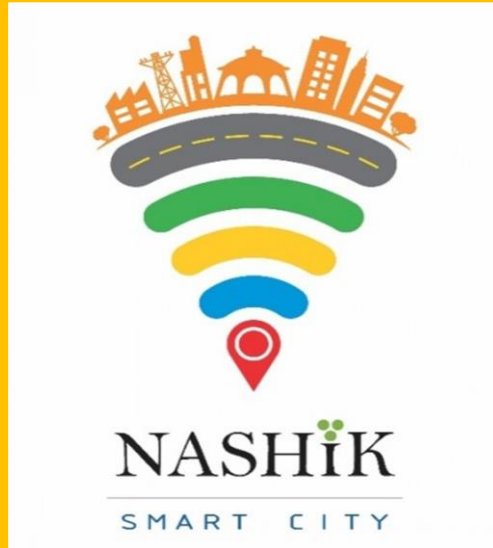




**Request for Proposal (RFP)
For
Selection of Implementation Agency
for Supply, Laying, Installation,
Testing and Commissioning of Nashik
& Trimbakeshwar City Network
Backbone along with providing
Operations & Maintenance Services**

**VOLUME II - Scope of Work and
Requirement Specifications**

**Tender Ref Number- NMSCDCL/51/2025-26
Date: July 30, 2025**

**Nashik Municipal Smart City Development
Corporation Limited (NMSCDCL)**

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- i. This Request for Proposal ("RFP") is issued by Nashik Municipal Smart City Development Corporation Ltd (NMSCDCL).
- ii. The information contained in this Request for Proposal document ("RFP") or subsequently provided to Bidders, whether verbally or in documentary or any other form by or on behalf of the NMSCDCL (the NMSCDCL) or any of its employees or advisors, is provided to Bidders, on the terms and conditions set out in this RFP.
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- v. The NMSCDCL also accepts no liability of any nature, whether resulting from negligence or otherwise, however caused, arising from reliance of any bidder upon the statements contained in this RFP.
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- vii. NMSCDCL or its authorized officers / representatives / advisors reserve the right, without prior notice, to change the procedure for the selection of the Successful Bidder or terminate discussions and the delivery of information at any time before the signing of any agreement for the Project, without assigning reasons thereof.
- viii. The RFP Document does not address concerns relating to diverse investment objectives, financial situation and particular needs of each party. The RFP Document is not intended to provide the basis for any investment decision and each Bidder must make its / their own independent assessment in respect of various aspects of the techno-economic feasibilities of the Project. No person has been authorized by NMSCDCL to give any information or to make any representation not contained in the RFP Document.
- ix. The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation and expenses associated with any demonstrations or presentations which may be required by the NMSCDCL or any other costs incurred in connection with

or relating to its Proposal. All such costs and expenses shall remain with the Bidder and the NMSCDCL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder, in preparation for submission of the Proposal, regardless of the conduct or outcome of the selection process.

1. Introduction

Information and Communication Technology (ICT) has changed the evolution of cities; the notion of “growing” cities is being replaced with the idea of making a city “Smart”. ICT has forced the think tank and compelling planners of the cities to not only consider the physical planning of a city but to also consider ICT enablement to make the economy, environment, mobility and governance more efficient and effective.

To build on these advances, innovative governments continue to seek new ways of maximizing business value; NMSCDCL is keen to take up initiatives in transforming Nashik into a Smart City by embedding smart devices, sensors and actuators within physical space and infrastructure of the city. This offers real-time data management, alerts, and information processing for the city administration and thus allows city planners to develop other innovative ecosystems in line with its people through technology.

The city administration is implementing all the identified ICT-led Smart City initiatives through its city level SPV i.e. Nashik Municipal Smart City Development Corporation Ltd (NMSCDCL). Fibre connectivity plays a crucial role in connecting services and integrating them onto a single platform.

1.1 Project Background

Considering critical network design parameters, such as secure, reliable, scalable, manageable, interoperable, capable and resilient, it is proposed that a secured optical fibre network backbone-based service delivery network shall be established across the city.

The network backbone is expected to provide a converged network, bringing together different city management vertical solutions on a common network infrastructure for Nashik and Trambak. The converged network shall facilitate information exchange between resources and applications across different domains. It will be an end-to-end open platform enabling services across the city.

An overarching OFC-based network is being planned as part of Nashik-Trimbakeshwar Kumbh 2027, which forms the backbone for all the envisaged applications. The network architecture being proposed, will comply with the best practices and industry standards to ensure high availability, scalability, manageability and security for the information, services and solutions being managed on the network.

The designed network shall provide uninterrupted services across the Nashik and Trambak connecting seamlessly with various stakeholders. With the capability to handle high bandwidth applications with low latency, the network forms the pivot for ICT based Smart City interventions in Nashik and Trambak city.

The various locations to be connected via fibre network are, but not limited to, Nashik Municipal Smart City Development Corporation Ltd, Police Stations/ Viewing Centres, Control & Command Centre (CCC), government hospitals and other city administrations' important buildings, field locations, traffic junctions etc. Optical Fibre shall be laid primarily along the road network comprising main city roads and street roads for both Nashik & Trambak

Nashik and Trambak City envisages establishing a strong network backbone for seamless experience for the forthcoming various Surveillance and other IT related projects in terms of improved quality, safety, security, and convenience to its residents. As a part Kumbh related IT project's broader vision, to continuously evolving to offer better services to pilgrims by harnessing the use of the best technology.

Technology will have a very crucial role in the implementation of Kumbh Mela IT initiatives across the city of Nashik and Trimbakeshwar. A reliable, high speed and scalable network will form the foundation on which the future IT initiatives shall be designed and built.

Since network will play a major role in the future initiatives the Kumbh Mela Authority has decided to create a City Wide Network Backbone Infrastructure which will be the backbone for implementation of Kumbh Mela initiatives across city of Nashik and Trimbakeshwar.

The provisioned network backbone infrastructure shall be designed in a manner which shall be capable to carry all the key IP services that shall be implemented in due course under Kumbh Mela initiatives. The Kumbh Mela Authority has decided to implement a dedicated and secure fibre network backbone to be established across Nashik and Trimbakeshwar City.

The expected benefits to be derived from city network backbone are:

- a) **Connectivity** – Network that interconnects citizens, government, business and communities
- b) **Efficient Management** – Network that allow better management and control to offer richer application experiences
- c) **Secure, Private and Resilient** – Network built considering security standards and best practices with stability in bandwidth provisioning and resilient
- d) **Reliable** – Network that is capable to deliver the envisaged bandwidth and related services
- e) **Scalable** – A network that can scale up to cater all the required bandwidth for deployment of future initiatives

The network backbone is expected to help the IT initiated projects under Kumbh Mela to build a converged network, bringing together different city management vertical solutions on a single foundational network infrastructure. The converged network shall facilitate information exchange between resources and applications across different domains. It is proposed to be an end-to-end platform enabling delivery of varied services for the pilgrims. Key objectives envisaged are to provide:

- IP connectivity that shall enable the citizens and pilgrims to avail varied services under Kumbh Mela city initiatives
- Wired and wireless, scalable, and highly secure network platform
- Data management framework to help enable data collection, organization, and sharing
- Adoption and usage of distributed compute and storage services, location services, and security services

This Fiber Backbone Infrastructure is an important aspect of the Kumbh Mela It projects initiative that shall enable the delivery of all the key and important services to be made available to its citizens with seamless access.

Network backbone infrastructure shall comprise of Dark Fibre, setting of various Point of Presence (PoPs), Core, Aggregation and Access locations that shall be established across the city. The fibre shall be further utilized to cover all Access locations for services to be as and when required.

Under this project, the agency has to supply, install, test, establish and maintain the fibre network as per requirement and establishing connectivity of the upcoming field devices at various junctions which with the centralized command and control centre.

Nashik Municipal Smart City Development Corporation Ltd (NMSCDCL) intends to appoint IA for Supply (Design & Develop), Installation, Testing, Commissioning and to provide Operation & Maintenance Services, for a period of 2 years from the date of solution Go Live, for the below mentioned components:

- City Network Backbone (Optical Fibre Cabling)
- Network Monitoring & Operations Management Platform

NMSCDCL planned to implement its ICT led Smart City Initiatives through various RFP packages, as mentioned below:

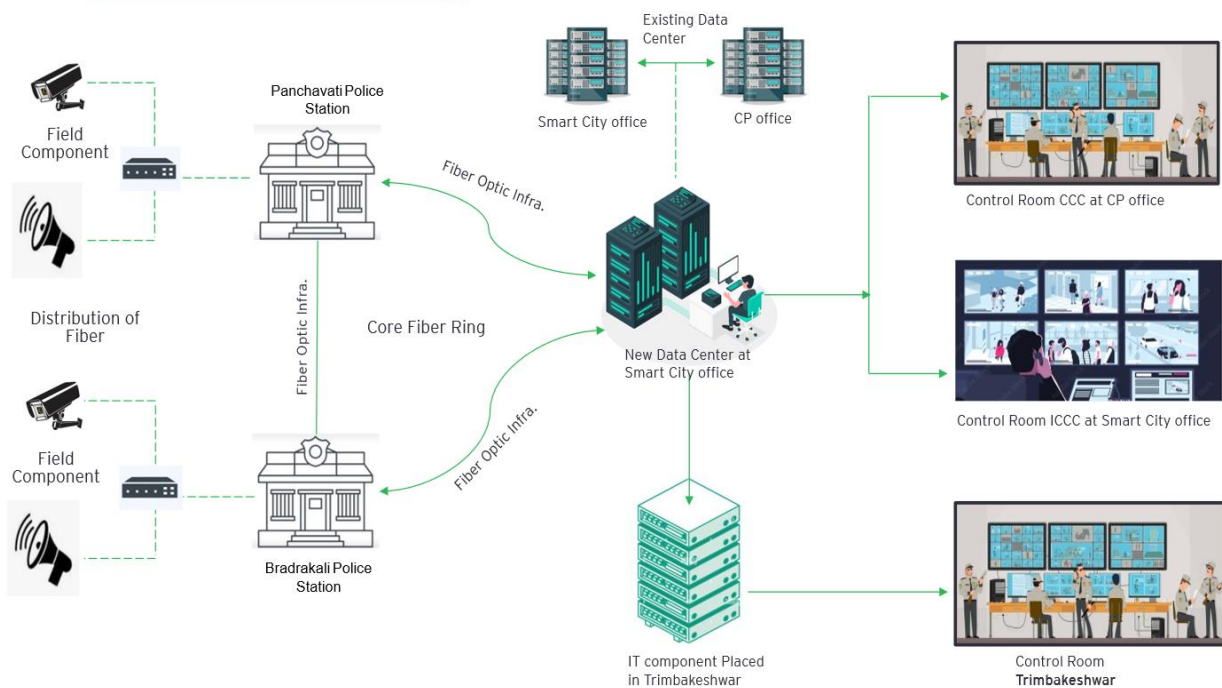
- RFP 1 – Selection of Implementing Agency for Supply, Laying Installation, Testing and Commissioning of Nashik and Trimbakeshwar City Network Backbone
- RFP 2 - SITC and O&M for remaining ICT led Smart City Initiatives (IT Infrastructure & systems) along with active equipment (field as well as centralised) for CCTV System and other smart elements.

1.2 Benefits Envisaged

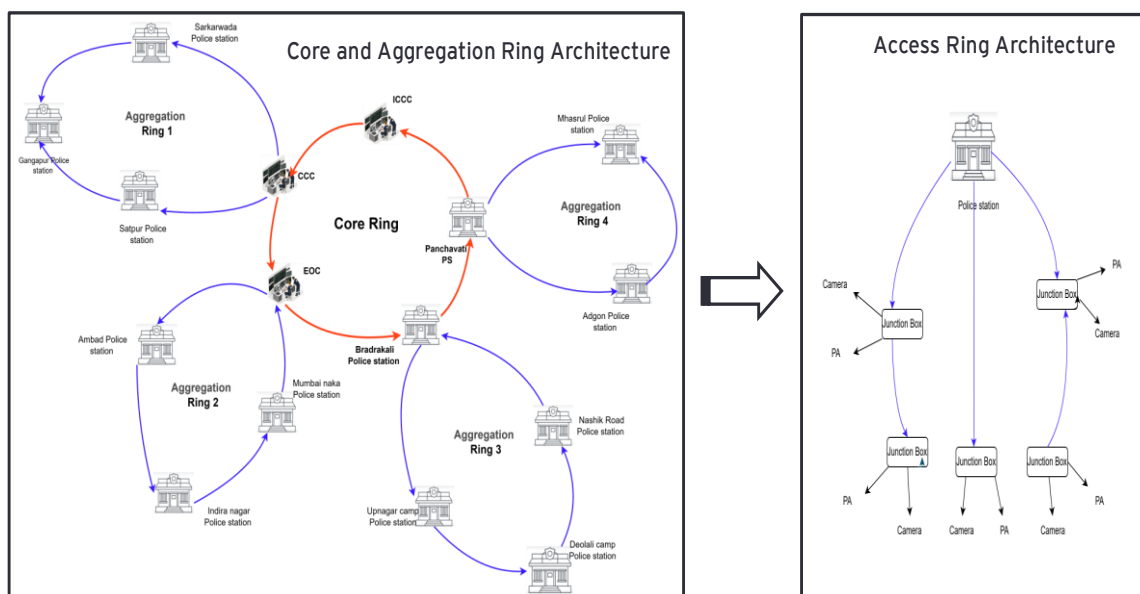
An optical fibre backbone in the initial phase will support the inclusion of almost all digital assets onto a common platform, which will ensure confluence of data from multiple sources, applications, sensors, objects and people. The establishment of this project will provide high quality, reliable, cost effective and sustainable network to the city administration. The network will be the provider of seamless connectivity solution for all surveillance systems. The provisioning of this network backbone will ensure connectivity to the data centres and control rooms with scalable capacities to allow for expansion in the future. In the long run, the network will also act as a source of opportunities for generating revenue. This project will have multifield benefits across the government departments and the effect will be felt by citizens.

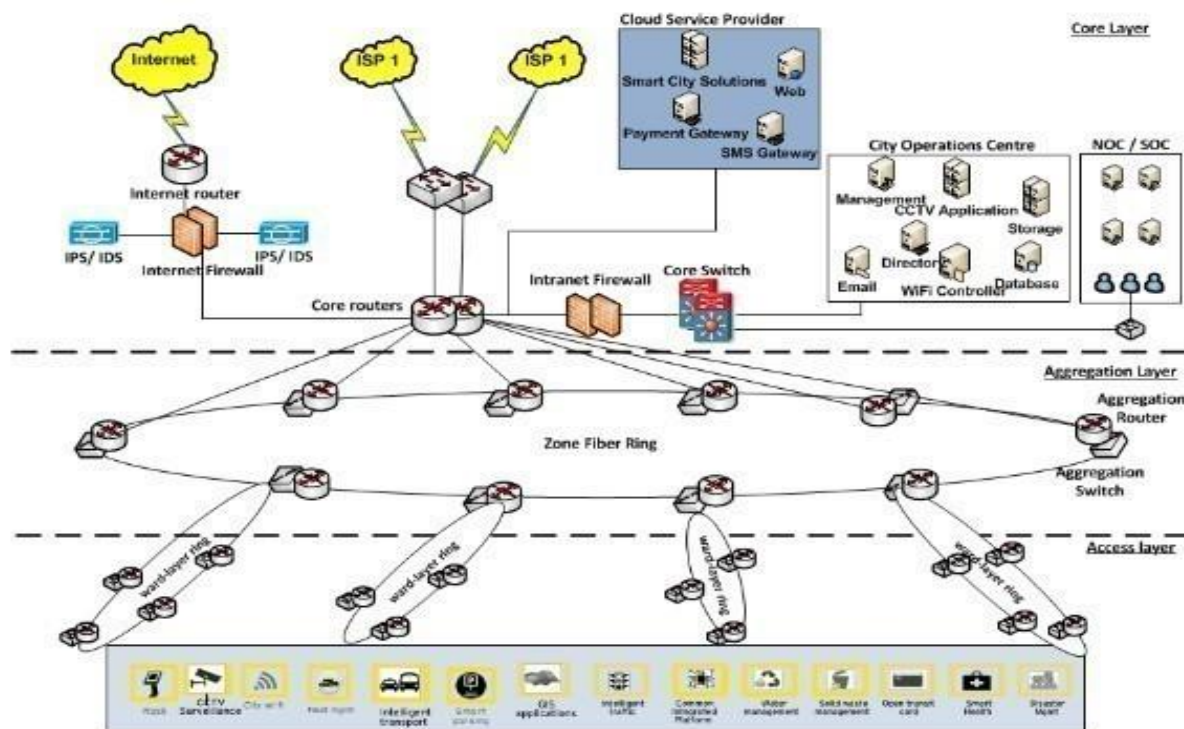
2. Indicative Solution Architecture

2.1 Indicative Deployment Architecture



2.2 Core, Aggregation and Access Indicative Architecture





The above diagram illustrates FIBER OPTIC NETWORK topology comprising of a backbone / Core and aggregation design along with the access layers in ring topology. The network described in this RFP is illustrative in nature as far as active component is concerned and bidders are free to suggest their network design. Bidders will implement passive fibre network as per the scope defined in this RFP. Above are the indicative design considerations for Fiber Optic Network which shall be followed while designing the network

2.3 Core Layer

The Core backbone ring topology shall meet the following minimum requirements:

- The Core backbone ring topology shall be constructed using 96 Core armoured Single mode Optical Fiber Cables (OFC).
- The Core layer shall have 4 numbers of 40 mm High Density Polyethylene (HDPE) pipes and 2 (two) numbers of dwc/ GI pipe of 100 mm.
- The Core architecture shall be formed in full ring topology to handle single point of failures
- The proposed ring architecture shall ensure high availability and faster convergence for service continuity.
- The Core layer shall have chamber at approx. 200 meters and shall have OFC joint splice closure at approx. 300 – 500 meters.
- Additional chambers to be constructed wherever there is a road crossing or at sharp turns.
- A loop of 20 meters of OFC shall be left in every Hand Hole/ Manhole.

2.4 Aggregation Layer

- The aggregation layer comprising of ring topology will be connected to 2 different POP locations. Each POP location will have one end of multiple access rings getting terminated from both directions.

- The Aggregation ring shall be constructed using a 96 Core armoured Single mode Optical Fiber Cables (OFC).
- It shall have 4 numbers of 40mm High Density Polyethylene (HDPE) pipes and 2 (two) numbers of dwc/ GI pipe of 100 mm. .
- The aggregation architecture shall be formed using ring topology.
- Different physical aggregation rings will utilize different fibre tubes of Core layer to reach to 2 PoPs.
- The distance between two Hand Holes/RCC Chamber should not exceed 200 meters.
- A loop of 20 meters of OFC shall be left in every Hand Hole/ Manhole.

2.5 Access Layer

96 core armoured cable will be laid separately in a duct for last mile connectivity at all locations to be connected on either Core or Access layer fibre. Last mile connectivity will be implemented in ring for all locations.

- The access layer shall be constructed using 96 Core armoured Single mode Optical Fiber Cables (OFC).
- The access layer shall have 4 numbers of 40 mm High Density Polyethylene (HDPE) pipes and 2 (two) numbers of dwc/ GI pipe of 100 mm. .
- The proposed ring architecture shall ensure high availability and faster convergence for service continuity.
- Additional chambers to be constructed wherever there is a road crossing or at sharp turns.
- A loop of 20 meters of OFC shall be left in every Hand Hole/ Manhole/ Last mile drop.

3. Scope of Work

Brief Scope of Work:

- IA shall be responsible for provisioning required network infrastructure and/or systems, along with coordination with other agencies for the end to end laying of fibre and establishing redundant network.
- IA shall exercise due care that soil from trenching intended to be loose for back filling is not mixed with loose debris. While trenching, IA should not cause damage to any underground installations belonging to others agencies and any damage caused should be made good at his own cost and expense.
- Optical Fibre Cable to be laid through HDPE/PLB HDPE Pipes buried at a nominal depth of 165 cms.
- Laying of HDPE/PLB HDPE pipes/coils coupled by HDPE/PLB HDPE sockets in excavated trenches, on bridges and culverts, drawing of 6 mm Polypropylene Para rope (P.P. rope) through the HDPE/PLB HDPE pipes/coils as per Construction Specifications and Sealing of HDPE/PLB HDPE pipe ends at every manhole by HDPE/PLB HDPE end caps of suitable size.
- Fixing of GI pipes with clamps at culvert /bridges and/or chambering or concreting of GI pipes/through, wherever necessary
- Backfilling, Removal & Cleaning of spillover/spread over/extra debris
- After backfilling of soft soil, a roller or hand compactor to be used to level and smooth the surface
- Mandatory Reinstatement and restoration of the excavated trenches according to the construction specification (in case of Tar/Concrete/Murum trenching)
- IA shall ensure procurement of 4 HDPE duct of 40 mm OD of different colours for ease of maintenance and recognition during maintenance phase. IA to ensure fibre to be blown in only one colour of HDPE duct across the entire route length of network infrastructure.
- Constructing & Opening of manholes for ensuring smooth passage for pulling the cable in any of the 4 HDPE duct. Pulling of Optical Fibre Cable with proper tools and accessories as per construction specifications. Sealing of both ends of the manholes by a hard rubber bush of suitable size to avoid entry of rodents into the HDPE/PLB HDPE pipes, putting split HDPE/PLB HDPE pipes with proper fixtures over the cable in the manhole to protect the bare cable during pulling the manhole. Backfilling and dressing of manholes.
- The IA shall be responsible for all necessary arrangements to remove or pump out water from trench. The IA should survey the soil condition encountering the section and make his own assessment about dewatering arrangements that may be necessary. No extra payment shall be admissible for this and the tendered rate may take care of this aspect.
- Optical Fibre Cables should be pulled through Permanently Lubricated HDPE Duct of 40 mm size conforming to the specifications as per TEC GR No. TEC/GR/TX/CDS-008/03 / MAR-11 or subsequent Amendments.
- Cable sealing Plug shall be used to seal the end of the ducts perfectly, after the OF cable is pulled in the duct. For pulling the cable through the ducts, it is necessary to provide manholes at that location and also at bends and corners wherever required. The ends of the PLB HDPE ducts/coils are closed with Cable sealing Plugs. The End Plugs used should be suitable for closing PLB HDPE ducts/coils. The Cable sealing plug shall confirm to TEC GR No. TEC/GR/TX/CDS- 008/03/MAR-11 or subsequent Amendments.
- Push Fit couplers shall be used for coupling PLB HDPE ducts/coils.
- The IA shall be responsible for coordinating with the upcoming CCTV IA and other IA 's to establish connectivity from the fibre termination point to the junction box of the smart solution. This involves ensuring seamless connectivity, effective coordination, and timely completion of the task. Any non-compliance resulting in delays, shall lead to appropriate action at the discretion of NMSCDCL.
- IA shall provision for warehouse services for the storage of all the project related infrastructure and accessories at its own cost.

- IA shall be responsible for obtaining all permits, RoW and approvals from various agencies/departments, necessary for installation of site infra at various locations under this project. NMSCDCL shall assist IA in obtaining the desired approvals.
- NMSCDCL shall support the bidder towards getting the waive-off for Right of Way (RoW) charges applicable under this project to the IA for undertaking laying of duct & fibre blowing while ensuring backfilling and restoration/ reinstatement of the trench/pit as per the norms and to the satisfaction of the concerned agency/department/approving authority, limited to the approved Network Route Plan. The IA is responsible for paying any required Right of Way (ROW) fees (if applicable).
- Prior to commencing any excavation activities—including duct laying, fibre blowing, and manhole/handhole construction—the Implementation Agency shall notify all concerned authorities and provide the network route plan to secure all required No Objection Certificates (NOCs) or permissions
- IA shall deploy sufficient manpower for multiple team to perform multiple activities onsite, in order to operate respective systems at NMSCDCL during the contract period, for which there shall be at least one qualified resource for each of the solution along with a Project Manager.
- The Implementation Agency shall deploy manpower with the requisite skill sets to effectively address and resolve on-site challenges within the prescribed timeframes. This shall include, but not be limited to, the restoration of mechanical damages (e.g., pipeline disruptions and related infrastructure), electrical faults, plumbing issues, and other site-related damages that may arise during the execution and O&M of the project.

3.1. City Network Backbone Scope of Work

The selected IA shall be responsible for Procurement, Supply, Installation, Testing and Establishment of OFC based City Network Backbone (Passive Infra only and Network Monitoring & Operations Management Platform) along with 2 (two) years of Operations & Maintenance Support, from the date of Go Live.

3.2. Detailed Route Survey

Fibre backbone infrastructure is an important component of the entire city initiative that shall enable the delivery of all the key and important services to be made available to its citizen centric services with seamless communication. Network backbone infrastructure shall comprise of trenching, ducting laying of ducts & blowing of fibre, restoration, reinstatement and setting of various point of presence (Pop) / access point that shall be established under Nashik and Trimbakeshwar city.

Preliminary detailed site survey shall be carried out by the IA for finalizing the route of Optical Fibre Cable basis indicative Network Architecture/ indicative list of locations mentioned in the RFP At the end of the survey, IA shall estimate the network route length to be executed via Horizontal Directional Drilling (HDD), to the best possible extent, and Open Trench Technique basis the site feasibility as applicable.

This component of the project would involve detailed field survey of all locations designing / mapping of the Optical Fiber Network on KMZ file Nominal design of network would be prepared on using different layers. Changes proposed during survey, execution and maintenance post hand over will also be updated and made available to the authority for end-to-end visibility of network. All important information like no. of ducts, type of fibre, no. of healthy fibre cores, location of chambers, manholes along with location information will be maintained in attributes of different layers in GIS (kmz file). The Implementation Agency (IA) shall prepare and submit comprehensive As-Built Drawings for the entire executed route to NMSCDCL.

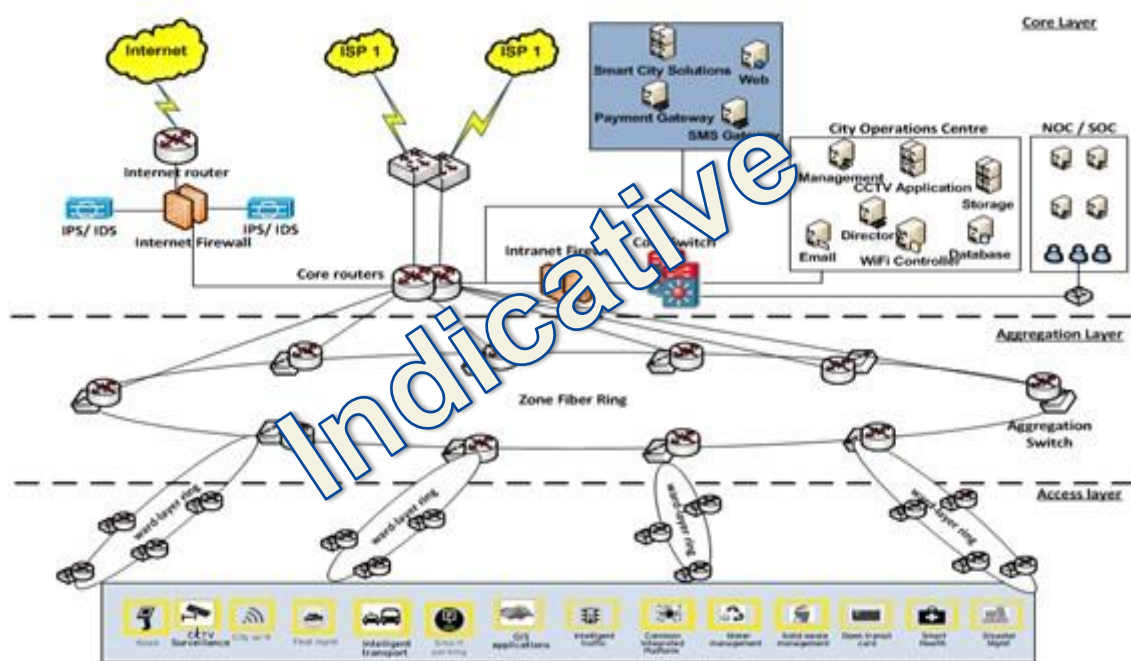
Following activities shall constitute this survey, but not limited to:

- Selecting the optimal route in general
- Deciding the number of drop and insert locations, chamber, route market, enclosure, LIU's etc.
- Assessing the length of fibre cable, duct, GI Pipe, HDPE, DWC and existing utilities (ducts/ chamber) to be used for fibre blowing
- Capturing the coordinates of the drop, insert locations and chambers.
- Finalizing the circuit distribution for the locations to be connected in ring/ linear with authority.
- Assessing the challenges/ issues such as type of soil, long cuttings, new embankments, waterlogged areas, major bridges, major yards, culverts etc.
- Collecting details of the existing facilities like telecommunication, utilities, water etc. and the additional requirements
- Assessing the number of road crossings and other protective works required to be done
- Capturing the areas where underground Fibre laying may not be feasible.
- Capturing the availability and coordinated of patches wherever UG Fibre laying may not be feasible.
- During the site survey exercise, details should be captured while keeping below points into consideration:
 - Avoiding laying of cable too close to a newly built road
 - Avoiding the toe of the embankment adjacent to the cultivated fields
 - Avoiding burrow pits and areas prone to water logging
 - Avoiding heavily fertilized soils containing acids, electrolytes and decomposable organic materials promoting bacterial activity
 - Avoiding proximity to chemical, paper and such other industries which discharge chemically active affluent
 - Avoiding large rock cuttings, routes of existing cables and areas difficult to approach
 - Avoid built up areas including those areas where building, etc. are likely to come up in future
 - Determining composition of the soil which may result in corrosion, etc. on the cable for which special protection for the cable shall be required
 - Working out requirement of transport vehicles like jeeps, lorries, motor trolleys, etc. for execution of the work
 - Avoiding side of the alignment which is likely to be affected due to addition/alteration of earth work/supply structures
 - Avoiding underground structures, signalling cables, power cables, pipelines, other utilities etc.

- Avoiding laying of cable on the side of the drains in built up areas which are generally difficult to lay
- Taking the cable route preferably through the bed of small culverts where water does not accumulate instead of taking it over the culverts
- Avoiding termites/rodents infected areas

3.3. Network Design Preparation

The Implementing Agency (IA) shall be responsible for the preparation of City Network Backbone layout/architecture, basis on the below mentioned indicative three-tiered architecture which is based on the Ring Topology to ensure redundancy at each node level with dual parenting and get the same approved by the NMSCDCL. The IA is also required to propose the Network Architecture as part of its technical bid.



The envisaged layers of the City Network Backbone are:

- a. **Core Layer:** The Core layer forms the backbone; comprising of network Point of Presence (PoP) at all the NMC/ NMSCDCL Viewing Centre/ Police Stations, Command Control Centre and NMC/NMSCDCL Head Office and the same shall be applicable for Trimbakeshwar City basis the network feasibility report. This layer shall enable all systems planned to be hosted at Command Control Centre to be accessed over the backbone. Core layer shall form the point of aggregation for all the traffic coming from the respective Aggregation Layer and beyond.
- b. **Aggregation Layer:** The aggregation layer is envisaged to have network PoPs at Nashik and Trimbakeshwar Police Stations/ Viewing Centres. The traffic coming from respective service/filed locations shall get aggregated at the Aggregation Layer PoP. The aggregation layer shall further connect to the Core layer for forwarding the traffic to the Core layer. All the Aggregation layer PoPs in the respective Police Stations/ Viewing Centres shall form individual rings to establish redundancy.

- C. **Services / Access Layer:** The Service/ Access layer shall be formed at various locations within the Police Stations/ Viewing Centres of Nashik and Trimbakeshwar. The service layer shall enable the smart city solutions such as City Surveillance and other ICT-IOT enables solutions, to connect to the network backbone. The aggregation switch of the respective smart city solution shall connect on the Service / Access layer devices to connect to the network backbone.

Various locations for deployment of above layers are:

#	Item	Deployment location
1	Core Layer	Data centre Integrated Command Control Centre of Nashik and Trimbak
2	Aggregation Layer	TCCC-Trimbak Command Control Center/Viewing Centres /Police Stations, Emergency Operation Center (EOC)
4	Service/Access Layer	The services layer is considered to be the edge locations/area where the ICT/ IOT solutions shall be deployed

3.4. Procure, Supply, Installation and establishment of both City Network along with requisite accessories

- Procure & Supply all the passive components and accessories required for laying of ducts and blowing of fibre including but not limited to duct pipes, jointers, couplers, fibre cable, splicer, jointer etc.
- All fittings, accessories and associated works for proper and safe installation of fibre assets to be taken into consideration by the IA.
- IA shall be responsible for laying of 4 ducts in Nashik City and Trimbakeshwar City, on the approved network route and design, using Horizontal Directional Drilling (HDD), wherever possible, and Open Trenching (OT) Technique basis on site feasibility as applicable. Optical Fibre of 96 core is proposed at the Core & Aggregation Layer and Service/Access layer in one of the ducts.
- HDPE Ducts and Optical Fibre shall be laid primarily along the roads and footpaths and close coordination will have to be done with concerned department for getting permission and deciding execution methodology
- Laying, jointing, live line installation, testing and commissioning of all optical fibre and its accessories
- The estimated fibre optic cable length requirements are indicated in the Bill of Material (BoM)
- For the purpose of payment of civil works related to laying of Duct/OFC, the length of the trench shall be used and not the length of the OFC laid or the ducts laid.

3.5. Pre Requisite for Laying of City Network

Responsibilities of the Implementing Agency (IA) for Project Execution

- A detailed plan outlining the list of equipment, number of field personnel, and number of HDD machines to be deployed shall be prepared to ensure adherence to project timelines. This plan shall be shared with the NMSCDCL and concerned authorities.

- All trenching, ducting, restoration, reinstatement, and testing activities related to civil works shall be carried out in accordance with the policies laid down by NMC/NMSCDCL.
- All applicable guidelines issued by the concerned authorities shall be reviewed and strictly followed during the execution of the work.
- HDPE ducts and OFC cables shall be laid underground, either through Horizontal Directional Drilling (HDD) or Open Trenching. HDD shall be used to the maximum extent possible. Aerial cabling is not permitted under the project unless specifically approved by the NMSCDCL under exceptional circumstances.
- Existing duct/pipe infrastructure owned by Nashik and Trimbakeshwar City shall be utilized wherever available, subject to approval by the NMSCDCL, to minimize excavation efforts. KML File of existing duct/owned cable route will be provided to the selected bidder during implementation period.
- Chambers, manholes, hand holes, and other related infrastructure shall be constructed as per the specific requirements at the site.
- All necessary land permits, NOCs, land lease rights, or any other licenses required for laying the city network and establishing Points of Presence (PoPs) shall be obtained accordingly.

3.6. Guiding Principles for Laying of 40 mm HDPE Pipes

Execution Guidelines and Technical Norms for Implementing Agency (IA)

- A total of four 40 mm HDPE pipes shall be laid as per the approved survey designs and designated network routes.
- Recoiling of 40 mm HDPE pipes shall be carried out using mechanical de-coilers.
- Care must be taken to maintain the minimum bending radius of both the pipe and the fibre optic cable along the entire network route.
- Trial pits shall be made at every 100-meter interval to identify the position of existing underground utilities. Based on the findings, the alignment of HDD/Open Trench shall be adjusted accordingly.
- Precautions shall be observed during excavation to prevent any damage to existing underground utilities. This includes obtaining as-built drawings of utilities, analyzing survey data, and conducting on-site visual inspections. In the event of any damage, the responsibility lies with the agency to repair it at the earliest and at its own cost, while indemnifying the Owner/Employer against such incidents.
- Coordination with current utility owners is essential before initiating excavation. If necessary, their representatives shall be present during the process.
- Proper barricading and signage boards shall be installed in accordance with the requirements of the concerned government authorities to ensure public safety and prevent chaos or accidents.
- End plugs shall be used to seal pipe openings and prevent ingress of mud, water, or dust.
- 40 mm HDPE couplers shall be used for joining sections of 40 mm HDPE pipes.
- Duct spacers shall be installed to ensure that the ducts do not intersect or collapse within the trench.
- Continuity of the 40 mm HDPE pipes shall be verified through Duct Integrity Testing (DIT) for all ducts.
- Colour coding of the 40 mm HDPE pipes shall be done in accordance with Electronic Industries Association and Telecommunications Industries Association (EIA/TIA) standards.
- In the event of any deviations in trench depth, the following specified norms shall be strictly followed.

No.	Depth of Trench	Recommended Protection for HDPE Duct
1.	1500 mm to 1650 mm	No protection required
2.	1000 mm to 1500 mm	100 mm DWC pipe
3.	500mm to 1000mm	100 mm GI pipe with 150 mm PCC
4.	Less than 500 mm from above surface of road	300mm x 300mm concrete box culvert to be constructed, at the edge and 100 mm GI shall be laid through the box culvert, 40 mm HDPE pipes to be passed through the same.

3.7. Laying of 40 mm HDPE Pipes using Horizontal Directional Drilling (HDD)

Horizontal Directional Drilling Equipment

- The Horizontal directional drilling equipment shall consist of a horizontal directional drilling machine of sufficient capacity to perform the bore and pullback the specified number of 40 mm HDPE pipes, a drilling fluid to successfully complete the bore, a guidance system to accurately guide boring operations, a truck of sufficient capacity to handle the drilling fluid volume and all other equipment required to complete the installation.
- HDD machine shall have a system to monitor and record maximum pull-back pressure during pull-back operations.
- There shall be a system to detect electrical current from the drilling string and an audible alarm which automatically sounds when an electrical current is detected.

Guidance System

- A magnetic guidance system (MGS) grade beacon or proven gyroscopic system shall be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation.
- The directional drilling guidance system shall have the capability of measuring vertical and horizontal positions and roll.
- The system shall obtain an accuracy range within five (5) centimetres of the actual position of the drilling head. It shall enable the driller to guide the drill head by providing immediate information of horizontal and vertical inclination on the tool face.
- The IA shall submit the reports and graph obtained from the guidance system specifying the depth and path of HDD bore as part of acceptance testing.

Drilling Fluid System

- The Drilling Fluid System shall be compliant to the requirements of concerned government authorities.
- Mixing System: A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver boring fluid composed of bentonite clay, potable water and appropriate additives.
- Drilling Fluid: Suitable drilling fluid shall be used based on existing soil conditions. The IA shall fully determine the soil conditions prior to fluid and additive selection.
- Delivery System: The drilling fluid pumping system shall have a capacity to provide an adequate flow rate and pressure to facilitate the HDD operation. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and conveyed to the drilling fluid recycling system as per set norms of

concerned government authority. Precautionary arrangements to be done to prevent spills into the surrounding environment.

- Drilling Fluid Recycling System: The IA shall abide by recycling of drilling fluid and disposal guidelines of concerned Government authorities. Environmental guidelines of concerned Government authorities to be adhered while disposing any debris and drilling fluid.

Execution Methodology

- The IA shall fully train all personnel in safety norms as prescribed by concerned Government authorities.
- The IA shall ensure that the bore path alignment shall be as per Survey Drawing approved by the concerned government authorities.
- The IA shall coordinate with all utility owners with underground utilities in the work area before starting of the work.
- Once the utilities have been located, IA shall physically identify the exact location of the utilities by taking test pits of minimum width of 2 meters across the drill path, in order to determine the actual location and path of any underground utilities. IA shall not commence boring operations until the location of all underground utilities within the work area have been verified.
- The IA shall use barricading and signage as per requirements of concerned Government authority pertaining to specific roads.
- The IA shall ream bore hole to a minimum of 125% diameter of the outside diameter of specified number of HDPE pipes tied together, using the appropriate tools upon successful completion of pilot bore.
- The IA shall not apply pressure more than the maximum safe pipe pull pressure at any time.
- The IA shall-demobilize equipment and restore the work-site to original condition as per the guidelines of concerned authorities.
- The IA shall test the continuity of 40 mm HDPE pipes as per the Duct Integrity test for all ducts.
- The IA shall construct a Hand Hole at each entry and exit pit. The IA shall carry on work in both directions from each pit such that the pit serves as entry pit for one HDD bore and exit for other HDD bore.
- The IA shall be completely responsible for damages, if any, to other utility during the work and shall resolve all disputes including rectification and reimbursement of the damages.
- The IA shall do necessary co-ordination with other utility companies prior to the excavation work.

3.8. Laying of 40 mm HDPE Pipes using Open Trenching Technique

- The IA shall lay 40 mm HDPE pipe in a flat bottom trench free from stones and sharp edged debris. Wherever stones or sharp-edged debris exist, sand bedding of 40 mm thickness shall be prepared on which the 40 mm HDPE pipes shall be laid.
- The IA shall be responsible for shoring and strutting the walls of the trench on either side of the trench as per the guidelines of concerned Government authorities.

3.9. Guiding Principles for Fibre Blowing

- It is proposed to blow 96 core OFC cable in the Core & Aggregation Layer and 96 core OFC cable in the Service/Access layer.
- The IA shall place route marker as per given alignment & maintaining offset distance from road centre, co-locating with each manhole and at every location where the route changes direction as per norms set by concerned government authorities.
- The IA shall use barricading and signage board as per requirements of concerned government authority in order to avoid any chaos and accidents to the general public.
- The IA shall install the OFC inside the 40 mm HDPE pipe as per design consideration. The OFC shall be installed by compressed air blowing technique.
- The IA shall handle the Optical Fibre Cable Drums as per instructions given by the manufacturer.

- The IA shall use Duct rodder for pulling OFC from one Man/Hand Hole to another Man/Hand hole for short spans as per side requirement.
- The IA shall ensure manufacturer's guidelines for minimum bend radius and tension are followed while installing the OFC.
- The IA shall keep minimum 20m loop in each Man/Hand hole, chamber properly coiled and tied with cable ties. Aluminium cable tags with punching to be used for tagging.
- The IA shall seal both the ends of 40 mm HDPE pipe with cable sealing plugs / simplex plugs after installing OFC.

3.10. Guiding Principles for Hand holes

- Holes for keeping service loops of duct shall be of suitable height as per the Project Requirements.
- All lids shall be manufactured with the markings "NASHIK AND TRIMBAKESHWAR CITY/NMSCDCL" in the logo area of the lid, in 25 mm recessed letters.
- Lid access points shall have recessed reinforced steel pull slots to allow for the removal of the cover with a hook or lever. Replace the lid if damage occurs to the pulling point.
- Bolts used on hand holes and lids shall be stainless steel, recessed hex head bolts with washer.
- The top of hand hole shall be flushed with the ground level.
- All PLB HDPE duct entries, cable entries and holes shall be properly sealed.
- Seal duct ends inside all hand holes with at least 40mm thick duct caulking after fibre is installed. Seal vacant duct with a manufacturer end plug and attach detectable pull tape.
- Hand holes shall have capabilities to absorb water as per ASTM 570 standards. They shall be provided with sump holes or open bottom for water drainage.
- No hand holes shall be installed under direct traffic load and shall be only suitable for installation at boulevards or areas where there is pedestrian movement.
- The HDPE manholes shall have following markings provided on each unit:
 - Code of product
 - Name of Manufacturer
 - Date of manufacturing
 - Named as 'NMSCDCL OFC HANDHOLE'

3.11. Guiding Principles for Manhole

- The manhole cover shall be heavy duty water tight FRC type. However, for easy handling purpose, the cover shall be constructed with suitable arrangement for lifting.
- The top of manhole should be flushed with the ground level.
- The manhole shall have suitable access from cable trench and sufficient holes in all walls for PLB HDPE duct entries and exits.
- Requisite brackets along with cable hangers for placing cable and splice box inside the manhole shall be provisioned and made of junk free material.
- The Manholes shall meet the physical and chemical Requirements listed below:
- Manholes shall be equipped with a covered sump hole for drainage and shall be reasonably waterproof..
- Manholes shall have capabilities to absorb water as per ASTM standards as per current version.
- All manholes shall have grounding halo installed that wraps the manhole and is connected to the ground rod.
- No manhole shall be installed under direct traffic load and shall be only suitable for installation at boulevards or areas where there is pedestrian movement.
- The IA shall provide additional Hand Holes at Major Road crossings, Bridges and other location.
- Required excavation and backfilling for the construction of the Hand Hole shall be carried out adhering to all the requirements of concerned Government authority.

3.12. Splicing of OFC and Installation of Fibre Splice Joint closure

- The IA shall ensure that the splice loss per joint shall be less than 0.01 dB/splicing joint.
- The IA shall ensure that during splicing fibre cores of 0.6 metre to 0.8 metre shall be stored in cable tray.
- The IA shall seal and install the Fibre Splice Joint closure assembly as per instructions of manufacturer.
- The IA shall carry one hour of leakage/ water penetration test on Fibre Splice Joint closures after installation.
- The IA shall attach Cable tags to all OFC which are entering the Fibre Splice Joint Closure and OFC readings shall be recorded for updating in the As-build and GIS drawings.
- The IA shall provide an As-build diagram for splicing of OFC. The diagram shall indicate the cores from all OFC with their colour coding and numbering.
- The IA shall use Mid-Span Access Buffer Tube Slitter during mid-span splicing (for last mile location connectivity) to ensure that buffer jackets of fibre tubes are cut longitudinally to access all fibres inside tube and then only required fibre cores will be cut for splicing with fibre cores of last mile cable.
- During maintenance of the network, IA shall ensure that all fibre cores are spliced at the cut location (and not only live fibre cores) during rectification process. NASHIK AND TRIMBAKESHWAR CITY / any third party as appointed may audit the health / continuity of all fibre cores at any time and IA shall have to facilitate this exercise by performing LSPM and OTDR testing in presence of the team.

3.13. Guiding Principles for Laying of DWC Pipes

- The IA shall use 100 mm DWC pipe to facilitate adequate protection to 40 mm HDPE pipe and OFC within low depth areas (as specified above) as well as at rail, road, bridge and culvert crossings.
- The IA shall insert maximum 2 numbers of 40 mm HDPE pipe in one 100 mm DWC pipe.
- The IA shall use 100 mm DWC coupler to joint 100 mm DWC pipe.
- The IA shall lay 100 mm DWC pipe on levelled bed of trench.
- The IA shall ensure that the trench bed is free from sharp edge, debris, and stones.

3.14. Guiding Principles for Laying of 100 mm GI Pipes

- The IA shall lay 100 mm GI pipe wherever road and culvert crossings are encountered on the route as well as in low depth areas as specified above.
- The IA shall insert 2 Nos. of 40 mm HDPE pipes through two 100 mm GI pipe.
- The IA shall clamp GI Pipe with suitable clamps where ever culvert crossing is to be done and excavation is not possible. The 40 mm HDPE Pipes shall be laid through GI Pipe.
- The IA shall build a box culvert to protect GI Pipe in case of lower depth as specified in the above.
- The IA shall extend GI pipe by at least 1 meter on each side of crossing subject to availability of space.
- The IA shall join GI pipes using GI Coupler.
- Wherever required, to protect the GI pipe from theft, suitable concreting shall be done to cover the GI pipe.

3.15. Backfilling and Reinstatement of Excavated Area

- The IA shall backfill and reinstate the area to its original condition as per the guidelines issued by the concerned government authorities pertaining to specific road after completion of work.

- The IA shall dispose the surplus earth material to a suitable location as indicated by concerned Government authorities.
- The IA shall be responsible for obtaining the sign off on the reinstated area from the concerned authority; the reinstatement shall be performed to the level of quality to be accepted by the concerned authority.

3.16. Testing & Commissioning

The IA shall be responsible for undertaking the following activities:

3.16.1. Optical Fibre Cable Testing Methodology

- The procedure shall comply with the ISO/IEC 14763-3 standard and to the vendor testing procedure.
- The ISO/IEC 14763 standard specifies the implementation and operation of customer premises cabling.
- The part 3 of this ISO document (14763-3) details test procedures for optical fibre cabling designed in accordance with ISO/IEC 11801:2002 and installed according to the recommendations of ISO/IEC 14763-2 (Planning and installation of customer premises cabling).
- Fibre-optic Tests applied to links and exclude equipment and work area cord.
- OF Attenuation testing is used to verify the initial performance of the installed link.
- 100 % of the installed OF links have to be tested and must pass the acceptance criteria.
- The attenuation of the link is measured using the insertion loss method. This method uses an optical source and an optical power meter to compare the difference between two optical power levels.
- When testing Single Mode optical Fibre links with a Light Source and a Power Meter, this measurement kit has to be capable of operating at 1550 nm and 1310 nm for Single Mode.
- The test scenario with a Light Source and a Power Meter shall be of the following for each link: Bidirectional testing @ 1550 nm and @ 1310 nm for single mode fibres and calculating average of both readings.
- The use of certification tool is recommended. Those tools are capable of producing a report logging the time of the test the link identification under test, the link length, the attenuation at the window tested and the acceptable link attenuation. The report shall also identify in which direction the testing was implemented.
- When testing with basic optical source and power meter, the operator will fill up a report logging the time of the test, the link identification under test, the link length and attenuation at the window tested in presence of the deputed staff/any person by NASHIK AND TRIMBAKESHWAR CITY/NMSCDCL.
- The report shall also identify in which direction the testing was implemented.
- Acceptable link attenuation to be calculated.
- The measured attenuation of the links shall have a lower value than the acceptable link attenuation calculated.
- The Test should be carried out by certified Engineer and once the report is submitted to the manufacturer, he will issue the Performance Certification which will mention minimum performance of 20 years or higher.
- The IA shall also provide bidirectional OTDR report for all fibre cores.

3.16.2. HDPE Ducts Testing Methodology

Factory Testing Requirement's for HDPE Ducts:

- Factory acceptance tests shall be conducted on randomly selected final assemblies of all equipment to be supplied. Visual inspection shall be carried out on 100% basis for all the equipment/items offered. Factory acceptance testing shall be carried out on PLB HDPE and accessories.
- From each batch PLB-HDPE duct presented by the IA for Factory acceptance testing, NMSCDCL shall select random sample (s).
- The following tests shall be carried out during Factory Acceptance Testing (FAT):

- Visual Inspection
- Dimension Check
- Hydraulic Characteristics
- Reversion Test
- Tensile Strength and Elongation Test
- Environmental Stress Crack Test
- Impact Strength Test
- Crush Resistance
- Mandrel Test
- Ovality Test
- Coil Set Test
- Internal Co-efficient of Friction
- Ash content
- Colour fading
- Optical Fibre Cable Blowing Test
- Air Pressure test on plastic coupler
- Ageing test on accessories
- Dimensional test shall be carried out on 10% sample of the respective lot.
- In case any of the selected samples fail, the failed sample is rejected and additional 20% samples shall be selected randomly and tested. In case any sample from the additional 20% also fails the entire batch may be rejected.

Pipe Integrity Test

- The IA shall perform the Duct Integrity test for all 40 mm HDPE pipes with blow compressed air at 5 Kg/Sq.cm for removing sand, mud and other foreign particles crept during laying of pipes.
- The IA shall carry out Duct integrity test with the help of medium density of sponge at pressure of 5 Kg/Sq.cm.
- The IA shall perform the Duct Integrity testing from Hand hole to Hand hole. However wherever the site conditions permit IA shall perform the Duct integrity test for several Hand holes together by coupling the 40 mm HDPE pipes within the Hand Holes.
- The IA shall carry out the Duct Integrity test before pulling/blowing of OFC.
- The IA shall seal the spare 40 mm HDPE pipes with End plugs immediately after acceptance of Duct integrity test

Duct Cleaning (Sponge Test):

- Compressed air should be blown through the duct in order to remove any dirt and water that has accumulated inside the duct with the help of suitable capacity Air Compressor.
- A short blast of air about 2-3 bar shall be blown through the duct for about 2 minutes.
- Sponge will be blown through the duct and should emerge from the other end to thoroughly clean the duct from inside.

Crush and Deformity Test:

- This test is to be done to check the integrity of the duct.
- During installation, while backfilling process there is a possibility of flattening, twisting or kinking of the duct.
- This is also possible if the duct has not been uncoiled properly and is laid improperly.
- Place the wooden shuttle in the duct. Shuttle should be 80% of inner diameter of the duct and 150 mm in length.
- Connect the Compressor pipe fitting to the duct.
- Place the flexible wire grip to the downstream end of the duct.
- Connect the air hose supply to the compressor and the equipment.

- Open the discharge valve of the compressor and blow the shuttle through the duct.
- Note: The shuttle will pass through at a very high speed and must be trapped in flexible wire grip to avoid accident and injury.

Mandrel/Shuttle Test:

- A mandrel/shuttle of at least 90% of the inside diameter size shall be passed through the duct to test the clear pathway of the duct.

Pressure Testing:

- This test is carried out to detect leakage in duct, if any. Seal one end of the duct with End Coupler and then through End Coupler with valve, feed the compressed air into the duct.
- Raise the pressure up to 5 Bar and then observe. After observing for 30 mins, pressure drop of up to a max. 0.5 Bar is permissible.
- The detection device for detecting the presence of the buried HDPE Duct shall have following features:
 - One set of Transmitter and Receiver along with suitable batteries in a portable box.
 - Capability to detect HDPE duct up to a depth of 3 meters.
 - Capability to emit peak audible signal when the HDPE duct is exactly below the receiver.
 - Capability to distinguish presence of passive metallic objects as well as current carrying metallic conductors other than the duct itself.
 - Capability to indicate the depth of the duct at which it has been buried.
 - Capability to change the Frequency of detection current to avoid possibility of mixing up with detection of another HDPE Duct in the vicinity, if any.
- It should have rugged one piece case design and sealed keypad for withstanding tough weather conditions and for superior moisture resistance.

Impact Strength on individual duct:

- There shall be no crack/split when 9.1kg load (Tup B) dropped from 1.5 meters. height after conditioning at 0 degree Cent. for one Hour.

Environmental Stress Crack resistance characteristics for duct:

- No cracking when tested with 10% LGEPAL solution, CO 0630 solution at 500C for 96 Hours.
- The Tensile strength of yield shall be at least 20N/ mm² as per ASTM F 2160, and ASTM D 638 Type IV.
- Hydraulic Characteristics - No Swelling leakage or bursting observed after 48 hours at an induced stress of 3.8 Mpa @ 800C as per IS 4984.
- Elongation at Break for both 40 mm and 20 mm duct shall be at least 500% as per ASTM F 2160, and ASTM D 638 Type IV standard.

The product shall meet or exceed the following American Society for Testing and Materials (ASTM) Standards:

- ASTM C 857-95: Standard Practice for Minimum Structural Design Loading for Underground Precast, Concrete Utility Structures;
- ASTM C 109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars;
- ASTM C 580: Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing's, and Polymer Concrete;
- ASTM C 496: Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens;
- ASTM C 543: Standard Specification for Pressure Vessel Plates, Alloy Steel, Quenched and Tempered Nickel-Chromium-Molybdenum.
- ASTM C 1028: Standard Test Method for Determining the Static Coefficient of Friction;
- ASTM C 570: Standard Specification for Oil- and Resin-Base Caulking Compound

City Network Commissioning

The IA shall be responsible for commissioning of the City Network, end to end, once all the active (electronic) components (at various levels) shall be provisioned by the NMSCDCL's appointed agency. It is the responsibility of the IA to make available OFC termination at each of the network PoPs (Police Stations/ Viewing Centres/ Field level) and assist the NMSCDCL's appointed Agency in terminating the OFC fibre threads/core at active electronics level (LIU). The IA shall have to submit a certificate of commissioning duly signed by the inspection agency appointed by the NMSCDCL, which shall test the end to end connectivity of the network in addition to certifying the length and depth of trenches, through which the cable has been laid.

Note: All the active electronics at centre as well as at field level shall be out of scope of the IA .

4. Provide Operations & Maintenance Services

The IA shall provide the Operation & Maintenance Services for a period of 2 (Two) years from the date of Go Live of the City Network solution, which will include the following activities, but not limited to:

4.1. Ducts & Optical Fibre Cable

- Routine inspection, viz. patrolling on the routes, to identify area where OFC / duct is exposed due to natural wear and tear etc.
- Faulty rectification of OFC cuts along routes.
- Replacement of OFC routes due to non-viability of transmission link.
- Ensure availability of OFC route marker along the route at regular intervals.
- Maintain proper condition of joint closure.
- Maintain condition of OFC with casing or with special arrangements near critical areas viz, major bridges, railway crossing, pipeline crossing etc.
- Visual inspection of joint closure to check ingress of water, foreign particles etc.
- Periodic measurement of the link attenuation loss to ensure that the link is free from any splice loss or point loss defects etc.
- Maintenance and update of as-built drawing, information along the OFC route.
- Maintaining history of events, analysis and reporting, public coordination with concerned authorities.
- Periodic coordination with the concerned authorities to keep abreast of any development works along the route.
- OTDR report of dark fibre shall be as on requirement
- Health status of fibre cores shall be monitored using Network Monitoring & Operations Management Platform and report shall be submitted to authority on monthly basis.
- Duct(s) blockage clearance and its health status report on yearly basis shall to be submitted to NMSCDCL. IA shall have to clear any blockages happened in ducts (if any) without any cost to NMSCDCL.

4.2. Fault Restoration Services

- The IA shall deploy maintenance teams at the designated locations to ensure SLA adherence. The maintenance teams shall comprise of manpower, logistics, required tools/tackles/machinery & equipment etc.
- The Implementing Agency shall provide OFC maintenance service on round the clock basis for attending & rectifying the OFC fault in minimum downtime (including travel time) from the time of lodging the complaint to the representative of IA at their designated office. The IA shall provide all assistance

including providing manpower, transportation of men and materials etc. if required in the event of link failure due to any other reason.

- The IA shall provide conveyance facilities for maintenance, for transporting the manpower, tools/tackles, test/ measuring equipment and consumables like: OFC cable, Joint Closures, Jointing Pit, duct, couplers, etc. Suitable vehicle shall be available round the clock with each of the maintenance team. Vehicle should be in good working condition and shall not be more than five years old.
- The IA shall provide communication facilities to the maintenance teams. This shall include landline phone at office location and mobile phone to members of the maintenance teams for the purpose of contacting on an urgent need basis. The team-in-charge should have mobile phone of mobile operator whose coverage is available in the desired section, and it should always be on.
- The IA will be required to carry out maintenance activities which include identification of OFC fault/cut on ground, obtaining permission from local authorities if required, excavation of earth to expose cable, laying of required length of OFC with protection wherever required, splicing of OFC, installation of Jointing pit & back filling of pit with sand, supply and installation of cable Route Markers and Joint Markers as per specification, testing of OFC and updating of OFC as-built drawings and communicating back to the helpdesk/user of service restoration to confirm that the fault is restored.
- Optimum functionality of maintenance teams is a prime necessity to carry out day to day maintenance of OFC links. OFC and accessories spares to cater for repair of at least 10 fibre cuts shall be maintained at all times.
- IA shall take insurance for all the workmen engaged under this contract and as per labour laws applicable from time to time.
- In case of preventive maintenance, timely communication shall be made with the required stakeholders and consent of the NMSCDCL sought.

4.3. Methodology for Fault Restoration/ Fibre Cuts

- Under OFC link cut condition, the following minimum activities shall have to be taken up by the IA for its restoration for the end-to-end restoration of the network traffic/service:
- On receipt of information of fault in OFC the team stationed at the Communication Node shall move immediately for locating and rectifying fault as per the response time given below. The working fibres shall be restored first. Sufficient labour shall be engaged for speedy restoration. Adequate care shall be taken not to damage any other cable if laid in the same trench.
- For the identification of exact fault location on immediate basis, the OTDR measurement of spare fibre shall be made from the nearest telecom station/Node. For better clarity, the OTDR measurement on spare fibre shall be taken at Nodes / nearest OFC joints situated at both ends of cut and using dummy fibre spool of 1km, in case required.
- After the OTDR measurement, the as-built drawing shall be referred and the physical site of fault on ground shall be located. It may be possible that data in as- built document may not be correct for the accuracy purpose. As-built drawing shall be taken as reference only. No claim of IA will be entertained on account of this. Accordingly, locating the OFC fault, the job of excavation in all types of soil, identification of OFC, blowing of cable, construction of jointing pits, splicing of OFC, back filling of trench & jointing-pit shall be taken up as per the standard procedure. This should be incorporated in the cable

route plan also. The splicing of fibres is to be carried out in line with the installed fibre and measurements are to be taken on spare fibres. In case the active fibres are to be used, precautions are to be taken with regard to the power launched on to the fibre. Restoration of site shall be done to the entire satisfaction of designated NMSCDCL personnel.

- In case of OFC cut where it is not possible to pull the cable from either end, the IA has to make two pits/ splicing joints between the required lengths of new OFC to be laid between the two joints. The spacing of joints/ pits shall be depending up on situation at site and shall be as decided by Site Engineer. Remaining OFC has to be coiled in both the pits. Wherever new joint is provided or existing joint is attended for rectification during the maintenance period joint shall be buried to the depth of 1.2 metre from the ground level in joint chamber
- After the completion of site activities, the IA shall ensure the restoration of the traffic from NMSCDCL NOC and thereafter, fresh OTDR measurement & traces (for 1310nm, 1550nm) shall be taken for all fibres & submitted to NMSCDCL representative
- After the completion of site activities and hop test, the As-built drawing shall be updated by incorporating the new details like OFC loop used, Joint-pit location, etc. The length of loop in joint pit after fault restoration shall be incorporated in as built drawings
- Any other job required for the restoration of the OFC fault/cut in totality is to be taken up by the IA . In case the site condition is not favourable for the immediate restoration of the fault, the temporary restoration of the service fibres shall be taken up immediately with the approval of authorized representative of NMSCDCL. Permanent restoration work will not be considered in breakdown time unless there is again link break during restoration job. Permanent restoration of joint pits is to be carried out by IA within reasonable time of fault / OFC cut. In case the site is not conducive for permanent restoration some arrangement of manpower has to be done by IA for safeguarding exposed OFC till permanent restoration. No extra payment shall be given to IA on account of deployment of additional manpower In such case, further cut in that stretch will not be counted in SLA measurements.
- It is mandatory for the IA to install the jointing chambers after permanent restoration is done.
- In case of any breakdown in the OFC network, IA shall be responsible for obtaining approval from concerned authorities as required for carrying out the repair. NMSCDCL can assist in getting permission for repair in few cases where there is urgency
- Drains, pipes, cables and similar services encountered in the course of the works shall be guarded by the IA at his own cost, so that they may continue in full and uninterrupted use to the satisfaction of the Owners thereof.
- Should any damage be done by the IA to any AC power mains, utility pipelines cables or lines (whether above or below ground etc.) whether or not shown on the drawings, the IA must make good or bear the cost of making good the same without delay to the satisfaction of the Engineer-in-Charge
- IA shall observe all national and local laws, ordinances, rules and regulations and requirements pertaining to the work and shall be responsible for extra costs arising from violations of the same
- IA shall have at all times during the performance of the work, a competent supervisor. Any instruction given to such supervisor shall be considered as having been given to the IA

- The IA shall employ as many personnel as required to comply with the local rules and administrative orders governing the Working Hours of Employment. The IA shall be responsible for compliance with all statutory requirements including personnel related matters.
- The minimum down time shall include time taken in restoration of fault/ cut caused by any means like miscreant activity at day or night, due to work done by any other organization, due to development of high losses/ break at existing joints, fault caused due to rodent, ant etc.
- In case of partial damage of the cable or development of high loss in the working and spare fibre or cable cut at any time (day/night) by miscreants or by any agency, the responsibility of repairing the defective fibre lies with the IA .
- In case IA fails to completely restore (as per original condition) or submit OTDR test (power level in live equipment) records or update the As Build Diagram (ABD), to establish completion of work a penalty shall be levied for the work involved at site.
- Examination of Finished Work. When finished work is taken down for the purpose of inspection for any reason, the IA shall bear the entire expenses incidental thereto in the event that the said work is found to be defective. This situation may be applicable to both planned work as also to emergency restoration.
- During the maintenance or fault rectification work, should any damage occur to the other cables, IA is liable to pay compensation as demanded by the respective agency.

5. Project Implementation Timelines, Deliverables and Payment Terms

#	Milestone	Deliverables	Timelines (in months)	Payment Terms
1	Project Initiation & Site Survey	Detailed Site Survey Report covering: - City network route, route length, core-aggregation-access nodes, infrastructure assessment etc. - GIS coordinates to be captured for all the sites/locations/route/ nodes etc. - KMZ file of fibre route plan marking hard soil, soft soil, HDD, open trenching parameters, existing utilities usage etc. - Network Architecture and Topology basis the site survey	T+2 month	NIL
2	Submission of Project Plan	Detailed Project Plan and revision thereafter	T+2 month	NIL
3	Supply of duct, fibre cables, LIU along with requisite accessories	- Material Test Report /Factory/Site Inspection - Infra & Systems Delivery Report (delivery challans) - Material Inspection Report signed by the NMC/NMSCDCL/ Concerned entity	T+6 months	5% of the Contract Value on Supply of each of 20% of the approved quantities (post site survey)
4	Laying of duct network along with requisite accessories	- Site Readiness Report - As Build Drawing (GIS mapping) - Site Acceptance Certificate signed by the NMC/NMSCDCL/ Concerned entity - Duct Integration Test	T+12 months	5% of the Contract Value on laying of duct on each of the 20% of the approved route length (post site survey)
5	Fibre blowing along with requisite accessories	- OTDR Report - Site Acceptance Certificate signed by the NMC/NMSCDCL/ Concerned entity	T+14 months	5% of the Contract Value on blowing of fibre cable on each of the 25% of the approved route length (post site survey)
6	Testing, Commissioning & Go Live of the City Network at Active Device Level (to be institutionalise by NMSCDCL's	- SITC of Network Monitoring & Operations Management Platform - User Acceptance Testing (UAT) Certificate - Operationalisation of City Network	T+15 months (T1)	5% of the Contract Value on operationalisation of each of the 25% of the approved route length (post site survey)

#	Milestone	Deliverables	Timelines (in months)	Payment Terms
	appointed agency)			
8	Operation & Maintenance	SLA Compliance Report	T1+24 months	10 % of the Work order value in equal quarterly instalment on approval of requested documents

Note:

- *T is the date of issuance Work Order and T1 is the date of Go Live*
- *Due payments shall be made promptly by the NMSCDCL, generally within forty-five (45) days after submission of an invoice along with requisite document. The contractor shall not hold a work and adversely affect the project progress while the payments are being processed by NMSCDCL. NMSCDCL reserves the right to levy appropriate penalty in the event the contractor delays execution of work for want of payment. Further NMSCDCL shall not pay any interest towards delay in release of payments for reasons attributable to either of the parties.*
- *NMSCDCL shall have power to make any alterations in or additions to the original specifications, drawings, designs and instructions that may appear to him to be a necessary or advisable during the progress of the work, and the IA shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by NMSCDCL and such alterations should not invalidate the contract and any additional work which the IA may be directed to do in the manner above specified as part of the work shall be carried out by the IA on the same condition in all respects on which he agreed to do the main work and at the same rates as are specified in the tender of main work. And if the additional and altered work includes any class of work for which no rate is specified in this contract, such class of work shall be carried out at the sanctioned rates of the D.S.R / S.S.R / C.S.R., etc.*
- *The currency or currencies in which payments shall be made to the IA under this Contract shall be Indian Rupees (INR) only.*
- *Reference of payment to the IA on actual basis, anywhere in the RFP, shall apply to the BoQ's line items basis the respective unit cost quoted by the bidder, as part of its financial bid or as per the agreement, provided its variation is within 10-20% vis a vis published rates like DSR/MGP/City's RA etc. else for those line items published rates (DSR/MJP/City's RA etc.) shall apply for making the payment on actual basis.*
- *Any penalties/ liquidated damages, as applicable, for delay and non-performance, as mentioned in this RFP document, shall be deducted from the due payments of the respective milestones.*
- *Taxes, as applicable, shall be deducted / paid, as per the prevalent rules and regulations*

6. Service Level Agreement

6.1. Purpose

The purpose of Service Levels is to define the levels of service provided by the IA to the-NMSCDCL for the duration of the contract. The benefits of this are:

- Help NMSCDCL control the levels and performance of IA 's services
- Create clear requirements for measurement of the performance of the system and help in monitoring the same during the Contract duration.
- Start a process that applies to NMSCDCL and IA attention to some aspect of performance, only when that aspect drops below the threshold defined by the NMSCDCL.

The Service Levels are between the NMSCDCL and IA .

6.2. Service Level Agreement & Target

- The section-6.7 & 6.8 reflects the measurements to be used to track and report system's performance on a regular basis. The targets shown in that section's tables are for the period of Contract.

6.3. General Principles of Service Level Agreement

The Service Level agreements have been logically segregated in the following categories:

SLA shall be applicable in implementation as well as operations and maintenance phase of the project. The penalties shall be applicable on Operations & Maintenance cost of the solution component calculated quarterly. SLA would be applicable on City Network backbone.

6.4. Service Level Agreement

- Service Level Agreement (SLA) shall become the part of the Contract between the NMSCDCL and the IA. SLA defines the terms of IA 's responsibility in ensuring the timely delivery of the deliverables and the correctness of the deliverables based on the agreed performance indicators as detailed in this section.
- The IA shall comply with the SLAs to ensure adherence to project timelines, quality and availability of services throughout the duration of the Contract. For the purpose of the SLA, definitions and terms as specified in the document along with the following terms shall have the meanings set forth below:
 - **"Total Time"** – Total number of hours in consideration for evaluation of SLA performance.
 - **"Downtime"** – Time period for which the specified services/components/system are not available in the concerned period, being considered for evaluation of SLA, which shall exclude downtime owing to Force Majeure and reasons beyond control of the IA .
 - **"Scheduled Maintenance Time"** – Time period for which the specified services / components / system with specified technical and service standards are not available due to scheduled maintenance activity. The IA shall take at least 15 days prior approval from the Client for any

such activity. The scheduled maintenance shall be carried out during nonpeak- hours and shall not exceed more than four (4) hours and not more than four (4) times in a year.

- **“Uptime”** – Time period for which the specified services are available in the period being considered for evaluation of SLA.
- **Uptime (%)** = $[1 - \{(Total\ Downtime) / (Total\ Time - Scheduled\ Maintenance\ Time)\}] * 100$.
- Penalties shall be applied for each criteria / solution individually and then added together for the total penalty for a particular quarter.
- **“Incident”** – Any event/abnormalities in the service/system being provided that may lead to disruption in regular/normal operations and services to the end user.
- **“Response Time”** – Time elapsed from the moment an incident is reported to the Helpdesk either manually or automatically through the system, to the time when a resource is assigned for the resolution of the same.
- **“Resolution Time”** – Time elapsed from the moment incident is reported to the Helpdesk either manually or automatically through system, to the time by which the incident is resolved completely and services as per the Contract are restored.

6.5. Service Levels Monitoring:

- The Service Level parameters as defined below, shall be monitored on a periodic basis, as per the individual parameter requirements. NMSCDCL shall provide the Enterprise Management System Tool for the SLA measurement and monitoring; IA shall be required to configure the desired solution component wise SLA in the same.
- IA shall be expected to take immediate corrective action for any breach in SLA. In case issues are not rectified to the complete satisfaction of NMSCDCL, within a reasonable period of time defined in this RFP, then the NMSCDCL shall have the right to take appropriate penalizing actions, or termination of the contract.

6.6. Penalties:

- Performance Penalty for not meeting a measurement parameter for any two months in consecutive quarters shall result in twice the penalty percentage of that respective measurement parameter in the third quarter for all the three months
- Maximum Penalty applicable for any quarter shall not exceed 10% of the 'quarterly O&M Payment' for the respective quarter.
- Three consecutive quarterly deductions of 10% of the applicable fee on account of any reasons shall be deemed to be an event of default and shall be treated as per the RFP clauses
- The payment to the implementation agency shall be on Quarterly basis however the penalty shall be calculated on monthly basis as per the SLAs stated in the RFP.

6.7. Implementation phase related SLA

S. No.	Measurement	Definition	Target	Penalty
Commencement of Work				
1	Team mobilization and Commencement of Work	IA is expected to mobilize project team for commencement of work Commencement of work would mean reporting and availability of IA's resources at the NMSCDCL's office for the project within defined period of 15 days and remaining	Within 15 days of issuance of Work Order or Contract Agreement, whichever is earliest	Delay beyond 7 calendar days = 0.2% of the contract value Delay beyond 8-15 calendar days = 0.5% of the contract value Delay beyond 15 days may lead to Termination of the Contract at the discretion of the NMSCDCL

6.8. City Network related performance levels

S. No.	Measurement	Definition	Resolution Target	Severity Level	Penalty Amount
A. MTTR / Down Time					
1	Mean Time To Repair (MTTR) for per fibre cut And / OR Complain Resolution (from time of logging, till resolution)	Mean Time To Repair (MTTR) shall be monitored on the time taken between logging of complaint against the network and its closure. Complain closure time shall be monitored on the time taken between logging of complain against the respective solution component and its closure	up to 6 hrs	0	0
2			≥ 6 hrs to 10 hrs	1	INR 10000 per day
3			≥ 10 hrs to 16 hrs	2	INR 20,000 per day
4			≥ 16 hrs	3	INR 50,000 per day

S. No.	Measurement	Definition	Resolution Target	Severity Level	Penalty Amount
		Measurement Tool: Reports generated from Network Monitoring & Operations Management Platform. IA shall submit quarterly reports on the performance basis on the above system generated report while the penalties shall be charged on quarterly basis			

6.9. Penalty for non-restoration of the Site:

In case of damage to the other existing utilities or infrastructure, IA shall be wholly responsible for taking remedial actions on urgent basis and shall bear all the repair cost, consequential damage cost as well.

Causing damage to other existing utilities & infrastructure	
Restoration of the utilities & site infrastructure	Penalty
Up to 2 / month	INR 5,000 per damage
3 to 5 / month	INR 10,000 per damage
Above 5 / month	INR 15,000 per damage
Any damage to any existing utilities or infrastructure	INR 20,000 per damage per day, if not restored within 24hrs.

Note: restoration of damaged utilities & infra should be completed on priority.

6.10. Reporting Procedures

- IA representative shall prepare and distribute Service level performance reports in a mutually agreed format by the **5th working day of subsequent month**. The reports shall include “**actual versus target**” Service Level Performance, a variance analysis and discussion of appropriate issues or significant events. Performance reports shall be distributed to NMSCDCL management personnel as directed by NMSCDCL.
- Also, IA may be required to get the Service Level performance report audited by a third-party Auditor appointed by the NMSCDCL.

6.11. Issue Management Procedures

- This process provides an appropriate management structure for the orderly consideration and resolution of business and operational issues in the event that quick consensus is not reached between NMSCDCL and Bidder.
- Implementing such a process at the beginning of the outsourcing engagement significantly improves the probability of successful issue resolution. It is expected that this pre-defined process shall only be used on an exception basis if issues are not resolved at lower management levels.

6.12. Issue Management Process

- Either NMSCDCL or IA may raise an issue by documenting the business or technical problem, which presents a reasonably objective summary of both points of view and identifies specific points of disagreement with possible solutions.
- Any unresolved issues/disputes concerning the Project/Contract between the Parties shall first be referred in writing to the Project Manager for his consideration and resolution. If the Project Manager is unable to resolve any issue/dispute within 5 days of reference to them, the Project Manager shall refer the matter to the Project Management Committee / authorized person. If the issues are still unresolved then it shall be referred to NMSCDCL for resolution.
- If NMSCDCL fails to resolve a dispute as per the above clause, the same shall be referred to the NMSCDCL BoD.

6.13. Service Level Change Control

General

It is acknowledged that this **Service levels may change as NMSCDCL's business needs evolve over the course of the contract period**. As such, this document also defines the following management procedures:

- a. A process for negotiating changes to the Service Levels
- b. An issue management process for documenting and resolving particularly difficult issues.
- c. NMSCDCL and Bidder management escalation process to be used in the event that an issue is not being resolved in a timely manner by the lowest possible level of management.

Any changes to the levels of service provided during the term of this Agreement shall be requested, documented and negotiated in good faith by both parties. Either party can request a change.

Service Level Change Process: The parties may amend Service Level by mutual agreement in accordance. Changes can be proposed by either party. Unresolved issues shall also be addressed. IA's representative shall maintain and distribute current copies of the Service Level document as directed by NMSCDCL. Additional copies of the current Service Levels shall be available at all times to authorized parties.

Version Control / Release Management: All negotiated changes shall require changing the version control number. As appropriate, minor changes may be accumulated for periodic release or for release when a critical threshold of change has occurred.

7. Requirement Specifications (Functional Requirements & Technical Requirements):

Note: To be provided on the Letter head of the respective OEM signed by Authorized Signatory along with counter sign of bidder's authorized signatory

7.1. Optical Fibre Cable

Sl. No	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Core	96		
2	Mode	Single Mode		
3	Standards	ITU-T G.652 D - Characteristics of a single-mode optical fibre cable for 96 core and ITU-T G.657-A Characteristics of a single-mode optical fibre cable for 96 core		
4	Standards	ANSI/ICEA S-87-640-1999 or latest - Standard for Optical fibre		
5	Standards	All applicable TIA/EIA standards for single mode fibre cable and those listed in these technical requirements		
6	Maximum Cabled Attenuation (dB/km)	1310nm 0.34 & 1550nm: 0.20 & 1625nm : 0.22		
7	Individual PMD (ps/sqrt.km)	≤ 0.1		
8	PMD LDV (ps/sqrt.km)	≤ 0.06		
9	Fibres per Tube	12		
10	Tube Material	PBT & Filling Gel (ID/OD :1.5/2.1 +/- 0.1)		
11	No of Tubes in Layer	8		
12	Core wrapping & water blocking element	Water blocking tape & water swell able yarns over FRP		
13	Metallic Armoring	Corrugated ECCS Steel Tape		

Sl. No	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
14	No of Ripcords Below ECCS Tape	2		
15	Outer Sheath Material	UV Proof Black HDPE		
16	Minimum Thickness(mm)	1.6		
17	Nominal Cable Dimensions (mm)	13.2+0.5		
18	Nominal Cable Weight (kg/km)	160+10%		
19	Tensile Strength (N)	Testing Standard: IEC-60794-1-21-E1 Cable Performance: $9.81 \times 1.3 \times W$ (W=Weight of 1 km cable)@ $\leq 0.25\%$ strain		
20	Crush Resistance (N/100 mm)	Testing Standard: IEC-60794-1-21-E3 Cable Performance: 3000 for 60sec		
21	Impact Strength (Nm)	Testing Standard: IEC-60794-1-21-E4 Cable Performance: W- SON. Height 0.5mtr		
22	Torsion	Testing Standard: IEC-60794-1-21-E7 Cable Performance: 2m, $\pm 180^\circ$, 10kg, 10 cycles		
23	Mtn. Bend Radius	Testing Standard: IEC-60794-1-21-E11 Cable Performance: 20 * Cable Diameter		
24	Kink resistance	Testing Standard: IEC-60794-1-21-E10 Cable Performance: 10* Cable Diameter		
25	Water Penetration Test	Testing Standard: IEC-60794-1-22-F5 Cable Performance: 1 m water head, 3m samples, 24 Hrs		
26	Drip Test	Testing Standard: IEC-60794-1-21-E14		

Sl. No	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
		Cable Performance: 30 cm, 709C, 24 h		
27	Temperature Performance	Testing Standard :IEC-60794-1-22-F1 Cable Performance: Max. change in attenuation shall be </- 0.15 dB/km		
28	Installation	-10 degree C to + 60 degree C		
29	Operation	-20 degree C to +70 degree C		
30	Storage	-20 degree C to + 70 degree C		

Note: All tests shall be carried out as per IEC Standards. Change in attenuation after and before shall be </- 0.15 dB/km for single mode fibre. No physical damages /crack on sheath.

Cable performance standards: Cable should comply to the following standards IEC 60793, IEC 60794, ITU-T.

7.2. 96 Port Pigtail Loaded LIU

Sr No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Type	Rack-Mount Fiber Optic Light Interface Unit (LIU)		
2	Rack Compatibility	19-inch standard rack mount		
3	Rack Units (RU)	4U		
4	Material	Mild Steel or Aluminium with 7-tank process powder coating		
5	Color	RAL 7035 (Light Grey) or Black		
6	Dimensions (H × W × D)	Approximately 176 mm × 440 mm × 350 mm		
7	Capacity	Up to 96 SC Simplex or 192 LC Duplex ports		
8	Adapter Compatibility	SC, LC, ST, FC (Simplex/Duplex)		
9	Splice Tray Capacity	Supports multiple splice trays; each tray accommodating up to 24 splices		
10	Cable Entry Points	Minimum 6 cable entry points with cable glands		

Sr No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
11	Cable Glands	Nylon with nitrile butadiene rubber; suitable for cable diameters of 5 mm to 14 mm		
12	Fiber Management	Integrated spools and routing guides for organized fiber management		
13	Insertion Loss	≤ 0.2 dB (Single mode), ≤ 0.3 dB (Multimode)		
14	Return Loss	≥ 50 dB		
15	Durability	≥ 1000 mating cycles		
16	Compliance Standards	Telecordia GR-326, RoHS compliant		
17	Operating Temperature Range	-10°C to +60°C		
18	Accessories Included	Mounting brackets, cable ties, splice trays, cable glands, screws		
19	Applications	Data Centers, Telecom Networks, FTTH, LAN/WAN, Surveillance Systems		

7.3. Fibre Patch Cords

Sr No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1		Patch cord material shall conform to the following standards at a minimum: House a single fibre in a 900 micron tight buffer tube. House the tight buffer in a flame retardant jacket with space between the jacket and tight buffer filled with Kevlar strength components. Be available in duplex configurations. Both mating faces of each connector shall be cleaned using fibre optic cleaning solvent cleaning wipe or patch prior to mating the connector surfaces.		
2	Type of Connector	SC/PC/LC/APC (As per field requirement)		
3	Operating Wavelength	1260 - 1620 nm		

Sr No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
4	Cut-off Wavelength	<1260 nm		
5	Mode Field Diameter	9.2 ± 0.4 µm @ 1310 nm 10.5 ± 0.5 µm @ 1550 nm		
6	Cladding Diameter	125 ± 1.0 µm		
7	Coating Diameter	245 ± 5 µm		
8	Insertion Loss	0.3 dB Loss (Connector to Connector) @ 1310 nm		
9	Operation Temperature	-20°C to 70°C		
10	Storage Temperature	-40°C to 80°C		
11	Cable Jacket Colour	Yellow, PVC Material		

7.4. Fibre Pigtaills

Sr No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Type of Connector	SC/LC/APC (As per field requirement)		
2	Operating Wavelength	1260 - 1620 nm		
3	Cut-off Wavelength	<1260 nm		
4	Mode Field Diameter	9.2 ± 0.4 µm @ 1310 nm 10.5 ± 0.5 µm @ 1550 nm		
5	Cladding Diameter	125 ± 1.0 µm		
6	Coating Diameter	245 ± 5 µm		
7	Insertion Loss	0.3 dB Loss (Connector to Connector) @ 1310 nm		
8	Operation Temperature	-20°C to 70°C		

Sr No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
9	Storage Temperature	-40°C to 80°C		
10	Cable Jacket Colour	Yellow, PVC Material		

7.5. Fibre Splice Joint Closure

SL No	Parameter	Minimum Requirement Description	Compliance (Yes/ No)	Reference (Doc/ Page No)
1	Closure Length	420 mm		
2	Closure outer diameter including Clamp	205 mm		
3	Fibre Tray Capacity	12 cores		
4	Fibre Capacity	96 core		
5	Cable Ports	4 cable entry ports + 1 no. oval port for branching application.		
6	Number of Fibre Splice Trays	12 nos.		
7	Others	The Fibre splice joint closure shall have sealing based on heat shrink technology or reusable gel end piece that opens and closes easily for adding or removing efficient cable sealing with specific grommets.		
8		The Fibre splice joint closure shall provide splice trays that are hinged to provide access to all splices without disturbing other splice trays for inter-tray fibre management.		
9		The fibre splice joint closure shall be water-proof and dust-proof.		
10		The fibre splice joint closure shall have a mechanism to route at least 1		

SL No	Parameter	Minimum Requirement Description	Compliance (Yes/ No)	Reference (Doc/ Page No)
		meter of loose tube per tray per optical fibre cable		
11		The joint closure shall have an earthing stud provided for grounding the armour of fibre cable		

7.6. HDPE DUCT

Sr. No.	Parameters	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	General	Permanently lubricated HDPE telecom Ducts for use as underground optical fibre cable conduits conforming to TEC/GR/TX/CDS-008/03/MAR-11 issued by Telecom Engg. Centre, New Delhi.		
2	General	HDPE Pipe Silicon Coated 40 mm outer dia		
3	General	Permanent lubricated HDPE Pipe / Duct shall confirm to IS 7328 or to its equivalent.		
4	General	Impact strength No crack or split in compliance to IS 12235		
5	General	Environmental Stress cracking resistance (ESCR) conforming to American Society for Testing & Materials (ASTM) D 1693		
6	General	Environment Condition with ambient temperature : 0 deg C to +55 degree C		
7	General	Appearance: Smooth inside & outside surface, free of blisters, shrink, hole, flaking, scratches & roughness. Duct shall be smooth, clean and round.		
8	General	Lubricated layer: Must have inner lubricant layer clearly visible & white in colour, uniform in thickness.		

7.7. 40 mm HDPE Coupler

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Type of Coupler	Push-Fit type 40 mm Dia. Coupler		

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
2	Pulling Force	≥330 kgf		
3	Construction Material	HDPE		
4	Others	The 40 mm HDPE Coupler shall be able to provide a durable airtight and watertight joint between two pipes without deteriorating the strength of the pipes.		

7.8. End Plug for 40 mm HDPE Pipe

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Type of End Plug	Push-Fit type 40mm ±0.4mm Dia. Plug		
2	Material used for manufacturing	HDPE		
3	Life expectancy	≥25 Years		
4	End Plug	The end plug once installed shall make the laid HDPE duct air tight.		

7.9. 100 mm DWC Pipe

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Type of Pipe	Double Wall Corrugated HDPE pipe		
2	Outer Diameter	100mm ±2mm		
4	Standard Length	6m ±1%		
5	Colour	Purple		
6	Operating	0°C to 70°C		

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
	Temperature			
7	Life Expectancy	≥25 Years		
8	Others	The DWC pipe shall consist of two layers, the outer layer shall be corrugated and the inner layer shall be plain and smooth.		
9		The DWC pipe shall be supplied in straight lengths of 6mtrs, suitable for shipping and handling purpose.		
10		The DWC pipe shall be checked visually for ensuring good workmanship that the ducts shall be free from holes, breaks and other defects. The ends shall be cleanly cut and shall be square with axis of the ducts.		
11		All the DWC pipes shall be clearly marked at intervals of minimum 1 meter but not longer than 3 meters with the following data which is not less than 5 mm high. The details of marking on pipe shall be approved by Client before commencement of manufacturing. Name of Client with logo Manufacture's name or trade mark Year of manufacturing Type of DWC pipe and size		

7.10. 100 mm HDPE Coupler for DWC pipe

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	Type of Coupler	Push-Fit type 100mm Dia. Coupler		
2	Pulling Force	≥250 kgf		
3	Construction Material	HDPE		

7.11. Route Marker

Sr. No.	Parameter	Minimum Requirement Description	Compliance (Yes / No)	Reference (Doc. / Page no)
1	General	Route markers made of Reinforced Cement Concrete (RCC) (1:2:4) of length 1450 mm and a bottom cross section of 150mmx200mm tapering to 75mmx125mm at top shall be provided. Route markers shall be provided at 500 mm from the trench and away from the road centre, at an average of 100 m. Markers shall also be provided at major directional changes in route (from straight) and at both sides of all types of crossings. 500 mm of the marker shall be underground and 300 mm shall be above the ground. Joint Markers shall be provided at each joint location and shall be same as route markers except that they shall be different in colour. In case joint markers and route markers fall at the same location, route marker shall not be installed and only joint marker shall be provided. The route/Joint indicators shall be painted with Primer before painting with oil paint. The route indicators shall be painted with yellow paint and joint indicators shall be painted with red paint. The marking shall face the road.		

7.12. Network Monitoring & Operations Management Platform

S. No.	Description
	Log management
1	The proposed solution must provide a customisable control of grouping of log events. Split events and log into multiple groups. Show nearby and surrounding events based on time.
2	Extract all the fields and list them to filter data. The proposed solution must allow customisation to easily view the health and performance
3	Show unique log event patterns from collected data and allow drill down on these events for faster troubleshooting and investigation.
4	Proposed solution should have features for logical grouping of server instances based on applications onboarded/ type of OS/ type of Databases/ type of devices in the log management solution
5	The solution should have the capability of logs from diverse formats such as JSON, syslog, or plain text. The system shall be capable of operating at a sustained EPS collection instance.
	Network Performance Management

S. No.	Description
6	The system must correlate node-level degradations with service- impacting incidents, enrich paths to enforce customizable performance policies for proactive violation alerts, and deliver an interactive visualization interface.
7	The platform should have unified agent to collect telemetry data like Metric, log and other details. The proposed solution must provide agentless as well as agent-based monitoring for server infrastructure
8	The system must correlate node level degradations with service-impacting incidents, enabling drill-down into node metrics, logs, and business-context tags for detailed analysis and operational troubleshooting.
9	There should be a tight integration between infrastructure metrics and logs to have the single consolidated console of Infrastructure & security events.
10	The OEM of the proposed Network Monitoring solution should have presence of min. 7 years in market in India.
	Fault Management
	Net Flow-based Traffic Analysis
11	The Net flow analyzer must be capable of automatically identifying and classifying applications and cloud services based on flow data.
12	The proposed solution must keep historical rate and Ip to Ip, Ip to protocol, protocol to protocol conversation data in its current long term operating database.
13	The system must support the ability to create reports that allow the user to search all IP traffic over a specified historical period, for a variety of conditions e.g destination port, or port range, interface or list of hosts or interfaces
14	The proposed solution should have at least 2 deployments (in state/central Government/ PSU) in India in last 5 years.
15	The proposed solution must comply with the standards: ISO 27001:2013 or higher for information security management. This ensures robust security, regulatory compliance, and comprehensive data protection across all managed network operations.
	ITSM - Help Desk Tool
16	The proposed solution should be aligned with ITIL framework principles and certified ITIL practices
17	The proposed helpdesk system shall support tracking of SLA (service level agreements) for call requests within the help desk through service types.
18	The proposed solution should allow administrator to define ticket dispatcher workflow which automatically assign incoming tickets based on rules defined in workflow.
19	The proposed solution should automatically suggest available technicians based on workload, average ticket closure time assigning tickets with no programming

S. No.	Description
20	The proposed helpdesk system shall be able to provide flexibility of incident assignment based on the workload, category, location etc.
	Asset Management
21	The proposed solution must provide asset baselining to manage and track asset effectively.
22	The Proposed solution should provide end to end Asset Life Cycle Management: Makes it easier to handle the complete life cycle of an asset, that is, all stages/modules from procurement to disposal
23	For the purpose of ensuring seamless integration, the proposed asset management solution should be provided by the same OEM as the service desk.

8. Indicative Bill of Material

S. No.	Item Description	Qty.	Unit	Unit Rate without tax	Total Amount (Rs.) without tax
1	Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately etc. complete.	7395	cum		
2	Excavation for roadway in earth, soil of all sorts, sand, gravel or soft murum including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stacking as directed.	48500	cum		
3	Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader / Paver on prepared surface and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- Plant Mix Method and Grading - II Material	7275	cum		
4	Wet Mix Macadam -- Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density. Laying By Grader/Paver	7275	Cum		
5	Prime coat - Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including cleaning of road surface and spraying, primer at the rate of 0.60 kg/sqm using mechanical means.	48500	Sqm		
6	Providing and applying tack coat on the prepared surface heating by flames in Boiler and spraying bitumen with sprayer on Granular surface treated with primer @ 2.75 kg/10 sqm(VG-30 bulk bitumen rates are considered to arrive at rates)	48500	Sqm		
7	DENSE BITUMINOUS MACADAM: Proving and laying dense bituminous macadam using crushed aggregates of Grading 1, premixed with bituminous binder of specified grade of Bitumen @ 4.50 per cent by weight of total mix and filler, transported to site with VTS , laid over a previously prepared surface, finished to the required grade, level, alignment, and rolling to achieve the desired density for 76-100 mm compacted thickness .USING Batch mix type hot mix plant with SCADA, Sensor Paver, Vibratory roller with Stone Dust filler.(VG-30 bulk bitumen rates are considered to arrive at rates)	4850	Cum		
8	BITUMINOUS CONCRETE:- Providing and laying bituminous concrete using crushed aggregates of grading 1, premixed with bituminous binder @ 5.20 per cent by weight of total mix and filler, transported to site with VTS , laid over a previously prepared surface, finished to the required grade, level, alignment, and rolling to achieve the desired compaction for 40 mm compacted thickness with specified grade of Bitumen, Excluding prime / tack coat. For Bitumen	2425	Cum		

S. No.	Item Description	Qty.	Unit	Unit Rate without tax	Total Amount (Rs.) without tax
	of specified grade -- USING Batch mix type hot mix plant with SCADA, Sensor Paver, Vibratory roller with Stone Dust filler. (VG-30 bulk bitumen rates are considered to arrive at rates)				
9	Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately etc. complete.	2000	cum		
10	Excavation for roadway in earth, soil of all sorts, sand, gravel or soft murum including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stacking as directed.	20000	cum		
11	Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader / Paver on prepared surface and compacting with vibratory roller to achieve the desired density, complete as per clause 401 -- Plant Mix Method and Grading - II Material	3000	cum		
12	Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate (natural sand/ VSI grade finely washed crushed sand) conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, , cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant/ Weigh batch mixer, transported to site with all leads and lifts, laid with a paver with electronic sensor /by suitable means as approved by Engineer-in-charge, compacting with vibratory roller, finishing, curing and including preparation of sub-grade surface if required etc. complete. with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/ concrete Batch mix plant (Pan mixer) etc. complete.	3000	cum		
13	Providing and laying 125 micron Low Density Polyethylene (LDPE) sheet confirming to IS 3395 : 1997 below concrete pavement including all materials and labour complete.	20000	Sqm		
14	Providing and fixing in position TMT FE 500, tie bars precoated with anticorrosive epoxy paint of 12 mm dia. 70 cms.long and at 30.00 cm. C/C and wherever directed including handling, straightening wrapping with paper of approved quality for half length, necessary cutting, handling, straightening , supported by assembly of TMT FE 500, chairs with proper alignment etc. complete.	8000	Nos.		
15	Providing and fixing in position TMT FE 500, 32 mm dia dowel bars precoated with anticorrosive epoxy paint of required Dia. 60 cms. Long and at 30.00 cm. C/C and wherever directed including handling, straightening, necessary cutting supported by TMT FE 500, chairs with proper alignment by using properly designed assembly of	8000	Nos.		

S. No.	Item Description	Qty.	Unit	Unit Rate without tax	Total Amount (Rs.) without tax
	Bulkheads lubricating half length with bituminous paint as directed etc. complete.				
16	Providing and laying in-situ M40 Grade unreinforced plain cement concrete pavement with max 20% fly Ash (Fly-ash upto 20% by weight of Cement) over a prepared sub base with 43 grade cement , coarse and fine aggregate (natural sand/ VSI grade finely washed crushed sand) conforming to IS 383, using fine and coarse aggregates combined gradation as per Table 600-3 of MORTH Specification 2013, mixed in a batching and mixing plant/ non tilting mixer and Weigh batcher as per approved mix design, admixtures, transporting to site, spreading, laying with approved make paver, compacted and finished in a continuous operation, finishing to lines and grades as directed by Engineer-in-charge and curing by curing compound /by providing cement vata in cement Mortar 1:8 @0.6m X 0.6m centre to centre, admeasuring 80 mm at bottom and 40 mm at top with depth of 75mm and maintaining the same throughout curing period by any other method approved by Engineer-in-charge.	5000	Cum		
17	Cutting transverse contraction joints 3 to 4 mm wide and depth 60mm. .in concrete slab using concrete cutting machine with diamond studded saw within 48 hours of casting of bay / slab etc. complete including subsequent widening of the groove 8 to 10 mm. wide at top having depth of 15 mm. as directed by Engineer in charge	86666.667	Rmt		
18	Providing to contraction joints polysulphide sealant (Pouring grade) confirming to BS : 5212 - 1989 into sawed groove widened at top for sealant reservoir of specified size and shape as per detailed drawing including fixing Polyethylene foam backer rod of required diameter (approx.. 25% larger than the initial 3 mOne Metric Tonneo 4 mm. joint) overlaid with bond breaking tape as per detailed drawing. Item includes cleaning the joints with water jet / air compressor and allowing joint to become thoroughly dry before sealant is applied and applying primer. (A) Contraction and longitudinal joints (15 mm. deep x 8 mm.wide)	86666.667	Rmt		
19	Transportation of material obtained from excavation including soil, rubble, bricks, RCC concrete, kerb stones, steel railing, iron pipes, channels etc. Obtained from excavation, dismantling, loading in a Truck of minimum 5 Cu M capacity or designed capacity and transporting with a lead of 10km within the municipal limits or any designated place, unloading, stacking or spreading of material etc. complete. As directed by Engineer In charge				
a	3KM	29920	Cum		
b	5KM	20866	Cum		
c	10KM	20866	Cum		
20	Providing and laying Cast in situ/Ready Mix cement concrete in M15 of trap/ granite/quartzite/gneiss metal for foundation and bedding / steps including steel centering, formwork, laying/pumping, compacting, roughening them if special finish is to be provided, finishing uneven and honeycombed surface and curing etc. complete. The Cement Mortar 1:3	315	cum		

S. No.	Item Description	Qty.	Unit	Unit Rate without tax	Total Amount (Rs.) without tax
	plaster is considered for rendering uneven and honeycombed surface, only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (Wooden centering will not be allowed.),with fully automatic micro processor based PLC with SCADA enabled reversible Drum Type mixer/concrete Batch mix plant (Pan mixer) etc. complete. With fine aggregate (Crushed sand VSI Grade)				
21	Excavation for roadway in earth, soil of all sorts, sand, gravel or soft murum including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stacking as directed.	6300	cum		
22	Excavation for roadway in hard murum and boulder including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m.and spreading for embankment or stacking as directed.	39320	cum		
23	Excavation for roadway in soft rock, including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading or stacking as directed.	40905	cum		
24	Excavation for roadway in hard rock by wedging and chiselling or line drilling including dressing section to the required grade, camber and side slopes and conveying the excavated materials with all lifts upto a lead of 50m. and spreading for embankment or stacking as directed.	11250	cum		
25	Providing earth work in embankment with approved materials obtained from other sources upto lead of 50m. including all lifts, laying in layers of 20cm. to 30cm. thickness breaking clods, dressing to the required lines, curves, grades & section, watering and compaction with vibratory roller with V-Sat attachment to achieve not less than 97 % of standard proctor density etc. complete (Material obtained from Other sources)	5000	cum		
26	Compacting the hard murum side widths including laying in layers on each side with vibratory roller including artificial watering etc. complete.	45000	sq mtr		
27	Providing installation & fixing of FRP Network cables (OFC) Inspection Chamber of Required size including all labour & Transportation charges, chamber to be installed in proper alignment & level as directed by engineer incharge. Including all other charges & excluding GST.				
a	0.900m x 0.900m x 1.000m	600	Per No		
b	0.900m x 0.900m x 0.800m	800	Per No		
c	0.900m x 0.900m x 0.600m	800	Per No		
28	Removing and Refixing of interlocking concrete paver blocks of all thickness of plain finish/colour or any size and shape, fixing on 40mm stone grit bedding laid in proper position, Levelling, filling joints with stone dust, compacting by compactor as per IRC 063, cleaning including loading,	25500	Sqm		

S. No.	Item Description	Qty.	Unit	Unit Rate without tax	Total Amount (Rs.) without tax
	unloading, transporting etc. complete as directed by Engineer-in-charge.				
29	Supplying, erecting, testing & commissioning GI sheet 0.8 mm (22 SWG) having zinc coating of 275 microns with galvanization process compliance to IS 2629:1985 to be used for fabrication of boxes panel boards etc. including cutting, bending, drilling, welding, riveting etc. and painting with one coat of red lead paint and 2 coats of enamel paint as per specification no. CP/SH/CR	4500	Sq.M		
30	Horizontal Direction Drilling (HDD) for Laying of 4 nos., 40mm outside diameter PLB-HDPE pipes (Excluding supply of pipes) in soft soil and hard murum at all depth including all necessary machine equipment and all other taxes excluding GST	15000	M		
31	Horizontal Direction Drilling (HDD) for Laying of 4 nos., 40mm outside diameter PLB-HDPE pipes (Excluding supply of pipes) in hard rock at all depth including all necessary machine equipment and all other taxes excluding GST	11000	M		
32	Supplying and erecting GI pipe 100mm dia. 'B' class at position with accessories complete as per specification no. CW-PLB/GP	80000	M		
33	Supplying and erecting high density polythene pipe ISI mark 40mm dia. Suitable for pressure of 6kg/cm2 connected to jet/submersible pump with required material complete	1148000	M		
34	Supplying and laying (Excluding excavation) 100 mm outside dia. double wall corrugated pipes (DWC) of HDPE for enclosing cable below ground/road surface, to required depth complete	358000	M		
35	Supply of 96 Optical Fibre Cable with one year of onsite warranty- 96 Core, Single Mode, ITU-T G.652 D – Characteristics, ANSI/ICEA S-87-640-1999 or latest - Standard for Optical fibre with Maximum Cabled Attenuation (dB/km) of 1310nm 0.34 & 1550nm: 0.20 & 1625nm : 0.22	330000	M		
36	Supply, Installation, Testing and commissioning of 96 core fibre splice closure with one year of onsite warranty- 12 cores Fibre Tray Capacity, 96 core Fibre Capacity, 4 cable entry ports + 1 no. oval port for branching application with 12 nos. of Fibre Splice Trays.	1000	Nos		
37	Laying of 96 core OFC cable by pulling/blowing method including opening of manhole, sealing of PLB HDPE pipes by rubber Bushes in manholes, providing HDPE/RCC/DWC Split Pipes in Manholes and Back filling of Manholes	330000	M		
38	Laying of 96 core OFC cable overhead by pulling/blowing method	10000	M		
39	Splicing of fibers in existing/new joined /handhold chambers for making straight/branch joints on existing/new routes and end to end testing of all fibers after splicing .	286080	Per Joint		
40	Supply & Laying of Nylon Rope (6mm) inside duct	861000	M		
41	SITC of Route Marker: Route markers made of Reinforced Cement Concrete (RCC) (1:2:4) of length 1450 mm and a bottom cross section of 150mmx200mm tapering to 75mmx125mm at top shall be provided.	1000	Nos		
42	SITC of 96 Port LIU	750	Nos		

S. No.	Item Description	Qty.	Unit	Unit Rate without tax	Total Amount (Rs.) without tax
43	Supplying and installing single mode simplex pigtail with SC/LC splicing complete. (Patch cord)	1500	Nos		
44	Supply Installation Testing and Commissioning of Network Monitoring & Operations Management Platform (Perpetual License)	3000	Per Device		
45	Operation and Maintenance charges for 2 years after Go-Live	2	Per Year		

9. Indicative List of Locations for establishment of connectivity

A. Location of Nashik City

S. No.	Name of Location	Latitude	Longitude
1.	Near Odha Railway Station	20.01789	73.91350
2.	Adgaon Track Terminal	20.04731	73.87721
3.	Nandur Naka Signal	19.99676	73.84379
4.	Jatra Hotel Chowk	20.02528	73.84189
5.	Mirchi Chowk	20.00503	73.82611
6.	Swami Narayan Choufuli	20.00201	73.81197
7.	Tapovan T Point Near Janardan Math Kaman	20.00834	73.81528
8.	Kapila Sangam tapovan	20.00062	73.81444
9.	Laxmi Narayan Lawns T Point Road going Towards Kevadiban	20.00225	73.81078
10.	Aathvan Lawns T Point	20.00483	73.80765
11.	Tapovan Corner Joshi Gas Gowdown	20.00671	73.80424
12.	Swami Narayan Mandir (BAPS) Below the Bridge of Nearest Highways	20.00970	73.80763
13.	Near By Nandurgaon MNC School	19.99239	73.84411
14.	Nilgiri Baag	20.00726	73.83150
15.	Bidi Kamgar Chowk	20.01127	73.8259
16.	Below the Bridge at Medical Choufuli	20.03086	73.85678
17.	Amrutdham Chowk	20.01605	73.82529
18.	Health Science University, Dindori Road, Mhasrul, Nashik (Ground In front)	20.078733	73.80267
19.	RTO Corner Signal/ Chhatrapati Shivaji Maharaj Chowk, Dindori Road, Mhasrul, Nashik	20.034101	73.80319

S. No.	Name of Location	Latitude	Longitude
20.	Jio Petrol pump Signal / Jijau Chowk, Mhasrul, Nashik	20.03587	73.80380
21.	Mhasrul Gaon Chowk, Dindori Road, Mhasrul, Nashik	20.047725	73.80618
22.	Vadnagar T Point ,Dindori Road, Mhasrul, Nashik	20.05052	73.80582
23.	Vadhane Colony/ Prabhat Nagar T Point,Dindori Road, Mhasrul, Nashik	20.04781	73.806055
24.	Kansara Mata Chowk, Mhasrul- Makhamalabad Link Road, Nashik	20.0487	73.7991
25.	Rao Hotel Signal Chowk, Peth Road, Mhasrul, Nashik	20.0464	73.7918
26.	Onkar Nagar T Point,Kishor Suryavanshi Marg, Mhasrul, Nashik	20.0377	73.7988
27.	Namko Hospital + R.T.O. Office Chowk, Peth Road, Mhasrul, Nashik	20.0342	73.7951
28.	Gamne Mala T Point, Shantinagar to Makhamalabad Road	20.0464	73.7774
29.	Shantinagar Bus Stop, Makhamalabad Road, Sai Siddhi All in One T Point	20.0416	73.7803
30.	Makhamalabad Gaon Bus Stand,Makhamalabad, nashik	20.048	73.7737
31.	Makhamalabad - Gangapur Katariya Bridge T Point Suyojit Garden Makhamalabad Road	20.0233	73.7569
32.	Health Science University, Dindori Road, Mhasrul , Nashik	20.0786	73.80510
33.	Hanuman Temple , Dindori Road , Commissioner Office Boundry	20.0817	73.8039
34.	Balaji Chowk , Kalanagar	20.035332	73.806701
35.	Sai Temple,Dindori Road, Mhasrul, Nashik	20.042515	73.805087

S. No.	Name of Location	Latitude	Longitude
36.	Vadhane Colony/ Prabhat Nagar , Dindori Road,Mhasrul, Nashik	20.052778	73.804701
37.	Sati Asara Temple , Ekta Nagar, Borgad, Nashik	20.0553	73.7952
38.	Chanakyapuri Society, Mhasrul-Makhamalabad Link Road, Nashik	20.0477	73.7959
39.	Mehardham, Peth Road, Nashik	20.0406	73.7941
40.	Shantinagar, Makhamalabad Road, Nashik	20.029300	73.783561
41.	Koliwada, Makhamalabad, Nashik	20.0453	73.7724
42.	Vaiduwadi, Mhasrul, Dindori Road	20.0460	73.8061
43.	Makhamalabad Gaon	20.0464	73.7736
44.	R.T.O. Corner	20.0331	73.8031
45.	Rajsweet Corner	20.03275	73.80285
46.	New Sambhajinagar Naka	20.01093	73.80981
47.	Amardham	20.00268	73.79885
48.	Sharadchandra Pawar Market Signal	20.03010	73.79543
49.	Nashik Krushi Utpanna Bajar Samiti	20.01461	73.79626
50.	Minatai Thakre Stadium	20.01252	73.81392
51.	Baijabai Chhavani Corner	20.01111	73.78706
52.	Makhamalabad Naka	20.01220	73.79022
53.	Peth Naka	20.01256	73.79280
54.	Dindori Naka	20.01165	73.79565
55.	Tin Putle Phulenagar	20.02076	73.79423
56.	Panchavati Karanja	20.00988	73.79494
57.	Kamalnagar	20.01917	73.81492
58.	Indrakund	20.01007	73.79333

S. No.	Name of Location	Latitude	Longitude
59.	Shanichowk	20.00784	73.79409
60.	Kalaram Mandir	20.00694	73.79596
61.	Sitagufa	20.00788	73.79630
62.	Nimani Bus Stand	20.01135	73.79637
63.	S.T.Depot no. 02	20.00929	73.80341
64.	J.K. Tyre	20.00699	73.80393
65.	Shrikrushna Ice Factory	20.00819	73.80344
66.	Shrikrushna Tirth Ashram Corner	20.00885	73.80276
67.	Katya Maruti Chowk	20.00880	73.80219
68.	Takle Nagar Board	20.00825	73.80125
69.	Pashan Maruti Temple Amardham Road, Infront of Library	20.00747	73.80036
70.	Devi Chowk , Amardham Road	20.00641	73.79963
71.	Dhandai Optician Ganeshwadi	20.00622	73.78862
72.	Munjoba Chowk	20.00572	73.79693
73.	Ayurvedic College, Phule Bajar	20.00538	73.79596
74.	Gadge Maharaj Bridge Corner	20.00497	73.79524
75.	Gauri Patangan Devi Mandir	20.00425	73.79448
76.	Gauri Patangan Near Haymas	20.00310	73.79414
77.	Talkuteshwar Mandir	20.00192	73.79827
78.	Rokdoba Chowk	20.00383	73.79322
79.	Gadge Maharaj Below Bridge	20.00447	73.79383
80.	Gadge Maharaj Above Bridge	20.00447	73.79383
81.	Dilli Darwaja	20.00408	73.79317
82.	Kapurtala Maidan Chimani Javal	20.00505	73.79274

S. No.	Name of Location	Latitude	Longitude
83.	Sanjivani Samadhi Mandir Near Haymas Mhasoba Patangan	20.00507	73.79350
84.	Ramsetu Bridge	20.00563	73.79231
85.	Sardar Chowk	20.00597	73.79349
86.	Nilkantheshwar Mandir	20.00648	73.79214
87.	Old Bhaji Patangan Near Haymas	20.00672	73.79265
88.	Sai Baba Mandir	20.00686	73.79320
89.	Ekmukhi Datta Mandir Near Haymas	20.00729	73.79147
90.	Devnamledar Samadhi Mandir	20.00717	73.79194
91.	Gandhi Talav Jyot	20.00826	73.79147
92.	Janardan Swami Stambhajaval	20.00843	73.79128
93.	Sulabh Showchalay Near Victoria Bridge	20.00862	73.79128
94.	Dinbandhu Office	20.00856	73.79186
95.	Ahilyabai Gym School Near Temple	20.00777	73.79257
96.	Ganesh Mandir Goreram Lane	20.00798	73.79284
97.	Kapaleshwar Mandir Samor	20.00824	73.79259
98.	Shi Chatru Sampraday Aakhada Mandir	20.00583	73.79240
99.	Vastrantar Gruh Ramkund	20.00797	73.79252
100.	Khandave Sabhagruh	20.00865	73.79393
101.	Malviy Chowk	20.00873	73.79409
102.	Janki Silk Saree	20.00898	73.79436
103.	Sukenkar Lane Corner	20.00903	73.79509
104.	Sivaji Chowk	20.00894	73.79634
105.	Patharvat Lane Hanuman Mandir	20.00895	73.79718
106.	Gajanan Chowk	20.00888	73.79832

S. No.	Name of Location	Latitude	Longitude
107.	Gurudwara Road Near Gurudwara	20.00901	73.79892
108.	Laxman Zula Bridge (Hatti Pul)	20.00883	73.80027
109.	S.T.Depot no. 02	20.00929	73.80341
110.	Santosh T Point	20.00977	73.80547
111.	Modakeshwar Vasahat, Rokdoba Pataangan	20.00287	73.79334
112.	Nehru Chowk	20.00404	73.79156
113.	Taalkuteshwar Mandir, Amardham Road	20.00102	73.79829
114.	LaxmiNarayan Ghat	20.00248	73.80554
115.	Kannamvaar Bridge	20.00044	73.80284
116.	Maruti Wafers, Tapovan Road	19.997734	73.809731
117.	Shivaji Chowk	19.99784	73.79655
118.	Azaad Chowk	19.99671	73.79427
119.	Gumshaha Baba Darga	19.99864	73.79703
120.	Kathada Savarkar Chowk	19.99683	73.79642
121.	Hotel Shirsaath	19.99599	73.79435
122.	Chowk Mandai	19.99577	73.79217
123.	Helbawdi Mashid Dudh Bazaar	19.99883	73.78988
124.	Dudh Bazaar	19.99934	73.78986
125.	Mhasrul Tek Shivaji Chowk	20.00020	73.79185
126.	Battaase Corner Budhwaar Peth	19.99935	73.79330
127.	Chhaprichi Taalim	19.99926	73.79418
128.	Jumma Masjid, Shirishkumar Chowk	20.00045	73.79454
129.	Chavhaata Devi Mandir	19.99837	73.79418
130.	Dande Hanuman Chowk	19.99682	73.79258
131.	Gaadge Maharaj Statue Main Road	20.00195	73.78880

S. No.	Name of Location	Latitude	Longitude
132.	Baadshahi Corner	20.00193	73.78972
133.	Dudh Bazaar	19.99934	73.78986
134.	Nehru Chowk	20.00404	73.79156
135.	Shaalimaar	20.00061	73.78670
136.	Nepaali Corner	20.00186	73.78730
137.	Azaad Chowk	19.99671	73.79427
138.	Shivaji Chowk	19.99784	73.79655
139.	Badi Dargaah	19.99951	73.79188
140.	Rokdoba Pataangan, Modkeshwar Vasahat	20.00287	73.79334
141.	Taalkuteshwar Mandir, Amardham Road	20.00102	73.79829
142.	Nehru Chowk	20.00404	73.79156
143.	Dudh Bazaar	19.99934	73.78986
144.	Shivaji Chowk	19.99784	73.79655
145.	Dwarka	19.99382	73.79644
146.	Dongre Vastigruh Maidaan	20.00662	73.77294
147.	Ravivar Kaaranja	20.00686	73.78965
148.	Ashok Stambh	20.00698	73.78464
149.	Dhumaal Point	20.00421	73.78900
150.	Nehru Chowk	20.00404	73.79156
151.	Gharpureghat T Point, Goda Riverside	20.00892	73.78310
152.	Meher Signal	20.00467	73.78397
153.	CBS Signal	20.00050	73.78243
154.	Thakkar Bazar Bus Stand	19.99878	73.78081
155.	Thakkar Bazaar Manse Karyalaya Chowk	19.99878	73.78081
156.	Mela Bus stand	19.99877	73.78080

S. No.	Name of Location	Latitude	Longitude
157.	Jaltaran Signal	19.995860	73.776326
158.	Magesh Mithai	20.00601	73.78948
159.	Saangli Bank Signal	20.00419	73.78679
160.	Redcross	20.00519	73.78727
161.	Ahilyabai Holkar Bridge	20.00788	73.78992
162.	Marathon Chowk	20.00614	73.77627
163.	Mico Circle	19.99446	73.77139
164.	Chopda Lawns	20.00992	73.77345
165.	Vidya Vikas Circle	20.00944	73.76667
166.	June Gangapur Naka	20.0074	73.77168
167.	Guracha Dawakhana	20.00692	73.78387
168.	Across Police Aayukt Office	20.00612	73.78102
169.	Gharpure Ghat, Siddheshwar Mandir	20.00921	73.78543
170.	Fani Baba Dargaah	20.00932	73.78715
171.	Gangawadi Chowk	20.00886	73.78959
172.	Ekmukhi Datta Mandir	20.00763	73.79073
173.	V. V Shirodkar Jogging Track PNT Colony	19.99829	73.76397
174.	Pramod Mahajan Garden	20.00763	73.77294
175.	Big Bazaar Chowk College Road	20.00562	73.76546
176.	Ahirrao Photo Studio	20.00395	73.77054
177.	Canada Corner	20.00306	73.77037
178.	Holaram Colony Chowk	19.99808	73.77184
179.	Kulkarni Garden	20.00233	73.77294
180.	Rane Dairy	20.00188	73.77496
181.	Tilakwadi Signal	20.00089	73.77701

S. No.	Name of Location	Latitude	Longitude
182.	K.T.H.M. College Samor	20.00611	73.77853
183.	V.N.Naik College Samor	20.00518	73.77360
184.	Gangapur Gaav Jakaat Naka	20.03007	73.71465
185.	Balaji Mandir Samoril Moklya	20.02604	73.71949
186.	Someshwar Dhabdhaba	20.02972	73.72268
187.	Jehaan Circle	20.01202	73.75602
188.	Pipeline Road Signal	20.01231	73.74548
189.	A.B.B Circle	19.99370	73.75425
190.	Shahid Circle	20.01190	73.75841
191.	Prasad Circle	20.01122	73.76067
192.	KBT Circle	20.01049	73.76412
193.	Vidyavikas Circle	20.00944	73.76667
194.	Bhosla Circle	20.00871	73.75554
195.	Modern Chowk	20.01707	73.75897
196.	Manywar Chowk	20.00708	73.75962
197.	Hallmark Chowk College Road	20.00575	73.76333
198.	Hotel Panchavati Elite Signal	19.99499	73.76345
199.	Akashwani Bhaji Market	20.01388	73.76095
200.	Asaaram Bapu Bridge	20.02152	73.75514
201.	Baardaan Phata	20.02441	73.72186
202.	Kataariya Bridge	20.02129	73.76729
203.	Satpur Club House Maidaan	19.99360	73.73339
204.	Satpur Ambad Link Road	19.97874	73.72603
205.	ITI Signal Satpur Trimbakeshwar Road	19.99339	73.74990
206.	Sakaal Circle Trimbakeshwar Road	19.99161	73.74171

S. No.	Name of Location	Latitude	Longitude
207.	Satpur Gaav Rajwada Trimbakeshwar Road	19.99109	73.73594
208.	Mahindra Circle Trimbakeshwar Road	19.99026	73.73101
209.	Shreeram Chowk Trimbakeshwar Road	19.98943	73.72908
210.	Papaya Nursery Signal Trimbakeshwar Road	19.98577	73.72372
211.	Bajrang Nagar T Point Satpur Ambad Link Road	19.97656	73.72689
212.	Samruddhi T Point/ Amrut Garden Signal Trimbakeshwar Road	19.98327	73.71847
213.	Pimpalgaon Bahula Trimbakeshwar Road	19.98055	73.71106
214.	Hotel Sanskruti Trimbakeshwar Road	19.97171	73.67922
215.	Satpurgaon Kamaan Trimbakeshwar Road	19.99082	73.73355
216.	Dr. Babasaheb Ambedkar Bhaaji Market Satpur Colony	19.98947	73.72404
217.	Anand Chhaya Circle Bus Stop Satpur Colony	19.98930	73.72125
218.	Near Baagul Driving School Savarkar Nagar	19.98859	73.71713
219.	Near Ashok Nagar Police Chowki	19.98891	73.71367
220.	Shri Chhatrapati Shivaji Maharaj Bhaaji Market Naagre Chowk	19.99089	73.71116
221.	Carbon Naka Satpur	20.00247	73.71137
222.	Near Reliance Petrol Pump Ganesh Nagar Pipeline Road	20.00379	73.74209
223.	Across Matoshri Sweets Kaamgaar Nagar Road	20.00246	73.74976
224.	Satpur Bus Stop	19.99026	73.73101
225.	Croma Showroom Signal, Poonaroad	19.97943	73.80754
226.	Kathe Galli Signal	19.990711	73.799296
227.	Dwarka Circle	19.99382	73.79644

S. No.	Name of Location	Latitude	Longitude
228.	Sarda Circle	19.99403	73.79036
229.	Gadkari Chowk	19.99341	73.78271
230.	Triambak Naka Signal	19.99712	73.78100
231.	Jaltaran Talaw Signal, Triambak Rd	19.995860	73.776326
232.	Mico Circle, Triambak Rd	19.99446	73.77139
233.	C.C.M Signal, Untawadi Rd	19.99088	73.76378
234.	Indra Nagar Bogda, Govind Nagar Side, Rd from Mumbai Naka to Service Rd to CBS	19.97962	73.78048
235.	Mumbai Naka Circle	19.98729	73.78436
236.	Sainath Chowfuli Signal, Rd to Indra Nagar	19.97962	73.78048
237.	Vadalanaka	19.99194	73.79366
238.	Usmaniya Chowk , Pakhaal Rd	19.98988	73.79509
239.	BharatNagar Chowfuli, Wadala Rd	19.99712	73.78100
240.	R.D.Circle, Indranagar Bogadyakadun C.C.M kade janara Rd	19.97962	73.78048
241.	AshokaMarg Signal, AshokaMarg	19.98694	73.77058
242.	Seble Furniture Chowk, Milind Nagar	19.99264	73.7724
243.	Nagsen Nagar	19.98857	73.79295
244.	RaviShankar Marg	19.97856	73.80685
245.	AshokaMarg	19.98093	73.79658
246.	Indra Nagar Jogging Track	19.97962	73.78048
247.	Bharat Nagar , Shivajiwadi Slum Area	19.98410	73.79219
248.	Bजारंगवढी	19.98517	73.80153
249.	Nagsen Nagar	19.99388	73.79395
250.	Milind Nagar	19.99184	73.77315

S. No.	Name of Location	Latitude	Longitude
251.	Kranti Nagar, Untawadi Rd	19.99163	73.76559
252.	Pathardi Phata	19.95692	73.75805
253.	Rane Nagar Bogda	19.96622	73.76738
254.	Indra Nagar Jogging Track	19.97969	73.77943
255.	ITI Bridge	19.98846	73.74998
256.	Datta Mandir Stop Kewal Park	19.97626	73.72709
257.	State Bank Chowfuli	19.96881	73.76898
258.	Lekha Nagar	19.97306	73.77339
259.	Shivaji Chowk	19.97528	73.77115
260.	Maharana Pratap Chowk	19.97365	73.76596
261.	Vijaynagar Bus Stop	19.96793	73.76018
262.	Uttam Nagar Bus Stop	19.96939	73.75486
263.	Pavan Nagar Bhaji Market	19.97473	73.75574
264.	Divya Adlab	19.98181	73.75578
265.	Trimurti Chowk	19.98427	73.75653
266.	Patil Nagar	19.98395	73.76030
267.	Mauli Lawns	19.97272	73.74741
268.	Vavre Nagar Jogging Track Kuthwad Nagar	19.97966	73.74731
269.	Bhole Mangal Karaylay Shubham Park	19.97072	73.75155
270.	Cidco Hospital	19.95937	73.75467
271.	Mahakali Chowk	19.97174	73.75841
272.	Ashwin Nagar	19.96140	73.76212
273.	Indra Gandhi Vasahat Kramank .2 Lekha Nagar Zhopadpatti Cidco Nashik	19.97500	73.77415

S. No.	Name of Location	Latitude	Longitude
274.	Audumbar Bus Stop Cidco Nashik	19.97209	73.76769
275.	Badade Nagar Rd Khande Mala Area	19.98008	73.76787
276.	Kamatwade Gaon Matale Chowk	19.9773	73.75042
277.	Azaad Nagar Khaadi Area	19.97121	73.73195
278.	Fadol Mala	19.96919	73.74706
279.	Ambad Gaon Chowfuli	19.96174	73.74432
280.	Garware T-Point	19.94392	73.7441
281.	Glasko T-Point	19.94939	73.73867
282.	RP Sweets, T-POINT	19.95579	73.73501
283.	Exelo Point	19.96309	73.73535
284.	Sanjiv Nagar Kamaan(Indian Hotel)	19.97025	73.73025
285.	Indian PetrolPump	19.97312	73.72841
286.	Datta Mandir Stop	19.97626	73.72709
287.	Chhatrapati Shivaji Maharaj, Statue Pathardi Phata	19.95675	73.75771
288.	Ambad Gaon	19.96174	73.74432
289.	Lokmat Ramp Jawal	19.95143	73.75221
290.	Villholi Check Post	19.93674	73.73611
291.	Sanjiv Nagar Parisar	19.96917	73.72898
292.	Kargil Chowk, Datta Nagar Parisar	19.95904	73.72675
293.	Mhada Colony, Jadhav Sankul Parisar	19.97163	73.72184
294.	Gharkul Chunchale Parisar	19.94670	73.71778
295.	Pushpanjali Beer Bar Corner Pethe Nagar Police Station kade janara rasta	19.97408	73.77544
296.	Rajiv Nagar Valucha Thiyya Corner	19.97259	73.77406

S. No.	Name of Location	Latitude	Longitude
297.	Dr. Babasaheb Ambedkar Statue, Bhagatsingh Nagar, Zhopadpatti, Rajiv nagar	19.96925	73.77052
298.	Rane Nagar Bogda Samor	19.96617	73.76806
299.	Pathardi Phata	19.95651	73.75862
300.	Bauddha Smarak Entry Gate, Pandavleni	19.94601	73.74674
301.	Garware Service Rd	19.9528	73.75473
302.	D-Mart Mumbai Agra Rd Chowfuli	19.93658	73.73599
303.	Kachra Depo , Gaulane Rd	19.917075	73.739424
304.	Signas Hospital, Pathardi Deolali Rd	19.95197	73.76887
305.	Shell Petrol pump Samor, Damodar Nagar kade , Pathardi Phata-Deolali Rd	19.94925	73.77082
306.	Pathardi Gaon Circle, Pathardi Phata-Deolali Rd	19.944148	73.77409
307.	Maruti Mandir, Pathardi Gaon	19.94238	73.77384
308.	Mango farm, Pathardi-Phata-Deolali Rd	19.941601	73.784912
309.	Jagganath Chowk, Wada-Pathardi Rd, Indra Nagar Nashik	19.95439	73.77597
310.	Samrat Sweet, Pandav Nagari, Chowfulli, Indra Nagar, Nashik	19.96027	73.7776
311.	Kalanagar Signal, Indra Nagar Nashik	19.9692	73.78237
312.	Kalanagar Chowk, Indra Nagar Nashik	19.96971	73.78242
313.	RathChakra Chowk, Chowfulli Indra Nagar Nashik	19.97217	73.78472
314.	Bappa Chowk, Indiranagar, Nashik	19.97151	73.78631
315.	Sainath Nagar, Chowfulli	19.97651	73.78900
316.	Indra Nagar Jogging Track City Garden	19.97794	73.78497

S. No.	Name of Location	Latitude	Longitude
317.	Indra Nagar Jogging Track Entry Gate	19.97898	73.78183
318.	Indra Nagar Bogda, Chowfulli	19.97952	73.78012
319.	Wadala gaon Corner, Ashoka Hospital	19.97244	73.79400
320.	Madina Nagar Chowfulli, Wadala Gaon Nashik	19.96836	73.79835
321.	MaNaPa Hospital, Wadalagaon, Mhada Vasahat Jawal	19.96816	73.78909
322.	Gaussiya Majid, Wadala Gaon Nashik	19.97092	73.79428
323.	Raza Chowk, Wadalagaon, Nashik	19.97001	73.79504
324.	Mali Galli, Hanuman Mandir, Wadalagaon, Nashik	19.96988	73.79296
325.	MaangirBaba Chowk, Wadalagaon, Nashik	19.96799	73.79221
326.	Mehaboob Nagar Galli no. 01 Medical Jawal Wadalagaon Nashik	19.96639	73.79050
327.	Madaar Majid, Sathenagar	19.96301	73.78929
328.	Madina Lawns pudhe, Wadalagaon Nashik	19.96305	73.78933
329.	Mumtaz Nagar, Wadalagaon Nashik	19.96758	73.79732
330.	Charwak Chowk, Indra Nagar Nashik	19.97237	73.78161
331.	Pimpal Chowk, Old Indra Nagar near Police Station, Indranagar Nashik	19.97020	73.77948
332.	Gamne Maidaan, WasanNagar Pathardiphata	19.95475	73.76926
333.	MarkMall, Krushnai Nagar, IndraNagar Nashik	19.96023	73.76867
334.	Samrat Sweet, Sadaiccha Nagar kade Janara Road, Indiranagar , Nashik	19.96034	73.77778
335.	Rajivnagar Slum, Rajivnagar, Indiranagar, Nashik	19.97112	73.77718

S. No.	Name of Location	Latitude	Longitude
336.	Damodar Chowk, Pathardiphata, Nashik	19.94967	73.76192
337.	New Petrolpump, Damodar Chowk kade janara Road,Behind Hotel Express INN	19.95002	73.75588
338.	Gajanan Maharaj Mandir, Kamodnagar, Nashik	19.97543	73.78186
339.	Ramdas Swami Takli Ghat Godavari River	19.98825	73.82235
340.	Hanuman Takli Ghat Godavari River	19.98854	73.82537
341.	Muktidham Ram Mandir Nashik Rd	19.95140	73.83743
342.	Mohammadiyaan Chowk Deolali Gaon Mistrivasti	19.94476	73.83452
343.	Datta Mandir Signal Nashik Poona Rd	19.95651	73.83408
344.	Chincholi Naka, Shinde Nagar	19.90479	73.91283
345.	Chehadi Jakat Naka, Truck Terminal Point, Nashik Rd	19.93637	73.85904
346.	Krushni Utapanna Bazaar Samiti-Ekhlare Rd	19.95163	73.84808
347.	Chhatrapati Shivaji Maharaj Statue Nashik Rd	19.95205	73.84043
348.	BharatRatna Dr. Babasaheb Ambedkar Statue Nashik Rd	19.94853	73.84088
349.	Bitco Chowk, Nashik Rd	19.95389	73.83769
350.	Godavari Nadi Dasak Ghat Jail Rd Nashik Rd	19.98827	73.84534
351.	Nashik Road Railway Station Baheeril Parisar	19.94807	73.84116
352.	Nashik Road Railway Station Platform No. 4 and Baheeril Parisar	19.94947	73.84361
353.	Nashik Road Bus Stand	19.94832	73.84121

S. No.	Name of Location	Latitude	Longitude
354.	Chhatrapati Shivaji Maharaj Statue Nashik Rd	19.97907	73.84245
355.	Bagul Nagar, Vihitgaon,T Point	19.94708	73.84670
356.	Sinnar Phata, Chowki Samor,Nashik Rd	19.93748	73.83465
357.	Jail Rd Panyachi Taaki, Nashik Rd	19.97030	73.83994
358.	Shinde gaon, Naygaon Rd T point	19.92256	73.91290
359.	Ashwini Colony-Shasikiya Tantraniketan Mahavidyalay Corner, Samaan Gaon Rd, Nashik Rd	19.95156	73.86066
360.	Bhagwati Lawns Jawal, Chowk, Jail Rd, Nashik Rd	19.97822	73.85325
361.	Jama Majid, Nashik Rd	19.95219	73.83753
362.	Maal Dhakka Gate Samor, Nashik Rd	19.95104	73.83998
363.	Vasco Chowk, Nashik Rd	19.94076	73.83962
364.	Chehdi Hanuman Mandir, Nashik Rd	19.93600	73.85454
365.	Siddharth Nagar Ekhlahare Gate	19.97654	73.87766
366.	6 Number Naka Lame Rd	19.9268	73.8338
367.	Bhairav Nath Mandir Rd D. Camp	19.9207	73.8334
368.	Sansari Naka	19.9068	73.8329
369.	Selection Corner	19.9045	73.8329
370.	Chandramani Bustop	19.1994	73.8326
371.	Trimurti Bus Stop D. Camp	19.9060	73.8261
372.	Devi Mandir Renuka Mata Mandir	19.8884	73.8327
373.	Old Bus Stand D. Camp	19.9021	73.8297
374.	Jama Majid Sunni	19.9028	73.8292
375.	Balwant Plaza D. Camp	19.9070	73.8295

S. No.	Name of Location	Latitude	Longitude
376.	Kale Chowk Hadola	19.9035	73.8300
377.	Rehman Nagar D. Camp	19.9040	73.8307
378.	Sunday Market D. Camp	19.9021	73.8308
379.	Sansari Gaon Chowk	19.9064	73.8399
380.	Levit Market	19.9018	73.8279
381.	Zenda Chowk	19.9011	73.8286
382.	Khanderao Takedi	19.8976	73.8224
383.	Kendriya Vidyalaya	19.8869	73.8330
384.	Mahalaxmi Mandir	19.9245	73.8267
385.	Karla Poornam Mandir	19.9211	73.8269
386.	Dastagir Baba Chowfuli	19.9186	73.8334
387.	Bhagur Naka No.2	19.8818	73.8331
388.	Shivaji Chowk Bhagur	19.8771	73.8343
389.	Donbhi Naka	19.8766	73.8318
390.	Ram Mandir/ Shahi Majid Bhagur	19.8743	73.8323
391.	Samaatwadi Bhagur	19.8780	73.8357
392.	Minara Majid/Gaikwad Galli	19.8784	73.8335
393.	Sawarkarwada Bhagur	19.8755	73.8334
394.	Tahuja Complex Vijay Nagar Bhagur	19.8780	73.8381
395.	Saibaba Mandir Bhagur Rahuri	19.8740	73.8382
396.	Sawanlila Lahavit Rd	19.8742	73.8265
397.	Sonawane Mill Bhagur	19.8749	73.8347
398.	Bhagur Bus Stand	19.8799	73.8332
399.	Barnes School Chowk	19.8769	73.8146
400.	9 Mile Commissioner Area Parking	20.06137	73.88972

S. No.	Name of Location	Latitude	Longitude
401.	Truck Terminal Parking	20.04731	73.87721
402.	MadSangvi Parking	20.00662	73.86739
403.	Nilgiri Bag Parking	20.00225	73.83117
404.	Peth Road Navin Stadium Parking	20.01256	73.79280
405.	Thakker Maidan	20.00632	73.77420
406.	Sharadchandra Pawar Market Parking	20.03010	73.79543
407.	Arogya Vigyan Vidyapeeth Dindori Rd, Mashrul, Nashik Border Open Parking	20.0786	73.8051
408.	9th Mile Commissioner Compound	20.06137	73.88972
409.	Truck Terminal Parking	20.04731	73.87721
410.	Adgoan T Point	20.03883	73.86811
411.	Medical Choufuli	20.03086	73.85678
412.	DMART	20.02923	73.83305
413.	Laxminarayan Festival Lawns	20.02739	73.84742
414.	Jatra Chowk	20.02528	73.84189
415.	Rasbihari Chowk	20.01942	73.83142
416.	Amrutdham Chowk	20.01605	73.82529
417.	K.K. Wagh Chowk	20.01501	73.82149
418.	Swami Narayan Chowk	20.01059	73.81008
419.	Santosh T Point	20.00922	73.80583
420.	Tapovan Crossing	20.00672	73.80428
421.	Kannamvar Bridge	20.00374	73.80323
422.	Lakhalgaon Hadd	20.00059	73.93385
423.	Odha	19.99724	73.90784
424.	Shilapur	19.99645	73.89945

S. No.	Name of Location	Latitude	Longitude
425.	Madsanghvi	20.00073	73.86998
426.	Manur Fata	19.99790	73.84962
427.	Nandur Naka	19.99676	73.84379
428.	Siddivinayak Chowk[PARKING]	20.00225	73.83117
429.	Mirchi Chowk	20.00503	73.82611
430.	Janardhan Swami Ashram	20.00201	73.81197
431.	Janardhan Swami T-Point	20.00834	73.81528
432.	Peth Road Commissioner Area	20.07942	73.77989
433.	Tavli Phata	20.06140	73.78314
434.	Raau Hotel Choufuli	20.04640	73.7918
435.	S T Workshop	20.04372	73.79322
436.	RTO	20.03310	73.80310
437.	Peth Choufuli	20.02261	73.79443
438.	Phule Nagar	20.02076	73.79418
439.	Phule Nagar Petrol Pump	20.02674	73.80056
440.	Bhakti Dham	19.99933	73.81013
441.	Peth Naka	20.01256	73.79280
442.	Arogya Vigyan Vidyapeeth	20.0786	73.80510
443.	Jakat Naka	20.06702	73.80561
444.	Dr.Babasaheb Ambedkar Chowk Mashrul	20.052699	73.804843
445.	Sarvajanik Shouchalay Mashrul	20.05052	73.80582
446.	Mahshrul Gaon	20.04781	73.806055
447.	Jijau Signal	20.035809	73.803691
448.	Raj Sweet Signal	20.03310	73.80310
449.	Tarwala Signal	20.02665	73.80080

S. No.	Name of Location	Latitude	Longitude
450.	Path Choufuli	20.01256	73.79280
451.	Market Gate Parisar	20.01461	73.79626
452.	Dindori Naka	20.01165	73.79565
453.	Tapovan Road Gangavaril Bridge Shankar Nagar Takli Road Pulachi Baju	20.00825	73.80125
454.	Sadhugram Entry Front Gate	20.00234	73.81082
455.	Laxminarayan Lawns Corner	20.00180	73.80784
456.	Panchmukhi Hanuman Mandir	20.00891	73.80270
457.	Juna Adgaon Nakya Kadun Nimani Kadhe yenarya Rastyavar	20.00888	73.80269
458.	Panchmukhi Hanuman Mandir samarun Dubhakavar Katya Maruti police chowki parent	20.00870	73.80288
459.	Hirawadi Road Backside	20.00893	73.80228
460.	Near Katya Maruti Mandir	20.00854	73.80103
461.	Manoday Society	20.00862	73.80165
462.	Pashaneshwar Hanuman Mandir Takle Nagar	20.00747	73.80036
463.	Navdurga Shejari Amardham Kadhe Janara Rasta	20.00792	73.79841
464.	Nagchowkakade Janara Rasta New Bridge	20.00648	73.79214
465.	Kalaram Mandir Kadhe Janara Rasta	20.00505	73.79274
466.	Gadge Maharaj Bridge	20.00447	73.79383
467.	Mari Mata Mandir	20.00548	73.79336
468.	Gouri Pathangan	20.00310	73.79414
469.	SARDAR CHOWK PANCHER	20.00597	73.79349
470.	Indiranagar Jogging Track	19.978923	73.78166

S. No.	Name of Location	Latitude	Longitude
471.	Mumbai Naka Circle	19.986813	73.78416
472.	Nagaji Signal	19.98850	73.79276
473.	Kathe Galli Signal	19.99091	73.79921
474.	Dwarka Circle	19.99422	73.79701
475.	Tractor House	19.997839	73.80212
476.	Samarth T Point	19.98897	73.80909
477.	Maruti Wafers	19.99816	73.80963
478.	Jaishankar Chowk	19.99407	73.80931
479.	ABB Circle	19.993820	73.75405
480.	Bhavani Circle	19.99446	73.77139
481.	In Front of Civil Hospital	19.99648	73.77842
482.	Rajdutt Hotel	19.99674	73.77960
483.	In Front of Thakkar Bajar Road	19.99680	73.77976
484.	In Front of Taluka Police Station	20.00090	73.78062
485.	Modak signal 4	19.99712	73.78100
486.	Cbs Signal	20.00050	73.78243
487.	Shalimar Chowk	20.00061	73.78670
488.	Gadge Maharaj Statue	20.00195	73.78880
489.	Bhardan Phat	20.02441	73.72186
490.	Someshwar Temple Gate Memorial	20.02181	73.72650
491.	Jehan Circle	20.01216	73.75603
492.	Old Gangapur Naka	20.00743	73.77168
493.	Marathon Chowk	20.00614	73.77627
494.	Ashoka Pillar	20.00698	73.78464
495.	Sunday Fountain	20.00686	73.78965

S. No.	Name of Location	Latitude	Longitude
496.	Meher Signal	20.00467	73.78397
497.	Sangli Bank Signal	20.00419	73.78679
498.	Saraf Bazar Old	20.00576	73.79033
499.	New Sunday Narayan Temple	20.00788	73.78992
500.	Mahamarg Bus Stand	19.98729	73.78295
501.	Thakkar Bazaar Bus Stand	19.99878	73.78081
502.	Meda bus stand	19.99877	73.78080
503.	Old CBS bus stand	20.00073	73.78157
504.	Anant Kanhere Maidan	19.99611	73.77960
505.	Dogre Hostel Ground	20.00662	73.77294
506.	Thakkar Dome Ground	19.99168	73.75519
507.	8th Mile / Ambegaon Bahula Mumbai Agra Highway Rural Border Parking		
508.	Khambale Phata, Trimbai Road Parking	19.95164	73.63594
509.	Sambhaji Stadium Parking	19.96082	73.75767
510.	Satpur Bus Stand, Trimbakeshwar Road	19.99026	73.73101
511.	Goulane Phata Mumbai Agra Rd	19.93675	73.73617
512.	Garware T Point Service Rd	19.94404	73.74410
513.	Road beside Volkswagen Road	19.94898	73.74934
514.	Road beside Hotel Welcome	19.95255	73.75374
515.	Road Besides Express Inn	19.95277	73.75473
516.	Pandavleni Bogda Both Ways	19.94607	73.74672
517.	Hotel Taj Gateway Tunnel	19.95569	73.75680
518.	Pathardi Phata Choufuli	19.95692	73.75805
519.	Satyam Mangal Karayalay. Ambad Bajru	19.96446	73.76533

S. No.	Name of Location	Latitude	Longitude
520.	Rane Nagar Both Sides	19.96622	73.76738
521.	State Bank Corner to Lekha Nagar Road	19.96881	73.76898
522.	Both Sides of Lekha Nagar Circle	19.97306	73.77339
523.	Bhujbal T Point	19.97615	73.77644
524.	Sanskriti Hotel Trimbakeshwar Rd	19.97171	73.67922
525.	Belgaum Dhaga T Point	19.977464	73.694016
526.	Vasali T Point	19.975020	73.689545
527.	Pimpalgaon T Point	19.98055	73.71106
528.	Samruddhi Circle	19.98327	73.71847
529.	Papaya Nursery Chowk	19.98577	73.72372
530.	Sriram Chowk	19.98943	73.72908
531.	Mahindra Signal Chowk	19.99026	73.73101
532.	Satpur T Point	19.99109	73.73594
533.	Victor Point	19.99109	73.73594
534.	Sakal Circle	19.99161	73.74171
535.	ITI Signal	19.99339	73.74990
536.	Carbon Naka T Point	20.00247	73.71137
537.	Ashok Nagar Choufuli	19.98891	73.71367
538.	Narhari Chowk	19.94967	73.76192
539.	Gurugobind College	19.95906	73.77727
540.	Kalanagar Signal	19.96928	73.78244
541.	Bapu Bangla	19.97355	73.78609
542.	Sainath Signal	19.97655	73.78908
543.	Cidco Hospital	19.95937	73.75467
544.	Shubham Park T Point	19.97072	73.75155

S. No.	Name of Location	Latitude	Longitude
545.	Divya Adlab Choufuli	19.98181	73.75578
546.	Trimurti Chowk	19.98427	73.75653
547.	Chincholi Naka, Nashik	19.90479	73.91283
548.	Krushni Utapanna Bazaar Samiti-Ekhlare Rd	19.95163	73.84808
549.	Chhatrapati Shivaji Maharaj Statue Nashik Rd	19.95205	73.84043
550.	BharatRatna Dr. Babasaheb Ambedkar Statue Nashik Rd	19.94853	73.84088
551.	Bitco Chowk, Nashik Rd	19.95389	73.83769
552.	Godavari Nadi Dasak Ghat Jail Rd Nashik Rd	19.98827	73.84534
553.	Ramdas Swami Takli Ghat Godavari River	19.98825	73.82235
554.	Hanuman Takli Ghat Godavari River	19.98854	73.82537
555.	Muktidham , Nashik Rd	19.95140	73.83743
556.	Sansari Naka D. camp	19.94621	73.83647
557.	Chandramani Stop Railway	19.94832	73.84121
558.	Bhagur Naka No.2	19.8818	73.8331
559.	Nashik Road Railway Station Main Building	19.94807	73.84116
560.	Nashik Road Railway Station Platform No. 4 and Baheril Parisar	19.94947	73.84361
561.	Nashik Road Bus Stand	19.94832	73.84121
562.	Railway Station Deolali Camp	19.89760	73.83619
563.	Sailani Baba Chowk	19.97907	73.84245
564.	Jama Mashid	19.95219	73.83753
565.	Satkar Point	19.95163	73.84808
566.	Deolaligaon Rajwada Corner	19.94231	73.83590

S. No.	Name of Location	Latitude	Longitude
567.	Vihitgaon Signal	19.93761	73.83466
568.	Dasak Ghat	19.98827	73.84534
569.	Sinnar Phata Signal	19.95163	73.84808
570.	Datta Mandir Signal	19.95651	73.83408
571.	Upanagar Signal	19.96910	73.81811
572.	Samrat signal	19.97592	73.81045
573.	Fame Signal	19.97943	73.80754

B. Location of Trimbakeshwar

S. No.	Name of Location	Latitude	Longitude
1	Talegaon Phata Highway	19.96191	73.64412
2	Talegon parking 1	19.954436	73.638201
3	Talegon parking 2	19.953282	73.637584
4	Talegon parking 3	19.959267	73.640483
5	Talegon parking exit	19.96022	73.64142
6	Talegon parking 4	19.96167	73.64167
7	Khambale Phata Highway	19.95969	73.63016
8	Beje Phata Highway	19.95550	73.60125
9	Anjaneri Kila	19.95457	73.59187
10	Anjaneri Tirth	19.95319	73.58512
11	Brahma Valley College Inner parking	19.95065	73.57622
12	Towards Talwade outer parking Highway	19.95076	73.56398
13	Talwade village outer parking	19.97353	73.55402
14	Pahine T point towards Bhilmal outer parking	19.89923	73.54833
15	Bhilmal outer paring	19.90022	73.54679
16	Pahine outer parking	19.89739	73.547765
17	Pahine Inner parking	19.94221	73.55186
18	Prayag Tirth	19.94533	73.5508573
19	Shri Panchayati Maha Nirvani Akhada	19.94470	73.55037
20	Shree Swami Samartha Gurupeeth Entrance	19.94402	73.54791
21	Shree Chandra Ghat	19.93881	73.53757
22	Kumbhmela Bus Station	19.93815	73.53594
23	Ambedkar square	19.934176	73.532502
24	Trimbakeshwar Municipal Council Office Corner	19.93484	73.53235

S. No.	Name of Location	Latitude	Longitude
25	Gagangiri Maharaj Tea Point (New Pole-1)	19.93486	73.5307
26	Gagangiri Maharaj Tea Point (New Pole-2)	19.934900	73.531387
27	Gagangiri Maharaj Tea Point (New Pole-3)	19.935005	73.530204
28	Khanderao Maharaj Mandir Chowk	19.93533	73.52941
29	Sundarabai math (Teli Galli) (New Pole-1)	19.934880	73.528265
30	Sundarabai math (Teli Galli) (New Pole-2)	19.934800	73.528250
31	Sundarabai math (Teli Galli) (New Pole-3)	19.934941	73.528577
32	Sundarabai math (Teli Galli) (New Pole-4)	19.935095	73.528646
33	Patil Galli (Teli Galli) (New Pole-1)	19.93407	73.52826
34	Patil Galli (Teli Galli) (New Pole-2)	19.933819	73.528190
35	Bhagwati Mandir (Teli Galli)	19.933503	73.528145
36	Kushavart Tirth	19.93287	73.52780
37	Kushavart Tirth near Darshan Pass Booking Counter	19.932500	73.527921
38	Indra Kund	19.932444	73.528603
39	New Gangaputra hotel (Kushavart to Trimbak Temple Street)	19.931835	73.528403
40	Tulsi inn (Kushavart to Trimbak Temple Street)	19.931775	73.529236
41	Kalp Niwas Lodge near (Laxmi Narayan Mandir)	19.932065	73.529720
42	Laxmi Narayan Mandir Chowk	19.93258	73.52979
43	Trimbakeshwar Temple North Gate Entrance Rd	19.93271	73.53062
44	Trimbakeshwar Temple North Gate Entrance	19.932560	73.530772
45	Chhatrapati Shivaji Maharaj Chowk Near Trimbakeshwar Temple North Gate	19.932887	73.531159
46	Patil Galli Chowk	19.933906	73.530702
47	Patil Galli Chowk Near Ajay Jewellers	19.933398	73.530704
48	Trimbakeshwar Taxi Stand near Patil Chowk	19.933912	73.531119
49	Trimbakeshwar Bus Stand	19.934381	73.531777
50	Grampanchayat Office	19.933422	73.531779
51	Hotel Swami palace near Tahsil Karyalay	19.934662	73.533344
52	Maheshwari Bhakt Nivas	19.935327	73.534151
53	Bank of Maharashtra - Trimbakeshwar Branch	19.936216	73.535043
	Around Trimbakeshwar Temple		
54	Around Trimbakeshwar Temple (North Gate Eixsting pole-1)	19.932507	73.530658
55	Around Trimbakeshwar Temple (North Gate Eixsting pole-2)	19.932538	73.530940
56	Around Trimbakeshwar Temple (North Gate Eixsting pole-3)	19.932525	73.531125
57	Around Trimbakeshwar Temple (East Gate Eixsting pole-4)	19.932295	73.531163
58	Around Trimbakeshwar Temple (East Gate Eixsting pole-5)	19.931944	73.531153
59	Around Trimbakeshwar Temple (South Gate Eixsting pole-6)	19.931885	73.531102
60	Around Trimbakeshwar Temple (South Gate Eixsting pole-7)	19.931896	73.530864

S. No.	Name of Location	Latitude	Longitude
61	Around Trimbakeshwar Temple (South Gate Eixsting pole-8)	19.931896	73.530668
62	Around Trimbakeshwar Temple (West Gate Eixsting pole-9)	19.931910	73.530331
63	Around Trimbakeshwar Temple (West Gate Eixsting pole-10)	19.931961	73.530333
64	Around Trimbakeshwar Temple (West Gate Eixsting pole-11)	19.932112	73.530331
65	Around Trimbakeshwar Temple (West Gate Eixsting pole-12)	19.932244	73.530329
	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli)		
64	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (New pole-1)	19.933139	73.528057
65	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-2)	19.933251	73.528323
66	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-3)	19.933377	73.528582
67	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-4)	19.933330	73.528859
68	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-5)	19.933168	73.529188
69	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-6)	19.933055	73.529426
70	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-7)	19.932912	73.529958
71	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-8)	19.932826	73.529460
72	Kushavart Tirth to Laxmi Narayan mandir Street (Bhour Galli) (Eixsting pole-9)	19.933145	73.528938
	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor		
73	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-3)	19.940445	73.533694
74	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-7)	19.945155	73.529780
75	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-9)	19.997889	73.593845
76	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-11)	19.949765	73.526059
77	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-13)	19.997312	73.592515
78	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-15)	19.954512	73.522477
79	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-17)	19.986037	73.581045
80	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-18)	19.981164	73.581151
81	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor (New Pole-22)	19.959822	73.511692
	Bilva Tirtha Road		
82	Bilva Tirtha Road (New Pole-1)	19.944384	73.528116
83	Bilva Tirtha Road (New Pole-2)	19.944384	73.526575
84	Bilva Tirtha Road (New Pole-3)	19.943138	73.525867

S. No.	Name of Location	Latitude	Longitude
85	Bilva Tirtha Road (New Pole-4)	19.942206	73.525631
86	Bilva Tirtha Road (New Pole-5)	19.942034	73.526691
87	Bilva Tirtha Road (New Pole-6)	19.941479	73.526500
88	Bilva Tirtha Road (New Pole-7)	19.941505	73.525535
89	Bilva Tirtha Road (New Pole-8)	19.940324	73.526386
90	Bilva Tirtha Road (New Pole-9)	19.938872	73.525592
91	Bilva Tirtha Road (New Pole-10)	19.936110	73.526477
92	Chowkimata Mandir	19.934421	73.526495
	Old Jawar Phata Chowk - TMC Office Road		
93	Old Jawar Phata Chowk - TMC Office Rd (New Pole-1)	19.939309	73.532928
94	Old Jawar Phata Chowk - TMC Office Rd (New Pole-2)	19.937936	73.532693
95	Old Jawar Phata Chowk - TMC Office Rd (New Pole-3)	19.936744	73.532445
96	Old Jawar Phata Chowk - TMC Office Rd (New Pole-4)	19.935477	73.532379
97	New Jawar Phata Chowk	19.937429	73.536205
98	Old Jawar Phata Chowk	19.940973	73.53326
99	Sapgon Phata	19.958388	73.514085
100	Sapgon Inner Parking	19.95811	73.51070
101	Trimbak - Jawar Rd Amboli Parking-1	19.97121	73.49627
102	Trimbak - Jawar Rd Amboli Parking-2	19.972907	73.492592
103	Kumbhar Talav Govt Parking Building Trimbak	19.936072	73.531478
104	Kumbhar Talav Open Parking Lot	19.935558	73.530444
	Sundarabai math - Nivruttinath Maharaj Samadhi Mandir corridor		
105	Sundarabai math - Nivruttinath Maharaj Samadhi Mandir corridor (New Pole-1)	19.934416	73.526551
106	Sundarabai math - Nivruttinath Maharaj Samadhi Mandir corridor (New Pole-2)	19.934442	73.525889
107	Sundarabai math - Nivruttinath Maharaj Samadhi Mandir corridor (New Pole-3)	19.9338127	73.5241871
108	Nivruttinath Maharaj Samadhi Mandir chowk (New Pole-4)	19.9332119	73.5238448
109	Nivruttinath Maharaj Samadhi Mandir	19.9331284	73.5232333
	Nivruttinath Maharaj Samadhi Mandir - Shree Swami Samartha Gurupeeth Entrance (Ring Road) Corridor		
110	Panch Agni Akhada	19.932439	73.523654
111	Atal Akhada	19.931796	73.523740
112	Gangasagar Lake Pole-1	19.931815	73.524650
113	Gangasagar Lake Pole-2	19.932407	73.525430
114	Brahmagiri Trek Entrance Point	19.930089	73.523097
115	Gatai	19.930424	73.525009
116	Aahilya Dam entrance on Ring Road	19.929137	73.526039
117	Aahilya Dam Pole-1	19.928340	73.526455
118	Aahilya Dam Pole-2	19.927084	73.527227
119	Aahilya Dam Ghat Pole-1	19.927225	73.527669
120	Aahilya Dam Ghat Pole-2	19.927598	73.527743
121	Aahilya Dam Ghat Pole-3	19.926755	73.527724

S. No.	Name of Location	Latitude	Longitude
122	Aahilya Dam Ghat Pole-4	19.927230	73.528150
123	Shree Panchayti Akhada Naya Udasin Nirvan	19.926745	73.528522
124	Patankar Chowk Ring Road	19.928691	73.527899
125	Bada Udasin Akhara Parking	19.928299	73.530966
126	Bada Udasin Akhara	19.929190	73.532071
127	(Ring Road) Corridor Pole-1	19.929963	73.531725
128	Guru Gaurakshnath Math	19.931752	73.532210
129	Near Shamshanbumi Ring Road	19.933470	73.533607
130	Niranjani Akhada	19.934845	73.538032
131	(Ring Road) Corridor Pole-2	19.935798	73.539471
132	Sadguru dham Ashram	19.937051	73.541168
133	(Ring Road) Corridor Pole-3	19.938618	73.542648
134	(Ring Road) Corridor Pole-4	19.939879	73.544123
135	(Ring Road) Corridor Pole-5	19.942194	73.546500
	Nivruttinath Maharaj Samadhi Mandir- Kushavart Ghat Corridor		
136	Nivruttinath Maharaj Samadhi Mandir- Kushavart Ghat (Pole-1)	19.933249	73.524222
137	Nivruttinath Maharaj Samadhi Mandir- Kushavart Ghat (Pole-2)	19.932989	73.525758
138	Nivruttinath Maharaj Samadhi Mandir- Kushavart Ghat (Pole-3)	19.932851	73.526785
139	Nivruttinath Maharaj Samadhi Mandir- Kushavart Ghat (Pole-4)	19.932420	73.527459
140	Nivruttinath Maharaj Samadhi Mandir- Kushavart Ghat (Pole-5)	19.933065	73.527440
141	Dhobighat Galli - Chowkimata Mandir (Pole-6)	19.933630	73.525722
	Panchali Galli (Parashuram Mandir - Patankar Chowk)		
142	Panchali Galli (Pole-1)	19.931367	73.529123
143	Panchali Galli (Pole-2)	19.931224	73.528920
144	Parashuram Mandir Chowk (Pole-3)	19.930389	73.528811
145	Panchali Galli (Pole-4)	19.929709	73.528512
146	Panchali Galli (Pole-5)	19.929203	73.528328
	Goutam Talav		
147	Goutam Talav (Pole-1)	19.930460	73.529631
148	Goutam Talav (Pole-2)	19.930493	73.531048
149	Goutam Talav (Pole-3)	19.931518	73.529441
150	Goutam Talav (Pole-4)	19.931564	73.530200
151	Goutam Talav (Pole-5)	19.931139	73.530971
	Chakra Tirtha Village (Beza)		
152	Chakra Tirtha Village Beza (Pole-1)	19.996354	73.593504
153	Chakra Tirtha Village Beza (Pole-2)	19.996026	73.593577
154	Chakra Tirtha Village Beza (Pole-3)	19.996287	73.594028
155	Chakra Tirtha Village Beza (Pole-4)	19.996631	73.594088
156	Chakra Tirtha Village Beza (Pole-5)	19.996613	73.593307
157	Chakra Tirtha Village Beza (Pole-6)	19.996481	73.592161

S. No.	Name of Location	Latitude	Longitude
158	Chakra Tirtha Village Beza (Pole-7)	19.996977	73.593916
159	Chakra Tirtha Village Beza (Pole-8)	19.997339	73.593710
160	Chakra Tirtha Village Beza (Pole-9)	19.997889	73.593845
161	Chakra Tirtha Village Beza (Pole-10)	19.997339	73.594438
162	Chakra Tirtha Village Beza (Pole-11)	19.996884	73.594966
163	Chakra Tirtha Village Beza (Pole-12)	19.998608	73.592708
164	Chakra Tirtha Village Beza (Pole-13)	19.997312	73.592515
165	Chakra Tirtha Village Beza (Pole-14)	19.995679	73.587499
166	Chakra Tirtha Village Beza (Pole-15)	19.993310	73.582607
167	Chakra Tirtha Village Beza (Pole-16)	19.990103	73.577939
168	Chakra Tirtha Village Beza (Pole-17)	19.986037	73.581045
169	Chakra Tirtha Village Beza (Pole-18)	19.981164	73.581151
170	Chakra Tirtha Village Beza (Pole-19)	19.976136	73.584014
171	Chakra Tirtha Village Beza (Pole-20)	19.973982	73.587245
172	Gajarwadi Inner Parking (Beza)	19.972271	73.588333
173	Shriram Shaktipith Mandir	19.977043	73.588971
174	Chakra Tirtha Village Beza (Pole-21)	19.976400	73.585532
175	Chakra Tirtha Village Beza (Pole-22)	19.967492	73.591236
176	Chakra Tirtha Village Beza (Pole-23)	19.962477	73.594524
177	Chakra Tirtha Village Beza (Pole-24)	19.958910	73.598027
178	Beza Phata Outer Parking	19.956853	73.601107
	Pahine Road		
179	Pahine Road (pole 1)	19.938869	73.553122
180	Pahine Road (pole 2)	19.933847	73.553847
181	Pahine Road (pole 3)	19.927747	73.554353
182	Pahine Road (pole 4)	19.921936	73.555222
183	Pahine Road (pole 5)	19.914631	73.5546
184	Pahine Road (pole 6)	19.907839	73.552083
185	Pahine Road (pole 7)	19.902369	73.550153
186	Pahine Road (pole 8)	19.899231	73.548331
	Nashik Trimbakeshwar road		
187	Nashik_TrimbakeshwarRoad (pole 1)	19.940211	73.540278
188	Nashik_TrimbakeshwarRoad (pole 2)	19.941628	73.542917
189	Nashik_TrimbakeshwarRoad (pole 3)	19.942914	73.545756
190	Nashik_TrimbakeshwarRoad (pole 4)	19.945431	73.553833
191	Nashik_TrimbakeshwarRoad (pole 5)	19.947881	73.558372
192	Nashik_TrimbakeshwarRoad (pole 6)	19.951914	73.568383
193	Nashik_TrimbakeshwarRoad (pole 7)	19.952169	73.576822
194	Nashik_TrimbakeshwarRoad (pole 8)	19.954981	73.596983
195	Nashik_TrimbakeshwarRoad (pole 9)	19.957867	73.609542
196	Nashik_TrimbakeshwarRoad (pole 10)	19.958417	73.620783
197	Kavnai	19.772989	73.613647
198	Sarvatirth Jatayu Mandir (Taked)	19.700214	73.776364
199	Vani	20.389425	73.909606

S. No.	Name of Location	Latitude	Longitude
200	Shreenath ghat	19.933789	73.5344
201	Trimbak - Jawar Rd Amboli Parking-	19.972494,	73.490778
202	New Jawar Phata - Old Jawar Phata - Sapgon Road corridor	19.957747	73.517125
203	Sadhugram	19.946608	73.552711