



Supply, Installation, Testing, Commissioning, Operation & Maintenance of Centralized Control & Monitoring System (CCMS) for Street Lighting on National Highways under RO, Uttarakhand on Five (05) Year Contract Basis.

BID DOCUMENT

July-2026

Regional Officer, RO-Uttarakhand,

National Highways Authority of India
58/37, Balbeer Road, Dehradun, (Uttarakhand)

Email: routtarakhand@nhai.org

National Highways Authority of India
RO-Uttarakhand

SECTION -I
NOTICE INVITING TENDER(NIT)

UK DIV-20011/23/2026-NHAI- RO Dehradun (E 321517)

Dated : 14.07.2026

Name of Work: Supply, Installation, Testing, Commissioning, Operation & Maintenance of Centralized Control & Monitoring System (CCMS) for Street Lighting on National Highways under RO, Uttarakhand on Five (05) Year Contract Basis.

Bids are invited from experienced and reputed Contractors having proven experience (minimum of three years) in the supply, installation, testing, commissioning, operation and maintenance of **Centralized Control & Monitoring Systems (CCMS)** for highways, urban roads, municipal corporations, or other government infrastructure projects.

1. The BOQ form and terms & conditions for the above service work may be downloaded from NHAI website <http://www.nhai.gov.in> or E-Tender Portal- NIC (<http://etenders.gov.in>) from next working day of receipt of approval by Competent Authority. The Contractor who download the NIT documents from the website will be required to pay a non-refundable fee of Rs.25000/- (Rupees Twenty Five Thousand only) at the time of the submission of the Bid proposal.

Key Dates:

1. Last Date of Online Bid Submission (Online): - **12.08.2026(1400 Hrs)**
2. Date and time of Technical Bid opening: - **13.08.2026.(1500 Hrs)**
3. Date of Financial Bid opening:- **To be notified**

3. **Cost of Bid Documents (Non-Refundable):Rs. 25,000/-**

The Bidders shall pay online and submit a payment receipt for **Rs. 25000/-**(Rupees Twenty Five Thousand only) towards cost of Bid Documents (non- refundable). Details of the designated bank account of NHAI Regional Office, Dehradun is as under:

S.No.	Particulars	Details
1.	Name of Beneficiary	National Highways Authority of India
2.	Name of Bank	IndusInd Bank
3.	Account No.	201018242666
4.	IFSC Code	INDB0001446

The RFP will be invited through e-tendering portal of NHAI only. Refer procedure under e-tendering for submission of RFP through e-tendering.

4. NHAI reserves the right to reject and cancel all quotations without assigning any reasons.

5. Address for any type of communication/ clarifications is given below: -

Regional Officer - Uttarakhand,
National Highways Authority of India
58/37, Balbeer Road, Dehradun,
Uttarakhand - 248001
Ph. 0135-2669752, Mob. 8130006045
Email:- routtarakhand@nhai.org

SECTION -II (INFORMATION TO BIDDERS)

Name of Work: Supply, Installation, Testing, Commissioning, Operation & Maintenance of Centralized Control & Monitoring System (CCMS) for Street Lighting on National Highways under RO, Dehradun on Five (05) Year Contract Basis.

Introduction:-

Bids are invited from firms having a **minimum of three (03) years' experience** in supply, installation, testing, commissioning, operation and maintenance of Centralized Control & Monitoring Systems (CCMS) for Street Lighting on National Highways.

Experience certificates shall be issued by Central / State Government departments, Public Sector Undertakings (PSUs), or Municipal Corporations

Note:

1. In case of nominated sub-contractor, a certificate from the Executive Engineer or equivalent of the Prime Employer should be obtained from whom an approval for sub contractor has been obtained.

1. Scope of Work:-

The scope of work shall include:

- a. Supply of **Centralized Control & Monitoring System (CCMS) feeder panels** conforming to the technical specifications provided in **Section-IV (Technical Specifications)**, including hardware, energy meters, communication modules, enclosure, stand, and all associated accessories.
- b. Installation, testing, and commissioning of CCMS feeder panels at designated switching points along National Highways, service roads, and slip roads.
- c. Operation of the CCMS for **automated and remote ON/OFF control** of street lighting based on astronomical (sunrise/sunset) timings and central control commands.
- d. Preventive and breakdown maintenance of CCMS hardware, communication systems, and web-based central monitoring software for the entire contract period.
- e. Supply, replacement, and upkeep of all consumables and accessories including SIM cards/data connectivity, batteries, relays, protection devices, and other replaceable components required for uninterrupted CCMS operation.
- f. Training of operators and NHAI/Authority personnel for operation, monitoring, report generation, and basic troubleshooting of the CCMS.
- g. Continuous monitoring, logging, and reporting of electrical parameters, energy consumption, system performance, faults, and alerts in compliance with applicable energy efficiency and safety standards.
- h. Deployment and integration of the CCMS on **National Highways** including GIS-based mapping and centralized supervision.

2. Information about Bidding: -

3.1	Address of the Authority for correspondence	Regional Officer - Uttarakhand, National Highways Authority of India 58/37, Balbeer Road, Dehradun, Uttarakhand - 248001 Email :-routtarakhand@nhai.org
3.2	Availability of Bid Documents	The bid documents will be available for download from NHAI website http://www.nhai.gov.in or E-Tender Portal-NIC (https://etenders.gov.in)
3.3	Earnest Money Deposit/Bid Security	Bid security amounting to five Lakh in the form of Demand Draft / Bank Guarantee in favour of NHAI Regional office payable at Dehradun.
3.4	Performance Security	Equivalent to 10% of Contract Price in the form of Bank Guarantee (on approved format)/Demand

		Draft, in favour of NHAI Regional Office, Dehradun payable at Dehradun after issuance of Letter of Acceptance (LOA).
3.5	Last Time and date of submission of Bid	12.08.2026 1400hrs
3.6	Time and date of opening of Technical Bid	13.08.2026 1500hrs
3.7	Duration of Contract	60 months (05Years), which may be extended/curtailed by the Authority based on performance & mutual consent.
3.8	Cost of Bid	Rs. 25000/-(Twenty Five Thousand only) online in Authority's designated bank account of NHAI Regional Office, Dehradun.

4. Method of Bidding:-

4.1 The bidder shall upload following documents:-

- a) The Proof of online payment for Tender Fee.
- b) **Proof of Bid Security.**
- c) Power of Attorney for signing the bid.
- d) Joint bidding Agreement for JV, if any.
- e) Experience certificates must be issued by the **Central / State Government, PSU, or Municipal Corporation.**

4.2 Additional information/ Guideline:-

- a) Bidders shall upload copies of all documents listed above while submitting the bid online.
- b) Technical & Financial evaluation of bid and declaration of result shall be done based on the documents received online after confirmation of Tender Cost in NHAI Regional Office, Dehradun's account.
- c) Bidders shall be asked to submit originals of all documents listed above after declaration of bid evaluation result by Authority.
- d) All the Bidders (including individual or any of its Joint Venture Members) failing to submit the original documents required as per 4.1 above shall be unconditionally debarred from bidding in NHAI projects for a period of 1 year.

5. In case L-1 Bidder fails to submit the originals as per para 4.1, the bidding process shall be annulled and tenders shall be re-invited.

6. Authorized Signatory holding Power of Attorney or person executing/delegating such Power of Attorney shall only be the Digital Signatory. In other cases, the BID shall be considered **non - responsive**

7. Eligibility Criteria:-

a) **The Bidder shall be a Contractor** engaged in the supply, installation, commissioning, operation and maintenance of **Centralized Control & Monitoring Systems (CCMS) for Street light work**, and shall have valid ownership/authorization for the proposed CCMS hardware and software.

b) **The Bidder shall have a minimum experience of three (03) years** in execution, operation and maintenance of CCMS for Street Lighting.

c) **The Bidder shall have an average annual turnover of not less than ₹2.00 Crores** during the last three (03) financial years.

d) **Experience certificates** in support of the above experience shall be attached with the Bid documents and shall be issued by **Central / State Government Departments, PSUs, or Municipal Corporations.**

8. Earnest Money Deposit (EMD)/ BID Security: -

The **Bidder** shall furnish, as part of the bid, an **Earnest Money Deposit (EMD) / Bid Security** of the amount specified in the RFP document. The EMD / Bid Security shall be submitted in the form of a **Demand Draft / Bank Guarantee**, drawn in favour of **NHAI Regional Office, Dehradun**, payable at **Dehradun**, or through any other mode as permitted on the e-tendering portal.

Any bid not accompanied by an acceptable EMD / Bid Security shall be treated as **non-responsive** and shall be rejected by NHAI. The EMD / Bid Security of unsuccessful bidders shall be returned as per applicable rules.

9. Bid Validity:-

The bids shall be valid for 120 days from the date of opening as prescribed in 3.6 above.

8. Bid Submission:-

The bidder shall be submitting Technical & Financial proposal/bid only in the online e-portal (<https://etenders.gov.in>) in accordance to the bidding document.

9. Bid opening

The technical bids will be opened in the presence of bidder or their authorized representative, who wish to be present at the time of opening of bid, on due date. After scrutiny and evaluation of technical bids, NHAI shall inform those who are eligible for opening of financial bid and dates of opening of financial bid shall be intimated later only in e-portal (<https://etenders.gov.in>) to those bidders fulfilling the eligibility criteria and whose bids are considered responsive by the committee.

10. Performance Security:-

The successful bidder will be required to submit the performance security for an amount specified in 3.4 in the form of Bank Guarantee (B.G.)/ Demand Draft in favour of NHAI Regional Office, Dehradun within 7 days of issue of letter of acceptance (LOA). The performance security shall be refunded after successful completion of contract.

11. Award and signing of Contract:-

NHAI shall issue Letter of Acceptance to the lowest bidder, whose Technical and Financial bid have been found technically and financially acceptable. The successful bidder shall then submit performance security within 7 days and execute the Agreement with NHAI on non-judicial stamp paper of Rs.100/- (Rs. One Hundred Only).

12. Right to vary quantities: -

NHAI reserves the right, at any time during the contract period, to **increase or decrease the number of CCMS feeder panels / locations / units** to be supplied, installed, operated and maintained, as per the actual requirement of services, **without any change in the agreed rate(s), terms and conditions of the Contract.**

13. Right to reject any or all the quotations:-

NHAI reserves right to reject any or all the bids without assigning any reason and no claim of whatsoever nature will be entertained for such act.

SECTION-III (TERMS & CONDITIONS)

1. The **Bidder/Contractor** shall have valid registration with the **GST Department** on the last date of submission of the Bid.
2. The **Bidder** shall own or have valid authorization/arrangement for the supply, installation, operation and maintenance of **Centralized Control & Monitoring System (CCMS) feeder panels**, including hardware, software, communication modules, and accessories conforming to the technical specifications prescribed in the RFP. Documentary proof of ownership/authorization shall be uploaded with the Bid.
3. **All CCMS feeder panels, controllers, energy meters and associated equipment** proposed under the Bid shall be new, unused, and of latest manufacture, and shall be in sound working condition at the time of installation.
4. In case any CCMS equipment, software platform, or communication service is provided through third-party arrangements, **valid authorization agreements / MOUs / licenses**, duly signed and legally valid, shall be submitted along with the Bid. Systems without valid authorization documents shall not be considered.
5. **All CCMS feeder panels and associated equipment shall be comprehensively insured**, wherever applicable, from a valid Insurance Company. The insurance shall be kept valid by the Contractor at its own cost during the entire contract period.
6. **NHAI shall not be responsible for any damage, theft, accident, cyber incident, data loss, or third-party claims** arising during installation, operation, or maintenance of the CCMS. The entire liability shall rest with the Contractor.
7. The Bidder shall quote rates **inclusive of all costs**, including but not limited to supply, installation, testing, commissioning, operation, monitoring, maintenance, software licenses, server/cloud charges, SIM cards/data connectivity, batteries, spare parts, consumables, insurance, and all other incidental charges **except GST**. The CCMS shall be operated and maintained on a **24×7 basis throughout the year**, as per NHAI's operational requirements.
8. **The scope/number of CCMS feeder panels/locations may be increased or decreased by NHAI** based on actual requirements. The variation shall be payable accordingly as per quoted rate.
9. The Contractor shall deploy **qualified, trained, and experienced technical personnel** for installation, operation, monitoring, and maintenance of the CCMS. All personnel shall follow prescribed safety norms. Any cost related thereto shall be deemed included in the quoted rates.
10. In case of **failure, malfunction, communication breakdown, or non-availability of any CCMS feeder panel or software service**, the Contractor shall restore the system with maximum period of **48 hours** from the time of reporting/Intimation. Failure to restore services within the stipulated time shall attract penalties of **₹5,000/- (Rupees Five Thousand only)** per instance or as specified in the RFP, recoverable from bills or Performance Security.
11. The CCMS shall be used exclusively for **monitoring, control, and automation of street lighting systems on National Highways / Associated infrastructure** under the jurisdiction of RO-Dehradun or as directed by NHAI.
12. The Bidder shall quote rates **clearly in words and figures**. In case of discrepancy, rates quoted in words shall prevail.
13. **Performance shall be measured** based on service levels as prescribed in the RFP. Monthly performance review and reconciliation shall be carried out.

14. The Contractor shall submit **monthly invoices certified by the Engineer-in-Charge** for release of payment.
15. **No escalation or revision** in quoted rates shall be allowed during the entire contract period, except as expressly provided in the RFP.
16. The Contractor shall commence and complete the installation work within **the period specified in the Letter of Acceptance (LOA)**.
17. Evaluation of bids shall be carried out on **L1 basis**, as specified in the RFP.
18. The successful Bidder shall submit all required statutory documents and execute the **Contract Agreement** on non-judicial stamp paper of Rs.100/- at its own cost.
19. The Contract shall initially be valid for **Five (05) Years**, including comprehensive Operation & Maintenance, subject to satisfactory performance. The Supply, Installation, Testing, Commissioning is to be completed within first year and Operation & Maintenance period shall be remaining 4 years.
20. In case of persistent failure to perform, NHAI shall have the right to **suspend or debar** the Contractor from participating in future tenders of MoRTH/NHAI/NHIDCL for a specified period.
21. NHAI reserves the right to **reject any or all bids** without assigning any reason.
22. The Contract may be terminated by either party by giving **one (01) months' notice**, without any compensation, as per termination provisions of the RFP
23. Bids received after the due date and time shall be **summarily rejected**.
24. Corrigendum / amendments, if any, shall be published only on the **NHAI website(<https://www.nhai.gov.in/>)**/ **e-Tender portal (<https://etenders.gov.in/>)**.
25. NHAI reserves the right to **modify, cancel, or annul** the tender process at any stage without assigning any reason.
26. The Contractor shall ensure **uninterrupted availability of all consumables, spares, accessories, software support, communication services (SIM/data connectivity), batteries, and replacement components** required for continuous and reliable operation of the **Centralized Control & Monitoring System (CCMS)** throughout the contract period.
27. The Bidder shall quote rates as specified in the **Financial Bid (BOQ)** – monthly / per-machine basis, as applicable.
28. NHAI shall have **no obligation**:
 - (a) Towards payment of wages, benefits, or statutory dues of Contractor's personnel.
 - (b) For losses due to negligence, accidents, or statutory violations by the Contractor.
 - (c) For theft, fire, or misconduct by Contractor's staff.
 - (d) For disputes between Contractor and its employees.
29. All disputes shall be subject to Dehradun jurisdiction only.
30. For Force Majeure, please refer Annexure- A1
31. For Arbitration - A2
32. For the indemnification clause, please refer Annexure- A3

Address:

Regional Officer - Uttarakhand,
National Highways Authority of India
58/37, Balbeer Road, Dehradun,
Uttarakhand - 248001
Ph. 0135-2669752, Mob. 8130006045
Email :-routtarakhand@nhai.org

Signature of the Applicant/**Authorised representative**

Date:

Place:

(Seal of Bidder)

Letter Head of Bidder

UNDERTAKING

I/We, M/s _____, having our registered office at _____, hereby submit this Bid for the Supply, Installation, Testing, Commissioning, Operation and Maintenance of Centralized Control & Monitoring System (CCMS) for Street Lighting for use by the National Highways Authority of India (NHAI), RO-Dehradun.

I/We hereby undertake to accept, comply with, and abide by all the terms and conditions, technical specifications, eligibility criteria, scope of work, and provisions contained in the Notice Inviting Tender (NIT), Request for Proposal (RFP), and all other tender documents, without any deviation, qualification, or reservation whatsoever.

**Signature of the Applicant/
Authorised representative**

Date:

Place:

(Seal of Bidder)

SECTION -IV (TECHNICAL BID)

The Technical bid shall consider following documents:-

1. Bid documents signed by the bidder on each page.
2. Cost of bid documents Rs. 25000/- to NHAI Regional Office, Dehradun's account).
3. Information of bidder in Annexure-I
4. Eligibility criteria in Annexure-II
5. Details of the proposed Centralized Control & Monitoring System (CCMS) components to be provided, as per Annexure-III.

TECHNICAL BID

ANNEXURE-I

Sr. No.	Particulars	Details
1.	Name of Bidder / Firm / Company	
2.	Detail address with Phone No.	
3.	Year of GST Registration	
4.	Name, Address & Phone No. Of the Authorized Signatory	
5.	Permanent Account Number (PAN) Firm/Company: Authorized Signatory:	
6.	Details of Payment of Cost of Bid:	Proof of payment shall be uploaded.
7.	Details of EMD	Proof of payment shall be uploaded.
8.	Details of Similar Works Executed during the last three (03) years	Name of Client (Central/State Government Department / PSU / Municipal Corporation / Urban Local Body / Highway Authority), Contract Value, Number and Type of Centralized Control & Monitoring System (CCMS) feeder panels installed, operated and maintained, Period of Contract, and Contact Person details (Name, Designation, Phone No. & Email ID).

**Signature of the Applicant/
Authorised representative**

Name:.....

Designation.....

Seal:.....

Date:

Place:

(Seal of Bidder)

TECHNICAL QUOTATION
ANNEXURE-II

Documents satisfying eligibility criteria:-

Original / Certified copies of experience certificates for a minimum period of three (03) year, duly issued and signed by the competent authority (not below the rank of Executive Engineer / Deputy General Manager / equivalent officer) of Central / State Government Departments / PSUs / Municipal Corporations, for supply, installation, operation and maintenance of Centralized Control & Monitoring Systems (CCMS) for Street lighting work.

**Name, Signature &
Seal of Bidder**

Date:

Place:

Annexure-III

****Details of Proposed Centralized Control & Monitoring System (CCMS): (To be provided as per Bid Conditions)****

SCOPE OF WORK

The scope of work shall include:

- a) Supply of Centralized Control & Monitoring System (CCMS) feeder panels conforming to the technical specifications provided in Section-IV (Technical Specifications), including hardware, energy meters, communication modules, enclosure, stand, and all associated accessories.
- b) Installation, testing, and commissioning of CCMS feeder panels at designated switching points along National Highways, service roads, and slip roads.
- c) Operation of the CCMS for automated and remote ON/OFF control of street lighting based on astronomical (sunrise/sunset) timings and central control commands.
- d) Preventive and breakdown maintenance of CCMS hardware, communication systems, and web-based central monitoring software for the entire contract period.
- e) Supply, replacement, and upkeep of all consumables and accessories including SIM cards/data connectivity, batteries, relays, protection devices, and other replaceable components required for uninterrupted CCMS operation.
- f) Training of operators and NHAI/Authority personnel for operation, monitoring, report generation, and basic troubleshooting of the CCMS.
- g) Continuous monitoring, logging, and reporting of electrical parameters, energy consumption, system performance, faults, and alerts in compliance with applicable energy efficiency and safety standards.
- h) Deployment and integration of the CCMS on National Highways including GIS-based mapping and centralized supervision.
- i) The SOP vide MORTH OM dt. 25.05.2026 to be treated as part of scope/specification is enclosed.

TECHNICAL SPECIFICATION

S. No.	Features	Description
1	Operational Features	The CCMS unit shall be capable of switching ON and OFF the street lights of an individual switching point and/or networked switching points from the Central Control Station, either instantaneously or automatically throughout the year based on sunrise and sunset timings, depending on the geographical location of the switching point. Supply Voltage : 415 (Three Phase) Battery Backup : At least 2 hour Supply Frequency : 50/60 Hz Operating temperature : Between 0 to $\geq 55^{\circ}$ C Relay Contact Rating : $\geq 10A$ 250VAC Device Timing : RTC with battery backup Metering : Inbuilt, $\leq$ Class 1 Accuracy LED Indication : Device Status, Network Connectivity, Software Connection & Modem Power The CCMS Inbuild gateway 4G with minimum of 1 GB RAM, Communication options: 4G with 2G fall back, 2.4 Ghz and 5.0 Ghz IEEE 802.11ac wireless LAN, Gigabit Ethernet, Bluetooth 5.0, BLE, Processor- Single board computer with Quad core cortex ARM processor and Port to be provided for Micro HDMI, MIPI CSI Camera Port, Two USB 3.0 ports, Micro SD Card, In-built GPS, Etc. The CCMS unit shall be a GPRS and/or GSM-based (with unique IMEI number) proven

	technology remote street lighting monitoring system with in-built protection against short circuit, over-voltage, surge, and anti-theft/tamper alerts. The CCMS unit shall be provided with a battery backup of minimum 12 hours. The CCMS shall have optically isolated communication ports for secure data transfer and protection against unauthorized access. The rating of the CCMS unit shall be minimum twice the connected lighting load. The CCMS unit shall be provided with auto-reset / plunger switch facility to restore the incomer/outgoing MCB automatically in auto mode. The CCMS unit shall have an independent hardware timer to ensure operation of street lights in case of network failure or any technical glitch. The CCMS shall have inbuilt three phase energy meter, Communication gateway, SMPS, Timer, Three phase Latching Relays, Changeover, MCB, Connectors, Gland, Changeover Switch. The CCMS Panel shall use all electrical components of reputed manufacturers such as L&T, ABB, Schneider, or equivalent. Engineer in charge may ask the Agency to change component of a particular make if he has reason to believe that the make used is of substandard quality. Auto-Manual switch: to be provided to manually switch On/Off the Lights for any malfunction or breakdown in the Smart High Mast Control & Monitoring Panel. It should also be able to operate the Auto-Manual switch On/Off for any on-site work on the output streetlight load network. The terminal connectors shall be able to handle current of double the capacity of maximum load current. The output cables shall be connected to the terminals using industrial grade lugs of maximum current carrying capacity of the cables. The CCMS Panel shall have a Smart Timer Unit (STU) with minimum specifications as given above. The 4G modem shall be a part of this STU and shall house a SIM card holder with inbuilt Energy Meter Circuit. The Bidder shall purchase SIM cards of the suitable company which has the best signal strength in project area. The Bidder shall pay for the rental and all other charges related to the SIM cards and server space during the period of 5 years. The Bidder shall purchase the Server space on the web, maintain and pay for the same during the period of 5 years. The CCMS Panel shall have three modes of operation : - Auto mode, where all operations are running as per the programmed software - Digital Timer mode, where the Smart High Mast Control & Monitoring Panel operations are done through Digital Timer - Manual mode, where the CCMS Panel is totally bypassed and operates in manual on / off mode. It shall be possible to set the timings of this Digital Timer manually.
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	Mechanical / Enclosure	The CCMS Panel shall be installed open to sky in outdoor conditions by the side of the road / footpath / junction. The Enclosure of Control panel shall be made of CRCA 1.2mm thickness, powder coated with impact resistance of IK10 & ingress protection IP 65. The powder coating shall be done with proper cleaning & process of base material to ensure rust free material throughout the life of the enclosure. The arrangement of all the items in panel shall be suitable for easy access for repairs and maintenance. The enclosure shall have locking system which cannot be easily opened by common tools. The suitable strong mounting arrangement shall be provided along with the Panel. The smart control box must be fixed on a PCC foundation as required. The enclosure shall have a permanently fixed electrical wiring diagram inside. The internal wiring shall be done as per proper industrial electrical code with terminals, connectors, casing, numbering ferrules, etc. The other details on the name plate shall be : i) Panel Nominal rating: ii) Voltage rating: iii) Maximum Current rating per phase: The Panel shall have a proper earthing terminal. All the mounting channels inside should be finished with rust proof electroplating.
2	Energy Measurement & Communication Features	Each CCMS feeder panel shall be provided with a 3-Phase, 4-Wire Energy Meter, ISI marked, LT AC, static, DLMS compliant (Category C1), with CT ratio 100/5A or 200/5A, having Accuracy Class 1 for both active and reactive energy, with Optical Port and RS-232/RS-485 communication port, along with compatible software, to be installed inside the CCMS panel. The CCMS control panel shall include, but not be limited to, MCB, MCCB, contactors, relays, controller, SPD, and associated accessories. The CCMS unit shall be capable of recording and providing the following parameters at programmable time intervals, switching-point wise and/or networked switching points: - Phase-wise Voltage - Phase-wise Current - Power Factor - Active Power (kW) - Apparent Power (kVA) - Cumulative Energy (kWh) - Cumulative Energy (kVAh) Recording of number of glowing hours of LED luminaires connected with each switch controller. Recording of power supply interruption duration. Provision of special emergency ON/OFF operation through wireless control. Benchmarking and threshold setting capability for generation of SMS alerts for: - Phase-wise over/under current - Phase-wise over/under voltage - MCB trip - Theft / tamper alert - Group failure of lights - No output supply. Alert SMS shall be forwarded to minimum five (05) mobile numbers. Provision for future integration of smart solutions such as environmental sensors, Wi-Fi hotspots, etc. Class 0.5S accuracy energy meter, with type test report from NABL accredited laboratory, shall be provided. The energy meter shall be calibrated annually.

		In case of an inbuilt energy meter, it shall be DLMS compliant, and shall have Class 1 accuracy for active energy (kWh) measurement. The integrated system shall measure, record and communicate all required electrical parameters including kWh, Voltage, Current, kW, kVA, kVAR, Power Factor and Frequency, and shall meet all data logging, reporting and functional requirements specified in the tender without any relaxation of performance criteria. The CCMS should be able to communicate of faulty lights separately if individual light monitoring device is installed over any lamps in future.
3	Web-Based Central Control & Monitoring System	a) CCMS shall have a web-based central server to receive, store, and process data from all CCMS units with time stamping. b) The system shall allow individual and group-wise control and monitoring of switching points. c) The system shall record glowing and non-glowing hours of LED luminaires for each switching point. d) Display of power failure details feeder-wise and luminaire-wise. e) Registration and display of all fault conditions such as over-voltage, over-current, power failure, contactor failure, door open alarm, etc., with real-time alerts. f) Generation of daily automated reports including energy consumption, energy savings, lamp failure, actual operating hours, and system uptime (%). g) Role-based user access control with capability to handle large-scale deployments. h) GIS / Google Map based visualization of all CCMS switching points. i) Remote configuration of CCMS units including ON/OFF timings, automation response time, system reset, and status monitoring. j) Minimum data update interval of 15 minutes, programmable up to 1 minute. k) GPS-based time synchronization of controllers and central server. l) Secure data storage for minimum 24 months online and archived data for entire contract period. m) Cyber security provisions including jamming/hacking detection, self-healing mechanism, and fail-safe operation ensuring default ON/OFF operation during system failure.

Declaration

I/We hereby certify that the above-mentioned machines are **owned / validly leased**, are in sound working condition, and fully comply with the technical specifications and eligibility requirements of the RFP.

Signature of the Applicant

(Seal of Bidder)

Date:

Place:

Annexure- C

ON NON-JUDICIAL PAPER of RS.100/-

To,
Regional Officer - Uttarakhand,
National Highways Authority of India
58/37, Balbeer Road, Dehradun,
Uttarakhand - 248001
Email :-routtarakhand@nhai.org

Name of Work:

I/We hereby submit a declaration that the bid submitted by the undersigned, on behalf of **[Name of the Bidder]**, shall **not be withdrawn or modified** during the period of validity of the bid, i.e. **not less than 120 (One Hundred Twenty) days** from the bid due date.

I/We, on behalf of **[Name of the Bidder]**, further accept that in case the bid is withdrawn or modified during the period of its validity, or if we fail to sign the Contract Agreement in case the work is awarded to us, or fail to submit the **Performance Security** within the time specified in the RFP, then **[Name of the Bidder]** shall be liable to be **suspended/debarred** from participation in the tendering process for works of **MoRTH / NHAI / NHIDCL and other Centrally Sponsored Schemes**, for a period of **one (01) year** from the bid due date of this work, as per applicable rules.

[Name of the bidder]

(Signature, Name and Designation of the Authorized Signatory)

Name of work: Supply, Installation, Testing, Commissioning, Operation & Maintenance of Centralized Control & Monitoring System (CCMS) for Street Lighting on National Highways under RO, Uttarakhand on Five (05) Year Contract Basis.

Time Period: - Five Years (60 Months)

Bill of Quantities (To be filed separately in Financial Bid only)

Sl. No.	Name of Item	Unit	Quantity	Quoted Rate (₹)
1	Supply, Installation, Testing & Commissioning of Centralized Control & Monitoring System (CCMS) conforming to the Technical Specifications of the RFP under Section-IV (Technical Bid), including but not limited to: - CCMS Feeder Panel (3-Phase) with enclosure, pole-mounted or ground/stand-mounted, and accessories etc. - CCMS Controller / RTU / Gateway with GPRS/GSM communication 3-Phase DLMS compliant Energy Meter - Protection devices (MCCB/MCB/ELCB/SPD, relays, contactors, etc.) - Antenna, wiring, earthing, and all hardware accessories - Web-based Central Control & Monitoring Software	Per CCMS		
Total				
	Note - Operation & Maintenance (O&M) of CCMS, including software support, server/cloud hosting, SIM/data connectivity, batteries, consumables, spares, preventive & breakdown maintenance, fault rectification, and reporting, complete in all respects, shall be payable at the rate of 12.5 % of the accepted CCMS supply and installation cost per feeder panel per year, applicable after completion of the first year, for the remaining period of the five-year contract.			

Name, Signature &
Seal of Bidder

BOQ

Preferable wattage consumption- 10-25kW for active power, LED light 180 Watts,63/25 kVA Transformers as per actual site condition, Ingress Protection- IP-65/66

Sl. No.	Name of Project	Total no. of street lights	Total no. of control panels
1	Haridwar-Nagina NH-74	83	1
		46	1
2	Nagina Kashipur section of NH-74	1441	32
3	Najibabad Bypass of NH119	616	8
4	Four laning of Rampur-Kathgodam section of NH-87 from km. 0.000 to km. 43.446 (Package-I) in the State of Uttar Pradesh under NHDP Phase-III on Hybrid Annuity Mode:-	741	35
5	Construction of Rudrapur Bypass section from Km. 0.000 to Km 20.640 in the state of Uttar Pradesh & Uttarakhand on Hybrid Annuity Mode:-	922	11
6	Four Laning of Rampur-Kathgodam section of NH-87 from km 43.446 to km 93.226 (Package-II) in the State of Uttarakhand under NHDP Phase-III on Hybrid Annuity Mode:-	1887	52
7	Four laning of Kashipur-Sitarganj section of NH-74 from km 175.000 to km 252.200 in the State of Uttarakhand and Uttar Pradesh under NHDP Phase-IV on DBFOT (Toll) Basis-	817	42
8	Two Laning with paved shoulder of Sitarganj - Tanakpur section of NH-125 from km.0.000 (Km.254.600 of NH-74) to Km.52.200 in the State of Uttarakhand under NHDP Phase-IV on EPC mode-	35	2
9	Upgradation and four laning of Poanta Saheb-Ballupur section of NH-72 in the state of Himachal Pradesh and Uttarakhand under NH(O) on hybrid annuity mode (HAM). Package-1: Ponta Saheb-Mednipur from design chainage 0.000 to chainage 18.700.	188	8
10	Up - gradation & Four Laning of Poanta Saheb- Ballupur Section of NH-72 in the State of Uttarakhand Under NH(O) on Hybrid Annuity Mode. Package-II: Medinipur to Ballupur (Dehradun) from Design Ch. 18.700 to 44.800.	449	19
11	Development of Six- lane access-controlled highway from design chainage 0+000 (Ganeshpur) to design Chainage 8+130 (near Mohand) of Ganeshpur - Dehradun section of NH-72A in the State of Uttar Pradesh under BharatmalaPariyojana (Package -1).	350	3

12	Development of six - lane access-controlled highway from design chainage 8+130 (near Mohand) to design chainage 16+380 Daat kali Tunnel of Ganeshpur - Dehradun section of NH-72A in the state of Uttar Pradesh & Uttarakhand under Bharatmalapariyojana on EPC Mode (Package-2)	450	4
13	Dudhadhari Elevated Flyover including approaches on Muzaffarnagar-Haridwar section from Km 206+220 to Km 208+870 of NH-58 on EPC Mode. Length: 2.65 km.	456	8
14	4 Laning of Gagalheri-Saharanpur-Yamunanagar(UP/Haryana Boarder) Section of NH-73 from Km. 33.000 (Design Ch. 35.400) To Km. 71.640 (Design Ch. 86.855) in State of Uttar Pradesh under NHDP- IV on Hybrid Annuity mode (Pkg-II)	365	26
15	4 Laning of Chutmalpur-Ganeshpur of NH-72A from Km. 0.000 (Km.22.825 of NH-73) to Km. 17.900 (Km. 16.000 of NH-72A) & Roorkee-Chutmalpur-Gagalheri of NH-73 from Km. 0+000 (Km. 33.000 of NH-73) to Km. 35.400 (Km. 71.640 of NH-73) in the state of Uttar Pradesh & Uttarakhand on Hybrid Annuity basis (Pkg-1)	1370	33
16	Development of 6-lane access-controlled Spur to Haridwar from Delhi-Saharanpur-Dehradun Economic Corridor in the state of Uttar Pradesh and Uttarakhand on Hybrid Annuity Mode under Bharatmala Pariyojana (0+00 to 50+700)	449	35
17	Six laning along with full access control provisions in stretches from Saharanpur bypass to Ganeshpur section of Delhi- Dehradun Economical Corridor in the Uttar Pradesh and Uttarakhand on EPC mode under Bharat Mala Pariyojna Phase -1(Package-2)	981	22
18	Upgradation and 4-laning of Haridwar Bypass Package-1 from Ch. 0.000 (Km. 188+100 of NH-58) to Ch. 15+100 (Km 5+100 of NH-74) in the state of Uttarakhand.	390	24
19	Strengthening under one time improvement Muzaffarnagar - Haridwar Section of NH-334 from Km 130.500 to Km 206.220 in the State of Uttar Pradesh & Uttarakhand on EPC Mode	4983	80
TOTAL		17019	446***

*** No. of CCMS Panels is tentative, which will be executed as per actual site requirement which depends on Power Consumption, No. of Transformer & No. of lights/attached Panel.

2.7 Force Majeure

2.7.1 Definition

(a)

For the purposes of this Contract, “**Force Majeure**” means an event which is beyond the reasonable control of a Party, and which makes a Party’s performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances, and includes, but is not limited to:

- war
- riots
- civil disorder
- earthquake
- fire
- explosion
- storm
- flood or other adverse weather conditions
- strikes, lockouts or other industrial action (*except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent*)
- confiscation or any other action by government agencies

(b)

Force Majeure shall not include:

- (i) any event which is caused by the negligence or intentional action of a Party or such Party’s sub-consultants, agents or employees; nor
- (ii) any event which a diligent Party could reasonably have been expected to:

(A) take into account at the time of the conclusion of this Contract, and

(B) avoid or overcome in the carrying out of its obligations hereunder.

(c)

Force Majeure shall not include insufficiency of funds or failure to make any payment required hereunder.

2.7.2 No Breach of Contract

The failure of a Party to fulfil any of its obligations hereunder shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such an event has taken all reasonable precautions, due care, and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

2.7.3 Measures to be Taken

(a)

A Party affected by an event of Force Majeure shall take all reasonable measures to remove such Party's inability to fulfil its obligations hereunder with a minimum of delay.

(b)

A Party affected by an event of Force Majeure shall notify the other Party of such event as soon as possible, and in any event not later than **fourteen (14) days** following the occurrence of such event, providing evidence of the nature and cause of such event, and shall similarly give notice of the restoration of normal conditions as soon as possible.

(c)

The Parties shall take all reasonable measures to minimize the consequences of any event of Force Majeure.

2.7.4 Extension of Time

Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

2.7.5 Payments

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Consultants shall be entitled to be reimbursed for additional costs reasonably and necessarily incurred by them during such period for the purposes of the Services and in reactivating the Services after the end of such period.

2.7.6 Consultation

Not later than **thirty (30) days** after the Consultants, as the result of an event of Force Majeure, have become unable to perform a material portion of the Services, the Parties shall consult with each other with a view to agreeing on appropriate measures to be taken in the circumstances.

ARBITRATION

1 Dispute Resolution

1.1 In the event of any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the "Dispute") shall, in the first instance, be attempted to be resolved amicably.

1.2 The Parties agree to use their best efforts for resolving all Disputes arising under or in respect of this Agreement promptly, equitably and in good faith, and further agree to provide each other with reasonable access during normal business hours to all non-privileged records, information and data pertaining to any Dispute.

2 Escalation of Dispute:

In the event of any Dispute(s) between the Parties remains unresolved within 30 (thirty) days of the notice in writing referred to in Clause 25.1.1 or such longer period as may be mutually agreed by the Parties, either Party may refer the Dispute to Arbitration or Conciliation in accordance with the provisions of Clause 25.3

3 Arbitration, Conciliation and Adjudication of Dispute

3.1 Any Dispute between the Parties the sum of which is of value less than Rupees 10 Crores which remains unresolved between the Parties through the mechanisms available/ prescribed in the Agreement, which has not been agreed upon/ reached settlement by the Parties, will be referred either to SAROD, (a Society registered under Society's Act, 1860 vide Registration no. S/RS/SW1049/2013) duly represented by Government/ Authority and National Highways Builders Federation (NHBF) or to India International Arbitration Centre ("IIAC").

3.1.1 The appointment of Tribunal, Code of conduct for Arbitrators and fees and expenses of SAROD/IIAC and the Arbitral Tribunal shall also be governed by the Rules of SAROD as amended from time to time or the India International Arbitration Centre Act 2019 and the regulations framed thereunder as amended from time to time. The rules of SAROD are placed at Annex-I.

3.1.2 Subject to the provisions of The Limitation Act, 1963, as amended from time to time, Arbitration may be commenced during or after the Contract Period, provided that the obligations of Authority and the Contractor shall not be altered by reason of the Arbitration being conducted during the Contract Period.

3.1.3 The venue of Arbitration shall be New Delhi, or a place selected by governing body of SAROD or IIAC, as the case may be, and the language for all documents and communications between the Parties shall be English.

3.1.4 Each Party shall bear its own costs and expenses incurred in connection with the arbitral proceedings.

3.1.5 The arbitrators. shall make a reasoned award (the "Award"). Any Award made in any arbitration held pursuant to this Article / shall be final and binding on the Parties as from the date it is made, and the Contractor and the Authority agree and undertake to carry out such Award without delay.

3.1.6 The Contractor and the Authority agree that the Award may be enforced against the Contractor and/or the Authority, as the case may be, and their respective assets wherever situated.

3.2 Any Dispute between the Parties, the sum of which is of value Rupees 10 Crores or above, which remains unresolved between the Parties through the mechanisms available or prescribed in the Agreement, which has not been agreed upon/ reached settlement by the Parties, will be resolved by Conciliation as per the Arbitration and Conciliation Act, 1996.

3.3 The Contractor and the Authority agree that the Award or a settlement agreement may be enforced against the Contractor and/or the Authority, as the case may be, and their respective assets wherever situated.

3.4 This Agreement and the rights and obligations of the Parties shall remain in full force and effect, pending the Award in any Arbitration hereunder. Further the Parties unconditionally acknowledge and agree that notwithstanding any Dispute between them, each Party shall proceed with the performance of its respective obligations, pending resolution of Dispute in accordance with this Article.

3.5 This provision relating to Conciliation under the Arbitration and Conciliation Act, 1996 shall cease to apply once the provisions relating to substitution of conciliation process by mediation are notified under Mediation Act, 2023, Thereafter "Conciliation" herein be referred to as Mediation as per the provisions of the Mediation Act 2023.

3.6 Notwithstanding anything to the contrary contained in the Agreement, it is agreed that any Dispute between the Parties the sum of which is of value equal to or above Rupees 10 Crores shall not be referred to Arbitration. It is further agreed that all declaratory disputes or non-monetary disputes shall not be referred to Arbitration. For the avoidance of doubt, it is clarified that nothing herein shall prevent the Parties from seeking resolution of such Disputes through civil courts.

LIABILITY AND INDEMNITY

36.1 General indemnity

36.1.1

The Contractor shall indemnify, defend, save and hold harmless the Authority and its officers, servants, agents, Government Instrumentalities and Government owned and/or controlled entities/enterprises, (the “**Authority Indemnified Persons**”) against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by the Contractor of any of its obligations under this Agreement or any related agreement or on account of any defect or deficiency in the provision of services by the Contractor to the Authority or to any User, or from any negligence of the Contractor under contract or tort or on any other ground whatsoever, **except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of this Agreement on the part of the Authority Indemnified Persons.**

36.1.2

The Authority shall indemnify, defend, save and hold harmless the Contractor against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature arising out of (a) defect in title and/or the rights of the Authority in the land comprised in the Site, and/or (b) breach by the Authority of any of its obligations under this Agreement or any related agreement, which materially and adversely affect the performance by the Contractor of its obligations under this Agreement, save and except that where any such claim, suit, proceeding, action, and/or demand has arisen due to a negligent act or omission, or breach of any of its obligations under any provision of this Agreement or any related agreement, and/or breach of its statutory duty on the part of the Contractor, its subsidiaries, affiliates, contractors, servants or agents, the same shall be the liability of the Contractor.

36.2 Indemnity by the Contractor

36.2.1

Without limiting the generality of Clause 36.1, the Contractor shall fully indemnify, hold harmless and defend the Authority and the Authority Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:

- (a) Failure of the Contractor to comply with Applicable Laws and Applicable Permits;
- (b) Payment of taxes required to be made by the Contractor in respect of the income or other taxes of the Contractor's contractors, suppliers and representatives; or
- (c) Non-payment of amounts due as a result of materials or services furnished to the Contractor or any of its contractors which are payable by the Contractor or any of its contractors.

36.2.2

Without limiting the generality of the provisions of this clause, the Contractor shall fully indemnify, hold harmless and defend the Authority Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which the Authority Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by the Contractor or by the Contractor's Contractors in performing the Contractor's obligations or in any way incorporated in or related to the Project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, the Contractor shall make every

reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the Contractor shall promptly make every reasonable effort to secure for the Authority a license, at no cost to the Authority, authorizing continued use of the infringing work. If the Contractor is unable to secure such license within a reasonable time, the Contractor shall, at its own expense, and without impairing the Specifications and Standards, either replace the affected work, or part or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

36.3 Notice and contest of claims

In the event that either Party receives a claim or demand from a third party in respect of which it is entitled to the benefit of an indemnity under this clause (the “**Indemnified Party**”), it shall notify the other Party (the “**Indemnifying Party**”) within 15 (fifteen) days of receipt of the claim or demand and shall not settle or pay the claim without the prior approval of the Indemnifying Party, which approval shall not be unreasonably withheld or delayed. In the event that the Indemnifying Party wishes to contest or dispute the claim or demand, it may conduct the proceedings in the name of the Indemnified Party, subject to the Indemnified Party being secured against any costs involved, to its reasonable satisfaction.

36.4 Defence of claims

36.4.1

The Indemnified Party shall have the right, but not the obligation, to contest, defend and litigate any claim, action, suit or proceeding by any third party alleged or asserted against such Party in respect of, resulting from, related to or arising out of any matter for which it is entitled to be indemnified hereunder, and reasonable costs and expenses thereof shall be indemnified by the Indemnifying Party. If the Indemnifying Party acknowledges in writing its obligation to indemnify the Indemnified Party in respect of loss to the full extent provided by this clause, the Indemnifying Party shall be entitled, at its option, to assume and control the defence of such claim, action, suit or proceeding, liabilities, payments and obligations at its expense and through the counsel of its choice; provided it gives prompt notice of its intention to do so to the Indemnified Party and reimburses the Indemnified Party for the reasonable cost and expenses incurred by the Indemnified Party prior to the assumption by the Indemnifying Party of such defence.

The Indemnified Party shall not be entitled to settle or compromise any claim, demand, action, suit or proceeding without the prior written consent of the Indemnifying Party, unless the Indemnifying Party provides such security to the Indemnified Party as shall be reasonably required by the Indemnified Party to secure the loss to be indemnified hereunder to the extent so compromised or settled.

36.4.2

If the Indemnifying Party has exercised its rights under Clause 36.3, the Indemnified Party shall not be entitled to settle or compromise any claim, action, suit or proceeding without the prior written consent of the Indemnifying Party (which consent shall not be unreasonably withheld or delayed).

36.4.3

If the Indemnifying Party exercises its rights under Clause 36.3, the Indemnified Party shall nevertheless have the right to employ its own counsel, and such counsel may participate in such action, but the fees and expenses of such counsel shall be at the expense of the Indemnified Party, when and as incurred, unless:

(a) The employment of counsel by such party has been authorized in writing by the Indemnifying Party;

(b) The Indemnified Party shall have reasonably concluded that there may be a conflict of interest between the Indemnifying Party and the Indemnified Party in the conduct of the defence of such action;

(c) The Indemnifying Party shall not, in fact, have employed independent counsel reasonably satisfactory to the Indemnified Party, to assume the defence of such action and shall have been so notified by the Indemnified Party; or

(d) The Indemnified Party shall have reasonably concluded and specifically notified the Indemnifying Party either:

(i) that there may be specific defences available to it which are different from or additional to those available to the Indemnifying Party; or

(ii) that such claim, action, suit or proceeding involves or could have a material adverse effect upon it beyond the scope of this Agreement;

Provided that if Sub-clauses (b), (c) or (d) of this Clause 36.4.3 shall be applicable, the counsel for the Indemnified Party shall have the right to direct the defence of such claim, demand, action, suit or proceeding on behalf of the Indemnified Party, and the reasonable fees and disbursements of such counsel shall constitute legal or other expenses hereunder.

36.5 No consequential claims

Notwithstanding anything to the contrary contained in this clause, the indemnities herein provided shall not include any claim or recovery in respect of any cost, expense, loss or damage of an indirect, incidental or consequential nature, including loss of profit, except as expressly provided in this Agreement.

36.6 Survival on Termination

The provisions of this clause shall survive Termination.

FORM OF BANK GUARANTEE FOR BID SECURITY

B.G. No.

Dated:

1. In consideration of you, National Highways Authority of India, having its office at G-5 & 6, Sector-10, Dwarka, New Delhi-110075 (hereinafter referred to as the "Authority", which expression shall unless it be repugnant to the subject or context thereof include its, successors and assigns) having agreed to receive the BID of..... and having its registered office at (hereinafter referred to as the "Bidder" which expression shall unless it be repugnant to the subject or context thereof include its/their executors, administrators, successors and assigns), for the <Name of the Project> (hereinafter referred to as "the Project") pursuant to the Bidding Document dated issued in respect of the Project and other related documents including without limitation the draft Contract Agreement (hereinafter collectively referred to as "Bidding Documents"), we (Name of the Bank) having our registered office atand one of its branches at (hereinafter referred to as the "Bank"), at the request of the Bidder, do hereby in terms of Clause 17.1 of Section I (ITB), irrevocably, unconditionally and without reservation guarantee the due and faithful fulfilment and compliance of the terms and conditions of the Bidding Documents (including the Bidding Document) by the said Bidder and unconditionally and irrevocably undertake to pay forthwith to the Authority an amount of Rs. **** (Rupees ***** only) (hereinafter referred to as the "Guarantee") as our primary obligation without any demur, reservation, recourse, contest or protest and without reference to the Bidder if the Bidder shall fail to fulfil or comply with all or any of the terms and conditions contained in the said Bidding Documents.
2. Any such written demand made by the Authority stating that the Bidder is in default of the due and faithful fulfilment and compliance with the terms and conditions contained in the Bidding Documents shall be final, conclusive and binding on the Bank.
3. We, the Bank, do hereby unconditionally undertake to pay the amounts due and payable under this Guarantee without any demur, reservation, recourse, contest or protest and without any reference to the Bidder or any other person and irrespective of whether the claim of the Authority is disputed by the Bidder or not, merely on the first demand from the Authority stating that the amount claimed is due to the Authority by reason of failure of the Bidder to fulfil and comply with the terms and conditions contained in the Bidding Documents including failure of the said Bidder to keep its BID open during the BID validity period as set forth in the said Bidding Documents for any reason whatsoever. Any such demand made on the Bank shall be conclusive as regards amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. **** Rupees ****only).
4. This Guarantee shall be irrevocable and remain in full force for a period of 180 (one hundred and eighty) days from the BID Due Date inclusive of a claim period of 60 (sixty) days or for such extended period as may be mutually agreed between the Authority and the Bidder, and agreed to by the Bank, and shall continue to be enforceable till all amounts under this Guarantee have been paid.

5. We, the Bank, further agree that the Authority shall be the sole judge to decide as to whether the Bidder is in default of due and faithful fulfilment and compliance with the terms and conditions contained in the Bidding Documents including, inter alia, the failure of the Bidder to keep its BID open during the BID validity period set forth in the said Bidding Documents, and the decision of the Authority that the Bidder is in default as aforesaid shall be final and binding on us, notwithstanding any differences between the Authority and the Bidder or any dispute pending before any Court, Tribunal, Arbitrator or any other Authority.
6. The Guarantee shall not be affected by any change in the constitution or winding up of the Bidder or the Bank or any absorption, merger or amalgamation of the Bidder or the Bank with any other person.
7. In order to give full effect to this Guarantee, the Authority shall be entitled to treat the Bank as the principal debtor. The Authority shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee from time to time to vary any of the terms and conditions contained in the said Bidding Documents or to extend time for submission of the BIDS or the BID validity period or the period for conveying acceptance of Letter of Award by the Bidder or the period for fulfilment and compliance with all or any of the terms and conditions contained in the said Bidding Documents by the said Bidder or to postpone for any time and from time to time any of the powers exercisable by it against the said Bidder and either to enforce or forbear from enforcing any of the terms and conditions contained in the said Bidding Documents or the securities available to the Authority, and the Bank shall not be released from its liability under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the said Bidder or any other forbearance, act or omission on the part of the Authority or any indulgence by the Authority to the said Bidder or by any change in the constitution of the Authority or its absorption, merger or amalgamation with any other person or any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of releasing the Bank from its such liability.
8. Any notice by way of request, demand or otherwise hereunder shall be sufficiently given or made if addressed to the Bank and sent by courier or by registered mail to the Bank at the address set forth herein.
9. We undertake to make the payment on receipt of your notice of claim on us addressed to [name of Bank along with branch address] and delivered at our above branch which shall be deemed to have been duly authorised to receive the said notice of claim.
10. It shall not be necessary for the Authority to proceed against the said Bidder before proceeding against the Bank and the guarantee herein contained shall be enforceable against the Bank, notwithstanding any other security which the Authority may have obtained from the said Bidder or any other person and which shall, at the time when proceedings are taken against the Bank hereunder, be outstanding or unrealised.
11. We, the Bank, further undertake not to revoke this Guarantee during its currency except with the previous express consent of the Authority in writing.

12. The Bank declares that it has power to issue this Guarantee and discharge the obligations contemplated herein, the undersigned is duly authorised and has full power to execute this Guarantee for and on behalf of the Bank.
13. For the avoidance of doubt, the Bank's liability under this Guarantee shall be restricted to Rs. ***** (Rupees *****only). The Bank shall be liable to pay the said amount or any part thereof only if the Authority serves a written claim on the Bank in accordance with paragraph 9 hereof, on or before [*** (indicate date falling 180 days after the BID Due Date)].
14. This guarantee shall also be operatable at our..... Branch at Uttarakhand, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
15. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHAI, details of which is as under:

S. No.	Particulars	Details
1.	Name of Beneficiary	National Highways Authority of India
2.	Name of Bank	IndusInd Bank
3.	Account No.	201018242666
4.	IFSC Code	INDB0001446

Signed and Delivered by Bank

By the hand of Mr./Ms its and authorised official.

(Signature of the Authorised Signatory)

(Official-Seal)

NH-11014/52/2026-HA(CN.265454)
Government of India
Ministry of Road Transport & Highways
(Highway Administration Cell)
Transport Bhawan, 1, Parliament Street, New Delhi - 110001

Date: 25th May 2026

OFFICE MEMORANDUM

Subject: Standard Operating Procedure (SoP) for the Centralized Web-Based Street Light Monitoring System(CCMS) on National Highways reg.

The undersigned is directed to refer to this Ministry's Office Memorandum No. NH-11014/52/2026-HA dated 06.03.2026 and National Highways Authority of India letter No. NHAI/Misc/Access Permission/2026/13 dated 23.02.2026 regarding installation of Smart Street Lighting Systems on National Highways.

2. In continuation of the above, an Standard Operating Procedure (SoP) has been prepared for the Centralized Web-Based Street Light Monitoring System & Portal (CCMS) and the same has been approved by the competent authority for circulation to all implementing agencies of the Ministry, viz., State PWDs, NHAI and NHIDCL.
3. Accordingly, all Regional Officers of the Ministry, Executive Directors of NHIDCL, and Regional Officers of NHAI are directed to ensure implementation of, and compliance with, the enclosed SoP in their respective jurisdictions for all **existing, under-implementation as well as new National Highway works**.
4. This issues with the approval of the Competent Authority.

Enclosure: SoP as above.

Ganesh B. Shelar
Executive Engineer (NFSG)

To,

1. All Regional Officers , MoRTH
2. All Executive Directors, NHIDCL
3. All Regional Officers / Project Directors, NHAI

Copy to:

1. The Director General (RD) & SS, MoRTH
2. The Chairman, NHAI, New Delhi - 110 075
3. The Managing Director, NHIDCL, New Delhi - 110 029
4. All ADGs/CEs in the Ministry of Road Transport & Highways
5. The Secretary General, Indian Roads Congress
6. NIC - for uploading on Ministry's website under "Comprehensive Compendium Circular"
7. Technical circular file of S&R (P&B) Section

Copy to: For Kind Information:

1. PSO to Secretary (RT&H)
2. Sr. PPS/PPS to AS&FA / Addl. Secretary (Road Safety)
3. Sr. PPS/PPS to JS(Highway) / PPS to CE(S&R) / PS to SE(Highway)

Government of India
Ministry of Road Transport & Highways

STANDARD OPERATING PROCEDURE (SOP)
Centralized Web-Based Street Light Monitoring Portal (CCMS)

Applicable to: Highway Stretches under MoRTH / NHAI/ NHIDCL

Escalation Matrix:

Level-I Service Provider (Agency)
Email: infoaselectricals@gmail.com
(M) 9650091122 & 7042014182 (Parveen Sharma)

Level -II ITFMS, NHAI HQ
Email- itteamleader@nhai.org
Ext. 1212 & 1028 (M) 9953008277, 9871917200

Level-III- GM IT, NHAI HQ
Email:- pramod@nhai.org
Ext. 1270 & 1500 (PA), (M)9810874066

Document Version: 1.0
Date: May -2026

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6. Flow Chart
7. Detailed Specification of CCMS
8. Detailed information of API specification
9. Public/User dashboard
10. User Login process
11. Minister/Admin Level Login– Agency-wide dashboard
12. RO Level – PIU & Project monitoring
13. PIU Level – Project-level dashboard
14. Project Level – Device-level monitoring
15. Responsibilities of Stakeholders (RO/PIU)
16. Responsibilities of Stakeholders Implementing Agency
17. Responsibilities of Stakeholders CCMS Admin
18. Escalation Matrix

1. INTRODUCTION

This Standard Operating Procedure (SOP) defines the operational framework for implementation, integration, monitoring, and maintenance of the Centralized Web-Based Street Light Monitoring Portal (CCMS) for highway stretches under MoRTH, NHA and NHIDCL.

2. BACKGROUND OF THE WORK

In compliance with the directions issued during the Senior Officers' Meetings (SOM) held at MoRTH, a unified and centralized portal for monitoring street lighting systems across National Highways has been developed. The Centralized Cloud-Based/Web-Based Street Light Monitoring Portal (CCMS) has been successfully implemented with approval of the Competent Authority. The system enables real-time monitoring, control, and analytics of feeder pillars installed across MoRTH, NHA and NHIDCL highway stretches.

Two pilot implementations have been successfully completed:

- NHA RO – UP East (Varanasi)
- MoRTH RO – Hyderabad

3. OBJECTIVES

- Ensure real-time monitoring of street light performance
- Monitor energy consumption and electrical parameters
- Enable automatic ON/OFF scheduling
- Improve operational efficiency
- Reduce downtime through early fault detection
- Provide centralized dashboard visibility
- Enable structured reporting and analytics

4. PURPOSE OF CCMS PORTAL

The Centralized Web-Based Street Light Monitoring Portal (CCMS) is established to provide a unified and technology-driven platform for real-time monitoring, control, and management of street lighting systems across all project locations. The portal enables centralized visibility of operational status, energy consumption, fault alerts, and performance parameters through secure data transmission and API integration. It supports data analytics, reporting, SLA monitoring, and energy savings verification, thereby enhancing operational efficiency, transparency, accountability, and informed decision-making among all stakeholders. i.e.

- Centralized Monitoring
- Real-Time Data Visibility
- Improved Operational Efficiency
- Energy Monitoring and Savings Verification
- Transparency and Accountability
- Data Analytics and Reporting
- Integration Capability

5. SCOPE OF WORK

This SOP applies to:

5.1 Software & Platform

- Cloud-hosted/web-based CCMS portal.
- Role-based secure login for MoRTH, NHAI, NHIDCL, RO, and PIU users.
- Centralized dashboards and reporting modules.
- 1-minute interval data logging.

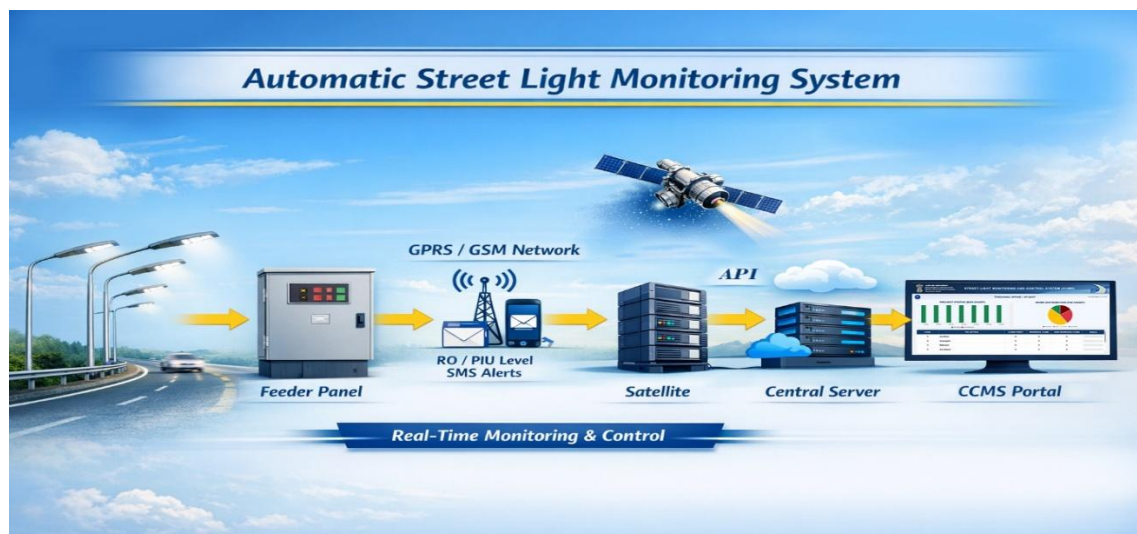
5.2 Integration & Connectivity

- Integration with FIU (Feeder Intelligence Unit) and Power Monitor (PM).
- RS-485 communication between FIU and PM.
- GPRS/GSM-based communication for live reporting.
- API-based integration with Central Control Station at CCMS.

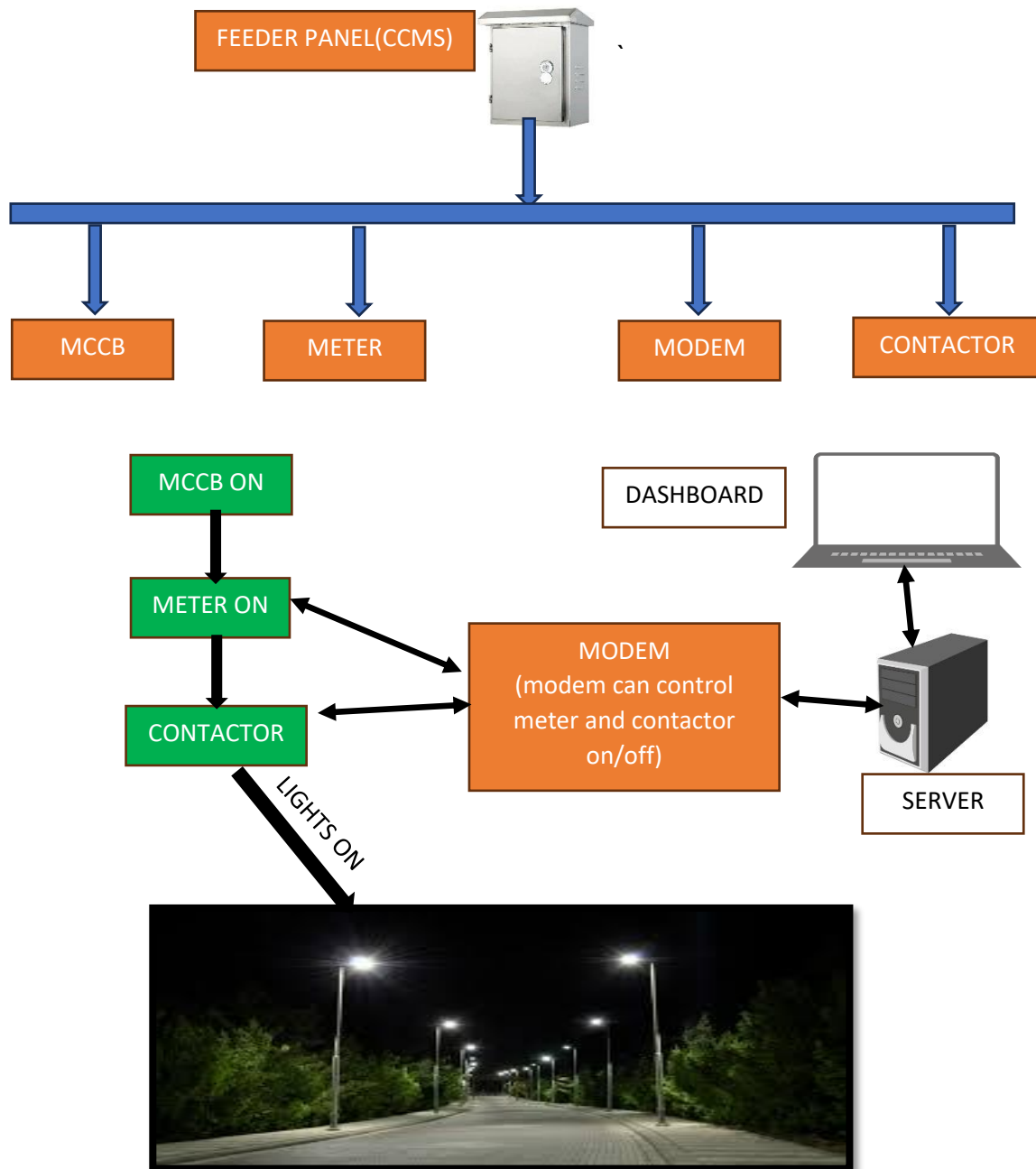
5.3 Functional Capabilities

- Live monitoring of working/non-working status.
- Monitoring of voltage, current, power factor, load parameters.
- Monitoring of energy consumption (kWh).
- Automatic ON/OFF scheduling.
- Fault detection and alert generation.
- Performance analytics and burn-hour tracking.

5.4 SYSTEM ARCHITECTURE OVERVIEW



6. FLOW CHART OF STREET LIGHT MONITORING AND CONTROL SYSTEM



- As soon as the MCCB was switched on, power came into the METER, the CONTACTOR switched on and as soon as the CONTACTOR switched on, it sent power to the light pole and the lights started glowing. (For More details refer page 5, point 7)
- The modem will be connected to both the meter and the contractor.
- As soon as the lights are switched on, the meter will start calculating the load and the modem will collect the data from the meter.

- The SIM is installed in the modem, as soon as the data is collected, it will keep sending it to the server through the net and data can be seen on the dashboard.

7. Details of devices that may be integrated/used in CCMS (Optional)

7.1 MCCB: Use Molded Case Circuit Breaker (MCCB) device designed for high-current applications to protect against overloads and short circuits.

7.2 Smart Energy Meter

- DIN rail mounting for easy installation
- High accuracy with Class 1.0/0.5 precision
- Self-powered operation in three-phase systems, eliminating the need for auxiliary power.
- Integrated Functionality

7.3 Functionalities:

- Built-in disconnection circuit with configurable protections.
- Guards against voltage variations, single phasing, phase reversal and current issues like current unbalances.
- Enables load control via communication for optimized use apart from set threshold.
- Offers dynamic communication interfaces: RS485 Modbus RTU or Wi-Fi, MQTT.
- User-selectable reset and retain modes for safe or alarming connections.
- Avoids equipment damage with overload protection.
- Programmable levels display load efficiency and status.
- Monitors individual phase energy consumption for maintenance indication.
- Dynamic communication with configurable addresses.
- Alphanumeric LCD display with LED indicators.
- Displays disconnection reasons and trip details.
- Monitor V, A, F, W, VA, PF, Wh, VAh, Load Hrs. and ON Hrs.
- Offers high Accuracy Class 0.5/1.0.
- Provides real-time information on basic, energy and power parameters. Offers energy tracking via LED pulses as well.
- Supports remote monitoring and control for an easy on-the-go load management.
- 5 slots of scheduling possible, avoid time switch.

7.4 Technical Specifications (it's for suggestion and optional only):

Accuracy	Class 1.0 as per IEC 62053-21 (Class 0.5: IEC 62053-22 - Optional)
Update Rate	1sec
Power System Type	Star (3Phase 4 wire) or 4 wire
Sensing / Measurements	True RMS, 1 Sec update time. 4 Quadrant Power & Energy
Voltage Inputs	4 Voltage inputs (V1, V2, V3, VN)
Rated Input Voltage	100–550 VLL AC
Burden	0.2VA Max. per phase
Frequency	45-65Hz

External fuse rating	2 A
Rated Current	100mA-80A
Permissible overload	120% Max
External fuse rating	200mA
Auxiliary supply	Self-powered
Power Consumption	< 5VA Max
Protection Class	3
Display Type	LCD, 1 Row 7-segment display
Display Dimension	68.4mm x 18mm x 2.85mm
Display Resolution	4 Digits (instantaneous), 7 Digits (integrated parameters)
Device ID & Parity	1 to 247 & Odd, Even, None Parity (Preferred Even)
Protocol & Interface	Modbus RTU & RS485 Baud rate: 4800 bps to 38.4kbps (Preferred 9600) Isolation: 2000 volts AC isolation for 1 minute between

7.5 Contactor:

- An electrical contactor is an [electromechanical switch](#) for controlling motors, lighting, and heating systems etc.
- 12 Volt DC operated Contactor.
- It uses a low-voltage electromagnetic coil to energize and close heavy-duty contacts, allowing for remote, safe operation.
- They differ from relays by handling much higher current loads.

7.6 SMPS

- 3phase power supply with 12Volt DC.

7.7 Modem

- It is an electronic device which is use to data transfer and collect the data from meter

7.8 Features

I. Digital Input Feedback:

Digital inputs shall provide real-time status monitoring of critical field parameters, including:

- Auto/Manual Mode: Indicates whether the system is operating automatically (based on schedule/logic) or manually controlled.
- Output MCCB ON/OFF: Displays the status of the Main Circuit Breaker supplying power to the lighting circuit.
- Trip Status: Indicates whether the MCCB or protective device has tripped due to overload, short circuit, or fault condition.
- Door Open/Close: Detects unauthorized or maintenance-related opening of the feeder panel door for security monitoring.
- Contactor ON/OFF: Confirms whether the contactor controlling the lighting circuit is energized or de-energized.

II. Digital Output:

Enables remote switching/control of street lighting circuits from the CCMS portal, allowing authorized users to turn lights ON/OFF or execute control commands centrally.

- III. In-Built Real Time Clock (RTC):
Ensures accurate time-based scheduling of street lights and maintains proper time stamping of events and logs, even during communication failure.
- IV. RS-485 Communication:
Provides reliable wired communication between energy meters, controllers, and other field devices using standard industrial communication protocol.
- V. 4G Network Support:
Enables wireless data transmission from field devices to the CCMS portal through a secure cellular network for real-time monitoring and control.
- VI. Control Meter for Communication:
Integrated energy meter measures electrical parameters such as voltage, current, power, and energy consumption and transmits data to the central portal.
- VII. Dimming Feature:
Allows adjustment of light intensity as per predefined schedule or remote command to optimize energy consumption and improve efficiency.
- VIII. Modem Operation through SMS (Optional):
Provides the capability to control or reset the modem through SMS-based commands in case of internet connectivity issues or emergency situations.

7.9 Data Format

API FLOW DIAGRAM

URL	https://scada.apstech.in/nhai/scadaapi.php

POST

In Headers:

Parameters	Values
User	scada
Password	nhai123
API_Key	0f086a6346192a3c67bbf45ac4cd7892

i) Postman: To validate your data

POST

▼

https://scada.apstech.in/nhai/scadaapi.php

Params

Authorization

Headers (11)

Body

Pre-request Script

Tests

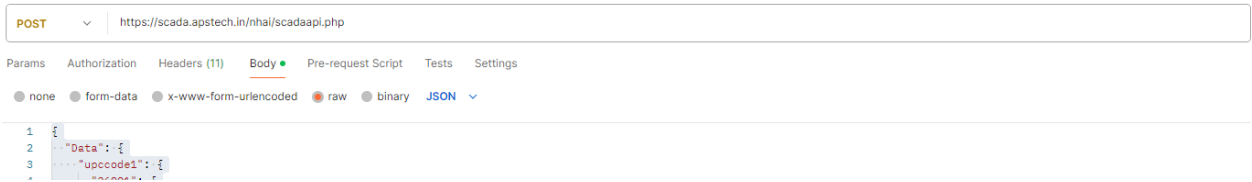
Settings

Headers

8 hidden

	Key	Value
☒	User	scada
☒	Password	nhai123
☒	API_Key	0f086a6346192a3c67bbf45ac4cd7892

ii) Paste Sample Data as below in JSON Format:



Note: "upccode1": having 4 deviceid 26001, 26002,26003,26004

Json Format	<pre> { "Data": { "upccode1": { "26001": { "DeviceId": "26001", "Watts_Total": "10", "Watts_R_Phase": "3", "Watts_Y_Phase": "3", "Watts_B_Phase": "4", "Var_Total": "0", "PF_Ave": "0.98", "Frequency": "50", "WH_Received": "1000", "DeviceTime": "3/5/2026 09:30:00 AM", "RLOUT": "111111", "DIGINPUT": "111111", "BATT": "1", "Location": "Test Location", "LightAmp": "5", "TotalLight": "20", "light_on": "0", "light_off": "0", "coordinates": "0", "schdeular_on": "0", "schdeular_off": "0", "ccmscapacity_kw": "0", "door_status": "0", "mccb_status": "0", "Var_R_Phase": "0", "Var_Y_Phase": "0", "Var_B_Phase": "0", "PF_R_Phase": "0", "PF_Y_Phase": "0", "PF_B_Phase": "0", "VA_Total": "0", "VA_R_Phase": "0", "VA_Y_Phase": "0", "VA_B_Phase": "0", "VLL_Average": "0", "VRY_Phase": "0", "VYB_Phase": "0", "VBR_Phase": "0", "VLN_Average": "0", "V_R_Phase": "0", } } } } </pre>
--------------------	--

	<pre> "V_Y_Phase": "0", "V_B_Phase": "0", "Current_Total": "0", "Current_R_Phase": "0", "Current_Y_Phase": "0", "Current_B_Phase": "0" }, "26002": { "DeviceId": "26002", "Watts_Total": "10", "Watts_R_Phase": "3", "Watts_Y_Phase": "3", "Watts_B_Phase": "4", "Var_Total": "0", "PF_Ave": "0.98", "Frequency": "50", "WH_Received": "1000", "DeviceTime": "3/5/2026 09:30:00 AM", "RLOUT": "111111", "DIGINPUT": "111111", "BATT": "1", "Location": "Test Location", "LightAmp": "5", "TotalLight": "20", "light_on": "0", "light_off": "0", "coordinates": "0", "schdeular_on": "0", "schdeular_off": "0", "ccmscapacity_kw": "0", "door_status": "0", "mccb_status": "0", "Var_Y_Phase": "0", "Var_B_Phase": "0", "PF_R_Phase": "0", "PF_Y_Phase": "0", "PF_B_Phase": "0", "VA_Total": "0", "VA_R_Phase": "0", "VA_Y_Phase": "0", "VA_B_Phase": "0", "VLL_Average": "0", "VRY_Phase": "0", "VYB_Phase": "0", "VBR_Phase": "0", "VLN_Average": "0", "V_R_Phase": "0", "V_Y_Phase": "0", "V_B_Phase": "0", "Current_Total": "0", "Current_R_Phase": "0", </pre>
--	--

	<pre> "Current_Y_Phase": "0", "Current_B_Phase": "0" } }, "upccode2": { "26003": { "DeviceId": "26003", "Watts_Total": "10", "Watts_R_Phase": "3", "Watts_Y_Phase": "3", "Watts_B_Phase": "4", "Var_Total": "0", "PF_Ave": "0.98", "Frequency": "50", "WH_Received": "1000", "DeviceTime": "3/5/2026 09:30:00 AM", "RLOUT": "111111", "DIGINPUT": "111111", "BATT": "1", "Location": "Test Location", "LightAmp": "5", "TotalLight": "20", "light_on": "0", "light_off": "0", "coordinates": "0", "schdeular_on": "0", "schdeular_off": "0", "ccmscapacity_kw": "0", "door_status": "0", "mcbb_status": "0" }, "26004": { "DeviceId": "26004", "Watts_Total": "10", "Watts_R_Phase": "3", "Watts_Y_Phase": "3", "Watts_B_Phase": "4", "Var_Total": "0", "PF_Ave": "0.98", "Frequency": "50", "WH_Received": "1000", "DeviceTime": "3/5/2026 09:30:00 AM", "RLOUT": "111111", "DIGINPUT": "111111", "BATT": "1", "Location": "Test Location", "LightAmp": "5", "TotalLight": "20", "light_on": "0", "light_off": "0", </pre>
--	--

```

"coordinates": "0",
"schdeular_on": "0",
"schdeular_off": "0",
"ccmscapacity_kw": "0",
"door_status": "0",
"mccb_status": "0"
}
}
}
}

```

Please note the **API response format in JSON** for validating errors by passing your data to the API. The API will check whether any required parameters are missing and return the status accordingly.

Error Validation Details: (Yellow colour “errors”: below)

- **Device ID 26001:** All parameters are present. No errors found.
- **Device ID 26002:** One parameter is missing – **"Var_R_Phase"**.
- **Device ID 26003:** Multiple parameters are missing.
- **Device ID 26004:** Multiple parameters are missing.

Note:

The **vendor will validate the request data** and return the appropriate error response if any required parameter is missing.

Kindly review and ensure that all required parameters are included before sending data to the API.

```

{
  "status": "success",
  "saved_devices": 1,
  "response": {
    "upccode1": {
      "26001": {
        "DeviceId": "26001",
        "Watts_Total": "10",
        "Watts_R_Phase": "3",
        "Watts_Y_Phase": "3",
        "Watts_B_Phase": "4",
        "Var_Total": "0",
        "PF_Ave": "0.98",
        "Frequency": "50",
        "WH_Received": "1000",
        "DeviceTime": "3/5/2026 09:30:00 AM",
        "RLOUT": "111111",
        "DIGINPUT": "111111",
        "BATT": "1",
        "Location": "Test Location",
        "LightAmp": "5",
        "TotalLight": "20",
        "light_on": "0",

```

	<pre> "light_off": "0", "coordinates": "0", "schdeular_on": "0", "schdeular_off": "0", "ccmscapacity_kw": "0", "door_status": "0", "mccb_status": "0", "Var_R_Phase": "0", "Var_Y_Phase": "0", "Var_B_Phase": "0", "PF_R_Phase": "0", "PF_Y_Phase": "0", "PF_B_Phase": "0", "VA_Total": "0", "VA_R_Phase": "0", "VA_Y_Phase": "0", "VA_B_Phase": "0", "VLL_Average": "0", "VRV_Phase": "0", "VVB_Phase": "0", "VBR_Phase": "0", "VLN_Average": "0", "V_R_Phase": "0", "V_Y_Phase": "0", "V_B_Phase": "0", "Current_Total": "0", "Current_R_Phase": "0", "Current_Y_Phase": "0", "Current_B_Phase": "0" }, "26002": { "DeviceId": "26002", "Watts_Total": "10", "Watts_R_Phase": "3", "Watts_Y_Phase": "3", "Watts_B_Phase": "4", "Var_Total": "0", "PF_Ave": "0.98", "Frequency": "50", "WH_Received": "1000", "DeviceTime": "3/5/2026 09:30:00 AM", "RLOUT": "111111", "DIGINPUT": "111111", "BATT": "1", "Location": "Test Location", "LightAmp": "5", "TotalLight": "20", "light_on": "0", "light_off": "0", "coordinates": "0", "schdeular_on": "0", </pre>
--	---

```

"schdeular_off": "0",
"ccmscapacity_kw": "0",
"door_status": "0",
"mccb_status": "0",
"Var_Y_Phase": "0",
"Var_B_Phase": "0",
"PF_R_Phase": "0",
"PF_Y_Phase": "0",
"PF_B_Phase": "0",
"VA_Total": "0",
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"VA_B_Phase": "0",
"VLL_Average": "0",
"VRY_Phase": "0",
"VYB_Phase": "0",
"VBR_Phase": "0",
"VLN_Average": "0",
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"V_Y_Phase": "0",
"V_B_Phase": "0",
"Current_Total": "0",
"Current_R_Phase": "0",
"Current_Y_Phase": "0",
"Current_B_Phase": "0"
}
},
"upccode2": {
  "26003": {
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    "Watts_Total": "10",
    "Watts_R_Phase": "3",
    "Watts_Y_Phase": "3",
    "Watts_B_Phase": "4",
    "Var_Total": "0",
    "PF_Ave": "0.98",
    "Frequency": "50",
    "WH_Received": "1000",
    "DeviceTime": "3/5/2026 09:30:00 AM",
    "RLOUT": "111111",
    "DIGINPUT": "111111",
    "BATT": "1",
    "Location": "Test Location",
    "LightAmp": "5",
    "TotalLight": "20",
    "light_on": "0",
    "light_off": "0",
    "coordinates": "0",
    "schdeular_on": "0",
    "schdeular_off": "0",
    "ccmscapacity_kw": "0",

```

```

        "door_status": "0",
        "mccb_status": "0"
    },
    "26004": {
        "DeviceId": "26004",
        "Watts_Total": "10",
        "Watts_R_Phase": "3",
        "Watts_Y_Phase": "3",
        "Watts_B_Phase": "4",
        "Var_Total": "0",
        "PF_Ave": "0.98",
        "Frequency": "50",
        "WH_Received": "1000",
        "DeviceTime": "3/5/2026 09:30:00 AM",
        "RLOUT": "111111",
        "DIGINPUT": "111111",
        "BATT": "1",
        "Location": "Test Location",
        "LightAmp": "5",
        "TotalLight": "20",
        "light_on": "0",
        "light_off": "0",
        "coordinates": "0",
        "schdeular_on": "0",
        "schdeular_off": "0",
        "ccmscapacity_kw": "0",
        "door_status": "0",
        "mccb_status": "0"
    }
}
},
"errors": [
    {
        "device": 26002,
        "missing_fields": [
            "Var_R_Phase"
        ]
    },
    {
        "device": 26003,
        "missing_fields": [
            "Var_R_Phase",
            "Var_Y_Phase",
            "Var_B_Phase",
            "PF_R_Phase",
            "PF_Y_Phase",
            "PF_B_Phase",
            "VA_Total",
            "VA_R_Phase",
            "VA_Y_Phase",
            "VA_B_Phase",

```

	<pre> "VLL_Average", "VRY_Phase", "VYB_Phase", "VBR_Phase", "VLN_Average", "V_R_Phase", "V_Y_Phase", "V_B_Phase", "Current_Total", "Current_R_Phase", "Current_Y_Phase", "Current_B_Phase"] }, { "device": 26004, "missing_fields": ["Var_R_Phase", "Var_Y_Phase", "Var_B_Phase", "PF_R_Phase", "PF_Y_Phase", "PF_B_Phase", "VA_Total", "VA_R_Phase", "VA_Y_Phase", "VA_B_Phase", "VLL_Average", "VRY_Phase", "VYB_Phase", "VBR_Phase", "VLN_Average", "V_R_Phase", "V_Y_Phase", "V_B_Phase", "Current_Total", "Current_R_Phase", "Current_Y_Phase", "Current_B_Phase"] }] } </pre>
--	---

8. API SPECIFICATION

Log In API

8.1 Get MoRTH, NHA, NHIDCL Basic data API

Login

Authenticate the user with the system and obtain the auth_token

Request

Method	URL
GET	NHAI Live: https://datalakeg.nhai.gov.in/nhaiapi/api/MastersAPI/Get?username=guest&password=Guest@2020 MoRTH Live: https://datalakem.nhai.gov.in/morth_api/api/MastersAPI/Get?username=guest&password=Guest@2020 NHIDCL Live: https://datalakem.nhai.gov.in/nhidcl_api/api/MastersAPI/Get?username=guest&password=Guest@2020

TYPE	PARAMS	VALUES
GET	Username	string
GET	password	string

Response

Status	Response
200	{ "token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ1bmVxdWVfbmFtZSI6Imd1ZXN0IiwibmJmljoxNzU0NTQ2Njg2LCJleHAiOiJlE3NTQ1NDc4ODYsImVudCI6MTc1NDU0NjY4Nn0.CtdUHOutoq3zxx8e8_wwWxA3ddUqzVkieSOa5yrweXc" }
404	{"error": "Not Found username/ Password."}
401	{"error": "failure."}
500	{"error": "Something went wrong. Please try again later."}

8.2 Get MoRTH, NHAI, NHIDCL Basic data API

Get the new updates

Request

Method	URL
GET	NHAI Live: https://datalakeg.nhai.gov.in/nhaiapi/api/MastersAPI/NHAIBasicDetailsAPIKey

	MoRTH Live: https://datalakem.nhai.gov.in/morth_api/api/MastersAPI/MoRTHBasicDetailsAPIKey NHIDCL Live: https://datalakem.nhai.gov.in/nhidcl_api/api/MastersAPI/NHIDCLBasicDetailsAPIKey
--	---

TYPE	PARAMS	VALUES
HEADER	Authorization	string
HEADER	api-key	string
HEADER	api-key	string

Authorization:- In header for all entities (MoRTH, NHAI, NHIDCL) use the Authorization and value will be the token generated from login api
api-key :- 0f086a6346192a3c67bbf45ac4cd7892 (same for all entity)
api-org :- APT(same for all entity)

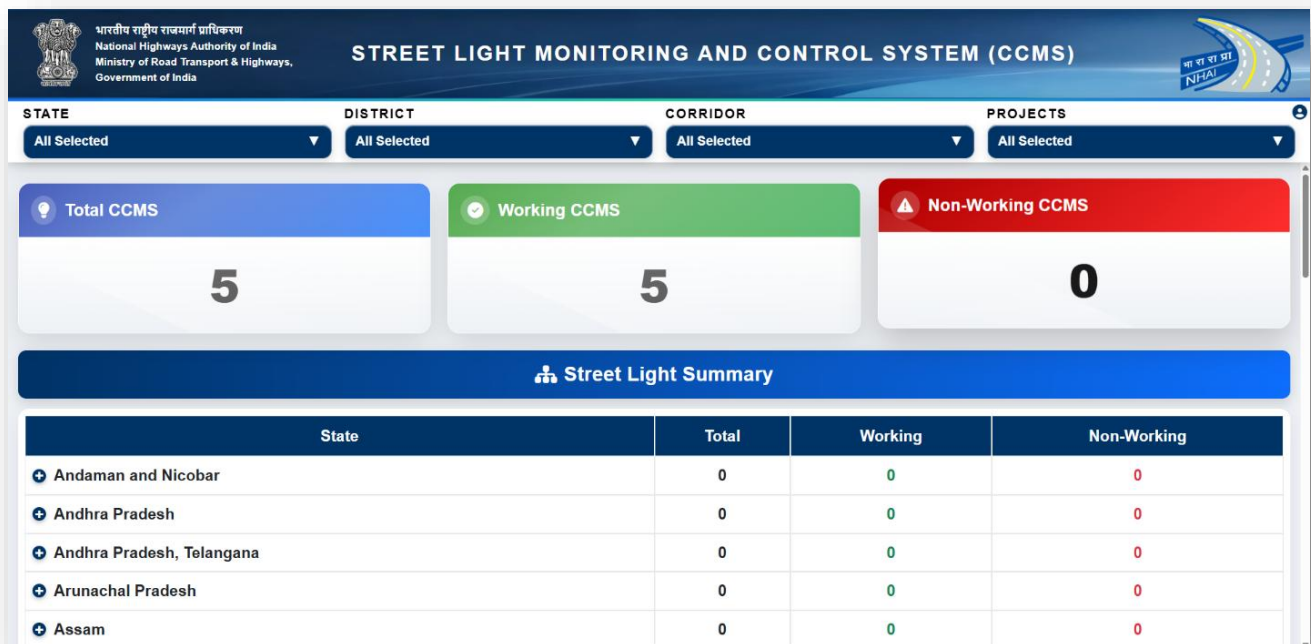
Request

Response

STATUS	RESPONSE
200	<pre>[{ "upc": "N/01001/01001/HR", "project_title": "Delhi-Vadodara Greenfield Alignment (NH-148N) (Pkg-01) (Ch. 0+000 to Ch. 18+461) [Sohna-Gurugram Road (NH-248A) near Alipur Village and ending before KMP Expressway]", "length": 18.5, "mode_name": "EPC", "current_project_stage": "CC Issued & O&M by Construction Agency", "implementing_ro": "RO-Delhi", "piu": "Sohna", "division": "Delhi", "state": "Haryana", "district": "Gurugram, Nuh", "name_of_concessionaire": "APCO Infratech Pvt. Ltd.", "name_of_ae": "Frischmann Prabhu India Pvt. Ltd. - K&J Projects Pvt. Ltd. -Indian Engineering Consultants India Pvt. Ltd. - CT Ltd. (CONSORTIUM)", "project_type": "Regular Civil Works", "created_on": "2020-03-05T00:23:57.928665", "loa_date": "2019-03-08T00:00:00", "agreement_date": "2019-07-11T00:00:00", "appointment_date": "2019-09-13T00:00:00", "scheduled_completiondate": "2021-09-11T00:00:00", "pcod_date": null, "final_completiondate": "2023-02-10T00:00:00", "dlpperiodfrom": "2019-09-13", }]</pre>

	<pre> "dlpperiodto": "2021-09-11", "omperiod": null, "awarded_cost": 1217.22, "revised_length": 18.5, "cumlength_completed_tilllastmonth": 17.44, "cumfinancial_progress_tilllastmonth": 98.95, "cumphysical_progress_tilllastmonth": 97.64, "lanes": "8L", "pm_scheme": "BM-1", "phase": "EXP", "ae_loa_date": "2019-08-29", "ae_agreement_date": "2019-09-18", "ae_start_appointment_date": "2019-09-23", "likely_completiondate": "2024-04-15T00:00:00", "civil_work_cost": 1144.0, "total_epc_cost": 1361.92, "estimate_la_cost": 460.0, "estimate_other_cost": 57.2, "total_capital_cost": 1879.12, "iacpatsc_status": "Appraised & Recommended", "pre_appraised_by": "PATSC", "approval_status": "Approved", "efcsfc_status": null, "awarded_date": "2019-03-05T00:00:00", "dateof_termination": null, "iacpatsc_appraisal_date": "30/11/2018", "efcsfc_appraisal_date": null, "approval_date": "2018-12-20T00:00:00", "cgm": "CGM-DL", "gm": "Delhi", "member": "Member-Technical", "overlays": "N/A", "strengthening": "N/A", "length_to_be_considered": 18.5, "nh": "148N", "corridor": "Delhi - Mumbai EXP" }] </pre>
500	{"error": "Something went wrong. Please try again later."}
401	{"error": "failure."}

9. Public/User dashboard



9.1 In this you will find 4 Dropdowns.

- State
- District
- Corridor
- Projects

9.2 By default you will see Total CCMS, Total Working, and Total Not Working in three rectangle boxes respectively.

9.3 If you want to see any particular state ,then first select the state, then its total CCMS, working, not working will be visible.

9.4 If you want to see any particular district, then select the district then its total CCMS, working, not working will be visible.

9.5 If you want to see any particular Corridor, then select corridor, then its total CCMS, working, not working will be visible.

9.6 If you want to see any particular project, then select the project, then its total CCMS, working, not working will be visible.

9.7 A tree structure will be visible below the boxes and it will also reflect along with Dropdown.

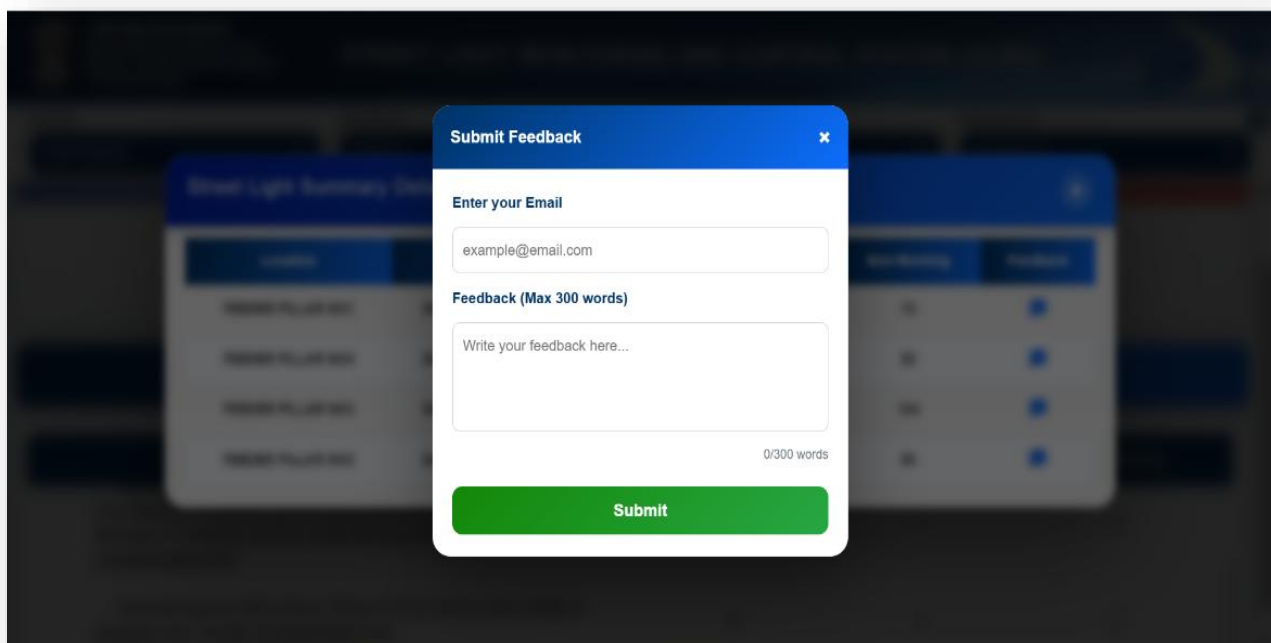
9.8 For find how many street lights on in a corridor, select first state then its district, and its corridor and in tree structure open it and click on the project and a popup open



The screenshot shows a 'Street Light Summary Detail' popup window. It contains a table with the following data:

Location	Corridor	Total Street Lights	Working	Non-Working	Feedback
FEEDER PILLAR NO1	Delhi - Kolkata	15	0	15	
FEEDER PILLAR NO4	Delhi - Kolkata	92	0	92	
FEEDER PILLAR NO3	Delhi - Kolkata	104	0	104	
FEEDER PILLAR NO2	Delhi - Kolkata	90	0	90	

9.9 For any feedback, please click on the **Feedback** icon. A pop-up window will open where valid details may be entered and submitted. The submitted feedback will automatically be sent via email to the concerned **PIU/RO** associated with the respective **Project (UPC)**



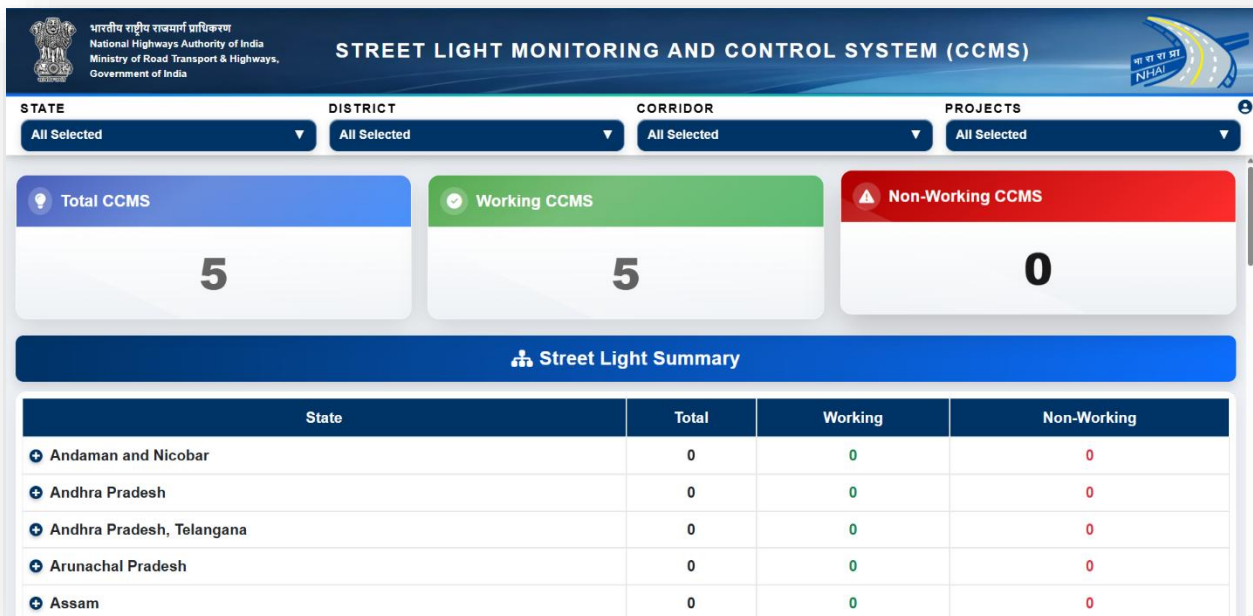
The screenshot shows a 'Submit Feedback' popup window. It contains the following fields and elements:

- Enter your Email**: A text input field with the placeholder 'example@email.com'.
- Feedback (Max 300 words)**: A text area with the placeholder 'Write your feedback here...'. Below the text area, it says '0/300 words'.
- Submit**: A green button at the bottom.

10. User Login process

Url:- <https://scada.apstech.in/nhai/>

10.1 Public/User dashboard



10.2 Click on the user icon on the right-hand side, select login, the login page will open

GPRS/GSM BASED CONTROLLING & MONITORING SYSTEM

Welcome To TAS Admin Panel

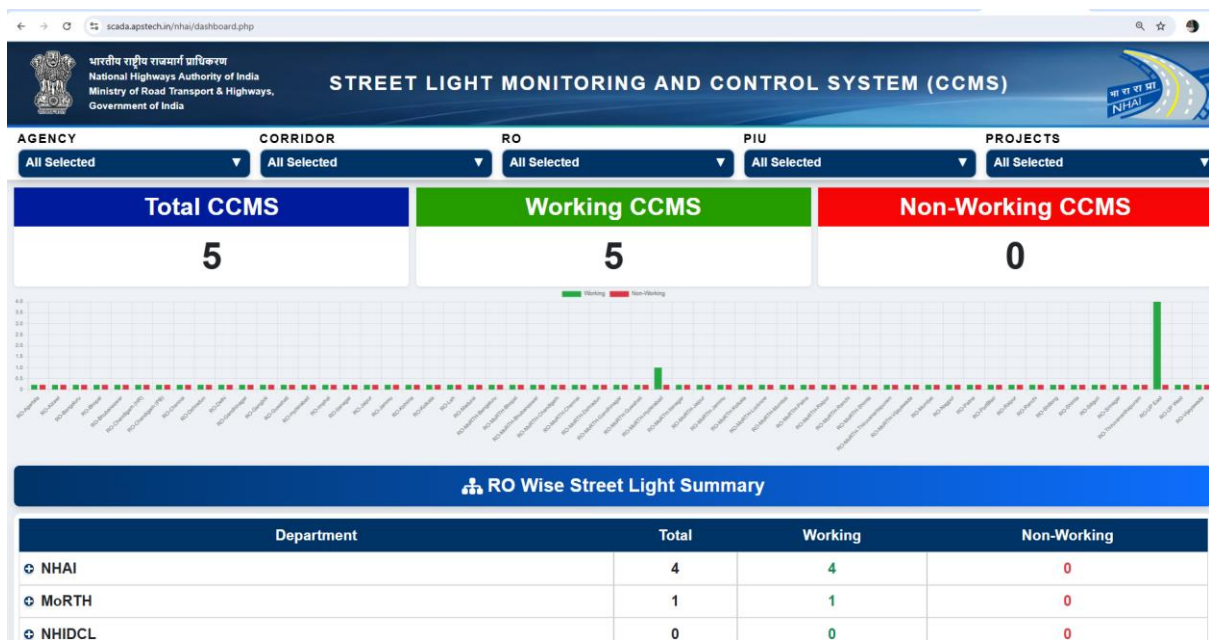
Username

Password

Login

10.3 Enter your credentials and login (Minister/Admin/NHAI/MoRTH/ NHIDCL/RO/PIU/ Project).

11. Minister/Admin Level – Agency-wide dashboard (MoRTH/NHAI/NHIDCL)



11.1 In this you will find 5 Dropdowns.

- Agency (MoRTH/NHAI/NHIDCL)
- Corridor
- RO
- PIU
- Projects

11.2 By default, you will see Total CCMS, Total Working, and Total Not Working.

11.3 Below you will see a bar graph in which the x axis will show the RO's name and the y axis will show the CCMS values.

11.4 A tree structure will be visible below the bar graph and it will also reflect along with Dropdown.

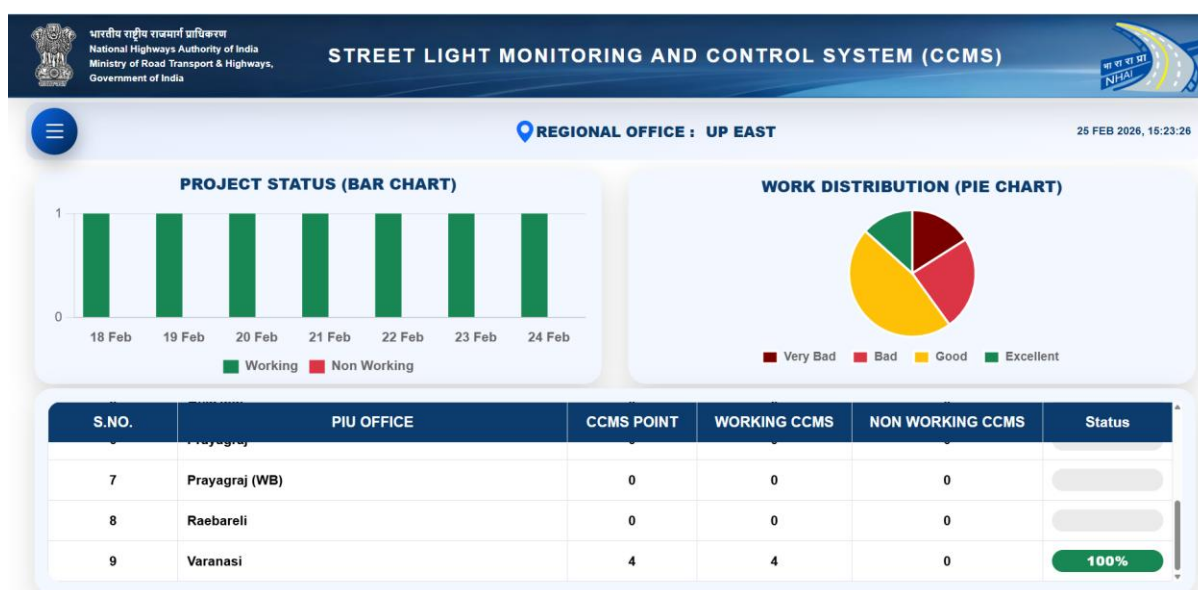
11.5 When you click on the + icon of an agency in the tree structure, corridors will open if present, if not direct RO's will open.

11.6 When you click on the + icon of an RO's in the tree structure, PIU's will open if present, if not direct projects will open.

11.7 When you click on the PIU in the tree structure, PIU's page will open.

11.8 When you click on the + icon of an PIU's in the tree structure, projects will open, and when you click on the project, the page of that particular project will open.

12. RO Level – PIU & Project monitoring



12.1 In this you will see a bar chart on the left side and a pie chart on the right side.

12.2 The bar chart will show the working and non-working CCMS of that project for the last 7 days.

12.3 In the pie chart, those disconnected for more than 6 days will be shown as **very bad**, those disconnected for 3-6 days will be shown as **bad**, those disconnected for 1-2 days will be shown as **good**, those disconnected for 0-1 days will be shown as **excellent**.

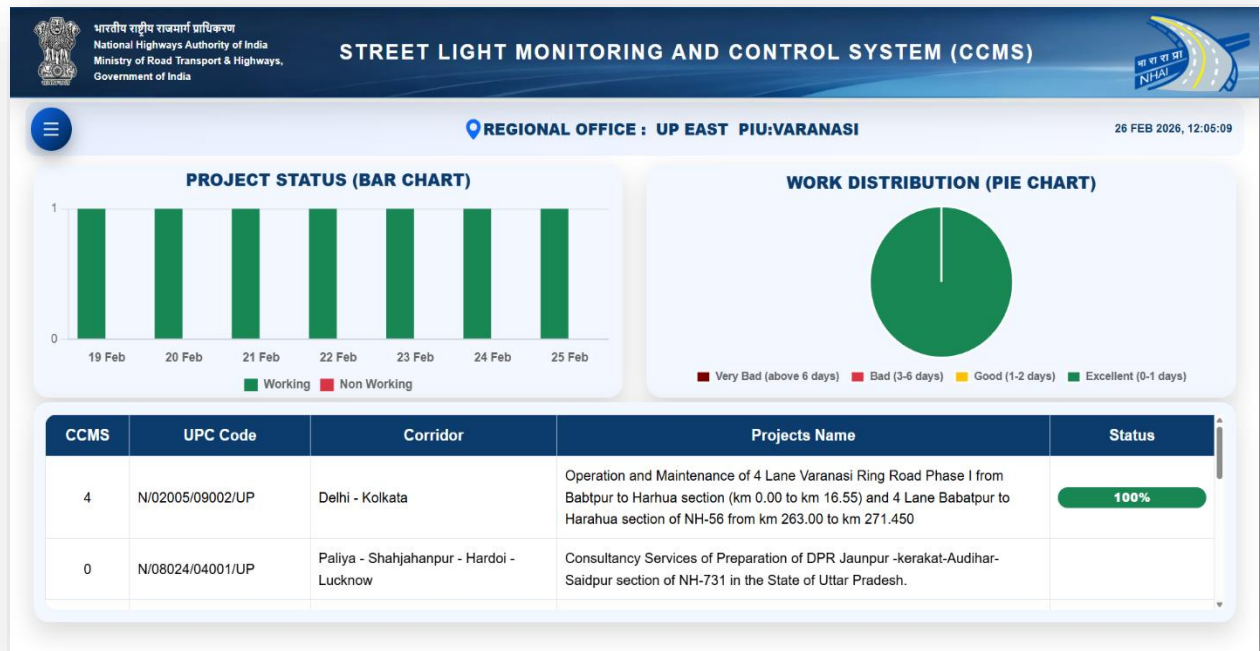
12.4 In the table below you will see the PIU OFFICE, CCMS POINT, WORKING, NON-WORKING, STATUS.

12.5 In the PIU Office column, the PIU of the regional office(RO) user logged in will be displayed.

12.6 When you click on the PIU in the table, PIU's page will open.

12.7 When you click on the + icon of an PIU's in the tree structure, projects will open, and when you click on the project, the page of that particular project will open.

13. PIU Level – Project-level dashboard



13.1 In this you will see a bar chart on the left side and a pie chart on the right side.

13.2 The bar chart will show the working and non-working CCMS of that project for the last 7 days.

13.3 In the pie chart, those disconnected for more than 6 days will be shown as **very bad**, those disconnected for 3-6 days will be shown as **bad**, those disconnected for 1-2 days will be shown as **good**, those disconnected for 0-1 days will be shown as **excellent**.

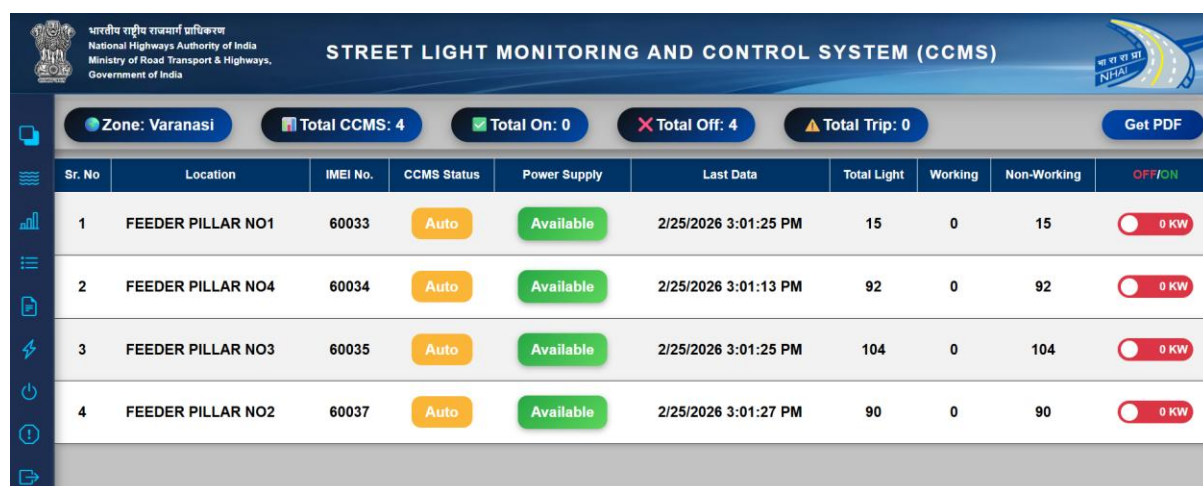
13.4 In the table below you will see the CCMS, UPC code, Corridor, Project Name, Status.

13.5 A particular UPC code for each project.

13.6 Clicking on the UPC code will open the page of that project.

13.7 There is also a menu icon when click on its u see, dashboard button for back to dashboard page and logout button.

14. Project Level – Device-level monitoring



Sr. No	Location	IMEI No.	CCMS Status	Power Supply	Last Data	Total Light	Working	Non-Working	OFF/ON
1	FEEDER PILLAR NO1	60033	Auto	Available	2/25/2026 3:01:25 PM	15	0	15	0 KW
2	FEEDER PILLAR NO4	60034	Auto	Available	2/25/2026 3:01:13 PM	92	0	92	0 KW
3	FEEDER PILLAR NO3	60035	Auto	Available	2/25/2026 3:01:25 PM	104	0	104	0 KW
4	FEEDER PILLAR NO2	60037	Auto	Available	2/25/2026 3:01:27 PM	90	0	90	0 KW

14.1 In this you will see the zone under which that project is located, total CCMS of that project, how many are running, how many are off, how many trips are there.

14.2 You can also download its PDF.

14.3 In the table you can see the

14.4 Location

- IMEI no. of that location (Device id)
- CCMS Status (Auto/ Manual)
- Power supply (Available/Not available/Disconnected)
- Last data (date time when update)
- Total light (how many light links in that location)
- Working
- Non-working
- Status (ON/OFF)

14.5 When click on IMEI No (Device id), a page will open in which u see grid in left

- In grid you see the location, Modem id
- Single phase voltage value
- Current value
- Double phase voltage value
- Average current value
- Average power factor(pf) value
- Value of Kilo watt per hour (KWH)
- Average VLL value
- Trip status
- Power status
- Data stamp
- Power consumption
- Area covered
- Total working
- Total non-working
- Faulty

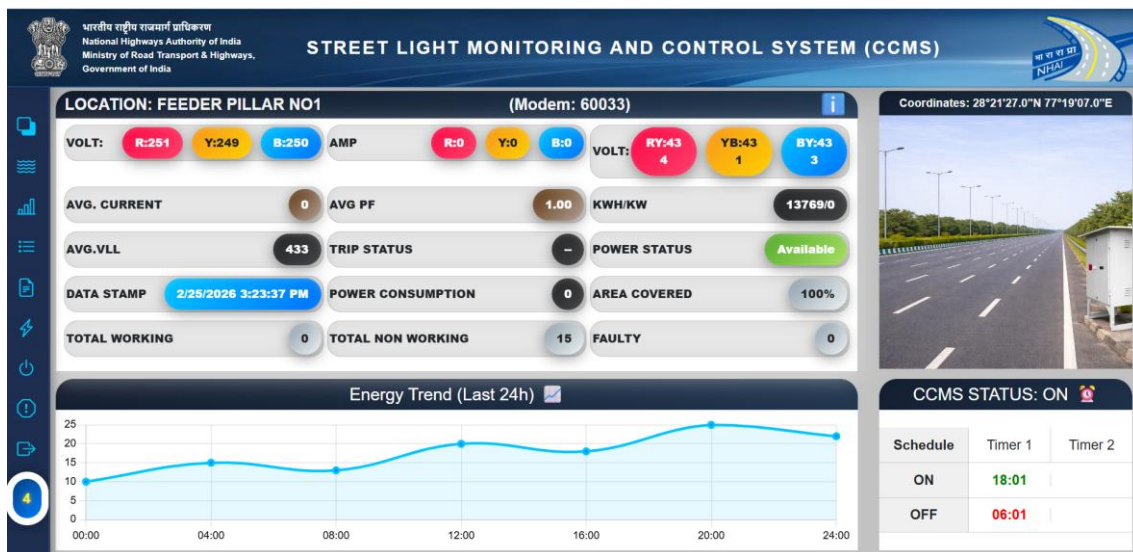
14.6 In right side you see the image of street light on/off with coordinates.

Below in left side you see the line graph which show last 24 hours data.

14.7 Below in right side, you can see a scheduler timer that shows when the timer will turn on and when it will turn off.

14.8 You can also set the timer by click on alarm icon.

14.9 Agency Level



14.10 In this you will find 4 Dropdowns.

- Corridor
- RO
- PIU
- Projects

14.11 By default, you will see Total CCMS, Total Working, and Total Not Working.

14.12 Below you will see a bar graph in which the x axis will show the RO's name and the y axis will show the CCMS values.

14.13 A tree structure will be visible below the bar graph and it will also reflect along with Dropdown.

14.14 When you click on the + icon of an agency (The name of the agency through which you have logged in will be shown) in the tree structure, corridors will open if present, if not direct RO's will open.

14.15 When you click on the + icon of an RO's in the tree structure, PIU's will open if present, if not direct projects will open.

14.16 When you click on the PIU in the tree structure, PIU's page will open.

14.17 When you click on the + icon of an PIU's in the tree structure, projects will open, and when you click on the project, the page of that particular project will open. (for more detailed see page 10-11.)

15. RESPONSIBILITIES OF STAKEHOLDERS (RO/PIU)

15.1 RO / PIU (Regional Office / Project Implementation Unit)

The RO/PIU shall act as the supervisory and monitoring authority to ensure smooth implementation and operation of the street lighting system.

Ensure API Readiness

- Ensure that the required Application Programming Interfaces (APIs) are properly configured and functional for seamless data exchange between field devices and the Central Control & Monitoring System (CCMS).
- Coordinate with IT teams to verify integration between software platforms.
- Conduct periodic testing of API connectivity to avoid data disruption.

15.2 Validate Data Accuracy

- Review data received from the field (energy consumption, burning hours, fault reports, etc.) for correctness and consistency.
- Cross-verify system-generated reports with physical site conditions wherever required.
- Ensure discrepancies are reported and corrected in coordination with the Implementing Agency.

15.3 Coordinate with Concessionaire

- Maintain regular communication with the concessionaire/contractor responsible for execution and maintenance.
- Conduct review meetings to monitor project progress, fault resolution timelines, and performance standards.
- Ensure compliance with contractual obligations and Service Level Agreements (SLAs).

15.4 Ensure Uninterrupted Data Flow

- Monitor continuous data transmission from field controllers and meters to the CCMS portal.
- Identify and escalate issues related to communication network failures.
- Ensure that downtime is minimized and restored within defined timelines.

16. RESPONSIBILITIES OF STAKEHOLDERS Implementing Agency

The Implementing Agency shall be responsible for on-ground execution, operation, and maintenance of the street lighting infrastructure.

16.1 Maintain Field Devices

- Ensure proper installation and maintenance of street light fixtures, controllers, feeder panels, and communication devices.
- Conduct regular inspection and preventive maintenance.
- Replace faulty components promptly to maintain system efficiency.

16.2 Ensure Calibration of Meters

- Conduct periodic calibration of energy meters as per statutory norms to maintain measurement accuracy.
- Maintain calibration records and certificates.
- Immediately address any discrepancies in meter readings.

16.3 Maintain Power Quality

- Ensure stable voltage supply and proper earthing at feeder panels.
- Monitor and address issues such as voltage fluctuations, harmonics, and phase imbalance.
- Coordinate with the electricity distribution company (DISCOM) in case of supply-related issues

17. RESPONSIBILITIES OF STAKEHOLDERS CCMS Admin (Central Control & Monitoring System Administrator)

The CCMS Admin shall be responsible for managing the digital platform used for monitoring and controlling the street lighting system.

17.1 Manage User Access

- Create, modify, and deactivate user accounts as per authorization levels.
- Ensure role-based access control to prevent unauthorized data access.
- Maintain a log of user activities for audit purposes.

17.2 Maintain Portal Uptime

- Ensure the CCMS portal remains operational and accessible with minimal downtime.
- Coordinate with IT support teams for server maintenance and software updates.
- Maintain system backups and disaster recovery mechanisms.

17.3 Data Analytics & Reporting

- Generate periodic reports on energy consumption, fault trends, uptime performance, and savings achieved.
- Analyze data to identify inefficiencies and recommend corrective measures.
- Provide customized dashboards and reports to RO/PIU and other stakeholders as required.

18. ESCALATION MATRIX

18.1 Purpose:

This escalation matrix defines the structured process for reporting and resolving issues related to the Centralized Control & Monitoring System (CCMS) Portal and associated API integrations. It ensures timely resolution, accountability, and proper communication flow among stakeholders.

18.2 Scope

This escalation mechanism shall apply only to IT-related issues, including:

- CCMS portal login/access issues
- Server downtime or portal inaccessibility
- API integration failures
- Data synchronization errors
- Dashboard/report generation errors
- Software bugs or system performance issues

Note: Issues related to field devices, street light faults, feeder panels, power supply, or civil/electrical works shall not be escalated through this IT matrix. Such issues must be addressed to the concerned division or field authority separately.

18.3 Escalation Levels

Level 1 – Service Provider (Hired by NHAI for CCMS Application for One Years)

Responsibility:

- First point of contact for all CCMS and API-related issues.
- Diagnose and resolve application-level and server-level issues.
- Ensure restoration of portal functionality within defined Service Level Agreements (SLAs).
- Provide incident acknowledgment and estimated resolution time.

Escalation Condition:

If the issue is not resolved within the prescribed SLA timeline or requires higher-level intervention.

Contact Details:

Email: infoaselectricals@gmail.com

Mobile: 9650091122 & 7042014182 (Parveen Sharma)

Level 2 – ITFMS Team at NHAI Headquarters

Responsibility:

- Monitor performance of the CCMS service provider.
- Provide technical oversight and coordination.
- Intervene in unresolved or critical issues impacting multiple users or regions.

- Facilitate coordination between internal IT infrastructure and external service provider.

Escalation Condition:

If the issue remains unresolved after Level 1 intervention or involves policy-level, infrastructure-level, or integration-level concerns.

Contact Details:

Email- itteamleader@nhai.org

Ext. 1212 & 1028

Mobile: 9953008277 (Ravi Bhardwaj ITFMS Team Lead) and 9871917200 (Raj Sharma ITFMS Software Developer)

Level 3 – General Manager (GM) – IT at NHAI Headquarters

Responsibility:

- Final authority for critical and high-impact IT-related issues.
- Decision-making in case of prolonged downtime or system failure.
- Escalation to higher administrative or contractual levels if required.
- Ensure compliance with contractual obligations of the service provider.

Escalation Condition:

- Major system outage
- Repeated SLA violations
- Cybersecurity incidents
- Critical API failure affecting reporting and monitoring functions

Contact Details:

Email:- pramod@nhai.org

Ext. 1270 & 1500 (PA)

Mobile: 9810874066

18.4 Escalation Process Flow

- Issue Identification by RO/PIU/CCMS User
- Complaint Logging with Level 1 (Service Provider)
- Acknowledgment and Resolution Attempt
- If unresolved → Escalate to Level 2 (ITFMS Team at NHAI HQ)
- If still unresolved or critical → Escalate to Level 3 (GM-IT at NHAI HQ)

18.5 Important Clarification

- This escalation matrix is strictly limited to IT and CCMS portal-related matters including API integration.
- All non-IT issues (such as street light malfunction, power supply failure, meter faults, physical damage, etc.) shall be addressed to the concerned division/field authority and shall not be escalated under this matrix.