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THAILAND

SPECIFICATION OR OBSTRUCTION?: HOW CIPP REHABILITATION SPECS CAN PROTECT QUALITY OR FREEZE INNOVATION

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APPLIED FELTS AND SINGAPORE SOCIETY FOR TRENCHLESS TECHNOLOGY

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SPECIFICATION OR OBSTRUCTION?

How CIPP rehabilitation specs can protect quality Or freeze innovation

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Welcome everyone

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Last year: “Is CIPP still the best?”

This year, the question changes

YES → But even good technology can be weakened by poor requirements.

Are our specifications protecting quality or preventing progress?

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Specifications should be guardrails, not handcuffs.

They should keep poor-quality work out, while allowing proven innovation in.

A modern rehabilitation specification should do three things:

PROTECT QUALITY

- Define design life and performance
- Set workmanship and acceptance limits
- Require clear QA/QC evidence

MANAGE RISK

- Reference current standards
- Require competent design and installation
- Clarify responsibilities before site work

ALLOW PROVEN INNOVATION

- Accept type-tested systems
- Recognise approvals such as DIBt
- Assess alternatives by equivalence

Strict enough to stop poor work.
Flexible enough to accept proven improvement.

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Why specifications were needed

CIPP became trusted because control improved

Early risks

uneven impregnation
handling / installation issues
uncertain cure control

Maturing controls

vacuum impregnation
defined installation methods
material testing

Industry confidence

repeatable outcomes
owner acceptance
standards and training

Strict specifications were not the enemy of innovation they helped make CIPP credible.

The copy/paste problem

A clause written for one era can quietly survive into the next.

1990s clauses

useful at the time
based on available materials
matched old inspection practice

2026 tender

different materials
digital QA/QC
new curing systems
current standards

Result

compliance arguments
unnecessary testing
innovation blocked
quality not necessarily improved

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Common symptoms of an ageing specification

These usually appear before the industry admits there is a problem

Outdated references

Fixed to superseded standards or old project documents.

Duplicated clauses

External standards rewritten locally, sometimes badly.

Obsolete tests

Tests retained because deletion feels risky.

Legacy deliverables

DVDs, paper-heavy handover, old software names.

Method lock-in

One installation method assumed to be the only acceptable method.

Unclear acceptance

Cosmetic, functional and structural issues mixed together.

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Stop specifying the recipe. Specify the result.

Owners need a durable rehabilitation outcome, not a shopping list

RECIPE-BASED

- Use this material
- Use this curing method
- Use this old test
- Submit this legacy format

Tends to protect history

PERFORMANCE-BASED

- Meet this design life
- Meet this structural class
- Show type-test evidence
- Prove cure and acceptance

Tends to protect outcomes

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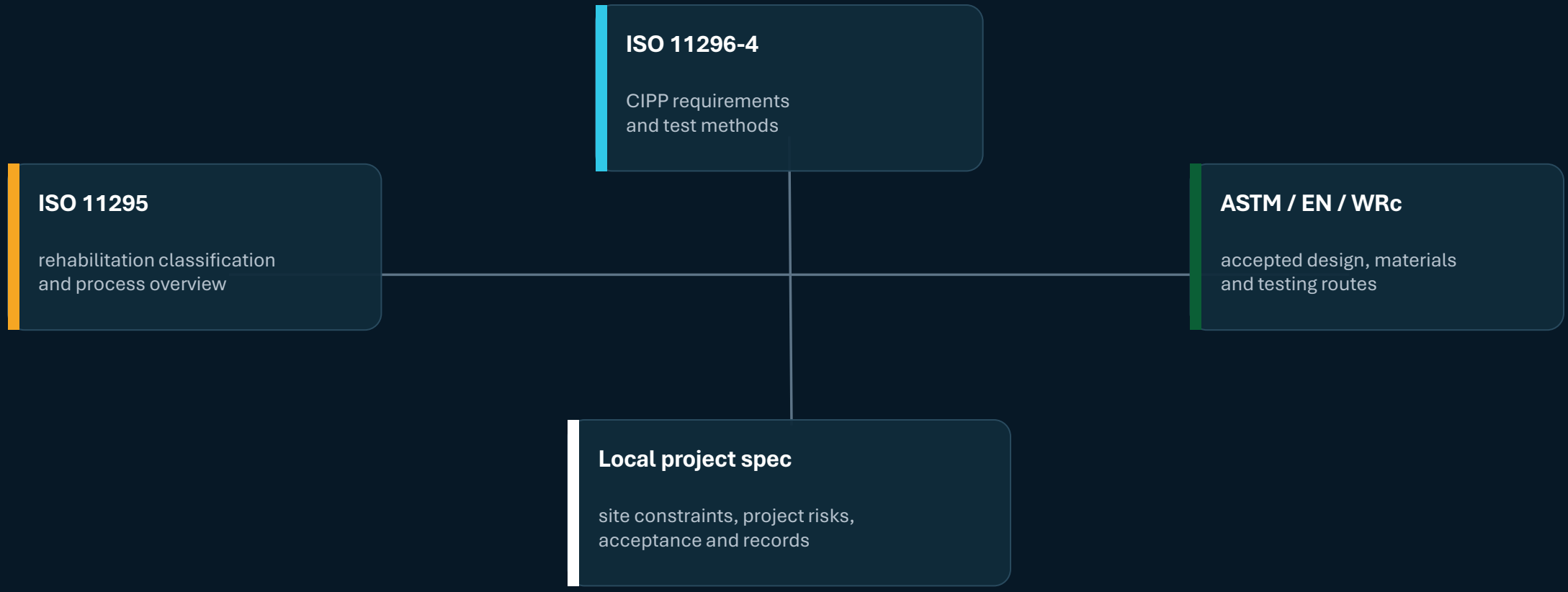
Use standards as the backbone

Do not rewrite them badly inside every local specification



Local specifications should define the project-specific requirements and reference current standards for the rest.

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Evidence should follow the whole project lifecycle

A good spec knows what proof is required at each stage

PRE-QUALIFICATION

TYPE TESTING & APPROVALS

Validates the material / system capability

Examples: long-term data, system approvals such as DIBt, recognised standards evidence

PROJECT-SPECIFIC EVIDENCE

Design

pipe-specific calculation

Factory QA

materials & traceability

Site QA/QC

wet-out, installation, cure

Acceptance

inspection & test records

Type Test validate the system

Project tests verify the installed work

Type tests are not repeated for every project

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Type tests validate systems not projects

Long-term evidence is vital, but it belongs in the right place

1. Type test / approval

- Validates a material or system family
- Normally completed before project use
- Examples: long-term data, creep evidence, DIBt or other recognised approvals

2. Project verification

- Confirms the selected liner suits the actual pipe
- Checks installed thickness, cure records, site samples and CCTV
- Demonstrates this installation was controlled

3. Acceptance decision

- Combines design, type evidence and site records
- Uses agreed defect criteria
- Approves the installed work, not the whole system again

No need to repeat full type tests for every project.
Use them to validate the system.
Use project tests to verify the installation.

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How good innovation gets rejected by wording

Often not by rejection of quality - by wording that allows only one route

OLD WORDING

- names one resin
- assumes one curing method
- uses one liner construction
- requires one deliverable format

SYSTEM REJECTED BY WORDING

BETTER WORDING

- requires compliance evidence
- allows proven equivalents
- defines performance
- controls acceptance

A good specification should reject unproven claims - not proven alternatives.

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Acceptance: separate what looks bad from what matters

CCTV is essential, but it is not always self-explanatory

Cosmetic observation

Visible surface feature with no evidence of performance loss.
Example: minor staining, print-through, superficial coating mark.

Functional concern

May affect flow, service reconnection, leakage path or maintainability.
Requires defined inspection and possible repair.

Structural defect

Potential loss of liner integrity, thickness, bond where required, cure or load capacity.
Requires engineering decision.

Specs should tell everyone which category applies - before the dispute starts.

Digital-first QA/QC

Modern projects should produce evidence, not paperwork

Before

condition survey
design assumptions
traffic / bypass plan
asset records

During

wet-out records
resin batch traceability
installation log
cure data

After

HD CCTV
test results
service records
as-built package

Owner value

searchable records
less dispute
better asset history
future maintenance

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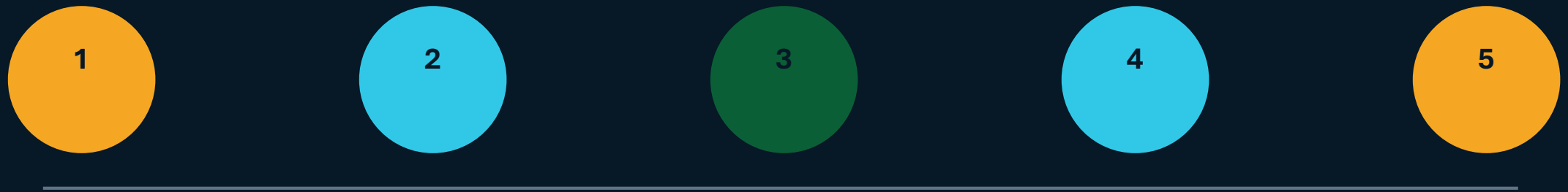
Specifications cannot replace competence

Training turns written requirements into real quality



Owner
asks for the outcome

Consultant
writes and administers

Manufacturer
proves the system

Contractor
delivers the work

Owner
judges acceptance

The best specification still fails if the people applying it do not understand the technology.

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What a modern rehab spec must do

A practical checklist for owners and consultants

Define the outcome

design life, structural class, hydraulic and durability requirements

Reference current standards

latest edition referencing where appropriate, with project-specific exceptions

Separate evidence stages

type testing, design, factory QA, site QA/QC and acceptance

Control critical risks

cure, wet-out, thickness, leakage, reconnections and inspection

Define defect categories

cosmetic, functional and structural acceptance routes

Require digital handover

searchable records suitable for future asset management

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What a modern spec should avoid

Removing bad requirements is as important as adding good ones

Old Standard versions

unless there is a genuine reason to freeze a version

Copy-pasted test clauses

when the external standard already defines the requirement

Routine long-term type tests

as project handover requirements

Brand or method lock-in

unless clearly justified by asset risk

Ambiguous visual acceptance

phrases like “to the satisfaction of the Engineer” alone

Legacy media requirements

formats that do not support modern asset management

Longer is not automatically stronger.
Clearer is stronger.

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What this means for the industry

Better specifications require shared responsibility

Owners

Ask for performance, evidence and clear asset records.

Consultants

Use current standards and write acceptance criteria that can be applied.

Contractors

Price for compliance, not for interpretation. Keep proper records.

Suppliers

Provide honest type evidence, material traceability and technical support.

A mature market is not one with the longest specs.
It is one with the clearest rules and the best evidence.

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Selected reference framework

Use the current applicable edition and local project requirements

ISO 11295

Pipeline rehabilitation: classification and overview of systems and replacement

ISO 11296-4

Cured-in-place pipes for renovation of underground non-pressure drainage and sewerage networks.

ASTM / EN / WRc / local standards

Useful where the method, design basis or region makes them appropriate.

Training and inspection programmes

Inspector and operator training should support consistent application of the specification.

Owner asset standards

Local utility requirements should define project-specific risks, records and acceptance process.

Manufacturer evidence

Type testing, material data, QA system and traceability should be reviewed before project use.

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The specification reset

- **Protect the asset.**
- **Control the risk.**
- **Allow proven innovation.**
- **Demand evidence.**

Specifications should be guardrails, not handcuffs.

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Come and Talk To Us @ Booth 8

ขอบคุณทุกท่านครับ
Thank you everyone