

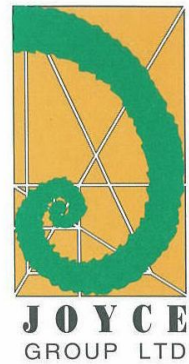
Joyce Group Limited

SITE VISIT REPORT
REPORT ON CONDITION
AND PERFORMANCE OF
HITCHINS TRAFFIGARD
MEMBRANE

Prepared by
Ron Thurlow
Joyce Group Limited

SEPTEMBER 2004

JN: 6264



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REPORT ON CONDITION AND PERFORMANCE OF HITCHINS TRAFFIGARD MEMBRANE

C O N T E N T S

	Page No.
1. INTRODUCTION	3
2. REASON FOR VISIT	4
3. SITE INSPECTION	4
4. DIAGNOSIS	9
5. CONCLUSION	9
6. REPORTING CONDITIONS	9
7. APPENDICES:	

**Experience and Qualifications of
Building Consultant Performing the
Inspection and Preparing the Report**



REPORT ON CONDITION AND PERFORMANCE OF HITCHINS TRAFFIGARD MEMBRANE

1. INTRODUCTION

- 1.1. Party requesting visit: Mr Jim Gerbes
Managing Director
Hitchins New Zealand Ltd
- 1.2 Sites:
1. Apartment 4
227 The Terrace, Wellington
 2. Apartment Block
217 The Terrace, Wellington
 3. 387 Karori Road, Wellington
 4. Carpark
151-159 Willis St, Wellington
 5. Carpark
Marion Square, Marion St, Wellington
 6. 4 Tensing Place, Khandallah, "
 7. Wellington Free Ambulance HQ
Thorndon, Wellington
 8. Commercial Building 27-39 Arthur St
 9. 2 Oku Street, Island Bay
 10. 123 Moxham Avenue, Hataitai
- 1.3. Date of Visits: 3 September 2004
16 September 2004
17 September 2004
21 September 2004
- 1.4. Weather: Northerly wind, cloudy,
occasional showers – 3 September
Fine 16,17,21 September

1.5. Consultant

Ron F Thurlow
BRANZ Accredited Adviser

2.0 REASON FOR VISIT:

- 2.1 To inspect and assess the condition of the Traffigard membrane installations on various buildings/homes.
- 2.2 On the sites visited, the inspection of the membrane was to ascertain that it is performing in compliance with clause B2 Durability of the NZ Building Code.
- 2.3 To prepare a report commenting on the condition of the membrane at each installation. This report is to be presented to Wellington City Council.

3.0 SITE INSPECTION

A visit was made to each site to view the membrane system.

The properties to be inspected were selected from a schedule of addresses supplied by Hitchins.

The schedule of addresses included details of the accredited Hitchins applicator contracted to apply to the product.

To make the selection, types of buildings and the substrates on which the membrane was applied were considered.

Hitchins provided advice on the scope of maintenance work provided to-date.

Durability was generally determined by visual observation and where possible discussion with tenants and observation in the space below the area coated.

3.1 Apartment 4 – 227 The Terrace, Wellington

The membrane was applied in 1987.

The membrane is applied on a deck over a garage area.

The L-shaped deck is accessible and faces towards the east and north.



The substrate is a mixture of concrete deck and suspended timber structure.

The deck is graded to good falls and ponding of water was not evident.

There is no evidence of mechanical damage on the surface.

Some minor wrinkling is occurring across the main deck and the access way from the living area of the home. The membrane has not suffered any damage at the wrinkling.

Some lichen/mould growth is evident on the surface of the membrane.

The turn ups at parapet and walls have not suffered damage.

The membrane installation is in very good order.

3.2 Apartment Block – 217 The Terrace, Wellington

The membrane was applied approximately 18 years ago.

The membrane is applied to the external walkway on the 4 elevations to the top apartment. The walkway, originally clad with mastic asphalt, is constructed over living spaces.

The surface of the membrane is wavy in some areas as a consequence of an uneven sub-grade.

No mechanical damage, wrinkling, cracking or delaminating is evident.

The membrane is in very good condition.

3.3 387 Karori Road, Karori, Wellington

The membrane installation was completed approximately 18 years ago.

The membrane is applied to a concrete substrate forming a deck at first floor level, which protects a small service space, entranceway and carparking.

The surface of the membrane has been kept free of grime and mould/lichen growth.

No mechanical damage, wrinkling cracking or delaminating is evident.

No evidence of leaking through the concrete slab substrate could be found.

The membrane is in very good condition.

3.4 Carpark – 151-159 Willis Street, Wellington

The membrane was applied approximately 20-years ago.

The application is on a concrete sub-grade forming a split-level carparking area over commercial premises.

The membrane is also applied to vehicle carriageways and ramps between the carparking levels.

Some scuffing at the carriageways adjacent to the tops and bottoms of the ramps is evident, particularly where the wheels of vehicles accessing the carpark have sledged across the surface of the substrate. In these exposed areas where minor cracking of concrete substrate is evident no membrane damage is evident over where the cracks disappear under the membrane.

In the carparking areas and pedestrian walkways where scuffing has not occurred there is no evidence of cracking, wrinkling or delamination.

The membrane is in very good order.

3.5 Carpark – Marion Square, Wellington

The membrane was applied approximately 9-years ago.

The application is over commercial space, on a concrete substrate, Concrete Upstands are formed at the eastern and western elevations and columns.

Some abrasion wear is evident in the vehicle carriage ways and there is mechanical damage to the arrises at the raised floor areas and bollards to the ramps and around car parking label-dispensing machines.

There is some peeling of the body coat around a floor drain on the western elevation adjacent to the stairway.

No cracking, bubbling, wrinkling or delamination is evident.

In the areas where the membrane bridges movement control joists at the perimeter upstands there is no evidence of damage or deterioration.

The membrane is generally in excellent order.

3.6 4 Tensing Place, Khandallah, Wellington

The membrane was applied 17 years ago.

The membrane is applied on a concrete access deck to the front entrance of the home. The deck faces north and west.

Grime was evident on the surface and there were several plant tubs/containers on raised legs spread across the deck.

No mechanical damage, wrinkling, cracking, bubbling or delamination was evident.

Regular cleaning maintenance does occur (advised by homeowner).

The membrane is in very good condition.

3.7 Wellington Free Ambulance Headquarters, 19 Davis Street, Thorndon

The membrane was applied in 1992.

The membrane is applied on a plywood substrate on a roof deck area between curved roof systems and around a clerestorey window area.

Skylights and service pipes penetrate the roof systems in several places.

Some deflection of the roof system has occurred around some of the skylights and pooling of stormwater is evident.

Some wrinkling of the membrane is evident at substrate street joins and there is some splitting of the membrane on one joint towards the northern end of the roof, where there is a change of direction of the building. The installation of an appropriately detailed control joint would have eliminated the possibility of damage to the membrane at the junction.

Some lichen/mould growth, collections of grime and vegetation growth were evident, particularly where water is ponding.

No other mechanical damage, cracking, wrinkling, bubbling or delamination was evident.

The membrane is generally in good condition. Action to make good the damaged area and to remove the moss and mould is being implemented by the owner.

3.8 Commercial Building – 27-39 Arthur Street, Wellington

The membrane was applied approximately 15 years ago.

The application is over commercial space on a concrete substrate and the area covered is used as a pedestrian access-way.

The membrane is turned up behind the fibre cement sheet exterior cladding on the southern elevation of the deck.

Some abrasion wear is evident along the walkway and there is some minor wrinkling and puckering at the cove to the upstand.

Some mechanical damage is evident at the stair riser above the wooden stair on the eastern end of the walkway.

No cracking, bubbling or delamination is evident.

No evidence of leaking from the walkway into the accessible spaces below could be identified.

The membrane is in very good condition.

3.9 2 Oku Street, Island Bay, Wellington

The membrane was applied 24 years ago and re-coated 8-10 years ago.

The application is on a roof over a living area. The roof area is of skillion construction with a sheet decking substrate. Gutters have been formed around some upper level structures to direct stormwater into deep gutters fixed to fascias.

Some minor puckering of the membrane is evident at substrate sheet joints.

No nail popping is evident on any of the sub-strate.

No cracking, bubbling or delamination of the membrane is evident.

In the sheltered areas some lichen and mould growth is evident.

The membrane is in excellent order. No evidence of leaking into the living area was identified.

3.10 123 Moxham Avenue, Hataitai

The membrane was applied to a garage roof and upstands at west and north perimeter walls 20 years ago.

The membrane is applied on a concrete substrate.

Some very minor wrinkling is evident adjacent to the edges of the roof on the north and south elevations.

No damage is evident on the wrinkles. Some lichen growth is evident.

No other mechanical damage, cracking, bubbly or delamination was evident.

The membrane is in very good order.

4.0 DIAGNOSIS

4.1 Generally the membrane systems are performing extremely well.

Signs of water ingress were looked for during the inspection. None were found or reported.

There is evidence some maintenance work has been carried out to repair damaged areas at the Willis Street Carpark. On each of the establishments there is evidence cleaning has been carried out but it is not considered that this has generally occurred regularly.

5.0 CONCLUSION

From the observations made the Traffigard membrane has performed as required up to and beyond 15 years as per the B2 (Durability Clause of the NZ Building Code).

6.0 REPORTING CONDITIONS

1. This report is based on a visual inspection only.
2. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the structure is free from defects.



3. No detailed site photographs have been taken of any inaccessible noted defects.
4. This report relates only to those areas, which could be reasonably accessed. The report does not cover hidden piping, beams, bracing or support elements, or any item that would required physical removal of material.

Signs of water ingress were looked for.

This report is provided for the use of **Hitchins New Zealand Ltd** only and may not be used by others without written permission. The Joyce Group Limited accepts no liability to third parties that may act on the contents of this report.

EXCLUSIONS

This report **does not** include comment about the following:

- a) Design of the house
- b) The surrounding neighbourhood
- c) The value of the property

No search has been made of:

- a) Local Authority file LIM or PIM reports



Ron F Thurlow
Brnz Accredited Adviser
Joyce Group Limited

Appendix 1

PRODUCT PERFORMANCE WARRANTIES



PRODUCER'S STATEMENT

On

TRAFFIGARD MEMBRANE PROCESS

Hitchins New Zealand Limited is the manufacturer and marketer of a range of product components involved in the Traffigard Membrane Process.

All products are produced to a high standard and subject to strict Quality Control procedures. The Traffigard Membrane Process is installed by an approved licensed Gunac applicator throughout New Zealand in keeping with Product Technical Dataspecs and comprehensive written Application Procedure instructions.

The Traffigard Membrane Process has been on the New Zealand, Australian, Far East and American market for in-excess of 25 years. In association with Hitchins' Research Laboratories Pty Limited, today Traffigard has an Australian Accreditation by CSIRO.

This Producer's Statement is to be read in conjunction with Hitchins' Product Technical documents on Traffigard Membrane Process, being:

- Traffigard Dataspecs
- Traffigard Brochure
- Traffigard Quality Control Schedule
- Traffigard Recommended substrate "Construction"
- Traffigard Application Procedure Instructions
- Traffigard Product Performance Warranty

1.0 New Zealand Building Code (NZBC) Compliance

The Traffigard Membrane Process when applied in accordance with the standard specification and recommendations of Hitchins New Zealand Limited by an approved licensed Gunac applicator will comply with and meet the relevant provision of the NZBC Clause.

- B1 Structure
- B2 Durability
- E2 External Moisture
- F2 Hazardous Building Materials

Details are set out in this Producer's Statement.

2.0 System Description

The Hitchins' Traffigard Membrane Process system is a multi-layered reinforced process, comprising of:-

- T Applicable Substrate Sealer
- T Joints and Holes Flushing compounds
- T Traffigard Hi-Build Acrylic Bodycoat
- T 300 gram Chopped Strand Fibreglass Mat
- T Traffigard Hi-Build Acrylic Topcoats

The finish can when required incorporate Traffigard non-slip and Formrok 335 for additional chemical resistance.

3.0 Finish Characteristics

- 3.1 Individual components of the system are covered in Hitchins New Zealand Limited Product Technical Dataspecs.
- 3.2 Being a liquid-applied process incorporating Chopped Strand Mat, the Traffigard Membrane Process does have certain material characteristics.
 - A Slightly profiled surface due to the incorporation of the Chopped Strand Mat.
 - B Slight ridging on the plywood sheet joints.
 - C Slight wrinkling at upstands.

4.0 Structure

The design, strength and stability, wind-loading, impact resistance and the construction of the substrate as required under Clause B1 will be covered by the project documentation and the construction firm.

5.0 Composition

- 5.1 Hitchins' Traffigard Membrane Process as under Clause 2.0 above is further detailed in the Product Technical Dataspecs, covering Solids, Flashpoint, Light Fastness, Film Flexibility, Tensile Strength, Chemical Resistance, and Fire Resistance.
- 5.2 As supplied, during its application and after installation Traffigard Membrane Process does not create any harmful substances and therefore complies with the provisions NZDCF2, Hazardous Building Materials.

6.0 Durability

The Traffigard Membrane Process under normal service conditions will comply within the requirements of the Building Code of Compliance for a service finish of 15 years subject to the maintenance requirements as covered under the Traffigard Product Performance Warranty.

7.0 Weather Resistant

The Traffigard Membrane Process applied as per the written application procedure instructions and maintained, provides a watertight integrity and therefore complies with E2 External Resistance.

For and on behalf of:-

HITCHINS NEW ZEALAND LIMITED



Jim Gerbes
MANAGING DIRECTOR

Dated: 4th August 2003



WARRANTY

SCHEDULE 'A'

TRAFFIGARD WARRANTY – PLYWOOD SUBSTRATE

HITCHINS NEW ZEALAND LIMITED are the manufacturers and marketers of the Traffigard Membrane System that has been on the New Zealand market for in-excess-of 20 years; has been tested and appraised by CSIRO and the Australian Building Systems Appraisal Council Limited and certified that Traffigard complies with all the relevant New Zealand Building Codes including the E2 and B2 requirements.

HITCHINS NEW ZEALAND LIMITED warrants that the Traffigard Membrane system installed over a sound substrate that conforms to the Building Code and by an approved Applicator in accordance with Hitchins written application procedure and instructions will perform and function as stated in the Hitchins Technical Dataspec. The warranty period is Fifteen (15) Years and is subject to maintenance requirements as covered below.

Maintenance

1. When required, wash down (with mild detergent) at low pressure.
2. If affected by moss and mould infestation, treat with an appropriate solution and clean down.
3. If mechanically damaged, have repairs carried out immediately.
4. Should the membrane become faulty (suspect material or installation), prompt notification to the Gunac applicator is required to ensure that rectification work is carried out at no charge to the client.
5. Inspect after eight (8) and then fifteen (15) years. Clean, prepare and repair (if and where necessary) and recoat with Traffigard's coloured resin to the complete membrane surface.

Note:

1. All maintenance work (items 1, 2, 3, and 5) is at the client's expense. The warranty is provided as required and maintenance is recommended to ensure that the Traffigard performs as required over and beyond the warranty period.
2. To extend the warranty beyond the initial warranty period for a further 15 Years, the membrane surface is to be cleaned, prepared, repaired (if and where necessary) and re-surfaced with reinforced Traffigard system.

Traffigard Characteristics

This is a liquid applied reinforced membrane which has certain natural characteristics.

- A. Slight profile surface due to the incorporation of the glass mat.
- B. Slight ridging on plywood sheet joints.
- C. Slight wrinkling at upstands to building.

Signed:

J E Gerbes

Title: **MANAGING DIRECTOR**
Hitchins New Zealand Limited

EXPERIENCE AND QUALIFICATIONS OF RONALD FREDERICK THURLOW

My full name is RONALD FREDERICK THURLOW.

1. I am employed by the Joyce Group Limited as a Building Consultant in Wellington. I have worked in the building industry since 1960.

BACKGROUND

2. I worked at WH Murray, Ranfurly, Central Otago as a tradesperson and carpenter from 1960 to 1965.

From 1966 to 1970 I worked as a Carpentry Instructor for the Department of Justice at the Waipiata Youth Centre, Central Otago. During that time I was also employed by the Department of Education as a part-time Woodwork Instructor.

3. From 1970 to 1975 I was employed in the Ministry of Works and Development Dunedin Residency and Dunedin District Office as a Building Overseer involved in maintenance work and treasury contract supervision.

Between 1976 and 1979, I continued working in the Ministry of Works and Development where I was workshop manager, architectural workshops, Green Island. I also had supervision and control of 35 staff in the multi disciplinary workshop team.

4. Between 1975 and 1979 I was tutor for advanced trade certificate students at the Otago Polytechnic.

From 1979 to 1980 I continued working at Works and Development in the Dunedin District Office as Building Officer responsible for Treasury Contract Supervision in the Dunedin District, including South Otago, North Otago and Central Otago and Building Maintenance in both North and Central Otago.

From 1980 to 1981 I worked in the Ministry of Works and Development, Head Office, Wellington as the Principal Building Officer. During this time I was involved in the preparation of the Supervisory Manual and Technical Manual for field staff. I was also involved in an analysis of the national maintenance expenditure and special project work (survey of problems with finishes of aluminium windows throughout New Zealand and leakage problems).

5. Between 1981 and 1985 I was the Deputy Manager, Building and Works Maintenance Unit and Property Maintenance Group, Wellington , for the Ministry of Works and Development. During this time I was appointed to assist with the initial development and introduction of the Building and Works Maintenance Unit and its day to day operation.
6. From 1985 to 1987 I was the Manager of the Property Maintenance Group for the Ministry of Works and Development in Wellington. This involved responsibility for over 240 staff members.
7. I began working for E Joyce & Associates Limited in 1988 as a Clerk of Works on the construction of the Park Royal Hotel in Wellington.
8. I continued working at E Joyce & Associates Limited between 1989 and 1990 as Branch Manager with responsibility for the operation of the Wellington Branch and the provision of consultancy services to clients.
9. From 1990 to 1996 I was employed at Joyce Group Limited as Group Projects Manager. In this position I was responsible for the management of construction projects within the Wellington area, the overseeing of projects in the Manawatu area, the coordination of national projects and the property management of several major property portfolios in the Wellington area.
10. From 1996-2003 I was employed as Project Manager and Building Consultant managing costs and implementation of construction and maintenance projects in the Wellington Branch of the Joyce Group Limited.

QUALIFICATIONS

11. I passed the New Zealand Advanced Trade Certificate in Carpentry in 1966 and the New Zealand Certificate in Building in 1970.

I am a Registered Clerk of Works, a Life Member of the Building Officials' Institute of New Zealand, a Member of the New Zealand Institute of Building Surveyors and an Associate Member of the Arbitrators and Mediators Institute of New Zealand.

I was accredited as an Adviser to the Building Research Association in 1994.



I have been commissioned as a Consultant to the Building Industry Authority to review the technical performance of Building Certifiers and Territorial Authorities with respect to their role in terms of the Building Act, 1991 and the issuing of building consents, code compliance certificates and compliance with the New Zealand Building Code.

12. I have appeared as an expert witness in the District Court of New Zealand and at arbitrations.

HS

Appendix 4 (continued)

WELLINGTON CITY COUNCIL

8th October 2004

Hitchins New Zealand Ltd
PO Box 40-749
Upper Hutt

Attn: Mr Jim Gerbes

Re: Hitchins Traffigard membrane system

Thankyou for the information on the suitability of the Hitchins Traffigard membrane system as an alternative solution of the Building Code.

Having considered the CSIRO information and the report from Joyce Group, Wellington City Council will consider Hitchins Traffigard as an alternative solution of the Building Code in regard to Clause E2 External Moisture for 15 years. This approval is for Hitchins Traffigard membrane system only.

When applying for a building consent where the Traffigard system is being used, your clients will need to clearly identify the product they are using and any limitations as noted in your supporting documentation. Any relevant construction details for the product will also need to be included as part of the building consent application.

At the time of application for a building consent, the applicant will also need to identify the registered applicator that will be installing the product.

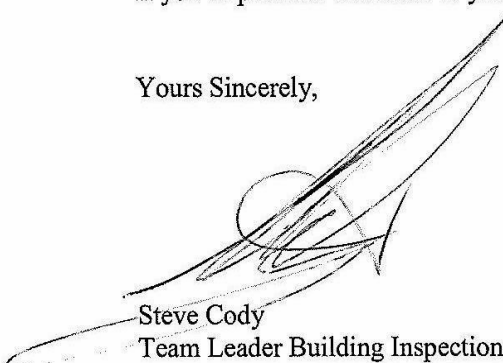
It would be helpful if you could provide details of your approved applicators, your quality assurance/training regimes and on going training that you provide to your applicators.

In addition, if the Hitchins Traffigard membrane system changes in either its chemical composition or method of installation, please inform the Council prior to the changes being implemented. This will allow the Council to determine if it is satisfied the proposed changes will still meet the requirements of the Building Code as an alternative solution for clause E2.

Please also be aware that this approval may change as industry knowledge and the Building Codes and relevant Acts change.

If you re-produce this letter to your clients please ensure it is re-produced in full.

Yours Sincerely,



Steve Cody
Team Leader Building Inspections
Building Consents & Licensing Services
Wellington City Council
Ph: 04 801 3228