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103	DRAINAGE PLAN	☐	
104	GROUND FLOOR PLAN	☐	
105	ATTIC PLAN	☐	
106	ELEVATIONS	☐	
107	ELEVATIONS	☐	
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315	WET AREA SYSTEMS	☐	

THIS SET OF DRAWINGS SHALL BE READ IN CONJUNCTION WITH ATTACHED

1) ENGINEERING CALCULATIONS AND DRAWINGS.
2) MANUFACTURER'S LITERATURE.
3) SPECIFICATIONS.

IT IS AN OFFENCE UNDER THE BUILDING ACT 2004 TO CARRY OUT ANY WORK NOT IN ACCORDANCE WITH THE BUILDING CONSENT. REFER THE RESOLUTION OF MATTERS CONCERNING COMPLIANCE TO THE OWNER. WHERE BUILDING CONSENT APPROVAL IS AFFECTED REFER ANY CHANGES TO THE TERRITORIAL AUTHORITY.

THERE ARE NO PRODUCT / SPECIFICATION SUBSTITUTIONS ALLOWED FOR THIS PROJECT WITHOUT PRIOR WRITTEN CONSENT FROM THE AUTHOR OF THESE DOCUMENTS AND THE OWNER / PROJECT CLIENT

GENERAL NOTES:

1. CONTRACTOR TO VERIFY JOINERY SIZES WITH OWNER. ALL EXTERNAL DOOR AND WINDOW SIZES SHOWN ARE ROUGH OPENING SIZES.
2. ALL MATERIAL FINISHES AND COLOURS TO OWNER'S SPECIFICATION UNLESS OTHERWISE STATED.
3. ALL CONSTRUCTION TO COMPLY WITH THE CODE OF PRACTICE NZS 3604 2011 AND LOCAL TERRITORIAL AUTHORITY BYLAWS.
4. ALL NEW / REPLACEMENT CISTERNS SHALL BE APPROVED DUAL FLUSH MODELS AS PER T. A. BYLAWS.
5. ALL INTERNAL DOOR SIZES SHOWN ARE FOR THE ACTUAL DOOR AND ARE NOT THE TRIM SIZE.
6. ALL DIMENSIONS & UNDERGROUND SERVICES TO BE CHECKED ON SITE BY CONTRACTOR BEFORE COMMENCEMENT OF ANY WORK.
7. CONTRACTOR TO ENSURE ALL GROUND LEVELS & HEIGHT RESTRICTIONS ARE CORRECT AND COMPLY WITH TERRITORIAL AUTHORITY BYLAWS THROUGHOUT CONSTRUCTION.
8. DO NOT SCALE FROM DRAWINGS & WORK FROM DIMENSIONS SHOWN.

FOR BC

RC - RM220116

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
COVER PAGE

SCALE @ A3.
1:1

SHEET NUMBER
101
OF: 35

WIND ZONE	**HIGH**
EXPOSURE ZONE	**D**
EQ ZONE	**1**
ZONE	**RES HARBOUR**
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

LEGAL DESCRIPTION
LOT 8, DP 560995
SITE AREA 660M²

SITE COVERAGE CALCULATION

HOUSE	192.16M²
COVERAGE	29.11%
DECK	30.09M²

IMPERMEABLE AREA CALCULATION

ROOF	221.76M²
NON ROOF	56.20M²
TOTAL	277.96M²
COVERAGE	42.11% (MAX 40%)

CUT / FILL VOLUME CALCULATION
18M³ CUT TOTAL M³ = 107
89M³ FILL TOTAL M² = 403.42

FINISHED FLOOR LEVEL (F.F.L.)
CONCRETE - TOP OF FINISHED SLAB
TIMBER FLOOR - TOP OF FLOORING

FINISHED GROUND LEVEL (F.G.L.)
MEANS THE LEVEL AFTER ALL BACKFILLING, LANDSCAPING AND SURFACE PAVING HAS BEEN COMPLETED

CLEARED GROUND LEVEL (C.G.L.)
MEANS THE LEVEL AFTER THE SITE EXCAVATION HAS BEEN COMPLETED BUT BEFORE BUILDING FOUNDATIONS HAVE BEEN EXCAVATED AND THE AREA OF THE SITE TO BE COVERED BY THE BUILDING IS FREE OF ALL DELETERIOUS MATERIAL

SET OUT
SITE SETOUT IS RECOMMENDED BY A SURVEYOR TO ENSURE THE POSITION OF BUILDING, CONFIRM SITE DATUM, FLOOR LEVELS, GROUND CONTOURS AND FENCES ARE SHOWN CORRECTLY. WHERE A SURVEY PLAN HAS NOT BEEN PROVIDED OR UNDERTAKEN PRIOR TO CONSTRUCTION, THEN IT BECOMES THE CLIENTS RESPONSIBLITY AND MAY INCUR FURTHER COSTS. DISCREPANCIES MAY AFFECT TOWN PLANNING RULES AND REQUIRE RESOURCE CONSENT.

CUT & FILL EXCAVATION NOTES
OUR MEASUREMENTS AND VOLUMES ARE NOT TO BE USED IN ANY WAY FOR QUANTITY SURVEY, OR COSTING PURPOSES, AS THE ACCURACY OF THE SURVEY & TOPOGRAPHICAL INFORMATION CONTAIN A MARGIN OF ERROR THAT INFLUENCES SUCH MEASUREMENTS & VOLUMES. EARTHWORKS VOLUMES ARE AFFECTED BY:

CUT VOLUMES
- 'BULKING' DUE TO EXCAVATED MATERIAL TAKING UP MORE SPACE ON A TRUCK.
- WHETHER ALLOWANCE HAS BEEN MADE FOR EXCAVATION OF SERVICE TRENCHES, REMOVAL OF VEGETATION, FOOTINGS, PADS AND PILE HOLES, DRIVEWAYS AND FOOTPATHS.
- ACTUAL DEPTHS OF TOPSOIL & STAINED CLAY THAT MAY GET REMOVED.
- REMOVAL OF MATERIAL FOUND TO BE 'UNSUITABLE' FOR FILL.

FILL VOLUMES REQUIRED
THESE CAN BE AFFECTED BY:
THE AMOUNT OF 'UNDERCUT' MADE DURING EXCAVATION.
- THE SLOPE OF THE BATTER AS RECOMMENDED IN THE GEOTEC REPORT.
- THE SUITABILITY OF THE CUT MATERIAL FOR COMPACTION PURPOSES.

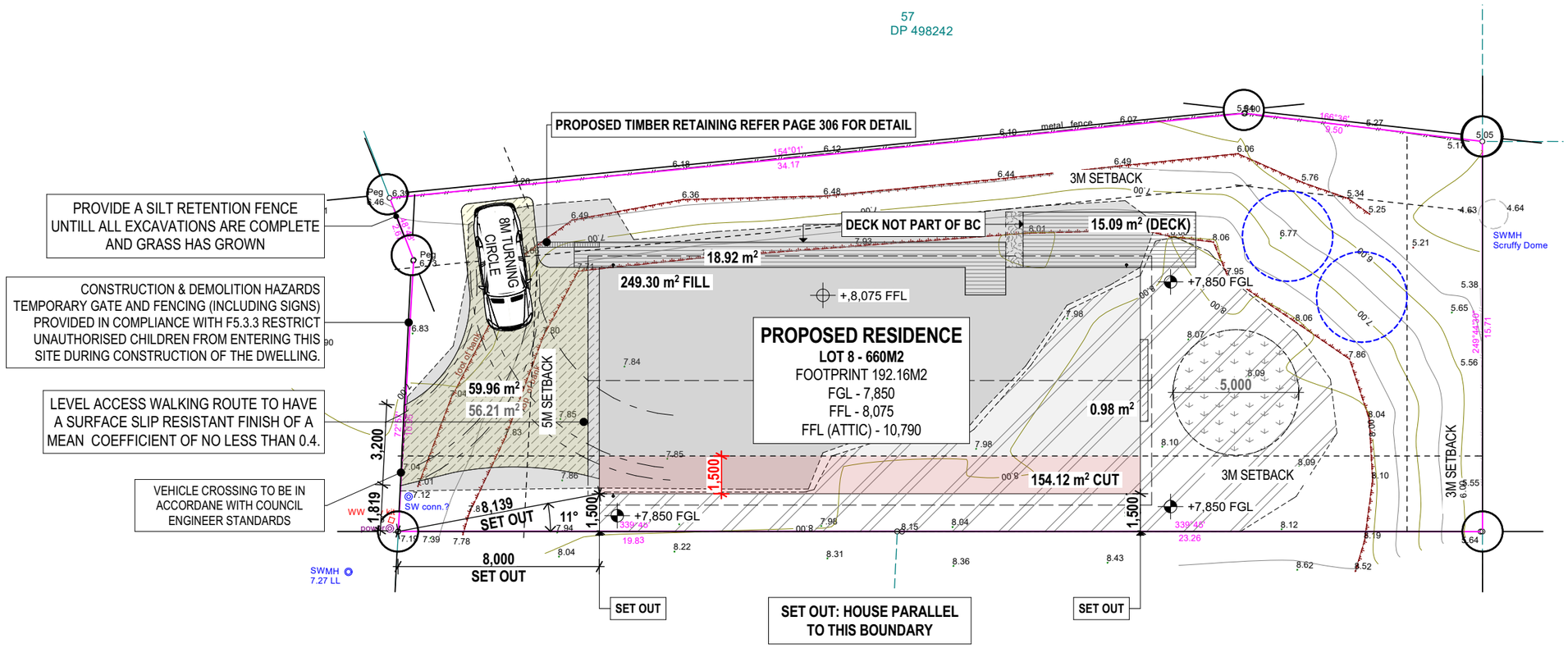
RC - RM220116

HOUSE
BRUSHED CONC
IMPERMEABLE
DECK
OUTDOOR LIVING

This review is limited to the structural design only as outlined in our calculations and other documentation. We have not reviewed any drawing dimensions. For any discrepancies please contact the undersigned.

Signed

Kevin Burrows (CPEng: 1897#)
GRAYSON DESIGN & DEVELOPMENTS LTD



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For
SEAN & KATE FULLAN

Drawing Title
SITE PLAN

SCALE @ A3.
1:200

SHEET NUMBER
102
OF: 35

WIND ZONE	HIGH
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EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

PROVIDE SILT RUN OFF PROTECTION

TAKE APPROPRIATE MEASURES TO PREVENT OR MINIMISE SEDIMENT GENERATION AND SILT RUN OFF. COMPLY WITH TERRITORIAL AND OTHER AUTHORITIES REQUIREMENTS RELATING TO CARYING OUT EARTHWORKS. PUMP WATER FROM TRENCHES AND OTHER AREAS OF SITE USING METHODS TO PREVENT SEDIMENT ENTERING ANY DRAIN OR WATERCOURSE. FILTER DIRTY WATER BEFORE DISCHARGING INTO ANY DRAINAGE SYSTEM

PLUMBING AND DRAINAGE:

1. ALL SANITARY PLUMBING AND DRAINAGE WORK MUST COMPLY WITH NZ BUILDING CODE ACCEPTABLE SOLUTION AS/NZS 3500 PART 2.2

2. ALL STORMWATER DRAINAGE WORK MUST COMPLY WITH NZ BUILDING CODE ACCEPTABLE SOLUTION E1/AS1

3. SANITARY PLUMBING MUST BE RUN IN PVC, AND WATER RETICULATION IN POLYBUTYLENE.

4. COLD WATER SUPPLY PIPE TO HAVE A NON-RETURN VALVE FITTED BEFORE THE FIRST OUTLET.

5. ALL EXISTING SERVICES MUST BE LOCATED AND PEGGED BEFORE COMMENCING WORK.

MINIMUM GRADIENT RATIO OF SANITARY DISCHARGE PIPES AND DRAINS:

1. AS/NZS 3500 PART 2 DISCHARGE PIPES AND DRAINS.

DRAIN GRADIENTS	TABLE 3.2
DISCHARGE PIPES	TABLE 6.1
DISCHARGE GRADIENTS	TABLE 7.1

TABLES ARE PROVIDED AT BACK OF DRAWINGS

DN65 - 2.50% DN80 - 1.65% DN100 - 1.65%
DN125 - 1.25% DN150 - 1.65% DN225 - 0.65%

MINIMUM GRADIENT RATIO OF STORMWATER DRAINS: NZBC E1/AS1

DN100, MAX MODIFIED CATCHMENT AREA: 200M - 1:120
DN150, MAX. MODIFIED CATCHMENT AREA: 400M2 - 1:200

PLUMBING NOTE

ALL FIXTURE PIPES INTO MIN DN65 (DN100 PREFERED) BRANCHES UNDER SLAB. PLUMBER TO CONFIRM UNDERSLAB WASTE PIPE LOCATIONS WITH SITE MANAGER BEFORE THE SLAB IS POURED

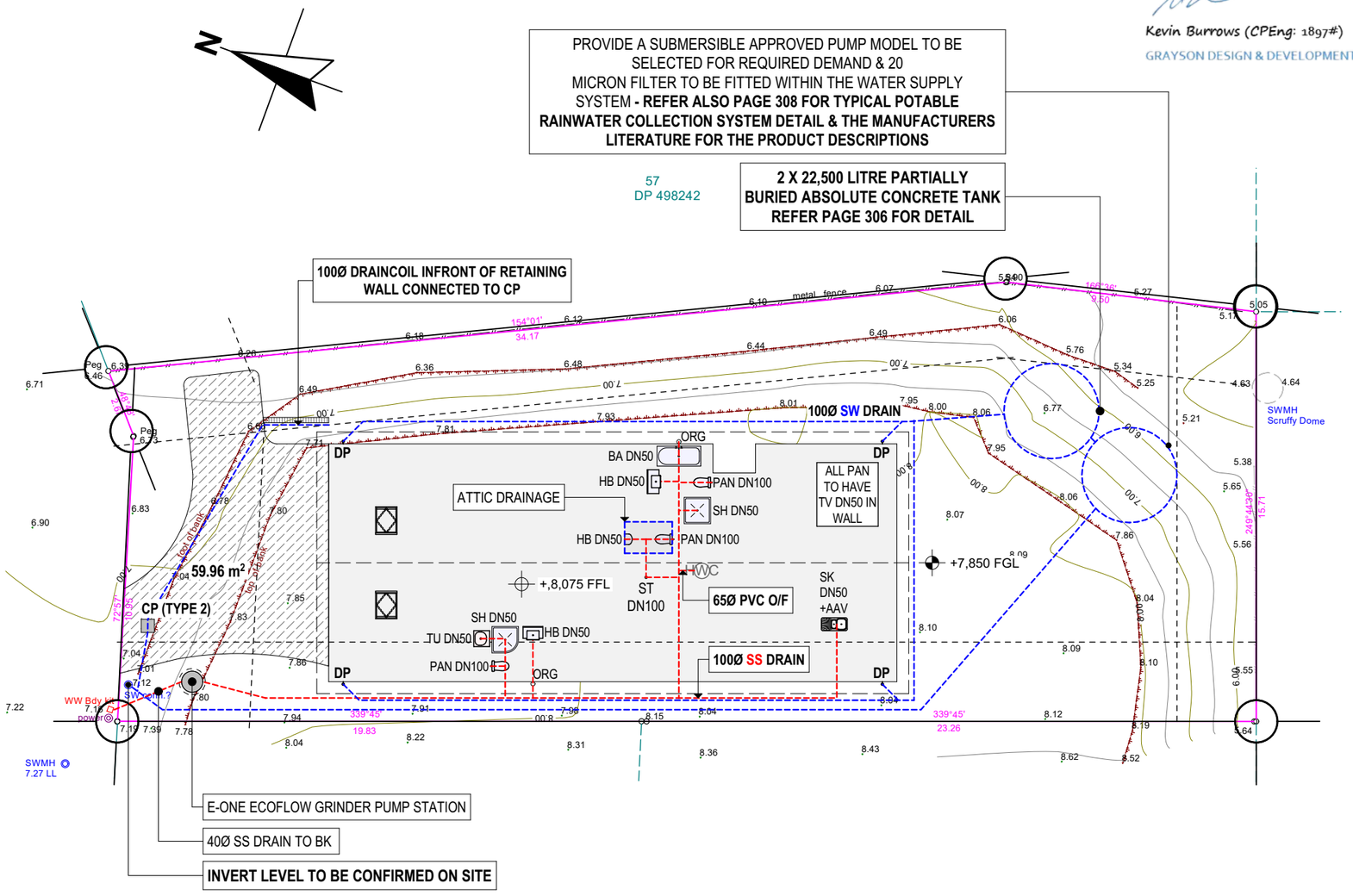
REFER ALSO - FOUNDATION PLAN

PLUMBING LEGEND

SS DRAIN

SW DRAIN

TV	TERMINAL VENT
AAV	AIR ADMITTANCE VALVE
CP	CESSPIT
DP	DOWN PIPE
ORG	OVERFLOW RELIEF GULLY
BA	BATH
DW	DISHWASHER
SH	SHOWER
SK	SINK
TU	LAUNDRY TUB
PAN	TOILET
HB	HAND BASIN
HWC	HOT WATER CYLINDER
ST	STACK



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DRAINAGE PLAN

SCALE @ A3.
1:200

SHEET NUMBER
103
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
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Drawn	DRAWN BY NAME
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(S) DOMESTIC SMOKE ALARMS.

SMOKE ALARMS SHALL COMPLY WITH APPROVED DOCUMENT F7 WARNING SYSTEMS. SMOKE ALARMS MAY BE BATTERY POWERED, HAVE A HUSH FACILITY HAVING A MIN. 60 SECOND DURATION, HAVE A TEST FACILITY AND BE APPROVED BY A RECOGNIZED AUTHORITY

(F) MANROSE FAN.

MANROSE AIR FLOW EXTRACTOR FAN - REFER LITERATURE FOR MORE DETAILED INFORMATION

GLAZING SCREENS

ALL GLASS SCREENS ARE TO BE CODE COMPLIANT TO ALL RELEVANT SAFETY GLASS STANDARDS AND ARE TO BE INSTALLED TO COMPLY WITH NZBC E3

WET AREAS WATERPROOFING SYSTEM OPTIONS

PROVIDE AN IMPERVIOUS AND EASILY CLEANABLE SURFACE TO ALL WALL AREAS LIKELY TO BE SPLASHED AND TO ALL BATHROOM, TOILET, LAUNDRY, KITCHEN AND MAIN ENTRANCE FLOORS.
USE ELEPHANT AQUABOARD ON BATHROOM, TOILET, LAUNDRY AND KITCHEN WALLS AND BATHROOM AND LAUNDRY CEILINGS.

TILING / WET AREAS SPECIFICATIONS

INSTALL ALL WET AREA LININGS, MEMBRANES AND TILING WORK IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, STANDARDS AND MANUFACTURERS LITERATURE:

NZBC E3/AS1 - INTERNAL MOISTURE
SPECIFICATION SECTIONS 6221A
ELEPHANT AQUABOARD WET AREA SYSTEMS AND DETAILS TECHNOKOLLA RASOGUM LITERATURE
FLOORING INSTALLATION MANUAL
AS3740 WATERPROOFING OF WET AREAS WITHIN RESIDENTIAL BUILDINGS
AS4992.2 CERAMIC TILE GROUTS AND ADHESIVES
AS3958.1 CERAMIC TILES - GUIDE TO THE INSTALLATION OF CERAMIC TILES

WALLS

• FIX TILES WITH APPROVED AND COMPATIBLE TILE ADHESIVE OVER TECHNOKOLLA RASOGUM WPM OVER ELEPHANT AQUABOARD SHEETS. FOR APPLICATIONS OF TILES
6MM OR LESS - STUDS @ 600CRS & NOGS @ 600CRS.
6MM OR MORE - STUDS @ 400CRS & NOGS @ 600CRS
• APPROVED PAINT SYSTEM. E.G. 1 COAT ALKYD SEALER AND 2 COATS WATER BASED ENAMEL

FLOORING

• TILING OVER CONCRETE FLOOR
FIX TILES WITH APPROVED AND COMPATIBLE TILE ADHESIVE OVER TECHNOKOLLA RASOGUM WATERPROOFING SYSTEM. ENSURE CONCRETE HAS HAD ADEQUATE CURING TIME

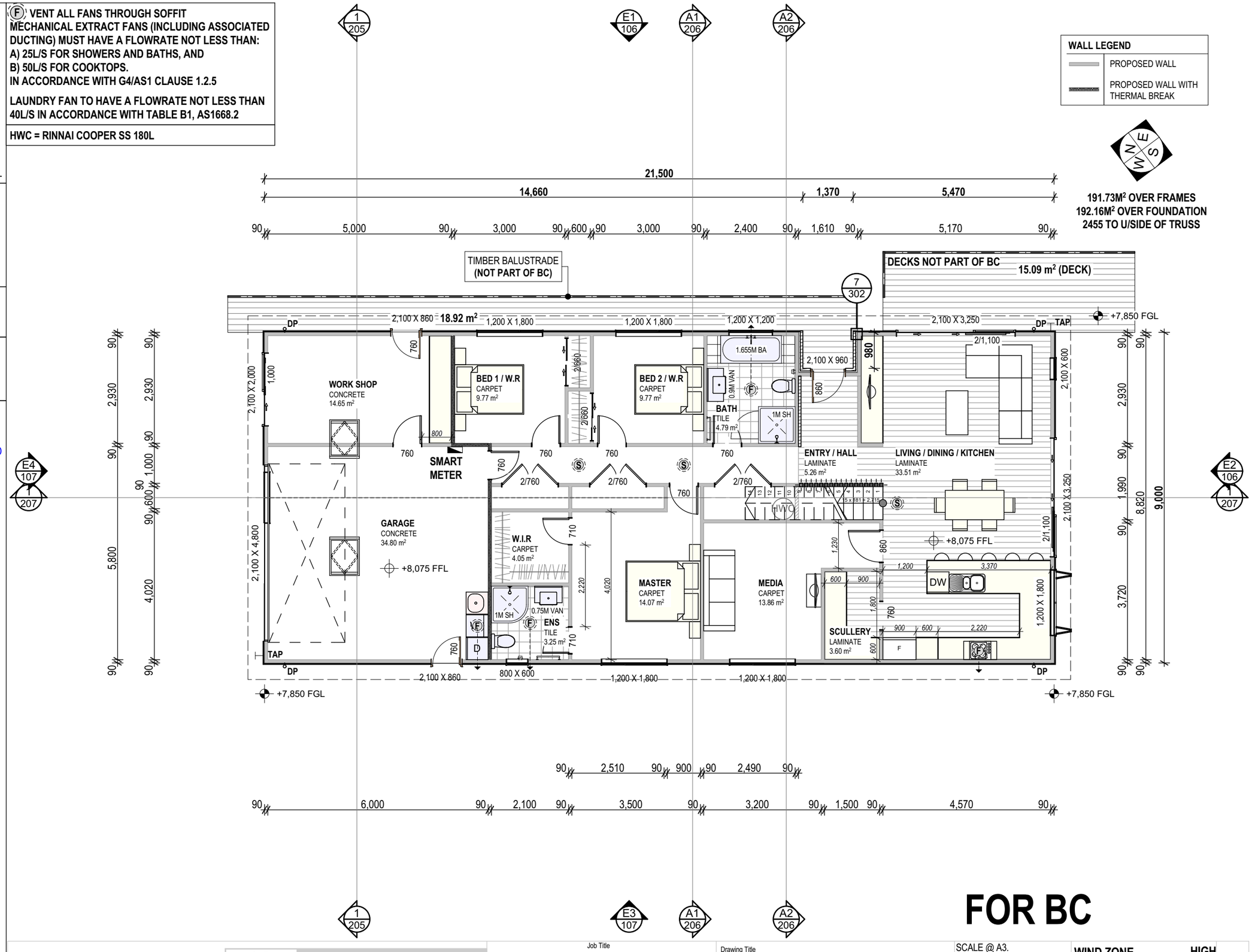
FLOORING

• VINYL OVER CONCRETE OR TIMBER FLOOR
FIX VINYL WITH APPROVED AND COMPATIBLE ADHESIVE OVER CONCRETE OR 19MM H3 PLYWOOD FLOOR.
REFER SPECIFICATION SECTION 6411.

(F) VENT ALL FANS THROUGH SOFFIT
MECHANICAL EXTRACT FANS (INCLUDING ASSOCIATED DUCTING) MUST HAVE A FLOWRATE NOT LESS THAN:
A) 25L/S FOR SHOWERS AND BATHS, AND
B) 50L/S FOR COOKTOPS.
IN ACCORDANCE WITH G4/AS1 CLAUSE 1.2.5

LAUNDRY FAN TO HAVE A FLOWRATE NOT LESS THAN 40L/S IN ACCORDANCE WITH TABLE B1, AS1668.2

HWC = RINNAI COOPER SS 180L



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At
68 WEKA ST MANGAWHAI
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SEAN & KATE FULLAN

Drawing Title
GROUND FLOOR PLAN

SCALE @ A3.
1:100

SHEET NUMBER
104
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
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TILING / WET AREAS SPECIFICATIONS

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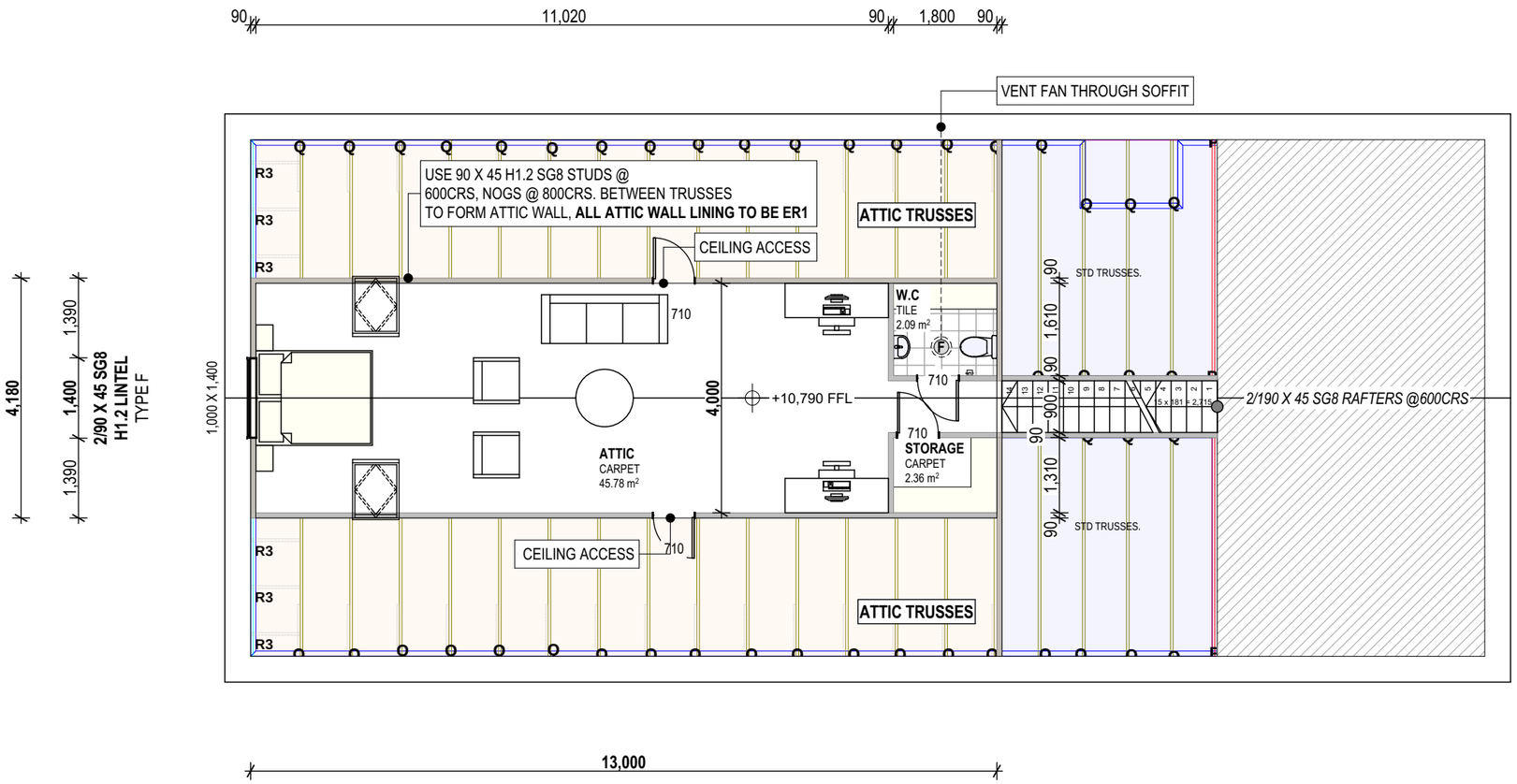
6MM OR MORE - STUDS @ 400CRS & NOGS @ 600CRS
• APPROVED PAINT SYSTEM. E.G. 1 COAT ALKYD SEALER AND 2 COATS WATER BASED ENAMEL

FLOORING

• TILING OVER TIMBER FLOOR
FIX TILES WITH APPROVED AND COMPATIBLE TILE ADHESIVE OVER TECHNOKOLLA RASOGUM WPM SYSTEM OVER JAMES HARDIE TILE AND SLATE UNDERLAY OVER 18MM H3.2CCA STRUCTURAL PLYWOOD OVER FLOOR JOISTS @ 400CRS MAX
DO NOT USE LOSP TREATED PLYWOOD



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Plot Date	4/08/2022

Job # 21035

ALUMINIUM JOINERY NOTES:

JOINERY MANUFACTURER TO CHECK AND VERIFY THE FOLLOWING PRIOR TO COMMENCING MANUFACTURE OF JOINERY UNITS.
ALL DIMENSIONS SHOWN ARE ROUGH OPENINGS.
ANY STRUCTURAL SUPPORTS WHERE REQUIRED.
REFER TO ENGINEERS DESIGNS WHERE REQUIRED.

1. **ALL JOINERY FAIRVIEW RESIDENTIAL / EVOLUTION SUITE GENERALLY AS REQUIRED FOR OPENING SIZES - UNLESS REQUESTED OTHER BY OWNER**
2. **ALL FRAMES DOUBLE GLAZED.**
3. **CONFIRM PANELS / GLAZING FOR FRONT DOOR WITH OWNER.**
4. **CONFIRM OPAQUE GLAZING WITH OWNER.**
5. **ALL SAFETY GLAZING SHALL BE SUPPLIED & INSTALLED TO THE REQUIREMENTS OF NZBC B1/AS1 & NZS 4223.3.**

GLAZING TO COMPLY WITH THE FOLLOWING STANDARDS

NZS 3504: SPECIFICATION FOR ALUMINIUM WINDOWS
NZS 4223: CODE OF PRACTISE FOR GLAZING IN BUILDINGS
NZS 4211: SPECIFICATION FOR THE PERFORMANCE OF WINDOWS

CLEAR FLOAT GLASS, TOUGHENED AS REQUIRED FOR PANE SIZE.
OPAQUE GLASS - ACID TECH OR LAMINATED WITH OBSCURE INTER LAYER.
ALL FIXINGS AND FLASHINGS TO MANUFACTURERS DETAILS AND SPECIFICATIONS.
INSTALL WITH THERMAKRAFT WINDOW WORM AND ALUBAND FLASHING TAPE SYSTEM TO WRAP MANUFACTURERS SPECIFICATIONS AND DETAILS.
FINISHES TO ALL SILL TRAYS AND FLASHINGS TO MATCH JOINERY FRAMES.
ALL HINGES FOR EXTERIOR JOINERY TO BE MARINE GRADE 316 STAINLESS STEEL.
ALL HARDWARE TO OWNERS SPECIFICATION

REFER FLOOR PLANS / ELEVATIONS FOR HANGING ORIENTATIONS.
ALL INTERIOR DOORS TO BE SEMI GLOSS PAINT FINISH.
ALL INTERIOR DOOR HEIGHTS AS SHOWN AND HOLLOW CORE UNLESS SPECIFIED OTHER.
SOLID SLASH ALL EDGES.

BUILDING ENVELOPE RISK MATRIX
ALL WALLS

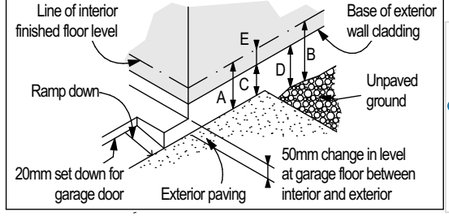
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0
Roof/wall intersection design	Low risk	0
Eaves width	High risk	2
Envelope complexity	Medium risk	1
Deck design	Low risk	0
Total Risk Score:		**4**

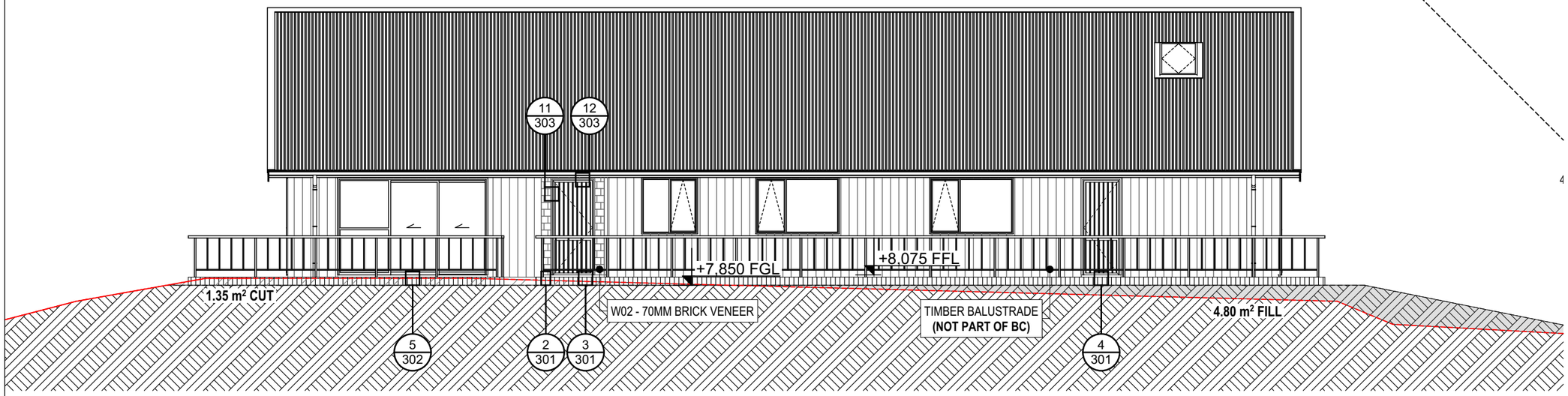
LEVELS AND CLADDING CLEARENCES TO COMPLY WITH E2/AS1 fig.65 / table 18

Min. clearance	Masonry Veneer	Other claddings				
	A	B	A	B	C	D	E
CONCRETE SLAB	100	150	150	225	100	175	50
TIMBER FLOOR	refer note				100	175	50

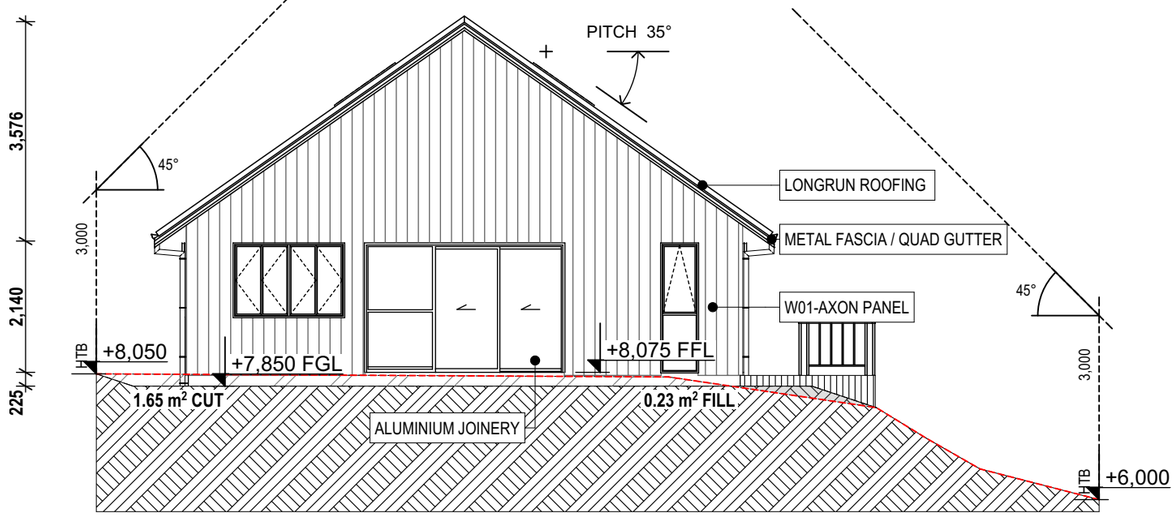
NOTE: refer to NZS3604 for Req.

Brick veneer requires additional clearance under slab rebate of 25mm to paved surfaces or 100mm to unpaved ground





E1 104 — EAST ELEVATION 1:100



E2 104 — SOUTH ELEVATION 1:100

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3. **CONFIRM PANELS / GLAZING FOR FRONT DOOR WITH OWNER.**
4. **CONFIRM OPAQUE GLAZING WITH OWNER.**
5. **ALL SAFETY GLAZING SHALL BE SUPPLIED & INSTALLED TO THE REQUIREMENTS OF NZBC B1/AS1 & NZS 4223.3.**

GLAZING TO COMPLY WITH THE FOLLOWING STANDARDS

NZS 3504: SPECIFICATION FOR ALUMINIUM WINDOWS
NZS 4223: CODE OF PRACTISE FOR GLAZING IN BUILDINGS
NZS 4211: SPECIFICATION FOR THE PERFORMANCE OF WINDOWS

CLEAR FLOAT GLASS, TOUGHENED AS REQUIRED FOR PANE SIZE.
OPAQUE GLASS - ACID TECH OR LAMINATED WITH OBSCURE INTER LAYER.
ALL FIXINGS AND FLASHINGS TO MANUFACTURERS DETAILS AND SPECIFICATIONS.
INSTALL WITH THERMAKRAFT WINDOW WORM AND ALUBAND FLASHING TAPE SYSTEM TO WRAP MANUFACTURERS SPECIFICATIONS AND DETAILS.
FINISHES TO ALL SILL TRAYS AND FLASHINGS TO MATCH JOINERY FRAMES.
ALL HINGES FOR EXTERIOR JOINERY TO BE MARINE GRADE 316 STAINLESS STEEL.
ALL HARDWARE TO OWNERS SPECIFICATION

REFER FLOOR PLANS / ELEVATIONS FOR HANGING ORIENTATIONS.
ALL INTERIOR DOORS TO BE SEMI GLOSS PAINT FINISH.
ALL INTERIOR DOOR HEIGHTS AS SHOWN AND HOLLOW CORE UNLESS SPECIFIED OTHER.
SOLID SLASH ALL EDGES.

BUILDING ENVELOPE RISK MATRIX
ALL WALLS

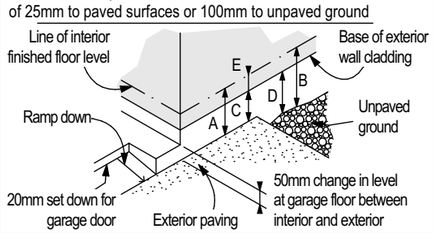
Risk Factor	Risk Severity	Risk Score
Wind zone (per NZS 3604)	High risk	1
Number of storeys	Low risk	0
Roof/wall intersection design	Low risk	0
Eaves width	High risk	2
Envelope complexity	Medium risk	1
Deck design	Low risk	0
Total Risk Score:		**4**

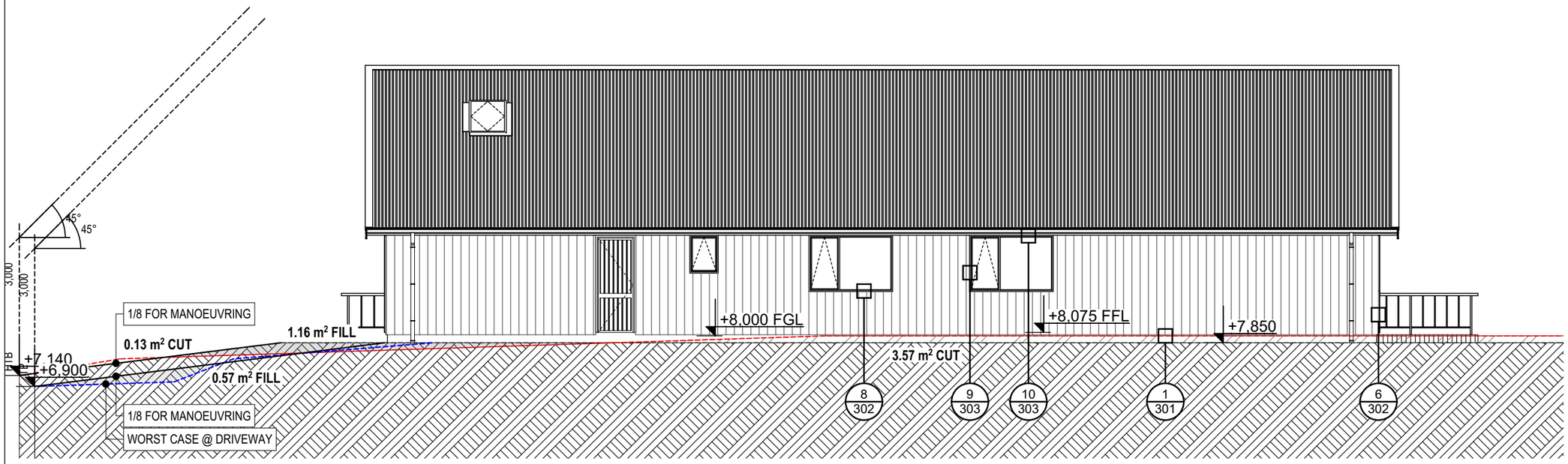
LEVELS AND CLADDING CLEARENCES TO COMPLY WITH E2/AS1 fig.65 / table 18

Min. clearance	Masonry Veneer	Other claddings				
	A B	A	B	C	D	E
CONCRETE SLAB	100 150	150	225	100	175	50
TIMBER FLOOR	refer note			100	175	50

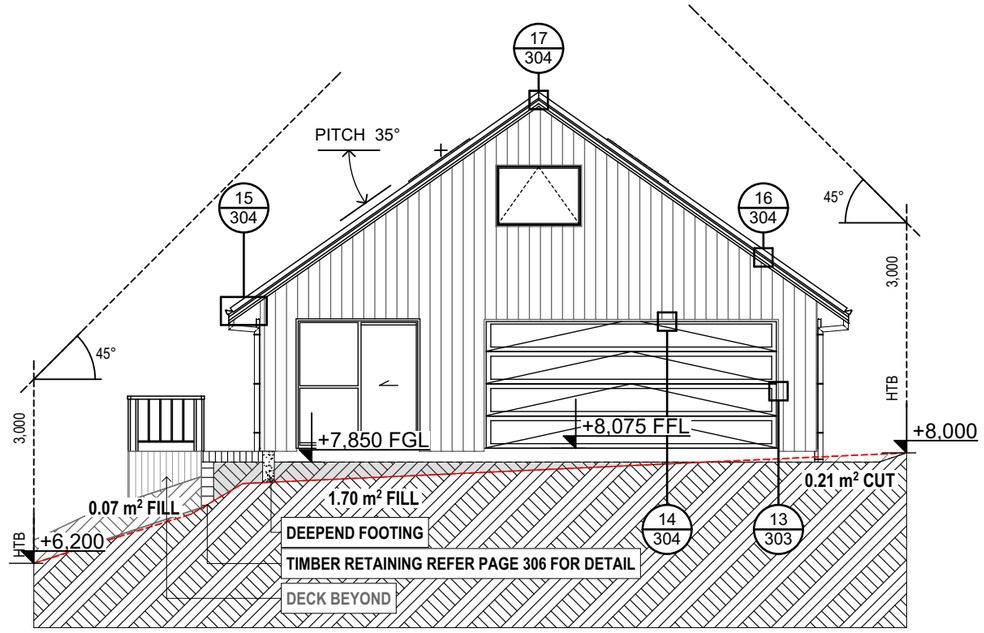
NOTE: refer to NZS3604 for Req.

Brick veneer requires additional clearance under slab rebate of 25mm to paved surfaces or 100mm to unpaved ground





E3 104 — WEST ELEVATION 1:100



E4 104 — NORTH ELEVATION 1:100

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
ELEVATIONS

SCALE @ A3.
1:100

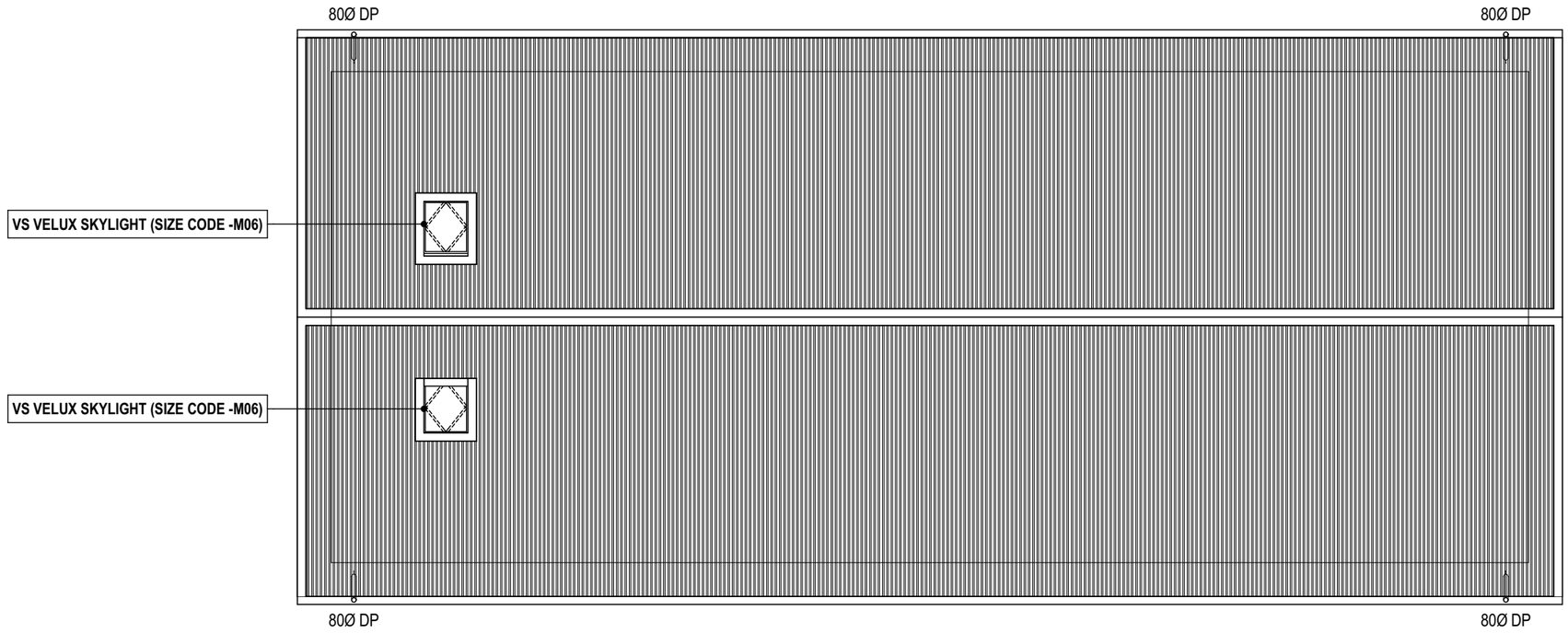
SHEET NUMBER
107
OF: 35

WIND ZONE	**HIGH**
EXPOSURE ZONE	**D**
EQ ZONE	**1**
ZONE	**RES HARBOUR**
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

DOWNPIPE CALCULATIONS:
PROPOSED ROOF PITCH = 35°
0° - 25° = 1 80Ø DP/85M²
25° - 35° = 1 80Ø DP/70M²
35° - 45° = 1 80Ø DP/60M²
PROPOSED ROOF AREA = 221.76M²
REQUIRED # OF DP = 4
SUPPLIED # OF DP = 4
COMPLIES

LONGRUN ROOFING
AREA: 221.76
35⁰ PITCH



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Job Title
PROPOSED DWELLING
At
68 WEKA ST
MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
ROOF PLAN

SCALE @ A3.
1:100

SHEET NUMBER
108
OF: 35

WIND ZONE	**HIGH**
EXPOSURE ZONE	**D**
EQ ZONE	**1**
ZONE	**RES HARBOUR**
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

DURABILITY OF ALL FIXINGS
FIXINGS ARE TO COMPLY WITH NZBC B2 DURABILITY AND
NZS 3604:2011 SECTION 4 - DURABILITY.

ALL ZONES
1. NAIL PLATES IN CLOSED AND ROOF SPACES TO BE CONTINUOUSLY COATED GALV. STEEL.
2. WIRE DOGS & BOLTS IN CLOSED AND ROOF SPACES TO BE HOT-DIPPED GALV. STEEL.
3.ALL OTHER STRUCTURAL FIXINGS IN COLSED ENVIRONMENTS TO BE MILD STEEL (UNCOATED NON-GALV. STEEL).

ZONE D
ALL FIXINGS ARE TO BE TYPE 304 OR 316 STAINLESS STEEL IN EXPOSED AND SHELTERED ENVIRONMENT.

ZONES B AND C
1. ALL FIXINGS WITHIN 600MM OF THE GROUND SHELTERED AND EXPOSED ARE TO BE TYPE 304 OR 316 STAINLESS STEEL.
2. ALL SHELTERED FIXINGS MORE THAN 600MM FROM THE GROUND ARE TO BE HOT-DIP GALV. STEEL.
3. ALL EXPOSED FIXINGS ARE TO BE TYPE 304 OR 316 STAINLESS STEEL.

FS1 - RIB RAFT FLOOR SLAB
90MM (MIN) THICK 25MPA SLAB WITH HURRICANE SE62res MESH, 40MM MIN TOP COVER, ON 1100SQ X 220MM THICK POLYSTYRENE PODS, OVER THERMAKRAFT 250 MICRON DPM. (LAP AND SEAL JOINTS 150MM) OVER MIN 25MM SAND BLINDING OVER COMPACTED HARDFILL.

SLAB TO BE CONSTRUCTED IN ACCORDNACE WITH SPECIFIC ENGINEERING DESIGN

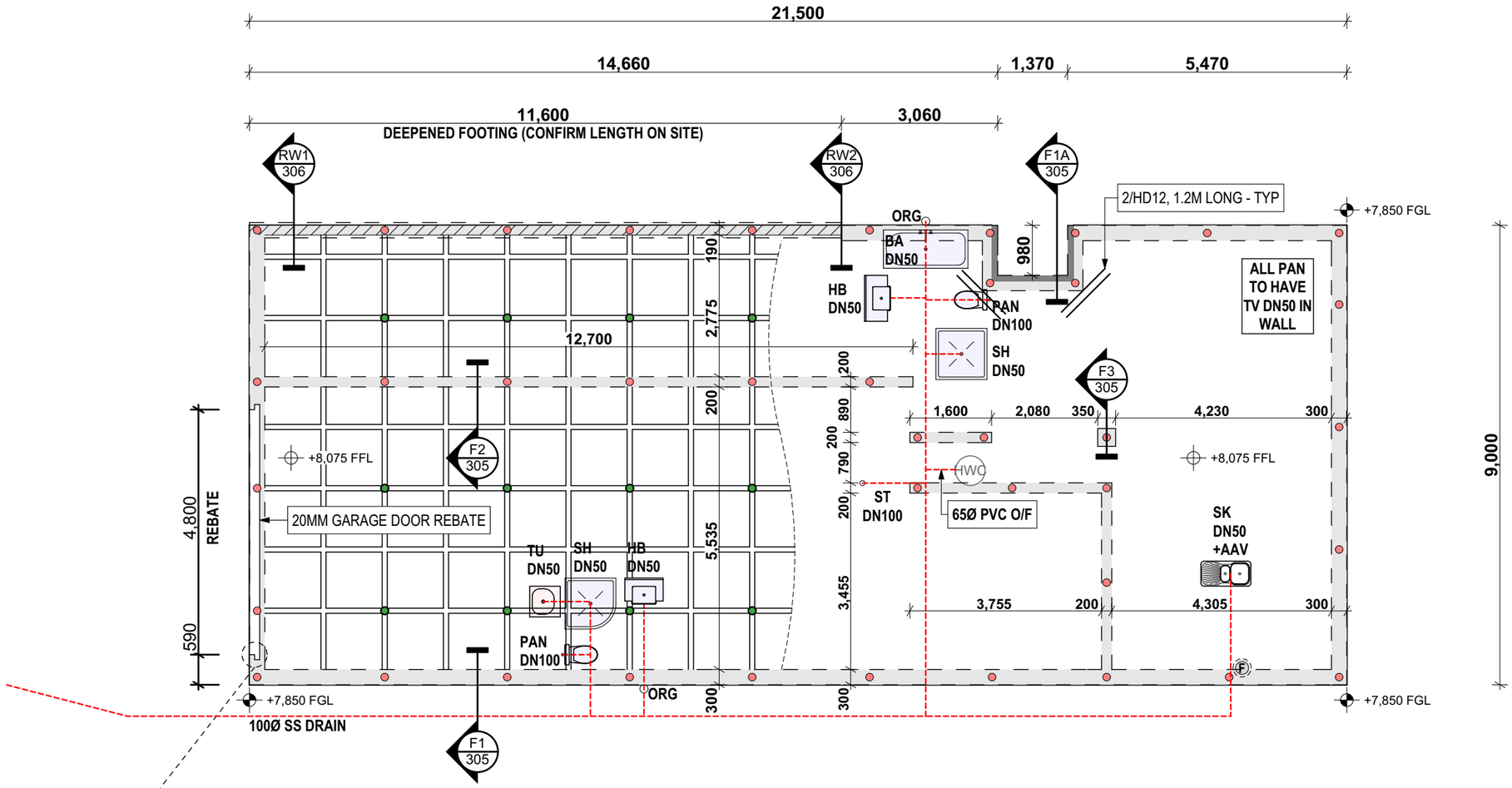
F1 - RAFTFLOOR EDGE BEAM - 300MM / INTERNAL RIB - 100MM
F1A - RAFTFLOOR EDGE BEAM
F2 - RAFTFLOOR INTERNAL THICKENING - 200MM
F3 - POST PAD
RW1 - DEEPENED FOOTING
RW2 - F1 TO RW1 CONNECTION
- **TYPE A PILES** - 150 DIA H5 POST DRIVEN WITH 500KG HAMMER, 1.0M DEEP. DRIVEN TO MIN 2.5M DEEP TO ACHIVE MAX SET 25MM
- **TYPE B PILES** - 150 DIA H5 POST DRIVEN WITH 500KG HAMMER, 1.0M DEEP. DRIVEN TO MIN 2.5M DEEP TO ACHIVE MAX SET 30MM

This review is limited to the structural design only as outlined in our calculations and other documentation. We have not reviewed any drawing dimensions. For any discrepancies please contact the undersigned.

Signed

Kevin Burrows (CPEng: 1897#)
GRAYSON DESIGN & DEVELOPMENTS LTD

PLUMBING NOTE	FOUNDATIONS BY ENGINEER
ALL FIXTURE PIPES INTO MIN DN65 (DN100 PREFERED) BRANCHES UNDER SLAB. PLUMBER TO CONFIRM UNDERSLAB WASTE PIPE LOCATIONS WITH SITE MANAGER BEFORE THE SLAB IS POURED	PLEASE REFER ENGINEERS PLANS & CALCULATIONS
	90MM RIB RAFT SLAB 192.16M2 REFER SLAB NOTE - ALL RIBS @ 1200CRS UNLESS DIMENSIONED



PLUMBING LEGEND

SS DRAIN
SW DRAIN

TV	TERMINAL VENT
AAV	AIR ADMITTANCE VALVE
CP	CESSPIT
DP	DOWN PIPE
ORG	OVERFLOW RELIEF GULLY
BA	BATH
DW	DISHWASHER
SH	SHOWER
SK	SINK
TU	LAUNDRY TUB
PAN	TOILET
HB	HAND BASIN
HWC	HOT WATER CYLINDER
ST	STACK

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
FOUNDATION PLAN

SCALE @ A3.
1:100
SHEET NUMBER
201
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

WALL FRAMING - HIGH WIND ZONE
ADAPTED FROM NZS 3604:2011 TABLE 8.2 & 8.3

LOAD BEARING SINGLE STOREY WALLS:
EXTERNAL WALLS
2400 MAX HEIGHT - USE 90 X 45 H1.2 SG8 STUDS @ 600CRS, NOGS @ 800CRS.
2700 MAX HEIGHT - USE 90 X 45 H1.2 SG 8 STUDS @ 400CRS NOGS @ 800CRS
3000 MAX HEIGHT - USE 90 X 45 H1.2 SG 8 STUDS @ 300CRS NOGS @ 800CRS
USE DOUBLE TOP PLATE OR CONTINUOUS 140 X 35 H1.2 SG8 RIBBON PLATE OVER SINGLE TOP PLATE.
INTERNAL WALLS.
3000 MAX HEIGHT - USE 90 X 45 H1.2 SG8 STUDS @ 600CRS, NOGS @ 800CRS

LOAD BEARING LOWER OF TWO STOREY WALLS
EXTERNAL WALLS.
2700 MAX HEIGHT - USE 90 X 45 H1.2 SG8 STUDS @ 400CRS, NOGS @ 800CRS.
3000 MAX HEIGHT - USE 90 X 45 H1.2 SG 8 STUDS @ 300CRS NOGS @ 800CRS
USE DOUBLE TOP PLATE OR CONTINUOUS 140 X 35 H1.2 SG8 RIBBON PLATE OVER SINGLE TOP PLATE.
INTERNAL WALLS.
2700 MAX HEIGHT - USE 90 X 45 H1.2 SG8 STUDS @ 600CRS, NOGS @ 800CRS.
3000 MAX HEIGHT - USE 90 X 45 H1.2 SG 8 STUDS @ 400CRS NOGS @ 800CRS

NON LOAD BEARING INTERNAL WALLS
2400 MAX HEIGHT - USE 90 X 45 SG8 H1.2 STUDS @ 600CRS, NOGS @ 800CRS.
3000 MAX HEIGHT - USE 90 X 45 SG8 H1.2 STUDS @ 400CRS, NOGS @ 800CRS.

TILED INTERNAL WALLS
90 X 45 H1.2 SG8 STUDS @ 400CRS & NOGS @ 600CRS.

BUILT UP MEMBERS ARE TO BE NAILED TO COMPLY WITH NZS 3604:2011, CLAUSE 2.4.4.7

LINTELS / BEAMS
ALL LINTEL AND BEAM DIMENSIONS SHOWN ARE OPEN SPANS ONLY. ALLOW EXTRA LENGTH FOR TRIMMING STUD REQUIREMENTS. REFER NZS 3604:2011 - CLAUSE 8.5 / TABLE 8.5 FOR TRIMMING STUDS

LINTEL FIXING
FIXING REQUIREMENTS SHOWN ON PLAN. REFER DETAILS.

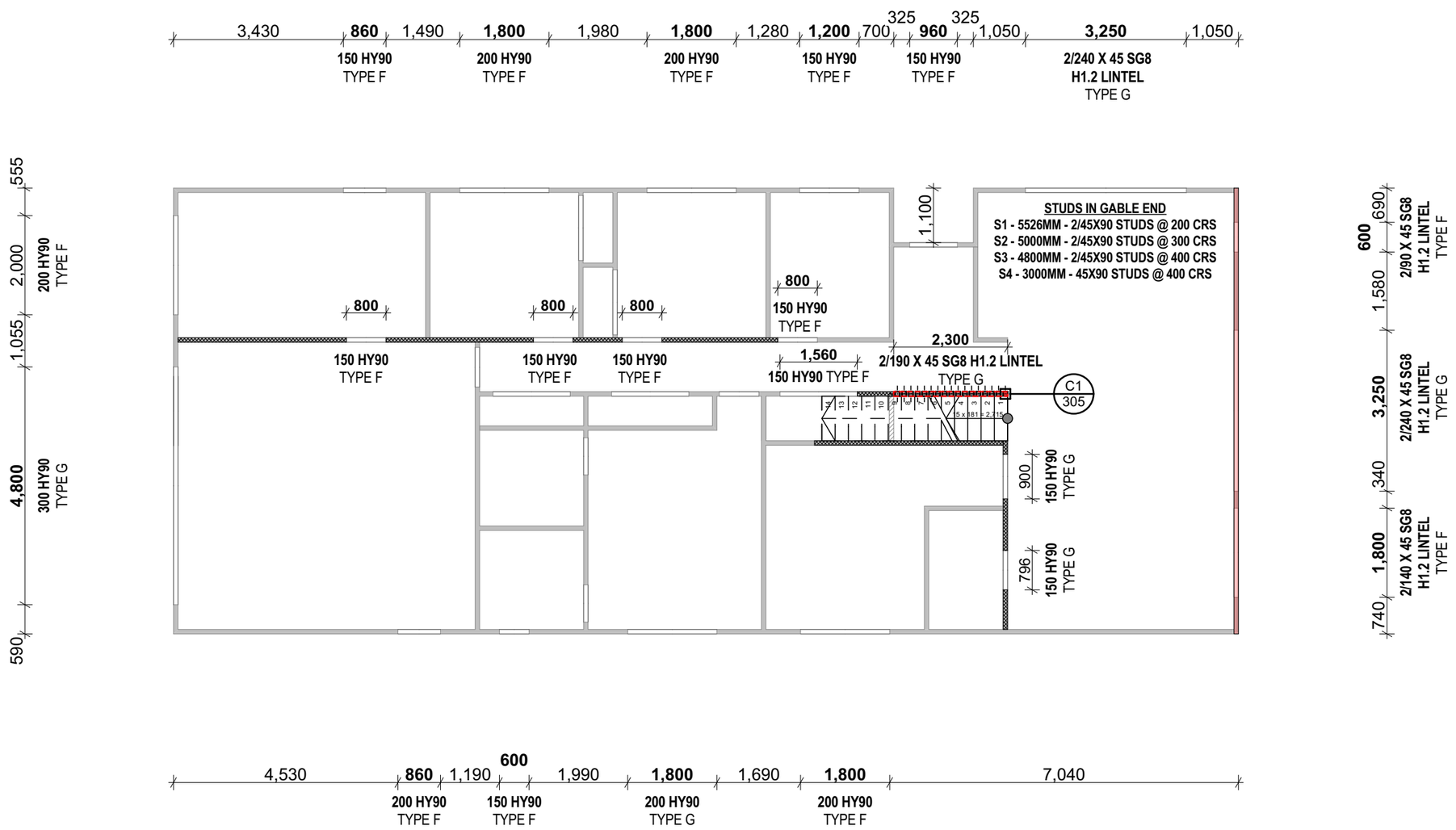
TOP PLATE FIXING
TYPE B **OR** BOWMAC STUD-LOK FIXING - ALL REQUIRED WALLS

REFER MITEK ON SITE GUIDE 2018 FOR LINTEL FIXING AND TOP PLATE FIXING DETAILS

WALL FRAMING NOTE
SOME WALL FRAMING & NOGS MAY NEED TO BE ADDED OR ALTERED ON SITE, CONFIRM WITH PROJECT MANAGER.

NOTE
ALL BOLTS SHALL HAVE 50SQ X 3MM WASHERS TO TIMBER FACES

WESTMORELAND HOMES LTD TO CONFIRM ALL JOINERY OPENING POSITIONS WITH PRECUT DESIGN PRIOR TO FABRICATIONS



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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
WALL FRAMING / LINTEL PLAN

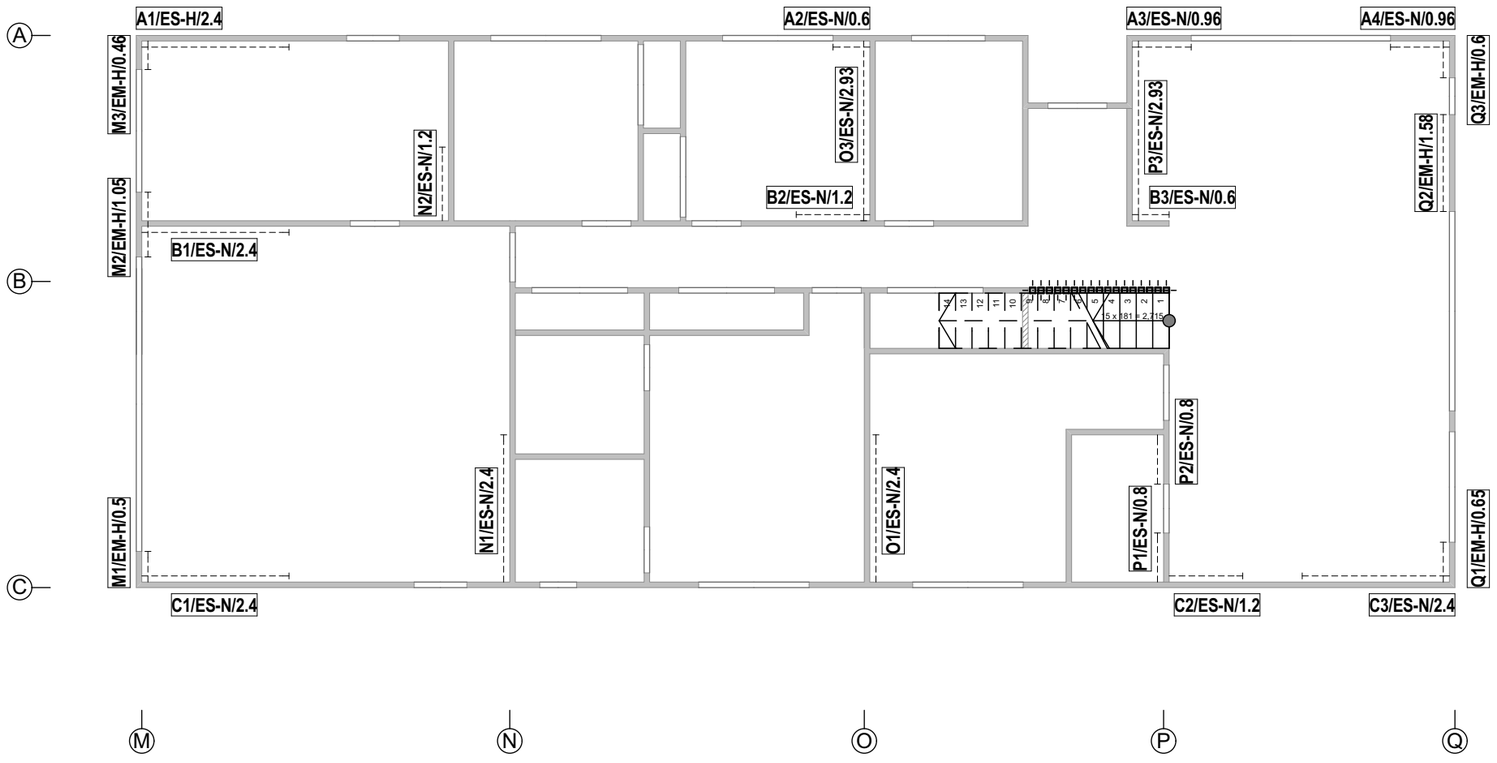
SCALE @ A3.
1:100

SHEET NUMBER
202
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

WALL BRACING
ALL WALL BRACES TO STUD WALLS ARE TO BE GIB 10MM BRACES INSTALLED IN ACCORDANCE WITH THE GIB EZYBRACE MANUAL 2016. REFER LITERATURE PROVIDED



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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
WALL BRACING PLAN

SCALE @ A3.
1:100

SHEET NUMBER
203
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

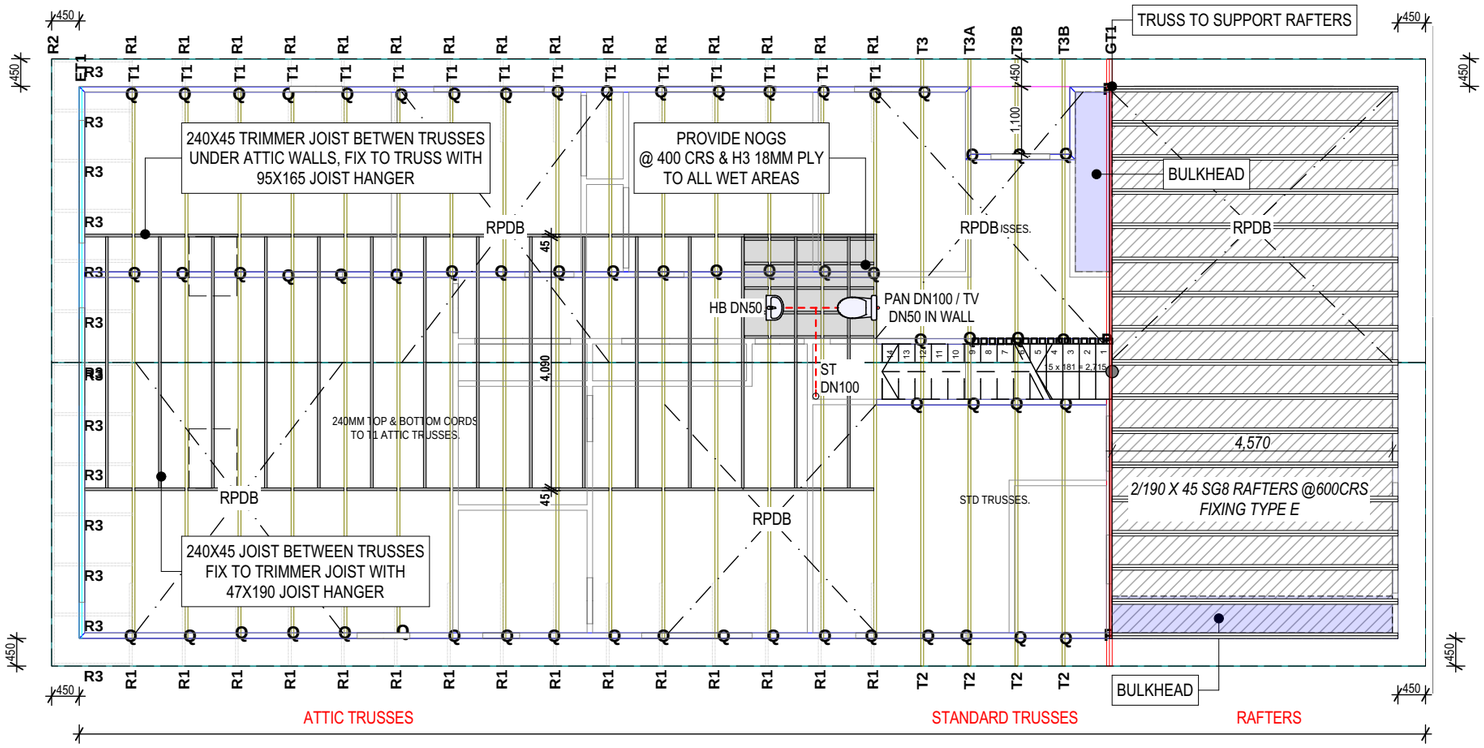
Job # 21035

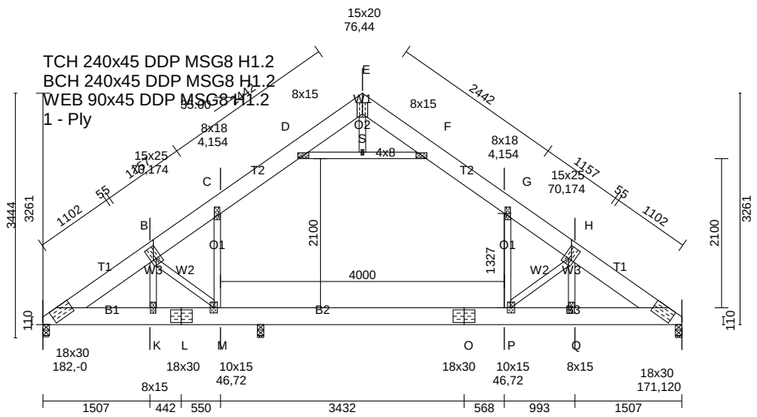
RAFTER FIXING
TYPE E (0.47KN)
2/90 X 3.15 SKEWED NAILS + 2 WIRE DOGS

PURLIN REQUIREMENTS
70 X 45 SG8 H1.2 PURLINS @ MAX 900C
TYPE T (2.4KN)
1/10G SELF-DRILLING SCREW, 80MM LONG (UP TO VERY HIGH)
TYPE U (5.5KN)
1/14G SELF-DRILLING TYPE 17 SCREW, 100MM LONG (EXTRA HIGH)

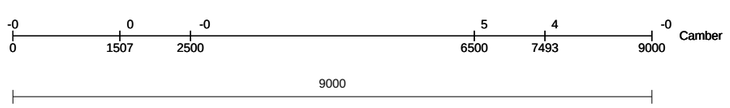
ROOF BRACING - LIGHT HIP/GABLE ROOF
1 ROOF PLANE DIAGONAL BRACE PER 50M² (RPDB)
1 BRACE = 1 PAIR OF LUMBERLOCK STRIP BRACES FIXED TO MANUFACTURERS SPECS OR 1 HIP / VALLEY RAFTER
5 X RPDB PROVIDED

LONGRUN ROOFING
AREA: 221.76
35⁰ PITCH





REFER ASLO - TRUSS DESIGNERS PLANS & CALCULATIONS



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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
ROOF FRAMING PLAN

SCALE @ A3.
1:100, 1:1

SHEET NUMBER
204
OF: 35

WIND ZONE	**HIGH**
EXPOSURE ZONE	**D**
EQ ZONE	**1**
ZONE	**RES HARBOUR**
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

FLOORS

FS1

90MM RIBRAFT SLAB. REFER FOUNDATION PLAN.

FS2

TIMBER SUBFLOOR WITH 18MM PARTICAL BOARD FLOORING OVER FLOOR JOISTS. REFER ROOF FRAMING PLAN. (18MM H3 PLY TO ALL WET AREAS)

WALLS

W01

AXON PANEL ON 18MM H3.1 CAVITY BATTENS OVER BUILDING PAPER ON H1.2 SG8 STUDS. 10MM ELEPHANT BOARD STOPPED TO LEVEL 4. WALL BATTS.

W02

70MM BRICK VENEER ON 50MM VENTED CAVITY OVER 6MM RAB BOARD ON H1.2 SG8 STUDS. 10MM ELEPHANT BOARD STOPPED TO LEVEL 4. WALL BATTS.

ROOFS

R01

COLORSTEEL LONGRUN CORRUGATED ROOFING OVER THERMAKRAFT UNDERLAY, 70 X 45 H1.2 SG8 PURLINS @ 900CRS MAX ON 90MM H1.2 GANGNAIL TRUSSES

CEILINGS

C01

10MM ELEPHANT BOARD FIXED TO UNDERSIDE OF 70 X 35 H1.2 BATTENS @ 600CCRS MAX. STOPPED TO LEVEL 4. CEILING BATTS OVER BATTENS.

C02

5MM HARDIESOFFIT LINING TO UNDERSIDE 70 X 45 H1.2 SG8 SOFFIT BATTENS @ 600CRS MAX

INSULATION REQUIREMENTS FOR NON-SOLID TIMBER WALL CONSTRUCTION

NZBC H1 2008 - CALCULATION METHOD.
R-VALUES SHOWN ARE PRODUCT R VALUES FOR CONSTRUCTION PURPOSES

1.0 ROOF.
1.1 COLORSTEEL ROOFING WITH UNDERLAY ON 90MM TRUSSES, R3.6 ECOINSULATION - R3.35

2.0 EXTERNAL WALLS.
2.1 TIMBER WEATHERBOARD ON CAVITY, BUILDING PAPER, 90MM TIMBER, R2.2 ECOINSULATION - R2.00
2.2 70MM BRICK ON CAVITY, BUILDING PAPER, 90MM TIMBER, R2.2 ECOINSULATION - R2.02

3.0 FLOORS.
3.1 RIBRAFT - R1.6
3.2 TIMBER SUBFLOOR, 18MM PARTICAL BOARD FLOORING, OVER 240+MM FLOOR JOISTS, USING R1.4 - R1.65

4.0 GLAZING.
4.1 ALUMINIUM JOINERY.
DOUBLE GLAZING TO ALL JOINERY - R0.26

TIMBER TREATMENT LEVELS:

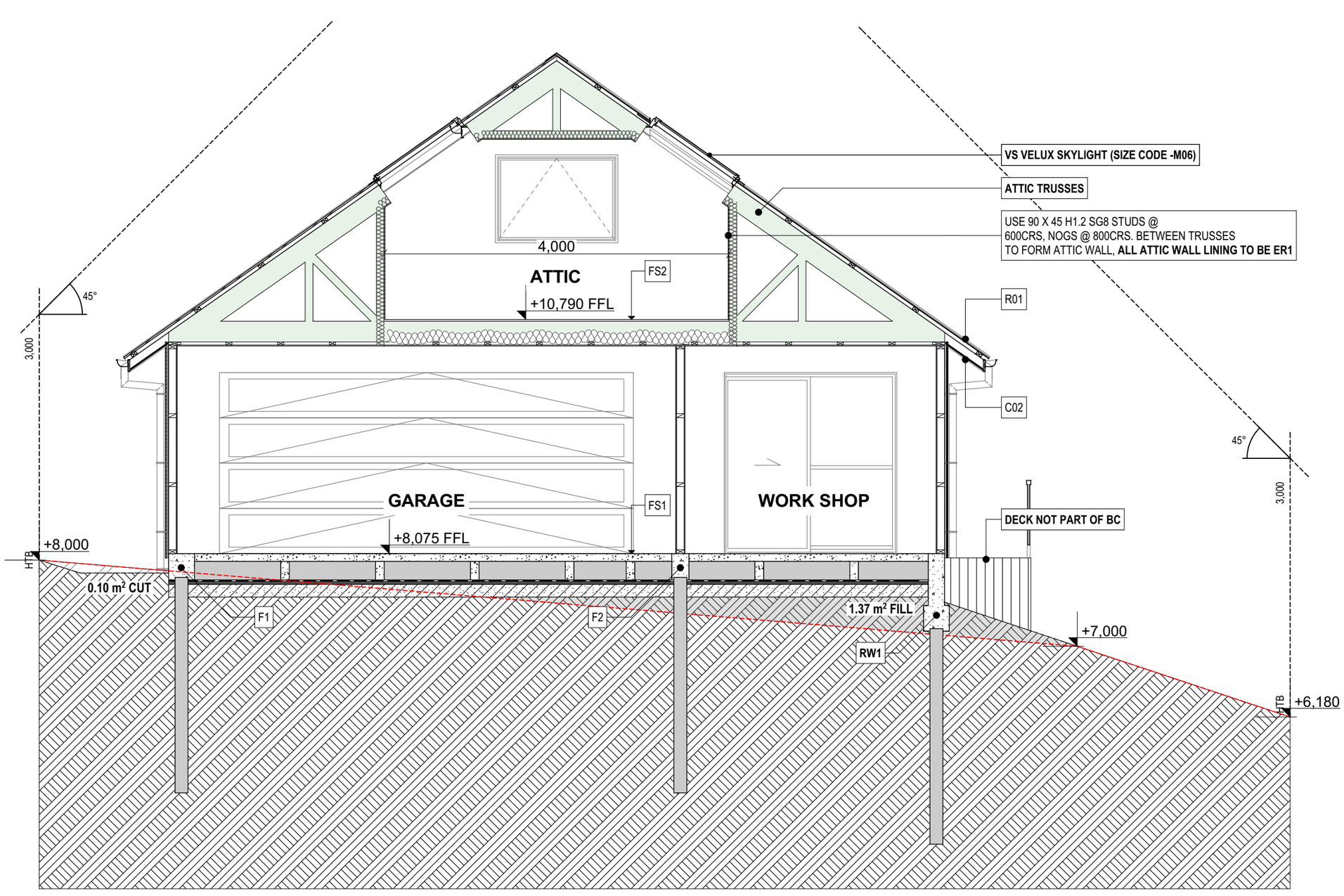
TREATMENT LEVELS TO COMPLY WITH NZBC CLAUSE B2/AS1 DURABILITY, NZS3602. TIMBER AND WOOD BASED PRODUCTS FOR USE IN BUILDING AND NZS3640 CHEMICAL PRESERVATION OF ROUND AND SAWN TIMBER. THIS TABLE IS A SUMMARY OF THE MINIMUM TREATMENT LEVEL REQUIREMENTS ONLY. HIGHER LEVELS MAY BE USED IN ANY SITUATION.

ALL WALL FRAMING AND ASSOCIATED MEMBERS - H1.2
ROOF FRAMING, TRUSSES AND CEILING JOISTS
ENCLOSED FRAMING WITHIN SKILLION / FLAT ROOFS
SUBFLOOR FRAMING / INTERIOR FLOOR FRAMING
PARAPET FRAMING
FRAMING FOR ENCLOSED DECKS,BALCONIES AND BALUSTRADES - NOT CANTILEVERED
ENCLOSED POST AND BEAM OR WALL TRIMMING
STUDS AND LINTELS UNDER ENCLOSED DECKS.

CLADDING CAVITY BATTENS - H3.1

EXPOSED DECKING / FRAMING AND EXTERNAL POST, BEAM AND BALUSTRADE - H3.2
FRAMING FOR ENCLOSED DECKS, BALCONIES AND ASSOCIATED MEMBERS - CANTILEVERED

PILES AND POSTS IN GROUND - H5



1/104 SECTION A 1:50

FLASHING AND WRAP SYSTEMS

ALL FLASHINGS, FLASHING TAPES, WRAPS, UNDERLAYS AND ASSOCIATED ACCESSORIES ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND AS PER DETAILS PROVIDED. NO SUBSTITUTIONS ARE PERMITTED WITHOUT PRIOR APPROVAL. IF SUBSTITUTIONS ARE MADE WITHOUT APPROVAL IT IS AT THE INSTALLERS RISK AND RESPONSIBILITY. INSTALLER ON SITE IS TO CHECK COMPATIBILITY OF ALL PRODUCTS.

FOR BC

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

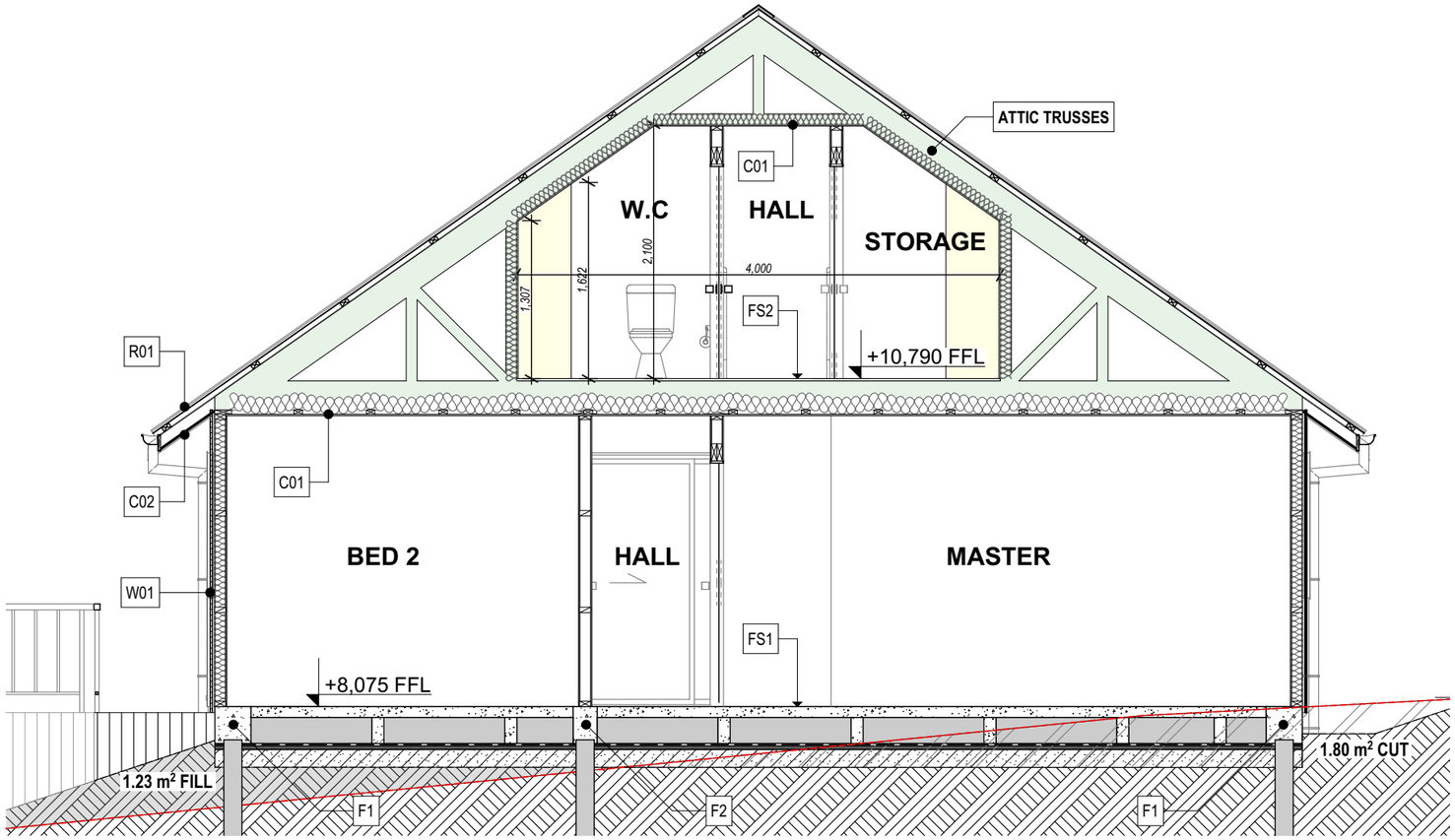
Drawing Title
SECTION A

SCALE @ A3.
1:50

SHEET NUMBER
205
OF: 35

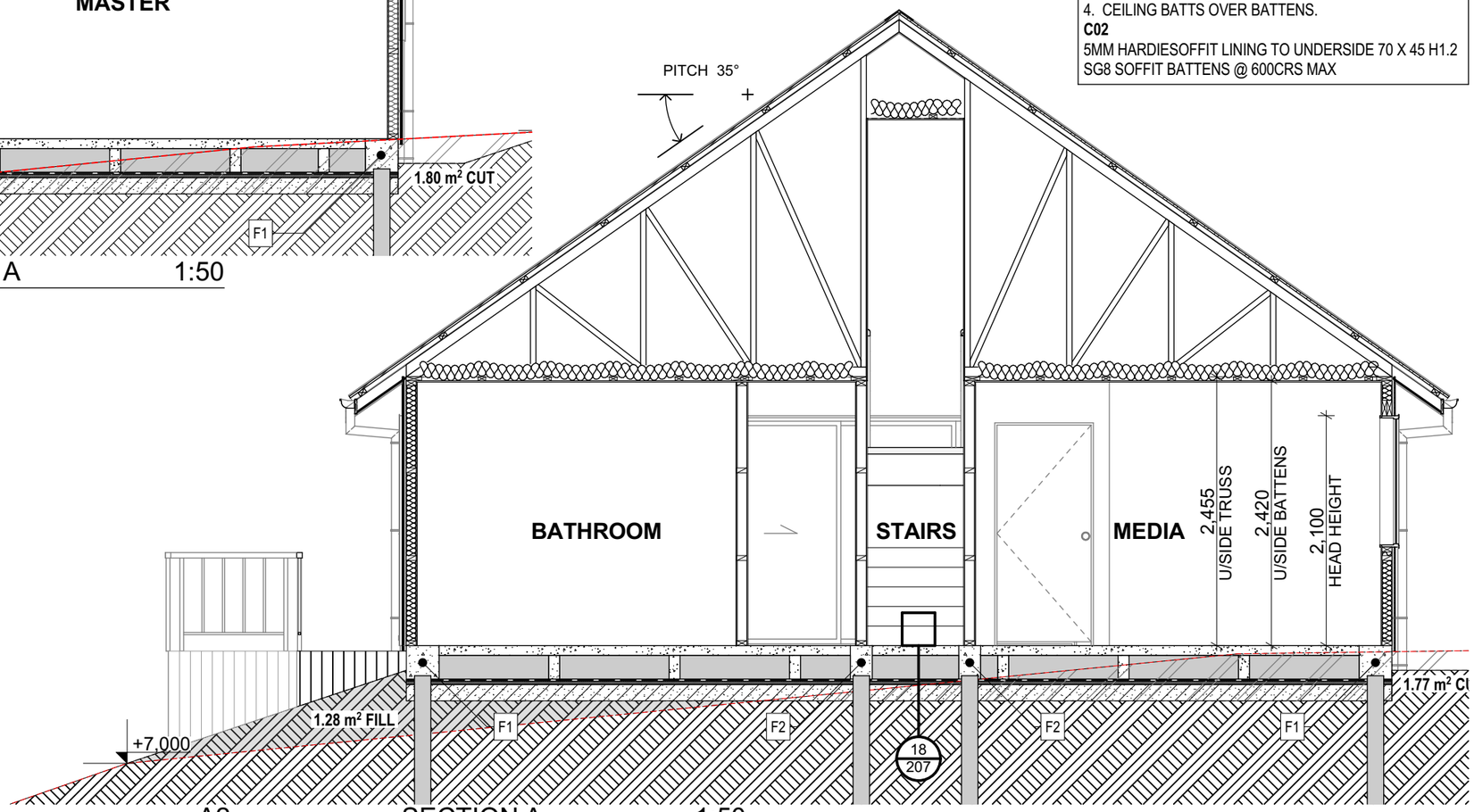
WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035



A1 SECTION A 1:50

104



A2 SECTION A 1:50

104

INSULATION REQUIREMENTS FOR NON-SOLID TIMBER WALL CONSTRUCTION

NZBC H1 2008 - CALCULATION METHOD.
R-VALUES SHOWN ARE PRODUCT R VALUES FOR CONSTRUCTION PURPOSES
1.0 ROOF.
1.1 COLORSTEEL ROOFING WITH UNDERLAY ON 90MM TRUSSES, R3.6 ECOINSULATION - R3.35
2.0 EXTERNAL WALLS.
2.1 TIMBER WEATHERBOARD ON CAVITY, BUILDING PAPER, 90MM TIMBER, R2.2 ECOINSULATION - R2.00
2.2 70MM BRICK ON CAVITY, BUILDING PAPER, 90MM TIMBER, R2.2 ECOINSULATION - R2.02
3.0 FLOORS.
3.1 RIBRAFT - R1.6
3.2 TIMBER SUBFLOOR, 18MM PARTICAL BOARD FLOORING, OVER 240+MM FLOOR JOISTS, USING R1.4 - R1.65
4.0 GLAZING.
4.1 ALUMINIUM JOINERY.
DOUBLE GLAZING TO ALL JOINERY - R0.26

FLOORS

FS1
90MM RIBRAFT SLAB. REFER FOUNDATION PLAN.

FS2
TIMBER SUBFLOOR WITH 18MM PARTICAL BOARD FLOORING OVER FLOOR JOISTS. REFER ROOF FRAMING PLAN. (18MM H3 PLY TO ALL WET AREAS)

WALLS

W01
AXON PANEL ON 18MM H3.1 CAVITY BATTENS OVER BUILDING PAPER ON H1.2 SG8 STUDS. 10MM ELEPHANT BOARD STOPPED TO LEVEL 4. WALL BATTS.

W02
70MM BRICK VENEER ON 50MM VENTED CAVITY OVER 6MM RAB BOARD ON H1.2 SG8 STUDS. 10MM ELEPHANT BOARD STOPPED TO LEVEL 4. WALL BATTS.

ROOFS

R01
COLORSTEEL LONGRUN CORRUGATED ROOFING OVER THERMAKRAFT UNDERLAY, 70 X 45 H1.2 SG8 PURLINS @ 900CRS MAX ON 90MM H1.2 GANGNAIL TRUSSES

CEILINGS

C01
10MM ELEPHANT BOARD FIXED TO UNDERSIDE OF 70 X 35 H1.2 BATTENS @ 600CCRS MAX. STOPPED TO LEVEL 4. CEILING BATTS OVER BATTENS.

C02
5MM HARDIESOFFIT LINING TO UNDERSIDE 70 X 45 H1.2 SG8 SOFFIT BATTENS @ 600CRS MAX

TIMBER TREATMENT LEVELS:

TREATMENT LEVELS TO COMPLY WITH NZBC CLAUSE B2/AS1 DURABILITY, NZS3602. TIMBER AND WOOD BASED PRODUCTS FOR USE IN BUILDING AND NZS3640 CHEMICAL PRESERVATION OF ROUND AND SAWN TIMBER. THIS TABLE IS A SUMMARY OF THE MINIMUM TREATMENT LEVEL REQUIREMENTS ONLY. HIGHER LEVELS MAY BE USED IN ANY SITUATION.

ALL WALL FRAMING AND ASSOCIATED MEMBERS	- H1.2
ROOF FRAMING, TRUSSES AND CEILING JOISTS	
ENCLOSED FRAMING WITHIN SKILLION / FLAT ROOFS	
SUBFLOOR FRAMING / INTERIOR FLOOR FRAMING	
PARAPET FRAMING	
FRAMING FOR ENCLOSED DECKS,BALCONIES AND BALUSTRADES - NOT CANTILEVERED	
ENCLOSED POST AND BEAM OR WALL TRIMMING STUDS AND LINTELS UNDER ENCLOSED DECKS.	
CLADDING CAVITY BATTENS	- H3.1
EXPOSED DECKING / FRAMING AND EXTERNAL POST, BEAM AND BALUSTRADE	- H3.2
FRAMING FOR ENCLOSED DECKS, BALCONIES AND ASSOCIATED MEMBERS - CANTILEVERED	
PILES AND POSTS IN GROUND	- H5

FLASHING AND WRAP SYSTEMS

ALL FLASHINGS, FLASHING TAPES, WRAPS, UNDERLAYS AND ASSOCIATED ACCESSORIES ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND AS PER DETAILS PROVIDED. NO SUBSTITUTIONS ARE PERMITTED WITHOUT PRIOR APPROVAL. IF SUBSTITUTIONS ARE MADE WITHOUT APPROVAL IT IS AT THE INSTALLERS RISK AND RESPONSIBILITY. INSTALLER ON SITE IS TO CHECK COMPATIBILITY OF ALL PRODUCTS.

FOR BC

Westmoreland HOMES

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ARCHITECTURAL : DESIGN
47 Forge Road, Silverdale
PO Box 88 Waiwera
Telephone: 09 426 7835
email: admin@makingplans.co.nz

Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

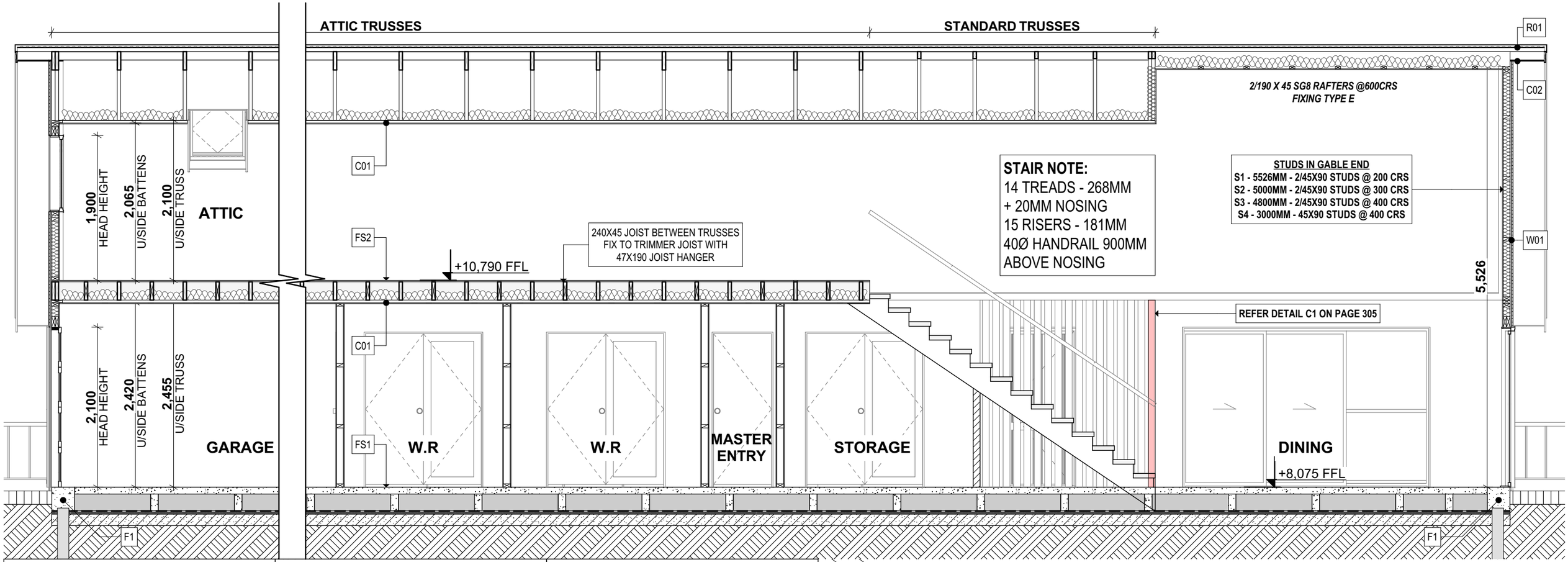
Drawing Title
SECTION A1/A2

SCALE @ A3.
1:50

SHEET NUMBER
206
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035



TIMBER TREATMENT LEVELS:

TREATMENT LEVELS TO COMPLY WITH NZBC CLAUSE B2/AS1 DURABILITY, NZS3602. TIMBER AND WOOD BASED PRODUCTS FOR USE IN BUILDING AND NZS3640 CHEMICAL PRESERVATION OF ROUND AND SAWN TIMBER. THIS TABLE IS A SUMMARY OF THE MINIMUM TREATMENT LEVEL REQUIREMENTS ONLY. HIGHER LEVELS MAY BE USED IN ANY SITUATION.

ALL WALL FRAMING AND ASSOCIATED MEMBERS - H1.2
ROOF FRAMING, TRUSSES AND CEILING JOISTS
ENCLOSED FRAMING WITHIN SKILLION / FLAT ROOFS
SUBFLOOR FRAMING / INTERIOR FLOOR FRAMING
PARAPET FRAMING
FRAMING FOR ENCLOSED DECKS,BALCONIES AND BALUSTRADES - NOT CANTILEVERED
ENCLOSED POST AND BEAM OR WALL TRIMMING
STUDS AND LINTELS UNDER ENCLOSED DECKS.

CLADDING CAVITY BATTENS - H3.1

EXPOSED DECKING / FRAMING AND EXTERNAL POST, BEAM AND BALUSTRADE - H3.2
FRAMING FOR ENCLOSED DECKS, BALCONIES AND ASSOCIATED MEMBERS - CANTILEVERED

PILES AND POSTS IN GROUND - H5

FLASHING AND WRAP SYSTEMS

ALL FLASHINGS, FLASHING TAPES, WRAPS, UNDERLAYS AND ASSOCIATED ACCESSORIES ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND AS PER DETAILS PROVIDED. NO SUBSTITUTIONS ARE PERMITTED WITHOUT PRIOR APPROVAL. IF SUBSTITUTIONS ARE MADE WITHOUT APPROVAL IT IS AT THE INSTALLERS RISK AND RESPONSIBILITY. INSTALLER ON SITE IS TO CHECK COMPATIBILITY OF ALL PRODUCTS.

FLOORS

FS1
90MM RIBRAFT SLAB. REFER FOUNDATION PLAN.

FS2
TIMBER SUBFLOOR WITH 18MM PARTICAL BOARD FLOORING OVER FLOOR JOISTS. REFER ROOF FRAMING PLAN. (18MM H3 PLY TO ALL WET AREAS)

WALLS

W01
AXON PANEL ON 18MM H3.1 CAVITY BATTENS OVER BUILDING PAPER ON H1.2 SG8 STUDS. 10MM ELEPHANT BOARD STOPPED TO LEVEL 4. WALL BATTS.

W02
70MM BRICK VENEER ON 50MM VENTED CAVITY OVER 6MM RAB BOARD ON H1.2 SG8 STUDS. 10MM ELEPHANT BOARD STOPPED TO LEVEL 4. WALL BATTS.

ROOFS

R01
COLORSTEEL LONGRUN CORRUGATED ROOFING OVER THERMAKRAFT UNDERLAY, 70 X 45 H1.2 SG8 PURLINS @ 900CRS MAX ON 90MM H1.2 GANGNAIL TRUSSES

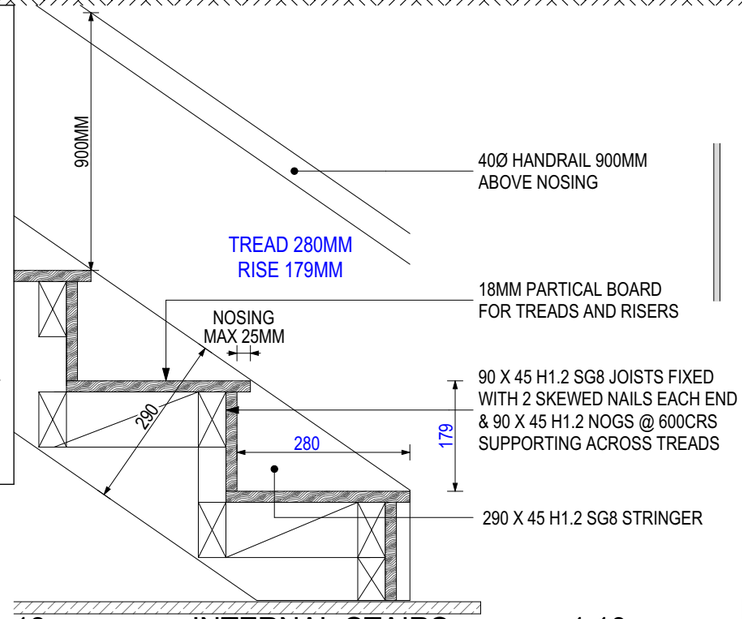
CEILINGS

C01
10MM ELEPHANT BOARD FIXED TO UNDERSIDE OF 70 X 35 H1.2 BATTENS @ 600CCRS MAX. STOPPED TO LEVEL 4. CEILING BATTS OVER BATTENS.

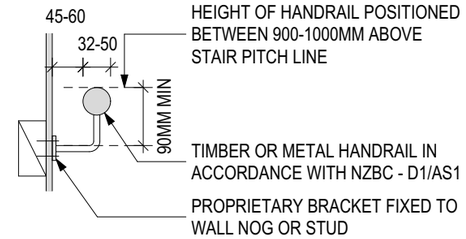
C02
5MM HARDIESOFFIT LINING TO UNDERSIDE 70 X 45 H1.2 SG8 SOFFIT BATTENS @ 600CRS MAX

INSULATION REQUIREMENTS FOR NON-SOLID TIMBER WALL CONSTRUCTION

NZBC H1 2008 - CALCULATION METHOD.
R-VALUES SHOWN ARE PRODUCT R VALUES FOR CONSTRUCTION PURPOSES
1.0 ROOF.
1.1 COLORSTEEL ROOFING WITH UNDERLAY ON 90MM TRUSSES, R3.6 ECOINSULATION - R3.35
2.0 EXTERNAL WALLS.
2.1 TIMBER WEATHERBOARD ON CAVITY, BUILDING PAPER, 90MM TIMBER, R2.2 ECOINSULATION - R2.00
2.2 70MM BRICK ON CAVITY, BUILDING PAPER, 90MM TIMBER, R2.2 ECOINSULATION - R2.02
3.0 FLOORS.
3.1 RIBRAFT - R1.6
3.2 TIMBER SUBFLOOR, 18MM PARTICAL BOARD FLOORING, OVER 240+MM FLOOR JOISTS, USING R1.4 - R1.65
4.0 GLAZING.
4.1 ALUMINIUM JOINERY.
DOUBLE GLAZING TO ALL JOINERY - R0.26



18 INTERNAL STAIRS 1:10
206



This review is limited to the structural design only as outlined in our calculations and other documentation. We have not reviewed any drawing dimensions. For any discrepancies please contact the undersigned.

Signed

Kevin Burrows (CPEng: 1897#)
GRAYSON DESIGN & DEVELOPMENTS LTD

FOR BC

Westmoreland HOMES

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Job Title
PROPOSED DWELLING
At
68 WEKA ST
MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
SECTION B

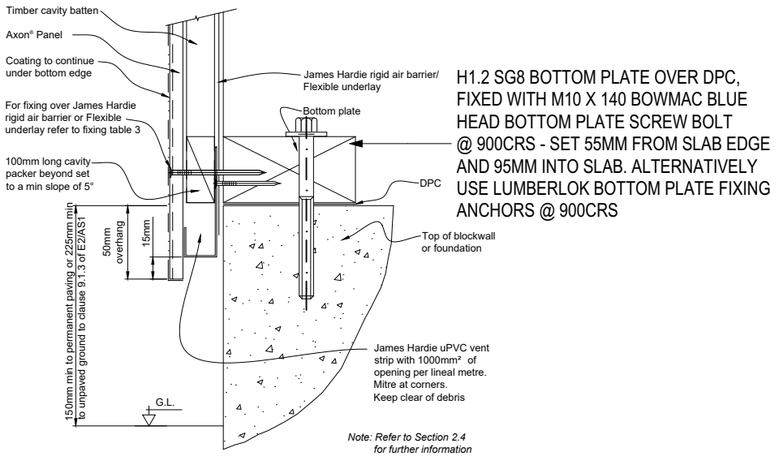
THIS DOCUMENT REMAINS THE PROPERTY OF MAKING PLANS LTD / ALL DIMENSIONS TO BE VERIFIED ON SITE

SCALE @ A3.
1:50, 1:10

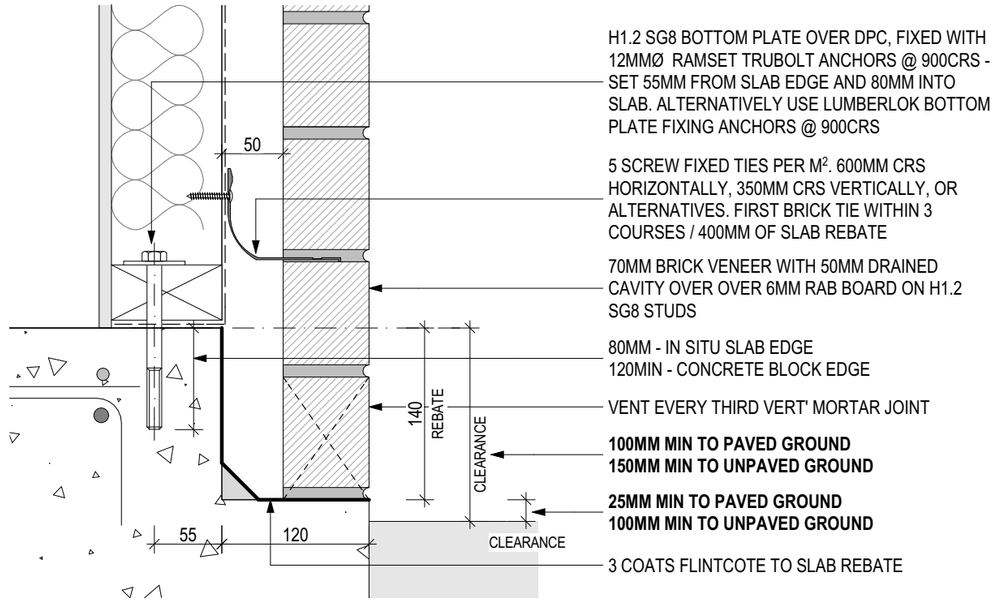
SHEET NUMBER
207
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

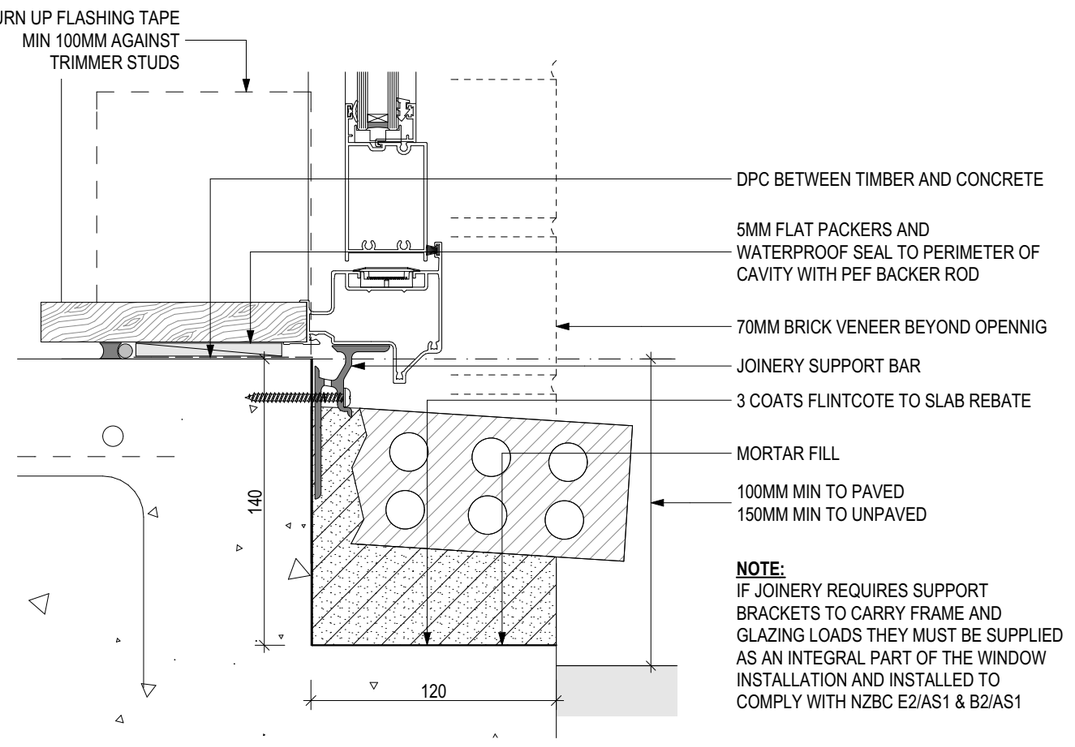
Job # 21035



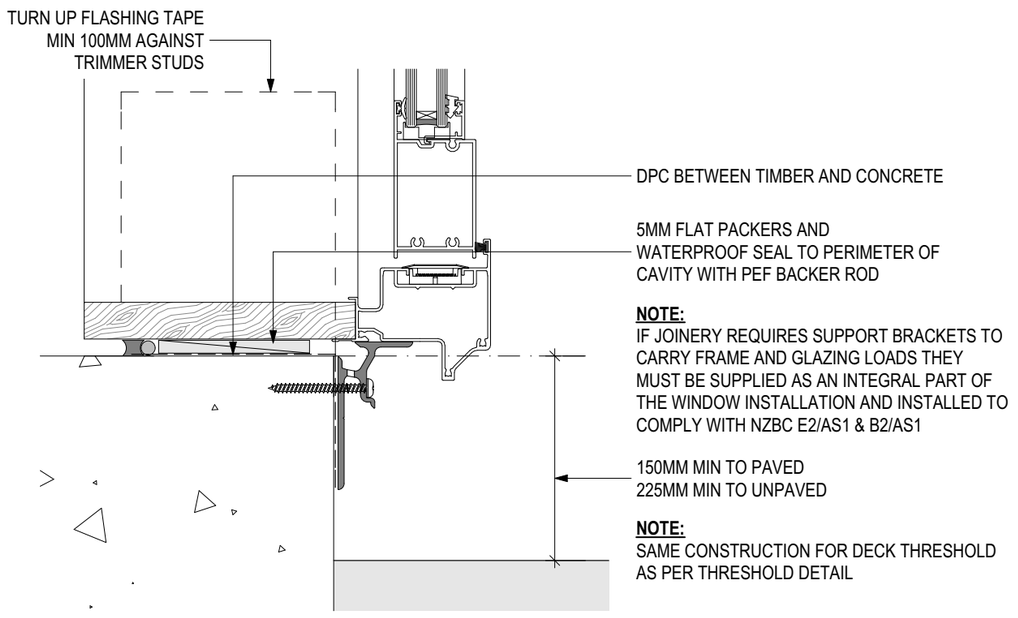
1 WALL BASE - AXON 1:3
107



2 WALL BASE - BRICK 1:5
106



3 DOOR SILL - OPEN IN (BRICK) 1:3
106



4 DOOR SILL - OPEN IN 1:3
106

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

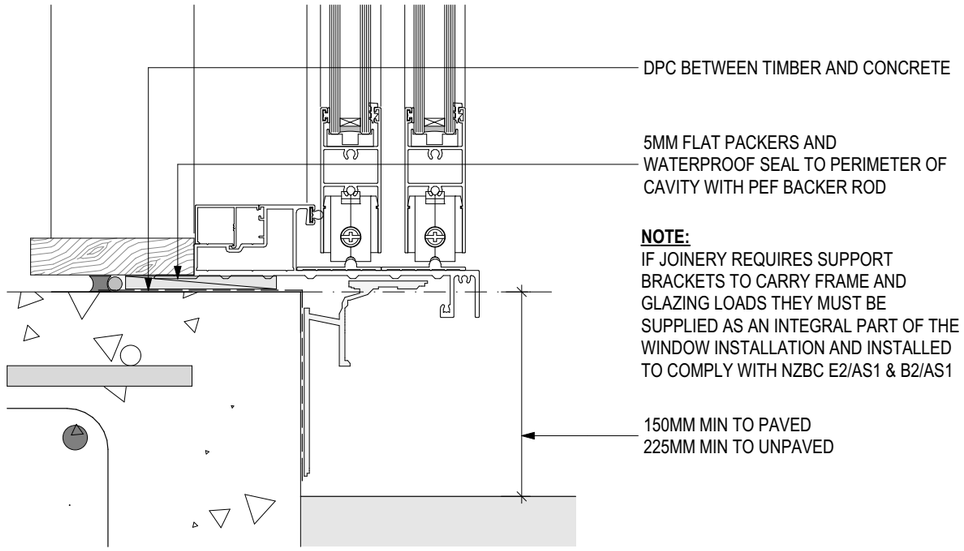
Drawing Title
ARCHITECTURAL DETAILS

SCALE @ A3.
1:3, 1:5

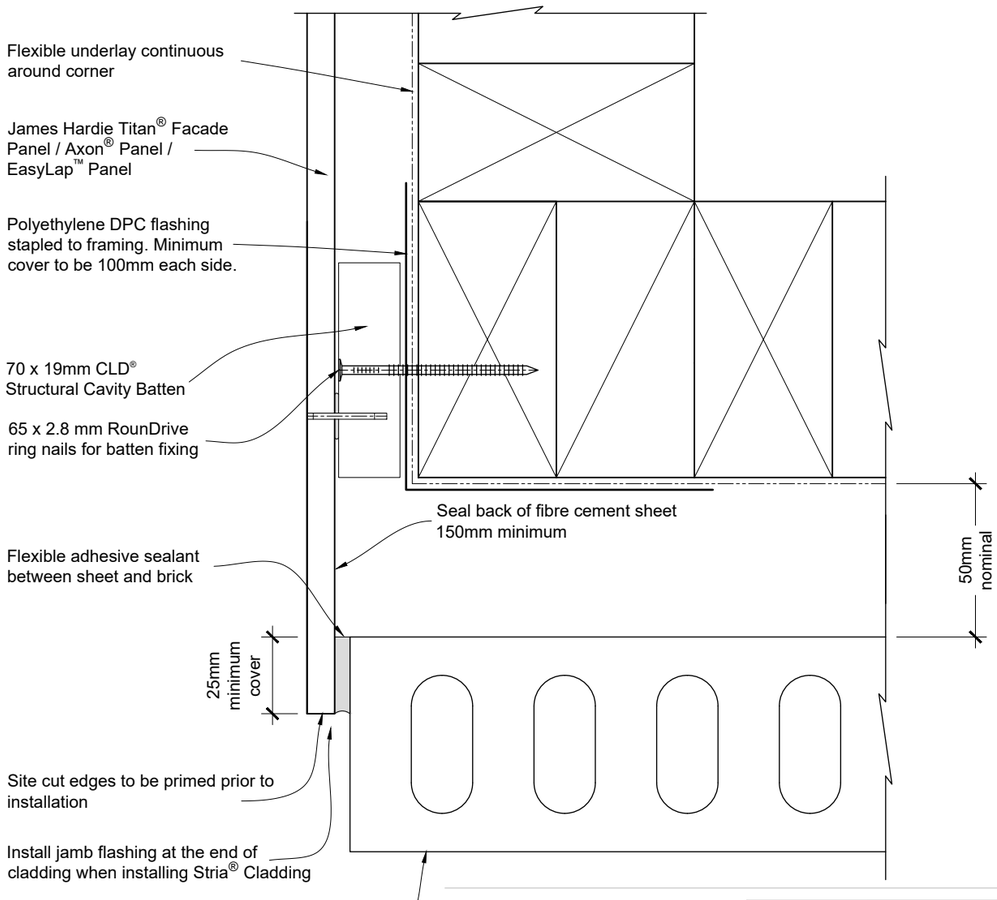
SHEET NUMBER
301
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

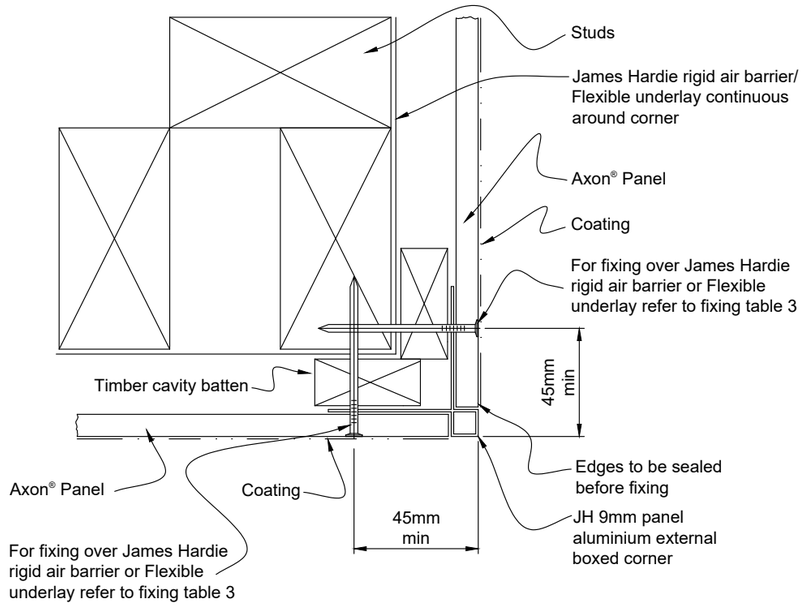
Job # 21035



5 DOOR SILL - STACKER 1:3
106



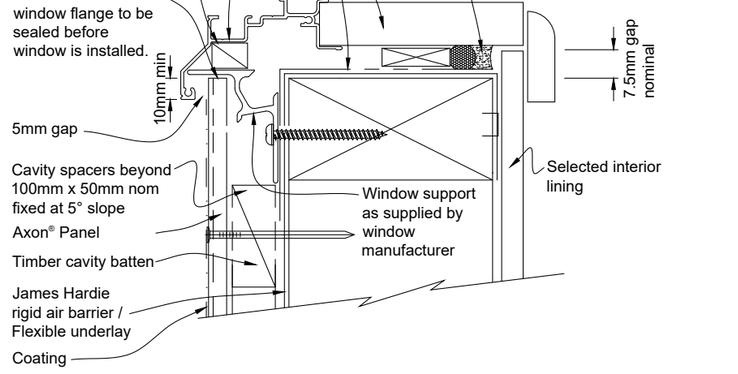
7 EXTERNAL CORNER - BRICK TO AXON 1:3
104



Note:

- *Refer to Figure 27 for jointing with 'h' mould.*
- *Do not run corner mould continuous over floor joists.*

6 EXTERNAL CORNER - AXON 1:3
107



General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1.
2. Building underlay must comply with acceptable solution E2/AS1.
3. Flashing tape must have proven compatibility with the selected building underlay and other materials with which it comes into contact.
4. When James Hardie rigid air barriers are used flashing tape to be applied to the entire opening.

Refer to the manufacturer or supplier for technical information for these materials.

8 WINDOW SILL - AXON 1:3
107

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

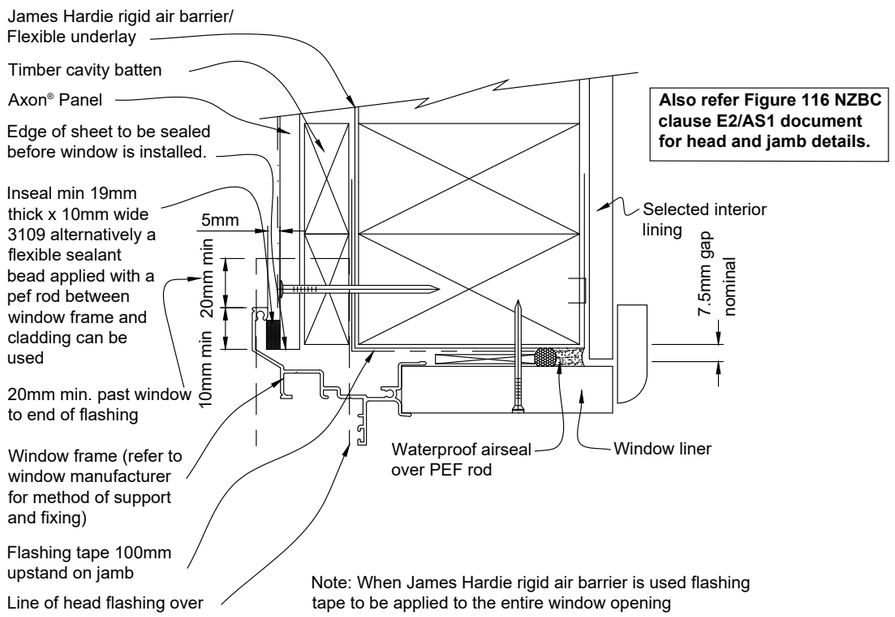
Drawing Title
ARCHITECTURAL DETAILS

SCALE @ A3.
1:3, 1:2

SHEET NUMBER
302
OF: 35

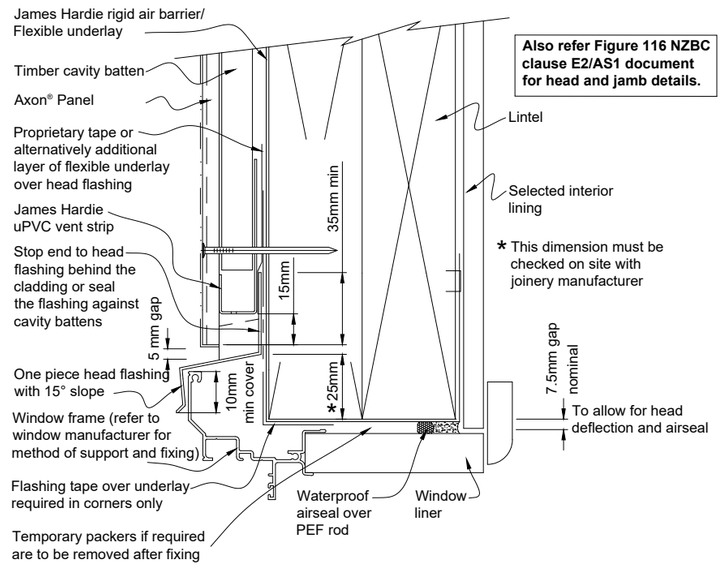
WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035



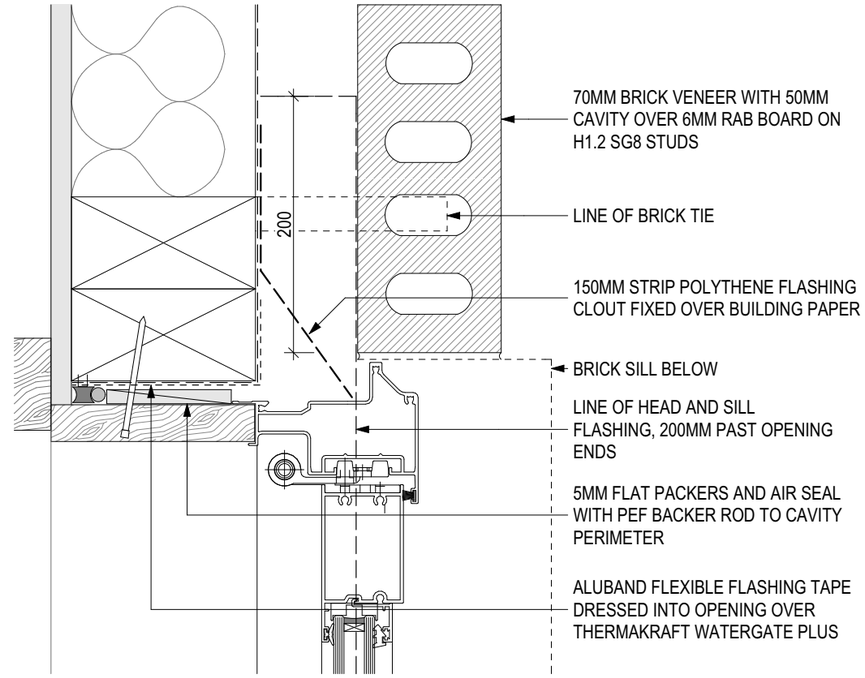
Note: When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening

9 107 WINDOW JAMB - AXON 1:3



Note:
- When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED projects
- Alternatively, the head flashing can be formed with stop ends

10 107 WINDOW HEAD - AXON 1:3



11 106 DOOR JAMB - BRICK 1:3

12 106 DOOR HEAD - BRICK 1:3

13 107 GARAGE JAMB - AXON 1:3

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

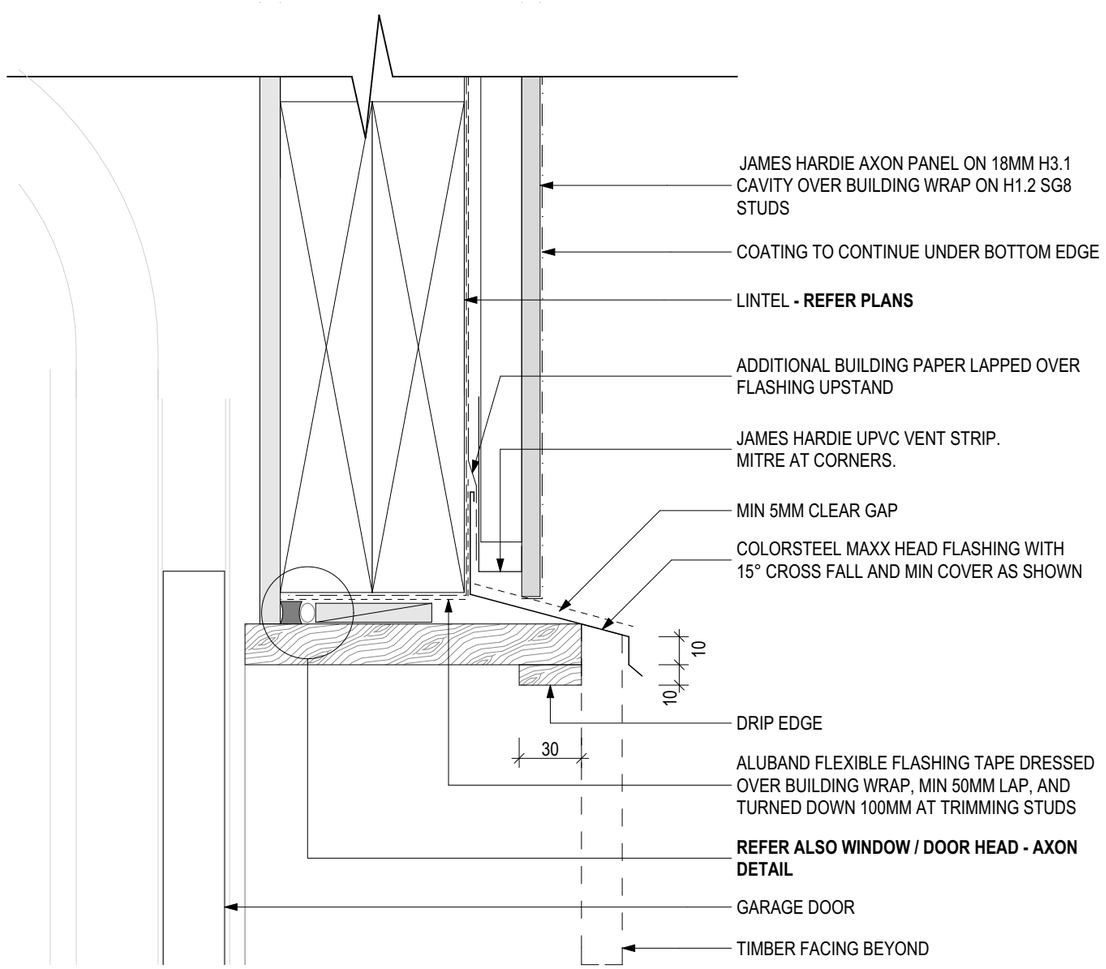
Drawing Title
ARCHITECTURAL DETAILS

SCALE @ A3.
1:3

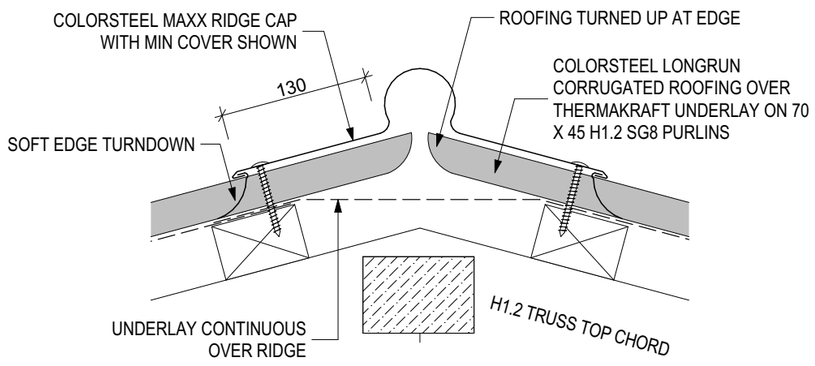
SHEET NUMBER
303
OF: 35

WIND ZONE	**HIGH**
EXPOSURE ZONE	**D**
EQ ZONE	**1**
ZONE	**RES HARBOUR**
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

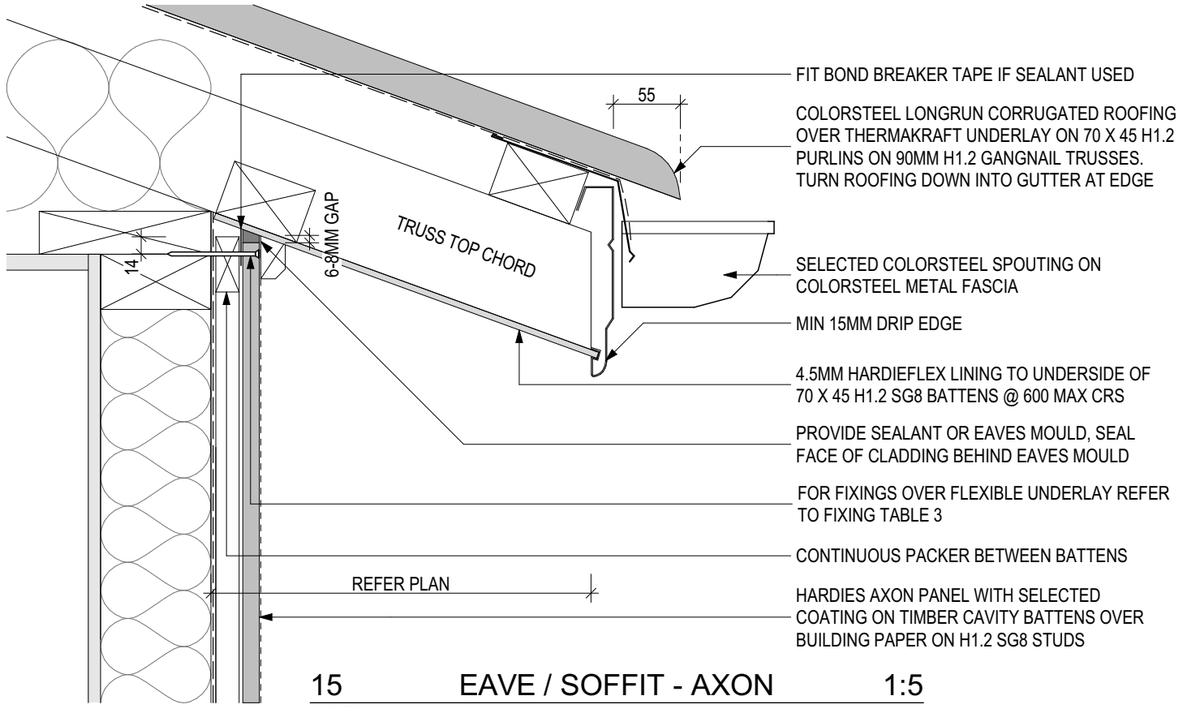
Job # 21035



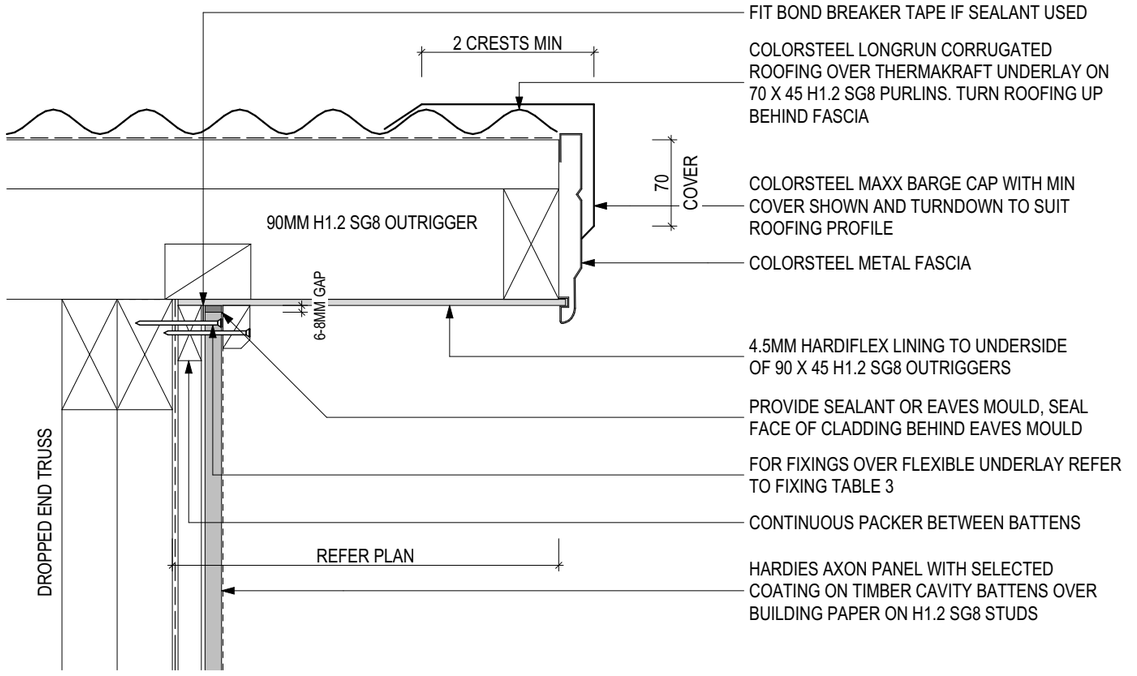
14 GARAGE HEAD - AXON 1:3
107



17 RIDGE 1:5
107



15 EAVE / SOFFIT - AXON 1:5
107



16 VERGE / SOFFIT - AXON 1:5
107

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

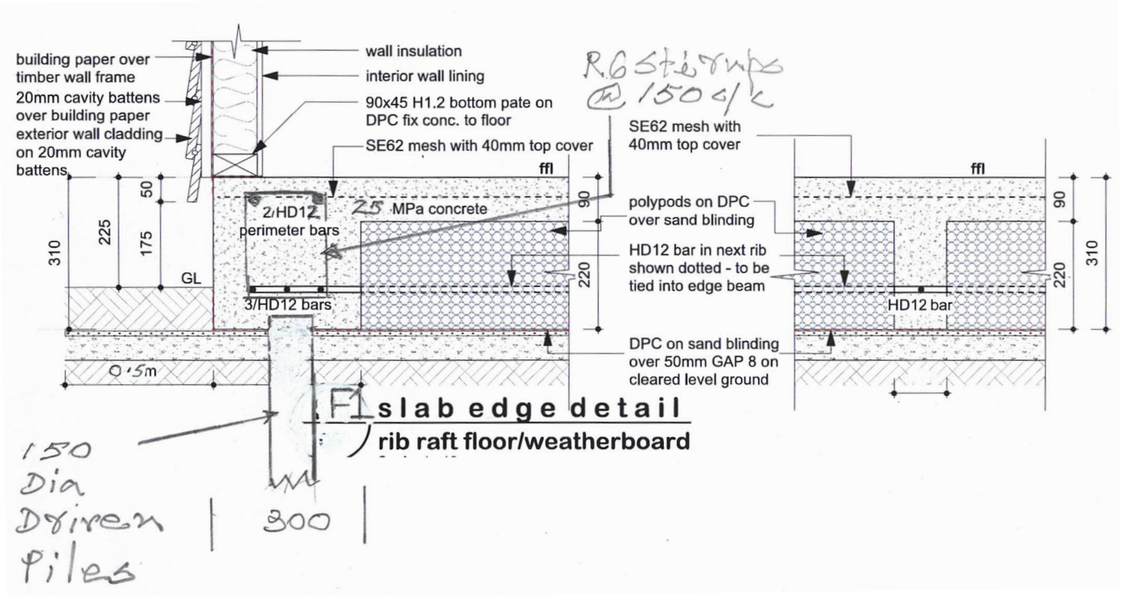
Drawing Title
ARCHITECTURAL DETAILS

SCALE @ A3.
1:3, 1:5

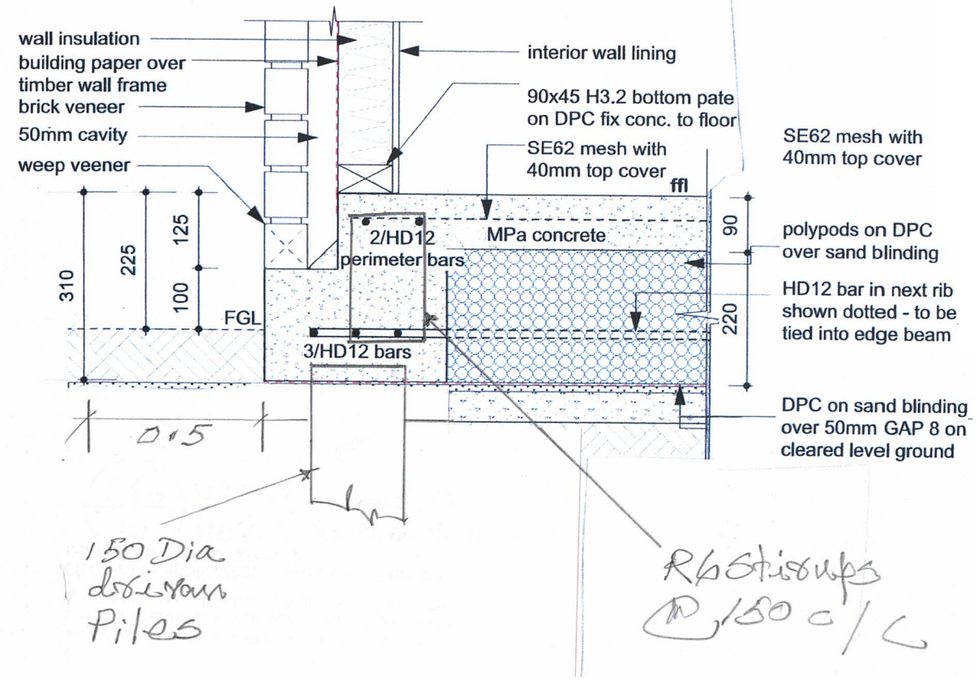
SHEET NUMBER
304
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

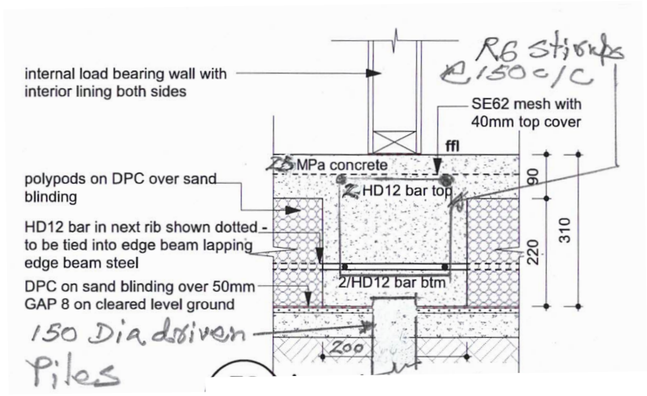
Job # 21035



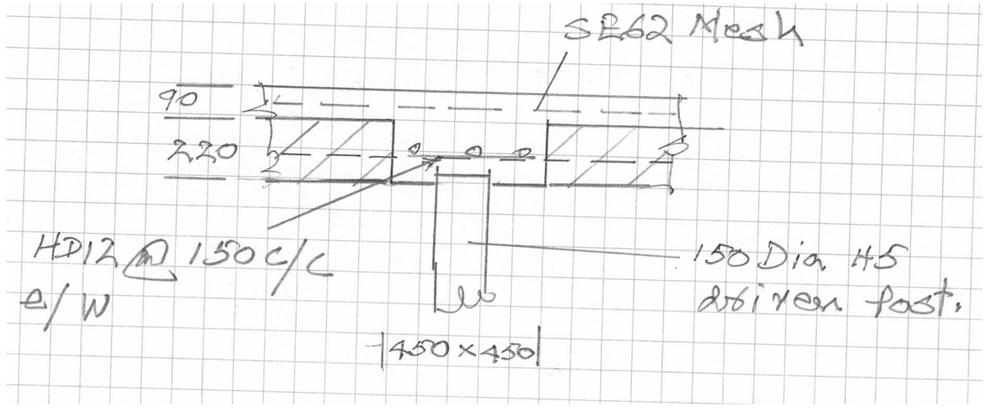
F1 RAFT FLOOR EDGE BEAM - 300MM / INTERNAL RIB - 100MM 1:10
201



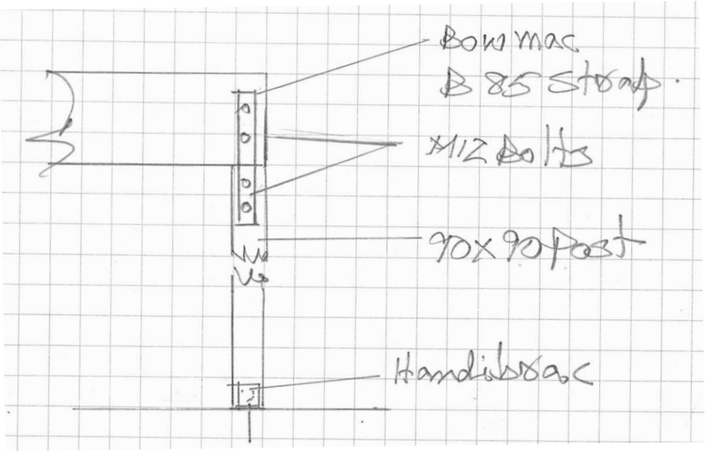
F1A RAFT FLOOR EDGE BEAM 1:10
201



F2 RAFT FLOOR INTERNAL THICKENING - 200MM 1:10
201



F3 POST PAD 1:10
201



C1 BEAM / POST FIXING 1:10
202

This review is limited to the structural design only as outlined in our calculations and other documentation. We have not reviewed any drawing dimensions. For any discrepancies please contact the undersigned.

Signed

Kevin Burrows (CPEng: 1897#)

GRAYSON DESIGN & DEVELOPMENTS LTD

Westmoreland HOMES

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
ENGINEERING

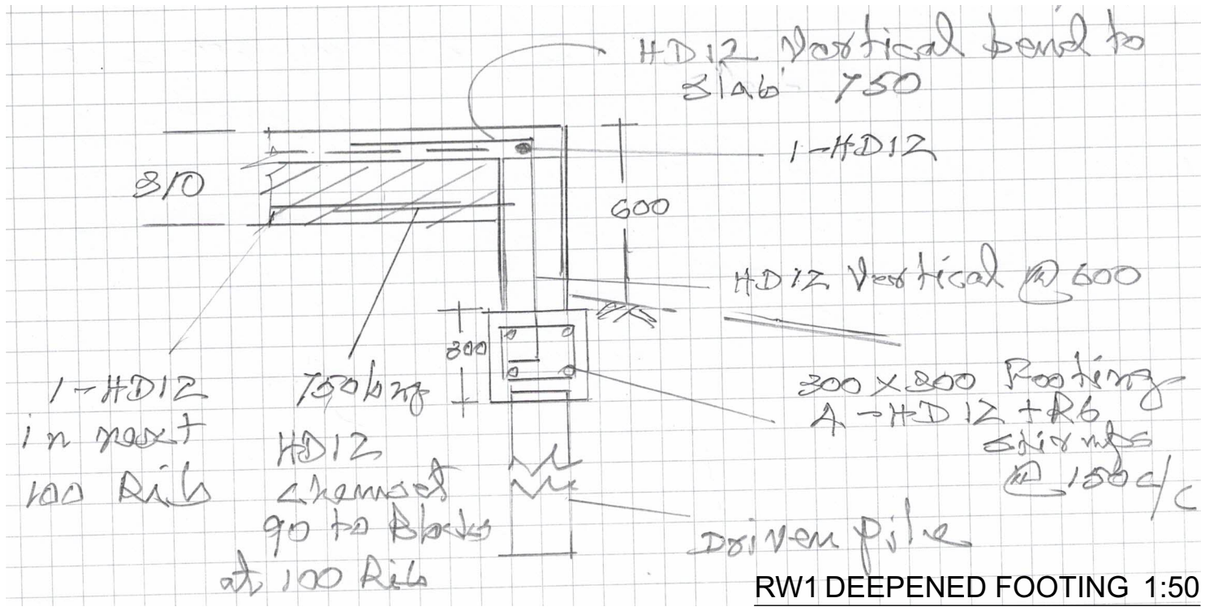
SCALE @ A3.
1:10

SHEET NUMBER
305
OF: 35

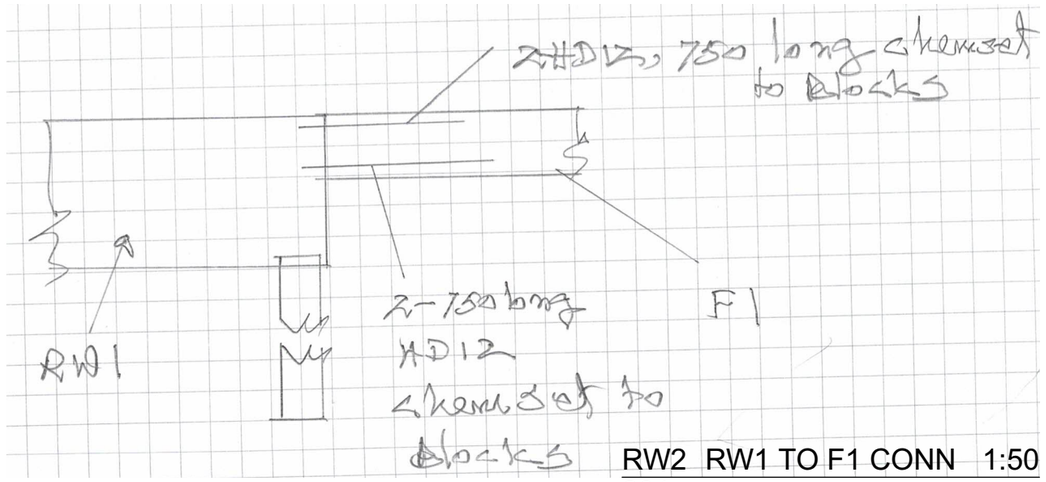
WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

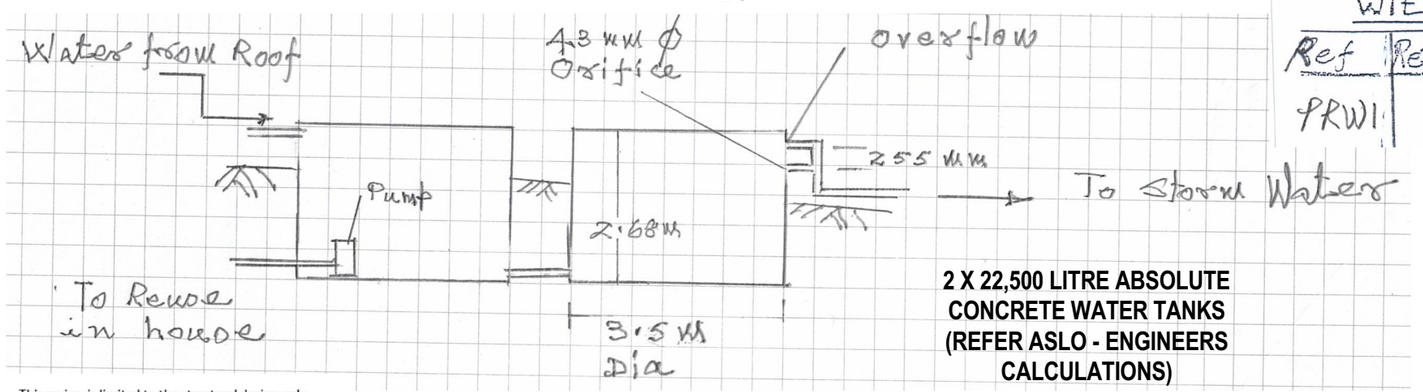
FOR BC



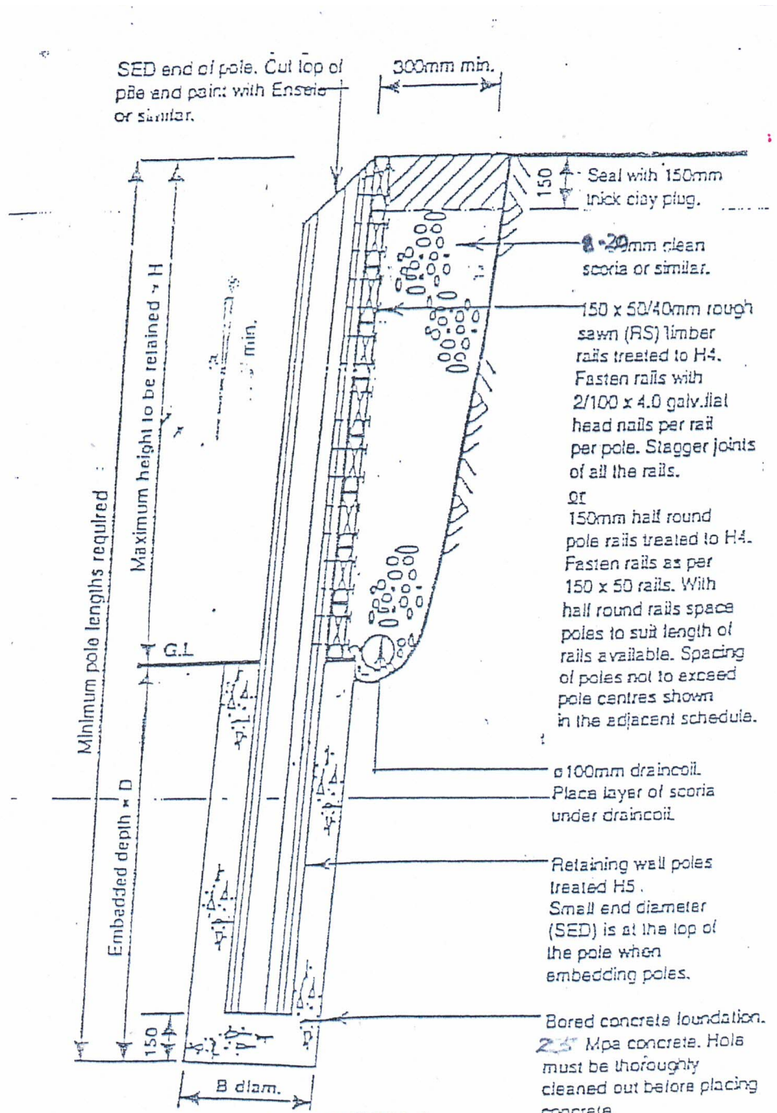
RW1 DEEPENED FOOTING 1:50
201



RW2 RW1 TO F1 CONN 1:50
201



2 X 22,500 LITRE ABSOLUTE CONCRETE WATER TANKS (REFER ASLO - ENGINEERS CALCULATIONS)



TYPICAL CROSS SECTION A
With 150 x 50 Rails

Ref	Retain Ht(m)	Embeded Depth(m)	Pole Dia(mm)	Footing Dia (mm)	Pole Spacing(mm)	Rail
RW1	0.9	1.4	175	400	1000	150x50

Construction Methodology Post Retaining Walls

Survey if required to ensure all work and Excavations carried out on owners side of the boundary line

Excavate and cut bank to required line and levels. Form benches to suit as required.

Drill foundation holes for the retaining walls as noted on the details.
Refer to Architects drawings and survey drawings for exact locations.
ASAP Install the poles into the foundations to the engineers design and drawing details.
Allow minimum one day for concrete cure.
Install rails as per design specifications

Install any necessary drainage pipes and bedding behind the wall with relevant falls to cesspit.

Arrange for council or engineer inspections required by the consent.

Allow to cure before any backfill to take place and or temporary prop if necessary.

For any delays during construction allow for temporary shoring of any cut banks.
If wet weather likely then provide waterproof sheeting to protect the cut face of the bank.
Note for cuts over 1.0m then a temporary barrier may be required.
If possible allow time for any future settlement under any deep fill areas.

FOR BC

This review is limited to the structural design only as outlined in our calculations and other documentation. We have not reviewed any drawing dimensions. For any discrepancies please contact the undersigned.

Signed

Kevin Burrows (CPEng: 1897#)
GRAYSON DESIGN & DEVELOPMENTS LTD

Westmoreland HOMES

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
ENGINEERING

SCALE @ A3.
1:10, 1:50, 1:1

SHEET NUMBER
306
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

Figure 9: **Low Pressure Valve – Vented Water Heater System – Temperature and Pressure Relief Valve**
Paragraphs 6.1.2 and 6.2.1 b)

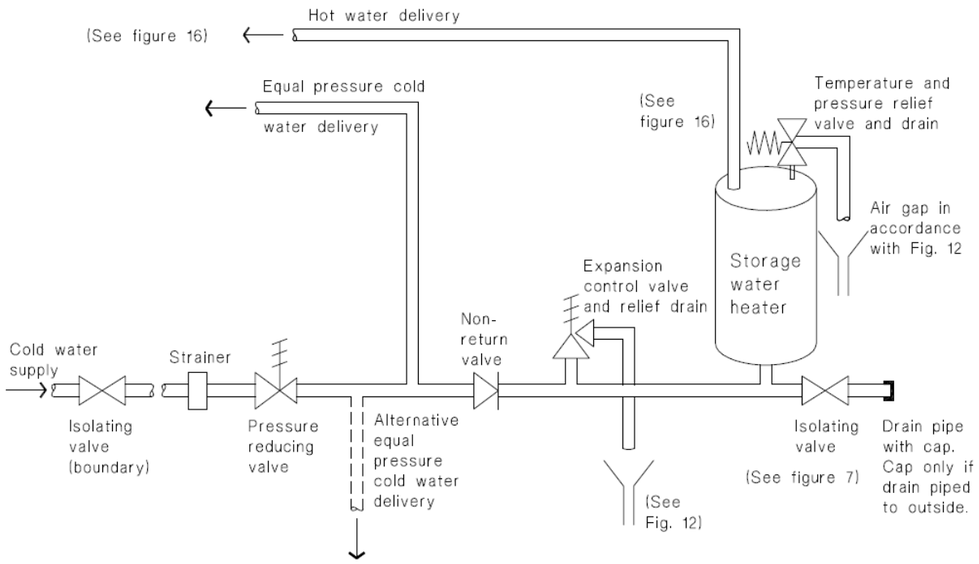


Figure 12: **Relief Valve Drains – Freezing Protection**
Paragraphs 6.7.1, 6.7.4 and 6.7.5

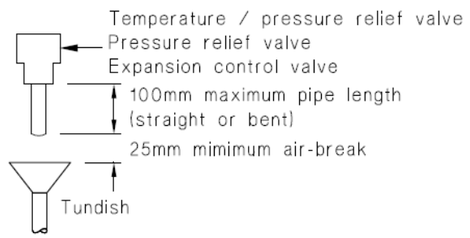


Figure 13: **Relief Valve Drains – Combined**
Paragraphs 6.7.1, 6.7.2 f) and 6.7.3

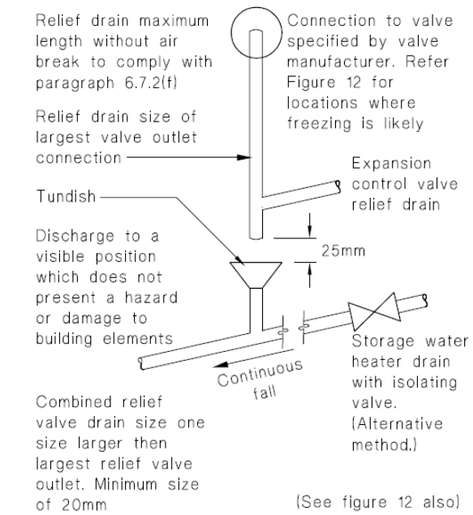


Figure 14: **Seismic Restraint of Storage Water Heaters 90 – 360 litres**
Paragraph 6.11.4

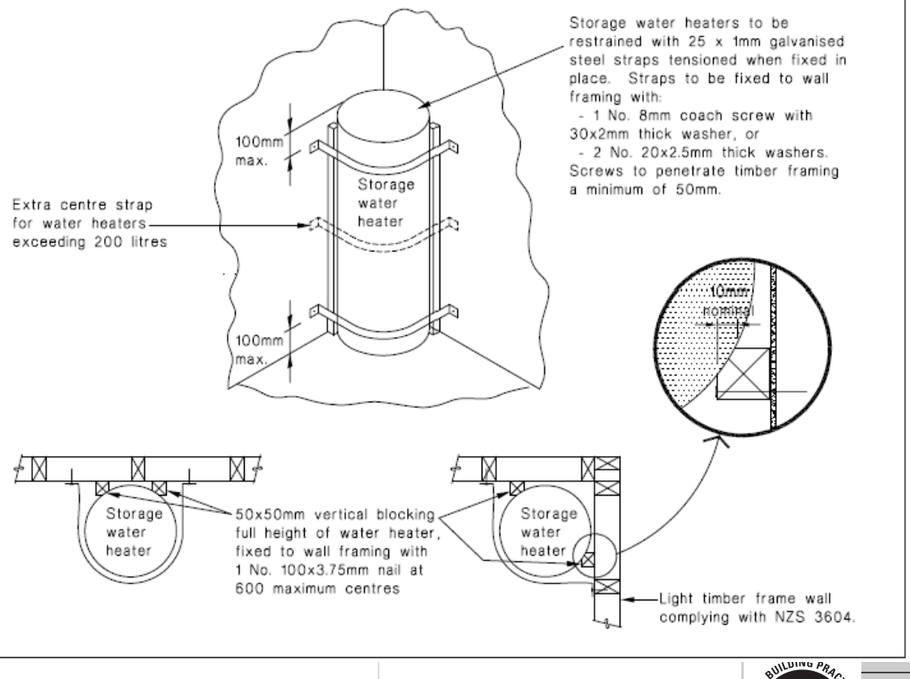
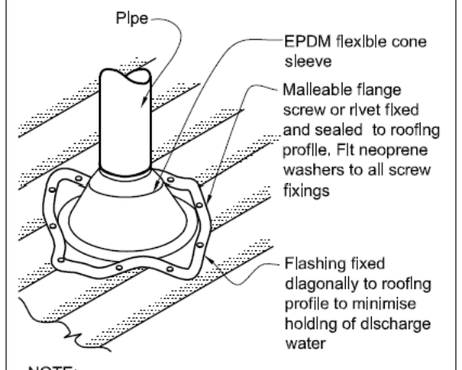
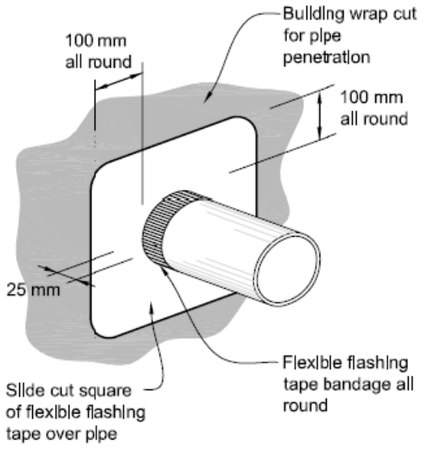


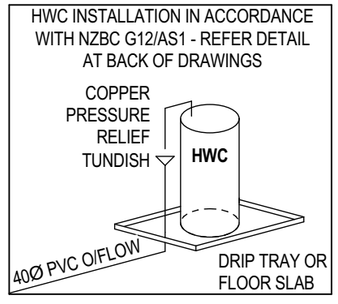
Figure 53: **Flashing for small pipes**
Paragraphs 8.3.10, 8.4.17 a), 9.6.8.5 and 9.6.9.6



NOTE:
(1) Max. roof pitch for this flashing 45°, minimum pitch 10°.
(2) For pipes up to 60 mm diameter.

Figure 68: **General pipe penetration**
Paragraph 9.1.9.3, Figure 123





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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
GENERAL DETAILS

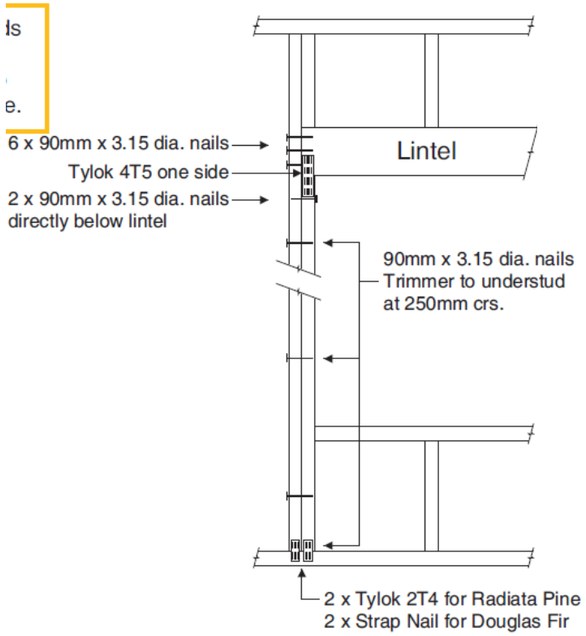
SCALE @ A3.

SHEET NUMBER
307
OF: 35

WIND ZONE	**HIGH**
EXPOSURE ZONE	**D**
EQ ZONE	**1**
ZONE	**RES HARBOUR**
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

TYPE F
4.0 kN



Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

TYPE G
7.5 kN

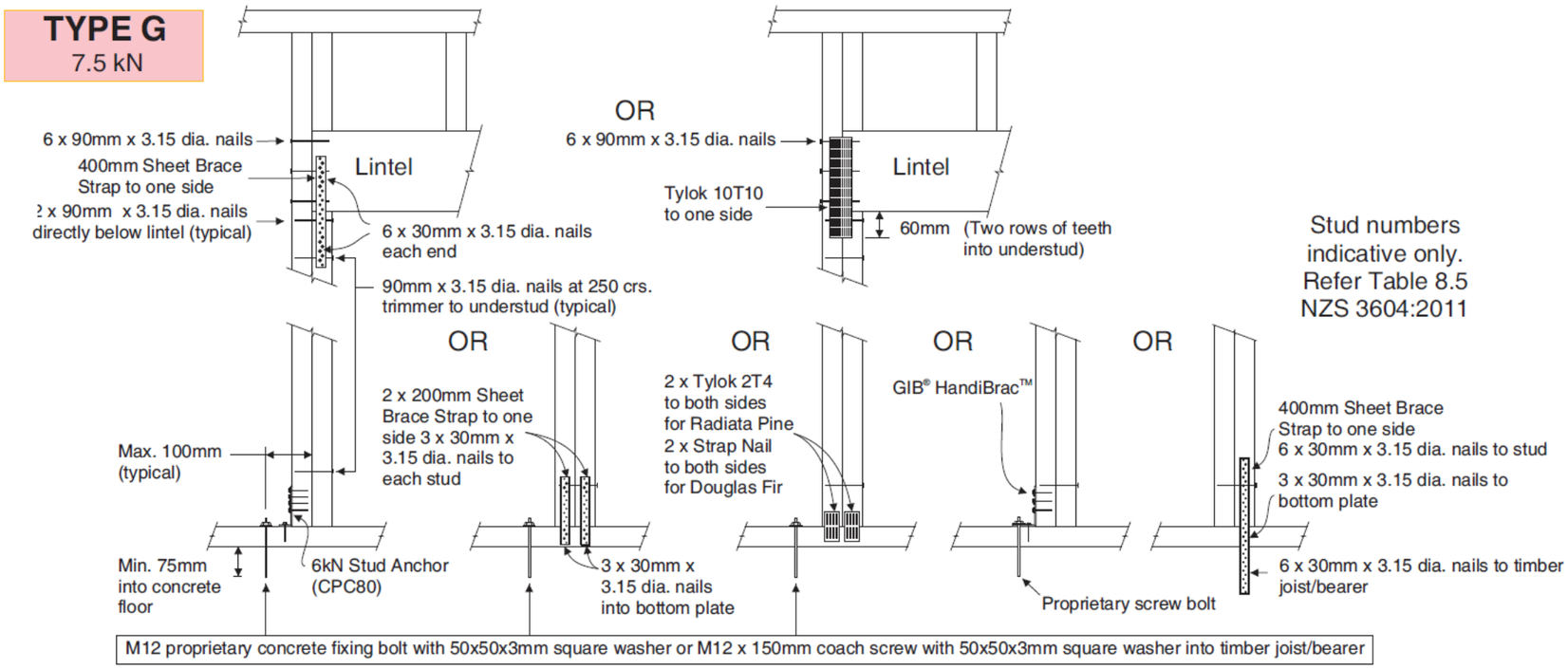
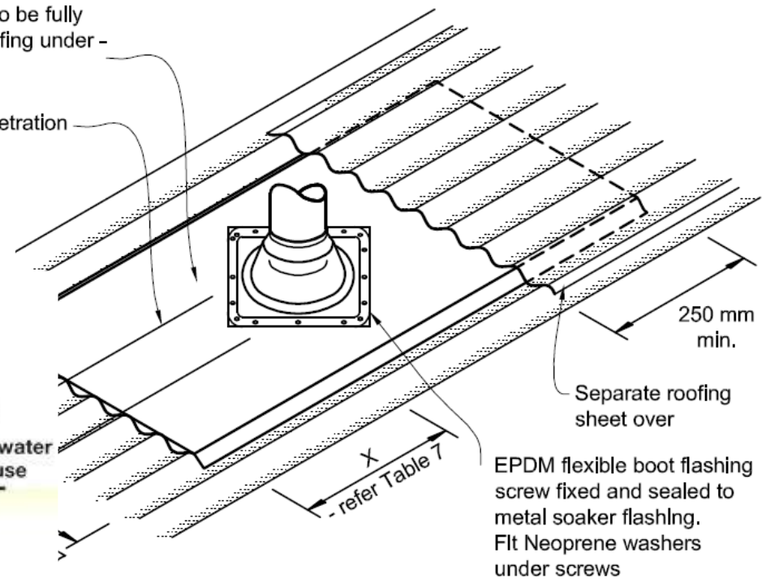
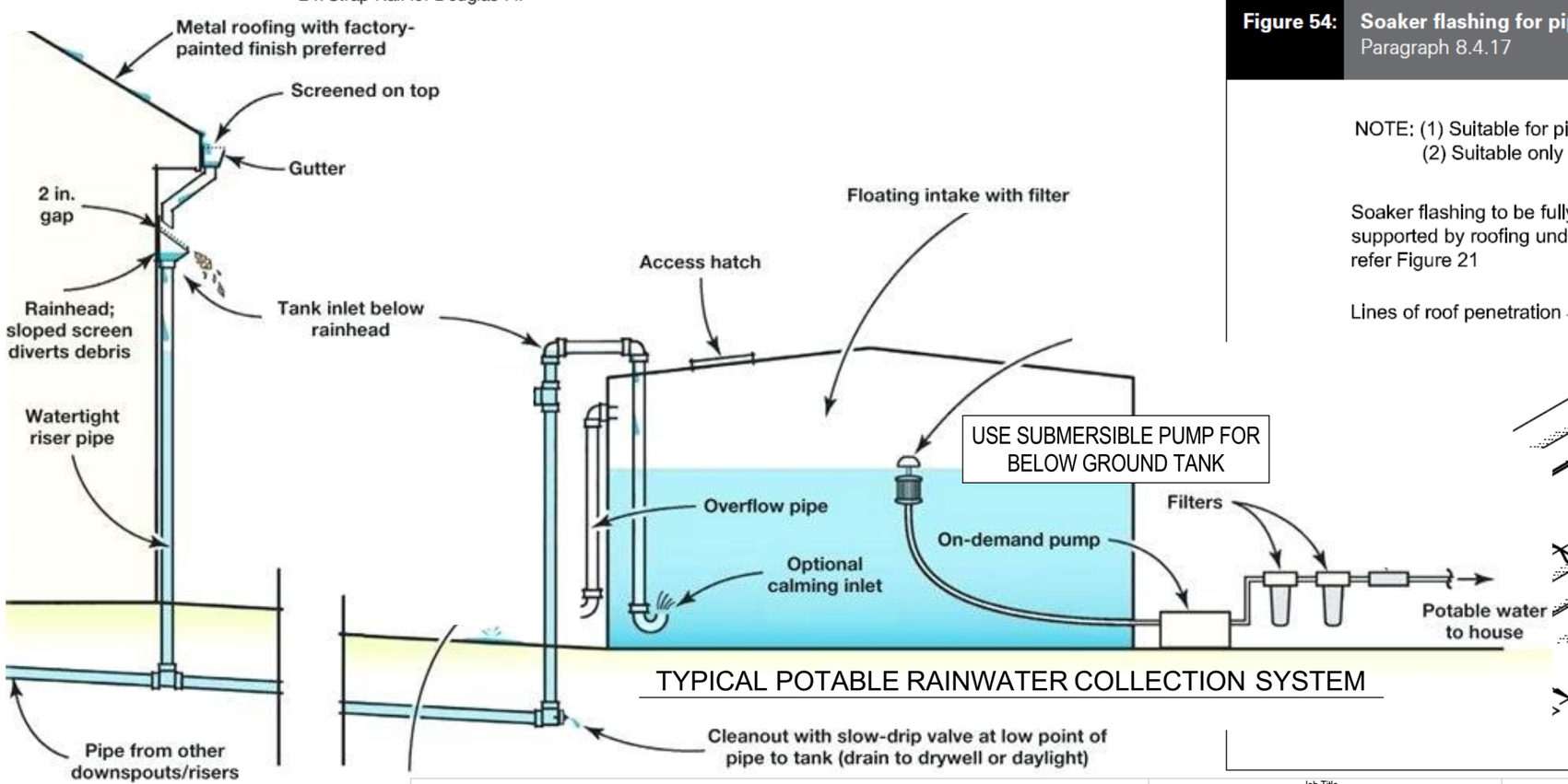


Figure 54: **Soaker flashing for pipe penetrations**
Paragraph 8.4.17

NOTE: (1) Suitable for pipes from 86 mm to 500 mm diameter.
(2) Suitable only for roof pitches of 10° or more.





TYPICAL POTABLE RAINWATER COLLECTION SYSTEM

Westmoreland HOMES

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Job Title
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At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
GENERAL DETAILS

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SCALE @ A3.

SHEET NUMBER
308
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

TABLE 3.2

MINIMUM GRADES OF DRAINS

Nominal size DN	Minimum grade, %
65	2.50
80	1.65
100	1.65
125	1.25
150	1.00
225	0.65
300	0.40

NOTE: Appendix B provides a table for conversion of grades as a percentage to grades as a ratio.

TABLE 3.3

MINIMUM FIXTURE UNIT LOADINGS FOR REDUCED GRADE DRAINS

Reduced grade %	Nominal size of drain, DN			
	80	100	125	150
1.45	9	10	—	—
1.25	10	18	—	—
1.10	×	×	27	—
1.00	×	×	38	—
0.85	×	×	×	75
0.65	×	×	×	160

TABLE 7.1

MAXIMUM FIXTURE UNIT LOADINGS FOR GRADED DISCHARGE PIPES

Grade %	Nominal size of pipe, DN								
	40	50	65	80	100	125	150	225	
5.00	6	15	51	65	376	953	1 959	7 098	
3.35	5	10	29	39	248	686	1 445	5 583	
2.50	4	8	21	27	182	509	1 148	4 513	
2.00	×	×	×	20	142	410	953	3 739	
1.65	×	×	×	16	115	342	813	3 258	
1.25	×	×	×	×	×	254	627	2 656	
1.00	×	×	×	×	×	×	509	2 272	

TABLE 6.1

FIXTURE UNIT RATINGS

Fixture	Fixture abbreviations	Min. size of trap outlet and fixture discharge pipe DN		Fixture unit rating
		NZ (only)		
Autopsy table	AT	50		3
Bain-marie	BM	40		1
Basin	B	40	32	1
Bath (with or without shower) (Note 1)	Bth.	40		4
Bath (foot)	Bath (foot)	40		3
Bath (baby)	Bath (baby)	40		3
Bath (shower)	Bath (shr)	40		4
Bedpan sterilizer	BPS	50		4
Bedpan washer	BPW	80		6 (F. valve) 4 (Cist.)
Bedpan washer	BPW	100		6 (F. valve) 4 (Cist.)
Bedpan washer/sterilizer	BPWS	80		6 (F. valve) 4 (Cist.)
Bedpan washer/sterilizer	BPWS	100		6 (F. valve) 4 (Cist.)
Bidet, bidette	Bid	40	32	1
Circular wash fountain	CWF	50		4
Clothes-washing machine—	CWM			
domestic		40		5
commercial		50		See Table 6.2
Dental unit	DU	40		1
Dishwashing machine—	DWM			
domestic		40		3
commercial		50		See Table 6.2
Drinking fountain	DF	40	25	1
Floor waste gully—	FW			
without fixture		50		0
with fixture				as per fixture rating
Glass-washing machine	GWM	40		3
Potato peeler	PP	50		3
Sanitary napkin disposal unit	SNDU	40		3
Shower—	Shr			
single		40	40	2
multiple		50		2 per shower head
Sink—			40	
single, or double (with or without disposal unit)	S	50		3
tea	TS	50		1
bar, domestic	BS(D)	40		1
bar, commercial	BS(C)	50		3

TABLE 6.1 (*continued*)

Fixture	Fixture abbreviations	Min. size of trap outlet and fixture discharge pipe DN		Fixture unit rating
		NZ (only)		
Sink cleaner	CS	50	40	1
Sink laboratory	LS	50		1
Sink (pot or utility)	PS	50		5
Slop hopper	SH	100		6 (F. valve) 4 (Cist.)
Trough—				
ablution	Tr.(A)	40		3
laundry (single or double)	Tr.(L)	40		5
Urinal—				
wall-hung (including waterless),	Ur.	40	32	1
stall, or each 600 mm length of slab		50		1
Water closet pan	WC	80		6 (F. valve) 4 (Cist.)
Water closet pan	WC	100		6 (F. valve) 4 (Cist.)
Bathroom group in a single room (basin, bath, shower, water closet)				6
Combination pan room sink and flushing bowl	PRS	80		6 (F. valve) 4 (Cist.)
Combination pan room sink	PRS	100		6 (F. valve) 4 (Cist.)

TABLE 3.1

MAXIMUM FIXTURE UNIT LOADING FOR VENTED DRAINS

Grade, %	Nominal size of drain, DN						
	65 (Note 1)	80	100	125	150	225	300
5.00	60	215	515	1 450	2 920	11 900	26 900
3.35	36	140	345	1 040	2 200	9 490	21 800
2.50	25	100	255	815	1 790	8 060	18 700
2.00	×	76	205	665	1 510	7 090	16 600
1.65	×	61	165	560	1 310	6 370	15 000
1.45	×	(50)	(140)	485	1 160	5 810	13 900
1.25	×	(42)	(120)	425	1 040	5 360	12 900
1.00	×	×	×	(380)	935	4 970	12 100
0.85	×	×	×	(340)	855	4 500	11 400
0.65	×	×	×	×	(725)	3 850	10 300
0.50	×	×	×	×	(595)	3 250	9 090
0.40	×	×	×	×	×	×	7 720
	×	×	×	×	×	×	6 780

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
GENERAL DETAILS

SCALE @ A3.
1:1

SHEET NUMBER
309
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

Table 10.18 – Nailing schedule for hand-driven and power-driven nails (see 10.5.1)

Joint	Hand-driven nails		Power-driven nails	
	Length (mm) **x diameter** (mm) **and type**	**Number/ Location**	**Length** (mm) **x diameter** (mm) **and type**	**Number/ Location**
Roof framing				
Rafter or jack rafter to ridge board or top plate (except skillion roofs) (see 10.2.1.3.7)	See table 10.1	See table 10.1	See table 10.1	See table 10.1
Truss to top plate of external wall	See tables 10.14 and 10.15	See tables 10.14 and 10.15	See tables 10.14 and 10.15	See tables 10.14 and 10.15
Truss to top plate of internal wall	100 x 3.75	2	90 x 3.15	2
Ceiling batten to parallel top plate of internal wall bracing element	75 x 3.15	2 at 400 mm centres	90 x 3.15	2 at 400 mm centres
Collar tie or cleat to rafter	75 x 3.15	4	75 x 3.06	4
Flitches to ridge board and roof members for each side on both joints	60 x 2.8	3	60 x 2.8	3
Hip rafter to top plate	See table 10.1	See table 10.1	See table 10.1	See table 10.1
Underpurlin strut to underpurlin or top plate or strutting beam	100 x 3.75 together with fixing types as set out in table 10.5	2	90 x 3.15 together with fixing types as set out in table 10.5	3
Strutting beam to top plate	See table 10.7	See table 10.7	See table 10.7	See table 10.7
Roof braces at each connection to a framing member:				
(a) 90 mm x 19 mm brace	75 x 3.15	3	75 x 3.15	3
(b) 70 mm x 45 mm brace runner	100 x 3.75	2	90 x 3.15	3
(c) 90 mm x 45 mm brace	100 x 3.75	3	90 x 3.15	5
(d) Steel strip brace				
(i) At ends	60 x 3.15	3	–	–
(ii) Other cases	60 x 3.15	2	–	–
(iii) To ends of braces	–	–	–	–

NOTE –
(1) Nail lengths and diameters are the minimum required.
(2) Refer to 4.4 for required protective coatings for metal fasteners.
(3) Proprietary fixings with the required fixing capacity indicated in the tables may be used.

SECTION 10 – ROOF FRAMING NZS 3604:2011

Table 10.18 – Nailing schedule for hand-driven and power-driven nails (continued) (see 10.5.1)

Joint	Hand-driven nails		Power-driven nails	
	Length (mm) **x diameter** (mm) **and type**	**Number/ Location**	**Length** (mm) **x diameter** (mm) **and type**	**Number/ Location**
Roof framing (continued)				
Blocking between rafters, joists or truss chords, 90 mm x 45 mm	100 x 3.75	2 (end nailed)	90 x 3.15	2 (end nailed)
Outrigger to gable top plate (as for equivalent purlins)	See table 10.10 and table 10.11	See table 10.10 and table 10.11	See table 10.10 and table 10.11	See table 10.10 and table 10.11
Outrigger to rafter	100 x 3.75 or 75 x 3.15	2 (end nailed) 4 (skewed)	90 x 3.15	3 (end nailed)
Flying rafter to outrigger	100 x 3.75	2	90 x 3.15	3
Outrigger blocking to top plate	100 x 3.75	4 (skewed)	90 x 3.15	4 (skewed)
Purlin or batten directly to rafter or top chord	See table 10.10 and table 10.11	See table 10.10 and table 10.11	See table 10.10 and table 10.11	See table 10.10 and table 10.11
Roof sarking				
Board sarking to rafters or top chords:				
(a) Boards not exceeding 75 mm wide	2½ x finished thickness	1	–	–
(b) Boards exceeding 75 mm wide		2	–	–
Sheet material for sheet sarking to:				
(a) Rafters or top chords at sheet edges	30 x 2.5 FH	150 mm centres	–	–
(b) Intermediate supports		300 mm centres	–	–
Purlins or battens through sarking to rafter or top chord	See table 10.15	See table 10.15	See table 10.15	See table 10.15

NOTE –
(1) Nail lengths and diameters are the minimum required.
(2) Refer to 4.4 for required protective coatings for metal fasteners.
(3) Proprietary fixings with the required fixing capacity indicated in the tables may be used.

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Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
ROOF NAILING SCHEDULE

SCALE @ A3.

SHEET NUMBER
310
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

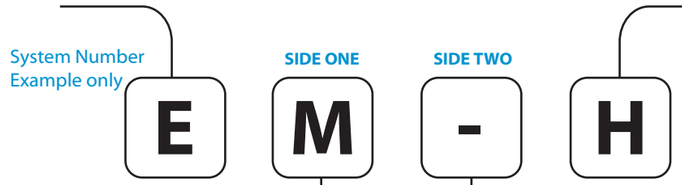
Quickbrace™ Design Solutions

Quickbrace™ Numbering System

E = Elephant Plasterboard

H = Panel Hold-downs Required (example shown)
N = No Hold-downs

System Number
Example only



SIDE ONE
S = Elephant Standard-Plus **or**
M = Elephant Multiboard (example shown) **or**

SIDE TWO
- = Single sided system only (example shown)
S = Elephant Standard-Plus
P = Plywood

QuickBrace™ Systems & Performance Table

System Number	Lining Requirement	Min. Length (m)	BU/m		Panel Hold-downs	Bracing Corner Pattern
			Wind	Earth-quake		
Plasterboard on One Side						
ES-N	Elephant Standard-Plus on One Side	0.4	65	60	**No**	**Condensed**
		1.2	70	65		
		1.8	80	65		
ES-H	Elephant Standard-Plus on One Side	0.4	80	75	**Yes**	
		0.8	100	85		
		1.8	115	85		
EM-H	Elephant Multiboard on One Side	0.4	95	100		
		0.8	120	110		
		1.2	140	115		
Plasterboard on Both Sides						
ESSN	Elephant Standard-Plus on Both Sides	0.4	80	75	**No**	**Condensed**
		0.8	90	80		
		1.2	95	85		
ESSH	Elephant Standard-Plus on Both Sides	0.4	95	110	**Yes**	
		0.8	140	130		
		1.2	150	140		
EMSH	Elephant Multiboard on One Side Elephant Standard-Plus on the Other	0.4	110	115		
		0.8	140	135		
		1.2	150	145		
Plasterboard One Side, Plywood the Other						
ESPH	Elephant Standard-Plus on One Side Plywood on the Other	0.4	100	115	**Yes**	**Condensed**
		0.8	140	140		
		1.2	150	150		
EMPH	Elephant Multiboard on One Side Plywood on the Other	0.4	120	135		
		0.8	140	145		
		1.2	150	150		

* Timber Floors - It is required by NZS 3604:2011 to limit BU ratings to 120 BU/m for timber floors. For a higher floor frame uplift, a specifically engineered design will be required.

Elephant QuickBrace™ **Systems** July 2015

Wall & Ceiling Construction Details

Wall Framing

Framing is to comply to NZS 3604:2011 and must be a minimum of 70 x 45mm for internal walls and 90 x 35mm for external walls. Nogs or dwangs are not a requirement in order to achieve the bracing ratings published in this document.

Fastening Bracing Elements to Floors

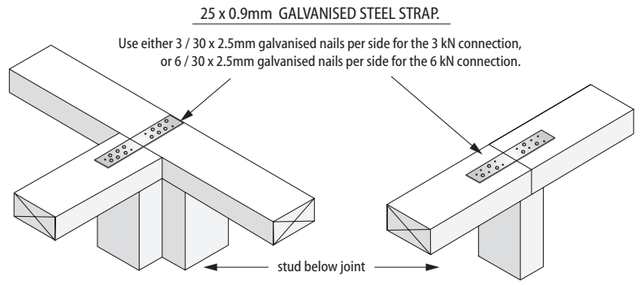
Quick-Brace™ System Number	Bottom Plate Fixing Requirements			Additional Requirements
	Concrete Floors		Timber Floors	Concrete or Timber
	External Walls	Internal Walls	External or Internal Walls	External or Internal
ES-N	Fix as per NZS 3604:2011	Fix as per NZS 3604:2011. Alternatively see **Note 1** below	Pairs of 100 x 3.75mm hand driven flat head nails or three 90 x 3.15mm power driven nails at 600mm centres all in accordance to NZS 3604:2011	None
ESSN	Not applicable			
ESSH	Not applicable	Fix as per NZS 3604:2011		Panel End Hold downs at each end of the bracing element.
EMSH				
ES-H	Fix as per NZS 3604:2011			
EM-H				
ESPH				
EMPH				

Note 1:

Min 75 x 3.8mm shot-fired fasteners with 16mm discs at 150mm & 300mm from end studs and thereafter at 600mm centres. Ensure a minimum penetration of 30mm into the concrete foundation.

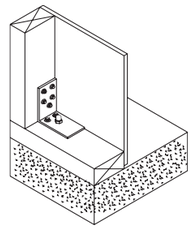
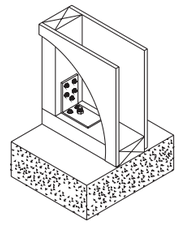
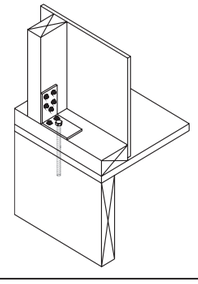
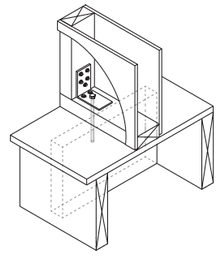
Top Plate Connections

Top plate connections detailed on the right meet the requirements of NZS 3604:2011 clause 8.7.3 Joints in Plates. The joints must be over a stud or solid blocking.
A 6kN connection is required if any bracing element in the wall exceeds 100 bracing units. Otherwise a 3kN connection is adequate.



Panel End Hold down Details - Bracing Anchor Brackets

Either Pryda® Bracing Anchor or any other proprietary panel end hold down bracket with a minimum performance of 15kN.

Concrete Floors		Timber Floors	
M12 galvanised anchor bolt or proprietary equivalent with minimum characteristic strength of 15kN . Set no less than 75mm into the concrete.		M12 x 150mm galvanised coach screw or proprietary equivalent with minimum characteristic strength of 12kN.	
External	**Internal**	**External**	**Internal**
			
Locate the bracket flush with the inside face of the framing in order to maximise concrete edge distance.	Locate the bracket centrally on the bottom plate.	Locate the bracing anchor bracket so that the coach screw is centred over the timber below.	Full depth solid blocking centrally positioned beneath the coach screw.

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68 WEKA ST
MANGAWHAI
For
SEAN & KATE FULLAN

BRACING DETAILS

SHEET NUMBER
311
OF: 35

EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21(

Panel End Hold down Details - Bracing Strap & Bolt Detail

N.B. Bottom plate anchor placements have been reduced to 80mm from the end of the bracing element. This is to be consistent with the bolt location when using bracing anchor brackets and represents industry best practise. This does not affect previous designs or installations.

Bracing Strap:

400 x 25 x 0.9mm galvanised strap passing under the bottom plate. Six 30 x 2.5mm galvanised flat head nails to each side of the stud and three 30 x 2.5mm galvanised flat head nails to each side of the bottom plate.

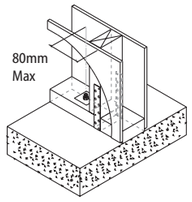
The bracing strap should be checked into the framing in order to make the substrate flush when receiving the plasterboard lining. Position it in such a way that the important corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown below will ensure the important corner fastenings won't penetrate the bracing strap.

Extra thickness and/or corrosion protection may be required on exposed and unexposed sites as per requirements of NZS 3604:2011

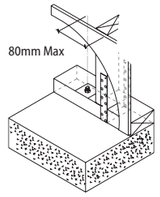
Concrete Floors

M12 x 150mm galvanised bolt or proprietary equivalent with minimum characteristic strength of 15kN.
Set no less than 75mm into the concrete.
Allow for a 3 x 50 x 50mm galvanised washer within 105mm of the ends of the bracing element.

Internal



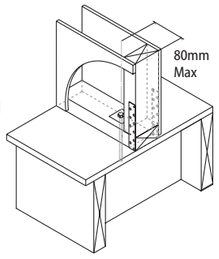
External



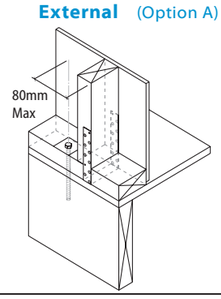
Timber Floors

M12 x 150mm galvanised coach screw or proprietary equivalent with minimum characteristic strength of 12kN.
Allow for a 3 x 50 x 50mm galvanised washer within 105mm of the ends of the bracing element.

Internal



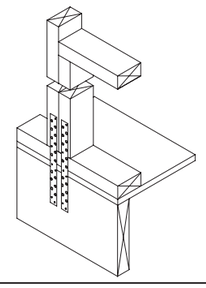
External (Option A)



Timber Floor: External

(Option B)
Block up to the first nog to allow for double strapping using three 100 x 3.75mm nails. Two 300 x 25 x 0.9mm galvanised straps pass down onto the floor joist. Six 30 x 2.5mm galvanised flat head nails to each stud and the floor joist and three to the bottom plate.

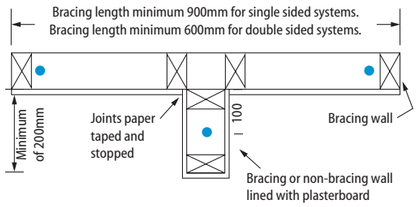
External (Option B)



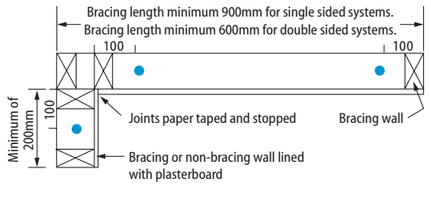
Intersecting Walls

Provided the minimum wall lengths are complied with and walls are constructed as described in this manual, bracing elements may be interrupted by intersecting walls as detailed below. Fasteners layout at the corners and around the perimeter of the bracing elements are as per The Fastener Layout figures on page 22. Joints between sheets shall be paper taped and stopped in accordance with the Elephant Plasterboard Installation Guide. Panel end hold-downs must also comply except that the location of bottom plate anchors is modified for L and T intersections as defined below.
The minimum bracing element length is 900mm for single sided bracing systems (ES-N, ES-H and EM-H) and 600mm for double sided bracing systems, (ESSN, ESSH, ESPH, EMSH and EMPH.)

(A) T INTERSECTION



(B) L INTERSECTION

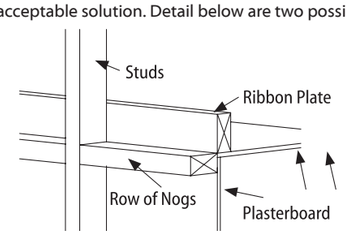


- Bottom plate fixing as required for bracing element or NZS 3604:2011 (as appropriate)

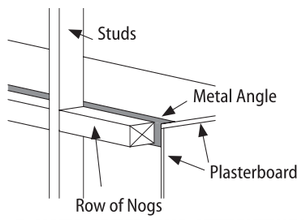
Parapets, Gable End Walls or Dropped or Suspended Ceilings

Sheeting material used in bracing elements must connect to both the top and bottom plates. Where the top plate is not accessible, fixing to a row of nogs is not an acceptable solution. Detail below are two possible solutions.

A continuous length of timber or ribbon plate, with the same minimum size as the bottom plate, fixed across the face of the studs just above the row of nogs and at the ceiling line.



A metal angle of minimum of 50 x 50 x 0.55mm fixed to the row of nogs at the ceiling line. Use minimum 30 x 2.5mm FH galv nails at 300mm centres.



HOMES
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66 WERA ST
MANGAWHAI
For
SEAN & KATE FULLAN

BRACING DETAILS

SHEET NUMBER 312 OF: 35

ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 2 1000

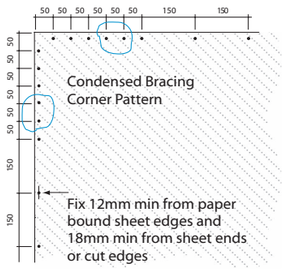
Wall Bracing Construction Details

Fastening the Plasterboard Linings

Elephant Plasterboard designated as a bracing element must be constructed with specified fasteners and fastener patterns. Specialised panel end hold downs may also be required as they are essential for obtaining the bracing unit ratings. The corner detail for plasterboard bracing elements require specific increased fastening. See figures below.

Fasteners:

Timber battens & Timber perimeters: 32mm x 6g High thread Drywall screws
Steel battens and Steel perimeter: 25mm x 6g self tapping screws



Fastener Brands Allowable

Fortress® , Grabber® or Senco ®. (Other fastener brands need to demonstrate equal or better performance).

Fastener Layout

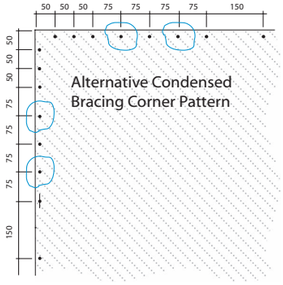
Refer Condensed Bracing Corner Pattern on the right. Place all fasteners 12mm from paper bound sheet edges and 18mm from sheet ends or cut edges. Fastening the middle of the bracing element is as per the recommended screw and glue methods. Refer to Elephant Plasterboard Installation Guide.

Minimum Sheet Size

Sheets less than 300mm wide are allowable provided that the joints form over solid framing or the sheet is back blocked. All joints must be paper taped and stopped.

Butt Joints

All butt joints should be either fitted over nogs or studs and fastened at 200mm centres or back-blocked. All joints must be paper taped and stopped. Refer to Elephant Plasterboard Installation Guide.



Horizontal Fixing

QuickBrace™ systems may be fixed horizontally. The specialised corner and perimeter bracing pattern need only to be placed over the length and width of the bracing element. Fastening in the field of the bracing element is as per the recommended glue and screw method.
Note- Care should be taken during the installation of the plasterboard, as often the studs that require the special mechanical fixing pattern are in the field of the sheet. It is important to insure that the adhesives are not placed on or near the studs that require these special perimeter fasteners as this can be a cause of screw popping.

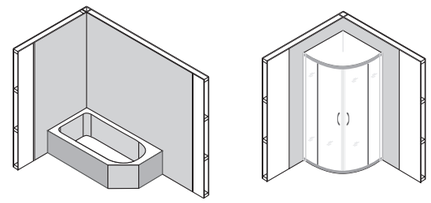
Alternative Corner Fastener Layout

If the installer has used the 50, 50, 50, 75, 75, 150 corner screw pattern then this can easily be remedied by simply placing an extra screw between the first 150mm (where possible). Refer to the Alternative Condensed Bracing Corner Pattern on the right.

Wet Areas

Do not place bracing elements in areas such as behind showers and baths. Placing bracing elements in water splash areas is acceptable provided that these areas are maintained impervious for the life of the building. Bracing elements require a 50 year durability.

Shaded area must not have Plasterboard Bracing Systems

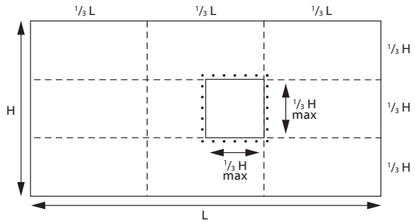


Allowable Substitutions

Elephant Aquaboard can be substituted for the Elephant Standard-Plus in QuickBrace™ systems ES-N, ESSN, ES-H, ESSH, ESPH and EMSH. Elephant Aquaboard can be substituted for the Elephant Multiboard in QuickBrace™ systems EM-H, EMSH and EMPH provided that the element is 600mm or longer and the perimeter screw pattern is reduced to 100mmm centres. Ensure that all other relevant bracing system requirements including the important corner patterns are met.

Openings in Bracing Elements

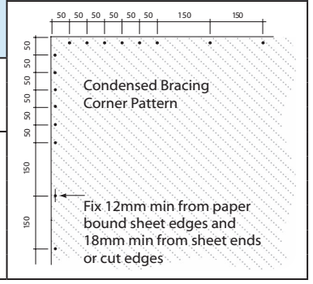
Large openings can only be placed in the middle 1/3 of the bracing element. Neither the opening height nor length can be more than 1/3 of the bracing element height. Fix the wall linings around the opening trimmers at 150mm centres. Smaller openings of 90 x 90mm or less are allowable but cannot be placed closer than 90mm from the edge of the bracing element.



Plywood

For systems ESPH and EMPH plywood is required. This can be Grade D-D 7mm construction plywood at a minimum. The plywood must be manufactured as per Australian/New Zealand Standard AS/NZS 2269:2004. The nailing pattern is at 150mm centres around the perimeter of the bracing element or each plywood sheet, whichever is the lesser width, using 50 x 2.8mm Flat head galvanised or stainless steel nails.
Sheet edges must be supported by framing or blocking. The corner pattern fastening is conventional and there is no need for the specialised corner patterns as is required on the plasterboard side of the brace.

PLASTERBOARD ON ONE SIDE

System Number	Lining Requirement	Min Length (m)	BU/m		Panel Hold-downs	Bracing Corner Pattern
			Wind	Earth-quake		
ES-N	Elephant Standard-Plus on one side	0.4	65	60	No	
		1.2	70	65		
		1.8	80	65		
ES-H	Elephant Standard-Plus on one side	0.4	80	75	Yes	
		0.8	100	85		
		1.8	115	85		
EM-H	Elephant Multiboard on one side	0.4	95	100		
		0.8	120	110		
		1.2	140	115		

FRAMING

Framing heights and dimensions to comply with NZS 3604:2011 and must be a minimum of 70 x 45mm for internal walls and 90 x 35mm for external walls. Nogs and Dwangs are not a requirement in order to achieve the bracing ratings in this document.
Refer to relevant sections and clauses of
NZBC B1: Structure; AS1 Clause 3 Timber -NZS 3604
NZBC B2: Durability; AS1 Clause 3.2 Timber -NZS 3602

FASTENING BRACING ELEMENTS TO FLOOR

Timber Floor:

Fastening within the bracing element must be done in accordance with NZS 3604:2011.
i.e. Either pairs of 100 x 3.75mm hand driven nails or three 90 x 3.15mm power driven nails at 600mm centres.
For **ES-H** and **EM-H:** Use the panel hold downs at each end of the bracing element.

Concrete Floors:

External or Internal walls: Within the bracing element fix the bottom plate as per NZS 3604:2011.
For **ES-N:** On Internal Walls alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs at 150mm & 300mm from end studs and thereafter at 600mm centres. Ensure a minimum penetration of 30mm into the concrete foundation.
For **ES-H** and **EM-H**: Use the panel hold downs at each end of the bracing element.

WALL LINING (As per Specified System Above)

One layer of Plasterboard lining type as per specified system above to ONE side of frame.
The Plasterboard sheets can be fixed vertically or horizontally. Use full height or full length sheets when fixing vertically or horizontally where possible. All sheet end butt joints must be fixed over solid timber framing and fastened at 200mm centres. Alternatively the sheet end butt joints may be back blocked. Sheets shall be touch fitted.

FIXING OF PLASTERBOARD LININGS

Fastening: (Corners and Perimeters of the bracing element)
32mm x 6g High thread Drywall screws (Fortress® or Grabber® or Senco®)

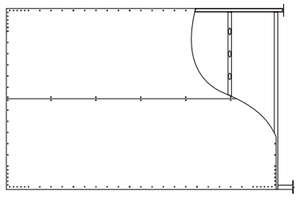
Fastening Centres: (Corners and Perimeters of the bracing element)
Corner Pattern: Refer to the bracing corner pattern above.
(See Page 22 for alternative allowable corner pattern.)
Perimeter Pattern: Place fasteners at 150mm centres around perimeter of bracing element.
Place all fasteners 12mm from paper bound sheet edges and 18mm from sheet ends or cut edges.

Fasteners and Fastening Centres in the Field of the bracing element
For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints. For Horizontally fixed sheets place fasteners at the sheet edge that crosses the studs. Place daubs of Drywall adhesives at 300mm centres to intermediate studs. Take extra care to ensure that screws or clouts are not placed closer than 200mm from any daubs of adhesive.

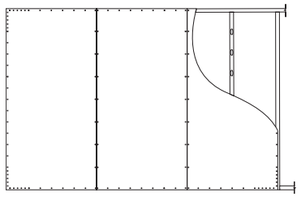
JOINTING

All fasteners stopped and all sheet joints reinforced with paper jointing tape.
All in accordance with the Elephant Plasterboard Installation Guide.

Horizontal Fixing

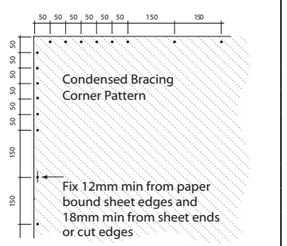


Vertical Fixing



Elephant QuickBrace™ **Systems** July 2015

PLASTERBOARD ON BOTH SIDES

System Number	Lining Requirement	Min Length (m)	BU/m		Panel Hold-downs	Bracing Corner Pattern
			Wind	Earth-quake		
ESSN	Elephant Standard-Plus on Both sides	0.4	80	75	No	
		0.8	90	80		
		1.2	95	85		
ESSH	Elephant Standard-Plus on Both sides	0.4	95	110	Yes	
		0.8	140	130		
		1.2	150	140		
EMSH	Elephant Multiboard on one side, Elephant Standard plus on the other	0.4	110	115		
		0.8	140	135		
		1.2	150	145		

FRAMING

Framing heights and dimensions to comply with NZS 3604:2011 and must be a minimum of 70 x 45mm for internal walls and 90 x 35mm for external walls. Nogs and Dwangs are not a requirement in order to achieve the bracing ratings in this document.
Refer to relevant sections and clauses of
NZBC B1: Structure; AS1 Clause 3 Timber -NZS 3604
NZBC B2: Durability; AS1 Clause 3.2 Timber -NZS 3602

FASTENING BRACING ELEMENTS TO FLOOR

Timber Floor:

Fastening within the bracing element must be done in accordance with NZS 3604:2011.
i.e. Either pairs of 100 x 3.75mm hand driven nails Or three 90 x 3.15mm power driven nails at 600mm centres.
For **ESSH** and **EMSH:** Use the panel hold downs at each end of the bracing element.

Concrete Floors:

Within the bracing element fix the bottom plate as per NZS 3604:2011.
For **ESSN**: For Internal Walls alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs at 150mm & 300mm from end studs and thereafter at 600mm centres. Ensure a minimum penetration of 30mm into the concrete foundation.
For **ESSH** and **EMSH**: Use the panel hold downs at each end of the bracing element.

WALL LINING (As per Specified System Above)

One layer of Plasterboard lining type as per specified system above to BOTH sides of frame.
The Plasterboard sheets can be fixed vertically or horizontally. Use full height or full length sheets when fixing vertically or horizontally where possible. All sheet end butt joints must be fixed over solid timber framing and fastened at 200mm centres. Alternatively the sheet end butt joints may be back blocked. Sheets shall be touch fitted.

FIXING OF PLASTERBOARD LININGS

Fastening: (Corners and Perimeters of the bracing element)
32mm x 6g High thread Drywall screws (Fortress® or Grabber® or Senco®)

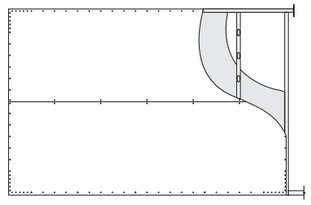
Fastening Centres: (Corners and Perimeters of the bracing element)
Corner Pattern: Refer to the bracing corner pattern above.
(See Page 22 for alternative allowable corner pattern).
Perimeter Pattern: Place fasteners at 150mm centres around perimeter of bracing element.
Place all fasteners 12mm from paper bound sheet edges and 18mm from sheet ends or cut edges.

Fasteners and Fastening Centres in the Field of the bracing element
For vertically fixed sheets place fasteners at 300mm centres to the intermediate sheet joints.
For Horizontally fixed sheets place fasteners at the sheet edge that crosses the studs. Place daubs of Drywall adhesives at 300mm centres to intermediate studs. Take extra care to ensure that screws or clouts are not placed closer than 200mm from any daubs of adhesive.

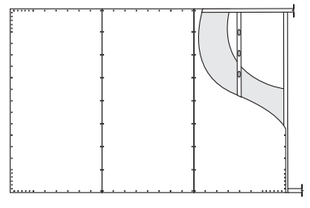
JOINTING

All fasteners stopped and all sheet joints reinforced with paper jointing tape.
All in accordance with the Elephant Plasterboard Installation Guide.

Horizontal Fixing



Vertical Fixing



FOR BC

Westmoreland HOMES
MAKING PLANS LTD
ARCHITECTURAL : DESIGN
47 Forge Road, Silverdale
PO Box 88 Waiwera
Telephone: 09 426 7835
email: admin@makingplans.co.nz

Job Title
PROPOSED DWELLING
At
68 WEKA ST MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
BRACING DETAILS

SCALE @ A3.
1:1
SHEET NUMBER
313
OF: 35

WIND ZONE	HIGH
EXPOSURE ZONE	D
EQ ZONE	1
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21035

DESIGN DETAIL

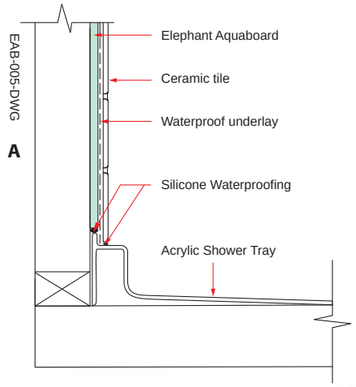
Showers - Tiled Walls and Acrylic Base

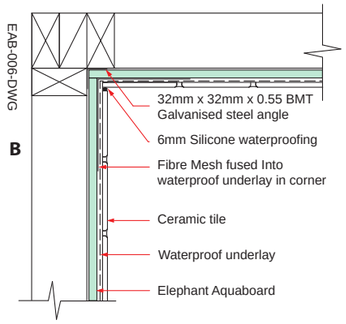
Galvanised steel corner angle

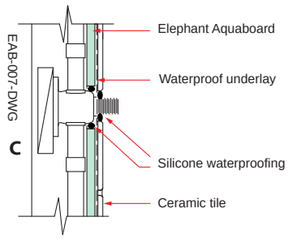
A galvanised metal angle of minimum dimension 32mm x 32mm x .55mm BMT shall be installed in the corner of the shower before any plaster-board is installed, this ensures that any sudden movement in the shower will maintain the structural stability of the timber framing behind the shower and possible stop the tiles from cracking or displacement.

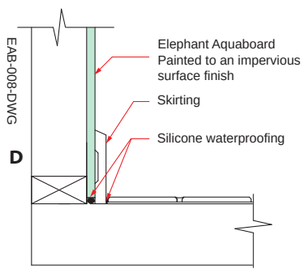
Fibre mesh and waterproof underlay

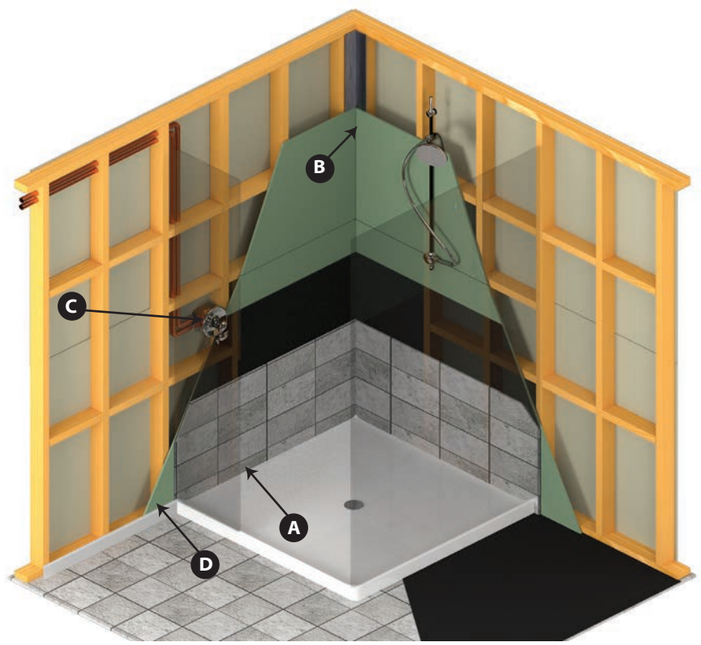
- A waterproof membrane must be applied to the tiled areas, refer to manufacturers recommendations and installation on waterproof membranes.
- All corners of the tiled area in the shower need embed reinforcing mats in the waterproofing membrane, refer to the manufacturers specifications and installation procedures.











Elephant Aquaboard Wet Area **Systems** July 2017

DESIGN DETAIL

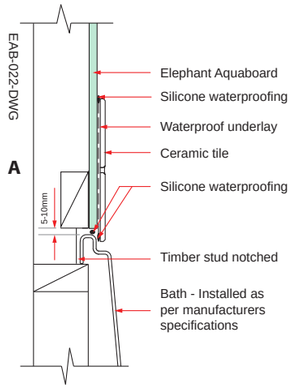
Tiled Bath Upstand and Typical Vanity

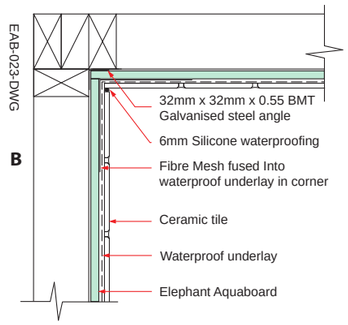
Galvanised steel corner angle

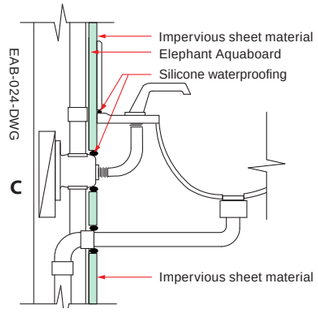
It is highly recommended that a 32mm x 32mm x .55mm BMT galvanised equal angle plate is installed in the corner of the tiled upstand before any plasterboard is installed, this ensures that any sudden movement in the shower will maintain the structural stability of the timber framing behind the shower and possible stop the tiles from cracking or displacement.

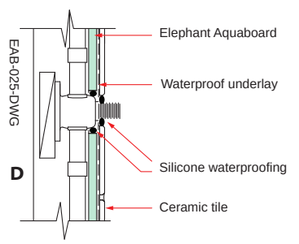
Fibre mesh and waterproof underlay

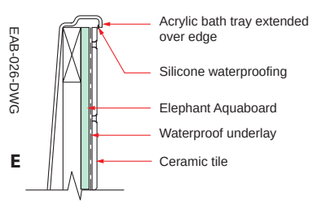
- A waterproof membrane must be applied to the tiled areas, refer to manufacturers recommendations and installation on waterproof membranes.
- All corners of the tiled area in the upstand need embed reinforcing mats in the waterproofing membrane, refer to the manufacturers specifications and installation procedures.











Westmoreland HOMES

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Job Title
PROPOSED DWELLING
At
68 WEKA ST
MANGAWHAI
For
SEAN & KATE FULLAN

Drawing Title
WET AREA SYSTEMS

SHEET NUMBER
314
OF: 35

EQ ZONE	T
ZONE	RES HARBOUR
Checked	MAKING PLANS
Drawn	DRAWN BY NAME
Plot Date	4/08/2022

Job # 21 - - -

DESIGN DETAIL

Kitchen and Laundry Areas

Under the definitions of the New Zealand Building Code E3, laundries are considered as wet areas, and as such need special consideration for lining of walls.

Aquaboard is well suited for this type of installation, refer to generic details on recommended installation.

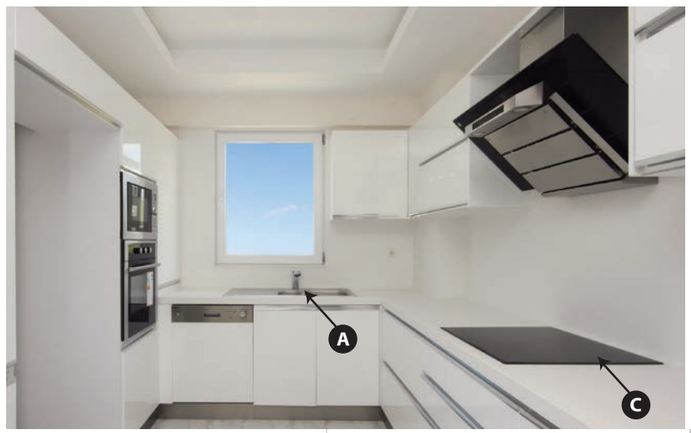
Laundry or kitchen walls lined with tiles to Aquaboard have limitations on tile weight.

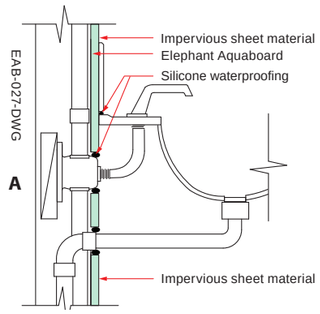
10mm Elephant Aquaboard - tile weights up to and including 20kg per sqm

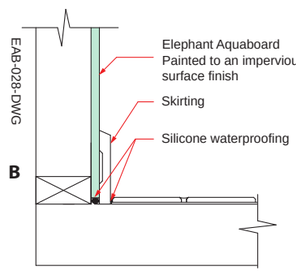
13mm Elephant Aquaboard - tile weights up to and including 32kg per sqm

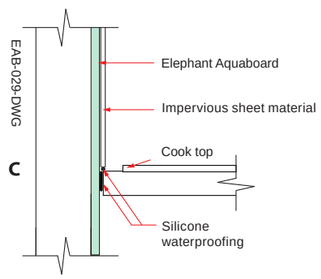
Any type of tiles approved for wet area systems may be used. For further information on tiling consult the BRANZ "Good Practice Guide on Tiling". When tiling an area ensure that screws are centred at least 100mm around the perimeter of the Aquaboard and up each intermediate stud to the tile height. Above that height general fixings are only required.

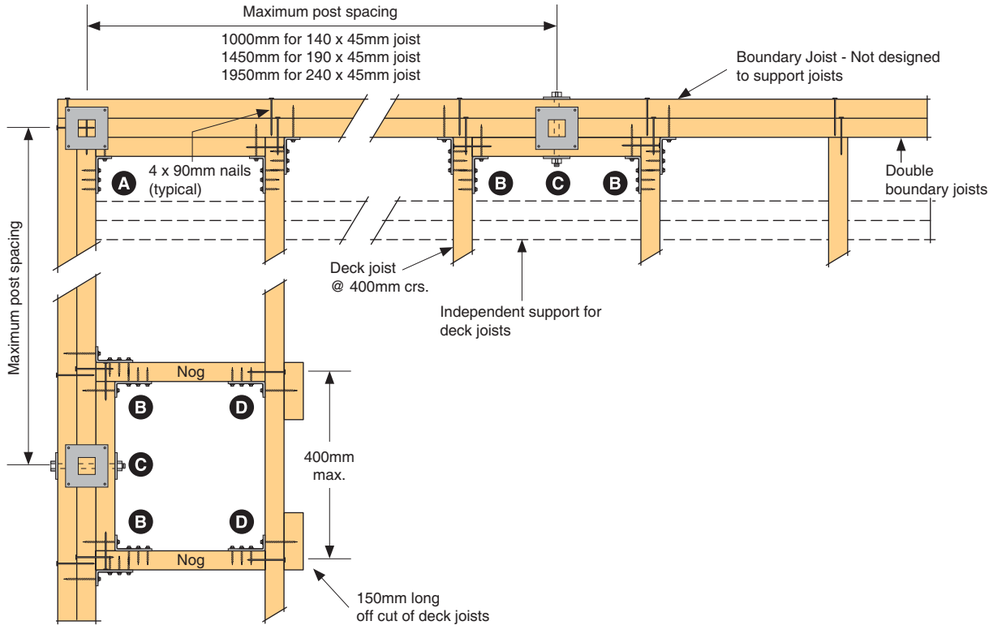
It is also required by the NZ Building Code to paint all exposed plasterboard surfaces in wet areas to a smooth impervious finish.
It is recommended that a paint manufacturer be consulted for a suitable paint application for wet area surfaces. Although the New Zealand Building Code says nothing regarding the type of lining required in wet areas, it is highly recommended to use Aquaboard in all wet areas due to the boards composition which repels water.

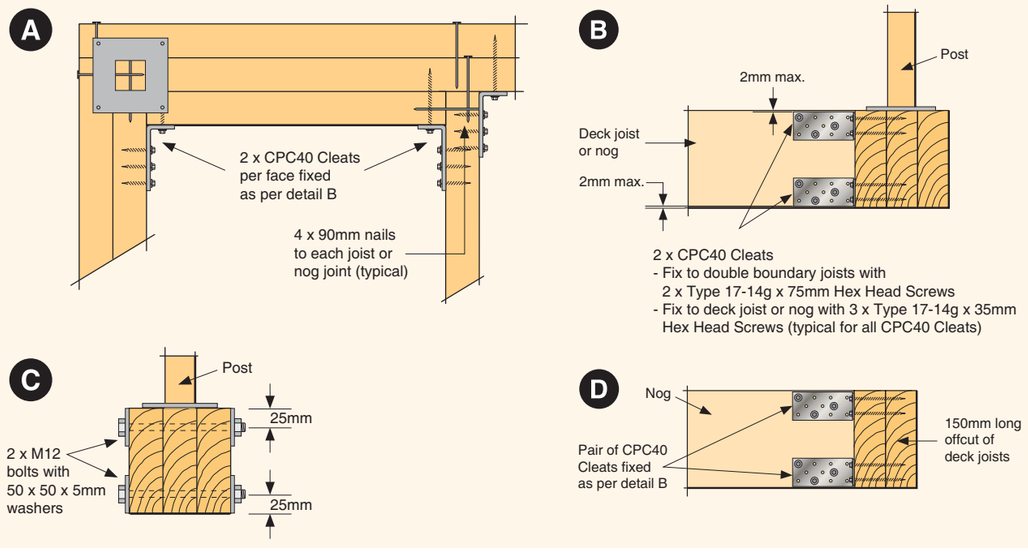












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