

The Committee has no personal development, induction or training programme.

The Director/Chair relationship is problematic, the Director has now resigned.

It is clear that the outgoing Director has improved things considerably in the past 12 months by getting to the root of the financial issues, improving reporting structures and has ensured that the Society met its key performance requirements. The recent Portage Ceramics Awards night was highly successful.

From the outside, in terms of the Gallery's performance and service delivery, one would never know there were any problems. In large part this must be attributed to the outgoing Director and the dedication and enthusiasm of the highly committed Chair and Management Committee.

However, unless the organisational and governance structures are clarified and restructured, there is a real danger that the Society will continue to experience difficulties, regardless of the calibre of the new Director.

Recommendations

It is recommended that:

- The existing Management Committee be replaced by a 'Governance' Committee consisting of no more than 5 members.
- That the title of Director be replaced using the title Business Manager.
- The role of the 'Governance' Committee be to set the strategic direction for the Society; to employ, review and remunerate the Business Manager; to undertake normal governance duties (policy formulation, risk management, operating oversight, stakeholder management etc) and to report to the 'owners' the results.
- That terms of office be set for members of the Governance Committee, such terms to be along the lines of a maximum of three, two year terms. At the end of each term, the member to resubmit their CV for re-election, rather than automatic roll-over. At the conclusion of a total of six years, the member must stand down for a period of one year before offering themselves for re-election.
- That the Governance Committee report monthly to the Council's liaison officer against the KPI's and financial metrics.
- That the Business Manager be given the responsibility for, and be held accountable for, the day-to-day management of the Society in all its entirety.
- That the Minutes of the Governance Committee meeting accurately record the deliberations of the Committee.
- That the Rules be updated accordingly.
- That the Council considers its prudential and fiduciary position with the Society.
- That when the Governance Committee is appointed, they partake in a one day governance workshop. This workshop to include governance design, strategic leadership and Committee/Business Manager relationships. BoardWorks International would be pleased to facilitate this workshop.

Appendix

Management Committee attendance 19/5/04 to 21/9/05

Attachments

Sample Interview questionnaires

**THE LOPDELL HOUSE SOCIETY
MANAGEMENT COMMITTEE PERFORMANCE
EVALUATION 2005**

MANAGEMENT COMMITTEE

Name:.....

The job description for a management committee member of the Lopdell House Society may read as follows:

Principle duties:

1. Establish and maintain the organisation vision, purpose and values
2. Decide strategy and structure
3. Delegate to management
4. Exercise accountability

Specific duties:

1. Monitor the performance of management of The Society
2. Ensure appropriate separation of duties and responsibilities
3. Ensure the committee members' independent views are given due consideration and weight
4. Ensure that stakeholders are provided with a balanced and accurate view
5. Regularly review its own performance.
6. Ensure fair and full participation of all committee members

The objective of this questionnaire is to gain a view of the overall effectiveness of the Committee against that job description. To simplify matters, these duties have been condensed under four headings. Each committee member is to complete the questionnaire. In answering the questions, please be honest and fair. The answers to this questionnaire will highlight areas of strength and assist in identifying areas where the Committee could improve its working methods.

Please rate each question by circling the most appropriate number on a scale from 1 to 4, 1 being totally disagree and 4 being totally agree.

Strategic leadership – matters central to the Committee's strategic leadership role

1. The Committee consults effectively with its "owners" and other key stakeholders to understand their perspectives and to obtain their opinions about The Society's priorities and direction.	1 2 3 4
2. The Committee ensures that there is appropriate reporting to "owners" and other key stakeholders on organisational performance and on issues important to them.	1 2 3 4
3. The Committee ensures there is a clear definition and statement of the Society's purpose, values and strategic priorities.	1 2 3 4
4. The Committee has clear criteria for deciding which matters justify its attention and bases its agendas and work programme on these.	1 2 3 4
5. Before reaching a decision on important issues, the Committee usually requests input from persons likely to be affected by the decision	1 2 3 4
6. Committee members have the skills and experience relevant to the Society's current and future challenges.	1 2 3 4
7. The Committee is more involved in trying to put out fires than in preparing for the future.	1 2 3 4
8. When faced with an important issue, the Committee often "brainstorms" and	1 2 3 4

tries to generate a whole list of creative approaches or solutions to the problem.	1	2	3	4
9. The Committee often discusses where the Society should be headed five or more years into the future.	1	2	3	4
10. The Committee provides leadership to the whole organisation, i.e. members, other stakeholders etc	1	2	3	4
11. When appropriate the Committee seeks counsel from professional advisors.	1	2	3	4
12. The Committee actively monitors issues and trends in its external environment that might affect The Society.	1	2	3	4
13. The Committee ensures that they have been provided with, or taken steps to obtain, full and detailed information to make informed decisions.	1	2	3	4

Committee functionality – the way the Committee organises itself to do its work

1. The Committee has explicit policies that spell out its own role and responsibilities, define its operating structures and methods.	1	2	3	4
2. The Committee has plans or policies in place that provide clear direction as to the outcomes or results it wishes the Society to achieve.	1	2	3	4
3. The Committee has a systematic approach to identifying, addressing and reviewing the principal risks facing the Society.	1	2	3	4
4. The Committee explicitly sets standards for its own performance as a governing Committee and reviews both these standards, and its performance compared to them, regularly.	1	2	3	4
5. Committee subcommittees are limited to providing effective guidance and policy advice to the Committee on matters within their brief.	1	2	3	4
6. An effective induction programme is provided for all new committee members.	1	2	3	4
7. The Committee communicates its decisions to all those who are affected by them.	1	2	3	4
8. The Committee delays action until an issue becomes urgent or critical.	1	2	3	4
9. The Committee has on occasion evaded responsibility for some important issue facing the Society.	1	2	3	4
10. The Committee allocates organisational funds for the purpose of its own education and development.	1	2	3	4
11. The Committee continually examines ways to improve its performance and increase its contribution to the Society.	1	2	3	4
12. Committee members utilise their collective skills and experience to carry out their roles as an effective Committee.	1	2	3	4

Committee meetings – the way the Committee conducts its meetings.

1. The focus of Committee meetings, and of members between meetings, is on policy relevant at a governance level and on strategic issues with longer-term significance (rather than on shorter-term day-to-day operational and management matters).	1	2	3	4
2. Committee meetings have been handled efficiently, with outcomes and decisions made which have provided clear guidance for the Society.	1	2	3	4
3. The Committee devotes sufficient time to thinking strategically to enable it to provide clear leadership to, and effective stewardship of, the Society.	1	2	3	4
4. The Committee effectively monitors the achievement of the Society's strategic results and policy compliance generally.	1	2	3	4
5. Committee meetings are conducted in a manner that enables each member to participate fully in discussion and decision making.	1	2	3	4

6. Conflicting views within the Committee are aired openly and dealt with effectively.	1	2	3	4
7. In Committee deliberations members focus on the interests of the organisation as a whole rather than on personal interests or those of their nominators..	1	2	3	4
8. Committee meetings are managed in a manner that engenders a collective sense that Committee time is well spent.	1	2	3	4
9. Differences of opinion in Committee decisions are more often settled by vote than by more discussion.	1	2	3	4
10. Our Committee meetings tend to focus more on current concerns than on preparing for the future.	1	2	3	4

Director/Committee relationships – the relationship between the Committee and its Director

1. The Committee has clear and consistently applied policies relating to its interaction with the Director and staff.	1	2	3	4
2. The Committee reinforces the accountability of the Director by directing and instructing only the Director and not other staff.	1	2	3	4
3. Reporting by the Director and other staff assists the Committee to focus on policy and matters of strategic importance rather than on low level operational detail.	1	2	3	4
4. The Committee's information needs are clear and information is made available in a form that allows all committee members to fully comprehend the Society's situation and performance.	1	2	3	4
5. The basis for Director performance evaluation is clearly expressed expectations as to both what the Society should achieve and what situations and circumstances should be avoided.	1	2	3	4
6. Director compliance with Committee expectations and policies is monitored regularly and constructive feedback provided	1	2	3	4
7. There is a robust and business-like relationship between the Director and the Committee.	1	2	3	4
8. Once policies and strategic direction are agreed, the Committee leaves the Director and staff to go about their business free from intrusion or interference.	1	2	3	4

Please describe the best time(s) you have had as a Committee member of The Society.

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What are the things you value most about being a Committee member of The Society?

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If you had three wishes for the Committee of The Society, what would they be?

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WAITAKERE BADMINTON CARPARK - WCC Proposal

PHYSICAL WORKS - STAGE I

Item	Description	Unit	Qty	Rate	Amount	
A	<u>CARPARK TO REAR</u>					
1.0	Establishment	LS	1	1,000.00	1,000.00	
2.0	Excavation	cm	400	30.00	12,000.00	
3.0	Retaining wall construction	sm	190	250.00	47,500.00	
4.0	Import and place hardfill	cm	1600	65.00	104,000.00	
5.0	Supply and place GAP40 basecourse	cm	150	75.00	11,250.00	
6.0	Stormwater	LS	1	10,000.00	10,000.00	
7.0	Remove trees	each	12	700.00	8,400.00	194,150.00
B	<u>WESTERN LINK</u>					
1.0	Establishment	LS	1	1,000.00	1,000.00	
2.0	Excavation	cm	100	30.00	3,000.00	
3.0	Retaining wall construction	sm	15	250.00	3,750.00	
4.0	Import and place hardfill	cm	100	65.00	6,500.00	
5.0	Supply and place GAP40 basecourse	cm	35	75.00	2,625.00	
6.0	Stormwater	LS	1	1,000.00	1,000.00	17,875.00
C	<u>EASTERN LINK</u>					
1.0	Establishment	LS	1	1,000.00	1,000.00	
2.0	Excavation	cm	100	30.00	3,000.00	
3.0	Retaining wall construction	sm	5	250.00	1,250.00	
4.0	Import and place hardfill	cm	100	65.00	6,500.00	
5.0	Supply and place GAP40 basecourse	cm	35	75.00	2,625.00	
6.0	Stormwater	LS	1	1,000.00	1,000.00	15,375.00

\$ 227,400.00 \$ 227,400.00

PROFESSIONAL FEES

Item	Description	Unit	Qty	Rate	Amount
1.0	Topo survey and concept plan	LS	1	2700.00	2700.00
2.0	Detailed Design and consents	LS	1	5400.00	5400.00
3.0	Contract Preparation & Documentation	LS	1	2200.00	2200.00
4.0	Contract Tendering, mgmt and supervision.	LS	1	6500.00	6500.00
5.0	Geotechnical investigation	LS	1	5000.00	5000.00

\$ 21,800.00 \$ 21,800.00

WAITAKERE BADMINTON CARPARK - WCC Proposal

PHYSICAL WORKS - STAGE II

Item	Description	Unit	Qty	Rate	Amount	
A	<u>CARPARK TO REAR</u>					
1.0	Establishment	LS	1	1,500.00	1,500.00	
2.0	Kerb and channel	m	100	35.00	3,500.00	
3.0	Trim, roll and compact basecourse	sm	960	10.00	9,600.00	
4.0	30mm asphaltic concrete	sm	960	20.00	19,200.00	
5.0	Roadmarking	LS	1	500.00	500.00	
6.0	Landscaping	LS	1	5,000.00	5,000.00	
6.0	Swimming pool type fence	m	100	100.00	10,000.00	
7.0	Lighting	LS	1	20,000.00	20,000.00	69,300.00
B	<u>WESTERN LINK</u>					
1.0	Establishment	LS	1	1,500.00	1,500.00	
2.0	Kerb and channel	m	55	35.00	1,925.00	
3.0	Trim, roll and compact basecourse	sm	170	10.00	1,700.00	
4.0	30mm asphaltic concrete	sm	170	20.00	3,400.00	
5.0	Roadmarking	LS	1	200.00	200.00	
6.0	Landscaping	LS	1	2,000.00	2,000.00	
6.0	Swimming pool type fence	m	60	100.00	6,000.00	
7.0	Lighting	LS	1	2,000.00	2,000.00	
8.0	Gate	LS	1	1,500.00	1,500.00	20,225.00
C	<u>EASTERN LINK</u>					
1.0	Establishment	LS	1	1,500.00	1,500.00	
2.0	Kerb and channel	m	50	35.00	1,750.00	
3.0	Trim, roll and compact basecourse	sm	170	10.00	1,700.00	
4.0	30mm asphaltic concrete	sm	170	20.00	3,400.00	
5.0	Roadmarking	LS	1	500.00	500.00	
6.0	Landscaping	LS	1	2,000.00	2,000.00	
6.0	Swimming pool type fence	m	50	100.00	5,000.00	
7.0	Lighting	LS	1	2,000.00	2,000.00	
8.0	Gate	LS	1	1,500.00	1,500.00	19,350.00
					108,875.00	108,875.00

PROFESSIONAL FEES

Item	Description	Unit	Qty	Rate	Amount
1.0	Contract Preparation & Documentation	LS	1	1500.00	1500.00
2.0	Contract Tendering, mgmt and supervision.	LS	1	2000.00	2000.00

\$ 3,500.00 3,500.00

ABB

TOTAL PROJECT COSTS

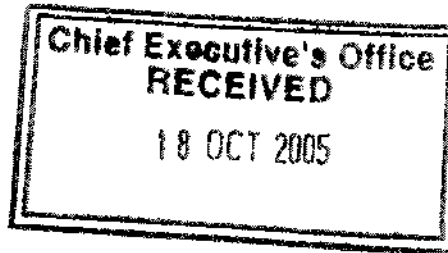
	REAR CARPARK	WESTERN LINK	EASTERN LINK	PROF. FEES	TOTAL
STAGE I	194,150.00	17,875.00	15,375.00	21,800.00	249,200.00
STAGE II	69,300.00	20,225.00	19,350.00	3,500.00	112,375.00
TOTAL	263,450.00	38,100.00	34,725.00	25,300.00	361,575.00

18 OCT 2005

Watercare Services Limited
Shareholders' Representative Group
Chairman, Dr Bruce Hucker

*Asst
19/10/05*

12 October 2005



Mr Harry O'Rourke
Chief Executive
Waitakere City Council
Private Bag 93109
Henderson
Waitakere City

Dear Mr O'Rourke

REAPPOINTMENT OF DIRECTORS TO THE BOARD OF WATERCARE

Regulations 27.1 and 27.2 of Watercare's Constitution, require one third of the directors to retire from office at the time of the annual general meeting (AGM), with those serving the longest in office being required to retire first.

Graeme Hawkins and Patrick Snedden will be retiring at this year's AGM. Mr Hawkins and Mr Snedden have indicated a desire to be re-elected.

The Watercare Shareholders' Representative Group met on 30 September 2005 and resolved to reappoint Mr Hawkins and Mr Snedden to the board of Watercare. To ratify these reappointments at the AGM, each shareholding council will need to formally pass or sign a resolution endorsing the SRG decision. This is in accordance with clause 20 of the Shareholders' Agreement.

Would you please arrange for the SRG representative who will be attending the AGM in December 2005 to obtain a binding mandate from your full council to vote with respect to the reappointments to the Watercare board.

I look forward to hearing from you.

Yours sincerely

Councillor Neil Morrison
Deputy Chair
Watercare Shareholders' Representative Group

Chief Executive	<input checked="" type="checkbox"/>
Corporate Services	<input type="checkbox"/>
City Services Maselle	<input type="checkbox"/>
Consultancy Services	<input type="checkbox"/>
ECC - WATER	<input type="checkbox"/>
Strategic Group	<input type="checkbox"/>
Consent Services	<input type="checkbox"/>
Field Services	<input type="checkbox"/>
	<input type="checkbox"/>

REPORT

**ENGINEERING ADVICE FOR
HERITAGE BUILDING
CHAPEL OF FAITH IN THE OAKS**

Report prepared for:
WAITAKERE CITY COUNCIL

Report prepared by:
TONKIN & TAYLOR LTD

Distribution:

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Job no: 22950

October 2005

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Executive summary

Tonkin & Taylor have been engaged by Waitakere City Council to provide engineering advice on structural defects at the Chapel of Faith in the Oaks in Waikumete Cemetery, West Auckland. This report provides details of investigative works undertaken, an assessment of the probable causes of the current defects, and options for remedial works.

A geotechnical investigation was undertaken consisting of trial pits and auger holes, as well as insitu and laboratory testing. This revealed that the Chapel is founded on very stiff clayey SILTS which exhibit low plasticity and low sensitivity. A structural survey of the Chapel revealed a large number of cracks in the Chapel walls, both structural and non-structural. These are believed to have been caused by differential settlements due to seasonal moisture changes, amplified by the moisture demand from tree roots. In addition, deterioration and splitting of a timber roof truss member in the north west corner was observed. This is believed to have been caused by lateral and vertical movements of the supporting wall, and water ingress from overflow of the guttering above. A number of areas of internal damage from damp were also observed.

A schedule of repairs is presented, along with two options for stabilisation works with preliminary cost estimates.

1 Introduction

This report details the results of investigative works undertaken by Tonkin & Taylor relating to the Chapel of Faith in the Oaks, and recommendations for remedial measures.

The Chapel of Faith in the Oaks in Waikumete Cemetery was opened in 1886, and is currently leased by Waitakere City Council to the Waikumete Chapel Restoration Trust, who are responsible for day to day operation and maintenance. The Chapel has a history of structural problems, most notably cracking in the walls and interior dampness, and two previous reports have been produced regarding the causes and solutions to these problems. In addition, a number of repairs have been undertaken in the past, including foundation works and sealing of wall cracks. However, cracking has continued since the repair works.

Tonkin & Taylor were engaged by Waitakere City Council to undertake a holistic assessment of the Chapel Building and its immediate surroundings to determine the cause and severity of the cracking, and to recommend options for remedial works with cost estimates.

2 Investigative Works

An investigative team visited the site on Wednesday 28th September 2005 and Thursday 29th September. Works carried out are described below.

2.1 Geotechnical Investigation

A total of three test pits and two hand augers were excavated in order to determine the nature of the Chapel foundations and the underlying ground conditions. A plan showing the location of the test pits and augers is shown in Appendix D. Test pit and auger logs are given in Appendix E.

The soils are generally consistent over the site and comprise a thin layer of topsoil and fill extending to a depth of 500mm. The underlying natural soils are East Coast bays Formation. These are derived from weathering of the interbedded siltstone and sandstone rocks in the Auckland region. The materials encountered were very stiff yellow clayey SILTS which exhibited low plasticity and low sensitivity. Natural water contents of recovered samples varied from 27% to 59%. Two samples were tested to determine their classification properties. These confirm the soils to be inorganic clays and silts of low to moderate plasticity. We would expect the shrinkage characteristics of these soils to be moderate in terms of the AS2870-1996 standard. Potential for swelling and shrinkage movements as a result of seasonal moisture changes are likely to be between 20-40mm.

In situ soil strength testing, consisting of shear vane tests, was performed in each of the test pits and auger holes. The results are given in Appendix E, and indicate that the shear strength of the natural soils is in the order of 130kPa. Based on these results, the following piling design parameters have been assumed:

- Skin friction = 60kPa (geotechnical ultimate), 45kPa (structural ULS), 30kPa (allowable).

- End bearing = 1000kPa (geotechnical ultimate), 500kPa (structural ULS), 330kPa (allowable).

Exposing the foundations revealed that the Chapel walls are supported on a 300mm deep concrete strip footing, which is supported by a rough concrete foundation wall, 500-700mm deep. The outside face of the concrete wall projects approximately 500mm from the outer face of the Chapel wall; however, it was not possible to determine the overall width of the concrete foundation wall.

Therefore, we can conclude that the Chapel is founded at a depth of 800-1000mm below ground level on the stiff residual soils.

2.2 Structural Survey

The structural survey consisted of the following elements:

- Visual inspection of exposed foundations.
- Visual inspection and photographic record of all defects.
- Coring to determine wall materials and condition.

2.2.1 Foundations

As mentioned in the previous section, the foundations for the external walls appear to consist of a concrete strip footing supported by a concrete wall. The presence of the strip footing is consistent with a 1981 drawing showing structural upgrading which was included in the 1991 Works Consultancy report by Dave Pearson. This drawing shows a 450mm wide by 300mm deep reinforced concrete strip footing. However, the concrete foundation wall is not shown on the drawing. No evidence of any piling underneath the external walls was found.

Visual inspection of the concrete in the exposed foundations indicated that the strip footing was cast within formwork and is dense, well compacted and in good condition. The concrete in the foundation wall appears to have been cast directly against the ground, and does not appear to have been well compacted.

2.2.2 Structure

A visual survey of the structure revealed a large number of defects. These defects have been tabulated in Appendix C. Defects are referenced to photographs, which are contained in Appendix B. A plan showing the location of the photographs is given in Appendix A. For ease of comparison, the labelling of the wall elevations is as per the 1991 Works Consultancy report.

The defects observed can be summarised as follows:

- Large numbers of hairline cracks in the internal and external plaster finish. A number of these are due to reopening of previously repaired cracks.
- A number of wider cracks in the internal and external plasterwork that are likely to extend into the wall beneath.
- A number of areas of flaking/blistering internal paint and efflorescence due to dampness.

- Severe deterioration and splitting of the timber roof truss adjacent to the support in the North West corner (intersection of elevations F and G).
- Guttering missing from the northern porch.

A 50mm diameter core was taken from the Chapel wall in the north eastern corner at a height of 1100mm above apron slab level. Inspection of the core indicates that the Chapel walls consist of a double layer of clay bricks, 270mm overall thickness (including a 20-30mm plaster layer on each face).

The Chapel roof was visually inspected using ladder access. The roof appears to be in good condition with no defects in the tiles, flashings or drainage observed; however, a build up of leaves in the eaves gutters was observed.

2.3 Effect of Trees

The arborist inspection confirmed that the large oak adjacent to the south east corner of the Chapel will draw significant amounts of moisture from the soil through its shallow root systems, amplifying the natural seasonal changes in soil moisture content. Although no significant roots were exposed during the test pit excavation, it is likely that the root network is at least as extensive as the canopy, and is likely to be within the top 1m of soil. However, many of these roots may have been severed during the previous underpinning works.

2.4 Location of Services

Services in the immediate vicinity of the Chapel were located using a combination of detection equipment and excavation. A plan of the located services is given in Appendix F.

The located Services comprised the following:

- A 100mm dia. PVC surface water drainage network, linked to downpipes on the south, east and west faces of the Chapel. Downpipes from the northern porch appear to be not connected to the drainage system, discharging directly into the ground. Excavations revealed that the invert depth of pipework adjacent to the building was 250mm. Based on a minimum fall of 1 in 80, the depth of the network in the vicinity of the Chapel is likely to be between 250mm and 500mm.
- Buried LV electrical cables which supply the circuit board inside the Chapel in the north eastern corner, and subsequently the external lighting system. These were not excavated, but are likely to be at a depth of between 300-600mm.

3 Likely Causes of Defects

3.1 Cracking in Walls

The cracking observed in the Chapel walls is likely to have been caused by differential settlement of the perimeter foundations, which in turn has been caused by shrinkage and swelling of the founding clay due to variations in moisture content. The variations in moisture content will have been amplified by the presence of mature trees, most notably the large oak adjacent to the south east corner of the Chapel.

The general pattern of cracking throughout the building indicates that settlement of the foundations at the buttressed corners is likely to have been greater than settlement beneath the walls and at re-entrant corners. This is due to wall loads being redistributed around large openings, such as the doorways and windows, towards the corners which are already heavily loaded due to the weight of the buttresses.

Dampness is not considered to be a cause of the cracking in the walls.

3.2 Damage to Roof Truss

The damage to the roof truss described in section 2.2.2 is likely to be due to a combination of building movements over time (both vertical and lateral), and deterioration of the timber at the support, probably due to water ingress from the spouting immediately above. This has resulted in a loss of competent bearing and subsequent splitting of the timber and damage to the surrounding wall fabric.

4 Recommended Remedial Works

Remedial work that is recommended on the Chapel can be divided into two categories:

1. Repair/Maintenance work - i.e. work required to make good existing defects such as cracking and plaster/paint/timber deterioration.
2. Stabilisation Work - i.e. work required to minimise the likelihood of the cracking reoccurring. Note that works to prevent future dampness are outside the scope of the brief for this report.

4.1 Repair/Maintenance Work

Recommended actions for repair work are detailed in the Defects/ Action schedule contained in Appendix C. The works can be summarised as follows:

- Repainting hairline cracking.
- Removing and reinstating areas of drummy plaster and flaking/blistering paintwork.
- Cleaning out structural cracking, installation of a repair system consisting of the following:
 - injection of epoxy repair resin into crack;
 - application of lime plaster and repainting.
- Note that if stabilisation works are not undertaken, the cracks will remain 'active' and the following additional works will be required to repair the cracks:
 - cutting of 1000mm long slots in mortar joints or brickwork at 350mm spacing;
 - installation of proprietary stainless steel rods across crack using cementitious grout .

- Removal of damaged section of truss timber and splicing of new timber to match original with installation of damp proof membrane between timber and masonry surfaces.
- Refixing of southern door to allow for current frame distortion.
- Replacement of guttering to northern porch.
- Ensuring all guttering is regularly cleared of leaves to prevent build up.

We estimate the cost for the above works to be as follows:

Painting of hairline cracking	\$300
Remove/replace deteriorated plaster and paint	\$1500
Repair of structural cracking	\$3000 (epoxy only) \$5500 (epoxy + steel tie)
Repair of roof truss	\$3000
Refix door	\$100
Replace guttering	\$100
Total	\$8000 (epoxy crack repair only) \$10500 (epoxy + rod crack repair)

4.2 Stabilisation Works

4.2.1 Control of cracking

To reduce the likelihood of further cracking developing, the Chapel foundations need to be isolated from volume changes in the underlying soils due to variations in moisture content. The following two options are proposed:

4.2.1.1 Option 1 – Cut off Wall

This option involves the installation of a 100mm wide subsurface mass concrete cutoff wall to a depth of 1.5m around the perimeter of the Chapel in order to isolate the foundations from changes in soil moisture content. To provide an additional barrier to moisture, an HDPE membrane or similar. In addition, a new concrete apron would be installed between the cutoff wall and the Chapel to prevent rainwater from entering the isolated area. The cutoff wall would be installed approximately 0.75m from the outside face of the Chapel wall.

Due to the proximity of the large oak in the south east corner, it is likely that this option would involve severing a number of roots during the trench excavation. However, as the tree leans toward the Chapel, the trench would be dug on the 'compression' side of the tree resulting in a negligible effect on tree stability. Some die back of the canopy could be expected over the Chapel due to severance of roots in this area. The existing services would need to pass through the cutoff wall in a number of locations. This could be achieved by sleeving the cables/pipes through the wall.

We estimate the cost for this option to be \$10,000, including reinstatement of planting and pathways around the Chapel.

4.2.1.2 Option 2 – Underpinning

This option involves installing reinforced concrete piling underneath the perimeter of the Chapel to sufficient depth to isolate the building from changes in soil moisture content. The piles would support a reinforced concrete ground beam which would be connected to the existing strip footing by steel dowels. Preliminary calculations indicate that 200mm diameter, 1.5m long piles would be required at 1.0m spacing, supporting a 400mm wide by 300mm deep ground beam. These works could be undertaken without removal of the existing concrete apron. Services could also be sleeved through or diverted beneath the ground beam.

We estimate the cost for this option to be \$42,000, including reinstatement of planting and pathways around the Chapel.

4.2.2 Site Drainage

From examination of the existing drainage plan and our investigation, it appears that the downpipes on the northern porch discharge directly into the ground. It is recommended that the downpipes from the northern porch are connected to the surface water drainage network to divert the runoff away from the founding soils. The estimated cost for this work is \$350, including reinstatement.

As the most likely cause of deterioration of the timber truss support is from overflow of guttering, the recommendations of section 4.1 apply, i.e. regular clearance and inspection of guttering. Specific recommendations have been previously made in section 7.1 of the 1994 report 'Cyclical Maintenance Issues at Waikumete Cemetery Chapel' by the NZ Historic Places Trust.

5 Conclusions

We recommend that all the repair works outlined in section 4.1 are undertaken to improve the structural integrity and appearance of the Chapel.

Of the two stabilisation options outlined in sections 4.2.1.1 and 4.2.1.2, we recommend that option 1 (cut off wall) is adopted, as we believe this option will achieve the reduction in differential settlement necessary to prevent further structural cracking at the minimum cost.

We also recommend that the drainage work outlined in section 4.2.2 is undertaken to prevent future storm water discharge into the soil adjacent to the northern porch.

6 References

- Chapel of Faith in the Oaks Building Report, Prepared for the Waikumete Chapel Restoration Trust, By Dave Pearson Conservation Architect (Works Consultancy Services Ltd), May 1994
- Cyclical Maintenance Issues at Waikumete Cemetery Chapel, By Dave Reynolds, NZ Historic Places Trust, August 1999

7 Applicability

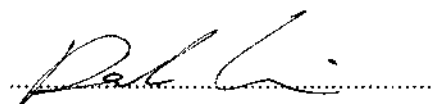
This report has been prepared for the benefit of Waitakere City Council with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

TONKIN & TAYLOR LTD

Environmental and Engineering Consultants

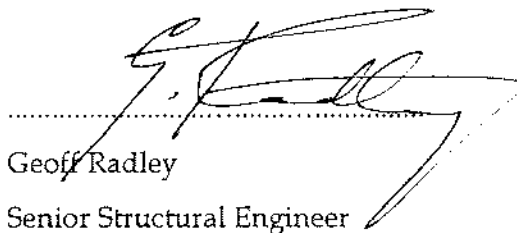
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Senior Structural Engineer

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