Ref: WS170089

15 November 2019

Parkwood Modular Buildings Pty Ltd
Lot 6 Kangoo Road
SOMERSBY NSW 2250

Attn: Mr John McDougall

Dear John

Re Structural Inspection of Prefabrication Buildings
November 2019

We confirm that ACOR consultants Pty Ltd attended the fabrication premises on the 11th November 2019 for the purpose on inspecting the structural elements of pre-fabricated housing and buildings at various stages during construction.

At the time of our inspection, relevant structural elements were assessed and were found to comply with the structural design specifications and with the requirements of the Building Code of Australia.

Should you have any further queries don't hesitate to contact the undersigned.

Yours faithfully
ACOR Consultants Pty Ltd

Andrew Hastie
Associate Structural Engineer
BE(Hons) MIEAust

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No. 1 Maitland Place
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ENGINEERS
MANAGERS
INFRASTRUCTURE PLANNERS
DEVELOPMENT CONSULTANTS

Ref: WS170089-cert01052019

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01 May 2019

Parkwood Modular Buildings Pty Ltd
Lot 6 Kangoo Road
SOMERSBY NSW 2250

Attn: Mr John McDougall

Re: Structural Engineering Certification (Standard Chassis)
Standardised Modular buildings / houses

This is to certify that the structural component of this project including inspections during fabrication, as shown on the drawings numbered SY100462:

Drawing No.	Revision	Drawing No.	Revision
S01	02	S02	02
S03	02	S03.02	02
S04	02	S05	02
S06	02	S07	02
S08	02	S09	02
S10	02		

was design by a practising structural engineer from this company in accordance with the normal engineering practice and meets the requirements of the Local Government (Manufactured Homes Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005, relevant conditions of the development consent and the current versions of the following Australian Standards:

AS1170.1, 2 & 4 – Structural Design Actions
AS1720 – Timber Structures
AS3600 – Concrete Structures
AS4100 – Steel Structures

In carrying out the design and inspections during fabrication we exercised the degree of skill, care and diligence normally exercised by Consulting Engineers in similar circumstances.

This certificate does not relieve other parties of their responsibilities for the works

Yours faithfully,
ACOR Consultants Pty Ltd

Andrew Hastie
Associate Structural Engineer
BE(Hons) MIEAust

A. GENERAL

A 1 THIS SET OF DRAWINGS IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS

A 2 ALL SET OUT DIMENSIONS ARE TO BE OBTAINED FROM THE ARCHITECTURAL DRAWINGS UNLESS SPECIFIC DIMENSIONS ARE GIVEN ON THE ENGINEERING DRAWINGS

A 3 THESE DRAWINGS SHOULD NOT BE SCALED

A 4 ALL MATERIALS AND WORKMANSHIP ARE TO BE OF THE HIGHEST STANDARD AND IN ACCORDANCE WITH ANY RELEVANT S A I GLOBAL CODES RELATING TO THEIR APPLICATION CERTIFICATES TO THIS EFFECT FROM A N A T A APPROVED TESTING LABORATORY SHALL BE FURNISHED ON REQUEST

A 5 DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART OF THE STRUCTURE SHALL BE OVER STRESSED

A 6 THE STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING SUPERIMPOSED LIVE LOADINGS

INTERNAL	1 5 kPa
GARAGE	3 0 kPa
BALCONY	2 0 kPa

B. SITE CLASSIFICATION

B 1 A SITE CLASSIFICATION SHALL BE CARRIED OUT PURSUANT TO CLAUSE 2 1 1 OF AS2870-1996 BY EITHER LOCAL COUNCIL QUALIFIED ENGINEER OR GEOTECHNICAL ENGINEER

B 2 THE DESIGN IS BASED ON EITHER SITE CLASSIFICATIONS A S M OR H IN ACCORDANCE WITH THE TABLES ON THE DRAWINGS

B 3 THE FOOTING SYSTEM SPECIFIED ON THESE DRAWINGS WILL MEET THE PERFORMANCE REQUIREMENTS SET OUT IN CLAUSE 1 3 OF AS2870-1996 (RESIDENTIAL SLABS AND FOOTINGS CODE) THE FOOTING SYSTEM IS INTENDED TO ACHIEVE ACCEPTABLE PROBABILITIES OF SERVICEABILITY AND SAFETY OF THE BUILDING DURING ITS DESIGN LIFE

B 4 APPENDIX B OF AS2870-1996 PROVIDES INFORMATION AND GUIDANCE ON THE MAINTENANCE OF FOUNDATION & SITE CONDITIONS SUBJECT TO ADOPTION OF THESE RECOMMENDATIONS THE BUILDING MAY EXPERIENCE MINOR DAMAGE BUT OF A SEVERITY NOT EXCEEDING THE LEVELS DEFINED IN APPENDIX C OF AS2870-1996

B 5 IT IS THE OWNERS RESPONSIBILITY TO ENSURE THE SITE IS PROPERLY MAINTAINED

B 6 THE FOOTING DETAILS SHOWN ARE FOR THE SITE CLASSIFICATION STIPULATED WHILST EVERY CARE HAS BEEN TAKEN TO VERIFY THAT THE INFORMATION SHOWN IS CORRECT ACOR CONSULTANTS PTY LTD TAKES NO RESPONSIBILITY FOR VARIATIONS WHICH MAY OCCUR DUE TO VARIATIONS IN SITE CONDITIONS

D. STEEL FIXER

D 1 ALL REINFORCING BAR AND FABRIC SHALL BE DESIGNATED AS SHOWN IN THE FOLLOWING TABLE AND SHALL COMPLY WITH THE APPROPRIATE CODES AS NOTED BELOW

SYMBOL	TYPE
R	STRUCTURAL GRADE ROUND BARS TO AS4671-2001 (230MPa)
S	STRUCTURAL GRADE DEFORMED BARS TO AS4671-2001 (230MPa)
N	TEMPCORE DEFORMED BARS TO AS4671-2001 (500MPa)
RL/SL	FABRIC TO AS4671-2001 (500MPa)
TM	TRENCH MESH TO AS4671-2001 (500MPa)
NOTE	THE NUMBER FOLLOWING THE SYMBOL IS THE BAR DIAMETER IN MILLIMETRES

D 2 MINIMUM LAP TO FABRIC TO BE AS SHOWN IN THE DIAGRAM BELOW

D 3 TRENCH MESH SHALL BE SPLICED WHERE NECESSARY BY A LAP OF 500mm ALL CROSS WIRES TO TRENCH MESH SHALL BE CUT FLUSH WITH OUTER MAIN WIRES

D 4 SPLICES IN REINFORCEMENT SHALL BE MADE IN ACCORDANCE WITH THE PROVISIONS OF TABLE 13 1 2 2 A OF AS3600-1994 OR IN ACCORDANCE WITH THE FOLLOWING TABLE

BAR SIZE	N12	N16	N20	N24	N28	N32
SPLICE LENGTH	400	600	800	1200	1350	1650

D 5 REINFORCEMENT SHALL BE SUPPORTED AT 800mm MAXIMUM CENTRES TO MAINTAIN THE NOMINATED POSITION AND COVER UNLESS REDUCED SPACING IS SPECIFIED

D 6 BAR CHAIRS SHOULD BE PLACED SUCH THAT REINFORCEMENT IS ALWAYS POSITIONED WITH SPECIFIED COVER

D 7 WELDING OF REINFORCEMENT OTHER THAN TACK WELDING FOR PURPOSE OF MAINTAINING BARS IN CORRECT POSITION IS NOT PERMITTED UNLESS SPECIFICALLY NOMINATED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER

E. CONCRETE

E 1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS

CONCRETE QUALITY

ELEMENT	SLUMP	MAX SIZE AGG	CEMENT TYPE	AS3600 F'c	ADMIXTURE	MIN CEMENT CONTENT PER M^3
PIERS	80	20	GP/GB	20MPa	NIL	250 Kg
SLAB	80	20	GP/GB	20MPa	NIL	250 Kg

E 2 DESIGN COVER TO THE REINFORCEMENT SHALL BE 40mm TO UNPROTECTED GROUND 40mm TO EXTERNAL EXPOSURE 30mm TO THE MEMBRANE IN CONTACT WITH THE GROUND AND 20mm TO THE INTERNAL SURFACE THE SLAB FABRIC SHALL BE PLACED TOWARDS THE TOP OF THE SLAB WITHIN THE ZONE DEFINED BY THESE LIMITS

E 3 ALL CONCRETE CONSTRUCTION TO BE COMPACTED WITH A MECHANICAL VIBRATOR

E 4 THE CONCRETE SLAB SHALL BE CURED USING AN APPROVED COMMERCIAL CURING COMPOUND AND IN ACCORDANCE WITH CLAUSE 19 1 5 OF AS3600-1994 CURING OF THE CONCRETE SHALL START IMMEDIATELY AFTER FINISHING

S. RESIDENTIAL STRUCTURAL STEEL WORK

S 1 ALL STRUCTURAL STEEL WORK SHALL COMPLY WITH AS 1111, AS 1112, AS 1163, AS 1554, AS 4100, AND THE A C S E STRUCTURAL STEEL FABRICATION AND ERECTION SPECIFICATIONS WHERE DEEMED APPROPRIATE BY THE CONTRACT DOCUMENTS

S 2 ABBREVIATIONS USED ARE AS FOLLOWS

- UB - UNIVERSAL BEAM
- UC - UNIVERSAL COLUMN
- PFC - PARALLEL FLANGE CHANNEL
- EA - ROLLED STEEL EQUAL ANGLE
- UA - ROLLED STEEL UNEQUAL ANGLE
- RHS - RECTANGULAR HOLLOW SECTION
- SHS - SQUARE HOLLOW SECTION
- B W - BUTT WELD
- F W - FILLET WELD

S 3 THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION IS THE BUILDER'S RESPONSIBILITY ADEQUATE TEMPORARY BRACING SHALL BE PROVIDED WHERE NECESSARY AND AS DIRECTED BY THE SUPERVISING ENGINEERING

S 4 ALL SHOP CONNECTIONS SHALL BE FULLY WELDED UNLESS NOTED OTHERWISE

S 5 BOLT DESIGNATION:

4 6/S COMMERCIAL BOLTS OF GRADE 4 6 TO AS1111 SNUG TIGHTENED

8 8/S HIGH STRENGTH STRUCTURAL BOLTS OF GRADE 8 8 TO AS 1252 SNUG TIGHTENED

S 6 UNLESS NOTED OTHERWISE ALL BOLTS SHALL BE M16 GRADE 8 8/S NO CONNECTION SHALL HAVE LESS THAN 2 BOLTS ALL BOLTS AND WASHERS SHALL BE GALVANISED

S 7 UNLESS NOTED OTHERWISE ALL WELDS SHALL BE 6mm CONTINUOUS FILLET TYPE GP BUTT WELDS, WHERE SPECIFIED, SHALL BE COMPLETE PENETRATION BUTT WELDS TO AS 1554 USE E4121 02 07 ELECTRODES FOR ALL WELDING UNLESS NOTED OTHERWISE

S 8 UNLESS NOTED OTHERWISE ALL GUSSET AND CONNECTION PLATES TO BE 10mm

S 9 THE BUILDER SHALL PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR FIXING STEEL TO STEEL AND TIMBER TO STEEL WHETHER OR NOT DETAILED ON THE DRAWINGS

S 10 ALL COLUMNS AND BEAMS SHOWN ON THE DRAWINGS FOR TIMBER FRAMED BUILDINGS SHALL BE LATERALLY RESTRAINED BY THE BUILDING FRAME AT EACH SUPPORT LOCATION THROUGH POSITIVE SCREW FIXING OF WALL STUDS TO THE COLUMNS AND EITHER JOISTS OR NOGGINGS TO THE BEAMS

S 11 ALL COLUMNS AND BEAMS SHOWN ON THE DRAWINGS FOR FULL BRICK BUILDINGS SHALL BE LATERALLY RESTRAINED BY THE BRICKWORK AT EACH SUPPORT THROUGH POSITIVE FIXING OF WALL TIES TO THE COLUMNS AND EITHER JOISTS OR NOGGINGS TO THE BEAMS NO ADDITIONAL RESTRAINT IS REQUIRED WHERE A BEAM DIRECTLY SUPPORTS A CONCRETE FLOOR SLAB

S 12 SURFACE TREATMENT AND COATINGS SHALL BE AS SPECIFIED WITHIN THE TABLE BELOW

ELEMENT	SURFACE CLEANING TO AS 1627 PART 4	COATINGS
ALL EXTERNAL STEELWORK	SUITABLE FOR GALVANISING	HOT DIPPED GALVANISED OR IN ACCORDANCE WITH AS2312
ALL INTERNAL STEELWORK	CLASS 1	R O Z P - 1 COAT

S 13 REFERENCE SHOULD BE MADE TO AS 2312 FOR GUIDANCE ON APPROPRIATE COATING SYSTEMS FOR ALL EXTERNAL APPLICATIONS COATING OF EXTERNAL LINTELS SHALL BE IN ACCORDANCE WITH BCA96 CLAUSES 3 3 3 4 AND 3 4 4 OR AS3700 CLAUSE 3 4 3
THE BUILDER MUST CLARIFY HIS CONTRACTUAL OBLIGATIONS IN THIS REGARD

S 14 CONCRETE ENCASED STEEL WORK SHALL BE WRAPPED WITH 10 S W G WIRE AT 100mm PITCH AND SHALL HAVE A MINIMUM CONCRETE COVER OF 150mm UNLESS NOTED OTHERWISE

C. FOOTINGS

C 1 GENERAL
ALL PIERING IS TO CONFIRM TO THE FOLLOWING TABLES FOR SINGLE & TWO STORY BUILDINGS AND NOTES C2 & C3 WHERE CONDITIONS DIFFER TO WHAT IS DETAILED THE STRUCTURAL ENGINEER IS TO BE NOTIFIED TO PROVIDE INSTRUCTIONS

C 2 PIER DEPTHS NOMINATED ARE MINIMUM REQUIREMENTS ONLY AND SHOULD BE INCREASED IF REQUIRED

C 3 MINIMUM 3 PIERS PER EACH CHASSIS BEAM UNLESS APPROVED BY ENGINEER IN WRITING

4m OVERALL WIDTH

BEARING STRATA	STANDARD CHASSIS
ALL PIERS	ALL PIERS
100KPa (SAND)	Ø450 AT 2.6m Ø600 AT 4m
150KPa (NATURAL CLAY/MATERIAL)	Ø450 AT 3.6m Ø600 AT 4m
250KPa (STIFF CLAY)	Ø450 AT 4m
400KPa+ (SHALE/ROCK)	Ø450 AT 4m

5m OVERALL WIDTH

BEARING STRATA	STANDARD CHASSIS
ALL PIERS	ALL PIERS
100KPa (SAND)	Ø450 AT 1.9m Ø600 AT 3.4m
150KPa (NATURAL CLAY/MATERIAL)	Ø450 AT 3m Ø600 AT 4m
250KPa (STIFF CLAY)	Ø450 AT 4m
400KPa+ (SHALE/ROCK)	Ø450 AT 4m

MIN PIER DEPTH (REFER TO S03)

DESCRIPTION	SITE CLASS	MIN PIER DEPTH 'D'
ROCK	A	400 OR LEVELLING PAD
STABLE	S	400
MODERATE REACTIVE	M	800
HIGHLY REACTIVE	H	1000 AT 2400 MINIMUM CTS

Issue	Description	Date	Drawn	Approved
2	REISSUED FOR CONSTRUCTION	30 04 19	ED	AH
1	ISSUED FOR CONSTRUCTION	11 07 17	AT	AH

FOR CONSTRUCTION

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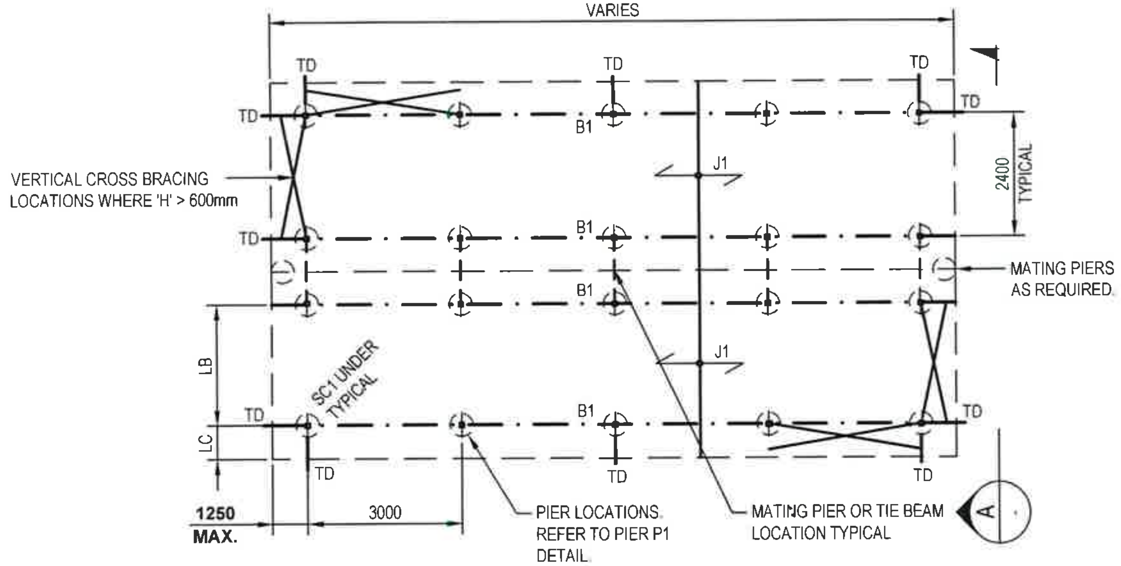
Project: PARKWOOD MODULAR BUILDINGS

Drawing Title: STRUCTURAL SERVICES
TYPICAL DETAILS - NOTES SHEET
STANDARD CHASSIS

Drawn	Date	Scale	Q A Check	Date
AT	APRIL 17	N T S	AH	Q A DATE

Designed	Project No	Dwg No	Issue
AH	WS170089	S01	2



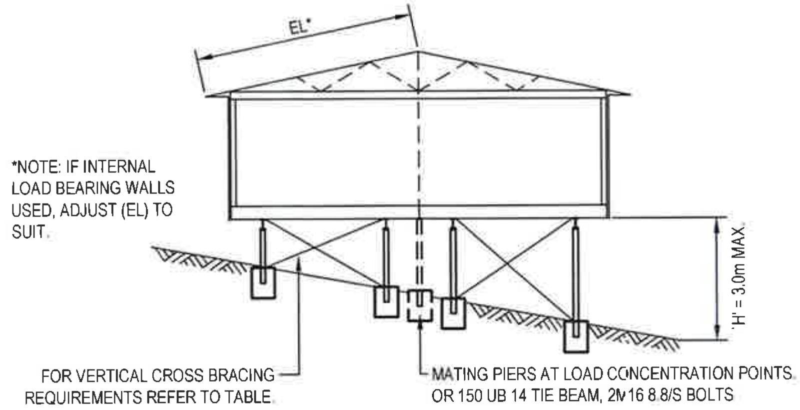
PIER LOCATION AND CHASSIS PLAN

TD - REFER TO TIEDOWN TYPICAL DETAILS

MEMBER SCHEDULE			
MARK	SIZE		REMARKS
B1	200UB18 OR 230 PFC		BEARER
MARK	HEIGHT 'H'	SIZE	CROSS BRACING
SC1	450 MIN -600mm	90x90x2.0 DURAGAL SHS	N/A
SC1	601-2400mm	90x90x2.0 DURAGAL SHS	MINIMUM OF 150mm² STEEL CROSS SECTIONAL AREA
SC1	2400 - 3000	90x90x2.0 DURAGAL SHS	MINIMUM OF 300mm² STEEL CROSS SECTIONAL AREA

NOTE:
MAX CANTILEVER = BACKSPAN/2 OR 1.3M WHICH IS LESS

MAX CANTILEVER WHEN SUPPORTING BI FOLD OR SLIDING DOORS = BACKSPAN/3 OR 1.0M WHICHEVER IS LESS



ELEVATION A

FLOOR JOIST SCHEDULE (J1)			
SIZE	BACK SPAN (LB)	MAX. CANTILEVER (LC)	EFFECTIVE ROOF (EL)
190 x 45 MGP10 AT 450 CTS	2400 CONTINUOUS	1200 1000 800	2400 3600 4800
190 x 35 MGP10 AT 450 CTS	2400 CONTINUOUS	1100 800 600	1500 3600 4800
140 x 35 MGP10 AT 450 CTS	2400 CONTINUOUS	800 600	1500 2400
STEEL C-SECTION IN ACCORDANCE WITH MANUFACTUERS SPECIFICATIONS			

REFER TO "UNDER-EAVE EXTENSIONS" DIAGRAMS.
NOTE: ROOFING MATERIAL IS SHEET METAL ONLY (TOTAL ROOF = 40kg/m²)

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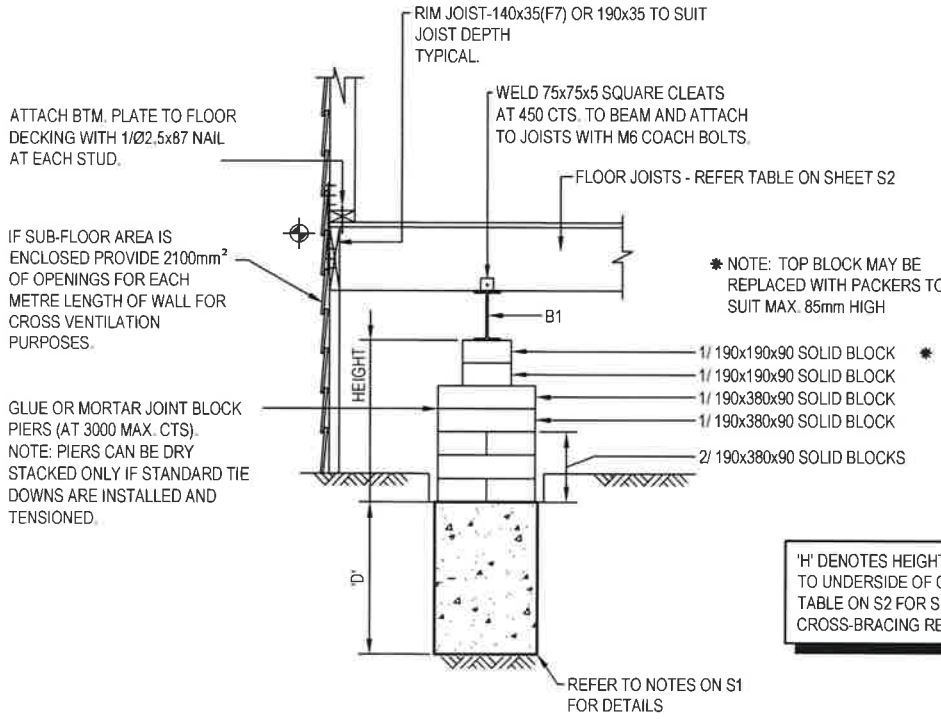
PARKWOOD MODULAR BUILDINGS

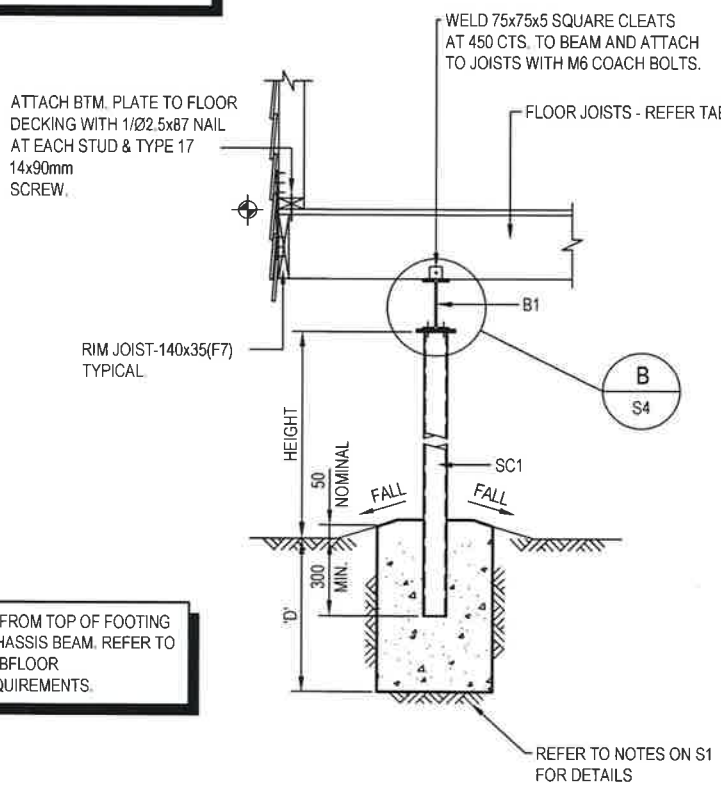
STRUCTURAL SERVICES
TYPICAL SUB FLOOR PLAN AND DETAILS
SHEET 1

Drawn	Date	Scale	QA Check	Date
AT	APRIL '17	N.T.S.	AH	Q.A. DATE
Designed	Project No	Dwg No	Issue	
AH	WS170089	S02	2	

TYPICAL GALVANISED STEEL STRAP, USE 6 STAPLES OR 3/Ø2.5x87 NAILS AT EACH SIDE OF JOINT. STEEL STRAP REQUIRED AT EVERY STUD AND AT BOTH STUDS AT EACH END OF OPENINGS.



'H' DENOTES HEIGHT FROM TOP OF FOOTING TO UNDERSIDE OF CHASSIS BEAM. REFER TO TABLE ON S2 FOR SUBFLOOR CROSS-BRACING REQUIREMENTS.



PIER P1 DETAIL WHERE HEIGHT < OR = 600mm

PAD FOOTING DETAIL

NOTE: WHERE BEDROCK ENCOUNTERED PROVIDE 50mm THICK LEVELING PAD

WHERE HEIGHT TO CHASIS BEAM IS 1000 FOR LESS THAN 25% OF ALL PIERS ON SITE, PIER HEIGHTS MAY BE INCREASED USING 2/190x390x90 BLOCKS. AN ADDITIONAL TIE DOWN SHOULD BE INSTALLED WHERE THIS OCCURS ON AN EXTERNAL ROW OF PIERS.

FOR CONSTRUCTION

2	ISSUED FOR CONSTRUCTION	30.04.18	BD	AH
1	ISSUED FOR CONSTRUCTION	11.07.17	AT	AH
Issue	Description	Date	Drawn	Approved

PARKWOOD

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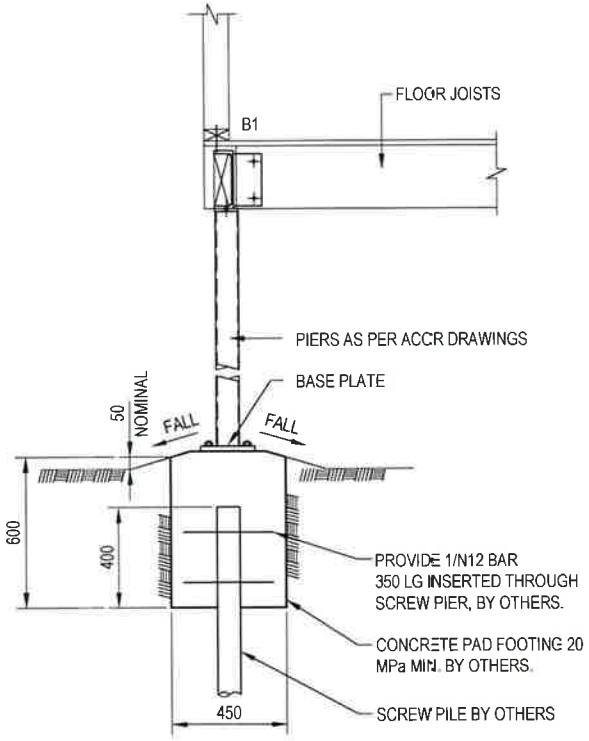
PARKWOOD MODULAR BUILDINGS

Drawing Title: STRUCTURAL SERVICES
TYPICAL SUB FLOOR PLAN AND DETAILS
SHEET 2

Drawn: AT	Date: APRIL '17	Scale: 20	A3	QA: AH	QA DATE
Designed: AH	Project No: WS170089	Dwg No: S03		Issue: 2	



TYPICAL SCREW PIER DETAIL FOR PIER WITH PAD FOOTING

SCREW PILE LOADING SCHEDULE (SAFE WORKING LOADS)

DEAD LOAD	LIVE LOAD
20 kN	20 kN

NOTE:
CONTRACTER TO DESIGN PIERS FOR MAXIMUM 150 ECCENTRIC LOAD.

FOR CONSTRUCTION

2		30.04.18	BD	AH
1		11.07.17	AT	AH
Issue	Description	Date	Drawn	Approved

PARKWOOD

ACOR CONSULTANTS

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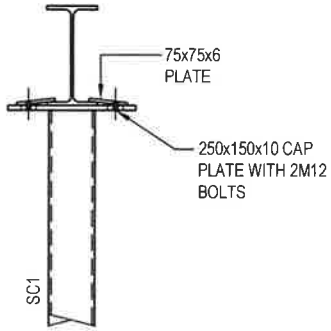
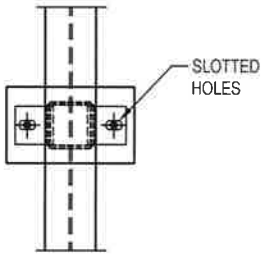
Project: PARKWOOD MODULAR BUILDINGS

Drawing Title: STRUCTURAL SERVICES
TYPICAL DETAILS
SCREW PIER WITH PAD FOOTING

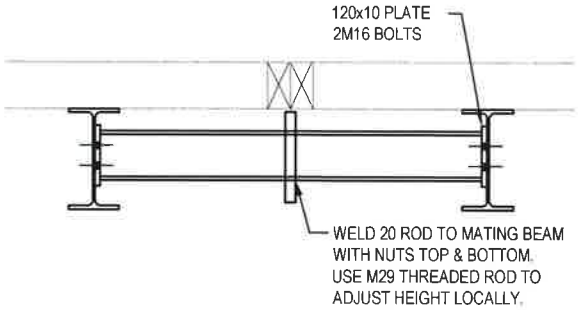
Drawn	Date	Scale	Q.A. Check	Date
AT	APRIL 17	20	AH	Q.A. DATE
Designed	Project No		Dwg. No	Issue
AH	WS170089		S03.02	2



DETAIL B / S3



PLAN



MATING BEAM DETAIL

100UC FOR 200 CHASSIS
150UC FOR 250 CHASSIS

FOR CONSTRUCTION

2	ISSUED FOR CONSTRUCTION	30.04.18	BD
1	ISSUED FOR CONSTRUCTION	11.07.17	AT

PARKWOOD

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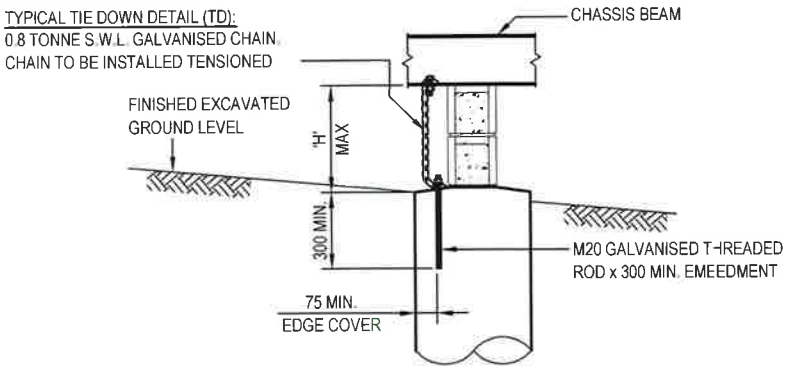
PARKWOOD MODULAR BUILDINGS

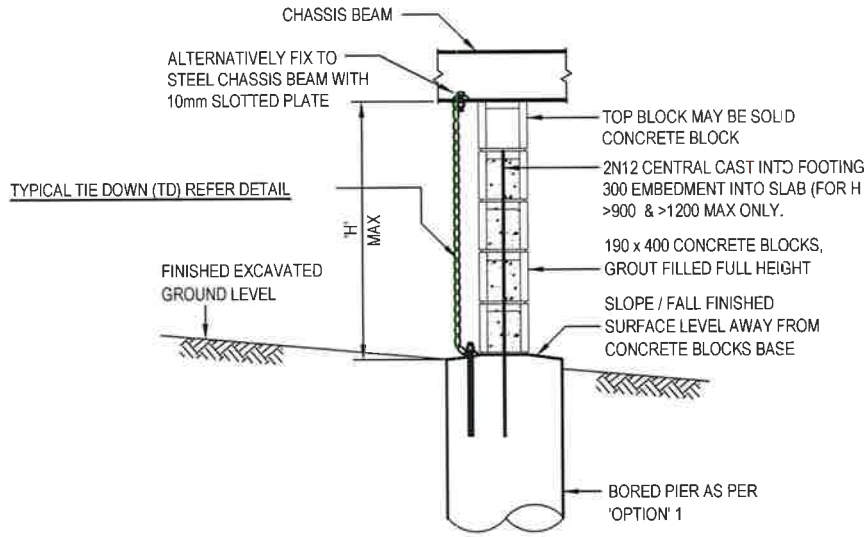
STRUCTURAL SERVICES
TYPICAL SUB FLOOR PLAN AND DETAILS
SHEET 3

Drawn: AT	Date: APRIL '17	Scale: 10		Q.A. Check: AH	Q.A. DATE
Designed: AH	Project No: WS170089	Dwg No: S04		Issue: 2	



ANCHOR DETAIL

FOR 190 x 400 GROUT FILLED CONCRETE BLOCKS 'H' = 400 MAX.
FOR 400 x 400 SOLID CONCRETE BLOCKS 'H' = 900 MAX.



ALTERNATE PIER DETAIL

FOR 190 x 400 GROUT FILLED CONCRETE BLOCKS 'H' = 400 MAX.
FOR 400 x 400 SOLID CONCRETE BLOCKS 'H' = 900 MAX.
FOR 190 x 400 REINFORCED CORE FILLED CONCRETE BLOCKS 'H' = 1200 MAX.

ANCHOR DETAILS

FOR CONSTRUCTION

2	ISSUED FOR CONSTRUCTION	30.04.'17	SD	AH
1	ISSUED FOR CONSTRUCTION	11.07.'17	AT	AH
Issue	Description	Date	Drawn	Approved

PARKWOOD MODULAR BUILDINGS

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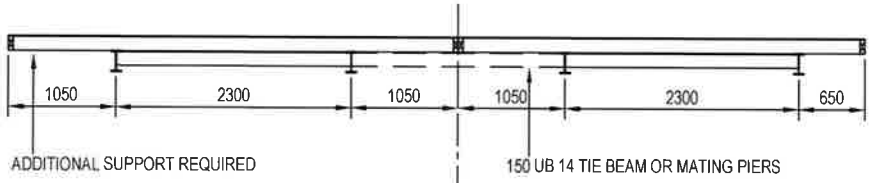
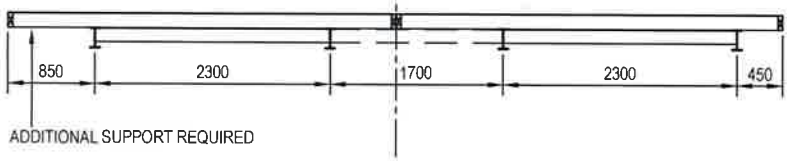
STRUCTURAL SERVICES
TYPICAL SUB-FLOOR ANCHOR DETAILS
SHEET 1

Drawn: AT	Date: APRIL '17	Scale: A1 1:20	D.R Check: AH	Date: Q.A DATE
Designed: AH	Project No: WS170089	Dwg. No: S05	Issue: 2	

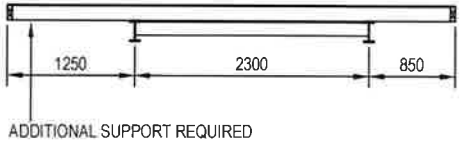
8000
(2@4.0m)



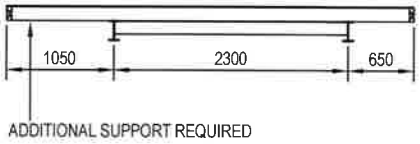
7200
(2@3.6m)



4000

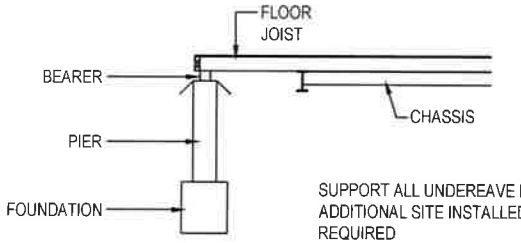


3600



UNDER-EAVE EXTENSIONS

REFER TO SHEET S2 FOR JOIST SCHEDULE



SUPPORT ALL UNDEREAVE EXTENSIONS WITH AN ADDITIONAL SITE INSTALLED BEAM AND PIERS AS REQUIRED

2	REVISED FOR CONSTRUCTION	30.04.19	BD	AH
1	ISSUED FOR CONSTRUCTION	11.07.17	AT	AH
Issue	Description	Date	Drawn	Approved

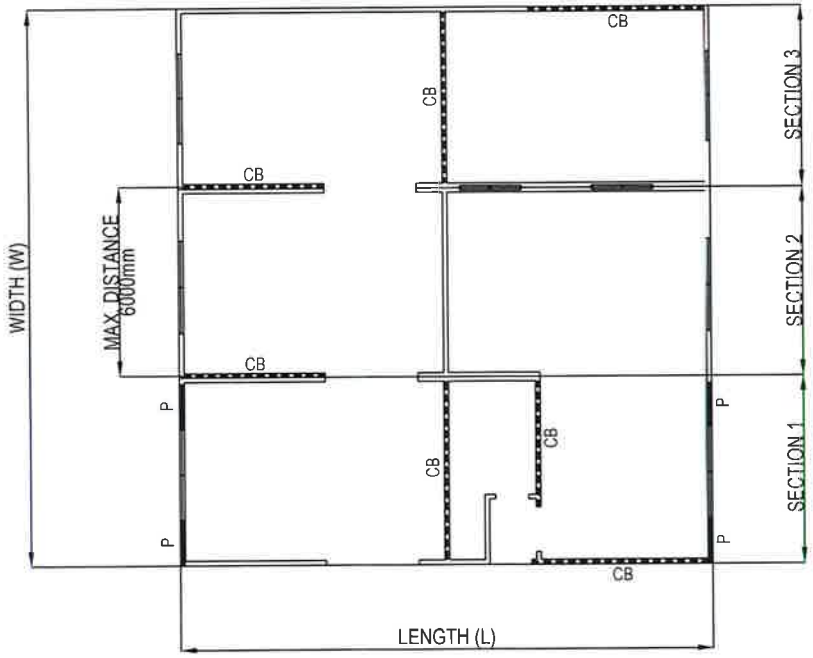
FOR CONSTRUCTION

ACOR Consultants Pty Ltd
Unit 10, Level 1, No 1 Martland Place
Baulkham Hills NSW 2153
T +61 2 9634 6311

Project: PARKWOOD MODULAR BUILDINGS

Drawing Title: STRUCTURAL SERVICES
TYPICAL DETAILS - UNDER EAVE EXTENSIONS

Drawn: AT	Date: APRIL '17	Scale: A3 1:50	QA Check: AH	QA Date:
Designed: AH	Project No: WS170089	Dwg No: S06	Issue: 2		



HOUSE WIDTH W (m)	WIND CLASSIFICATION N3 IN ULTIMATE STRESS SINGLE STOREY STANDARD HOUSE LENGTH L (m) WITH Max 15° ROOF PITCH											
	4		8		10		12		16		18	
	NUMBER OF TYPE B BRACING (6 kN PER BRACING)											
4	2 2	N.S. W.E.	4 2	N.S. W.E.	4 2	N.S. W.E.	5 2	N.S. W.E.	7 2	N.S. W.E.	8 2	N.S. W.E.
8	2 4	N.S. W.E.	4 4	N.S. W.E.	4 4	N.S. W.E.	5 4	N.S. W.E.	7 4	N.S. W.E.	8 4	N.S. W.E.
12	2 5	N.S. W.E.	4 5	N.S. W.E.	4 5	N.S. W.E.	5 5	N.S. W.E.	7 5	N.S. W.E.	8 5	N.S. W.E.

N

BRACING LEGEND:

P DENOTES PLYWOOD TYPE B BRACING. REFER TO BRACING DETAILS IN DRWG No. S8

CB LONG SIDE AND INTERNAL CROSS BRACING. REFER TO BRACING DETAILS IN DRWG No. S8

- MAXIMUM DISTANCE BETWEEN BRACING WALLS SHALL BE 6000.
- REFER TO TABLE ABOVE FOR BRACING REQUIREMENTS.

FLOOR PLAN:

- FLOOR JOISTS TO BE TREATED PINE OR SIMILAR. DO NOT IN ANY WAY UNDERMINE, ENDANGER OR DESTABILISE ANY ADJACENT STRUCTURES (OR PARTS THEREOF)
- ENGINEER TO BE CONTACTED PRIOR TO ANY PROPPING, BRACING CR UNDERPINNING AS MAY BE REQUIRED.
- ALL FOOTINGS MUST BEAR FULLY ON FIRM NATURAL STRATA OF THE SAME TYPE HAVING AN ALLOWABLE BEARING CAPACITY OF 150kPa MINIMUM.

STRUCTURAL NOTES:

- TIMBER ROOF BATTENS TO BE FIXED TO RAFTERS WITH ONE BUILDEX No.14-10x75mm TYPE 17 SCREW OR, 2/87xØ2.5 NAILS AT EACH RAFTER
- ROOF SHEETING TO BE FIXED AS PER MANUFACTURERS' INSTRUCTIONS TO RESIST WIND PRESSURES OF 1.60kPa
- WINDOW, DOOR FRAMES AND GLAZING TO BE DESIGNED TO RESIST WIND PRESSURES OF 1.17kPa.
- IF ROOF PITCH IS LESS THAN 15° THEN ABOVE TABLE IS ADEQUATE. IF GREATER THAN 15° SEEK ADDITIONAL BRACING REQUIREMENTS FROM ENGINEER

FOR CONSTRUCTION

2	REISSUED FOR CONSTRUCTION	30.04.19	BD	AH
1	ISSUED FOR CONSTRUCTION	11.02.19	AT	AH
Issue	Description	Date	Drawn	Approved

PARKWOOD

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Project: PARKWOOD MODULAR BUILDINGS

Drawing Title: STRUCTURAL SERVICES
TYPICAL DETAILS - BRACING PLAN

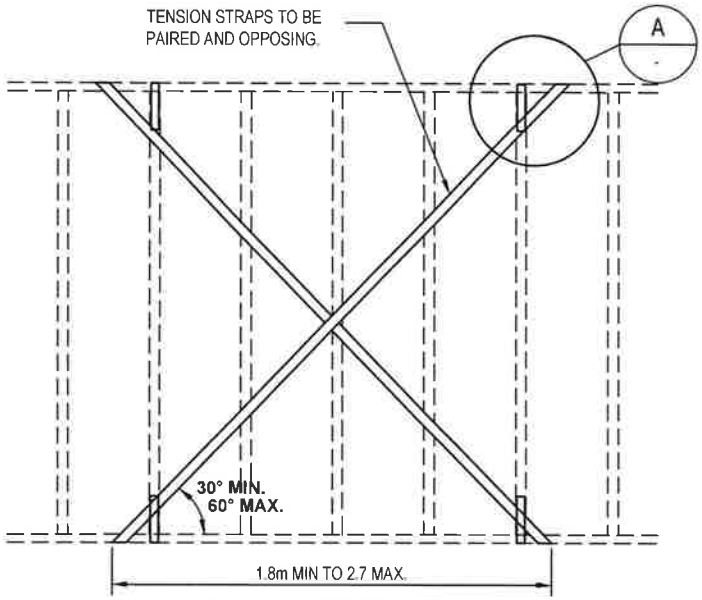
Drawn	Date	Scale @ A1	Q.A. Quality	Qty
AT	APRIL '17	1:100	AH	Q.A. DATE
Designed	Project No.		Drawing No.	Issue
AH	WS170089		S07	2

TYPE B - STRAP BRACING (SB) SPECIFICS

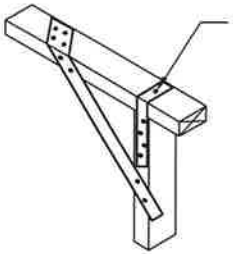
TYPE OF DIAGONAL BRACE	MATERIAL & SIZE	NAILING REQUIREMENTS		SPECIAL REQUIREMENTS
		TO EACH STUD	TO EACH PLATE	
TENSION STRAP	GALVANIZED FLAT METAL TENSION STRAP NOM SIZE 30 x 0.8mm & MIN SECTION OF 24mm^2	2/30 x 3.15mmØ GALV. FLATHEAD NAILS	4/30 x 2.8mm Ø GALV. FLATHEAD NAILS	STRAPS MUST BE PROPERLY TENSIONED AND STRAP MUST RETURN OVER TOP PLATE & UNDER BOTTOM PLATE. THE STUD NEAREST TO EACH END OF EACH DIAGONAL STRAP SHALL BE FIXED TO THE PLATES WITH STRAPS OR FRAMING ANCHORS 4/30 x 2.8mmØ NAILS AT EACH END.

NOTE

REFER TO PLATE FIXING TABLE FOR TOP AND BOTTOM PLATE FIXING DETAILS.



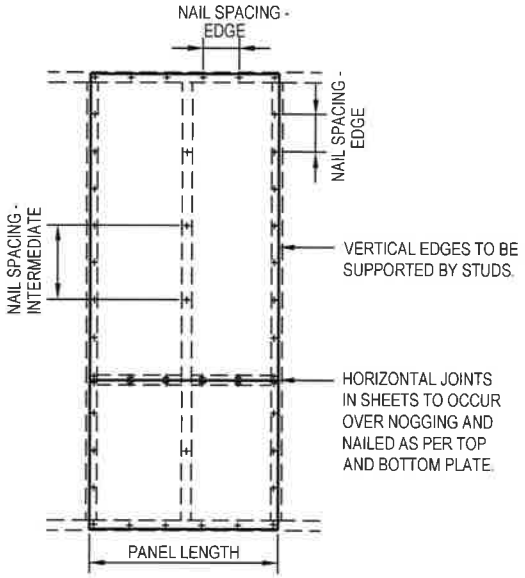
TYPE B TENSION STRAP



DETAIL A

TYPE B - SHEET BRACING (PB) SPECIFICS

PRODUCT	AUSTRALIAN STANDARD	TYPE/ GRADE	MINIMUM THICKNESS (mm) FOR STUD SPACING (mm).		PANEL LENGTH (mm)	NAIL SIZE (mm)	NAIL SPACING (mm)		SPECIAL REQUIREMENTS
			450	600			EDGE	INTERMEDIATE	
PLYWOOD	AS 2269	F8 F11 F14 F27	7 6 4 4	9 7 6 4.5	900 / 1200	30x2.8mm Ø GALV	50 TO PLATES AND 150 TO EDGE STUDS	300	NO NOGGING REQ'D EXCEPT AT SHEET ENDS. NAILS SHALL BE 7mm FROM ALL EDGES
HARDBOARD (MASONITE)	AS 2458	G P	6.4	6.4	900 / 1200	30x2.8mm Ø GALV	50 TO PLATES AND 150 TO EDGE STUDS	300	NAILS TO BE 10mm FROM VERTICAL EDGES AND 20mm FROM HORIZONTAL EDGES. NO NOGGING REQ'D EXCEPT AT SHEET ENDS



TYPE B - SHEET BRACING NOTES

1. PANEL LENGTHS GREATER THAN THOSE LISTED ABOVE CAN BE CONSIDERED AS A NUMBER OF BRACING UNITS DIRECTLY PROPORTIONED TO THEIR INSTALLED LENGTH, I.E. A 1200mm PANEL OF PLYWOOD EQUALS 1200/900 = 1.33 BRACING UNITS.
2. NAILS SHOULD BE DRIVEN JUST BELOW THE SURFACE OF THE SHEET USING THE HAMMER FACE ONLY. NAILS MUST NOT BE PUNCHED.
3. PB* INDICATES - FULL AVAILABLE LENGTH.
4. REFER TO PLATE FIXING TABLE FOR TOP AND BOTTOM PLATE FIXING DETAILS.

FOR CONSTRUCTION

2	REVISED FOR CONSTRUCTION	30.04.18	BC	AH
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No.	Description	Date	Drawn	Approved

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PARKWOOD MODULAR BUILDINGS

Drawing Title: STRUCTURAL SERVICES TYPICAL BRACING DETAILS SHEET 1

Drawn	Date	Scale	A0	Chk.	Date
AT	APRIL '17	N.T.S		AH	Q.A. DATE
Designed	Project no	Dwg No	Issue
AH	WS170089	S08	2

PLATE FIXING TABLE

BRACING TYPE	PLATE	FIXING DETAILS
TYPE A	BOTTOM PLATE TO JOISTS BOTTOM PLATE TO SLAB	2/75mm NAILS AT 600mm CENTRES ALONG JOIST FOR PLATES TO 38mm THICK AND 2/90mm NAILS AT 600mm CENTRES ALONG JOIST FOR PLATE TO 50mm THICK. 1/75mm MASONRY NAIL AT MAXIMUM 1200mm CENTRES FOR 38mm THICK PLATES. 1/90mm MASONRY NAIL AT MAXIMUM 1200mm CENTRES FOR 50mm THICK PLATES.
TYPE B	BOTTOM PLATE TO JOISTS BOTTOM PLATE TO SLAB	1/M10 BOLT OR 1/30 x 0.8 GALVANISED METAL STRAP AT MAXIMUM 1200mm CENTRES ALONG JOIST OR TO EVERY SECOND JOIST. STRAP TO HAVE 3/30 x 2.8mm DIA. NAILS EACH END. 1/M10 BOLT OR CAST IN GALVANISED METAL BOTTOM PLATE CONNECTOR AT EACH END OR BRACING UNIT AND AT 1200mm MAXIMUM CENTRES.
ALL TYPE A or B	TOP PLATE TO CEILING OR ROOF FRAMING	JOISTS, BATTENS OR RAFTERS SHALL BE FIXED TO TOP PLATES WITH 2/75mm NAILS AT EACH CROSSING AT MAXIMUM OF 1200mm CENTRES ALONG THE TOP PLATE. TRUSSES CAN BE FIXED TO TOP PLATE USING BLOCKING OR PROPRIETARY CONNECTORS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

GENERAL NOTES:

1. FIXING SHOULD COMMENCE AS CLOSE AS POSSIBLE TO THE ENDS OF EACH BRACING UNIT.
2. WALL TOP PLATES MUST BE DESIGNED TO PROVIDE LATERAL LOAD TRANSFER WHILE ALLOWING TRUSS TO SETTLE UNDER DEAD LOAD.

SUB FLOOR BRACING:

ALL BRACING SHALL BE FIXED TO THE FLOOR OR FOOTING BELOW AND THE FLOOR ABOVE TO ENABLE THE TRANSFER OF THE FULL DESIGN STRENGTH OF THE BRACING SYSTEM.
BRACING IN THE SUB-FLOOR SHALL BE EVENLY DISTRIBUTED. THE MAXIMUM DISTANCE BETWEEN BRACING SETS, STUMPS, PIERS, WALLS OR POSTS, ETC. UNDER A PLATFORM STRIP OR SHEET TIMBER FLOOR SYSTEM SHALL BE 1400mm PROVIDED THE MINIMUM WIDTH OF THE FLOOR IS 6000mm.

FOR CONSTRUCTION

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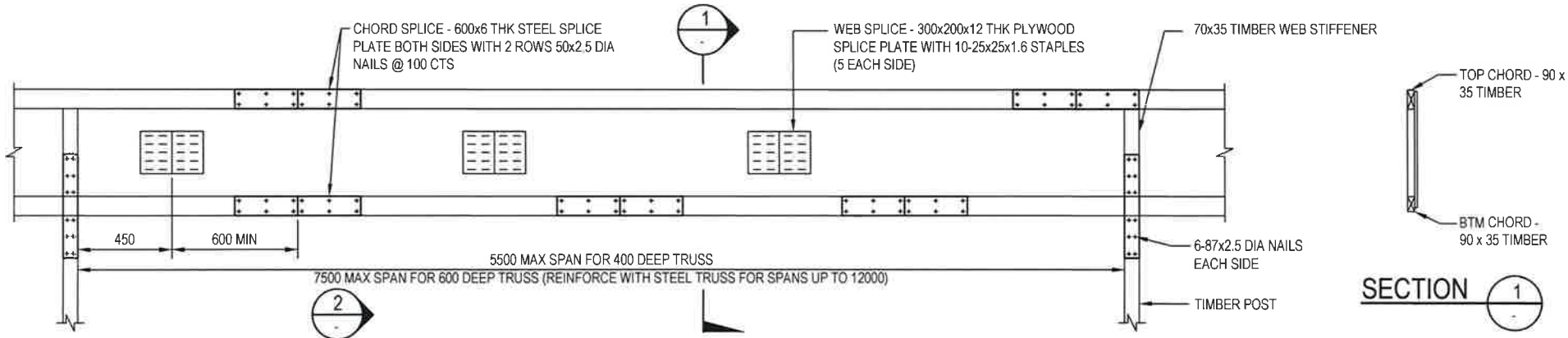
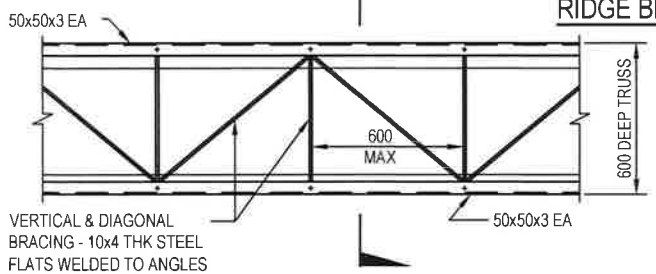
PARKWOOD MODULAR BUILDINGS

STRUCTURAL SERVICES
TYPICAL BRACING DETAILS
SHEET 2

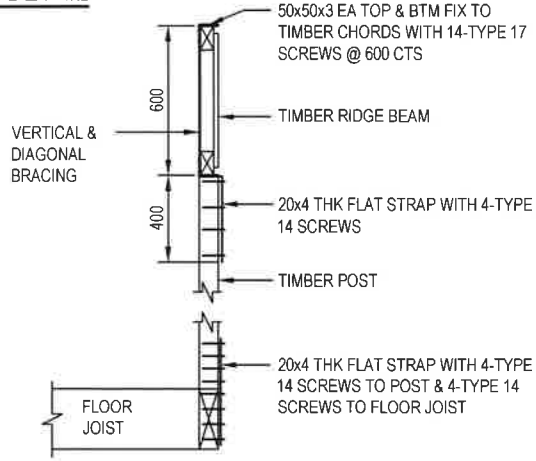
Drawn	Date	Scale	B.E. Check	Date
AT	APRIL '17	N.T.S.	AH	Q.A. DATE
Designed	Project No.	Dwg No.	Issue
AH	WS170089	S09	2



RIDGE BEAM CONNECTION DETAIL



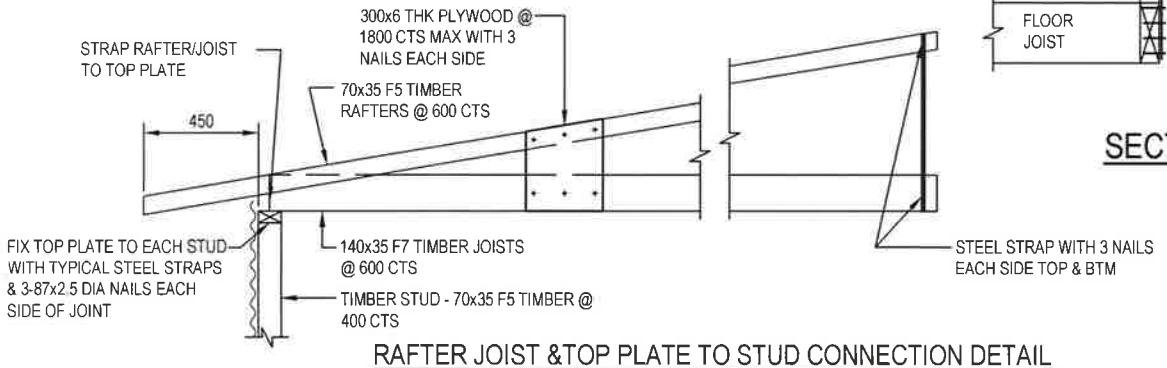
STEEL TRUSS REINFORCEMENT TO RIDGE BEAM DETAIL



SECTION 1

NOTE: ALL STRAPS TO BE 350 MPa YEILD STRENGTH AND 18mm² CROSS-SECTIONAL AREA MINIMUM

SECTION 2



RAFTER JOIST &TOP PLATE TO STUD CONNECTION DETAIL

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1	ISSUE FOR CONSTRUCTION	11.07.17	AT

PARKWOOD MODULAR BUILDINGS

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Drawing Title: STRUCTURAL SERVICES TYPICAL ROOF DETAILS SHEET 1

Drawn: AT	Date: APRIL 17	Scale: NTS	@ A1	Q.A. Check: AH	Date: QA DATE
Designed: AH	Project No: WS170089	Dwg No: S10		Issue: 2	