Digital Connectivity Infrastructure Evaluator

Model Curriculum

QP Name: Digital Connectivity Infrastructure (DCI) Evaluator

QP Code: ICE/TEL/Q0302

Version: 1.0

NSQF Level: 6

Model Curriculum Version: 1.0

The Institution of Civil Engineers Society

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Table of Contents

Training Parameters

Sector	Telecom
Sub-Sector	Digital Infrastructure
Occupation	Digital Connectivity Infrastructure
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2153.0400

Minimum Educational Qualification and Experience	S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
	1.	Completed 4-years UG (B.E./B.Tech in Civil/IT/ECE/Electrical Engineering OR B.Arch)	1.5 years of relevant experience
		OR	
	2.	Completed 3-year diploma after 10th (Diploma in Civil/IT/ECE/Electrical Engineering/Architecture)	4 years of relevant experience
		OR	
	3.	Previous relevant Qualification of NSQF Level 5.5 (as Digital Connectivity Infrastructure (DCI) Designer)	1.5-year of relevant experience
		OR	
	4.	Previous relevant Qualification of NSQF Level 5	3-years of Relevant Industry Experience

Pre-Requisite License or Training	NA
Minimum Job Entry Age	As per Govt. Norms
Last Reviewed On	NA
Next Review Date	07-10-2028
NSQC Approval Date	07-10-2025
QP Version	1.0
Model Curriculum Creation Date	07-10-2025
Model Curriculum Valid Up to Date	07-10-2028
Model Curriculum Version	1.0
Minimum Duration of the Course	480 Hours
Maximum Duration of the Course	480 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

- Understand the foundational concepts of Digital Connectivity Infrastructure (DCI), its evaluation framework and basics of drone landing at Digital infrastructure.
- Apply regulatory standards (MBBL, NBC) to assess DCI compliance in civil and power infrastructure.
- Execute comprehensive on-site evaluations for DCI quality, resilience, and future readiness.
- Analyze wired connectivity provisions, service provider integration, and overall service performance.
- Interpret and act upon user feedback to enhance DCI service quality.
- Master DCI audit reporting, continuous monitoring, and non-compliance resolution.
- Navigate the complete DCI rating lifecycle, including initial award, reassessment, renewal, and appeal processes.
- Identify, mitigate, and remediate risks and faults within DCI.
- Adhere to workplace safety standards and develop essential employability skills for professional practice.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP

NOS and Module Details	Theory Duration (in Hours)	Practical Duration (in Hours)	On-the-Job Training Duration (Mandatory) (in Hours)	On-the-Job Training Duration (Recommended) (in Hours)	Total Duration (in Hours)
ICE/TEL/N0305: Perform Evaluation of Framework, Components and Basics of Drone Landing at Digital Infrastructure **NOS Version: 1.0** **NSQF Level: 6**	**44:00**	**30:00**	**01:00**	**00:00**	**75:00**
Module 1: Introduction to DCI Evaluator and Components of DCI	06:00	04:00	00:00	00:00	10:00
Module 2: Regulations, Standards and Permissions	07:00	05:00	00:00	00:00	12:00
Module 3: Digital connectivity Registration process and Rating Lifecycle	14:00	09:00	00:00	00:00	23:00
Module 4: Understand the elements of Active and Passive Infrastructure	04:00	06:00	01:00	00:00	11:00
Module 5: Prior processing for DCI	08:00	06:00	00:00	00:00	14:00
Module 6: Basics of Drone Landing at Digital Infrastructure	05:00	00:00	00:00	00:00	05:00

ICE/TEL/N0306: Conduct Assessments on DCI Compliance and Resilience as per MBBL & NBC **NOS Version: 1.0** **NSQF Level: 6**	**44:00**	**48:00**	**13:00**	**00:00**	**105:00**
Module 7: Digital Connectivity Compliance as per Model Building Bye Laws (MBBL) and National Building Code (NBC)	12:00	11:00	04:00	00:00	27:00
Module 8: Robust Digital Connectivity in Civil Infrastructure as per MBBL and NBC	10:00	12:00	03:00	00:00	25:00
Module 9: Reliable Digital Connectivity in Power Infrastructure, as per MBBL or NBC	10:00	12:00	03:00	00:00	25:00
Module 10: Resilience Digital Connectivity Infrastructure	12:00	13:00	03:00	00:00	28:00
ICE/TEL/N0307: Perform Evaluation for Future-Ready Digital Connectivity in Infrastructure, Services and user Experience **NOS Version: 1.0** **NSQF Level: 6**	**55:00**	**49:00**	**16:00**	**00:00**	**120:00**
Module 11: Digital Connectivity Infrastructure demand or readiness in future	12:00	13:00	04:00	00:00	29:00
Module 12: Wired Digital Connectivity	12:00	13:00	04:00	00:00	29:00
Module 13: Digital Connectivity Infrastructure Service Providers	12:00	06:00	04:00	00:00	22:00
Module 14: Digital Connectivity Infrastructure Service Quality Assessment	14:00	12:00	04:00	00:00	30:00
Module 15: Digital Connectivity Infrastructure: User Perception & Feedback	05:00	05:00	00:00	00:00	10:00
ICE/TEL/N0308: Conduct DCI Audit Reporting, Monitoring, feedback and non- compliance management **NOS Version: 1.0** **NSQF Level: 6**	**15:00**	**15:00**	**00:00**	**00:00**	**30:00**

Module 16: Reporting, Monitoring, Feedback, and Non - Compliance	15:00	15:00	00:00	00:00	30:00
ICE/TEL/N0309: Perform Reassessment, Renewal and Appeal management in DCI Rating award process **NOS Version: 1.0** **NSQF Level: 6**	**38:00**	**22:00**	**00:00**	**00:00**	**60:00**
Module 17: Digital Connectivity Award of Rating and Reassessment	18:00	11:00	00:00	00:00	29:00
Module 18: Digital Connectivity Rating Renewal and Appeal process	20:00	11:00	00:00	00:00	31:00
ICE/TEL/N0310: Perform Remedial Risk Assessment and Mitigations Strategies for DCI **NOS Version: 1.0** **NSQF Level: 6**	**08:00**	**07:00**	**00:00**	**00:00**	**15:00**
Module 19: Digital Connectivity Infrastructure Risks, Faults, and Remediation	08:00	07:00	00:00	00:00	15:00
ICE/TEL/N0311: Perform Workplace Safety Practices during DCI Evaluation **NOS Version: 1.0** **NSQF Level: 6**	**06:00**	**09:00**	**00:00**	**00:00**	**15:00**
Module 20: Workplace Safety and sustainable practices	06:00	09:00	00:00	00:00	15:00
DGT/VSQ/N0102: Employability Skills (60 Hours) **NOS Version: 1.0** **NSQF Level: 4**	**60:00**	**00:00**	**00:00**	**00:00**	**60:00**
Module 21: Employability Skills (60 Hours)	60:00	00:00	00:00	00:00	60:00
Total Duration	**270:00**	**180:00**	**30:00**	**00:00**	**480:00**

Module Details

Module 1: Introduction to DCI Evaluator and Components of DCI
Mapped to ICE/TEL/N0305, v1.0

Terminal Outcomes:

- Explain the significance of Digital Connectivity Infrastructure in national and regional development.
- Understand how to interpret the key functions and responsibilities of a DCI evaluator across.
- Explain the various DCI elements from sample layouts or field visuals.

Duration (in hours): 06:00	Duration (in hours): 04:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain what constitutes DCI evaluator and its role in enabling digital services. • Discuss the importance of DCI evaluator in National Development • Understand about components of Smart Poles and urban ICT (e.g., Wi-Fi kiosks, EV charging). • Discuss the role of stakeholders including Digital connectivity Rating Agency (DCRA), Property Manager, Telecom service providers (TSPs), Digital Connectivity Infrastructure providers (DCIPs). • Discuss about the Job Role of a DCI Evaluator.	• Overview of DCI Components in sample diagrams and models. • Explain basic infrastructure blueprints/layouts and network maps.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
National Digital Communications Policy (NDCP), BharatNet project guidelines, Smart Cities framework, DoT/MeitY publications	

Module 2: Regulations, Standards and Permissions
Mapped to ICE/TEL/N0305, v1.0

Terminal Outcomes:
- Discuss relevant regulations from TRAI, BIS, and DoT applicable to DCI.
- Understand the Right of Way (RoW) requirements and the procedural flow for approvals.
- Explain interpret regulatory documents for compliance auditing.
- Explain draft and prepare sample RoW applications and related documentation.
- Understand the compliance and provision of Model Buildings Bye Laws (MBBL) and National Building Code (NBC).

Duration (in hours): 07:00	Duration (in hours): 05:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the functions and mandates of TRAI (Telecom Regulatory Authority of India), DoT (Department of Telecommunications) and BIS (Bureau of Indian Standards) in digital connectivity infrastructure. • Explain how to identify relevant standards like BIS standards for structured cabling and DoT guidelines for tower installations and fiber deployment. • Explain the Right of Way (RoW) policy, including central and state-level provisions for underground and overhead telecom infrastructure. • Understand licensing requirements and compliance categories. • Understand the compliance to applicable Model Buildings Bye Laws (MBBL) and National Building Code (NBC) for digital connectivity Infrastructure • Explore national/international best practices for evaluating readiness (e.g., Smart City norms).	• Explain sample documents like DoT circulars, TRAI recommendations. Explain relevant annexures like site layout, route map, NOC request, and safety certifications. • Explain documentation, select routes on digital maps, and check approval workflows.
Classroom Aids	
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software	
Tools, Equipment and Other Requirements	
Sample regulations (DoT RoW Rules, TRAI recommendations, BIS Template RoW application forms and annexures. Model Buildings Bye Laws (MBBL) and National Building Code (NBC) guidelines on DCI.	

Module 3: Digital connectivity Registration process and Rating Lifecycle
Mapped to ICE/TEL/N0305, v1.0

Terminal Outcomes:
- Understand the eligibility, registration, approval, and listing process for Digital Connectivity Rating Agencies (DCRAs).
- Grasp the conditions and ongoing obligations DCRAs must adhere to for effective operation.
- Outline the registration process for Property Managers and their key obligations during the rating lifecycle.
- Explain property classification, the overall rating process, and the foundational TRAI regulations governing digital connectivity ratings.

Duration (in hours): 14:00	Duration (in hours): 09:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the Eligibility Criteria of Digital Connectivity Rating Agency (DCRA) Registration • Explain the registration process of DCRA • Understand the grant of Registration and Listing on Rating Platform. • Explain the conditions of Registration for DCRA • Understand the Obligations for DCRA • Explain the process of registration for Property Manager • Understand the Obligations for Property Manager. • Explain the classification of Properties for Rating. • Explain the process of Rating.	• Understand TRAI's "Rating of Properties for Digital Connectivity Regulations, 2024" and the associated draft manual for property assessment criteria. • Explain filling out sample registration forms and identifying required documentation. • Overview practicing the steps for registering a property for rating, including mock data entry for property details.
Classroom Aids	
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software	
Tools, Equipment and Other Requirements	
Manual "Rating of Properties for Digital Connectivity Regulations, 2024"	

Module 4: Understand the elements of Active and Passive Infrastructure
Mapped to ICE/TEL/N0305, v1.0

Terminal Outcomes:
- Understand the active infrastructure components and their role in managing and directing network signals.
- Explain the function of passive infrastructure elements in enabling physical data transmission across networks.
- Explain the synergy between active and passive systems to ensure seamless and efficient communication.
- Discuss industry standards and protocols for the installation and integration of network infrastructure.

Duration (in hours): 04:00	Duration (in hours): 06:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Define active infrastructure (e.g., routers, switches, access points) and their role in signal processing and network management. - Explain passive infrastructure (e.g., cables, patch panels, connectors) and its function in physical data transmission. - Describe the interaction between active and passive components to enable seamless network communication. - Understand industry standards and protocols governing active and passive infrastructure installation.	- How to setup and configuration of active devices, such as routers and switches, for network connectivity. - Explain the process of terminating and testing passive components like cables and connectors. - Explain continuity and performance tests for passive cabling systems. - Explain the active components and how to integrate with existing passive infrastructure. - Discuss the inspections to identify potential faults in active and passive systems.

Classroom Aids
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements
Crimping tool, cable testers, wire strippers, punch-down tools, Multimeters, Routers, switches, access points, patch panels, network servers, power supplies, Cat5e/Cat6 cables, fiber optic cables, coaxial cables, RJ45 connectors, fiber optic connectors (LC, SC), coaxial connectors, Labels, cable ties, grounding kits, for demo only : network simulation software.

Module 5: Prior processing for DCI
Mapped to ICE/TEL/N0305, v1.0

Terminal Outcomes:

- Discuss the essential steps required for setting up a robust digital connectivity infrastructure.
- Explain the importance of planning for scalability, reliability, and compliance with industry standards.
- Describe how to evaluate the physical environment for installation, including size, layout, ventilation, and power supply.
- Explore the different methods to identify optimal locations for equipment such as routers, switches, and access points.
- Discuss the process of creating network topology diagrams to visualize device connectivity.
- Understand how to select appropriate cabling options like Ethernet or fiber optics and determine routing paths.
- Explain the significance of redundancy and failover mechanisms for uninterrupted connectivity.
- Understand the importance of adhering to TIA/EIA and ISO/IEC standards for cabling and connectivity.
- Describe the steps for estimating the required quantities of cables, connectors, and hardware.
- Explore different methods for verifying the quality of cables, connectors, and other hardware components.
- Explain the process of pre-configuring networking equipment, such as routers and switches, before deployment.

Duration (in hours): 08:00	Duration (in hours): 06:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the preparatory steps needed for setting up a robust digital connectivity infrastructure. • Describe how to evaluate the physical environment for connectivity installation (size, layout, ventilation, power supply). • Explain how to identify optimal locations for equipment placement (routers, switches and access points). • Discuss how to creating network topology diagrams to visualize device connectivity. • Understand how to select appropriate cabling (Ethernet, fiber optics) and routing paths. • Describe about redundancy and failover mechanisms for uninterrupted connectivity. • Understand about adhere TIA/EIA and ISO/IEC standards for cabling and connectivity. • Describe how estimate quantities of cables, connectors, and hardware. • Understand how to verify the quality of cables, connectors, and hardware components. • Understand how to pre-configuring equipment, such as routers and switches,	• How to measure room dimensions and identify obstructions or interference sources for network setup. • Explain the different techniques for marking cable routes and equipment mounting locations accurately. • How to create floor plans that designate specific areas for connectivity equipment installation. • Overview the cable cutting and labeling practices for efficient identification. • Explain the process of crimping RJ45 connectors and testing cables for continuity. • Overview how to set up default IPs, passwords, and initial configurations for routers, switches and access points effectively.

before deployment.

Classroom Aids
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software
Tools, Equipment and Other Requirements
Measuring tape, , Microsoft Visio, Cisco Packet Tracer, Free CAD, Cable cutters, strippers, and crimping tools, Punch-down tools, Fiber optic, Cable testers, Multi-meters, routers, switches, access points, modems, Cat6/Cat6a cables, fiber optics, Patch panels, keystone jacks, and cable management accessories, Cable ties, Velcro straps, conduits, Labels , markers, Insulated gloves , ESD wrist straps and safety goggles

Module 6: Basics of Drone Landing at Digital Infrastructure
Mapped to ICE/TEL/N0305, v1.0

Terminal Outcomes:
- Understand principles of safe drone landing, including altitude control, descent speed, and landing zone assessment.
- Describe how to identify site-specific landing factors in digital connectivity infrastructure such as telecom towers, data centers, and fiber cable zones.
- Discuss how to assess environmental conditions including wind, visibility, GPS strength, and surface stability before landing.
- Explain the landing issues such as signal loss, sensor errors, or obstacle detection warnings.
- Understand DGCA guidelines and site-specific SOPs for drone landing at digital infrastructure sites.

Duration (in hours): 05:00	Duration (in hours): 00:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the principles of safe drone landing, including altitude control, descent speed, and landing zone assessment. • Understand site-specific factors within digital connectivity infrastructure (e.g., Data center rooftops, fiber cable zones) that influence landing operations. • Describe the wind, visibility, GPS signal strength, and surface stability before initiating a landing. • Discuss the precautions to avoid electromagnetic interference (EMI) and prevent damage to network hardware or communication lines. • Understand how to Identify and address potential challenges such as signal loss, sensor errors, or obstacle detection warnings during descent. • Understand basic DGCA (Directorate General of Civil Aviation) guidelines and site-specific standard operating procedures for drone landing.	

Classroom Aids
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements
NIL

Module 7: Digital Connectivity Compliance as per Model Building Bye Laws (MBBL) and National Building Code (NBC)
Mapped to ICE/TEL/N0306, v1.0

Terminal Outcomes:
- Understand the importance of MBBL and NBC in DCI design and implementation.
- Verify the approval status and compliance of DCI designs.
- Assess the physical implementation of DCI against approved designs.
- Identify and document deviations from MBBL and NBC standards.
- Prepare compliance checklists and score assessments accurately.

Duration (in hours): 12:00	Duration (in hours): 11:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the purpose and scope of Model Building Bye-Laws (MBBL) and National Building Code (NBC) in relation to digital connectivity infrastructure (DCI). - Discuss the key provisions within MBBL and NBC that pertain to structured telecom infrastructure, safety standards, and future-readiness for digital services. - Understand the requirements for DCI design planning and formal approval. - Explain the elements of DCI design as per applicable bye-laws or NBC (e.g., horizontal and vertical pathways, entry points, telecom rooms, HVAC in telecom rooms). - Explain the importance of design adherence for seamless connectivity and future-proofing. - Understand the principles of ensuring DCI implementation strictly aligns with the approved design. - Understand the concepts of standardization, quality, and maintainability in digital infrastructure deployment. - Understand as-build documents and their verification against approved designs. - Define minor vs. major deviations in DCI design and implementation. - Discuss the impact of deviations on future readiness and digital connectivity provisioning. - Understand the requirements for	- Overview reviewing architectural drawings and DCI blueprint for formal approvals and adherence to MBBL/NBC. - Explain verifying certification by competent authorities. - Overview conducting on-site physical verification of DCI installation against approved designs. - Explain documenting observed compliance and deviations with supporting evidence (e.g., photographs). - Explain recording specific deviations and their types. - Overview reviewing testing and commissioning certificates for DCI components to validate as-build implementation.

maintaining compliance summaries, architectural drawings, and site inspection reports. • Explain the scoring criteria based on compliance levels.	

Classroom Aids

Whiteboard, Marker, Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

Document viewing software (PDF reader, CAD software for architectural drawings), Spreadsheet software (e.g., Microsoft Excel, Google Sheets) for compliance checklists and scoring, Image capturing and editing software for site photographs. **Hardware:** Computer/laptop for document review and report generation, Digital camera/smartphone for capturing site photographs. **Other Requirements:** MBBL and NBC regulations, Checklists for physical verification.

Module 8: Robust Digital Connectivity in Civil Infrastructure as per MBBL and NBC
Mapped to ICE/TEL/N0306, v1.0

Terminal Outcomes:

- Evaluate civil infrastructure provisions beyond MBBL/NBC for DCI maintenance and future upgrades.
- Assess the scalability and upgradability of telecom rooms and cable pathways.
- Determine the readiness of civil infrastructure for future mobile and wireline technologies.
- Verify the ease of access for DCI repair and maintenance.
- Document and score additional civil infrastructure provisions accurately.

Duration (in hours): 10:00	Duration (in hours): 12:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Understanding the rationale for exceeding MBBL and NBC standards for enhanced digital connectivity. - Explain the concepts of future-proofing, scalability, and maintainability in DCI civil infrastructure. - Describe the importance of capacity for expanding telecom rooms, cable pathways, and ducts to support increasing telecom and digital infrastructure needs. - Understand the provisions for alternate telecom cable entry points, horizontal and vertical pathways. - Explain the assessing civil infrastructure to support future mobile technologies (e.g., 5G/6G), wireline connectivity (e.g., fiber-optic cables), IoT, M2M communication, etc. - Understand the space earmarking for mobile base stations, distributed antenna systems, Wi-Fi infrastructure, DTH systems, etc. - Discuss the significance of planned access areas for DCI to ensure ease of maintenance and repair. - Understand the importance of clear labeling and marking of DCI equipment, pathways, and cable ducts. - Explain the requirements for building layout plans, expansion feasibility reports, and site photos. - Explain scoring criteria based on the level of provision for expansion and ease of access.	- Overview conducting physical inspections to assess the availability, scalability, and upgradability of civil infrastructure (telecom rooms, ducts, pathways). - Explain evaluating maintainability (ease of installation, repair, and replacement). - Overview verifying allocation of space for telecom rooms, ducts, and cable pathways that exceed standard requirements. - Explain marking specific civil infrastructure deemed beyond requirements. - Overview inspecting telecom rooms, ducts, risers, and pathways for sufficient space for future mobile and wireline deployments. - Explain assessing earmarked space for mobile base stations, DAS, Wi-Fi, and DTH. - Overview checking physical accessibility of pathways, telecom rooms, cable ducts, and equipment points. - Explain verifying labeling and marking of DCI elements.

Classroom Aids

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

CAD software or image viewer for building layout plans, Spreadsheet software for compliance checklists and scoring, Digital camera/smartphone for site photos. **Hardware:** Measuring tape/laser distance meter for assessing space, Lighting equipment for inspecting confined spaces.

Module 9: Reliable Digital Connectivity in Power Infrastructure, as per MBBL or NBC
Mapped to ICE/TEL/N0306, v1.0

Terminal Outcomes:

- Assess the availability and functionality of redundant power sources for DCI.
- Verify the robustness and backup duration of UPS systems for DCI.
- Evaluate the implementation and effectiveness of power continuity monitoring systems.
- Understand the integration of DCI power, fire alarms, and HVAC with Building Management Systems (BMS).
- Document and score power infrastructure provisions for reliability.

Duration (in hours): 10:00	Duration (in hours): 12:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the criticality of uninterrupted and reliable power supply for DCI operation. - Discuss the role of redundant power sources (backup generators, alternative power systems) in ensuring DCI operational continuity during power failures. - Explain the significance of Uninterrupted Power Supply (UPS) systems for service availability. - Understand the UPS capacity, backup time calculation, and redundancy (load sharing). - Discuss the role of power supply monitoring systems in ensuring DCI power continuity. - Explain the concepts of real-time power status dashboards, health status monitoring (UPS, generator, switch gear), and automated alert mechanisms. - Explain the purpose of BMS in centralized control and monitoring of major building services (fire alarms, access control, HVAC, power systems). - Understand the impact of BMS integration on DCI service availability and continuity. - Understand the requirements for power layout diagrams, load switchover test reports, monitoring system screenshots, and BMS architecture diagrams. - Explain the scoring criteria based on redundancy, UPS backup duration, and monitoring/BMS integration levels.	- Overview verifying the availability of redundant power sources and confirming key DCI systems. - Explain conducting sample power source switching tests (automatic switchover). - Overview checking DCI systems for UPS backup from line diagrams. - Explain verifying UPS power capacity against DCI system rated load. - Overview sample testing UPS system's ability to provide uninterrupted power during input power failure. - Explain verifying availability of monitoring dashboards showing real-time power status and alerts. - Overview testing automated alert mechanisms for real-time notification of power anomalies. - Explain verifying integration of DCI power, fire alarms, and HVAC with BMS. - Overview validating BMS communication and notification capabilities.
Classroom Aids	
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint	

Presentation and software
Tools, Equipment and Other Requirements
Spreadsheet software for compliance checklists and scoring, Monitoring system interface software (for screenshots). **Hardware:** Multimeter/power analyzer (optional for advanced verification).

Module 10: Resilience Digital Connectivity Infrastructure
Mapped to ICE/TEL/N0306, v1.0

Terminal Outcomes:

- Assess the availability of alternate external entry paths for DCI to ensure route diversity.
- Evaluate the implementation of non-flooding measures to protect DCI installations.
- Verify the redundancy in power sources and DCI pathways within the property.
- Document and score DCI resilience measures comprehensively.

Duration (in hours): 12:00	Duration (in hours): 13:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Define DCI resilience and its importance in ensuring uninterrupted digital connectivity. - Understand how DCI can withstand disruptions, minimize downtime, and manage network congestion. - Explain the significance of alternate external entry paths for DCI in providing route diversity. - Understand the impact of route diversity on reducing service disruptions from network faults or damage within the property. - Explain the ideal scenario: route diversity up to telecom rooms. - Understand the risks of flooding to DCI and measures to mitigate damage (raised installations, waterproof enclosures, drainage systems). - Understand the strategic placement of telecom rooms and power equipment (UPS, generators, switch panels) on higher floors or raised platforms. - Discuss the importance of independent drainage systems for DCI rooms. - Explain the application of redundancy to both power supply and connectivity pathways (fiber, other cables) inside the property. - Understand ensuring path diversity across building blocks, basements, and towers. - Discuss the requirement of a minimum of two physically separated paths for digital connectivity till key aggregation points. - Describe the requirements for ducts and pathway layout diagrams, design	- Overview examining on-site layouts for ducts from entry points and cable pathways to confirm alternate entry paths. - Explain assessing sufficient capacity for multiple service providers. - Overview checking actual location of telecom rooms (higher floors, away from flooding zones). - Explain verifying installation of power equipment on raised platforms. - Overview ensuring no water drain systems is connected to DCI rooms. - Explain checking the availability and functional checks of drainage systems to prevent backflow. - Overview reviewing DCI for independent power sources (main grid, backup generators/UPS). - Explain examining availability of path diversity for fiber and other cables across building blocks. - Overview verifying physically separated paths for digital connectivity. - Explain preparing assessment reports on DCI resilience, including photo evidence and test reports.

documentation, and photographic evidence. • Explain the scoring criteria based on the level of alternate paths, non-flooding measures, and implemented redundancies.	

Classroom Aids

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

CAD software or image viewer for layout diagrams, Spreadsheet software for compliance checklists and scoring, Digital camera/smartphone for photographic evidence. **Hardware:** Measuring tape/laser distance meter. **Other Requirements:** Ducts and pathway layout diagrams, Power and cable layout diagrams

Module 11: Digital Connectivity Infrastructure demand or readiness in future
Mapped to ICE/TEL/N0307, v1.0

Terminal Outcomes:

- Assess the property's infrastructure for supporting the latest generation of mobile connectivity (4G/5G).
- Validate the support or upgradability of installed DCI for future frequency bands and technologies.
- Evaluate the upgradability and scalability of wireline DCI, particularly fiber-optic networks.
- Document and score the future readiness of digital connectivity infrastructure.

Duration (in hours): 12:00	Duration (in hours): 13:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the importance of future readiness in DCI. - Understand how DCI can adapt, scale, and integrate upcoming innovations (5G, advanced Wi-Fi, smart building solutions). - Discuss the requirements for infrastructure to support 4G/5G and future network standards (high-speed, low-latency, reliable communication). - Explain the key components: Distributed Antenna Systems (DAS), fiber backhaul connectivity. - Explain the importance of designing DCI to support integration of future wireless communication bands and evolving wired/mobile technologies. - Understand the capability of RF infrastructure (radio units, baseband units, duplexers, combiners, transmitters) for upcoming technologies. - Understand the crucial role of fiber-optic networks in high-speed internet access. - Explain the evaluating infrastructure for higher bandwidth capacities (1 Gbps, 10 Gbps, or higher), new transmission standards (DWDM) Dense Wavelength Division Multiplexing, (PON) Passive Optical Networks and enhanced network architectures. - Understand assessing physical infrastructure for adding fiber cables (pathways, ducts, termination points). - Explain the requirements for lists of installed equipment, photographs, Bill of Material (BoM), datasheets, and wireline	- Overview physically inspecting mobile network infrastructure (DAS, fiber backhaul). - Explain cross-checking compatibility with current frequency bands for latest technology. - Overview assessing support or upgradability of installed DCI for future bands. - Explain verifying RF infrastructure capabilities. - Explain assessing current fiber-optic network bandwidth capabilities (e.g., 1 Gbps, 10 Gbps). - Overview evaluating fiber type for DWDM/PON support. - Overview inspecting physical infrastructure (cable pathways, ducts, fiber termination points) for future fiber additions. - Explain checking fiber distribution frames for ease of upgrades/expansions. - Explain how to prepare assessment reports on future readiness, including BoM, datasheets, and photographic evidence.

DCI upgradability documents. • Discuss scoring criteria based on technology support, future band compatibility, and wireline bandwidth capabilities.	

Classroom Aids

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

Spreadsheet software for compliance checklists and scoring, Digital camera/smartphone for photographs. **Hardware:** Optical power meter/fiber test equipment (optional for advanced wireline verification). **Other Requirements:** mobile and wireline technologies (4G, 5G, DWDM, PON).

Module 12: Wired Digital Connectivity
Mapped to ICE/TEL/N0307, v1.0

Terminal Outcomes:

- Assess the quality and redundancy of backhaul fiber connectivity from service providers to the property.
- Verify the extension of fiber connectivity to individual user premises within the property.
- Evaluate the availability of fiber connectivity in each room, office, or commercial space.
- Document and score the wired connectivity infrastructure.

Duration (in hours): 12:00	Duration (in hours): 13:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Understand the role of wired connectivity in providing high-speed, reliable, and low-latency digital connectivity. - Explain the support for various applications: business operations, smart building technologies, residential broadband. - Discuss the essentiality of high-capacity fiber optic backhaul from service provider to property. - Understand the benefits: enhanced network performance, reduced latency, support for high-bandwidth applications (video conferencing, cloud computing, smart building management). - Understand the redundancy measures (dual entry fiber paths). - Explain the significance of extending fiber-optic infrastructure directly to end-users (residential, office, commercial units). - Explain the advantages of superior bandwidth, lower latency, future-proof infrastructure (5G backhaul, cloud services and smart building applications). - Discuss the importance of well-planned fiber layouts from telecom rooms to user premises for faster provisioning and maintenance. - Understand the goal of providing fiber connectivity to every individual space within the property. - Understand eliminating dead zones and ensuring uniform digital experience. - Understand the requirements of fiber testing results, photographs of	- Overview conducting physical verification of fiber optic backhaul infrastructure. - Explain checking redundancy measures for uninterrupted connectivity. - Explain measuring and validating actual peak and average bandwidth from all service providers. - Overview physically verifying that fiber-optic cabling extends up to each residential, office, or commercial unit. - Explain reviewing fiber network architecture diagrams showing distribution. - Explain visually inspecting rooms, offices, or commercial spaces on a sample basis for fiber-optic connectivity infrastructure and termination points. - Overview conducting sample fiber test reports confirming connectivity to each unit and termination points. - Explain preparing assessment reports on wired connectivity, including test results and photographic evidence.

termination points, fiber network architecture diagrams and site survey reports.	
• Understand scoring criteria based on the number of wireline service providers, percentage of fiber-connected user units, and extent of in-room fiber connectivity.	

Classroom Aids

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

Spreadsheet software for compliance checklists and scoring, Digital camera/smartphone for photographs. **Hardware:** Optical fiber power meter, Visual Fault Locator (VFL), Optical Time Domain Reflectometer (OTDR) for fiber testing

Module 13: Digital Connectivity Infrastructure Service Providers
Mapped to ICE/TEL/N0307, v1.0

Terminal Outcomes:

- Confirm the number of wireline Internet Service Providers (ISPs) integrated with the property's DCI.
- Assess the extent to which mobile service providers have coverage or integration with the property's DCI.
- Verify active service subscriptions and operational status of integrated providers.
- Document and score the availability of service providers, enhancing competition and choice.

Duration (in hours): 12:00	Duration (in hours): 06:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Understand the presence of multiple wireline (ISPs) Internet service Providers and mobile service providers enhance competition, service quality, redundancy and network resilience. - Explain the benefits for property managers, businesses, and residents: greater flexibility, improved service continuity, optimized cost structures. - Explain verification methods for (ISPs) Internet service Providers integration with DCI. - Discuss review of agreements and integration test reports. - Explain validation of operational status of integrated ISPs. - Understand assessing indoor mobile coverage from multiple Telecom Service Providers (TSPs). - Explain validation of DCI integration with In-Building Solutions (IBS), Small Cells, or Wi-Fi offload for enhanced indoor coverage. - Understand the requirements for TSP/ISP agreements; network integration certificates/test reports, service subscription status, RF coverage maps, and network performance test results. - Understand scoring criteria based on the number of integrated wireline ISPs and mobile service providers, and their coverage percentage.	- Overview inspecting infrastructure and service availability to confirm the number of integrated wireline ISPs. - Explain reviewing TSP/ISP agreements and sample integration test reports. - Explain how to prepare assessment reports on service provider availability, including integration details and coverage verification.
Classroom Aids	

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements
Spreadsheet software for compliance checklists and scoring, RF signal strength measurement tools/apps (e.g., for walk/drive tests). **Hardware:** Mobile phones/test devices for coverage verification. **Other Requirements:** Sample TSP/ISP agreements, Network integration certificates, RF coverage maps or walk/drive test results.

Module 14: Digital Connectivity Infrastructure Service Quality Assessment
Mapped to ICE/TEL/N0307, v1.0

Terminal Outcomes:

- Assess mobile network coverage and performance in public areas, including lifts and basements.
- Evaluate the security, coverage, and performance of public Wi-Fi networks in public areas.
- Measure mobile network coverage and performance in non-public areas.
- Determine the security, coverage, and performance of public Wi-Fi networks in non-public areas.
- Assess the average download speed of different wireline networks.
- Document and score service performance parameters.

Duration (in hours): 14:00	Duration (in hours): 12:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Understand parameters like signal strength, data speed (download/upload), latency, call quality (voice/video), call setup success rate, call retainability, and service uptime. - Describe the importance of performance assessment in public and non-public areas, including challenging environments like lifts and basements. - Understand the methodology for RF testing for mobile coverage. - Understand the assessing data speed and voice call quality during peak and off-peak hours. - Understand the reference signal strength as per TRAI QoS regulations - Understand the evaluation of Wi-Fi network availability, security measures (WPA2/WPA3 compliance), speed, and latency - Discuss the importance of secure and seamless Wi-Fi for data and voice services - Understand the assessment of average download speed for different wireline networks in their highest speed plans - Explain the comparison of actual speeds against advertised speeds. - Understand the requirements for RF coverage maps, speed test logs, call quality reports, Wi-Fi coverage maps, and security audit reports - Understand scoring criteria based on coverage percentage, minimum download speeds, and number of service providers	- Overview conducting RF testing in public areas (lobbies, corridors, lifts, basements) and non-public areas (flats, offices, conference rooms) using industry-standard tools. - Explain assessing data speed and voice call quality over a day covering peak hours - Identifying all public and non-public Wi-Fi service areas. - Overview conducting sample WPA2/WPA3 compliance checks for security. - Overview performing coverage, speed, and latency tests during peak hours. - Overview conducting speed tests using standard tools (e.g., TRAI My Speed App) at various user locations during peak traffic hours - Explain RF coverage maps and Wi-Fi heatmaps. - Explain preparing assessment reports on service performance, including detailed test results.

| meeting performance thresholds. | |

Classroom Aids

Whiteboard, Marker, Computer/laptop, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

RF testing tools (e.g., dedicated mobile network testing software, spectrum analyzers), Wi-Fi analysis tools (e.g., Wi-Fi survey software, network sniffers), Speed test applications (e.g., TRAI My Speed App), Spreadsheet software for data analysis and reporting. **Hardware:** GPS for location tagging during tests. **Other Requirements:** Knowledge of TRAI QoS regulations for signal strength, Reference values for minimum download speeds for 4G/5G and Wi-Fi.

Module 15: Digital Connectivity Infrastructure: User Perception & Feedback
Mapped to ICE/TEL/N0307, v1.0

Terminal Outcomes:

- Understand the importance of user feedback in assessing digital connectivity quality.
- Design and implement structured surveys for collecting user feedback on various aspects of digital connectivity.
- Identify compliance requirements and scoring criteria related to user experience in digital connectivity assessments.
- Prepare and maintain necessary documentation for user feedback.

Duration (in hours) : 05:00	Duration (in hours) : 05:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Define user experience in the context of mobile, wireline and Wi-Fi services. - Explain the key parameters influencing user experience: network reliability, speed, latency, ease of access, call quality, streaming quality, minimal disruptions. - Understand the sampling methods: minimum user feedback collection (10% of users if <1000, 100 users if >1000) - Describe the different types of questions for assessing voice call quality, accessibility, retainability, data speed (wireline and wireless), latency, service uptime, and coverage - Understand detailed compliance checklist for user feedback forms. - Understand scoring criteria based on the percentage of users providing overall positive experience (80%, 70%, 50%, 40%). - Explain the procedures for uploading relevant documents to the rating platform or maintaining them at the DCRA level.	- Identifying documents compliance and non-compliance. - Explain how to prepare a module-specific report summarizing the user experience assessment findings, including scores and supporting evidence.

Classroom Aids
Whiteboard, Marker, Computer/laptop , Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements
NA

Module 16: Reporting, Monitoring, Feedback and Non - Compliance
Mapped to ICE/TEL/N0308, v1.0

Terminal Outcomes:

- Understand the DCRA's responsibilities in monitoring and responding to feedback and complaints post-rating.
- Explain the functionality and purpose of the standardized stakeholder feedback mechanism on the rating platform.
- Describe the lifecycle of stakeholder feedback, from submission and categorization to resolution by Property Managers.
- Comprehend the process and importance of yearly reviews of stakeholder feedback conducted by DCRAs.
- Outline the procedure for Property Managers to take and report corrective actions in a time-bound manner.
- Understand how instances of non-compliance by DCRAs or Property Managers are addressed as per regulations.

Duration (in hours): 15:00	Duration (in hours): 15:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain structured methodology for conducting DCI audit reports, compliance summaries, identifying non-compliance, and deviation logs reports for the TRAI rating system. - Understand the DCRA's mandate (Regulation 11) to continuously monitor feedback and complaints received from service providers and end-users regarding awarded ratings. - Understand the DCRA's responsibility to examine feedback, evaluate the need for rating review or corrective actions, and follow up with the property manager. - Understand the Standardized Stakeholder Feedback Mechanism - Explain feedback Processing and Resolution by Property Managers - Discuss yearly review of stakeholder feedback by DCRA. - Understand the corrective Actions by Property Managers: - Explain how addressing Non-Compliance - Understand the validating the credibility of submitted evidence.	- Explain practicing reviewing mock feedback/complaint data on a rating platform. - Explain categorizing incoming feedback according to defined categories (connectivity performance, infrastructure gaps and general suggestions). - Overview preparing a summary review report for DCRA, including analysis, conclusions, and recommendations for the property manager. - Identifying types of evidence that would support stakeholder feedback (e.g., speed test screenshots, photos of infrastructure issues). - Explain how to compile findings, images, and compliance status into a structured report format (PDF/Excel). - Overview how to use digital tools (smartphone/tablet) for real-time reporting during on-site evaluations.

Classroom Aids
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements
Spreadsheet Software: (e.g., Microsoft Excel, Google Sheets), **TRAI Regulations:** Access to the relevant sections of "Rating of Properties for Digital Connectivity Regulations, 2024" (specifically Regulation 11)

Module 17: Digital Connectivity Award of Rating and Reassessment
Mapped to ICE/TEL/N0309, v1.0

Terminal Outcomes:

- Understand the classification system for digital connectivity ratings.
- Explain the factors determining the validity period of digital connectivity ratings.
- Identify the eligibility criteria for re-rating a property's digital connectivity.
- Describe the components of a full upgrade of Digital Connectivity Infrastructure (DCI) that warrant a re-rating.
- Recognize technological advancements and user demand as drivers for re-rating.
- Understand other regulatory and service-related changes that may necessitate a re-rating.

Duration (in hours): 18:00	Duration (in hours): 11:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Overview of how digital connectivity ratings are categorized and assigned (e.g., A, B, C, etc - Understand the purpose of different rating tiers in reflecting the quality and robustness of digital infrastructure. - Understand the concept of Rating Validity. - Explain the factors affecting validity period and purpose of Re-rating and Eligibility Criteria for Re-rating. - Explain Digital Connectivity Infrastructure (DCI) including: i. Expansion of fiber optic networks (e.g., increased capacity, broader reach). ii. Installation in-building solutions (IBS) to improve indoor mobile coverage. iii. Enhancement of power backup systems (UPS, generators) for critical digital infrastructure. iv. Integration of smart network management systems for improved monitoring and control. - Understand how the deployment of new technologies (e.g., 5G, advanced Wi-Fi standards, high-speed fiber networks) improves connectivity. - Understand the impact of significant improvements in broadband speed, latency, and network resilience. - Explain the implementation of next-generation digital services (e.g., IoT-enabled automation) and their role in increasing demand for upgraded ratings. - Explain the role of expanding digital service requirements from occupants, enterprises, or businesses in driving re-rating requests. - Understand the affecting the Rating as per	- Overview case studies to determine appropriate validity periods based on infrastructure characteristics and regulatory context. - Explain reviewing project plans, implementation reports, and certification documents for DCI upgrades. - Explain user feedback and demand reports to justify technological up - gradation for re-rating. - Overview verifying regulatory compliance updates and new service provider agreements.

Regulatory Criteria: i. Increase in the number of telecom service providers (wired or wireless) at the property. ii.Upgraded compliance with Model Building Bye-Laws (MBBL) and National Building Code (NBC) for digital infrastructure (e.g., addressing previous deviations). iii. Expansion of telecom facilities to previously underserved areas within the property. iv. Improvements in service reliability, redundancy, and fault tolerance mechanisms.	

Classroom Aids

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

Spreadsheet software (e.g., Microsoft Excel, Google Sheets), Case studies

Module 18: Digital Connectivity Rating Renewal and Appeal process
Mapped to ICE/TEL/N0309, v1.0

Terminal Outcomes:
- Understand the application timeline and submission requirements for rating renewal.
- Identify the necessary documentation and information for a renewal application.
- Describe the assessment and verification process for rating renewals, including documentation review, infrastructure inspection, performance evaluation, and regulatory compliance checks.
- Explain the multi-tiered appeal process (DCRA review, Authority escalation) for rating decisions.
- Prepare and submit renewal applications and appeal documents accurately.

Duration (in hours): 20:00	Duration (in hours): 11: 00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Understand the importance of adhering to prescribed timelines for renewal applications to ensure continuity of rating. - Overview of the submission channels and procedures for renewal applications. - Understand the need to document any modifications or enhancements made to the Digital Connectivity Infrastructure (DCI) since the previous assessment includes expansion of networks, installation of new solutions, or enhancements to power systems. - Understand the significance of a formal self-declaration affirming continued adherence to Model Building Byelaws (MBBL), National Building Code (NBC). - Understand the payment requirements and schedules for renewal processing fees. - Understand the recognition of the renewal assessment for comprehensive process used for the initial award of ratings. - Understand examination of submitted records, including previous compliance reports, updated infrastructure documentation, and service provider agreements. - Understand the necessity of a physical or digital audit to verify the property's telecom infrastructure and its ongoing adherence to the original rating criteria. - Understand the assessment of current service reliability, network availability and analysis of user feedback. - Explain about verification that the property remains compliant with MBBL, NBC, and all other applicable digital infrastructure	- Explain compiling necessary documentation for renewal, including upgrade details, self-declarations, and fee payment proofs. - Identifying and addressing any gaps in documentation from previous assessments. - Role-playing exercises where trainees act as assessors reviewing documentation, conducting virtual inspections (based on provided scenarios/diagrams), and evaluating performance data for a renewal. - Identifying and selecting appropriate supporting documentation for an appeal. - Understand the procedural steps for filing an appeal with DCRA and, if necessary, escalating to the Authority.

standards.

Appeal Process:

- Understand the mechanism for property managers to dispute or seek reconsideration of a rating decision.
- Understand the requirement for a clear justification, citing specific criteria or sub-criteria for reconsideration.
- Explain the importance of providing comprehensive supporting documentation, technical reports, or third-party assessments.
- Discuss about inclusion of any additional evidence of DCI improvements not previously considered.
- Understand potential outcomes of DCRA review: revising the rating, upholding the original rating, or recommending corrective actions for future re-rating.
- Understand the timelines (within 30 days of DCRA decision) and prescribed format for escalation.
- Discuss fee requirements for appeal submission at the Authority level.
- Understand the finality of the Authority decision after the expiry of the appeal period.
- Explain the different methods of examination: Independent case assessment based on submitted evidence and regulatory provisions, or review by a specialized expert panel providing recommendations.

Classroom Aids

Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements

Spreadsheet Software: (e.g., Microsoft Excel, Google Sheets), **Communication Tools:** Email, video conferencing. **Hardware:** Scanner/Digital Camera.

Module 19: Digital Connectivity Infrastructure Risks, Faults, and Remediation
Mapped to ICE/TEL/N0310, v1.0

Terminal Outcomes:

- Identify typical risks and hazards in DCI infrastructure evaluation.
- Assess causes and types of infrastructure faults or non-compliance.
- Recommend corrective and preventive measures.
- Document remedial actions and update evaluation reports.
- Use safety and risk mitigation tools on-site.

Duration (in hours): 08:00	Duration (in hours): 07: 00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Discuss the different types of Risks and hazards in Digital connectivity Infrastructure. - Understand the root causes of common faults and types of infrastructure faults or non-compliance - Explain the DCI remedial actions and mitigation strategies and preventive practices. - Document remedial actions and update evaluation reports. - Understand corrective actions based on test results.	- Overview the sample DCI layout or images. - Explain mark and list observed risks. - Explain checking power load at a PDU and recommend load balancing or UPS replacement. - Explain fill a risk register (fault, cause, impact, action taken, follow-up). - How to update a DCI sample evaluation report with remediation status.
Classroom Aids	
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software	
Tools, Equipment and Other Requirements	
Spreadsheet Software: (e.g., Microsoft Excel, Google Sheets), **Digital Camera/Smartphone:** For capturing images of DCI for risk identification and remediation proof. **Multimeter/Power Analyzer:** For understanding power load checks, Sample DCI Layouts and Images, Risk Register Template, DCI Evaluation Report Template	

Module 20: Workplace Safety and Sustainable Practices
Mapped to ICE/TEL/N0311, v1.0

Terminal Outcomes:
- Explain how to apply field safety standards for telecom and fiber work, including height and electrical hazards.
- Understand conduct risk identification and implement mitigation protocols for on-site work.
- Overview the correct usage of PPE and safe climbing practices.
- Discuss complete field safety audits using validated checklists and tools.

Duration (in hours): 06:00	Duration (in hours): 09:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss safety protocols for working at height, including proper equipment use (e.g., harnesses, fall arresters). • Understand electrical safety precautions, including lockout/tagout procedures, grounding, and safe handling of electrical components. • Explain safety hazards associated with telecom towers, fiber installations, and data center environments. • Understand the process of conducting a site risk assessment by identifying potential hazards (e.g., falls, electrical shock, heat exposure). • Understand assess the severity and likelihood of risks to prioritize safety measures. • Discuss implement mitigation strategies (e.g., safety barriers, fire protection measures, emergency response protocols). • Understand the importance of adhering to field protocols for safety, including signage, equipment checks, and communication procedures. • Understand confined space entry protocols, especially for underground or enclosed DCI installations. • implement ways to optimize usage of material including water in various tasks/activities/processes • Supervise the team to ensure responsible use of resources. • Motivate the team to carry out routine cleaning of tools, machines and equipment. • Guide the team to optimize use of electricity/energy in various tasks/activities/processes.	• Explain wear and adjust personal protective equipment (PPE), including helmet, gloves, boots, and harness, following industry standards. • Explain the use fall protection gear like lifelines, lanyards and anchor points. • Overview performs a safe climbing procedure for telecom towers, ensuring all safety protocols are followed during ascent and descent. • Overview the use of appropriate climbing gear (e.g., climbing harness, rope, fall arrest device) and techniques to minimize risks. • Overview performs a safety audit on-site using a checklist to identify potential hazards (e.g., exposed cables, unsecured equipment). • Explain review and document corrective actions needed to improve safety compliance at the worksite. • Explain how to respond and simulate emergency scenarios (e.g., electrical shock, fall) by applying appropriate first aid measures and notifying authorities. • Understand the evacuation procedures and site-specific emergency protocols. • Implement periodic checks of the functioning of the equipment/machine and rectify wherever required • Guide the team to report malfunctioning and lapses in maintenance of equipment • Implement ways to use electrical equipment and appliances properly

Classroom Aids
Whiteboard, Marker, Computer, Peripherals (keyboard, mouse, monitor), Projection Equipment, PowerPoint Presentation and software

Tools, Equipment and Other Requirements
Personal Protective Equipment (PPE): Helmet, gloves, boots, high-visibility vest, fall protection gear: climbing harness, lifeline, shock-absorbing lanyards, Anchor points, **Safety Auditing Tools:** Field safety checklist, Risk assessment templates for evaluating site hazards.

Module 21: Employability Skills (60 Hours)
Mapped to DGT/VSQ/N0102, v1.0

Duration (in hours): 60:00

Key Learning Outcomes

Introduction to Employability Skills :

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries.
2. List different learning and employability-related GOI and private portals and their usage.

Constitutional values - Citizenship :

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen.
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century :

5. Discuss the importance of relevant 21st-century skills.
6. Exhibit 21st-century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Elucidate the appropriate code of conduct.

Basic English Skills :

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone.
9. Read and interpret text written in basic English.
10. Write a short note/paragraph / letter/e -mail using basic English.

Career Development & Goal Setting :

11. Discuss the difference between job and career.
12. Create a career development plan with well-defined short- and long-term goals.

Communication Skills :

13. Elucidate the importance of communication and professional communication.
14. Explain the importance of following verbal and non-verbal communication etiquette in various settings.
15. Elucidate the process of interacting with reporting superiors regarding job order, work output requirements, targets, performance indicators, and incentives.
16. Discuss how effective coordination ensures the timely completion of tasks in accordance with quality standards.
17. Describe the steps involved in ensuring the timely resolution of problems, complaints, and delays

through coordination with relevant personnel and superiors.

18. Determine the role of active communication and respect in achieving a smooth workflow and resolving work standards and quality-related concerns with personnel and superiors.

19. Explain the significance of maintaining appropriate documentation concerning completed work schedules as per organizational requirements.

20. Elucidate the importance of prioritizing teamwork and supporting team members in achieving shared goals.

Diversity & Inclusion :

21. Describe the recommended practices for preventing sexual harassment, physical and verbal abuse, and the objectification of women in the workplace.

22. Discuss the appropriate safety precautions to follow while utilizing transportation facilities and during night trips, particularly concerning women's safety.

23. Elucidate the process for escalating issues related to abuse and sexual harassment in the workplace according to the POSH Act and organizational procedures.

24. Determine how to effectively educate co-workers on women's rights and the importance of showing respect to all genders, including persons with disabilities.

Financial and Legal Literacy :

25. Outline the importance of selecting the right financial institution, product, and service.

26. Overview how to carry out offline and online financial transactions, safely and securely.

27. List the common components of salary and compute income, expenditure, taxes, investments etc.

28. Discuss the legal rights, laws, and aids.

29. Elucidate the purchase, inspection, indenting, and recordkeeping procedure for stores.

Essential Digital Skills :

30. Describe the role of digital technology in today's life.

31. Overview how to operate digital devices and use the associated applications and features, safely and securely.

32. Discuss the significance of displaying responsible online behaviour while browsing, using various social media platforms, e-mails, etc., safely, and securely.

33. Create sample word documents, excel sheets and presentations using basic features.

34. utilize virtual collaboration tools to work effectively.

Entrepreneurship :

35. Explain the types of entrepreneurships and enterprises.

36. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan.

37. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement.

38. Create a sample business plan, for the selected business opportunity.

39. Describe the best practices for leading teams.

40. Explain the 5S Standards and their implementation for organize the workplace and create a

productive work environment.

41. Explain how to manage clients, contractors, subordinates and labourers.

Customer Service :

42. Explain the importance of implementing appropriate hygiene, grooming standards, and professional dress code at work to cater to different types of customers.

43. Elucidate the significance of practicing and encouraging active listening for effective communication with both customers and co-workers.

44. Discuss the methods used to ensure effective probing of customers to identify their needs and expectations.

45. Describe the strategies for maintaining effective communication with customers, keeping them informed regarding any issues and developments involving them.

46. Determine the steps involved in identifying and addressing customer dissatisfaction and complaints promptly and effectively.

47. Explain the importance of being fair and firm with staff to achieve work objectives and describe leave and attendance management.

48. Explain the importance of upskilling self and staff for continuous improvement.

Getting Ready for apprenticeship & Jobs :

49. Create a professional Curriculum Vitae (CV)

50. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively.

51. Discuss the significance of maintaining hygiene and confidence during an interview.

52. Elucidate how to give a personal introduction and present oneself.

53. Perform a mock interview.

54. List the steps for searching and registering for apprenticeship opportunities.

On- the- Job-Training
Mapped to ICE/TEL/Q0302, v1.0

Mandatory Duration (in hours): 30:00	Recommended Duration (in hours): 00:00
Location: On-Site/ Off-Site	

Terminal Outcomes:

- Understand compliance requirements from Model Building Bye-Laws (MBBL) and National Building Code (NBC) for digital infrastructure integration.
- Identify relevant clauses related to ducts, fiber pathways, telecom rooms, and access points in building codes.
- Apply compliance standards during construction and field assessments to ensure regulatory adherence.
- Verify installations against code provisions and assess civil structures for digital infrastructure readiness.
- Evaluate integration of power and telecom systems , including raceways and cable separation practices.
- Implement safety and resilience features like redundancy, uptime planning, and failover mechanisms.
- Plan for disaster recovery setups , alternate routing, and future scalability of infrastructure.
- Assess infrastructure readiness for emerging technologies like 5G, IoT, and smart systems.
- Ensure future-proof design considering urban planning, population density, and service demand growth.
- Install and inspect wired networks , including fiber and copper cabling, for performance and compliance.
- Coordinate with ISPs and telecom providers for backhaul connectivity and service provisioning.
- Measure network KPIs such as bandwidth, latency, and packet loss to evaluate performance.
- Collect and analyze user feedback using structured tools to improve service quality.
- Document all processes, including approvals, test reports, compliance logs, and deviation records.
- Follow field safety protocols for working at heights, electrical safety, and confined space entry during DCI deployment.

Annexure

Trainer Requirements

Minimum Educational Qualification	Specialization	Relevant Industry Experience		Preferable Training Experience	
		Years	Specialization	Years	Specialization
Post Graduation	Civil/IT/ECE/Electrical Engineering / Architecture	2	in domain specific skills	1	in relevant field
OR					
Graduation	Civil/IT/ECE/Electrical Engineering / Architecture	4	in domain specific skills	1	in relevant field
OR					
Diploma	Civil/IT/ECE/Electrical Engineering / Architecture	6	in domain specific skills	1	in relevant field

Trainer Certification	
Domain Certification	**Platform Certification**
Recommended that the Trainer is certified for the Job Role: "*Digital Connectivity Infrastructure (DCI) Evaluator*", mapped to the Qualification Pack: "ICE/TEL/Q0302, v1.0". The minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: "Trainer (VET and skills)", mapped to the Qualification Pack: "MEP/Q2601, v3.0". The minimum accepted score is 80%.

Assessor Requirements

Minimum Educational Qualification	Specialization	Relevant Industry Experience		Preferable Training Experience	
		Years	Specialization	Years	Specialization
Post Graduation	Civil/IT/ECE/Electrical Engineering / Architecture	2	in domain specific skills	1	in relevant field
OR					
Graduation	Civil/IT/ECE/Electrical Engineering / Architecture	4	in domain specific skills	1	in relevant field
OR					
Diploma	Civil/IT/ECE/Electrical Engineering / Architecture	6	in domain specific skills	1	in relevant field

Assessor Certification	
Domain Certification	**Platform Certification**
Recommended that the Assessor is certified for the Job Role: "*Digital Connectivity Infrastructure (DCI) Evaluator*", mapped to the Qualification Pack: "ICE/TEL/Q0302, v1.0". The minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: "Trainer (VET and skills)", mapped to the Qualification Pack: "MEP/Q2701, v3.0". The minimum accepted score is 80%.

Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

1. **Assessment System Overview:**

Assessment is done through ICES affiliated Assessment Agencies. Assessors are trained & certified by ICES after Training of Assessor (ToA) program. Assessments are conducted to gauge and assess the trainee's skill and knowledge competency in the specified areas.

The assessment will have both theory, practical and viva components as per ratio specified in each NOS for **Digital Connectivity Infrastructure – Evaluator** job role.

During the practical task, trainees are assessed on their workmanship, quality of finished product and time management. They will be graded for all their assessments based on the approved assessment strategy which is signed off by ICES. The Assessor submits an assessment plan to ICES prior to assessments.

The assessment plan contains the following information:
- What will be assessed, i.e. the competency based on each NOS based on theory, practical and viva questions
- How assessment will occur i.e. methods of assessment
- When the assessment will occur
- Duration of assessment
- Where the assessment will take place i.e. context of the assessment (workplace/simulation)
- The criteria for decision making i.e. those aspects that will guide judgments
- Where appropriate, any supplementary criteria are used to make a judgment on the level of performance.

ICES will be monitoring thoroughly the complete Assessment process.

2. **Testing Environment:**
- Training partner shares the batch start date and end date, number of trainees and the job role.
- Assessment will be fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue/test center only.
- The knowledge/theory assessments are conducted with proper seating arrangements with enough space between the candidates to prevent mal practicing.
- Question set for Theory and Practical will be distributed to each candidate by the Assessor.
  - Theory testing will include MCQ type questions, pictorial questions etc. which will test the trainee on his theoretical knowledge of the subject.
  - Practical assessments will be conducted in the approved test centers. The training provider will ensure adequate tools and materials are available to conduct the practical test.
  - Viva Testing will be conducted during or post to the practical assessment by the assessor concerned. This Viva Assessment is applicable to understand the outcomes from OJT attended by the concerned candidate.
- One (1) Assessor is eligible to conduct assessments of a batch of maximum 30 candidates.
- The assessment must comprise of two components, namely:

- ➤ Knowledge assessment (Theory and Viva assessment)
- ➤ Skill assessment (Practical / Hands-on Skill assessment)

3. **Mode of assessment**
   - Demonstration/Practical Performance /Skill Assessment
   - Synoptic multiple-choice question test for Theory Assessment
   - Viva for Knowledge Assessment (Applicable to note the outcomes from OJT only)

4. **Performance/skill assessment:**
   - The performance/skill assessment will be conducted through demonstration/practical
   - For the practical test trainees are assessed through a given task, which they have to complete correctly for them to be marked as passed.
   - The assessment is conducted in a simulated working environment. Due to this fact, the assessors must note that the naturally occurring evidence of competence is unavailable or infrequent. Simulation must be undertaken in a Realistic Working Environment which provides an environment that replicates the key characteristics of the workplace in which the skill to be assessed is normally employed.

5. **Knowledge Assessment:**
   - The knowledge assessments are conducted through Theory (written) Test and Viva Test
   - Synoptic test is used for this. It is an MCQ (Multiple Choice Question) test which is prepared externally and externally marked, meaning by agency having no link with training partners.
   - The Viva test will be conducted by the assessor in the oral mode considering the communication and domain understanding of skills of trainees.
   - The assessment strategy, weightage and duration of assessment for **Digital Connectivity Infrastructure – Evaluator** is summarized below

Assessment Type	Formative or Summative	Strategies	Weightage	Duration (hours)
Knowledge	Summative	MCQ	45	1 hour
Knowledge	Summative	Viva	10	1 hour
Skill	Summative	Structured practical Task	45	7 hours

6. **Assessment Quality Assurance levels/Framework**
   - ICES has developed assessment criteria framework for each Qualification pack as per National Occupational Standards. The criteria framework includes weightages/marks for each criterion under knowledge and skill. The criteria ensure quality assurance as they ensure valid, consistent and fair assessments at all locations. Issued to the affiliated Assessment body. The Assessment Body develops questions based on ICES's approved assessment criteria.
   - The training partner will intimate the time of arrival of the assessor and time of leaving the venue. Random spot checks/audit may be conducted by ICES to monitor assessment.
   - Continuous Monitoring through virtual and In-person mode are conducted to ensure the assessment is conducted as per stipulated process
   - Process and Technical audit of assessment batches by quality team are conducted to avoid errors in assessment process
   - A well -defined comprehensive framework of NON-COMPLIANCE MATRIX is defined and implemented to identify the non-compliance made by assessor and AA and punitive actions are taken correspondingly.

- The capacity building sessions are conducted regularly for assessors and assessment agencies to update them about best practices in assessment

4. Types of evidence or evidence-gathering protocol:
- Evidence in the form of answer sheets in case of knowledge assessments (Theory only) is collected.
- For Practical and Viva assessments videos and photographs are prepared as evidence. These are submitted by the assessor to the assessment agency. ICES does random checks of the same with the participant/ trainee's ID and ascertains authenticity and validity of assessments.
- Post Assessment, the evidence are uploaded by Assessor to assessment agency and further assessment agency to ICES as per stipulated TAT
- Evidence are broadly photographic and video graphics in nature (Geo-Tagged)
- Results along with evidence to be submitted to ICES by the concerning Assessment Agency in the prescribed format and on Digital Format and Physical Format (As required)
- Results to be uploaded on SIDH and other relevant portals for collective data management.

5. Method of verification or validation:
- The process and technical audit of assessment batches are done by Awarding Body
- Attendance of each candidate is verified, and it is ensured that only those candidates are assessed by assessors who are meeting the stipulated minimum percentage of attendance
- The result of each candidate is verified; it is verified that that result on SIP is matched with respect to summary sheet submitted by AAs
- Under detailed technical audit for sample batches, the knowledge and skill assessment results for each candidate are checked in technical aspect.
- All the evidence of batches are preserved on server of Awarding Body digital platform

On the Job:
- On job training (OJT), candidates undergo training and leaning at actual workplace for a fixed period of time and a certain weightage of assessment is allocated out of total skill weightage of Qualification Pack for undergoing OJT as stipulated by ICES. This OJT score and assessors' end point score are combined to arrive at final Marking/grading of trainees' skill test. The OJT score is determined by Supervisor / Engineer / other authorized head of departments of relevant industry under which candidates undergo on job training.
- The Assessment is subject to take place only after submission of OJT data (in case of STT only) approved by concerned industry and training provider.
- The Hard copy of the OJT report (on trainings, outcomes, exposures learnt and feedback certified by Supervisor / Engineer / other authorized head of departments of relevant industry) will be submitted to the Assessor by the concerned candidate on the Assessment date only, failing which the candidate may not be allowed for attending the Assessment.
- As OJT is mandatory for this QP, the TP should ensure the correct submission of all relevant reports pertaining to OJT of each trained candidate. The Assessment agency is responsible for collecting all the relevant information and submit the same to ICES in future (if required).

References

Term	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for

	each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.

Acronyms and Abbreviations

Acronym	Description
MSDE	Ministry of Skill Development and Entrepreneurship
NCVET	National Council for Vocational Education and Training
NSDC	National Skill Development Corporation
AB	Awarding Body
AA	Assessment Agency
TP	Training Partner
TC	Training Centre
ITI	Industrial Training Institute
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NEP	New Education Policy
QP	Qualification Pack
Q-File	Qualification File
MC	Model Curriculum
NOS	National Occupational Standard(s)
PC	Performance Criteria
KU	Knowledge and Understanding
GS	Generic Skills
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
DDUGKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
STT	Short Term Training
RPL	Recognition of Prior Learning
NAPS	National Apprenticeship Promotion Scheme
NQR	National Qualification Register
OJT	On the Job Training
NSQC	National Skill Qualification Committee
NSQF	National Skills Qualification Framework
EMF	Electro Motive Force
LV	Low-Voltage
AC	Alternating Current
DC	Direct Current
DB	Distribution Boards
APFC	Automatic Power Factor Control
MCB	Miniature Circuit Breaker
ELCB	Earth Leakage Circuit Breaker
CCTV	Closed-Circuit Television
HVAC	Heating, Ventilation and Air Conditioning
BMS	Building Management System
BIM	Building Information Modeling
RF	Radio Frequency
MoCA	Multimedia over Coax Alliance
SNR	Signal-to-Noise Ratio
FTTH	Fiber to the Home
ISP	Internet Service Provider
IP	Internet Protocol
NOC	No Objection Certificate

DCI	Digital Connectivity Infrastructure
MBBL	Model Building Bye Laws
NBC	National Building Code
DGCA	Directorate General of Civil Aviation