Government of India
Department of Telecommunication
Telecommunication Engineering Centre
Gate No. 5, Khurshid Lal Bhawan, Janpath, New Delhi-110001.
Fixed Access (FA) Division

File No.: 33-6/2025-FA/TEC **Date: 13.08.2025**

Subject: Notice for invitation for joint Sub-DCC & MF meeting of FA division to be held on 20th August 2025 in respect revision of standard for GR on "Electronic Locator System TEC 73070:2014 (Old No. TEC/GR/TX/TIE-07/02 MAR 14)-reg.

A meeting of the Sub Development Coordination Committee (DCC) & Manufacturer's Forum (MF) of FA Division, TEC is scheduled on Wednesday, 20th August 2025, 11:00 am. onwards to discuss the revision of GR (Generic requirement) on "Electronic Locator System TEC 73070:2014". In this regard, TEC has also asked the comments / inputs from the stakeholders as per the notice uploaded in TEC website (https://tec.gov.in/consultations) in accordance with provisions in the Telecommunications (Framework to Notify Standards, Conformity Assessment and Certification) Rules, 2025.

2. The details of meeting link are as below:

- **Name:** Sub DCC & MF meeting of FA division for revision of GR, **TEC 73070:2014 on 'Electronic Locator System".**
- **Meeting date & time : Wednesday, 20th August 2025, 11:00 a.m**
- **Meeting link: https://cdotmeet.cdot.in/vmeet/rooms/z0v-m4a-znr-ycy/join**

3. The electronic copy of existing GR TEC 73070:2014 is enclosed for your reference, study and technical inputs/comments on technological advancements and changes in relevant standards.

4. Further, the inputs received from the OEMs/ Manufacturers till date are compiled and attached herewith at Annexure-B.

5. Members are requested to kindly provide their comments as per the attached format at **Annexure -A** on the various clauses of the enclosed existing GR and also on the proposals (attached at Annex-B), if any, in advance positively by 18th August 2025 to adgfa-tec-dot@gov.in with copy to rafa.tec-dot@govcontractor.in; dirfa.tec@gov.in and ddgfla.tec@gov.in.

6. Members are requested to kindly make it convenient to attend the meeting.

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Deo Pratap
AD (FA), TEC

Encl: 1. Existing GR as above
2. Annexure-A and B as above

To
1. All Sub-DCC/Manufacturer Forum Members.
2. AD (IT), TEC for uploading the notice on TEC web site.

ANNEXURE-A

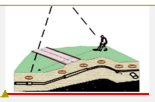
NAME OF .....(MEMBER/MANUFACTURER)

I. COMMENTS ON GR on Electronic Locator System (TEC 73070:2014) -

Clause No.	Clause Description	Comments, if any	Remarks, if any

Annexure- B

Clause No.	Clause Description	Comments from Asian Contec Limited
1.0	The Electronic Locator System is a precise method of marking and subsequently locating the underground cable system. To effectively manage the outside plant, there is a need for a direct linkage between the cable route map and the actual field cable route. The map presently provides the general information about location of the cable route but does not pin point underground plant such as for cable joint, bend, road crossing etc. The Electronic Locator System can be used so that the operator can exactly locate the underground point where the marker is buried.  Fig.1. Electronic Locator  Fig.2 Disc and Ball marker	M/s Asian Contec Limited The RFID Marker and Locator System is designed to accurately mark, locate, and map underground unarmored/ Armored/Copper cable routes. Since these cables are buried and not visible above ground, the system provides a reliable way to mark their path in the future- helping with maintenance, expansion, or preventing accidental damage during excavation. The RFID Marker and Locator System is designed to enable efficient underground cable route marking and tracking. RFID markers are buried along with the cable during installation and remain completely invisible above ground. Each RFID marker contains a unique identification number. Once installed, the marker's location is recorded using an RFID marker locator device, which features an integrated GPS module. This enables accurate geotagging (latitude and longitude) of every marker. The collected data—comprising of "Unique RFID Marker ID" and GPS Coordinates (Latitude & Longitude) is used to create a GIS (Geographic Information System) map that visually represents the underground cable routes

	The system consists of Electronic Locator unit and underground buried electronic markers (Fig.1& Fig.2).	and the exact locations of the markers. This GIS mapping system enhances tracing back of underground assets by providing the Navigation capability using the GPS coordinates of the RFID markers, it Helps in future maintenance or excavation work, reduces the risk of cable damage. It shall be designed to enable seamless synchronization of marker-related data with a secure cloud storage platform, ensuring data integrity and availability across the system. Once synchronized, the marker data is instantly accessible via an Android-based mobile application, which serves as a field tool for technicians and service personnel. The system consists of Marker Locator unit and underground buried RFID based electronic markers (Fig.1& Fig.2) Formatted: Font color: Auto  Formatted: Font color: Auto  Formatted: Font color: Auto 
1.1	The Marker Locator unit consists of a transmitter, tuned frequency receiver and a suitable antenna housed in a light weight probe.	M/s Asian Contec Limited The Marker Locator unit consists of an Inbuilt GPS ,

		Tuned Transceiver antenna having a day readable display unit and Loudspeaker
1.2	The Electronic locator generates and transmits a specific frequency signal to the buried electronic marker. The Electronic Marker, tuned to this frequency, reflects the signal back to the locator. The locator verifies the reflected signal picked up through the probe and the location is indicated with a visual indication and an audible tone.	M/s Asian Contec Limited The Marker locator generates and transmits a specific frequency signal to the buried electronic marker. The Electronic RFID Marker, tuned to this frequency, reflects the signal back to the locator. The locator verifies the reflected signal picked up through the probe and the location is indicated with a visual indication and an audible tone.
2.0	TECHNICAL REQUIREMENTS: 2.1 Cable Route Tracing Mode : Radio Frequency Mode. 2.2 Accuracy of Location : The Electronic Locator System shall be capable of Locating the Marker buried upto a Max. depth of 220 cms. The Marker shall be located within a radius of 30 cms from the spot where the peak signal has been detected. 2.3 Transmitter Frequencies : i) 101.4 KHz. OR ii) 121.6 KHz. OR iii) 145.7 KHz. (as per the requirement of the user depending upon the application.) 2.4 Frequency Tolerance & Drift : < ±..l % 2.5 Transmitter Output Power : 1.5 Watts (Max.) 2.6 Type of Modulation : Output Carrier 100% modulation, with 500 Hz. Carrier (varying tone). Carrier ON time 800 Micro Seconds (approx.) 2.7 Antenna : Type of antenna along with its fixers to be specified by the manufacturer.	M/s Asian Contec Limited **Electronic Marker Technical Requirements** **a. Marker Type:** Electronic Marker with passive RFID (buried underground), Ball Marker or Disc Type marker >20cms with RIFD chip Having 10 Digit Hexadecimal code for Unique identification. **b. Operating Frequency:** i) 101.4 KHz. OR ii) 121.6 KHz. OR iii) 145.7 KHz. **c. Depth Capability:** Upto 1.8 for Detection & 1.5m for the Identification **d. Construction:** Sealed ABS Plastic **e. Operating Temp** **f. Marker Casing:** The Marker shall have passive resonant network and sealed with HDPE material or any other suitable engineering

	2.8 Receiver	:	Detects the radio frequencies reflected by the buried Marker. The Locator shall have facilities of Peak & Null reception. (a) 'PEAK' Reception: Tone/deflection shall be at highest. (b) 'NULL' Reception: Tone/deflection shall be weak or cancelled.	plastic which is resistant to rodents or any other insects in the underground environment, and shall have suitable holes for fixing purpose. **g. Colour/application of Marker :** The marker shall follow internationally accepted frequencies and colour conventions i.e. 101.4 KHz, orange colour for Telecommunication cables." **h. Tensile Strength & Elongation:** The tensile strength and elongation of the Marker shall be carried out. The tensile strength at yield for finished material shall be 20 N/sq mm. minimum. & elongation at break shall not be less than 350%. **i. Thermal stress crack resistance:** The Marker shall be under compression load test of 10 Kg at a temperature of 55°C for 750 hours. There shall not be any indication of stress cracking or split on the surface of the marker. **j. Hot-Cold Cycle:** The marker is kept between -10°C and 55°C for one week with weight. There shall not be any indication of stress cracking.
	2.9 Indications	:	Audible indication in the loudspeaker and deflection in the meter.	
	2.10 Power Requirements	:	a) Transmitter/Receiver to work on dry cells for outdoor working. The cells used shall be of standard type and commonly available like AA/AAA type. b) The instrument with these dry cells should work continuously for 8 hours. c) Low battery indication to be provided.	
	2.11 Dimensions & Weight	:	The electronic locator with its probe and marker shall be portable, compact and robust. The dimensions and weight shall be specified and furnished by the manufacturer.	
	2.12 Environment	:	Operating Temperature -10 °C to $+55^0$ C	
	2.13 Cabinet/Casting for locator	:	Suitable sheet metal or reinforced plastic or ABS	
	2.14 Painting	:	Enamel Painting for metal cabinet preferred.	
	2.15 Marker Casing	:	The Marker shall have passive resonant network and sealed with HDPE material or any other suitable engineering plastic which is resistant to rodents or any other insects in the underground environment, and shall have suitable holes for fixing purpose.	
	2.16 Colour/application of Marker :		The marker shall follow internationally accepted frequencies and colour conventions i.e. 104.4 KHz, orange colour for Telecommunication cables."	**2.1 Marker Locator Unit (Transceiver unit)** The marker locator shall be capable of locating and storing marker information,

	2.17 Tensile Strength & Elongation:	The tensile strength and elongation of the Marker shall be carried out. The tensile strength at yield for finished material shall be 20 N/sq mm. minimum. & elongation at break shall not be less than 350%.	including Geo Coordinates, acquired at the time of installation. It shall read the Marker ID and capture relevant data to ensure accurate records. Additionally, the locator shall enable the user to trace back and navigate to the marker's location using the stored information using the built-in GPS system and marker reading capability to precisely pinpoint the location where the marker is installed. **a. Accuracy of Location:** The Marker Locator System shall be capable of Locating the Marker buried upto a Max. depth of 170 cms. The Marker shall be located within a radius of 10 cms from the spot where the peak signal has been detected. **b. Transceiver Frequencies:** i) 101.4 KHz. OR ii) 121.6 KHz. OR iii) 145.7 KHz. (as per the requirement of the user depending upon the application.) **c. Frequency Tolerance & Drift:** < ±..l % **d. -** **e. Type of Modulation:** Output Carrier 100% modulation, with 500 Hz. Carrier (varying tone). Carrier ON time 800 Micro Seconds (approx.) **f. Antenna:** Type of antenna to be specified by the manufacturer: Fixed Type OR Removable type. **g. Receiver capability:**
	2.18 Thermal stress crack resistance:	The Marker shall be under compression load test of 10 Kg at a temperature of 55°C for 750 hours. There shall not be any indication of stress cracking or split on the surface of the marker.	
	2.19 Hot-Cold Cycle :	The marker is kept between -10°C and 55°C for one week with weight. There shall not be any indication of stress cracking.	
	2.20 Sealing of marker :	This consists of one minute immersion in mineral oil at 100°C. The sealing shall not show any functional abnormalities (It should meet CI. 2.2)	
	2.21 RFID Memory :	Markers having RFID memory should have at least 1024 bits of memory to support storage of data on the marker.	

		Detects the radio frequencies reflected by the buried Marker. **h. Indications:** **a)** Audible indication in the loudspeaker and deflection in the meter. Tone/ Deflection shall be highest when Marker Locator antenna is over the buried marker. **b) Marker ID read function:** Marker locator shall able to read the Marker Unique ID and shall indicate over the display **GPS Navigation:** Locator should provide audio guidance function to allow Operator to navigate to location of RFID marker**. Preferably, Map based GPS navigation should be available directly on the control unit display of the marker locator.** **i.** Marker Type: Electronic Marker with passive RFID (buried underground), Ball Marker of diameter more than 10cm or Disc Type marker of diameter more than 22cms with RIFD chip for Unique identification. **j. Power Requirements:** **a)** Marker Locator to work on dry cells for outdoor working. The cells used shall be of standard type and commonly available like AA/AAA type. Alternatively, Li-ion batteries rechargeable cells should be pre-fitted. **b)** The instrument with these dry cells should work

		c) Low battery indication to be provided. b) The instrument with these dry cells should work **k. Dimensions & Weight:** The Marker Locator and marker shall be portable, compact and robust. The dimensions and weight shall be specified and furnished by the manufacturer. **l. Environment:** Operating Temperature -10 °C to $+55^0$ C **m. Cabinet/Casting for locator :** Suitable sheet metal or reinforced plastic or ABS **n. Painting**: Enamel Painting for metal cabinet preferred.
		2.21 Data Saving & Security : The RFID Marker Locator System shall be equipped with a three-tier data storage and security mechanism to ensure uninterrupted data availability and integrity. The following capabilities are required: **1. Layer 1: On-Device Storage** • The locator device shall have internal memory to store data for a minimum of 4,000 RFID markers. ▪ This ensures data availability even if the RFID marker is lost, damaged, or cannot be detected again **2. Layer 2: Local PC Storage** • The system shall support data transfer and storage to a local PC

		using manufacturer-provided software. • This allows for data backup, analysis, and report generation without requiring internet access. **3. Layer 3: Cloud Storage** ○ The system shall provide an option to upload all marker data to a secure cloud-based platform. ▪ Access to the cloud storage must be protected by user-specific login credentials to maintain data confidentiality and security These storage layers must function independently to provide redundancy and ensure that critical data is not lost under any circumstance M/s 3M India Ltd. 2.1 The specification is marker locator means to detect electronic markers 2.8 Only Peak antenna can trace markers 2.12 Operating Temperature -10° C to +55° C
		p. Technical Requirement for Software **2.22.**1 The data base management software to be provided by the original equipment manufacturer, shall be robust and reliable. It shall have the capability to store comprehensive marker information, including Project Name, Line Details, Marker ID,

		GPS Coordinates (Latitude and Longitude), Text Annotations describing cable type or surrounding conditions , and support for upload image of location where marker has been installed via PC or desktop. The software must facilitate seamless synchronization of this data with a cloud storage platform, ensuring that all marker information is consistently and reliably accessible through the associated Android-based mobile application. Alternatively, control unit of marker locator should contain camera, for acquiring and uploading images to marker database, along with attribute information such as project name, arttribute information such as cable type etc
		2.22.2 The marker database shall be accessible on any Android smartphone through the dedicated Marker Database software, which shall be available for download from the Google Play Store. The application shall enable users to view installed markers directly on their smartphones as overlays on Google Maps. Alternatively, marker database should be

		available on marker locator control unit,
		2.22.3 The Android-based mobile application shall provide navigation functionality, allowing users to locate and navigate to a selected RFID marker using the smartphone's built-in GPS capabilities.. Alternatively, marker locator control unit should contain built in cellular function for map based GPS navigation using google maps or any other similar application.
		2.22.4 The software shall be supplied either via a CD or through an official web download link provided by the OEM. The installation process must be simple and user-friendly, requiring minimal technical expertise.
		2.22.5 Data Sharing: The software shall support exporting marker data in commonly used formats such as .KML and .CSV, enabling easy sharing of data with other stakeholders involved in operations and maintenance activities.
3.1	The Electronic Locator System shall be fully solid state and field proven employing state of the art technology.	M/s Asian Contec Limited The RFID Marker Locator System shall be fully solid state and field proven employing state of the art technology.
3.6	Each sub-assembly/components shall be clearly marked to show its functions and schematic reference so that they are identifiable from the component layout diagram in the manual. These shall be easily accessible for removal and testing.	M/s 3M India Ltd. User manual should be considered as a valid document against this compliance

3.8	The Electronic Locator shall be IP54 compliant.	M/s Asian Contec Limited The RFID marker Locator system shall be IP54 compliant.
3.9	The Electronic Locater shall have high Contrast Display Suitable for all weather and light conditions.“	M/s Asian Contec Limited The RFID marker Locater shall have high Contrast Display Suitable for all weather and light conditions.“
3.10.1	The Electronic Locator System shall be able to pin point earmarked buried Telecom. facilities such as cables, joints etc.	M/s Asian Contec Limited The RFID marker Locator System shall be able to pin point earmarked buried Telecom. facilities such as cables, joints etc. where markers have been installed.
3.10.2	The electronic locator system shall be in two Parts : a) Electronic Marker with passive RFID or without RFID (buried underground) b) Electronic Marker Locator Unit“	M/s Asian Contec Limited The electronic locator system shall be in two Parts : a) Electronic Marker with passive RFID b) Marker Locator Unit
3.10.4	The Electronic locator shall generate and transmit a specific frequency signal to the buried electronic marker. The Electronic Marker, tuned to this frequency, reflects the sign back to the locator. The locator verifies the reflected signal picked up through the probe and the location is indicated with a visual indication and an audible tone.	M/s Asian Contec Limited The RFID marker locator shall generate and transmit a specific frequency signal to the buried electronic marker. The Electronic Marker, tuned to this frequency, reflects the sign back to the locator. The locator verifies the reflected signal picked up through the probe and the location is indicated with a visual indication and an audible tone.
3.10.5	The Electronic locator shall be provided with sensitivity control facility so that the indicator system viz., needle deflection and audible signal can be conveniently set during the use.	M/s Asian Contec Limited The RFID marker locator shall generate and transmit a specific frequency signal

		to the buried electronic marker. The Electronic Marker, tuned to this frequency, reflects the sign back to the locator. The locator verifies the reflected signal picked up through the probe and the location is indicated with a visual indication and an audible tone.
3.10.6	The locator shall be capable of locating markers of any of the frequencies through a selection feature on the front panel of the locator. 83.0 kHz Gas pipelines Yellow 104.4 kHz Telecommunication cables Orange 121.6 kHz Wastewater pipelines Green 134.0 kHz Energy cables Red 145.7 kHz Water pipelines Blue	M/s Asian Contec Limited The locator shall be capable for locating telecom markers prefrerabiliy with 101.4 kHz resonant frequency. However marker locator versions shall be available that are suitable for other services of any of the frequencies. **N.B.: The purchaser shall decide the type of electronic marker locator to be ordered as per the requirements.** M/s 3M India Ltd. Telcom frequency should be 101.4 kHz . Colour/application of Marker: The Marker shall be uniformly coloured as given below: **1.** 101.4 KHz. Orange for Telecommunication Cables **2.** 145.7 KHz. Blue for Water Pipelines **3.** 121.6 KHz. Green for Sewage Pipelines **4.** 83.0KHz. Yellow for Gas Pipelines and also the std global colour codes should be used for power and other segments "Colour/application of Marker: The marker shall follow The marker shall follow the international frequencies and the colour conventions

3.10.7	Electronic locator should have facility to be able to read & write data on the marker RFID memory. RFID memory should be on the marker.	M/s Asian Contec Limited Electronic locator should have facility to be able to read & write data on the marker RFID memory. Alternatively, electronic marker locator should be able to read RFID Marker ID of RFID Marker and write into marker locator memory either capability to add attribute information in field.
3.11.3	The instrument shall conform to the requirements for Environment specified TEC GR No. SD QM-333. Issue March 2010-Standard for environment testing of Telecommunication equipment'". The applicable tests shall be for environmental category 'D' including those for dust, vibration and corrosion.	M/s 3M India Ltd. The environmental testing report or declaration applicable for the offered product by the OEM should be considered as valid and no further local testing should be asked from the OEM
3.12.1	The instrument shall work on dry cells for outdoor working. The cells used shall be of standard type and commonly available like AA/AAA type. The instrument with these dry cells should work continuously for 8 hours.	M/s Asian Contec Limited The instrument shall work on dry cells for outdoor working. The cells used shall be of standard type and commonly available like AA/AAA type. The instrument with these dry cells should work continuously for 8 hours. Alternatively, Li-ion batteries rechargeable cells should be pre-fitted.
3.12.2	The manufacturer shall furnish the power consumption of the instrument.	M/s Asian Contec Limited 3.12.3 The manufacturer shall furnish the power consumption of the instrument.
5.1 (g)	Immunity to voltage dips & short interruptions (applicable to only ac mains power input ports, if any"	M/s 3M India Ltd. Not applicable

5, 5.1 (a-d)	EMI/ EMC Requirements	M/s 3M India Ltd. The EMC/ EMI testing report or declaration applicable for the offered product by the OEM should be considered as valid and no further local testing should be asked from the OEM.
New Clause	In built GPS	M/s 3M India Ltd. It is advisable to have a Marker Locator with inbuilt GPS system.
New Clause	Data Log Storage	M/s 3M India Ltd. Locator should have internal storage minimum up to 500 logs and should have provision to store in external device like pen drive or external hard disk