

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

Approval for Pipeline Rehabilitation Contractors and Systems

Story: Pipe Lining

Theme: Construction

A document which explains the pre-approval process for specialist lining contractors working on the SCIRT horizontal repair programme.

This document has had sections removed and redacted to protect contractors' commercial interests.

For a current list of approved contractors authorised to carry out lining works on Christchurch City Council assets, contact the Council.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz



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Revision History

Revision	Date	Name	Brief Description
1	18/07/2013	Phil McFarlane	Original
2	5/11/2013	Stephanie Thompson / Tony Gordon	Pre-approved list added
3	27/11/2013	Tony Gordon	Approved for Release
4	17/01/2014	Stephanie Thompson	City Care Pre-approved list updated
5	27/03/2014	Philip McFarlane / Stephanie Thompson	City Care Pre-approved list updated
6	6/08/2014	Tony Gordon	Additional approvals added
7	22/08/2014	Tony Gordon	Additional approvals added
8	17/11/2014	Tony Gordon	Additional approvals added
9	26/11/2014	Tony Gordon	Additional approvals added
10	23/04/2015	Tony Gordon	Additional approvals added; new vehicle loadings applied
11	24/04/2015	Tony Gordon	Minor corrections
12	26/06/2015	Tony Gordon	Adjustments to some product information; minor corrections
13	9/07/2015	Tony Gordon	Additional approvals added
14	14/10/2015	Tony Gordon	Additional approvals added (Pipeworks)
15	19/10/2015	Tony Gordon	Modification to approvals (Quik-Shot)
16	5/01/2016	Tony Gordon	Advanced Pipeline Services approval rescinded
17	30/05/2016	Tony Gordon	Additional LJR approval (Quik-Shot); removal of approval for one size of one product (Interflow); minor wording changes.
18	2/12/2016	Tony Gordon	Additional approvals added (Quik-Shot)

1 Approval Process

1.1 General

1.1.1 Purpose & Scope

This document covers the pre-approval of rehabilitation systems for gravity pipelines, DN375 and smaller, using / including:

- Cured in place pipe (CIPP) lining, which is cured by either ambient cure or by circulating hot water or introducing controlled steam within the tube.
- Lining with spiral wound profile strip, with or without grouting
- Folded PVC lining
- No Dig Spot Repair (NDSR) patching using CIPP
- Lateral lining
- Lateral Junction Repair (LJR) patches.

1.1.2 Codes and Standards

This document is to be read in conjunction with:

- Pipe Lining Specification

Approval of a rehabilitation system does not alter the requirement to comply fully with the requirements of the Pipe Lining Specification.

1.1.3 Product Approval Process

SCIRT has established a technical panel to approve specialist lining contractors and rehabilitation systems for renewal of gravity wastewater and stormwater pipes.

A pre-approved list is located in Section 2. The list details:

- Specialist lining contractors who have demonstrated that they are able to undertake works that comply with this specification
- The rehabilitation systems that the specialist lining contractors are approved to install
- The circumstances under which each particular rehabilitation system is approved to be used and any limitations regarding its use

Pre-approved rehabilitation systems can be installed by approved specialist lining contractors without the need to submit further details, in situations that comply with the details provided in the approved Performance Work Statement and satisfy the circumstances and limitations listed in the pre-approval.

To apply to be pre-approved, specialist lining contractors are to furnish a Performance Work Statement Submittal containing the information detailed in the Submittal Section of this Specification.

Innovation and value added improvements are encouraged. Therefore, additional specialist lining contractors may apply to be pre-approved at any time. Likewise, applications to add rehabilitation systems or refine rehabilitation systems that have already been pre-approved may be made at any time.

Pre-approval is not exclusive. Approval is based solely on ability to demonstrate compliance with this specification.

Approval may be revoked or redefined if actual performance does not meet the requirements of this document.

From time to time, it may be necessary to use rehabilitation systems or variations of systems that have not been pre-approved. In which case, applications for approval for specific projects can be made using the same process.

1.2 Submittals

The Performance Work Statement is to demonstrate that the specialist lining contractor has the ability to undertake work that complies with the Specification. The Performance Work Statement is to include the following:

A. Relevant Previous Experience

A statement is to be provided outlining previous experience with respect to the installation of pipe lining systems. This should include as a minimum:

1. Number of years which the participant has been in business installing pipe lining systems.
2. List of participant's relevant, largest or most significant clients.

B. Track Record

The statement is to list at least five (5) pipe lining projects completed in the previous five (5) years. The following items shall be described in tabular form for each project respectively:

1. Client's name, company and contact telephone number(s).
2. Client Representative's name, company and contact telephone number(s) (if applicable).
3. Project name, location, contract value and duration when the project was completed.
4. If any of the nominated projects were joint ventures, please identify the JV partner(s) and the proportion and nature of the work undertaken by the participant's company.
5. Type of lining system used.
6. Distances and diameters of pipes lined
7. List of main ancillary works carried out by participant, e.g. traffic management, over-pumping, etc.
8. Level of design input by participant.
9. Where available: Record of Client's satisfaction with regard to the participant carrying out works to target performance levels, on schedule and within budget.

C. Capability Statement

A statement is to be provided containing an outline of the capability to design and to install pipe lining systems in Christchurch including any necessary enabling works (e.g. CCTV inspections, over-pumping of existing wastewater flows and installation and maintenance of traffic management schemes). The statement is to include a brief description of the organisation's:

1. Annual turnover
2. Approximate percentage of annual turnover associated with pipe lining
3. Number of personnel employed

4. Design capability
5. Principal locations of operation
6. Main plant and equipment owned and operated by the participant
7. The extent to which skilled personnel and plant & equipment could be deployed in Christchurch.

In the case of submissions from organisations based outside of New Zealand, the statement should describe how the organisation's knowledge and capability will be transferred to the personnel involved in the lining works in Christchurch.

D. Management Skills and Company Systems

A brief description of the management methods and systems operated by the organisation, including:

1. Health & Safety Management System
2. Quality Management System
3. Environmental Management System

List any accreditation/certification of management systems to national or international standards, e.g. ISO 9001:2008 or ISO 14001:2004.

E. Methodology

General

A brief statement of the methodology and resource available for the following:

1. Cleaning and debris removal.
2. Removal of roots, protrusions, loose bricks and opening of laterals without man entry into the pipe.
3. Bypass pumping plan and design.
4. Contingency measures for dealing with any overflows or spillages.

Mainline Liners

1. Method Statements, to include wet-out, installation and curing procedures. Provide details of the curing regime, e.g. required temperatures and the times that the temperatures are to be maintained.
2. Details of proposed fabric and resin, including resin type, resin manufacturer and resin properties.
3. Details of how the liner is to be sealed at manholes and other openings, including details of all materials to be used.
4. MSDS sheets for all materials.
5. Manufacturer's shipping, storage and handling recommendations for all components of the lining system.
6. Test results from samples of completed liner taken from previous contracts to demonstrate the flexural bending strength and modulus of elasticity of the finished liner.
7. Data regarding the flexibility of the liner(s) and suitability for use in earthquake zones.

8. The dimensions and tolerances of the installed liner, including details of the expected annulus between the host pipe and the liner.
9. Installation methodology, to include where applicable wet-out, inversion and curing procedures.
10. Design life.
11. Resistance to chemical or biological attack.
12. Resistance to abrasion by sand, silts etc., especially during cleaning/jetting.
13. Design calculations for each thickness of liner to demonstrate the adequacy of the proposed liner(s) over the range of depths that approval is sought.
14. List of any defects inherent in the proposed lining system and the expected tolerance. (Inherent defects are those that commonly occur with the lining system, where it is not possible or commercially practical to eliminate because of the inherent nature of the system).
15. Statement on which defects in the liner can and cannot be repaired and a method statement for repair of repairable defects and removal of the liner if un-repairable defects occur.
16. Contingency measures for dealing with any overflows or spillages.
17. Details of proposed quality assurance and testing & inspection procedures, including sample ITPs.
18. Any additional technical data or other information that could assist in the evaluation of submissions.

No Dig Spot Repairs (Patching)

1. Method Statements, to include wet-out, installation and curing procedures.
2. Inspection and Test Plans.
3. Details of proposed fabric and resin, including resin type, resin manufacturer and resin properties.
4. MSDS sheets for all materials.
5. Test results taken from completed patches to demonstrate the flexural bending strength and modulus of elasticity of the finished patches.
6. Design calculations for each size and thickness of patch to demonstrate the adequacy of the proposed patch over the range of depths that approval is sought.

Lateral Liners

1. Method Statements, to include wet-out, installation and curing procedures. Provide details of the curing regime, e.g. required temperatures and the times that the temperatures are to be maintained.
2. Inspection and Test Plans.
3. Details of proposed fabric and resin, including resin type, resin manufacturer and resin properties.
4. MSDS sheets for all materials.

5. Test results taken from completed liners to demonstrate the flexural bending strength and modulus of elasticity of the finished liner.
6. Design calculations for each size and thickness of liner to demonstrate the adequacy of the proposed liner over the range of depths that approval is sought.

Lateral Junction Repairs (LJR)

1. Method Statements, to include wet-out, installation and curing procedures. Provide details of the curing regime, e.g. required temperatures and the times that the temperatures are to be maintained.
2. Inspection and Test Plans.
3. Details of proposed fabric and resin, including resin type, resin manufacturer and resin properties.
4. Dimensions of the proposed LJR.
5. MSDS sheets for all materials.
6. Test results taken from completed installations to demonstrate the flexural bending strength and modulus of elasticity of the finished LJR.
7. Design calculations for each size and thickness of LJR to demonstrate the adequacy of the proposed LJR over the range of depths that approval is sought.