5.1 CIPP Pipeline Inspection and QA/QC Best Practises

Training Module 6 for Andrews.engineer

CIPP Pipeline Rehabilitation Systems

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CIPP Pipeline QA/QC and Best Practises

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Day	09.00		12.00		12.45		16.00
1	5.1 Course Introduction	5.2 CIPP Rehabilitation Systems		L U N C H	5.3 CIPP Design and Specifications	5.4 CIPP Impregnation and Curing	
2	5.5 CIPP Systems Site and field issues, QA/QC, Defect analysis	5.10 Course Summary, Review					

CIPP Pipeline Rehabilitation Systems

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Glossary of Terms O&M

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Inspection: the routine or planned checking by visual means or by closed circuit television (CCTV) to ensure that the sewer, maintenance hole or other structure is performing satisfactorily.

Maintain: to keep the sewerage system operating in accordance with legal requirements.

Cleanse: clearance of chokes and blockages, including flushing when necessary.

Empty: provision and maintenance of a proper outfall and ensuring flow to that outfall.

Glossary of Terms: Sewer Rehabilitation

Rehabilitation: all aspects of upgrading the performance of existing sewer systems; structural rehabilitation includes repair, renovation and renewal.

Repair: rectification of damage or defect to the structural fabric of the sewer or installation and reconstruction of short lengths but not the reconstruction of the whole.

Renovation: methods by which the performance of a length of sewer is improved by incorporating the original sewer fabric but excluding isolated local repairs and root or silt removal.

Renewal: construction of a new sewer on, or off, the line of an existing sewer; the basic function and capacity of the new sewer being similar to those of the old.

Replacement: construction of a new sewer on, or off, the line of an existing sewer; the function of the new sewer will incorporate that of the old but may also include improvement and development work.

Glossary of Terms:
Sewer Structural Grading

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Sewer Grade: sewers are designated five different grades — 1, 2, 3, 4 and 5, depending upon their structural condition.

Grade 1 Sewer: acceptable structural condition

Grade 2 Sewer: minimal risk of collapse

Grade 3 Sewer: collapse unlikely in the near future but further deterioration likely

Grade 4 Sewer: collapse likely in the foreseeable future

Grade 5 Sewer: collapsed or collapse imminent

Clayware and Concrete Pipe Sewers

Internal Condition Grade	Typical Defect Descriptions
5	Already collapsed Deformation >10% and broken Extensive areas of fabric missing Fracture with deformation >10%
4	Broken Deformation up to 10% and broken Fracture with deformation 5-10% Multiple fracture Serious loss of level Spalling large Wear large
3	Fracture with deformation <5% Longitudinal cracking or multiple cracking Minor loss of level More severe joint defects, i.e. open joint (large) or joint displaced (large) Spalling medium Wear medium
2	Circumferential crack Moderate joint defects, i.e. open joint (medium) or joint displaced (medium) Spalling slight Wear slight
1	No structural defects

Brick Sewers (not exceeding 3 ring)

Internal Condition Grade	Typical Defect Descriptions
5	Already collapsed Missing invert Deformation >10% and fractured Displaced/hanging brickwork and deformation <10% Extensive areas of missing brickwork
4	Total mortar loss with deformation >10% Deformation up to 10% and fractured Displaced/hanging brickwork Small number of missing bricks Dropped invert Moderate loss of level Spalling large Wear large
3	Total mortar loss without other defects Single bricks displaced Deformation <5%, no fracture and only moderate mortar loss Spalling medium Wear medium
2	Minor cracking Surface mortar loss Spalling slight Wear slight
1	No structural defects

Localised Repair and Robotics

- **CIPP Patch lining**
- **Resin Injection**
- **Re-rounding**
- **Joint Sealing**
- **Robotic systems**
- **Vacuum Excavation**

Renovation Techniques and Materials

Non Man-entry Lining Techniques

Cured-in-Place Pipe

Lining with close fit pipe

Stabilisation (chemical grouting)

Non man entry in-situ coatings

Spiral Wound Lining

Sliplining

Renovation Techniques and Materials

Man-entry Lining Techniques

Man-entry lining with Pipe Segments and Panels

Lining with Discrete Pipes

Man-entry Insitu Coatings

CIPP Relining of Large Dia & Ovoid Sewers

Spiral Wound Lining

Cured in Place Best Practices

- A client representative visiting projects
- Communicating with the Client and Contractor
- Recommends final acceptance
- Checks the QA/QC procedures
- Project Schedule
- Documentation review, (suppliers, contractor)
- Communication

Cured in Place Best Practices

- Regular meeting attendance, facilitating communication between client and contractor
- Understand the procedure, equipment, materials being used
- Understands the schedule, specifications, requirements
- Technical data sheets, MSDS
- Safety requirements, Traffic management, highway or rail working
- Night schedule
- Checks and communicates that the project on track
- If testing required, co-ordinates with contractor
- If there are defects, causes and effect

Summary

- **Understand**
- **Communicate**
- **Report**