

DIAGONAL EDUCATION INSTITUTE @ TRICHY

(NATIONAL DEVELOPMENT AGENCY PROMOTED BY GOVT OF INDIA)

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QUALITY MANAGEMENT IN QA / QC IN CIVIL CONSTRUCTION

INTRODUCTION

ELEMENTS OF CIVIL CONSTRUCTION

DRAWING VERIFICATION AND INSPECTION

UNIT- INTRODUCTION TO QA/QC IN CIVIL CONSTRUCTION

- ✓ Importance of QA/QC in construction
- ✓ Key roles and responsibilities of a QA/QC Engineer
- ✓ The difference between Quality Assurance (QA) and Quality Control (QC)

QUALITY CONTROL SYSTEMS IN CONSTRUCTION

- ✓ Overview of QC systems
- ✓ Quality management principles and practices in construction
- ✓ Importance of standard operating procedures (SOPs) and protocols
- ✓ Integrated Quality Management Systems (QMS)
- ✓ Tools used for quality monitoring

MATERIAL TESTING AND ANALYSIS

- ✓ Types of materials tested in construction (Concrete, Steel, Soil, Asphalt, etc.)
- ✓ Methods of testing materials:
 - **Concrete Testing:** Slump test, Cube test, etc.
 - **Steel Testing:** Tensile strength, Elongation, Bend test
 - **Soil Testing:** Proctor test, Liquid limit, and Plastic limit
 - **Asphalt Testing:** Marshall Stability test, Penetration test
 - **Aggregate Test :** sieve analysis for Coarse & Fine aggregate
- ✓ Interpretation of test results and their impact on project quality
- ✓ Material certificates and documentation requirements

INSPECTION AND AUDITS

- ✓ Types of inspections:
 - Material Inspection
 - Pre-construction inspection
 - In-process inspections (e.g., foundation, superstructure, finishes)
 - Post-construction inspections (e.g., final checks before handover)
- ✓ Methods for conducting inspections:
 - Visual inspections
 - Dimensional checks
 - Nondestructive testing (NDT)
 - Performance testing (e.g., load testing, environmental exposure tests)
- ✓ Auditing procedures for QC processes and systems
- ✓ Ensuring compliance with project specifications and contracts

DOCUMENTATION AND REPORTING

- ✓ The importance of documentation in QC
- ✓ Essential reports in construction quality control:
 - Daily/Weekly inspection reports
 - Test and analysis reports
 - Non-conformance reports (NCRs)
 - Defects logs and resolution documentation
 - Quality audits and compliance reports
- ✓ Proper documentation for traceability and legal purposes
- ✓ Reporting and maintaining records for future references (e.g., maintenance plans, warranty issues)

ISO CERTIFICATIONS AND STANDARDS

- ✓ Understanding ISO 9001 (Quality Management Systems)
- ✓ The role of ISO standards in construction
- ✓ Certification process and maintaining compliance
- ✓ Application of ISO guidelines for construction quality control
- ✓ Impact of ISO 9001 certification on construction projects and quality assurance
- ✓ Auditing for ISO compliance

RISK MANAGEMENT IN QA/QC

- ✓ Identifying and managing risks in the construction process
- ✓ Common quality risks: Material defects, workmanship issues, equipment failures
- ✓ Risk assessment techniques and tools
- ✓ Developing risk mitigation strategies
- ✓ Contingency planning and risk-based decision-making

- ✓ How to handle non-conformances and defects (root cause analysis)

PROJECT MANAGEMENT IN QA/QC

- ✓ The role of a QA/QC engineer in project management
- ✓ Integrating QA/QC into project planning and scheduling
- ✓ Key performance indicators (KPIs) for quality
- ✓ Budgeting and cost control for quality assurance activities
- ✓ Coordination between project teams (designers, engineers, contractors) to ensure quality standards are met
- ✓ Ensuring quality timelines align with overall project timelines

SAFETY AND COMPLIANCE IN QA/QC

TESTING AND MEASUREMENT EQUIPMENT HANDLING

PRACTICAL EXERCISES:

Exercise 1: Material Testing

- Conducting basic material tests like concrete cube testing, steel tensile testing, and soil compaction.
- Hands-on experience with standard testing equipment.

Exercise 2: Site Inspection and Audits

- Simulated site inspection and audit processes for a construction project.
- Identification of non-conformities and recommendations for corrective actions.

Exercise 3: Risk Management and Process Improvement

- Conducting a risk assessment for a construction site and preparing a risk mitigation plan.
- Case study analysis on process improvement techniques (Six Sigma or Lean Construction).

Exercise 4: Documentation Preparation

- Preparation of key QA/QC documents such as inspection reports, non-conformance reports (NCRs), and test results documentation.

REPORT PREPARATION

DURATION :- 1 MONTH(FT METHOD)

PLACEMENT & REAL TIME PROJECTS

FEE – Rs 21500/-

CERTIFICATION

