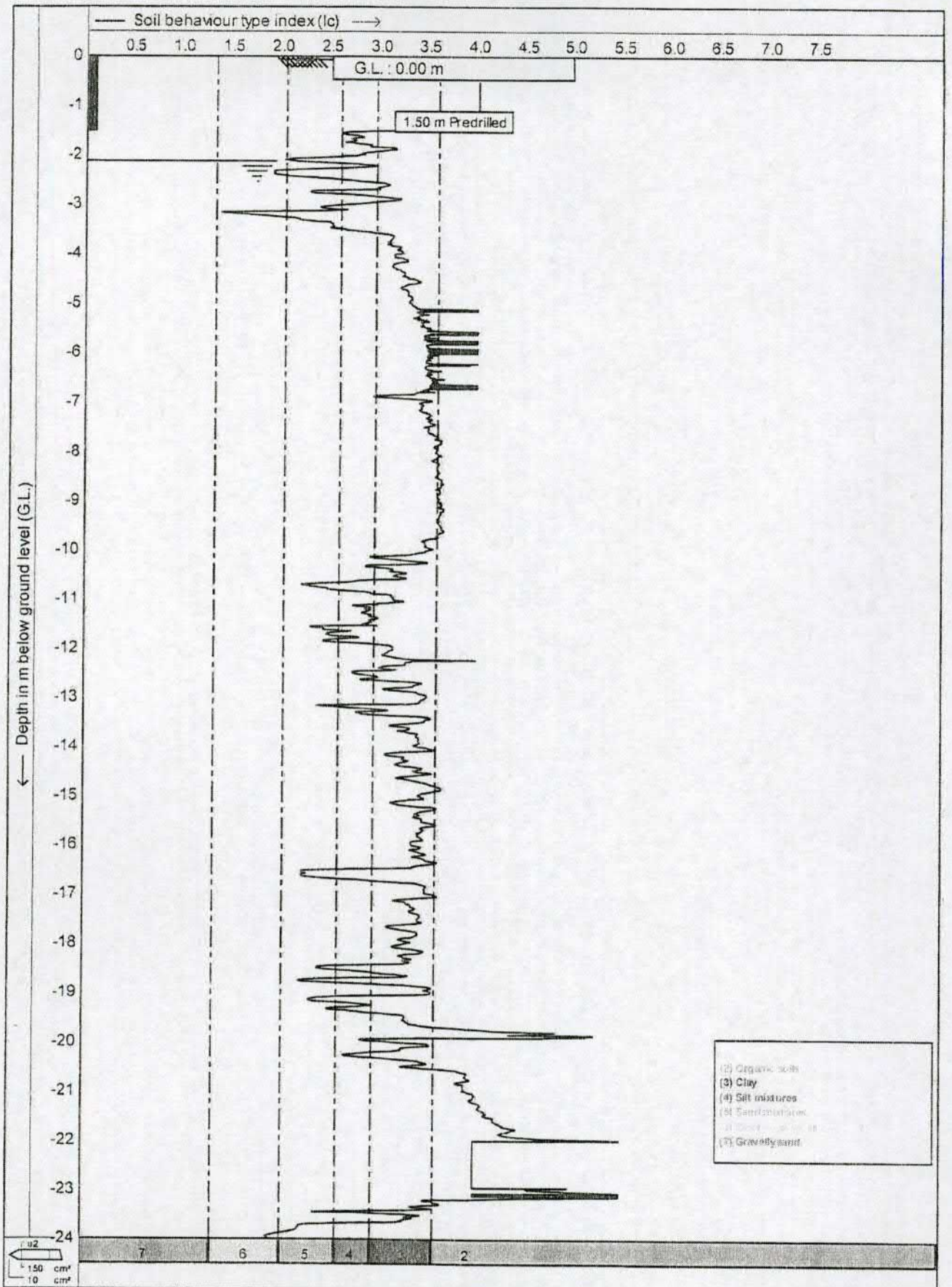


PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : RCP

Location: 14 Grey St - Tauranga

Position: 0, 0 RD

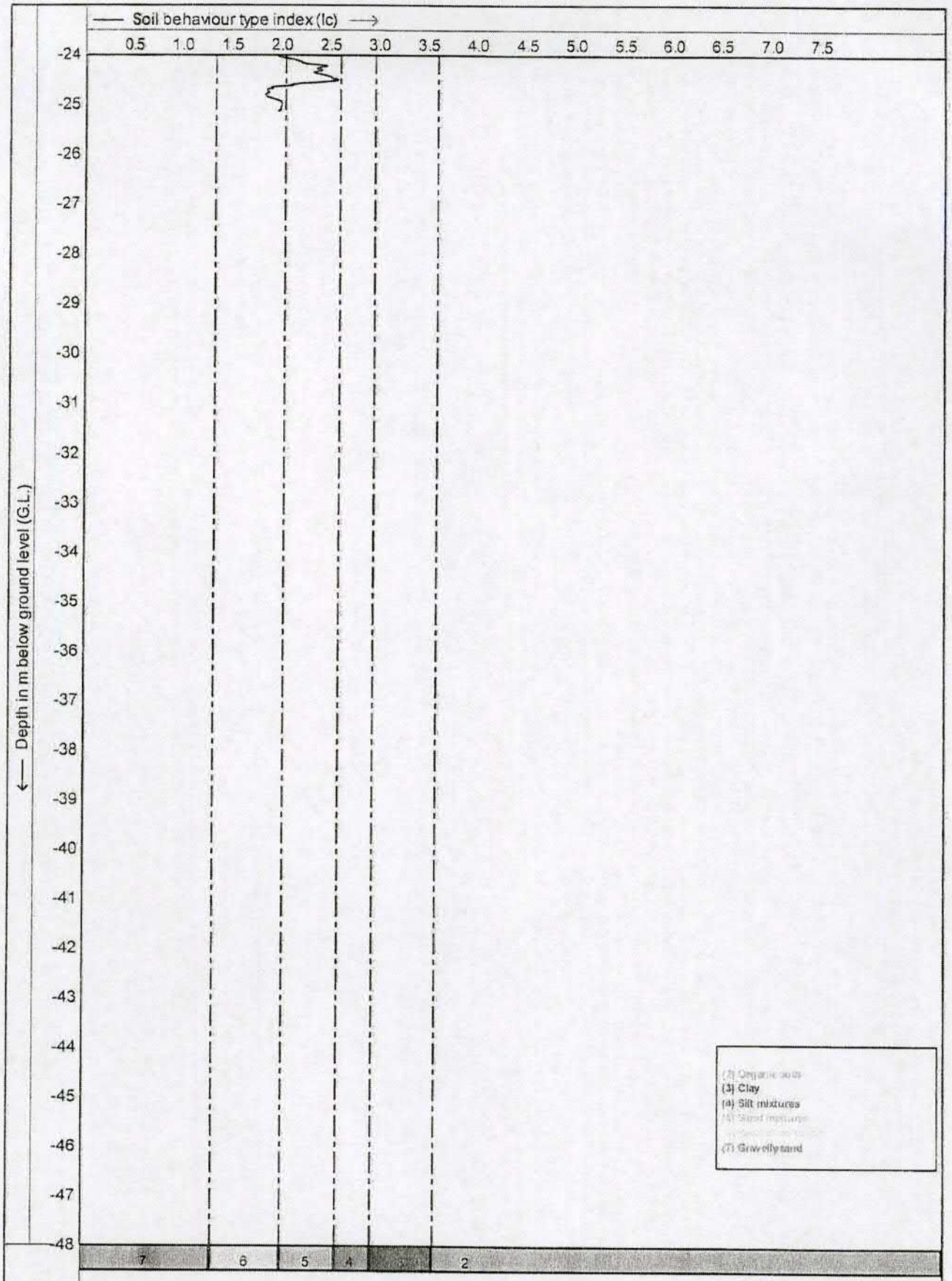
Date : 5-2-2014

Cone no. : C10CRIP.C13184

Project no. : 05SL1

CPT no. : 01

17/28



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **RCP**

Location: **14 Grey St - Tauranga**

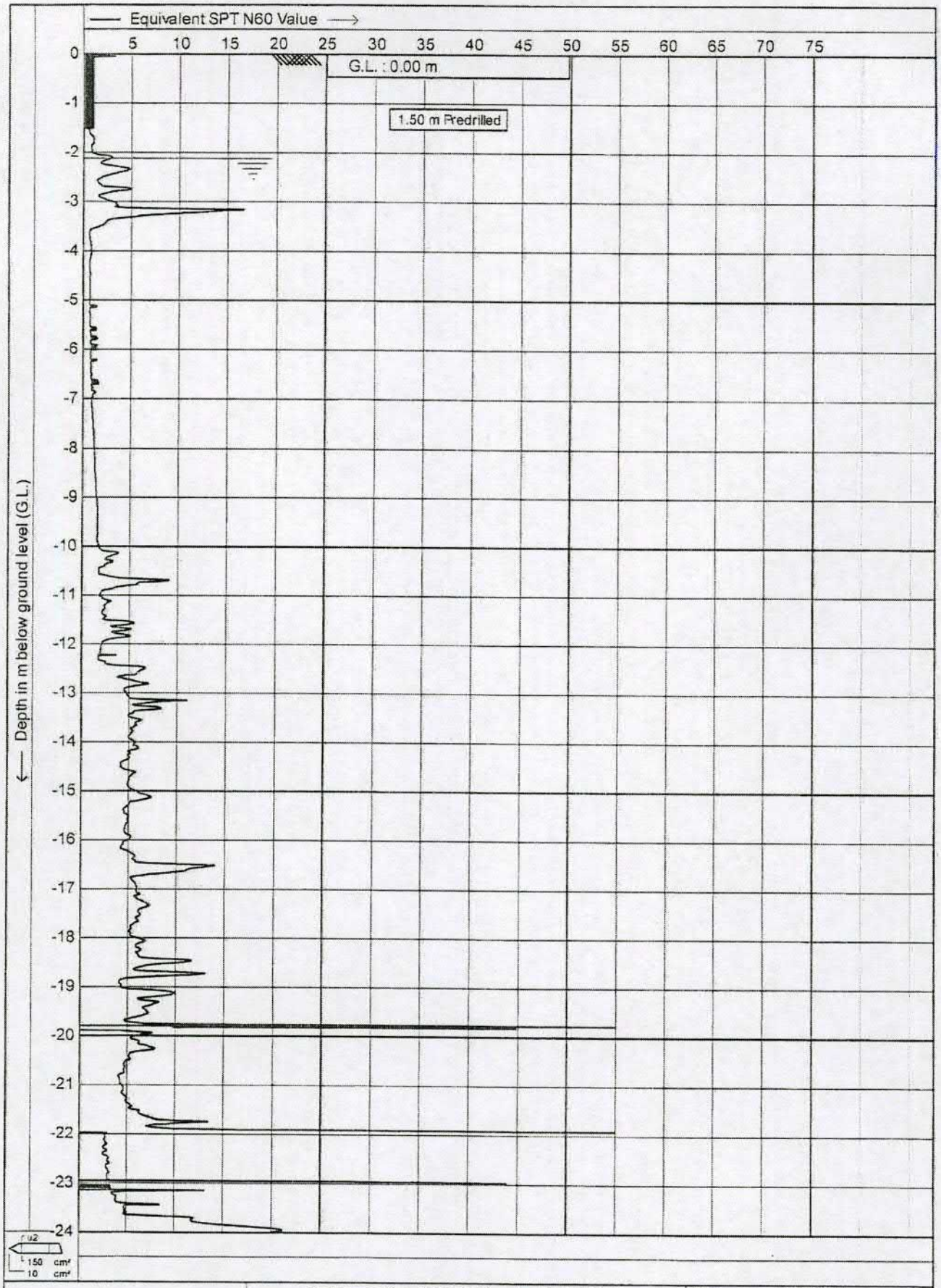
Position: **0, 0 RD**

Date : **5-2-2014**

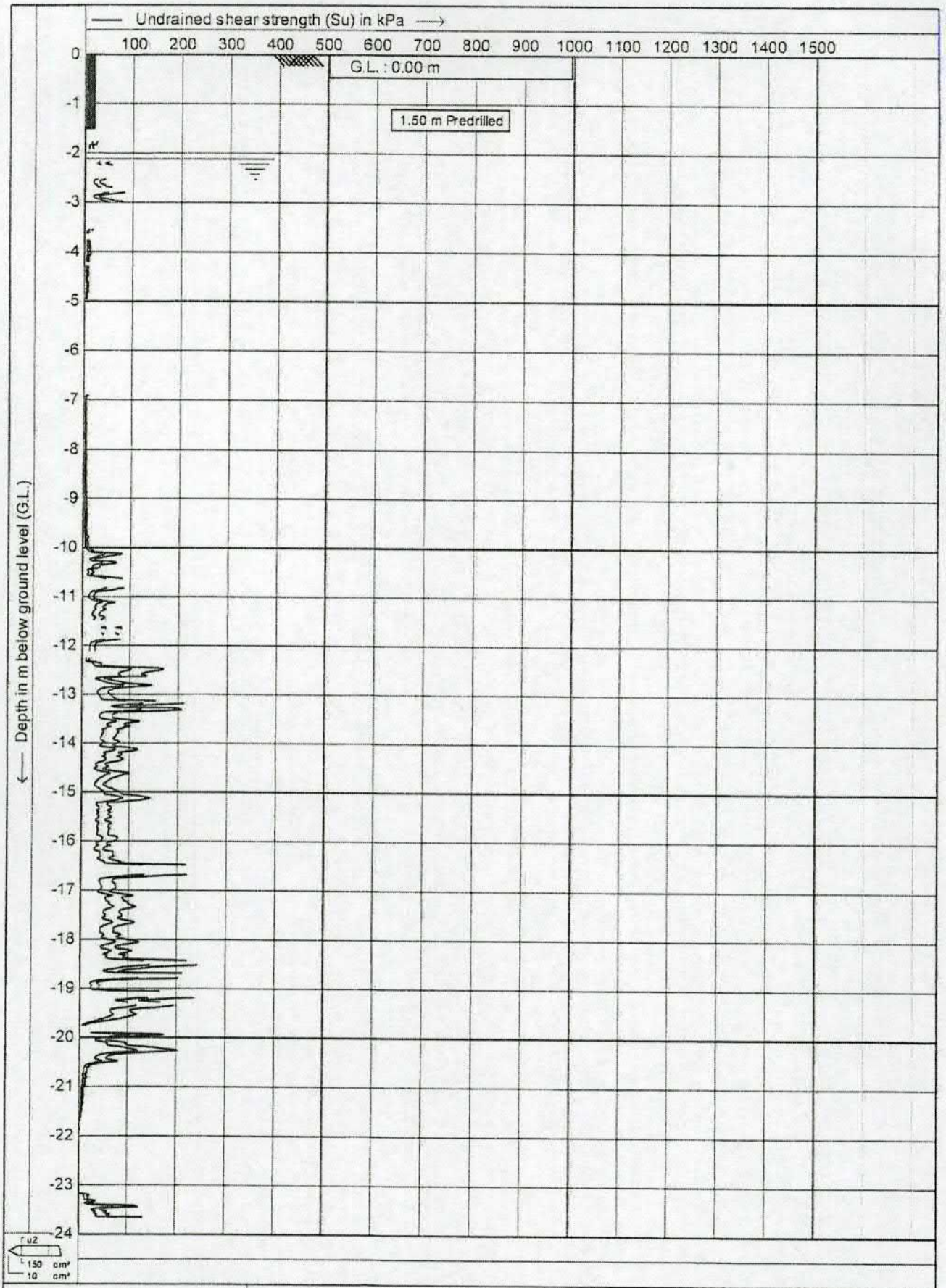
Cone no. : **C10CFIIP.C13184**

Project no. : **05SL1**

CPT no. : **01**



PERRY GEOTECH	Test according A.S.T.M. Standard D 5778-12	Date : 5-2-2014	
	Project : RCP	Cone no. : C10CFIIP.C13184	
	Location: 14 Grey St - Tauranga	Project no. : 05SL1	
	Position: 0, 0 RD	CPT no. : 01	23/28



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : RCP

Location: 14 Grey St - Tauranga

Position: 0, 0 RD

Date : 5-2-2014

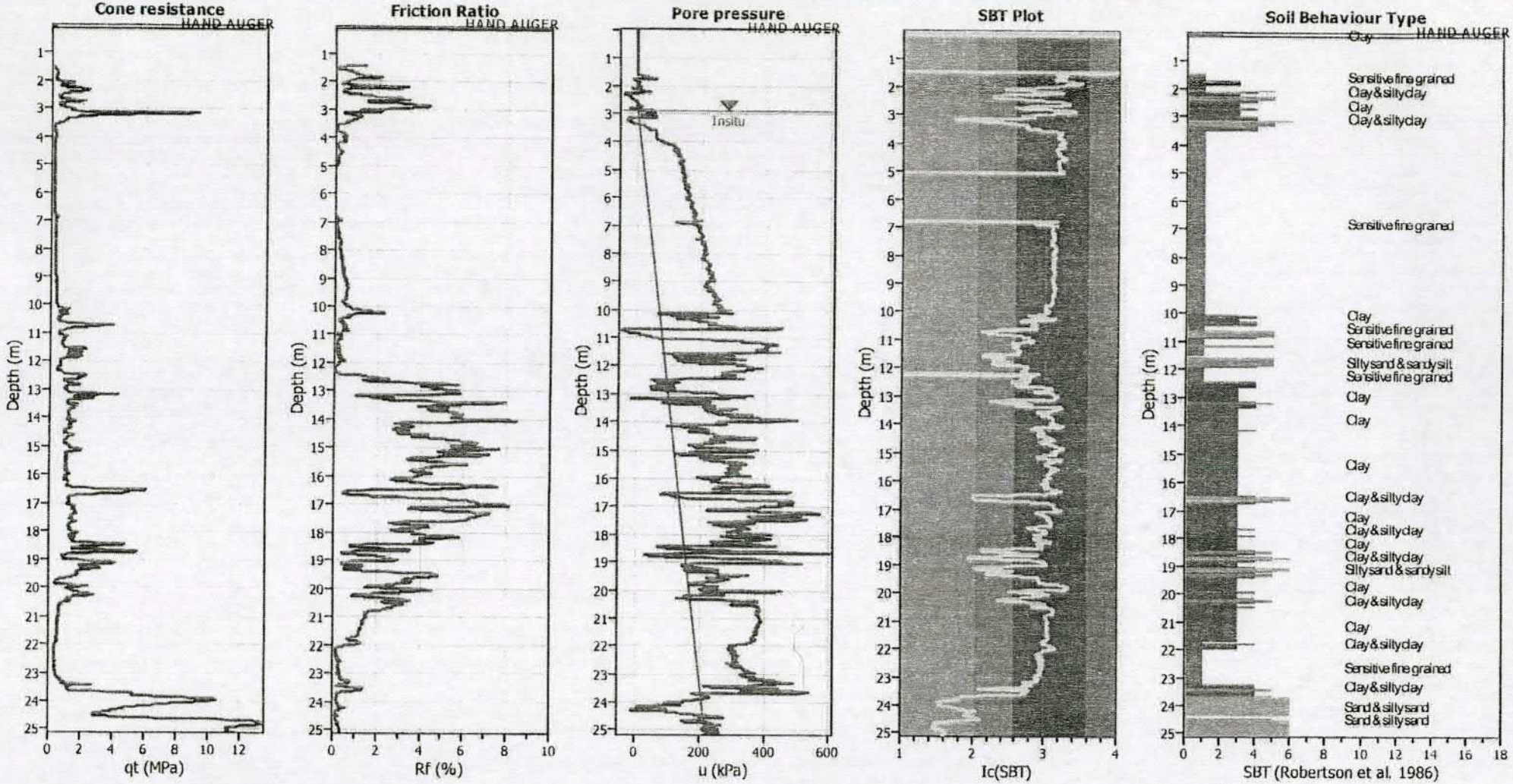
Cone no. : C10CFIIP.C13184

Project no. : 05SL1

CPT no. : 01

19/28

CPT basic interpretation plots



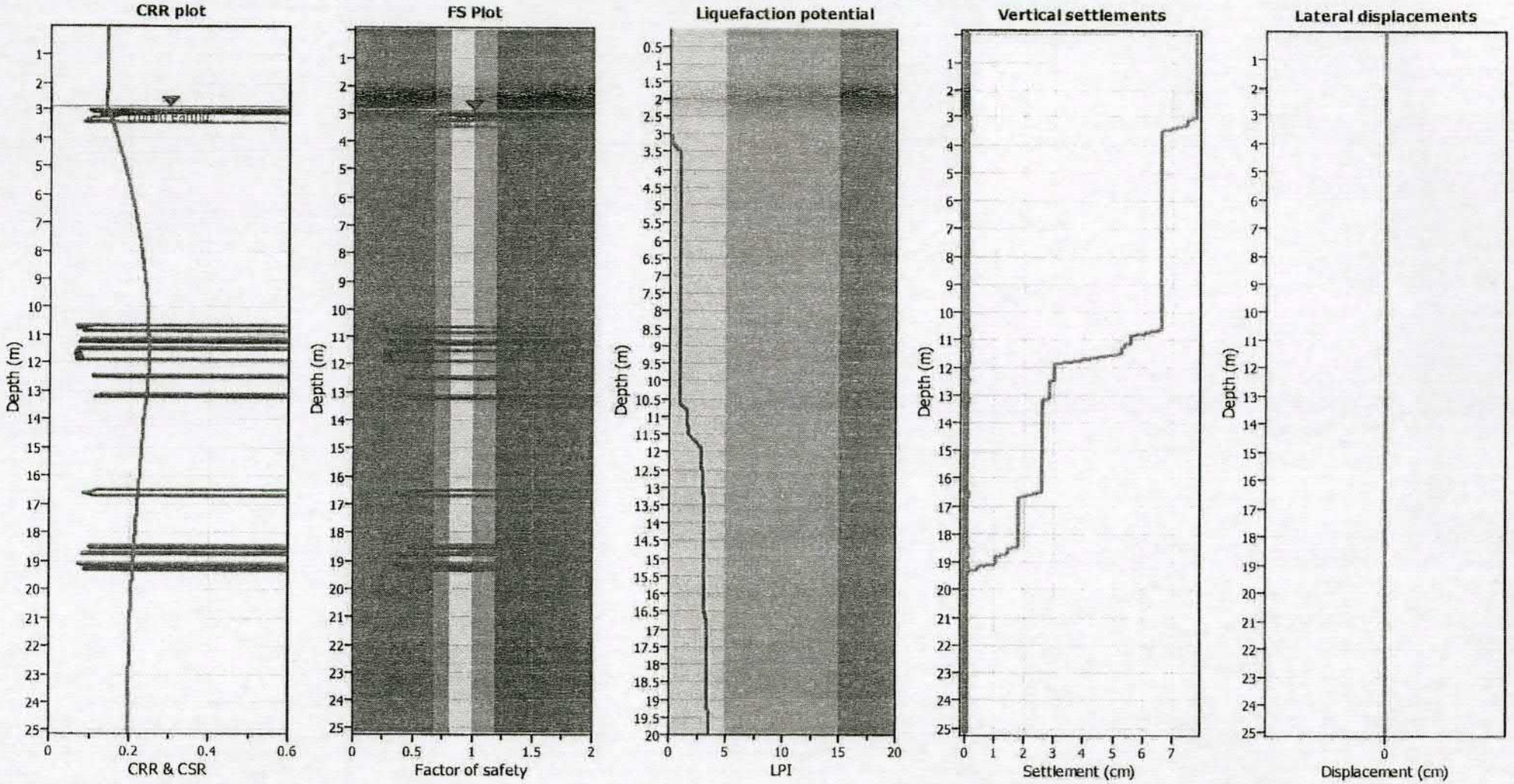
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	2.90 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.22	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	2.90 m	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	2.90 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.22	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.90 m	Fill height:	N/A	Limit depth:	20.00 m

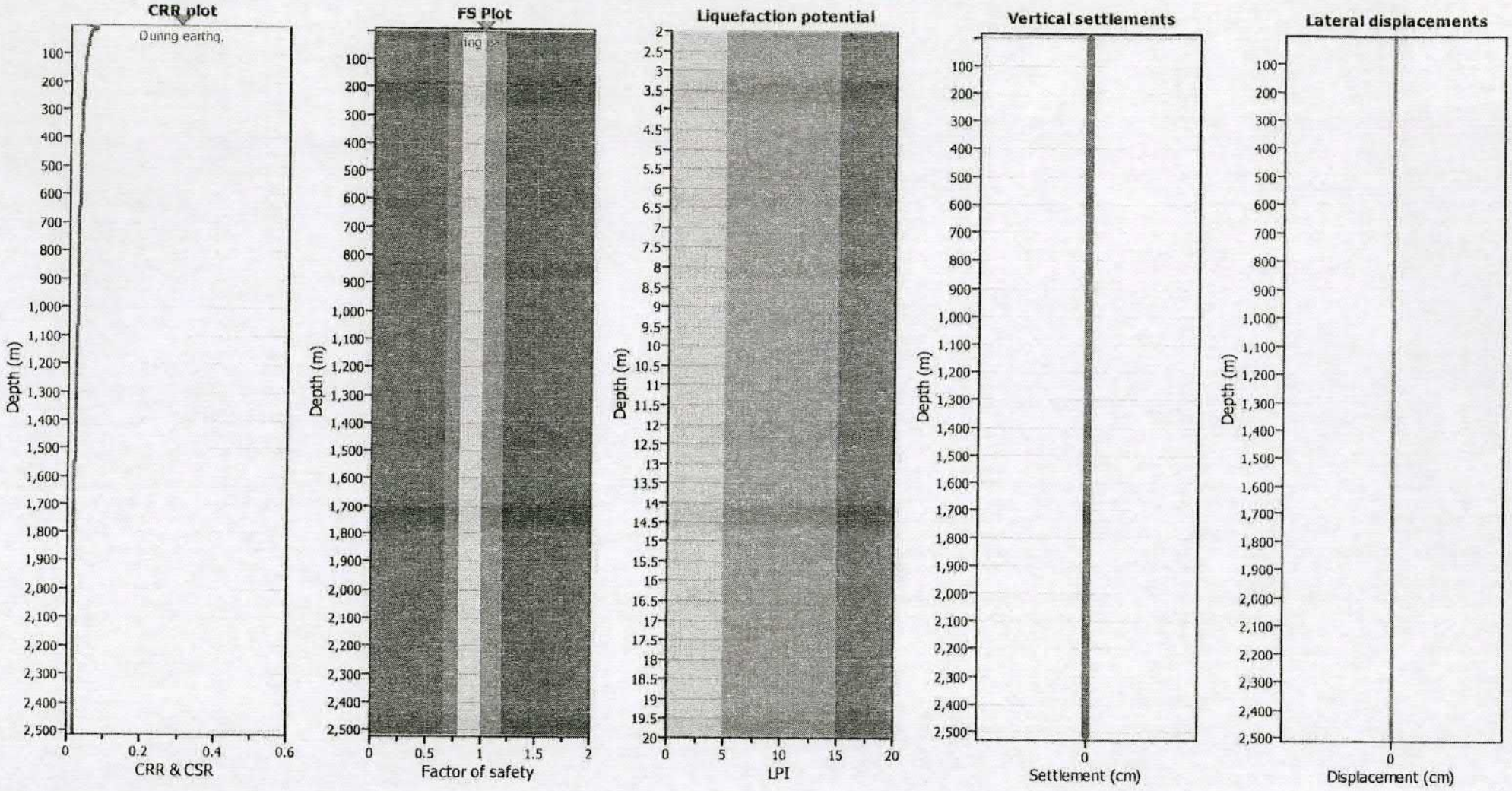
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liquefaction are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	2.90 m	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.06	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.90 m	Fill height:	N/A	Limit depth:	20.00 m

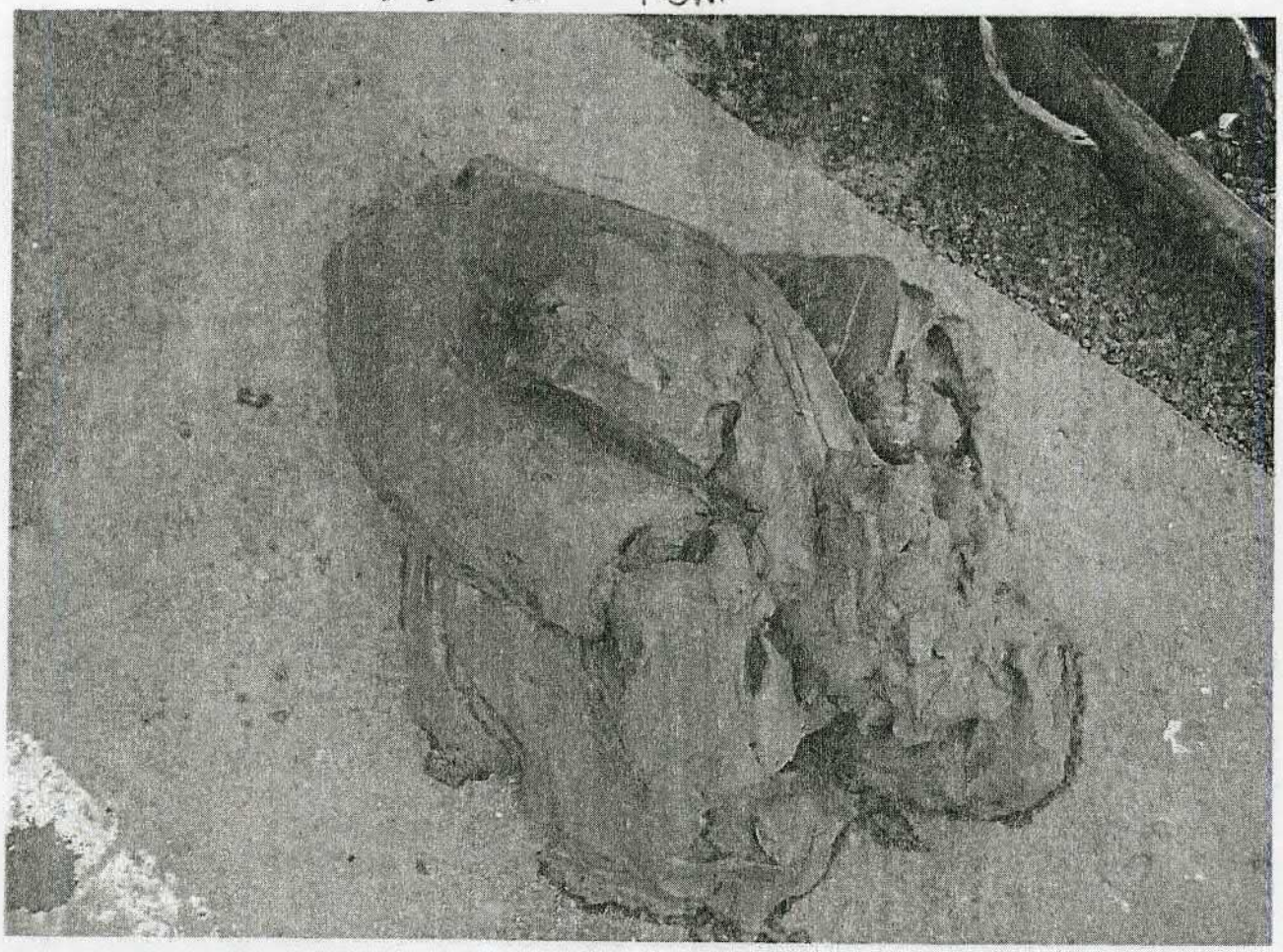
F.S. color scheme

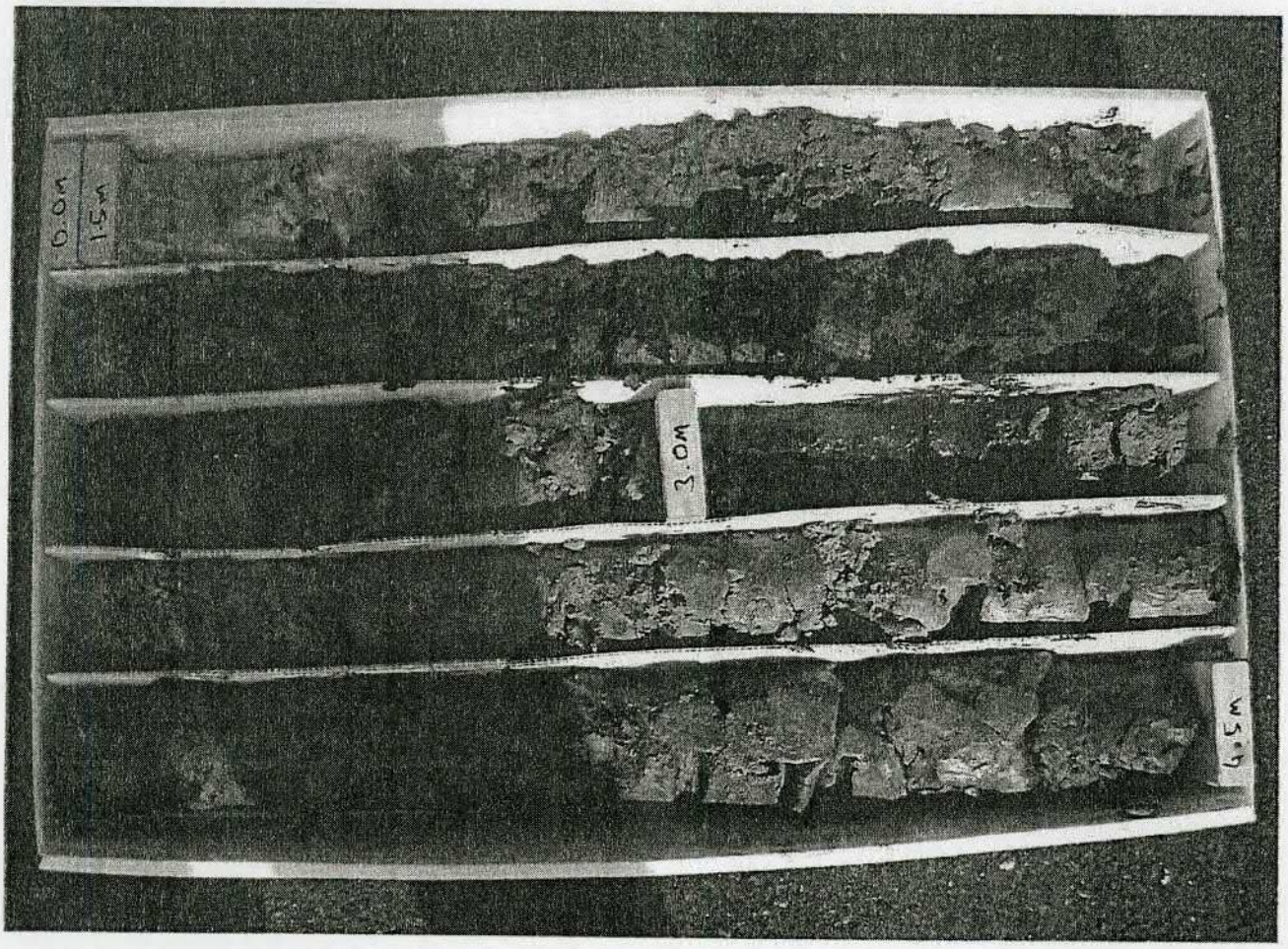
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liquefaction are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

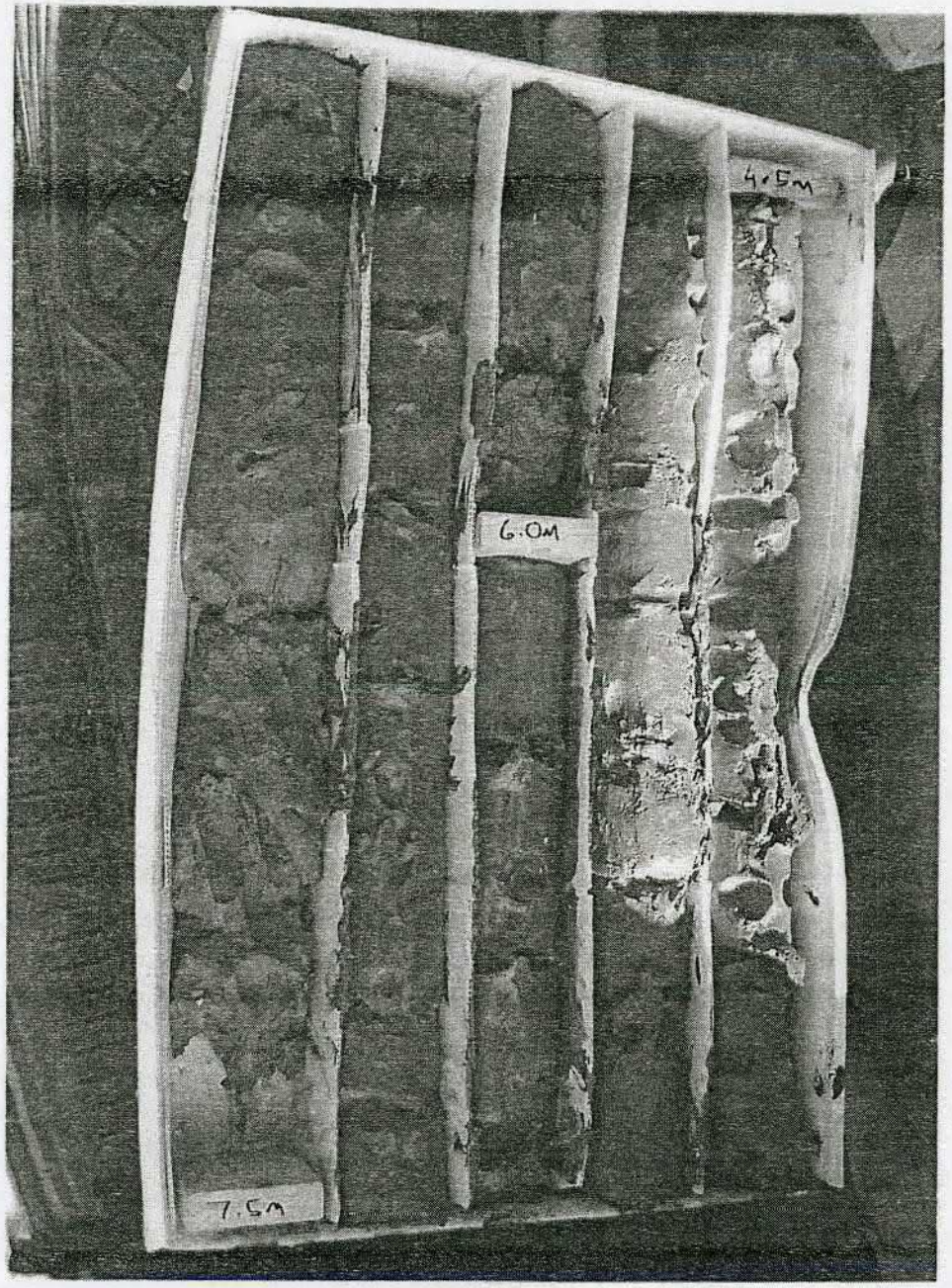
LPI color scheme

- Very high risk
- High risk
- Low risk

7.5 to 9.0m






4.5M
6.0M
7.5M

TONKIN & TAYLOR LTD
CONSULTING ENGINEERS
REGISTERED SURVEYORS AND TOWN PLANNERS
47 George Street, Newmarket, P.O. Box 5271 Auckland 1, New Zealand.
Telephone: 771-865 Telex: NZ21594 Cable: TONTAY

Our Ref.

PROPOSED EXTENSION TO THE STATE INSURANCE BUILDING TAURANGA

SITE INVESTIGATION

REF: 6542
SEPTEMBER 1984

PREPARED FOR:
Hoadley Budge & Partners
105 Queen St
AUCKLAND

DISTRIBUTION:
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REPORT

1.0 INTRODUCTION

This report presents the results of a subsoil investigation carried out at the site of a proposed addition to the State Insurance Building, Tauranga. In accordance with our brief, we have established subsoil conditions beneath the site, carried out laboratory testing and provide herein foundation design criteria.

It is understood from discussions with Mr David Cook of Hoadley Budge & Partners that the proposed extension to the State Insurance Building is to consist of a two-storey and penthouse structure with columns on a 3 m x 3 m grid. Working loads at each column location are to be in the order of 310 kN. Gross foundation pressures are expected to be in the order of 22 kPa.

The site is flat, presently a carpark and partly surrounded by the State Insurance Building whose raft foundation extends about 1 m into the site. We understand that the adjacent Regent Theatre is supported on wooden friction piles. We also understand that a portion of the existing building is to be demolished to make way for the extension.

2.0 PROCEDURES

Two boreholes were put down by Brown Brothers Ltd using a rotary machine rig between 21 August and 22 August, 1984. Under the full time supervision of a technician from this office, representative samples were taken and returned to our laboratory for inspection and possible testing. The borelogs attached describe the materials encountered. Borehole locations are shown on Drawing 6542-1.

Laboratory testing consisted of shear vane tests on selected undisturbed samples to determine undrained shear strengths, and

consolidation tests to estimate the amount of settlement expected from the proposed extension. Test results are shown on attached borelogs and plates 1 to 3.

3.0 SUBSOIL CONDITIONS

The conditions encountered accord well with borelogs supplied by Hoadley Budge & Partners from earlier investigatory work at the adjacent site. We therefore feel that the subsurface profile beneath the site and the immediate area is generally consistent. Borehole data suggests that a layer of loose, pumiceous, probably estuarine silts and sands, approximately 12 to 13 m thick, overlies a 5-7 m layer of firmer silty peat. Boreholes 1 and 2 were terminated at 24.5 m and 20 m respectively in much firmer coarse gravelly sands.

The topmost estuarine deposit was found to consist of dilatant pumiceous silts and layers of coarse sands. Standard penetration test results were consistently low, with 'N' values within 2-10 blows/300 mm which suggests that this material is in the loose to medium relative density range. The more cohesive soils were found to have a range of undrained shear strengths between 20-90 kPa, as determined by laboratory shear vane tests. However this type of material is typically sensitive and can be particularly susceptible to disturbance, hence the lower values may be unrepresentative of the true in-situ undrained shear strengths which we consider can be taken as at least 50 kPa. Consolidation tests of selected horizons generally indicate that the subsoils within the upper 10 m are moderatley compressible. The 5-7 m of fine grained organic soils and peat underlying the layered silts and sands are highly compressible and have low shear strengths.

SPT 'N' values of the underlying coarse sands and gravels are between 22 and 38 blows/300 m suggesting this material to be in the medium to dense range.

Subsurface conditions are described in detail on the attached borehole logs.

4.0 FOUNDATION CONSIDERATIONS

We consider that pile type foundations may not be a cost effective alternative for this situation since the depth to firm

subsoils is some 20 m. We consider the proposed structure can be adequately supported on a raft type foundation, as is the existing State Insurance Building. Accordingly, we confine our comments and recommendations to that foundation option.

We note that the existing building was designed on the basis of similar foundation pressures and conditions to those of the proposed building. The performance of this building over the past 20 years appears to have been satisfactory. Based on plans supplied by Hoadley Budge & Partners, the gross foundation pressure exerted by the present State Insurance Building has been substantially compensated for by a net foundation excavation of approximately 1 m. Therefore the existing State Insurance Building has theoretically undergone minimal amounts of settlement.

We consider the extension will also be unaffected by substantial settlement provided that the raft is based at the same level as the existing raft. This will also ensure the integrity of the existing raft. Although the theoretical settlement has been calculated at 3 mm, and therefore well within acceptable limits we consider it prudent that the extension be structurally isolated from the existing building. Given the nature of the subsoils, much of any settlement is likely to occur during construction and therefore continued settlement is unlikely to be severe.

On the basis of measured values, an undrained shear strength of 50 kPa is assumed to be representative of the more cohesive intervals within the upper estuarine deposits. The allowable bearing pressure for static loads, using a safety factor of 3, would be 115 kPa and therefore well in excess the applied bearing pressure.

5.0 LIMITATION

Recommendations and opinions contained in this report are based upon data from boreholes. Inferences about the nature and continuity of subsoil away from boreholes are made but cannot be guaranteed.

During construction, the site should be examined by an engineer competent to judge whether the exposed subsoils are compatible with the assumptions of the report. We are available for engagement to provide this service and recommend that we be engaged for this purpose, wherever possible, in order to

preserve continuity. In all circumstances, however, if variations in the subsoil occur which differ from that described or assumed to exist then the matter should be referred back to us.

This report has been prepared for the particular project described in the brief to us and no responsibility is accepted for the use of any part of this report in other contexts or for any other purpose.

TONKIN & TAYLOR LTD
Consulting Civil Engineers
& Registered Surveyors

Report Prepared by: B.A. Law

Enclosures:

Borelogs	1 & 2
Plates	1 - 3
Drawing	6542-1

TONKIN & TAYLOR LTD
CONSULTING ENGINEERS
REGISTERED SURVEYORS AND TOWN PLANNERS
47 George Street, Newmarket. P.O. Box 5271 Auckland 1, New Zealand.
Telephone: 771-865 Telex: NZ 21594 Cable: TONTAY

Our Ref: 6542
22 May, 1985

Hoadley Budge & Partners
Architects and Engineers
105 Queen St
AUCKLAND

ATTENTION: Mr D.J. Cook

Dear Sirs,

STATE INSURANCE BUILDING, TAURANGA

In response to your letter of 15 May 1985 we have reviewed the information we have on soil conditions in this area and have the following comments to make:

1. Bore hole information is available for the present State Insurance site and the Star Hotel site but not for the adjoining theatre or Woolworths sites. The information available shows that soil conditions are less favourable at the Star Hotel site than at the State Insurance site. At the Insurance site there is an inorganic surface layer of silts and sands which extends to a depth of about 12 m, which is followed by about 6 m of silty peat. At the Star site the surface layer of silt and silty sand is only about 3 m thick and this is followed by very soft marine clay which extends down to about 12 m. Below this marine clay a series of silt and sand layers interbedded with peat are found.

2. We agree with your proposal to use a compensated raft foundation for the proposed new building. We consider that this raft should be designed so that the net increase in loading on the soil does not exceed about 6 kPa (equivalent to about 300 mm of soil depth). Because of the generally poor soil conditions the risk of a small amount of settlement will have to be accepted (regardless of the applied pressure) and the new building should therefore be structurally separated from the existing building. We understand that the ground surface slopes toward the Woolworths site, and it may be necessary therefore to vary the depth of the raft so that the applied pressure

DCB

.../2

15 May 1985

Tonkin & Taylor Ltd,
P.O. Box 5271,
AUCKLAND.

Attention: Mr A. Pickens

Dear Sir,

RE: State Insurance Building Tauranga

Thank you very much for the work you have done to date on this project.

The State Insurance Office are now negotiating to purchase the adjoining theatre property with the intention of erecting a 3 storey building over that site and the remainder of their present site. In order to re-accommodate some existing tenants the project is intended to proceed rapidly with design starting now and construction beginning in mid July.

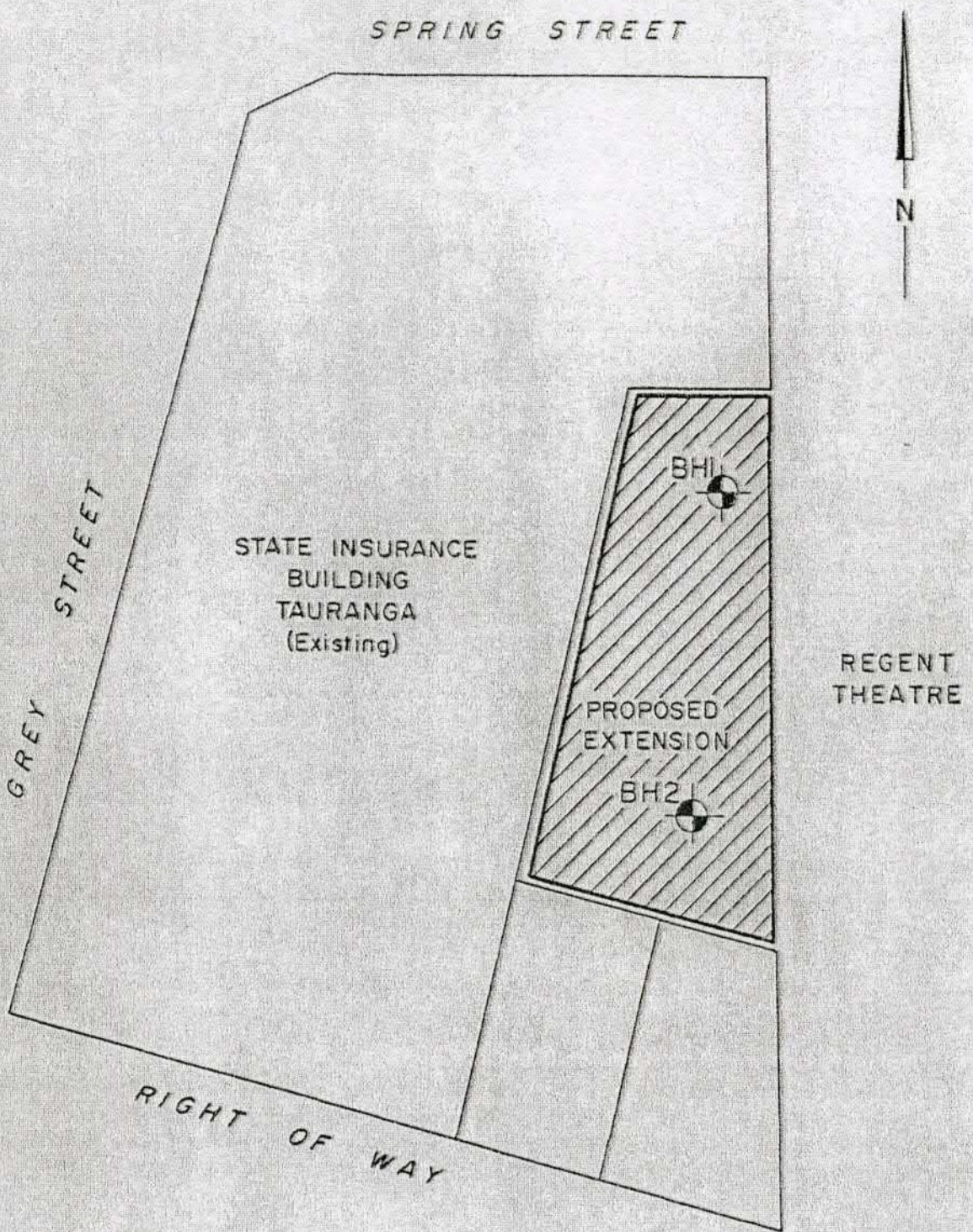
The State Insurance Office have obtained a copy of the foundation investigation for the Star Hotel site which extends to within 10 metres of the theatre site.

We intend to design the foundations for the new development as a compensated raft and anticipate that the all up weight will be of the order of 28 KPa.

We enclose a locality plan and copy of the Star Hotel site report. Please advise us of further investigation work, if any, you consider necessary to confirm our design assumptions.

Yours faithfully,

HOADLEY BUDGE & PARTNERS



Legend

T.&T. Machine bore August 1984

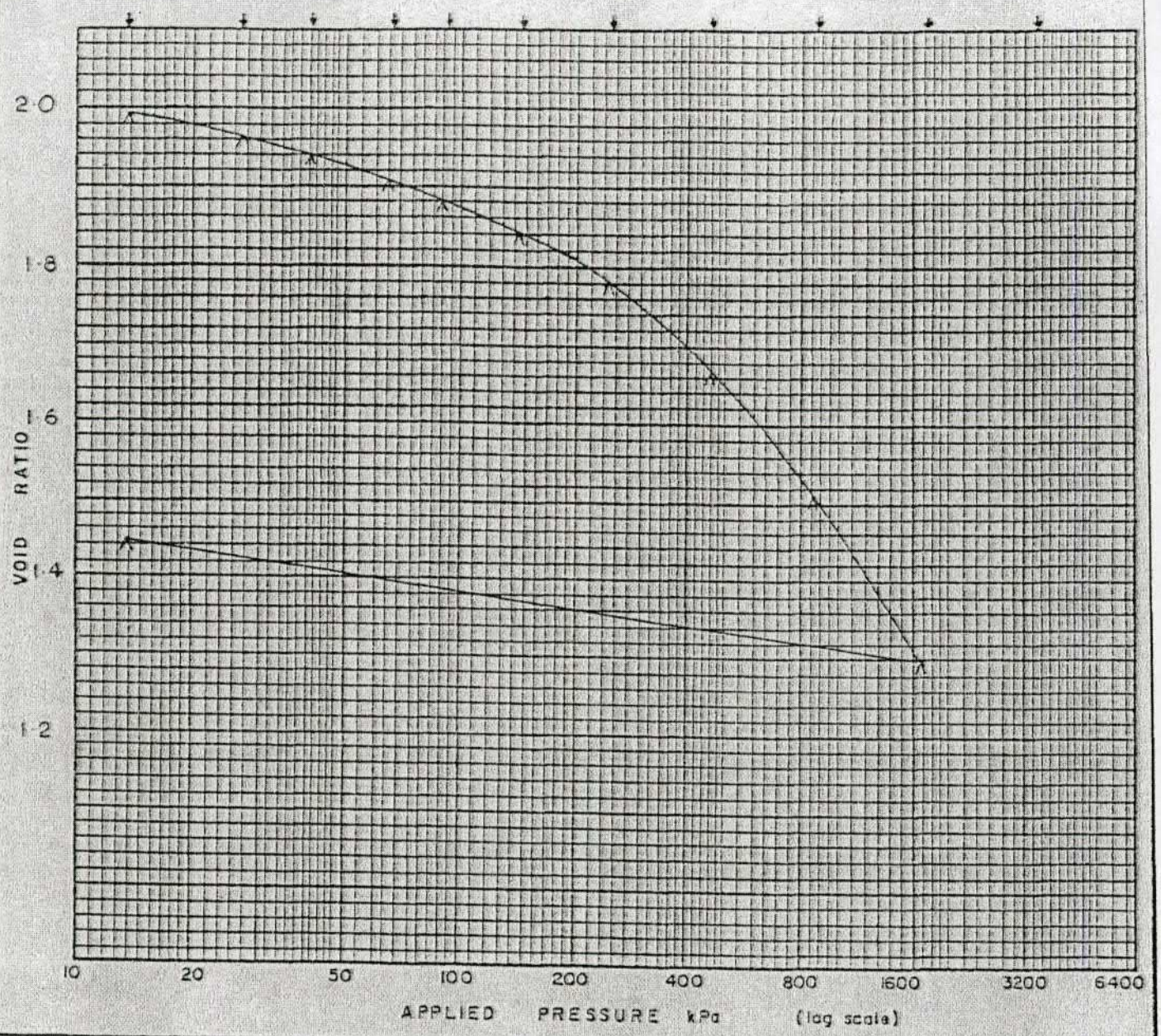
SCALE 1:200

STATE INSURANCE BUILDING PROPOSED EXTENSION TAURANGA	TONKIN & TAYLOR CONSULTING ENGINEERS & REGISTERED SURVEYORS 47 GEORGE ST. NEWMARKET	DRAWING No. 6542-1
Borehole Location Plan		DATE SEPT. 1984

CONSOLIDATION TEST

BORE/~~PIT~~ 2
SAMPLE 6
DEPTH 3·40 m

SITE GREY SPRING JOB No. 6542



PRESSURE kPa	VOID RATIO	PRESSURE INCREMENT kPa	COEFFICIENT OF CONSOLIDATION mm^2/s
As received	2·024		
13·4	1·990		
26·8	1·964		
40·2	1·942	13·4 → 26·8	0·64
67·0	1·910	26·8 → 40·2	1·7
93·8	1·885		
147	1·844	40·2 → 67·0	1·2
255	1·781		
469	1·676	67·0 → 93·8	1·6
898	1·512		
1755	1·300		
13·4	1·448		

REMARKS SILT, SANDY, MEDIUM TO FIRM, SENSITIVE

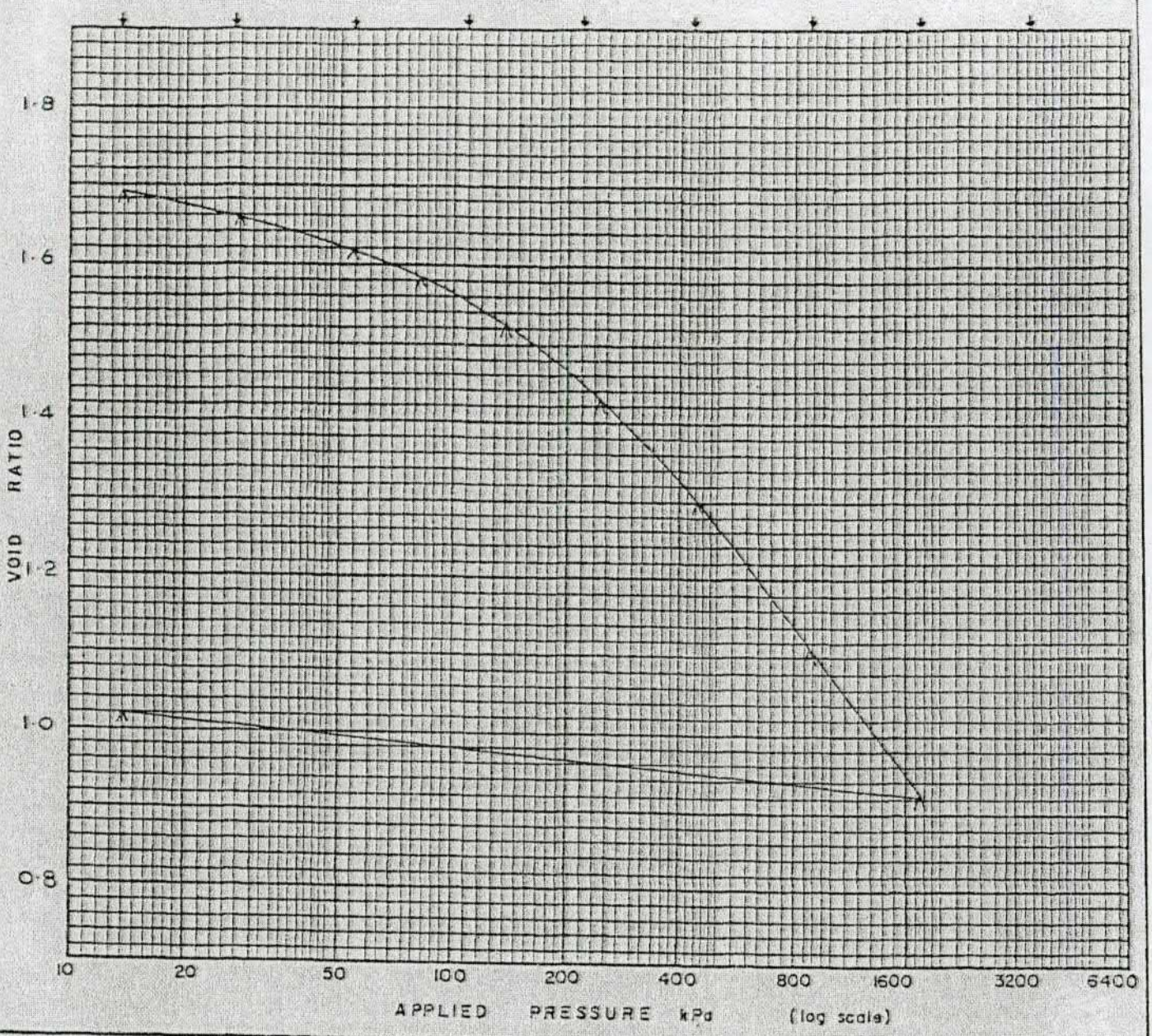
TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS

PLATE No. 3

CONSOLIDATION TEST

BORE/~~PIT~~ 1
SAMPLE 6
DEPTH 4·3 m

SITE GREY SPRING JOB No. 6542



PRESSURE kPa	VOID RATIO	PRESSURE INCREMENT kPa	COEFFICIENT OF CONSOLIDATION mm^2/s
As received	1·740		
13·4	1·695		
26·8	1·665	13·4 → 26·8	1·7
53·6	1·622		
80·4	1·587	26·8 → 53·6	1·8
134	1·531		
241	1·429	53·6 → 80·4	1·2
456	1·306		
884	1·104	80·4 → 134	1·3
1742	0·922		
13·4	1·022		

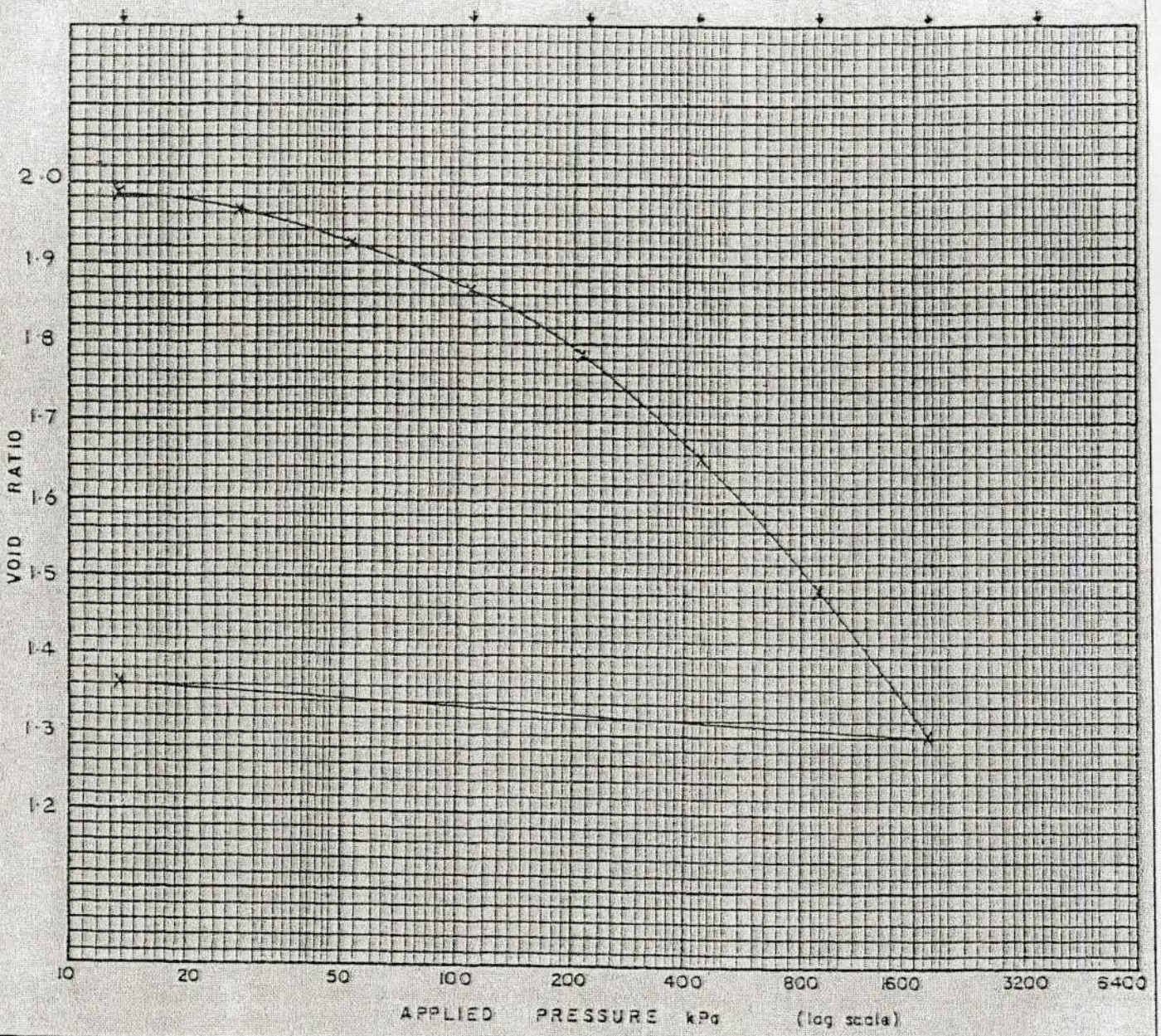
REMARKS SAND, SILTY, BROWN-ORANGE, SOFT/MEDIUM. LIGHTLY DILATENT, SENSITIVE

TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS PLATE No. 2

CONSOLIDATION TEST

BORE/~~PIT~~ 1
SAMPLE 4
DEPTH 3·0 m

SITE GREY SPRING JOB No. 6542



PRESSURE kPa	VOID RATIO	PRESSURE INCREMENT kPa	COEFFICIENT OF CONSOLIDATION mm^2/s
As received	2·030		
13·4	1·988		
26·8	1·961		
53·6	1·922	13·4 → 26·8	1·5
107	1·865	26·8 → 53·6	1·5
215	1·784	53·6 → 107	1·5
429	1·659	107 → 215	1·3
858	1·483		
1716	1·295		
13·4	1·361		

REMARKS SILT, SLIGHTLY CLAYEY, MEDIUM/FIRM, LIGHT BROWN/GREY, DILATENT, SENSITIVE, PUMILIOUS

TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS | PLATE No. 1

SITE: GREYSPRING - TAURANGA

BOREHOLE No. 2

JOB No: 6542 DATE DRILLED: 22/8 RL GROUND:

SHEET 2 OF 2

DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	UNDRAINED SHEAR STRENGTH K Pa	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS (%) W_P W W_L
PEAT, woody, firm with silty horizons		14			
		15			
		16			
- becomes silty		17			
SAND, medium to coarse, dense, grey		18			
LOST CORE		19			
- as above				N = 38	
END OF BOREHOLE @ 19.7 m		20			
		21			

NOTES:

DRILL METHOD: Rotary Machine Drilled

TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS

SITE: GREYSPRING - TAURANGA

BOREHOLE No. 2

JOB No: 6542 DATE DRILLED: 22/8 RL GROUND:

SHEET 1 OF 2

DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	UNDRAINED SHEAR STRENGTH K Pa (40 60 80)	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS (%) W_P W W_L
FILL, sandy, gravelly, firm		1		N = 5	
SILT, sandy, sl.organic, with rootlets, dk.grey		2		N = 2	
		3			
SAND, silty, with coarser horizons pumiceous, stained red, green		4			
LOST CORE		5			
as above with silt pockets		6		N = 5	
LOST CORE		7			
SAND, coarse, silty		8		N = 7	
LOST CORE		9			
SILT, sl.sandy, grey pumiceous		10		N = 8	
- beomces organic		11			
- becomes sandy med/coarse		12		N = 11	
LOST CORE					
PEAT, silty firm		13			

NOTES:

DRILL METHOD: Rotary Machine Drilled

TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS

SITE: GREYSPRING - TAURANGA

BOREHOLE No. 1

JOB No: 6542 DATE DRILLED: 22/8 RL GROUND:

SHEET 2 OF 2

DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	UNDRAINED SHEAR STRENGTH K Pa	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS (%) Wp W WL
PEAT		14			
		15			
- with silty horizons		16			
		17			
- sandy horizons		18			
		19			
LOST CORE		20			
SAND, sl.gravelley, sl.silty, pumiceous, grey, med. to dense		21			
		22			
		23		N = 22	
		24		N = 26	
END OF BOREHOE @ 24.5m		25			

NOTES:

DRILL METHOD: Rotary Machine Drilled

TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS

SITE • GREYSPRING - TAURANGA

BOREHOLE No. 1

JOB No: 6542 DATE DRILLED: 22/8 RL GROUND:

SHEET 1 OF 2

DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	UNDRAINED SHEAR STRENGTH K Pa, X Lab shear vane (40 60 80)	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS (%) Wp X W Wl
FILL, sandy, silty, firm		1			
SILT, sandy, sl.clayey pumiceous dilatant, with coarse sand layers yellow and grey		2		N = 1	
LOST CORE		3			
SILT, as above, occ.rootlets, brown		4			
SAND, gravelly, pumiceous		5			
LOST CORE		6			
SAND, with silt horizons, sl.clayey green		7		N = 4	
LOST CORE		8			
LOST CORE		9		N = 4	
SAND, sl.silty, grey with green horizons		11			
SILT, pumiceous, firm, grey					
PEAT, silty, firm		12			
		13			

NOTES:

DRILL METHOD: Machine Rotary Drilled

TONKIN & TAYLOR CONSULTING CIVIL AND FOUNDATION ENGINEERS

BOREHOLE LOGS AND TEST RESULTS
APPENDIX OF TERMS

SOIL DESCRIPTIONS

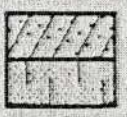
General: The descriptive system used is based mainly on grain size and comments on geological origin are supplementary

Soil Types and Symbols:

Symbol	Description
	limestone
	volcanic rock
	sandstone
	siltstone or mudstone
	cemented
	gravel (size > 2mm)
	sand (size 0.06 to 2.0 mm)
	silt (size 0.002 to 0.06 mm)
	clay (size < 0.002 mm)
	peat
	fill

These symbols are similar to those of the Unified Classification System (U.S.A.). They are adapted in some instances to denote soils not completely described in the adjacent table.

example



sandy clay

silty sand

Soil Strengths (cohesive)

Term	Undrained Shear Strength (kPa)
very soft	0 – 12
soft	12 – 25
medium	25 – 50
firm	50 – 100
stiff	100 – 200
hard	200 – 400
stone strength	>400

SOIL COLOURS

Colours, for purposes of description, have been simplified to light, standard and dark shades of red, pink, yellow, orange, brown, grey, green, blue and purple together with plain white and black.

ABBREVIATIONS

●	undrained triaxial test result	W_L	liquid limit
○	ditto – sample remoulded	PSD	particle size determination
■	laboratory vane test result	CONS	consolidation test
□	ditto – sample, remoulded	COMP	compaction test
N	blows per foot, standard penetration test (SPT)	Q	compressive strength
		Cu Qu	undrained triaxial test (set)
B	blows per 3 feet for 3" open barrel driven as for S.P.T. test	C' ø'	effective stress triaxial test
		γ mm	max./min. density test
▽	recorded water level	k	permeability coefficient
W	natural moisture content	S.L.	shrinkage limit
W_p	plastic limit	O.C.	organic content
St	sensitivity	ρ	bulk density

SAMPLE TYPES

●	open barrel	▮	large diameter thin walled tube (10 cm. or greater)
◉	double or triple barrel	▯	small diameter thin walled tube
▪	standard penetration test	○	disturbed sample
△	block		

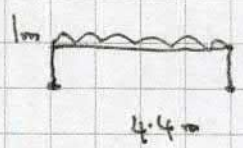
ARNOLD & JOHNSTONE LTD
CONSULTING CIVIL & STRUCTURAL ENGINEERS
ACENZ

JOB No 11413
PAGE Ca 1
BY RHA
DATE 25 07 14

46 Spring St Revise Existing Canopies

Loading similar or less than existing

new RHS portal to support new glazing



$G = 1.5 \times 0.3 + 0.2 = 0.65\ kN/m$
$Q = 0.25 \times 1.5 = 0.4\ kN/m$

$E_m = 0.4 \times 0.8 \times 1.5 \times 4.5 = 1.5\ kN.$

try 89 x 5 shs.

$\Delta_f = 5 \times 1.05 \times 4.4^4 / 384 \times 200 \times 1.8$
$= 14.2\ mm$

try 100 x 6 shs $I = 3.0$
$\Delta_f = 8.5\ mm.$
$\leq 4500/515$ OK

100 x 6 shs.

$M^* = (1.2 \times 0.65 + 1.5 \times 0.4) 4.4^2/8$
$= 3.3\ kNm$

$\phi M_s = 29.8\ kNm \times 0.99$
$= 29\ kNm > 3.3 \therefore$ OK.

Check racking.

$\Delta_f E_s = (0.25 \times 0.4 \times 0.65 \times 4.4) \times 1^3 / 3 \times 200 \times 3.0 \times 2$
$= 0.08\ mm$ small OK.

Compare 150pfc with 290 x 45.

EI 290 x 45 = $90 \times 8 = 720$
EI 150pfc = $8 \times 200 = 1600$ OK as need to be 2x for cant loading

Innerscape Ltd

46 Spring Street

Mechanical and Hydraulic Specification

46 Spring Street

Mechanical and Hydraulic Specification

Prepared for

Resource Co-ordination Partnership (RCP)

Prepared by

Innerscape Ltd
PO Box 991
Cambridge, NZ
Post Code 3450

Revision History

Revision Number	Purpose	Date	Prepared By
0	For Consent and Tender	24 July 2014	Ken McKenzie

Table of Contents

1. General

The building services work associated with this contract is to facilitate the seismic re-strengthening works being carried out on the building, and to accommodate the new bank tenancy on the ground floor that will occupy the current ex State and Gregory tenancy areas.

All work shall be carried out in accordance with the RCP Main Contract – General and Special Conditions of Contract.

Any doubts or apparent ambiguities as to the meaning of any part of the drawings or specifications shall have been set forth in writing with the tender in order that such doubt or ambiguity may be removed or provided for before acceptance of tender. Otherwise such portion of the drawings or specifications shall bear the meaning placed upon them by the Project Manager.

The nature and intent of this specification is to provide heating, ventilation, and air conditioning (HVAC), and hydraulic services scope descriptions and general installation arrangements and requirements. The Mechanical Contractor shall complete the detail design and drawings, and complete the works as defined herein, and as shown on the contract drawings. The Mechanical Services Contractor shall furnish everything reasonably necessary for a complete and fully functional installation, notwithstanding any omissions in the drawings and/or specifications.

The mechanical and hydraulic services installation and revisions shall be in accordance with the NZ Building Code, NZS 4303, AS1668, AS/NZS 3500 and all other appropriate standard specifications and amendments and codes of practice listed in NZ Standard Association publications which are current at the time of tendering. Equipment shall be installed and commissioned in accordance with manufacturer's recommendations and good engineering practice, and all installations shall be fully coordinated with the other sub trades.

Items to be provided by the contractor for review shall include but not be limited to the items listed below.

Drawings:

- HVAC system installation shop drawings.
- Equipment support and seismic restraint details.

Co-ordinate with building works and all other trades to ensure information is provided in a timely manner. Any abortive work or additional costs incurred due to failure to provide adequate information in a timely manner shall be at the contractor's expense.

2. Scope of Works

The Mechanical and Hydraulic Services contract shall include the detailing, supply, co-ordination, installation, and commissioning of the work summarised below and as outlined on the contract drawings. The Contractor shall visit site and confirm all proposed ducting and piping routes, equipment locations, and access provisions. All work necessary to provide complete and fully functional systems shall be included.

Ground Floor:

- Remove and dispose of the redundant hydronic fancoils and associated pipework in the Langtons and ex State tenancy ceiling spaces. Remove and isolate any remaining electrical and controls cabling associated with the removed equipment.

- Pump down and reclaim the refrigerant in the existing VRF systems, and allow to remove and store the ceiling cassette and ducted heat pump units currently serving the Langtons, ex State, and Gregory tenancy areas. Remove the associated refrigerant and condensate drain lines and disconnect and coil back controls and power wiring to enable the new structural beams to be installed.
- Remove and dispose of the existing fresh air ductwork in the affected areas as illustrated on the contract drawings to enable the new structural beams to be installed.
- Remove and dispose of the existing supply ductwork from the ducted heat pump unit serving the Gregory tenancy area to enable the new structural beams to be installed. The heat pump will be reinstated for re-use in the new bank tenancy, but all new ductwork, grilles, and diffusers will be part of the tenancy fitout works, and are not included in this contract.
- Re-install the existing VRF system ceiling cassette and ducted heat pump units back as close as practical to their original locations in the new ceiling grids. Reconnect the associated refrigerant and condensate drain lines reticulated over/under the new beams as appropriate, and reconnect controls and power wiring. Provide and install any condensate lift pumps as may be required. Purge and recharge the refrigerant systems in accordance with manufacturer's recommendations, and re-commission the systems.
- Note that it may be possible for heat pump fancoils to be left in position during structural upgrades, as long as they are adequately protected and do not inhibit installation of the new structure. However piping and cabling will definitely have to be removed, and unit positions will need to be adjusted to suit the new ceilings, so allowance for unit demounting has been requested. This can be discussed and agreed on a unit-by-unit basis with the main contractor during construction.
- Supply and install new fresh air ductwork reticulated around the new structural beams as shown on the contract drawings. Provide all new supply duct connection spigots, complete with balancing dampers, and new flexible duct connections to the fancoils. Fresh air duct sizes are generally intended to match existing, but the contractor shall confirm sizes and balance the fresh air system to achieve a fresh air ventilation rate of 1 l/s/m² tenancy floor area as required in NZS 4303 for mall and arcade retail areas.
- Remove the existing 65mm drain line serving the sink in the ex State tenancy area, and replace with a new 100 sanitary drain line. Provide branch connections for new WCs, sinks, and FWG as shown on the contract drawings. Floor penetrations and final connections to sanitary fixtures will be part of the tenancy fitout works, and are not included in this contract. Provide a new vent line from the new branch drain and connect to the existing building vent riser. The contractor shall trace and locate the existing vent arrangements to confirm suitable vent line route and connection point.
- Provide a 20mm cold water supply, with isolation valve and capped connection terminated above the tenancy ceiling for the bank tenancy. It is expected that this water supply can be extended from the existing water supply to the tenancy kitchenette sink. The contractor shall trace and locate the existing water supply arrangements to confirm suitable connection point. Hot water heater(s), DCW, and HW reticulation within the new bank tenancy will be part of the tenancy fitout works, and are not included in this contract.

Level 1:

- Remove and dispose of the redundant hydronic fancoils and associated pipework in the Tattoo and Gym tenancy ceiling spaces. Remove and isolate any remaining electrical and controls cabling associated with the removed equipment.
- Pump down and reclaim the refrigerant in the existing VRF systems, and allow to remove and store the ceiling cassette heat pump units currently serving the Tattoo and Gym tenancy ceiling spaces affected by the structural re-strengthening works. Remove the associated refrigerant and condensate drain lines and disconnect and coil back controls and power wiring to enable the new structural beams to be installed.
- Remove the existing fresh air ductwork in the affected areas as illustrated on the contract drawings to enable the new structural beams to be installed. Save and store selected sections of the ductwork for re-installation.
- Re-install the existing VRF system ceiling cassette heat pump units back as close as practical to their original locations in the new ceiling grids. Re-install existing ceiling grilles and diffusers and new flexible duct connections to the fancoils reticulated over/under the new beams as appropriate. Reconnect the associated refrigerant and condensate drain lines reticulated over/under the new beams as appropriate, and reconnect controls and power wiring. Provide and install any condensate lift pumps as may be required. Purge and recharge the refrigerant systems in accordance with manufacturer's recommendations, and re-commission the systems.
- Note that it may be possible for heat pump fancoils to be left in position during structural upgrades, as long as they are adequately protected and do not inhibit installation of the new structure. However piping and cabling will definitely have to be removed, and unit positions will need to be adjusted to suit the new ceilings, so allowance for unit demounting has been requested. This can be discussed and agreed on a unit-by-unit basis with the main contractor during construction.
- Supply new duct connections and extensions and re-install fresh air ductwork reticulated around the new structural beams as shown on the contract drawings. Re-use existing and supply new duct connection spigots, complete with balancing dampers as appropriate, and provide new flexible duct connections to the fancoils. Fresh air duct sizes are generally intended to match existing, but the contractor shall confirm sizes and balance the fresh air system to achieve a nominal fresh air ventilation rate of 1 l/s/m² tenancy floor area. This equates to 10 l/s/person as required in NZS 4303 for gym and office areas, for an average occupancy density of 10 people per 100 m², which is the same as the original building fresh air system design parameters.

Level 2 and Roof:

- No services upgrades or alterations are proposed as part of this contract.

Associated with the above services the Mechanical Services Contractor shall provide the following:

- Programme of sub-contract works and commissioning.
- Workshop drawings as necessary for duct construction s coordination.
- Provision of cabling, ductwork, and pipework fixings and support systems.

- Commissioning and testing of all plant installed in this sub-contract.
- Labelling of the completed installation.
- Provision of A3 "As-built" drawings of the mechanical installation and wiring schematics for insertion onto the manuals.
- Instruction to Principal's representatives on the Operation and Maintenance of all systems.
- Provision of 1 year defects liability following practical completion.
- Provision of preventative maintenance during the 1 year defects liability period.

3. Works by Others

The following works are not included in the Contract and will be performed by others.

3.1. By The Contractor(s) Responsible For Building Works

- All coring, cutting, patching, trimming and making good of the building envelope and structure for the installation of equipment, cabling, ductwork, and the like, provided the installation takes place in accordance with the building programme.
- Provision of service access provisions.
- The Mechanical Services Contractor shall liaise with the Contractor responsible for the Builder's Works to ensure building services penetration and equipment access locations are arranged and coordinated in a timely fashion.

3.2. By The Fire Protection Services Contractor

The Mechanical Contractor shall confirm and advise the Main Contractor of Fire Protection Services Contract work requirements associated with mechanical services at the time of tender. Unless otherwise advised, the Contractor responsible for Fire Protection Services Works shall include for provision of the following:

- Confirmation that wiring has been provided, or provide new wring as may be necessary from the main Fire Alarm Panel to provide a fire signal to shut down the HVAC systems in a fire condition, and terminated at the mechanical services distribution board(s) for fire alarm signal wiring.
- The Mechanical Contractor shall provide terminal blocks in the distribution board for fire alarm signal wiring, and a low voltage transformer to generate power supply for the signal circuit (if not already installed). Fire signal to mechanical plant to be provided by the fire alarm system opening the circuit via a relay within the Fire Alarm Panel.
- Attendance during fire interface testing and demonstration to the Engineer and Territorial Authorities.

4. Contract Drawings

Refer to the following Mechanical Drawing for details of the required scope of works:

- M00 – Cover Sheet
- M01 – Ground Floor HVAC Demolition Plan

- M02 – Ground Floor New HVAC Layout
- M03 – Level 1 HVAC Demolition Plan
- M04 – Level 1 New HVAC Layout
- M05 – Ground Floor Hydraulic Services Revisions

Key mechanical and hydraulic services system details are included on the drawing, but confirmation of site dimensions, structural elements, electrical supply connections, and detailing of final installation shall be by the Mechanical Services Contractor.

5. Design Criteria

Fresh air ventilation will be provided from the existing fresh air systems. Ductwork reticulation is being revised to clear the new structural elements, and systems revised to suit the new ground floor tenancy layout, but no central system upgrades or significant airflow changes are required. Refer to the scope of works for the fresh air delivery compliance requirements.

Heating and cooling will be provided from the existing VRF heat pump systems. Fancoils will be removed and pipework revised to accommodate the new structural elements, but no central system upgrades or heating/cooling capacity changes are required.

6. Ductwork

All new fresh air supply ductwork shall be fabricated from galvanised sheetmetal and shall comply with the latest edition of Sheetmetal and Air Conditioning Mechanical Services Contractors National Association (S.M.A.C.N.A) Duct Construction Standards. All duct sizes shown on the drawings are air stream sizes (i.e. inside acoustic linings where these are used).

Provide balancing dampers at all new supply branch spigots. Single leaf butterfly type dampers may be used, and shall be provided with a visible indicating-locking type quadrant (Bullock manufacture or approved equivalent) with Open/ Closed positions and blade direction clearly identified on the adjustable quadrant which is mounted clear of the insulation surface.

Provide and install flexible ductwork from the fresh air supply branch outlets to existing reinstated diffusers and heat pump plenum inlet spigots. Provide and install flexible ductwork from the existing reinstated heat pump plenum discharge spigots to existing reinstated diffusers. Flexible duct maximum length shall be limited to 3.0 meters.

The existing fresh air ductwork is not insulated, and no insulation is required on new fresh air sheet metal ductwork and flexible ducts.

Flexible ducts carrying conditioned air from heat pumps to supply diffusers shall be insulated with fibreglass or equivalent blanket media and wrapped in a polyethylene sleeve. Flexible ducts shall comply with the requirements of the NZ Building Code.

Flexible ducts shall be installed fully extended to avoid excessive air flow pressure drop. The minimum internal radius for bends in flexible ducts shall be equal to the duct diameter.

All flexible duct connections to spigots shall be secured using an approved tape and band clamps on the duct. On insulated ducts the insulation and polyethylene sleeve

shall be drawn onto the spigot and the sleeve taped to the ductwork insulation to provide a vapour seal.

Provide appropriate supports, brackets and seismic restraints for all ductwork and equipment to comply with the requirements of SMACNA and NZS 4219.

7. HVAC Piping

Refrigeration piping connecting separate items of packaged air conditioning equipment shall be copper, sized and installed in accordance with the manufacturer's instructions.

Refrigeration piping shall be Pair coil pre-insulated piping, complete with polyethylene insulation, Armaflex, or equivalent.

The Mechanical Contractor shall revise heat pump condensate drainage arrangements as necessary to accommodate the new structural beams. All heat pumps shall be reconnected to drain back into the original connection points, or alternate new connections provided. Provide and install any additional condensate lift pumps as may be necessary. Condensate drainage systems shall be installed in accordance with the manufacturer's specifications and applicable plumbing codes.

Allow for minimum 1:80 min falls to drain by gravity from each unit drain connection.

Provide pipe sleeves where pipes pass through walls, floors, and ceilings. Pipe sleeves can be omitted when pipes pass through internal walls and formed openings are provided.

Pipe sleeves at non-fire rated partitions shall be PVC pipe section. The annular space between pipe sleeve and pipe shall be caulked with fibreglass, with sealing plates at both sides.

Pipe sleeves for metal pipes in fire rated partitions shall be galvanised steel pipe with a minimum wall thickness of 1.6mm and of the same size as for non-fire rated partition. The annular space between pipe and sleeve shall be caulked with ceramic fibre rope. Pipe insulation sections penetrating at fire rated partition shall be protected by an approved intumescent material. For PVC pipes, the pipe penetrations shall be protected by approved intumescent fire collars.

8. Hydraulic Services Piping

Sanitary plumbing system designed and installed to standard AS/NZS 3500 2:2003

Domestic cold water system designed and installed to standard AS/NZS 3500 1:2003

Registered plumbers using the best modern trade practices shall carry out installation of the Hydraulic Services.

Piping materials shall be:

- Domestic cold water – COPPER NZS 3501 (Table 1), Fusiotherm or equivalent polypropylene random water pipe to DIN 8077 and DIN 8078, or cross-link polyethylene pipe to AS/NZS 2492.
- Soil and stormwater drains – uPVC (SN6 grade) above ground
- Waste and Vent pipes – uPVC

- Exposed waste and water connections – c.p. COPPER

Minimum grade of sanitary pipework shall be:

- Ø40 – Ø65 - 1:40
- Ø100 - 1:60
- Vent - 1:80
- Condensate - 1:100

Provide cleaning eyes, sealed clean outs or demountable joints sufficient to permit ready access for cleaning (bottom of stacks, at end of long soil pipes and wastes, and excessive bends on soil or waste).

Branches and take-offs for soil, waste and vents shall be in the form of a sweep-tee connection.

Plastic soil, waste, vent and stormwater pipework shall be chemical solvent welded or rubber ring expansion joined in accordance with the manufacturer's recommendations.

Cap off all sanitary branches beneath the floor for tenancy fit-out connection.

Membrane-wrap all uPVC, HDPE, MDPE, PP & PPr pipework where passing through in-situ concrete. Double "denso" wrap sleeves and pipes where copper pipes are in contact, pass through or within concrete slabs in the ground, through brick, block, concrete walls or footings.

Provide hangers or equivalent supports at intervals in accordance with the appropriate standard for the pipework. Plastic pipework must be supported strictly in accordance with the manufacturer's recommendations.

Install split ring adjustable or other approved type hangers and round plated steel rods for all horizontal runs. All pipework shall be provided with a 3mm rubber based separation between pipe and pipe clip.

The new tenancy water isolation valve shall be ball type, and capped for tenancy fit-out connection.

9. Seismic Restraints

The complete mechanical services systems within the seismically re-strengthened areas of the building, as de-mounted and re-installed, or installed new by the Mechanical Services Contractor shall include provisions to minimise damage in the event of earthquake.

The recommendations of NZS 4219 shall be strictly followed, and the Mechanical Services Contractor shall be responsible for providing detailed shop drawings for equipment supports and restraints approved by a qualified engineer.

Particular attention shall be paid as follows:

- Ductwork suspended more than 200mm below structure shall be restrained in accordance with NZS 4219.
- Grilles and diffusers and associated plenum boxes shall be suspended from structure and restrained in accordance with NZS 4219.
- Gripple or equivalent stainless steel wire tethering systems may be considered acceptable for lightweight ductwork and equipment where compliance with NZS 4219 can be demonstrated.

- Where plant items are to be mounted on anti-vibration mountings, the mounting arrangement shall be designed to permit the displacement resulting from operation of the plant, but shall prevent the plant from being thrown off the mountings when subjected to earthquake movement.
- All plant fixings, holding down bolts and pipe hangers shall be designed in accordance with NZS 4219.
- Pipework (rigid) that crosses a seismic joint in a building shall be provided with braided type Powerflex flexible connectors at the point of crossing the seismic joint.
- All pipe hangers shall be designed in accordance with NZS 4219.
- Bracing, brackets and fixings shall be selected to comply with NZS 4219. The structure to which the bracing is fixed must be of sufficient strength to withstand the seismic forces specified in NZS 4203 and the approval of the Structural Engineer shall be sought when locating bracing points.

10. Electrical and Controls

The Mechanical Services Contractor shall be responsible for the recording of all existing electrical and controls connection arrangements, disconnecting and making safe, and reconnection when heat pumps are reinstated.

All existing power supplies and controls are expected to be re-used, and no revisions or upgrades are proposed as part of this contract.

The contractor will be responsible for preparing wiring diagram record drawings, and testing, and commissioning of the controls systems associated with the VRF systems affected by this contract.

HVAC system fans and heat pumps shall be wired to shut down in the event of a fire alarm, and re-start when the alarm has been cleared.

Existing connectivity to the VRF system central controller and BMS shall be reinstated.

All electrical systems for the mechanical services shall be completed in compliance with the AS/NSS 3000:2007 NZ Wiring Regulations, and as required for correct operation and protection of the mechanical services equipment.

All cables shall be multicore TPS or PVC. Cabling shall be sized on a maximum of 2.5% VD. 20% spare current capacity shall be provided within the VD. Calculations shall be provided on request. Main isolators shall be sized on a minimum of 115% of the circuit protection carrier size.

All electrical installation work shall be done by qualified personnel, in compliance with current wiring regulations and code requirements, and the Mechanical Contractor shall be responsible for providing a **Certificate of Compliance** on completion.

11. Testing and Commissioning

The Mechanical Contractor shall be responsible for testing and commissioning of all systems removed and re-installed under this contract. Commissioning shall include the following recommended procedures and also those of the equipment manufacturers, CIBSE and ASHRAE guides.

Operate all equipment under a loaded condition to ensure that there is no undue noise and vibration.

Record all commissioning results, and details of equipment and systems, on commissioning summary sheets.

The Mechanical Services Contractor shall adjust the systems and carry out remedial work until all the commissioning results are satisfactory.

Commissioning

After the air systems have been fully tested, the Mechanical Services Contractor shall commission the complete system.

Commissioning shall include the following recommended procedures and also those of the equipment manufacturers, CIBSE and/or ASHRAE guides:

Operate all equipment under a loaded condition to ensure that there is no undue noise and vibration.

Measure the actual equipment performance and check operation of all safety devices.

Heat Pumps:

- Manufacturer's tests confirmed.
- Motor current under full and part load.
- Check all heat pump operating conditions – compressor suction and discharge pressure, oil pressure, refrigerant levels.
- Room temperature.
- Noise level check.

Fans:

- Air flow rate.
- Motor operating current.

Controls:

- Test all control interlocks.
- Set all thermostats and automatic controls and demonstrate control response and stability by artificially increasing and reducing system load.
- Adjust all control set points.

BRANZ Appraised
Appraisal No.329 [2005]

BRANZ Appraisals

Technical Assessments of products for building and construction

BRANZ APPRAISAL No. 329 (2005)

This Appraisal replaces BRANZ Appraisal No. 329 (1996) issued October 1996.

Amended 30 August 2013

SUPERCOURSE 500 DAMP-PROOF COURSE & CONCEALED FLASHING

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WFTAO

Product

1.1 Supercourse 500 is a single layer black polyethylene, embossed on both faces to produce a small diamond pattern. It is for use as a general damp-proof course (DPC), and also as a concealed flashing for brick veneer cladding.

Scope

2.1 Supercourse 500 has been appraised for use as a damp-proof course within the following scope:

- for separating timber, wood-based products and metal from concrete, masonry or brick; and,
- as a moisture barrier and flashing in masonry veneer constructed in accordance with NZS 3604 and NZS 4229.

2.2 Supercourse 500 has also been appraised for use as a concealed flashing at jambs and sills of aluminium window and door joinery in masonry veneer walls constructed in accordance with NZS 3604.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Supercourse 500 Damp-Proof Course and Concealed Flashing, if used, designed, installed and maintained in accordance with the statements and conditions of this Certificate, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (a), 50 years. Supercourse 500 meets this requirement. See Paragraph 8.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2 and E2.3.3. When used as a DPC, Supercourse 500 will meet the requirements of E2.3.3. When used as a flashing as part of a masonry veneer cladding system, Supercourse 500 will contribute to meeting the requirements of E2.3.2. See Paragraphs 11.1 and 11.2.
Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Supercourse 500 meets this requirement and will not present a health hazard to people.

3.2 This Certificate appraises an Alternative Solution in terms of the New Zealand Building Code compliance.

Technical Specification

4.1 Supercourse 500 is 0.5 mm thick, extruded polyethylene film. It consists of a single layer of black polyethylene, embossed on both faces to produce a small diamond pattern. The total thickness of the product after embossing is 0.75 mm. Supercourse 500 is supplied in rolls 20 m long and is available in widths of 50, 75, 90, 100, 150, 200, 250, 300, 400, 500 and 1000 mm. Other widths are available upon request.
4.2 Each roll is labelled with the product name, dimensions, standards reference, and manufacturer's information.

Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather and must be stored under cover, in clean, dry conditions.

Technical Literature

6.1 Refer to the Appraisals listings on the BRANZ website for details of the current Technical Literature for Supercourse 500. The Technical Literature must be read in conjunction with this Certificate. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Certificate must be followed.

Design Information

General

7.1 Supercourse 500 is a suitable moisture impermeable alternative to bituminous DPC's and flashings. It is intended for use as a DPC separating timber and wood-based products from concrete or masonry elements, or where required, timber jack studs or bearers from timber piles, e.g. where required by NZBC Acceptable Solution E2/AS1, Paragraph 10.2.3, or NZS 3604, Paragraph 2.3.3.
7.2 When used as a DPC, the roll width selected must enable the Supercourse 500 to extend at least 6 mm beyond each face of the timber in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 10.2.3(b), or NZS 3604, Paragraph 2.3.3(b).
7.3 Supercourse 500 is also suitable for use as a flashing material for weather sealing window and door joinery installations in masonry veneer wall claddings as detailed in the Technical Literature.

Timber Treatment

7.4 Supercourse 500 when used as a DPC or concealed flashing, is suitable for use in contact with timber treated with light organic solvent preservative (LOSP) or water-based timber preservatives.

Durability

Serviceable Life

8.1 Supercourse 500 is expected to have a serviceable life in excess of 50 years when it is installed in accordance with the requirements of this Certificate and the Technical Literature, provided it is not exposed to the weather or ultra-violet (UV) light for a total of more than 30 days, and is never exposed to chemicals, or solvents that will degrade polyethylene.

Control of Internal Fire and Smoke Spread

9.1 Damp-proof courses and flashings are exempt from the surface finish requirements of NZBC Acceptable Solutions C/AS1 – C/AS6 by NZBC Acceptable Solution C/AS1 Paragraph 4.2.2 e), and NZBC Acceptable Solutions C/AS2 – C/AS6 Paragraph 4.17.6 e).

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Supercourse 500 from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

11.1 Supercourse 500, when used as a DPC in accordance with this Certificate, prevents walls, floors and structural elements in contact with the ground from absorbing or transmitting moisture in quantities that could cause undue dampness or damage to building elements to meet the performance requirements of Clause E2.3.3.
11.2 Supercourse 500, when installed as a flashing in accordance with the Technical Literature and this Certificate, will assist in the masonry veneer cladding system meeting the performance requirements of Clause E2.3.2.

Installation Information

Installation Skill Level Requirements

12.1 Installation must always be carried out in accordance with the Technical Literature and this Certificate, by competent tradespersons with an understanding of DPC and flashing installation.

Supercourse 500 Installation

General

13.1 Strips of Supercourse 500 may be cut to length with a sharp knife.

DPC Installation

13.2 The surfaces to be separated must be smooth and flat, free from projections such as small stones or sharp ridges that may puncture the membrane when pressure is applied.

13.3 When used to separate timber and wood-based products from concrete or masonry, Supercourse 500 should be temporarily held in place with small hot-dip galvanised clouts or zinc plated staples. The strip of DPC must be wide enough to fully protect the width of the material in contact with the concrete or masonry. Refer also to Paragraph 7.2.

13.4 When used under timber plates fixed over concrete floor slabs and foundation walls, a small slit should be made in the material before pushing down over the bolts or fixings. Alternatively, a small hole can be formed by gently tapping the product resting on top of the bolt until a puncture is formed.

Flashing Installation

14.1 Supercourse 500 must be fixed in place to framing members at maximum 300 mm centres with small hot-dip galvanised clouts.

14.2 Horizontal and vertical joints must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the flashing.

14.3 At the sill/jamb junction, the jamb flashing must overlap the sill flashing.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

15.1 The following tests have been carried out on Supercourse 500 by Amdel Ltd, a NATA Certified laboratory: Water permeability, thickness, mass per unit area, pigment, impact resistance, and labelling, all in accordance with AS/NZS 2904 and AS/NZS 4347. The test results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

16.1 Durability and weathertightness opinions were given by BRANZ technical experts.

16.2 The practicability of installation has been assessed by BRANZ and found to be satisfactory.

16.3 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Supercourse 500 has been examined by BRANZ, and details of the methods adopted for quality control and the quality of the materials used, have been obtained.

17.2 The quality management system of the Supercourse 500 manufacturer, Cromford Pty Ltd, has been assessed and registered as meeting the requirements of ISO 9001: 2000 by SAI Global, Certificate Number QEC8059.

17.3 The quality of supply to the market is the responsibility of Thermakraft Industries (NZ) Ltd.

17.4 Building designers are responsible for the design of the building, and for the incorporation of Supercourse 500 into their design in accordance with the instructions of Thermakraft Industries (NZ) Ltd.

17.5 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Industries (NZ) Ltd.

Sources of Information

- AS/NZS 2904: 1995 Damp-proof courses and flashings.
- AS/NZS 4347 Damp-proof courses and flashings - Methods of test.
- NZS 3604: 1999 Timber Framed Buildings.
- NZS 4229: 1999 Concrete masonry buildings not requiring specific engineering design.
- Compliance Document for the New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, Supercourse 500 Damp-Proof Course and Concealed Flashing is fit for purpose and will comply with the Building Code to the extent specified in this Certificate provided it is used, designed, installed and maintained as set out in this Certificate.

The Appraisal Certificate is issued only to the Certificate Holder, Thermakraft Industries (NZ) Ltd, and is valid until further notice, subject to the Conditions of Certification.

Conditions of Certification

1. This Certificate:
a) relates only to the product as described herein;
b) must be read, considered and used in full together with the technical literature;
c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
d) is copyright of BRANZ.
2. The Certificate Holder:
a) continues to have the product reviewed by BRANZ;
b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
c) abides by the BRANZ Appraisals Services Terms and Conditions.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ
4. BRANZ makes no representation as to:
a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
c) any guarantee or warranty offered by the Certificate Holder.
5. Any reference in this Certificate to any other publication shall be read as a reference to the version of the publication specified in this Certificate.

For BRANZ

P Robertson
Chief Executive

Date of issue: 23 September 2005

Amendment No. 1, dated 30 August 2013.
This Appraisal has been amended to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.

BRANZ Appraised
Appraisal No.289 [2012]

BRANZ Appraisals

Technical Assessments of products for building and construction

BRANZ APPRAISAL No. 289 (2012)

This Appraisal replaces BRANZ Appraisal No. 289 (2006) dated 22 November 2006.

GIB® FIRE RATED SYSTEMS

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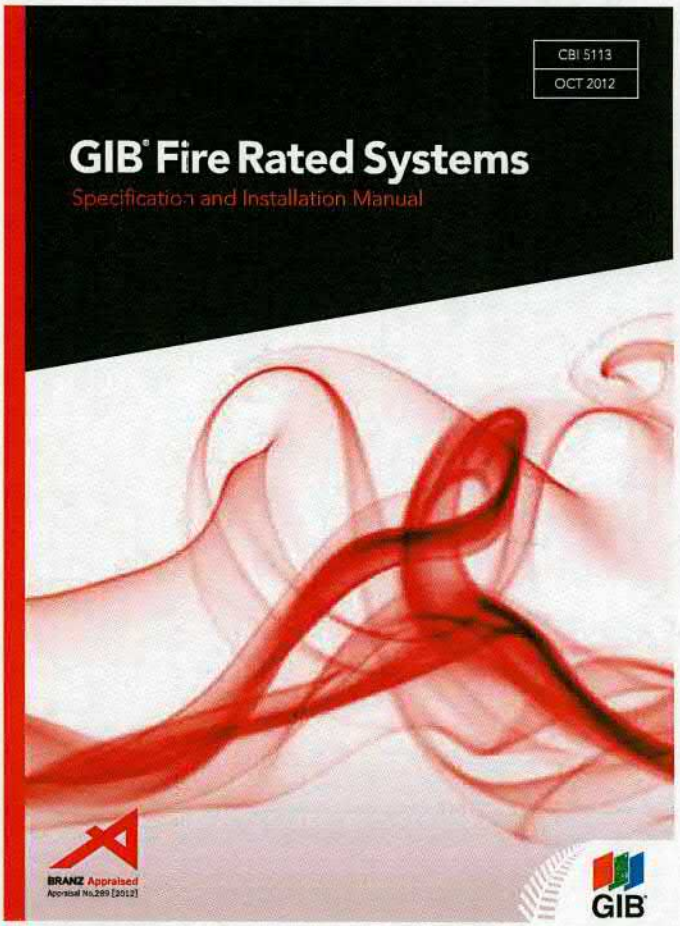
WFTAO

Product

1.1 GIB® Fire Rated Systems are a range of fire-rated constructions based on the use of GIB® plasterboards. The range consists of timber and steel framed wall, floor/ceiling and ceiling systems as well as steel beams, steel columns, risers, shafts, ducts and service penetrations.



Scope

2.1 GIB® Fire Rated Systems have been appraised for use as fire-rated load bearing and non-load bearing framed construction elements in buildings.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the GIB® Fire Rated Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB® Fire Rated Systems meet the requirements for loads arising from self-weight and impact [i.e. B1.3.3 (a) and (j)]. See Paragraphs 10.1 – 10.3.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB® Fire Rated Systems meet the requirements. See Paragraphs 11.1 – 11.3.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4(a) and C3.7. GIB® Fire Rated Systems meet the requirements by providing passive fire and smoke protection. See Paragraphs 13.1 – 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB® Fire Rated Systems meet this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

General

4.1 GIB® Fire Rated Systems are primarily based on two types of GIB® plasterboard, GIB® Standard Plasterboard and GIB Fyreline®. Other GIB® plasterboards may be substituted as follows:

- 10 or 13 mm GIB Braceline®, GIB Noiseline®, GIB Aqualine® and GIB Ultraline® and 13 mm GIB® Standard® and GIB Toughline® may be substituted for 10 mm GIB Fyreline®.
- Similarly 13 mm GIB Braceline®, GIB Noiseline®, GIB Aqualine® and GIB Toughline® may be substituted for 13 mm GIB Fyreline®.

GIB® Plasterboards

GIB Fyreline®

4.2 GIB Fyreline® is a paper-bound gypsum-plaster core sheet lining material. Glass fibre and other additives are added to the core during manufacture. The sheets have a taper on the two long sheet edges. GIB Fyreline® is available in thicknesses of 10 mm, 13 mm, 16 mm and 19 mm with a sheet width of 1200 mm. Sheet thicknesses of 10 mm and 13 mm are available in standard lengths between 2400 mm and 3600 mm and sheet thicknesses of 16 mm and 19 mm are available in standard lengths between 2400 mm and 3000 mm. The nominal weight is 7 kg/m², 9.7 kg/m², 13.9 kg/m², and 16.6 kg/m² for 10 mm, 13 mm, 16 mm and 19 mm thick sheet respectively. GIB Fyreline® face paper is pink in colour.

GIB® Standard Plasterboard

4.3 GIB® Standard plasterboard is a paper-bound gypsum-plaster core sheet lining material. GIB® Standard plasterboard is available in 10 mm and 13 mm thicknesses and a sheet width of 1200 mm and 1350 mm (GIB® Wideline). The sheets have a taper on the two long sheet edges. The 10 mm thick sheets are also available with a square edge. Sheets are available in various lengths from 2400 mm to 6000 mm. The nominal weights are 6.5 kg/m² and 8.5 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB® Standard plasterboard face paper is a light buff colour.

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:
  6g x 25, 32, 41 mm and 7g x 51, 57 mm.
- GIB® Grabber® Self Tapping Drywall Screws for fixing to light gauge steel:
  6g x 25, 32, 41 mm; 7g x 51 mm and 8g x 63, 76 mm.
- GIB® Nail annular threaded shank:
  30 x 2.87 mm and 40 x 2.87 mm.
- Ceiling Suspension Systems.
- USG Donn® ScrewFix® Suspension System.
- USG Drywall Grid Suspension System.
- Rondo® Key-Lock™ steel frame suspension system.
- Beam/Column Clips.
- Rondo® FurringTrack, Clips and Angle.

Accessories and Compounds

4.4 A combination of GIB® Paper Tape, GIB-Cove®, Trims and compounds are used. The requirements are specified in the GIB® Fire Rated Systems Technical Literature and details of the products and installation are found in the GIB® Site Guide Technical Literature.

Boundary Wall Bottom Plate Connections

4.5 The single storey light timber framed boundary fire wall detail contained in the Technical Literature relies on GIB® HandiBrac™ brackets to provide structural stability.

- GIB® HandiBrac™, galvanised steel 90 x 62 x 54 x 1.55 mm thick angle bracket.
- GIB® HandiBrac™ Washer, 50 x 60 x 5 mm thick electroplated.
- GIB® HandiBrac™ Fixings, 8 Type 17 screws 5 x 35 mm.
- Proprietary concrete anchors with a minimum characteristic uplift capacity of 8 kN.

Note: For corrosion protection requirements refer to NZS 3604: 2011 Section 4.

Handling and Storage

5.1 The best results are achieved when GIB® plasterboards are treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.

5.2 All accessories must be kept dry.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for GIB® Fire Rated Systems. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 The GIB® Fire Rated Systems Technical Literature contains solutions for the passive fire protection of loadbearing and non-load bearing, timber or steel-framed elements, wall, floor/ceiling and ceiling systems, riser, shaft and ducts, columns and beams and service penetrations.

7.2 GIB® Fire Rated Systems are used where a Fire Resistance Rating (FRR) is required and as part of the total GIB® lining system or specific fire partitioning design.

7.3 GIB® plasterboards must not be exposed to temperatures of 52°C or greater for prolonged periods. Refer to appliance and fitting manufacturers for installation details.

Control Joints

8.1 Where control joints are required, the joints must be specifically designed to maintain the integrity of the fire rated system.

GIB® Fire Rated Systems

9.1 The GIB® Fire Rated Systems Technical Literature describes a range of design options for the construction of loadbearing and non-loadbearing fire resistant construction elements. All FRRs are given in minutes for stability, integrity and insulation up to a maximum of 240 minutes. The following systems are addressed:

Fire Rated Wall Systems

Two Way FRR – Timber Frame Walls,
Two Way FRR – Steel Frame Walls,
One Way FRR – Timber or Steel Frame.

Fire Rated Floor/Ceiling Systems, Suspended Ceilings, Universal Ceilings, Risers, Shafts and Ducts, Steel Beams and Columns

Floor*/Ceiling Systems,
Floor*/Ceiling Systems – Suspended Grid*,
Ceiling Systems – Timber or Steel Frame,
Risers, Shafts and Ducts.

** Note: Proprietary floor joist systems, suspended ceiling systems, metal supports, and flooring have not been assessed for other than fire and sound properties and are otherwise outside the scope of this Appraisal.*

Junction Details for Fire and Smoke Separations, Chase Walls

Describes the construction requirements at wall-to-wall, wall-to-ceiling, wall-to-floor, wall-to-floor/ceiling and drywall-to-masonry/concrete junctions of fire separations. Describes chase wall construction details and control joints. Construction in accordance with these details will preserve the FRR of the fire rated elements and prevent the passage of smoke.

Penetrations in GIB® Fire Rated Systems

Describes construction details and requirements for services penetrations in and through GIB® Fire Rated Systems.

** Note: Proprietary penetration seals and sealants have not been assessed and are outside the scope of this Appraisal.*

Stability of Fire Rated Elements

Describes the NZBC requirements for Structural Stability of fire rated elements and provides details of a single storey light timber framed boundary fire wall.

Structure

Framing

10.1 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of GIB® Fire Rated Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
- Steel framing must be designed to withstand loads in accordance with AS/NZS 1170.

Impact Resistance

10.2 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

Boundary Walls

10.3 The Technical Literature provides details for a single storey light timber framed boundary fire wall, which can resist a possible force of 0.5 kPa in any direction as required by NZBC Verification Method B1/VM1 Clause 2.2.4(iii).

Durability

11.1 The ability of the systems to maintain their FRR for at least 50 years is dependent on their regular maintenance and remaining dry in service.

11.2 Framing and cladding systems must have durabilities which meet the performance requirements of NZBC B2. The integrity of fire rated sealants and packing must be maintained. These have not been assessed and are outside the scope of this Appraisal.

11.3 Lining systems must be protected from internal and external moisture in accordance with NZBC E2 and E3. In particular Garage Boundary Walls must be installed with a drained cavity cladding system complying with NZBC Acceptable Solution E2/AS1 to achieve a 15 year durable life.

Maintenance

11.4 Any cracks or damage which may occur as a result of events such as exposure to excessive moisture or flooding, local outbreak of fire, wind or earthquake, timber shrinkage, or excessive impact, must be repaired immediately. Repair will include the replacement of any damaged sheets, materials or components.

11.5 Fire rated sealants must be regularly inspected, at least annually, and maintained in accordance with the instructions of the sealant manufacturer. Sealant joints must be repaired or replaced as necessary.

Prevention of Fire Occurring

12.1 Separation or protection must be provided to GIB® Systems from heat sources such as stoves, heaters, flues and chimneys.

12.2 Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Internal Surface Finishes

13.1 Table 1 shows the Material Group Numbers for GIB® plasterboards without applied paint or wallpaper finishes. GIB® plasterboards can be used as internal surface linings where permitted by NZBC Performance Clause C3.4(a).

13.2 When an applied finish is used over GIB® Plasterboards, the Material Group Number must be obtained from the manufacturer of the finish product or system, for the complete lining system.

Table 1. Surface Finish Properties

Product	Material Group Number
GIB Fyreline®	1-S
GIB® Standard	1-S
GIB Aqualine®	1-S
GIB Braceline®	1-S
GIB Noiseline®	1-S
GIB Toughline®	1-S
GIB Ultraline®	1-S

Fire Resistance Ratings (FRRs)

13.3 GIB® Fire Rated Systems can be used to provide FRRs as determined by NZBC Acceptable Solutions C/AS1 – C/AS7 and NZBC Verification Method C/VM2.

Structural Stability during Fire

14.1 In order to satisfy the requirements of NZBC C6 Structural Stability, designers must ensure that fire rated elements are supported by building elements having at least the same FRR as the fire rated element they are supporting.

External Moisture

15.1 Lining systems must be protected from external moisture in accordance with NZBC E2.

15.2 The Boundary Wall detail provided in the Technical Literature requires installation of a drained cavity wall cladding system in accordance with the requirements in NZBC Acceptable Solution E2/AS1. The Gib® Plasterboard must be kept dry during the installation of the cladding system and in service.

Note: The drained cavity wall cladding system has not been assessed and is outside the scope of this Appraisal.

Internal Moisture

16.1 GIB® plasterboards are intended for use in dry internal situations and must not be used where they are likely to be exposed to liquid water or be installed where extended exposures to humidity above 90% RH can reasonably be expected.

Airborne and Impact Sound

17.1 The GIB® Fire Rated Systems Technical Literature gives noise attenuation properties for the fire rated systems. Refer to GIB® Noise Control Systems for further information.

Installation

Installation Skill Level Requirement

18.1 Installation must be carried out by contractors experienced in plasterboard installation and the principles of fire rated construction.

General

19.1 GIB® Fire Rated Systems must be installed in accordance with the specifications contained in the GIB® Fire Rated Systems and the GIB® Site Guide Technical Literature. For inspection reference must be made to the Technical Literature.

Cutting Sheets

19.2 GIB® plasterboard sheets are cut by scoring the paper face with a sharp, short-bladed trimming knife. The plasterboard must then be snapped away from the cut face and the back paper cut. Cutouts for switch boxes and other penetrations should be made using a keyhole saw.

Health and Safety

19.3 Dust resulting from the sanding of boards, jointing or finishing compounds may be a respiratory irritant, therefore the use of a suitable face mask is recommended. Where sealants, insulation and other materials are used, the instructions of the manufacturer must be followed.

Wall Framing

19.4 Construction details for the framing, in particular type, dimensions and spacings, must be strictly in accordance with the specifications oulined in GIB® Fire Rated Systems and the specific design documentation for the building project.

19.5 All framing must be plumb, level and in true alignment.

19.6 The GIB® Site Guide specifies timber framing with a moisture content less than 18% at the time interior linings are installed. The use of kiln-dried timber is recommended.

Fixing

19.7 The GIB® Fire Rated Systems Technical Literature includes options for the orientation of linings (e.g. horizontal or vertical fixing). The installer must ensure that the specifications for these options are strictly adhered to. All joints must be made over framing.

19.8 The length and spacing of GIB® Nails or drywall screws for the fixing of GIB® plasterboard linings to framing must be strictly in accordance with the specifications.

19.9 Options are included for nail and screw fixing. Care must be taken to ensure that fastener heads only indent the paper liner surface and do not damage the paper itself.

Jointings and Finishing

19.10 All joints in single or outer layers of multiple layer linings must be paper-tape reinforced. A minimum of two layers of bedding compound are required to achieve the stated fire resistance rating (FRR). Inner sheet joints of multiple layer linings do not require stopping.

Basis of Appraisal

The following is a summary of the technical investigations carried out.

Tests

20.1 The following tests have been carried out by BRANZ:

- Testing to determine the FRR of a range of wall and floor/ceiling systems, penetrations and closures.
- Fire Resistance Tests in accordance with AS 1530.4 to determine the FRR of construction elements.
- Cone calorimeter tests to ISO 5660.

Other Investigations

21.1 The GIB® Fire Rated Systems and GIB® Site Guide Technical Literature has been examined by BRANZ and found to be satisfactory.

21.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

21.3 Opinions on the fire resistance of variations to systems tested in accordance with AS 1530.4 were given by BRANZ experts.

21.4 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

21.5 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

Quality

22.1 Winstone Wallboards Limited's manufacturing process and details of the quality composition of the materials, have been examined by BRANZ and found to be satisfactory.

22.2 The quality management systems of Winstone Wallboards Limited have been assessed and registered with TELARC as meeting the requirements of ISO 9001.

22.3 Winstone Wallboards Limited is responsible for the quality of the product supplied.

22.4 The quality of the application and finish on site is the responsibility of the installation and stopping contractors.

22.5 Designers are responsible for the design of buildings.

22.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

Sources of Information

- AS 1530: 2005 Part 4 Fire resistance tests on elements of construction.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- ISO 5660 Reaction-to-fire tests – heat release, smoke production and mass lose rate – Part 1: Heat release rate (cone calorimeter method) and Part 2: Smoke production rate (dynamic measurement).
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- New Zealand Building Code Handbook, Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- New Zealand Building Code Clauses C1-C6 Protection from Fire, Department of Building and Housing, 10 April 2012.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, GIB® Fire Rated Systems is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Winstone Wallboards Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
a) relates only to the product as described herein;
b) must be read, considered and used in full together with the technical literature;
c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
d) is copyright of BRANZ.
2. Winstone Wallboards Limited:
a) continues to have the product reviewed by BRANZ;
b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
c) abides by the BRANZ Appraisals Services Terms and Conditions.
d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
c) any guarantee or warranty offered by Winstone Wallboards Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Winstone Wallboards Limited or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 8 November 2012

BRANZ Appraised
Appraisal No.427 [2007]

BRANZ Appraisals

Technical Assessments of products for building and construction

BRANZ APPRAISAL No. 427 (2007)

Amended 31 January 2012

GIB AQUALINE® WET AREA SYSTEMS

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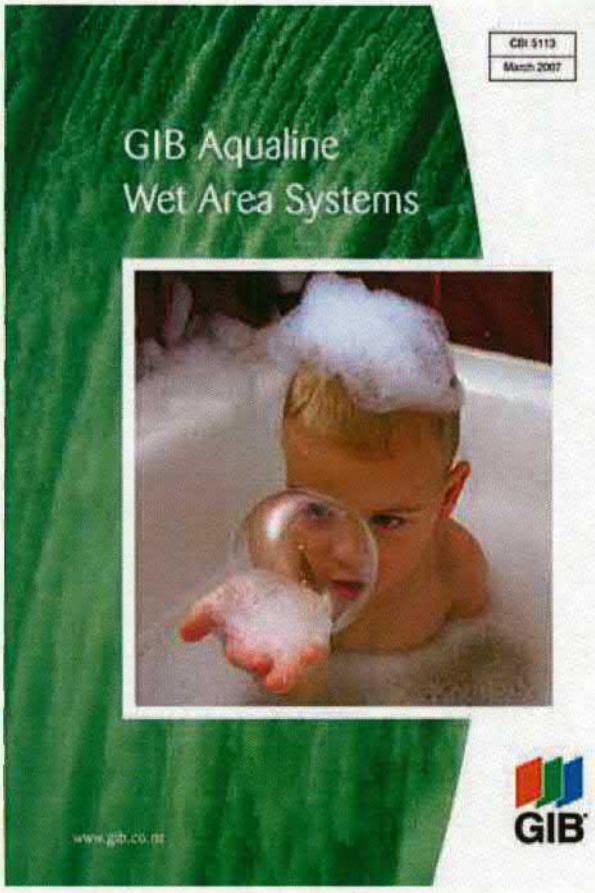
WFTAO

Product

1.1 GIB Aqualine® Wet Area Systems are for the interior lining of timber and steel frame walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water resistant lining material is desirable.

1.2 GIB Aqualine® Wet Area Systems are based on 10 mm and 13 mm thick GIB Aqualine® water resistant plasterboard.



Scope

2.1 GIB Aqualine® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:

- on framed walls and ceilings within the scope limitations on NZS 3604; and,
- on timber and light gauge steel framed walls and ceiling subject to specific design; and,

2.2 GIB Aqualine® may also be used to substitute for some other GIB® Plasterboards in fire-rated, sound-rated and bracing-rated wall and floor/ceiling constructions.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the GIB Aqualine® Wet Area Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB Aqualine® Wet Area Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 8.1 - 8.3.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 9.1 - 9.5.

Clause C3 SPREAD OF FIRE: Performance C3.3.1, C3.3.2, and C3.3.5. GIB Aqualine® Wet Area Systems meet these requirements by providing passive fire and smoke protection.
Clause E3 INTERNAL MOISTURE: Performance E3.3.4, E3.3.5 and E3.3.6. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 13.1 - 13.3.
Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB Aqualine® Wet Area Systems meet this requirement and will not present a health hazard to people.
Clause G6 AIRBORNE AND IMPACT SOUND: Performance G6.3.1 and G6.3.2. GIB Aqualine® Wet Area Systems meet the requirements. See Paragraph 14.1.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 The GIB® plasterboards and accessories used in the GIB Aqualine® Wet Area System and supplied or specified by Winstone Wallboards Limited are as follows:

GIB Aqualine®

4.2 GIB Aqualine® is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. The sheets have a taper on the two long sheet edges. GIB Aqualine® is available in 10 mm and 13 mm sheet thicknesses, a sheet width of 1200 mm and in lengths of 2400 mm, 2700 mm, 3000 mm and 3600 mm. The maximum weights are 7.8 kg/m² and 10.2 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:
  6g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel:
  6g x 25 mm and 32 mm.
- GIB® Nails
  30 mm and 40 mm x 2.8 mm

Adhesive and Sealants

- GIBFix® One (Acrylic)
- GIBFix® All-Bond (Solvent)

GIB® Accessories and GIB® Jointing Compounds

- As specified in the GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature.

Finishes

4.3 Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

5.1 The best results are achieved when GIB Aqualine® is treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.

5.2 All accessories must be kept dry.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the GIB Aqualine® Wet Area System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 GIB Aqualine® provides a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls and paint, and wallpaper to walls and ceilings.

7.2 GIB Aqualine® must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths (See Paragraphs 7.4 and 8.2).
- In areas of high humidity (above 90% RH) or continually wet such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52°C or greater for prolonged periods. (Refer to appliance and fitting manufacturer's for installation details.)

7.3 GIB Aqualine® may be substituted for some other GIB® Plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems, GIB® Noise Control Systems and GIB Ultraline® PLUS Lining System.

Wet Areas

7.4 Wet areas are spaces where sanitary fixture and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

1. Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
2. Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. Shower areas must additionally be waterproof. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finish, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertenancy Walls – Wet Areas

7.6 Intertenancy drywall constructions that incorporate fire resistance and noise control must be protected from water splash. In shower areas GIB Aqualine® must not be substituted for other GIB® Plasterboards but must be an extra lining layer. Refer to the GIB Aqualine® Wet Area Systems Technical Literature.

Tiling

7.7 GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® up to 20kg/m²
- 13 mm GIB Aqualine® up to 32kg/m².

Note: Most ceramic and porcelain wall tiles weigh less than 20kg/m². For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

Framing

7.8 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of GIB Aqualine® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
- Steel framing must be designed to withstand loads in accordance with AS/NZS 1170.

Structure

Bracing

8.1 GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900 mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100 mm centres, using the GIB Braceline® corner fixing pattern.

8.2 GIB Aqualine® must not be used for bracing in shower areas or behind baths.

Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

Durability

Serviceable Life

9.1 GIB Aqualine® has a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining GIB Aqualine® will have a serviceable life in excess of 50 years. The ability of GIB Aqualine® to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB Aqualine® substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB Aqualine® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Outbreak of Fire

10.1 Separation or protection must be provided to GIB Aqualine® Wet Area Systems from heat sources such as stoves, heaters, flues and chimneys.

10.2 NZBC Acceptable Solution C/AS1, Part 9 and Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Spread of Fire

11.1 When 10 mm GIB Aqualine® is substituted into fire rated systems in place of 10 mm GIB Fyreline®, the FRR of that system will be maintained. Similarly, the FRR is maintained when 13 mm GIB Aqualine® is substituted for 13 mm GIB Fyreline®.

Flame Barrier

12.1 Where flame barriers are required by Acceptable Solution C/AS1 Table 6.3, GIB Aqualine® is a suitable material to provide a 10 minute flame barrier, provided all sheet joints are formed over framing, or backblocked with GIB® plasterboard.

Internal Moisture

13.1 When installed in accordance with this Appraisal, GIB Aqualine® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

13.2 The construction methods meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

13.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

Airborne and Impact Sound

14.1 When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur.

Installation Information

Installation Skill Level Requirement

15.1 Installation of GIB Aqualine® Wet Area Systems can be carried out by any competent building contractor.

General

16.1 GIB Aqualine® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Cutting

16.2 GIB Aqualine® is easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

Health and Safety

16.3 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Framing

16.4 To achieve an acceptable decorative finish, GIB Aqualine® Wet Area Systems and the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallbaords Limited recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

Fixing Sheets

Non-Tiled Areas

17.1 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws or GIB® Nails at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

17.2 Control joints must be provided at maximum 4 m centres.
Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle prior to lining the walls.
17.3 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 100 mm centres to perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

17.4 Supports of timber or steel battens or ceiling joists must be 450 centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine®.
17.5 GIB Aqualine® sheets must be fixed with GIB® Grabber® screws at 600 mm centres around perimeter and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive fixed at 200 mm centre between.

Penetrations and Sealants

18.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.
18.2 A bead of silicone sealant must be placed to the full thickness of the GIB Aqualine® sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.
18.3 In tiled areas, a bead of silicone sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

19.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.
19.2 Tiled shower areas must incorporate a waterproofing membrane over GIB Aqualine®. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Investigations

20.1 The GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.
20.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.
20.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.
20.4 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

Quality

21.1 Winstone Wallboards Limited's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.
The quality management systems of Winstone Wallboards Limited have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581.
Winstone Wallboards Limited is responsible for the quality of the product supplied.
21.2 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.
21.3 Designers are responsible for the design of buildings.
21.4 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- BRANZ Good Practice Guide - Tiling, March 2004.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.

BRANZ

In the opinion of BRANZ, GIB Aqualine® Wet Area Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to the Client, Winstone Wallboards Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
a) relates only to the product as described herein;
b) must be read, considered and used in full together with the technical literature;
c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
d) is copyright of BRANZ.
2. The Client:
a) continues to have the product reviewed by BRANZ;
b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
c) abides by the BRANZ Appraisals Services Terms and Conditions.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation as to:
a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
c) any guarantee or warranty offered by the Client.
5. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.

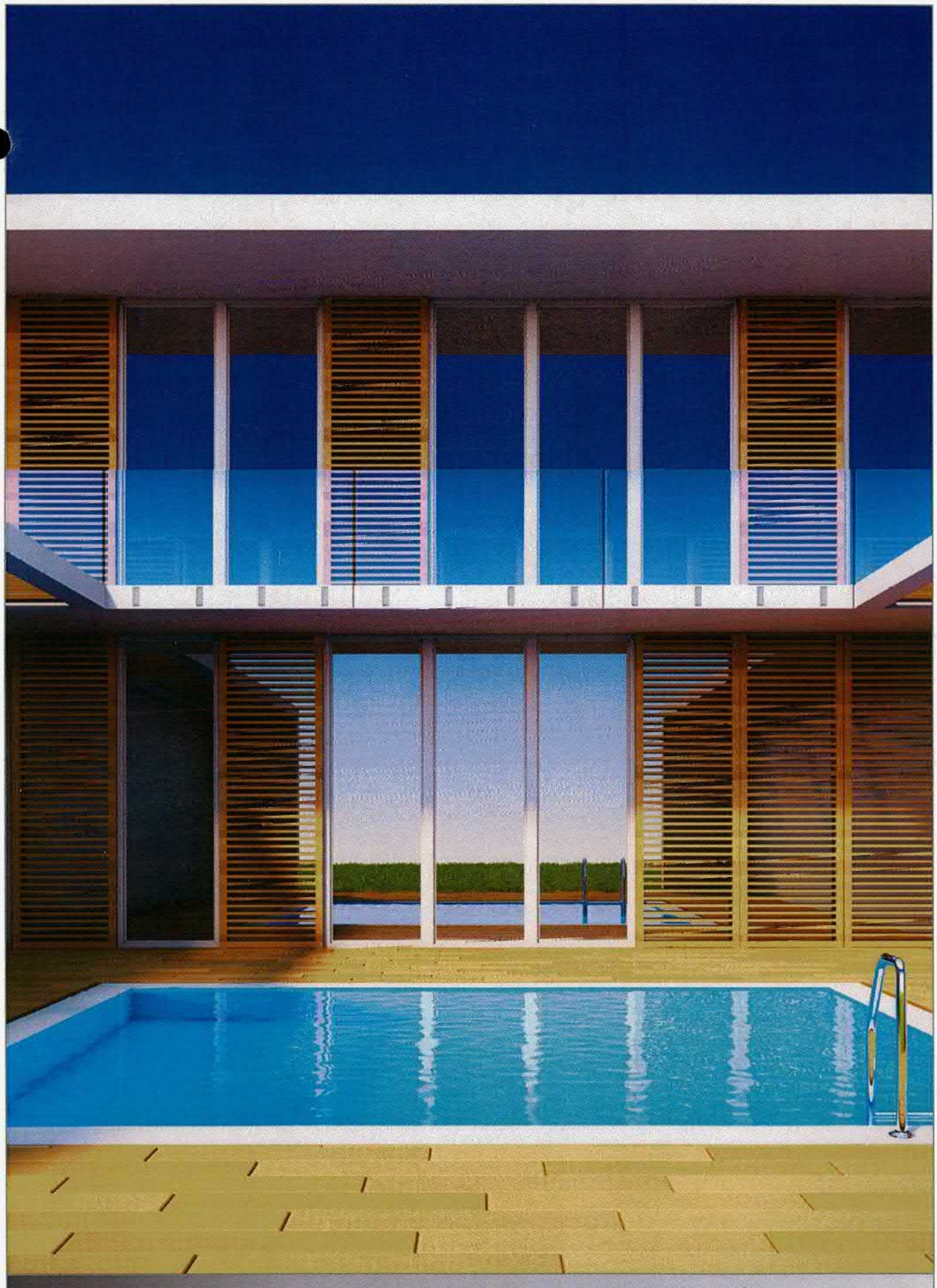
For BRANZ

P Robertson
Chief Executive

Date of issue: 4 April 2007

Amendment No. 1, dated 29 April 2010.
This Appraisal has been amended to include a new adhesive, GIBFix® One, and to update reference to AS/NZS 1170.

Amendment No. 2, dated 31 January 2012.
This Appraisal has been amended to update reference to NZS 3604: 2011.



JURALCO

JURALCO EDGETEC® JH CLAMP BALUSTRADE SYSTEM

ISSUE A3/14

Juralco Aluminium Building Products Ltd designs and distributes specialist aluminium joinery systems through a national network of franchised fabricators and agents.

For more than 25 years we have been at the forefront of specialist aluminium door and window products suitable for New Zealand joinery and building methods. Our comprehensive product range includes security and insect screens, balustrades and gates, shutters and awnings, shower screens, wardrobe doors and organisers and internal doors.

The Juralco JH Clamp Balustrade System is designed to use 12mm Frameless Glass. The system is extremely versatile and can be custom made in a range of configurations and powder-coat colours to meet most modern architectural requirements.

This Guide is intended for use by Architects and Specifiers
See Index page 3

Note 1

Juralco Edgetec® JH Clamp Balustrade is for Residential Occupancy types A, B, E and C3 only
Occupancy Types as per AS/NZ 1170.1.2002

Code	Type of Occupancy for part of the building or structure	Specific Uses
A	Domestic and Residential activities.	All areas within or serving exclusively one dwelling including stairs, landings etc, but excluding external balconies and edges of roofs. (see C3)
B, E	Offices and work areas not included elsewhere including storage areas.	Light access stairs and gangways not more than 600mm wide. Fixed platforms, walkways, stairways and ladders for access. Areas not susceptible to overcrowding in office and institutional buildings; also industrial and storage buildings.
C3	Areas without obstacles for moving people and not susceptible to over crowding.	Stairs, landings, external balconies, edges of roofs etc.

Note 2

All for 12mm toughened Glass, Frameless.
Glass must have a minimum strength of 100mpa
All edges polished, all Holes to be smooth and chip and crackfree

Note 3

The Dulux powder coating warranty period is conditional upon the Clamps being maintained in accordance with the Dulux 'Care and Maintenance Instructions'. Contact your balustrade installer for a copy of the Care and Maintenance procedure.

Note 4

Juralco Balustrade Systems building code compliance documentation requires all balustrade installations are to be completed in accordance with the requirements of our authorised installer certification.

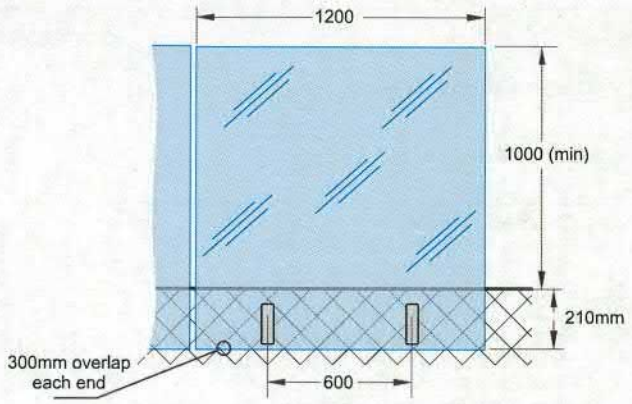
Juralco Edgetec® JH Clamp Balustrade System - Typical Layouts

2 x JH Glass Clamps per Panel

Typical panel shown.
See individual fixing details for other panel/height options

Juralco JH Clamp Balustrade
for Residential Occupancy
types A, B, E and C3

All for 12mm toughened Glass.
Glass must have a minimum strength of 100mpa
All edges polished
All Holes to be smooth and chip and crackfree

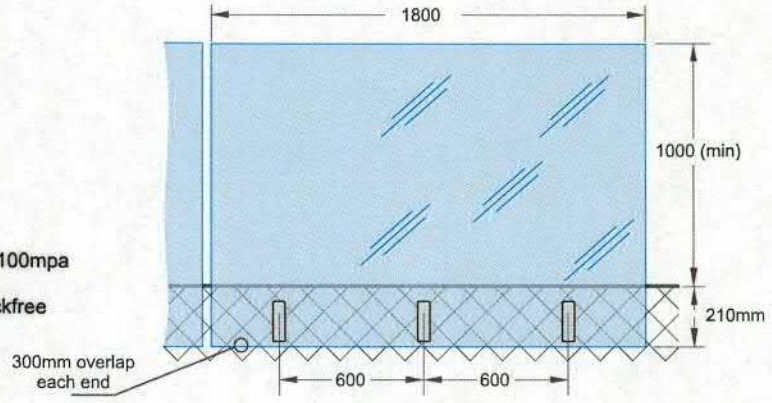


3 x JH Glass Clamps per Panel

Typical panel shown.
See individual fixing details for other panel/height options

Juralco JH Clamp Balustrade
for Residential Occupancy
types A, B, E and C3

All for 12mm toughened Glass.
Glass must have a minimum strength of 100mpa
All edges polished
All Holes to be smooth and chip and crackfree

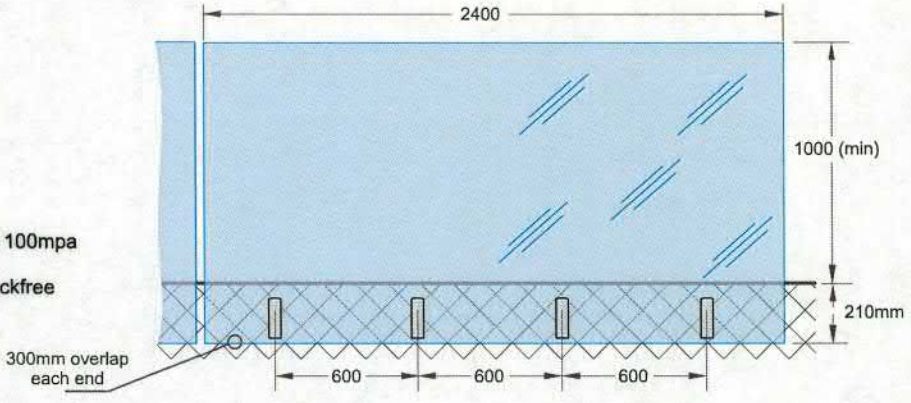


4 x JH Glass Clamps per Panel

Typical panel shown.
See individual fixing details for other panel/height options

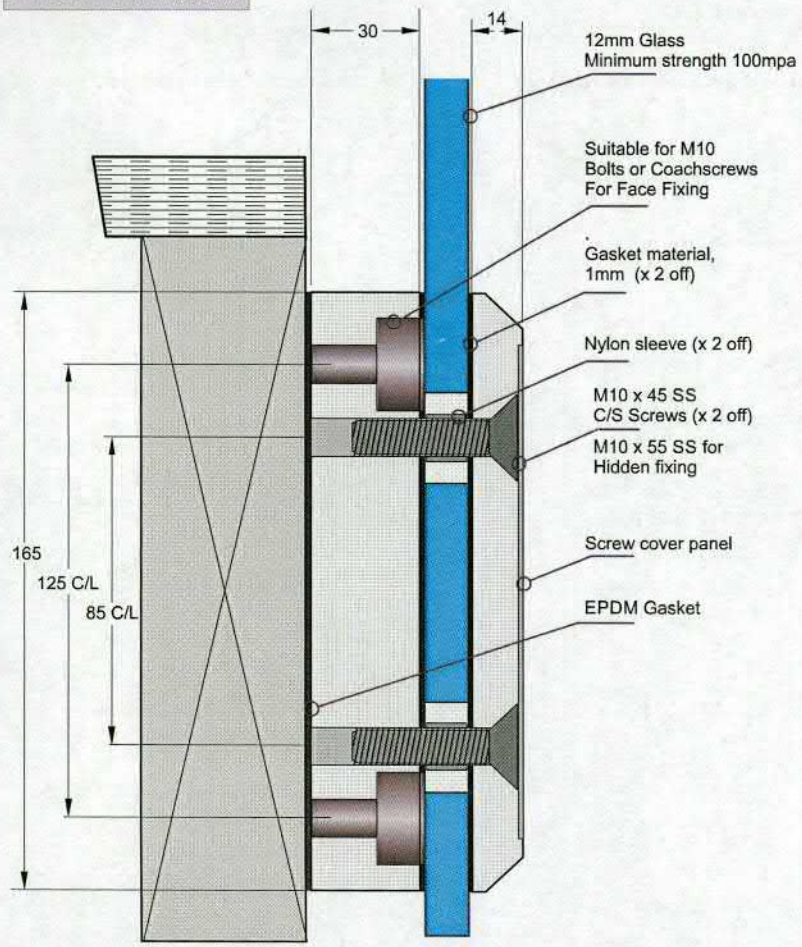
Juralco JH Clamp Balustrade
for Residential Occupancy
types A, B, E and C3

All for 12mm toughened Glass.
Glass must have a minimum strength of 100mpa
All edges polished
All Holes to be smooth and chip and crackfree

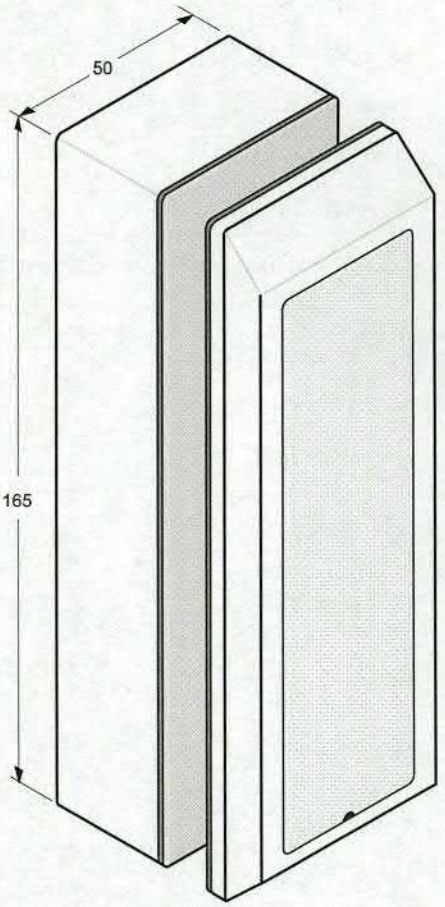


Juralco Edgetec® JH Clamp Balustrade System - Dimensions

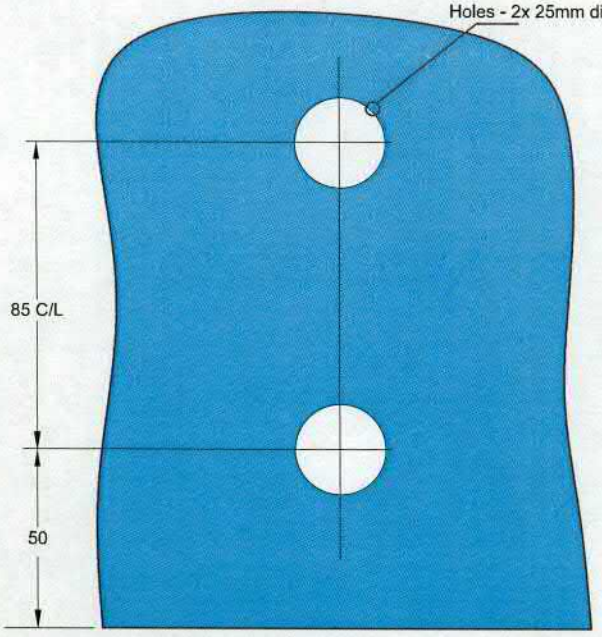
JH Glass Clamp
Part No JH 165



Elevation showing the Main Features



Note:
1 - Cover Panels.
Held in place with JMF/X02 Double sided tape



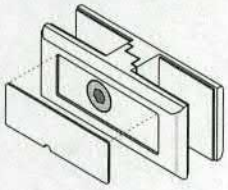
12mm Glass - Holes

All for 12mm toughened Glass.
Glass must have a minimum strength of 100mpa
All edges polished
All Holes to be smooth and chip and crackfree

Juralco Edgetec® JH Clamp Balustrade System - Components

Glass Panel Top Support
Straight Bracket
Part No JET 68/180

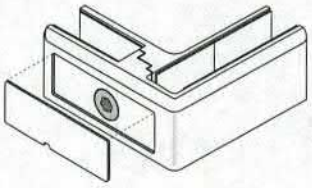
Suitable for 12mm Toughened Glass



Powder coat finish

Glass Panel Top Support
Corner Bracket
Part No JET 63/90

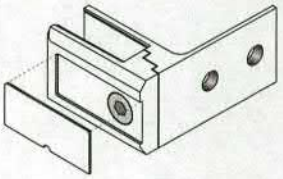
Suitable for 12mm Toughened Glass



Powder coat finish

Glass Panel Top Support
End Bracket
Part No JET 44

Suitable for 12mm Toughened Glass

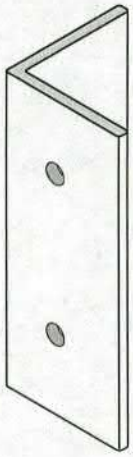


Powder coat finish

The brackets above must be used if mounting to Timber decks. Only for 180deg and 90deg junctions

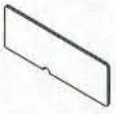
Angle - Hidden Fixing
Part No JET/JH165HFBKT

Kit includes 2 x M10 x 55 SS C/S screws



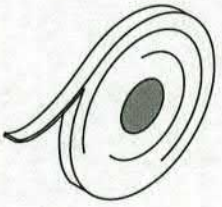
ex 70x70x6 Aluminium angle x 165 long

Glass Bracket
Replacement Cover Plate
Part No JET 68/51



Acrylic Tape 8mm x 0.8mm
Part No JMF/X02/66

Attach Screw Cover Plates



Double sided 8mm wide x 66mt Roll

Juralco Edgetec® JH Clamp Balustrade System - Typical Fixing

Complies with NZS3604:2011 - Double Boundary Joists

Typical FACE Fix Post to Timber - Coachscrews

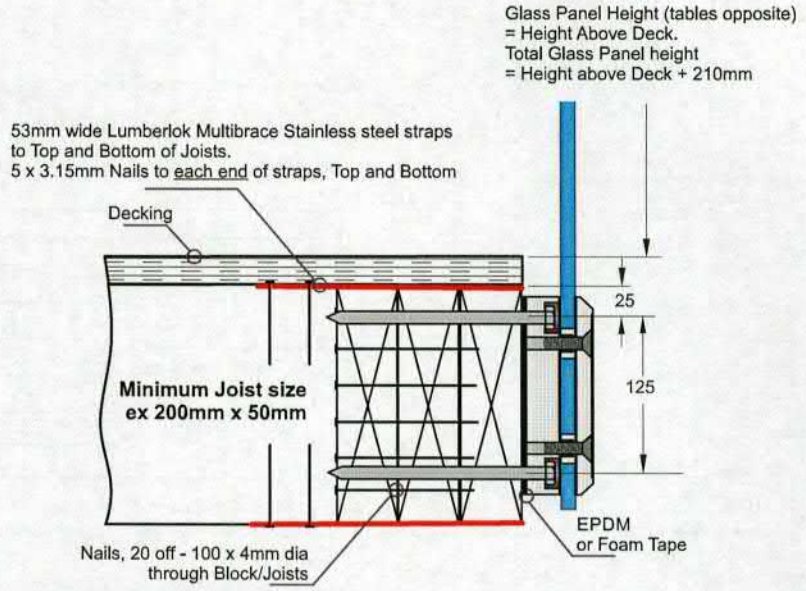
A Design engineer must ensure the deck can support the appropriate load applied at each clamp

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

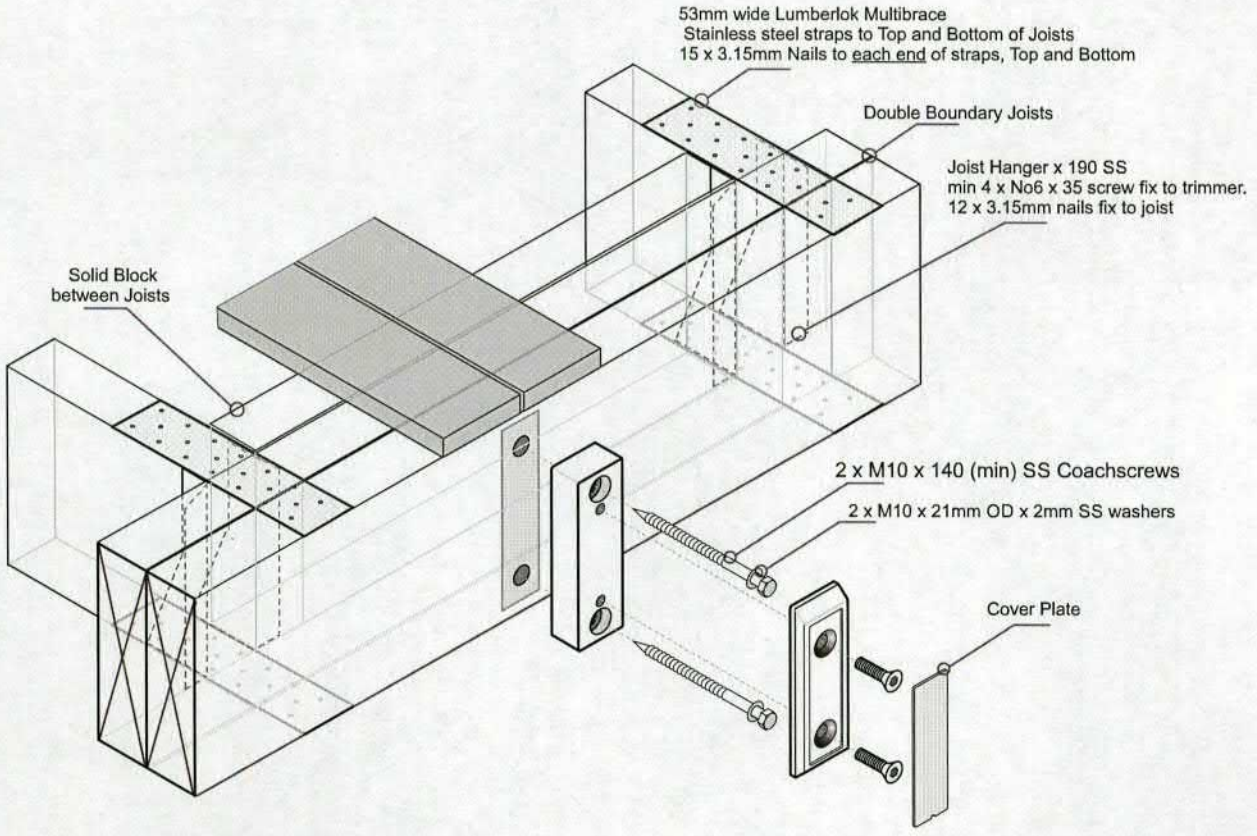
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.



1 - Coachscrews 130mm min thread engagement into joists+block
2 - Bond all coachscrews with SIKA Supergrip to full depth.
3 - A Rubber, EPDM or Foam Tape layer must be installed between the Clamp and Timber
4 - The glass Top Support Brackets must be used onTimber decks.



All fixings must be Stainless steel

Juralco Edgetec® JH Clamp Balustrade System - Typical Fixing

Complies with NZS3604:2011 - Double Boundary Joists

Typical HIDDEN FACE Fix Post to Timber - Coachscrews

A Design engineer must ensure the deck can support the appropriate load applied at each clamp

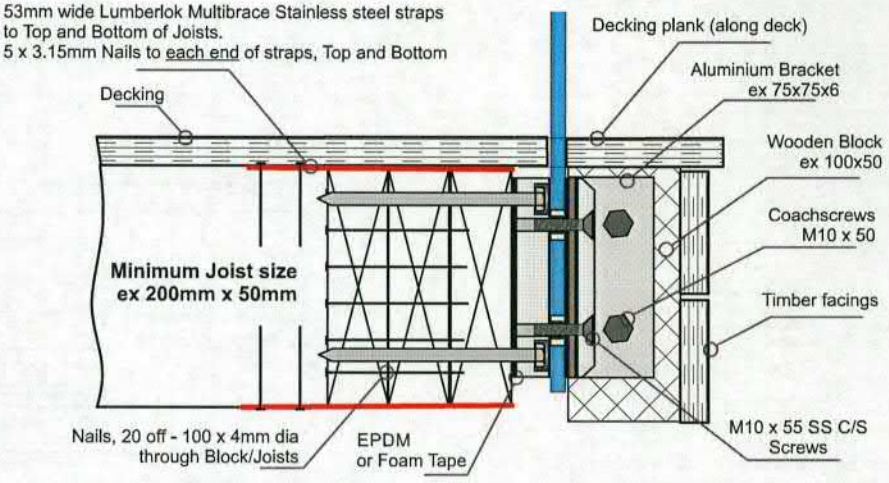
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

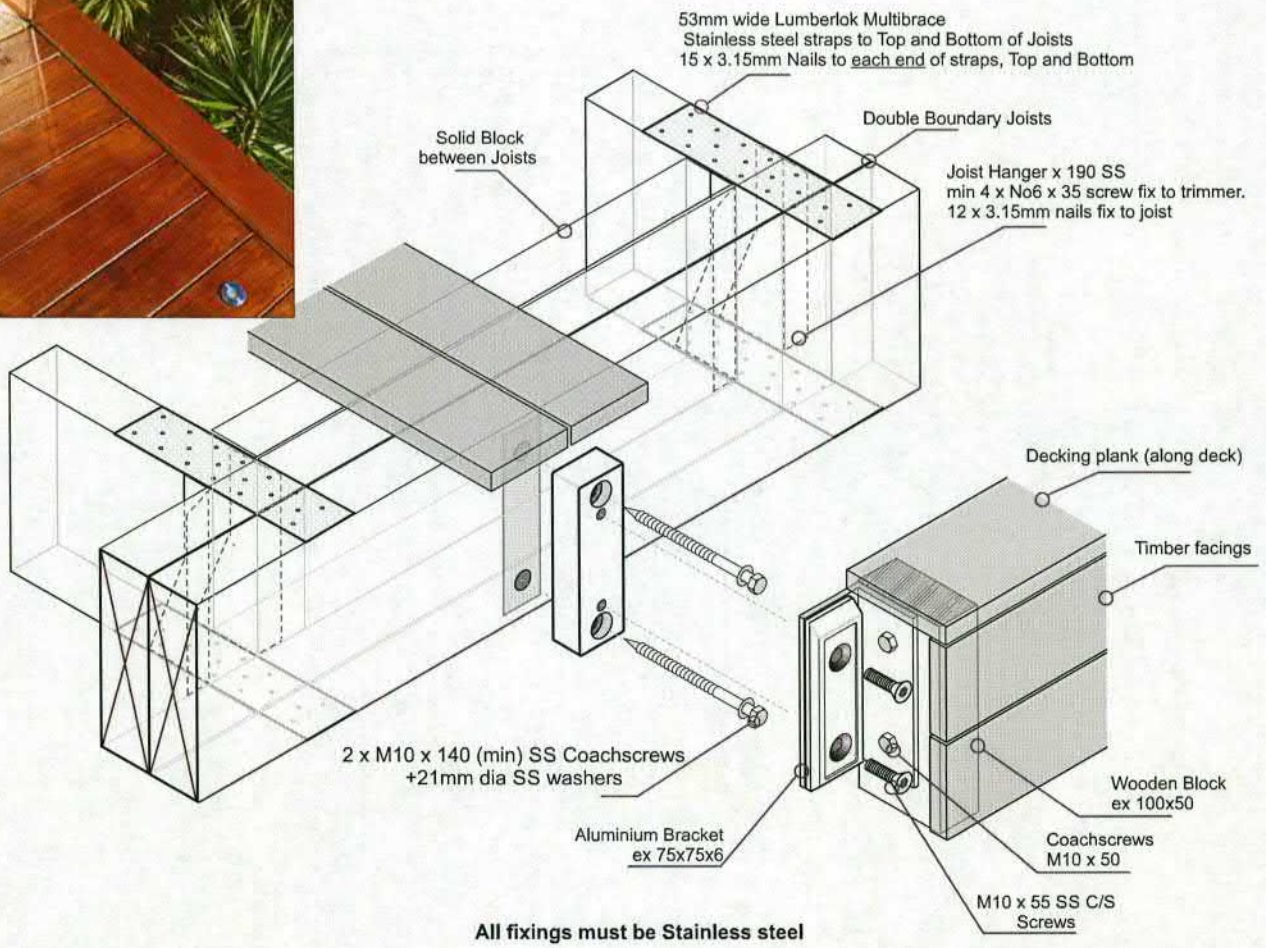
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.

Note: Decking Planks and Timber Facings must be screw attached to allow for removal under B2 Durability requirements



1 - Coachscrews 130mm min thread engagement into joists+block
2 - Bond all coachscrews with SIKA Supergrip to full depth.
3 - A Rubber, EPDM or Foam Tape layer must be installed between the Clamp and Timber
4 - The glass Top Support Brackets must be used onTimber decks.



All fixings must be Stainless steel

Juralco Edgetec® JH Clamp Balustrade System - Typical Fixing

Complies with NZS3604:2011 - Double Boundary Joists

Typical FACE Fix Post to Timber - Bolts

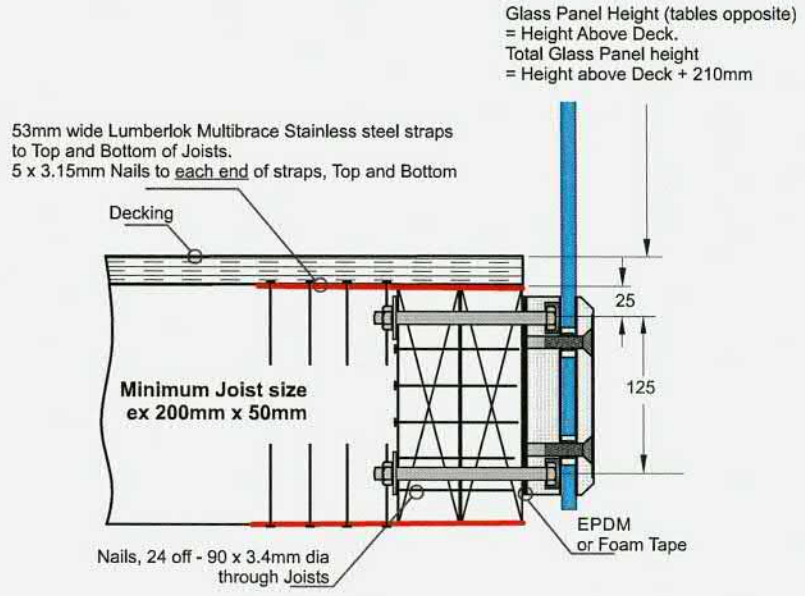
A Design engineer must ensure the deck can support the appropriate load applied at each clamp

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

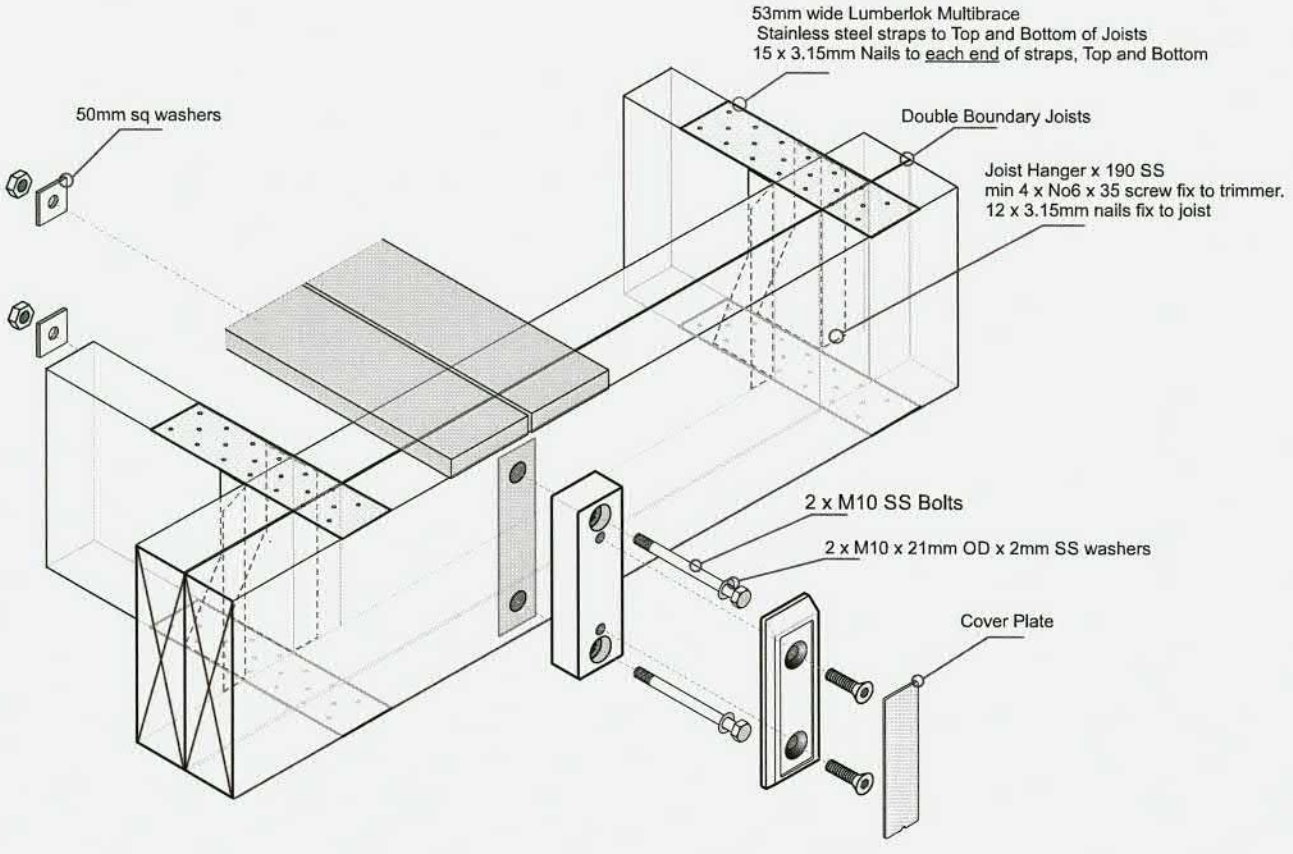
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.



1 - A Rubber, EPDM or Foam Tape layer must be installed between the Clamp and Timber

2 - The glass Top Support Brackets must be used on Timber decks.



All fixings must be Stainless steel

Juralco Edgetec® JH Clamp Balustrade System - Typical Fixing

Complies with NZS3604:2011 - Double Boundary Joists

Typical HIDDEN FACE Fix Post to Timber - Bolts

A Design engineer must ensure the deck can support the appropriate load applied at each clamp

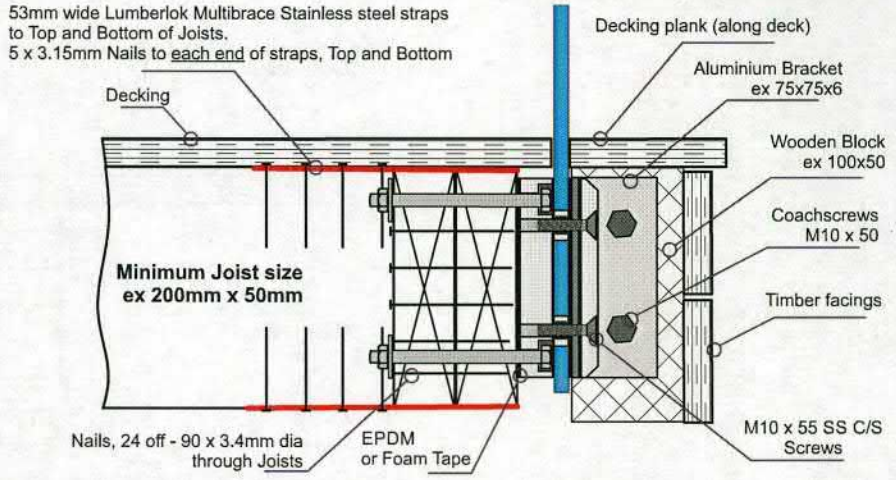
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

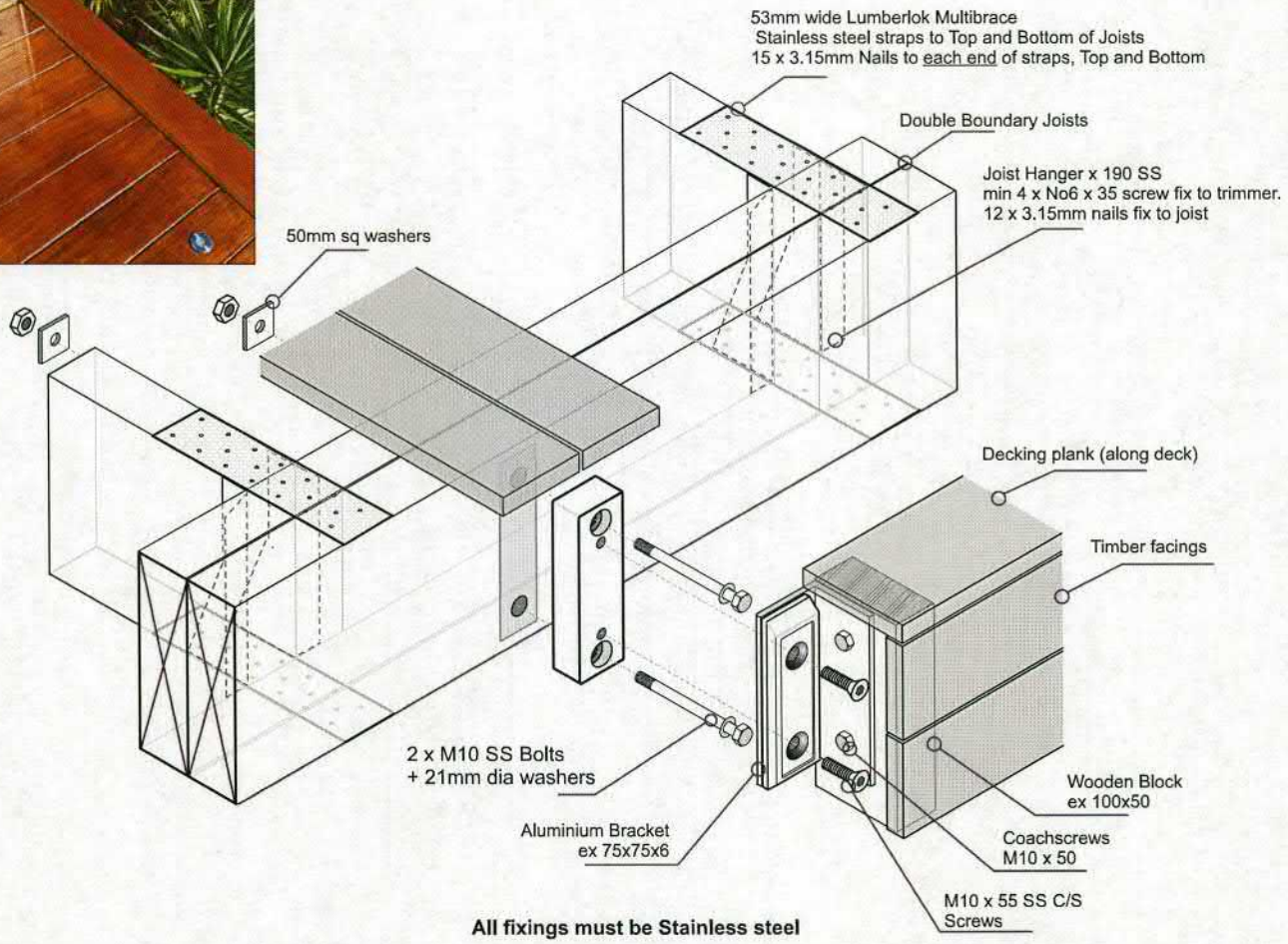
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Timber	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.

Note: Decking Planks and Timber Facings must be screw attached to allow for removal under B2 Durability requirements



1 - A Rubber, EPDM or Foam Tape layer must be installed between the Clamp and Timber
2 - The glass Top Support Brackets must be used on Timber decks.



All fixings must be Stainless steel

Juralco Edgetec® JH Clamp Balustrade System - Typical Fixing

Complies with NZS3604:2011 - Double Boundary Joists

Typical FACE Fix Post to Waterproof Timber Deck - Spacers and Coachscrews

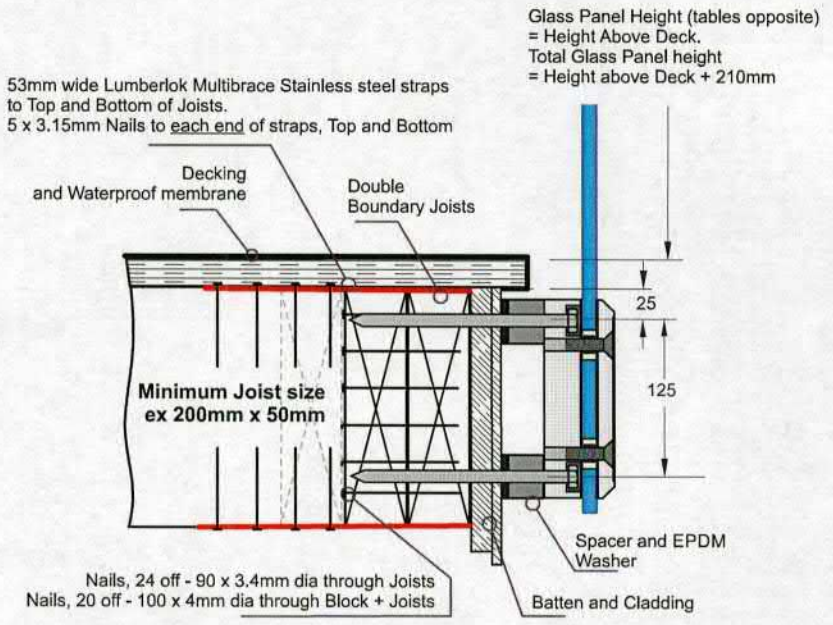
A Design engineer must ensure the deck can support the appropriate load applied at each clamp

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber. Waterproofed deck	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

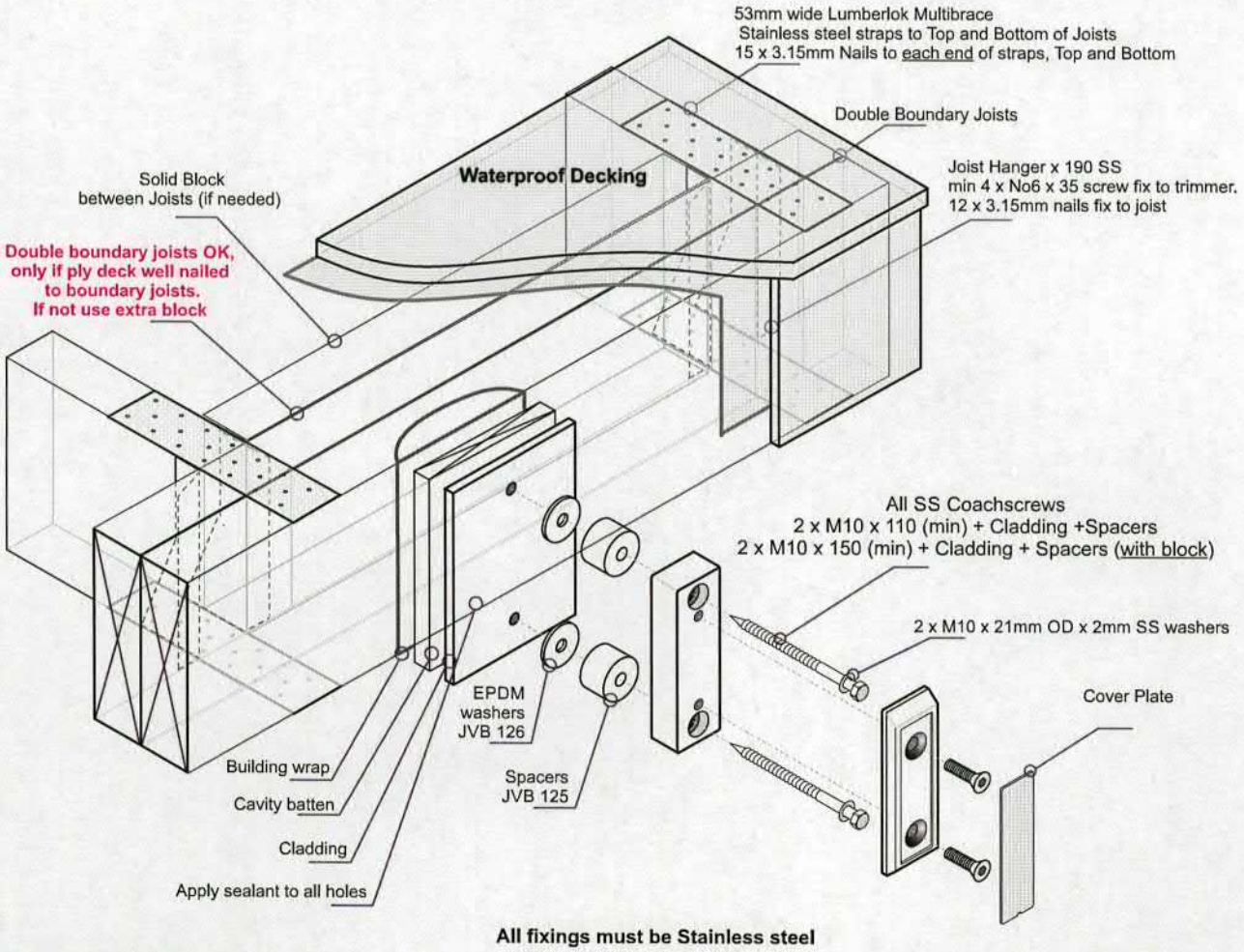
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber. Waterproofed deck	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Coach Screws into Timber. Waterproofed deck	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.



1 - Coachscrews 90mm min thread engagement into joists/block
2 - Bond all coachscrews with SIKA Supergrip to full depth.
3 - The glass Top Support Brackets must be used on Timber decks.



All fixings must be Stainless steel

Juralco Edgetec® JH Clamp Balustrade System - Typical Fixing

Typical FACE Fix to Steel - M10 Bolts

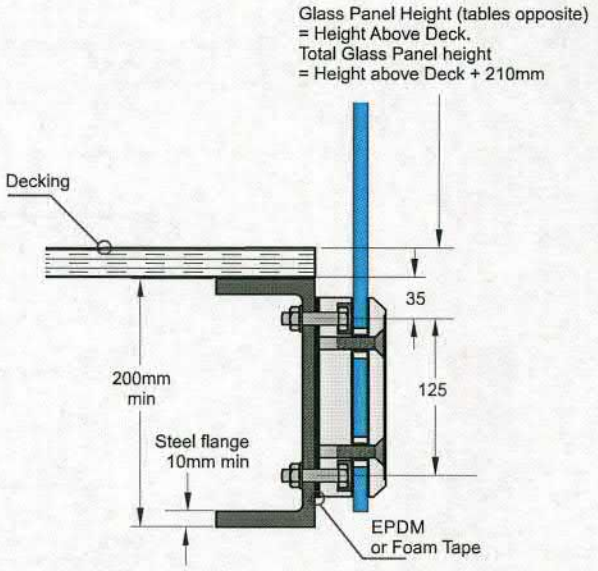
A Design engineer must ensure the deck can support the appropriate load applied at each clamp

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Steel	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

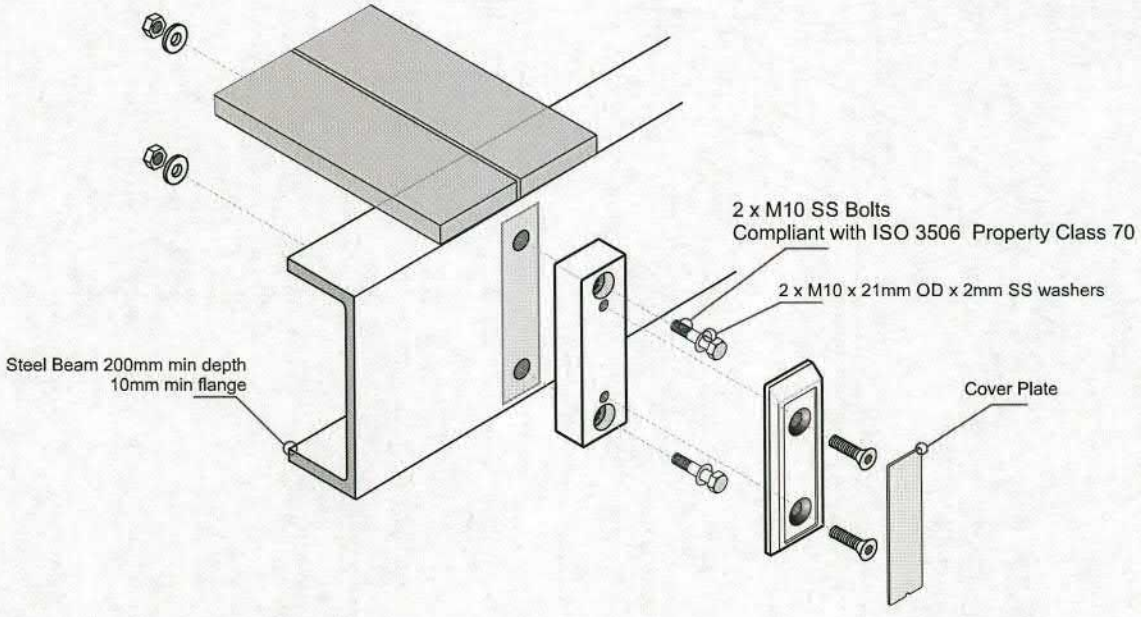
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Steel	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Bolts into Steel	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.



1 - A Rubber, EPDM or Foam Tape layer must be installed between the Clamp and Steel



All fixings must be Stainless steel

Typical FACE Fix to Concrete - M10 Studs

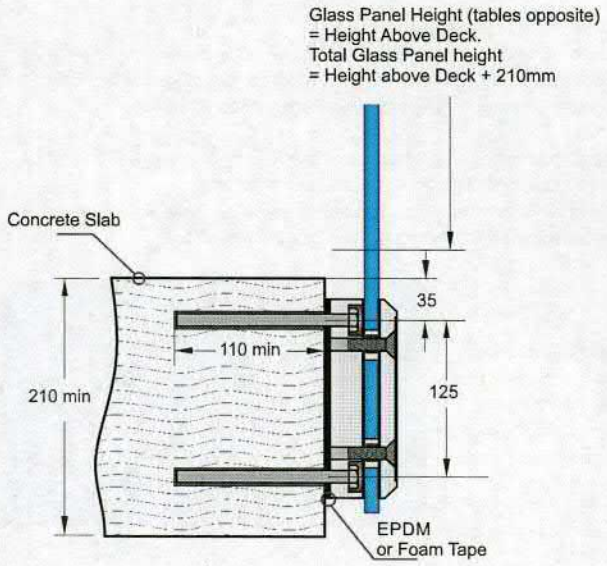
A Design engineer must ensure the deck can support the appropriate load applied at each clamp

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Studs into Concrete	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 2 per Panel	Ends
	1099	1200	600	300
	1199	1000	500	250
	1299	800	400	200

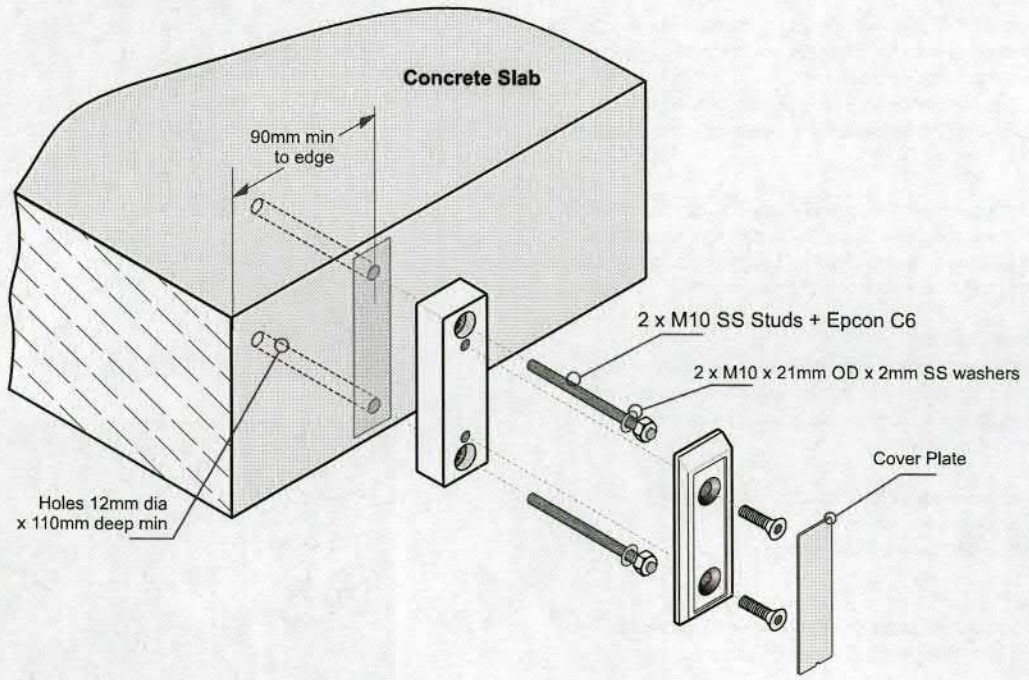
Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Studs into Concrete	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 3 per Panel	Ends
	1099	1800	600	300
	1199	1500	500	250
	1299	1200	400	200

Occupancy A, B, E and C3 only				
Face Fixed with 2 x M10 Studs into Concrete	Glass Panel Height mm(max)	Glass Panel Width mm(max)	Clamp Spacing 4 per Panel	Ends
	1099	2400	600	300
	1199	2000	500	250
	1299	1600	400	200

Exceeds the wind loading for all Wind Zones up to Extra High as set out in NZS 3604:2011
Where the balustrades extend to the edge of the building in High, Very High, and Extra High Wind Zones use a pair of corner brackets top and bottom.



1 - All fixings must engage into the structural slab.
2 - A Rubber, EPDM or Foam Tape layer must be installed between the Clamp and Concrete



All fixings must be Stainless steel

Juralco Edgetec® JH Clamp Balustrade System - Powder Coating Care

Warning re use of solvents:
- In some cases strong solvents are recommended for thinning various types of paints and also for cleaning up mastics and sealants.
- These can be harmful to the extended life of the powder coated surface, and must not be used for cleaning purposes.
- It is important to note that the damage will not be visible immediately and may take up to 12 months to develop.

If paint splashes or sealants and mastics need to be removed then the following may be safely used:
Methylated Spirits, Ethyl Alcohol, Isopropanol or preferably a mild detergent in warm water.

Joinery Protection during Installation:
All the activity on a construction site means that your window joinery or other powder coated items may get knocked or scratched, splattered with mortar, plaster, textured coating or paint during the later stages of construction.

Please ensure that all powder coated articles are masked or covered at this time.
It is far easier to prevent accidents than to try and correct them.
Should your joinery receive mortar or paint splashes see that these are removed before cure and follow the instructions contained in this brochure.

Typical sticker used to warn other trades of the need to protect and mask off powder coated joinery (applies to anodised joinery also)

"IMPORTANT ALL TRADES"
This valuable aluminium joinery will suffer permanent damage from: plaster, mortar and paint splashes - Protect if splashes occur - Immediately wash down joinery with water or meths - Do not allow splashes to harden! ~ Do not use solvents! - Do not remove this label until final clean completed.

This photograph display damage that has occurred on site, post installation. The photo of the masked joinery displays clear signs of damage that could have occurred were it not masked. Please ensure that your joinery is protected right through the entire construction process.

Many products that live outdoors are powder coated both to protect and to beautify the article. These powder coated articles can include such diverse products as your window joinery, entrance or garage doors, letter boxes, meter boxes, lawn mowers, plant pots and many other every day items.

Maintenance Program:
To extend the life of powder coated articles and to comply with warranty requirements for powder coated aluminium joinery, a simple, regular maintenance program should be implemented.
The effects of ultra violet light, atmospheric pollution, dirt, grime and airborne salt deposits can all accumulate over time and should be removed at regular intervals.

As a general rule cleaning should take place every six months. In areas where pollutants are more prevalent, such as beachfront houses and industrial or geothermal areas, then a cleaning program should be carried out on a more frequent basis ie. every one to three months.

Cleaning your powder coating:
1. Carefully remove any loose surface deposits with a wet sponge.
2. Use a soft brush (non abrasive) and a mild household detergent (do not use solvents) in warm water, remove dust, salt and other deposits.
3. Rinse off with clean fresh water.

Restoring weathered or scratched surfaces:
Repair of Scuffed or Scratched surfaces
Dulux Spray Cans are available in all colour card colours.

Repair of Small Scratches or Chips.
Dulux Dabsticks are ideally suited for the repair of small scratches.
Dabsticks may not be available in all colour card colours.

Repair of Weathered areas .
Dulux Gloss Up is a light to medium cutting cream ideally suited for gloss restoration and has been specifically designed for this purpose.
Gloss Up contains no waxes or silicone and is a one step system.

Contact Dulux Powder Coatings , ph 0064 9 441 8244

Juralco Edgetec® JH Clamp Balustrade System - Glass Care

Glass Cleaning and Maintenance

Architectural glass products must be properly cleaned during the construction period so visual and aesthetic clarity are maintained. Because glass can be permanently damaged if improperly cleaned, glass producers and fabricators recommend strict compliance with the following procedures.

First, determine whether the glass is clear, tinted or reflective. Surface damage is more noticeable on reflective glass compared with the other glass products. If the reflective coated surface is exposed, either on the exterior or interior, special care must be taken when cleaning, as scratches can result in coating removal and a visible change in light transmittance. Cleaning tinted and reflective glass in direct sunlight should be avoided. Cleaning should begin at the top of the building and continue to the lower levels.

Commence cleaning by soaking the glass surfaces with clean water and a soap solution to loosen dirt or debris. Then, using a mild, non-abrasive commercial window washing solution, uniformly apply the solution to the glass surfaces with a non-abrasive applicator and follow with a squeegee to remove all of the cleaning solution from the glass surface.

Ensure that no metal parts of the cleaning equipment touch the glass surface and that no abrasive particles are trapped between the glass and the cleaning materials. All water and cleaning solution residue should be dried from the window gaskets, sealants and frames.

Scratches and Metal Scrapers

Scratches can occur from hard pointed objects or poor handling, but most often occurs from the careless removal of foreign matter from the glass surface.

Mortar splatter and paint are common offenders and efforts to remove after hardening almost always lead to surface damage. It is essential that the foreign materials are removed before they harden. Better still, if construction work continues after glazing, that the glazed areas are protected by adhesive plastic films or suitable tarpaulins or covers.

One of the common mistakes made by non-glass trades people, including glass cleaning contractors, is the use of razor blades or other metal scrapers on a large portion of the glass surface. Using large blades to scrape a window clean carries considerable risk of causing damage to the glass.

The glass industry, fabricators, distributors and installers neither condones nor recommends any scraping of glass surfaces with metal blades or knives. Such scraping usually permanently damages or scratches the glass surfaces. When paint or other construction materials cannot be removed with normal cleaning procedures, a new 25mm razor blade may have to be used. The razor blade should be used on small spots only. Cleaning should be done in one direction only. Never scrape in a back and forth motion as this could trap particles under the blade that could scratch the glass.

Blades or scrapers can dislodge "pickup" on toughened glass. There are fine particles of glass that are fused on to the surface during toughening. Once dislodged they can scratch the glass.

Glass Cleaning, Do's and Don'ts

DO NOT..

- Do Not - Use Scrapers of any type or size on a Glass surface
- Do Not - Leave building dirt or residues to remain on Glass for a period of time.
- Do Not - Begin cleaning glass until you have identified the surface type.
- Do Not - Clean Glass surfaces in direct sunlight.
- Do Not - Allow dirty water or cleaning residues to remain on the Glass.
- Do Not - Begin cleaning before rinsing off a loose residues.
- Do Not - Use abrasive cleaning solutions, materials or solvents.
- Do Not - Allow metal parts of the cleaning equipment to come in contact with the Glass.
- Do Not - Trap abrasive particles between the cleaning material and the Glass.

DO...

- Clean glass promptly when dirt or building residues appear.
- Determine glass surface type.
- Exercise special care when cleaning coated surfaces.
- Avoid cleaning glass surfaces in direct sunlight.
- Start cleaning at the top of a building, then continue to lower levels.
- Soak the glass surface in a clean soapy solution before cleaning.
- Use a mild non abrasive commercial cleaner.
- Use a squeege to remove all cleaning solution.
- Try your procedures on a small window and check.
- Caution other trades re the care and protection of the glass surfaces.

**Residues of surface grit may be present from the toughening production process.
These grit particles must not be dragged across the surface.
NEVER use Metal Scrapers**

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FIREPRO

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CI/SfB
B109 DATASHEET – Mar 14

Product specifications can change. Contact us to ensure you have our latest datasheet

FIREPRO B109 INSULATING INTUMESCENT PIPE SLEEVES Ideal for Plaster Board Walls Concrete & Brick Walls & Concrete Floors

Firepro B109 Insulating Intumescent Pipe Sleeves maintain the fire-rating of walls and floors penetrated by plastic or metal pipes. They are especially useful where insulation continues uninterrupted through fire-rated floors and walls. The sleeves consist of an intumescent fire stopping and insulation pipe section placed around the pipe where it penetrates a fire rated floor or wall. The B109 sleeve can be quickly and simply fitted on to a pipe and slid into the penetration without the need of support, no steel band is required in plaster board walls.

To retrofit the B109 pipe sleeve may be slit along its length, fitted around the pipe and the join sealed with self-adhesive foil tape. When a fire occurs the B109 sleeve expands to fill the space between the pipe and the penetration. It will crush plastic pipes and close off the pipe forming a solid core preventing the passage of fire and smoke.
B109 is supplied in 300mm lengths that can be cut to the required length with a knife.

FIRE TESTING

B109 Insulating Intumescent Pipe Sleeves are fire tested to BS476.20:22 1987 with both pipe ends capped to simulate a continuous run of pipe.
Not designed as a floor waste collar.
For floor waste collars see our B310 & B318 datasheets.

PIPES PENETRATING FLOORS

	Concrete Floor 100mm thick	Concrete Floor 140mm thick
PVC		
Upto 82mm Dia. pipe with B109 - 190mm long	-/60/60	-/120/120
110mm Dia. pipe with B109 - 190mm long	-/60/60	-/120/60
160mm Dia. pipe with B109 - 140mm long	-/60/60	-/90/90
POLYBUTYLENE		
12mm to 28mm Dia. pipe with B109 - 140mm long	-/60/60	-/120/120
COPPER		
12mm Dia. pipe with B109 - 140mm long	-/60/60	-/120/90
Up to 158mm Dia. pipe with B109 -140mm long	-/60/15	-/120/15
160mm Dia. pipe with B109 - 140mm long	-/60/-	-/120/-
STEEL		
12.5mm Dia. pipe with B109 - 140mm long	-/60/60	-/120/120
Up to 165mm Dia. pipe with B109 - 140mm long	-/60/15	-/120/15

FIREPRO B109 INSULATING INTUMESCENT PIPE SLEEVES continued

Fire Testing continued

PIPES PENETRATING WALLS	Brick or concrete wall 100mm thick or 1 Hour fire-rated Gypsum Plasterboard wall.	Brick or concrete wall 140mm thick or appropriate period fire-rated plasterboard wall.
PVC		
Up to 55mm Dia. Pipe with B190 - 160mm long	-/60/60	-/120/120
Up to 110mm Dia. Pipe with B190 - 182mm long	-/60/60	-/120/120
160mm Dia. Pipe with B190 - 182mm long	-/60/60	-/120/117
POLYBUTYLENE		
12mm Dia.pipe with B109 - 132mm long	-/60/60	-/120/120
15mm Dia.pipe with B109 - 132mm long	-/60/60	-/120/114
21mm Dia.pipe with B109 - 132mm long	-/60/60	-/120/120
28mm Dia.pipe with B109 - 132mm long	-/60/60	-/120/120
COPPER		
12mm Dia.copper pipe with B109 - 132mm long	-/60/60	-/120/120
Up to 160mm Dia.copper pipe with B109 - 132 long	-/60/15	-/120/15
STEEL		
Up to 22mm Dia.Pipe with B109 - 132mm long	-/60/60	-/120/120
Up to 165mm Dia.pipe with B109 - 132mm long	-/60/60	-/120/15

Sizes Available & Product Codes	Nominal Internal Diameter
Firepro B109-21	21mm
Firepro B109-27	27mm
Firepro B109-34	34mm
Firepro B109-42	42mm
Firepro B109-48	48mm
Firepro B109-60	60mm
Firepro B109-76	76mm
Firepro B109-89	89mm
Firepro B109-114	114mm
Firepro B109-169	169mm

Note:- Variations in external diameter will occur in manufacture. Check sizes before installation. Typical external diameter is 54mm over internal (if 27mm thick wall).

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CI/SfB
B312 DATASHEET – Mar 14

Product specifications can change. Contact us to ensure you have our latest datasheet

FIREPRO B312 JUMBO FIRE COLLARS

Up to 315mm outside diameter pipes

DESCRIPTION

Firepro B312 Jumbo Fire Collars prevent the spread of fire where large uPVC and PE pipes penetrate fire barrier floors and walls. The collars low profile and hinged quick-clip construction allows fast, simple installation either before or after pipework is erected. Firepro B312 Jumbo Fire Collars have an outer casing of powder coated steel with a liner of intumescent material. They are simple to install as no crushing spring is required. Where a fire occurs the intumescent material expands by several hundred percent, filling the cavity in the pipe floor or wall with non-combustible material, maintaining both fire integrity and insulation. Unlike intumescent assisted mechanical damper type fire collars, Firepro B312 contain no fusible links, springs or other moving parts to require servicing.

SIZE AVAILABLE

B312-315mm for pipes up to 315mm Outside Diameter.
B312-250mm for pipes up to 250mm Outside Diameter.
B312-200mm for pipes up to 200mm Outside Diameter.
For smaller pipes Firepro manufactures several styles of Pipe Collars and Pipe Wraps.

FIRE TESTING

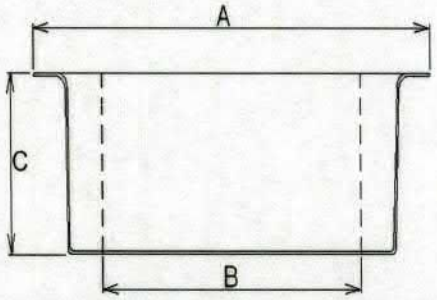
Fire testing has been carried out to AS/NZ1530:4 (1997), AS4072:1 1992 section 3 and BS476.20:22 (1987) as follows:
Floor B312-315mm Fire Tested FRL up to -/153/153
Floor B312-250mm Fire Tested FRL up to -/202/202
Floor B312-200mm Fire Tested FRL up to -/238/238
Wall B312-315mm Fire Tested FRL up to -/123/123
Wall B312-250mm and B312-200mm Fire engineering assessed up to -/120/120 when applied as set out in this Datasheet. The above tests have been carried out with 2 metre long pipes uncapped at end outside the furnace to maximise fire severity.
In addition fire tests have been carried out on floors to the above standards with non-fire pipe ends capped for situations where this would be appropriate, such as pipes capped by skylights.
B312 are compliant with AS4072.1-2005 Section 4.6.1.

Polyethylene pipes should comply with AS4130.

INSTALLATION BELOW CONCRETE FLOORS

- Close the collar over the pipe. Fasten to the fire barrier through all flange holes using 8mm thick masonry bolts. Attach below the floor, not in or above the floor.

- On top of the slab around the pipe, apply a 10 x 10mm fillet of Firepro M707 Fire & Acoustic sealant.



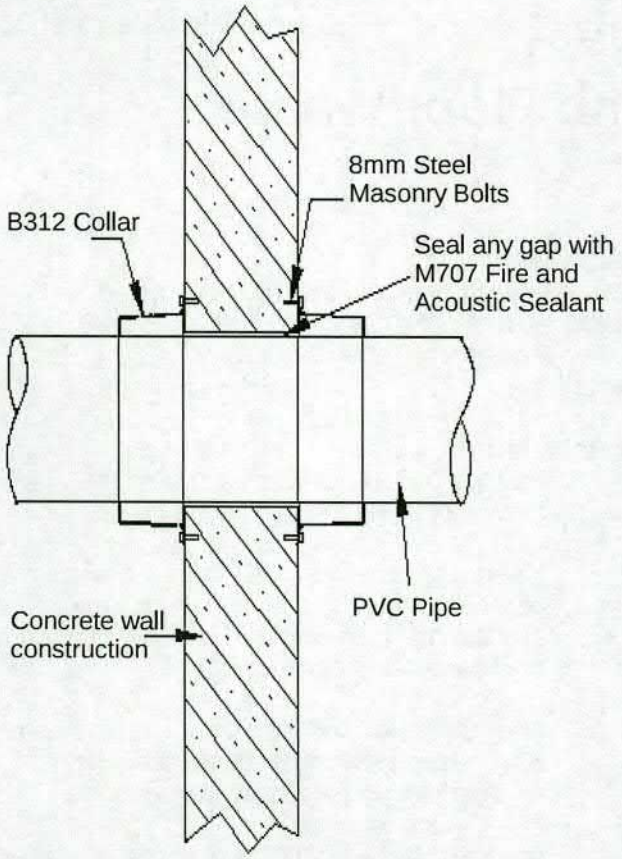
Dimensions in millimeters (nominal)

	Overall Diameter	Pipe O.D.	Height
	A	B	C
B312-200	337	200	107
B312-250	390	250	130
B312-315	476	315	145

NOTE: The technical information and suggestions for use and application presented herein represent the best information available to us and are believed to be reliable. If used beyond the situations detailed on this datasheet we advise confirming their suitability before installation.
All dimensions are nominal.
We reserve the right to make changes or to withdraw designs and products without notice.

FIREPRO B312
JUMBO FIRE COLLARS (continued)

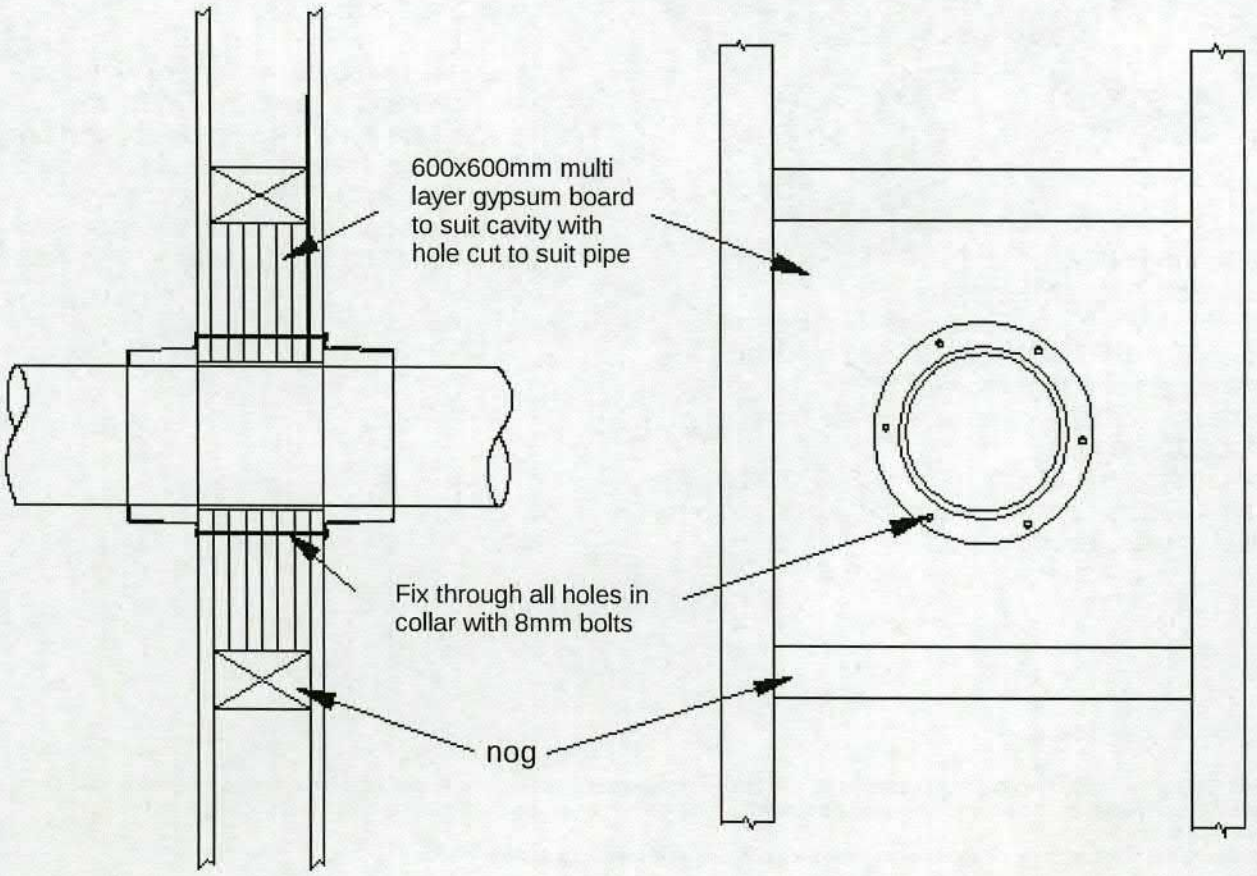
Concrete Wall Details:



INSTALLATION ON WALLS

- Two collars are required, one for each side of the wall.
- Minimum wall thickness for One Hour Fire Resistance Rating using B312 collars is 87.5mm for concrete and plaster board walls. Minimum for 2 hour Fire Resistance Rating is 120mm for use on concrete walls and 96mm on plaster board walls.
- The wall must have a fire rating equal or above the fire rating required of the Fire Collar.
- Close the collar over the pipe. For **concrete walls**, fasten the collars to the wall using 8mm thick steel masonry bolts through all flange holes. For **gypsum plaster walls** make a 600 x 600mm block of the fire wall material to the thickness of the wall framing. Install the block in the wall frame using nogs to suit. Line the wall over the block with the fire wall material. Mark and cut the hole for the pipe through the entire wall and solid block. Install the pipe. Using 8mm thick steel bolts which extend through the thickness of the wall, bolt the flanges of the two collars together. Bolt through all holes on the collar flanges.

Plaster Board Wall Details:



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CI/SfB
B318 DATASHEET – Mar 14

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FIREPRO B318 One-plumb Floor Waste Pipe Collar System

Firepro B318 Pipe Collar System is designed specifically for floor waste situations where there is a requirement to meet the specifications of AS4072.1 Section 4.6.2 on 100mm ID uPVC pipes penetrating concrete floor slabs of 150mm or greater thickness. In situations where compliance with 4.6.1 is appropriate is appropriate, see our B315 datasheet.

The B318 System is made up of 3 parts: a B318 Cast-in Collar, a FWD101 Rubber Disc, and a FWD100 Intumescent Puck.

The collar is cast in place around the outside of the pipe. The disc and puck installed within the pipe.

Fire Testing
The Firepro B318 One-plumb System is fire tested by Bodycote Warrington Fire to AS1530.4 1997 and AS4072 1992 for floor waste only in concrete floors of 150mm or greater thickness. The system achieved a fire rating of -/240/180.
Assessed to AS1530.4 2005 and AS4072.1 2005 – Part 4.6.2 as appropriate for floor wastes using a steel or brass floor grating.

Water Flow Test
The intumescent puck FWD100 was tested and approved by CSIRO to MP52-2005 ATS5200.040. 8.3 waterway requirements for floor waste outlet systems.

Installation

1 Nail the B318 floor waste collar to the formwork using the pre-drilled holes.

2 Insert a short length of 100mm pipe into the collar ensuring contact with the formwork and that the pipe will extend above the top of the floor slab when poured.

3 After the formwork is stripped the pipe can be retained in the floor waste collar or removed for other service connections.

4 Apply PVC glue to the outside of the rubber disc FWD101 and place the disc within the pipe between the top of the floor waste collar and the floor slab.

5 When the glue is dry and the rubber disc secure within the pipe, the FWD100 intumescent puck is inserted into the rubber disc. Ensure that the cavity in the rubber disc is in alignment with the cavity of the intumescent puck to enable the necessary water flow to be maintained.

CERTIFICATE OF CONFORMITY

CODEMARK™

CertMark New Zealand

This is to certify that

Symonite (Alubond) Cladding Systems

Product Description

Aluminium Composite Panel consisting of 2 skins of aluminium sandwiching a proprietary core.

Products:

- Alubond
- Alubond FRB1
- Alubond FRA2

Product Purpose or Use

External decorative wall cladding for timber frame or timber frame infill construction used as partial or complete cladding system.

Certificate Holder

Symonite Panels Limited
24G Allright Place, Mt Wellington
PO Box 124000, Penrose, Auckland
Ph: 09 570 7077 | Fax: 09 574 6910
www.symonite.co.nz

CodeMark Certification Body

CertMark Australasia Ltd
(ACN 154 306 804)
JAS-ANZ Accreditation No. Z4450210AK
PO Box 231 Tuakau NZ 2121
www.certmark.co.nz

Complies with the Building Code of New Zealand:

1. NZBC Structure: B1.3.1, B1.3.2 and B1.3.4
2. NZBC Durability: B2.3.1(b)
3. NZBC External Moisture: E2.3.2, E2.3.3 & E2.3.5
4. NZBC Hazardous Building materials: F2.3.1

Alubond FRB1 and Alubond FRA2 also comply with:

1. NZBC Protection from Fire: C3.5, C3.7(a), (b) and (c)
2. NZBC Protection from Fire: 5.8 C/AS1 – C/AS7 (Acceptable Solution)

Subject to the following conditions and limitations:

1. This certificate provides third parties with compliance to NZBC Clauses and standards specified within this certificate, provided that all components of design, fabrication and installation are overseen and approved by Symonite Panels Limited.
2. Design is where Symonite Panels Limited develop project specific shop drawings. These shop drawings are produced from architectural concepts from which a building consent has been issued.
3. Only to be installed by a suitably qualified tradesperson trained by Symonite specifically to install Symonite Alubond Cladding Systems.

John Thorpe
Director
CertMark Australasia Pty Ltd

21/08/2013
Date of issue

CMA-CM40094
Certificate Number

JAS-ANZ
WWW.JAS-ANZ.ORG/REGISTER

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

- This certificate is issued by an independent certification body accredited by the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation & Employment (MBIE) under the Building Act 2004. MBIE does not in any way warrant, guarantee, or represent that the building method or product the subject of this certificate conforms to the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. MBIE disclaims, to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.
- It is advised to check that this Certificate of Conformity is currently valid and not withdrawn, suspended or superseded by a later issue by referring to the MBIE website, http://www.mbie.govt.nz/
- This certificate may only be reproduced in its entirety

APPROVED
These plans are approved in accordance with The NZ Building Code.
These plans must remain on site.
TAURANGA CITY COUNCIL

IPENZ ENGINEERS NEW ZEALAND | NEW ZEALAND INSTITUTE OF ARCHITECTS INCORPORATED | ACENZ

Building Code Clause(s) B1

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on the reverse side)*

ISSUED BY: Nancekivell Cairn Ltd
(Design Firm)

TO: Juralco Auminium Building Products Ltd
(Owner/Developer)

TO BE SUPPLIED TO: Non specific
(Building Consent Authority)

IN RESPECT OF: Edgetec Commercial Balustrade System
(Description of Building Work)

AT: Non Specific
(Address)

..... **LOT** ..... **DP** ..... **SO** .....

We have been engaged by the owner/developer referred to above to provide Structural Engineering review of testing of posts with connections to steel beams & design connection to other materials ...services in respect of the requirements of
(Extent of Engagement)
Clause(s) B1 (Structure) ..... of the Building Code for

○ All or ◉ Part only (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

☐ Compliance Documents issued by Department of Building & Housing .....
(verification method / acceptable solution)
..... or

☑ Alternative solution as per the attached schedule AS/NZS 1170, NZS 3603, AS / NZS 4673 .....

The proposed building work covered by this producer statement is described on the drawings titled JURALCO Edgetec Commercial Balustrade ystem ..... and numbered Issue 11/12 .....;

together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

(i) Site verification of the following design assumptions Deck design to support balustrade by others .....

(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code.

I, Bruce Nancekivell .....am: ☑ CPEng 30994 .....#
(Name of Design Professional)
☐ Reg Arch .....#

I am a Member of : ☑ IPENZ ☐ NZIA and hold the following qualifications: B. Eng.(Auckland) .....

The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ ◉ YES ○ NO

SIGNED BY B.G Nancekivell ..... ON BEHALF OF Nancekivell Cairn Ltd .....
(Design Firm)

Date 15 Nov. 2012 ... *(signature)* .....

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

Protective Coatings Specification

TG-2012-115103

Supercedes : 11311
Spec Type : New
Job Name : 18526 - A & J: Standard Specifications
Description : System 03: Interior/ Exterior Steelwork ...Three coat high gloss finish
Location : Tauranga, New Zealand
Environment : Interior/ Exterior moderate to coastal Cat B: Low – Cat D: High
Substrate : Mild Steel

Company : Arnold & Johnstone Ltd
Address : PO Box 933
City : Tauranga
Region : Bay of Plenty
Country : New Zealand

Contact : Richard Arnold
Title :
Postcode :
Phone : 07 578 0921
Email : richard@ajeng.co.nz

carboline
Coatings - Linings - Fireproofing

Altex Coatings Limited
PO Box 142
TAURANGA
New Zealand

Phone: (64-7) 541-1221
Fax: (64-7) 541-1310

Surface Preparation

Where necessary, grind sharp edges to a smooth 2 mm radius before blasting.
Abrasive blast to SSPC SP10 (Sa2.5) to achieve a uniform jagged blast profile of between 35 and 50µm.
Apply Coat 1 to the prepared SP10 substrate.
Apply full coats of Coats 2 and 3.
All surfaces must be clean and dry before painting

Coating System

Product	Coating	Colour	TC	WFT	DFT	MR	MinRC	MaxRC	Thin	Note
1 - Carbozinc 859 EZ2	full prime		9.3	107	75	4:1	1.5 hrs	1 mth	#2	
2 - Carboguard 690	full coat		5.3	188	150	4:1	2 hrs	7 days	#2	
3 - Carbothane 134 HG	full coat		11.7	86	60	4:1			#25	

TC = Theoretical coverage m2/litre
WFT = Wet Film Thickness um
DFT = Dry Film Thickness um
MR = Mix ratio by volume

MinRC = Recoat Minimum@20°C/50% RH
MaxRC = Recoat Maximum@20°C/50% RH
Thin = Thinner(Spray)

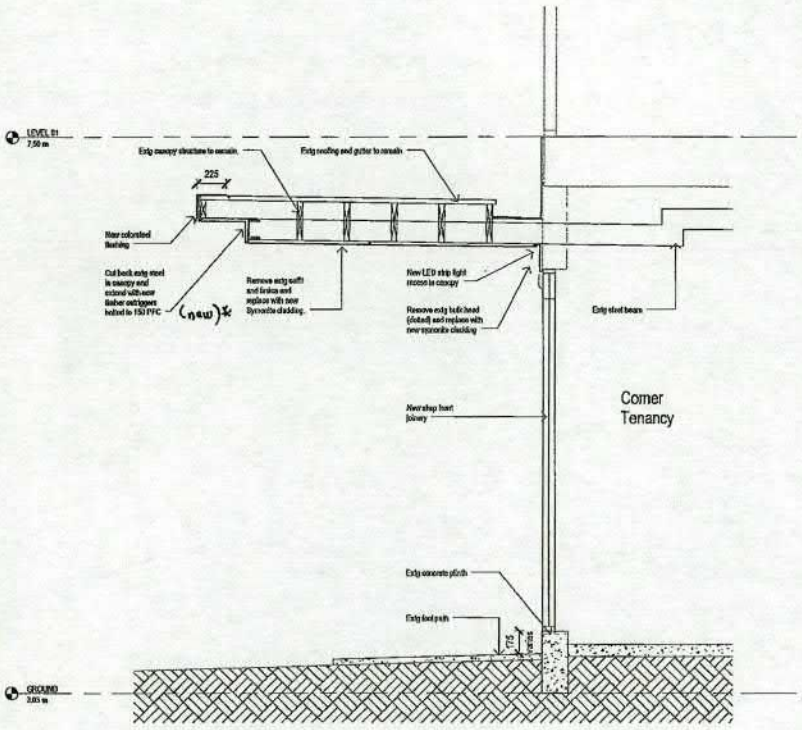
Notes

Complies with AS/NZS 2312:2002 system PUR4, 15 to 25 years for an exterior coastal environment category C: medium (35 µm rust/ year, ISO 9223 category 3).

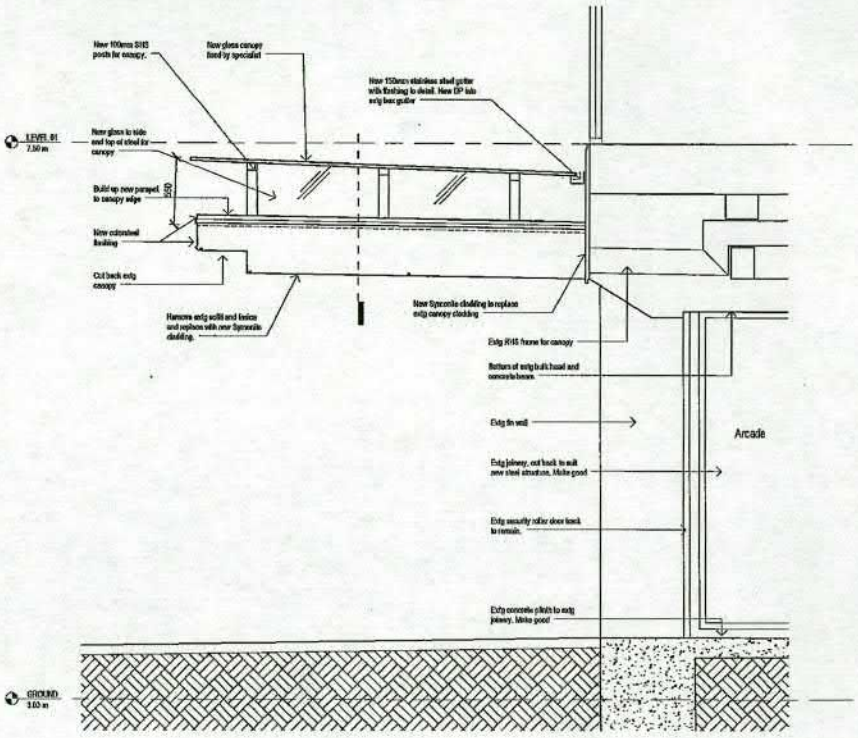
Repair of weld damaged and mechanically damaged areas:
Degrease in accordance with SSPC SP1 to remove all soluble contamination. Power tool clean to SSPC SP3 all weld damaged areas. Lightly abrade overlap area and sand topcoat mechanically damaged areas to a fine matt finish. Spot prime all SP3 prepared areas with Carbozinc 858 applied at 75 µm DFT. Allow to cure for 3 hours minimum. Spot coat with Coats 2 and 3, all spot primed areas, progressively lapping over original paint.
NB: DO NOT exceed maximum recoat times

Issue Date:	Authorised By:	Issued By:	Written By:
Friday, 10 August 2012	Neil Adamson	Elliot Gaensicke	Neil Adamson

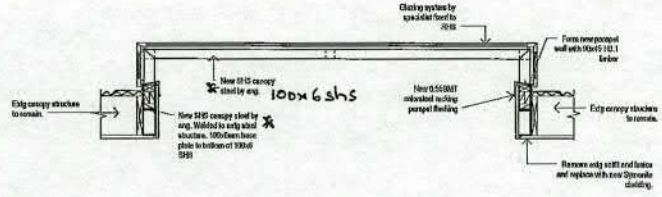
* For specific details referred to in the above specification, please refer to the relevant product or material safety data sheets
* Spray application is normally recommended. Suitable equipment may include airless/air assisted airless /HVLP or conventional pressure pot equipment
* If the specified thickness is not achieved in one coat, additional coats must be applied to meet the specified D.F.T. Stripe coats should be brush applied.
* Any contamination or moisture which occurs between coats must be removed by suitable means before applying successive coats in the system.
* Care must be taken handling and applying all paint coatings. All stated minimum and maximum recoat times are based on 20°C/50% RH.
* This specification has been issued in good faith based on information given by the Client at the time of issue. Altex Coatings Ltd has taken all reasonable steps to ensure the specification meets the needs of the client but reserves the right to amend or withdraw the specification if (a change in conditions so dictate)



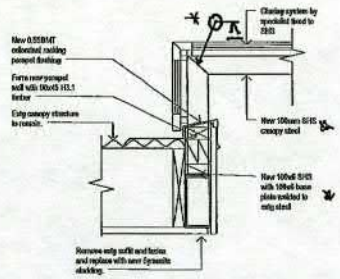
2 A1400 Corner Shop Front canopy
A1 SCALE 1:20



1 A1400 New Canopy Grey Street
A1 SCALE 1:20



3 A1400 New Canopy Section
A1 SCALE 1:20



4 A3103 Canopy edge detail
A1 SCALE 1:10

NOTES :- Refer notes on 11413-S04 especially 1(c) and 1(i)
- Prepare and paint steelwork to Carboline specification TC 2012-115103

DESIGN ENGINEER

The structural elements designated * on this drawing have been designed by Arnold & Johnstone Ltd, Consulting Engineers

Job No. 11413 Signed [signature] 31 07 14

BUILDING CONSENT

General notes:
1. Do not scale off drawings.
2. Contractor shall verify and be responsible for all dimensions on site.
3. Architects to be notified of any variation between the site dimensions and those on plans.

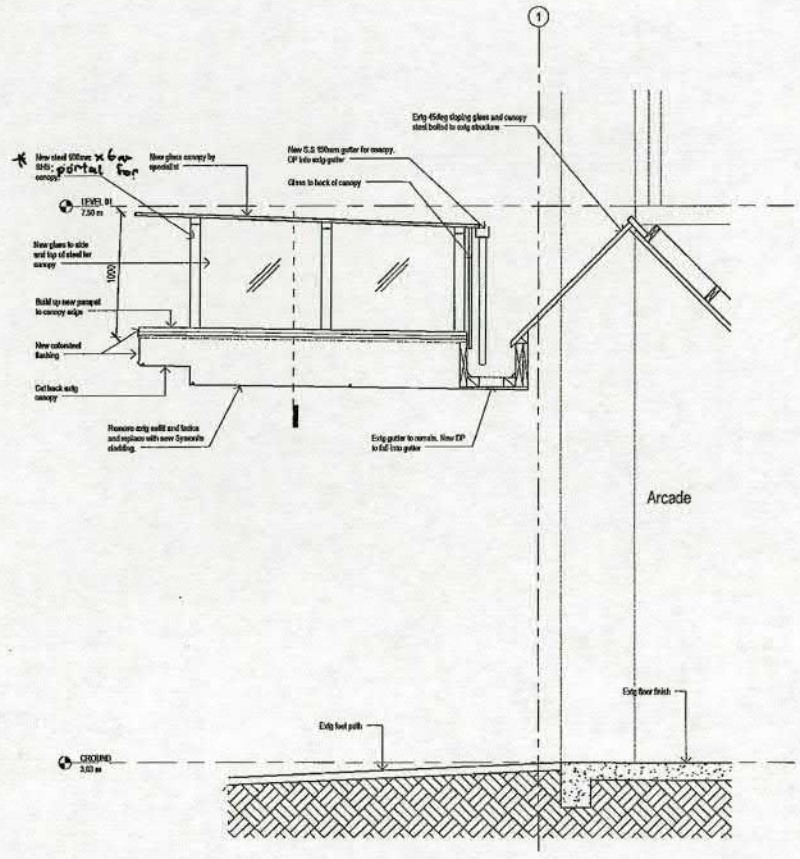
REVISIONS

FIRSTPRINCIPLES architects
+64 7 574 6728, po box 14214, tauranga MC 3143, new zealand

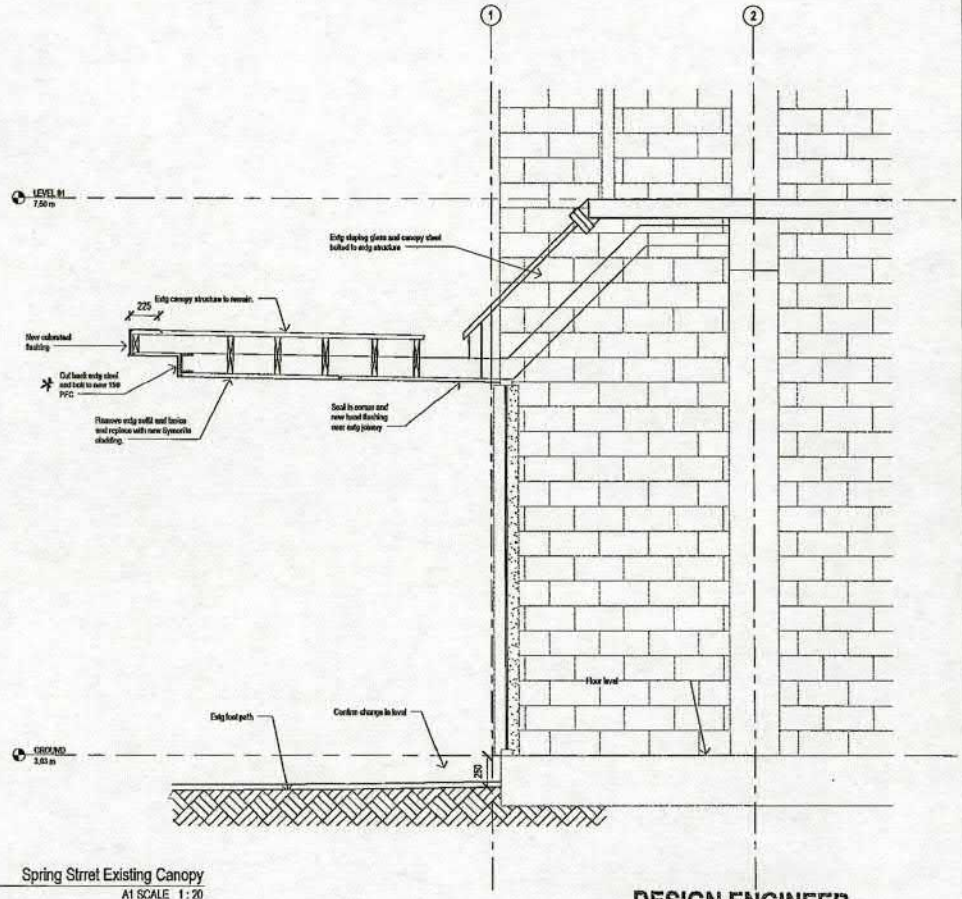
Project: SPRING STREET
Address: Spring Street

Drawing: CANOPY SECTIONS
Scale: As indicated @ A1

Drawn By:	Checked By:	Date:
KU	GP	29/07/14
Project No.	Sheet No:	Revision:
RCP_03	A3102	



1 / A1400 Spring Street New Entry Canopy
A1 SCALE 1:20



2 / A1400 Spring Strret Existing Canopy
A1 SCALE 1:20

DESIGN ENGINEER

The structural elements designated ★ on this drawing have been designed by Arnold & Johnstone Ltd, Consulting Engineers

Job No. 11413 Signed 31 07 14

BUILDING CONSENT

General notes:
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3. Architects to be notified of any variation between the site dimensions and those on plans.

REVISIONS

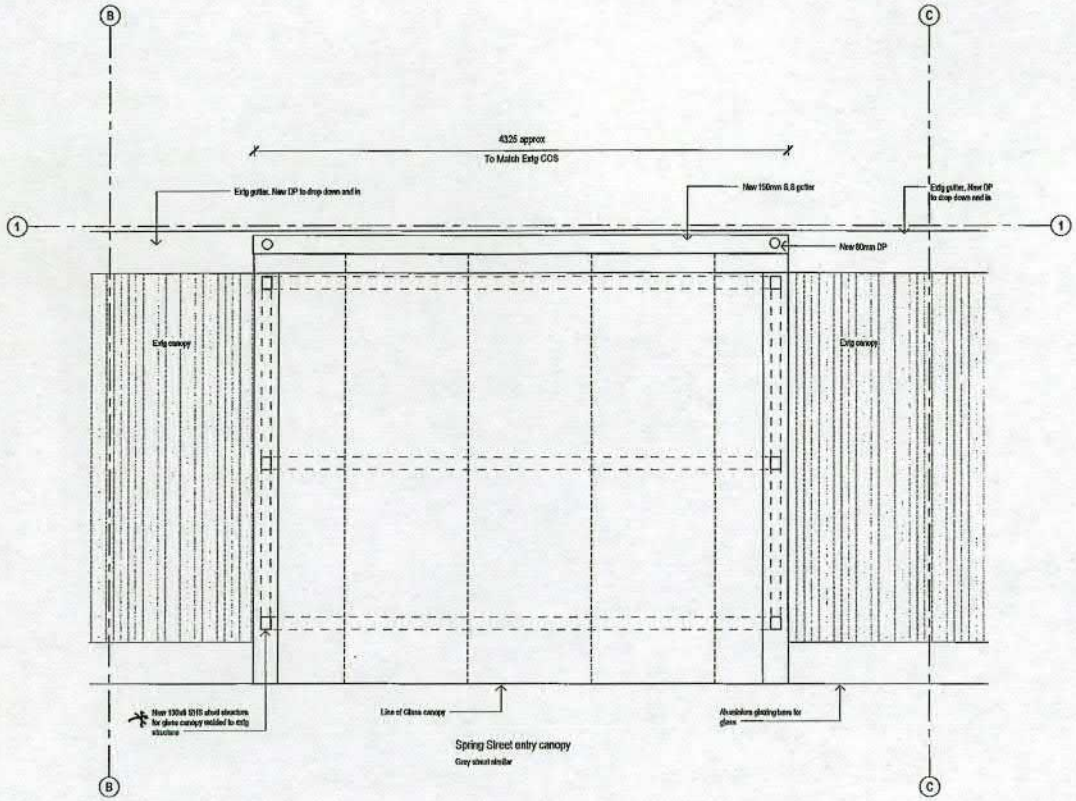
FIRSTPRINCIPLES architects
+64 7 574 6728, po box 14214, tauranga MC 3143, new zealand

Project: SPRING STREET
Address: Spring Street

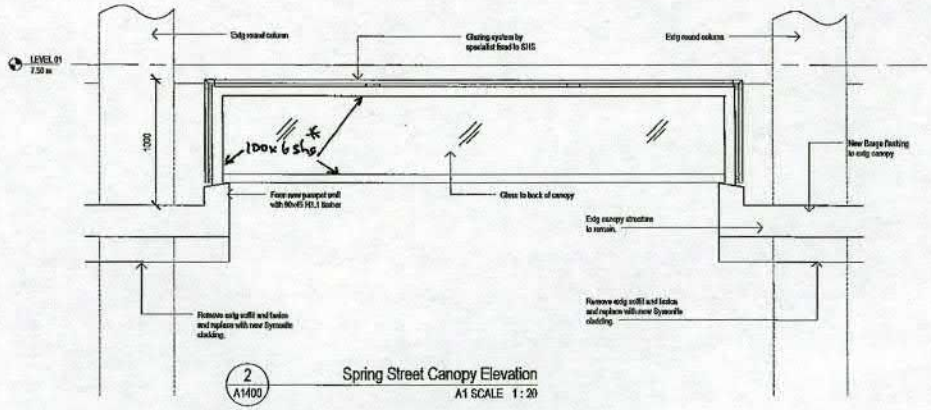
Drawing: CANOPY SECTIONS
Scale: 1:20 @

Drawn By:	Checked By:	Date:
KU	GP	29/07/14

Project No.	Sheet No:	Revision:
RCP_03	A3103	



1 / A1701 Spring Street Canopy Plan
A1 SCALE 1 : 20



2 / A1400 Spring Street Canopy Elevation
A1 SCALE 1 : 20

DESIGN ENGINEER

The structural elements designated * on this drawing have been designed by Arnold & Johnstone Ltd, Consulting Engineers

Job No. 11413 Signed [signature] 31 07 14

BUILDING CONSENT	REVISIONS				
This design and drawing is the copyright of First Principles Architects Limited and is not to be reproduced without written permission © General notes: 1. Do not scale off drawings. 2. Contractor shall verify and be responsible for all dimensions on site. 3. Architects to be notified of any variation between the site dimensions and those on plans.		FIRSTPRINCIPLES architects +64 7 574 6728, po box 14214, tauranga MC 3143, new zealand	Project: SPRING STREET Address: Spring Street	Drawing: CANOPY PLAN AND ELEVATION Scale: 1 : 20 @	Drawn By: KU Checked By: GP Date: 07/31/14 Project No. RCP_03 Sheet No: A3104 Revision:

MCH Limited
GRAHAM COX BE(Hons) MIPENZ
MIKE HORSLEY BE MIPENZ
CIVIL AND STRUCTURAL ENGINEERS

19 Willow Street
PO Box 1029
TAURANGA 3140
Telephone: (07) 578-4071
Facsimile: (07) 578-4176

PRODUCER STATEMENT – PS2 – DESIGN REVIEW

ISSUED BY: MCH Ltd *(Review Firm)*

TO: Prime Investment Group *(Owner)*

TO BE SUPPLIED TO: Tauranga City Council *(Territorial Authority)*

IN RESPECT OF: Seismic Strengthening to 71% NBS *(Description of Building Work)*

AT: 46 Spring Street
Tauranga *(Address)*

APPROVED
These plans are approved in accordance with The NZ Building Code.
These plans must remain on site.
TAURANGA CITY COUNCIL

LOT ..... **DP** ..... **SO** .....

MCH Ltd *(Review Firm)* has been engaged by Resource Coordination Partnership Ltd *(Owner/Developer/Contractor)* to review the design documents for this project in respect of the requirements of Clause(s) B1/VM1 of the Building Regulations 1992

The design is for ☒ All ☐ ~~Part only~~ as specified in the building consent of the building work and has been prepared by Arnold & Johnstone Ltd *(Design Firm)* in accordance with B1/VM1 *(verification method(s)/acceptable solutions(s))*

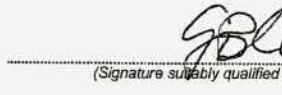
(respectively) of the approved documents issued by the Building Industry Authority and is described in Arnold & Johnstone's design report and calculations, ref; 11413 (V133) , dated Nov'12 and the drawings 11413, S01-S12 (all Rev.B), issued 25 Jul'14

the specification and other documents according to which the building is proposed to be constructed. As an independent design professional covered by a current policy of Professional Indemnity Insurance to a minimum value of $200,000, I advise that on the basis of the review I have undertaken **I BELIEVE ON REASONABLE GROUNDS** that subject to:

(i) the site verification of the following design assumptions
- -all elements meet the durability requirements of the NZ Building Code
- -inspection of construction by the Territorial Authority
- -all non-specific design construction to NZS 3604:2011 and NZS 4229:2013

(ii) all proprietary products meeting the requirements of the performance specification, the drawings, specification and other documents according to which the building is proposed to be constructed comply with the relevant provisions of the Building Code.

SIGNED BY Graham Cox ON BEHALF OF MCH Ltd



(Signature suitably qualified Design Professional)

DATE: 31-7-14

BE (Civil), MIPENZ, CPEng (Chartered Professional Engineer No: 50782)
(Professional Qualifications)

PO Box 1029, Tauranga
(Address)

Note: This statement shall be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Review Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.