



JOB No. 19/148

## STRUCTURAL COMPUTATIONS

FOR

PROJECT: PROPOSED UNITS

ADDRESS: No. 4 & 6 DUBBO ST.  
ALBION

MADE BY: KP.

DATED: June '19

The enclosed computations are in accordance with the following references and codes of practice:-

AS 1170.1	SAA Loading Code	Part 1: Dead & live loads and load combinations
AS 1170.2		Part 2: Wind Loads
AS 3600	SAA Concrete Structures	
AS 1250.	SAA Steel Structures Code	
AS 4100	SAA Steel Structures	
AS 1538	SAA Cold-formed Steel Structures Code	
AS 3700	SAA Brickwork Code	
AS 1684	SAA Light timber Framing Code	
AS 1720.1	SAA Timber Structures Code	
AS 2870	SAA Residential slabs and footings - Construction	

Building Code of Australia  
Victorian Timber Framing Manual - Timber Promotion Council  
Safe Load Tables - A I S C  
Steel Designer Manual  
Reinforced Concrete Handbook



Regulation 126

**Building Act 1993**  
**Section 238(1)(a)**  
**Building Regulations 2018**

**CERTIFICATE OF COMPLIANCE – FOR PROPOSED BUILDING WORK**

**TO**

Relevant Building Surveyor .....  
 Postal Address ..... Postcode.....

**This Certificate is issued in relation to the proposed building work at;**

..... **No. 476 DUBBO ST.** .....  
 ..... **ALBION** .....

**Nature of proposed building work;**

Construction of ..... **EIGHT DOUBLE & TWO SINGLE STOREY** .....  
 ..... **DWELLINGS INCL. GARAGES Class 1a & 1a9** .....

**Prescribed class of building work for which this certificate is issued:**

Design or part of the design of building work relating to structural matter.

**Documents setting out the design that is certified by this certificate:**

Computations <b>19/148 sheets 1 to 27</b>	Prepared by <b>V. Pavlovic</b>	Date: <b>18-6-19</b>
Drawings <b>19/148 sheets 1 to 16</b>	Prepared by <b>V. Pavlovic</b>	Date: <b>18-6-19</b>
Other Documents	Prepared by	Date:

**The design certified by this certificate complies with the following provisions of Building act 1993, Building Regulations 2018, NCC 2019 Vol 2 Part 2.1, Part 3.0 & Part 3.1; Standards AS1684.2-2010; AS1720.1-2010; AS4100-1998; AS2870-2011; AS4055-2012; AS3500.3-2015; AS1170.0-2002; AS1170.1-2002; AS1170.2-2011; AS3600-2009; AS4773.1-2015; AS4773.2-2015**

**I prepared the design, or part of design, set out in the documents listed above.**

**I certify that the design set out in the documents listed above complies with the provisions set out above.**

**I believe that I hold the required skills, experience and knowledge to issue this certificate and can demonstrate this if requested to do so.**

**Vinko Pavlovic**

Shop 15 Arabin Plaza, Arabin Street, Keilor, VIC 3036

Category/Class **..CIVIL ENGINEER**

Reg No: **EC-1224**

**SIGNATURE**

**DATE:**

**18-6-19**

COMPUTATION SHEET

SHEET 1 of 27  
 Job No.:  
 Date:  
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PROJECT:  
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 Consulting Structural & Civil Engineers

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 Mobile : (0417) 55 11 69  
 A.H. : (03) 9449 3322

UNIT 1

1.0 BEAM LIXING

Span 4700

LOADINGS

tilted roof  $w_1 = 1.0 \times 4.0 = 4.0 \text{ kN/m}$   
 $w_2 = 0.3 \times 4.0 = 1.2 \text{ kN/m}$   
 self wall  $w_3 = 1.2 \text{ kN/m}$   
6.0 kN/m

Max. BM = 17.7 kNm

Try 200 X 25 CHANNEL

$I = 19.1 \times 10^6$   
 $Z = 191 \times 10^3$

$\sigma_b = 92.5 \text{ MPa}$  OK

$P_r = 10.6 \text{ kN}$  OK

ADOPT 200UB25  
 OR 2/400X45WL  
 OR 230X25 CHANNEL

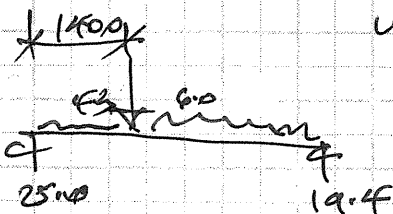
Span 4200

LOADINGS

reaction (guy) = 15.1 kN  
 reaction (truss (guy)) = 6.5 kN  
21.6 kN

w1: floor  $w_1 = 1.5 \times 2.4 = 3.6 \text{ kN/m}$   
 $w_2 = 0.5 \times 2.4 = 1.2 \text{ kN/m}$   
 self wall  $w_3 = 1.2 \text{ kN/m}$   
6.0 kN/m

w2: tiled roof  $w_1 = 1.0 \times 2.4 = 2.4 \text{ kN/m}$   
 $w_2 = 0.3 \times 2.4 = 0.7 \text{ kN/m}$   
 self wall  $w_3 = 1.2 \text{ kN/m}$   
4.3 kN/m



Max BM = 30.8 kNm

Try 200UB30

$I = 28.9 \times 10^6$   
 $Z = 279 \times 10^3$

COMPUTATION SHEET

SHEET 2 of 27  
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$$\Rightarrow f_w = 110.4 \text{ MPa OK}$$

$$f_t = 9.6 \text{ m OK}$$

ADOPT 200UB30  
 & 250UB26

2/0 BEAMS MEMS

Span 3200

LOADINGS

tilted roof  $y = 1.0 \times 2.0 = 2.0 \text{ kN/m}$   
 $w_y = 0.3 \times 2.0 = 0.6$   
 self (wall  $y = 1.2$ )  
 floor  $y = 1.5 \times 2.0 = 3.0$   
 $w_y = 1.5 \times 2.0 = 3.0$   
 7.8 kN/m

Max. BM = 9.9 kNm

Try 2/240X450F17HW

$I = 103.8 \times 10^6$   
 $Z = 860 \times 10^3$

$$\Rightarrow f_b = 11.5 \text{ MPa OK}$$

$$f_{DL} = 10.2 \text{ m OK}$$

ADOPT 3/240X450F17HW  
 & 2/290X450F17HW

Span 1700

LOADINGS

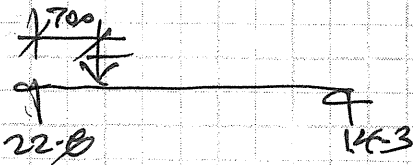
reaction (ext) = 12.5 kN

tilted roof  $y = 1.0 \times 3.4 = 3.4 \text{ kN/m}$   
 $w_y = 0.3 \times 3.4 = 1.0$   
 self (wall  $y = 1.2$ )  
 5.6 kN/m

Max. BM = 18.3 kNm

Try 200UB25

$I = 23.6 \times 10^6$   
 $Z = 232 \times 10^3$



COMPUTATION SHEET

SHEET 3 of 27

Job No.:

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$$\begin{aligned} \rightarrow h &= 79.0 \text{ mm OK} \\ f &= 8.0 \text{ mm OK} \end{aligned}$$

ADOPT 200UB25

3/0 BEAM BED 4

Span 3200

LOADINGS

As far as medr, less floor = 3.8 kN/m

Max. BM = 4.9 kNm

ADOPT 2/240X40PINE

K.O PORCH BEAMS

Span 1900

LOADINGS

$$\begin{aligned} \text{dead load} &= 1.0 \times 1.5 = 1.5 \text{ kN/m} \\ \text{self wt} &= 0.3 \times 1.5 = 0.45 \\ \text{floor} &= 0.2 \\ \hline &= 2.2 \text{ kN/m} \end{aligned}$$

Max BM = 1.0 kNm

ADOPT 190X40PINE

S/O BEAMS OUTSIDE KDRY

Span 1400

LOADINGS

$$\begin{aligned} \text{dead load} &= 1.0 \times 2.0 = 2.0 \text{ kN/m} \\ \text{self wt} &= 0.3 \times 2.0 = 0.6 \\ \text{floor} &= 0.5 \times 1.2 = 0.6 \\ \text{ceiling} &= 1.5 \times 1.2 = 1.8 \\ \hline &= 6.2 \text{ kN/m} \end{aligned}$$

Max BM = 1.5 kNm

Span 1000 Cant

LOADINGS

ADOPT 2/190X40PINE

As above, less floor = 3.8 kN/m  
reaction (rtu) = 4.3 kN

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Max BM = 6.2 kNm

try 2/290x400x17mm

$W_{pl,y} = 4.9 \text{ m}^3 \text{ OK}$

$I_{pl,y} = 3.4 \text{ km} = \text{span} / 297 \text{ OK}$

ADOPT 2/290x400x17mm

G.O GROUND FLOOR UNTELS

6.1 GARAGE

Span 2700

LOADINGS

tiled roof  $w_{eff} = 1.0 \times 2.2 = 2.2 \text{ kN/m}$

$(w_y = .3 + 2.2 = .7)$

self br  $w_y = .3$

brickwork  $w_y = 4.5 \times .6 = 2.7$

5.8 kN/m

Max. BM = 5.3 kNm

ADOPT TEE UNTEL:  
 150x10 PL. VEB  
 x 200x6 PL. HOR.

6.2 KITCH.

Span 1600

LOADINGS

tiled roof  $w_{eff} = 1.0 \times 3.5 = 3.5 \text{ kN/m}$

$(w_y = .3 + 3.5 = 1.1)$

self br wall  $w_y = 1.27$

floor  $w_y = .5 \times 2.5 = 1.27$

$(w_y = 1.5 \times 2.4 = 3.6)$

Max. BM = 3.4 kNm

10.6 kN/m

ADOPT 2/190x350x17mm

6.3 KITCH / LIVING

Span 1700

LOADINGS

As above = 10.6 kN/m

COMPUTATION SHEET

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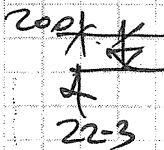
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reaction (kN) = 15.1 kN



Max. BM = 5.5 kNm

ADOPT 2/250x450 R1714W

6.4 BED 4

Span 900

LOADING

As for kitchen = 10.6 kNm

Max. BM = 1.1 kNm

ADOPT 190x450 R1916E

UNIT 2

7.0 BAM MALS 4 WDRX

Span 5500

LOADING

floor  $w_{fl} = 1.0 \times 4.0 = 4.0 \text{ kN/m}$   
 $w_{ce} = 0.3 \times 4.0 = 1.2$   
 wall  $w_w = 1.2$   
6.4 kNm

Max. BM = 24.2 kNm

try 200UB30

$S_x = 86.2 \text{ cm}^3$

$f_t = 13.2$  TOO HIGH

ADOPT 250UB31

Span 1600

LOADING

As above = 6.4 kNm

Max BM = 2.1 kNm

ADOPT 2/250x450 R1916E

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B.O STAIR TRIMMERS

Span 4700

LOADINGS

$$\begin{aligned} \text{floor } l_y &= .5 \times 2.4 = 1.2 \text{ kN/m} \\ l_w &= 1.5 \times 2.4 = 3.6 \\ \text{self/wall } l_y &= 1.2 \\ & \underline{6.0 \text{ kN/m}} \end{aligned}$$

Max BM = 16.6 kN

Try 200UB25

$\rightarrow l_w = 71.6 \text{ MPa OK}$

$\rightarrow f_T = 8.1 \text{ MPa OK}$

ADOPT 200UB25

Span 5500

LOADINGS

$$\begin{aligned} \text{reaction } l_w &= 14.1 \text{ kN} \\ \text{self } l_w &= 1.2 \text{ kN/m} \end{aligned}$$



Max. BM = 14.2 kN

Try 200UB25

$\rightarrow l_w = 61.3 \text{ MPa OK}$

$\rightarrow f_T = 8.7 \text{ MPa OK}$

ADOPT 200UB30

Span 2200

LOADINGS

reaction  $l_w = 14.1 \text{ kN @ Mid Span}$

$$\begin{aligned} \text{tiled roof } l_y &= 1.0 \times 2.0 = 2.0 \text{ kN/m} \\ l_w &= .3 \times 2.0 = .6 \\ \text{self/wall } l_y &= 1.2 \\ & \underline{3.8 \text{ kN/m}} \end{aligned}$$

Max BM = 10.1 kN

ADOPT 200UB25



PROJECT:  
at



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9-0 BEAM BED ←

Span 3600

LOADING As above = 3.8 kN/m

Max BM = 6.2 kNm

ADOPT 2/240 X 450 F17HW

10-0 GROUND FLOOR LINTELS

10-1 LIVING

Span 1700

LOADING

floor  $w_y = 5 \times 3.6 = 1.8 \text{ kN/m}$

$w_y = 1.5 \times 3.6 = 5.4$

self/wall  $w_y = 1.2$   
8.4 kN/m

Max. BM = 3.1 kNm

ADOPT 190 X 450 F17HW

10-2 ENTRY / BED ←

Span 900

LOADING

reaction  $w_y = 11.3 \text{ kN}$  @ Mid Span

floor  $w_y = 5 \times 1.2 = 0.6 \text{ kN/m}$

$w_y = 1.5 \times 1.2 = 1.8$

self/wall  $w_y = 1.2$   
3.6 kN/m

Max. BM = 2.9 kNm

ADOPT 190 X 450 F17HW

UNIT 3

BEAMS GARAGE

Span 11-0  
Span 3000  
LOADING

tilted roof  $w_y = 1.0 \times 4.8 = 4.8 \text{ kN/m}$

$w_y = 3 \times 4.8 = 1.4$

self/wall  $w_y = 1.2$

floor  $w_y = 5 \times 1.0 = 0.5$

$w_y = 1.5 \times 1.0 = 1.5$

9.4 kN/m

COMPUTATION SHEET

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Max. BM = 10.6 kNm

Try  $2/250 \times 400 \times 170$

$f_{b1} = 12.3 \text{ MPa}$  ok

$f_{d1} = 10.3 \text{ MPa}$  ok

ADOPT  $3/250 \times 400 \times 170$   
OR  $2/290 \times 400 \times 170$

Span 3500

LOADING

reaction (max) = 26.2 kN @ mid span

self wt  $w_y = 3.1 \text{ kN/m}$

Max BM = 25.1 kNm

Try 200UB25

$f_{b1} = 106.2 \text{ MPa}$  ok

$f_{t1} = 5.8 \text{ MPa}$  ok

ADOPT 200UB25

1210 BEAM MEALS / LIVING

Span 2400

LOADING

As above =  $9.4 \text{ kN/m}$

floor  $w_y = 5 \times 0.8 = 4$

wall  $w_y = 1.5 \times 0.8 = 1.2$

11.0 kN/m (B.O)

Max. BM = 7.9 kNm

ADOPT  $2/250 \times 400 \times 170$

Span 4000

LOADING

reaction (max) = 13.2 kN

floor roof  $w_y = 1.9 \times 3.5 = 6.65$

wall  $w_y = 1.3 \times 3.5 = 4.55$

self/wall  $w_y = 1.2$

5.8 kN/m

**COMPUTATION SHEET**

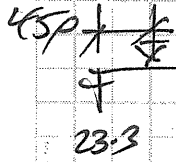
SHEET 9 of 27  
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13.1  $\text{Max BM} = 158 \text{ kNm}$   
 Try  $2/290 \times \text{KRF17HD}$   
 $\rightarrow S_x = 11.7 \text{ m}^2 \text{ ok}$   
 $r_{xx} = 15.6 \text{ m}$  TOO HIGH

ADOPT  $3/290 \times \text{KRF17HD}$   
 or  $200 \text{UB25}$

Span 3100 (also work)

LOADS

tile  $w_{ty} = 1.0 \times 4.0 = 4.0 \text{ kN/m}$   
 $w_{wy} = 1.3 \times 4.0 = 5.2$   
 self  $w_{self} = 1.2$   
 $6.4 \text{ kN/m}$

$\text{Max. BM} = 7.7 \text{ kNm}$

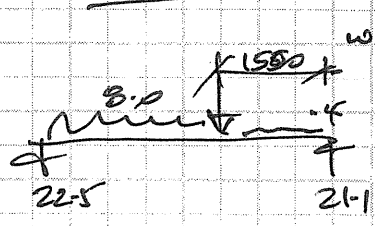
Try  $2/250 \times \text{KRF17HD}$   
 $\rightarrow S_x = 9.0 \text{ m}^2 \text{ ok}$   
 $r_{xx} = 8.6 \text{ m} \text{ ok}$

ADOPT  $2/250 \times \text{KRF17HD}$

Span 4000

LOADS

reaction  $w_{ry} = 23.0 \text{ kN}$



w.i. floor  $w_{ty} = 1.5 \times 3.4 = 5.1 \text{ kN/m}$   
 $w_{wy} = 1.5 \times 3.4 = 5.1$   
 self  $w_{self} = 1.2$   
 $8.0 \text{ kN/m}$

$\text{Max BM} = 31.2 \text{ kNm}$

Try  $200 \text{UB30}$   
 $\rightarrow S_x = 11.2 \text{ m}^2 \text{ ok}$   
 $r_{xx} = 8.3 \text{ m} \text{ ok}$

ADOPT  $200 \text{UB30}$

COMPUTATION SHEET

SHEET 10 of 29  
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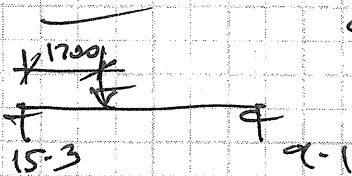
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Span 4700

LOADING

reaction betw = 22.57 kN

self wt = 0.3 kN/m



Max BM = 25.4 kNm

try 200UB30

$\rightarrow I_x = 91.1 \text{ m}^4 \text{ ax}$

$\rightarrow I_y = 8.9 \text{ m}^4 \text{ ax}$

ADOPT 200UB30

13/5 STAIR TRIMMER

Span 3600

LOADING

floor  $w = 1.5 \times 2.0 = 1.0 \text{ kN/m}$

( $w = 1.5 \times 2.0 = 3.0$ )

self wt wall  $w = 1.2$

$S = 2 \text{ kN/m}$

Max. BM = 8.4 kNm

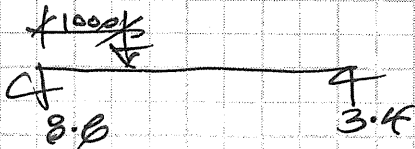
ADOPT 3/240 X 45F17H2  
 @ 2/290 X 45F17H2

Span 4700

LOADING

reaction betw = 9.4 kN (6.1 kN)

self wt wall  $w = 1.6 \text{ kN/m}$



Max. BM = 8.57 kNm

try 2/290 X 45F17H2

$\rightarrow I_x = 6.8 \text{ m}^4 \text{ ax}$

$\rightarrow I_y = 9.6 \text{ m}^4 \text{ ax}$

ADOPT 3/290 X 45F17H2

COMPUTATION SHEET

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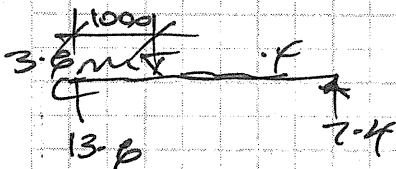
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Span 2700

LOADINGS

reaction frames (wt) = 9.4 kN (6.1)  
 reaction beam (wt) = 3.4 - /  
 reaction mass (wt) = 3.9 - /  
16.7 kN (12.1)



w. : tiled roof (w) = 1.0 x 2.0 = 2.0 kN/m  
 (y) = .3 x 2.0 = .6 - /  
 self / wall (y) = 1.2 - /  
3.8 kN/m

Max BM = 11.9 kN

ADOPT 3/240X450X110  
 OR 2/290X450X110

14.0 BEAM ENTRY

Span 2200

LOADINGS

tiled roof (w) = 1.0 x 2.0 = 2.0 kN/m  
 (y) = .3 x 2.0 = .6 - /  
 self / wall (y) = 1.2 - /  
3.8 kN/m

reaction (wt) = 3.4 kN @ Midspan

Max BM = 4.2 kN

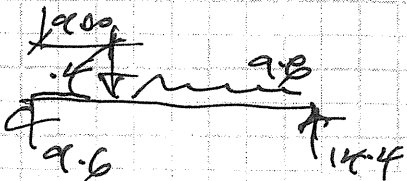
ADOPT 2/240X450X110

15.0 BEAM BED

Span 3000  
LOADINGS

reaction (wt) = 3.1 kN (2.6)

w. : tiled roof (w) = 1.0 x 3.5 = 3.5 kN/m  
 (y) = .3 x 3.5 = 1.1 - /  
 self / wall (y) = 1.2 - /  
 floor (y) = .5 x 2.0 = 1.0 - /  
 (w) = 1.5 x 2.0 = 3.0 - /  
9.8 kN/m



Max BM = 10.6 kN

COMPUTATION SHEET

SHEET (2 of 27)  
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try 2/240 X 450 (F1112)  
 $\rightarrow \frac{1}{16} = 12.3 \text{ MPa OK}$   
 $\frac{1}{32} = 9.0 \text{ MPa OK}$

ADOPT 2/240 X 450 (F1112)

16-0 BEAM PDR

Span 1600  
 LOADINGS

reaction beam (try) = 4.9 kN  
 reaction mull (try) = 12.2 - /  
 17.1 kN



∴ At above = 3.8 kN

Max BM = 2.8 kNm

ADOPT 2/240 X 450 (F1112)

17-0 GROUND FLOOR UNTELS

17-1 GARAGE

Span 2700  
 LOADINGS

reaction (try) = 14.1 kN @ Mid Span

tiled roof (try) = 1.0 x 1.0 = 1.0 kN/m

(try) = 0.3 x 1.0 = 0.3

brickwork (try) = 4 x 0.6 = 2.6

self (try) = 0.3

4.2 kN/m

Max. BM = 13.3 kNm

ADOPT TEE UNTELS:  
 200 X 10 PL VEB  
 X 200 X 10 PL. HBR

17-2 MULL / PASSAGE

Span 1700  
 LOADINGS

floor (try) = 0.5 x 2.8 = 1.4 kN/m

(try) = 1.5 x 2.8 = 4.2

self/wall (try) = 1.2

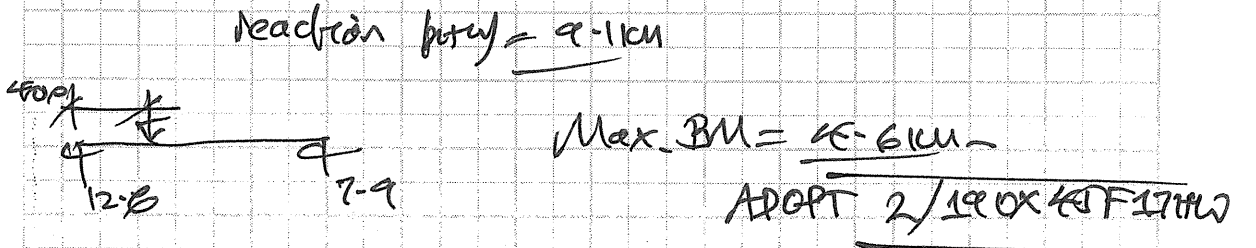
6.8 kN/m

PROJECT:  
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17.3 WIKING  
Span 3000

LOADS

reaction btw = 23.3 kN @ Mid span  
 tiled roof =  $1.0 \times 2.0 = 2.0 \text{ kN/m}$   
 $(w = 3 \times 2.0 = 0.6 \text{ m})$   
 self wt =  $0.2 \text{ m}$   
 2.8 kN/m

Max. BM = 20.6 kNm

ADOPT 2/360x45LUL  
OR 200x75 CHANNEL

UNITS 4 x 5

18.0. BEAMS STAIRS & ENTRY

Span 4600

LOADS

floor (w) =  $0.5 \times 2.8 = 1.4 \text{ kN/m}$   
 $(w = 1.5 \times 2.8 = 4.2 \text{ m})$   
 self wt/wall =  $1.2 \text{ m}$   
 6.6 kN/m

Max BM = 17.9 kNm

Try 200UB25

$S_x = 77.2 \text{ cm}^3$  ok

$R_t = 8.0 \text{ mm}$  ok

ADOPT 200UB30

COMPUTATION SHEET

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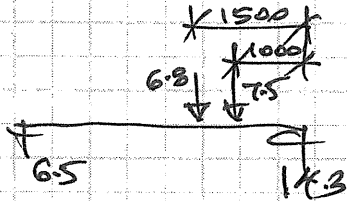


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Span 5000

LOADING



reaction beams  $w_{ty} = 6.8 \text{ kN}$   
 $w_{ty} = 7.5 \text{ kN}$

self wt / wall  $w = 1.2 \text{ kN/m}$

Max. BM = 16.4 kNm

Try 200UB30  $I = 28.9 \times 10^6$   
 $Z = 279 \times 10^3$

$z_{ty} = 58.6 \text{ mm} <$

$r_x = 8.3 \text{ m} <$

ADOPT 250UB31

19.0 BEAMS LIVING/KITCH

Span 2900

LOADING

tiled roof  $w = 1.0 \times 3.8 = 3.8 \text{ kN/m}$   
 $w = 0.3 \times 3.8 = 1.1$   
self wt / wall  $w = 1.2$   
floor  $w = 0.5 \times 2.4 = 1.2$   
 $w = 1.5 \times 2.4 = 3.6$

10.9 kN/m (7.7)

Max. BM = 11.5 kNm

ADOPT 3/240X467(17H)  
~~or 2/290X467(17H)~~

Span 1700

LOADING

As above = 10.9 kN/m

Max BM = 3.9 kNm

ADOPT 2/240X467(PINE)

Span 4600

LOADING

reaction  $w_{ty} = 6.5 \text{ kN @ mid span}$

As above = 10.9 kN/m



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Max BM = 36.3 kNm

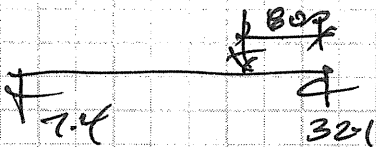
Try 250UB31  $I = 44.4 \times 10^6$   
 $Z = 353 \times 10^3$

$\sigma = 102.8 \text{ MPa} < \sigma_c$   
 $f_T = 8.6 \text{ MPa}$

ADOPT 250UB31

Span 4700

LOADING



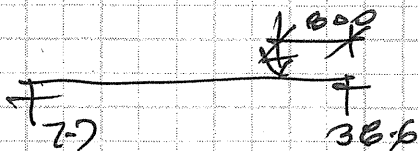
reaction  $W_y = 37.6 \text{ kNm}$   
 self  $W_y = 4 \text{ kNm}$

Max. BM = 25.7 kNm

ADOPT 250UB31

Span 5300

LOADING



reaction  $W_y = 44.2 \text{ kNm}$   
 self  $W_y = 4 \text{ kNm}$

Max BM = 30.8 kNm

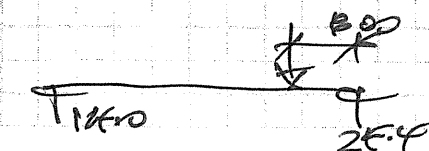
Try 250UB31

$\sigma = 87.3 \text{ MPa} < \sigma_c$   
 $f_T = 7.5 \text{ MPa} < f_T$

ADOPT 250UB31

Span 4700

LOADING



reaction  $W_y = 15.8 \text{ kNm}$   
 tiled roof  $W_y = 1.9 \times 2.8 = 5.3 \text{ kNm}$   
 $W_y = 3 \times 2.8 = 8.4 \text{ kNm}$   
 self/wall  $W_y = 1.2 \text{ kNm}$   
 $4.8 \text{ kNm}$

Max. BM = 20.4 kNm

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200UB28  
 $I_{xx} = 8014 \text{ cm}^4$   
 $I_{yy} = 102 \text{ cm}^4$

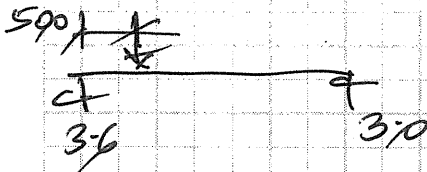
ADOPT 200UB30  
OR 250UB26

20.0 BEAM CDRY

Span 2000

LOADS

filed  $w_{self} = 1.9 \times 5 = 9.5 \text{ kN/m}$   
 $w_{cy} = 3 \times 5 = 15 \text{ kN/m}$   
 select  $w_{wall} = 1.2$   
 $w_{dead} = 1.5 \times 4 = 6 \text{ kN/m}$   
 $w_{live} = 1.5 \times 4 = 6 \text{ kN/m}$   
27 kN/m



reaction  $w_{total} = 1.2 \text{ kN}$

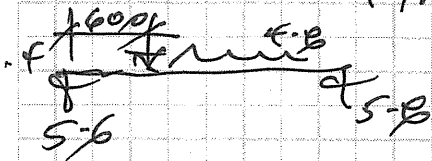
Max BM = 1.7 kN

ADOPT 2/240X400 PIPE

Span 1500  
LOADS

reaction  $w_{total} = 3 \text{ kN}$   
 reaction truss  $w_{total} = \frac{3 \cdot 8}{6 \cdot 8} \text{ kN}$

$w_{total}$  for beam needs = 4.8 kN



Max BM = 3.3 kN

ADOPT 2/240X400 PIPE

21.0 BEAMS PORCH

Span 1800  
 cant (unit 4)

LOADS

reaction  $w_{total} = 7.2 \text{ kN}$  (1.5)

self  $w = 1.2 \text{ kN}$

Max BM = 1.6 kN

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$$S_b = 1.9 \text{ mPa-OK}$$

$$f_{OL} = 5.1 \text{ m} = \text{span}/35.3 \text{ OK}$$

Span 2500 (unit 5)

ADOPT 2/240X40F17HW

LOADS

reaction (avg) = 0.95 kN (0.61)

self  $w_y = -2 \text{ kN}$

Max BM = 3.0 kN

Try 200X25 CHANNEL  
I = 191 X 10<sup>6</sup>  
Z = 191 X 10<sup>3</sup>

$$S_b = 15.7 \text{ mPa-OK}$$

$$f_t = 4.6 \text{ m} = \text{span}/53.7 \text{ OK}$$

ADOPT 200X25 CHANNEL

220 GROUND FLOOR UNTELS

22-1 GARAGE

Span 2700

LOADS

filed  $w_{efy} = 1.9 \times 2.0 = 2.0 \text{ kN}$

$w_y = .3 \times 2.0 = .6$

self (wall)  $w_y = 1.2$

brick (avg) = 4.4 X 1.0 = 4.4

8.2 kN

Max BM = 7.5 kN

ADOPT TEE UNTEL

200X10 PL. UPR  
4 200X9 PL. LFR

22-2 LIVING

Span 3000  
LOADS

filed  $w_{efy} = 1.9 \times 1.6 = 1.6 \text{ kN}$

$w_y = .3 \times 1.6 = .5$

self (wall)  $w_y = 1.2$

3.3 kN

Max BM = 3.7 kN

ADOPT 240X70F17HW

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UNITS 6 & 7.

23.0 BEAM LIVING

Span 5100

LOADINGS

tiled roof  $w_y = 1.0 \times 2.6 = 2.6 \text{ kN/m}$   
 $w_y = 1.3 \times 2.6 = 3.4$   
self wt / wall  $w_y = 1.2$   
4.6 kN/m

Max. BM = 14.9 kNm

Try 200UB25  
 $\sigma_b = 64.2 \text{ MPa}$  ok  
 $\sigma_T = 8.6 \text{ MPa}$  ok

ADOPT 200UB25

24.0 BEAM BED 3

Span 3600

LOADINGS

tiled roof  $w_y = 1.0 \times 2.0 = 2.0 \text{ kN/m}$   
 $w_y = 1.3 \times 2.0 = 2.6$   
self wt / wall  $w_y = 1.2$   
3.8 kN/m

Max. BM = 6.2 kNm

ADOPT 2/240X400FL7HW

25.0 STAIR TIMMERS

Span 3300

LOADINGS

floor  $w_y = 1.5 \times 2.2 = 3.3$   
 $w_y = 1.5 \times 2.2 = 3.3$   
self wt / wall  $w_y = 1.2$   
5.6 kN/m

Max. BM = 7.6 kNm

Try 2/240X400FL7HW

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$\sigma_{fb} = 8.8 \text{ MPa}$  OK

$f_{OL} = 7.7 \text{ m}$  OK

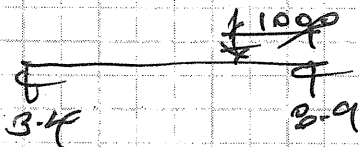
ADOPT 2/240X400X17HW

Span 5100

LOADING

reaction  $W_{try} = 9.3 \text{ kN}$  (p.o)

self load  $w = 0.6 \text{ kN/m}$



Max. BM = 8.7 kN

try 2/240X400X17HW

$\sigma_{fb} = 6.9 \text{ MPa}$  OK

$f_{OL} = 11.7 \text{ m}$  OK

ADOPT 3/240X400X17HW  
~~200UB25~~

26.0 BEAMS PORCH

Span /LOADING

Similar to units 4x5

ADOPT 2/240X400X17HW  
~~200X75 CHANNEL~~

27.0 GROUND FLOOR UNTELS

27.1 GARAGE

Span 2700 (UNIT 6)

LOADING

tiled roof  $w = 1.0 \times 2.5 = 2.5 \text{ kN/m}$

$w = 3 \times 2.5 = 0.75$

self  $w = 3$

brick (w) =  $1.4 \times 0.6 = 0.84$

6.21 kN/m

Max. BM = 5.6 kN

ADOPT TEE UNTEL  
150X100L.VOR  
X 200X60L.HOR

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Span 2700 (unit 7)

LOADING

$$\begin{aligned} \text{As above} &= 6.2 \text{ kN/m} \\ \text{tiled roof } (y) &= 1.0 \times 1.0 = 1.0 \\ (y) &= .3 \times 1.0 = .3 \\ \hline &7.5 \text{ kN/m} \end{aligned}$$

Max BM = 6.8 kNm

ADOPT TEE UNTEL:  
200X104 LUB  
X 200X6 PLITER

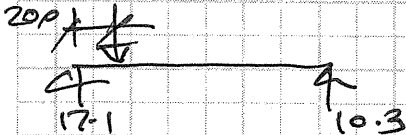
27.2 PASSAGE

Span 1800

LOADING

$$\begin{aligned} \text{tiled roof } (y) &= 1.0 \times 3.0 = 3.0 \text{ kN/m} \\ (y) &= .3 \times 3.0 = .9 \\ \text{self (wall } y) &= 1.2 \\ \text{floor } (y) &= .5 \times 2.6 = 1.3 \\ (y) &= 1.5 \times 2.6 = 3.9 \\ \hline &10.3 \text{ kN/m} \end{aligned}$$

reaction (wry) = 8.9 kN



Max BM = 5.2 kNm

ADOPT 2/190X117 IUBK

27.3 LIVING

Span 4000

LOADING

$$\begin{aligned} \text{tiled roof } (y) &= 1.0 \times 2.0 = 2.0 \text{ kN/m} \\ (y) &= 3 \times 2.0 = .6 \\ \text{self (wall } y) &= .6 \\ \hline &3.2 \text{ kN/m} \end{aligned}$$

Max. BM = 6.4 kNm

ADOPT 200X75 CHANNEL

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UNIT 9

28.0 BEAMS GARAGE

Span 3000

LOADS Similar to Unit 3 = 9.4 kN/m

ADOPT 3/240X4(F17)HD  
OR 2/240X4(F17)HD

Span 3500  
LOADS

Similar to Unit 3

ADOPT 200UB25

22.0 BEAM OUTSIDE GARAGE

Span 2100

LOADS As for bed 3 with  $G = 3.6$  kN/m (3.2)

Max BM = 2.11 kNm

ADOPT 2/240X4(F17) PINE

30.0 BEAM BED 4

Span 3000

LOADS tiled roof  $w = 1.0 \times 2.2 = 2.2$  kN/m

$(w) = 0.3 \times 2.2 = 0.66$

self weight  $w = 1.27$   
4.13 kN/m

Max. BM = 4.61 kNm

ADOPT 2/240X4(F17) PINE

31.0 BEAMS PASSAGE

Span 2700

LOADS tiled roof  $w = 1.0 \times 2.6 = 2.6$  kN/m

$(w) = 0.3 \times 2.6 = 0.78$

self weight  $w = 1.27$

floor  $w = 0.5 \times 1.8 = 0.9$

$(w) = 1.27 \times 1.8 = 2.286$

8.31 kN/m (S.B)

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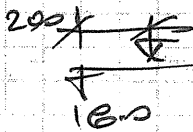


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Max. BM = 7.6 kNm  
 try  $2/240 \times K(F17HW)$   
 $\rightarrow \sigma = 8.8 \text{ MPa. ok}$   
 $f_{DL} = 5.5 \text{ m ok}$

Span 1000  
 LOADS



reaction  $W_{ry} = 22.4 \text{ kN}$   
 select  $g = 2 \text{ m}$

ADOPT  $2/240 \times K(F17HW)$

Max BM = 3.6 kNm

ADOPT  $2/240 \times K(F17HW)$

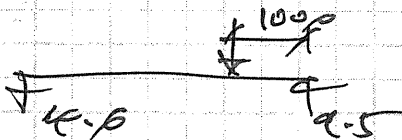
32.0 BALUS STAIRS

Span 3600  
 LOADS

floor  $g = 5 \times 1.8 = 9 \text{ kN/m}$   
 $W_{ry} = 15 \times 1.8 = 2.7 \text{ kN}$   
 select  $W_{all} g = 1.2 \text{ kN/m}$   
 Max BM = 7.8 kNm

ADOPT  $3/240 \times K(F17HW)$   
or  $2/290 \times K(F17HW)$

Span 4500  
 LOADS



reaction  $W_{ry} = 8.7 \text{ kN (5.2)}$

select  $W_{all} g = 1.2 \text{ kN/m}$

Max BM = 6.9 kNm

try  $2/290 \times K(F17HW)$   
 $\rightarrow \sigma = 7.1 \text{ MPa. ok}$   
 $f_{DL} = 10.6 \text{ m ok}$

ADOPT  $2/290 \times K(F17HW)$



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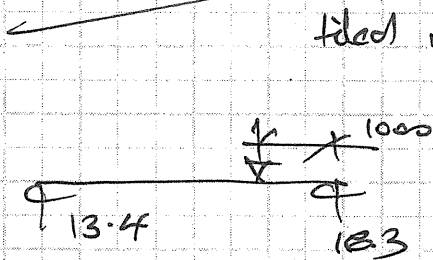
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3300 BEAMS LIVING

Span 5500

LOADS

reaction  $W_y = 8.71 \text{ kN}$



fixed  $w_{eff} = 1.0 \times 3.0 = 3.0 \text{ kN/m}$   
 $w = 0.3 \times 3.0 = 0.9 \text{ kN/m}$   
 self  $w_{wall} = 1.2 \text{ kN/m}$   
5.1 kN/m

Max. BM = 17.6 kNm

ADOPT 200UB25

Span 2100  
LOADS

As above = 5.1 kN/m

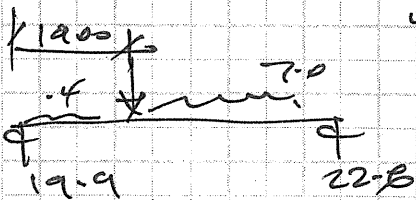
Max. BM = 2.8 kNm

ADOPT 2/240X447PME

Span 5200

LOADS

reaction  $W_y = 18.8 \text{ kN}$



w. floor  $w = 0.5 \times 2.8 = 1.4 \text{ kN/m}$   
 $w_{self} = 1.5 \times 2.8 = 4.2 \text{ kN/m}$   
 self  $w_{wall} = 1.4 \text{ kN/m}$   
7.0 kN/m

Max. BM = 37.1 kNm

try 250UB37  $I = 44 \times 10^6$   
 $Z = 353 \times 10^3$

$\sigma_b = 105 \text{ MPa}$  ok

$f_T = 11.1 \text{ mm}$  ok

ADOPT 250UB37.

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35-0 BEAM PORCH

Span 1900

LOADS

Similar to Unit 4 = 7.2 kN/m (.5)

Self wt (a) = 2 kN/m

Max BM = 1.8 kNm

Try 2/250 x 450 x 120

$f_c > 21 \text{ MPa}$  ✓

$f_{cr} = 6.1 \text{ MPa} = \text{span} / 313 \text{ ok}$

ADOPT 2/250 x 450 x 120

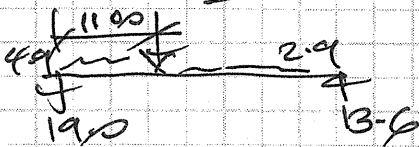
35-0 GROUND FLOOR LIMTEL

35-1 GARAGE

Span 2700

LOADS

reaction  $W_{ry} = 22.8 \text{ kN}$  @ Mid Span.



Max BM = 17.9 kNm

ADOPT TEE LIMTEL:  
250 x 100 PLU  
x 200 x 100 HOK

Span 900  
LOADS

35-2 ENTRY

reaction  $W_{ry} = 11.2 \text{ kN}$  @ Mid Span

As for beam bed 4 = 4.1 kN/m

Max BM = 2.9 kNm

ADOPT 190 x 450 x 120

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35-3 PASSAGE

Span 900  
LOADING

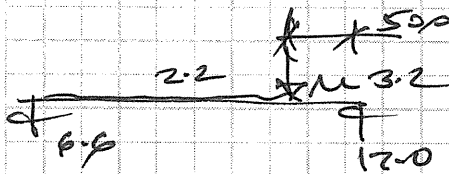
reaction (wtu) =  $4.0 \text{ kN} @ \text{mid span}$   
 tiled roof =  $1.0 \times 1.5 = 1.5 \text{ kN/m}$   
 $w = .3 \times 1.5 = .5$   
 self w =  $.2$   
2.2 kN/m

Max BM = 1.31

ADOPT 190 X 190 R17 HW

35-4 LIVING

Span 2200  
LOADING



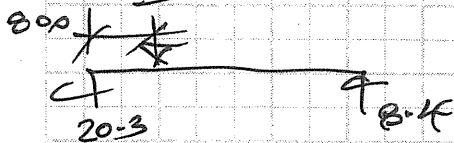
reaction (wtu) = 18.3 kN

tiled roof  $w = 1.0 \times 1.5 = 1.5 \text{ kN/m}$   
 $w = .3 \times 1.5 = .5$   
 self/wall =  $.2$   
3.2 kN/m

Max. BM = 8.1 kN

ADOPT 2/240 X 190 R17 HW

Span 4000  
LOADING



As above = 2.2 kN/m

reaction wtu = 19.9 kN

Max BM = 15.5 kN

ADOPT 2/360 X 150 R17 HW  
2/230 X 150 CHANNEL

Span 1800  
LOADING

tiled roof =  $1.0 \times 1.0 = 1.0 \text{ kN/m}$   
 $w = .3 \times 1.0 = 1.2$   
 self/wall =  $.2$   
 floor =  $.5 \times 1.2 = .6$   
 $w = 1.5 \times 1.2 = 1.8$   
3.8 kN/m

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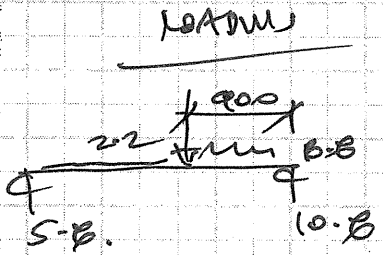
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Max BM = 3.61kN

Span 2400

ADOPT 2/190X400 IPE170



w<sub>1</sub>: As above = 3.81kN

w<sub>2</sub>: As above = 2.2kN

reaction (at r) = 5.4kN

Max BM = 6.2kN

ADOPT 2/190X400 IPE170

36.0 GARAGE UNTEL - UNIT 2

Span 2700  
LOADING

brick wy = 4.4 x 1.2 = 5.28kN  
 self wy = .3  
5.58kN

Max. BM = 5.0kN

ADOPT TEE UNTEL  
150X10 PL. VER.  
X 200X6 PL. HOR.

37.0 GARAGE UNTEL; - UNIT 3 X 10

Span 2700  
LOADING

fixed roof wy = 1.0 x 2.0 = 2.0kN  
 wy = .3 x 2.0 = .6  
 self wy = .3  
 brick wy = 4.4 x .6 = 2.64  
5.54kN

ADOPT TEE UNTEL;  
150X10 PL. VER.  
X 200X6 PL. HOR.

38.0 BRACING

Assume, WIND CLASSIFICATION N1

COMPUTATION SHEET

SHEET 27 of 27

Job No.:

Date:

MADE BY..

PROJECT:  
at



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Consulting Structural & Civil Engineers

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UNIT 1

Area Front =  $52.3 \text{ m}^2$  RF =  $.62 \times 52.3 = 32.4 \text{ km}$

→ BRACING 18.0 km

Area Side =  $58.5 \text{ m}^2$  RF =  $.58 \times 58.5 = 33.9 \text{ km}$

→ BRACING 18.0 km

UNITS 2 & 3

Area Front =  $47.6 \text{ m}^2$  RF =  $.62 \times 47.6 = 29.5 \text{ km}$

→ 16.0 km

Area Side =  $58.9 \text{ m}^2$  RF =  $.58 \times 58.9 = 34.1 \text{ km}$

→ BRACING 18.0 km

UNITS 4 & 5

Area Front =  $51.3 \text{ m}^2$  RF =  $.62 \times 51.3 = 31.8 \text{ km}$

→ 16.0 km

Area Side =  $57.1 \text{ m}^2$  RF =  $.58 \times 57.1 = 33.1 \text{ km}$

→ 18.0 km

UNITS 6 & 7

Area Front =  $32.1 \text{ m}^2$  RF =  $.62 \times 32.1 = 19.9 \text{ km}$

→ 12.0 km

Area Side =  $70.5 \text{ m}^2$  RF =  $.58 \times 70.5 = 40.9 \text{ km}$

→ 22.0 km

UNIT 8

Area Front =  $30.0 \text{ m}^2$  RF =  $.58 \times 30 = 16.8 \text{ km}$

→ 9.0 km

Area Side =  $53.2 \text{ m}^2$  RF =  $.52 \times 53.2 = 27.7 \text{ km}$

→ 15.0 km

UNIT 9

Area Front =  $36.9 \text{ m}^2$  RF =  $.62 \times 36.9 = 22.9 \text{ km}$

→ 12.0 km

Area Side =  $77.8 \text{ m}^2$  RF =  $.58 \times 77.8 = 45.1 \text{ km}$

→ 24.0 km

UNIT 10

Area Front =  $20.0 \text{ m}^2$  RF =  $.58 \times 20 = 11.2 \text{ km}$

→ 7.0 km

Area Side =  $58.3 \text{ m}^2$  RF =  $.52 \times 58.3 = 30.3 \text{ km}$

→ 18.0 km

*Pavlovic*  
MIAKWR 18-6-19