Eclipse Opening Roof Design Worksheet
This worksheet is a summary of design calculations from the Eclipse Opening Roof Design Manual
October 2013

Owners: EILEEN CLARK Address: 270 DOWLING STREET DUNGOG.

1. Wind Design Factors

Wind Region = A

Terrain Category = 2

Shielded or Non-shielded = NONSHIELDED

2. Design Wind Pressure, q_z

Using the Design Wind Factors select q_z from the Tables in Section 2 of Design Manual. **q_z** = 1.02 **kPa**

3. Pressure Coefficient, Cp_u & Cp_d

Determine both UPWARD and DOWNWARD pressure coefficients.

Height of Structure h_c = 3.5 m h_c/w_c = 0.827 **Cp_u** = 1.2

Height of Building h = 3.5 m

Projection of Structure w_c = 4.05 m h_c/h = 1.0 **Cp_d** = 0.6

Number of Enclosed Sides = 3

4. Wind Pressure (kPa)

Calculate wind pressure for both UPWARD and DOWNWARD directions.

Upward Pressure P_u = $q_z \times Cp_u$ = 1.02 x 1.2 **P_u** = 1.224 **kPa**

Downward Pressure P_d = $q_z \times Cp_d$ = 1.02 x 0.6 **P_d** = 0.612 **kPa**

5. Select Louvre Span (m)

Using P_u and P_d select the maximum louvre span from the Tables in Section 5 of the Design Manual.

Maximum Louvre Span, based on UPWARD pressure = 3.2 m

Maximum Louvre Span, based on DOWNWARD pressure = 4.2 m

The Allowable Maximum Span is the LESSER of these two values.

Maximum Louvre Span, Ls = 3.2 m

6. Louvre Support Beams

Calculate the Uniformly Distributed Beam Load (UDL) then select beam with appropriate span from Table 6.1.

For Design Pressure, P use the HIGHER value of P_u and P_d **P** = 1.224 **kPa**

EDGE BEAM Louvre Span Length (dist. between tracks): L = 3.2 m.

UDL = P x L/2 = 1.224 x 1.6 **UDL** = 1.958 **kN/m**

MID BEAM Louvre Span Lengths (dist. between tracks): L1 = _____ m L2 = _____ m

UDL = P x (L1 + L2)/2 = _____ x _____ **UDL** = _____ **kN/m**

Beam Selection Summary:

	UDL	Size	Max. Span
Beam 1	1.958	250x50x3	5.39
Beam 2	.....	.....	.....
Beam 3	.....	.....	.....

SHADEMASTER SHELTER SYSTEM
Design Sheet – Roof System

Calculations and tables are referenced from the SHADEMASTER Shelter System Simplified Design Procedures Manual June

Client: EILEEN CLARK BANK HOTEL.

Designed by: HV ALUMINIUM

Address: 270 DOWLING STREET, DUNGOG

Date: 27.11.24

REGION A	AUSTRALIAN WIND REGION
TC 2	TERRAIN CATEGORY CLASSIFICATION
NON SHIELDED	SHIELDING CLASSIFICATION (Shielded, Partially Shielded, Non-Shielded)
qz= 0.835 kPa	ULTIMATE WIND PRESSURE (selected from Table U1) R = h ÷ P
ATTACHED	STRUCTURE TYPE (Attached or Freestanding / Flat Roof) = 0.65
c Cp= 1.06	COEFFICIENT OF PRESSURE (selected from 6 conditions Page 12 to 14) p = (qz) x (Cp) = _____ kPa

OR With Naturelite p = (qz) x (Cp) x 1.1* + = _____ kPa

*Maximum One Naturelite per Metre or + Naturelite at 600mm spacing use 1.333

ROOFING DESIGN

P= 0.885 kPa — ROOF DESIGN PRESSURE

ROOF SHEET TYPE: 90 INSULATED

ROOF SHEET SUPPORT CONDITION	READ FROM TABLE		
	Region A	Region B	Region C
[x] Simply Supported	Table RS/A	Table RS/B	Table RS/C
[ ] Single Cantilever	Table RS/A	Table RS/B	Table RS/C
[ ] Continuous Spans	Table RS/A	Table RS/B	Table RS/C

Ls= 5.0 m — ACTUAL ROOF SPAN REQUIRED: 5.0 metres MAXIMUM SPAN PERMITTED: 5.68 metres

BEAM DESIGN

Calculate Load on Beam Wb= .835 (qz) x 1.06 (Cp) x 3.8 AVE. (Ls) x .616 (r) = 2.09 (kN/m)

Wb= 2.09 kN/m — BEAM TYPE: DOUBLE 250x50x3 ALUMINIUM

BEAM SUPPORT CONDITION	READ FROM TABLE
[x] Simply Supported	Region A, B or C
[ ] Single Cantilever	Region A, B or C
[ ] Double Cantilever	Region A, B or C
[ ] Continuous Spans	Region A, B or C

Lb= 6.7 m — ACTUAL BEAM SPAN REQUIRED 6.7 metres MAXIMUM SPAN PERMITTED: 6.9 metres

PL= kN

POST & FOOTING DESIGN

Calculate Load on Post PL= x (qz) x (Cp) x (Ls) x (Lb) x (k) x (r) = ____ (kN)

POST LOAD

Use Post Type = x x (Attached structure only)

Select Post & Footing from Table P1 or P2

Footing size = x x

OR

100mm Slab = (m²)

(k) = Post Load Coefficient - refer Table A2
(r) = Beam Load Factor - refer Table A1
(d) = Lateral Load Factor - refer Table A3

kN

_____ x _____ x _____

Calculate Lateral Post Loads For Freestanding Structures

F1 = (Lb x k +3.2) x 0.04 x (qz) x (Ls) x (r) = ____ kN

F2 = (Ls x r + d) x 0.01 x (qz) x (Lb) x (k) = ____ kN

SELECT THE GREATER VALUE OF F1 AND F2 POST SIZE FOR FREESTANDING STRUCTURE

A3 SHEET

GENERAL NOTES

1. The Hunter Douglas products as defined within the 'Ultimate Limit State Design Procedures Manual' have been designed to withstand the relevant loads specified in the SAA Loading Code (AS 1170 parts 1 and 2) including dead, live and wind loads. (see note 5).
2. For connections to existing structures the builder must satisfy himself that the existing structure and connection are capable of resisting the design forces applied at that point.
3. Footing dimensions shown are minimum and shall be increased to produce the ballast required in the calculations.
4. All standard fasteners are to be ϕ 12 'Hilek' self driven tek screws or similar approved.
5. Where access to the awning roof is required for maintenance purposes, a temporary walkway (250 x 38mm F7 softwood) (ref AS 1562 clause 3.51) shall be placed between any two supports at a distance of not more than 1 metre from either support. Where the 0.9mm panel is used at spans not exceeding 4260mm, the temporary walkway is not required. Maintenance Live Load = 0.25 kPa
6. Edge distance on steel base plate to be:
   M12 bolts = 20mm
   M16 bolts = 25mm
   Base plate to be 300 MPa grade (min.).
7. Chemset anchors (or similar approved) to be installed in accordance with manufacturers specification.
8. Slab edge thickness in accordance with AS2870 "Residential Slab Footings".
9. Min fall on roof sheeting 1 in 17.
10. All bolts have washers of the appropriate diameter beneath both the bolt head and the nut.
11. Unless noted otherwise all steelwork including bracket and cleats to be grade 300 MPa.
12. Unless noted otherwise all welds to be general purpose 6.0 mm continuous fillet welds. Electrodes to be either E41XX or W4XX. Where required general purpose single penetration V-butt welds to be used.
13. Unless noted otherwise all fixtures into brickwork to be M10 excalibur (Powers) screws. Screws must not be placed into the vertical mortar course.
    Min embeddment = 45mm (min)
    Minimum Edge Spacing = 50mm (min)
    Minimum Bolt Spacing = 85mm (min)
14. All loads shown within this specification sheet are 'Ultimate Limit State'. Loads must be related to the Ultimate Limit State Design Procedures Manual.
15. Allowable bearing stress beneath foundation is 100 kPa.
16. Naturelle panels to be used as detailed within the design manual. Naturelle to be fixed to the appropriate beam as detailed in the fixing schedule. Panel to be sealed in against back gutter with an approved flexible sealant.
17. The M12 through bolt associated with the 50mm aluminium post connector must be located 30mm Min from the top of the post connector. (Distance measured from centrelines).
18. The existing brickwork has been assumed to have a compressive strength of 15MPa (min).
19. Strengthening of the existing timber trusses shall be determined from the following tables:-

TILED ROOFS (CONCRETE/TERRACOTTA)

Maximum Hunter Douglas Roof Sheet span without Strengthing existing truss tails (m)

Ultimate Design Wind Pressure (kPa)	Spacing of Existing Roof Trusses		
	600mm (centres)	900mm (centres)	1200mm (centres)
0.50	6.00	6.00	6.00
0.50	6.00	6.00	5.28
0.75	6.00	4.51	3.52
1.00	4.86	3.38	2.64
1.25	3.89	2.71	2.11
1.50	3.24	2.25	1.76
1.75	2.76	1.93	1.51
2.00	2.43	1.69	1.32
2.25	2.16	1.50	1.17
2.50	1.95	1.35	1.06
2.60	1.87	1.30	1.02

Notes:- The above tables assume the following:-
* Existing roof trusses are 90 x 35 (F7) timber trusses.
* Existing roof is tiled with either concrete / terracotta.
* Existing roof has been constructed in accordance with the National timber framing manual & good building practices.
* Strengthening requirements as detailed above have been determined on the max span of the roof sheeting as specified. Adjustment to suit particular project maybe required.
* If these assumptions are not applicable to the structure in question, consultation with Richard Hoks Moretti is required.

STEEL ROOF SHEET

Maximum Hunter Douglas Roof Sheet span without Strengthing existing truss tails (m)

Ultimate Design Wind Pressure (kPa)	Spacing of Existing Roof Trusses		
	600mm (centres)	900mm (centres)	1200mm (centres)
0.50	6.00	6.00	6.00
0.50	6.00	6.00	4.66
0.75	6.00	4.10	3.11
1.00	4.55	3.07	2.33
1.25	3.64	2.46	1.87
1.50	3.04	2.05	1.55
1.75	2.60	1.76	1.33
2.00	2.28	1.54	1.17
2.25	2.02	1.37	1.04
2.50	1.82	1.23	0.93
2.60	1.75	1.18	0.90

* Strengthening Bracket or similar approved must be two (2) sheets of G550 cold formed steel 2.4mm thick by 80mm deep, mounted either side of the timber top chord with M12/4.6 bolts @ 300mm ctrs. The plates must terminate 600mm passed the wall top plate. Similar strengthening details can be used on approval.

ROOF PANEL TO BEAM FIXING SCHEDULE

Region Classification	RF Beam	Fascia Gutter
Region A	Hilek ϕ12 gauge, sheet metal self driving screws through every valley into centre of the top flange of the RF beam (or similar approved).	Hilek ϕ12 gauge, sheet metal self driving screws through every valley and every ridge.
Region B	Hilek ϕ12 gauge, sheet metal self driving screws through every valley into centre of the top flange of the RF beam (or similar approved).	Hilek ϕ12 gauge, sheet metal self driving screws through every valley and every ridge.
Region C	Two (2) ϕ14 gauge self driving tek screw with deck bond washer fixed to every valley into centre of the top flange of RF beam.	Hilek ϕ14 gauge tek screw self driving through every valley & every ridge.

Note: Variation to this schedule must be approved by the engineer prior to construction.
: All tek screws to have deck bond washers beneath the head.

ENGINEERING CERTIFICATION

The standard details has been checked by calculation and comply with the provisions of the relevant Australian Standards for structural adequacy.

We are satisfied that a structure built in accordance with these details is adequate for the purpose provided

1. Materials and components comply with the properties and conditions of the Ultimate Limit State Design Procedures Manual.
2. Loads, spans and attachments are determined in accordance with actual site conditions and design parameters supplied.
3. Assembly and erection comply with the details.

WARNING
NOTE: This certification is issued based exclusively on the use of Hunter Douglas specified components as shown in the attached section of this document. Any substitution voids this certificate

Signed _____

November 2003
BRETT HAILS
ME Aust, CPEng, NPER, RPEV
RPEQ Membership No: 5327 (Queensland)
RPEV Membership No: EC 18515 (Victoria).
DIRECTOR
Richard Hoks Moretti (NSW) Pty Ltd.
Civil, Structural & Building Consulting Engineers
224 Victoria Road, Drummoyne NSW 2047

BUILDER'S CERTIFICATE

We, the undersigned being Authorised Distributors of Shademasters Shelter Systems certify that:

1. We have checked the applicable loading on the structure proposed and are satisfied that the spans comply with the Simplified Design Manual and the specification details.
2. When an existing structure is used as a support the load imparted there to can be safely resisted.

Signed: _____
Date: _____
on behalf of: _____
_____
Telephone No: _____
Builders Lic. No: _____

HUNTER DOUGLAS LIMITED

INSULATED ROOF - PLAN AND STANDARD DETAILS

CLIENT:

ADDRESS:

DRAWN:	DATE:	DWG. No.	A3	REV.

SHELTER SYSTEM DESIGNED AND TESTED BY

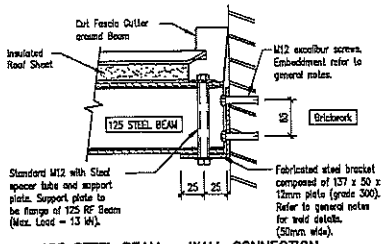
SHADEMASTER
Registered Trademark of Hunter Douglas Limited

NEW SOUTH WALES
338 Victoria Road
Rydalmere NSW 2116
Post Office Box 31
Rydalmere NSW 2116
ACN 009 675 709
Telephone (02) 9638 8000
Fax (02) 9638 8035

TYPE OF STRUCTURE

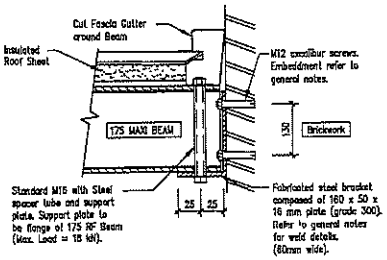
Shelter System
Issue No.103 - November 03

A3 SHEET



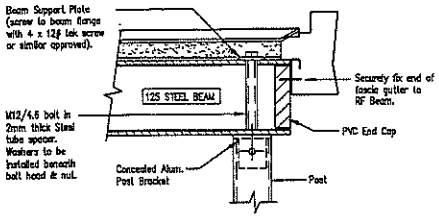
125 STEEL BEAM – WALL CONNECTION

– All bolts to have approved washers beneath both the bolt head and nut.

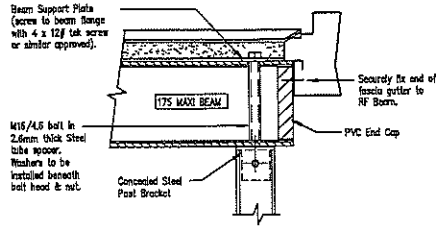


175 MAXI BEAM – WALL CONNECTION

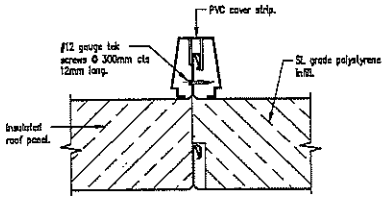
– All bolts to have approved washers beneath both the bolt head and nut.



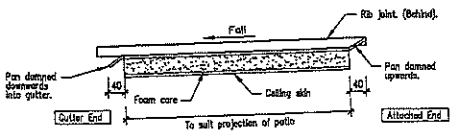
125 STEEL BEAM – POST CONNECTION



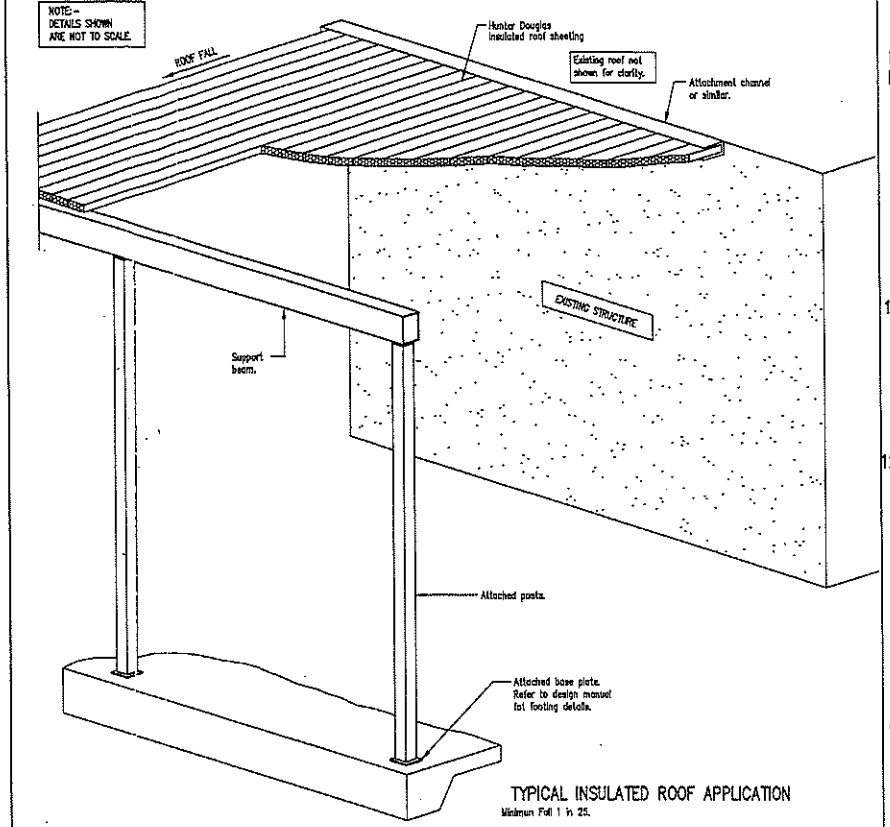
175 MAXI BEAM – POST CONNECTION



PATIO ROOF PANEL ASSEMBLY

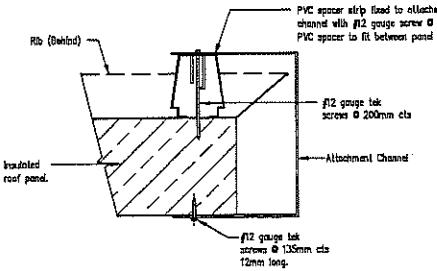


TYPICAL ROOF PANEL



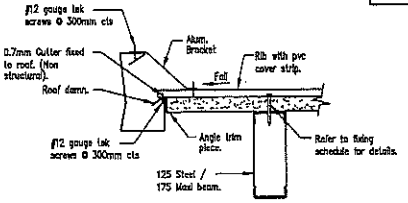
TYPICAL INSULATED ROOF APPLICATION

Minimum Fall 1 in 25.



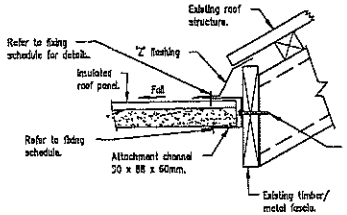
PATIO ROOF ASSEMBLY FASICA FIXING

– Refer to fixing schedule for details.
– Washer to be installed beneath tek head.



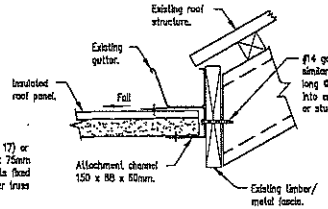
TYPICAL GUTTER END ASSEMBLY

– Washer to be installed beneath tek head.



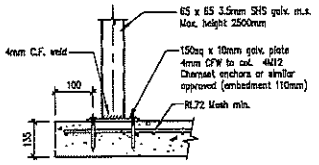
GUTTER REMOVED – FASCIA FIXING

– Refer to fixing schedule for details.
– Washer to be installed beneath tek head.



RETAINED GUTTER – FASCIA FIXING

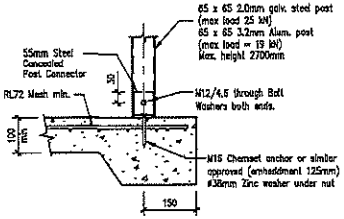
– Refer to fixing schedule for details.
– Washer to be installed beneath tek head.



Post may be 75 x 75 x 3.5mm SHS steel (galv) with 250 x 250 x 12mm m.s. base plate. Anchors to be 4M16 Chemsets or similar approved embedment 125mm. Max height 2500mm.

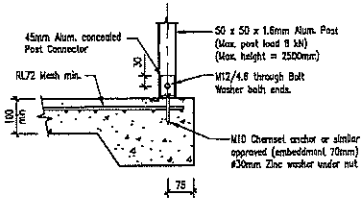
FREESTANDING STRUCTURES (NO WALLS)

– Existing slab to have thickness of 135mm.
– Concrete strength at 28 days to comply with AS 3600.
– Refer to Ultimate Limit State Design Procedures Manual for footing details.



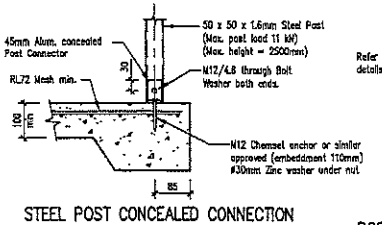
55mm POST CONNECTION DETAILS FOR ATTACHED STRUCTURES

– Existing concrete slab 140mm thick on ground
– Concrete strength at 28 days to comply with AS 3600.
– Refer to Ultimate Limit State Design Procedures Manual for footing details.



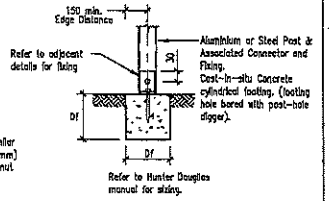
ALUMINIUM POST CONCEALED CONNECTION DETAILS FOR ATTACHED STRUCTURES

– Existing concrete slab 100mm thick on ground
– Concrete strength at 28 days to comply with AS 3600.
– Refer to Ultimate Limit State Design Procedures Manual for footing details.



STEEL POST CONCEALED CONNECTION DETAILS FOR ATTACHED STRUCTURES

– Existing concrete slab 125mm thick on ground
– Concrete strength at 28 days to comply with AS 3600.
– Refer to Ultimate Limit State Design Procedures Manual for footing details.

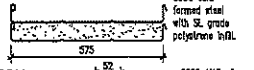


POST FOOTING / PAD FOOTING DETAIL

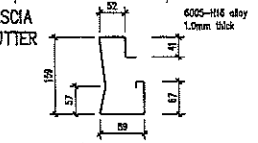
– Concrete strength at 28 days to comply with AS 3600.
– Refer to Ultimate Limit State Design Procedures Manual for footing details.

MAJOR STRUCTURAL COMPONENT SPECIFICATION

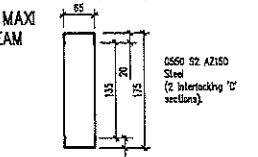
ROOF PANEL



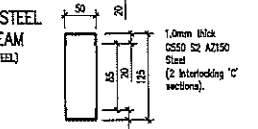
FASCIA GUTTER



175 MAXI BEAM



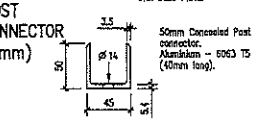
125 STEEL BEAM (STEEL)



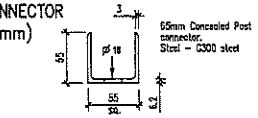
POSTS

Aluminium – 6063 T6 50 x 1.6mm wall thickness Steel – galv. mild steel 65 x 65 3.0mm SHS with base Plate. 75 x 75 3.5mm SHS with base Plate.

POST CONNECTOR (45mm)



POST CONNECTOR (55mm)



The span of each member is determined by reference to the Sheden Shelter System Ultimate Limit State Design Procedures Manual.

SHELTER SYSTEM DESIGNED AND TESTED BY

SHADEMASTER

Registered Trademark of Hunter Douglas Limited

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TYPE OF STRUCTURE

Shelter System

Issue No.104 - November 03

Drawing Not to Scale