Building Code Clause(s)………B1………….

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on page 2)

ISSUED BY:.KEVIN O'CONNOR & ASSOCIATES LIMITED.. ...
(Design Firm)

TO:……TKKM O Tamaki Nui A Rua……………..…………………………………………………REF:…115520…………
(Owner/Developer)

TO BE SUPPLIED TO:…Tararua District Council…………………………………………………………………………
(Building Consent Authority)

IN RESPECT OF:………Ridge Beam, Entry Portal and Foundations to Block B………………………………………….
(Description of Building Work)

AT:…36 Makirakiri Road, Dannevirke…………………………………………………………………………….………….
(Address)

…………………………………..…………………………… **LOT**…1…… **DP** …23991… **SO** …………….

We have been engaged by the owner/developer referred to above to provide Design of a Ridge Beam and Entry Portal to Block B services in respect of the requirements of
(Extent of Engagement)

Clause(s) …………………B1…………………………………………………..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 the Ministry of Business, Innovation & EmploymentNZS1170(parts), NZS3101, NZS3404 or
(verification method / acceptable solution)

☐ Alternative solution as per the attached schedule……………………………………………………………………

The proposed building work covered by this producer statement is described on the drawings titled TKKM O

Tamaki Bui A Rua Block B and numbered 115520 SK01-SK13 ;
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 safe ground bearing capacity of 100kPa…………………………
(ii) All proprietary products meeting their performance specification requirements;

I **believe on reasonable grounds** that a) 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 and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:
☐CM1 ☐CM2 ☐CM3 ☐CM4 ☐CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, DAMIAN EDWIN LINEHAN……… am: ☒CPEng No. 1004738…………………#
(Name of Design Professional)

☐Reg Arch …………………. .#

I am a Member of : ☒ IPENZ ☐NZIA and hold the following qualifications CPEng, BE(Hons)Civil……………
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: ☒

SIGNED BY DAMIAN EDWIN LINEHAN ON BEHALF OF KEVIN O'CONNOR & ASSOCIATES LIMITED
(Design Firm)

Date…9th February 2016………..…… (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.

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suit of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design Intended for use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;

PS2 Design Review Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;

PS3 Construction Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011[2]

PS4 Construction Review Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACENZ, IPENZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ) or the New Zealand Institute of Architects (NZIA), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

***Professional Indemnity Insurance**
As part of membership requirements, ACENZ requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI Insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to $500,000.

Professional Services during Construction Phase
There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5 for Engineers[3]). The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4
Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design firm's engagement.

Attached Particulars
Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

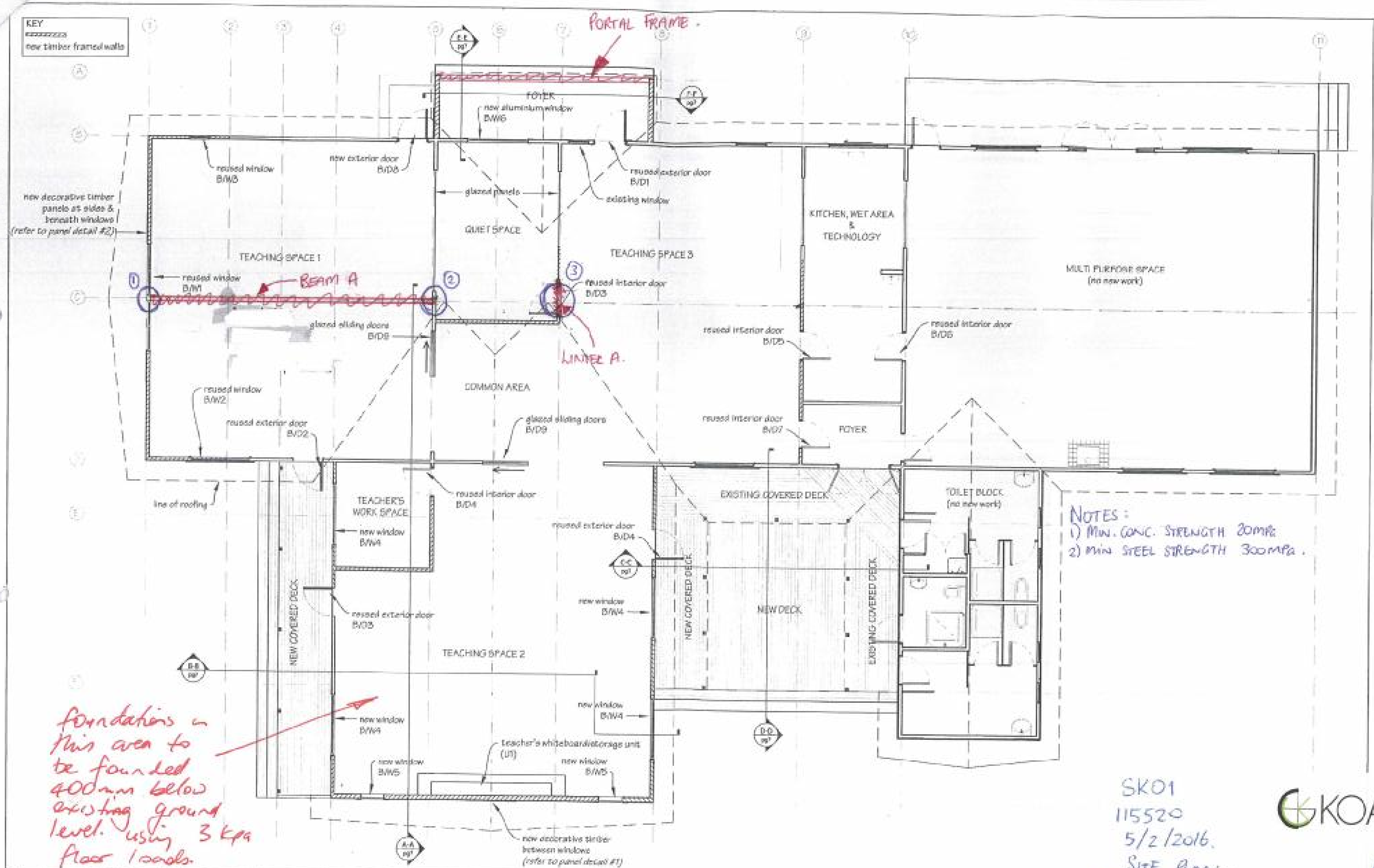
1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013

2 NZIA Standard Conditions of Contract SCC 2011

3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)

4 PN Guidelines on Producer Statements

www.acenz.org.nz
www.ipenz.org.nz
www.nzia.co.nz



NOTES:
1) MIN. CONC. STRENGTH 20MPa
2) MIN STEEL STRENGTH 300MPa.

foundations in this area to be founded 400mm below existing ground level. using 3 kpa floor loads.

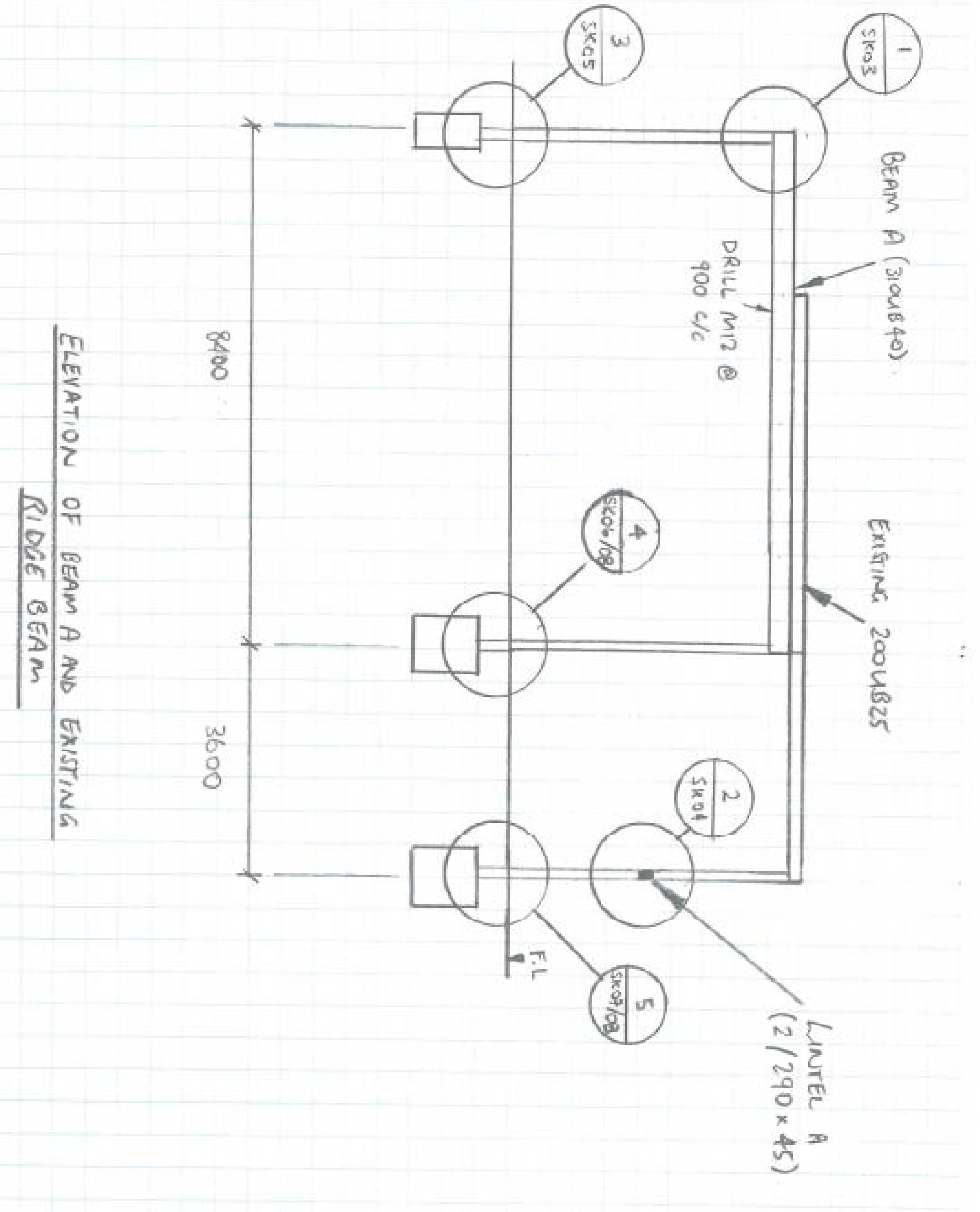
SK01
115520
5/2/2016.
SITE PLAN.
RL

Ian Rattray Building Consultant P. O. Box 40-651 Upper Hutt 5140	Phone (04) 526-7711 Mobile 021-427.342 Email Web	TKKM O Tamaki Nui A Rua 36 Makirakiri Road Dannevirke	PROJECT Roll Growth Classrooms	DRAWING TITLE Block B; Proposed Floor Plan

KOA
P 06 356 7000 E info@koa.co.nz W www.koa.co.nz
Kevin O'Connor & Associates Ltd
71 Pitt Street, PO Box 600, Palmerston North 4440

CLIENT TKKM O TAMAKI NUI A RUA BOT				
SUBJECT BLOCK B.				
FILE No. 15520	DATE 3/2/16	PAGE SK02. OF	BY RL.	CKD

KOA



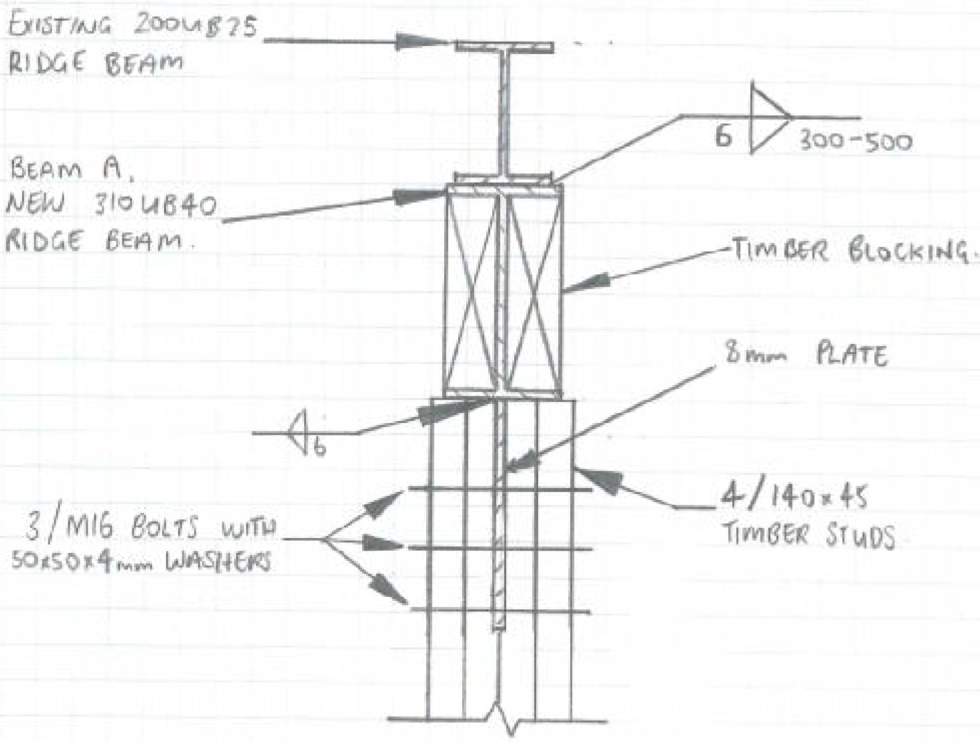
NOTES :

1) MIN. CONC. STRENGTH 20MPa
2) MIN. STEEL STRENGTH 300 MPa.
3) ALL DIMENSIONS TO BE CHECKED ON SITE
4) PROP EXISTING 200UB25 RIDGE BEAM FOR NEW 310UB40 (BEAM A) TO BE INSTALLED AND STUDS REPLACED

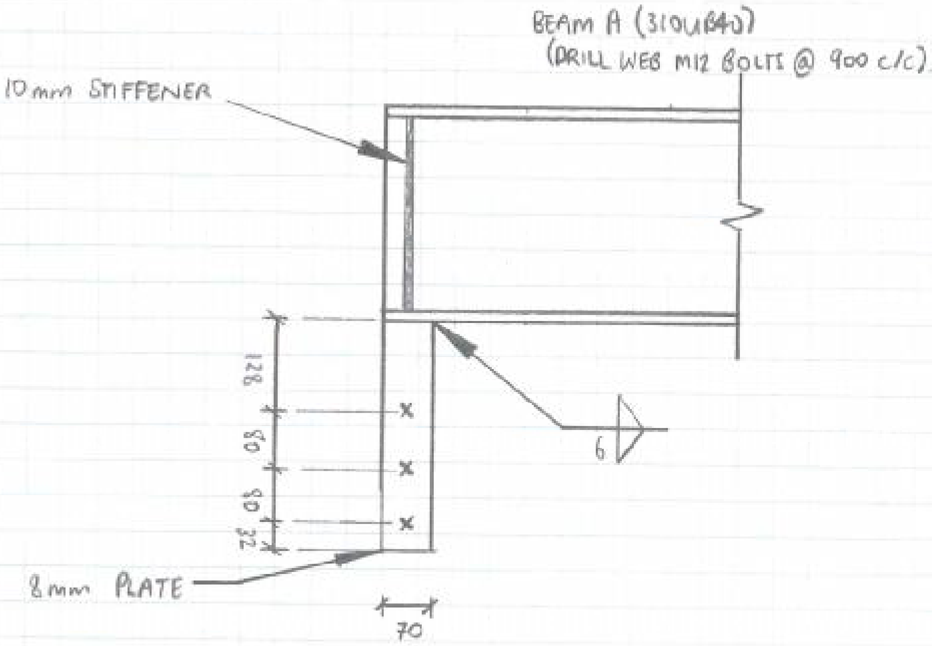
CLIENT TKKM O TAMAKI NUI A RUA BOT

SUBJECT BLOCK B

FILE No.	DATE	PAGE	OF	BY	CKD
115520	3/2/16	SK03		RL	



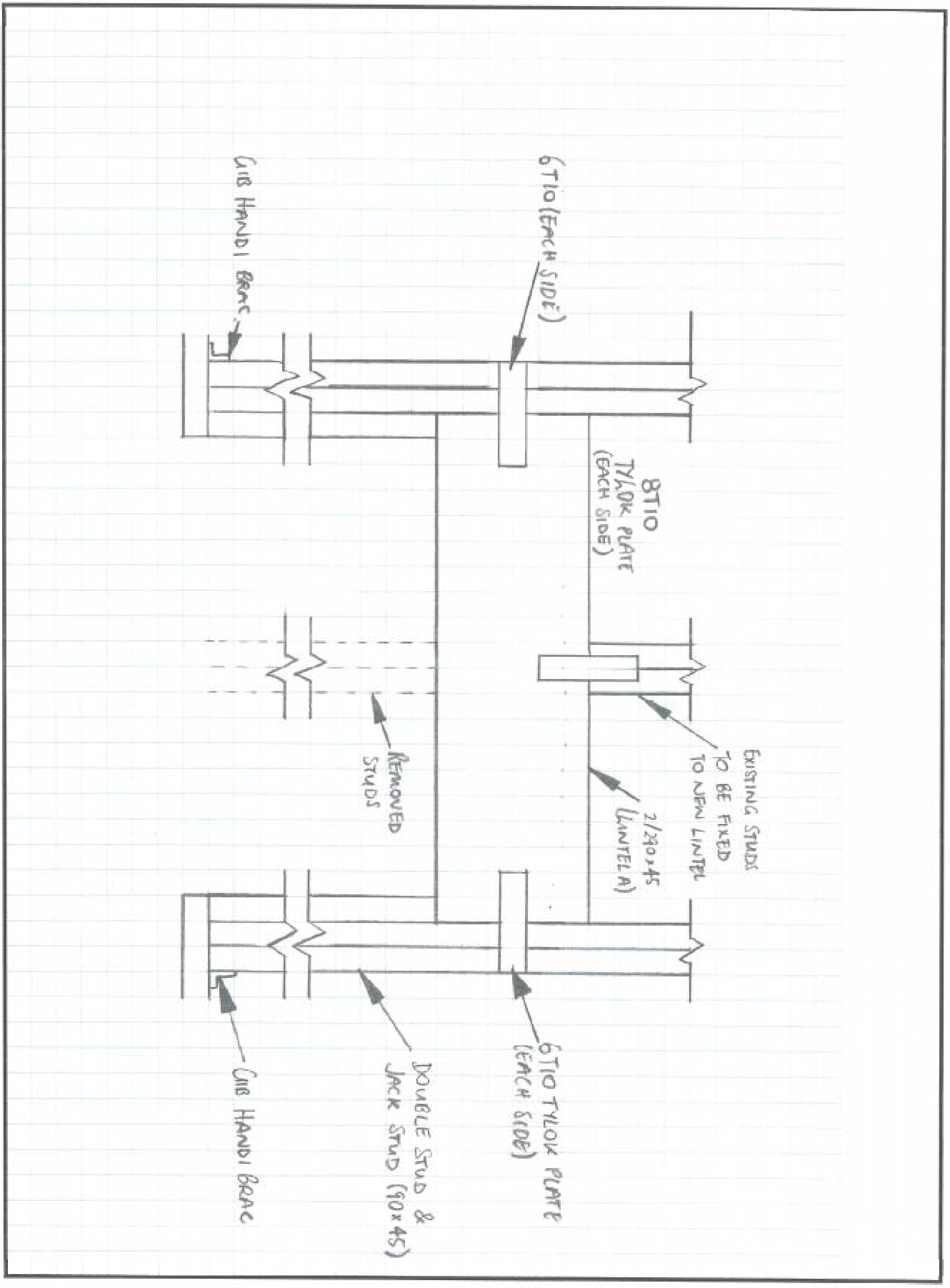
BEAM A END CONNECTION.



BEAM A PLATE CONNECTION

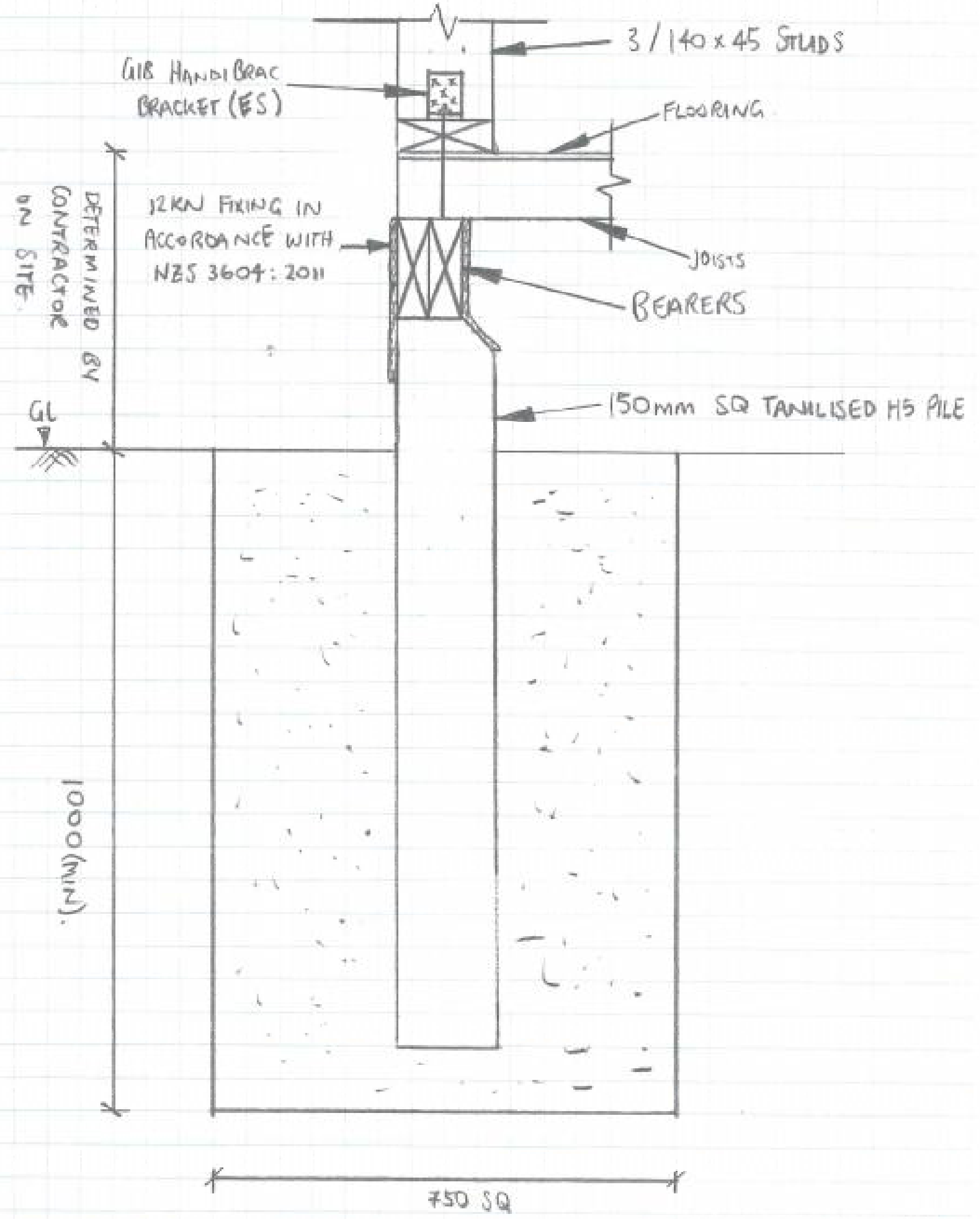
CLIENT	TKKM O TAMARIKI NUI A RUA BOT
SUBJECT	BLOCK B ALTERATIONS.

FILE No.	DATE	PAGE	OF	BY	CKD
115520	1/2/16	SK04		RL	



CLIENT	TKKM O TAMAKI NUI A RUA BOT				
SUBJECT	BLOCK B ALTERATIONS				
FILE No. 115520	DATE 3/2/16	PAGE SK05	OF	BY RL	CKD

KOA



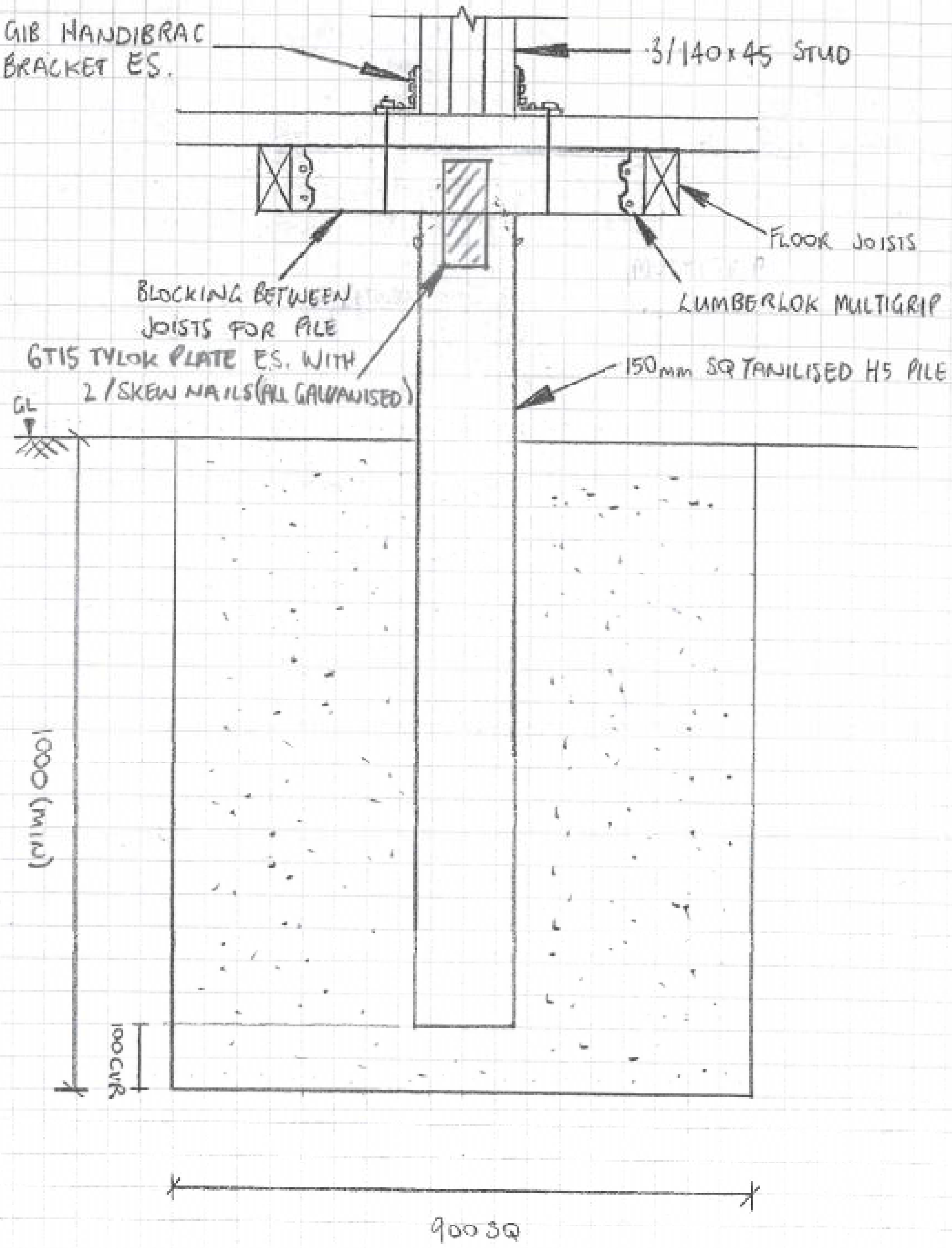
PILE UNDER SUPPORT ①

NOTES:

1) MIN CONC. STRENGTH 20MPa
2) PROVIDE SOLID BLOCKING FROM BEARER TO UNDERSIDE OF FLOORING.

CLIENT TKKM O TAMAKI NUI A RUA BOT.
SUBJECT BLOCK B ALTERATIONS.

FILE No.	DATE	PAGE	OF	BY	CKD
115520	3/2/16	SK06		RL.	

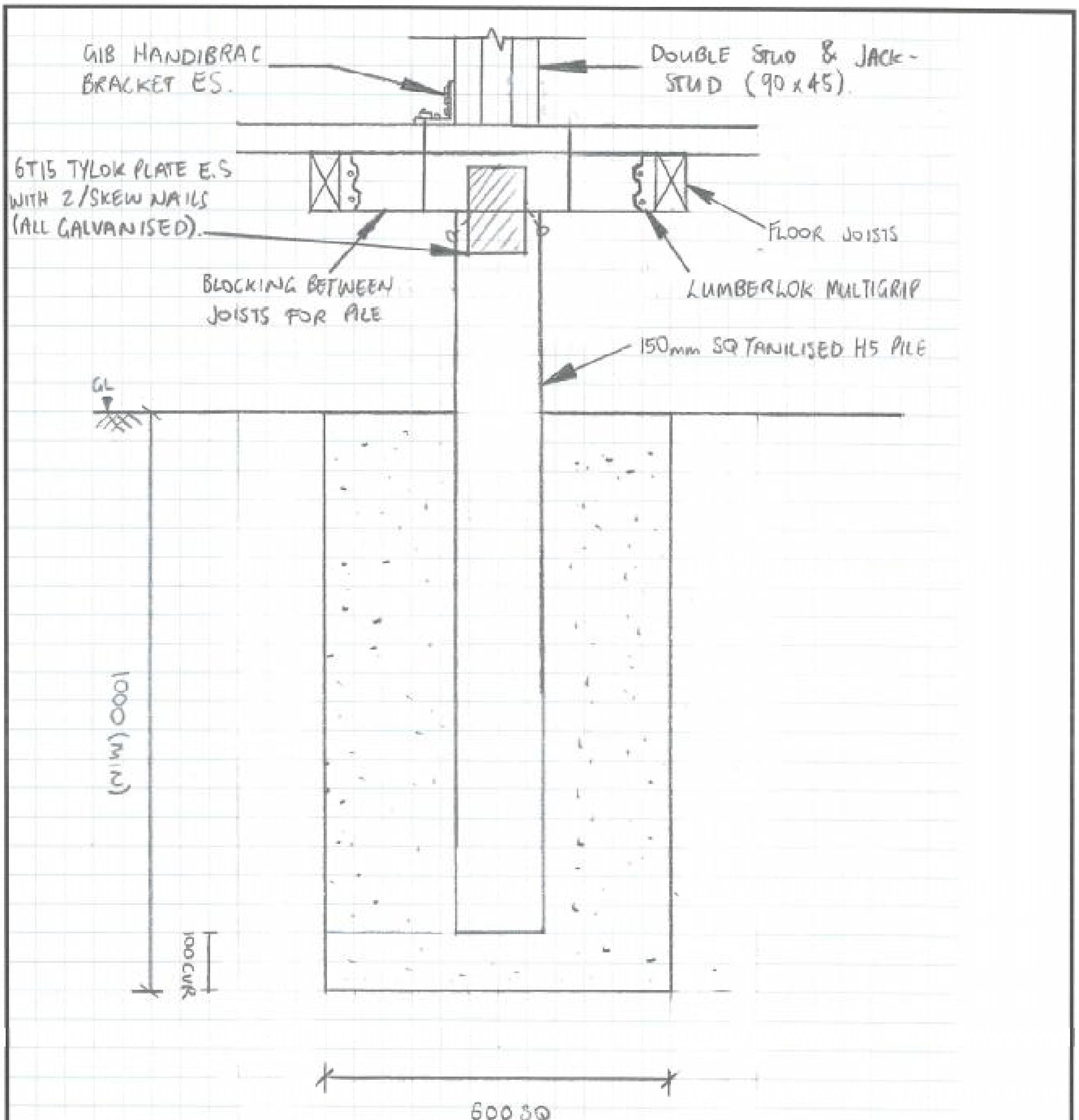


PILE UNDER SUPPORT (2)

NOTES:

1) MIN CONC STRENGTH 20 MPa
2) PROVIDE SOLID BLOCKING FROM PILE TO UNDERSIDE OF FLOORING.

CLIENT	TKKM O TAMAKI NUI A RUA BOT			
SUBJECT	BLOCK B ALTERATIONS			
FILE No. 115520	DATE 3/2/16	PAGE SK07 OF	BY RL.	CKD



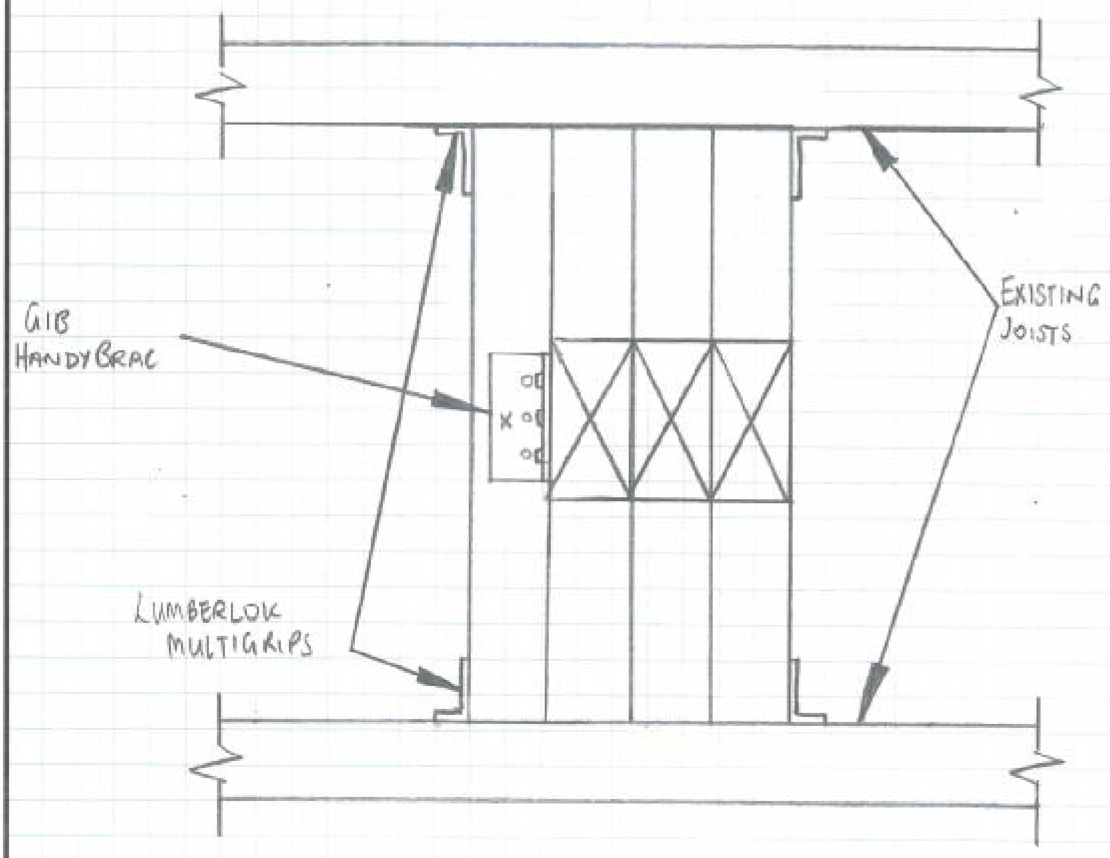
PILE UNDER SUPPORT (3) (BOTH SUPPORTS).

NOTES:

1) MIN CONC STRENGTH 20 MPa
2) PROVIDE SOLID BLOCKING FROM PILE TO UNDERSIDE OF FLOORING.

CLIENT	TKKM O TAMAKI NUI A RUA			
SUBJECT				
FILE No. 115520	DATE 3/2/16	PAGE SK08 OF	BY RL.	CKD

KOA



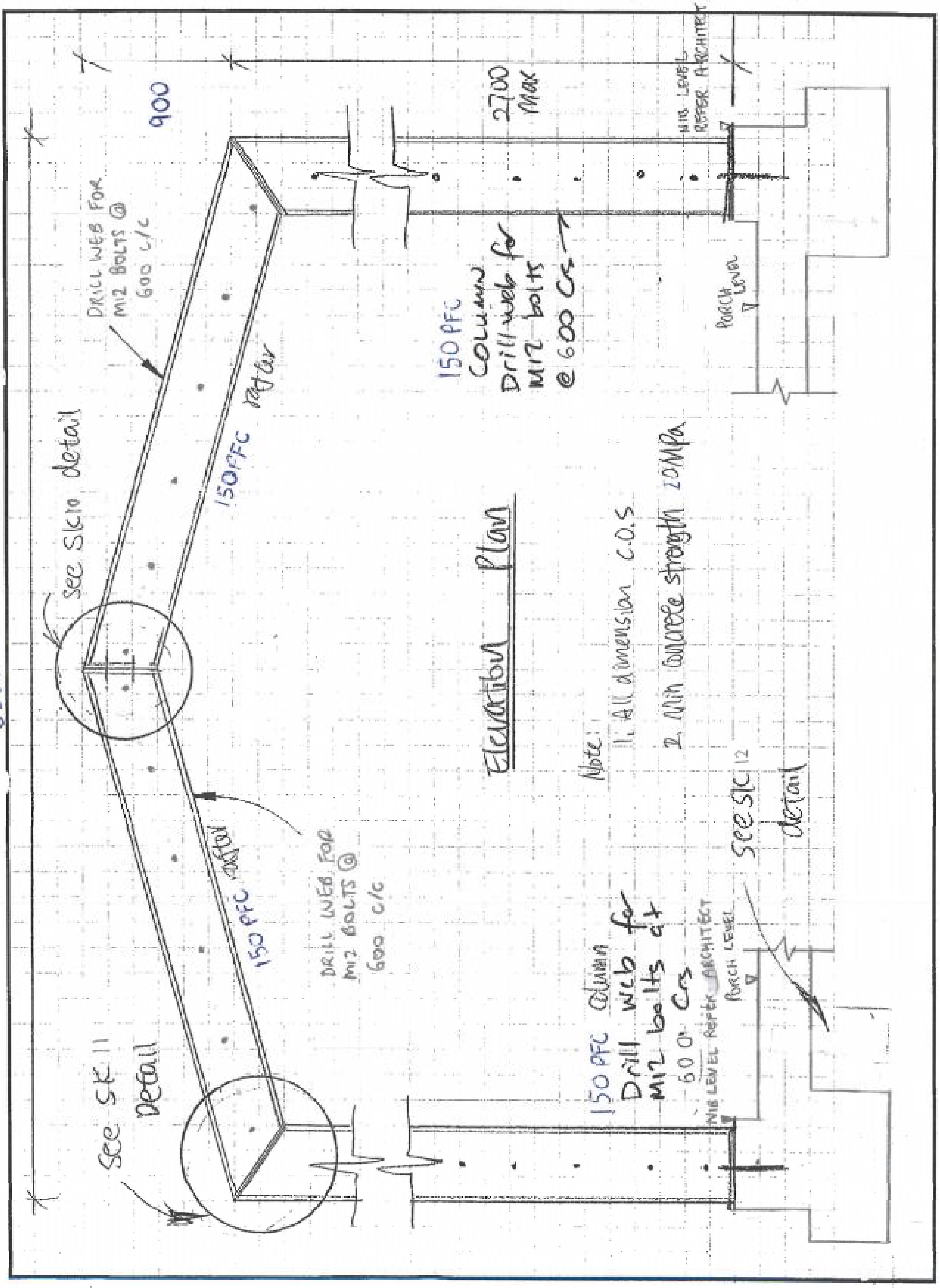
PLAN OF FLOOR JOIST BLOCKING UNDER SUPPORTS (2) & (3)

CLIENT IKKM O TAMARIKI NUI A RUA

SUBJECT

FILE No. 115520 | DATE 2/2/16 | PAGE SK09 | BY RL

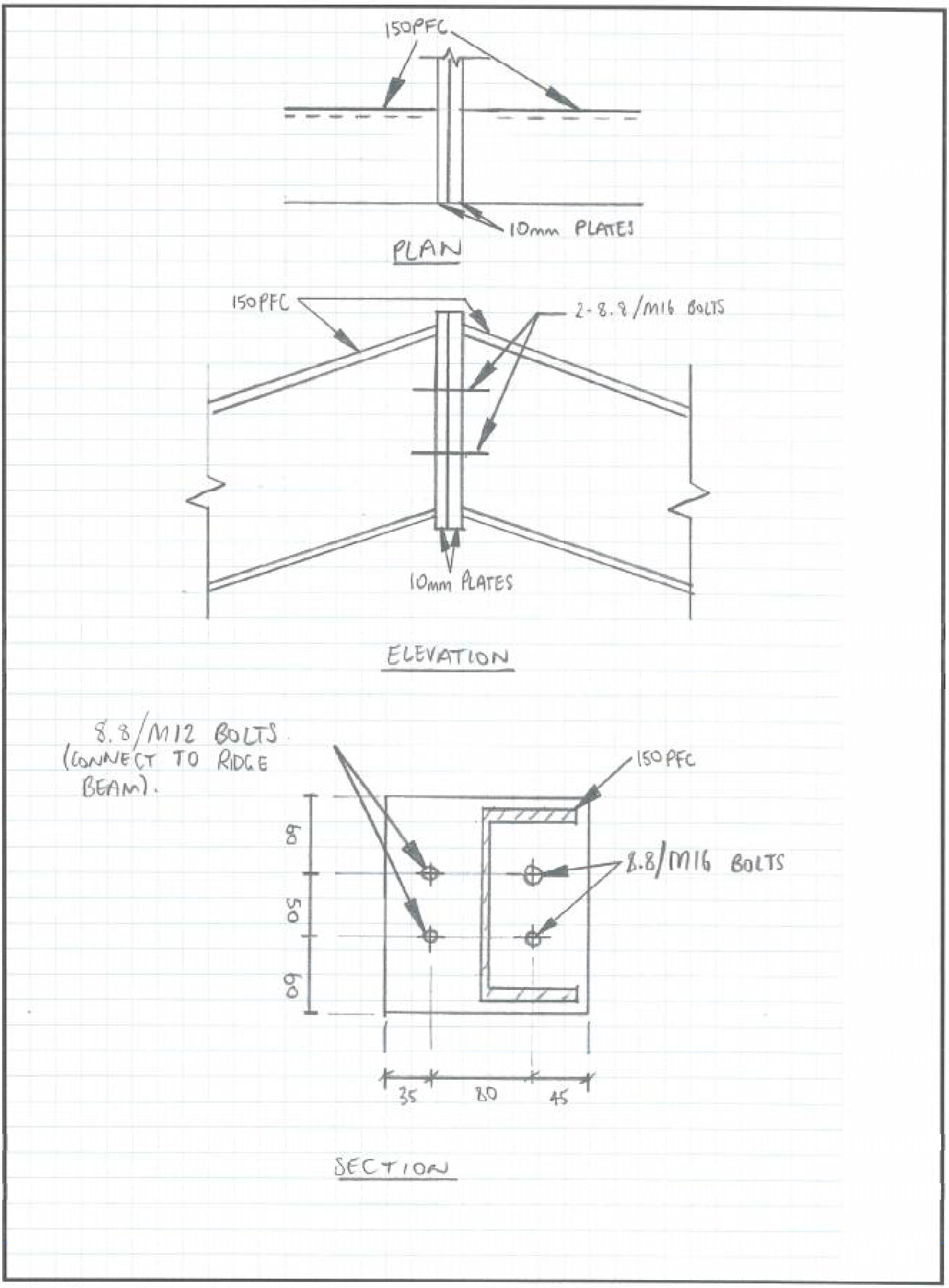
& ASSOCIATES LTD

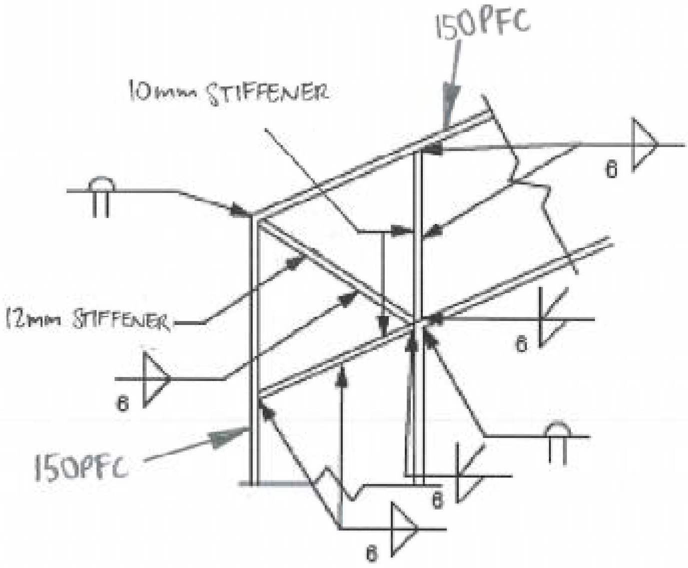


CLIENT TKKM O TAMAKI NUI A RUA

SUBJECT Block 6

FILE No.	DATE	PAGE	OF	BY	CKD
115520	5/2/16	SK10		RC.	





ALTERNATIVE PORTAL FRAME KNEE JOINT

5

SK11
115520
5/2/16.

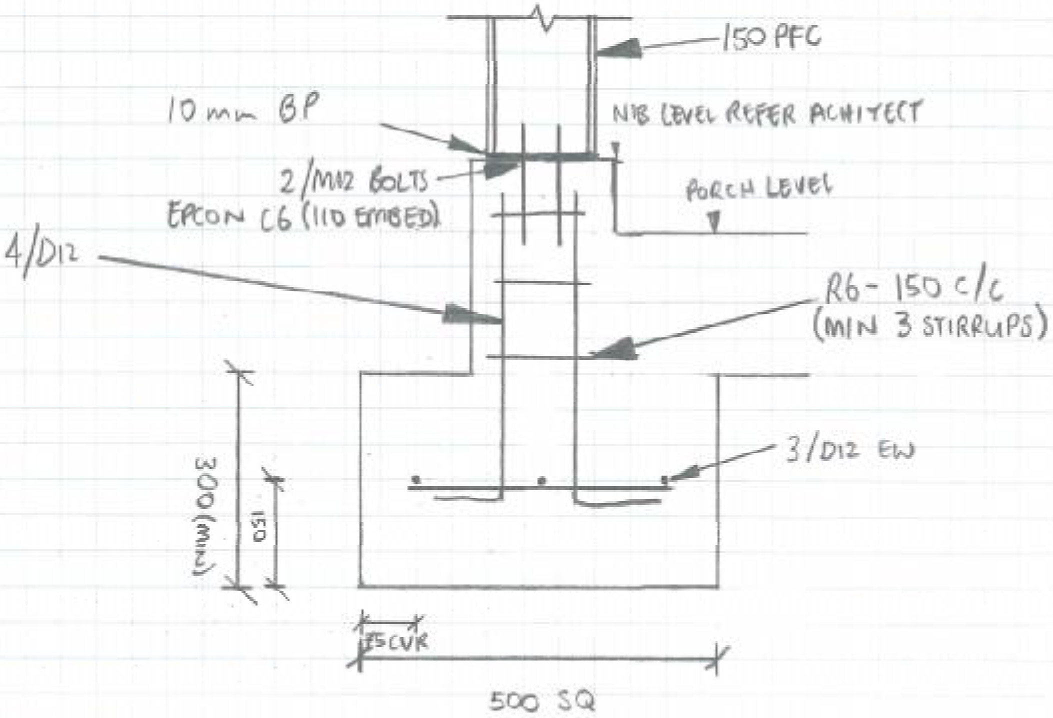
KOA

RL.

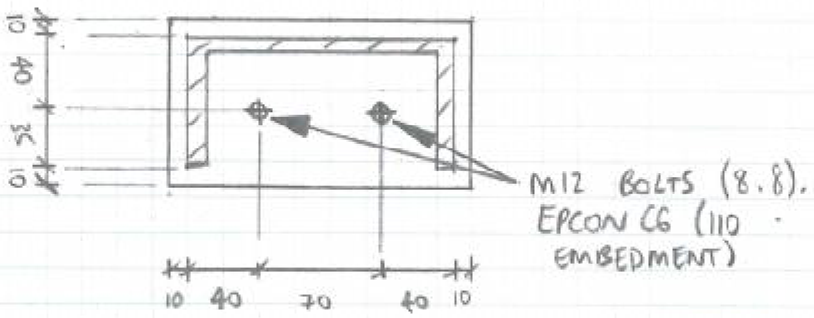
P 06 356 7000 E info@koa.co.nz W www.koa.co.nz
Kevin O'Connor & Associates Ltd
71 Pitt Street, PO Box 600, Palmerston North 4440

CLIENT	TKKM O TAMAKI NUI A RUA			
SUBJECT				
FILE No. 115520	DATE 5/2/16	PAGE SK12 OF	BY RL	CKD

KOA

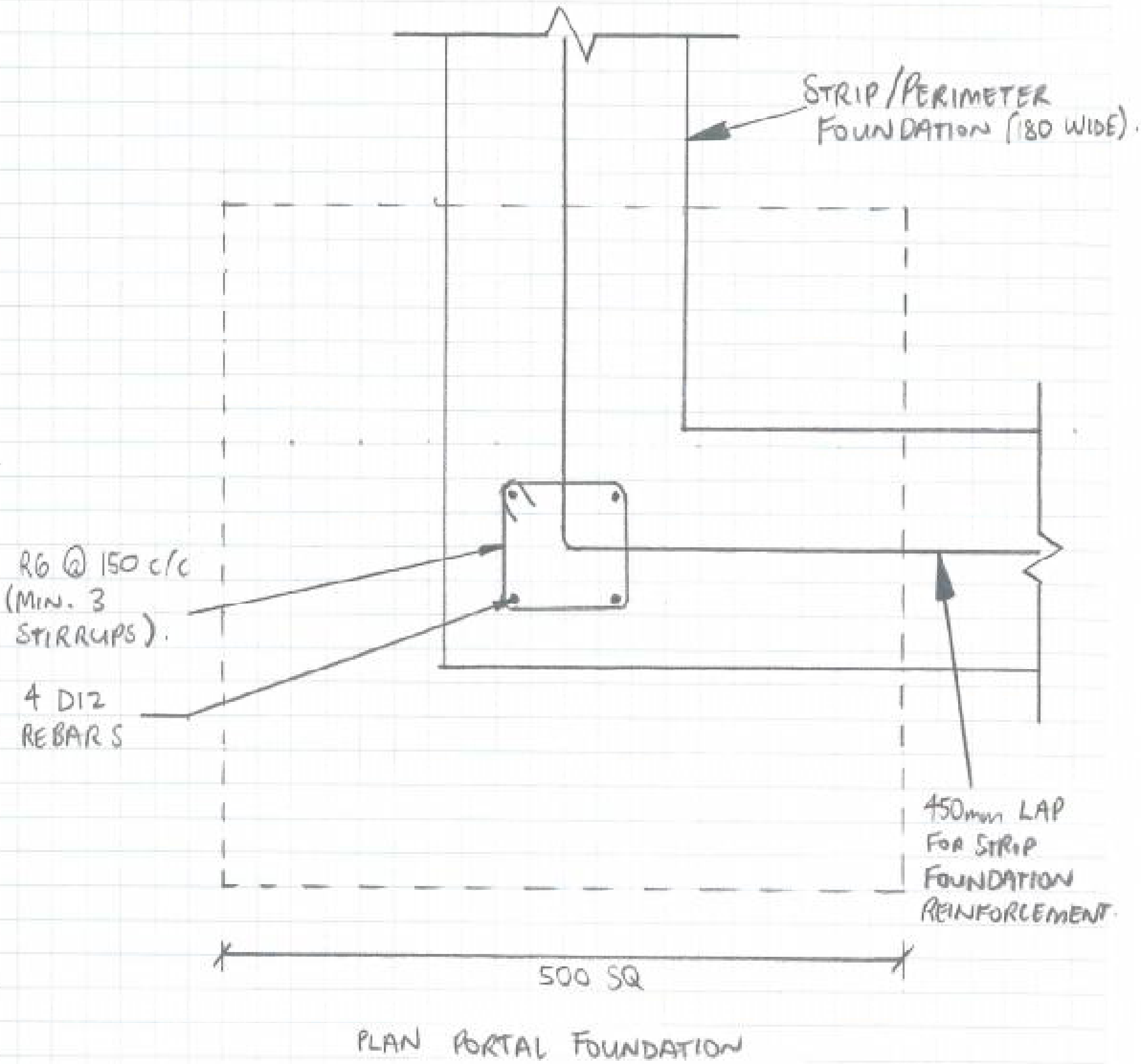


PORTAL FRAME FOUNDATION ELEVATION



PORTAL FRAME COLUMN BASE PLATE

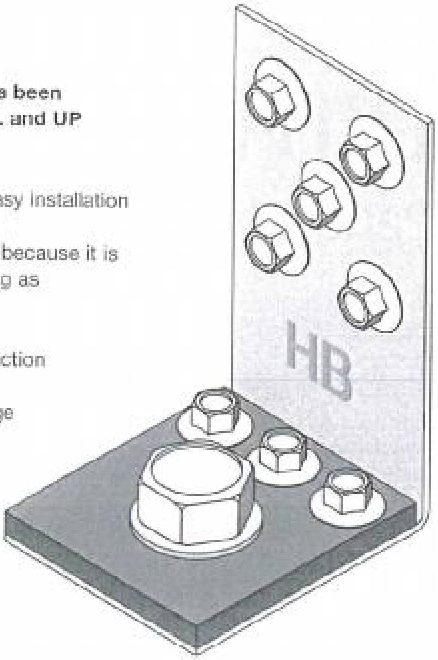
CLIENT	TKKM O TAMAKI NUI A RUA				
SUBJECT					
FILE No. 115520	DATE 5/2/16	PAGE SK13	OF	BY RL.	CKD



GIB HandiBrac®

Panel Hold-Down Bracket

Developed in conjunction with MiTek™, the GIB HandiBrac® has been designed and tested for use as a hold-down bracket in GIB® BL and UP bracing elements.



- The GIB HandiBrac® registered design provides for quick and easy installation
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps
- The GIB HandiBrac® is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings

Components

GIB HandiBrac® is available in boxes of 10, each containing 5 pairs.
Components per paired pack include:

- 2 x GIB HandiBrac® Brackets
- 2 x Washers
- 16 x Tek Screws
- 2 x BOWMAC screw bolts included within specific GIB HandiBrac® pack

GIB® Bracing Elements

The GIB HandiBrac® is a proprietary product that has been tested and is suitable for use with specified GIB Ezy Brace® systems.

Fixing to Timber Framed Floors

BOWMAC screw bolt or a 150mm by 12mm diameter galvanised coach screw (with a characteristic uplift strength of 12kN).

Fixing to Concrete Slabs

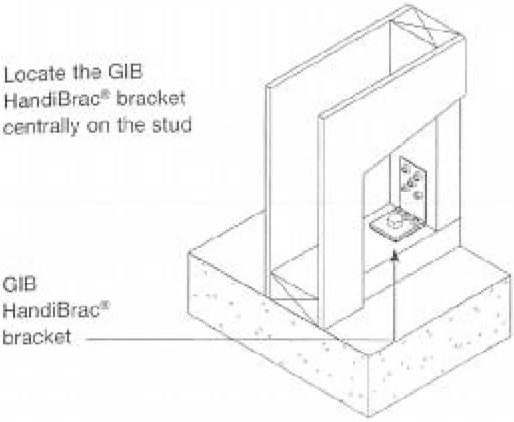
BOWMAC screw bolt or an alternative proprietary fixing with a characteristic uplift strength of 15kN

GIB®

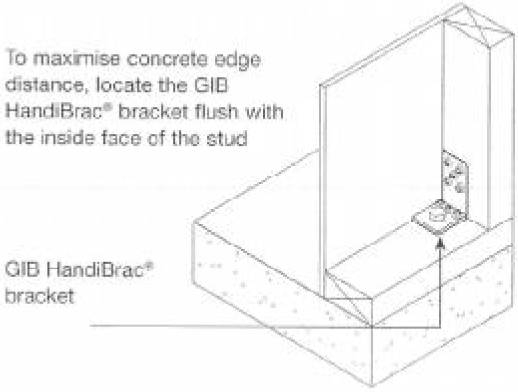
MiTek®

Panel Hold-down Details

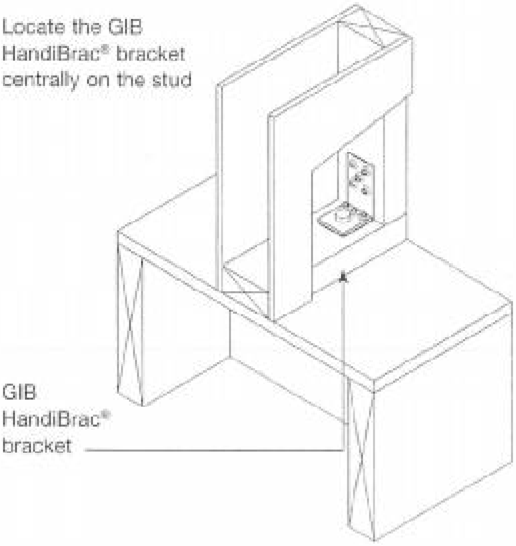
Concrete Floor - Internal Wall
The bottom plate at both ends of the bracing element is fixed using a fastener with a proprietary fixing with a minimum characteristic uplift strength of 15 kN. If included in pack see overleaf instruction to install BOWMAC screw bolt.



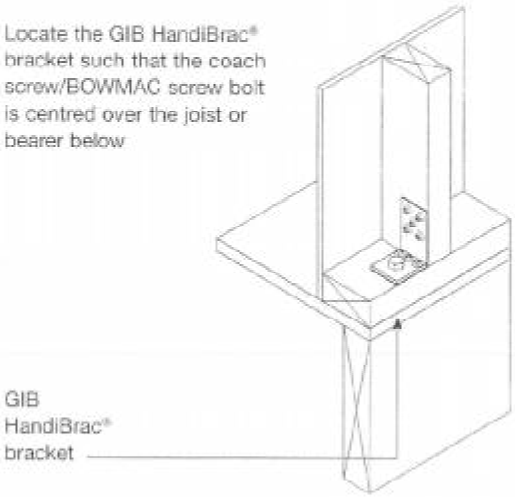
Concrete Floor - External Wall
The bottom plate at both ends of the bracing element is fixed using a fastener with a proprietary fixing with a minimum characteristic uplift strength of 15 kN. If included in pack see overleaf instruction to install BOWMAC screw bolt.



Timber Floor - Internal Wall
Bottom Plate is fixed using a BOWMAC screw bolt (if supplied) or a 150mm by 12mm diameter galvanised coach screw (with a characteristic uplift strength of 12kN). For BOWMAC screw bolt installations see overleaf.



Timber Floor - External Wall
Bottom Plate is fixed using a BOWMAC screw bolt (if supplied) or a 150mm by 12mm diameter galvanised coach screw (with a characteristic uplift strength of 12kN). For BOWMAC screw bolt installations see overleaf.

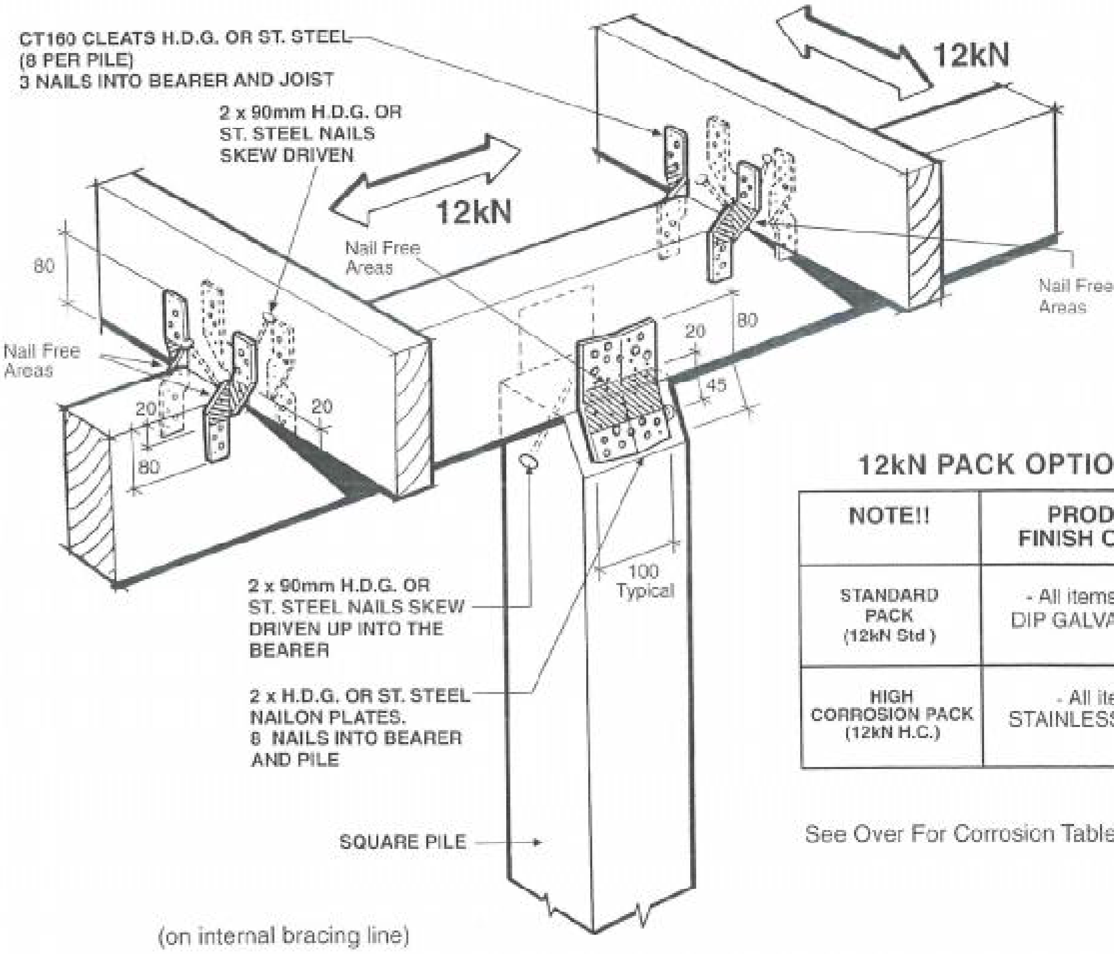


GIB

MiTek®

FOR BRACED PILES OR ANCHOR PILES

The 12kN Pile Fixing must be installed in accordance with this brochure
Auckland University Tested. Test Ref. 4613
All subfloor construction must be in accordance with NZS 3604:2011
NZS 3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Clause 7.1.2



(on internal bracing line)

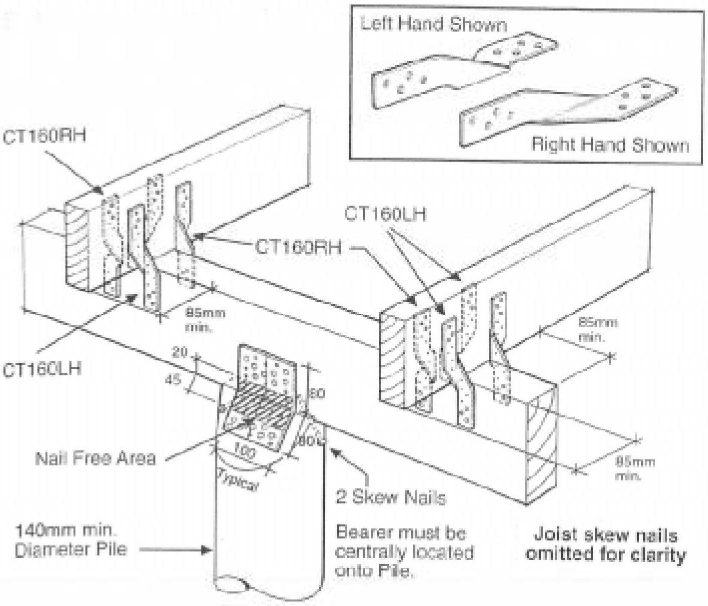
12kN PACK OPTIONS

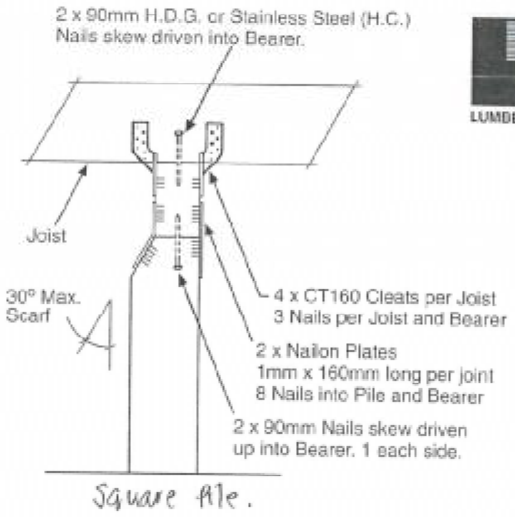
NOTE!!	PRODUCT FINISH OPTIONS
STANDARD PACK (12kN Std)	- All items HOT DIP GALVANISED
HIGH CORROSION PACK (12kN H.C.)	- All items STAINLESS STEEL

See Over For Corrosion Table.

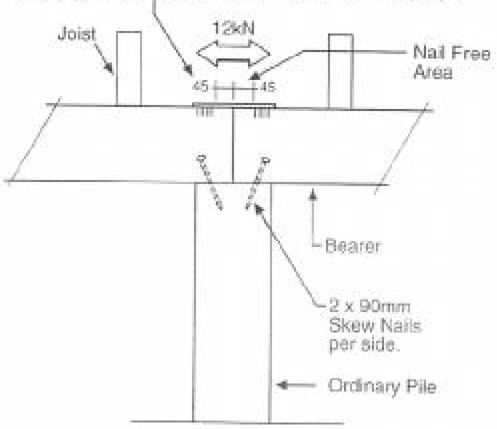
Available from leading Builders Supply Merchants throughout New Zealand

MiTek



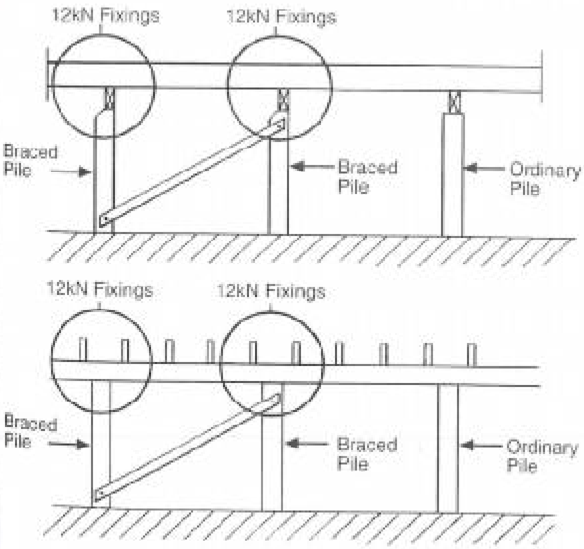


Nailon Plate 1mm x 160mm long (ex 12kN Pack)
8 Nails per end. No Nails within 18mm of timber edge.



Clause 6.12.7.2
NZS 3604:2011

CORROSION HAZARD USE TABLE	
Standard Pack (12kN Std) - Zones B & C - All Fixings ABOVE 600mm from Ground level	All items Hot Dip Galvanised.
High Corrosion Pack (12kN HC) - Zone D - All Fixings BELOW 600mm from Ground level	All items Stainless Steel (304).



Sample Subfloor Elevations
12kN Fixing - Pile to Bearer
- Joists to Bearer

PILE TO BEARER
- Nailon Plate (2 per joint) 1mm x 100mm (Typical) x 160mm long
- 8 Nails per Plate into Pile
- 8 Nails per Plate into Bearer
- 2 Skew Nails 90mm (1 per face)

JOIST TO BEARER
- CT160 Cleats (4 per Joist) 160mm long
- 3 Nails per Cleat into Joist
- 3 Nails per Cleat into Bearer
- 2 Skew Nails 90mm (1 per side)

NAILS
- 80 x 45mm x 3.55 dia. Spiral Nails
- 6 x 90mm x 4 dia. St. Steel Nails (H.C. Pack only)

Each set represents 1 x 12kN Pile Fixing

(packed 4 sets per carton)
2 x Nailon Plates 160mm long
8 x CT160 Cleats
80 x 45mm x 3.55 dia. Spiral Nails
90mm x 4 dia. St. Steel Angular Groove
6 - H.C. Pack

Refer front page for Product Finish Options

90mm H.D.G. Nails not included.

CLIENT TKKM O TAMAKI NUI A RUA BOT

SUBJECT

FILE No.	DATE	PAGE	OF	BY	CKD
115520	21/1/16			RL	

KOA

LOADS

ROOF — G : STEEL CORRUGATED SHEETING = 0.12 kPa

TIMBER FRAMING :

$4.6 kN/m^3 (1000/600 \times 0.19 \times 0.045 \times 3 + 1000/600 \times 0.075 \times 0.045)$ = 0.23 kPa

LINING & SERVICES = 0.05 kPa.

CEILING (10mm THICK GIB) = 0.10 kPa.

0.5 kPa.

Q : = 0.25 kPa.

WALL

INTERNAL, G: PARTICLE BOARD LINING [0.1kPa FRAMING] = 0.30 kPa.

EXTERNAL, G: WEATHERBOARD (OBLIQUE) = 0.5 kPa

FLOOR. G: TIMBER FLOOR (VINYL & PARTICLE BOARD) = 0.5 kPa.

Q: CLASSROOM. = 3.0 kPa.

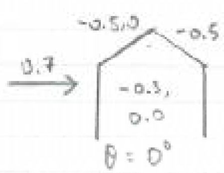
WIND

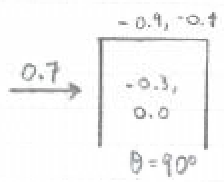
q_{ULS} = 1.01 kPa

q_{SLS} = 0.68 kPa.

C_{fig} = −0.9 ↑

= 0.5 ↓





Wu ↑ = 0.91 kPa

Wu ↓ = 0.51 kPa.

KOA		Page No.:	1
JOB NAME:	**TKKM O Tamaki Nui A Rua, Dannevirke**	Date	21/1/16
Job/File Number:	**115520**	Designer:	KOAPN
Description:		Checker:	

Determination of Site Wind Speeds

Enter Return Period of interest 500

Determination of Site Wind Speed $V_{sit,B} = V_R * M_d * M_{(z,cat)} * M_s * M_t$ m/sec

Enter Wind Region ID = A7

Wind Regime with this region is **Frontal**

Regional Wind Speed = V_R = 45 Ajustment Factor = 1 '= **45** m/sec V1.2

Directional (d) or Non-directional (n) wind speeds D

Elements being considered C *(C = Complete building & Primary Structure; O= Other elements)*

Wind Directional Multiplier, Md, for Region A7

N	NE	E	SE	S	SW	W	NW
0.9	**0.9**	**0.8**	**0.9**	**0.9**	**0.9**	**1**	**1**

Terrain/Height Multiplier

Enter Building Height Z= 4 m

Enter Reference height of interest 4 m *(can select several heights up the Building)*

Terrain Category Averaging Distance 1000 m *(As given in Table 4.2A)*

Enter the distance of each 1000 m of the site

Terrain Category present over	TC	N	NE	E	SE	S	SW	W	NW
Averaging Distance	1	2/6000	2/6000	2/6000	2/6000	2/6000	2/6000	2/6000	2/6000
Starting at base of building and	2								
Moving away in an upwind direction	3								
	4								
(Refer to Clause 4.2.3)	5								
	6								
	7								
	8								
Sum of averaging distances		1068	1068	1068	1068	1068	1068	1068	1068
check distance provided>Required		OK	OK	OK	OK	OK	OK	OK	OK
Weighted average terrain category		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
M(z,cat)=		**0.91**	**0.91**	**0.91**	**0.91**	**0.91**	**0.91**	**0.91**	**0.91**

Shielding Effects *(Note Shielding Zone is arc radius 20h &+/- 45 degree perp to wall)*

Effective shielding length has been assessed as 80 m *(20 * Building Height)*

Effective shielding buildings are required to have Ht> 4 m *(Shielding Bldgs Ht >= Bldg Ht)*

(Note if Upwind Slope >0.2 then no sheilding is present - Cl 4.3.1)

Enter		N	NE	E	SE	S	SW	W	NW
No. Bldgs in shielding zone of ht>h	No.	0	0	0	0	0	0	0	0
Avg. Height of shielding bldgs	m								
Avg. Breadth of shielding bldgs	m								
	Ls=	0	0	0	0	0	0	0	0
	s=	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ms=	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

21/01/2016

KOA		Page No.:	2
JOB NAME:	**TKKM O Tamaki Nui A Rua, Dannevirke**	Date	21/1/16
Job/File Number:	**115520**	Designer:	KOAPN
Description:	0	Checker:	

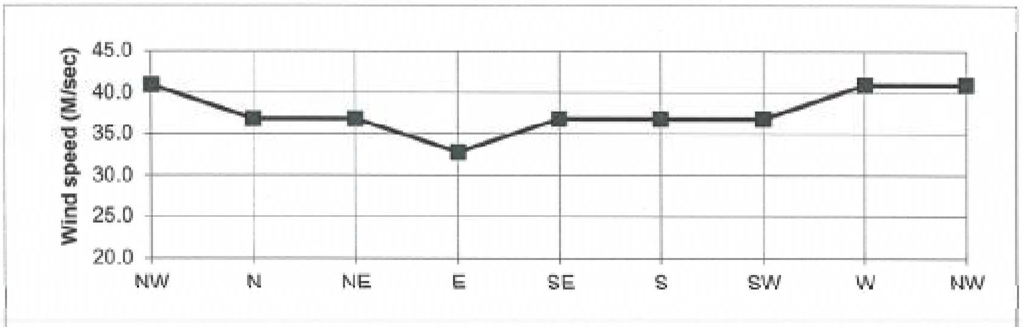
Terrain Multiplier, Mt

{Max of Ml, Mc, Mh}

Hill Shape Multiplier		F	F	F	F	F	F	F	F
Enter Upwind Hill Shape (E,H,R,F)		F	E	E	E	F	F	F	F
{E=Escarpment, H=Hill, R=Ridge, F=Flat}									
Ridge Elevation	m		197	197	197				
Upwind Valley Elevation	m		179	179	160				
H = Height of Terrain feature	m	0	18	18	37	0	0	0	0
Contour at midheight of feature	m								
Enter Lu			300	245	762				
Crest Slope	Rad								
Distance from Site to Crest	m		0	0	0				
Enter L if site is on Lee side of the slope									
Hill Shape Multiplier	**Mh**	**1.000**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Lee Zone Multiplier		N	NE	E	N	S	SW	W	N
Site is within a Lee Zone? (Y or N)					N				N
Distance Site to Leeward Crest	km								
	Ml	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Elevation Multiplier (Eqn 4.4(1))	*{Note 5*	**50**							
Enter approx. Elevation if >500 m	m	0		Then Me =	1				
Topographic Multiplier	**Mt**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

	NW	N	NE	E	SE	S	SW	W	NW
Product of Multipliers=		**0.82**	**0.82**	**0.73**	**0.82**	**0.82**	**0.82**	**0.91**	**0.91**
Directional Wind Speeds Are	**41.0**	**36.9**	**36.9**	**32.8**	**36.9**	**36.9**	**36.9**	**41.0**	**41.0**

{Note Ultimate Wind Speed shall be greater than 30 m/sec for Ultimate conditions Cl 2.3}



Determine Design Wind Speeds				0	Dir 1	Dir 2	Dir 3	Dir 4
Enter the Bearing (1~180) of the normal to the longest wall				45	45	135	225	315
Design Wind speeds, Vd	at Ref ht	**4 m**	m/sec		**36.9**	**36.9**	**41.0**	**41.0**
Basic Design wind pressures, q	at Ref ht	**4 m**	kPa		**0.81**	**0.81**	**1.01**	**1.01**

21/01/2016

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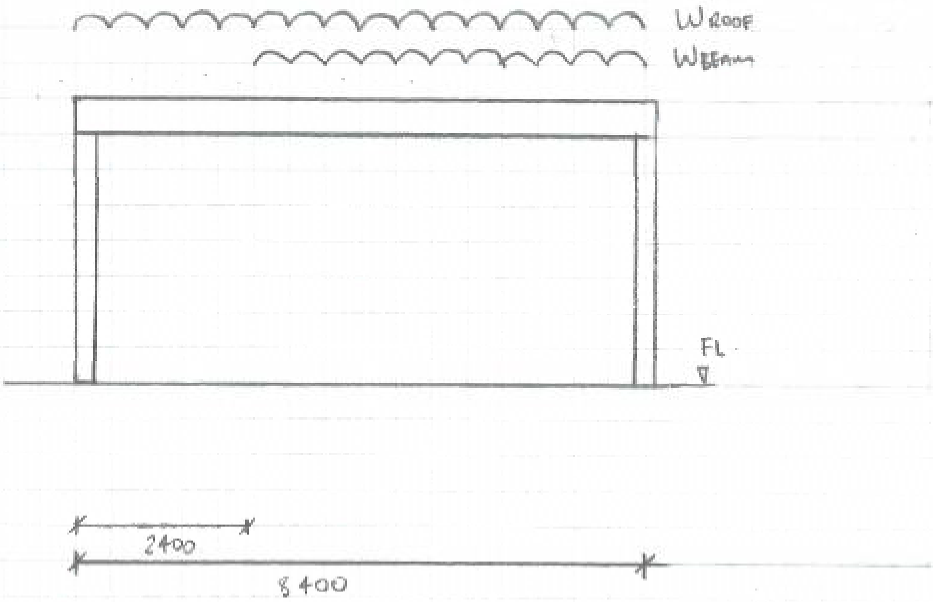
STEEL BEAM DESIGN



ROOF SPAN = 9.4m

TRIB. WIDTH = 4.7m.

LOADS

DEAD

ROOF = 0.5 kPa × 4.7m. [G_min = 0.25 kPa]

= 2.35 kN/m

BEAM (200UB 25) = [(7850 kg/m³ × 9.81 N/kg)/1000 N/kN] × 3230 × 10⁻⁶ m²

= 0.25 kN/m

LIVE

ROOF = 0.25 kPa × 4.7m

= 1.18 kN/m

WIND

Wu ↑ = 0.91 kPa × 4.7 m
= 4.3 kN/m

Wu ↓ = 0.51 kPa × 4.7 m
= 2.4 kN/m

DEFLECTION LIMIT = $\frac{L}{300}$

= $\frac{8400\text{mm}}{300}$

= 28 mm

TRY 310UB 4

Δ = 16 mm <u>OK</u>

ϕM_{bx} = 153 kNm [α = 1.13][Le = 2400mm] (MEMDES).

M^* = 56.7 kNm.

ϕM_b > M^* <u>OK</u>.

USE 310UB40

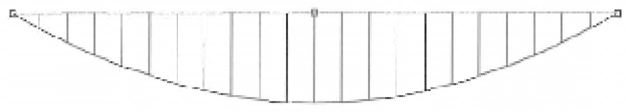
Effective length used was the largest unrestrained length.

Microstran V9

richard.langley
Job: Ridge Beam 1
UB Ridge Beam

02/02/2016
09:58:42 a.

Load Cases:
8 C 1.2G+Wu Down+PhiCQ



theta: 270 phi: 4

Bending Moment, Mz

Microstran V9.20.1.24

J:\100\115\115520 TKKM BOT MAKIRAKIRI RD - KURA, BLOCK B ALTERATIONS_AEE\03 Structural Engineering\05 Microstran files\Ridge Beam 1.msw

Microstran V9

richard.langley
Job: Ridge Beam 1
UB Ridge Beam

02/02/2016
09:59:02 a.

Load Cases:
11 C Gmax+Q

Y
X
Z
theta: 270 phi: 4

Displaced Shape

Microstran V9.20.1.24

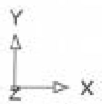
J:\100\115\115520 TKKM BOT MAKIRAKIRI RD - KURA, BLOCK B ALTERATIONS_AEB\03 Structural Engineering\05 Microstran files\Ridge Beam 1.msw

Microstran V9

richard.langley
Job: Ridge Beam 1
UB Ridge Beam

02/02/2016
10:20:11 a.

Load Cases:
8 C 1.2G+Wu Down+PhiCQ



theta: 270 phi: 4

Support Reactions

CLIENT

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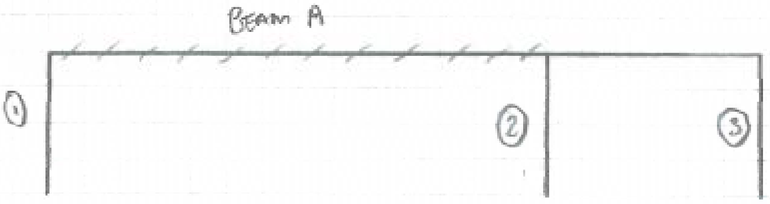
KOA

STUD DESIGN ①



TIMBER STUD.

$M^* = (0.6m \times 1.0 \times 1.01 \, kPa) \times (4.0m)^2 / 8$ [STUDS @ 600 c/c]

$= 1.21 \, kNm.$

$N^* = 27.4 \, kN$

USE 3/140 × 45 TIMBER STUDS

Structural Timber Column Calculation Sheet

Job Name:	TKKM O Tamariki Nui A Rua BOT	**Date:**	29 January 2016
Job Number:	115520	**Designer:**	RL
Description:			

Timber Column Design

M*	1.2	kNm	
N*	27.4	kNm	
d	140	mm	
b	45	mm	
No. Members	3		
phi bending	0.8		
phi compression	0.8		
k1	1		
k8x	0.42		
k8y	0.9		
fb	14	Mpa	
fc	18	Mpa	
A	18900	mm2	
Zx	441000	mm3	
Zy	141750	mm4	
phi Mx	2.074464	kNm	
phi My	1.42884	kNm	
phi Ncx	114.3072	kN	**OK**
phi Ncy	244.944	kN	**OK**
N*c/phi Ncx+M*x/phi Mx	0.82		**OK**
N*c/phi Ncy+(M*x/phi Mx)^2	0.45		**OK**

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KOA

SUPPORT ② DESIGN

$R_A = [1.2(2.35 + 0.25) \times 3.6m + 1.5(1.18kN/m \times 3.6m)]/2$

$= 8.8\ kN$

$N_c^* = 27.4\ kN + 8.8\ kN$

$= 36.2\ kN$

$M^* = (0.6 \times 1.01kPa \times 0.6m) \times (4.0m)^2 / 8$ [$C_{fig} = 0.6$]

$= 0.72\ kNm$

USE 2/140 × 45 STUDS.

Structural Timber Column Calculation Sheet

Job Name:	TKKM O Tamariki Nui A Rua BOT	**Date:**	2 February 2016
Job Number:	115520	**Designer:**	RL
Description:			

Timber Column Design

M*	0.72	kNm	
N*	36.2	kNm	
d	140	mm	
b	45	mm	
No. Members	2		
L_{ax}	2000	mm	
L_{ay}	800	mm	
phi bending	0.8		
phi compression	0.8		
$S_x=L_{ax}/d$	14.3		*"Look up k_8 from Figure 17.2"*
$Sy=L_{ay}/b$	8.9		
k1	1		
k8x	0.9		
k8y	1		
fb	14	Mpa	
fc	18	Mpa	
A	12600	mm2	
Zx	294000	mm3	
Zy	94500	mm4	
phi Mx	2.96352	kNm	
phi My	1.0584	kNm	
phi Ncx	163.296	kN	**OK**
phi Ncy	181.44	kN	**OK**
N*c/phi Ncx+M*x/phi Mx	0.46		**OK**
N*c/phi Ncy+(M*x/phi Mx)^2	0.26		**OK**

KOA

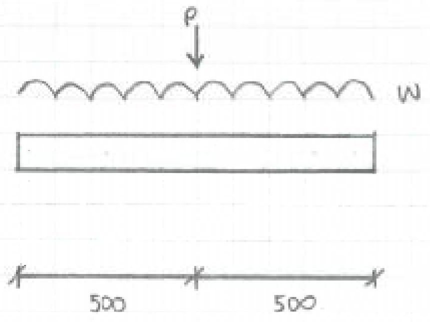
SUPPORT ③ DESIGN

CHECK EXISTING BEAM REACTION ON NEW LINTEL (LINTEL A).

$N^*_c = 8.8\,kN + (1.2(2.35+0.25)+1.5(1.18)) \times 7.1\,m/2$

$= 26.2\,kN$

$P_G = 13.9\,kN$
$P_Q = 6.3\,kN$



WALL HEIGHT $= 4000\,mm - 2000\,mm$

$= 2000\,mm$

$G_{WALL} = 0.3\,kPa \times 2.0\,m$

$= 0.6\,kN/m$

$R = [26.2\,kN + 1.35(0.6\,kN/m) \times 1.0\,m] / 2$

$= 13.51\,kN$

$M^* = [1.35(0.6) \times 1.0^2/8] + [26.2 \times 1.0/4]$

$= 6.6\,kNm$

$\Delta_{LIMIT} = 1000\,mm / 300$

$= 3\,mm$

TRY 2/240 x 45

$\phi M_{bx} = 9.7\,kNm$ $\quad M^* < \phi M_{bx}$ ok

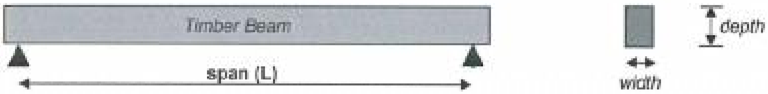
$\Delta = 0.5\,mm$ ok

Job Number: 115520
Job Title: TKKM O Tamaki Nui A Rua
Beam Reference: Lintel A

Calcs by: RL
Date: 3-Feb
Checked by:

TIMBER BEAM DESIGN

NZS 3603:1993



Beam Size = 90 (width) x 290 (depth) mm

$Z =$ 1261500 mm^3

Span of Beam (L) = 1000 mm
Effective Span (L_{ay}) = 1000 mm
Bending Moment (M*) = 6.6 kNm (ULS)
Shear Force (V*) = 13.5 kN (ULS)

Loaded Form: Point load (midspan)
3.5 kNm (SLS)
7 kN (SLS)

Load Duration: Permanent — $k_1 = 0.6$ — Table 2.4

Timber Grade: VSG8/VSG8, dry

Bending strength f_b =	14	MPa
Compressive Strength f_c =	18	MPa
Tension Strength f_t =	6	MPa
Stress in Shear f_s =	3	MPa
Modulus of Elasticity E =	8000	MPa
Lower Bound Mod of E E_{lb} =	6600	MPa
F =	0.8	

Number of Parallel Supports: 2 — $k_4 = 1.14$ — Table 2.7

Assume no Grid system — $k_5 = 1$ — Cl 2.9.2

max of $S = 1.35 \times \frac{(L_{ay} \times}{b} ((d/b)^2 - 1)^{0.5})^{0.5} = 7.9$ or $3 \times d/b = 9.67$ — $k_8 = 1.00$ — Cl 3.2.5.2, Table 2.8

BENDING CAPACITY

$M_n = k_1\, k_4\, k_8\, k_5\, f_b\, Z =$ 12.08 kNm — Cl 3.2.1

$\phi M_n =$ 9.66 kNm — O.K.

SHEAR CAPACITY

$V_n = k_1\, k_4\, k_5\, f_s\, A_s =$ 35.70 kN — $A_s = (2bd)/3 =$ 17400 mm^2 — Cl 3.2.3.1

$\phi V_n =$ 28.56 kN — O.K.

DEFLECTION

Shear Deflection = 0.2 mm
Flexual deflection = 0.3 mm

Total Deflection = 0.5 mm

Deflection / Span = 1 / 1919

CLIENT

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SUPPORT (3)

N^*_c = 13.4 kN.

M^* = $(0.6 \times 1.01\,kPa \times 0.3m) \times (2.0m)^2/8$

= 0.091 kNm.

USE 2/90 x 45 SG 8 TIMBER STUDS

Structural Timber Column Calculation Sheet

Job Name:	TKKM O Tamariki Nui A Rua BOT	**Date:**	29 January 2016
Job Number:	115520	**Designer:**	RL
Description:			

Timber Column Design

M*	0.091	kNm	
N*	13.4	kNm	
d	90	mm	
b	45	mm	
No. Members	2		
L_{ax}	2000	mm	
L_{ay}	2000	mm	
phi bending	0.8		
phi compression	0.8		
$S_x=L_{ax}/d$	22.2		*"Look up k_8 from Figure 17.2"*
$Sy=L_{ay}/b$	22.2		
k1	1		
k8x	0.64		
k8y	0.64		
fb	14	Mpa	
fc	18	Mpa	
A	8100	mm2	
Zx	121500	mm3	
Zy	60750	mm4	
phi Mx	0.870912	kNm	
phi My	0.435456	kNm	
phi Ncx	74.6496	kN	**OK**
phi Ncy	74.6496	kN	**OK**
N*c/phi Ncx+M*x/phi Mx	0.28		**OK**
N*c/phi Ncy+(M*x/phi Mx)^2	0.19		**OK**

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KOA

PILE DESIGN

LOADS

DEAD

ROOF = 12.8 kN (MAX FOR ↓)

= 6 kN (MIN FOR ↑)

WALL = 0.5 kPa × 4m HEIGHT × 1.6m LENGTH

= 3.2 kN (MAX FOR ↓)

= 0.5 kPa × 4m × 0.5m

= 1 kN (MIN FOR ↑).

FLOOR = 0.5 kPa × 1.6 m LENGTH × 1.2 m WIDE

= 0.96 kN (↓)

= 0.25 kPa × 1.6m × 1.2m

= 0.48 kN (↑)

SW PILE [ASSUMED] = $24 kN/m^3 \times (0.4 m\ SQ)^2 \times 0.4 m$ DEEP

= 1.54 kN

G_{max} = 18.5 kN

G_{min} = 9.0 kN

LIVE

ROOF = 4.96 kN (0.25 kPa UDL)

FLOOR = 3.0 kPa × 1.6m × 1.2m

= 5.76 kN

Q = 10.72 kN

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KOA

WIND

$W_u \uparrow$ = 18.1 kN

$W_u \downarrow$ = 10.1 kN

LOAD COMBINATIONS PILE ①

$1.35\,G_{max}$ = 25.0 kN

$1.2\,G_{max} + 1.5\,Q$ = 38.3 kN

$0.9\,G_{min} + W_u \uparrow$ = −10 kN

$1.2\,G_{max} + W_u \downarrow + \psi_c Q$ = 37.7

$G_{max} + \psi_c Q$ = 22.0 kN

q SAFE @ 1m = 350 kPa

ϕq_{ULT} = 0.5 × 3 × 350 kPa

= 525 kPa

$$\left(\frac{38.3\,kN}{525\,kPa}\right)^{1/2} = 270\ mm$$

FOR UPLIFT ...

$$\frac{W_u}{0.9} = G_{MIN}$$

$$\frac{18.1\,kN}{0.9} = 20.1\,kN$$

SW_{PILE} = 20.1 − (6 + 1 + 0.48)

= 12.6 kN

PILE WIDTH = $(12.6 / 24)^{1/2}$

= 0.725 m (1m DEEP)

USE 750 mm SQ BY 1000 mm DEEP PILE

KOA

PILE ②

DEAD

ROOF = 12.8 + (2.6 kN/m × 3.6m / 2)
= 17.48 kN (↓)
= 6 + ((1.18 + 0.25) × 3.6 / 2)
= 8.57 kN (↑)

WALL = 0.3kPa × 1.6m / 2 × 4m
= 0.96 kN (↓)
= 0.3 kPa × 0.25m × 4m
= 0.3 kN (↑)

FLOOR = 0.5 kPa × 1.6m × 1.2m
= 0.96 kN (↓)
= 0.25 kPa × 1.6m × 1.2m
= 0.48 kN (↑)

SW PILE = 24 kN/m³ × 1m DEEP × (750mm)²
= 13.5 kN (↓/↑)

G_{MAX} = 32.9 kN
G_{MIN} = 22.9 kN

LIVE

ROOF = 4.96 kN + (1.18 kN/m × 3.6m / 2)
= 7.1 kN

FLOOR = 3.0 kPa × 1.6m × 1.2m
= 5.76 kN

Q = 12.9 kN

WIND

$W_u \uparrow$ = 18.1 kN + (1.01kPa × 0.8 × 4.7m × 3.6m /2) = 24.9 kN

$W_u \downarrow$ = 10.1 kN + (1.01kPa × 0.2 ×

LOAD COMBINATIONS

$1.2G_{max} + 1.5Q$ = 68.64 kN

$1.2G_{max} + W_u\downarrow + \psi_c Q$ = 63.64 kN

$0.9G_{min} + W_u\uparrow$ = -5.2 kN

$G_{max} + \psi_c Q$ = 39.94 kN

$\left(\frac{68.64 \text{ kN}}{525 \text{ kPa}}\right)^{1/2}$ = 362 mm

$\frac{W_u\uparrow}{0.9} = G_{min}$

$\frac{24.9 \text{ kN}}{0.9}$ = 27.7 kN

SWPILE = 27.7 kN - 8.57 - 0.3 - 0.48
= 18.36 kN

WIDTH = $\left(\frac{18.36 \text{ kN}}{1m \times 24 \text{ kN/m}^3}\right)^{1/2}$
= 875 mm

USE 900 mm SQ BY 1000 DEEP PILE

CLIENT

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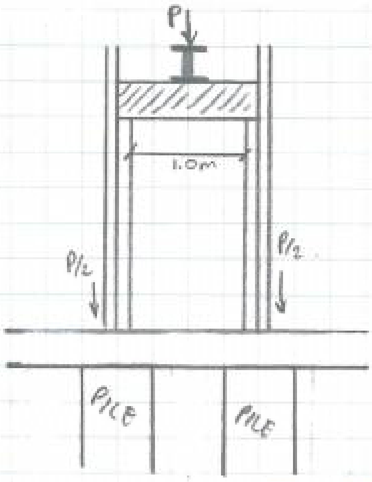
PILE ③



KOA

PILE ③

WORST CASE : DIRECTLY UNDER LINTEL STUD

DEAD

ROOF = [(2.6 kN/m)(7.1 + 3.6)/2]/2
= 7.0 kN ↓
= 3.5 kN ↑

WALL = 0.3kPa × 4m × 1m
= 1.2 kN ↓
= 0.6 kN ↑

FLOOR = 0.5kPa × 1m × 1m.
= 0.5 kN ↓
= 0.25 kN ↑

SW PILE = 1.0m × (0.9 m)^2 × 24kN/m^3
= 19.44 kN

G_{MAX} = 28.14 kN
G_{MIN} = 23.8 kN

LIVE

Roof = [(1.18 kN/m)(7.1 + 3.6)/2]/2
= 3.2 kN

FLOOR = 3.0kPa × 1m + 1m.
= 3 kN

Q = 6.2 kN.

WIND

$Wu\uparrow = [(1.01\,kPa \times 0.8 \times 4.7m \times (3.6m + 7.1m)/2]/2$

$= 10.2\ kN$

$Wu\downarrow = [(1.01\,kPa \times 0.2 \times 4.7m \times (3.6m + 7.1m)/2\ ]/2$

$= 2.6\ kN$

LOAD COMBINATIONS

$1.2G + 1.5Q = 62.4\ kN$

$1.2G_{MAX} + Wu\downarrow + \psi_c Q = 49.1\ kN$

$0.9G_{MIN} + Wu\uparrow = 5.0$

$G_{MAX} + \psi_c Q = 34.5\ kN$

$\left(\frac{62.4\,kN}{525\,kPa}\right)^{1/2} = 345\ mm$

FOR UPLIFT . . .

$\frac{10.2}{0.9} = 11.3\ kN$

$SW_{PILE} = 11.3 - 3.5 - 0.6 - 0.25$

$= 7.0\ kN$

$\left(\frac{7.0\,kN}{24\,kN/m^3}\right)^{1/2} = 0.540\,m$

USE 600 mm SQ BY 1000 mm DEEP PILE

KOA

BOLTED CONNECTION DESIGN.

TRY 2 - M12

$Q_{k1} = k_{11} f_{cj} d_a^2$ OR $0.5 b_e f_{cj} d_a$

$= (2.0)(36.1 MPa)(12 mm)^2$

$= 10397$

OR $= 0.5(45 mm)(36.1 MPa)(12 mm)$

$= 9747$

$Q_{sk1} = 2Q_{k1}$ (for three members)

$= 19494$

$\phi Q_n = \phi \, n \, k_1 k_{12} k_{13} Q_{sk}$ [$Q_{sk} = Q_{sk1}$, parallel].

$= 0.7(2)(1.0)(0.7)(1.0)(19494)$

$= 19.1$ kN.

TRY 3 - M16

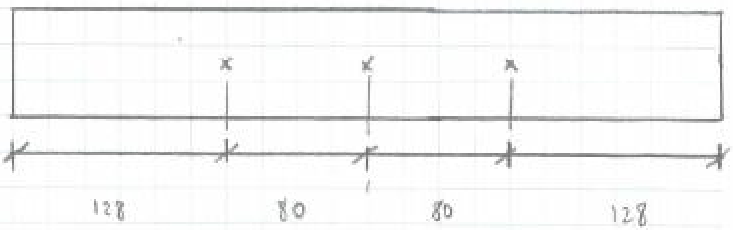
$Q_{sk1} = 25.992$ kN

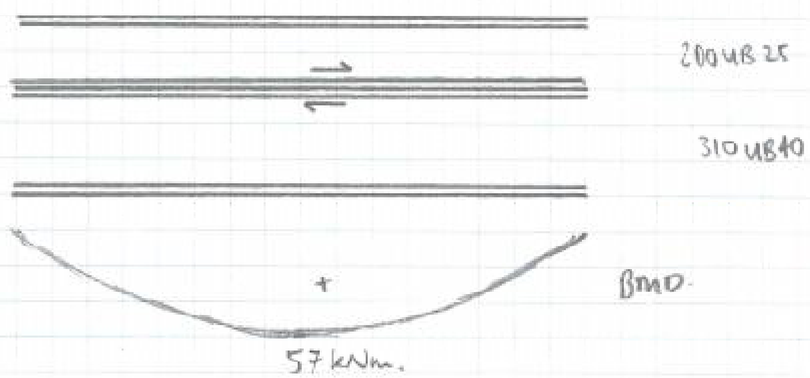
$\phi Q_n = 38.2$ kN

$N^* = 36.2$ kN

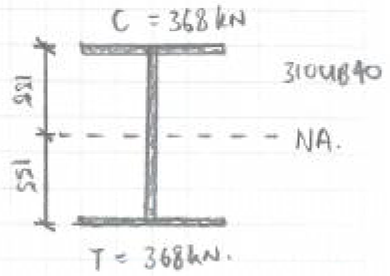
$\phi Q_n > N^*$ OK

416 LONG
70 WIDE
10 DEEP





$\frac{57\ kNm}{0.155\ m} = 368\ kN$



$\phi V_w = \phi (0.6 f_{uw} t_t k_r)$ FOR 6mm FILLET, $t_t = 4.24$mm

$= 0.6 (0.6 (410\ MPa)(4.24mm)(1.0))$

$= 626\ kN/m.$

$\frac{368\ kN}{626\ kN/m} = 0.588\ m$ OF WELD

∴ USE 300mm FILLET WELD EACH SIDE EVERY 500mm

CLIENT

SUBJECT

FILE No. 115520 | DATE 3/2/16 | PAGE D11 | OF | BY RL | CKD

TYLOK PLATE

$W_u = 20.4$ kN

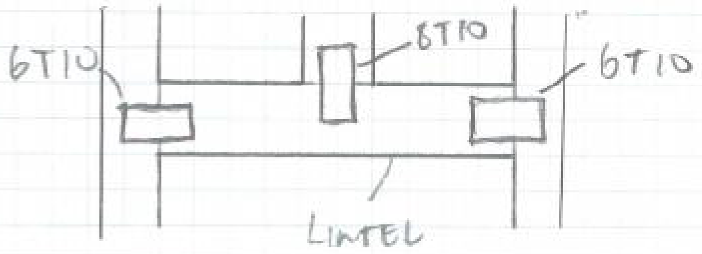
$\frac{20.4\text{kN}}{0.481 \text{ kN/tooth pair}} = 43$ pairs

$43/2 = 22$ pairs per side.

8T10 ⇒ $8 \times (10/2) = 40$ pairs ok.

USE 8T10

USE 6T10 ON LINTEL END FIXINGS



CLIENT	TKKM O TAMAKI NUI A RUA				
SUBJECT	BLOCK B				
FILE No. 115520	DATE 5/2/16	PAGE D12	OF	BY RL.	CKD

KOA

STUD CONNECTIONS

Connections to bottom plates use GIB HANDYBRAC connection which provide 12kN fixing per bracket. for timber framed floors.

CONNECTION ①

$W_u \uparrow = 18.1 \text{ kN}$

USE 2/GIB HANDYBRAC

CONNECTION ②

$W_u \uparrow - G_{ROOF} = 24.9 \text{ kN} - 8.57 \text{ kN}$ (MAX)

$= 16.3 \text{ kN}$

USE 2/GIB HANDYBRAC

CONNECTION ③

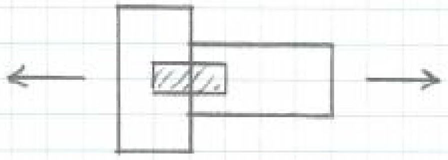
$W_u \uparrow = 10.2 \text{ kN}$

USE 1/GIB HANDYBRAC

KOA

PILE BLOCKING CONNECTION

Wu↑ - G = 17 kN (REFER D12)



0.481 kN /tooth /pair

$\frac{17 \text{ kN}}{0.481 \text{ kN/pair}}$ = 52 pairs

EACH SIDE

∴ 26 pairs reqd.

TRY 6T15 TYLOK PLATE

$6 \times (15/2)$ = 45 PAIRS OK

KOA

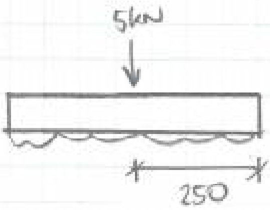
PAD REINFORCEMENT

$$A_s = \frac{\sqrt{f'_c}}{4f_y} b_w d$$

$$= \frac{\sqrt{20}}{4(300)} (500)(150)$$

$$= 280 \text{ mm}^2$$

∴ USE 3 - D12 EW.



$M = 5 \times 0.25$

$= 1.25$ kNm

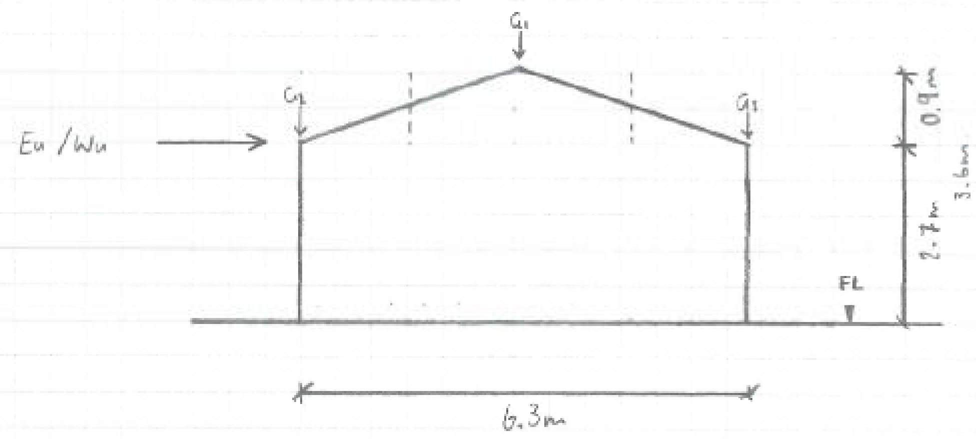
TRY 3 - D12

$\phi M = 12.5$ kNm OK

CLIENT				
SUBJECT				
FILE No. 115520	DATE 29/1/16	PAGE E1 OF	BY RL	CKD

KOA

PORTAL FRAME DESIGN



LOADS

$G_1 = 0.5kPa \times (6.3m/2) \times (2.0m/2)$

$= 1.58 kN$

$Q_1 = 0.25kPa\ (6.3m/2) \times (2.0m/2)$

$= 0.79 kN$

$G_2 = 0.5kPa \times (6.3m/4) \times (2.0m/2)$

$= 0.79kN$

$Q_2 = 0.25kPa \times (6.3m/4) \times (2.0m/2)$

$= 0.39 kN$

$G_2 = G_3$

$Q_2 = Q_3$

E2

Earthquake Design Actions

Report for

6104789N 2773556E

Compiled by

KOAPN of KOA

1170ACTIONS GNS SCIENCE

Site properties

Location:	**6104789N 2773556E**
	176.10°E -40.22°S
Soil class:	**D: Deep or soft soil**
Hazard factor [Z]:	**0.41**
(as part of Dannevirke)	
Nearest fault:	**Mohaka Fault**
Fault distance:	**11.1 km**

Structure properties

Building importance class:	**2**
Design working life:	**50 yrs**
Dominant period X [T]:	**0.4 s**
Dominant period Y [T]:	**0.4 s**

Ultimate Limit State	X	Y
Structural ductility factor[μ]:	1.25	1.25
Probability of exceedence:	1/500	1/500
Spectral shape factor [C_h(T)]:	3.00	3.00
Return period factor [R_u]:	1.00	1.00
Near fault factor [N(T,D)]:	1.00	1.00
Elastic hazard spectrum [C(T)]:	1.23	1.23
Structural performance factor [S_p]:	0.93	0.93
Inelastic spectrum scale factor [k_μ]:	1.14	1.14
Minimum base shear	0.04	0.04
Design Action Coefficient [C_d (T)]:	**1.00**	**1.00**

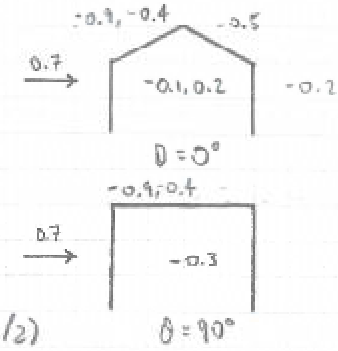
Servicability Limit State (1)	X	Y
Structural ductility factor[μ]:	1.00	1.00
Probability of exceedence:	1/25	1/25
Spectral shape factor [C_h(T)]:	3.00	3.00
Return period factor [R_s]:	0.25	0.25
Near fault factor [N(T,D)]:	1.00	1.00
Elastic hazard spectrum [C(T)]:	0.31	0.31
Structural performance factor [S_p]:	0.70	0.70
Inelastic spectrum scale factor [k_μ]:	1.00	1.00
Design Action Coefficient [C_d (T)]:	**0.22**	**0.22**

WIND LOADS.

C_{fig} ↑ = -0.9 - 0.2 = -1.1

C_{fig} ↓ = -0.4 + 0.2 = -0.2 ✗

C_{fig} → = 0.7 + 0.3 = 1.0



W_{u1} ↑ = 1.01 kPa × (-1.1) × (6.3 m/2) × (2.0 m/2)

= 3.5 kN

W_{u2} ↑ = 1.8 kN

W_{u3} ↑ = 1.8 kN

SEISMIC FORCE

E_{u1} = 1.00 × 1.58 kN

= 1.58 kN

E_{u2} = 1.00 × (0.79 kN + (0.6 m × 2.7 m/2 × 0.5 kPa))
(T.W 0.6m ASSUMED, WALL G-)

= 1.2 kN

E_{u3} = 1.2 kN

$\frac{E_s}{E_u} = \frac{0.22}{1.00}$

= 0.22

CLIENT

SUBJECT

FILE No.	DATE	PAGE	OF	BY	CKD
115520	29/1/16	E4		RL	

KOA

DEFLECTION LIMITS

$\Delta_{ULS} = 2.5\% \times 2700\,mm$

$= 67.5\,mm$

$\Delta_{SLS_{Eu}} = \frac{2700\,mm}{300}$

$= 9\,mm$

$\Delta_{SLS_G} = \frac{6300\,mm}{300}$

$= 21\,mm$

TRY 150PFC (BEAMS & COLUMNS)

$\Delta E_u = 29\,mm$ OK

$\Delta E_s = 8\,mm$ OK

$\Delta_G = 20\,mm$ OK.

BEAM $M^* = 9.64\,kNm$

COLUMN $M^* = 9.64\,kNm$

$N^* = 4.96\,kN$

150 PFC BEAM

$\alpha_m = 2.2$

$\phi M_{sx} = 37\,kNm$

$\phi M_{bx} = 37\,kNm$

$\phi M_{bx} > M^*$ OK.

150PFC COLUMN.

$\alpha_m = 1.75$

$\phi M_{sx} = 37$ kNm

$\phi M_{bx} = 37$ kNm OK

$\phi N_{cx} = 523$ kN

$\phi N_{cy} = 226$ kNm OK

DESIGN FOUNDATION

TAKE 1m WALL WEIGHT EACH SIDE OF COLUMN.

$G_{WALL} = 2m \times 2.7m \times 0.5kPa$

$= 2.7$ kN

$SW_{PAD} = 24kN/m^3 \times 0.4m$ DEEP $\times (0.5m$ WIDE$)^2$

$= 2.4$ kN

$N_c^* = 2.7kN + 2.4kN + 4.96kN$

$= 10.1$ kN $W_u 1 = 7.1kN$ OK

$\frac{N_c^*}{A} = 40$ kPa $[A = (0.5m)^2]$

$q_{SAFE}(300mm) = 70$ kPa

$\phi q_{ULS} = 105$ kPa.

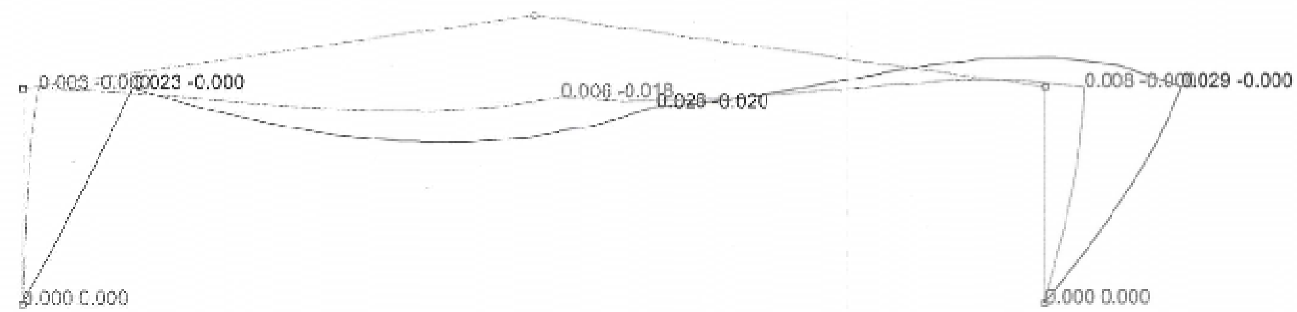
40 kPa < 105 kPa OK.

Microstran V9

richard.langley
Job: 115520 Portal Frame
115520

02/02/2016
11:33:31 a.

Load Cases:
9 C Gmax+Eu+PhiCQ
11 C Gmax+Es



Y
X
Z
theta: 270 phi: 8

Displaced Shape

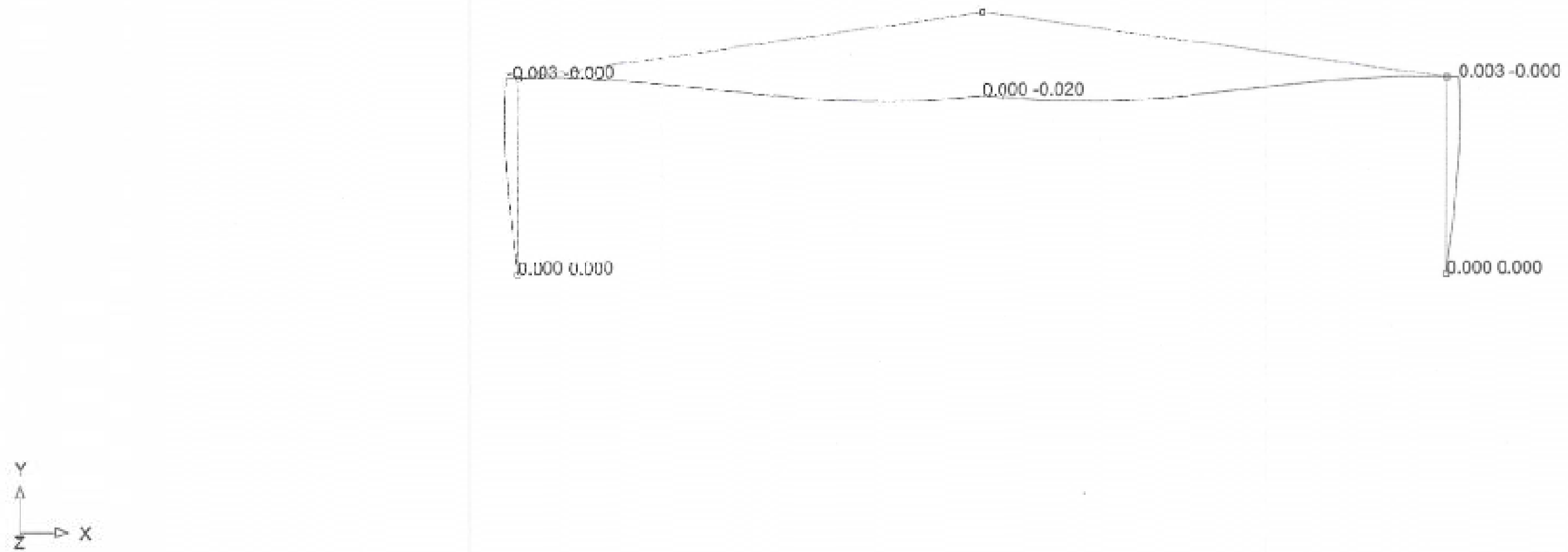
Microstran V9.20.1.24 J:\100\115\115520 TKKM BOT MAKIRAKIRI RD - KURA, BLOCK B ALTERATIONS_AEB\03 Structural Engineering\05 Microstran files\115520 Portal Frame.msw

Microstran V9

richard.langley
Job: 115520 Portal Frame
115520

02/02/2016
11:33:48 a.

Load Cases:
10 C Gmax+PhiLQ



theta: 270 phi: 8

Displaced Shape

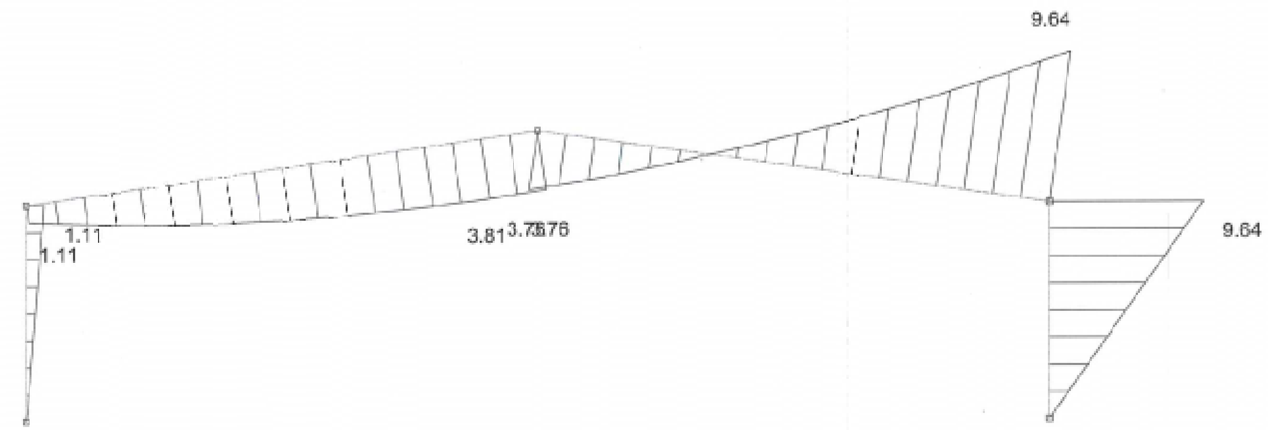
Microstran V9.20.1.24 J:\100\115\115520 TKKM BOT MAKIRAKIRI RD - KURA, BLOCK B ALTERATIONS_AEB\03 Structural Engineering\05 Microstran files\115520 Portal Frame.msw

Microstran V9

richard.langley
Job: 115520 Portal Frame
115520

02/02/2016
11:34:27 a.

Load Cases:
9 C Gmax+Eu+PhiCQ



Y
X
Z
theta: 270 phi: 8

Bending Moment, Mz

Microstran V9.20.1.24

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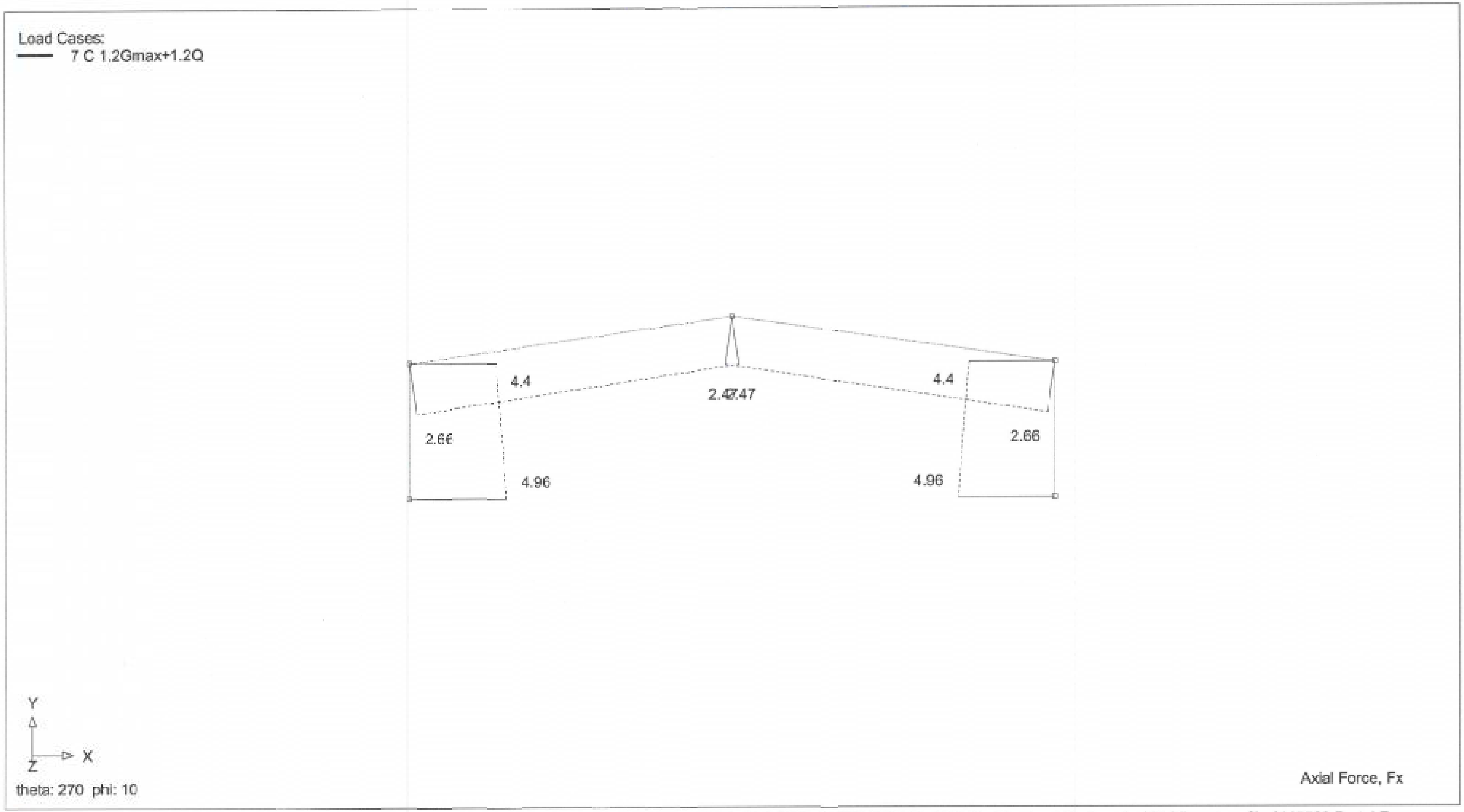
Microstran V9

richard.langley
Job: 115520 Portal Frame
115520

02/02/2016
11:35:26 a.



Microstran V9.20.1.24

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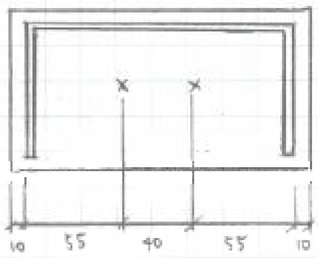
CLIENT				
SUBJECT				
FILE No. 115520	DATE 2/2/16	PAGE E6 OF	BY RL	CKD

KOA

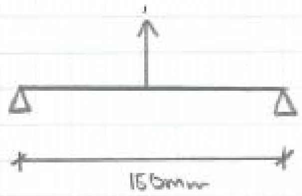
BASEPLATE DESIGN



$W_u \uparrow = (1.8\,kN + 1.8\,kN + 3.5\,kN)/2$

$= 3.6\,kN$

$\phi N_{tf} = 27.0\,kN$ OK [M12 - 4.6/S]



$M^* = (3.6\,kN \times 0.15)/4$

$= 0.135\,kNm$

$\phi M_{sx} = \phi f_y Z_e$

$Z_e = \frac{M_{sx}}{f_y}$

$\frac{bd^2}{6} = \frac{M^*}{f_y}$

$d = \sqrt{\frac{6M^*}{f_y b}}$

$= \sqrt{\frac{6(0.135\,kNm)}{(350\,000\,kPa)(0.15\,m)}}$

$= 3.9\,mm$

ϕN_{ur} (M12) = 15.8 kN (110 EMBEDMENT) OK

USE 2/M12 C6 EPCON BOLTS WITH 10mm BASE PLATE

KOA

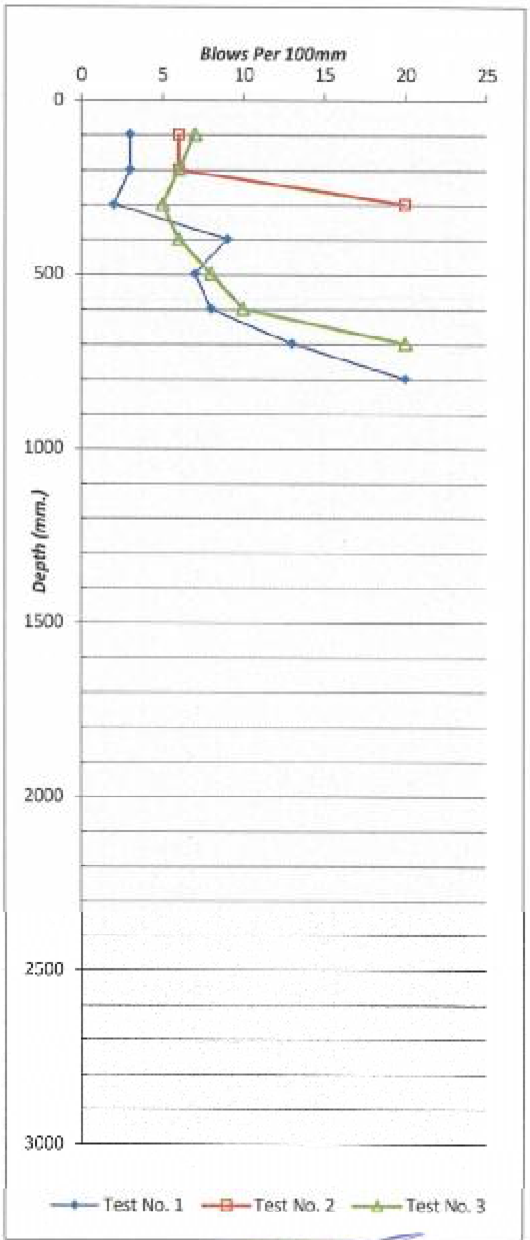
Scala Penetrometer Test Sheet

		Our Ref:	**115520**
Project Name:	Block B Alterations Foundation Investigation	***Date Tested:***	19 January 2016
Project Location:	36 Makirikiri Rd, Dannevirke	***Time Tested:***	9:00AM
Client Name:	TKKM O Tamaki Nui A Rua	***Tested By:***	Peter.Massam
Client Address:		***Report Date:***	19 January 2016

Tests:	NZS4402:1986 Test 6.5.2 Hand Method Using a Scala Penetrometer
	NZGS:2001 Test Method For Determining the Vane Shear Strength of a Cohesive Soil

Test Hole (Blows / 100mm : Bearing Capacity (Kpa)

Depth (mm)	Test No. 1 Blows per 100mm	Test No. 1 Safe Bearing Capacity (Kpa)	Test No. 2 Blows per 100mm	Test No. 2 Safe Bearing Capacity (Kpa)	Test No. 3 Blows per 100mm	Test No. 3 Safe Bearing Capacity (Kpa)
100	3	100	6	175	7	190
200	3	100	6	175	6	175
300	2	70	20	350	5	150
400	9	230			6	175
500	7	190			8	210
600	8	210			10	240
700	13	280			20	350
800	20	350				
900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						
2500						



Test Location Diagrams: Attached

Remarks:

Checked by: ____________________ Approved by: ____________________

Name: ____________________ Name: ____________________

Scala Penetrometer Test Sheet

Our Ref: 115520

Project Name:	Block B Alterations Foundation Investigation	***Date Tested:***	19 January 2016
	36 Makirikiri Rd, Dannevirke	***Time Tested:***	9:00AM
Project Location:	TKKM O Tamaki Nui A Rua	***Tested By:***	Peter.Massam
		Report Date:	19 January 2016

Tests:	NZS4402:1986 Test 6.5.2 Hand Method Using a Scala Penetrometer
	NZGS:2001 Test Method For Determining the Vane Shear Strength of a Cohesive Soil

Test Hole (Blows / 100mm : Bearing Capacity (Kpa)

Depth (mm)	Test No. 4		Test No.		Test No.	
	Blows per 100mm	Safe Bearing Capacity (Kpa)	Blows per 100mm	Safe Bearing Capacity (Kpa)	Blows per 100mm	Safe Bearing Capacity (Kpa)
100	3	100	5	150	3	100
200	5	150	5	150	2	70
300	5	150	4	125	3	100
400	7	190	5	150	4	125
500	12	270	6	175	6	175
600	15	320	6	175	9	230
700	20	350	8	210	20	350
800			13	280		
900			20	350		
1000						
1100						
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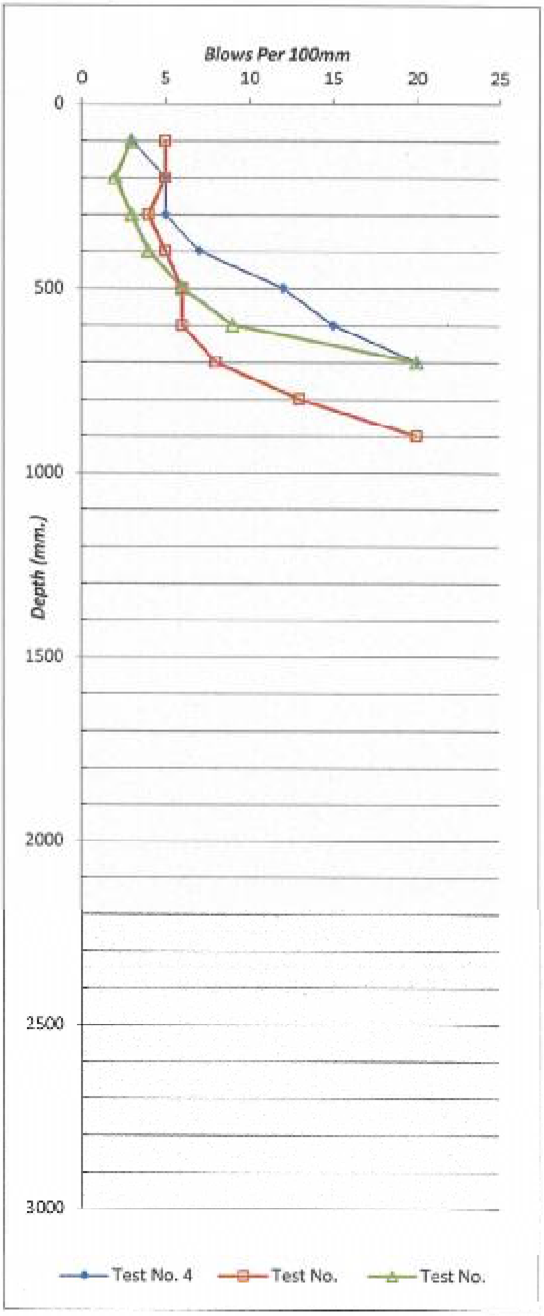


Test Location Diagragms: Attached

Remarks:

KOA

Hand Auger & Shear Vane Test Sheet

Our Ref: 115520

Project Name:	Block B Alterations Foundation Investigation	***Date Tested:***	19 January 2016
	36 Makirikiri Rd, Dannevirke	***Time Tested:***	9:00AM
Project Location:	TKKM O Tamaki Nui A Rua	***Tested By:***	Peter.Massam
		Report Date:	19 January 2016

Tests: NZS4402:1986 Test 6.5.2 Hand Method Using a Scala Penetrometer
NZGS:2001 Test Method For Determining the Vane Shear Strength of a Cohesive Soil

Shear Vane at PT Test No. 1

Depth (mm)	SV Divisions = kPa			
300		=	0	kPa
600		=	0	kPa
900		=	0	kPa
1200		=	0	kPa

50mm Ø Hand Auger at PT Test No. 1

Depth (mm)		Type and Comment
0	200	Topsoil
200	300	Soil and gravel
300		Rocks

Shear Vane at PT Test No. 5

Depth (mm)	SV Divisions = kPa			
300		=	0	kPa
600		=	0	kPa
900		=	0	kPa
1200		=	0	kPa

50mm Ø Hand Auger at PT Test No. 5

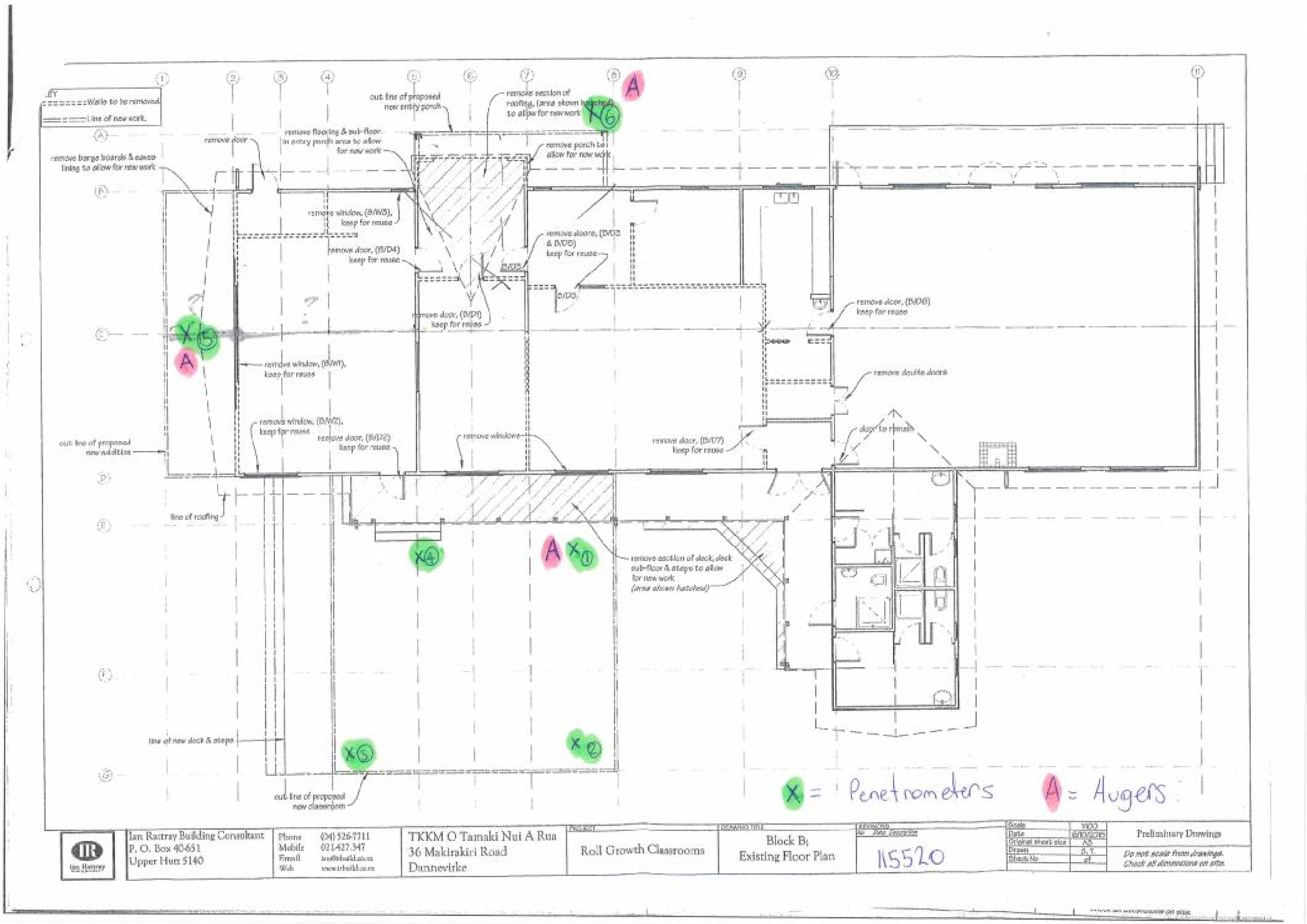
Depth (mm)		Type and Comment
0	200	Topsoil dry
200		Gravel and rocks

Shear Vane at PT Test No. 6

Depth (mm)	SV Divisions = kPa			
300		=	0	kPa
600		=	0	kPa
900		=	0	kPa
1200		=	0	kPa

50mm Ø Hand Auger at PT Test No. 6

Depth (mm)		Type and Comment
0	200	Topsoil
200	400	Soil and gravel
400		Rocks



Walls to be removed.
Line of new work.
remove barge boards & eaves lining to allow for new work
remove door
remove flooring & sub-floor in entry porch area to allow for new work
out line of proposed new entry porch
remove section of roofing, (area shown hatched) to allow for new work
remove porch to allow for new work
remove window, (B/W3), keep for reuse
remove door, (B/D4) keep for reuse
remove doors, (B/D3 & B/D5) keep for reuse
remove door, (B/D1) keep for reuse
remove window, (B/W1), keep for reuse
remove window, (B/W2), keep for reuse
remove door, (B/D2) keep for reuse
remove window
remove door, (B/D7) keep for reuse
remove door, (B/D6) keep for reuse
remove double doors
door to remain
out line of proposed new addition
line of roofing
remove section of deck, deck sub-floor & steps to allow for new work (area shown hatched)
line of new deck & steps
out line of proposed new classroom
X = Penetrometers
A = Augers
Ian Rattray Building Consultant
P. O. Box 40651
Upper Hutt 5140
Phone (04) 526-7711
Mobile 021427.347
TKKM O Tamaki Nui A Rua
36 Makirakiri Road
Dannevirke
Roll Growth Classrooms
Block B; Existing Floor Plan
115520
Preliminary Drawings
Do not scale from drawings. Check all dimensions on site.