Maharashtra Industrial Township Limited (MITL)

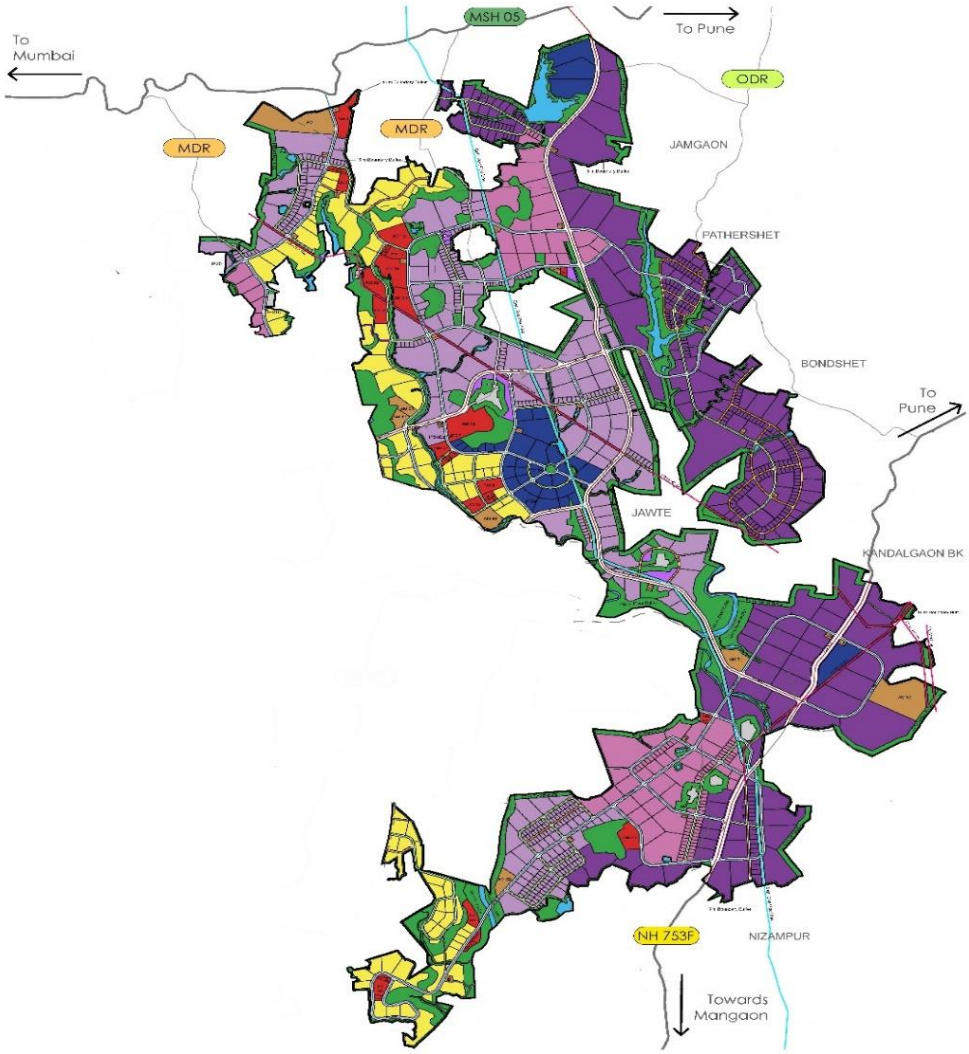
Design, Construction, Testing, Commissioning, Operation and Maintenance of Infrastructure Works at Dighi Port Industrial Area (DPIA) Phase 1 on EPC Basis

Request for Proposal cum Request for Qualification

Volume II: Technical Specifications

Part H - Information and Communication Technology (ICT)

July 2025



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Laws of the Republic of India are applicable to this tender.

Each Bidder’s procurement of this tender constitutes its agreement to, and acceptance of, the terms set forth in this Disclaimer. By acceptance of this tender, the recipient agrees that this tender and any information herewith supersedes documents(s) or earlier information, if any, in relation to the subject matter hereto.

1 Information and Communication Technology (ICT)

This part of Vol II provides specifications, scope and other details for the EPC contractor to develop the civil infrastructure required as a prerequisite for deployment of ICT components by another contractor/Master System Integrator.

DPIA, being a Greenfield Industrial smart city, the EPC tender will precede the implementation of ICT components by the Master System Integrator (MSI).

The client intends to provide an ICT framework that enables real-time monitoring, control, and integration of utilities and services with the ICT systems to be deployed by the Master System Integrator (MSI) in future.

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2 Design Philosophy and Design Basis

1 Design Basis:

The Contractor shall carry out the design, engineering, procurement, construction, installation, Commissioning, Operation and Maintenance of ICT-related infrastructure works under this contract adhering to the ICT design basis as below:

a) **SCADA Systems**: The infrastructure to be provided by the Contractor must support SCADA integration for power, water, and waste management systems. This involves incorporating secure communication protocols (OPC UA), firewalls, switches, and cabling for real-time data transmission to the ICCC.

b) **Telecommunication and Data Infrastructure**: Contractor's design must include provisions for laying telecommunication ducts, OFC (optical fiber cables), and ensuring adequate bandwidth to support for future ICT systems like RFID, AVL, and cloud-based monitoring.

c) **Power Supply and Control Systems**: Contractor shall provide 24x7 power supply for all ICT systems, including streetlights, rooftop solar systems, and surveillance systems.

d) **Foundational Infrastructure for Future ICT**: The ducts, gantries, trenches, and poles provided by the contractor shall support future ICT installations.

2 Design Criteria:

The Contractor shall adhere to the below mentioned ICT design criteria for the design, engineering, procurement, construction, installation, Commissioning, Operation and Maintenance of ICT related works under this contract:

a) Industry Standards: Adhering to established industry standards for network architecture, communication protocols, and system interoperability.

b) Future Expansion: The design must accommodate future expansion needs, allowing for seamless upgrades without disrupting existing operations.

c) Environmental Considerations: Ensure that infrastructure deployed for ICT equipment is robust enough to withstand environmental conditions specific to the project site.

d) Data Security and Reliability: Prioritize data security, system redundancy, and minimal downtime to ensure continuous operations and safeguard against potential failures.

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3 Scope

The contractor scope for ICT related works under this contract will include but not limited to the following:

Infrastructure Component	ICT Component/ System	Scope of Work
RCC Trench/Electrical Duct	Laying of Fibre Optic cable	Contractor shall provide RCC Trench/Electrical duct, cable tray, core cutting, manhole, etc. as per the ICT Access Network for various ROWs. The RCC trench shall be precast with adequate section to accommodate ICT components viz. fibre arrangement, housing, splice closure etc. Contractor shall provide access to the precast duct segment for fibre arrangement through manholes for maintenance purposes at every 200m . The contractor shall provide at least one manhole for every four plots to provide ICT connectivity to all the plots and/or for maintenance purposes. Contractor shall provide precast factory-made, heavy-duty manhole covers with fair finish and MITL logo for each such segment of the electrical duct/ RCC trench. Contractor shall provide DWC cross ducts of minimum 2x100mm dia. for crossing the roads at locations identified by Client. The contractor shall provide access in the median for providing requisite connectivity to the ICT devices (to be installed in the median) by way of chamber/handhole/ manhole of a minimum of 300 x 300 x 300 (all dimensions in mm). Contractor shall provide minimum 100mm HDPE DWC pipes connectivity from RCC trench/Electrical duct or from open trench up to the plot boundary/entry for providing ICT Connectivity. Contractor to refer to the typical ICT drawings included in this RFQ cum RFP document.
Manhole	ICT connectivity to plots	Contractor shall provide manhole of appropriate size at the end of cross ducts as per the requirement and as per the instructions of Client, wherever the RCC Trench/Electrical ducts is not available.

Infrastructure Component	ICT Component/ System	Scope of Work
		The contractor shall provide at least one manhole for every four plots to provide ICT connectivity to all the plots. The maximum distance between two successive ICT manholes (at the end of the cross duct) shall not exceed 30 m centre to centre. Contractor's scope shall include laying of 100mm HDPE/DWC ducts from manhole up to the plot boundary.
Ducts for ICT pole/gantry connectivity	ICT connectivity to ICT Poles/Gantry	The contractor shall lay 2 x 50mm dia. HDPE DWC pipes from nearby trench/manhole till ICT pole/gantry as per typical ICT drawings to provide connectivity for ICT devices.
Cable Tray	Laying of ICT cables	The contractor shall provide separate cable tray of minimum 600mm width within the Electrical duct/RCC Trench for ICT cables. The ICT cable tray shall be on uppermost tier of the cable tray assembly along the plot side wall of the Electrical duct/RCC Trench.
POP Room	Housing of networking ICT components/equipment	The contractor shall provide POP room (as per the typical POP room drawing) of upto 1200 sq.ft. carpet area for installation of ICT equipment. Contractor shall provide the POP room complete with wall plastering, colouring, light fittings, single point power source from the meter panel of the substation. The power supply shall be 24 x 7 raw power of minimum 50 KVA (with Breaker). The contractor shall provide 2 x 200mm dia. HDPE/DWC pipe for laying fibre optic cable from RCC Trench/Electrical ducts up to the POP room The contractor to provide space adjacent to the POP room for minimum 2 nos. dedicated earth pits for the earthing of ICT systems.
Space for ICT Poles/ Gantries	Installation of ICT Poles & Gantry	The contractor shall provide adequate space for foundations of the gantry/poles installed with ATCC & ANPR cameras at locations as per the typical ICT drawings including locations within 100 meters of DPIA Entry/Exit on 24m, 30m & 45m ROW. The space shall accommodate

Infrastructure Component	ICT Component/ System	Scope of Work
		foundation of minimum size 1.2m (L) x 1.2m (W) x 1.5m (D). The contractor shall also provide adequate space for the foundation of poles installed with ICT field devices (viz. poles for Solar Blinkers, CCTV etc) at locations on all ROWs as per the typical ICT drawings. The space shall accommodate foundation of minimum size 0.5m (L) x 0.5m (W) x 1.2m (D).
Power Supply	ATCC & ANPR Cameras	The contractor shall provide dedicated 24 x 7 raw power of minimum 1 KVA (with Breaker) in all IPFBs at strategic location within 100 meters of Entry/Exit on 24m, 30m & 45m ROW for powering of ATCC and ANPR Cameras as per ICT Typical Drawings. The contractor shall provide a dedicated ICT Feeder Pillar Box (IPFB) at all locations mentioned in ICT Typical Drawings.
Power Supply	CCTV Cameras	The contractor shall provide dedicated 24 x 7 raw power of minimum 1 KVA (with Breaker) in all IPFBs on all ROWs for Surveillance cameras as per ICT Typical Drawings. The contractor shall provide a dedicated ICT Feeder Pillar Box (IPFB) at all locations mentioned in ICT Typical Drawings.

Prior to construction, the contractor has to obtain approval of employer's engineer on the detailed engineering and drawings for all ICT Component including but not limited to RCC trenches, ICT related precast electrical duct sections, cross ducts, cable ducts, manhole, adequate space provision for ICT Poles & Gantries and Point of Presence (POP) room structure.

The Contractor shall obtain the approval for the executed work related to ICT Components as per the laid down process for Inspection of Civil works prior to including it in the invoice.

In addition to the above scope of work, the contractor shall design various systems as indicated below so as to provide the interface for data connectivity and seamless integration with the ICT components.

Infrastructure Component	ICT Component/ System	Scope of Work
Streetlighting system	ICT integration with Street Lighting System	The Contractor shall provide access for ICCC to monitor the agreed-upon parameters of the street lighting system.

Infrastructure Component	ICT Component/ System	Scope of Work
		required firewall & switches at the contractor's streetlight control system for integration with the ICCC. cable trays for laying ducts (2 x 40mm) from the contractor's street lighting control system to ICCC provide access through APIs with Open Platform Communications Unified Architecture (OPC UA) to communicate the data & the available parameters from the contractor's street lighting control system to ICCC. provide Shapefile of entire street light network assets in the prescribed format for integration with ICCC.
Roof Top Solar system	Roof Top Solar proposed for respective Utility Building	The Contractor shall provide access for ICCC to monitor the agreed-upon parameters of rooftop solar systems. required firewall & switches at the contractor's rooftop solar system for integration with the ICCC. cable trays for laying ducts (2 x 40mm) from the contractor's rooftop solar control system to ICCC provide access through APIs with Open Platform Communications Unified Architecture (OPC UA) to communicate the data & the available parameters from the contractor's rooftop solar control system to ICCC. provide Shapefile of entire rooftop solar network assets in prescribed format for integration with ICCC.
Power system	Soft Interface through GPRS/GSM & Cloud of Power parameters	The contractor shall make data and parameters available using API (using Open Platform Communications Unified Architecture OPC UA) for integration of data and monitoring of available parameters of Power SCADA from the Cloud at ICCC through GPRS/GSM. contractor to provide all the necessary hardware such as GPRS/GSM Modem with SIM Card along with associated charges to enable the data transfer. In case the communication protocol is available other than OPC UA, the EPC contractor must ensure that the available integration methodology/medium of the system in Cloud is adopted for ensuring integration and availability of data and parameters at ICCC from the Cloud.

Infrastructure Component	ICT Component/ System	Scope of Work
		Required Firewall & switches for integration of Power SCADA data and parameters at Power SCADA CR and in Cloud to be provided by the EPC contractor
Power system	Integration technology use for field devices i.e. RMU, transformer etc.	The contractor shall provide access for integration of ICCC with Power system infrastructure and any cloud data only through the control room for Power SCADA. There will be no direct interface of ICCC with field-based power system devices.
Water system	Field device integration including Water Leakage Detection System	The contractor shall provide access for integration of ICCC with Water supply infrastructure and any cloud data only through the Control room of Water SCADA. There will be no direct interface of ICCC with field-based Water supply devices. Required Firewall & switches at the Water SCADA control room to be provided by the contractor for integration of Water SCADA data and parameters with ICCC.
Water system	Smart Water Metering	The contractor is to provide access to MSI through APIs using Open Platform Communications Unified Architecture (OPC UA) to transmit the data over GPRS/GSM-based network from Smart Water Metering Application to ICCC and other IT application/software as per MITL requirements. The contractor is to provide all the necessary hardware such as a GPRS/GSM Modem with a SIM Card along with associated charges to enable the data transfer.
GIS	GIS Layers	The contractor shall provide shape files of the entire ICT & non-ICT Infrastructure (Utilities, Buildings, Road network, Landscape, etc.) components to MSI for integration with ICCC.

The contractor shall cooperate with the Master System Integrator (to be appointed in future) for the required integrations as mentioned above and provide necessary support to the Master System Integrator in conducting the User Acceptance Test. The UAT will include end-to-end testing of data flows from field devices such as transformers, RMUs, CCTV cameras and smart meters to the ICCC via SCADA and integration protocols (e.g., OPC UA, GPRS/GSM). Each subsystem will be tested individually, followed by overall integration testing to ensure end-to-end connectivity and functionality. The contractor shall facilitate seamless communication between the infrastructure components mentioned above and the Integrated Command and Control Center (ICCC) to be developed by the Master System Integrator.

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4 Standards and Codes

DPIA ICT Systems shall be deployed adhering to standards that align with both global best practices and Indian regulations. The Contractor shall design, supply, install, and construct infrastructure under this contract that shall comply with the following standards to ensure compatibility with various systems being deployed by MITL in DPIA, including ICT systems.

1 Technical Standards

a) **ISO/IEC 27001**: Information security management systems.

b) **ISO/IEC 20000-1**: IT service management.

c) **BIS Standards**:

i. **Unified Digital Infrastructure (UDI-ICTRA): IS 18000:2020** - Reference architecture for a secure and sustainable digital infrastructure.

ii. **Data Layer Reference Architecture: IS 18002 (Part 1):2021** - Reference architecture for the data layer of a unified digital infrastructure.

iii. **Unified Data Exchange Architecture: IS 18003 (Part 1):2020** - Reference architecture for unified data exchange.

iv. **Information Technology Equipment Safety: IS 13252 (Part 1)** - General requirements for the safety of information technology equipment.

v. **Audio, Video and Similar Electronic Apparatus Safety Requirements: IS 616** - Safety requirements for audio, video, and similar electronic apparatus.

vi. **Accessibility Requirements for ICT Products and Services: IS 17802 (Part 1)**

vii. **Customer Contact Centres: IS/ISO 18295-1** - Service requirements for customer contact centres and **IS/ISO 18295-2** - Requirements for organisations that use customer contact centres.

1 **IEEE 802.3**: Ethernet standards for wired networking.
2 **IEEE 802.11**: Wireless networking standards.
3 **ISO/IEC 11801**: Generic cabling for customer premises.
4 **ISO/IEC 14763-2**: Implementation and operation of cabling infrastructure.
5 **TIA/EIA-568**: Commercial building telecommunications cabling standards.
6 **IEC 62443**: Industrial communication networks and cybersecurity for operational technology.
7 **ISO/IEC 15408**: Evaluation criteria for IT security (Common Criteria).

2 Operational Standards

a) ITIL (Information Technology Infrastructure Library): Best practices for IT service management.

b) PMBOK (Project Management Body of Knowledge): Standards for project management processes.

c) ISO 9001: Quality management systems requirements.

d) ISO 22301: Business continuity management systems.

e) ISO 31000: Risk management guidelines.

3 Security Standards

a) **ISO/IEC 27002**: Code of practice for information security controls.

b) **NIST Cybersecurity Framework**: Framework for improving critical infrastructure cybersecurity.

c) **ISO/IEC 27017**: Guidelines for information security controls applicable to cloud services.

d) **ISO/IEC FDIS 27402** Cybersecurity – IoT security and privacy – Device base line requirements

e) **IS/IEC 62443 Series** - Security for Industrial Automation and Control Systems

f) **IS 14990 ISO/IEC 15408** –1 Series Information technology – Security techniques -Evaluation criteria for IT Security

g) **IS 15671 ISO/IEC 18045 Information technology** -Security techniques - Methodology for IT Security Evaluation

h) **IS 16335 Power control systems** - Security requirements

i) **IS 17737** Series Mobile Device Security

j) **•IS/ISO/IEC 27033 Series Information Technology** –Security Techniques - Network Security

k) **•IS/ISO/IEC 27034 Series Information technology** –Security techniques - Application Security

l) **•IS/ISO/IEC 27035 Series Information technology** –Security techniques - Information Security incident management

m) **•ISO/IEC 27400 Cybersecurity –IoT security and privacy** – Guidelines

n) **CERT-IN Guidelines**: Indian Computer Emergency Response Team guidelines for cybersecurity.

4 Compliance Standards

a) **Data Protection Act, 2023 (DPDP Act):** To protect the personal data of individuals by regulating its collection, processing, storage, and sharing.

b) **IT Act 2000**: Indian Information Technology Act and its amendments.

c) **ISO/IEC 27701**: Privacy information management.

d) **SEBI Guidelines**: For financial ICT systems compliance (if applicable).

e) **UIDAI Guidelines**: For systems involving Aadhaar data.

5 Networking and Communications Standards

a) **RFC Standards**: Relevant Request for Comments (RFC) standards from the IEsTF (Internet Engineering Task Force).

b) **IPv4/IPv6**: Internet Protocol standards.

c) **ITU-T Standards**: International standards for telecommunications.

d) **TRAI Regulations**: Telecom Regulatory Authority of India guidelines for telecom infrastructure.

6 Software and Application Development Standards

a) **ISO/IEC 12207**: Software life cycle processes.

b) **ISO/IEC WD 27090 Cybersecurity** — Artificial Intelligence Guidance for addressing security threats and failures in artificial intelligence systems

c) **ISO/IEC WD 27091 Cybersecurity and Privacy**—Artificial Intelligence—Privacy protection

d) **CMMI (Capability Maturity Model Integration):** Guidelines for process improvement.

e) **Agile/Scrum Standards**: Best practices for software development and project management.

f) **STQC Guidelines**: Standardization Testing and Quality Certification guidelines by the Indian government.

g) **eGov Standards** - Customer facing applications solution shall at least comply with the published e-Governance standards, frameworks, policies and guidelines available on http://egovstandards.gov.in (updated from time-to-time)

7 Hardware Standards

a) **BIS Certification**: Bureau of Indian Standards certification for hardware products.

b) **UL Standards**: Safety standards for electrical and electronic products.

c) **RoHS (Restriction of Hazardous Substances Directive):** Compliance for hazardous materials in electronics.

d) **E-Waste Management Rules, 2016:** Guidelines for disposal of electronic waste in India.

8 Environmental and Sustainability Standards

a) **ISO 14001**: Environmental management systems.

b) **MoEFCC Guidelines:** Ministry of Environment, Forest and Climate Change guidelines for environmental clearance and compliance.

9 Data and Document Management Standards

a) **ISO 15489-1:** Information and documentation, records management.

b) **ISO/IEC 27040**: Storage security.

c) **IS 17428 Series** - Data Privacy Assurance

d) **ISO/IEC 27018**: Protection of personal data in the cloud.

e) **Digital India Standards:** Guidelines under the Digital India initiative for data management and security.

10 Health and Safety Standards

a) **OHSAS 18001/ISO 45001:** Occupational health and safety management systems.

b) **NEC (National Electrical Code):** Standards for electrical safety in the workplace.

c) **NBC 2016 (National Building Code of India 2016):** Guidelines for the safety and design of buildings in India.

11 Testing and Validation Standards

a) **ISO/IEC 17025:** General requirements for the competence of testing **and calibration laboratories.**

b) **IEEE 829:** Software testing documentation standards.

c) STQC Certification: Indian government's standardization and testing certification for software and IT systems.

d) **IEC 61508:** Functional safety of electrical/electronic/programmable electronic safety-related systems.

12 Other Relevant Standards

a) **ISO/IEC 19770**: Software asset management.

b) **ISO/IEC 38500:** Corporate governance of information technology.

c) **National Cyber Security Policy 2013**: Guidelines from the Government of India for cybersecurity.

5 Commissioning, Operation & Maintenance Support to Master System Integrator

1 Commissioning

The contractor shall provide necessary support to MSI for the commissioning of ICT Components including but not limited to the following

a) Provide 24X7 LT (415V/220V) power supply for all ICT equipment including field devices as well as POP rooms.

b) Provide Civil infrastructure including but not limited to RCC trenches, Electrical ducts, cross ducts, Manhole etc.

c) Provide connectivity and communication paths for all Infrastructure components connected to the ICCC as listed under Scope of Work (Section 3 of this document).

d) Support MSI to run system diagnostics and network performance tests to ensure the flow of data is uninterrupted, secure, and accurate.

2 Operation & Maintenance

The contractor shall provide the necessary support to MSI for the operation & maintenance of ICT Systems/Components including but not limited to the following

The handover stage will ensure that all assets, systems, and documentation are transferred to the Master System Integrator (MSI) and other stakeholders. This stage will cover:

a) Maintain 24X7 LT (415V/220V) power supply for all ICT equipment including field devices as well as POP rooms.

b) Maintain Civil infrastructure including but not limited to RCC trenches, Electrical ducts, cross ducts, Manhole etc.

c) Ensure connectivity and communication paths for all Infrastructure components connected to the ICCC as listed under Scope of Work (Section 3 of this document).

d) Support MSI in running periodic system diagnostics and network performance tests to ensure the flow of data is uninterrupted, secure, and accurate.

e) Attend and repair any broken-down civil infrastructure related to ICT as per Repair/Rectification of Defects and Deficiencies indicated in the Contract agreement.