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Temporary Structures Assessment
North Byron Parklands

A project of Billinudgel Property Pty Ltd
(Billinudgel Property Trust)

Tweed Valley Way and Jones Road, Yelgun

Lot 312 DP 1163830
Lot 1 - DP 1145020
Lot 46, 402, 403 and 404 - DP 755687
Lot 410 DP 755687
Lots 2 and 12 - DP 848618
Lot 101 - DP 856767
Lot 30 - DP 880376
Lots 100 and 101 - DP 1178907
Lots 101, 102 and 107 - DP 1001878
Lot 107 – DP 1001878
Lots 12 and 14 – DP 875112

19 October, 2017

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DISCLAIMER

Usage Note: This report has been prepared for the exclusive use of North Byron Parklands (Parklands) only, and is not to be used for any other purpose or event or by any other person or corporation.

No reliance should be placed on information contained within this report other than for the purpose of the application to vary the existing Major Project approval for North Byron Parklands (Parklands).

1.0 Outline

This assessment has been prepared on behalf of Billinudgel Property Trust (Billinudgel Property Pty Ltd trading as North Byron Parklands (Parklands) which operates a cultural events site at Yelgun near Byron Bay.

The Parklands site operates under a concept plan approval and project approval, granted by the NSW Planning Assessment Commission (the Commission) on behalf of the Minister for Planning on 24 April, 2012 (MP 09_0028). The approvals are subject to a trail period, up to the end of August 2019. The approvals allow up to 20 event days a year, comprising 3 small to large events (of up to 35,000 patrons) with up to 10 event days per year, and up to 10 minor community event days (of up to 1,500 patrons).

The concept plan allows ongoing events after the trial period subject to further planning approval meeting certain conditions of approval, and the satisfactory performance of the trial events.

Parklands is now seeking approval for ongoing use of the cultural events site following the trial period, including the continued use of the existing site infrastructure and the development of additional infrastructure to support the cultural events site.

The proposal involves undertaking outdoor events on the site for up to 20 event days a year, comprising:

- 2 large events per year (ie. Splendour in the Grass and Falls Festival) over a maximum of 5 event days each, catering for up to 35,000 patrons per event day;
- 3 medium event days a year (for other music concerts or cultural events), catering for up to 25,000 patrons per event day;
- 5 small community event days, catering for up to 5,000 patrons per event day; and
- 2 minor community event days, catering for up to 1,500 patrons per event day.

Further, approval is sought for the progressive growth of one of the large events (ie. Splendour in the Grass) to 42,500 patrons and then 50,000 patrons a day, subject to meeting key performance indicators (KPIs) relating to traffic, noise and biodiversity.

The proposal also involves:

- Temporary camping associated with outdoor events, with capacity for up to 25,000 campers a day (ie. similar to existing);
- Development of a conference centre and associated accommodation (as per the approved concept plan), with capacity for up to 180 attendees and accommodation for up to 120 guests a day;
- Continued use of existing site infrastructure and facilities;
- Development of additional site infrastructure and facilities, including:
    - An administration building;
    - Event area facilities and works, including:
        - Amphitheatre regarding works;
        - Drainage improvements;
        - Potable water infrastructure;
        - Sewerage infrastructure and amenities;
        - Electrical and telecommunications infrastructure;
        - Security fencing;
    - On-site and off-site road and transport facilities and works; and
- Continued habitat restoration and vegetation management works.

The proposal is classified as State Significant Development (SSD) under Part 4 of the Environmental Planning and Assessment Act, 1979 (EP&A Act), and consequently requires approval from the Minister for Planning. The proposal also requires modification to the approved concept plan, and the Minister is also the approval authority for that application. On 18 January, 2017, the Department of Planning & Environment (the Department), issued Secretary's Environmental Assessment Requirements (SEARs) for the proposal.

This report provides for details in respect to the erection and use of temporary structures within the Parklands cultural event site.

Details provided within this report and appendices provides for the erection and use of temporary structures as an integral component for the use of the event site, and documentation has been prepared to account for the requirements under Clause 12 of the *State Environmental Planning Policy – (Miscellaneous Consent Provisions) 2007,* and *Schedule 1* of the *Environmental Planning and Assessment Regulation 2000.*

The proposed land use is an *Entertainment Venue*, with respect to the requirements of *Schedule 1* of the *Environmental Planning and Assessment Regulation 2000,* involving the erection and use of temporary structures as well as those structures with stage and patron viewing, together with the use of any other temporary structures and this report takes account of fire safety and other considerations as required under the Performance Provisions of Part B1 and the Deemed-to-Satisfy provisions of NSW Part H102 of the *National Construction Code - Building Code of Australia* (BCA)*, 2016*, and as well as details in respect to the requirements of *Schedule 3* of the *Environmental Planning and Assessment Regulation 2000*, with no Performance Solution proposed as part of this development application submission to meet those requirements.

Pursuant to the provisions of the *Environmental Planning and Assessment Regulation 2000*, Parklands will appoint a Principal Certifying Authority for the issue of an Occupation Certificate prior to the use of those temporary structures, with the relevant supplier providing construction details including design documentation to account for Part B1 requirements of the BCA, fire hazard properties of fabrics, egress requirements and temporary fire- fighting installations, as well as other requirements provided by NSW Part H102 provisions, which would be specific to proposed temporary structures for each event, and which are to be submitted with that Occupation Certificate application together with a temporary structures Fire Safety and Other Considerations assessment report, to allow for event specific temporary structure installations, and provide for a procedure which will account for compliance requirements with the relevant provisions of the *National Construction Code – Building Code of Australia*, *2016,* as well as those requirements as outlined under *Schedule 3* of the *Environmental Planning and Assessment Regulation 2000*.

It is proposed that Disabled Viewing Platforms will be provide within each temporary structure (see typical to Appendix A1) and that monitoring the number of persons deemed to be accommodated within each temporary structure at any one time will be undertaken by security services responsible for coordination of each event safety and emergency management plans for the use of the temporary structures, where necessary.

The period of approval proposed for the use of any temporary structure is to account for the erection, use and removal of that temporary structure for any event within the Parklands cultural events site involving proposed music, arts, food, leisure, sporting and technology activities for which application is sought.

1.1 Exclusions

This report should not be construed to infer that an assessment for compliance with the following has been undertaken:

a) the requirements of the WorkCover Authority.

b) those provisions of *National Construction Code - Building Code of Australia, 2016* not relevant to temporary structures; and

c) *Disability Discrimination Act, 1992*.

2. NSW PART H102 – TEMPORARY STRUCTURES

The following provides an assessment of the likely maximum sized temporary structure proposed for the cultural events site for which approval is sought, which may be considered an Entertainment Venue, apart from Appendix C1 which provides for an occupancy other than use, as detailed to Table 1, under the performance requirements of Part B1 and Deemed-to-Satisfy and NSW H102 of the *National Construction Code - Building Code of Australia, 2016.*

Table 1

Maximum Temporary structure (typical arrangement)	**Estimated Patron Area**	**Ratio m²/persons (Maximum Capacity)**	**Deemed No. of Persons**
Appendix A1a - 45m x 75m Tent	2,700m²	Proposed 0.5 for 2,700m²	5,400
Appendix A1b – 45m x 60m Tent with tiered seating	2,025m²	All seated - proposed 1p/seat (includes seating to central floor area) Central floor area standing only – proposed 0.5 for 45m²	2,184 1,000
Appendix C1 – 25m x 35m Hocker	875m²	Proposed 4m²/p as maximum occupancy for dressing room	218

2.1 H102.1 – Application of Part

It should be noted that the intention of this Part is applied to temporary structures used as Entertainment Venues, defined as "*a building used as a cinema, theatre, concert hall or an indoor sports stadium*" as provided under the *Environmental Planning and Assessment Act 1979,* and although the current definitions may exempt some structures from such criteria, details are provided to demonstrate compliance with the requirements that would be applicable to typical temporary structures used for events within the property in the event that they may be applied at any time, subject to any change in definition of use.

2.2 H102.2 - Exits - Exclusions

Exits as nominated in Appendix A1a and A1b have been provided for patrons and no exclusion is sought for the participants with exits provided to the back of house areas of each temporary structure and stage structure, as provided under the Provisions of this Clause.

2.3 H102.3 – Locations of Exits

Temporary tent structures are provided with open side walls as one aggregate exit and as detailed to Appendix A1a, with the exception of the theatre type tent structure as detailed to Appendix A1b, as well as other temporary marquee structures likely to be partially enclosed as detailed to Appendix C1, and are to be provided with exit numbers and aggregate exit widths to the perimeter of the temporary structure to suit the events operation and organizational requirements, and as provided within Table 2.

In respect to any temporary structures proposed as an Entertainment Venue to be provided with tiered seating, and closed external side walls to those tiered seating areas only, exits are to be provided as detailed to Appendix A1b to suit that internal configuration and accounting for the requirements of Table H102.4 of the NSW provisions to the *National Construction Code - Building Code of Australia, 2016.*

In the case of a temporary stage installation, including side of stage viewing areas, exits are to be provided as detailed to Appendix A1b.

It should be noted that all exits will be configured to account for the Building Code of Australia requirements that no point within the temporary structures will be more than 20 metres from a point where travel in two different directions is provided to an exit, with the maximum travel distance to any exit not to exceed 40 metres.

2.4 H102.4 - Exits to be Provided

It is proposed that the number of exits required as aggregate exits and the aggregate width of those exits for each temporary structure, based on the maximum deemed number of persons each structure can provide for or accommodate, will satisfy the requirements of Table H102.4 – Number of Exits and Widths, NSW Provisions of the *National Construction Code - Building Code of Australia, 2016*, as detailed in Table 2.

Any tiered seating installations which would be proposed within a temporary structure and which would provide for theatre type entertainment are proposed to be serviced by exits discharging directly to the open space, as detailed to Appendix A1b, and any variation to this will account for the number of exits and widths based on the deemed number of persons, in accordance with Table H102.4.

Table 2

Temporary structure	**No. of Exits required**	**Aggregate Width of Exits (m)**
Appendix A1a - 45m x 75m Tent	15	53
Appendix A1b – 45m x 60m Tent with tiered seating	5 (standing) 5 (central floor area seated)	9 9
Appendix C1 - 25m x 35m Hocker	3	4.5
Note: In the case of open walled tents or other temporary structures the number of exits provided may be provided as 1 exit which will be equal to or greater than the required aggregate exit width for the proposed deemed number of persons, and therefore will be counted as multiple exits.		

2.5 H102.5 – Vertical Clearances for Exits

Access to and through all exits within all temporary structures are proposed to satisfy the 2 metre minimum unobstructed height all round, with a minimum clearance of 2.4 metres proposed above each exit within a temporary tent structure.

2.6 H102.6 – Curtains Across Exits

No curtains or flaps are proposed to be provided across any exit as detailed to Appendix A1a, A1b and C1 and in the event that an exit is required to be provided with a curtained exit ie: to restrict access, such exit will be maintained by security personnel conversant with emergency evacuation procedures, and the management of that exit would form part of the emergency management plan for the operation of that temporary structure to ensure egress is not obstructed or impeded.

2.7 H102.7 – Curtains and Blinds

All curtains will be selected to satisfy the provisions AS 1530.2 – Flammability Index, typical of stage curtains selected and used within the event industry.

2.8 H102.8 – Fabrics

External wall and roof fabrics of each proposed temporary structure have been tested under AS 1530.2 – Flammability Index, to ensure that no fabric used in the construction of that temporary structure has a Flammability Index of not more than 6, or as provided by this part.

2.9 H102.9 – Guardrails

Seating proposed within any temporary structure detailed as typical within Appendix A1a and A1b and proposed to be stepped platforms, will be provided with rigid guardrails from the front of the first riser to the back and along the full width of the rear of that platform to the sides.

2.10 H102.10 – Seating

Seating proposed within any temporary structure as part of this application and as typically detailed to Appendix A1b, will where applicable, be provided to satisfy the NSW provisions of H101.11.1, H101.11.2, H101.11.3(b), H101.11.5(a), (c), H101.11.6(a), H101.11.8(a), (b), (c) and (d).

2.11 H102.11 – Sanitary Accommodation

Determinations of sanitary facilities for male, female and disabled persons will be provided under the Provisions of Table F2.3 of the *National Construction Code - Building Code of Australia, 2016,* and for the purposes of this assessment only, a typical proposed temporary structure as a single auditorium is detailed to Table 3.

Table 3

▪ Appendix A1a – Estimated Patrons: (based on 5,400p ie: 2,700 males, 2,700 females)	▪ Male	W.C.s 7 Urinals 27 Hand basins 18
	▪ Female	W.C.s 37 Hand basins 18
	▪ Disabled	W.C.s (Unisex) 1 Hand basins 1
▪ Appendix A1b – Estimated Patrons: accounting for proposed tiered seating 1,352p and central floor standing 1,000p: (total based on 2,352p ie: 1,176 males, 1,176 females)	▪ Male	W.C.s 4 Urinals 12 Hand basins 8
	▪ Female	W.C.s 18 Hand basins 8
	▪ Disabled	W.C.s (Unisex) 1 Hand basins 1
▪ Appendix C1 – Estimated Patrons: (based on 218p ie: 109 males 109 females)	▪ Male	W.C.s 1 Urinals 2 Hand basins 1
	▪ Female	W.C.s 3 Hand basins 1
	▪ Disabled	W.C.s (Unisex) 1 Hand basins 1

2.12 H102.12 – Projection Suites

No projection suite is proposed for any temporary structure under this application, with visuals provided by video projection ancillary to any stage performances under the control of the event production.

2.13 H102.13 – Fireplaces and Heating

Fireplaces or other form of heating is not proposed to be provided within any temporary structure that is determined as an Entertainment Venue. It should be noted that any heating to any temporary structure not used as an entertainment venue will be selected following a risk assessment to account for any hazards and to satisfy the standards applicable to that installation.

2.14 H102.14 – Electrical Services

It is proposed that generators will be provided to the whole of the event site to service the stage and lighting requirements outside and within each of the temporary structures.

Certification in respect to the supply and installation of the electrical services to satisfy the requirements AS 3002 and where applicable AS/NZS 3000 and the Local Supply Authority, will be submitted prior to the issue of the Occupation Certificate as required by the Environmental Planning and Assessment Act.

It should be noted that the Provisions of NSW H101.19.1(a) is satisfied and H101.19.3(b) is not applicable in respect to the proposed event site.

2.15 H102.15 – Artificial Lighting

All lighting will be controlled from security managed and restricted production areas, and it is considered that the provisions of H101.20.1(a) and H101.20.1(b) are satisfied.

It is confirmed that lighting within any temporary structure will not utilise time delayed lamps such as mercury vapour type, and H101.20.2 is not applicable.

H102.15.1 – Emergency Lighting Levels

Generator powered emergency evacuation lighting will be provided to satisfy the Provisions of H102.15, and will be sited to provide a minimum of 0.2 lux at floor levels within each temporary structure).

H102.15.2 – Emergency Lighting Power Supply

It is proposed that emergency lighting will be provided by dedicated lights to operate as separate circuits to that of production sound and lighting installations, powered from dual operating generator services for the duration of an event, which are provided with an automatic transfer switch to alternate the supply and maintain a power system to those lighting services should the initial generator power supply fail.

2.16 H102.16 – Exit Signs

Exit and directional exit signage is to be installed and maintained to AS 2293.1 – 2005, and provided with battery back up on a generator mains powered system and are located above each exit as an aggregate exit and as detailed in Appendix A1a, A1b and C1, to satisfy the NSW Provisions of Part E4.5, with all required exit signage visible from all paths of travel to the required exits and accounted for in the coordination of the emergency evacuation procedures plan for an event.

2.17 H102.17 – Fire Fighting Services

Portable Extinguishers, which have been selected and located to satisfy the provisions of Table E1.6 of the Building Code of Australia, and a certificate of maintenance under AS 1851.1 – 1995, will be provided.

Fire-fighting services will be provided to the event site to ensure adequate protection is afforded as determined on the advice of the NSW Rural Fire Services as the Statutory Authority for any proposed event on the site.

As the event site is not serviced by a reticulated water supply, fire-fighting services as on-site reservoirs of 10,000 litres will be selectively located and strategically sited within proximity to service those temporary structure with a floor area of more than 500m^2.

This together with the distribution of portable fire extinguishers in selected locations to service each temporary structure, in conjunction with implementation of the recommendations by the Statutory Authority, will provide for suitable fire-fighting services.

3. Building Code of Australia Part B1-Structural Provisions

All structural elements of any proposed temporary structures are to be designed and certified by a registered and practicing Structural Engineer as provided by the *National Construction Code* requirements of Part A2 and the applicable provisions of Part B1 in respect to AS/NZS 1170.0 and 1170.1 – 2002, and AS/NZS 1170.2 – 2011, to account for dead and live load capacities, including concentrated action capacity and site specific design wind speeds, as well as AS 4100 – 1998 in respect to steel structures and AS 1576 – 2010 in respect to scaffolding requirements, for all proposed forms of construction and where applicable, and once erected , confirming and certifying that all temporary structure construction is structurally adequate and capable of supporting the loads applicable for their proposed use and design intent.

A Geotechnical Engineering Certificate for the event site has been prepared addressing the adequacy of the ground on which the structure is to be erected, and this together with the abovementioned certification of structural design and construction capacity, will ensure that each temporary structure will have the ability to sustain the temporary structures whilst in use.

A Structural Engineering certificate of construction for the erection of the Temporary structures will be provided for each event prior to the issue of the Occupation Certificate for the use of that structure.

4. Schedule 3A – Management and Use of Entertainment Venue

4.1 Nitrate Film

No proposal for use of nitrate films are proposed as part of this submission.

4.2 Stage Management

No proscenium safety curtains, drencher system or smoke exhaust system applicable to or proposed for any temporary structure, however during all stage performances, each stage will be provided at all times with a stage (production) manager and dedicated security management personnel, conversant with the use of portable fire extinguishers and emergency evacuation procedures for coordination and response in the event of an emergency.

4.3 Proscenium Safety Curtains

No proscenium curtains are to be provided to any temporary structure installation.

4.4 Projection Suites

No projection suites are proposed for use within any temporary structure, and where a film is being screened within a defined entertainment venue, a person trained in the operation of the projector and conversant with the use of portable fire extinguishers will be in attendance at all times during any screening.

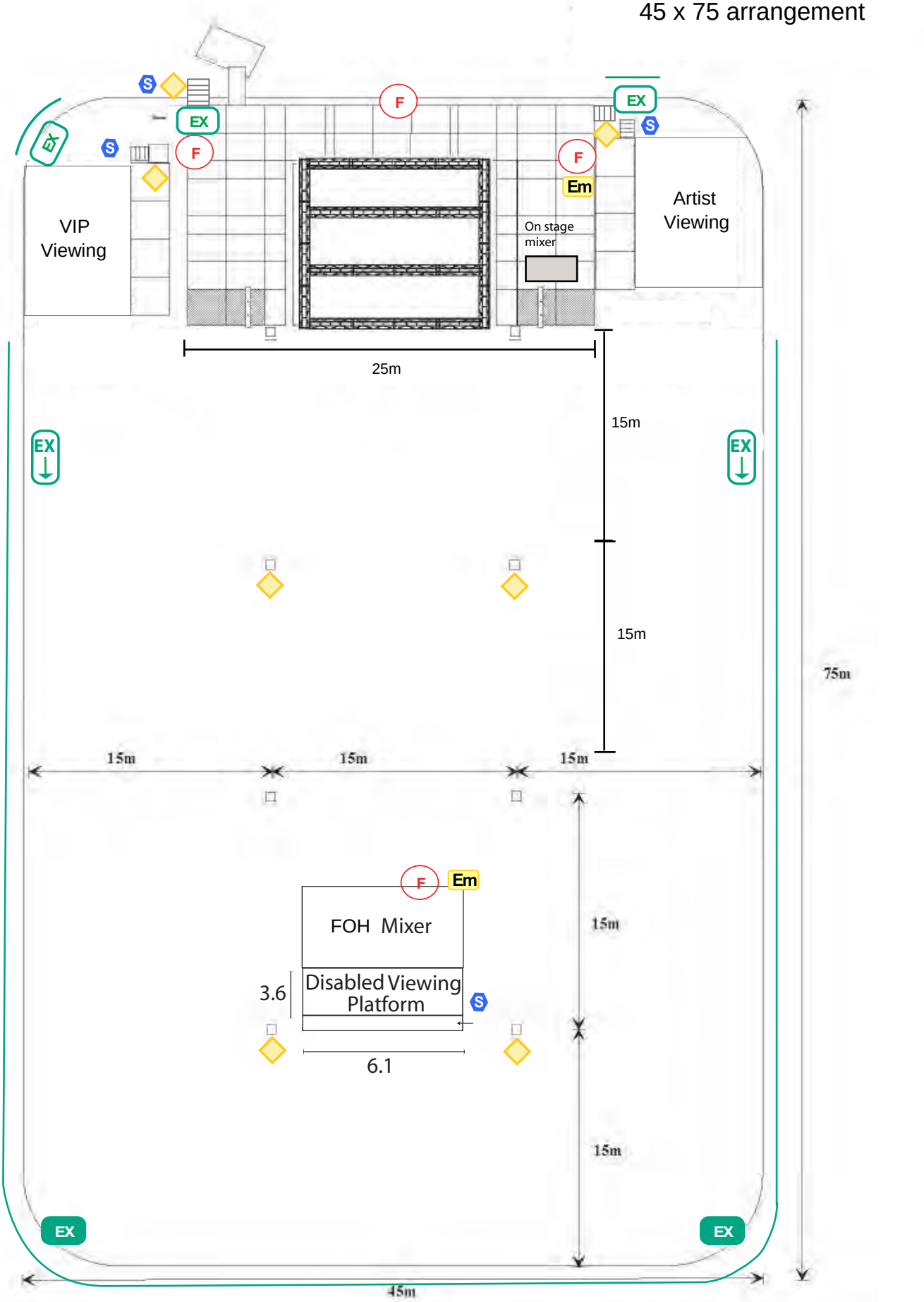
4.11 Emergency Evacuation Plans

Emergency management plans will be prepared in conjunction with security management plans to account for organization control and evacuation procedures in the event of an emergency for any proposed event.

Appendix A1

Temporary Tent Structure

45 x 75 arrangement



Key

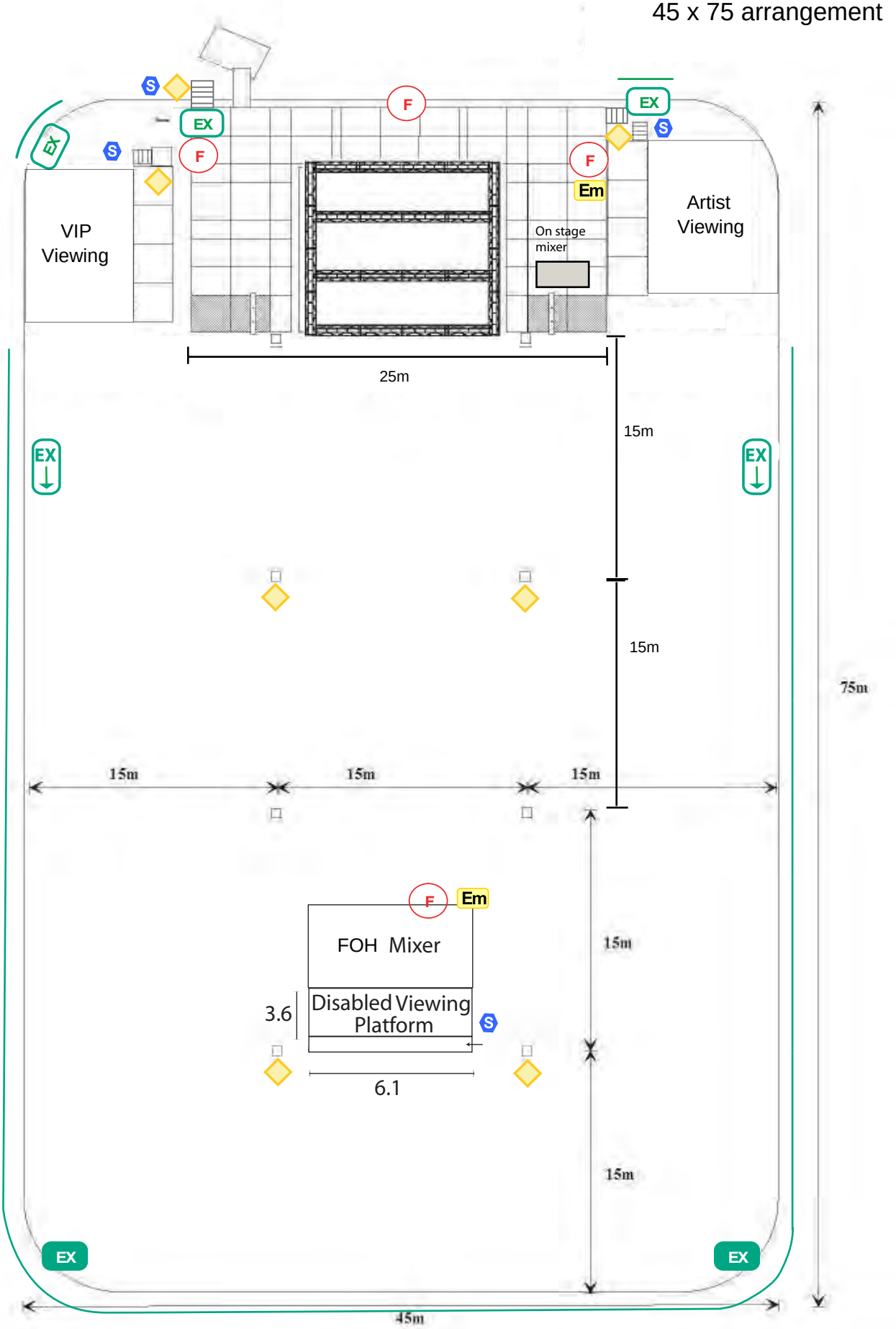
- EX — Exit Sign
- EX — Jumbo Exit Sign
- EX → — Directional Exit Sign
- Aggregate Exit
- F — Portable Fire Extinguishers
- Emergency Lights
- Em — Essential Fire Safety Schedule & Emergency Evacuation Plan
- S — Security

Not to Scale

Appendix A1a

Temporary Tent Structure

45 x 75 arrangement



Key

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- EX — Jumbo Exit Sign
- EX → — Directional Exit Sign
- Aggregate Exit
- F — Portable Fire Extinguishers
- Emergency Lights
- Em — Essential Fire Safety Schedule & Emergency Evacuation Plan
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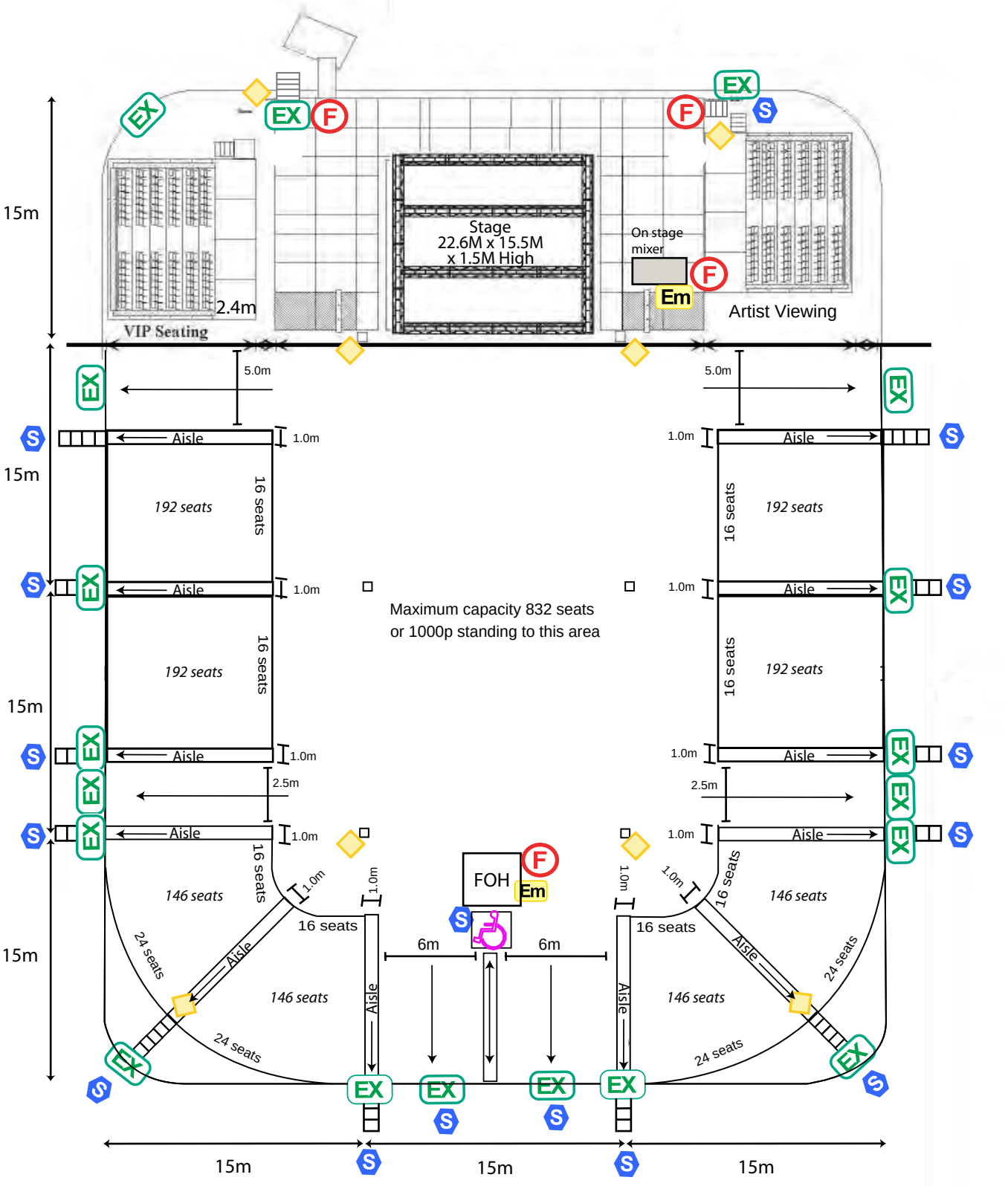
Not to Scale

Appendix A1b

Temporary Tent Structure with
Tiered Seating
45 x 60 Arrangement



Key

EX	Exit Sign		Disabled Viewing Platform	Em	Essential Fire Safety Schedule
EX	Jumbo Exit Sign	F	Portable Fire Extinguishers	S	Security
EX→	Directional Exit Sign		Emergency Lights		

DESIGN PROJECT GROUP Pty Ltd
CONSULTING ENGINEERS A.C.N. 006777920
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

PROC: E1(A1)
JUNE 1984

COMPUTATIONS

PROJECT NO: 01164B
DATE: July 05

PROJECT TITLE 45m x 45m Square Tent with Round Corners
(with Extensions to 45m x 90m, 45m x 105m,
45m x 120m and 45m x 135m, 45m x 60m, 45m x 30m)
all without Quarter Poles
for
Janlin Big Tent Hire

REFERENCES AS1170
AS4100

ENGINEER

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 181147
The Institution of Engineers, Australia

Signature: David J. Wills

Date: July 05

DESIGN PROJECT GROUP PTY LTD
CONSULTING ENGINEERS A.C.N. 064150917 (Inc. in Vic.)
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

Computations

Job No. 011645 Sheet No. .....

Eng. ..... Date. .....

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Checked .....

Date .....

45m x 90m, 105, 120, 135m **SQUARE TENT** ROUND CORNERS

THIS TENT DOES NOT HAVE QUARTER POLES, IT RELIES ON THE HEAVY CURVATURE OF THE PANELS BETWEEN THE CENTRE POLES TO RUN WATER OFF AND CREATE A VERY TAUT ROOF TO WITHSTAND WINDS

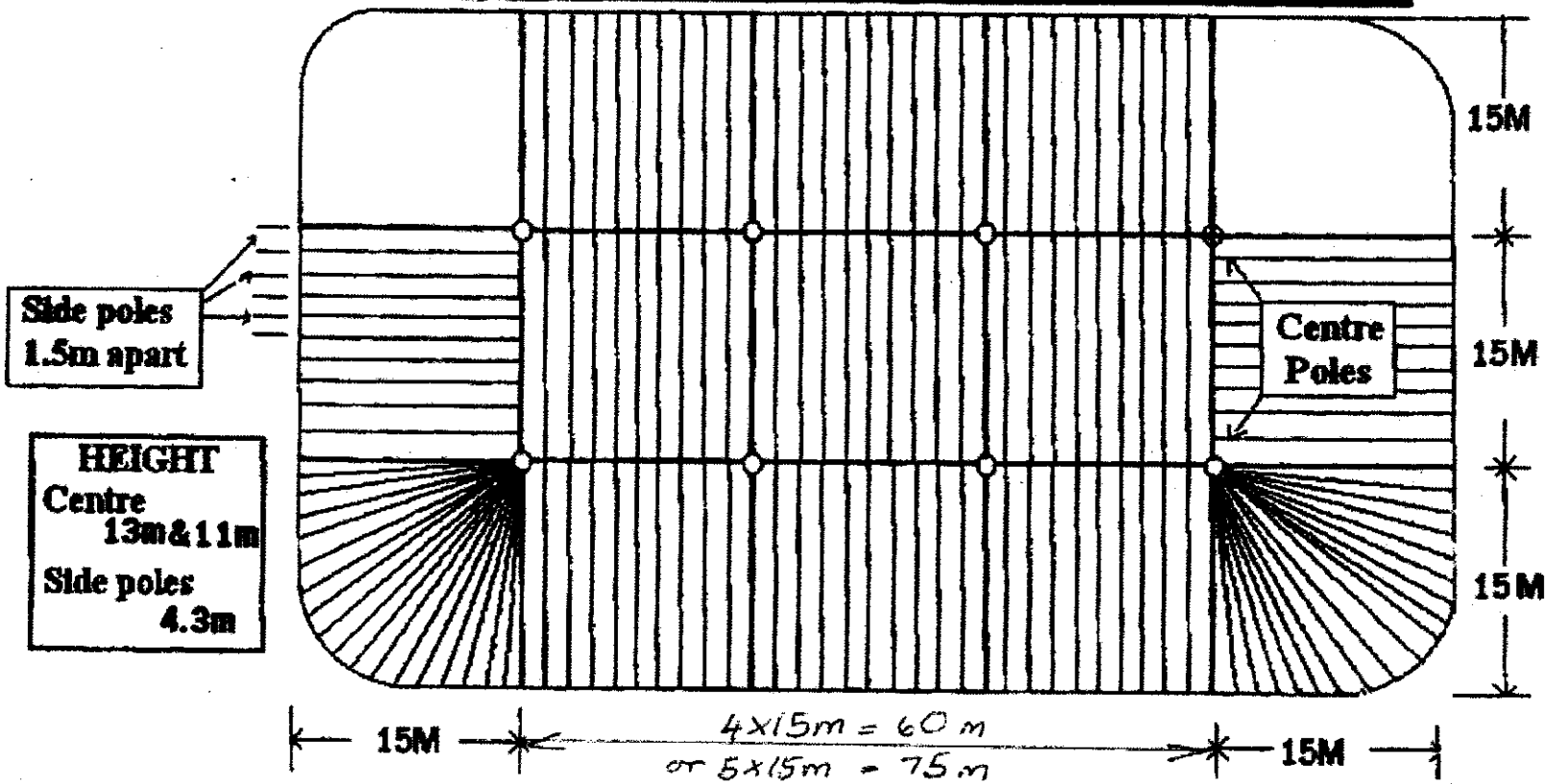


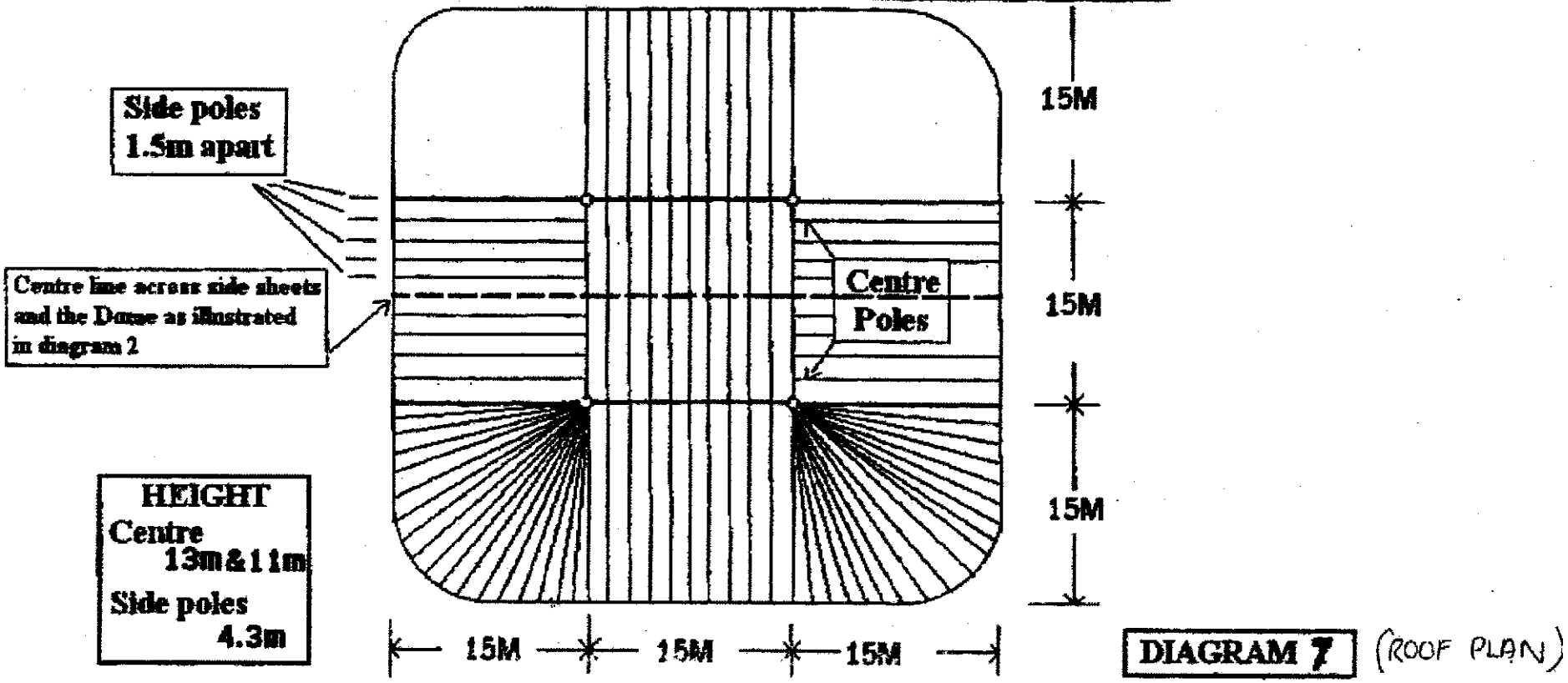
DIAGRAM 4 (ROOF PLAN)

NOTE:- TENT TO BE EVACUATED UNDER THE FOLLOWING CONDITIONS
(1) TERRAIN CATEGORY 3 and 4 :- WHEN WIND SPEED REACHES 25 m/sec (49 knots)
(2) TERRAIN CATEGORY 1 and 2 :- WHEN WIND SPEED REACHES 21 m/sec (41 knots)

1913

45m x 45m SQUARE TENT ROUND CORNERS

THIS TENT DOES NOT HAVE QUARTER POLES, IT RELIES ON THE HEAVY CURVATURE OF THE PANELS BETWEEN THE CENTRE POLES TO RUN WATER OFF AND CREATE A VERY TAUT ROOF TO WITHSTAND WINDS



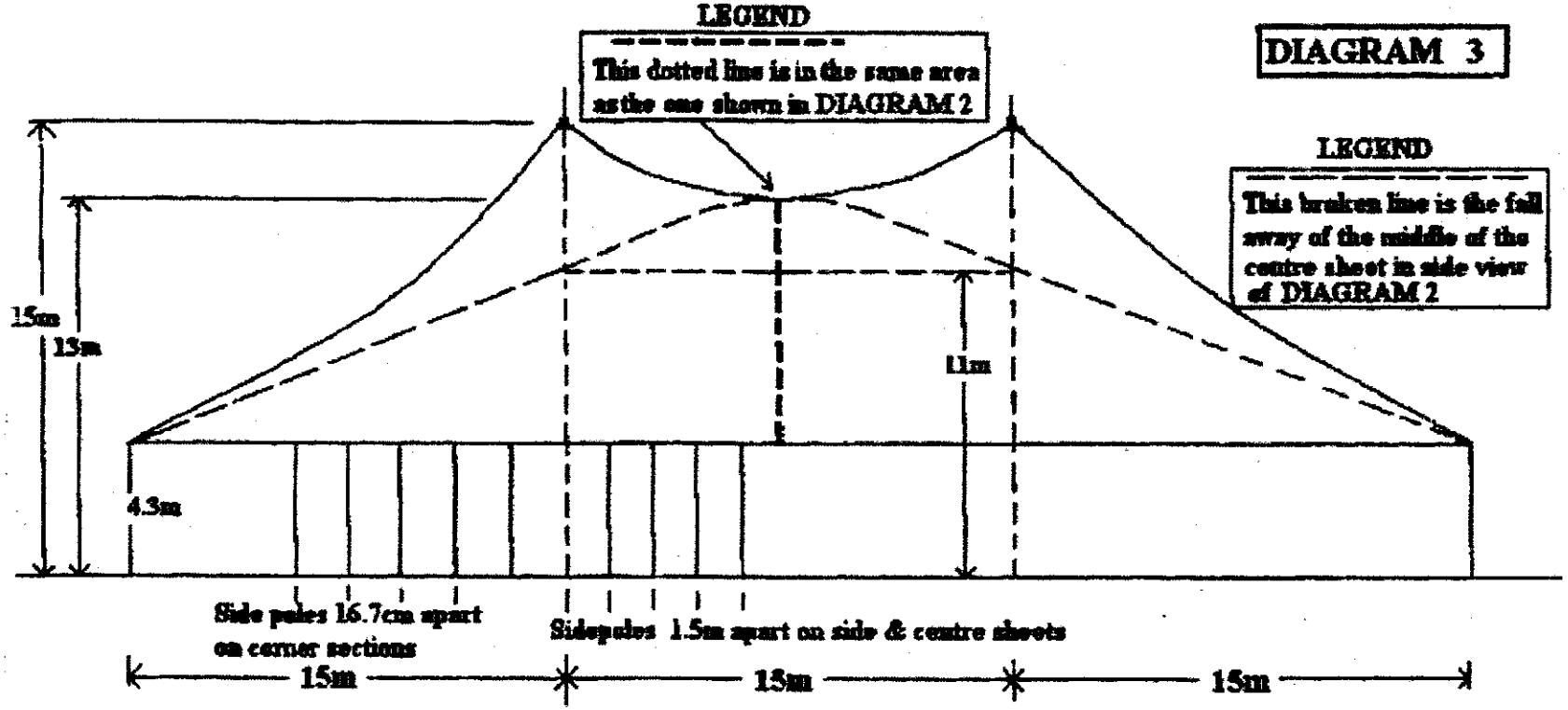
HEIGHT
Centre 13m & 11m
Side poles 4.3m

DIAGRAM 7 (ROOF PLAN)

NOTE :- TENT TO BE EVACUATED UNDER THE FOLLOWING CONDITIONS
(1) TERRAIN CATEGORY 3 AND 4 :- WHEN WIND SPEED REACHED 25m/sec (49kt
(2) TERRAIN CATEGORY 1 AND 2 :- WHEN WIND SPEED REACHES 21m/sec (41

(N)

END VIEW 45M X 45M TENT No QUARTER POLES

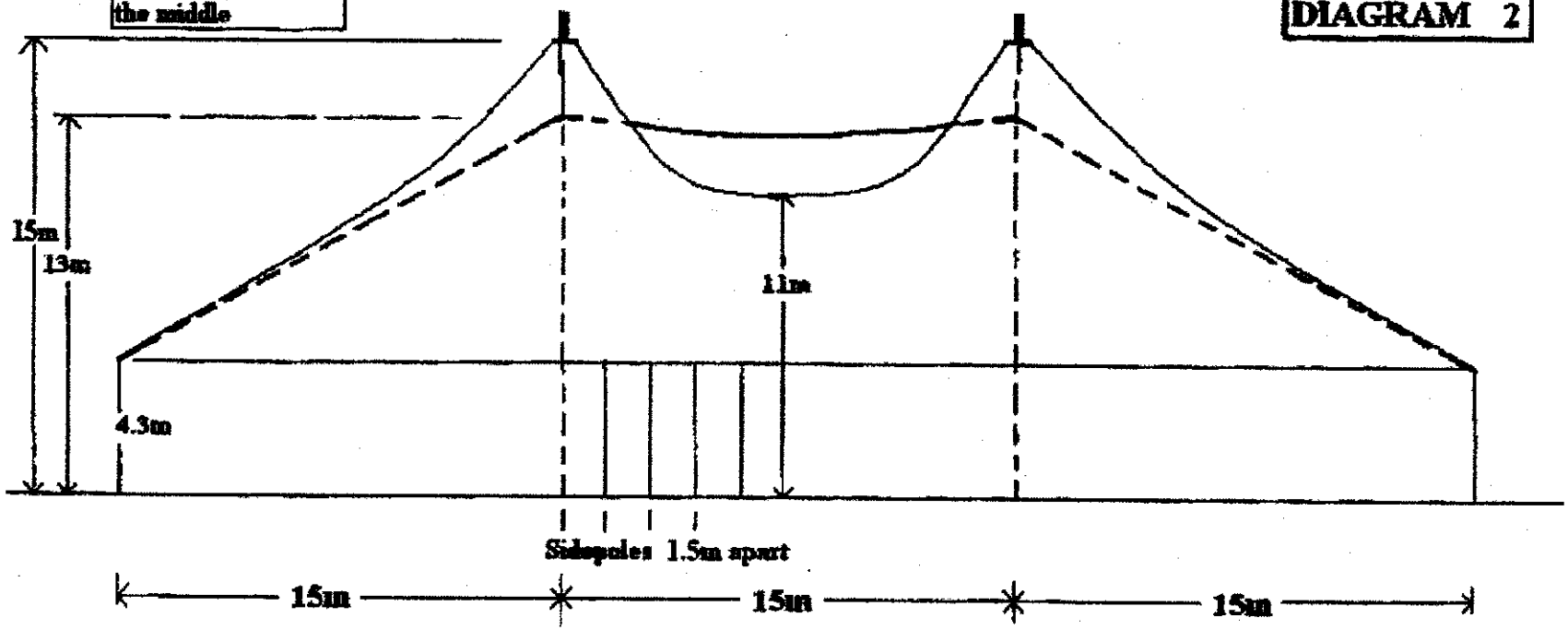


LEGEND

This is the outline of the sheet through the middle

SIDE VIEW 45M X 45M TENT No QUARTER POLES

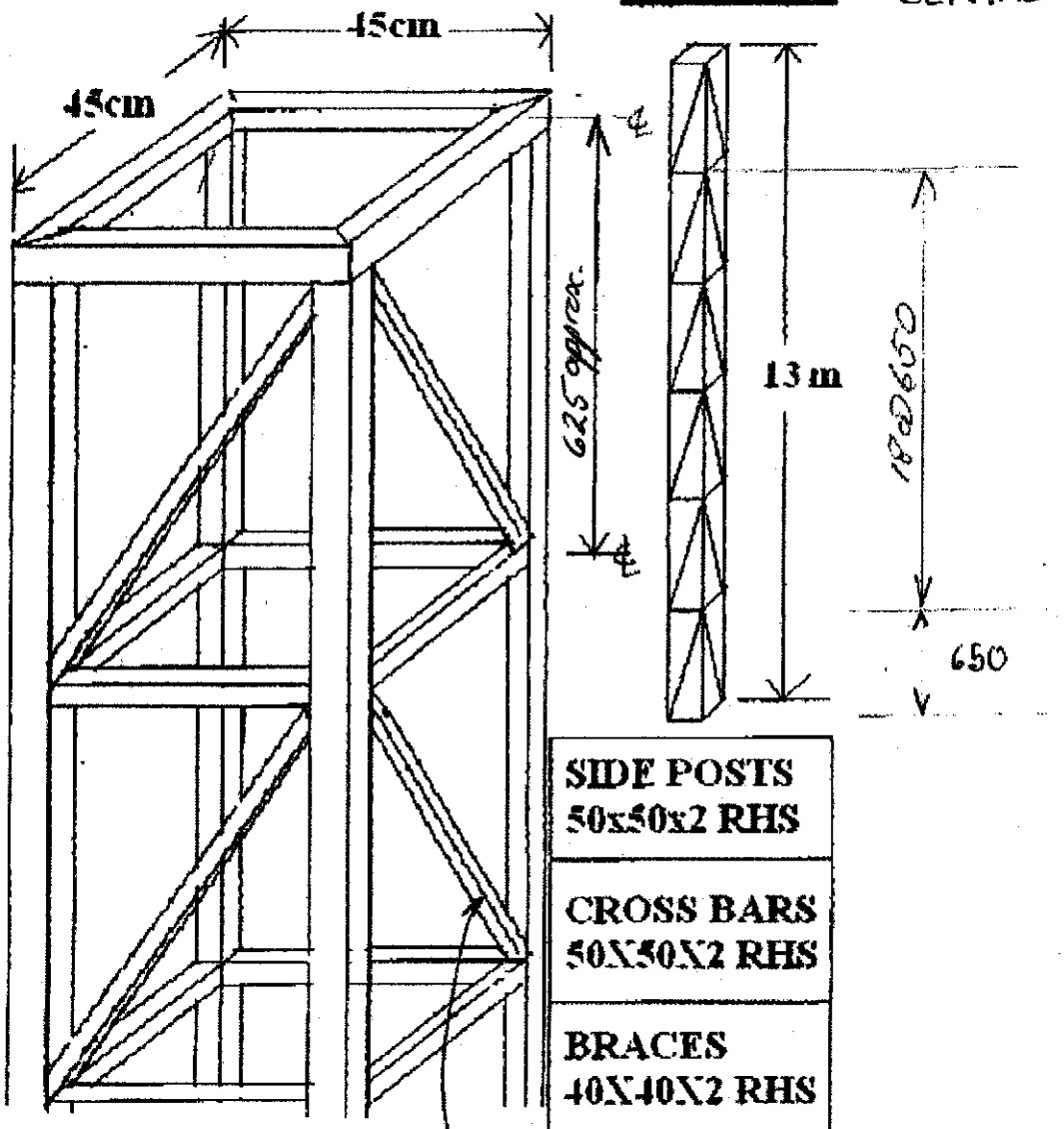
DIAGRAM 2



16.5m TRUSSE CENTRE POLE
Base 13metre
Top Extends 3.5metre

DIAGRAM 5

LOWER SECTION CENTRE POST

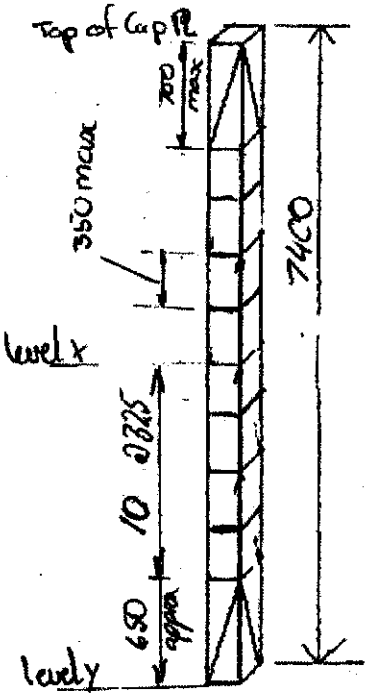


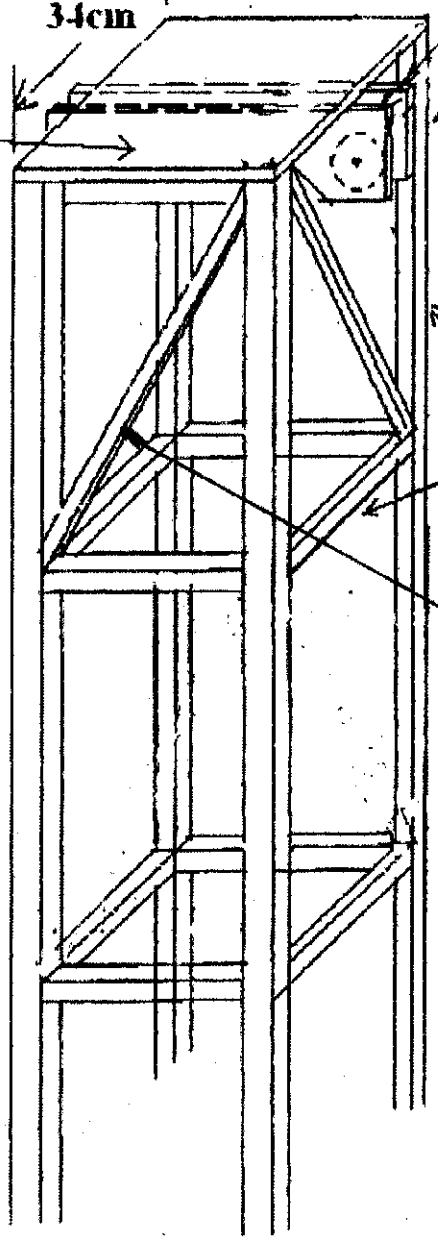
SIDE POSTS 50x50x2 RHS
CROSS BARS 50X50X2 RHS
BRACES 40X40X2 RHS

Diagonal braces on all 4 sides

UPPER SECTION CENTRE POST

DIAGRAM 6





20 mm plate to support pulley side plates with gusset attached

2 x 100 x 10 plates to support pulley

PULLEY
One pulley on each side to take tent pull up cable

500kg lifting capacity (SWL)

SIDE POSTS
50x50x2 RHS

CROSS BARS
50X50X2 RHS

BRACES
40X40X2 RHS

Note:- Diagonal Braces on all 4 side

NOT TO SCALE

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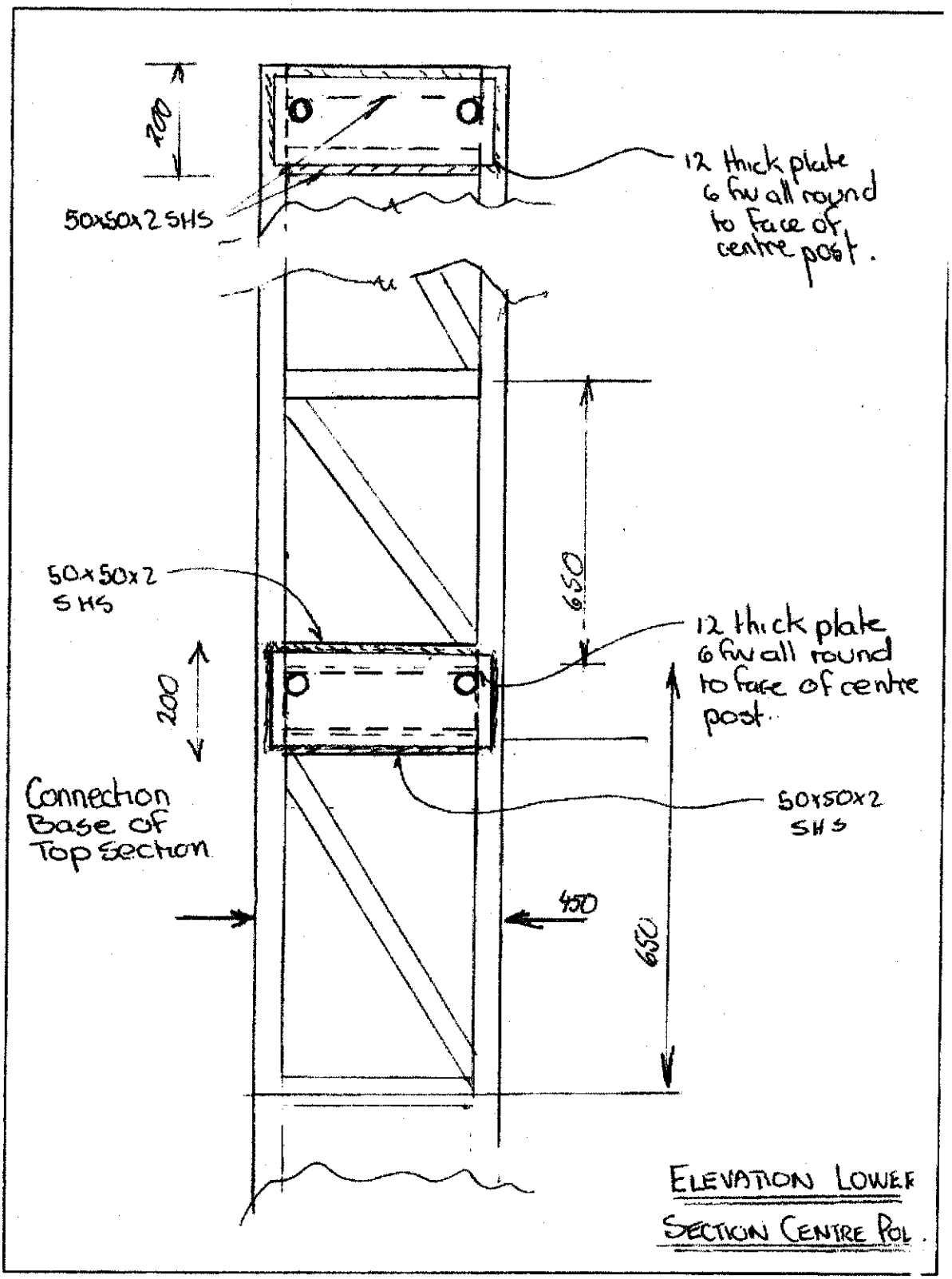
Job No. 011643 Sheet No. 7

Eng. DMV Date. July 05



Checked .....

Date .....

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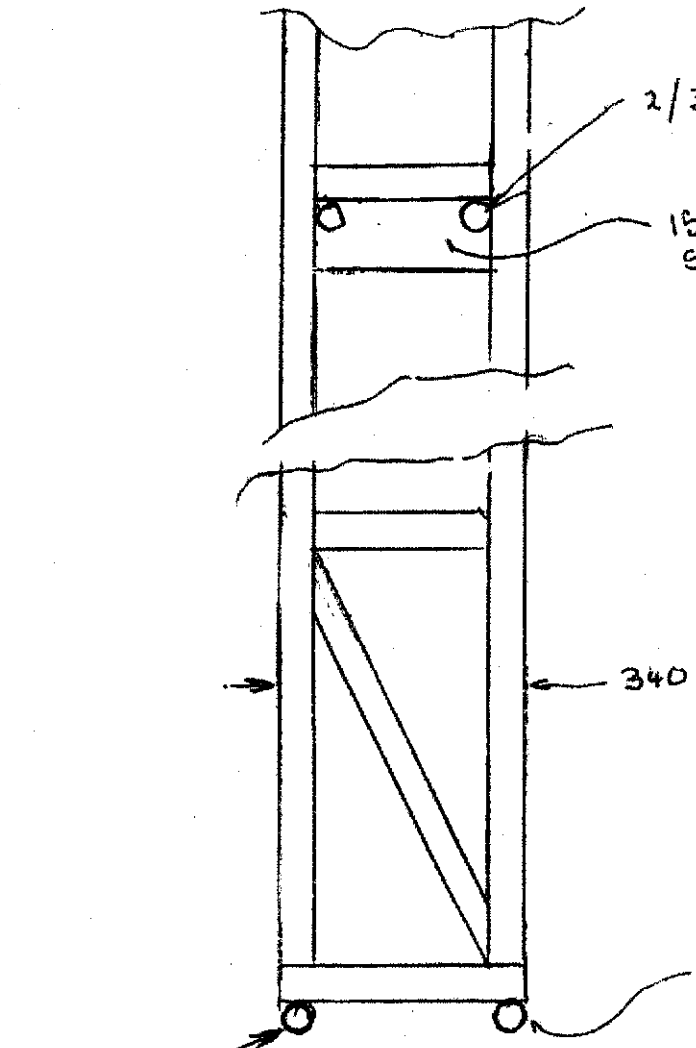

Note:- 25 dia MS pins for connection to base section

ELEVATION UPPER SECTION OF CENTRE POLE

Checked .....

Date .....

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Job No. 0164B Sheet No. 9

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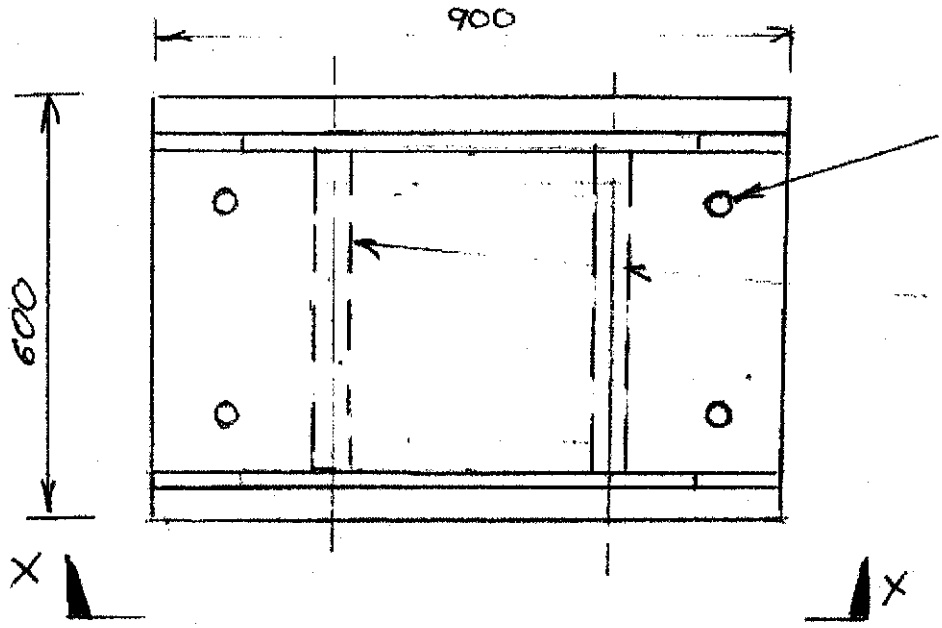
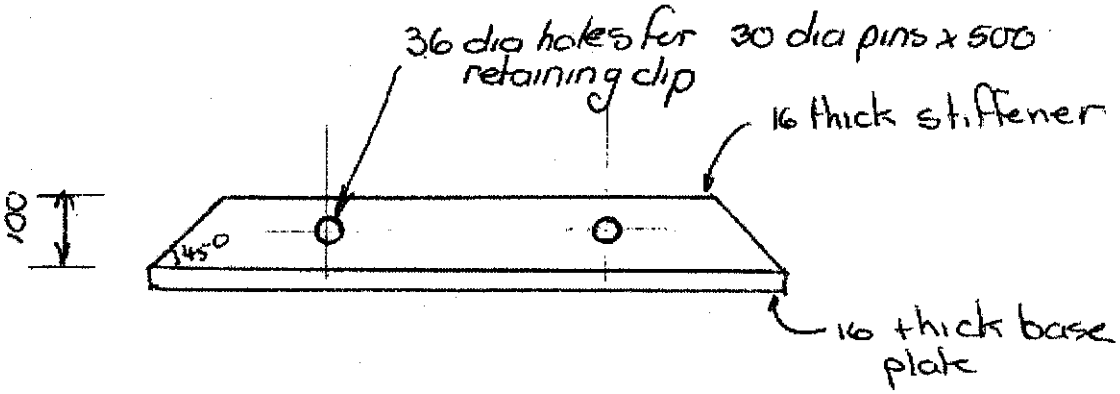


PLAN OF BASE PLATE



SECTION X - X

Checked .....

Date .....

10

JANLIN BIG TENT HIRE

JANLIN CIRCUSES PTY LTD
ACN 069 720 225
12 BYLOSS ST
CHESTER HILL
NSW 2162

DESIGN PROJECT GROUP

Att David Wills

Dear David,

I have enclosed four sheets of diagrams of a 45m x 75m tent that does not have quarter poles in it.

(1) This tent relies on the curvatures of the roof panels to keep it taut and thereby resist movement in the wind. The large amount of panels directly linked to their own side pole create a very tight roof.

(2) As the diagram (4) shows the centre sheet panels start at one side of the tent and continue up over the dome and down to the other edge of the tent which distributes the strain evenly.

(3) The panels are welded together incorporating a sleeve through which a webbing strap is inserted and attached at each end to a side pole plate, this gives strength to keep the panels taut.

(4) In the centre sheets the panels are 1.5m wide, 10 panels in each centre sheet.

(5) The corner sheets have panels 1.67m wide including the rounded corners, 16 panels in each corner quarter sheet.

(6) The lacings that join the sections together have a 10mm cable through the seams and these are attached to the bale rings at the top of the tent.

(7) The ridge created at the top also has a 10mm cable through a sleeve to with stand the pressure of the panels pulling down across the middle of the centre dome sheets.

(8) Bale rings are 100cm diameter at the base and taper upwards to a 90cm diameter top ring where the pull up cables are attached.

(9) Guy straps are 50mm wide tie down webbing with ratchets that are rated at 2500 kg.

(10) The fastening points (pegs) are positioned 4.3m out from the edge of the tent.

(11) Centre poles are truss frames as per diagram. Side poles are 4.3m x 75mm x 1.6mm wall thickness.

DESIGN

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Job No. 01164B Sheet No. 11

Eng. [signature] Date. July 05

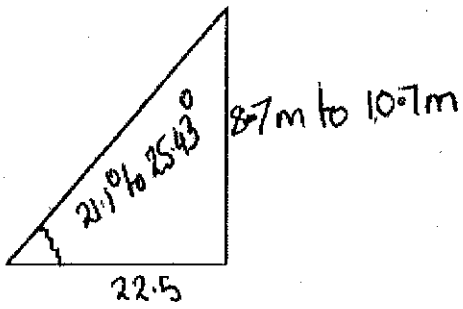
MARQUEES

WIND LOADING

From AS 1170

Vp = 41m/sec from West

TERRAIN CATEGORIES 3 AND 4



Vz = VMzcat.Ms Mt Mi

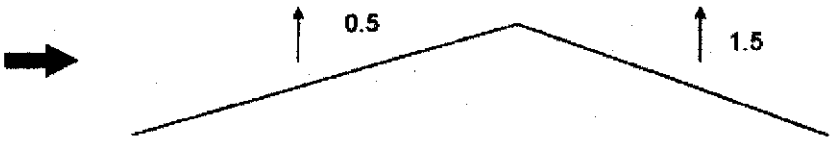
= 41 x 0.75 x 1 x 0.8

= 24.6 m/sec

qz = $0.6 \times 24.6^2 \times 10^{-3}$

= 0.363 kPa

Worst case when sides are up and blocked underneath



Average = 1

Therefore wind load on roof = 1 x 0.363 kPa

= 0.363 kPa

TERRAIN CATEGORY 2 and 1

Wind Load = $(0.91 / 0.75)^2 \times 0.363 = 0.5285$ kPa

Checked .....

Date .....

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Job No. 01164B Sheet No. 12
Eng. [illegible] Date. July 05

3.2.4 Terrain Category.

Terrain, over which the approach wind flows towards a structure, shall be assessed on the basis of the following category descriptions.

(a) Category 1 - exposed open terrain with few or no obstructions and water surfaces at servicability wind speeds (V_s) only.

(b) Category 2 - open terrain, grassland with few well scattered obstructions having heights generally from 1.5 m to 10.0 m and water surfaces at wind speeds (V_u) and (V_p).

(c) Category 3 - terrain with numerous closely spaced obstructions having the size of domestic houses (3.0 m to 5.0 m high).

(d) Category 4 - terrain with numerous large, high (10.0 m to 30.0 m) and closely spaced obstructions such as large city centres and well-developed industrial complexes.

Selection of terrain category shall be made with due regard to the permanence of the obstructions which constitute the surface roughness, in particular vegetation in tropical cyclonic regions shall not be relied upon to maintain a wooded terrain roughness.

Checked .....
Date .....

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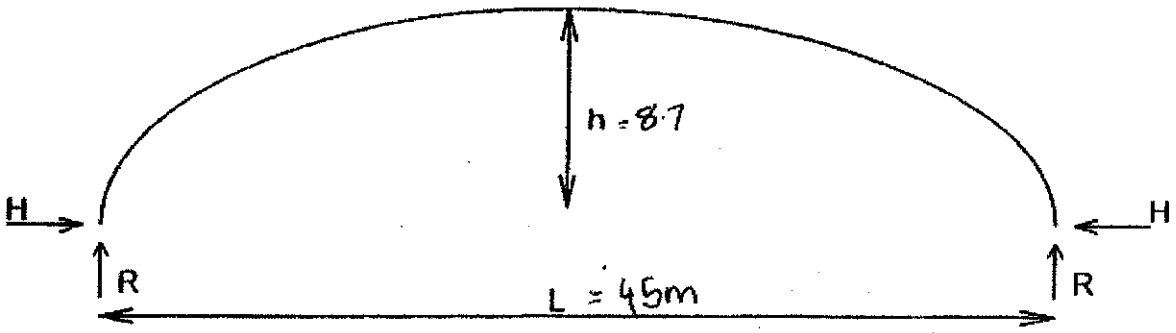
Eng. MW Date. July 05

PVC COVERING



$$H = 0.363 \times \frac{45^2}{8 \times 8.7} = 10.56 \text{ kN/m}$$

$$R = 0.363 \times \frac{45}{2} = 8.167 \text{ kN/m}$$

$$T_{max} = H(1 + 16\theta^2)^{1/2}$$

$$= 13.35 \text{ kN/m}$$

$$\theta = \frac{8.7}{45.0}$$

$$\text{Capacity of PVC} = \frac{2.4 \text{ KN} \times \frac{1000}{50}}{3} \text{ factor of safety} = 16 \text{ KN}$$

Not critical Case

Checked .....

Date .....

14

Caractéristiques techniques	Technical data	Technische Daten	Précontraint® 702	
Fil	Yarn	Garn	1100 Dtex PES HT	TERSUISSE
Poids au m²	Weight sqm	Gewicht m²	520 g/m²	EN ISO 2286-2
Largeur	Width	Breite	180 cm	
Résistance rupture (chaîne/trame)	Tensile strength (warp/weft)	Reißkraft (Kette/Schuss)	280/280 daN/5cm	EN ISO 1421
Résistance déchirure (chaîne/trame)	Tear strength (warp/weft)	Weiterreißkraft (Kette/Schuss)	30/28 daN	DIN 53.363
Adhérence	Adhesion	Haftung	10 daN/5 cm	EN ISO 2411
Opacité	Blackout	Opak	> 98%	
Finition	Finish (Varnish)	Behandlung (Schlusslack)	Vernis BIFACE	
Réaction au feu	Flame retardancy	Brennverhalten	NFP 92-507 M2 - NFPA 701 Test 2 - BSFM F1B DIN 4102-1 B1 - BS 7837 - AS/NZS 1530.3 - SIS 650082 JMTAC - UNE 23.727 - M2	
Températures maximum d'utilisation	Temperature extremes (while handling)	Maximale Anwendungs-temperaturen	-30°C / +70°C	
Système d'assurance qualité	Quality Insurance	Qualitätssicherung	ISO 9001	

Les caractéristiques techniques indiquées sont des valeurs moyennes

Technical data are average values

Die angegebenen technischen Daten sind Mittelwerte

Technique d'extraction Précontraint® FERRARI	Précontraint® FERRARI sealing technology	Beschichtungstechnik Précontraint® FERRARI
Stabilité dimensionnelle exceptionnelle	Exceptional dimensional stability	Außerordentliche Filialenstabilität
Durabilité supérieure	Longer durability	Höhere Haltbarkeit
Excellente soudabilité	Excellent welding	Sehr gute Verschweißbarkeit
Opacité spéciale chapiteaux	Special blackout for big tops	Spezielle Opak-Textilien für Zirkuszelte

TEXYLOOP®

PRECONTRAINT 702

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F 38352 LA TOUR DU PIN cedex
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www.ferrari-textiles.com

Alternative Covering

15

Senator™
High Performance Australian PVC

PRODUCT SPECIFICATION

PRODUCT: **SENATOR™ PVC 650 T/S**

DESCRIPTION:	SENATOR 650 T/S is a heavy duty, PVC Coated Tent & Tarpaulin fabric. The base fabric is a high quality, high tenacity polyester fabric in a tearstop construction. The product is also proudly 100% Australian Made for Australian conditions.
WEIGHT:	650gsm Nominal
CONSTRUCTION:	Woven Denier Polyester 9 x 8.5 with Tearstop in both directions.
WIDTH:	205cm
TENSILE STRENGTH: (AS 2001.2.3)	WARP – 3320N WEFT – 2650N ← conservatively use 2·4 KN/0·050 M OR
TONGUE TEAR: (BS 3424.5)	WARP – 650N WEFT – 650N
FLEX CRACKING: (AS 1441.6)	400,000 Cycles
COATING ADHESION:	90 N.
COLD CRACK TEMP:	-30°C
SPECIAL FEATURES:	Flame Retardent tested to AS1530 parts 2 and 3 Test report available, UV Treated, Antifungicide, Acryllic Lacquer Coated.
Stock Colours:	As Required

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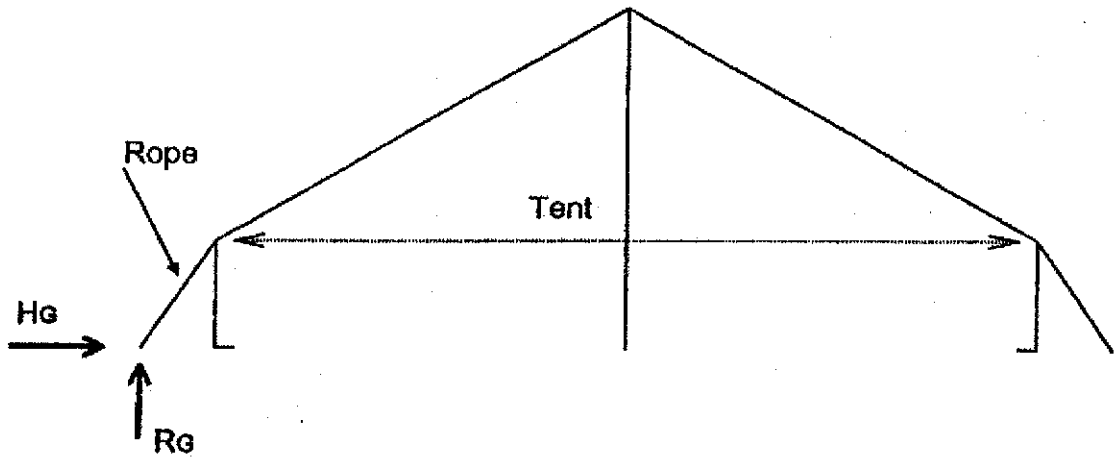
Job No. 01164B Sheet No. 16

Eng. DW Date July 95

ROPE CAPACITY



R_G = 8.167 KN/M

$H_G \approx 0.363 \times \frac{53.6^2}{8 \times 13}$ = 10.03 KN/M

$T_{max} = H(1 + 16\theta^2)^{1/2}$ $\quad \theta = \frac{13}{53.6}$

= 13.975 KN/M

∴ Load per rope = 13.975 x 1.5 = 21 KN

Use 50 mm tie down webbing 2500kg rating

Capacity = $\frac{24.5}{3}$ factor of safety = 8.17KN

Critical

Allowable wind speed Terrain Categ 3 and 4 = 25.5 m/sec

Allowable wind speed Terrain Categ 2 and 1 = 21.0 m/sec.

Checked .....

Date .....

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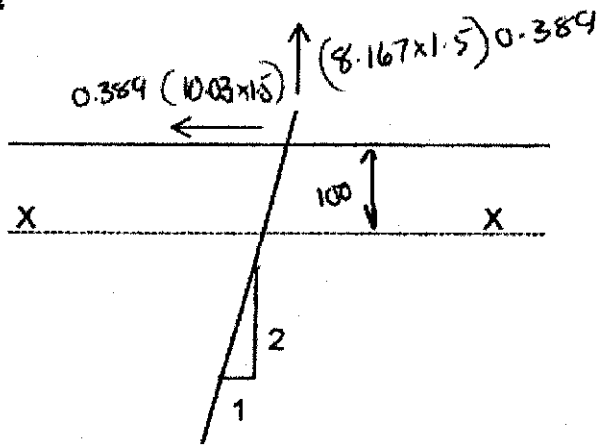
Job No. 011648 Sheet No. 17

Eng. RAW Date July 2005

PEGS



wind speed adjustment

Moment in peg about X - X

$= (10.03 \times 1.5 \times 0.1 + 8.167 \times 1.5 \times 0.05) \times 0.389$

$= (2.117) \times 0.389$

Use 35mm dia axle

$$f_b = \frac{2.117 \times 10^6 \times 0.389}{0.0982 \times 35^3} = 196 < 262 \times 1.33 \text{ MPa}$$

Note:- Depth of peg to be determined on site by experience and testing

Checked .....

Date .....

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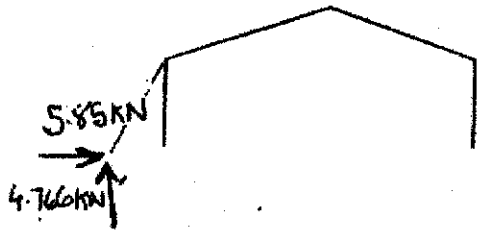
Job No. 01164B Sheet No. 18

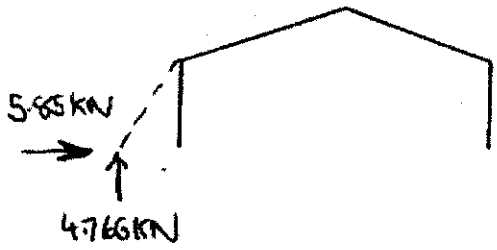
Eng. DMW Date. July 05

PEG LOADS (with sides of tent up)

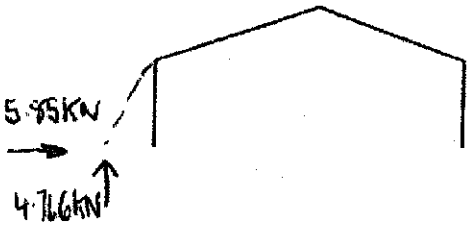
Terrain Category 3 & 4



Terrain Category 2



Terrain Category 1



Checked .....

Date .....

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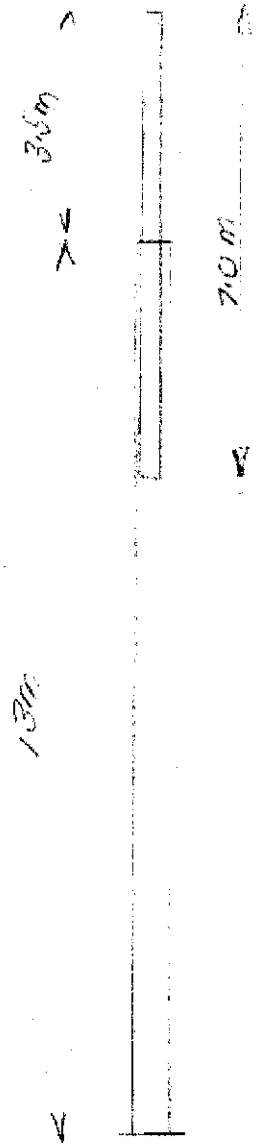
Job No. 01164B Sheet No. 19

Eng. DNV Date July 2005

CENTRE POLES



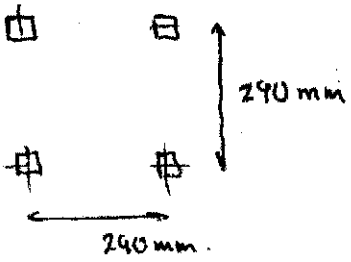
Side member 50×50×2

$A = 374\ mm$

$r = 19.5\ mm$

$I = 0.141 \times 10^6\ mm^4$

$Z = 5.66 \times 10^3\ mm^3$



Combined Section

$$r = \sqrt{\frac{I}{A}} = \sqrt{\frac{I_{2+4\times374\times145^2}}{4\times374}}$$

$$= 145$$

$$\frac{L}{r} = \frac{16500}{145} = 114\ mm$$

$\Rightarrow$ Fac = 76 MPa

$\Rightarrow$ Pall = $76 \times 374 \times 4 = 113\ KN$

Actual Load

$$= 0.01 \times \frac{45}{3} \times 15 \times \frac{1}{0.825} = 2.5\ KN$$

OK

Checked .....

Date .....

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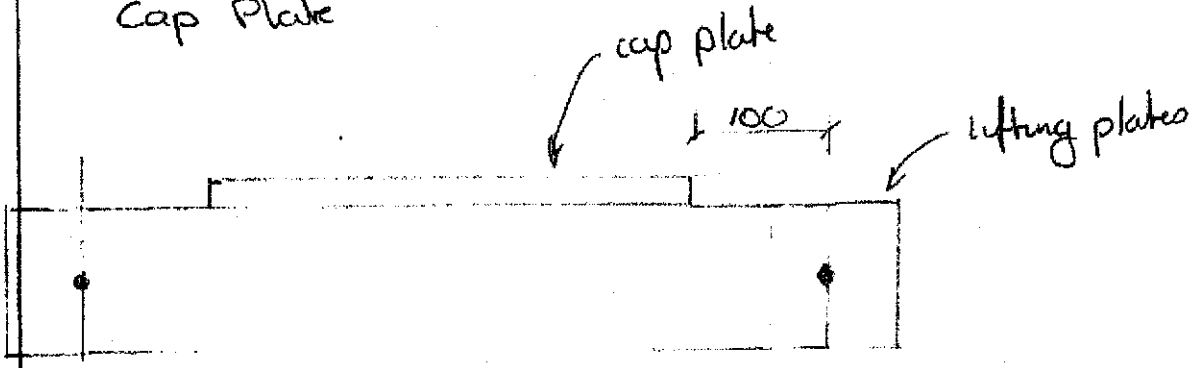
Job No. DW643 Sh. 20

Eng. DMW Date July 05

Cap Plate



Elevation

500kg

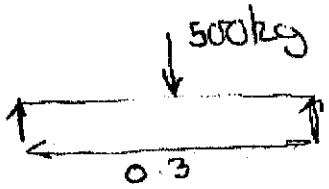
$M = 500 \times \frac{9.8}{1000} \times 0.1 = 0.49 \text{ kNm}$

2 plates Try 100 x 10

$f_b = \frac{0.49}{\frac{1}{6} \times 10 \times 100^2} \times \frac{1}{2} = 14.7 \text{ MPa}$

Allow for impact ⇒ 29 MPa OK.

Cap Plate



$M = \frac{500 \times 9.8}{1000} \times \frac{0.3}{4}$

$= 0.3675 \text{ kNm}$

$f_b = \frac{0.3675}{\frac{1}{6} \times 50 \times 16^2} = 172.3 \text{ MPa}$

Use 20mm plate

$\Rightarrow f_b = 110 \text{ MPa}$

Allow for impact ⇒ 165 MPa OK

Checked .....

Date .....

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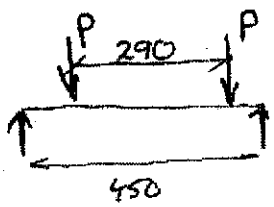
Computations

Job No. 01164B Sheet No. 21

Eng. SMV Date. July 05

Check Splice



$P = 2.5\,kN$

$M = 2.5 \times 0.08$

$= 0.20\,kNm$

25 dia pin

$f_b = \frac{0.20}{0.0982 \times 25^3} = 130\,MPa < 175\,MPa$ OK

$\Delta n = \frac{2.5 \times 10 \times 450^3}{6 \times 2 \times 10^5 \times \frac{\pi \times 25^4}{64}} \left[\frac{3}{4} \times \frac{80}{450} - \left(\frac{80}{450}\right)^3 \right]$

$= 9.900 \left[0.1333 - 0.0056 \right]$

$= 1.32\,mm$ OK

Checked .....

Date .....

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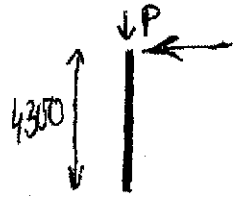
Job No. 01164B Sheet No. 21

Eng. DM Date July 05

SIDE POLES



75mm dia x 1.6 thick

$$\text{Area} = \pi \times \frac{75^2}{4} - \pi \times \frac{71.8^2}{4}$$

$$= 368.95\,mm^2$$

$$r = \frac{1}{4}\sqrt{75^2 + 71.8^2} = 25.96$$

$$\frac{L}{r} = 165.6 \Rightarrow F_{ac} = 30MPa$$

$$\Rightarrow P_{allowable} = 11kN.$$

$$P_{actual} = 0.01 \times \left(1.5 \times \frac{4.5}{2} + 4.3 \times 1.5\right) = 0.402kN$$

OK.

Checked .....

Date .....

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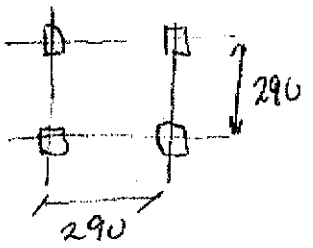
Job No. 01164B Sheet No. 23
Eng. PMC Date July 05

CENTRE POLE CAPACITY

From page 19 Capacity of Centre Pole = 113 kN (axial)
Load from Tent = 2.5 kN
Axial Capacity = 110 kN

$M_{cap} = 0.6 \times 350 \times Z$

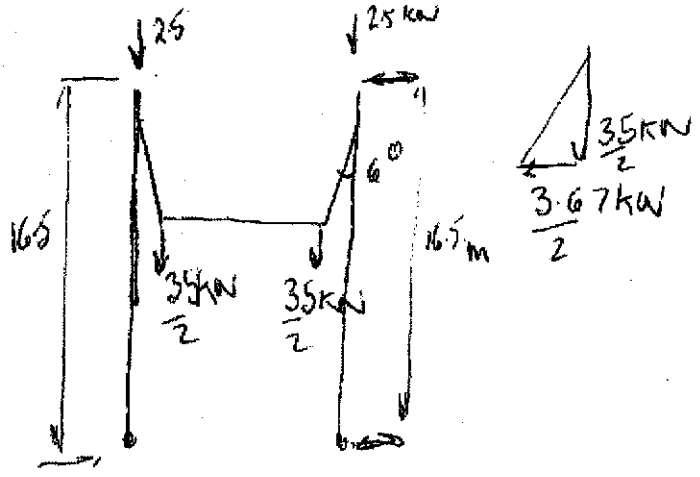


$I = 4 \times 344 \times 145^2$

$\Rightarrow Z = \frac{4 \times 344 \times 145^2}{145}$

$= 199.52 \times 10^3 mm^3$

$\therefore M_{cap} = 199.5 \times 0.6 \times \frac{350}{1000} = 42 kNm$



$M = 1.835 \times 16.5/4 + 35 \times 0.45$

$= 23.3 kNM$

Checked .....
Date .....

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Job No. 01164B Sheet No. 24
Eng. DMJ Date. July 05

Vertical Component from Cable

$\frac{23.3}{16.5} = 1.412$ KN

45°

Total Column Load = 1.412 + 17.6 + 2.5 + ½ self wt 8 = 30 kN

= 30 kN

Combined Stress = $\frac{30}{110} + \frac{23.3}{42}$

= 0.83 < 1.0

OK

Summary

:- Max. addition load / per centre pole 1.75 tonne
with max lift angle to post = 60°

Top Cables to be cable of taking 200 kg in addition to other loads (including anchor point)

Base plate to bear on ground cable of taking 4 tonne. max tonne vertical load

Checked .....

Date .....

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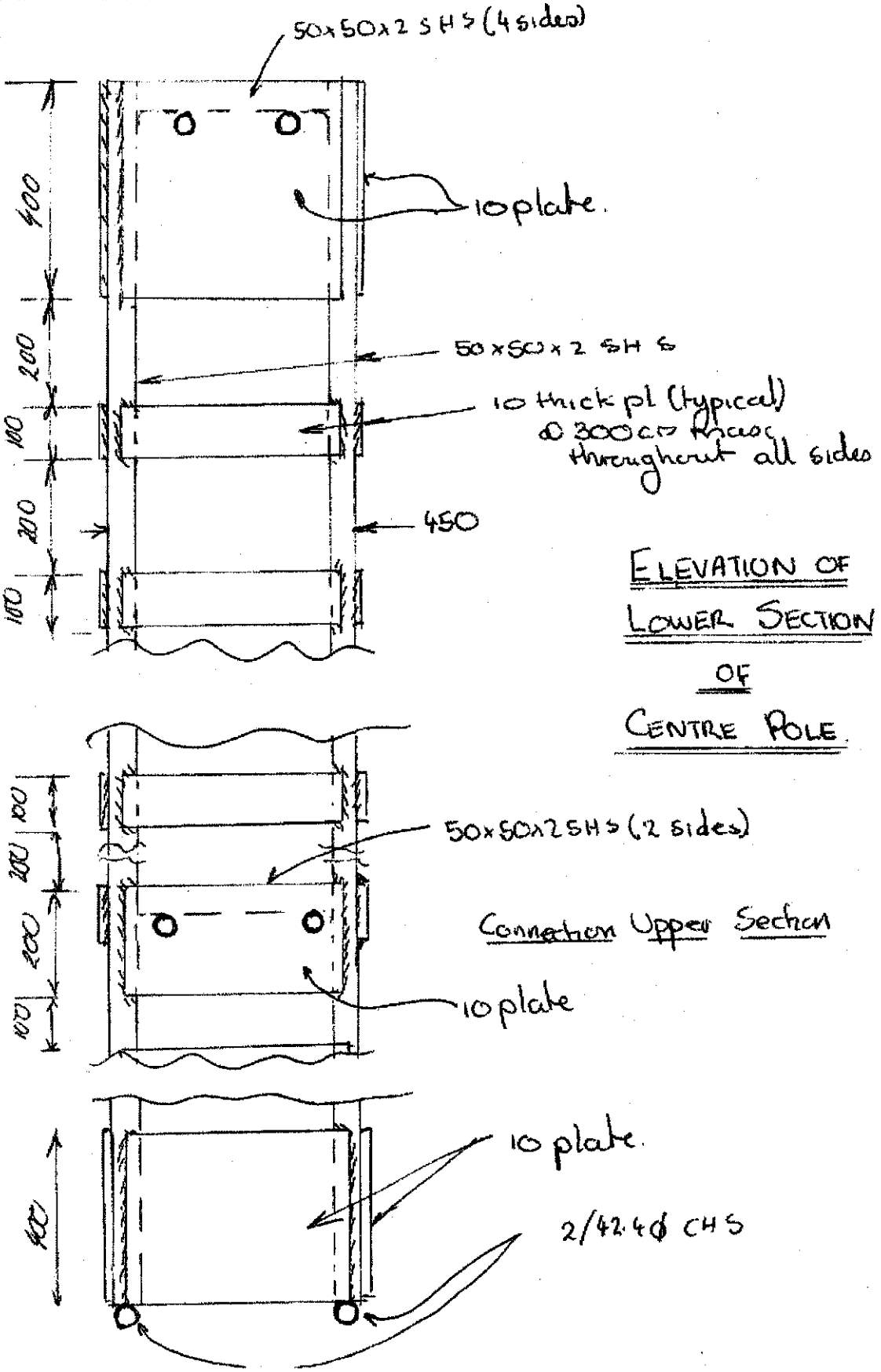
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

Computations

Job No. 01164B Sheet No. 25

Eng. PW Date. July 05

ALTERNATIVE CENTRE POLE



DESIGN PROJECT GROUP PTY LTD
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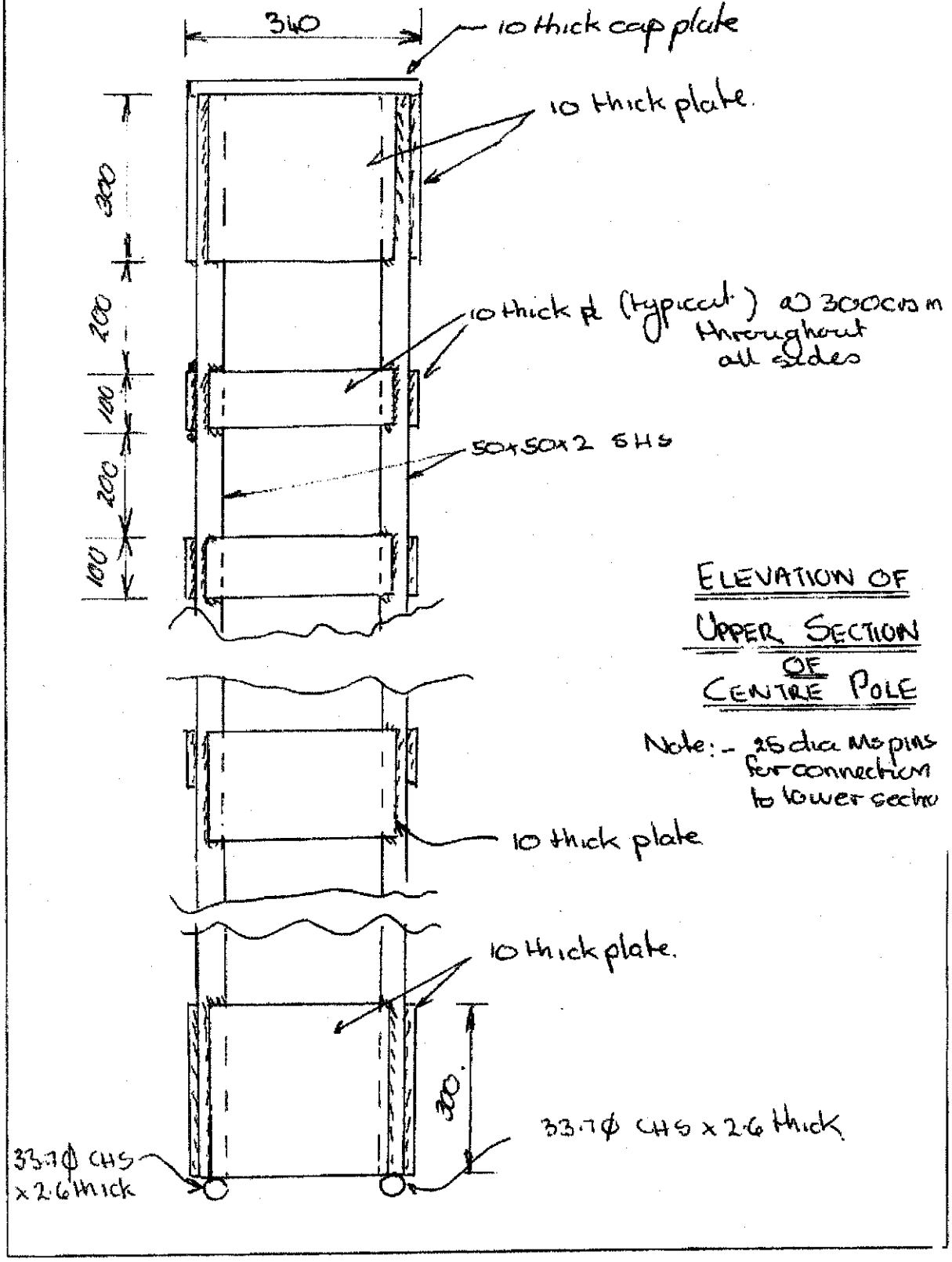
Fax: (03) 9388 2121

Computations

Job No. D1164B Sheet No. 26

Eng. SMN Date. July 05

ALTERNATIVE CENTRE POLE



ELEVATION OF UPPER SECTION OF CENTRE POLE

Note:- 25 dia M8 pins for connection to lower sectn

Checked .....

Date .....

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Job No. 01164B Sheet No. 27

Eng. DMW Date. July 05

Design of Battens

Centre to Centre of Battens

$50 r_i = 50 \times 19.5 = 975$

or $0.6 \times \frac{16500}{145} \times 19.5 = 1331$

Min^m ht intermediate battens $\geq 2 \times 50 = 100$m

Max^m ht of end battens = 400

Checked .....

Date .....

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215 Albert Street, Brunswick 3056
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PROC: E1(A1)
JUNE 1994

COMPUTATIONS

PROJECT NO: 08474
DATE: Dec' 2008

PROJECT TITLE

20m x 30m Tent no Quarter Poles
&
20m dia Round Tent
no Quarter Poles
for
Janlin Circuses PL

REFERENCES

AS1170
AS4100

ENGINEER

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 1...747
The Institution of Engineers, Australia

Signature: David J. Wills

Date: Dec. 2008

PROC E1

DESIGN

DESIGN PROJECT GROUP PTY LTD
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215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121
ABN 13 006 777 920

Computations
Job No. 08474 Sheet No .....
Eng JDW Date Dec 04

TABLE OF CONTENTS

Note:- (1) For Terrain category 3 & 4 tents to be evacuated when wind speed reaches 34.5 m/sec

(2) For Terrain category 1 & 2 tents to be evacuated when wind speed reaches 28.4 m/sec.

Checked .....
Date .....

(1)

JANLIN CIRCUSES Pty Ltd

Trading as
BURTONS CIRCUS
LENNON BROS CIRCUS
STARDUST CIRCUS

ABN 29 069 720 225

12 Byloss St
Chester Hill 2162
Fax 0417 655935
0418 238881

18th Dec 2008

DESIGN PROJECT GROUP
Att David Wills

Dear David,

I have enclosed 7 sheets of diagrams and information for a 20m x 30m tent that has 2centre poles and no quarter poles in it and can be erected as a 20m round top or a 20m x 30m tent.

(1) This tent relies on the curvatures of the roof panels to keep it taut, thereby resisting movement in the wind.

(2) The panels are welded together with a 125mm overlapping at each seam.

(3) The round end section panels are evenly spaced 1570 at the outside edge and taper up to the cupola above. The centre sheet sections have panels that are 1666 wide

(4) The round tent is constructed in 2 sections with lacings to join them together. Another section is added to increase the length to 30m

(5) The outside edge and the top edge of the tent is reinforced to withstand the pressure applied to it.

(6) The seam between the 2 centre poles has a 12mm wire cable through the ridge

(7) Guy straps are 50mm wide tie down straps with ratchets rated at 2000kg.

(8) The fastening points (pegs) are positioned 3500 from the edge of the tent.

(9) Centre poles are 12.3m tall and are a trusse type pole as per diagram.

(10). Side poles are 3500 long x 40N/B x 2mm wall thickness

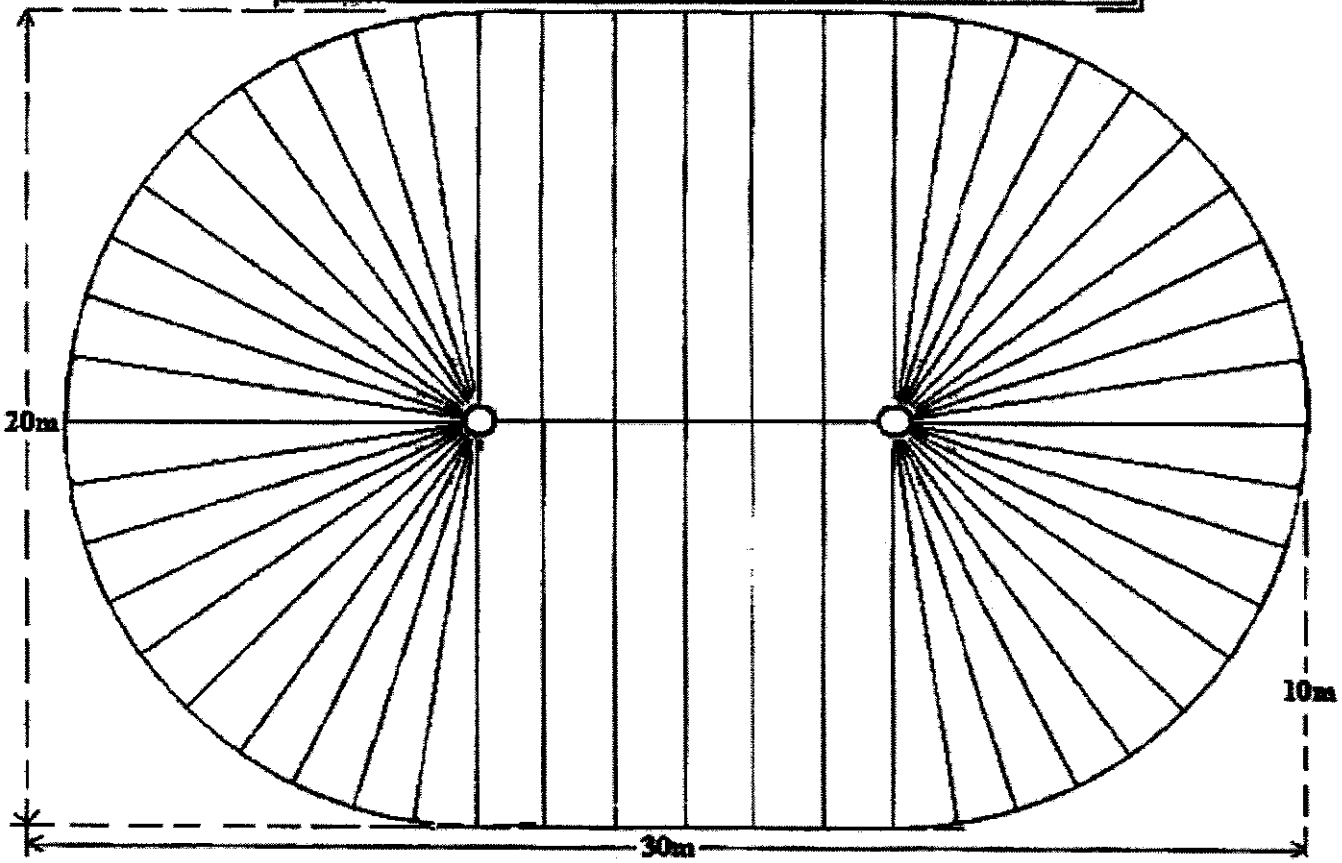
(11) The material being used is Ferrari 702 Preconstraint.

Thanking you.

Lindsay Lennon

(2)

Top View 20m x 30m Tent no Quarter Poles



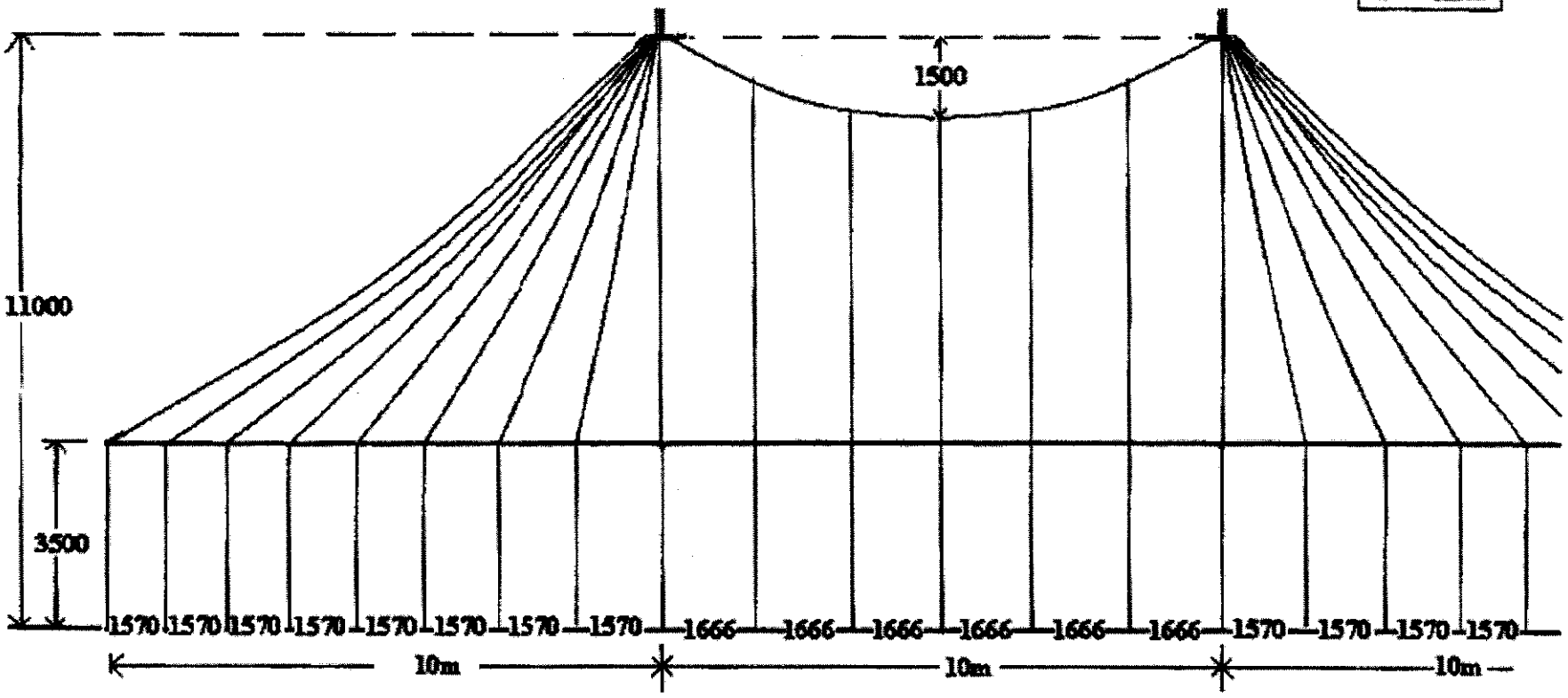
NOT TO SCALE

(2)

(3)

Side View 20m x 30m Tent no Quarter Poles

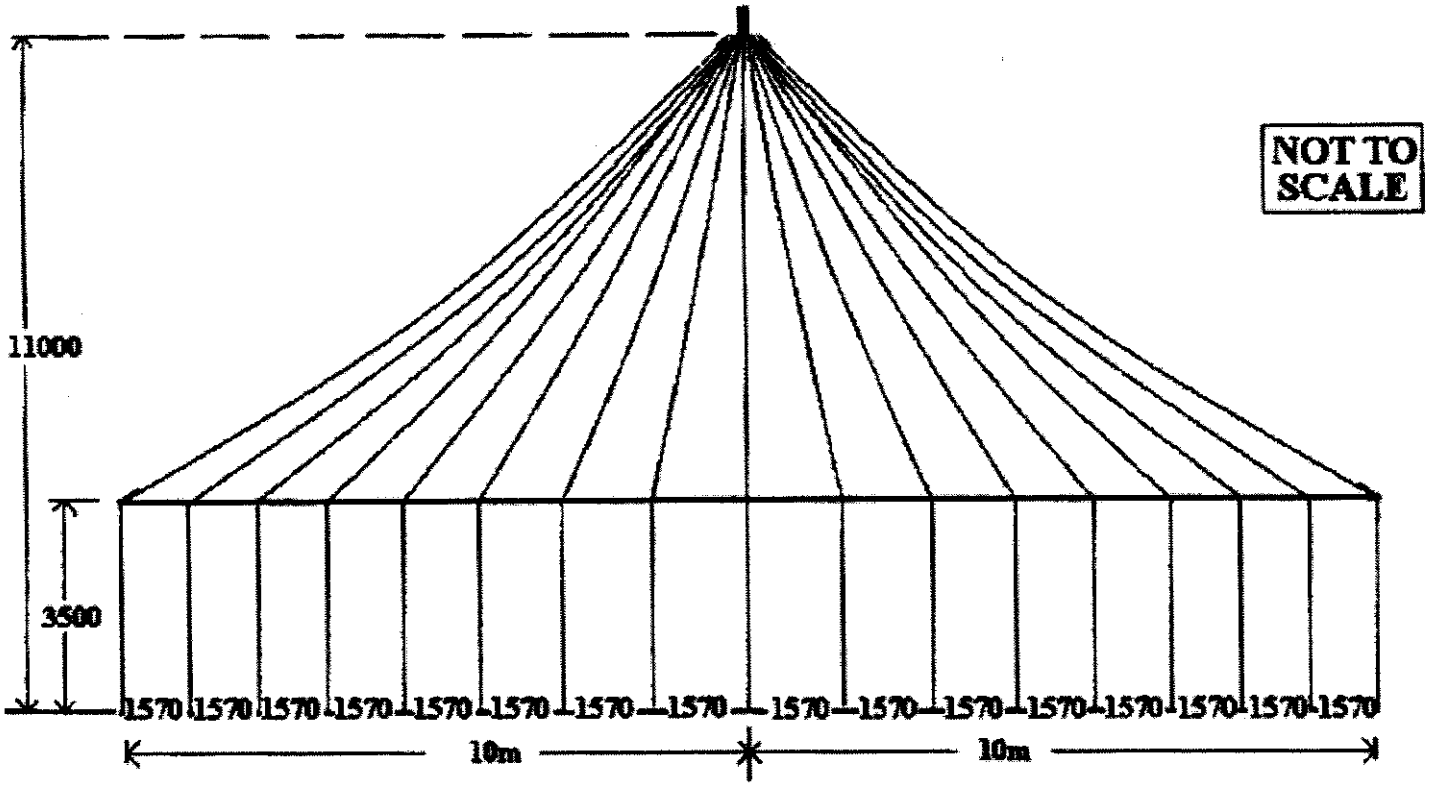
NOT TO SCALE



(2)

(4)

End View 20m x 30m Tent no Quarter Poles

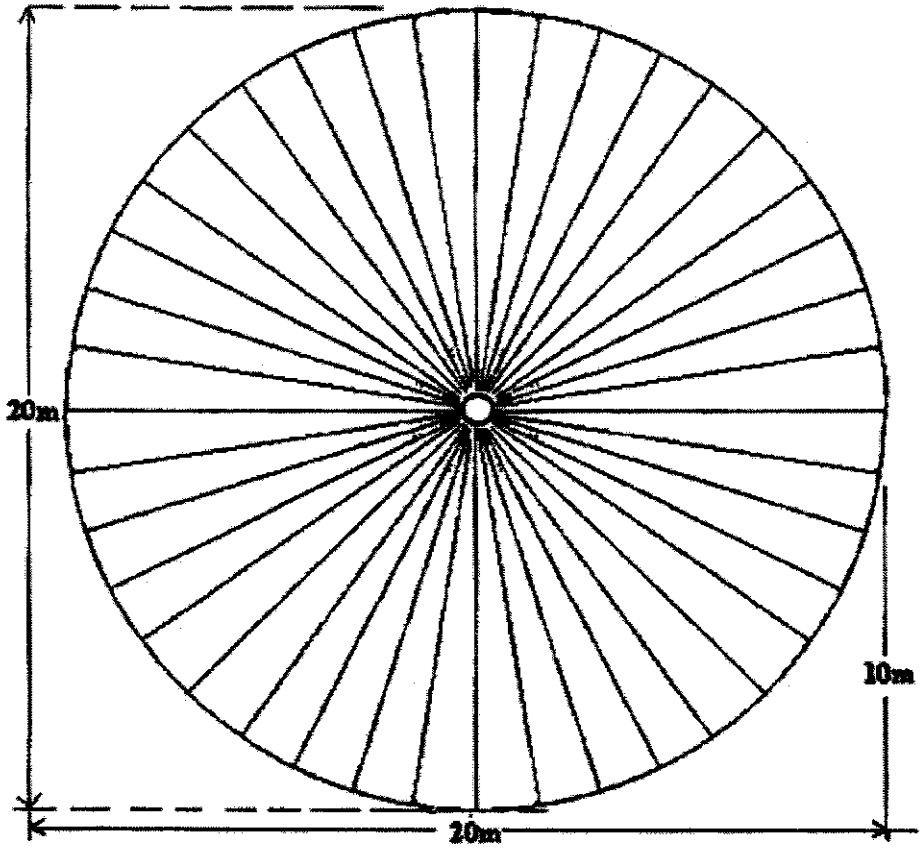


(4)

1945

(5)

Top View 20m RoundTent no Quarter Poles

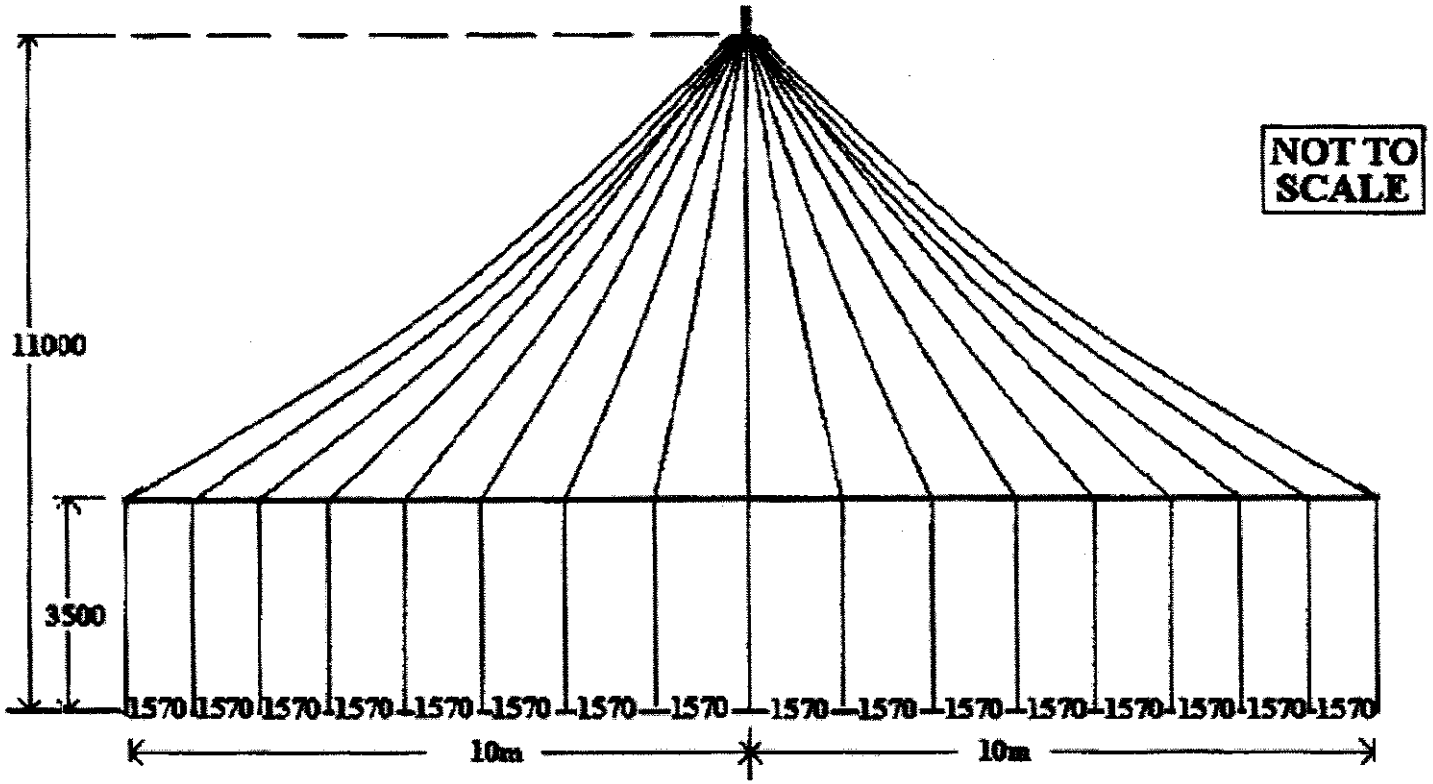


NOT TO SCALE

(5)

(6)

Side View 20m Tent no Quarter Poles

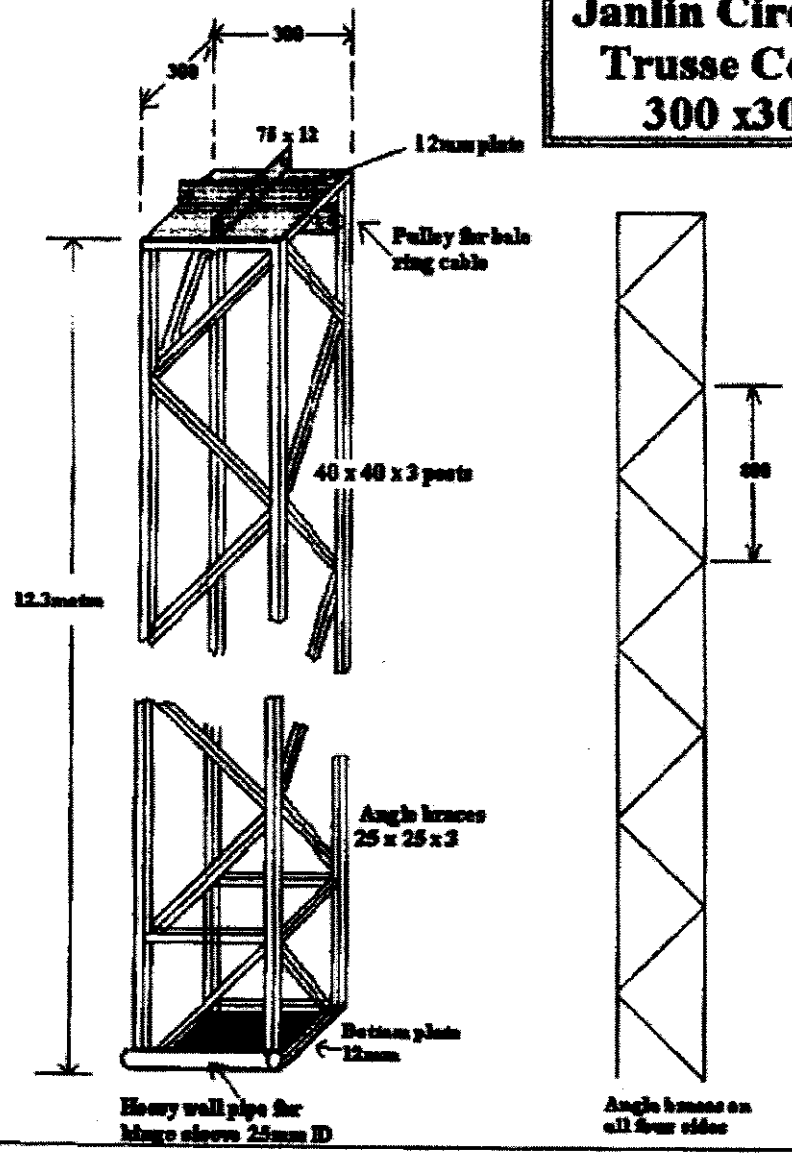


(6)

(7)

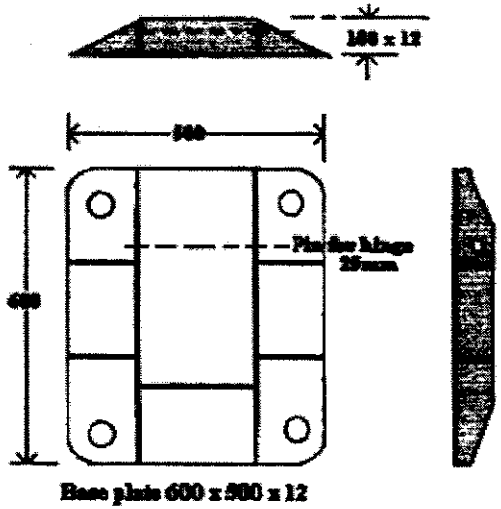
Janlin Circuses Pty Ltd
Trusse Centre Pole
300 x300 x 12.3m

Not to scale



Side Pole
40 N/B x 2mm wall thickness

Base Plate



(1)

1948

DESIGN

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Computations

Job No. 08474 Sheet No. 8

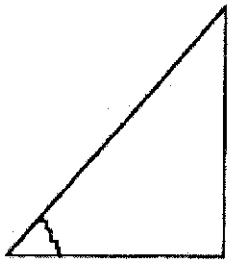
Eng. DW Date. Dec 09

MARQUEES

WIND LOADING

From AS 1170

Vp = 41m/sec from West



TERRAIN CATEGORIES 3 AND 4

Vz = VMzcat.Ms Mt Mi

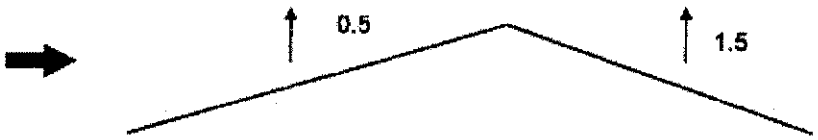
= 41 x 0.75 x 1 x 0.8

= 24.6 m/sec

$qz = 0.6 \times 24.6^2 \times 10^{-3}$

= 0.363 kPa

Worst case when sides are up and blocked underneath



Average = 1

Therefore wind load on roof = 1 x 0.363 kPa

= 0.363 kPa

TERRAIN CATEGORY 2 & 1

Wind Load = (0.91 / 0.75)^2 x 0.363 = 0.5285 kPa

Checked .....

Date .....

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Computations

Job No. 08474 Sheet No. 9

Eng. ONJ Date. Dec 08

3.2.4 Terrain Category.

Terrain, over which the approach wind flows towards a structure, shall be assessed on the basis of the following category descriptions.

(a) Category 1 - exposed open terrain with few or no obstructions and water surfaces at servicability wind speeds (V_s) only.

(b) Category 2 - open terrain, grassland with few well scattered obstructions having heights generally from 1.5 m to 10.0 m and water surfaces at wind speeds (V_u) and (V_p).

(c) Category 3 - terrain with numerous closely spaced obstructions having the size of domestic houses (3.0 m to 5.0 m high).

(d) Category 4 - terrain with numerous large, high (10.0 m to 30.0 m) and closely spaced obstructions such as large city centres and well-developed industrial complexes.

Selection of terrain category shall be made with due regard to the permanence of the obstructions which constitute the surface roughness, in particular vegetation in tropical cyclonic regions shall not be relied upon to maintain a wooded terrain roughness.

Checked .....

Date .....

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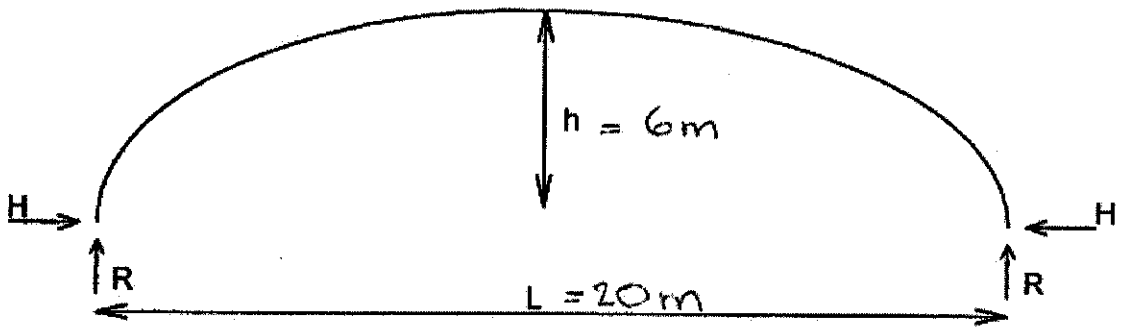
Computations

Job No. 0847A Sheet No. 10

Eng. ONV Date. Dec '08

PVC COVERING



Terrain Categ 3 & 4

$$H = 0.363 \times \frac{20^2}{8 \times 6} = 3.025 \text{ KN/m}$$

$$R = 0.363 \times \frac{20}{2} = 3.63 \text{ KN/M}$$

$$T_{max} = H(1 + 16\theta^2)^{1/2}$$

$$= 4.725 \text{ KN/m}$$

$$\theta = \frac{6}{20}$$

$$\text{Capacity of PVC} = \frac{2.4/0.050}{6} \text{ factor of safety} = 8 \text{ KN/m} \quad \text{OK}$$

Terrain Category 1 & 2

$$T_{max} = 4.725 \times \frac{0.5246}{0.363} = 6.88 \text{ KN/m} < 8 \text{ KN/m OK}$$

Checked .....

Date .....

97208A (11)

Caractéristiques techniques	Technical data	Technische Daten	Précontraint® 702	
Fil	Yarn	Garn	1100 Dtex PES HT	TERSUISSE
Poids au m²	Weight sqm	Gewicht m²	[illegible] g/m²	EN ISO 2286-2
Largeur	Width	Breite	180 cm	
Résistance rupture (chaîne/trame)	Tensile strength (warp/weft)	Reisskraft (Kette/Schuss)	280/280 daN/5cm	EN ISO 1421
Résistance déchirure (chaîne/trame)	Tear strength (warp/weft)	Weiterreisskraft (Kette/Schuss)	20/20 daN	DIN 53.363
Adhérence	Adhesion	Haftung	10 daN/5 cm	EN ISO 2411
Opacité	Blackout	Opak	> 99%	
Finition	Finish (Varnish)	Behandlung (Schlusslack)	Vernis BIFACE	
Réaction au feu	Flame retardancy	Brennverhalten	NFP 92-507 M2 - NFPA 701 Test 2 - CSFM T19 DIN 4102-1 B1 - BS 7837 - AS/NZS 1530.3 - SIS 650082 SITAC - UNE 23.727 - M2	
Températures maximum d'utilisation	Temperature extremes (while handling)	Maximale Anwendungs-temperaturen	-30°C / +70°C	
Système d'assurance qualité	Quality insurance	Qualitätssicherung	ISO 9001	
Les caractéristiques techniques indiquées sont des valeurs moyennes	Technical data are average values	Die angegebenen technischen Daten sind Mittelwerte		

conservatively use 2.40 kN/50

Technique d'enduction Précontraint® FERRARI	Précontraint® FERRARI coating technology	Beschichtungstechnik Précontraint® FERRARI
Stabilité dimensionnelle exceptionnelle	Exceptional dimensional stability	Aussergewöhnliche Flächenstabilität
Durabilité supérieure	Longer durability	Höhere Haltbarkeit
Excellente soudabilité	Excellent welding	Sehr gute Verschweissbarkeit
Opacité spéciale chapiteaux	Special blackout for big tops	Spezielle Opak-Textilien für Zirkuszelte

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PRECONTRAINT GARANTIE FERRARI

PRECONTRAINT® 702

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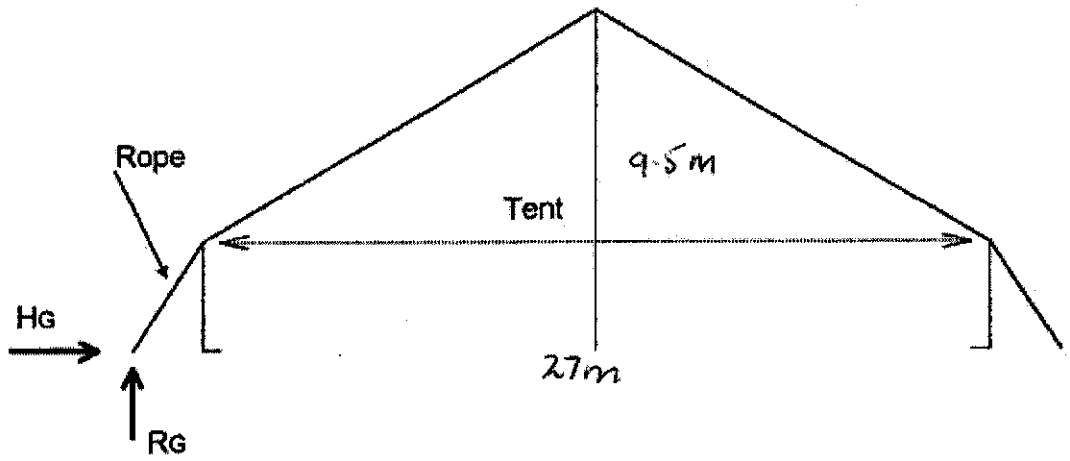
Computations

Job No. 08474 Sheet No. 12

Eng. SNV Date. Dec 08

ROPE CAPACITY



Terrain Category 3 & 4

RG = 3.63 KN/M

$H_G \approx 0.363 \times \frac{27^2}{8 \times 9.5}$ = 3.48 KN/M

$T_{max} = H(1 + 16\theta^2)^{1/2}$ $\quad \theta = \frac{9.5}{27}$

= 6.00 KN/M

∴ Load per rope = 6 x 1.57 = 9.42 KN

Use 20 KN rope

Capacity = $\frac{20}{3}$ factor of safety = 6.67 KN

Reduce wind speed to 34.5m/sec ⇒ Load per rope 6.67 KN

Terrain Category 1 & 2

Wind speed = 28.4 m/sec

Checked .....

Date .....

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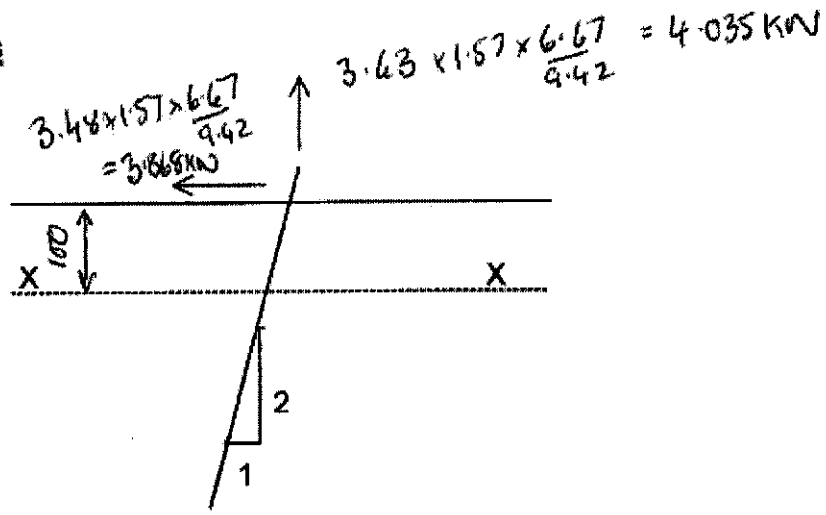
Computations

Job No. 08474 Sheet No. 13

Eng. DW Date Dec 08

PEGS



Moment in peg about X - X

= 3.868 x 0.1 + 0.05 x 4.035

= 0.5886 kNm

$$f_b = \frac{0.5886 \times 10^6}{0.0982 \times 35^3} = 140 < 262 \times 1.33 \text{ MPa}$$

Note:- Depth of peg to be determined on site by experience and testing

Checked .....

Date .....

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Computations

Job No. 05974 Sheet No. 14

Eng. DMV Date. Dec 08

LOADS (with sides of tent up)

Terrain Category 3 & 4

Terrain Category 2 & 1

Checked .....

Date .....

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215 Albert Street, Brunswick 3056
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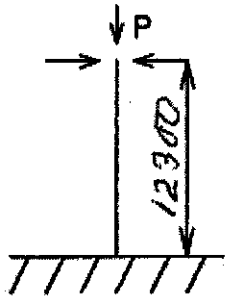
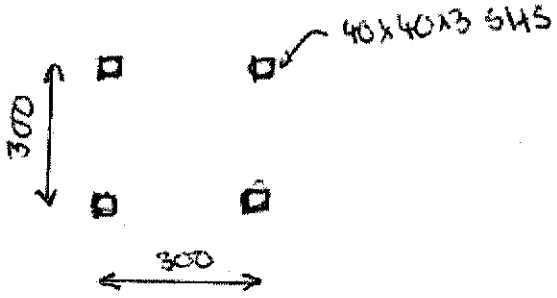
Computations

Job No. 0847 Sheet No. 15

Eng. JW Date. Dec 08

CENTRE POLE





40x40x3 SHS Area = 421 mm²

r = 14.9

Latticed Strut

$\therefore r = \sqrt{\frac{I}{A}} = \sqrt{\frac{4 \times 421 \times 1302^2}{4 \times 421}} = 130$

$\frac{L}{r_y} = \frac{12300}{130} = 94.6 \Rightarrow f_{ac} = 81 MPa$

$P_{all} = \frac{421 \times 4 \times 81}{1000} = 136 kN$ OK.

Max load $= \frac{30m}{2} \times 20m \times 1.5 \times \frac{850}{1000} \times \frac{9.8}{1000}$

$= 3.75 kN$ OK

Checked .....

Date .....

DESIGN PROJECT GROUP Pty Ltd
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215 Albert Street, Brunswick 3056
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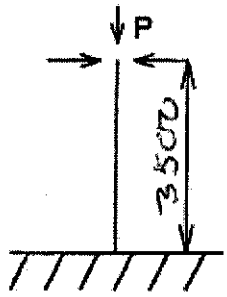
Computations

Job No. 0847 Sheet No. 16

Eng. JW Date. Dec 08

SIDE POLE



40NB x 2mm thick.

$$\text{Area} = \frac{\pi \times 44^2}{4} - \frac{\pi \times 40^2}{4} = 263.89\,mm^2$$

$$r = \frac{1}{4}\sqrt{44^2 + 40^2} = 14.86$$

$$\frac{L}{r} = 235.5 \qquad Fac = 17\,MPa$$

$$\therefore P_{all} = \frac{17 \times 263.89}{1000} = 1.42\,KN$$

$$P_{actual} = 1157 \times 116 \times 10 \times 850 \times \frac{1}{1000} \times \frac{9.4}{1000}$$

$$= 0.13\,KN \quad OK$$

Checked .....

Date .....

DESIGN PROJECT GROUP Pty Ltd
CONSULTING ENGINEERS A.C.N. 0006777920
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

PROC: E8(C1)
JUN 2006

DPG Job No.: 08474

Building Act 1993
BUILDING REGULATIONS 2006

REGULATION 1507: CERTIFICATE OF COMPLIANCE - DESIGN

To
Relevant building surveyor: .....
Postal address: .....**Post Code:** .....

From
Building practitioner: ***David Wills*** **Category/Class:** ***Civil Engineer***
Postal address: ***215 Albert Street Brunswick*** **Post Code:** ***3056***

Property Details
Number: ..... **Street/Road:** ..... **City/Suburb/Town:** .....
Lot/s: ..... **LP/PS:** ..... **Volume:** ..... **Folio:** .....
Crown Allotment: ..... **Section:** ..... **Parish:** ..... **County:** .....
Municipal District: .....

Compliance
I did/~~did not~~* prepare the design and I certify that the part of the design described as: 20m x 30m Tent no Quarter Poles & 20m dia Round Tent no Quarter Poles for Jantin Circuses PL

complies with the following provisions of the Regulations**: ***Section B of the Building Code of Australia and the relevant Codes referred therein.***
** Includes BCA and relevant Australian Standards

Design Documents
Drawing Nos.: N.A.....
..... **Prepared by:** ..... **Date:**.....
Specifications: N.A ..... **Prepared by:** ..... **Date:**.....
Computations: Project No. 08474 sheet 1 to 16.....
..... **Prepared by:** Design Project Group PL **Date:** Dec 2008
Test reports: NA.....
..... **Prepared by:** ..... **Date:**.....
Other documents: NA.....
..... **Prepared by:** ..... **Date:**.....
Reference drawings: NA.....
..... **Prepared by:** ..... **Date:**.....

Signature
Signed Building Practitioner: David J. Wills **Registration No.:** ***EC 1043***
Date: 23/12/2008

Note: - (1) For Terrain Category 3 & 4 tents to be evacuated at wind speed 34.5m/sec
(2) For Terrain Category 1 & 2 tent to be evacuated at wind speed 28.4 m/sec
(3) See p.14 for peg loads

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 181147
The Institution of Engineers, Australia

PROC: E8

Appendix A4

DESIGN PROJECT GROUP Pty Ltd
CONSULTING ENGINEERS A.C.N. 006777920
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

PROC: E1(A1)
JUNE 1994

COMPUTATIONS

PROJECT NO: 06180
DATE: March 2006

PROJECT TITLE 27m x 45m Square End Tent
(Alternative Combinations
18m x 27m, 27m x 27m & 27m x 36m)
for Jarlin Bigtent Hire

ARCHITECT N/A

REFERENCES AS1170
AS4100

ENGINEER

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 181147
The Institution of Engineers, Australia

Signature: David J. Wills

Date: March 2006

PROC E1

DESIGN

DESIGN PROJECT GROUP PTY LTD
CONSULTING ENGINEERS (Inc. in Vic.)
215 Albert Street, Brunswick 3056
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ABN 13 006 777 920

Computations
Job No. 06/80 Sheet No .....
Eng DW Date March 06

TABLE OF CONTENTS

Note:- ① For Terrain Category 3 and 4 tent to be evacuated when wind speed reaches 34 m/sec (66 knots

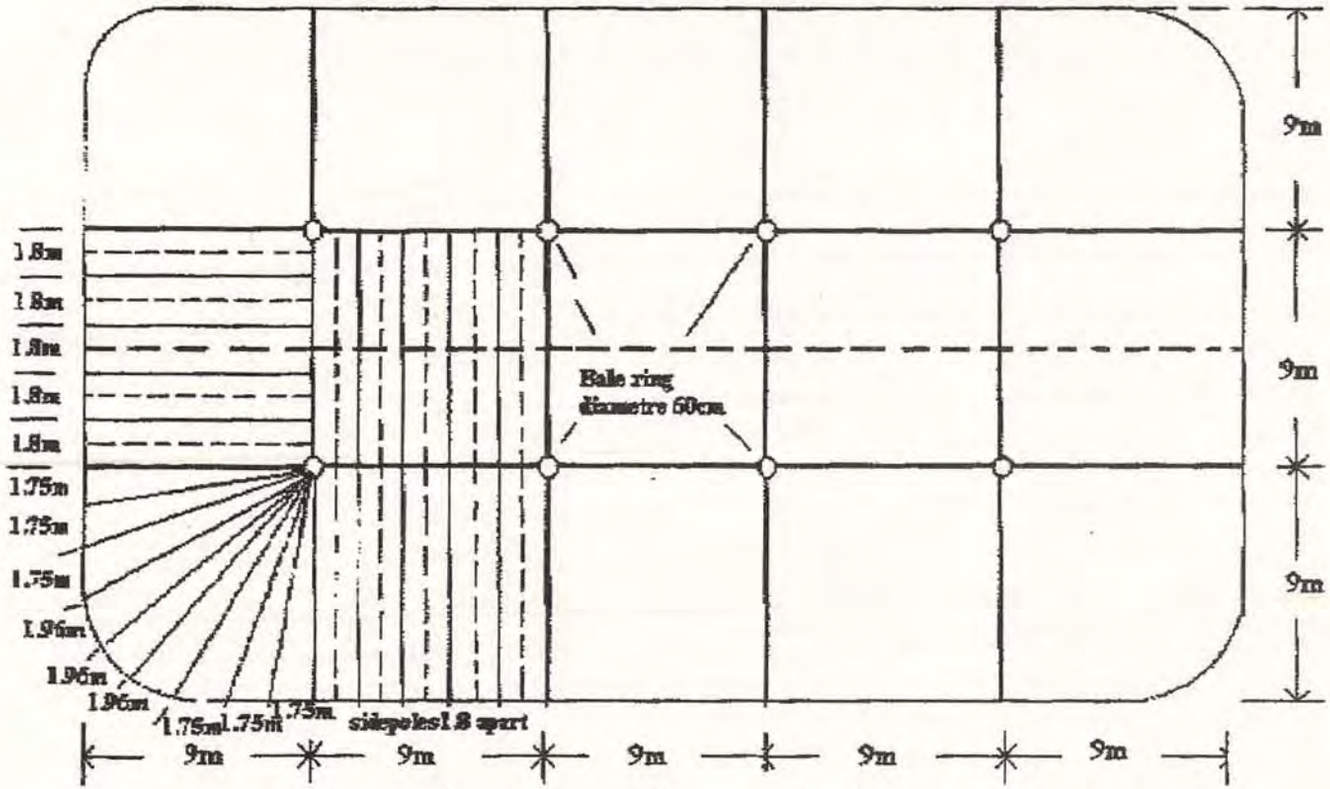
② For Terrain Category 2 and 1 tent to be evacuated when wind speed reaches 28 m/sec (54.5 knots)

Checked .....
Date .....

27m x 45m Square End Tent ROUND CORNERS

THIS TENT DOES NOT HAVE QUARTER POLES. IT RELIES ON THE HEAVY CURVATURE OF THE PANELSBETWEEN THE CENTRE POLES TO RUN WATER OFF AND CREATE A VERY TAUT ROOF TO WITHSTAND WINDS

Not to scale



Alternative lengths 4x9 bays = 36m
3x9 bays = 27m

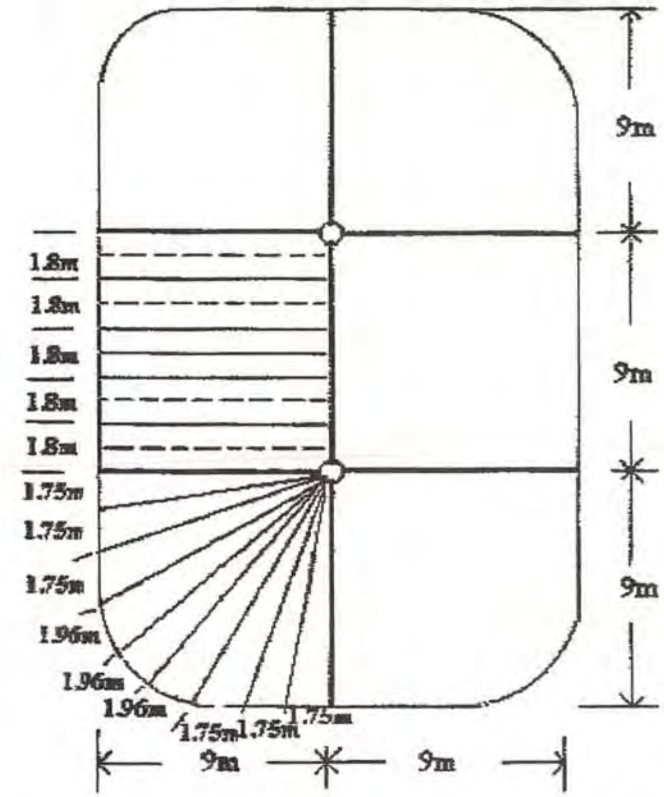
Note: (1) Guy straps rated @2500kg
(2) Pegs to be 35mm truck axles (H.T. steel)
(3) Pegs located 4m out from edge of tent
(4) Side poles - 76dia x 1.6 thk M.S.

(1)

/8m x 27m Square End Tent ROUND CORNERS

THS TENT DOES NOT HAVE QUARTER POLES, IT RELIES ON THE HEAVY CRVATURE OF THE PANELS BETWEEN THE CENTRE POLES TO RUN WATER OFF AND CREATE A VERY TAUT ROOF TO WITHSTAND WINDS

Not to scale

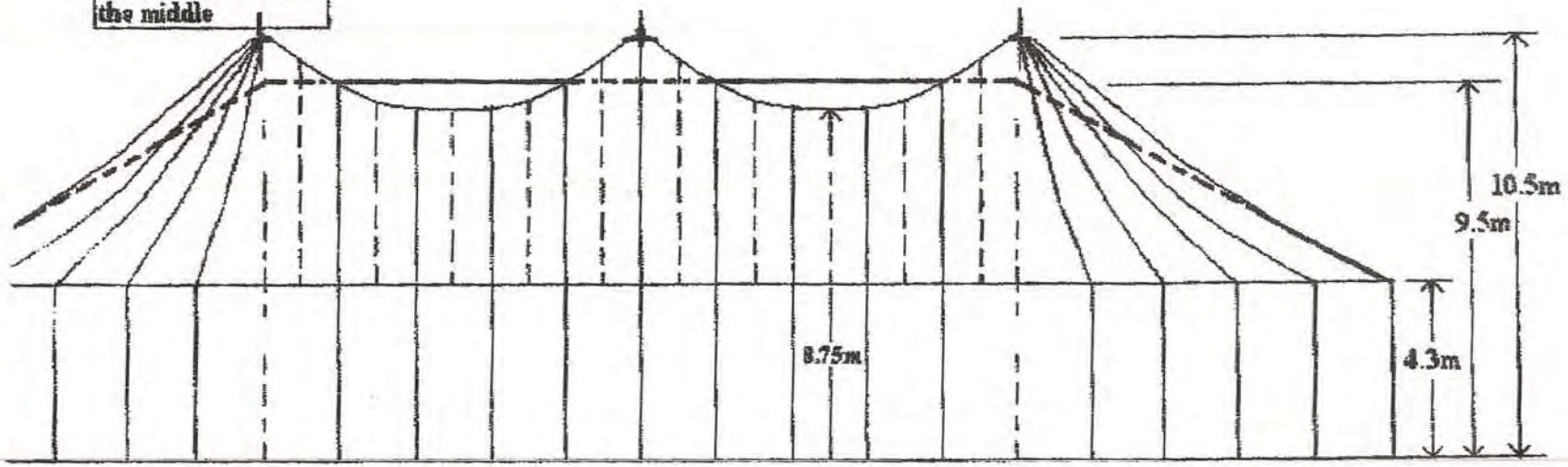


See Notes on page 1

LEGEND

This is the outline of the sheet through the middle

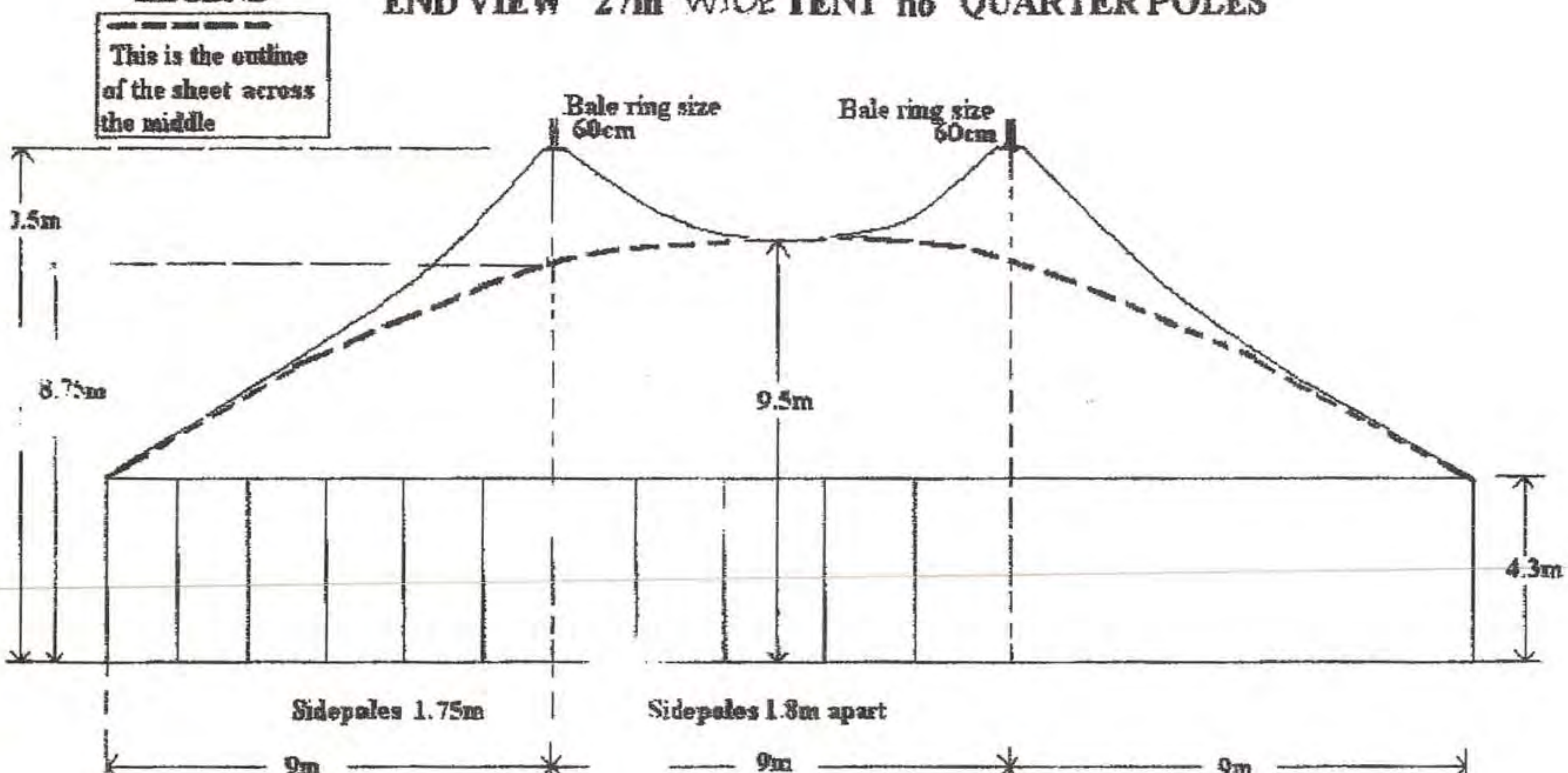
SIDE VIEW 27m wide TENT No QUARTER POLES



No. of bays varies (see plan)

(3)

END VIEW 27m WIDE TENT no QUARTER POLES

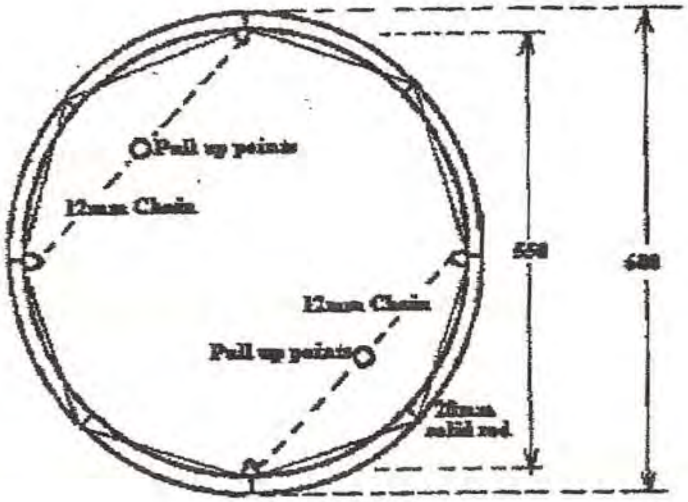


(4)

1964

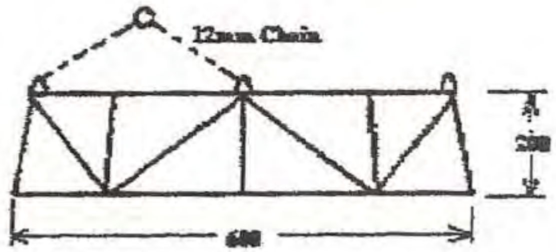
Bale rings for 27m x 36m tent

Not to scale



Bale rings made from 20mm solid rod with angle braces made from same.

The chains are fastened to loops on the side of the bale rings and to a central link then shackled to the pull up cable that goes through the top of the centre pole



(5)

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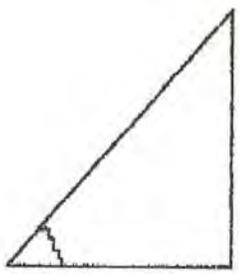
Computations
Job No. 06180 Sheet No. 7
Eng. GJW Date March 06

MARQUEES

WIND LOADING

From AS 1170

Vp = 41m/sec from West



TERRAIN CATEGORIES 3 AND 4

Vz = VMzcat.Ms Mt Mi

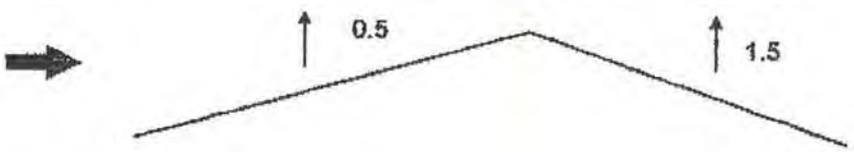
= 41 x 0.75 x 1 x 0.8

= 24.6 m/sec

qz = $0.6 \times 24.6^2 \times 10^{-3}$

= 0.363 kPa

Worst case when sides are up and blocked underneath



Average = 1

Therefore wind load on roof = 1 x 0.363 kPa

= 0.363 kPa

TERRAIN CATEGORY 2 & 1

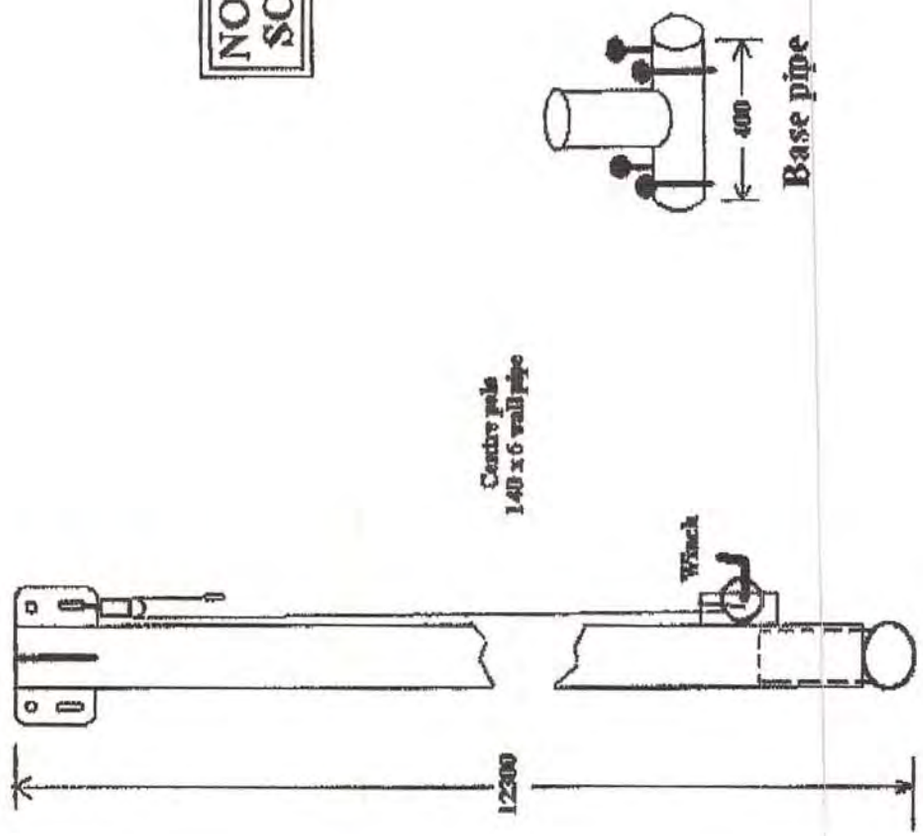
Wind Load = $(0.91 / 0.75)^2 \times 0.363 = 0.5285$ kPa

Checked .....
Date .....

1967

(6)

NOT TO SCALE



Centre pole
for 18m x 27m tent
or 27m x 27m tent
or 27m x 36m tent
or 27m x 45m tent

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Computations
Job No. 06180 Sheet No. 8
Eng. SJN Date. March 06

3.2.4 Terrain Category.

Terrain, over which the approach wind flows towards a structure, shall be assessed on the basis of the following category descriptions.

(a) Category 1 - exposed open terrain with few or no obstructions and water surfaces at servicability wind speeds (V_s) only.

(b) Category 2 - open terrain, grassland with few well scattered obstructions having heights generally from 1.5 m to 10.0 m and water surfaces at wind speeds (V_u) and (V_p).

(c) Category 3 - terrain with numerous closely spaced obstructions having the size of domestic houses (3.0 m to 5.0 m high).

(d) Category 4 - terrain with numerous large, high (10.0 m to 30.0 m) and closely spaced obstructions such as large city centres and well-developed industrial complexes.

Selection of terrain category shall be made with due regard to the permanence of the obstructions which constitute the surface roughness, in particular vegetation in tropical cyclonic regions shall not be relied upon to maintain a wooded terrain roughness.

Checked .....
Date .....

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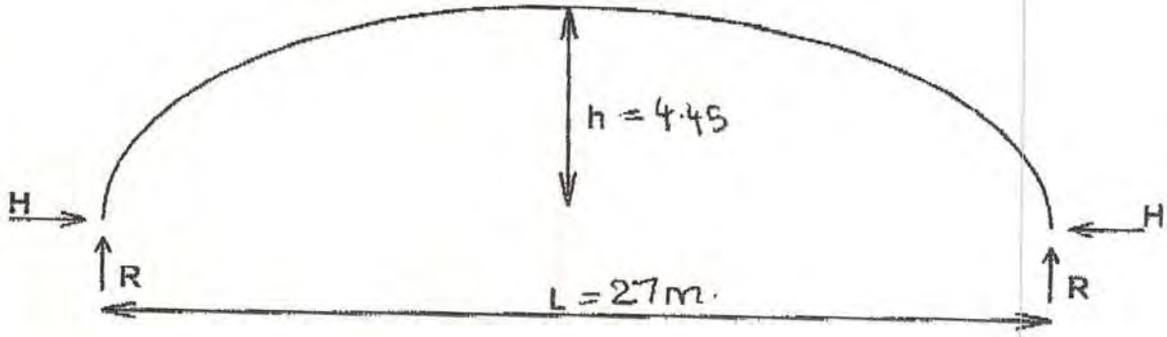
Computations

Job No. 06180 Sheet No. 9

Eng. GN Date. March 06

PVC COVERING



$$H = 0.363 \times \frac{27^2}{8 \times 4.45} = 7.433 \text{ KN/m}.$$

$$R = 0.363 \times \frac{27}{2} = 4.90 \text{ KN/m}$$

$$T_{max} = H(1 + 16\theta^2)^{1/2}$$

$$= 8.903 \text{KN/M (Terrain Categ 3\&4)} \qquad \theta = \frac{4.45}{27}$$

$$\text{Capacity of PVC} = \frac{2.65 \times 1/0.050}{4 \text{ factor of safety}} = 13.25 \text{KN/m}$$

(For terrain category 1 & 2 Tmax = 12.962 KN/m.
∴ OK)

Checked .....

Date .....

(10)

Senator™
High Performance Australian PVC

PRODUCT SPECIFICATION

PRODUCT: **SENATOR™ PVC 650 T/CD**

DESCRIPTION:	SENATOR 650 T/CD is a heavy duty, PVC Coated Tent & Tarpaulin fabric. The base fabric is a high quality, high tenacity polyester fabric in a tearstop construction. The product is also proudly 100% Australian Made for Australian conditions.
WEIGHT:	700gsm Nominal
CONSTRUCTION:	Woven Denier Polyester 9 x 8.5 with Tearstop in both directions.
WIDTH:	205cm
TENSILE STRENGTH: (AS 2001.2.3)	WARP – 3320N WEFT – 2650N
TONGUE TEAR: (BS 3424.5)	WARP – 650N WEFT – 650N
FLEX CRACKING: (AS [illegible])	400,000 Cycles
COATING ADHESION:	90 N.
COLD CRACK TEMP:	-30°C
SPECIAL FEATURES:	**Flame Retardent** tested to AS1530 parts 2 and 3 Test report available, **UV Treated, Antifungicide. Acrylic Lacquer Coated.**
Stock Colours:	As Required

21.

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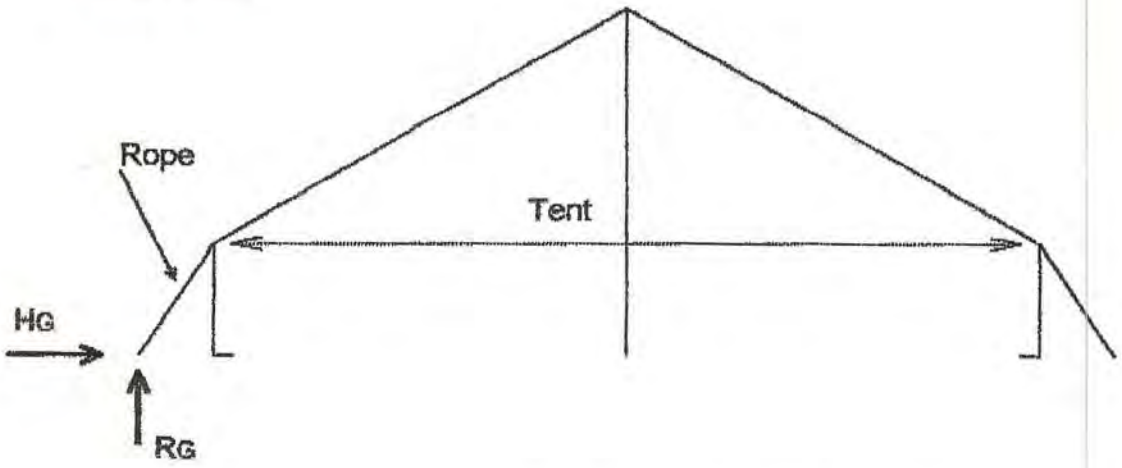
Computations

Job No. 06180 Sheet No. 11

Eng. DJN Date. March 06

ROPE CAPACITY



R_G = 4.9 KN/M

$H_G \approx 0.363 \times \frac{35^2}{8 \times 8.75}$ = 6.35 KN/M

$T_{max} = H(1 + 16\theta^2)^{1/2}$ $\theta = \frac{8.75}{35}$

= 8.98 KN/M

∴ Load per rope = 8.98 x 1.6 = 16.2 KN
(Terrain Categ 3 & 4)

Use 2500 kg straps

{ Terrain Categ 1 & 2
Load per rope = 23.58 KN OK }

Checked .....
Date .....

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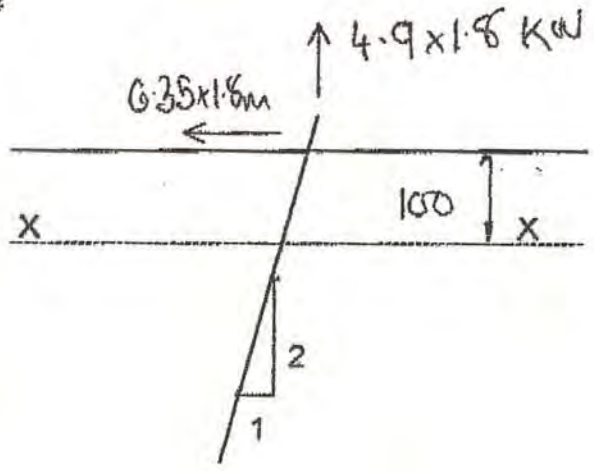
Computations
Job No. 06180 Sheet No. 12
Eng. DW Date. March 06

PEGS



Moment in peg about X - X

$= 0.35 \times 1.8 \times 0.100 + 4.9 \times 1.8 \times 0.05$

$= 1.575$ KN m

$$f_b = \frac{1.575 \times 10^6}{0.0982 \times 35^3} = 374 \text{ f } 262 \times 1.33 \text{ MPa}$$

Note:- Depth of peg to be determined on site by experience and testing

Reduce Wind Load Terrain Category 3 & 4 to 34 m/sec
$q_z = 0.25$ kPa $\therefore f_b = 257$ MPa OK

Reduce Wind Load Terrain Category 2 & 1 to 28 m/sec
$q_z = 0.243$ kPa OK

Checked .....
Date .....

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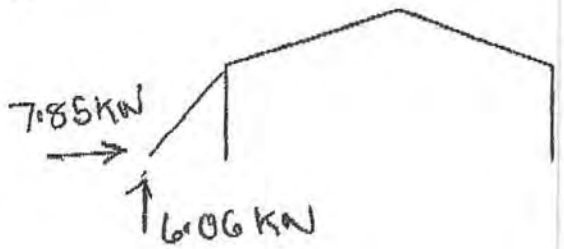
Computations

Job No. 06180 Sheet No. 13

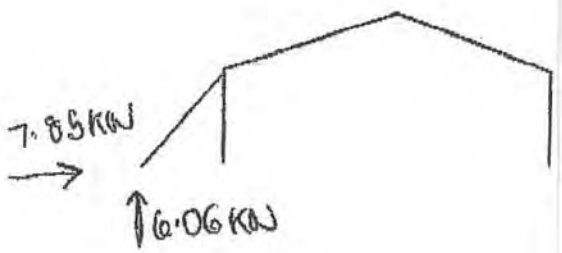
Eng. DW Date March 06

LOADS (with sides of tent up)

Terrain Category 3 & 4



Terrain Category 2 & 1



Checked .....

Date .....

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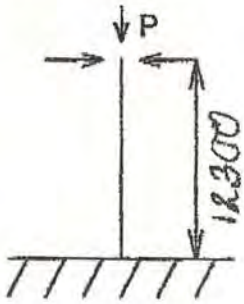
Computations

Job No. 06180 Sheet No. 14

Eng. ONJ Date. March '06

CENTRE POLE



$P = 700\,g(sqm) \times \frac{1}{1000} \times \frac{9.8}{1000} \times 9 \times 9 \times 1.414$

$= 0.7866\,KN$

140 dia x 5 thick CHS

Area $= 2120\,mm^2$

$r = 47.7$

Effective length $= 10.3\,m$

$\frac{L}{r} = \frac{10.3 \times 0.85 \times 1000}{47.7} = 183$

Fac $= 13\,MPa$

$P_{cap} = 27.56\,KN$ OK

Checked .....

Date .....

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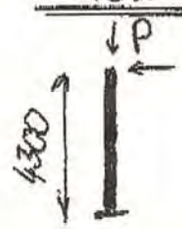
Computations

Job No. 06180 Sheet No. 15

Eng. DW Date. March 06

SIDE POLE (76dia x 1.6 Thick)



Axial Capacity = ?

$$r_x = r_y = \frac{1}{4}\sqrt{76^2 + 72.8^2} = 26.3$$

$$\frac{L}{r_y} = \frac{4300}{26.3} = 163 \Rightarrow F_{ac} = 30\ MPa$$

$$\text{Axial Capacity} = 30\left(\frac{\pi \times 76^2}{4} - \frac{\pi \times 72.8^2}{4}\right)$$

$$= 11.22\ KN.$$

$$P_{actual} = 700 \times \frac{1}{1000} \times \frac{9.8}{1000} \times (1.414 \times 1.8 \times 1.9 + 1.8 \times 4.3)$$

$$= 0.01\ KN \quad OK.$$

Checked .....

Date .....

Appendix A5

DESIGN PROJECT GROUP Pty Ltd
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Telephone: (03) 9388 0801
Fax: (03) 9388 2121

PROC: E1(A1)
JUNE 1994

COMPUTATIONS

PROJECT NO: 962620
DATE: March 2000

PROJECT TITLE 25.8m Diameter x 6.12m Long
Pole and Peg Marquee
for
Jamlin Circuses Pty Ltd

ARCHITECT N/A

REFERENCES AS1170
AS 4100
AS 3900

ENGINEER David Wills
Registered Building Practitioner EC1043

Signature: David J. Wills

Date: March 2000

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 181147
The Institution of Engineers, Australia
I E Aust

DESIGN PROJECT GROUP PTY LTD
CONSULTING ENGINEERS A.C.N. 054150917 (Inc. In Vic.)
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

Computations
Job No. 96220 Sheet No. .....
Eng. DNW Date. .....

TABLE OF CONTENTS

Checked .....
Date .....

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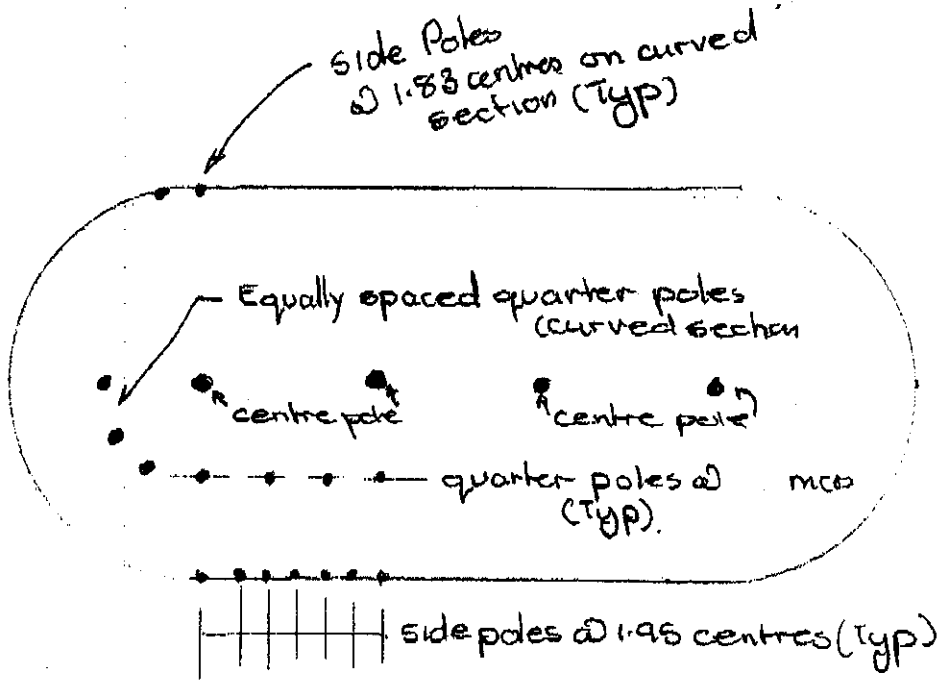
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

Computations
Job No. 96262D Sheet No. 1 *
Eng. DM Date. March 2000



Plan

Note:- When wind speed exceeds 30knots (15.4m/sec.) the tent must be evacuated.

Checked .....
Date .....

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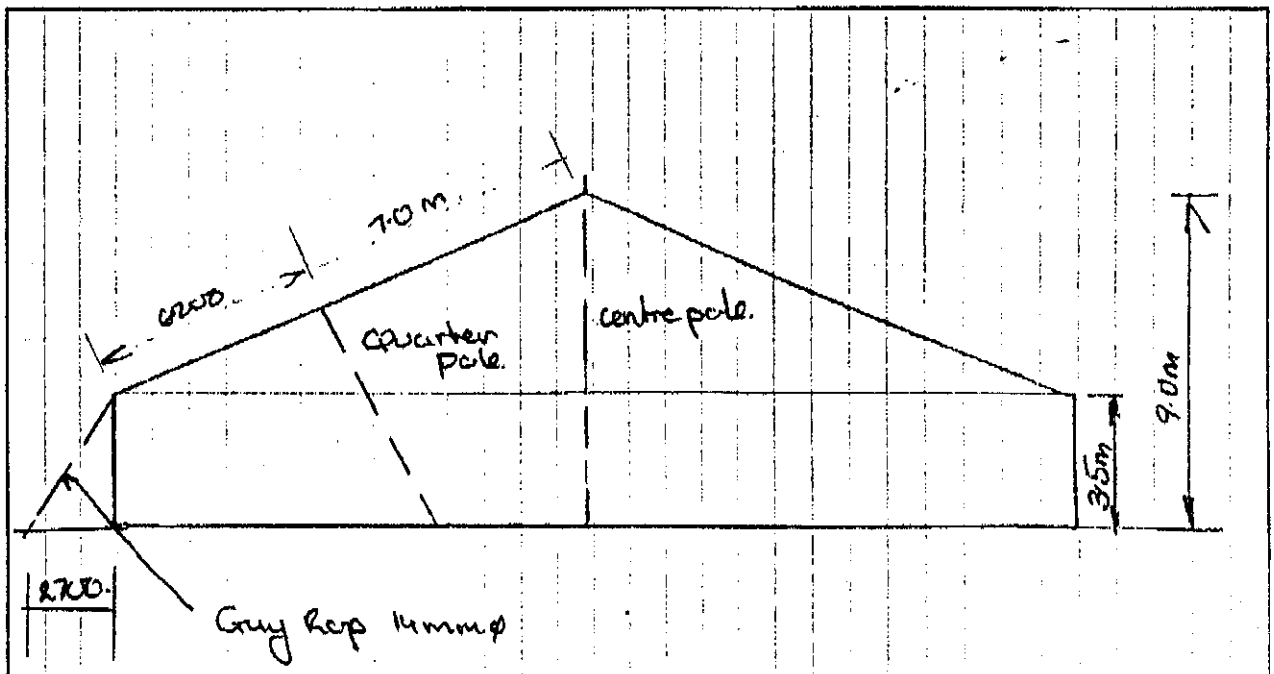
Computations

Job No. 96262D Sheet No. 2

Eng. OW Date. Feb 2000



Elevation

Centre Pole	140 dia x 5 mm wall (baseplate 140φ pipe x 400 long)
Quarter Pole	dia x . mm wall (baseplate 100 dia 6 thk)
Side Pole	50 dia x 2. mm wall (baseplate 55 dia 3 thk

Checked .....

Date .....

DESIGN

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Computations
Job No. 9626D Sheet No. 3
Eng. BW Date. Feb 2000

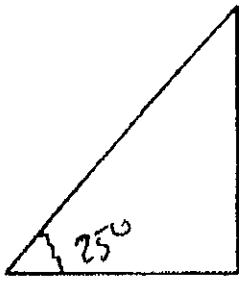
MARQUEES

WIND LOADING

From AS 1170

Vp = 41m/sec from West

TERRAIN CATEGORIES 3 AND 4



Vz = VMzcat.Ms Mt Mi

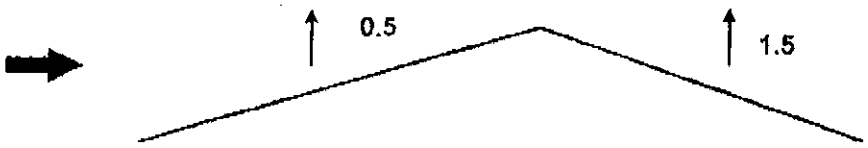
= 41 x 0.75 x 1 x 0.8

= 24.6 m/sec

$qz = 0.6 \times 24.6^2 \times 10^{-3}$

= 0.363 kPa

Worst case when sides are up and blocked underneath



Average = 1

Therefore wind load on roof = 1 x 0.363 kPa

= 0.363 kPa

TERRAIN CATEGORY 2

Wind Load = $(0.91 / 0.75)^2 \times 0.363 = 0.5285$ kPa

TERRAIN CATEGORY 1

Wind Load = $(1.05 / 0.75)^2 \times 0.363 = 0.7115$ kPa

Checked .....
Date .....

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Computations

Job No. 962620 Sheet No. 4

Eng. DW Date Feb 2000

3.2.4 Terrain Category.

Terrain, over which the approach wind flows towards a structure, shall be assessed on the basis of the following category descriptions.

(a) Category 1 - exposed open terrain with few or no obstructions and water surfaces at servicability wind speeds (V_s) only.

(b) Category 2 - open terrain, grassland with few well scattered obstructions having heights generally from 1.5 m to 10.0 m and water surfaces at wind speeds (V_u) and (V_p).

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Checked .....

Date .....

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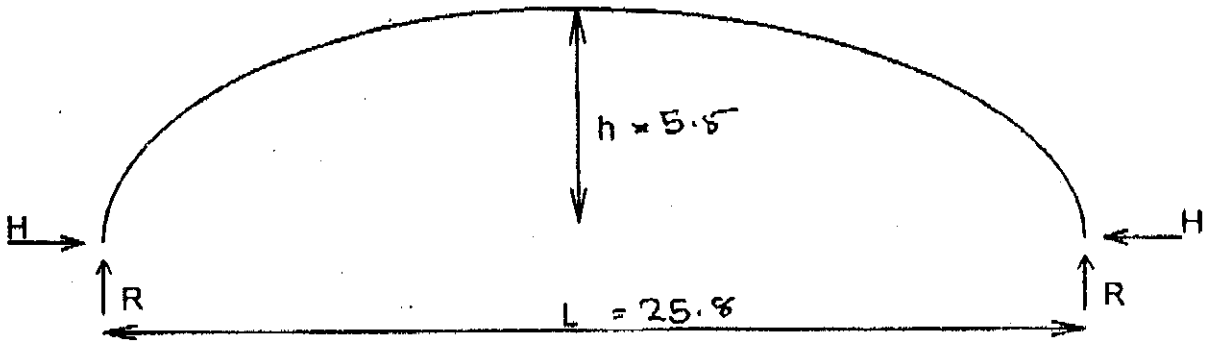
Computations
Job No. 962620 Sheet No. 5
Eng. DW Date. Feb 2020

PVC COVERING



$$H = 0.363 \times \frac{25.8^2}{8 \times 5.5} = 5.49\ KN/m$$

$$R = 0.363 \times \frac{25.8}{2} = 4.68\ KN$$

$$T_{max} = H(1 + 16\theta^2)^{1/2} = 7.21\ KN \qquad \theta = \frac{5.5}{25.8}$$

$$\text{Capacity of PVC} = \frac{2.4 \times \frac{1}{0.050}}{6\ \text{factor of safety}} = 8KN$$ OK Terrain Categ 3 & 4

Terrain Categ 2 allowable wind speed
$= \left(\sqrt{\frac{8}{7.21} \times \frac{0.363}{0.5285}}\right) \times 41 = 35.17 m/sec$

Terrain Categ 1 allowable wind speed
$= \left(\sqrt{\frac{8}{7.21} \times \frac{0.363}{0.715}}\right) \times 41 = 30.84 m/sec.$

Checked .....
Date .....

(6)

BIRKMYRE

PVC 650 TEAR PROOF

Width: 188 cm
Base Cloth: 1100Dtex Polyester 9x9
Weave: Tear Stop
Weight: 625 gm/mt² (min.)
625 - 700 gm/mt² (typical value)
Finish: Fire Retardent P.V.C. coated
with maximum U.V. absorbers
Tensile Strength: 2600 N/5cm warp
(AS2001.2.3) 2400 N/5cm weft
Tongue Tear: 640 N warp
(BS3424.7B) 550 N weft
Coating Adhesion: 90 N/5cm (min.)
Flex Cracking Resistance: 400,000 cycles (min.)
Cold Crack Temp.: Minus 20°C
Roll Lengths: 45mt/roll

Colours: (In order of appearance)
Red R134 — Light Blue N250 — Emerald G198
Yellow C77 — Orange R83 — Royal N198
White W7 — Olive G183 — Green G161
Cherry R102 — Blue N38 — Brown B297
Black Z

1983

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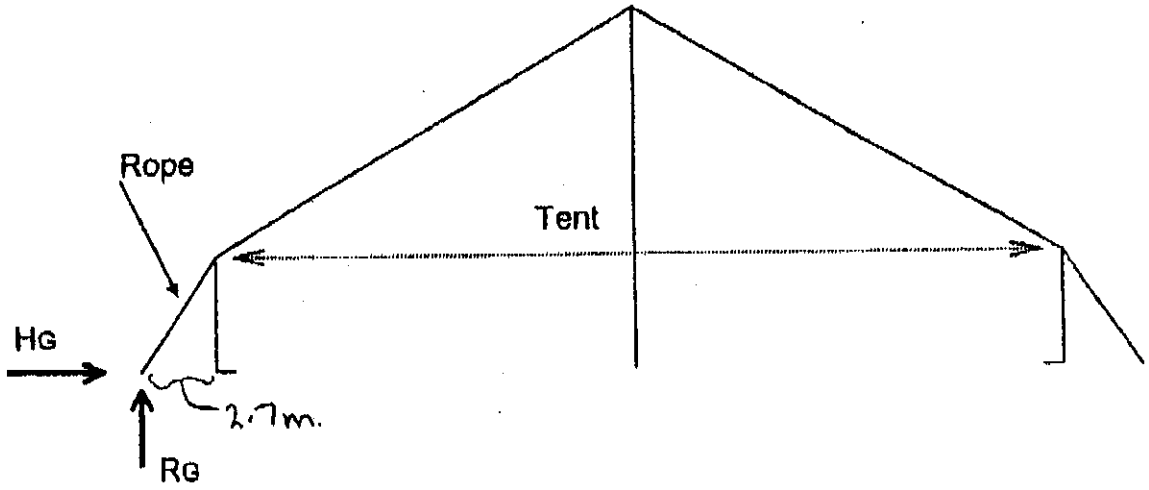
Computations
Job No. 967620 Sheet No. 17
Eng. DW Date. Feb 2000

ROPE CAPACITY



R_G = 4.68 KN/M

$H_G \approx 0.363 \times \frac{31.2^2}{8 \times 9}$ = 491 KN/M

$T_{max} = H(1 + 16\theta^2)^{1/2}$ $\theta = \frac{9}{31.2}$

= 7.497 KN/M

∴ Load per rope = 7.497 x 1.95 = 1462 KN

Use 14mm ø rope silver

Capacity = $\frac{21.1}{3}$ factor of safety = 7.0 KN

Allowable wind speed = $\left(\sqrt{\frac{7}{1462}}\right) \times 41$ = 28.37 m/sec

Terrain Category 2 = $28.37 \times \sqrt{\frac{0.363}{0.6258}}$ = 23.51 m/sec.

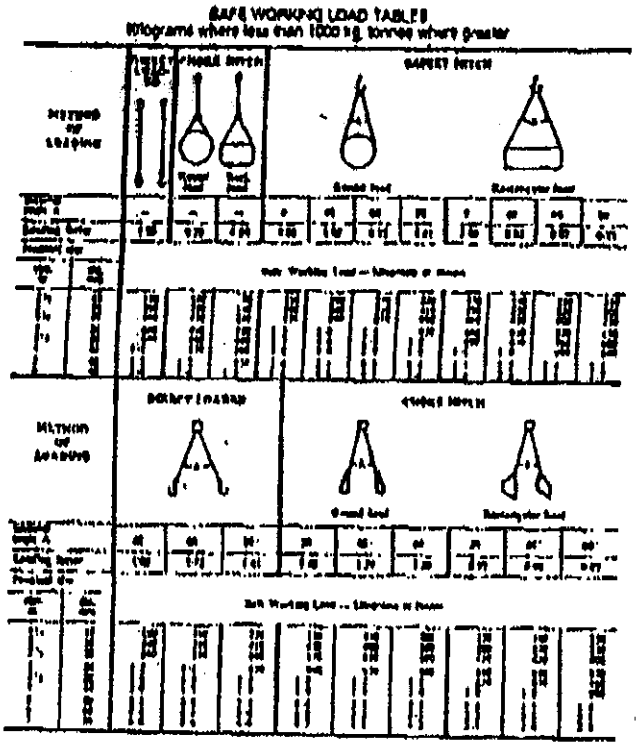
Terrain Category 1 = $28.37 \times \sqrt{0.268/0.7115}$ = 20.26 m/sec

Checked .....
Date .....

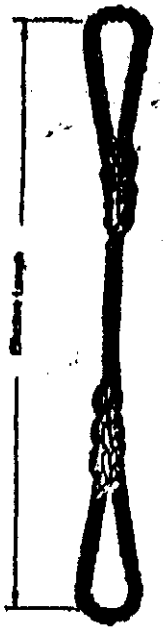
FIBRE-ROPE SLINGS

(OF NATURAL OR SYNTHETIC ROPE)

AS 1380 - 1972



A. SINGLE-PART WITH SOFT EYES



B. ENDLESS

The following rules should always be observed in estimating the safe working load of any rope.

(1) For use as lifelines, slings and general lifting gear in medium factories and workshops for moderate work (but not handling hot materials or liquids injurious to human life and limb or the rope itself) and where not subject to rough usage, the factor of safety shall be at least six (6).

(2) For use as tackles, ship's purchases, lashings, slings, shifters and general lifting gear in heavy industries where rope is subject to rough usage, the factor of safety shall be at least seven (7).

When supporting personnel the factor of safety shall be at least 10 with a minimum size of rope to be used 19 mm dia. (2½" circ.).

COMPARISON ROPE TABLE FOR LAID ROPES

Size of Rope		Sisal or Manila		Polypropylene Fibre or Multi Filament		Polyethylene Monofilament		Nylon (Polyamide) Multi Filament		Polyester Multi Filament		Silverplume (Polyethylene-Polypropylene Blend)	
Diameter mm	Circumference Inch	Approximate Breaking Force		Approximate Breaking Force		Approximate Breaking Force		Approximate Breaking Force		Approximate Breaking Force		Approximate Breaking Force	
		kN	TonF	kN	TonF	kN	TonF	kN	TonF	kN	TonF	kN	TonF
3	⅛			1.5	15	1.0	.10	1.8	.18	1.7	.17		
4	¼	1.4	.14	2.4	.24	2.0	.20	3.7	.37	3.7	.37		
5	⅜	1.7	.17	3.3	.33	2.8	.28	3.9	.39	3.8	.38		
6	¼	2.6	.26	4.5	.45	3.9	.39	5.5	.55	5.3	.53	4.8	.48
7	9/32	3.4	.34	6.3	.63	5.3	.53	7.6	.76	7.1	.71		
8	5/16	4.7	.47	8.5	.83	7.1	.66	10.0	1.0	9.3	.93	7.7	.77
9	11/32	5.2	.52	10.6	1.06	8.8	.86	12.5	1.25	11.6	1.16		
10	3/8	6.2	.62	12.8	1.28	10.7	1.07	15.3	1.53	14.0	1.4	11.4	1.14
12	7/16	8.3	.83	18.3	1.83	15.0	1.5	22.0	2.2	20.0	2.0	15.9	1.59
14	1/2	12.6	1.26	25.0	2.5	20.9	2.0	31.0	3.1	27.4	2.74	21.1	2.11
16	5/8	16.0	1.6	30.0	3.0	27.4	2.74	38.8	3.88	36.0	3.6	26.8	2.68
18	11/16	21.0	2.1	38.8	3.94	33.8	3.38	49.1	4.91	45.0	4.5	32.7	3.27
20	3/4	26.2	2.62	49.6	4.96	41.8	4.18	62.3	6.23	55.0	5.5	38.6	3.86
22	7/8	32.4	3.24	58.8	5.88	49.8	4.98	74.7	7.47	67.0	6.7	45.0	4.5
24	1	39.8	3.98	68.7	6.87	58.8	5.88	99.8	9.98	80.0	8.0	53.9	5.39
26	1¼	53.0	5.3	84.6	8.46	73.7	7.37	120	12.0	106	10.6	72.6	7.26
32	4	66.0	6.6	120	12.0	102	10.20	154	15.4	134	13.4	95.0	9.5
36	1½	84.7	8.47	153	15.2	128	12.8	189	18.9	160	16.0	120	12.0
40	5	103	10.3	184	18.4	153	15.3	234	23.4	204	20.4	147	14.7
48	6	149	14.9	259	25.9	219	21.9	329	32.9	288	28.8		
56	7	196	19.5	349	34.8	296	29.6	443	44.3	386	38.6		
64	8	251	25.1	446	44.6	378	37.8	561	56.1	496	49.6		
72	9	314	31.4	558	55.8	470	47.0	697	69.7	621	62.1		
80	10	385	38.5	697	69.7	568	56.8	839	83.9	765	76.6		

NOTE: The approximate Breaking Force given in this Table must in no way be construed as a safe working load of the rope.

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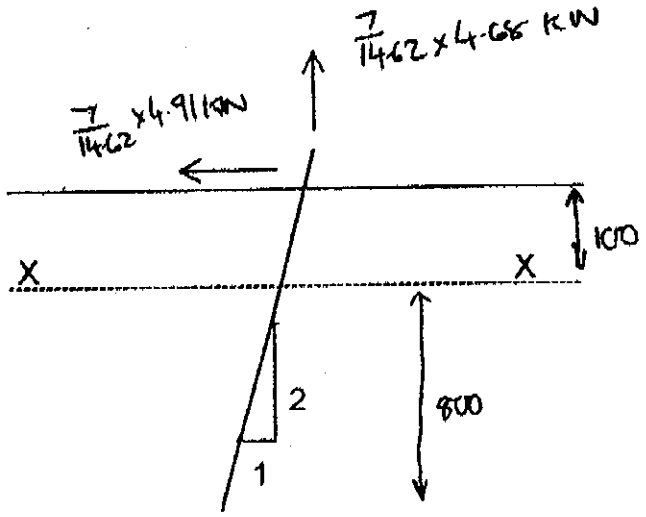
Computations
Job No. 962620 Sheet No. 9
Eng. PW Date. Feb 2000

PEGS



Moment in peg about X - X

$= 0.05 \times \frac{7}{14.62} \times 4.68 + 0.1 \times \frac{7}{14.62} \times 4.91$

$= 0.347$

Using 35mm ϕ (HS steel peg)

$f_b = \frac{0.347 \times 10^6}{0.0982 \times 35^3} = 82.6 MPa, < 262 \times 1.33 \text{ MPa}$

Note:- Depth of peg to be determined on site by experience and testing

Checked .....
Date .....

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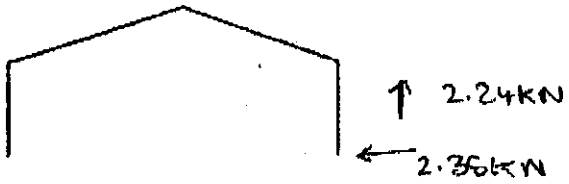
Computations

Job No. 962620 Sheet No. 10

Eng. GNW Date. Feb 2000

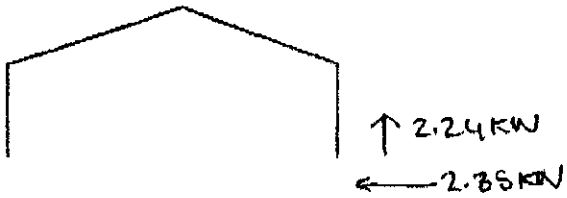
LOADS (with sides of tent up)

Terrain Category 3 & 4



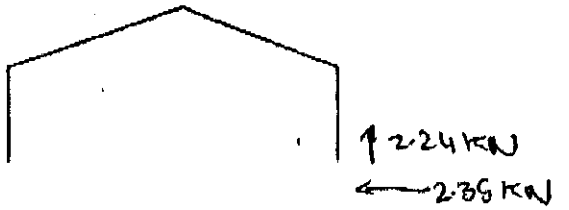
Allowable wind speed = 25.37 m/sec

Terrain Category 2



Allowable wind speed = 23.61 m/sec

Terrain Category 1



Allowable wind speed = 20.26 m/sec

Checked .....

Date .....

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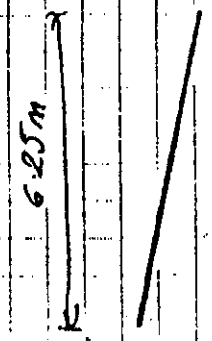
Computations
Job No. 9x262D Sheet No. 11*
Eng. JMW Date. Feb 2001

QUARTER POLE DESIGN



100 mm dia x 6mm thick base plate.

100 dia x 2.8

$A = \frac{\pi}{4}(75^2 - 71.8^2) = 368 mm^2$

$r_x = \frac{1}{4}\sqrt{75^2 + 71.8^2} = 25.9$

$\frac{L}{r} = \frac{6250}{25.9} = 240.7$

$\Rightarrow F_{ac} = 15 MPa$

Area supported $= \frac{12.9}{2} \times 4 = 25.8 m^2$

Mass PVC $= 0.01 \times 25.8 = 0.258 kN$

From Safe Load tables capacity of 75 dia x 1.6 mm CHS
$= 5.53 kN$

Base plate bearing pressure $= \frac{0.258 \times 10^3}{\pi \times \frac{100^2}{4}} = 0.033 kPa$

OK

Checked .....
Date .....

DESIGN

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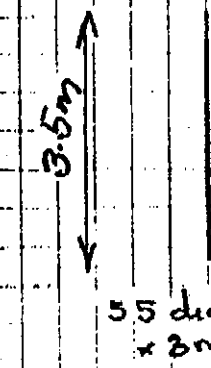
Computations
Job No. 96262D Sheet No. 12
Eng. RNW Date. Feb 2000

SIDE POLE DESIGN



Joined with 6mm ϕ bolts

50 ϕ x 2.6

$A = \frac{\pi}{4}(50^2 - 46^2) = 3016 mm^2$

$r_x = \frac{1}{4}\sqrt{50^2 + 46^2} = 16.98$

$\frac{L}{r} = \frac{3500}{16.98} = 206$

$F_{sc} = 20 MPa$

Area supported = $\frac{12.9}{2 \times 2} \times 1.95 - \frac{12.6}{2} m^2$

Mass PVC = $0.01 \times \frac{12.6}{2} = 0.125 kN = 0.063k$

From safe load tables capacity of 50 ϕ x 2.0mm

C.H.S = 6.0 kN

allow for wa

Base plate bearing pressure = $\frac{0.063 \times 10^3 \times 2}{\pi \times \frac{55^2}{4}}$

= 0.052 kPa O.K.

Checked .....

Date .....

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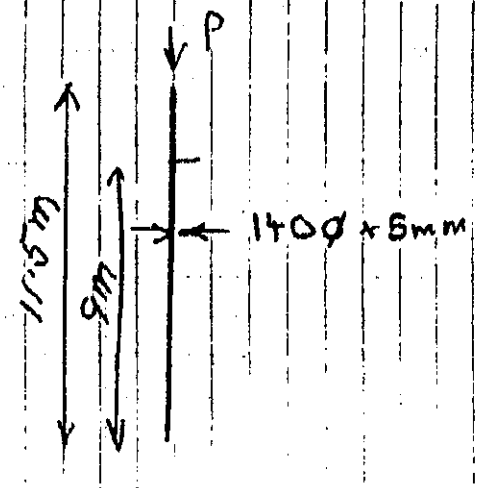
Computations

Job No. 960620 Sheet No. 13

Eng. RNW Date. Feb 20

CENTRE POST DESIGN



$A = 2120\ mm^2$

$r = 47.7\ mm$

effective length 9m

$P_{comp} = 50.3\ kN$

$M_{comp} = 8.92\ kNm$

Base plate 140ϕ x 400 long

$P \approx 3\ kN$ OK.

JTM

Checked .....

Date .....

1990

AP

Appendix A6

DESIGN

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215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0601
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PROC: E1(A1)
JUNE 1994

COMPUTATIONS

PROJECT NO: 972084
DATE: Feb 2000

PROJECT TITLE

Cupola Style 4-Pole Big Top
36m dia
for
Janlin Circuses Pty Ltd

ARCHITECT

REFERENCES

AS 1170
AS 4100
AS 3900

ENGINEER I David Wills
Registered Building Practitioner EC-1043

Signature: David J. Wills

Date: Feb 2000

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 181147
The Institution of Engineers, Australia

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

PROC E1

1992

AAA

DESIGN

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Computations

Job No. 972068 Sheet No. .....

Eng. GW Date. .....

TABLE OF CONTENTS

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

Checked .....

Date .....

1993

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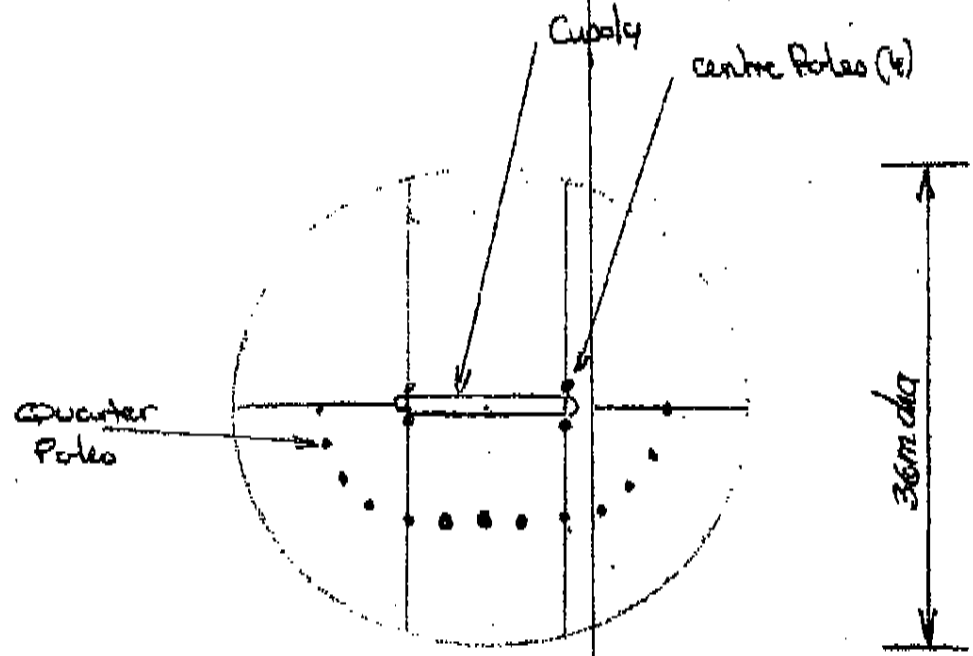
Computations

Job No. 972044 Sheet No. 1

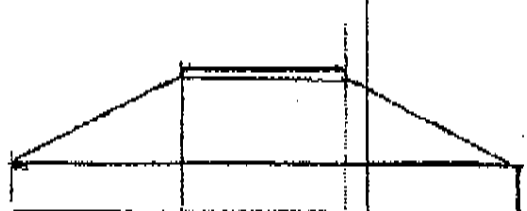
Eng. GW Date. Feb 2000



Roof Plan

Note:- The tent should be evacuated under the following conditions

(1) Terrain Category 3 when wind speed reaches 32.7 m/sec (60 km/h
(2) " " 2 " " " " 27 m/sec (53 km/h
(3) " " 1 " " " " 23 m/sec (45 km/h



Elevation

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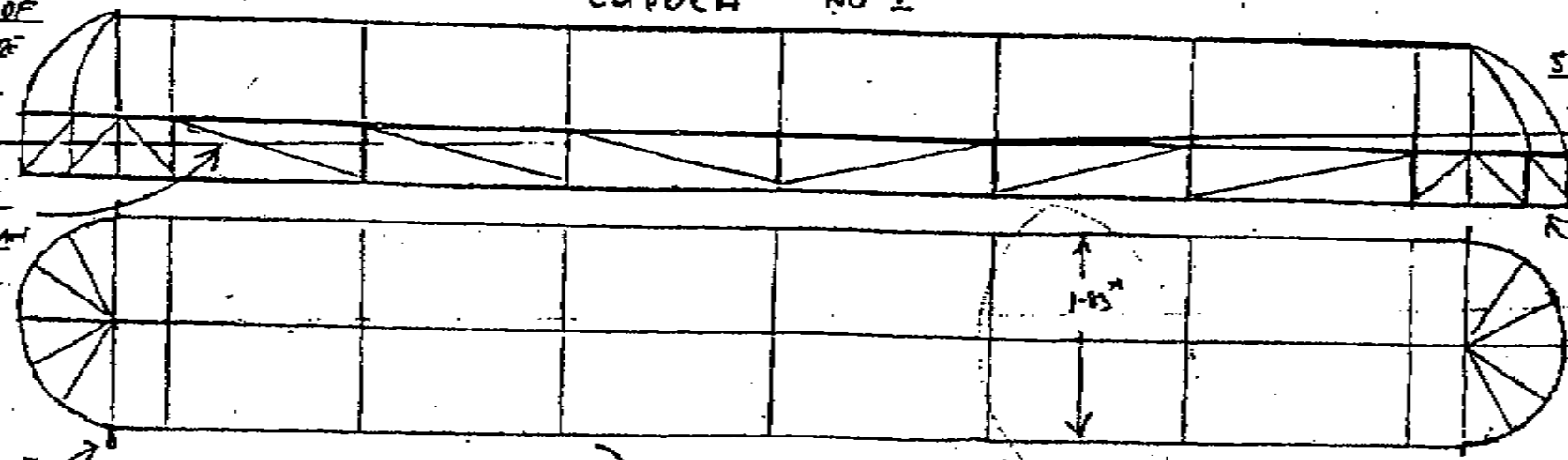
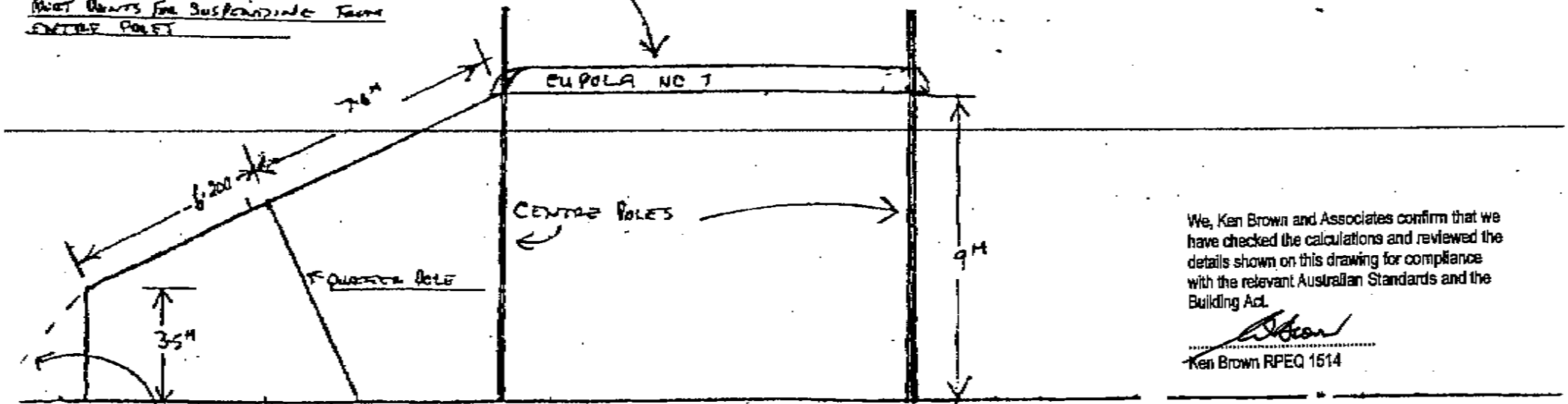
CUPOLA NO 2





We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

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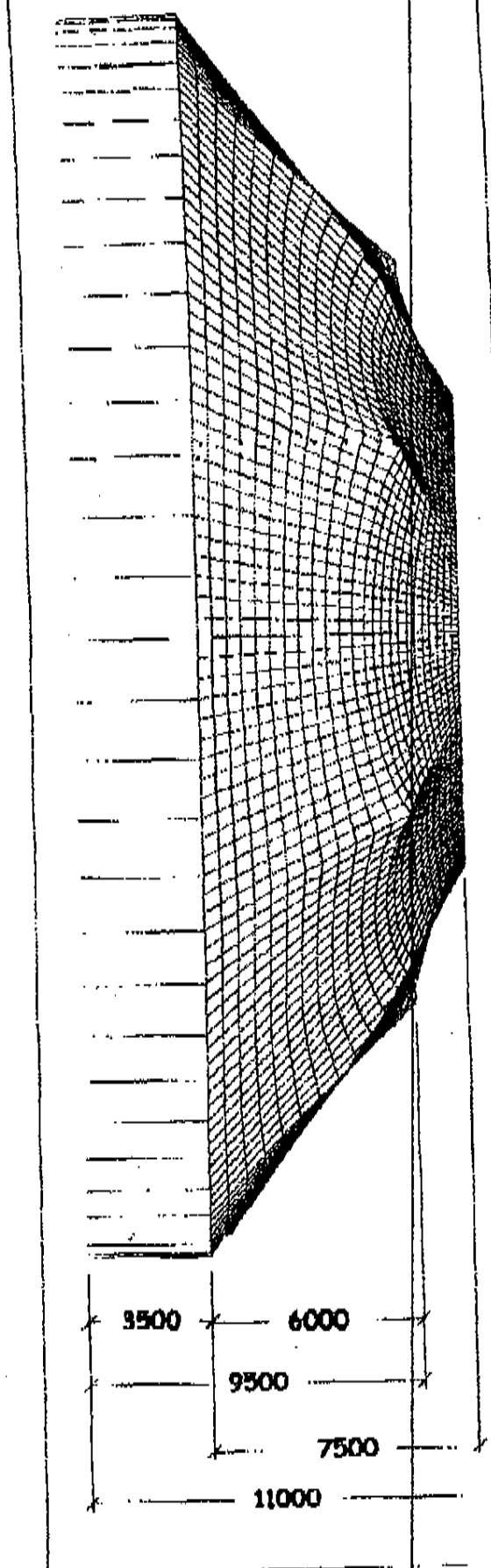
CUM STRAPS 3 TONNE CAPACITY

CENTRE POLES (OFF) 11.5M LONG
DIAM 140MM x 5MM WALL

QUARTER POLES
DIAM. 100MM x 2.6MM WALL

SIDE POLES
DIAM 50MM x 1.6MM WALL

12M 12M



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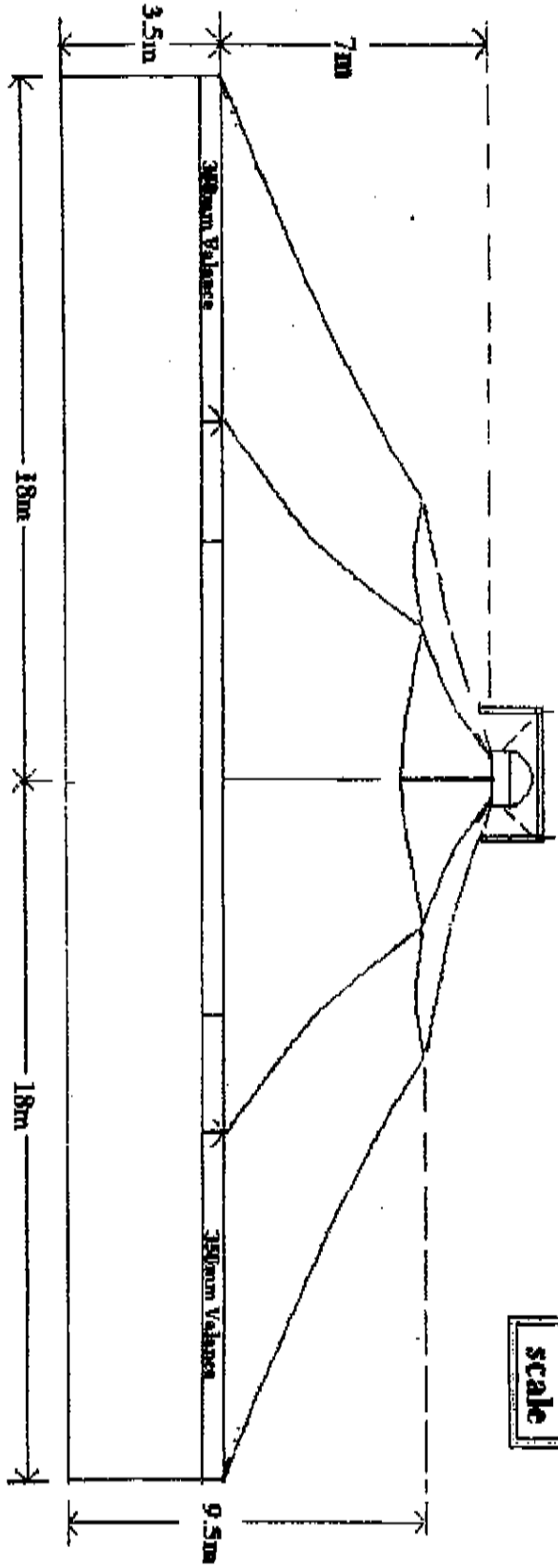
1996



END VIEW 36m TENT 8 QUARTER POLES

Not to scale

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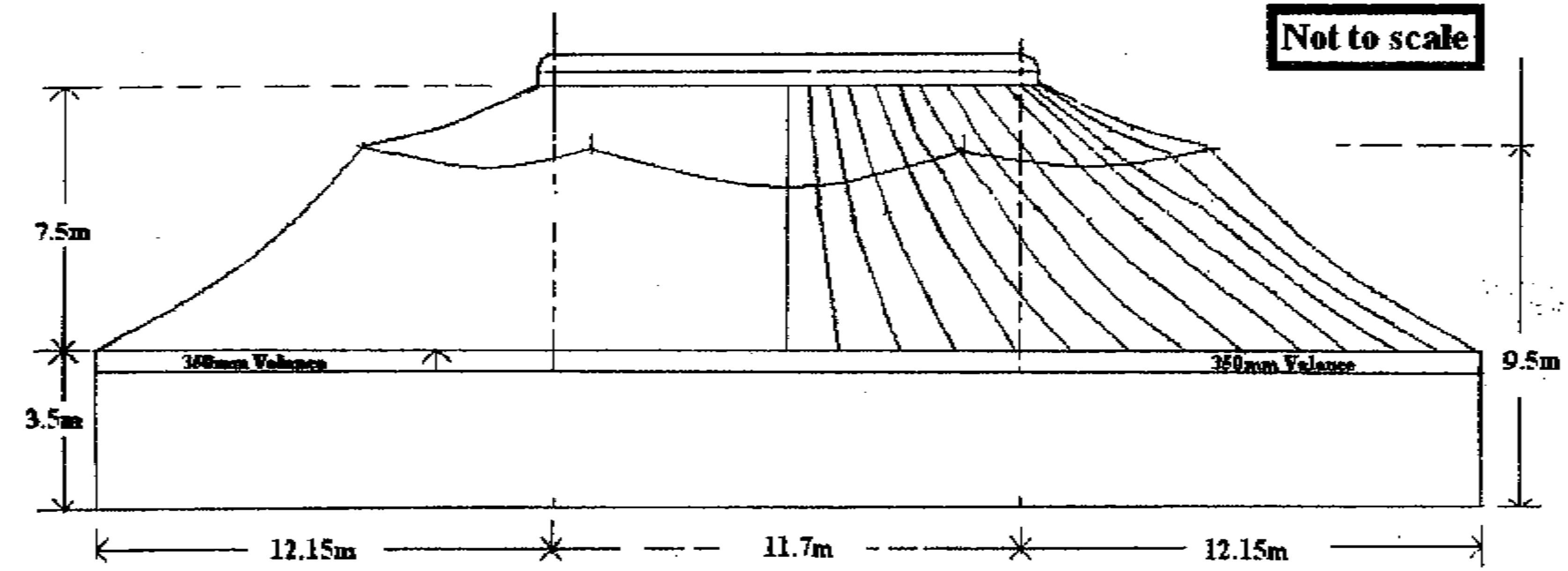
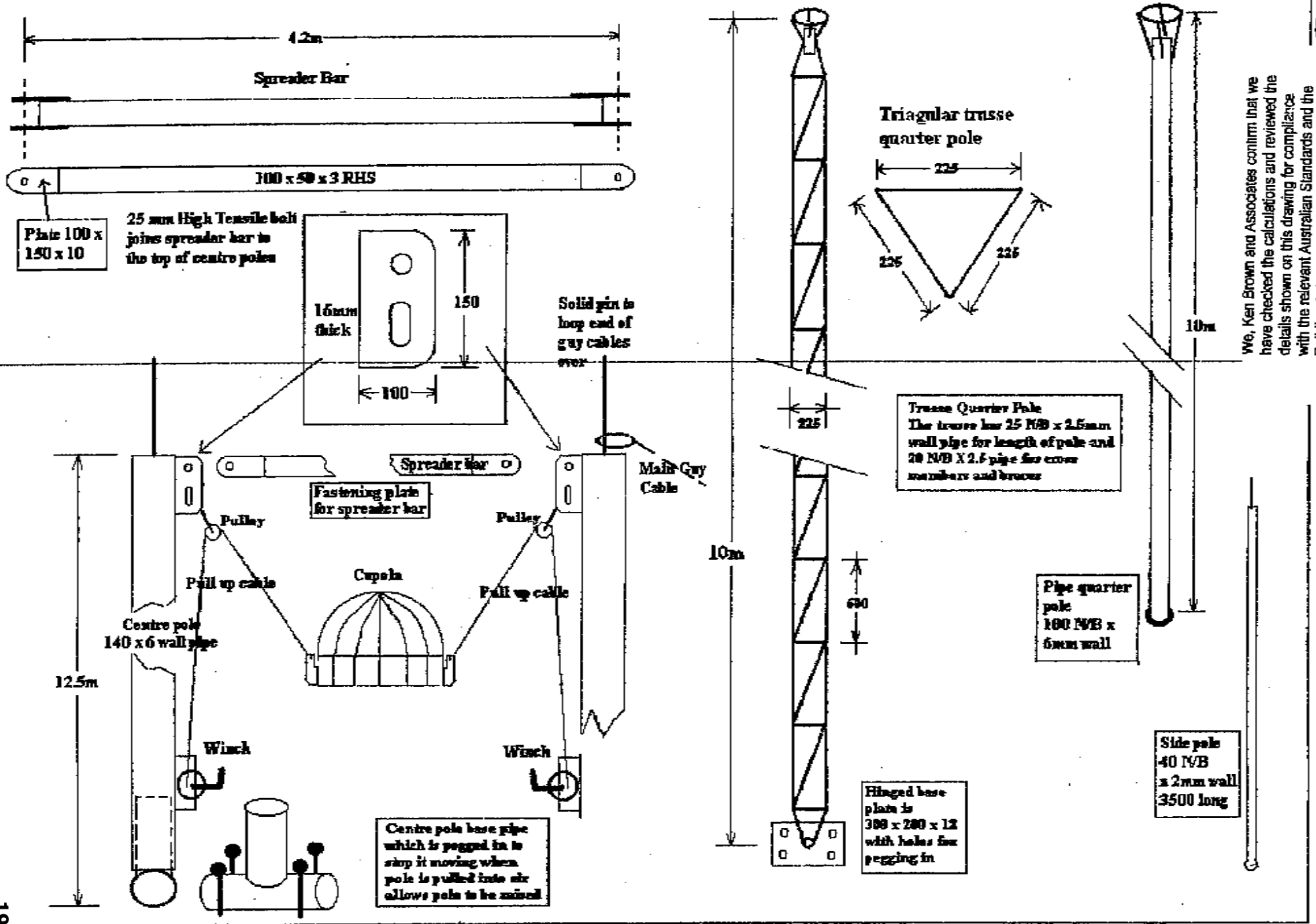
SIDE VIEW 36m TENT 8 QUARTER POLES

Not to scale



1997



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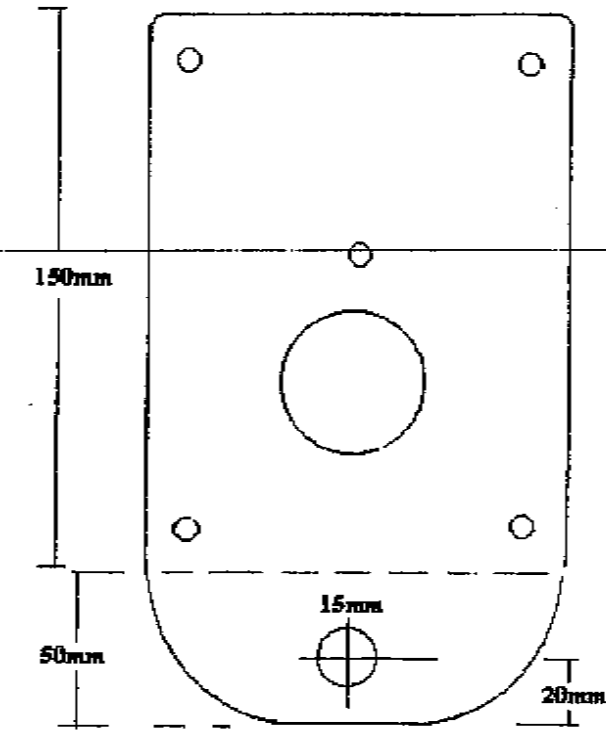
1998

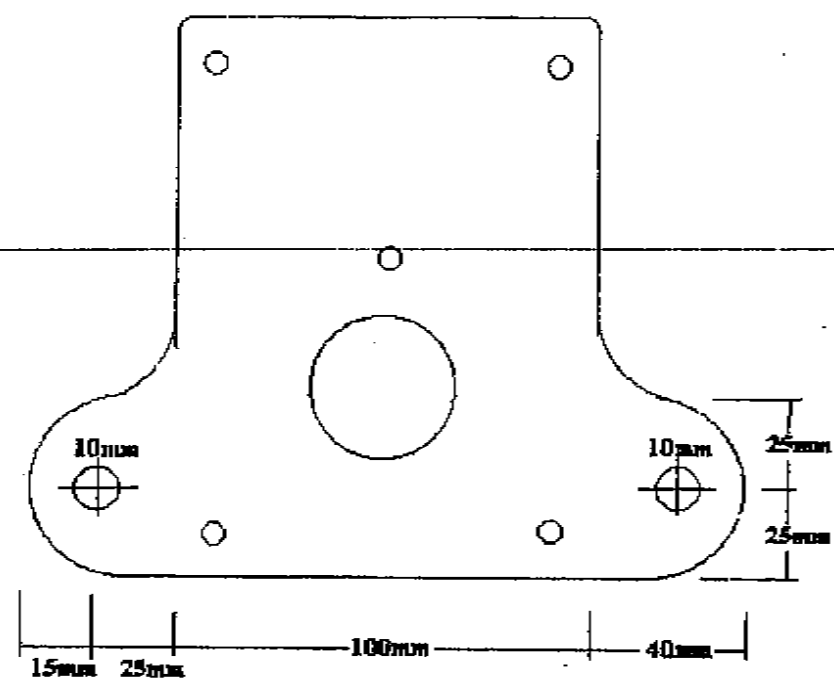
4
A

SIDE POLE PLATES

Top plate



Bottom plate



Stardust Circus

12 Byloss St Chester Hill 2162

0418 238881 Lindsay Lennon

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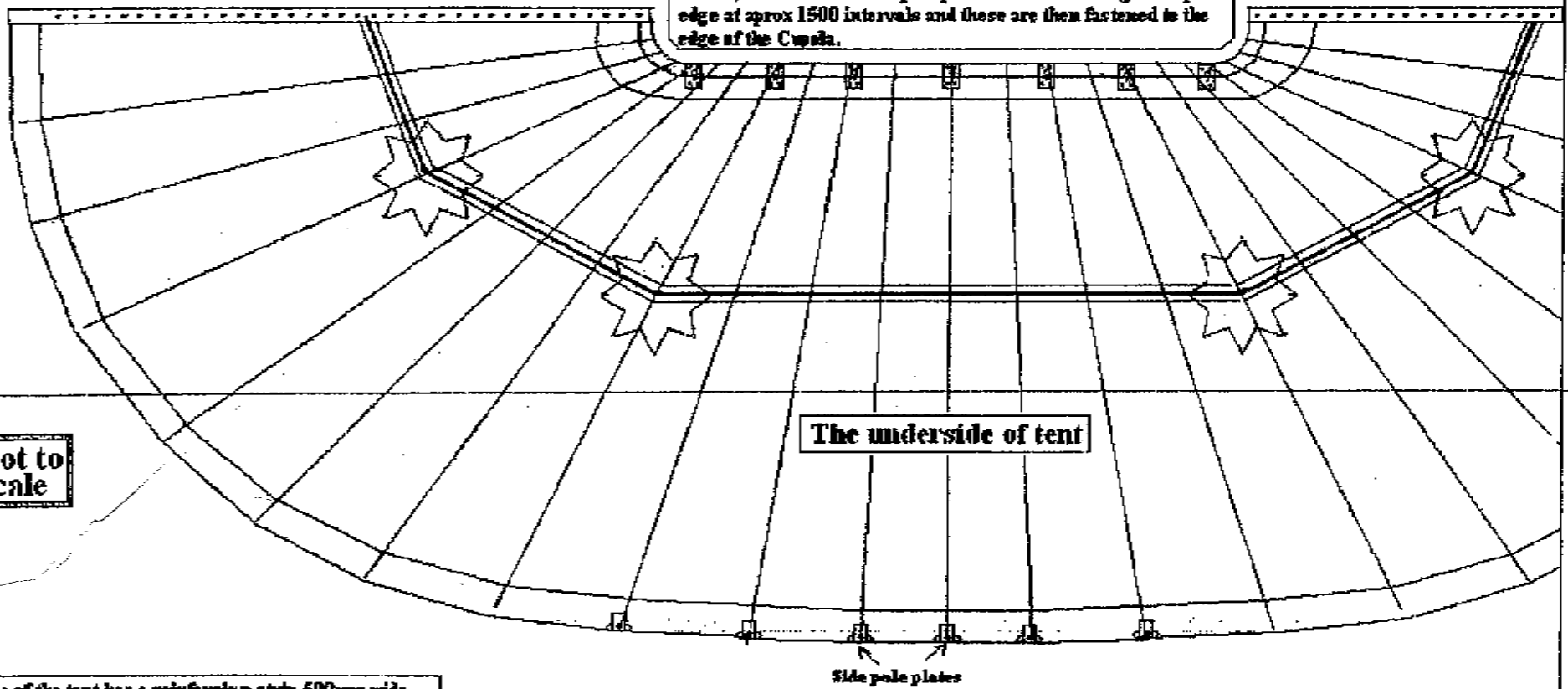
1999

(6)

Lacing strip with loops of rope 20cm apart thread through corresponding strip from the other section of tent

The top edge of the tent is reinforced with a 900 wide strip of material, plus another 2 layers of material close to the edge. Plates, similar to the side pole plates are bolted along the top edge at aprox 1500 intervals and these are then fastened to the edge of the Cupola.



Not to scale

The edge of the tent has a reinforcing strip 500mm wide welded on to help distribute the strain.

The panels are welded together with a 50mm overlap.

The outer edge where the side plate are bolted have 2 pieces of webbing sewn in to reinforce the main pulling points

The side pole plates are bolted in with 5 seperate bolts.

A cable is attached between each plate to create a strong rimrope situation.

A stormband reinforcement sleeve is welded on the underneath of the tent between the quarter poles.

A webbing tie down strap is inserted into the sleeve and fastened to a steel plate that is bolted into the reinforced quarter pole position creating a strong storm band.

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

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The tent is constructed in 2 pieces and has a heavily reinforced lacing at each end which secured them together.

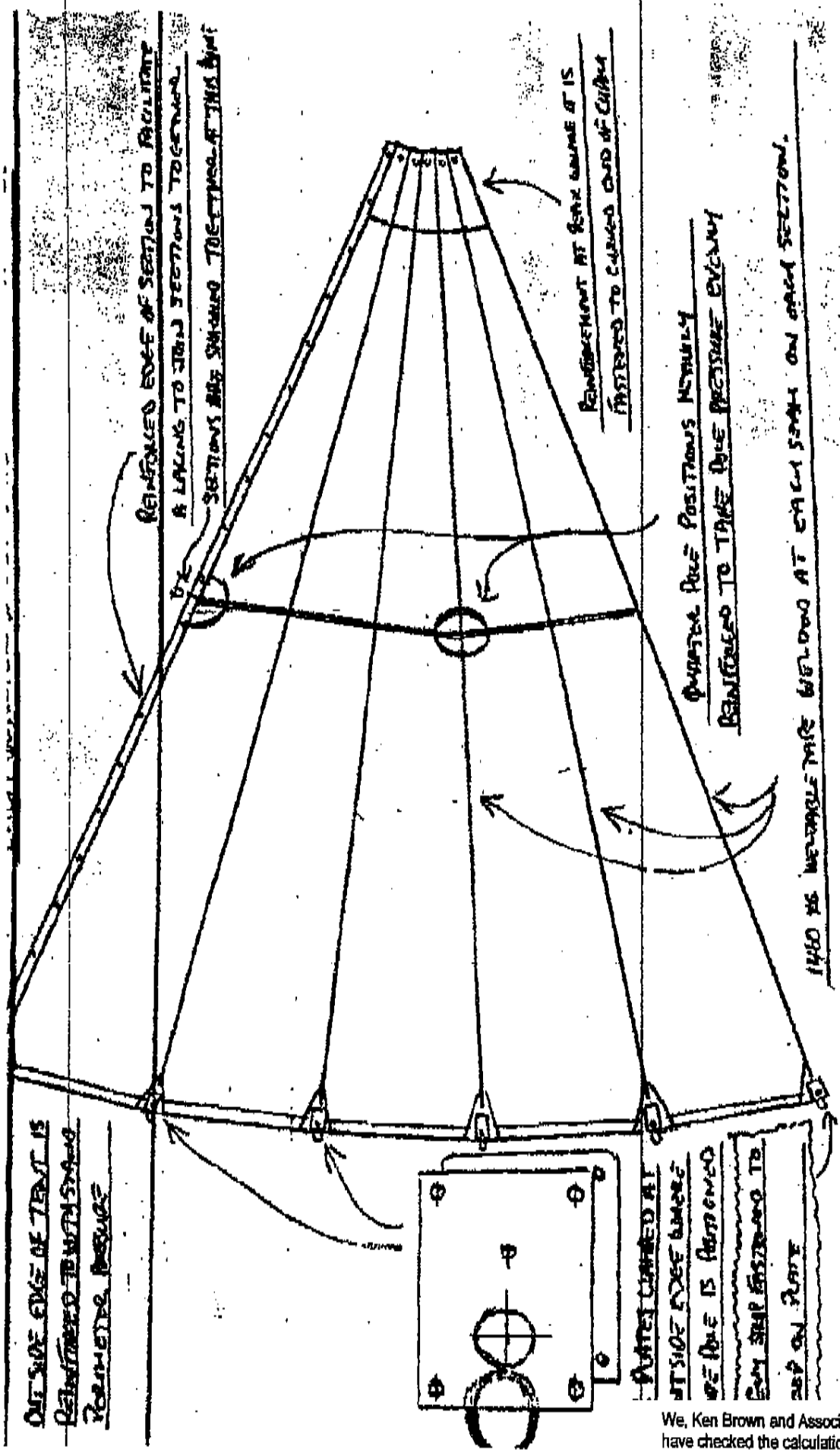
The guy straps at the outside edge of the tent are tie down webbing with a 3000kg rating.

Ratchets with straps connecting to pegs are then attached to the guy straps and tighten out the tent.

Centre poles are held in place by Main Guys that are attached to ratchet chain blocks to keep them in place and secure.

Winches are used to pull the tent up by means of cables running through pulleys at top of the centre poles and down to the Cupola.

2000



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2002

(4)

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Computations
Job No. 972080 Sheet No. 4
Eng. GNV Date. Nov-97

Wind Loading

From AS1170

V_p = 41 m/sec from West

Terrain Category 3 and 4

$V_z = V M_{z,cat} M_s M_t M_i$

$= 41 \times 0.75 \times 1 \times 0.8$ — Less than 6 months use.

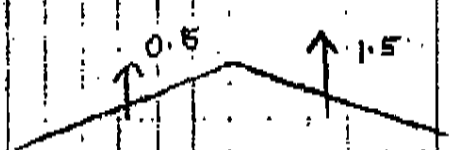
$= 24.6$ m/sec.

$q_z = 0.6 \times 24.6^2 \times 10^{-3}$

$= 0.363$ kPa

31°

Worst Case when sides are up and blocked underneath



Average = 1

Wind Load on roof = 1.0×0.363 kPa

$= 0.363$ kPa

Terrain Category 2

Wind Load = $\left(\frac{0.91}{0.75}\right)^2 \times 0.363 = 0.5285$ kPa

Terrain Category 1 = $\left(\frac{1.05}{0.75}\right)^2 \times 0.363 = 0.7119$ kPa

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

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2003

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Computations
Job No. 99206A Sheet No. 5
Eng. GW Date. Nov 3

3.1.4 Terrain category. Terrain, over which the approach wind flows towards a structure, shall be assessed on the basis of the following category descriptions

(a) Category 1—exposed open terrain with few or no obstructions and water surfaces

(b) Category 2—open terrain, grassland with few well scattered obstructions having heights generally from 1.5 m to 10.0 m

(c) Category 3—terrain with numerous closely spaced obstructions having the size of domestic houses (3.0 m to 5.0 m high).

(d) Category 4—terrain with numerous large, high (10.0 m to 30.0 m high) and closely spaced obstructions such as large city centres and well-developed industrial complexes.

Selection of terrain category shall be made with due regard to the permanence of the obstructions which constitute the surface roughness, in particular vegetation in tropical cyclonic regions shall not be relied upon to maintain a wooded terrain roughness.

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

(6)

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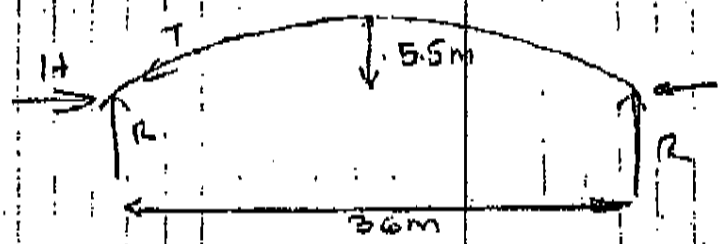
Computations
Job No. 97205A Sheet No. 6
Eng. KBN Date. Nov'97

PVC Covering



$H = \frac{0.363 \times 36^2}{8 \times 5.5} = 10.692$ KN/m

$R = 0.363 \times \frac{36}{2} = 6.53$ KN

$T_{max} = H(1 + 16\theta^2)^{1/2}$ $\theta = \frac{5.5}{36}$

$= 12.53$ KN (Tensile load on fabric per m)

Capacity of Tearstrip $= \frac{2.4}{0.050} \times \frac{1}{6}$ ← factor of safety

$= 8.0$ KN

Allowable wind speed $\left(\sqrt{\frac{8}{12.53} \times \frac{0.363 \times 10^3}{0.6}}\right)^{\frac{1}{0.75+0.8}} = 32.70$ m/sec *

Terrain Categ 2 allowable wind speed

$= \left(\sqrt{\frac{8}{12.53} \times \frac{0.363}{0.5285}}\right)^{41} = 27.15$ m/sec *

Terrain Categ 1 allowable wind speed

$= \left(\sqrt{\frac{8}{12.53} \times \frac{0.363}{0.7115}}\right)^{41} = 23.40$ m/sec *

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

2004

(1)

BIRKMYRE

PVC 650 TEAR PROOF

Width: 188 cm
Base Cloth: 1100Dtex Polyester 9x9
Weave: Tear Stop
Weight: 625 gm/mt² (min.)
625 - 700 gm/mt² (typical value)
Finish: Fire Retardent P.V.C. coated
with maximum U.V. absorbers
Tensile Strength: 2600 N/5cm warp
(AS2001.2.3) 2400 N/5cm weft
Tongue Tear: 640 N warp
(BS3424.7B) 550 N weft
Coating Adhesion: 80 N/5cm (min.)
Flex Cracking Resistance: 400,000 cycles (min.)
Cold Crack Temp.: Minus 20°C
Roll Lengths: 45mt/roll

Colours: (in order of appearance)
Red R134 — Light Blue N250 — Emerald G198
Yellow C77 — Orange R83 — Royal N198
White W7 — Olive G163 — Green G161
Cherry R102 — Blue N38 — Brown B297
Black 2

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

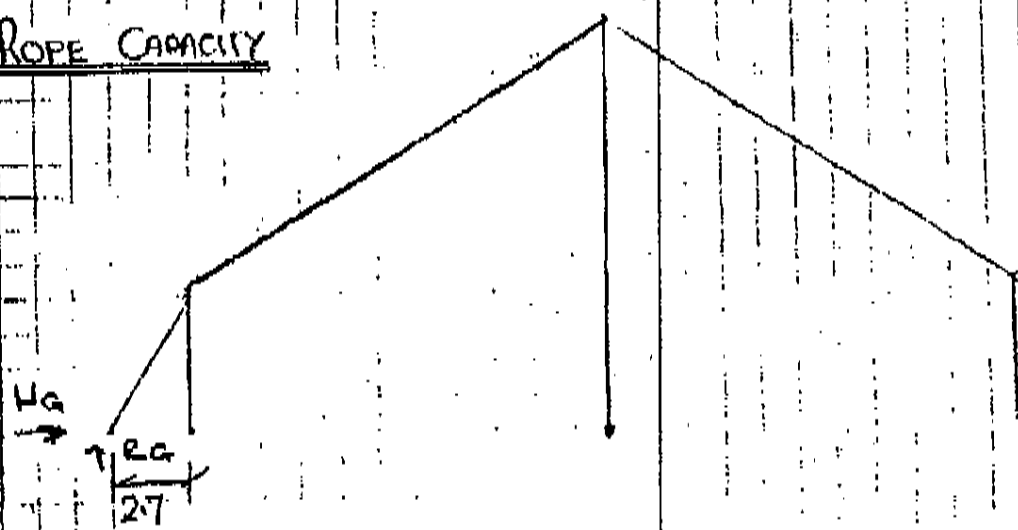
.....
Ken Brown RPEQ 1514

2005

DESIGN PROJECT GROUP PTY LTD
CONSULTING ENGINEERS A.C.N. 054160317 (Inc. in Vic.)
215 Albert Street, Brunswick 3056
Telephone: (03) 388 0801
Fax: (03) 388 2121

Computations
Job No. 9NORA Sheet No. 8
Eng. KBN Date. Nov'07

ROPE CAPACITY



$R_A = 6.53$ KN/m

$H_a = 0.363 \times \frac{41.4^2}{8 \times 9} = 8.64$ KN/m

$T_{max} = H(1 + 16\theta^2)^{\frac{1}{2}}$ $\quad \theta = \frac{9}{41.4}$

$= 11.45$ KN/m

∴ Load per rope = $11.45 \times 1.95 = 22.33$ KN

Use 3 tonne (30 KN) capacity straps

Terrain Categ 2 Load per rope = $\frac{0.525}{0.363} \times 22.33 = 32.31$ KN
OK for velocity up to $\sqrt{\frac{30}{32.31}} \times 41 = 39.38$ m/sec

Terrain Categ 1 Load per rope = $\frac{0.715}{0.363} \times 22.33 = 43.98$ KN
OK for velocity up to $\sqrt{\frac{30}{43.98}} \times 41 = 33.86$ m/sec

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

2006

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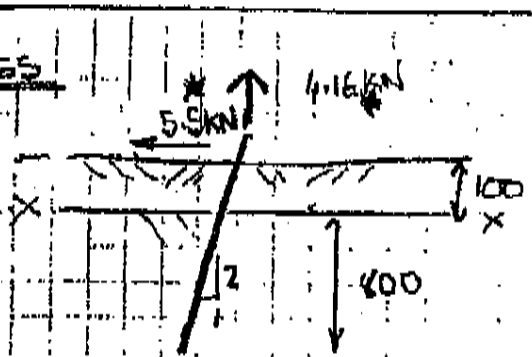
Computations
Job No. 972044 Sheet No. 9
Eng. DIW Date. Nov-5

* PVC critical
p.6 of calcs

PEGS



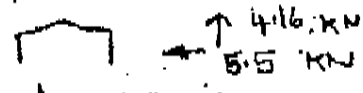
Moment in peg = 0.05 x 4.16 + 0.1 x 5.5 = 0.758 kNm

smallest peg 35 mm ϕ (HS steel) $f_b = \frac{0.758 \times 10^6}{0.0982 \times 35^3} = 180$ MPa < 210 MPa ok

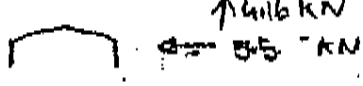
NOTE:- Depth of peg to be determined on site by experience and testing

Loads (with sides of marquee up.)

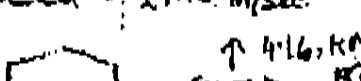
Terrain Category 3 & 4
Allowable wind speed = 32.7 m/sec



Terrain Category 2
Allowable wind speed = 27.15 m/sec.



Terrain Category 1
Allowable wind speed = 23.4 m/sec



We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

2007

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CONSULTING ENGINEERS A.C.N. 064160917 (Inc. in Vic.)
215 Albert Street, Brunswick 3056
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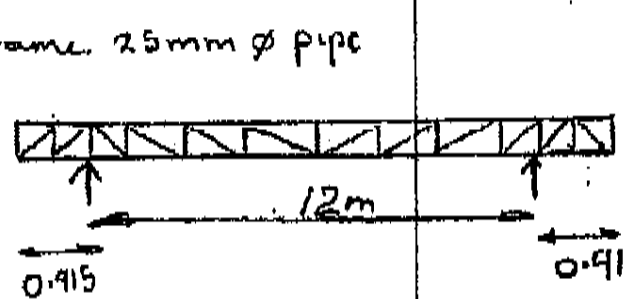
Computations
Job No. 97208 Sheet No. 10
Eng. KMW Date. Nov 97

CUPOLA DESIGN

Top Frame. 25mm ø pipe



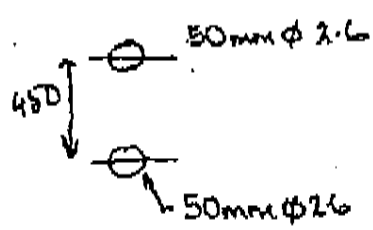
centre cupola (No.2)

Truss chords 50mm ø pipe x 2.6 thick
Braces 35mm ø pipe

Self wt of cupola ? (½ cupola)

Top Chord	3.5 kg/m
Bott Chord	3.5
Web members	5.0
Top frame	6.0
	20.0 kg/m ≈ 0.2 kN/m

Wt of canvas /m = 0.01 x 10 = 0.1 kN/m



$I = 367 \times 450^2 = 78,367,500$
$Z = 348800$
$r_x = 16.78$ mm
} Truss Properties

Truss

Moment $= 0.3 \times \frac{12^2}{8} = 5.4$ kNm ∴ Chord Force $= \frac{5.4}{0.45} = 12$ kN

Allowable chord force $\frac{L}{r_{xx}} = \frac{2000}{16.78} = 119$ Pall = 19.2 kN OK

Diagonal Force $= 1.8 \times \frac{2.05}{0.45} = 8.2$ kN (T) OK. 0.45 $\frac{2.05}{2}$

Vert Strut max force = 1.8 kN OK.

Δ Truss $= \frac{5}{384} \times \frac{0.3 \times 12000^4}{2 \times 10^5 \times 78367800} = 5.16$ mm OK

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

2008

DESIGN PROJECT GROUP PTY LTD
CONSULTING ENGINEERS A.C.N. 084150917 (Inc. In Vic.)
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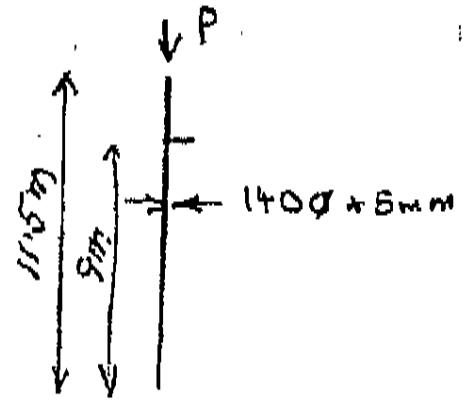
Computations

Job No. 9720sA Sheet No. 11

Eng. GMW Date. Nov 07

CENTRE POST DESIGN



Base plate 140ϕ x 400 long

$A = 2120\ mm^2$

$r = 47.7\ mm$

effective length 9m

$P_{comp} = 50.3\ kN$

$M_{comp} = 8.92\ kNm$

$P_{ab} = 0.3(6 + 6.6) = 3.75\ kN.$

OK

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

2009

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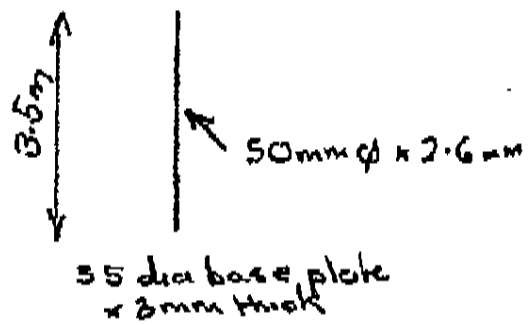
Computations

Job No. 9720 Sheet No. 12

Eng. SRW Date. Nov 07

SIDE POLE DESIGN



Joined with 6mm ϕ bolts

50 ϕ x 2.6

$A = \frac{\pi}{4}(50^2 - 44.8^2) = 381\ mm^2$

$r_x = \frac{1}{4}\sqrt{50^2 + 44.8^2} = 16.7\%$

$\frac{L}{r} = \frac{2500}{16.7\%} = 208$

$F_{sc} = 28\ MPa$

Area supported = $\frac{18}{2 \times 2} \times 1.95 = 8.775\ m^2$

Mass PVC = $0.01 \times \frac{8.775}{2} = 0.05\ kN$

From safe load tables capacity of 50ϕ x 2.6mm

C.H.S = 7.74 kN

allow for walls

Base plate bearing pressure = $\frac{0.05 \times 10^3 \times 2}{\pi \times \frac{55^2}{4}}$

$= 0.042\ kPa$ OK

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

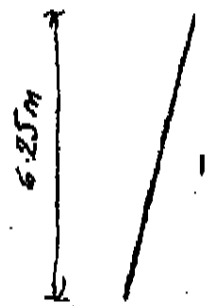
Ken Brown RPEQ 1514

2010

DESIGN
DESIGN PROJECT GROUP PTY LTD
CONSULTING ENGINEERS A.C.N. 054 169 917 (Ins. in Vic.)
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0601
Fax: (03) 9388 2121

Computations
Job No. 9720/6A Sheet No. 13
Eng. SMW Date. Nov 05

Quarter Pole Design



100 mm dia x 6 mm thick base plate.

100 dia x 1.6
$A = \frac{\pi}{4}(100^2 - 96.8^2) = 495$ mm
$r_x = \frac{1}{4}\sqrt{100^2 + 96.8^2} = 34.79$
$\frac{L}{r} = \frac{6250}{34.79} = 179.6$
$\Rightarrow$ Fac = 25 MPa

Area supported = $\frac{18}{2} \times 1.95 = 17.55\ m^2$
Mass PVC = $0.01 \times 17.55 = 0.1755$ kN
Fac = $\frac{0.1755 \times 1000}{495} = 0.36$ MPa O.K

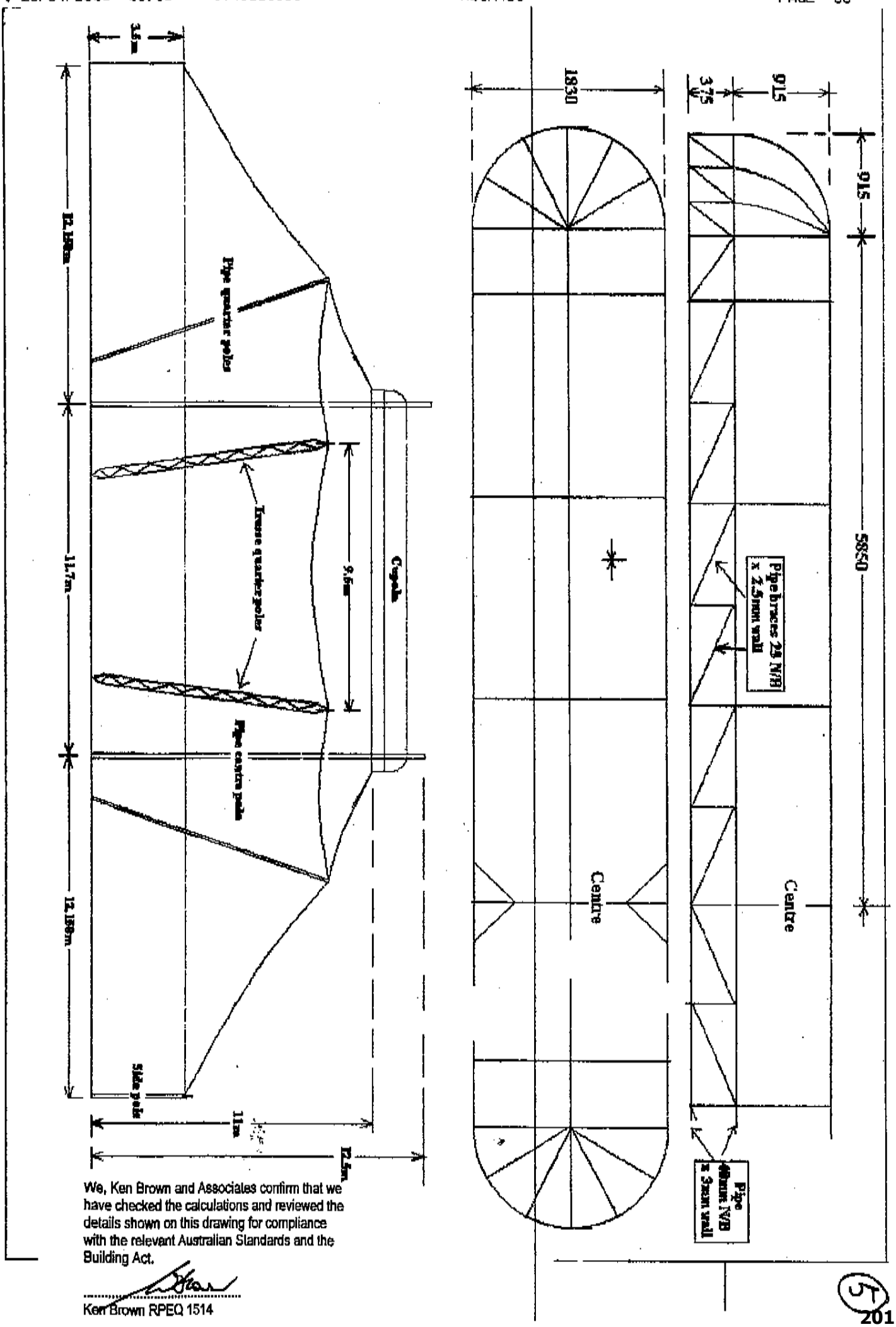
Bore plate bearing pressure = $\frac{0.1755 \times 10^3}{\pi \times \frac{100^2}{4}} = 0.022$ KPa

OK

We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

2011

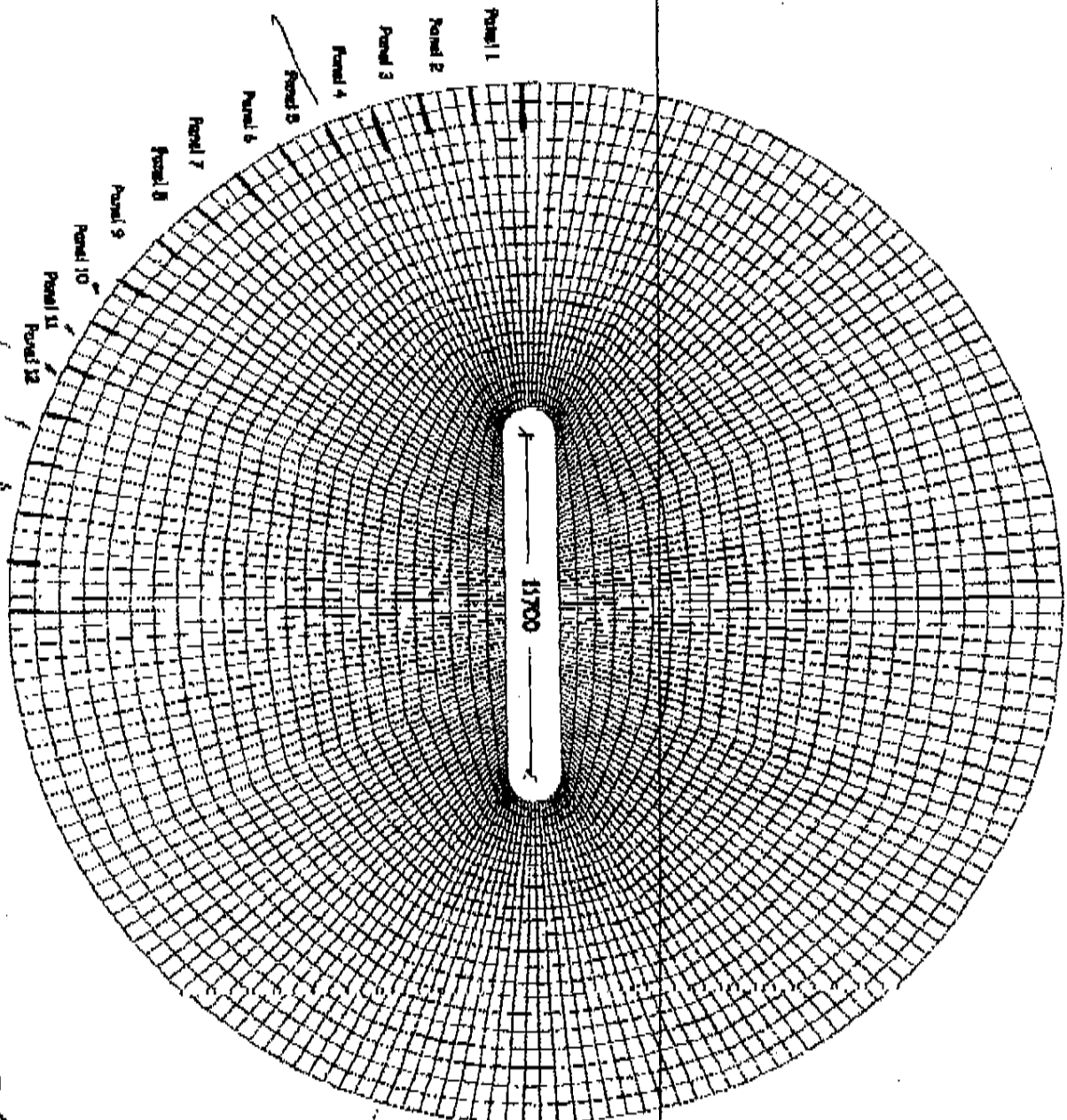


We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

5

2012



We, Ken Brown and Associates confirm that we have checked the calculations and reviewed the details shown on this drawing for compliance with the relevant Australian Standards and the Building Act.

Ken Brown RPEQ 1514

DESIGN PROJECT GROUP Pty Ltd
CONSULTING ENGINEERS A.C.N. 008777920
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

COMPUTATIONS

PROJECT NO: 03289
DATE: Oct '03

PROJECT TITLE 20m x 26·66m. Square End Tent with Round Corners for Janlin Circuses

ARCHITECT N/A.

REFERENCES AS1170
AS4100

ENGINEER

David J. Wills
MIEAust CPEng
Chartered Professional Engineer
Membership No. 181147
The Institution of Engineers, Australia
I E Aust

Signature: David J. Wills

Date: October '03

PROC E1

(1)

JANLIN CIRCUSES PTY LTD

ABN 29 069 720 225 12 Byloss St
Chester Hill 2162
Fax 0417655935
04180238881
3 Oct. 2003

DESIGN PROJECT GROUP

Att David Wills

Dear David,

I have enclosed three sheets of diagrams of a 20m x 26 m tent that does not have quarter poles in it.

(1) This tent relies on the curvatures of the roof panels to keep it taut thereby resisting movement in the wind.

(1a) The panels are directly linked in line across the tent and connected to side poles at the edge and tensioned by tie down straps and ratchets to pegs.

(2) The panels are welded together by overlapping the two panels by 50mm and and sandwiching a weldable webbing 48mm wide for a length off 1metre from edges of tent, into this seam.

(3) In the centre sheets the panels are 1.665m wide, 4 panels in each centre sheet.

(4) The corner sheets have 8 panels 1.75m wide at the outside, including the rounded corners, these all taper away to the peak.

(5) The tent is constructed in three sections which lace together, allowing it to be configured in three different layouts, 20m x 26.66m, 20m x 20m and 20m x 13.32m

(6) The ridge created through the top of dome has a webbing strip welded through it to withstand the pressure of the side and end panels pulling against it.

(7) The peak where the centre pole goes through is reinforced to withstand the strain placed on it.

(8) Guy straps are 2000kg x 50mm wide tie down straps with ratchets rated at 2500kg.

(9) The fastening points (pegs) are positioned 3m from the edge of the tent.

(10) Centre poles are 125 nominal bore x 5mm wall thickness

(11) Side poles are 3m x 75mm x 1.6 wall thickness.

(12) The height of the peaks are 11metres.

Thanking you

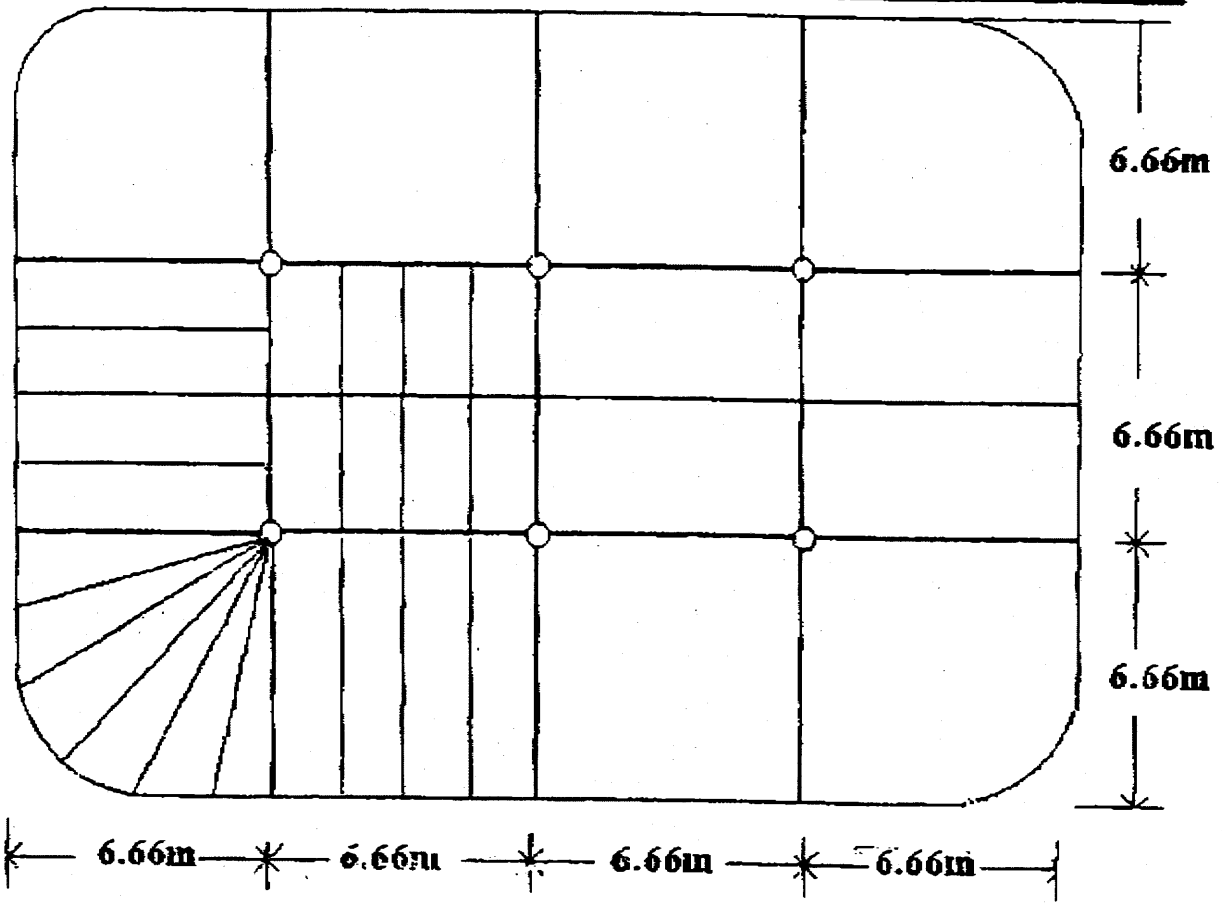
Lindsay Lennon

Note:- Tents have been designed for a wind speed of 41m/sec (80 knots) - subject to tie down being sufficient for tent. DWills

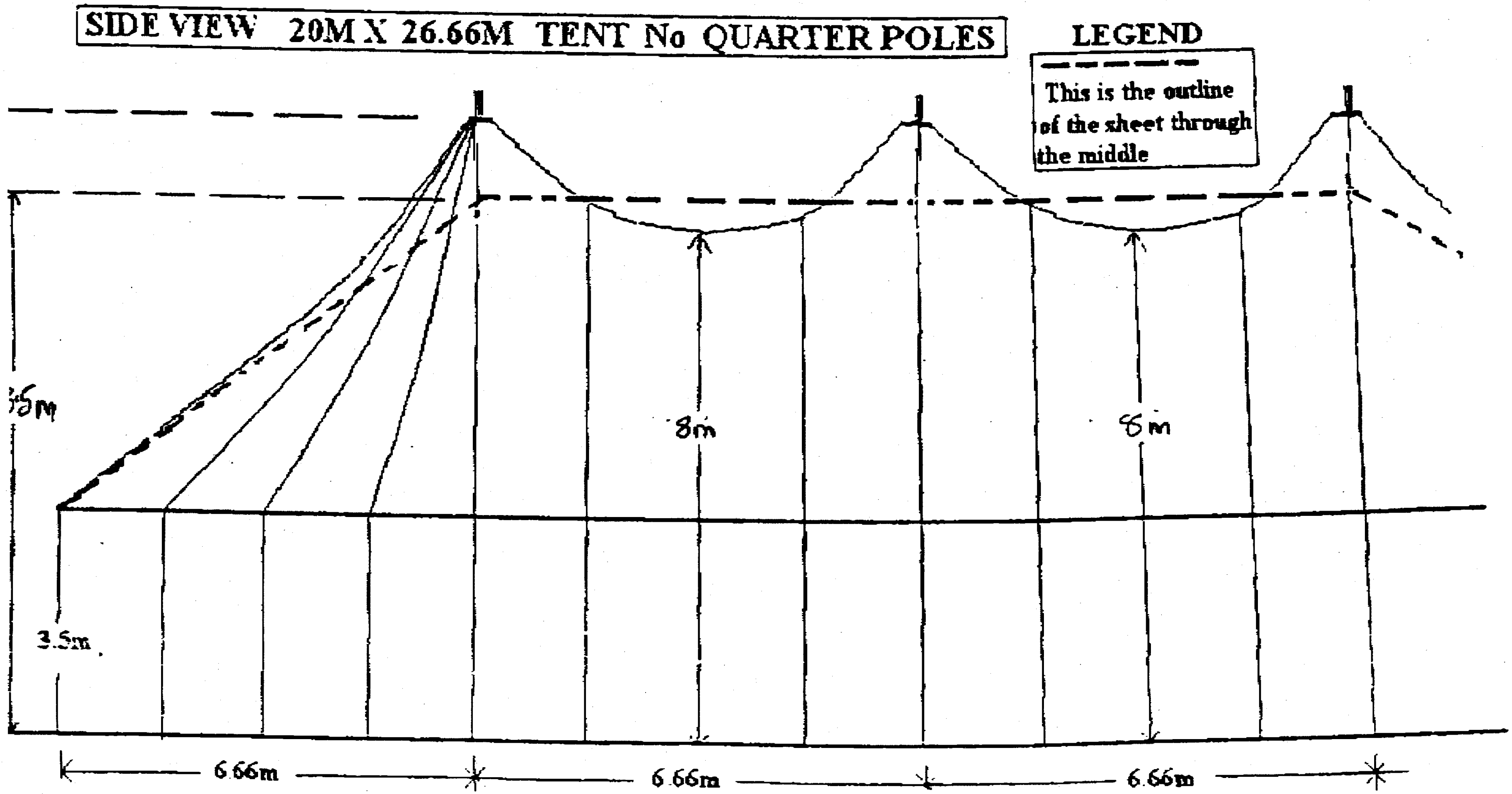
20m x 26.66m Square End Tent ROUND CORNERS

THIS TENT DOES NOT HAVE QUARTER POLES, IT RELIES ON THE HEAVY CURVATURE OF THE PANELS BETWEEN THE CENTRE POLES TO RUN WATER OFF AND CREATE A VERY TAUT ROOF TO WITHSTAND WINDS

Not to scale

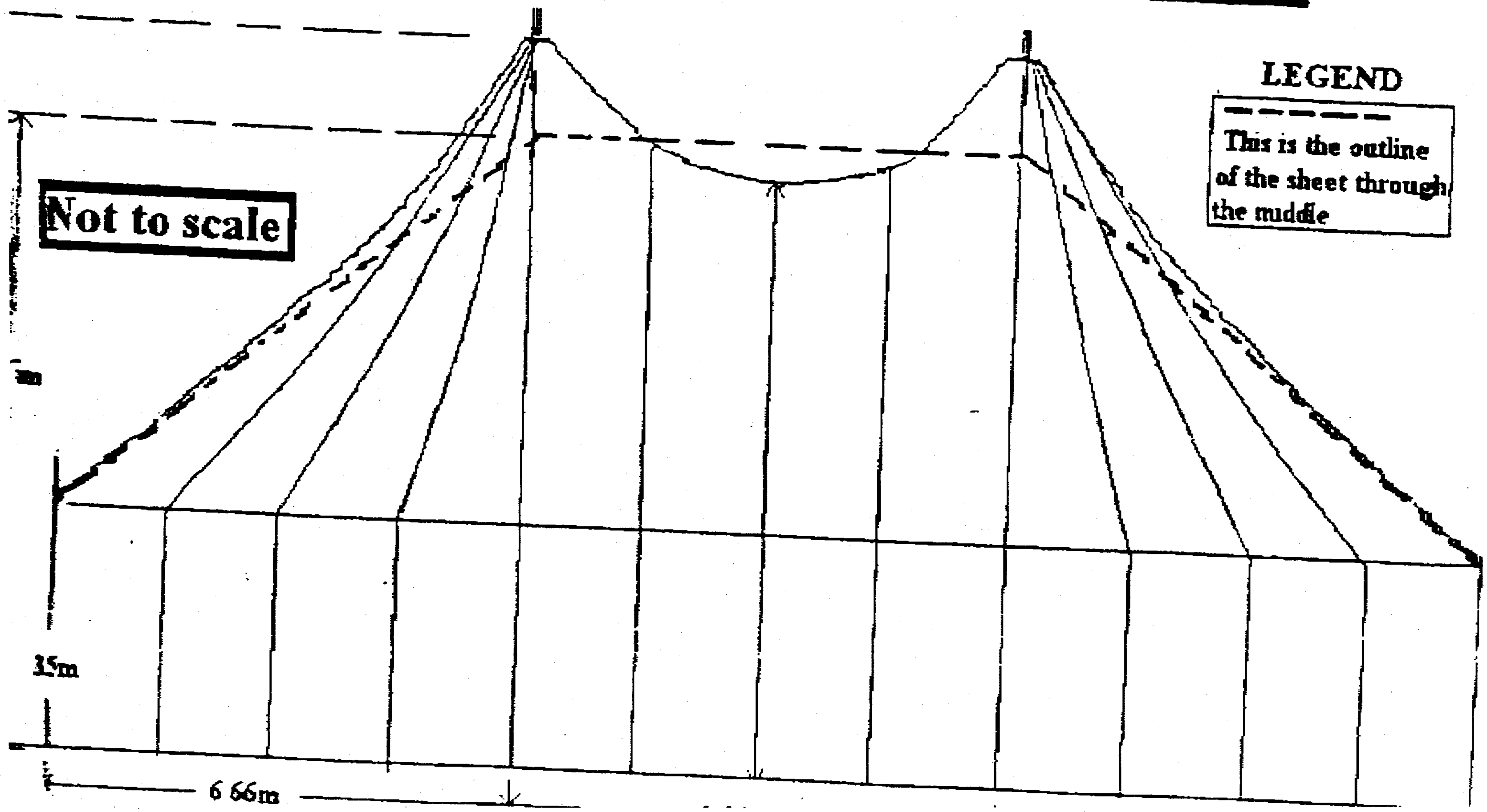


2017

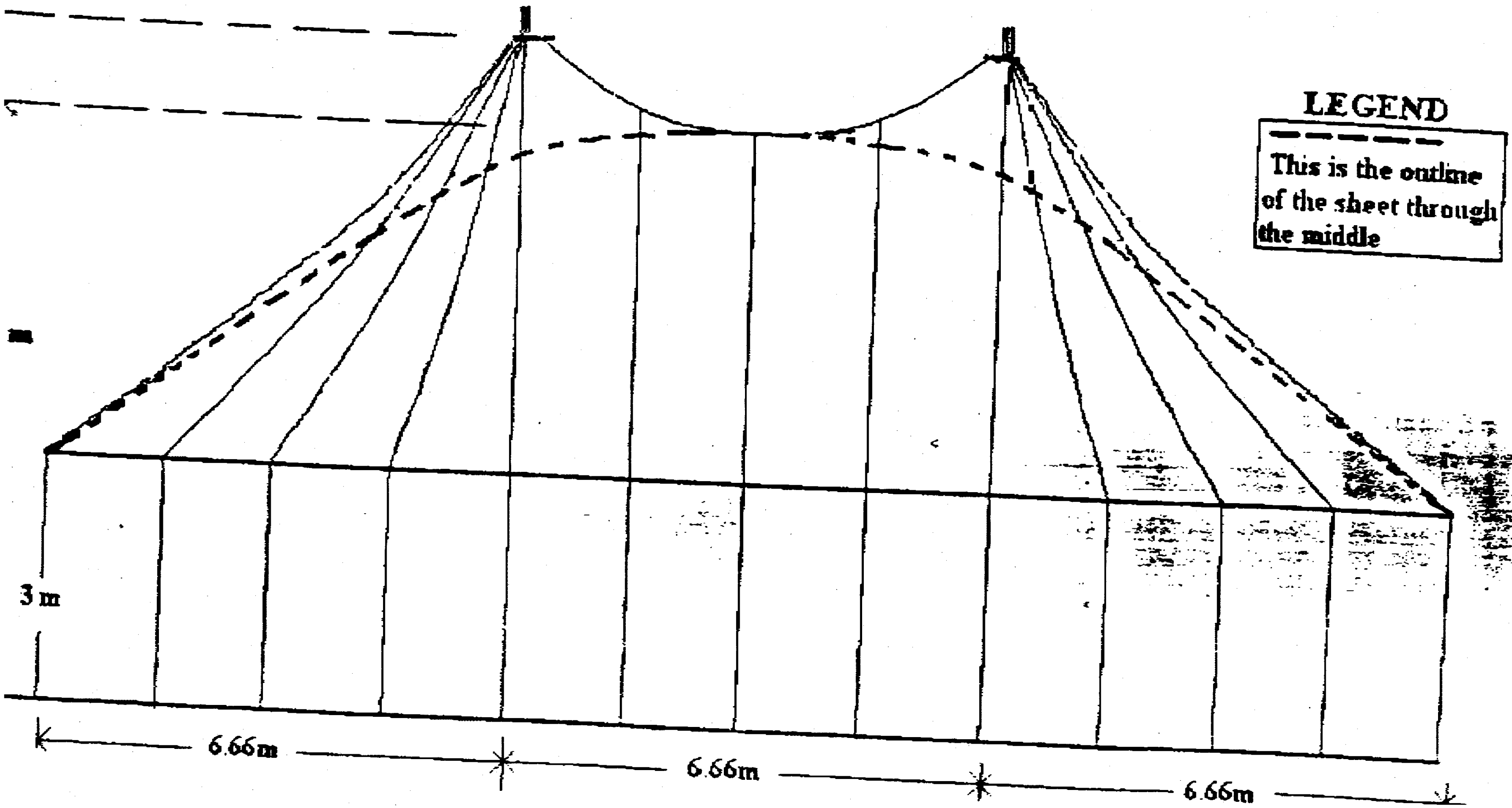

SIDE VIEW 20M X 26.66M TENT No QUARTER POLES
LEGEND
This is the outline of the sheet through the middle
3.5m
8m
8m
6.66m
6.66m
6.66m

(3)

SIDE VIEW 20M X 20M TENT No QUARTER POLES



END VIEW 20m x 26.66m TENT No QUARTER POLES



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CONSULTING ENGINEERS A.C.N. 006777920
215 Albert Street, Brunswick 3056
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Computations

Job No. 03284 Sheet No. 6

Eng. QW Date. Oct 03

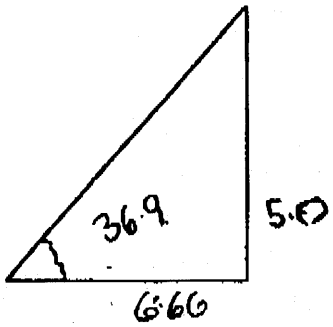
MARQUEES

WIND LOADING

From AS 1170

Vp = 41m/sec from West

TERRAIN CATEGORIES 3 AND 4



Vz = VMzcat.Ms Mt Mi

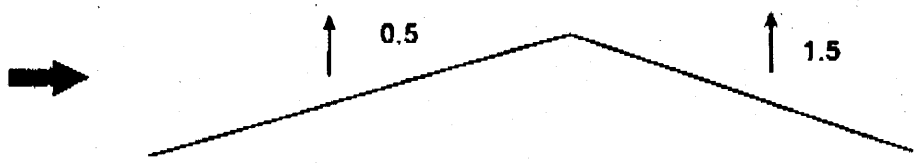
= 41 x 0.75 x 1 x 0.8

= 24.6 m/sec

qz = $0.6 \times 24.6^2 \times 10^{-3}$

= 0.363 kPa

Worst case when sides are up and blocked underneath



Average = 1

Therefore wind load on roof = 1 x 0.363 kPa

= 0.363 kPa

TERRAIN CATEGORY 2 ¢ \

Wind Load = $(0.91 / 0.75)^2 \times 0.363 = 0.5285$ kPa

Checked .....

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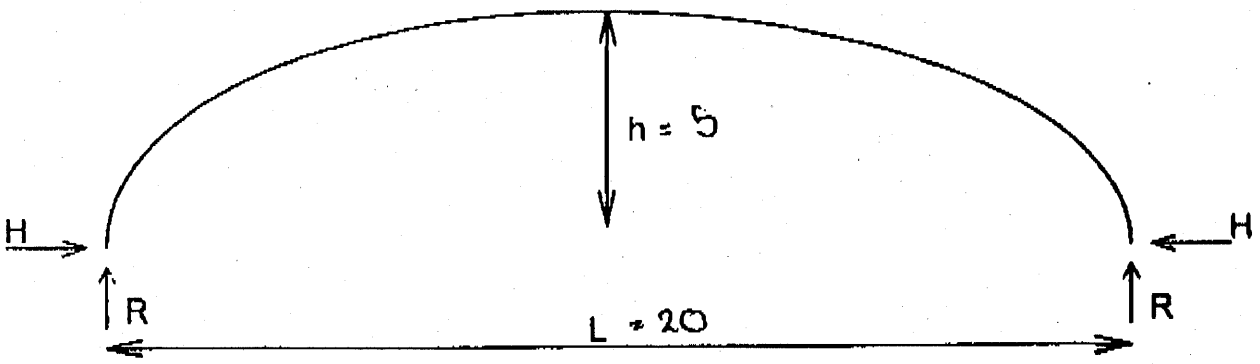
Computations

Job No. 03269 Sheet No. 7

Eng. GW Date. Oct'03

PVC COVERING



$$H = 0.363 \times \frac{20^2}{8 \times 5} = 3.63 \text{ kN/m}$$

$$R = 0.363 \times \frac{20}{2} = 3.63 \text{ kN/m}$$

$$T_{max} = H(1 + 16\,\theta^2)^{1/2}$$

$$\theta = \frac{5}{20}$$

$= 5.134 \text{kN/m}$ (Terrain Categ 3 & 4)

Capacity of PVC $= \frac{2.8 \times 6.05}{6}$ factor of safety $= 9.33 \text{ kN/m}$ OK.

(Terrain Category 2) :- $T = \frac{5.134 \times 0.5285}{0.363} = 7.475 \text{kN}$

∴ OK

Checked .....

Date .....

Caractéristiques techniques	Technical data	Technische Daten	Précontraint® 702	
Fil	Yarn	Garn	1100 Dtex PES HT	TERSUISSE
Poids au m²	Weight sqm	Gewicht m²	830 g/m²	*NF EN ISO 2286-2*
Largeur	Width	Breite	180 cm	
Résistance rupture (chaîne/trame)	Tensile strength (warp/weft)	Reisskraft (Kette/Schuss)	280/280 daN/5cm	*NF EN ISO 1421*
Résistance déchirure (chaîne/trame)	Tear strength (warp/weft)	Weiterreisskraft (Kette/Schuss)	30/28 daN	*DIN 53.363*
Adhérence	Adhesion	Haftung	10 daN/5 cm	*NFG 37.107*
Opacité	Blackout	Opak	> 99%	
Finition	Finish (Varnish)	Behandlung (Schlusslack)	Vernis BIFACE	
Réaction au feu	Flame retardancy	Brennverhalten	M2 *NFP 92.503/NF EN 14115* BS 7837 - UNE 23727/90 B1 *DIN 4102* - NFPA 701 *LS2* California State Fire Marshal T19	
Températures maximum d'utilisation	Temperature extremes (while handling)	Maximale Anwendungs-temperaturen	-30°C / +70°C	
Système d'assurance qualité	Quality insurance	Qualitätssicherung	ISO 9002	
Les caractéristiques techniques indiquées sont des valeurs moyennes	Technical data are average values	Die angegebenen technischen Daten sind Mittelwerte		

Technique d'enduction Précontraint® FERRARI	Précontraint® FERRARI coating technology	Beschichtungstechnik Précontraint® FERRARI
Stabilité dimensionnelle exceptionnelle	Exceptional dimensional stability	Ausserordentliche Flächenstabilität
Durabilité supérieure	Longer durability	Höhere Haltbarkeit
Excellente soudabilité	Excellent welding	Sehr gute Verschweissbarkeit
Opacité spéciale chapiteaux	Special blackout for big tops	Spezielle Opak-Textilien für Zirkuszelte

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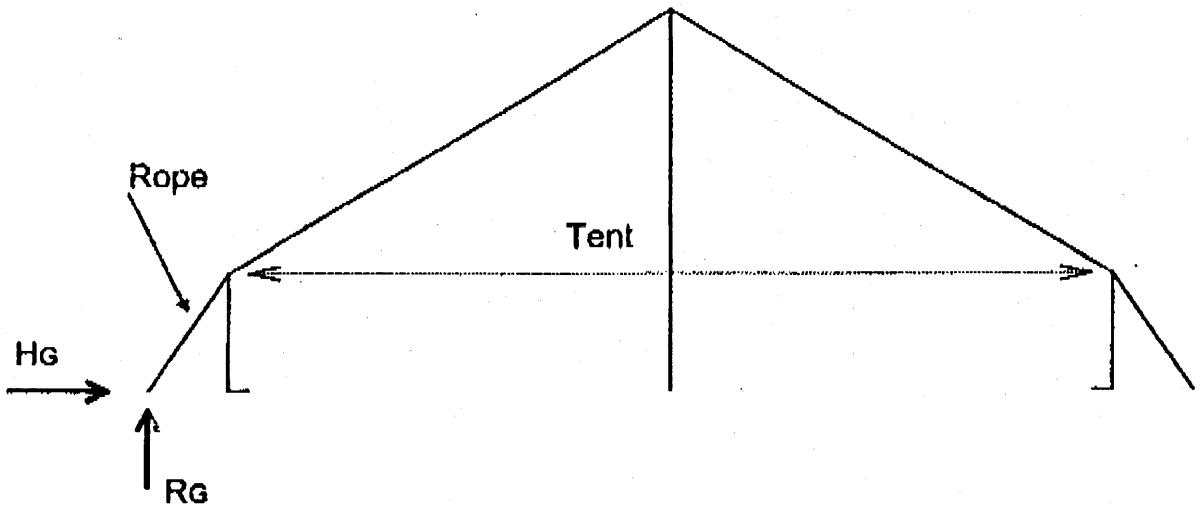
Computations

Job No. 03286 Sheet No. 9

Eng. DW Date Oct 03

ROPE CAPACITY



R_G = 3.63 KN/M

$H_G \approx 0.363 \times \frac{26^2}{8 \times 8.5}$ = 3.61 KN/M

$T_{max} = H(1 + 16\theta^2)^{1/2}$ $\theta = \frac{8.5}{26}$

= 5.94 KN/M

∴ Load per rope = 5.94 x 1.665 = 9.89 KN
(Terrain Catg 3)

Use 2000kg capacity straps

Capacity = 19.6 KN OK.

(Terrain Category 1 & 2 load per Rope = 14.394 kN OK)

Checked .....

Date .....

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CONSULTING ENGINEERS A.C.N. 006777920
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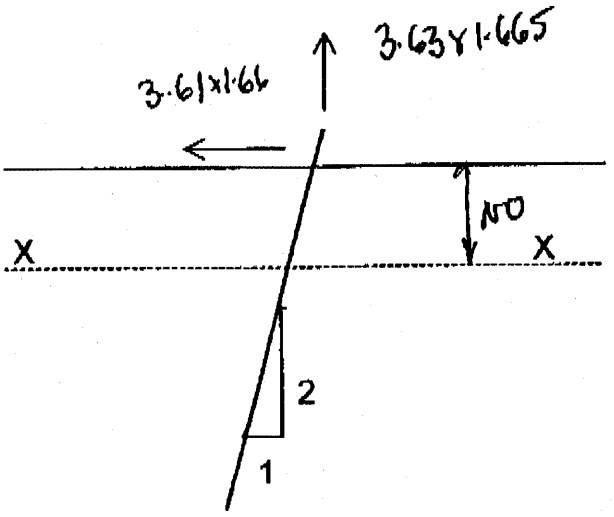
Computations

Job No. 03264 Sheet No. 10

Eng. DM Date. Oct 03

PEGS



Moment in peg about X - X

= $3.61 \times 1.66 \times 0.1 + 3.63 \times 1.665 \times 0.05$

= 0.9015 KN M

35mm dia high tensile truck axles

$f_b = \frac{0.9015 \times 10^6}{0.0982 \times 35^3}$ = 2.14MPa < 262 x 1.33 MPa

(Terrain Category 3)

Note:- Depth of peg to be determined on site by experience and testing

(Terrain Category 1 & 2 f_b = 3.11 MPa < 262 x 1.33 MPa

∴ OK)

Checked ..

Date

DESIGN PROJECT GROUP Pty Ltd
CONSULTING ENGINEERS A.C.N. 006777920
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

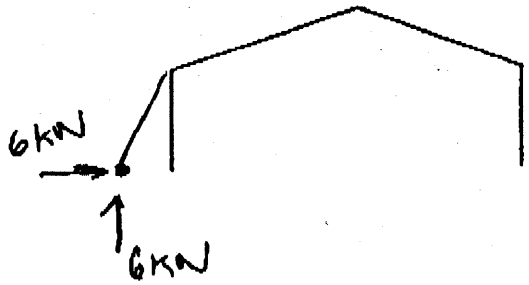
Computations

Job No. 03244 Sheet No. 11

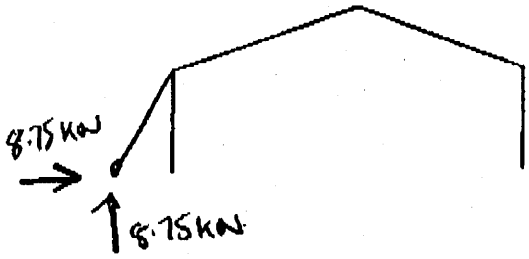
Eng. DJN Date. Oct 03

LOADS (with sides of tent up)

Terrain Category 3 & 4



Terrain Category 2 & 1



Checked .....

Date .....

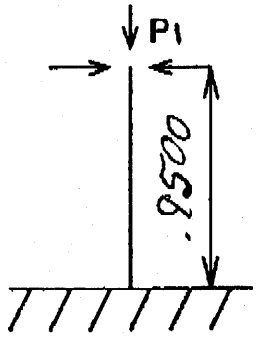
DESIGN PROJECT GROUP Pty Ltd
CONSULTING ENGINEERS A.C.N. 006777920
215 Albert Street, Brunswick 3056
Telephone: (03) 9388 0801
Fax: (03) 9388 2121

Computations

Job No. 03244 Sheet No. 12.

Eng. BM Date. Oct 03

CENTRE POLE



125 nominal bore 5mm thick CHS

Area = 2042 mm² $Z = 64 \times 10^3$ mm³

$r_y = 45.99$ mm

$\frac{L}{r_y} = \frac{9500}{45.99} = 206.6$

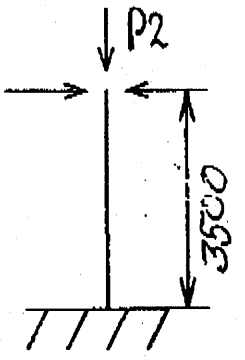
$\Rightarrow$ Fac = 20 MPa

Allowable axial load = 40 KN

P1 actual = $0.01 \times 6.66 \times 6.66 \times 1.3$

= 0.6 KN OK

SIDE POLE



75 mm x 1.6 thick CHS

Area = 385 mm² $Z = 7.53 \times 10^3$ mm³

$r_y = 27$ mm

$\frac{L}{r_y} = \frac{3500}{27} = 129.62$

$\Rightarrow$ Fac = 50 MPa

Allowable axial load = 19.25 KN

P2 actual = $0.01 \times 1.3 \times \frac{6.66}{2} \times 1.66 \times 1.3$

= 0.093 KN OK.

Checked .....

Date .....

Certificate of Test

QUOTE No.: HF07ANF4225

REPORT No.: FNF1182

TEST FOR FLAMMABILITY OF MATERIALS IN ACCORDANCE WITH AS 1530.2-1993

TRADE NAME: **FERRARI 702S BLOCKOUT FABRIC 8103**

SPONSOR: Innova International Pty Ltd
36-40 Sunmore Close
MOORABBIN EAST VIC

DESCRIPTION OF SAMPLE: The sponsor described the specimen as a PVC coated polyester fabric with carbon interlayer.

Nominal total thickness: 0.65 mm
Nominal mass: 830 g/m²
Colour: white

TEST PROCEDURE: Six (6) samples were tested in accordance with Australian Standard 1530 Part 2 - Test for Flammability of Materials - 1993.

RESULTS: The following were obtained for the specimen:

	Maximum Flame Height	Time for Flame to Reach Top (t)	Area Under Curve (°C.min)
Mean	3.3	n/a	3.8
Coefficient of Variance (%)	12.87	n/a	14.94

From which the following indices were obtained:

SPREAD Factor	SPEED Factor	HEAT Factor	FLAMMABILITY INDEX
1	n/a	1	2

These test results relate only to the behaviour of the test specimens of the material under the particular conditions of test, and are not intended to be the sole criterion for assessing the potential fire hazard for the material in use.

DATE OF TEST: **20 October 2004**

Issued on the 20th day of October 2004 without alterations or additions.

Janelle Sinclair
Testing Officer

Garry E Collins
Manager, Fire Testing and Assessments

This laboratory is accredited (Accreditation No. 3532) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

CSIRO Manufacturing & Infrastructure Technology
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555

AWTA TEXTILE TESTING

Australian Wool Testing Authority Ltd – trading as AWTA Textile Testing
A.B.N. 43 006 014 106
26 Robertson Street, Kensington, Victoria 3031
P.O. Box 240, North Melbourne, Victoria 3051
Phone (03) 9371 2126 Fax (03) 9371 2102

TEST REPORT

CLIENT : JANLIN CIRCUSES PTY LTD
12 BYLOSS STREET
CHESTER HILL NSW 2162

TEST NUMBER : 7-520467-BN
DATE : 17/07/2003

SAMPLE DESCRIPTION Clients Ref: Valmex FR 900 Duo Opaque Type 11
PVC Coated Fabric
Colour: Black/White
Approx mass: 1030g/m2

AS 1530.2-1993 Test for Flammability of Materials

DATE TESTED: 17/07/2003

Flammability Index: 6 Range 0 - 100 for most material

		Length	Width	
Spread Factor: Range 0 - 40		5	5	
Heat Factor: Range 0 - upward		1	1	
Maximum height (d)	mean	5.1	5.4	
	cv	7.4	6.9	%
Time (t)	mean	N/A	N/A	s
	cv	N/A	N/A	%
Heat (a)	mean	1.7	1.6	degC min
	cv	15.6	12.9	%
No of specimens tested		6	6	

These test results Relate only to the behaviour of the test specimens of the material under the Particular conditions of the test, and they are not intended to be the Sole criterion for assessing the potential fire hazard of the material in use

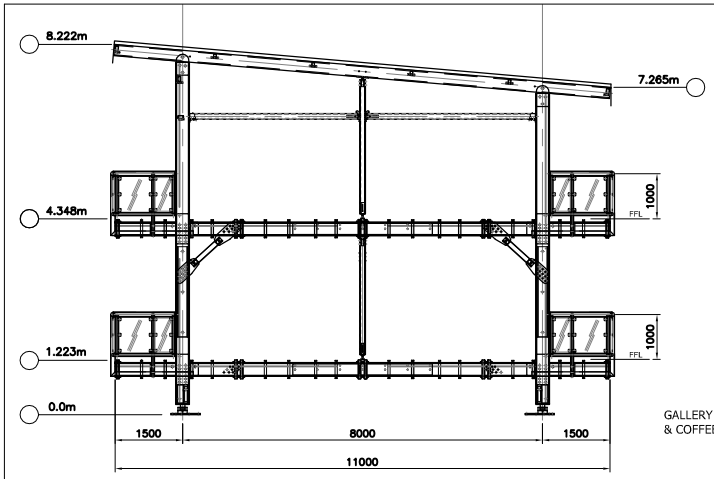
1278925 1

This Laboratory is accredited by the National Association of Testing Authorities, Australia, for:
- Chemical Testing of Textiles & Related Products — Accreditation No. 983
- Mechanical Testing of Textiles & Related Products — Accreditation No. 985
- Heat & Temperature Measurement — Accreditation No. 1356

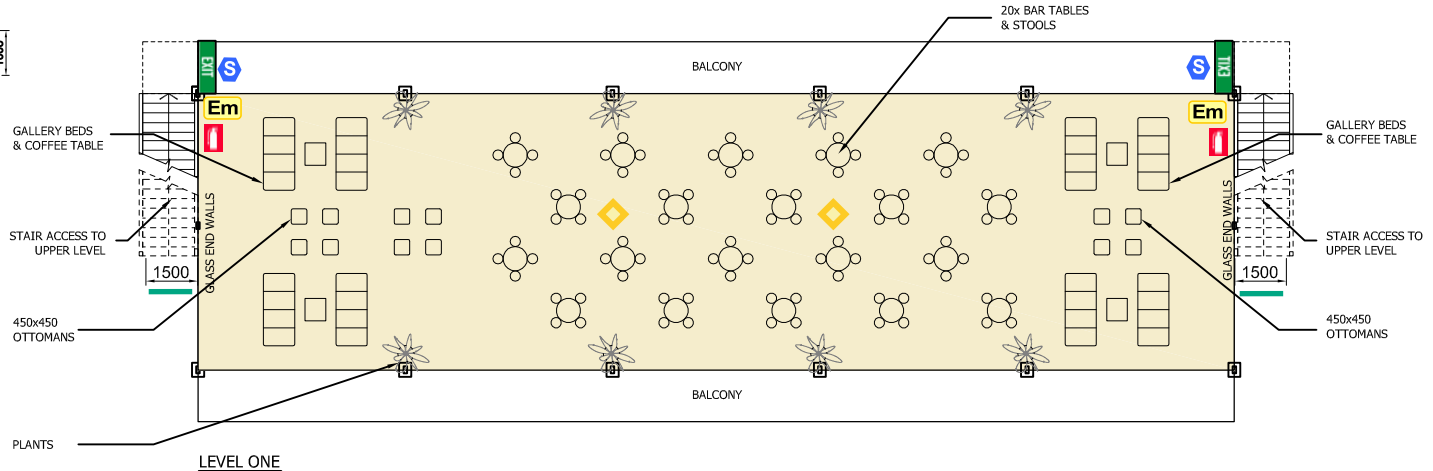
The tests reported herein have been performed in accordance with its terms of accreditation. Samples and raw identifying descriptions have been provided by the client unless otherwise stated. AWTA Ltd makes no warranty, implied or otherwise, as to the source of the tested samples. The above test results relate only to the sample or samples tested. This document shall not be reproduced except in full and shall be rendered void if amended or altered. This document, the names AWTA Textile Testing and AWTA Ltd may be used in advertising providing the content and format of the advertisement have been approved in advance by the Managing Director of AWTA Ltd.

APPROVED LABORATORY

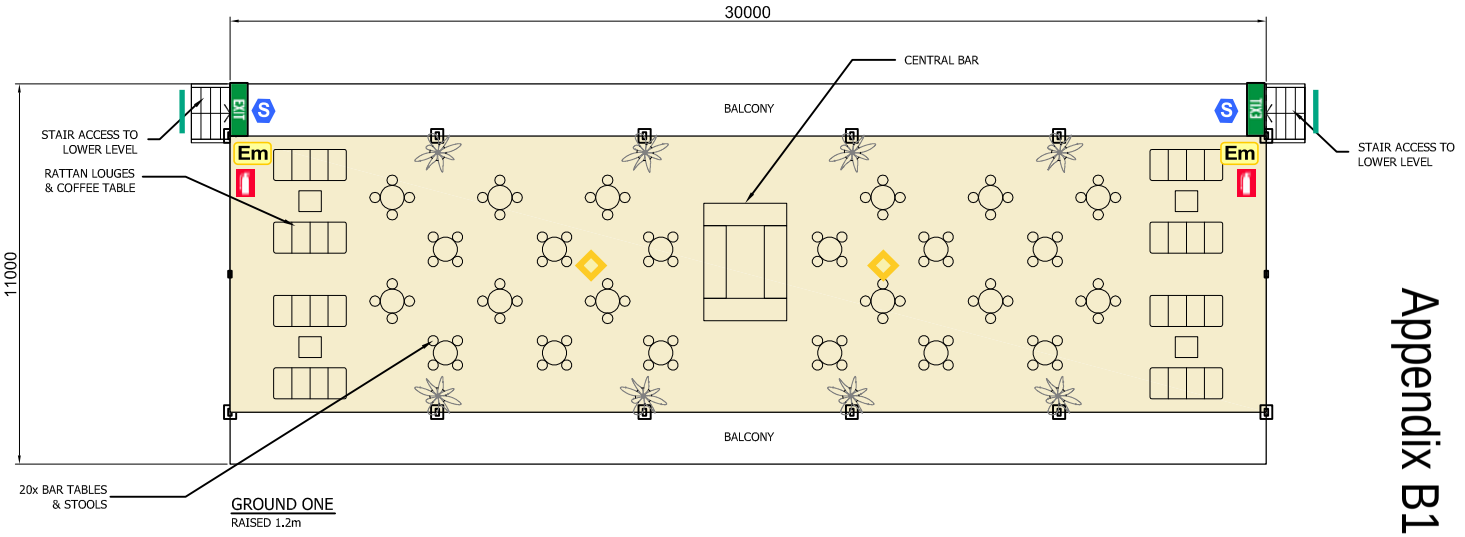
MANAGING DIRECTOR



END ELEVATION



LEVEL ONE



GROUND ONE
RAISED 1.2m

Appendix B1

PRELIMINARY

2029

No	Revision	Drawn	Checked	Approved	Date
A	CLIENT ISSUE	JM	GY		1-02-10

Note: * Indicates signatures on original issue of drawing or last revision of drawing

Exit Sign
Directional Exit Sign
Aggregate Exit
Security
Portable Fire Extinguishers
Emergency Lights
Em Essential Fire Safety Schedule & Emergency Evacuation Plan

Pages Hire Centre (NSW) Pty Ltd
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www.pages.id.au

Scale	AS SHOWN
	DO NOT SCALE
Cad	J.MANCERA
Checked	G.YALLOP
Approved	
Date	1-02-10

This Drawing must not be used for Construction unless signed as Approved

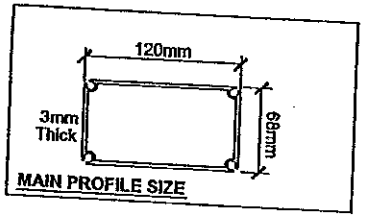
Client / Project: North Byron Parklands

Title: 11m x 30m 2 STOREY STRUCTURE

Original Size: A3 | Drawing No: 10-01-119648-A01 | Rev: A

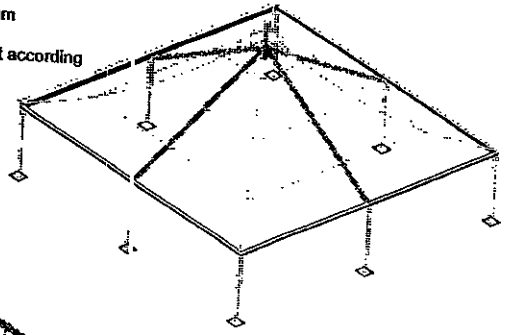
Cad File No: C:\A-PROJECT\PAGES EVENT EQUIPMENT\PROJECTS\2010\10-01-119648\DWGS\10-01-119648-A01.DWG

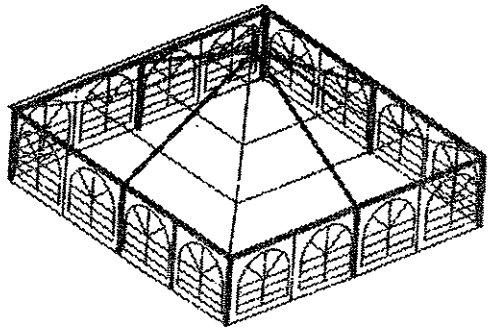
Plot Date:

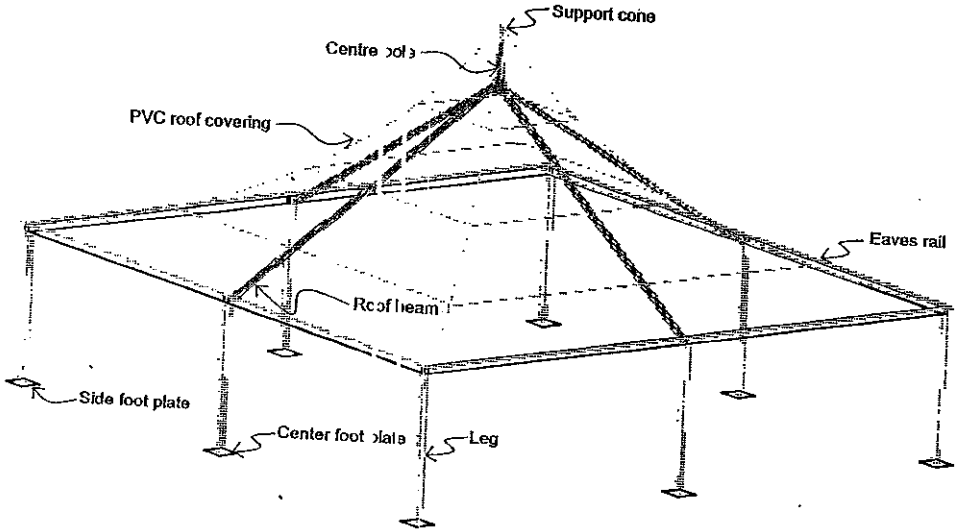


Material Specifications
Aluminium(framework):Hard pressed extruded aluminium
steel(connections):European - hot dipped galvanised
PVC covering: White - High glooss PVC flame retardant according
4102 B1/B2

Frame Specifications
Span width: 10m
Eave height: 2.5m
Ridge height (internal): 6.45m
Bay spacing: 5m
Longest component: 5.22m
Wind loading: 80km per hr/0.3kn*

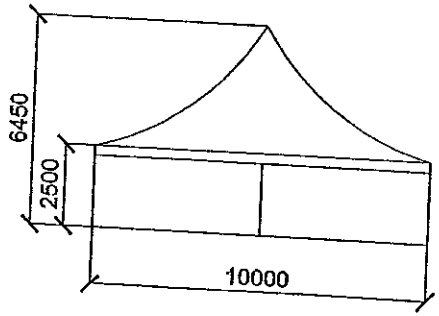


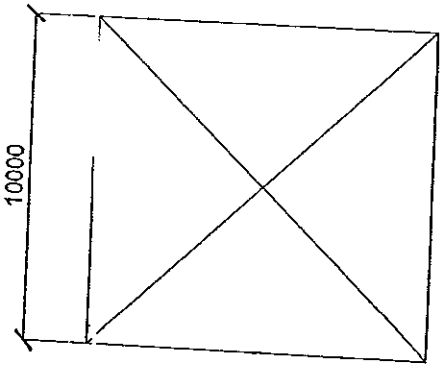




Optional Accessories
PVC window walls
Single & double door units
Decorative linings
Rain gutters for joing structure

NAME OF PART	SIZE(mm)	QUANTITY	MATERIAL
Leg	20(x68x2460	8 pcs	Alu alloy
Roof Beam	20(x68x5220	4 pcs	Alu alloy
Eaves Rail	20(x68x4900	8 pcs	Alu alloy
Foot Plate		8 pcs	Alu alloy





Appendix B2

PRELIMINARY

No	Revision	Drawn	Checked	Date
A	ISSUED FOR INFORMATION	JM	SN	24/11/05

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Scale	AS SHOWN
Drawn	J.Mancera
Checked	S.Nercessian
Approved	
Date	24/11/05

DO NOT SCALE

Client
Project 10M X 10M Pagoda Tent
Title
Original Size A3
Drawing No: 10M X 10M Pagoda Tent
Rev: A

2030