.1.2 The Contractor shall be responsible for the following work under the quality provisions of this contract:
- Implementing their corporate Quality Management System in accordance with ISO 9001;
 - Developing and implementing a Project Quality Plan to cover all Work Under the Contract, whether permanent or temporary both on-site and off-site;
 - Operating, maintaining and reviewing the Project Quality Plan and associated quality management system procedures; and
 - Keeping Quality Records in accordance with ISO 9001 Clause 4.2.4.

A301.1.3 The Contractor shall have a corporate Quality Management System which complies with ISO 9001 and shall provide evidence of third party assessment and endorsement.

A301.1.4 The quality system shall incorporate quality system elements as follows:

- The quality system elements for all prepared designs for all permanent (where required under the Contract) and temporary work incorporated in the Works, and the design of approved alternative designs for parts of the permanent Works shall be to ISO 9001 Clause 7.3 Design and Development.

A301.1.5 The following additional requirements apply to the quality system:

- All design work, which is undertaken for permanent and temporary Works incorporated in, or associated with, shall be verified internally prior to submission.
- Documentation and records to be supplied are detailed herein.

A301.1.6 The Quality System documents shall be prepared in accordance with ISO 9001 and shall cover all work under the Contract, both on-site and off-site.

A301.2 Project Quality Plan (PQP)

A301.2.1 The Contractor shall prepare a project specific Project Quality Plan (PQP) in line with his ISO 9001 Quality System. The PQP shall be Contract-specific and shall include specific quality practices, resources, activities and responsibilities relevant to the Contract Works.

A301.2.2 The Contractor shall submit the PQP to the Engineer within 7 days of the Contract Commencement Date or at least 14 days prior to the intended commencement of any permanent Works under the Contract, whichever is the earlier. The Engineer will take maximum 7 days for issuing comments (if any) to be incorporated by the Contractor.

A301.2.3 The resolution of such comments on the PQP submission to the satisfaction of the Engineer and the subsequent acceptance of the PQP by the Engineer shall constitute a HOLD POINT (as defined in this Section) on the commencement of any permanent Works under the Contract.

A301.3 System Element Procedures

A301.3.1 Quality System Procedures shall be prepared to meet the requirements of ISO 9001. These Procedures and Instructions shall be submitted for approval 14 days prior to the commencement of the relevant activity.

A301.4 Hold Points & Witness Points

A301.4.1 Hold Points are those points beyond which the work may not proceed without review and comment by the Engineer.

A301.4.2 Witness Points are those points beyond which the work may not proceed without advising the Engineer prior to commencement.

A301.4.3 As a minimum requirement, the specified hold points shall be included in the Inspection and Test Plans where identified in the technical Clauses of

the Specification by the words "to the approval of the Engineer", "Engineer for Approval", "agreement of the Engineer" or similar.

A301.4.4 The Engineer may nominate additional witness and hold points in the Contractor's Inspection and Test Plans.

A301.4.5 Where hold points are nominated no work shall proceed unless agreed by the Engineer.

A301.4.6 For avoidance of doubt, the review by the Engineer of any hold point or witness point will not relieve the Contractor of any responsibility for the satisfactory execution or performance of the work that is the subject of the review.

A301.5 Documentation

A301.5.1 In addition to the documentation required by ISO 9001, copies of all relevant Codes of Practice, Test Methods and Standards referred to in the Specification including a copy of ISO 9001 shall be kept on Site.

A301.6 Inspection and Test Plans (ITP's)

A301.6.1 Inspection and Test Plans (ITP's) shall be prepared for each of all on site and off site construction activities/processes for which the Contract requires inspections of test to be performed. ITP's shall describe all inspections and tests required, the criteria for acceptance and the person in charge and responsible for each inspection or test. ITP's shall note any hold points or witness points that require the Engineers approval or presence.

A301.6.2 Proforma ITPs shall be submitted to the Engineer for review and approval at least 14 days (unless specified otherwise) before the subject operation/activity is first undertaken. Operations which are subject to inspection or test shall not commence until the relevant ITP is accepted by the Engineer.

A301.6.3 The ITPs shall cover all inspection and testing required by the Contract and shall include surveying and measuring verification processes, as well as sampling procedures. All quality control laboratory tests shall be performed in accordance with the relevant Indian or other standards approved in writing by the Engineer for the relevant test. Test reports shall be certified by an approved signatory.

A301.6.4 The ITPs shall clearly state the times within which each activity will be completed. All test reports shall be made available immediately they are produced. Failure to produce satisfactory test reports within the specified time may be considered to demonstrate that the work to which the test report relates is unsatisfactory, and remedial work may be ordered to be undertaken forthwith.

A301.7 Sampling and Testing

A301.7.1 All sampling and testing required by the Contract or instructed by the Engineer shall be carried out only by such independent commercial testing facilities as may be approved by the Engineer.

A301.7.2 The Contractor shall submit to the Engineer the name(s) of the independent commercial testing facilities that are proposed. The submission shall contain

such data as is necessary to fully demonstrate to the Engineer that (each) such testing facility is adequately equipped, supervised and staffed and has relevant previous experience. The testing facility shall obtain the accreditation from the National Accreditation Board for Testing and Calibration Laboratories (NABL) for the relevant tests unless otherwise approved by the Engineer, and where appropriate shall be on a list approved by the relevant Authorities. The Contractor's submission shall also include the lists of sampling and tests proposed to be undertaken by the testing facility (or facilities) together with a statement for each test regarding whether it is to be executed at the testing facility or elsewhere (including on Site). In the latter case, and for all sampling, attendance of personnel from the testing facility shall be provided during the sampling and/or execution of the test. Once any testing facility has been approved in writing by the Engineer it shall be appointed by the Contractor and then will be termed an Approved Laboratory for the tests listed within such approval.

- A301.7.3 The Contractor may propose to undertake testing at the Field Laboratory (refer Section A403) on Site, providing these meet all the above requirements, and in particular that the testing facility is operated, managed and staffed by independent commercial testing company. Should the Engineer at any time be dissatisfied with the quality of testing carried out at the testing facilities established on Site, he may require such tests to be performed at a permanent independent commercial testing facility away from the Site until such time as the Contractor can demonstrate to the Engineer's satisfaction that the necessary improvements have been made at the testing facilities on Site.
- A301.7.4 Should the Contractor have reasonable cause to change testing facilities he may propose an acceptable alternative to the Engineer. Should the Engineer at any time have reasonable cause to be dissatisfied with the performance of any Approved Laboratory he will so inform the Contractor who shall propose an acceptable alternative independent testing facility. In either case, after receiving written approval of the new testing facility (and upon completion of any test or series of tests already committed) the Contractor shall make the necessary change in appointment. Costs, if any, of or associated with any such change shall be borne by the Contractor.
- A301.7.5 The management of each Approved Laboratory shall nominate in writing the person or persons who are authorised by them to sign test reports, and a copy of this authorisation shall be sent to the Engineer. No test report shall be accepted by the Engineer as valid without the signature of a person whom the Engineer has been informed in writing is so authorised to sign test reports from that Approved Laboratory.
- A301.7.6 Where tests or other samples are required to be made, prepared or selected, such work as is necessary to cut or otherwise make or prepare the selected specimen(s) shall be executed by the Contractor under the supervision of the Approved Laboratory unless specifically agreed otherwise by the Engineer. If any test or sample preparation, making or selection proceeds without such supervision they shall not be accepted and the work re-executed. The Engineer shall be notified prior to the carrying out of such work so that he can be present. The Engineer may also instruct that the Contractor carry out additional sampling or testing in order to verify that the requirements of the Contract are being met.
- A301.7.7 The Engineer shall reserve the right to carry out his own independent sampling and testing for the purposes of cross-checking and verification of

the Contractors sampling and testing. The Contractor shall provide all reasonable access to the Works for the Engineer to carry out such independent sampling and testing. Where the findings of the Engineers independent sampling and testing indicate a non-conformance with the Contract requirements, the Contractor shall immediately raise a Non-Conformance Report (as defined in this Section) covering the work represented by the non-conforming results.

A301.7.8 Any additional sampling or testing related to replacement of damaged or lost samples, to the methods of working or construction, to previously failed tests or any other cause whatsoever shall be executed by an Approved Laboratory.

A301.7.9 The Contractor shall clearly identify methods of sampling and testing and the party or parties responsible in the ITP's for the relevant construction activity.

A301.8 Storage of Samples

A301.8.1 Where samples are required by the Contract the Contractor shall provide and maintain a suitable facility or facilities to temporarily store such samples on Site. The samples shall be kept as long as the Engineer requires, and then taken to an approved laboratory for testing and/or disposed of by the Contractor.

A301.8.2 Within two weeks of a notice from the Engineer, the Contractor shall provide, erect, and maintain adjacent to the Engineer's Site Office. standard shipping containers (approximately 6.0m long by 2.4m wide by 2.4m high) for use as a core and sample store throughout the course of the Works and for so long a time during the Last Maintenance Period as the Engineer may require. Each container shall be fitted out with two rows of metal racks along its length on either side reaching to the top of the container and fitted with shelves at 1.1 metres width and 0.15 metres centres vertically. Each shelf shall be capable of supporting full core boxes stacked to the full height. One window shall be installed at the shorter side of each container. The Contractor shall, when advised by the Engineer, remove the containers, leaving the Site in a clean and tidy state. Samples stored in the containers shall, when advised by the Engineer, be disposed of by the Contractor

A301.9 Inspection

A301.9.1 The Contractor shall provide the Engineer with access to all laboratories and other facilities used for quality control tests such that it can be verified that the specified requirements are being met.

A301.10 Identification and Traceability

A301.10.1 Unless otherwise specified, the acceptance of work shall be based on testing of the Works in lots. All required samples and test results shall be identified with the precise field locations and lots to which they relate.

A301.10.2 The results of all tests shall be reported to the Engineer in a format agreed with the Engineer within 7 days of the execution of the test or within the time required elsewhere in the Contract or the relevant approved ITP, whichever is the sooner. All reports of tests carried out by Approved Laboratories submitted to the Engineer shall be originals prepared by the

Approved Laboratory and be signed by a person authorised by the management of the Approved Laboratory.

A301.10.3 All test samples shall be marked with a unique reference and in a manner such that the reference will not be erased or otherwise lost prior to testing. Should it not be appropriate for the samples to be immediately collected by the Approved Laboratory, the Contractor shall deliver them to an approved sample store(s) on Site. Such sample store(s) shall be provided and maintained by the Contractor. The Contractor shall provide and maintain within the sample store(s) all necessary racks and/or equipment and keep them in good repair

A301.10.4 All Quality records shall be traceable from the Inspection and Test Procedures to the deliverable set.

A301.11 Records

A301.11.1 The Contractor shall generate quality records covering all construction activities, field surveys, survey data reduction, data editing, data plotting and chart presentation.

A301.11.2 Conformance records shall be stored and maintained such that they are readily retrievable in facilities that provide a suitable environment to minimise deterioration or damage, and to prevent loss. Records shall be retained progressively and handed over completely within four weeks of the issue of the Taking-over Certificate for the completed Works.

A301.11.3 Conformance records shall be available at all reasonable times, and copies provided within 24 hours of receipt of the test results.

A301.12 Non-conformance

A301.12.1 The Contractor shall notify the Engineer of any product or service non-conformance. Notification shall be submitted as Non-conformance Reports (NCR) and shall indicate the proposed method of rectification and shall be subject to acceptance by the Engineer. Additionally, the Engineer may require the Contractor to raise an NCR for any work that is in the opinion of the Engineer not in conformance to the requirements of the Contract. The Contractor shall prepare Standard forms shall be utilized for use as Non-conformance Reports; the format of these forms shall be agreed with the Engineer prior to the Works.

A301.12.2 Work which is the subject of a Non-conformance Report shall not be covered prior to inspection and agreement with the Engineer.

A301.13 Surveillance and Audit

A301.13.1 Quality surveillance and audits shall be carried out to ensure conformance to the requirements of the Contract. These will involve system element audits, product and service audits, and process and technical procedure audits.

A301.13.2 The audits to be undertaken will be in addition to the Contractor's audits and will not relieve the Contractor of its responsibilities under the Contract. The Engineer will carry out audits in accordance with ISO 19011 at times to be determined by the Engineer. The Contractor will be given at least five day's notice that a quality audit is to be carried out. The Contractor shall

make or arrange to be available all necessary facilities, documents etc including subcontractors etc. for audits.

- A301.13.3 The Engineer may delegate all or part of its responsibilities to a Quality Assurance Officer. The Contractor will be advised in writing of the name of this person, its organisational position and authority, and of the delegations, which will apply.

A301.14 Subcontractors

- A301.14.1 The Contractor shall be fully responsible for integrating all Subcontractor's quality systems into its own Quality System or alternatively for arranging for the Subcontractor to work within a quality system developed and provided by the Contractor.

- A301.14.2 The Contractor shall be the single point of responsibility for the production, implementation and auditing of the quality system required under the Contract.

A400 TEMPORARY FACILITIES AND CONTROLS

A401 GENERAL

A401.1 Contractors Site Establishment Plan

- A401.1.1 The Contractor shall submit his Site Establishment Plan to the Engineer for approval at least seven (7) days prior to the commencement of any site establishment, temporary or any other Works under the Contract.

- A401.1.2 This submission shall include confirmation of the Contractor's intended date for the commencement of site establishment and any other site work.

- A401.1.3 The Contractors Site Establishment Plan shall include figures or drawings and accompanying notes detailing the proposed site establishment work (subject to the further requirements of this section of the Specification) including but not limited to the following items;

- (i) Proposed temporary service/utility alignments, tapping points and evidence of arrangements made for the use of such service with the relevant authorities;
- (ii) General layout of site fencing, site access points, internal roads and parking areas;
- (iii) General layout of construction facilities including the Contractors field offices, sheds, sanitary and first aid facilities, Field Laboratory and Engineers Site Office;
- (iv) Details of arrangements for emergency access/egress and evacuation mustering points;
- (v) General layout of work areas, any on site batching plants, casting yards, fabrication or coating workshops;
- (vi) General layout of any load out wharves or temporary marine Works and associated navigation arrangements;
- (vii) All other details relating to the site establishment as required under the Contract or by any relevant authority;
- (viii) Dust protection measures from adjacent bulk stockpiles

A401.1.4 The approval of the Site Establishment Plan by the Engineer shall constitute a HOLD POINT on the commencement of site establishment, temporary or any other Works under the Contract.

A401.1.5 Any request by the Contractor to change the agreed proposals shall be subject to the agreement of the Engineer.

A402 TEMPORARY UTILITIES

A402.1 General

A402.1.1 It is the responsibility of the Contractor to arrange and obtain permission from the relevant Authorities for the installation, connection and disconnection of temporary services and utilities such as power, water, telephones and any other services the Contractor deems necessary to execute the Works. All temporary services shall be separately metered and the Contractor shall be responsible for all costs associated with the supply of these services.

A402.1.2 The Contractor shall submit details of the temporary service/utility alignments, tapping points and evidence of arrangements made for the use of such service with the relevant authorities to the Engineer for approval as part of his Site Establishment Plan.

A402.1.3 The installation and operation of all temporary services and utilities shall comply with all statutory and local authority standards and requirements.

A402.1.4 No groundwater shall be tapped for any purpose.

A402.1.5 All temporary services shall be removed and made good at the completion of the Works. Any conduits, pipes and the like that are permitted to remain by the Engineer due to construction constraints shall be clearly indicated on the "as constructed" drawings.

A403 CONSTRUCTION FACILITIES

A403.1 Contractor's Site Compound

A403.1.1 The entire Contractor's Site Compound including all Contractors site offices, all sanitary and first aid facilities, car parking, field laboratory, Engineer's Site Office and the like shall be confined within the area designated for the Contractor's site establishment in Clause A104 and as shown on the Drawings.

A403.1.2 The Contractor shall take all necessary measures to reduce dust from adjacent port areas, including from bulk stockpiles by means of barriers or other suitable systems. Special precautions are to be taken during the monsoon period taking into account prevailing wind directions.

A403.1.3 The Contractor shall submit the proposed location and layout of the Contractor's Site Compound to the Engineer for approval as part of his Site Establishment Plan.

A403.2 First Aid Facilities

A403.2.1 The Contractor shall provide, equip and maintain throughout the Contract Period, a medical room together with first aid equipment and stores and

other suitable facilities and arrangements for the first aid treatment of all persons on the Site and the transportation of any injured persons to hospital. The Contractor shall provide and maintain an ambulance on site full time for the duration of the site work.

A403.3 Sanitary Facilities

A403.3.1 The Contractor shall provide and maintain to the satisfaction of the Engineer sufficient sanitary facilities and ablutions for all personnel engaged on the Works who shall use these provided facilities exclusively. The Contractor shall be responsible for arranging for the proposed handling and disposal of sewage from the site and for obtaining all required permissions from the relevant authorities.

A403.3.2 No sewage or effluent shall be discharged into any river, creek or the waters of the Port. Where possible, sewage should be treated so as to achieve the required standards prescribed by the Gujarat Pollution Control Board and reused/recycled within the Works to the extent feasible.

A403.4 Provision of Field Laboratory

A403.4.1 The Contractor shall establish and maintain a field laboratory sufficiently equipped to carry out all field and laboratory testing required under the Contract as required for site control on the quality of materials and the Works.

A403.4.2 The field laboratory shall be located adjacent to the Engineers Site Office and shall be connected by covered walkway. The field laboratory shall be fully air-conditioned and shall be provided with amenities like water supply, electric supply etc. as in the site office of the Engineer.

A403.4.3 The Contractor shall provide the specified Field Laboratory (fully furnished and operational) within 28 days of the Contract Commencement Date or at least 7 days prior to the commencement of construction of any permanent Works under the Contract, whichever is the earlier.

A403.4.4 The complete establishment of the Field Laboratory on site by the Contractor to the satisfaction of the Engineer shall constitute a HOLD POINT on the commencement of any permanent Works on site under the Contract. The Field Laboratory shall be provided and maintained until 28 days after the issue of the Taking-over Certificate for the complete Works.

A403.4.5 The floor space requirement for the field laboratory shall be as decided by the Contractor, subject to the approval of the Engineer. It shall include office space for the Quality Assurance and Materials Engineers, one from the Contractor's side and another from the Engineer's side and a store for the storage of samples. The remaining space shall be provided for the installation of equipment, laboratory tables and cupboards, working space for carrying out various laboratory tests, besides a wash basin, toilet facility and a curing tank for the curing of samples, around 4m x 2m x 1m in size and a fume chamber. The furnishing in each of two offices of the Quality Assurance and Materials Engineers shall be similar to that provided for the Engineer's Site Office as specified above. Wooden/concrete working table with a working platform area of about 1m x 10m shall be provided against the walls, also providing wooden cupboards above and below the working tables to store accessories such as sample moulds etc. At least 4 racks of

slotted angles and M.S. sheets and at least 6 stools for laboratory test operators shall also be provided.

A403.4.6 The Contractor shall submit the proposed floorplan and layout of the Field Laboratory to the Engineer for approval as part of his Site Establishment Plan.

Laboratory Equipment

A403.4.7 The field laboratory shall be provided with equipment including but not limited to the following;

A403.4.8 General

- | | | |
|--------|--|-----------------|
| (i) | Oven - Electrically operated, thermostatically controlled range upto 200 °c sensitivity 1°c | 1 No. |
| (ii) | Platform balance 300 kg capacity | 1 No. |
| (iii) | Balance 20 kg capacity- self indicating type | 1 No. |
| (iv) | Electronic Balance 5 kg capacity accuracy 0.5 gm | 2 Nos. |
| (v) | Water bath - electrically operated and thermostatically controlled with adjustable shelves, sensitivity 1°c | 1 No. |
| (vi) | Thermometers: Mercury-in-glass thermometer range 0 °c to 250 °c Mercury-in-steel thermometer with 30cm stem, range upto 300 °c | 4 Nos. |
| (vii) | Gas stove or electric hot plate | 1 No. |
| (viii) | Glasswares, spatulas, wire gauzes, steel scales, measuring tape, casseroles, karahis, enameled trays of assorted sizes, pestle-mortar, porcelain dishes, gunny bags, plastic bags, chemicals, digging tools like pickaxes, shovels etc | As required |
| (ix) | Set of IS sieves with lid and pan:
450mm diameter:
106mm, 75.0mm, 63mm, 53mm, 37.5mm, 26.5mm, 19.0mm, 13.2mm, 9.5mm, 6.7mm, and 4.75mm size
200mm diameter:
2.36mm, 2.0mm, 1.18mm, 600 micron, 425 micron, 300 micron, 150 micron, and 75 micron | 1 set
2 sets |
| (x) | Water testing kit | 1 set |
| (xi) | First aid box | 1 set |

A403.4.9 For soils and aggregates

- | | | |
|-------|---|-------|
| (i) | Riffle Box | 1 No. |
| (ii) | Atterberg Limits (liquid and plastic limits) determination Apparatus | 1 set |
| (iii) | Compaction Test Equipment both 2.5 kg and 4.5 kg rammers (Light and Heavy compactive efforts) | 1 set |
| (iv) | Dry Bulk Density Test apparatus (sand pouring cylinder, tray, can etc.) complete | 1 set |
| (v) | Speedy Moisture Meter complete with chemicals | 1 set |
| (vi) | Post-hole Auger with extensions | 1 set |
| (vii) | Core cutter apparatus 10 cm dia, 10/15 cm height, complete with dolly, rammer etc. | 1 set |

- | | | |
|--------|---|-------|
| (viii) | Aggregate Impact Value Test apparatus/Los Angeles Abrasion Test apparatus | 1 set |
| (ix) | Flakiness and Elongation Test Gauges | 1 set |
| (x) | Standard measures of 30, 15 and 3 litres capacity along with standard tamping rod | 1 set |
| (xi) | California Bearing Ratio test apparatus | 1 set |
| (xii) | Unconfined compression test apparatus | 1 set |

A403.4.10

A403.4.11 For cement and cement concrete

- | | | |
|-------|---|--------|
| (i) | Vicat apparatus for testing setting times | 1 set |
| (ii) | Slump testing apparatus | 4 sets |
| (iii) | Compression and Flexural strength testing machine of 200 tonne capacity with additional dial for flexural testing | 1 No. |
| (iv) | Needle Vibrator | 2 Nos. |
| (v) | Air Meter | 1 No. |
| (vi) | Vibrating hammer for vibrating dry mix as for Dry Lean Cement Concrete sub-base | 1 No. |

Note: The items and their numbers listed above in this Clause shall be decided by the Engineer as per requirements of the Project and modified accordingly.

A403.4.12 Notwithstanding the above requirements, the Contractor shall provide all equipment required to carry out all field and laboratory testing specified in the Contract including any equipment not specifically identified above.

A403.4.13 The land for the erection of laboratories shall be the responsibility of the Contractor. The field laboratory equipment shall be provided by the Contractor for the use of the Employer and/or Engineer. They shall remain the property of the Contractor and shall be returned to the Contractor within 28 days after issuing the Taking-over Certificate.

A403.4.14 The Contractor shall be responsible for all aspects of maintenance and operation of the Laboratories, including all associated costs with purchase, delivery, erection, calibration of equipment, operation, including sampling, storage, curing and testing of materials, periodic re-calibration of equipment, supply of consumables, recording and submitting test results to the Engineer and removal on completion of the Works.

A404 **TEMPORARY WORKS AND CONSTRUCTION AIDS**

A404.1 General

A404.1.1 The Contractor shall design, construct, maintain and remove upon completion all temporary Works, falsework and construction aids necessary for the construction of the permanent Works.

A404.1.2 These shall include but not be limited to temporary traffic diversions, roadways, footpaths, accesses, drains, sheet piling and shoring, temporary jetties, load out wharves and moorings, slope stabilisation/protection, staging, scaffolds, props and other temporary supports, weir boxes, sluices and other temporary bunds or any other work of a temporary nature necessary for the construction of the permanent Works as may be required.

- A404.1.3 The Contractor shall design and construct all temporary Works safe and suitable in every respect to carry all plant required for the Works or for providing access or for any other purpose connected with the Works, to the satisfaction of the Engineer.
- A404.1.4 It is the responsibility of the Contractor to arrange and obtain permission from the relevant Authorities for the construction of all such temporary Works the Contractor deems necessary to execute the Works. All temporary Works shall comply with all statutory and local authority standards and requirements.
- A404.1.5 Complete details of the proposed temporary Works including detailed design calculations and drawings shall be submitted to the Engineer for review at least 14 days prior to the commencement of the Works. The Engineer will take maximum 7 days for issuing comments (if any) to be incorporated by the Contractor and resubmit/approval.
- A404.1.6 The resolution of such comments on the Temporary Works submission to the satisfaction of the Engineer and subsequent acceptance by the Engineer shall constitute a HOLD POINT on the commencement of the subject Temporary Works.
- A404.1.7 Examination and/or approval by the Engineer of any drawings or other documents submitted by the Contractor shall not relieve the Contractor of his responsibilities or liabilities under the Contract.
- A404.1.8 All temporary Works shall be removed and made good at the completion of the Works. Any such Works that are permitted to remain by the Engineer due to construction constraints shall be clearly indicated on the "as constructed" drawings.
- A405 **VEHICULAR ACCESS AND PARKING**
- A405.1 Contractors Site Access Management Plan**
- A405.1.1 The Contractor shall submit his Site Access Management Plan to the Engineer for approval at least 7 days prior to the commencement of any site establishment, temporary or any other Works under the Contract.
- A405.1.2 The Contractors Site Traffic Management Plan shall include figures or drawings and accompanying notes detailing the proposed site traffic management Works (subject to the further requirements of this section of the Specification) including but not limited to the following items;
- (i) General layout of internal site access and haul roads;
 - (ii) General layout of internal car-parking and traffic circulation;
 - (iii) Arrangement and approximate timing for the delivery of materials and equipment throughout the course of the Works as well as any special arrangements or controls for mobilisation of oversize plant or delivery of oversize equipment;
 - (iv) Proposed internal construction traffic controls (signage, line marking, signals etc) both for internal site roads and at interfaces with existing external roads;

- (v) Any proposed temporary traffic controls for existing external roads that may be necessary from time to time to facilitate delivery of materials or equipment to site or any other Works on such roads;
 - (vi) Arrangements for marine access to marine construction work and Site Portions including navigational arrangements, temporary aids to navigation, anchoring and mooring arrangements and any proposal for conditional use of the Employers existing marine facilities as defined in Section A105 of the Specification.
- A405.1.3 The Contractor shall prepare the Site Access Management Plan with a view to minimising interference with existing port traffic (both landside road traffic and marine traffic and shipping) to and from the existing facilities in the vicinity of the site. All vehicles or marine craft using the existing port/public roads or port waters external to the site shall comply with the prevailing local and port rules and regulations as well as the requirements of any other relevant authorities.
- A405.1.4 The Site Access Management Plan shall identify such facilities as are necessary to ensure that construction dust and debris is not carried onto the existing port roads, thoroughfares or adjoining properties by vehicles leaving the site. Any damage or disturbance caused by vehicles leaving the site shall be rectified immediately by the Contractor to the satisfaction of the Engineer.
- A405.1.5 The approval of the Site Access Management Plan by the Engineer shall constitute a HOLD POINT on the commencement of site establishment, temporary or any other site Works under the Contract as well as mobilisation of plant and delivery of any materials or equipment to the site.
- A405.1.6 Any request by the Contractor to change the agreed proposals shall be subject to the agreement of the Engineer.
- A406 **TEMPORARY BARRIERS AND ENCLOSURES**
- A406.1 General**
- A406.1.1 The Contractor shall maintain fencing, employ watchmen and any other measures necessary so as to maintain the security of the Site at all times pursuant to the requirements of Clause 4.22 of the Conditions of Contract.
- A406.1.2 Temporary fencing shall be installed and maintained by the Contractor for the security of plant, equipment and materials used in connection with the Works.
- A406.1.3 The temporary fence shall be completed as soon as practical following initial Possession of the Site and removed immediately prior to issue of the Taking-Over Certificate for the Works (or part thereof).
- A406.1.4 Temporary fencing shall consist of 2.1 m high chain mesh fence consisting of interlinked fencing panels. The panels are to be effectively coupled to prevent pedestrian access through the fence. The fence is to be of a type that is easily relocated if required by the Engineer. The temporary fence shall be supplied complete with a dedicated access gate.
- A406.1.5 The fencing arrangements noted above are the minimum standards of fencing that the Employer will accept.

A406.1.6 It remains the responsibility of the Contractor to establish the type of fencing that the Contractor requires to separate the construction area from public areas, other sites and port operational areas and to provide the level of site security the Contractor deems necessary for the site and work areas.

A406.1.7 Construction work shall be confined to within the fenced construction site area except with the written approval of the Engineer.

A407 **TEMPORARY CONTROLS**

A407.1 General

A407.1.1 The Contractor shall provide details of all temporary controls to be employed on site (in respect of the environment, health and safety, quality, site traffic etc.) in the relevant management plans specified elsewhere in this Specification.

A407.1.2 The Contractor and all Subcontractors shall comply with all requirements of the approved management plans and shall employ and maintain all temporary controls identified therein throughout the Works. The Contractor shall remain responsible for all activities carried out under the Contract notwithstanding any approval given by the Engineer.

A408 **PROJECT IDENTIFICATION**

A408.1 General

A408.1.1 The Contractor shall erect two signboards at prominent locations on the Site to identify the site to occasional visitors. The size, layout and location of the signboards shall be agreed with the Engineer.

A408.1.2 The Contractor shall not erect within or near the site or elsewhere on the Employer's land any sign or notice board without prior approval, except safety signs.

A408.1.3 The Contractor shall dismantle, remove and dispose of all such signs off site upon issue of the Taking-Over Certificate for the Works.

A500 **PRODUCT/MATERIALS REQUIREMENTS**

A501 COMMON REQUIREMENTS

A501.1 General

A501.1.1 No information about the sources of materials for execution of the Works is provided under the contract. The Contractor is deemed to have made his arrangements for the availability of construction materials and deemed to include all associated transportation in his rate. It is assumed that the Contractor has identified all such sources before quoting his rates for the Works to assess the availability of construction materials in required quantity and quality.

A501.1.2 Materials to be used in the work shall conform to the specifications mentioned on the drawings, the requirements laid down in this section and specifications for relevant items of work covered under these specifications.

A501.1.3 Only new products, materials or equipment shall be supplied for use in the permanent Works. Pre-owned or pre-used products, materials or equipment shall not supply unless specifically accepted in writing by the Engineer.

A501.1.4 Products, materials and equipment to be incorporated in the permanent Works shall not be used in any temporary Works prior to their incorporation into the permanent Works unless specifically accepted in writing by the Engineer.

A501.1.5 If any material, not covered in these specifications, is required to be used in the work, it shall conform to relevant Indian Standards, if there are any, or to the requirements specified by the Engineer.

A501.2 Approval of Manufacturers and Suppliers

A501.2.1 The Contractor shall submit details of the proposed source, manufacturer or supplier of all products, materials or equipment to be used in the permanent Works to the Engineer for approval.

A501.2.2 The details to be submitted by the contractor shall include but not be limited to the following;

- (i) Name of product, material or equipment to which the submission relates including reference to relevant sections of the Contract documents;
- (ii) Name of proposed source, manufacturer or supplier;
- (iii) Certificates, test results or any other information or evidence demonstrating that the proposed product, material or equipment confirms to the requirements of the Contract;
- (iv) Declaration that the product, material or equipment shall be supplied in accordance with the requirements of the Contract including all specified markings and certificates;
- (v) Instructions or directions for the handling, storage or usage of the product, material or equipment from the source, manufacturer or supplier;
- (vi) Any other relevant technical details as may be required under the Contract or by the Engineer.

A501.2.3 The Contractor shall submit such details to the Engineer for approval at least 14 days prior to placing orders for the subject product, materials or equipment. The approval of the submission by the Engineer shall constitute a HOLD POINT on the delivery of the subject product, materials or equipment to site. Irrespective of any such approval, the Contractor shall remain responsible for the quality and conformance of the subject product, material or equipment to the requirements of the Contract.

A501.2.4 Once approved, sources shall not be changed without the written approval of the Engineer. If it is found after trial that sources of supply previously approved do not produce uniform and satisfactory products, or if the product from any other source proves unacceptable at any time, the Contractor shall furnish acceptable material from other sources at his own expense.

A501.3 Samples

A501.3.1 Where required by the Engineer, the Contractor shall at his own expense, submit to the Engineer for approval, samples of any of the materials and components to be used in the Contract Works. The quality of materials and components to be used in the Works shall not be inferior to the approved samples.

A501.3.2 Raw and processed samples of the mineral aggregates from the approved quarry shall be submitted by the Contractor to the Engineer at no extra cost.

A501.3.3 All samples shall be removed from site and disposed of by the Contractor when the Engineer advises that they are no longer required.

A501.4 Alternatives or Equivalents

A501.4.1 In all cases where the name of a particular type or make of material, product, equipment or item is referred to in the Contract, this indicates the minimum acceptable standard. The Contractor may offer equipment or materials other than those specified and in all such cases the Contractor's offer shall be of at least equal quality. The same shall apply where the words "or approved equivalent" are used.

A501.4.2 In these instances, the Contractor shall submit to the Engineer for approval a statement detailing the alternative material or equipment and shall include full technical descriptions, drawings and specifications and shall provide such further information as is required to demonstrate to the Engineer that the alternatives are equivalent in every way to those specified.

A501.4.3 Acceptance of the Contractors offered alternatives shall be subject to the acceptance and approval of the Engineer and the Employer who shall not be bound to accept any such offer.

A501.5 Delivery, Storage and Handling Requirements

A501.5.1 No products, materials or equipment shall be delivered to site until the Contractor has established all traffic and environmental controls on site and has adequate facilities on site for unloading and storage of the products, material and equipment prior to their incorporation into the Works.

A501.5.2 All products, materials and equipment delivered to site shall be handled and stored so as to prevent damage or deterioration prior to their incorporation into the permanent Works. All stockpiles and storage stacks shall be maintained by the Contractor in a safe state with sufficient working space provided to permit safe access by the Engineer for inspection and checking of the delivered products, materials and equipment.

A501.5.3 All proprietary products, materials and equipment used on the Works shall be handled, stored, used, fixed or applied strictly in accordance with the manufacturer's instructions and to the satisfaction of the Engineer. The Contractor shall obtain the manufacturer's instructions in this regard at the time of ordering and shall submit to the Engineer along with his submission of the proposed source.

A502 TESTS AND STANDARD OF ACCEPTANCE

A502.1 General

A502.1.1 All materials even though stored in an approved manner shall be subjected to an acceptance test prior to their immediate use.

A502.1.2 Independent testing of cement for every consignment shall be done by the Contractor at site in the laboratory approved by the Engineer before use. Any cement with lower quality than those shown in manufacturer's certificate shall be debarred from use. In case of imported cement, the same series of tests shall be carried out before acceptance.

A502.1 Testing and Approval of Material

A502.1.1 The Contractor shall furnish test certificates from the manufacturer/supplier of materials along with each batch of material(s) delivered to site.

A502.1.2 The Contractor shall set up a field laboratory with necessary equipment for testing of all materials, finished products used in the construction as per requirements of conditions of contract and the relevant specifications. The testing of all the materials shall be carried out by the Engineer or his representative for which the Contractor shall make all the necessary arrangements and bear the entire cost.

A502.1.3 Tests which cannot be carried out in the field laboratory have to be got done at the Contractor's expense at any recognised laboratory/testing establishments in India or abroad as approved by the Engineer. All necessary cost for witnessing the test by Engineer's representative shall have to be borne by the Contractor.

A502.2 Sampling of Materials

A502.2.1 Samples provided to the Engineer or his representative for their retention are to be in labelled boxes suitable for storage.

A502.2.2 Samples required for approval and testing must be supplied well in advance at least 48 hours or minimum period required for carrying out relevant tests to allow for testing and approval. Delay to works arising from the late submission of samples will not be acceptable as a reason for delay in the completion of the works.

A502.2.3 If materials are brought from abroad, the cost of sampling/testing whether in India or abroad shall have to be borne by the Contractor.

A502.3 Rejection of Materials not conforming to the Specifications

A502.3.1 Any stack or batch of material(s) of which sample(s) does not conform to the prescribed tests and quality shall be rejected by the Engineer or his representative and such materials shall be removed from site by the Contractor at his own cost. Such rejected materials shall not be made acceptable by any modifications.

A502.4 Testing and Approval of Plant and Equipment

A502.4.1 All plants and equipment used for preparing, testing and production of materials for incorporation into the permanent works shall be in accordance with manufacturer's specifications and shall be got approved by the Engineer before use.

A600 PROJECT EXECUTION

A601 **EXAMINATION AND PREPARATION**

A601.1 Construction Work Method Statements

- A601.1.1 In addition to the submission of the Detailed Construction Sequence and Methodology as defined in Clause A202, the Contractor shall submit separate individual Construction Work Method Statements (CWMS) detailing the sequence and method of working he intends to adopt for various items of work including but not limited to site clearance and demolition, earthworks, cast-in-situ piling, precast concrete work, construction of pre-cast/cast-in situ superstructure, pavements, construction of landside concrete structures, steel fabrication and coating work, water supply work, stormwater drainage work, electrical work and any other items for which the Engineer requires the submission of a CWMS.
- A601.1.2 The CWMS shall be consistent with the overall Detailed Construction Sequence and Methodology and shall comply with any additional construction sequence or phasing requirements nominated on the Drawings and/or elsewhere in this Specification. The purpose of the CWMS is to aid the planning and integration of activities and correct technical execution of the Works within the requirements of the Contract. In this regard, it shall be written such that it can be understood completely by the labour and supervisory personnel response for the Works.
- A601.1.3 The CWMS shall provide detailed information regarding materials, equipment and plant to be utilised, labour requirements, time frame and schedule of the Works including Subcontractors, prerequisite conditions, details and order of activities for each operation, safety measures, environmental controls and any other relevant technical aspects including those detailed elsewhere in the Specification or Drawings.
- A601.1.4 The CWMS shall be consistent with the requirements of the approved PQP and shall include a description of testing and inspection records, reporting channels (including names of responsible supervisory personnel) and frequency and actions where records indicate non-conformance with the specification. The relevant agreed ITPs for the subject Works shall be appended to the CWMS for easy reference.
- A601.1.5 Proposed repair methods for the rectification of any anticipated minor defects or damage (such as concrete patching and repairs for instance) shall also be appended to the CWMS.
- A601.1.6 Where any construction activity includes an interface with either the existing port operations, or with an associated Contract, the CWMS shall also include the procedures to be followed by his staff and equipment for the management of such interfaces.
- A601.1.7 Unless specifically noted otherwise in the relevant sections of this Specification, the Contractor shall submit the proposed CWMS to the Engineer for approval at least 14 days prior to the intended date for first commencement of the construction Works to which the CWMS relates. The Engineer will take maximum 7 days for issuing comments (if any) to be incorporated by the Contractor and resubmit/approval.
- A601.1.8 The resolution of such comments on the CWMS submission to the satisfaction of the Engineer and the Engineers subsequent approval of the

CWMS shall constitute a HOLD POINT on the commencement of the Works to which the CWMS relates.

- A601.1.9 Examination and/or approval by the Engineer of the CWMS submitted by the Contractor shall not relieve the Contractor of his responsibilities or liabilities under the Contract. The sole responsibility for the safety and adequacy of the methods adopted by the Contractor will remain with the Contractor, irrespective of any approval given by the Engineer.
- A601.1.10 The Contractor shall be responsible for issuing copies of the approved CWMS to the relevant Works personnel and supervisory staff to ensure that they are fully familiar with the CWMS.
- A601.1.11 Notwithstanding any approval of the CWMS, the Engineer shall reserve the right to require further amendment or modification of the CWMS in the event that additional issues are observed on site following commencement of the construction Works to which the CWMS relates. Similarly, the Contractor is free to propose further amendment or modification to the CMWS subject to the approval of the Engineer.

A601.2 Construction and Progress Survey

Contractors In-Survey

- A601.2.1 Prior to commencement of Works on site, the Contractor shall carry out a detailed topographic and bathymetric survey of the site area including all seabed areas in the vicinity of the marine construction Works. The survey shall show the location and level of all existing structures and features, spot levels and existing survey benchmarks.
- A601.2.2 The Contractor shall survey the existing LPG pipeline and shall install survey monitoring marks at 5m intervals along the pipeline where the pipeline lies within 50m of the Site Portion boundary. The Contractor shall liaise with the pipeline operator as necessary to arrange access to the pipeline and shall obtain their agreement in regard to the nature and location of the survey monitoring marks.
- A601.2.3 The Contractor shall submit survey drawings at 1:1000 (or other scale as may be agreed with the Engineer) in hardcopy and electronic PDF and CAD format based on this "in-survey" to the Engineer for agreement and record.

Contractors Progress Survey

- A601.2.4 All relevant dimensions of the existing features on Site shall be checked and verified to ensure that the Works achieve the specified construction tolerances and good fit up at all interfaces between new and existing.
- A601.2.5 An "As Built" survey of the completed Works and shall be carried out progressively to demonstrate that the installation work conforms to the installation tolerances shown on the Drawings or this Specification.
- A601.2.6 In particular, the Contractor shall carry out Progress survey on the following work elements as necessary to demonstrate conformance to the requirements of the Drawings and Specification for as-built location, dimensions, levels, thickness, gradients or any other specified requirement:
- Underground Services and Utilities

- Subgrade and Pavement layers
- Any other elements for which survey is specified for conformance

- A601.2.7 The lines and the levels of all permanent Works shall be carefully set out and frequently checked, care being taken to ensure that correct gradients and cross-sections are obtained everywhere.
- A601.2.8 No reference peg or marker shall be moved or withdrawn without the approval of the Engineer and no earthwork or structural work shall be commenced until the centre line has been referenced.
- A601.2.9 The Contractor will be the sole responsible party for safe-guarding all survey monuments, bench marks, beacons, etc. The Engineer will provide the Contractor with the data necessary for setting out line and the centre line of the tracks. All dimension and levels shown on the drawings or mentioned in documents forming part of or issued under the Contract shall be verified by the Contractor on the site and he shall immediately inform the Engineer of any apparent errors or discrepancies in such dimensions or levels.
- A601.2.10 After obtaining approval of the Engineer, construction can commence and the profile and cross-sections shall form the basis for measurements and payment. The Contractor shall be responsible for ensuring that all the basic traverse point are in place at the commencement of the contract and if any are missing, or appear to have been disturbed, the Contractor shall make arrangements to re-establish these points. A "Survey File" containing the necessary data will be made available for this purpose. If in the opinion of the Engineer, design modifications of the centre line or grade are advisable, the Engineer will issue detailed instructions to the Contractor and the Contractor shall perform the modifications in the field, as required, and modify the ground levels on the cross-sections accordingly as many times as required.

A601.3 Protection of Existing Port Infrastructure

Port Structures Condition Survey

- A601.3.1 Prior to commencement of any construction Works in the vicinity of any structure owned or operated by the Employer, the Contractor shall undertake a Condition Survey of the in-situ position and condition of all any wharf, berth and hard standing area likely to be impacted by the Contractor's Works. The Condition Survey shall be carried out by suitably qualified persons approved by the Engineer and it shall be capable of audit by third parties.
- A601.3.2 The Condition Surveys shall include all parts of the structure and surrounds likely to be impacted by the Contractor's operations and shall be subject to agreement with the Engineer.

Loading of Existing Port Structures

- A601.3.3 Full details of any proposed construction loading on existing Port structures shall be submitted to the Engineer for approval prior to Works proceeding. The Engineers acceptance of this submission shall constitute a HOLD POINT on the loading of any existing Port structure.
- A601.3.4 Where it is proposed to carry out partial demolition of any structures as part of the Works, the Contractor shall undertake an engineering assessment of

the reduced load capacity of the structure under the partially demolished condition. If required, temporary Works shall be designed and installed by the Contractor to ensure that the demolition Works proceed without creating a hazardous situation.

Damage to Port Structures

A601.3.5 If in the sole opinion of the Engineer, the Contractor has caused damage to any part of a structure by unloading or loading or any other operations the Contractor shall be responsible for carrying out repairs to the structure to the satisfaction for the authority.

A601.3.6 All costs and expenses associated with the repairs to such damage or the replacement of damaged parts shall be for the Contractor's account.

Port Waters Depth Reduction

A601.3.7 The Contractor's marine construction Works and operations must not reduce the depths of the channel or berths as at the date of the site "in-survey". The Contractor shall survey the area of impact of its operations as required to ensure that navigation depths are never reduced.

A601.3.8 If the depth of the Port is compromised the Contractor shall be required to provide 24 hour survey availability and shall demonstrate to the Harbour Master that the Port's maintained navigable depths have not been adversely affected. All costs associated with such survey work and depth reduction shall be to the Contractor's account.

Existing Utilities and Services

A601.3.9 All information regarding the existing or future utilities and services shown on the Drawings has been obtained and/or reproduced from various sources and is for indication only. The Contractor shall be responsible for making his own assessment of the exact details, lines, levels, nature, type, size, location and all other matters of relevance to the existing utilities and services at the site prior to commencement of any site Works.

A601.3.10 Any unidentified services uncovered by the contractor shall be immediately brought to the attention of the Engineer.

A601.3.11 The information on affected services and utilities may not be exhaustive and the final position of these services within the Works shall have to be drawn up based on the information furnished by different authorities linked with the utilities as directed by the Engineer. the Contractor's programme must take into account the period of notice and duration of diversion work concerning each authority as given on the Drawings and the Contractor must also allow for any effect of these services and alterations upon the Works and for arranging regular meetings with the various authorities on commencement of the Contract and throughout the period of the Works in order to maintain the required co-ordination. During the period of the Works, the Contractor shall have no objection if the public utility bodies / authorities vary their decisions in the execution of their proposals in terms of programme and construction, provided that, in the opinion of the Engineer, the Contractor has received reasonable notice thereof before the relevant alterations are put into operation.

A601.3.12 The Contractor shall take every precaution to avoid damage to existing utilities and services at the site. No clearance or alterations of utilities or services shall be carried out unless specifically ordered by the Engineer.

A601.3.13 Any services affected by the Works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of the Works. The work of temporarily supporting and protecting the public utility services during execution of the Works shall be deemed to be part of the Contract and no extra payment shall be made for the same.

A601.3.14 The Contractor may be required to carry out the removal or shifting of certain service/utilities on specific orders from the Engineer for which payment shall be made to him. Such work shall be taken up by the Contractor only after obtaining clearance from the Engineer and ensuring adequate safety measures.

A602 **EXECUTION**

A602.1 **General**

A602.1.1 In every case, the Works shall be carried out to the satisfaction of the Engineer and conform to the location, lines, dimensions, grades and cross-sections shown on the drawings or as indicated by the Engineer. The quality of materials, processing of materials as may be needed at the site, salient features of the construction work and quality of finished work shall comply with the requirements set forth in succeeding sections of this Specification.

A602.2 **Radio Communications**

A602.2.1 Any radio frequencies proposed for use by the Contractor for site communications shall be subject to the approval of GPPL terminal operations, the Harbour Master and any other existing operator or relevant Authority. The Contractor shall be responsible for arranging all permits and licences required for the operation of radio equipment throughout the Works.

A602.3 **Construction Plant and Equipment**

A602.3.1 In addition to the general conditions indicated in the Contract Documents, the following conditions regarding use of equipment in works shall be satisfied:

- The Contractor shall be required to give a trial run of the equipment for establishing their capability to achieve the laid down Specifications and tolerances to the satisfaction of the Engineer before commencement of the Works;
- All equipment provided shall be of proven efficiency and shall be operated and maintained at all times in a manner acceptable to the Engineer;
- All the plant/equipment to be deployed on the Works shall be approved by the Engineer for ensuring their fitness and efficiency before commencement of work;
- Any material or equipment not meeting the approval of the Engineer shall be removed from the site forthwith;

- No equipment will be removed from site without permission of the Engineer; and
- The Contractor shall also make available the equipment for site quality control work as directed by the Engineer.

Cranes and Lifting Equipment

A602.3.2 All cranes, lifting equipment and winches shall comply with Indian and Local Government requirements and all third party surveyor requirements, for example Lloyds, B.V., DNV, ABS, and Indian Safety Authority or similar.

A602.3.3 Test certificates, maintenance records and the like for all cranes, wires, slings and winches shall be available for inspection by the Engineer and for third party audit. Slings for which test certificates are not available shall not be used and will be removed from site prior to the commencement of the Works.

A602.4 Repair Methods

A602.4.1 The Contractor shall submit to the Engineer for approval details of all proposed repair methods to be employed as may be necessary to rectify any minor defects or incidental damage in elements of the permanent Works.

A602.4.2 Details shall include but not be limited to information on the type and manufacturer of any proprietary products to be used and any specific directions from the manufacturer regarding their use, detailed work methods for effecting the repairs and any other relevant technical information as may be required by the Engineer.

A602.4.3 The Contractor shall generally submit these details pre-emptively as part of his CWMS for the relevant construction activity. Where additional or unforeseen repairs are required, the Contractor shall make additional submission as directed by the Engineer.

A602.4.4 No repair work is to be carried out until the damaged, defective or non-conforming section of the Works has been inspected by the Engineer and the Contractor has submitted his Non-conformance Report for the Engineers review. The acceptance of the Non-Conformance Report by the Engineer shall constitute a HOLD POINT on the covering of the Works and/or commencement of repair work.

A602.4.5 Irrespective of any agreed repair methods, the Engineer shall not be bound to accept any proposed repairs and shall reserve the right to reject any damaged, defective or otherwise non-conforming Works.

A603 CLEANING AND WASTE MANAGEMENT

A603.1 Site Maintenance

A603.1.1 The Works includes the housekeeping of the Site including but not limited to:

- Daily cleaning of the Site including all amenities and facilities supplied by the Contractor to the Engineer;
- Daily cleaning of all amenities and facilities supplied by the Employer to the Contractor;

- Collection and disposal of all domestic, toxic and hazardous waste, oils and petroleum hydrocarbons, empty drums and other containers, waste timber, asbestos impregnated products all in accordance with all applicable Laws and regulations governing the disposal of these items or materials;
- Retrieval of any waste materials deposited on the sea bed by Contractor;
- Collection and storage of all surplus construction material;
- Special clean-ups required throughout the cyclone season and tie down Works required for cyclone alerts including any damage preventative measures to both temporary facilities and amenities and to partly or wholly constructed installations and enclosures;
- Final clean-up and re-instatement of the Site;
- Compliance with all environmental protection requirements.

A603.2 Construction Waste Management and Disposal

- A603.2.1 The Contractor's is required to put into practice a philosophy for waste minimisation to reduce, reuse, recycle and recover as much waste material or refuse as is practical. Waste minimisation and segregation shall be exercised during mobilisation, installation, execution and demobilisation phases of the Works.
- A603.2.2 The Contractor shall endeavour to minimise waste materials such as equipment consumables, packaging and the like. All scrap generated during construction shall be segregated into components such as glass, paper products, aluminium, steel, rubber, insulation materials, plastics, steel, wood and the like.
- A603.2.3 All demolished and excavated material, excess building materials and waste, other than material designated to be stockpiled on the site, shall be removed from site and disposed of in a legal manner. All permits and approvals necessary for the removal and disposal of demolition materials shall be obtained in advance.
- A603.2.4 All unused material shall be removed from site in a progressive manner either by use of a weekly emptied dump hopper or similar removal arrangement. The Site and surrounds shall be kept tidy at all times.
- A603.2.5 Plastics and rubber shall not be disposed of by burning. Asbestos shall be disposed of in accordance with all relevant regulations. Materials infested by vermin, pests or rot shall be destroyed in a way that will minimise the risk of infecting other materials. Hazardous wastes shall be destroyed or otherwise disposed of in compliance with the relevant regulations.
- A603.2.6 The Contractor shall take all precautions to ensure that with the exception of materials that will form part of the Works, no materials of any kind being used or transported to or from the Site fall on adjoining property or public thoroughfares or into the water. Any material or item that does so fall shall be removed as early as practical to the satisfaction of the Engineer.
- A603.2.7 Construction debris from this Contract shall remain the property of the Contractor and be removed by the Contractor from the site or adjoining area as applicable to the satisfaction of the Engineer. All such work shall be

carried out at the Contractor's own expense for which payment shall be deemed to have been included in the Contract Sum.

A604 PROTECTING INSTALLED CONSTRUCTION

A604.1 Use of Surfaces by Construction Traffic

A604.1.1 Construction traffic shall not be allowed on pavement under construction unless authorised by the Engineer. Even in that case the load and intensity of construction traffic should be so regulated that no damage is caused to the subgrade or pavement layers already constructed. Where necessary, service roads shall be constructed for this purpose and the same shall be considered as incidental to the work without any extra cost.

A604.1.2 The wheels or tracks of plant moving over the various pavement courses shall be kept free of deleterious materials.

A604.1.3 The only traffic permitted access to the base course shall be that engaged in laying and compacting the surfacing or that engaged on such surface treatment where the base-course is to be blinded and/or surface dressed. Should the base course become contaminated, the Contractor shall make good by clearing it to the satisfaction of the Engineer, and if this is impracticable, by removing the layer and replacing it to Specification without any extra cost.

A605 COMPLETION PROCEDURES

A605.1 General

A605.1.1 Requirements for Tests on Completion, Employer's Taking Over of the Works and Defects Liability shall be as per the requirements of the Conditions of Contract and subject to the additional requirements outlined in this Specification. The additional requirements specified in the following sections shall not be interpreted as limiting the Contractors responsibilities under Contract in this regard in any way.

A605.2 Preliminary Inspection of the Works at Completion

A605.2.1 In addition to the requirements of the Contract regarding Tests on Completion, the Contractor shall undertake joint general inspection of the completed Section with the Engineer and the Employer at least 14 days prior to the Contractors intended submission of application for a Taking-over Certificate for the Section.

A605.2.2 The Contractor shall record any and all defects or omissions identified during the joint inspection including any that in the sole opinion of the Engineer and/or Employer are required to be rectified prior to the issue of a Taking-over Certificate and those that may be rectified after issue of the Taking-over Certificate under Defects Liability.

A605.2.3 Following the joint inspection, the Contractor shall submit the agreed Draft List of Defects and Minor Omissions including the agreed disposition with respect to the timing and method of rectification of each to the Engineer for approval. The Contractor shall also include on the List any outstanding documentation or administrative requirements under the Contract. The Contractor shall advise the date for rectification of each individual item on the Draft List of Defects and Minor Omissions.

A605.2.4 The acceptance of this Draft List of Defects and Minor Omissions by the Engineer shall constitute a HOLD POINT on the submission of application for a Taking-over Certificate for the Section by the Contractor.

A605.3 Inspection of the Works at Completion

A605.3.1 Within 7 days following receipt of the Contractors application for a Taking-over Certificate for the Section (subject to the requirements above), the Contractor shall undertake a further joint general inspection of the Section with the Engineer and Employer.

A605.3.2 This final inspection shall be to confirm that all items previously identified on the Draft List of Defects and Minor Omissions as being required to be rectified prior to issue of the Taking-over Certificate have been rectified and to re-confirm the status of the items permitted to be rectified after issue of the Taking-over Certification for the Works under Defects Liability.

A605.3.3 Following the joint inspection, the Contractor shall submit the agreed Final List of Defects and Minor Omissions including the agreed disposition with respect to the timing and method of rectification of each to the Engineer for approval.

A605.3.4 The acceptance of this Final List of Defects and Minor Omissions by the Engineer as well as completion of all Tests on Completion and submission of all other required documentation and submittals per the requirements of the Contract shall constitute a HOLD POINT on the issuing of the Taking-over Certificate for the Section.

A606 SUBMITTALS AT COMPLETION

A606.1 Operation and Maintenance Data

A606.1.1 The Contractor shall provide a full set of all operations and maintenance manuals as may be required under the Contract in hardcopy (3No. copies) and electronic PDF format to the Engineer prior to submittal of the Contractor's application for a Taking-over Certificate for the completed Section .

A606.1.2 These manuals shall provide sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair the Plant. The wording of all such manuals shall be agreed with the Engineer and the Employer in advance.

A606.1.3 A Section shall not be considered to be completed for the purposes of taking over as defined in the Conditions of Contract until the Engineer has received in the form required by the Contract final operation and maintenance manuals in such detail, and any other manuals specified in the Specifications and the Drawings for these purposes.

A606.2 Final Site Survey

A606.2.1 Upon completion of a Section, the Contractor shall carry out final as-built detailed topographic survey of the site area including all new construction work. The survey shall show the location and level of all new and existing structures and features, spot levels and existing survey benchmarks.

A606.2.2 The Contactor shall submit survey drawings at 1:1000 (or other scale as may be agreed with the Engineer) in hardcopy and electronic PDF and CAD format based on this "as-built survey" to the Engineer for agreement and record prior to the prior to submittal of the Contractor's application for a Taking-over Certificate for the completed Section. A Section shall not be considered to be completed for the purposes of taking over as defined in the Conditions of Contract until the Engineer has received and agreed the Final Site Survey Drawings as specified above.

A606.2.3 The Employer reserves the right to make use of the Final Site Survey data for his own purposes either during the Contract or thereafter.

A606.3 As-Built Drawings

A606.3.1 The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works, showing the exact as-built locations, sizes and details of the work as executed. These records shall be kept on the Site and shall not be used by the Contractor for any purpose other than for the purposes of the preparation of the As-built Drawings in accordance with the requirements of the Contract.

A606.3.2 The Contractor shall prepare a full set of As-built drawings for the whole of the Works based on the Contract Drawings with amendments made to reflect any major changes in setout, design or construction method.

A606.3.3 All dimensions, levels and set-out coordinates shall be updated based on the in-survey, progress and as-built surveys undertaken throughout the works. Additional information on the as-built pile founding depths and setout shall be added to the drawings based on the Contract piling records.

A606.3.4 The Contractor shall submit the draft as-built drawings in hardcopy (5No. A3) and electronic CAD and PDF format to the Engineer for approval prior to the submittal of the Contractor's application for a Taking-over Certificate for the completed Works.

A606.3.5 The Contractor shall incorporate all comments and amendments required by the Engineer and once agreed, shall submit the final As-Built Drawings in hardcopy (3No. A3 and 3No. A1) and electronic CAD and PDF format to the Engineer.

A606.3.6 The Works shall not be considered to be completed for the purposes of taking over as defined in the Conditions of Contract until the Engineer has received these documents in the form required by the Contract.

A606.4 Warranties

A606.4.1 The Contractor shall provide a full set of all warranties for products of workmanship as may be required under the Contract in hardcopy and electronic original format and PDF format to the Engineer prior to submittal of the Contractor's application for a Taking-over Certificate for the completed Section.

A606.4.2 The wording of all such warranties shall be agreed with the Engineer and the Employer in advance.

A606.5 Project Record Documents

- A606.5.1 The Contractor shall provide a full set of the project quality records in hardcopy and electronic original format and PDF format to the Engineer within 28 days of issue of the Taking-over Certificate for the completed Section.
- A606.5.2 The Contractor shall maintain separate volume covering quality documentation for any outstanding minor Works carried out under defects liability. This separate volume shall be submitted to the Engineer at least 14 days prior to the expiration of the Contract defects liability period.