Wombalano

Meteorological masts 120M

A S B U I L T 1 F e b r u a r y 2 0 2 1

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DRAWING REGISTER

Drawing No.	Rev.	Description
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S-02		MAST PLAN LAYOUT
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Title
Wombalano
Meteorological Mast 120m
Drawing Schedule

Date	Scale	SHEET SIZE	Dwg No.	Rev
10.09.20	-	A3	G-01	
Approval: PD	Drafter: DW		project code 180820	

Check and verify all measurements on site. Do not scale from drawings

General:

1. Read structural drawings with all other contract drawings and relevant Australian standards, notify any discrepancy and obtain written instruction before proceeding.

2. Contractor to confirm location and level of underground services prior to foundation piling/excavation works. Notify any conflicts with the designed works and obtain written instruction before proceeding.

3. Check and verify existing dimensions and levels on-site before commencing construction or off-site fabrication.

4. All Grade D500N reinforcement shall comply with AS/NZS 4671 and be manufactured using the micro alloy process. Quench and tempered steel shall not be used on this project.

5. Holding down bolts, weld plates, and other fixing devices to be set accurately in position and rigidly fixed prior to concreting or grouting.

Foundations:

1. Foundation sizes and details indicated are based on an allowable bearing capacity of 200 kPa. Contractor to verify actual soil bearing capacity at regular intervals in foundation excavation and report result to engineer.
2. Underside of foundation beams/pads/strips to be set 350mm (min.) Below the lower of either cleared ground level or adjacent proposed finished ground level, unless shown otherwise.
3. Minimum curing time 7 days

Concrete Work:

1. All materials and workmanship shall be in accordance with AS 3600 subject to relevant sections of the specification.

2. Concrete strengths:

Reinforced concrete	=	32MPa
Cement grout	=	60MPa

3. Minimum concrete cover to be 50mm.

✓ As Built 1 February 2021

Steelwork:

1. All workmanship and materials shall be in accordance with AS 4100 and AS 1554
2. Welded connections between structural members shall be min 6mm continuous fillet SP welds (or size equivalent to the minimum thickness of connecting members where less than 6mm) unless noted otherwise. Welded connections between lattice & chords shall be minimum 6mm complete and incomplete penetration butt welds - class SP.
3. Bolt types (and designations, where used) shall be as follows:
   - 4.6/S - Commercial bolts to AS 1111, snug tightened.
   - 8.8/S - High strength structural bolts, with bolts, nuts and hardened washers to AS 1252, snug tightened only.
   - 8.8/TB - High strength structural bolts as above, fully tensioned to AS 4100 in a bearing type joint.
   - 8.8/TF - High strength structural bolts as above, fully tensioned to AS 4100 in a friction type joint and unless noted otherwise, with mating surfaces left uncoated - clean as "rolled" condition.
4. M16 high strength (8.8/S) bolts shall be used in all connections unless noted otherwise, notwithstanding this, no steel to steel connection shall be made with less than 2-M16 (8.8/S) bolts, unless noted otherwise.
5. Bolt holes in steel to steel and steel to concrete connections shall be bolt diameter + 2mm and 3mm respectively, for base plates allow bolt diameter + 6mm.
6. All holding down bolts shall be grade 8.8/S (UNO).
7. Unless noted otherwise all nuts, bolts & washers shall be hot dip galvanized.
8. All plates shall be 10mm thick unless noted otherwise.
9. Weld material shall have nominal tensile strength of 490 MPa as per AS 4100, amendment 1, 2012, table 9.7.3.10(1).
10. All welds shall be category SP to AS 1554 part 1 unless noted otherwise.
11. Steel fabricator shall provide all bolts necessary for the erection of the steelwork and bolts, holes and cleats necessary for the erections of steelwork as shown, noted or implied.
12. Protective surface treatment to structural steelwork shall be as follows: unless noted otherwise.

Protective Surface Treatment Note:

General Mast Assembly
Hot dip galvanize "HDG600" (AS/NZS 2312)

Guy Footing Anchor Beams not Encased in Concrete
Hot dip galvanize "HDG600" (AS/NZS 2312)

Compaction Specification:

Replacement Soil for Masts:

1. Excavate anchor pit and install steel anchor and attachments.
2. To cover anchor beam install select fill material won from excavation or from surrounding sources and compact the filling. Compact fill in 150mm compacted depth layers around beam. Source fill as described in Section 3 below. Test as described in Section 5 below.
3. Fill remainder of anchor excavation with select material won from excavation or from surrounding sources and compact the filling. Select fill is to be free from any organic material such as roots and topsoil, and be either:
   - Well graded rock with suitable pines for compaction (with soil weight of 22kN/m^3 after compaction.
   - Clays and silts (based on ϕ=20° and c=20KPa, or
   - Sand (based on ϕ=35°)

   Note: Minimum soil properties are as stated above, unless noted differently in Geotechnical report.

   Select fill particles size and shape is to suit compacted layer thickness.
4. Adequate compaction is achieved by providing a compacted density equal to a controlled fill classification. Controlled fill is defined in AS 2870. Sandy fill is to be placed in layers not greater than 300mm loose. Non-sandy soils and clay soils require layer depths not greater than 150mm when compacted. Compaction is to be achieved by mechanical tamping. This will require compaction by rodding, by a vibrating plate or smooth drum roller attached to a backhoe/excavator or walk behind Wacker Packer.
5. Compliance with controlled fill is deemed to be achieved in sandy soils if a dynamic cone penetrometer test (as defined by AS 1289.6.3.3) produces blow count of 7 or more for 300mm. For non sandy and clay soils controlled fill is deemed to be achieved if soil is moist and compacted in layer depths not more than 150mm when compacted.

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Title: Wombalano Meteorological Mast 120m General Notes

Date	Scale	SHEET SIZE	Dwg No.	Rev
10.09.20	-	A3	G-02	
Approval: PD	Drafter: DW		project code 180820	

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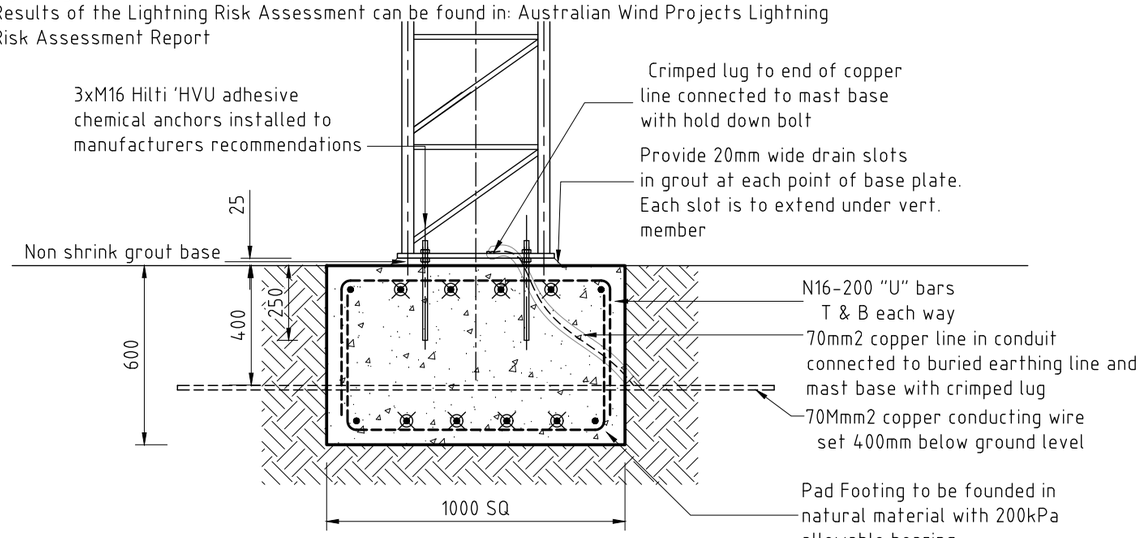
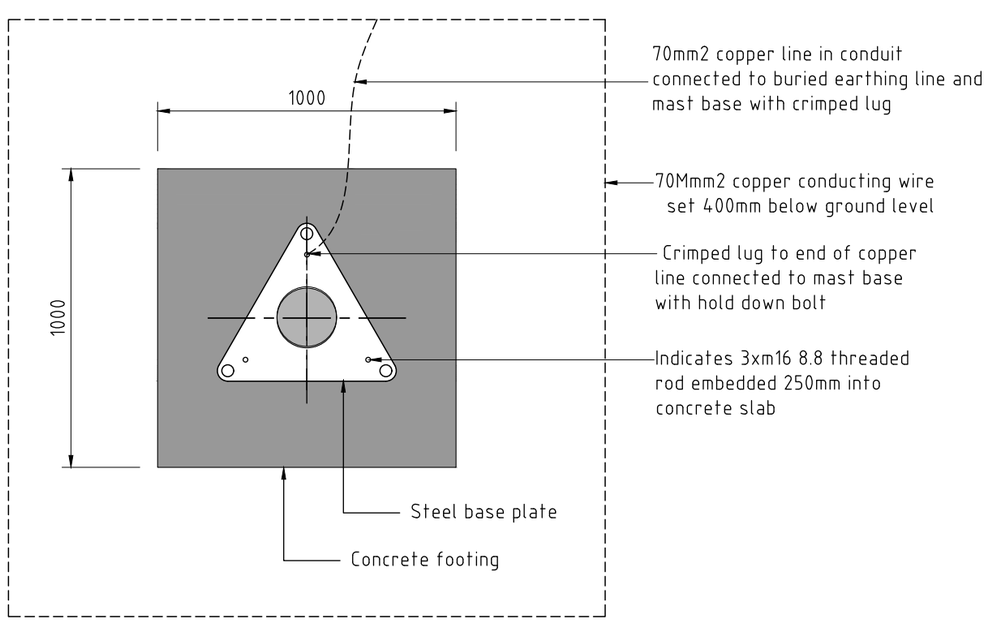
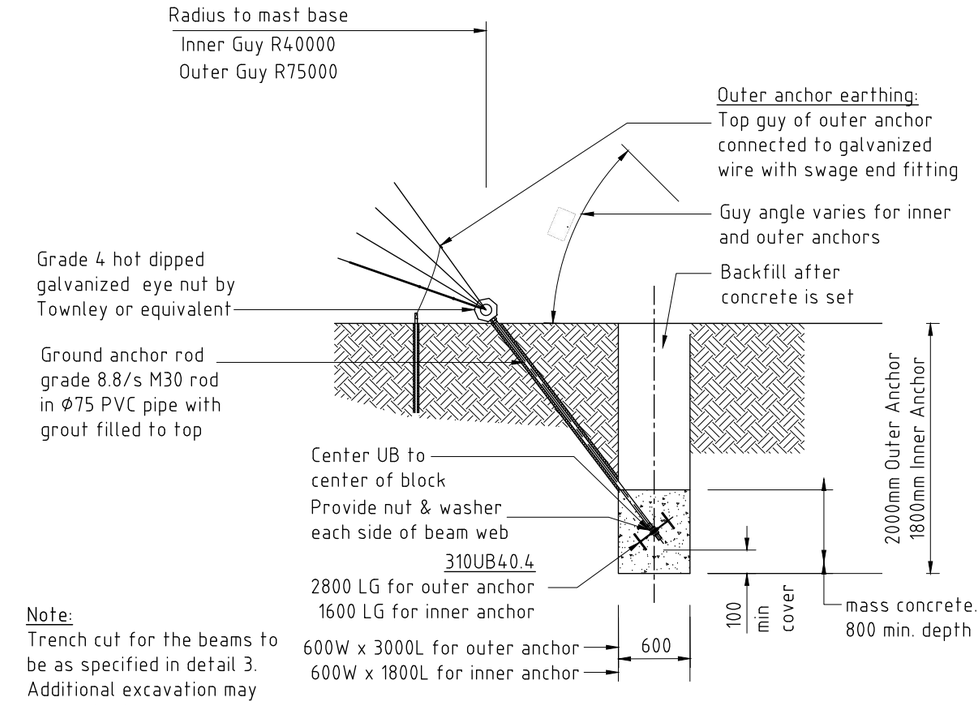
Lightning Protection System designed to AS/NZ 1768
70mm2 Copper conducting line around base connected to the mast with positive electrical connection through mast from finial to the earth system at the base. Designed to a maximum of 10Ω resistance
Outer Guy wires connected to earth system designed to a maximum of 10Ω resistance.
Lightning Protection System designed to AS/NZ 1768 Clauses: 4.12.2, 4.13, 6.5.1, 6.9.4
Results of the Lightning Risk Assessment can be found in: Australian Wind Projects Lightning Risk Assessment Report



Detail 1 Mast Footing Detail
Scale 1:20



Detail 2 Mast Base Detail
Scale 1:20



Note:
Trench cut for the beams to be as specified in detail 3. Additional excavation may be required to ensure in-situ soil remain stable during construction

Detail 3 Guy Wire Footing Detail
Scale 1:50

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1:20 100 0 100 200 300 400 500mm

Title: Wombalano Meteorological Mast 120m Footing and Guy anchor details

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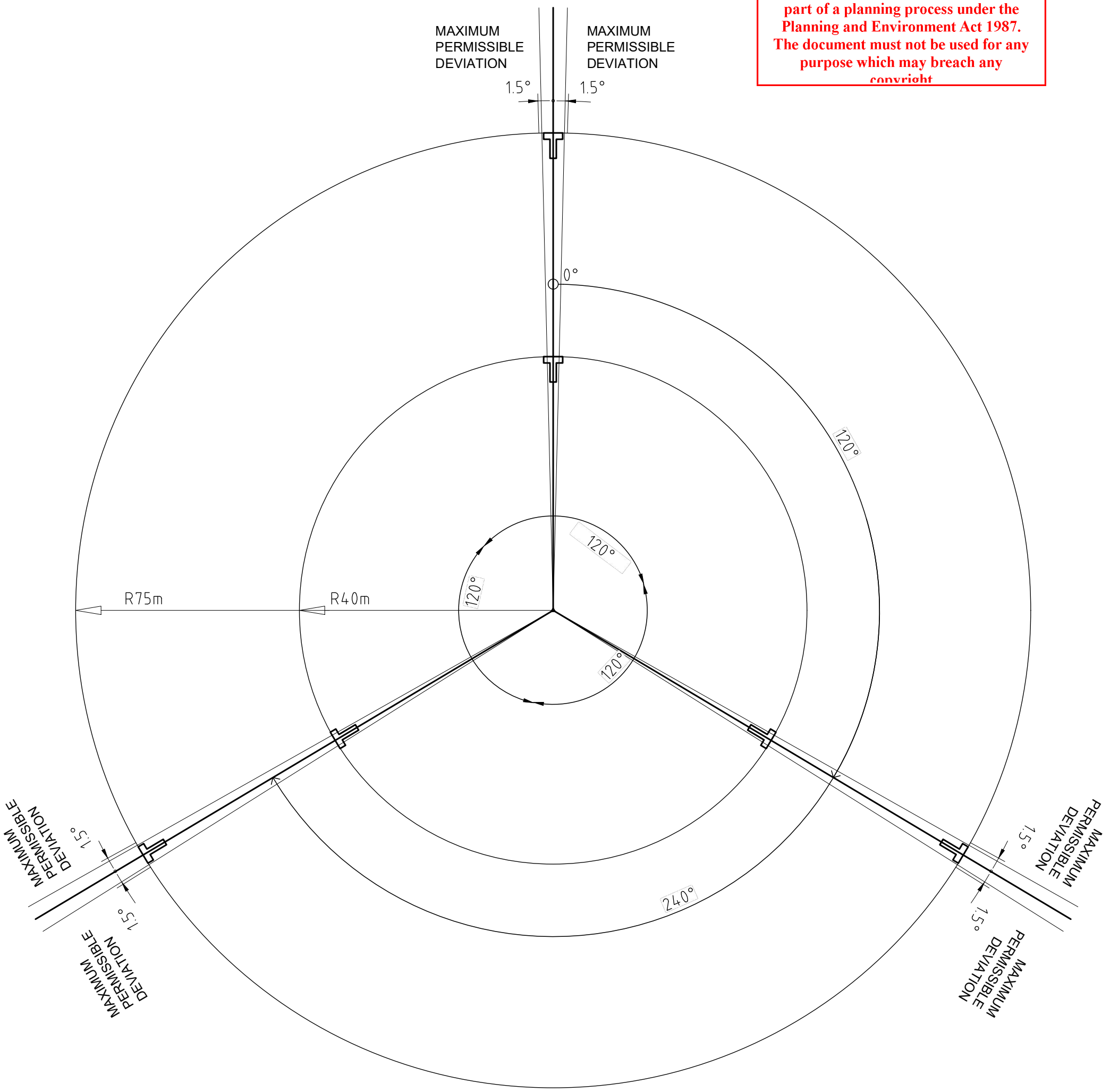

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Title
Wombalano
Meteorological Mast 120m
Mast Plan Layout

Date	Scale	SHEET SIZE	Dwg No.	Rev
10.09.20	NTS	A3	S-02	
Approval	Drafter DW		project code 180820	

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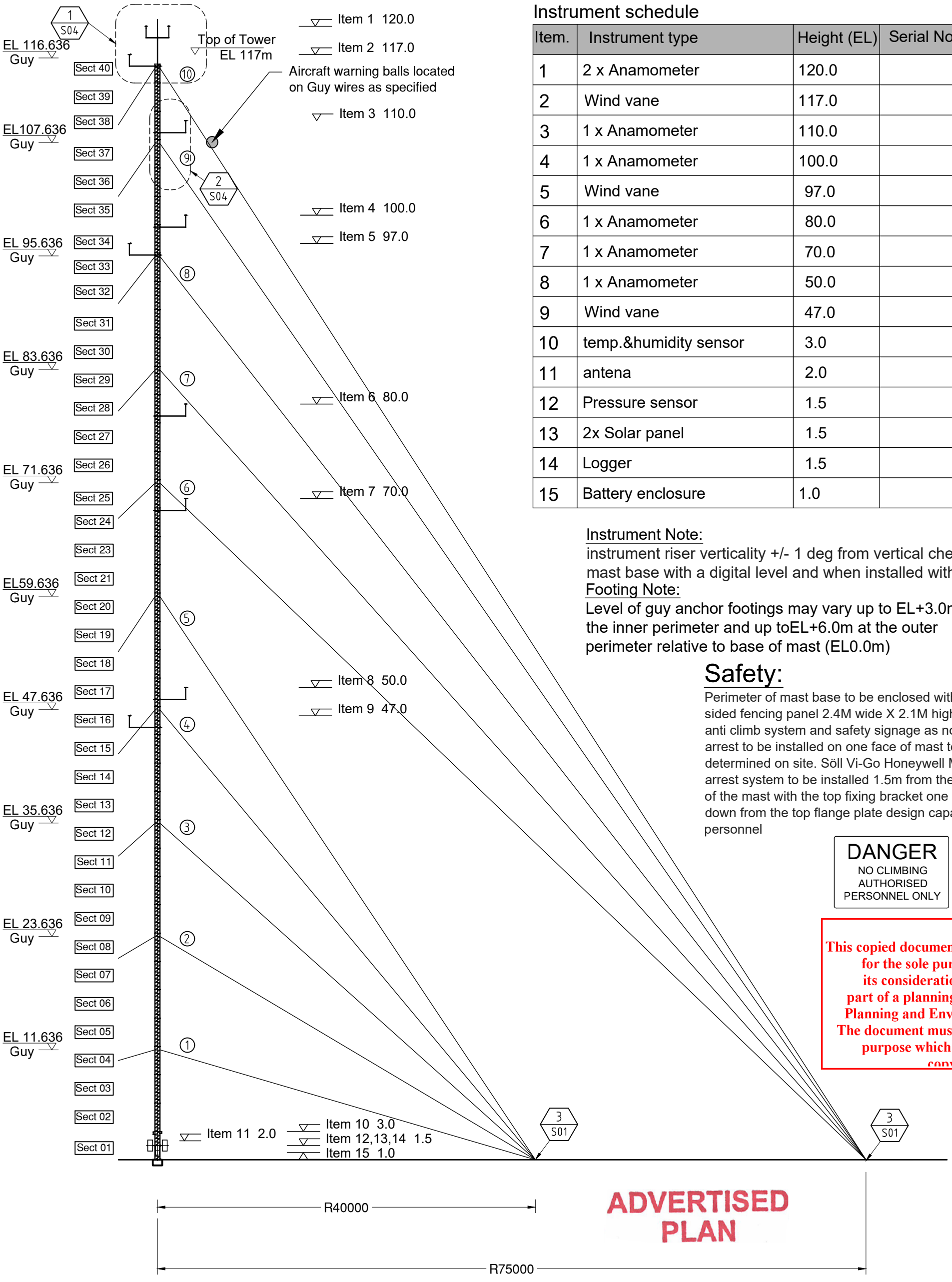

Instrument schedule

Item.	Instrument type	Height (EL)	Serial No.	Model
1	2 x Anamometer	120.0		
2	Wind vane	117.0		
3	1 x Anamometer	110.0		
4	1 x Anamometer	100.0		
5	Wind vane	97.0		
6	1 x Anamometer	80.0		
7	1 x Anamometer	70.0		
8	1 x Anamometer	50.0		
9	Wind vane	47.0		
10	temp.&humidity sensor	3.0		
11	antena	2.0		
12	Pressure sensor	1.5		
13	2x Solar panel	1.5		
14	Logger	1.5		
15	Battery enclosure	1.0		

Instrument Note:
instrument riser verticality +/- 1 deg from vertical checked at the mast base with a digital level and when installed with a theodolite

Footing Note:
Level of guy anchor footings may vary up to EL+3.0m at the inner perimeter and up toEL+6.0m at the outer perimeter relative to base of mast (EL0.0m)

Safety:

Perimeter of mast base to be enclosed with three sided fencing panel 2.4M wide X 2.1M high with anti climb system and safety signage as noted.Fall arrest to be installed on one face of mast to be determined on site. Söll Vi-Go Honeywell Miller Fall arrest system to be installed 1.5m from the bottom of the mast with the top fixing bracket one step down from the top flange plate design capacity for 2 personnel

DANGER
NO CLIMBING
AUTHORISED
PERSONNEL ONLY

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Title
Wombalano
120m Meteorological Mast
Mast Elevation

Date	Scale	SHEET SIZE	Dwg No.	Rev
10.09.20	NTS	A3	S03	
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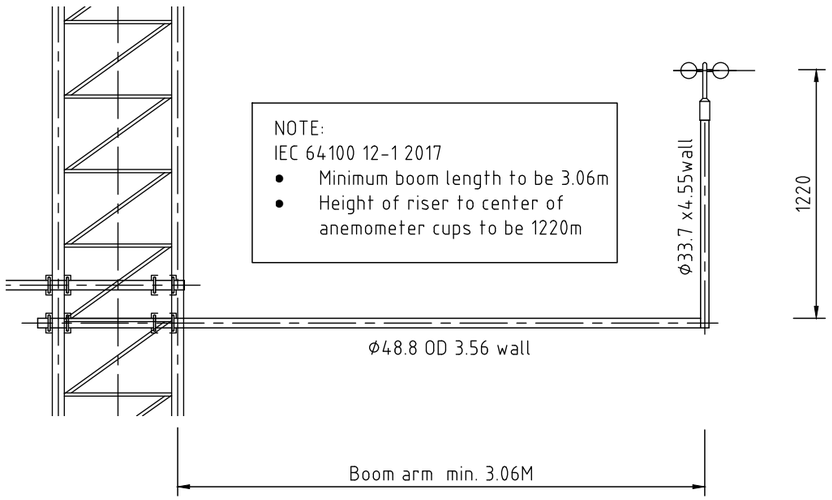
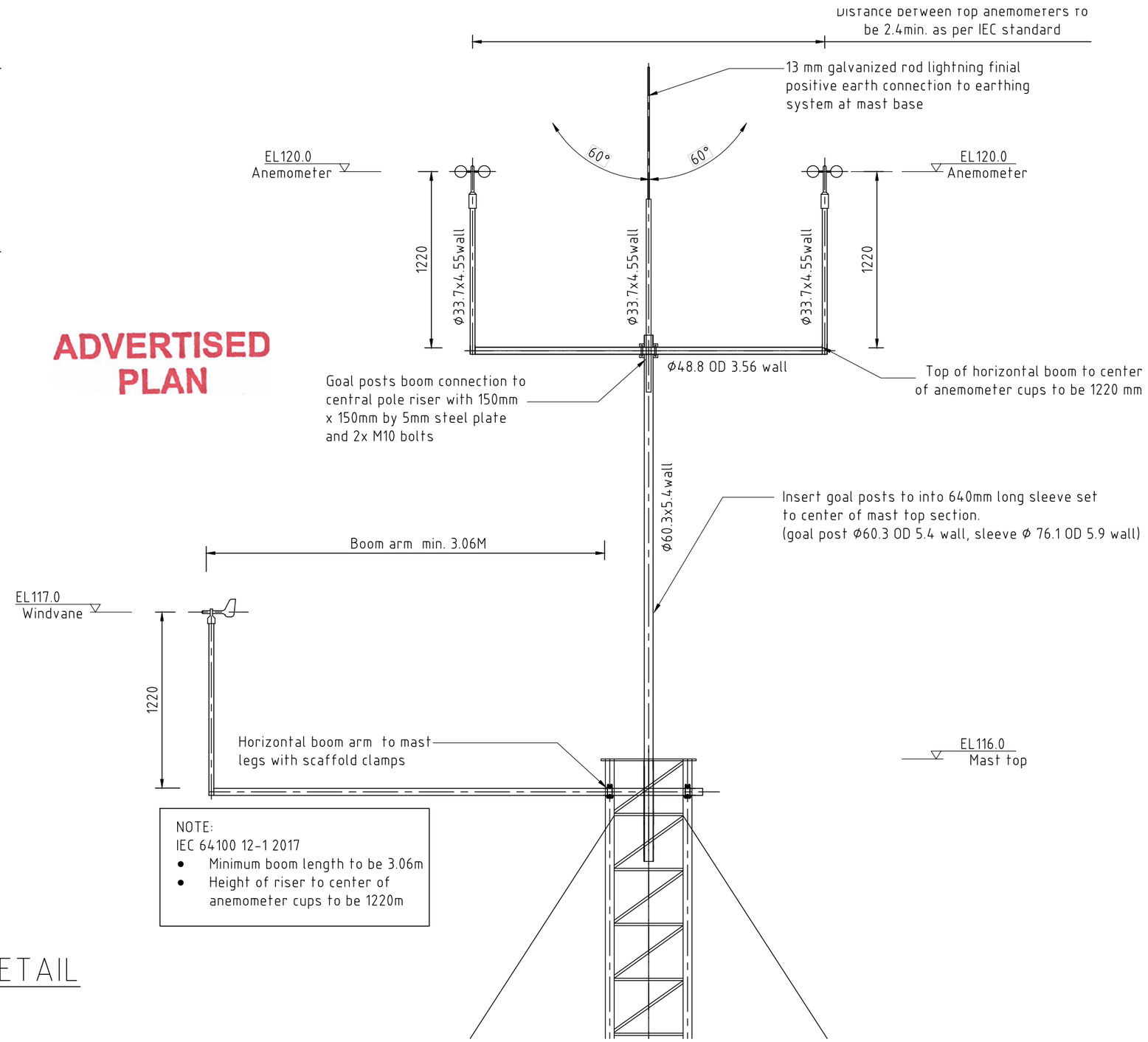


2 S-03 DETAIL (boom arm)
Scale 1:30

NOTES:
METEOROLOGICAL MAST CONSTRUCTION TO BE IN ACCORDANCE WITH IEC 64100-12-1 2017 EDITION 2

SINGLE BOOM ARMS FOR ALL INSTRUMENT ELEVATIONS ON MAST SECTIONS TO BE AS INDICATED ON MAST TOP DRAWING AND DETAIL DRAWING

CABLE ROUTING:
ANEMOMETER AND WIND VANES INTERNAL CABLING TO BE ROUTED THROUGH THEIR VERTICAL SUPPORT TUBES



1 S-03 DETAIL

Mast Top Layout
Scale 1:30

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Wombalano Meteorological Mast 120m Mast Top	10.09.20	-	A3	S-04	
	Approval PD	Drafter DW		project code 180820	

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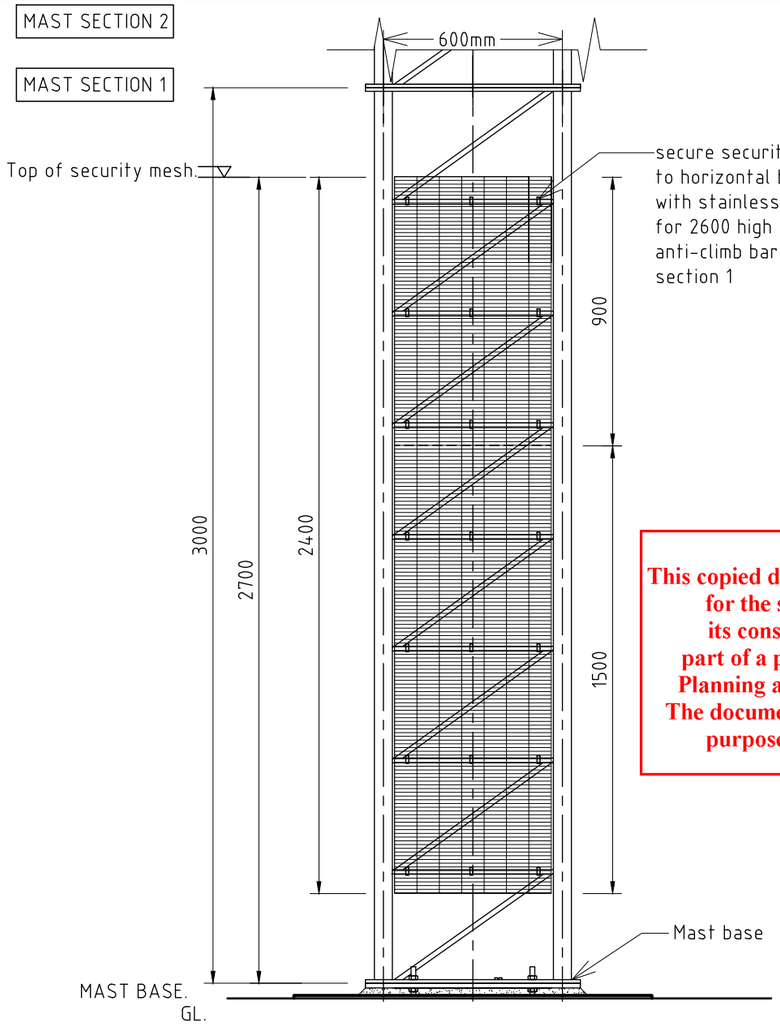
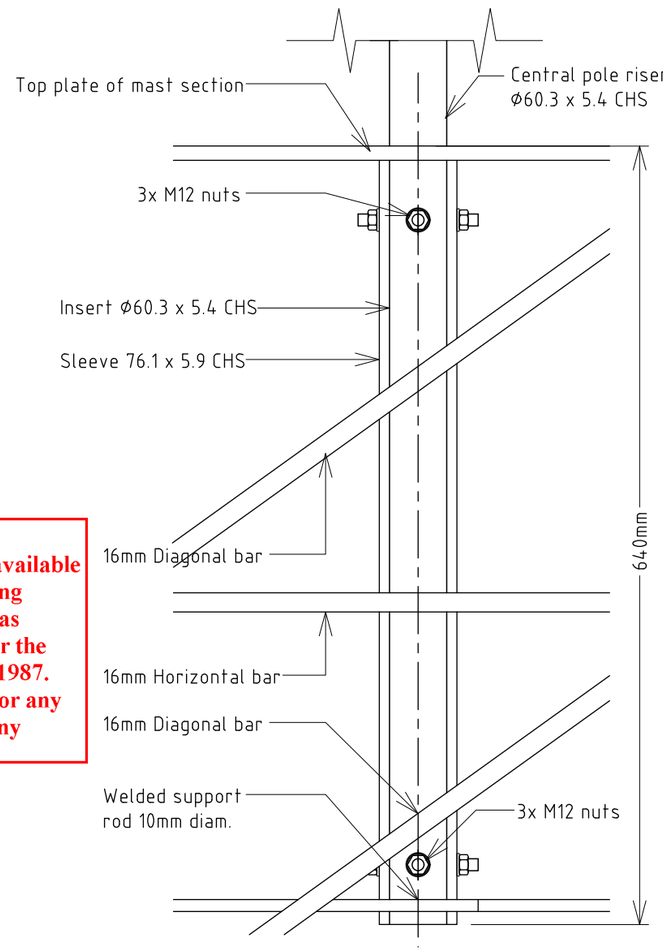
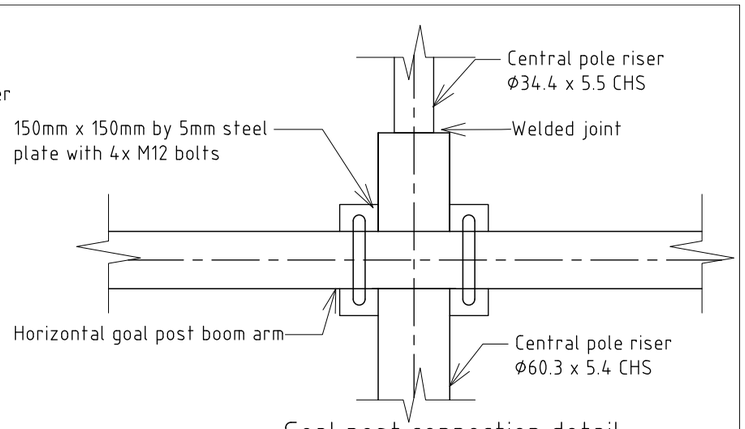


Anti-climb detail
Scale 1:20

NOTES:
Anti-climbing device to be fixed to all sides of mast section 1. 2400mm h x 500mm w except where logger box is installed on mast section.
358 high security fencing weld mesh to be used with stainless steel zip ties to secure mesh to mast leg at 2700mm high from mast base level.
2 sides of mast to be sealed with full length of 2400mm X 500mm mesh. one side to be sealed with two sheets 1@ 1500mm x 500mm and 1@ 900mm x 500mm for ease of fixing and accessibility to mast by qualified personnel when required by using cutting tool.

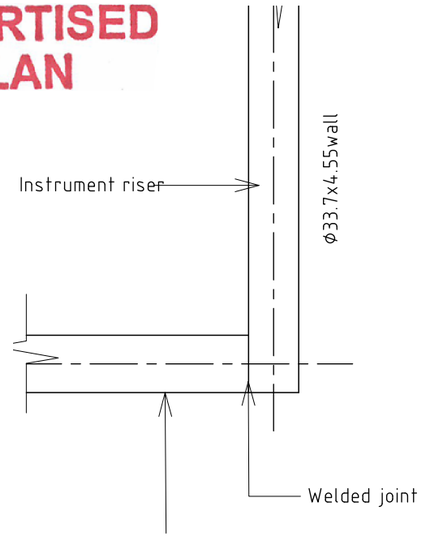


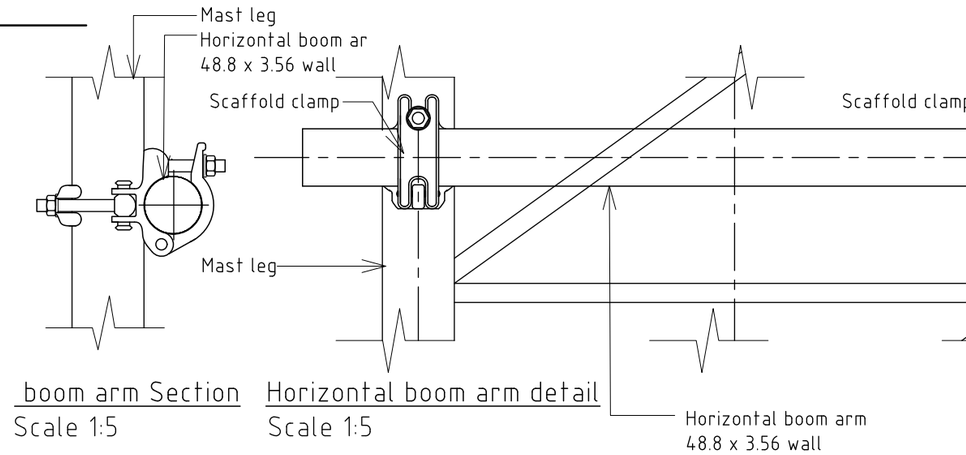


Goal post connection detail
Scale 1:5

NOTES:
All welded joints to be in accordance with AS1101.3:2005

See Mast section shop drawings for structural details





boom arm Section
Scale 1:5

Horizontal boom arm detail
Scale 1:5

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Meteorological Mast 120m
Details / Anti-climb

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