GENERAL NOTES

G1. STABILITY OF THE BUILDINGS, TRANSFORMERS & OTHER EQUIPMENT & FOUNDATIONS DURING CONSTRUCTION & THE CONSEQUENCES OF EXCAVATION IN THE VICINITY OF ADJACENT STRUCTURES ARE THE BUILDER'S RESPONSIBILITY.
G2. ALL PROPRIETARY ITEMS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
G3. ALL WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE CURRENT STANDARDS AUSTRALIA CODES AND BUILDING CODE OF AUSTRALIA.
G4. DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES.
G5. ALL LEVELS ARE IN METRES ON AUSTRALIAN HEIGHT DATUM UNLESS NOTED OTHERWISE.
G6. ELECTRICAL SAFETY SHALL BE IN ACCORDANCE WITH AUSGRID'S ELECTRICAL SAFETY RULES, NS 165 AND AS REQUIRED BY AUSGRID SUPERINTENDENT.
G7. HANDLE & DISPOSE OF ALL CONTAMINATED MATERIAL IN ACCORDANCE WITH RELEVANT O.H.&S. ACTS & REGULATIONS AND EPA REQUIREMENTS.
G8. IN CASE OF DOUBT - ASK

DESIGN CRITERIA

25 YEAR DESIGN LIFE
IMPORTANCE LEVEL 1 TO AS1170.0
WIND RETURN PERIOD - 50 YEARS
V_{50} = 39 ms^{-1}

FOUNDATIONS

F1. GROUND IS ASSUMED TO BE MEDIUM DENSE, WELL GRADED SAND (ø 30°), OR SOFT CLAY (C_U=20kPa) OR BETTER.
F2. FOOTING EXCAVATIONS SHALL BE CLEANED TO REMOVE ALL LOOSE OR SOFTENED MATERIAL PRIOR TO PLACING OF CONCRETE.
F3. CONCRETE SHOULD BE PLACED AS SOON AS POSSIBLE AFTER EXCAVATION. IF EXCAVATIONS ARE LIKELY TO REMAIN OPEN FOR MORE THAN 24 HOURS A BLINDING LAYER OF CONCRETE SHALL BE PLACED TO PROTECT THE FOUNDATION BASE.
F4. FOOTINGS/PILES TO BE LOCATED CENTRAL UNDER POSTS UNLESS NOTED OTHERWISE.
F5. THE CONTRACTOR SHALL PROVIDE GEOTECHNICAL INSPECTION & CERTIFICATION SERVICES BY A PRACTISING GEOTECHNICAL ENGINEER DURING THE WORKS. THE GEOTECH SHALL CONFIRM THAT THE FOUNDATION MATERIAL HAS THE MINIMUM BEARING CAPACITY AND A CERTIFICATE IS TO BE PRODUCED TO AUSGRID SUPERINTENDENT PRIOR TO PLACING CONCRETE FOUNDATIONS. ALL FOUNDATIONS SHALL BE CERTIFIED THAT THEY HAVE BEEN FOUNDED IN ACCORDANCE WITH THE DRAWINGS.

STRUCTURAL STEELWORK NOTES

GENERAL

S1. FABRICATE & ERECT ALL STRUCTURAL STEELWORK IN ACCORDANCE WITH AS 4100, AS 1554, AS 1101.3 & THE SPECIFICATION.
S2. SHOP DETAILS SHALL BE SUBMITTED FOR APPROVAL. 7 DAYS SHALL BE ALLOWED FOR APPROVAL. APPROVAL SHALL BE OBTAINED BEFORE FABRICATION COMMENCES.
S3. QUALIFICATIONS OF WELDING PROCEDURE AND PERSONNEL SHALL CONFORM TO SECTION 4 OF AS 1554.1. NON-DESTRUCTIVE TESTING OF WELDS SHALL INCLUDE 100% VISUAL INSPECTIONS AND ADDITIONAL TESTING AS SHOWN ON THE DRAWING. WELDING PROCEDURES SHALL BE SUBMITTED AND APPROVAL OBTAINED BEFORE FABRICATION COMMENCES. HOLD POINT
ALL WELDS SHALL BE INSPECTED BY A QUALIFIED WELDING INSPECTOR IN ACCORDANCE WITH AS 1554 AND AN INSPECTION REPORT SHALL BE SUBMITTED TO THE AUSGRID SUPERINTENDENT AS EACH WELD IS COMPLETED. ANY UNSATISFACTORY WELDS SHALL BE RECTIFIED, RE-INSPECTED AND RE-REPORTED. A WELDING CERTIFICATE OF CONFORMANCE SHALL ALSO BE SUBMITTED AT COMPLETION OF WELDING.
S4. VERIFY ALL SETTING OUT DIMENSIONS BEFORE STARTING WORK.
S5. DO NOT OBTAIN DIMENSIONS BY SCALING THE STRUCTURAL ELEMENTS.
S6. WHERE QUANTITIES ARE STATED, THEY ARE FOR ONE COMPLETE STRUCTURE.
S7. PROVIDE TEMPORARY BRACING TO MAINTAIN STABILITY OF STEELWORK DURING CONSTRUCTION.

MATERIALS

S8. UNLESS OTHERWISE NOTED STRUCTURAL STEEL TO BE USED IN ACCORDANCE WITH:
AS 1163 HOLLOW SECTIONS - GRADE 350
AS 1594 HOT ROLLED FLATS - GRADE 300
AS 3678 HOT ROLLED SLABS - GRADE 300
AS 3679 HOT ROLLED STRUCTURAL SECTIONS - GRADE 300
S9. UNLESS NOTED OTHERWISE USE
(a) 10mm THICK GUSSET, FIN & END PLATES WELDED ALL ROUND.
(b) ALL FILLET WELDS TO BE 6mm CONTINUOUS, CATEGORY GP.
(c) ALL BUTT WELDS SHALL BE FULL PENETRATION, CATEGORY SP.
(d) ALL BOLTS TO BE 20mm DIAMETER.
(e) ALL BOLTS GRADE 8.8/S TO AS 1252 (INCLUDING PURLIN/GIRT BOLTS).
(f) ALL HOLDING DOWN BOLTS ARE TO BE GRADE 4.6/S TO AS 1111.
(g) ALL BOLTS AND HOLDING DOWN BOLTS TO BE HOT DIP GALVANISED TO AS 1214.
(h) ALL BOLTS TO BE SNUG TIGHT TO AS 4100 U.N.O.
(i) ALL CONNECTIONS TO HAVE A MINIMUM OF 2 BOLTS.
(j) ALL HOLLOW SECTIONS SHALL BE GRADE C350 U.N.O.
(k) ALL WELDING SHALL COMPLY WITH SAA STRUCTURAL STEEL WELDING CODE AS 1554 UNLESS OTHERWISE SPECIFIED.
(l) ALL COMPOUND MEMBERS, BASE PLATES, CAP PLATES, END PLATES, GUSSET PLATES, FIN PLATES, STIFFENERS, BATTEN PLATES & LACINGS INCLUDING OTHER FITMENTS SHALL BE 6mm CONTINUOUS FILLET WELDED TO THEIR RESPECTIVE MEMBERS UNLESS OTHERWISE SPECIFIED.
S10. IF COMMERCIAL CLASS BOLTS ARE SPECIFIED, THEY SHALL BE HEXAGON HEAD.
S11. WELDS ARE TO BE GROUND FLUSH WHERE SURFACE IS TO BE TRAFFICABLE.
S12. CHIP ALL WELDS FREE OF SLAG.
S13. CONTRACTOR IS TO CONFIRM WITH SUPERINTENDENT WHERE EXPOSED WELDS ARE TO BE GROUND FLUSH.
S14. DO NOT GROUT UNDER BASE PLATES UNTIL ELECTRICAL EQUIPMENT ERECTION IS COMPLETE.
S15. AUSGRID MEMBER TAGGING SYSTEM IS TO BE INCLUDED ON SHOP DRAWINGS FOR CHECKING PURPOSES.

FINISHES

S16. ALL STEELWORK IS TO BE HOT DIP GALVANISED TO AS 4680 AFTER FABRICATION. ALL SECTIONS SEALED WITH END OR BASE PLATES TO BE PROVIDED WITH 25mm DIA VENT HOLE EACH END IN AN INCONSPICUOUS LOCATION.
S17. WELDS & AREAS WHERE GALVANISING HAS BEEN DAMAGED TO BE TREATED WITH ZINCFIX OR EQUIVALENT APPROVED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

COORDINATION & DESIGN REVIEW
LATEST EARTHING REVIEW UNDERTAKEN REFER TO TRIM REFERENCE D18/436932
LATEST ELECTRICAL REVIEW UNDERTAKEN REFER TO TRIM REFERENCE D18/494136

SAFETY IN DESIGN NOTES

THE DESIGNER SAFETY REPORT PREPARED BY AUSGRID DESIGNERS IS INTENDED TO MEET THE REQUIREMENTS OF THE SAFE WORK AUSTRALIA CODE OF PRACTICE JULY 2012 & THE APPLICABLE NSW WHS 2011 REGULATIONS FOR DESIGNER SAFETY REPORT - 295.

SD1 DESIGNER SAFETY REPORT - CIVIL/STRUCTURAL WORKS - TRIM REFERENCE D15/414538 SHALL BE READ IN CONJUNCTION WITH THESE DRAWINGS.
THIS DESIGNER SAFETY REPORT CONSIDERS CIVIL/STRUCTURAL DESIGN ISSUES ONLY AND DOES NOT ADDRESS ELECTRICAL, EARTHING ETC WHICH SHOULD BE ADDRESSED BY THE RELEVANT DESIGNER.
SD2 ATYPICAL RESIDUAL RISKS ARE NOTED IN THE DESIGNER SAFETY REPORT.
SD3 ALL WORK TO BE UNDERTAKEN IN ACCORDANCE WITH WHS LEGISLATION, WORKCOVER REQUIREMENTS, AUSGRID'S ELECTRICAL SAFETY RULES, BE SAFE PROCEDURES, NETWORK STANDARDS AND ALL OTHER SAFETY PLANS/PROCEDURES AND SWMS.
SD4 REFER TO AUSGRID'S ASBESTOS REGISTER PRIOR TO COMMENCING WORK.
SD5 LEAD PAINT MAY BE PRESENT AT EXISTING INSTALLATION.
SD6 MAINTAIN EARTHING GRID AT ALL TIMES. MAKING AND BREAKING OF EARTHING CONNECTIONS WILL BE BY AUSGRID ONLY.
SD7 WARNING! CABLE LOCATIONS SHOWN ON THIS DRAWING ARE INCOMPLETE AND FOR DESIGN PURPOSES ONLY. COMPLY WITH AUSGRID NETWORK STANDARDS AND UNDERTAKE A SERVICES SEARCH PRIOR TO CONSTRUCTION.
SD8 MAINTAIN SITE AND BUILDING SECURITY AT ALL TIMES
SD9 CERTIFICATION OF THE COMPLETED WORKS IS REQUIRED IN WRITING FROM THE AUSGRID DESIGN ENGINEER UNLESS OTHERWISE ADVISED IN WRITING BY DEVELOPMENT SERVICES - CIVIL & BUILDING SECTION. CERTIFICATION SHALL BE OBTAINED TO ENSURE COMPLIANCE WITH WH&S SAFETY IN DESIGN LEGISLATION AND NS 261. CERTIFICATION CANNOT BE PROVIDED UNLESS THERE IS COMPLIANCE WITH THE NOMINATED INSPECTIONS. REFER TO INSPECTION & CERTIFICATION NOTES. FOOTINGS TO BE INSPECTED BEFORE PLACING CONCRETE.
S10 IF SIGN IS TO BE INSTALLED WITHIN 3 m OF AN EARTHING SYSTEM, CONSULT WITH AUSGRID EARTHING FOR ADDITIONAL EARTHING REQUIREMENTS.

CONCRETE NOTES:

C1A. ALL CONCRETE MUST BE IN ACCORDANCE WITH THE CURRENT AS CODE 3600. ALL CONCRETE TO BE MANUFACTURED AND SUPPLIED IN QUALITY CONTROLLED CERTIFIED PLANT, IN ACCORDANCE WITH AS 1379. NO SITE MIXING PERMITTED. CONCRETE TESTS AS REQUIRED BY AS 1379 - CERTIFICATES TO BE PROVIDED AS FOLLOWS:

ITEM	REQUIREMENT
- SLUMP	- AS PER CODE
- 7 DAY STRENGTH	- IF REQUIRED
- 28 DAY CHARACTERISTIC STRENGTH	- FIRST TRUCK, 3rd TRUCK AND EVERY 5th TRUCK FOLLOWING BUT NOT LESS THAN CODE
- FLEXURAL STRENGTH	- FOR PAVING SLABS WHERE FLEXURAL STRENGTH IS SPECIFIED
- CHLORINE & SULPHATE CONTENT	- AS PER CODE
- DRYING SHRINKAGE	- AS PER CODE
- AIR CONTENT	- NOT REQUIRED

C2. CONCRETE QUALITY
WATER/CEMENT RATIO SHALL NOT BE GREATER THAN 0.45. NO WATER TO BE ADDED ON SITE.

ELEMENT	MAX. AGG SIZE	SLUMP	CHARACTERISTIC STRENGTH F'c (AS 3600) AT 28 DAYS	MAXIMUM SHRINKAGE STRAIN με
PILES	20 mm	80 mm	32 MPa	650
FOOTINGS	20 mm	80 mm	32 MPa	650

C3. CLEAR CONCRETE COVER IN mm TO REINFORCEMENT UNLESS NOTED OTHERWISE.

ELEMENT	FORMED & SHELTERED	FORMED & EXPOSED	AGAINST EARTH
PILES	40 mm	45 mm	65 mm
FOOTINGS	40 mm	45 mm	65 mm

C4. NO ADMIXTURES ARE TO BE ADDED TO CONCRETE WITHOUT THE PRIOR WRITTEN APPROVAL OF THE AUSGRID STRUCTURAL ENGINEER.
C5. CONCRETE SHALL NOT BE POURED ON HOT WINDY DAYS WITH EVAPORATION RATES GREATER THAN 1.5 $l/m^2/h$ WHERE THE EVAPORATION RATE IS ABOVE 0.6 $l/m^2/h$ IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS TO PREVENT PLASTIC SHRINKAGE CRACKING.
C6. ALL CONCRETE SHALL BE CURED IMMEDIATELY AFTER FINISHING CONCRETE TO ENSURE THE PREVENTION OF CRACKING AND TO SATISFY THE REQUIREMENTS OF STRENGTH, SERVICEABILITY AND DURABILITY. ALL CONCRETE SURFACES TO BE KEPT CONTINUOUSLY WET FOR 7 DAYS AND THEN ALLOWED TO GRADUALLY DRY OUT. THE USE OF SPRAYED MEMBRANE-FORMING CURING COMPOUNDS COMPLYING WITH AS 3799 SHALL BE PERMITTED, SUBJECT TO PRIOR APPROVAL BY THE AUSGRID STRUCTURAL ENGINEER.
C7. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN & SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT.
C8. LAPS IN MESH SHALL BE MADE SO THAT THE TWO OUTERMOST TRANSVERSE WIRES OF ONE SHEET OVERLAP THE TWO OUTERMOST TRANSVERSE WIRES OF THE SHEET BEING LAPPED. SEE SKETCH BELOW:
C9. ALL REINFORCEMENT TO BE ACCURATELY PLACED IN POSITION SHOWN & TIED & ADEQUATELY SUPPORTED TO GIVE SPECIFIED COVER.
C10. CONCRETE SIZES SHOWN DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
C11. DEPTH OF BEAM IS GIVEN FIRST & INCLUDES SLAB THICKNESS.
C12. CONDUITS PIPES ETC. MUST NOT BE PLACED IN CONCRETE COVER & NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE ALLOWED UNLESS APPROVED IN WRITING BY THE AUSGRID STRUCTURAL ENGINEER.
C13. ALL TIE RODS WHERE NOT SHOWN ON THE DRAWING SHALL BE N12-200. PROVIDE N12 TIES AS REQUIRED TO SUPPORT REINFORCEMENT BARS IF STANDARD BAR CHAIRS ARE OF INADEQUATE HEIGHT.
C14. ALL BAR CHAIRS TO BE PLASTIC OR CONCRETE TYPE UNLESS NOTED OTHERWISE. STEEL BAR CHAIRS PERMITTED IN SWITCHYARD FOOTINGS ONLY.
C15. CONCRETE ELEMENTS SHALL BE FINISHED IN ACCORDANCE WITH AS 3610 AS FOLLOWS (OTHERWISE AS ON DWG):

ITEM	FORMED SURFACE FINISH (AS3610)	UNFORMED SURFACE FLATNESS (TOLERANCE CLASS)	UNFORMED SURFACE FINISH METHOD
FOOTINGS	CLASS 4	C	WOOD FLOAT

C16. UNFORMED SURFACE FLATNESS TOLERANCE SCHEDULE.

TOLERANCE CLASS	MEASUREMENT	MAXIMUM DEVIATION mm
A	3 m STRAIGHT EDGE	3
B	3 m STRAIGHT EDGE	6
C	600 mm STRAIGHT EDGE	6

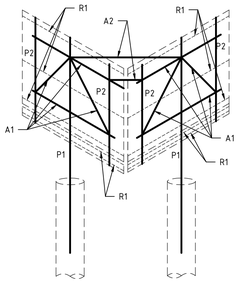
C17. UNFORMED ELEMENTS IN CONTACT WITH THE GROUND (EXCEPT FOR FOOTINGS) SHALL BE SEPARATED WITH A POLYMERIC FILM UNDERLAY TO AS2870 MINIMUM THICKNESS 200 MICRONS.
C18. EXTERNAL EMBEDDED ITEMS SHALL BE PLACED SO THAT THEY ARE NOT WITHIN THE ZONE OF CONCRETE COVER REQUIRED TO PROTECT THE REINFORCEMENT.
C19. THE EXPOSED EDGE OF THE CONCRETE SHALL BE FINISHED WITH A 10mm RADIUS CORNER UNO.

REINFORCEMENT SYMBOLS

C20. RL denotes RECTANGULAR LOW DUCTILITY REINFORCING FABRIC TO AS/NZS 4671
SL denotes SQUARE LOW DUCTILITY REINFORCING FABRIC TO AS/NZS 4671
R denotes STRUCTURAL GRADE ROUND BAR TO AS/NZS 4671
N denotes N00 GRADE DEFORMED BAR NORMAL DUCTILITY TO AS/NZS 4671
C denotes COLD WORKED DEFORMED BAR TO AS/NZS 4671
THE NUMBER FOLLOWING THE SYMBOLS R, N AND C IS THE BAR DIAMETER IN MILLIMETRES

ALUMINIUM SIGN NOTES

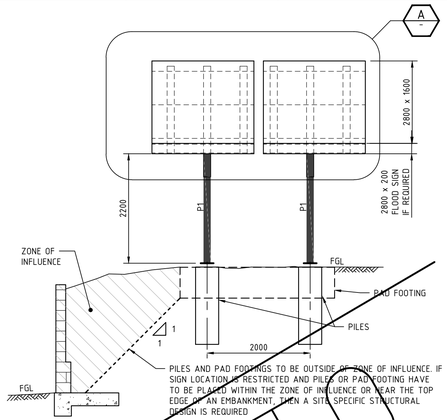
A1. SIGN DESIGN AND CONTENT TO BE IN ACCORDANCE WITH RMS STANDARDS AS FOUND AT HTTP://WWW.RMS.NSW.GOV.AU/CGI-BIN/INDEX.CGI?ACTION=SEARCHWATERWAYSIGNS.FORM
A2. THE ATTENTION OF THE CONTRACTOR IS DRAWN TO RMS SPECIFICATION 3409
A3. SIGN BLANKS SHALL BE 4MM THICK ALUMINIUM SHEET ALLOY. THE ALUMINIUM ALLOY SHALL BE TYPE 5251 OR 5052, TEMPER H38 OR H36 IN ACCORDANCE WITH AS 1743. THEY SHALL BE FREE OF CRACKS, TEARS AND OTHER SURFACE BLEMISHES;
A4. THE FACE OF EACH SIGN BLANK SHALL BE CHEMICALLY CLEANED AND ETCHED OR MECHANICALLY ABRADED. THE BACK OF EACH SIGN BLANK SHALL BE RENDERED DULL AND NON-REFLECTIVE EITHER BY MECHANICAL OR CHEMICAL MEANS AND SHALL BE FREE OF SCRATCHES AND BLEMISHES.
A5. THE SIGN SHALL BE FIXED TO THE SIGN BRACE RAILS USING 4.0MM ALUMINIUM POP RIVETS AT 150 MM MAXIMUM CENTRES. RIVET SHALL HAVE A MINIMUM TENSILE STRENGHT OF 1910 N AND A MINIMUM SHEAR STRENGTH OF 1520 N. THE HEAD OF THE RIVET SHALL BE PAINTED TO MATCH THE COLOUR OF THE SIGN AT THE SPECIFIC LOCATION.
A6. APPROVED ANTI-GRAFFITI FILM SHALL BE PROVIDED IF REQUIRED BY AUSGRID



ISOMETRIC VIEW
NTS

MEMBER SCHEDULE

MARK	SIZE
P1	139.7x5.4 CHS (NB125 HA C250
P2	139.7x3.5 CHS
A1	65x65x6 EA
A2	65x65x6 EA
R1	ALUMINIUM SIGN BRACE RAIL. CAPRAL PART 809128 ALUMINIUM GRADE 6060-T5 OR EQUIVALENT. CONNECTION TO GALVANISED POST TO HAVE ELECTRICAL SEPARATION. FIX WITH PROPRIETARY SIGN POST BRACKET



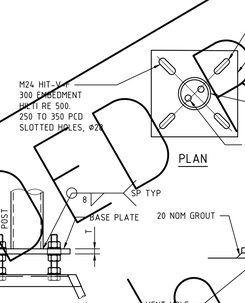
PILES AND PAD FOOTINGS TO BE OUTSIDE OF ZONE OF INFLUENCE. IF SIGN LOCATION IS RESTRICTED AND PILES OR PAD FOOTING HAVE TO BE PLACED WITHIN THE ZONE OF INFLUENCE OR NEAR THE TOP EDGE OF AN EMBANKMENT, THEN A SITE SPECIFIC STRUCTURAL DESIGN IS REQUIRED

ELEVATION
SCALE 1:50

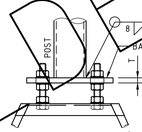
MEMBERS 'A1' AND 'A2' NOT SHOWN FOR CLARITY, REFER TO SECTIONS '1' & '3' FOR DETAILS

PLAN VIEW
SCALE 1:50

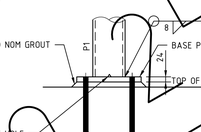
4 SECTION
SCALE 1:50



PLAN

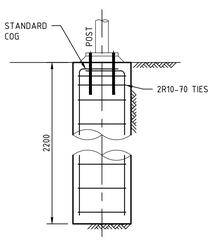


SECTION
ALTERNATE FOR CONNECTION TO PROPRIETARY FOOTING
SCALE 1:10



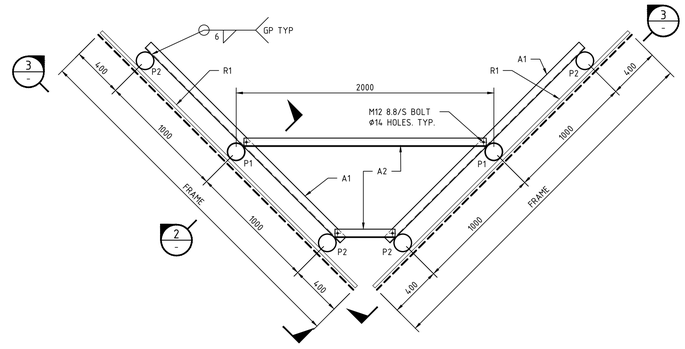
SECTION
POST FIXED TO TOP OF PILE DETAIL
SCALE 1:10

TYPICAL PILE SECTION
SCALE 1:20

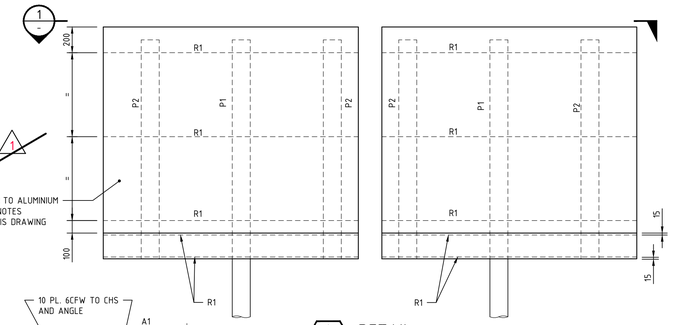


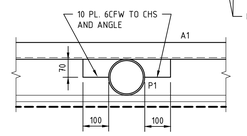
OPTION POST FIXED TO TOP OF PILE
OPTION POST CAST-INTO PILE

PILE OPTION DETAILS
SCALE 1:20



1 SECTION
SCALE 1:20



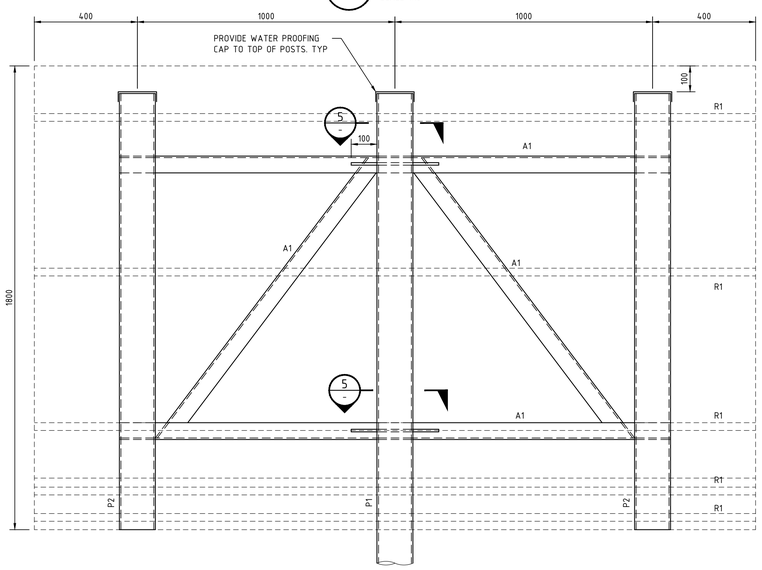


A DETAIL
SCALE 1:20

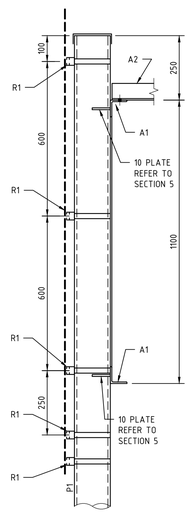
MEMBERS 'A1' AND 'A2' NOT SHOWN FOR CLARITY, REFER TO SECTION1 '1' & '3'

5 SECTION
SCALE 1:10

ALTERNATIVE PAD FOOTING OPTION DETAILS



3 SECTION
SCALE 1:10



2 SECTION
SCALE 1:10

AMENDMENTS						
AMD	DATE	DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
1	28.06.18	ISSUED FOR CONSTRUCTION. NOTES ADDED. DETAILS REVISED	ML	DS	PL	KG
2	23.10.18	ISSUED FOR CONSTRUCTION. MEMBER SCHEDULE AND DETAILS REVISED	JA	DS	PL	KG
3	02.03.20	DRAWING SUPERSEDED	JA	DS	PL	KG

CAD DRAWING DO NOT MANUALLY AMEND AMENDMENTS

ASSOCIATED DRAWINGS	
SUBMARINE CABLE SIGN SIGNAGE SUPPORTS	237976
SIGNAGE SUPPORTS STRUCTURAL DETAILS	237975

Ausgrid
570 George Street
SYDNEY NSW 2000

SCALE	AS SHOWN
DESIGNED	DAVID STANBURY
DRAWN	MARKO LJOLJIC
CHECKED	PAUL LOVARINI
APPROVED	KATINA GALLEN
DATE	01-2018
TRIM REF	2015/21013/1
PROJECT NUMBER	900037254-0030

STANDARD CONSTRUCTIONS
BI-DIRECTIONAL SIGN SUPPORT
STRUCTURAL DETAILS

DRAWING No 238007 | SHEET 1 | AMD 3 | SIZE B1

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