LIGHTNING PROTECTION INTERNATIONAL PTY LTD

TELECOMMUNICATIONS SOLUTIONS

LPI NEW ZEALAND
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09 833 5749 | info@lpinz.co.nz

LEGEND

EP/E C — EARTH ELECTRODE INSTALLED AS PER EARTH ELECTRODE DETAIL DRAWING (REFER TO E2 FOR DETAILS) LPI-UCBER1813

EP/LP C — EARTH ELECTRODE INSTALLED AS PER EARTH ELECTRODE DETAIL DRAWING (REFER TO E2 FOR DETAILS) LPI-UCBER1813

(M) 2 HOLES ON LOWER CABLE BAR SUPPORT BRACKET, CONNECT EACH TO EARTH PEG WITH 50mm² GYEW. USE CRIMP LUG AT TOWER END AND MIN. M10 STAINLESS STEEL BOLT.

(R) IF REBAR CONNECTION ARE PROVIDED, CONTRACTOR TO PROVIDE MECHANICALLY CLAMPED CONNECTIONS ONTO THE FOUNDATION STRUCTURAL STEEL REBAR. USE A REBARCON CONNECTION TYPE LPI-PL503M LPI-REBARCON 50mm 3M C/W PLATE CONNECT TO EP/E. EXOTHERMIC WELD AT EP/LP.

BONDING CONNECTIONS

[A] EXOTHERMIC WELD TYPE LPI-LWCMS12750325. REFER TO DRAWING E2 FOR DETAILS.

[B] CABLED CONNECTIONS TO LPI-COUPLER127PM - REFER TO DRAWING E2 FOR DETAILS. CONNECT MIN. M10 STAINLESS STEEL BOLT

NOTES :

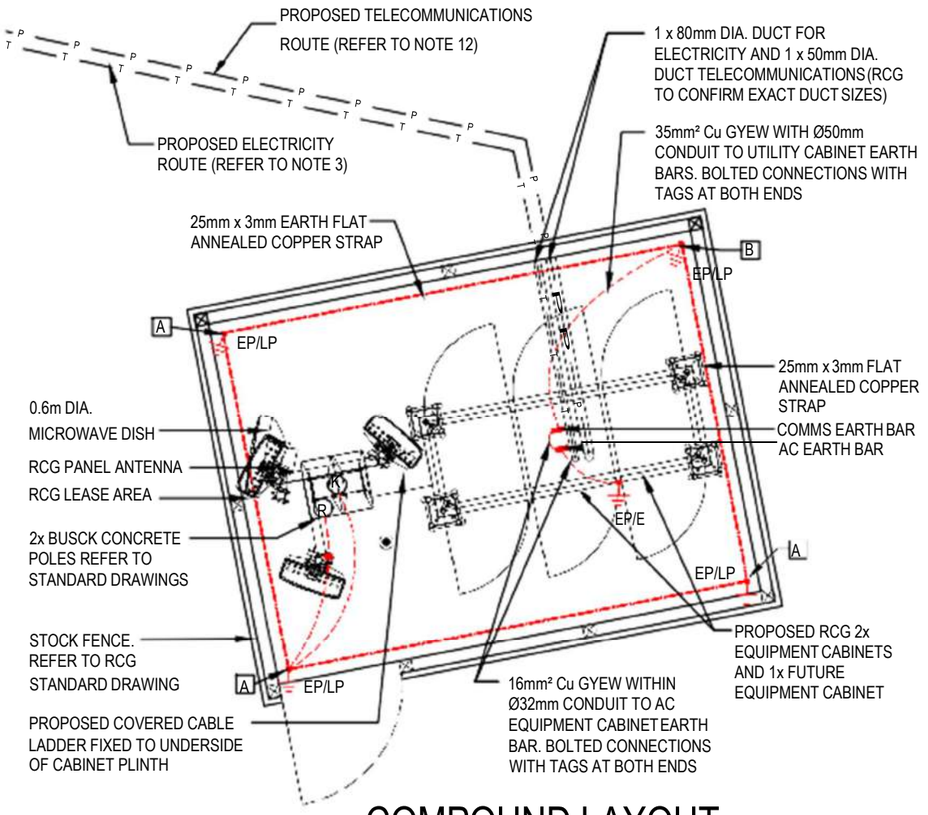
1. EARTHING INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE TO NZS 1768-2007.
2. ELECTRICAL CONTRACTOR IS TO PERFORM A SOIL RESISTIVITY TEST PRIOR TO START OF EARTHING INSTALLATION AS THEY MAY HAVE TO DRILL DEEPER HOLES FOR THE EARTH PEGS OR EVEN INCREASE THE NUMBER OF PEGS TO ACHIEVE LOW IMPEDANCE EARTHING (<10 OHMS).
3. ELECTRICAL CONNECTION BY SERVICE COMPANY, ROUTE TO BE CONFIRMED ON SITE BETWEEN SERVICE COMPANY AND LAND OWNER/POWER UTILITY.
4. ALL JOINTS AND JUNCTIONS AT EARTH PEGS TO BE CADWELDED EXCEPT FOR THE MAIN ELECTRICAL EARTH, GUSSET PLATE AND JOINTS. CABLE CONNECTIONS TO EP/E SHALL BE BOLTED WITH STAINLESS BOLT, WASHER AND NUT.
5. CONTACT PASTE BETWEEN CONTACT SURFACES REQUIRED ON ALL BOLTED CONNECTIONS (IE. EP/E, POLE, CABINET AND CABLE EARTH BARS).
6. EARTH ELECTRODES WHERE POSSIBLE SHALL BE 12.7mm x 1.8m COPPER BONDED RODS (2 X LPI-UCBER1813 + 1 X LPI-LEHC-58R AS REQUIRED).
7. ALL EARTH CONDUCTORS MUST BE INSTALLED DIRECTLY BETWEEN POINTS OF CONNECTION USING MINIMUM BENDS, AND ANY BENDS BEING AS SMOOTH AS POSSIBLE.
8. EARTHING SYSTEM UNSLEEVED EARTH TO BE BACKFILLED WITH EXISTING SOIL OR GROUND ENHANCING COMPOUNDS ONLY. SITE CONCRETE OR CRUSHED ROCK NOT TO BE USED.
9. CABLE PULL PIT TO BE PROVIDED AS REQUIRED BASED ON FINAL SERVICE CONNECTION ROUTE.
10. FULL POWER AND MEN EARTHING CONNECTIONS NOT SHOWN. REFER TO RCG TYPICAL UTILITY ELECTRICAL CABINET FOR FURTHER DETAILS (EATON EC33).
11. MINIMUM SEPARATION BETWEEN VERTICAL EARTHING ELECTRODE (RODS) SHALL BE TAKEN AS TWICE THE LENGTH OF THE EARTHING ELECTRODE.
12. TELECOMMUNICATIONS CONNECTION BY SERVICE COMPANY, ROUTE TO BE CONFIRMED ON SITE BETWEEN SERVICE COMPANY AND LAND OWNER/UTILITY.
13. LIGHTNING AIR TERMINAL SHALL BE MOUNTED A MINIMUM 1.5m ABOVE THE TOP OF THE TOWER OR HIGHEST MOUNTED EQUIPMENT (WHICHEVER IS GREATER). AIR TERMINAL SHALL BE METALLICALLY FIXED TO THE TOP OF THE TOWER, AND 25mm x 3mm COPPER STRAP.
14. IF SITE FENCE AND GATE ARE OF METALLIC TYPE, CONTRACTOR SHALL ENSURE THEY ARE ELECTRICALLY CONTINUOUS, AND BOND THESE AT MULTIPLE LOCATIONS TO THE NEAREST EP/LP AND EP/E WITH 35mm² Cu GYEW WITHIN 50mm DIA CONDUIT BURIED/ TRENCHED TO MINIMUM REQUIRED DEPTH AS PER DRAWING E2 (500mm MINIMUM).

GENERAL NOTES :

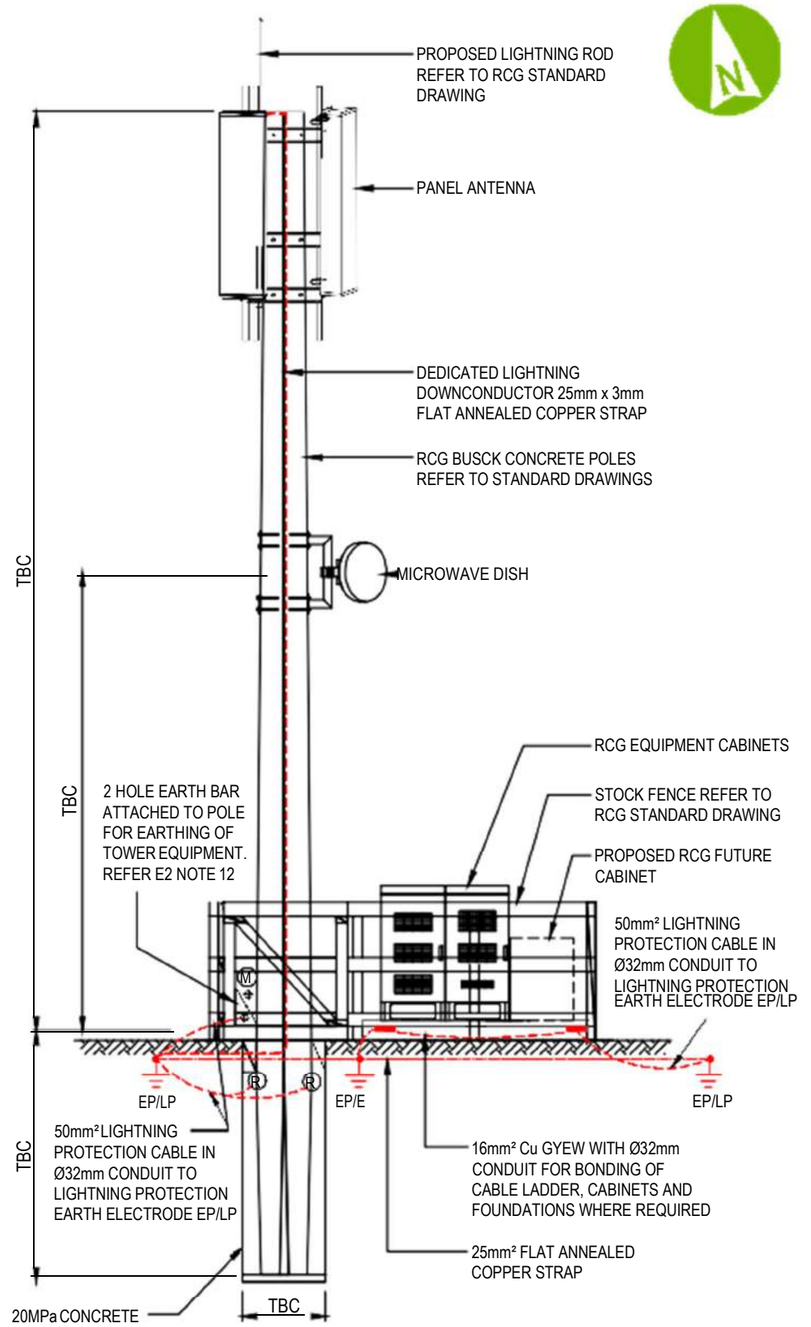
1. EARTH CONTINUITY OF TOWER SHALL BE GUARANTEED BY THE TOWER STRUCTURE MANUFACTURER AND INSTALLER.
2. EARTH CONNECTION OF ANTENNA AND TOWER TELECOMMUNICATIONS EQUIPMENT IS NOT SHOWN. CONTRACTOR SHALL SUPERVISE THE CORRECT EARTHING TERMINATION OF ALL TOWER EQUIPMENT SUCH AS MW AND RRHs. ENSURING SUITABLE CABLE CONTAINMENT IS PROVIDED FOR PERMANENT EARTHING TERMINATION OF EQUIPMENT EARTHS. THESE CONNECTIONS SHALL BE MADE BY THE RELEVANT INSTALLER AS PER MANUFACTURER'S REQUIREMENTS, TO THE EARTH TERMINATION POINT PROVIDED.
3. THE DRAWING HAS BEEN PRODUCED IN COLOUR. THE CONTRACTOR SHALL ENSURE THAT THE DRAWING IS PRINTED IN COLOUR TO CAPTURE THIS DETAIL PROVIDED. ITEMS COLOURED IN RED ARE THE MINIMUM PROVISION THAT THE CONTRACTOR IS EXPECTED TO SUPPLY AND INSTALL TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS. THE CONTRACTOR SHALL CARRY OUT EARTH RESISTANCE TESTING IN ACCORDANCE WITH AS/NZS 1768 FOLLOWING THE PROVISION OF THE MINIMUM, AND DETERMINE WHETHER THE ADDITIONAL PROVISION IS REQUIRED. THE CONTRACTOR SHALL PRICE FOR BOTH OPTIONS, AND CARRY THE REQUIRED MATERIALS TO AVOID ADDITIONAL RE-WORK.

MINIMUM PROVISION THAT THE CONTRACTOR IS EXPECTED TO SUPPLY AND INSTALL TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS

4. THE CONTRACTOR SHALL CARRY OUT EARTH RESISTANCE TESTING IN ACCORDANCE WITH AS/NZS 1768 FOLLOWING THE PROVISION OF THE MINIMUM, AND DETERMINE THE ADDITIONAL PROVISION IS REQUIRED. THE CONTRACTOR SHALL PRICE FOR BOTH OPTIONS, AND CARRY THE REQUIRED MATERIALS TO AVOID ADDITIONAL RE-WORK. CONTRACTOR SHALL INFORM RCG IF 10ohms IS NOT ACHIEVED AND GET APPROVAL PRIOR TO PROCEEDING WITH ADDITIONAL EARTHING.
5. WHERE 25mm x 3mm FLAT COPPER STRAP IS SPECIFIED, CONTRACTOR MAY PROPOSE 70mm² BARE COPPER CABLE AS AN ALTERNATIVE TO SUIT THEIR INSTALLATION. CONTRACTOR SHALL ENSURE THAT ALL SUITABLE CONNECTIONS ARE PROVIDED TO ACCOMMODATE THIS CHANGE IN DESIGN.



COMPOUND LAYOUT



EAST ELEVATION

CONTRACTOR TO ENSURE ALL EXISTING SERVICES ARE MARKED OUT ON SITE PRIOR TO CONSTRUCTION.

NOTE: ALL SERVICE PLANS HAVE NOT BEEN INCORPORATE INTO THIS DRAWING. LAYOUT SHOWN IS TYPICAL ONLY, CONTRACTOR SHALL MODIFY ACCORDINGLY TO SUIT SITE SPECIFIC DESIGN.

PRINT IN COLOUR

CLIENT: Rural Connectivity Group

REV	DATE	REVISION DETAILS	APPROVED
A	17.06.19	FOR INFORMATION	J.GRIFFIN
B	28.06.19	FOR INFORMATION	J.GRIFFIN
C	26.07.19	FOR INFORMATION	D.LeROUX
D	08.08.19	FOR INFORMATION	D.LeROUX

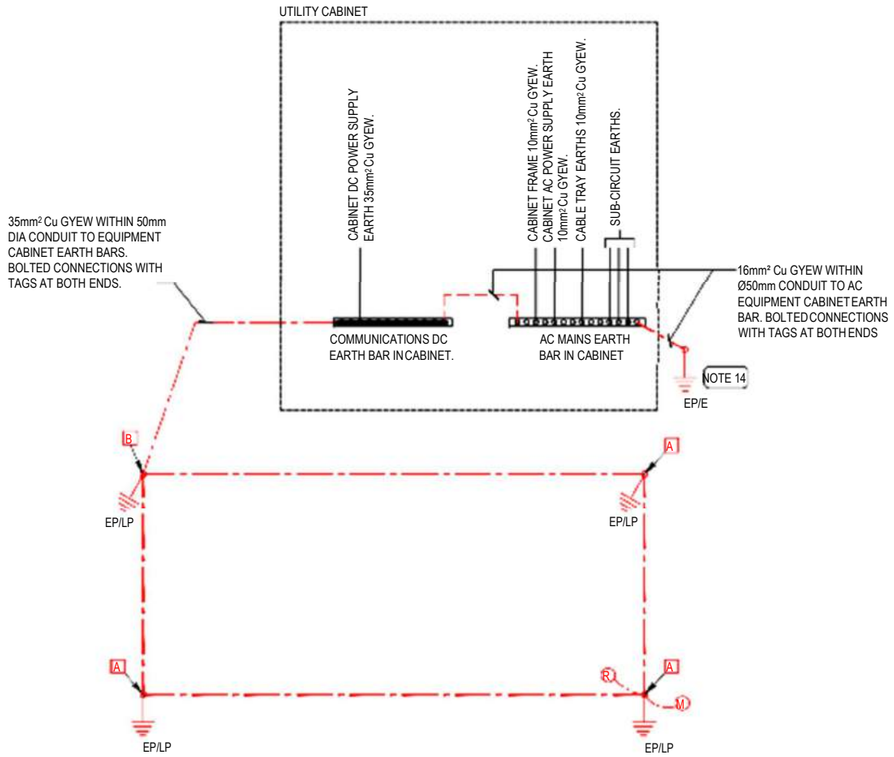
SCALE	SIZE
NTS	A3

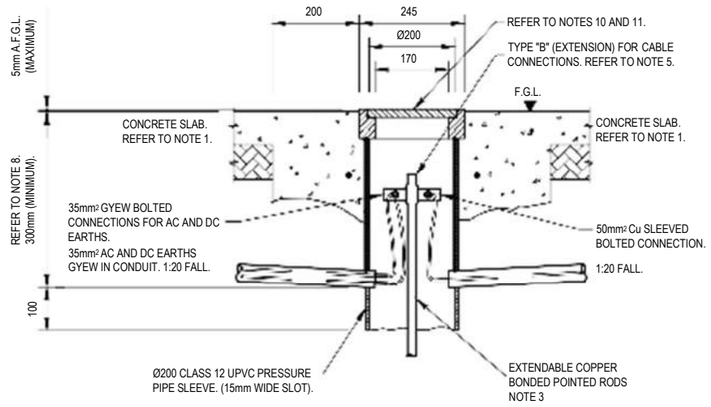
DRAWN: .TTUM
DESIGNED: D.JARDINE
REVIEWED: P.ANTHONY

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
DATE
T.ILICH

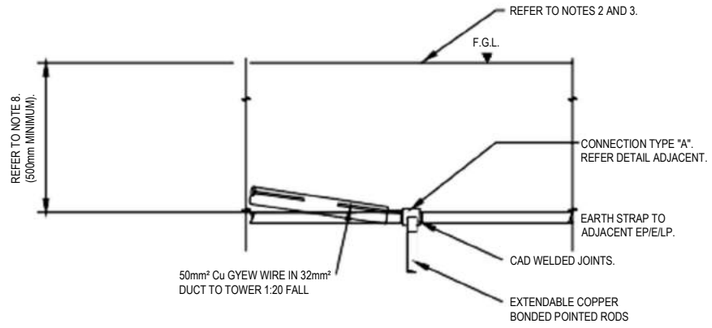
PROJECT: RBI II
TITLE: LIGHTNING PROTECTION EARTH LAYOUT

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	505814	CON	DWG	ST	E1	D

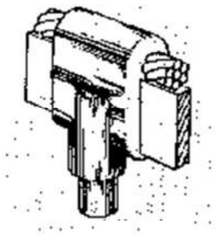




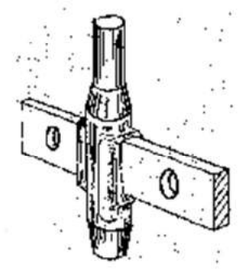
TYPICAL ELECTRICAL EARTH ELECTRODE EP/E DETAIL.
(NOTE 12)



TYPICAL LIGHTNING PROTECTION EARTH ELECTRODE EP/LP DETAIL.
(NOTE 12)



CONNECTION DETAIL TYPE A - EXOTHERMIC WELD 50mm CABLE TO COPPER TAPE 23mm x 3 mm TO 12.7mm EARTH ROD, TYPE LPI-LWCMS12750325 OR SIMILAR (NOTE 12)



CONNECTION DETAIL TYPE B - EXOTHERMIC WELD COUPLER FOR 127 EARTH ROD WITH TAGS PURPOSE MADE, TYPE LPI-COUPLER127PM OR SIMILAR (NOTE 12)

NOTES:

1. CAST INSITU CONCRETE SURROUND, REINFORCED WITH D12 PERIMETER BARS. WHEN EXISTING SURROUNDING AREA IS ASPHALT, COLOUR NEW CONCRETE BY WAY OF MIX ADDITIVES TO MATCH EXISTING ASPHALT.
2. CONTRACTOR SHALL DIRECT BURY THIS CONNECTION AFTER THE SUCCESSFUL COMPLETION OF INSPECTION AND TESTING. SHALL BE BACKFILLED WITH GROUND ENHANCING COMPOUNDS ONLY. SITE CONCRETE OR CRUSHED ROCK NOT TO BE USED.
3. EXTEND ELECTRODE BY SEQUENTIALLY ADDING 1200mm SECTIONS TO THE ELECTRODE TO ACHIEVE EARTH IMPEDANCE <10 OHMS.
4. WHEN GROUND ROCK IS PRESENT, DRILL Ø80 HOLE AND FILL WITH EEM EARTH ENHANCING MATERIALS, LPI-RESLO, GROUND RESISTING LOWERING COMPOUND OR EQUIVALENT EARTH COMPOUND.
5. LPI-COUPLER127PM TO BE ADDED TO EARTH ELECTRODE AFTER CONFIRMATION OF CORRECT EARTH RESISTANCE.
6. ENSURE ALL EARTH ELECTRODE CASING LIDS ARE LEVEL WITH CONCRETE SLAB FINISH.
7. NOTE THAT ALL LIGHTNING PROTECTION EARTH WIRES/CABLES AND ELECTRICAL EARTH WIRES/CABLES SHALL BE GREEN AND YELLOW. (GYEW = GREEN AND YELLOW EARTH WIRE).
8. DIMENSION IS DEPENDENT ON LENGTH OF CONDUIT IN RELATION TO 1:20 REQUIRED FALL. DIMENSION TO BE KEPT TO A MINIMUM.
9. ALL EXPOSED LIGHTNING PROTECTION CONNECTIONS SHALL BE SUITABLY PROTECTED FROM THE WEATHER USING SPECIFIED ZINC RICH PAINT.
10. 150mm HEAVY DUTY PVC COVER AND FRAME. LPI EARTH PIT LPI-EPIT-P WITH BOTTOM SECTION REMOVED, OR SIMILAR APPROVED PRODUCT.
11. ATTACH TO COVER, SCREW FIXED TRAFFOLITE LABEL, GREEN ON WHITE, 80x25. "ELECTRICAL EARTH ELECTRODE DO NOT DISCONNECT".
12. CONNECTION DETAILS SHOWN ARE TYPICAL ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THE SELECTION AND PURCHASE OF CONNECTIONS REQUIRED TO MEET THE DESIGN REQUIREMENTS OF THE INDIVIDUAL EARTHING ELECTRODES. REFER TO DWG E1 FOR CONNECTION SCHEMATIC.
13. CONTRACTOR SHALL ENSURE THE CORRECT METAL TO METAL CONNECTIONS ARE SUPPLIED AND INSTALLED TO PREVENT CORROSION.
14. DEDICATED EARTH INSPECTION PIT, THE FOLLOWING TO REPLACE NOTE 11: ATTACHE TO COVER, SCREW FIXED TRIFOLIATE LABEL, GREEN ON WHITE, 80x25 "DEDICATED EARTH INSPECTION ELECTRODE DO NOT DISCONNECT"

PRINT IN COLOUR

CLIENT: Rural Connectivity Group

REV	DATE	REVISION DETAILS	APPROVED
A	17.06.19	FOR INFORMATION	J.GRIFFIN
B	28.06.19	FOR INFORMATION	J.GRIFFIN
C	26.07.19	FOR INFORMATION	D.LeROUX
D	08.08.19	FOR INFORMATION	D.LeROUX

SCALE	SIZE
NTS	A3

DRAWN: J.LUM
DESIGNED: D.JARDINE
REVIEWED: P.ANTHONY

PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
DATE
T.ILICH

PROJECT: RBI II
TITLE: LIGHTNING PROTECTION EARTH SCHEMATICS

DRAWING No.: PROJECT No. 505814 – WBS CON – TYPE DWG – DISC ST – NUMBER E2 – REV D

LEGEND

EP/E ○ EARTH ELECTRODE INSTALLED AS PER EARTH ELECTRODE DETAIL DRAWING (REFER TO E2 FOR DETAILS) LPI-UCBER1813

EP/LP ○ EARTH ELECTRODE INSTALLED AS PER EARTH ELECTRODE DETAIL DRAWING (REFER TO E2 FOR DETAILS) LPI-UCBER1813

Ⓕ HOLDING DOWN BOLT FOUNDATION ANCHOR PLATE - IF PROVIDED IN INSTALLATION. WELDED CONNECTION TO CONNEC TO EP/LP. WELDED CONNECTIONS AT EP/LP. CABLE SHALL BE 50mm² Cu/GYEW

Ⓜ 2 HOLES ON LOWER CABLE BAR SUPPORT BRACKET, CONNECT EACH TO EARTH PEG WITH 50mm² GYEW. USE CRIMP LUG AT TOWER END AND MIN. M10 STAINLESS STEEL BOLT.

Ⓡ MECHANICALLY CLAMPED CONNECTIONS ONTO THE FOUNDATION STRUCTURAL STEEL REBAR. USE A REBARCON CONNECTION TYPE LPI-PL503M LPI-REBARCON 50mm 3M C/W PLATE CONNECT TO EP/E. EXOTHERMIC WELD AT EP/LP.

BONDING CONNECTIONS

A EXOTHERMIC WELD TYPE LPI-LWCMS12750325. REFER TO DRAWING E2 FOR DETAILS.

B CABLED CONNECTIONS TO LPI-COUPLER127PM - REFER TO DRAWING E2 FOR DETAILS. CONNECT MIN. M10 STAINLESS STEEL BOLT

NOTES :

1. EARTHING INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE TO NZS 1768-2007.
2. ELECTRICAL CONTRACTOR IS TO PERFORM A SOIL RESISTIVITY TEST PRIOR TO START OF EARTHING INSTALLATION AS THEY MAY HAVE TO DRILL DEEPER HOLES FOR THE EARTH PEGS OR EVEN INCREASE THE NUMBER OF PEGS TO ACHIEVE LOW IMPEDANCE EARTHING (<10 OHMS).
3. ELECTRICAL CONNECTION BY SERVICE COMPANY, ROUTE TO BE CONFIRMED ON SITE BETWEEN SERVICE COMPANY AND LAND OWNER/POWER UTILITY.
4. ALL JOINTS AND JUNCTIONS AT EARTH PEGS TO BE CADWELDED EXCEPT FOR THE MAIN ELECTRICAL EARTH, GUSSET PLATE AND JOINTS. CABLE CONNECTIONS TO EP/E SHALL BE BOLTED WITH STAINLESS BOLT, WASHER AND NUT.
5. CONTACT PASTE BETWEEN CONTACT SURFACES REQUIRED ON ALL BOLTED CONNECTIONS (IE. EP/E, POLE, CABINET AND CABLE EARTH BARS).
6. EARTH ELECTRODES WHERE POSSIBLE SHALL BE 12.7mm x 1.8m COPPER BONDED RODS (2 X LPI-UCBER1813 + 1 X LPI-LEHC-58R AS REQUIRED).
7. ALL EARTH CONDUCTORS MUST BE INSTALLED DIRECTLY BETWEEN POINTS OF CONNECTION USING MINIMUM BENDS, AND ANY BENDS BEING AS SMOOTH AS POSSIBLE.
8. EARTHING SYSTEM UNSLEEVED EARTH TO BE BACKFILLED WITH EXISTING SOIL OR GROUND ENHANCING COMPOUNDS ONLY. SITE CONCRETE OR CRUSHED ROCK NOT TO BE USED.
9. CABLE PULL PIT TO BE PROVIDED AS REQUIRED BASED ON FINAL SERVICE CONNECTION ROUTE.
10. FULL POWER AND MEN EARTHING CONNECTIONS NOT SHOWN. REFER TO RCG TYPICAL UTILITY ELECTRICAL CABINET FOR FURTHER DETAILS (EATON EC33).
11. MINIMUM SEPARATION BETWEEN VERTICAL EARTHING ELECTRODE (RODS) SHALL BE TAKEN AS TWICE THE LENGTH OF THE EARTHING ELECTRODE.
12. TELECOMMUNICATIONS CONNECTION BY SERVICE COMPANY, ROUTE TO BE CONFIRMED ON SITE BETWEEN SERVICE COMPANY AND LAND OWNER/UTILITY.
13. LIGHTNING AIR TERMINAL SHALL BE MOUNTED A MINIMUM 1.5m ABOVE THE TOP OF THE TOWER OR HIGHEST MOUNTED EQUIPMENT (WHICHEVER IS GREATER). AIR TERMINAL SHALL BE METALLICALLY BONDED TO THE TOP OF THE TOWER.
14. REFER TO DRAWING E2 DETAIL 1 FOR FURTHER INFORMATION.
15. IF SITE FENCE AND GATE ARE OF METALLIC TYPE, CONTRACTOR SHALL ENSURE THEY ARE ELECTRICALLY CONTINUOUS, AND BOND THESE AT MULTIPLE LOCATIONS TO THE NEAREST EP/LP AND EP/E WITH 35mm² Cu GYEW WITHIN 50mm DIA CONDUIT BURIED/TRENCHED TO MINIMUM REQUIRED DEPTH AS PER DRAWING E2 (500mm MINIMUM).

GENERAL NOTES :

1. EARTH CONTINUITY OF TOWER SHALL BE GUARANTEED BY THE TOWER STRUCTURE MANUFACTURER AND INSTALLER.
2. EARTH CONNECTION OF ANTENNA AND TOWER TELECOMMUNICATIONS EQUIPMENT IS NOT SHOWN. CONTRACTOR SHALL SUPERVISE THE CORRECT EARTHING TERMINATION OF ALL TOWER EQUIPMENT SUCH AS MW AND RRHs.THESE CONNECTIONS SHALL BE MADE BY THE RELEVANT INSTALLER AS PER MANUFACTURER'S REQUIREMENTS, TO THE EARTH TERMINATION POINT PROVIDED.
3. THE DRAWING HAS BEEN PRODUCED IN COLOUR. THE CONTRACTOR SHALL ENSURE THAT THE DRAWING IS PRINTED IN COLOUR TO CAPTURE THIS DETAIL PROVIDED. ITEMS COLOURED IN RED ARE THE MINIMUM PROVISION THAT THE CONTRACTOR IS EXPECTED TO SUPPLY AND INSTALL TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS. ITEMS COLOURED IN BLUE ARE THE ADDITIONAL PROVISION ANTICIPATED FOR DIFFICULT SITES THAT IS REQUIRED TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS. THE CONTRACTOR SHALL CARRY OUT EARTH RESISTANCE TESTING IN ACCORDANCE WITH AS/NZS 1768 FOLLOWING THE PROVISION OF THE MINIMUM, AND DETERMINE WHETHER THE ADDITIONAL PROVISION IS REQUIRED. THE CONTRACTOR SHALL PRICE FOR BOTH OPTIONS, AND CARRY THE REQUIRED MATERIALS TO AVOID ADDITIONAL RE-WORK.

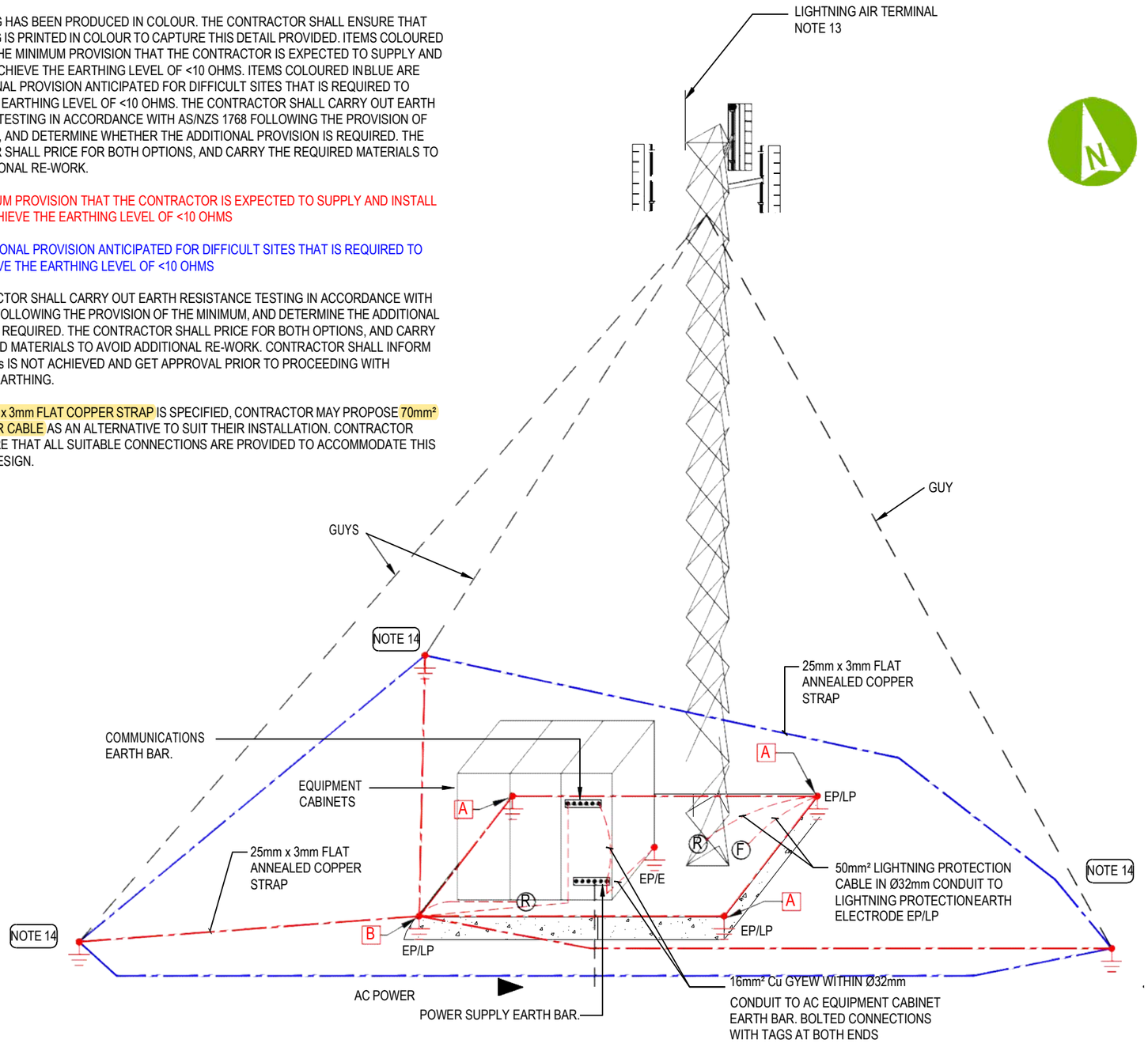
—— – —— MINIMUM PROVISION THAT THE CONTRACTOR IS EXPECTED TO SUPPLY AND INSTALL
– — — – TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS

—— – —— ADDITIONAL PROVISION ANTICIPATED FOR DIFFICULT SITES THAT IS REQUIRED TO
– — — – ACHIEVE THE EARTHING LEVEL OF <10 OHMS

4. THE CONTRACTOR SHALL CARRY OUT EARTH RESISTANCE TESTING IN ACCORDANCE WITH AS/NZS 1768 FOLLOWING THE PROVISION OF THE MINIMUM, AND DETERMINE THE ADDITIONAL PROVISION IS REQUIRED. THE CONTRACTOR SHALL PRICE FOR BOTH OPTIONS, AND CARRY THE REQUIRED MATERIALS TO AVOID ADDITIONAL RE-WORK. CONTRACTOR SHALL INFORM RCG IF 10ohms IS NOT ACHIEVED AND GET APPROVAL PRIOR TO PROCEEDING WITH ADDITIONAL EARTHING.
5. WHERE 25mm x 3mm FLAT COPPER STRAP IS SPECIFIED, CONTRACTOR MAY PROPOSE 70mm² BARE COPPER CABLE AS AN ALTERNATIVE TO SUIT THEIR INSTALLATION. CONTRACTOR SHALL ENSURE THAT ALL SUITABLE CONNECTIONS ARE PROVIDED TO ACCOMMODATE THIS CHANGE IN DESIGN.

CONTRACTOR TO ENSURE ALL EXISTING SERVICES ARE MARKED OUT ON SITE PRIOR TO CONSTRUCTION.

NOTE: ALL SERVICE PLANS HAVE NOT BEEN INCORPORATE INTO THIS DRAWING. LAYOUT SHOWN IS TYPICAL ONLY, CONTRACTOR SHALL MODIFY ACCORDINGLY TO SUIT SITE SPECIFIC DESIGN.



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A	17.06.19	FOR INFORMATION	J.GRIFFIN
B	28.06.19	FOR INFORMATION	J.GRIFFIN
C	26.07.19	FOR INFORMATION	D.LeROUX
D	08.08.19	FOR INFORMATION	D.LeROUX

CLIENT: Rural Connectivity Group

PRINT IN COLOUR

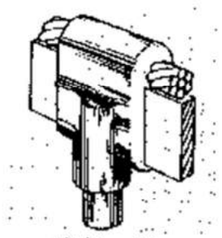
SCALE	NTS
SIZE	A3
DRAWN	J.LUM
DESIGNED	D.JARDINE
REVIEWED	P.ANTHONY
APPROVED	T.ILICH
DATE	

PRELIMINARY
NOT FOR CONSTRUCTION

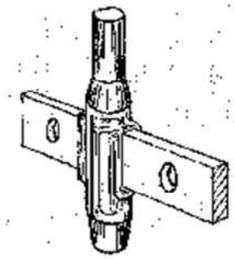
PROJECT: RBI II

TITLE: LIGHTNING PROTECTION EARTH LAYOUT

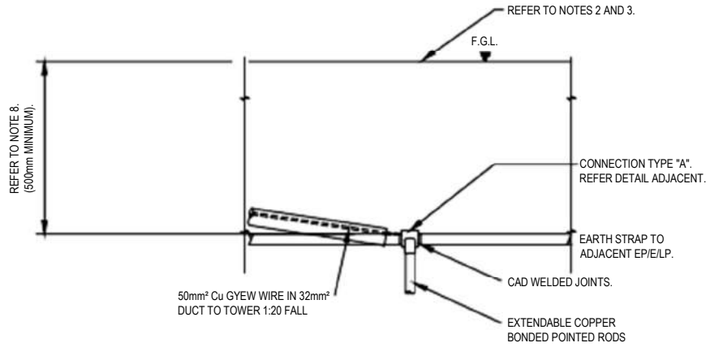
DRAWING No.: PROJECT No. 505814 – WBS GUY – TYPE DWG – DISC ST – NUMBER E1 – REV D



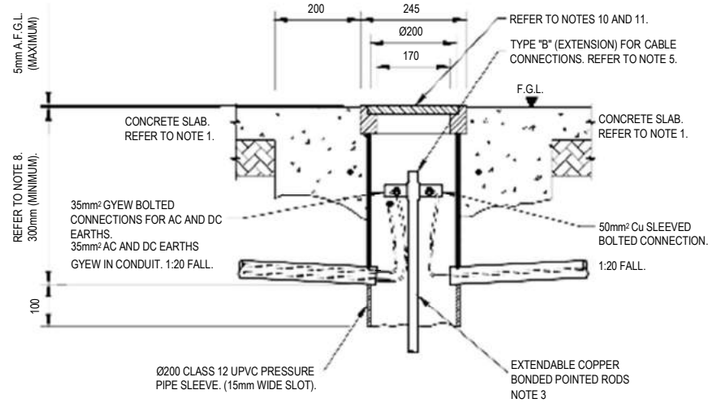
CONNECTION DETAIL TYPE A - EXOTHERMIC WELD
50MM CABLE TO COPPER TAPE
23mm x 3 mm TO 12.7mm EARTH ROD, TYPE LPI-LWCMS12750325 OR SIMILAR (NOTE 12)



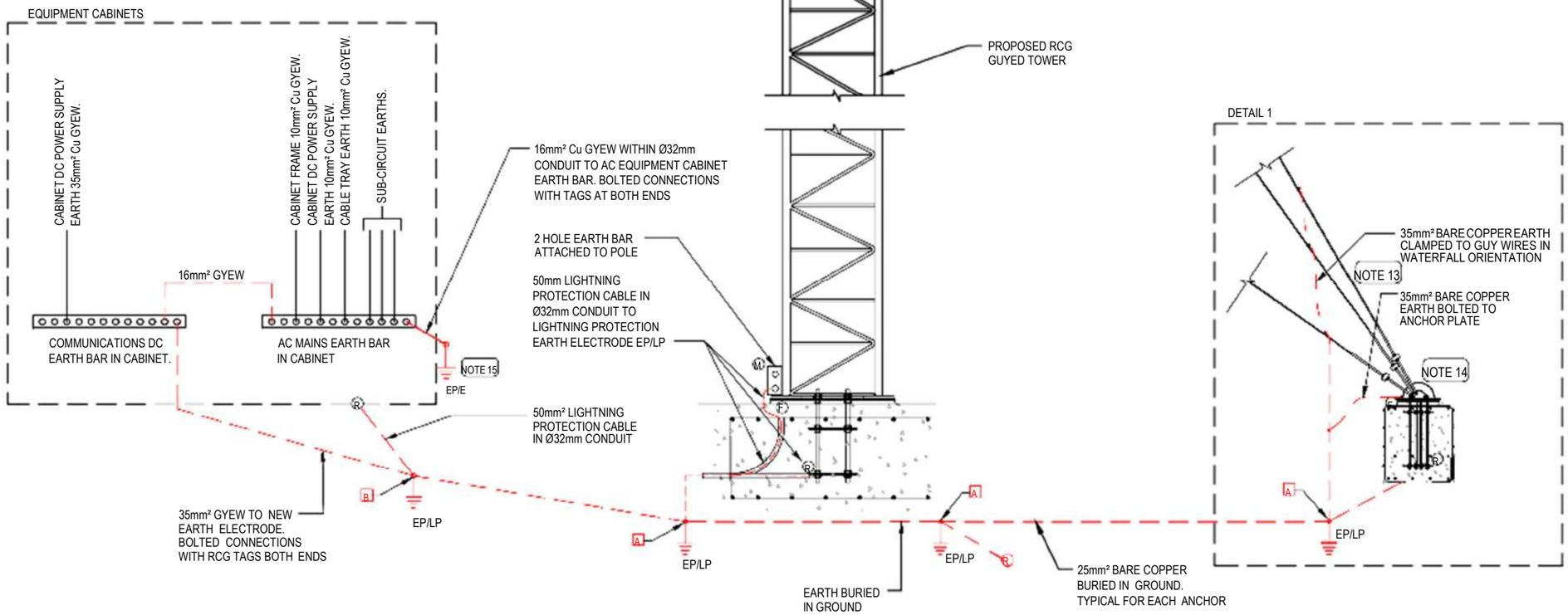
CONNECTION DETAIL TYPE B - EXOTHERMIC WELD COUPLER FOR 127 EARTH ROD WITH TAGS PURPOSE MADE, TYPE LPI-COUPLER127PM OR SIMILAR (NOTE 12)



TYPICAL LIGHTNING PROTECTION EARTH ELECTRODE EP/LP DETAIL. (NOTE 12)



TYPICAL ELECTRICAL EARTH ELECTRODE EP/E DETAIL. (NOTE 12)



NOTES:

1. CAST INSITU CONCRETE SURROUND, REINFORCED WITH D12 PERIMETER BARS. WHEN EXISTING SURROUNDING AREA IS ASPHALT, COLOUR NEW CONCRETE BY WAY OF MIX ADDITIVES TO MATCH EXISTING ASPHALT.
2. CONTRACTOR SHALL DIRECT BURY THIS CONNECTION AFTER THE SUCCESSFUL COMPLETION OF INSPECTION AND TESTING. SHALL BE BACKFILLED WITH GROUND ENHANCING COMPOUNDS ONLY. SITE CONCRETE OR CRUSHED ROCK NOT TO BE USED.
3. EXTEND ELECTRODE BY SEQUENTIALLY ADDING 1200mm SECTIONS TO THE ELECTRODE TO ACHIEVE EARTH IMPEDANCE <10 OHMS.
4. WHEN GROUND ROCK IS PRESENT, DRILL Ø80 HOLE AND FILL WITH EEM EARTH ENHANCING MATERIALS, LPI-RESLO, GROUND RESISTING LOWERING COMPOUND OR EQUIVALENT EARTH COMPOUND.
5. LPI-COUPLER127PM TO BE ADDED TO EARTH ELECTRODE AFTER CONFIRMATION OF CORRECT EARTH RESISTANCE.
6. ENSURE ALL EARTH ELECTRODE CASING LIDS ARE LEVEL WITH CONCRETE SLAB FINISH.
7. NOTE THAT ALL LIGHTNING PROTECTION EARTH WIRES/CABLES AND ELECTRICAL EARTH WIRES/CABLES SHALL BE GREEN AND YELLOW. (GYEW = GREEN AND YELLOW EARTH WIRE).
8. DIMENSION IS DEPENDENT ON LENGTH OF CONDUIT IN RELATION TO 1:20 REQUIRED FALL. DIMENSION TO BE KEPT TO A MINIMUM.
9. ALL EXPOSED LIGHTNING PROTECTION CONNECTIONS SHALL BE SUITABLY PROTECTED FROM THE WEATHER USING SPECIFIED ZINC RICH PAINT.
10. 150mm HEAVY DUTY PVC COVER AND FRAME. LPI EARTH PIT LPI-EPIT-P WITH BOTTOM SECTION REMOVED, OR SIMILAR APPROVED PRODUCT.
11. ATTACH TO COVER, SCREW FIXED TRAFFOLITE LABEL, GREEN ON WHITE, 80x25. "ELECTRICAL EARTH ELECTRODE DO NOT DISCONNECT".
12. CONNECTION DETAILS SHOWN ARE TYPICAL ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THE SELECTION AND PURCHASE OF CONNECTIONS REQUIRED TO MEET THE DESIGN REQUIREMENTS OF THE INDIVIDUAL EARTHING ELECTRODES. REFER TO DWG E1 FOR CONNECTION SCHEMATIC.
13. CONTRACTOR SHALL PROVIDE GALVANISED CABLE/TAIL CONNECTION AND/OR BI-METAL LUGS FOR CONNECTION TO STAYS TO PREVENT CORROSION OF STAY DUE TO DISSIMILAR METALS. OPTION FOR USE OF OFFCUT GUY WIRE WITH BI-METAL LUG AND COPPER CONNECTION TO EP/LP.
14. CONTRACTOR SHALL ENSURE THE CORRECT METAL TO METAL CONNECTIONS ARE SUPPLIED AND INSTALLED TO PREVENT CORROSION.
15. DEDICATED EARTH INSPECTION PIT, THE FOLLOWING TO REPLACE NOTE 11: ATTACHE TO COVER, SCREW FIXED TRIFOLIATE LABEL, GREEN ON WHITE, 80x25 "DEDICATED EARTH INSPECTION ELECTRODE DO NOT DISCONNECT".

PRINT IN COLOUR

CLIENT: Rural Connectivity Group

REV	DATE	REVISION DETAILS	APPROVED
A	17.06.19	FOR INFORMATION	J.GRIFFIN
B	28.06.19	FOR INFORMATION	J.GRIFFIN
C	26.07.19	FOR INFORMATION	D.LeROUX
D	08.08.19	FOR INFORMATION	D.LeROUX

SCALE	NTS
SIZE	A3
DRAWN	T.TIM
DESIGNED	D.JARDINE
REVIEWED	P.ANTHONY
APPROVED	T.ILICH
DATE	

PRELIMINARY
NOT FOR CONSTRUCTION

PROJECT	RBI II
TITLE	LIGHTNING PROTECTION EARTH SCHEMATICS

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	505814	GUY	DWG	ST	E2	D

LEGEND

EP/E — EARTH ELECTRODE INSTALLED AS PER EARTH ELECTRODE DETAIL DRAWING (REFER TO E2 FOR DETAILS) LPI-UCBER1813

EP/LP — EARTH ELECTRODE INSTALLED AS PER EARTH ELECTRODE DETAIL DRAWING (REFER TO E2 FOR DETAILS) LPI-UCBER1813

Ⓕ HOLDING DOWN BOLT FOUNDATION ANCHOR PLATE - IF PROVIDED IN INSTALLATION. WELDED CONNECTION TO CONNEC TO EP/LP. WELDED CONNECTIONS AT EP/LP. CABLE SHALL BE 50mm² Cu/GYEW

Ⓡ MECHANICALLY CLAMPED CONNECTIONS ONTO THE FOUNDATION STRUCTURAL STEEL REBAR. USE A REBARCON CONNECTION TYPE LPI-PL503M LPI-REBARCON 50mm 3M C/W PLATE CONNECT TO EP/E. EXOTHERMIC WELD AT EP/LP.

Ⓜ 2 HOLES ON LOWER CABLE BAR SUPPORT BRACKET, CONNECT EACH TO EARTH PEG WITH 50mm² GYEW. USE CRIMP LUG AT TOWER END AND MIN. M10 STAINLESS STEEL BOLT.

Ⓢ MECHANICALLY CLAMPED CONNECTIONS ONTO THE FOUNDATION STRUCTURAL STEEL REBAR TAKEN TO TWO DIAGONALLY OPPOSITE M CONNECTION PLATES. USE A REBARCON CONNECTION TYPE LPI-PL503M LPI-REBARCON 50mm² Cu/GYEW CHANGE TO CRIMP LUG AT THE MAST END.

BONDING CONNECTIONS

[A] EXOTHERMIC WELD TYPE LPI-LWCMS12750325. REFER TO DRAWING E2 FOR DETAILS.

[B] CABLED CONNECTIONS TO LPI-COUPLER127PM - REFER TO DRAWING E2 FOR DETAILS. CONNECT MIN. M10 STAINLESS STEEL BOLT

NOTES :

1. EARTHING INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE TO NZS 1768-2007.
2. ELECTRICAL CONTRACTOR IS TO PERFORM A SOIL RESISTIVITY TEST PRIOR TO START OF EARTHING INSTALLATION AS THEY MAY HAVE TO DRILL DEEPER HOLES FOR THE EARTH PEGS OR EVEN INCREASE THE NUMBER OF PEGS TO ACHIEVE LOW IMPEDANCE EARTHING (<10 OHMS).
3. ELECTRICAL CONNECTION BY SERVICE COMPANY, ROUTE TO BE CONFIRMED ON SITE BETWEEN SERVICE COMPANY AND LAND OWNER/POWER UTILITY.
4. ALL JOINTS AND JUNCTIONS AT EARTH PEGS TO BE CADWELDED EXCEPT FOR THE MAIN ELECTRICAL EARTH, GUSSET PLATE AND JOINTS. CABLE CONNECTIONS TO EP/E SHALL BE BOLTED WITH STAINLESS BOLT, WASHER AND NUT.
5. CONTACT PASTE BETWEEN CONTACT SURFACES REQUIRED ON ALL BOLTED CONNECTIONS (IE. EP/E, POLE, CABINET AND CABLE EARTH BARS).
6. EARTH ELECTRODES WHERE POSSIBLE SHALL BE 12.7mm x 1.8m COPPER BONDED RODS (2 X LPI-UCBER1813 + 1 X LPI-LEHC-58R AS REQUIRED).
7. ALL EARTH CONDUCTORS MUST BE INSTALLED DIRECTLY BETWEEN POINTS OF CONNECTION USING MINIMUM BENDS, AND ANY BENDS BEING AS SMOOTH AS POSSIBLE.
8. EARTHING SYSTEM UNSLEEVED EARTH TO BE BACKFILLED WITH EXISTING SOIL OR GROUND ENHANCING COMPOUNDS ONLY. SITE CONCRETE OR CRUSHED ROCK NOT TO BE USED.
9. CABLE PULL PIT TO BE PROVIDED AS REQUIRED BASED ON FINAL SERVICE CONNECTION ROUTE.
10. FULL POWER AND MEN EARTHING CONNECTIONS NOT SHOWN. REFER TO RCG TYPICAL UTILITY ELECTRICAL CABINET FOR FURTHER DETAILS (EATON EC33).
11. MINIMUM SEPARATION BETWEEN VERTICAL EARTHING ELECTRODE (RODS) SHALL BE TAKEN AS TWICE THE LENGTH OF THE EARTHING ELECTRODE.
12. TELECOMMUNICATIONS CONNECTION BY SERVICE COMPANY, ROUTE TO BE CONFIRMED ON SITE BETWEEN SERVICE COMPANY AND LAND OWNER/UTILITY.
13. LIGHTNING AIR TERMINAL SHALL BE MOUNTED A MINIMUM 1.5m ABOVE THE TOP OF THE TOWER OR HIGHEST MOUNTED EQUIPMENT (WHICHEVER IS GREATER). AIR TERMINAL SHALL BE METALLICALLY BONDED TO THE TOP OF THE TOWER.
14. IF SITE FENCE AND GATE ARE OF METALLIC TYPE, CONTRACTOR SHALL ENSURE THEY ARE ELECTRICALLY CONTINUOUS, AND BOND THESE AT MULTIPLE LOCATIONS TO THE NEAREST EP/LP AND EP/E WITH 70mm² Cu GYEW WITHIN 50mm DIA CONDUIT

GENERAL NOTES :

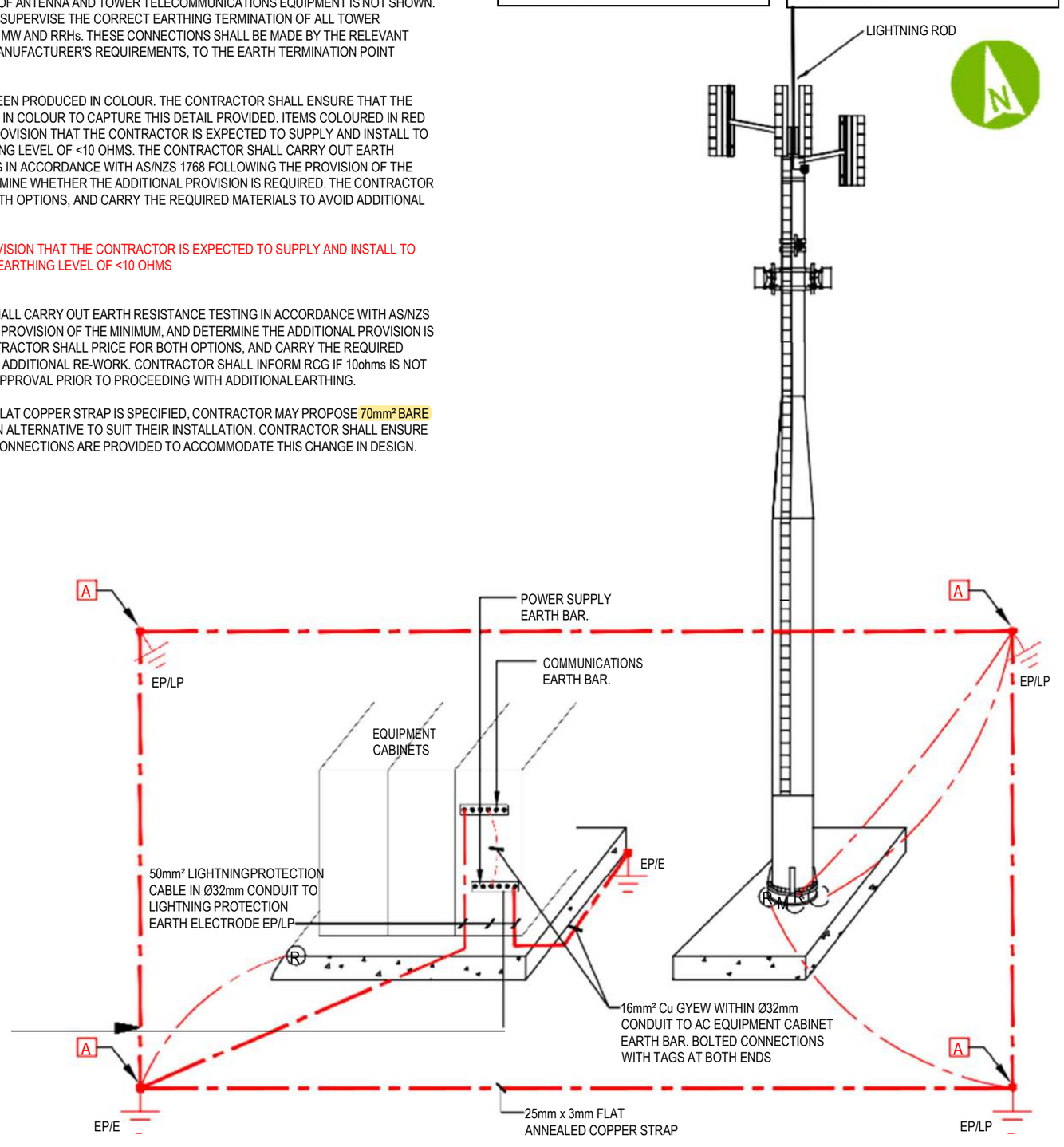
1. EARTH CONTINUITY OF TOWER SHALL BE GUARANTEED BY THE TOWER STRUCTURE MANUFACTURER AND INSTALLER.
2. EARTH CONNECTION OF ANTENNA AND TOWER TELECOMMUNICATIONS EQUIPMENT IS NOT SHOWN. CONTRACTOR SHALL SUPERVISE THE CORRECT EARTHING TERMINATION OF ALL TOWER EQUIPMENT SUCH AS MW AND RRHs. THESE CONNECTIONS SHALL BE MADE BY THE RELEVANT INSTALLER AS PER MANUFACTURER'S REQUIREMENTS, TO THE EARTH TERMINATION POINT PROVIDED.
3. THE DRAWING HAS BEEN PRODUCED IN COLOUR. THE CONTRACTOR SHALL ENSURE THAT THE DRAWING IS PRINTED IN COLOUR TO CAPTURE THIS DETAIL PROVIDED. ITEMS COLOURED IN RED ARE THE MINIMUM PROVISION THAT THE CONTRACTOR IS EXPECTED TO SUPPLY AND INSTALL TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS. THE CONTRACTOR SHALL CARRY OUT EARTH RESISTANCE TESTING IN ACCORDANCE WITH AS/NZS 1768 FOLLOWING THE PROVISION OF THE MINIMUM, AND DETERMINE WHETHER THE ADDITIONAL PROVISION IS REQUIRED. THE CONTRACTOR SHALL PRICE FOR BOTH OPTIONS, AND CARRY THE REQUIRED MATERIALS TO AVOID ADDITIONAL RE-WORK.

MINIMUM PROVISION THAT THE CONTRACTOR IS EXPECTED TO SUPPLY AND INSTALL TO ACHIEVE THE EARTHING LEVEL OF <10 OHMS

4. THE CONTRACTOR SHALL CARRY OUT EARTH RESISTANCE TESTING IN ACCORDANCE WITH AS/NZS 1768 FOLLOWING THE PROVISION OF THE MINIMUM, AND DETERMINE THE ADDITIONAL PROVISION IS REQUIRED. THE CONTRACTOR SHALL PRICE FOR BOTH OPTIONS, AND CARRY THE REQUIRED MATERIALS TO AVOID ADDITIONAL RE-WORK. CONTRACTOR SHALL INFORM RCG IF 10ohms IS NOT ACHIEVED AND GET APPROVAL PRIOR TO PROCEEDING WITH ADDITIONAL EARTHING.
5. WHERE 25mm x 3mm FLAT COPPER STRAP IS SPECIFIED, CONTRACTOR MAY PROPOSE 70mm² BARE COPPER CABLE AS AN ALTERNATIVE TO SUIT THEIR INSTALLATION. CONTRACTOR SHALL ENSURE THAT ALL SUITABLE CONNECTIONS ARE PROVIDED TO ACCOMMODATE THIS CHANGE IN DESIGN.

CONTRACTOR TO ENSURE ALL EXISTING SERVICES ARE MARKED OUT ON SITE PRIOR TO CONSTRUCTION.

NOTE: ALL SERVICE PLANS HAVE NOT BEEN INCORPORATE INTO THIS DRAWING. LAYOUT SHOWN IS TYPICAL ONLY, CONTRACTOR SHALL MODIFY ACCORDINGLY TO SUIT SITE SPECIFIC DESIGN.



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A	17.06.19	FOR INFORMATION	J.GRIFFIN
B	28.06.19	FOR INFORMATION	J.GRIFFIN
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SCALE	NTS
SIZE	A3
DRAWN	J.LUM
DESIGNED	D.JARDINE
REVIEWED	P.ANTHONY

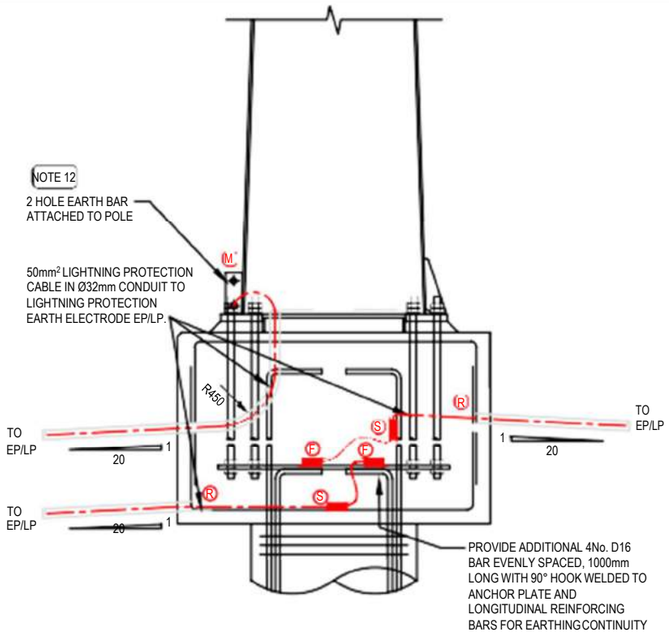
PRELIMINARY
NOT FOR CONSTRUCTION
APPROVED
DATE
T.ILICH

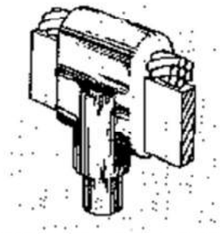
PROJECT: RBI II

TITLE: LIGHTNING PROTECTION EARTH LAYOUT

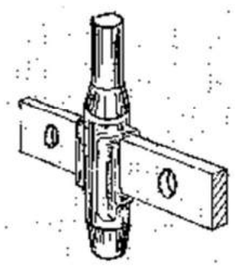
DRAWING No.: PROJECT No. 505814 – WBS MON – TYPE DWG – DISC ST – NUMBER E1 – REV D

Plot Date: 8/8/2019 4:26:42 PM Office: NZAKL Filename: \\AURECON.INFO\SHARES\NZAKL\PROJECTS\500000-BST\505814 - RCG - RBI2 TOWER DESIGN REVIEW\5 CADD\DRGS\ELEC\505814-MON-E1.DWG

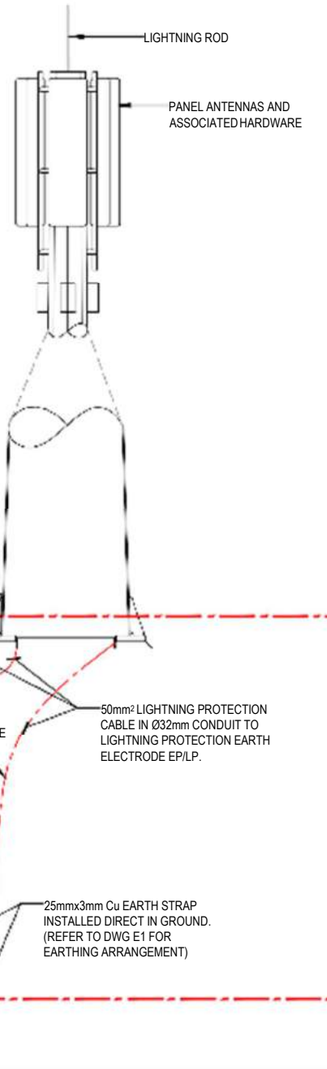


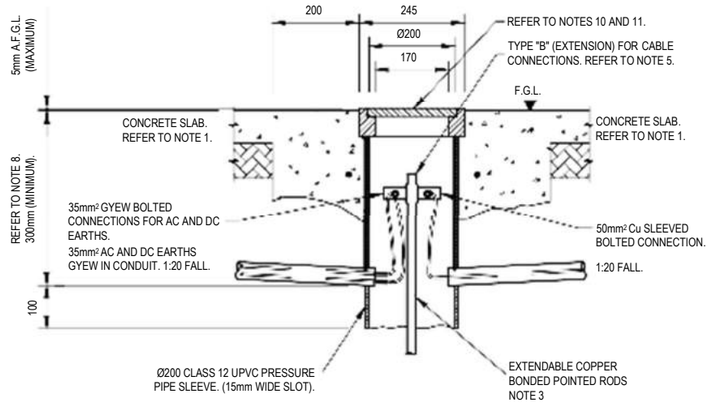


CONNECTION DETAIL TYPE A - EXOTHERMIC WELD 50mm CABLE TO COPPER TAPE 23mm x 3 mm TO 12.7mm EARTH ROD, TYPE LPI-LWCMS12750325 OR SIMILAR (NOTE 12)

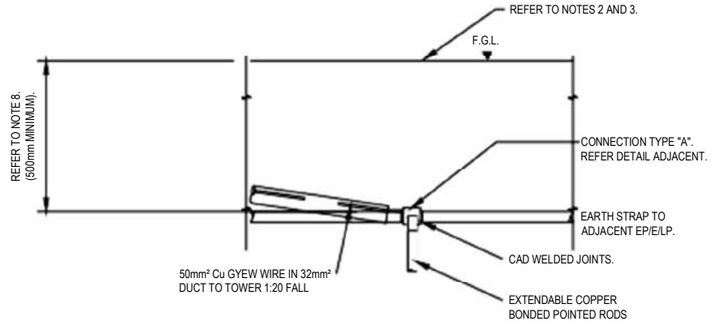


CONNECTION DETAIL TYPE B - EXOTHERMIC WELD COUPLER FOR 127 EARTH ROD WITH TAGS PURPOSE MADE, TYPE LPI-COUPLER127PM OR SIMILAR (NOTE 12)





TYPICAL ELECTRICAL EARTH ELECTRODE EP/E DETAIL. (NOTE 12)



TYPICAL LIGHTNING PROTECTION EARTH ELECTRODE EP/LP DETAIL. (NOTE 12)

NOTES:

1. CAST INSITU CONCRETE SURROUND, REINFORCED WITH D12 PERIMETER BARS. WHEN EXISTING SURROUNDING AREA IS ASPHALT, COLOUR NEW CONCRETE BY WAY OF MIX ADDITIVES TO MATCH EXISTING ASPHALT.
2. CONTRACTOR SHALL DIRECT BURY THIS CONNECTION AFTER THE SUCCESSFUL COMPLETION OF INSPECTION AND TESTING. SHALL BE BACKFILLED WITH GROUND ENHANCING COMPOUNDS ONLY. SITE CONCRETE OR CRUSHED ROCK NOT TO BE USED.
3. EXTEND ELECTRODE BY SEQUENTIALLY ADDING 1200mm SECTIONS TO THE ELECTRODE TO ACHIEVE EARTH IMPEDANCE <10 OHMS.
4. WHEN GROUND ROCK IS PRESENT, DRILL Ø80 HOLE AND FILL WITH EEM EARTH ENHANCING MATERIALS, LPI-RESLO, GROUND RESISTING LOWERING COMPOUND OR EQUIVALENT EARTH COMPOUND.
5. LPI-COUPLER127PM TO BE ADDED TO EARTH ELECTRODE AFTER CONFIRMATION OF CORRECT EARTH RESISTANCE.
6. ENSURE ALL EARTH ELECTRODE CASING LIDS ARE LEVEL WITH CONCRETE SLAB FINISH.
7. NOTE THAT ALL LIGHTNING PROTECTION EARTH WIRES/CABLES AND ELECTRICAL EARTH WIRES/CABLES SHALL BE GREEN AND YELLOW. (GYEW = GREEN AND YELLOW EARTH WIRE).
8. DIMENSION IS DEPENDENT ON LENGTH OF CONDUIT IN RELATION TO 1:20 REQUIRED FALL. DIMENSION TO BE KEPT TO A MINIMUM.
9. ALL EXPOSED LIGHTNING PROTECTION CONNECTIONS SHALL BE SUITABLY PROTECTED FROM THE WEATHER USING SPECIFIED ZINC RICH PAINT.
10. 150mm HEAVY DUTY PVC COVER AND FRAME. LPI EARTHPIT LPI-EPIT-P WITH BOTTOM SECTION REMOVED, OR SIMILAR APPROVED PRODUCT.
11. ATTACH TO COVER, SCREW FIXED TRAFFOLITE LABEL, GREEN ON WHITE, 80x25. "ELECTRICAL EARTH ELECTRODE DO NOT DISCONNECT".
12. CONNECTION DETAILS SHOWN ARE TYPICAL ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THE SELECTION AND PURCHASE OF CONNECTIONS REQUIRED TO MEET THE DESIGN REQUIREMENTS OF THE INDIVIDUAL EARTHING ELECTRODES. REFER TO DWG E1 FOR CONNECTION SCHEMATIC.
13. CONTRACTOR SHALL ENSURE THE CORRECT METAL TO METAL CONNECTIONS ARE SUPPLIED AND INSTALLED TO PREVENT CORROSION.
14. DEDICATED EARTH INSPECTION PIT, THE FOLLOWING TO REPLACE NOTE 11: ATTACHE TO COVER, SCREW FIXED TRIFOLIATE LABEL, GREEN ON WHITE, 80x25 "DEDICATED EARTH INSPECTION ELECTRODE DO NOT DISCONNECT".

PRINT IN COLOUR

CLIENT

Rural Connectivity Group

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A	17.06.19	FOR INFORMATION	J.GRIFFIN
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C	19.07.19	FOR INFORMATION	D.LeROUX
D	08.08.19	FOR INFORMATION	D.LeROUX

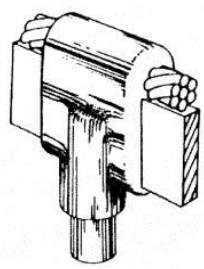
SCALE	NTS
SIZE	A3
DRAWN	J.TUM
DESIGNED	D.JARDINE
REVIEWED	P.ANTHONY
	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED	T.ILICH
DATE	

PROJECT	RBI II
TITLE	LIGHTNING PROTECTION EARTH SCHEMATICS

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	505814	MON	DWG	ST	E2	D

EARTHING SOLUTIONS

LPI NEW ZEALAND
WWW.LPINZ.CO.NZ



LPINZ EXOWELD MOLD	
Product Code	**Description**
LPI-LWCMS12750325	LPI NZ EXOWELD MOLD TO EXOTHERMICALLY WELD 50MM2 CABLE TO COPPER TAPE 25MM X 3MM TO 12.7MM EARTH ROD
LPI-LWCMS12770325	LPI NZ EXOWELD MOLD TO EXOTHERMICALLY WELD 70MM2 BARE CABLE TO COPPER TAPE 25MM X 3MM TO 12.7MM EARTH ROD

LPINZ SHOTS & IGNITOR	
Product Code	**Description**
LPI-SHOT #150 / #250	LPI NZ WELD METAL SHOTS #150 / #250 AVAILABLE IN POUCH, TUBE, PODS
LPI-ELIG	LPI ELECTRONIC IGNITOR

09 833 5749 | **info@LPINZ.co.nz**
Unit 6, 22 Moselle Avenue, Henderson, Auckland

LPI COUPLER WITH BUS BAR	
Product Code	**Description**
LPI-COUPLER127PM	LPI EXOTHERMIC WELD COUPLER FOR 12.7MM EARTH ROD WITH TAGS PURPOSE MADE

LPI U-BOLT ROD CLAMP	
Product Code	**Description**
LPI-UBRCT35120	LPI U-BOLT ROD CLAMP, TO SUIT 14-19 MM RODS AND 35 MM2 - 120 MM2 CABLE OR 25 MM X 3 MM TAPE

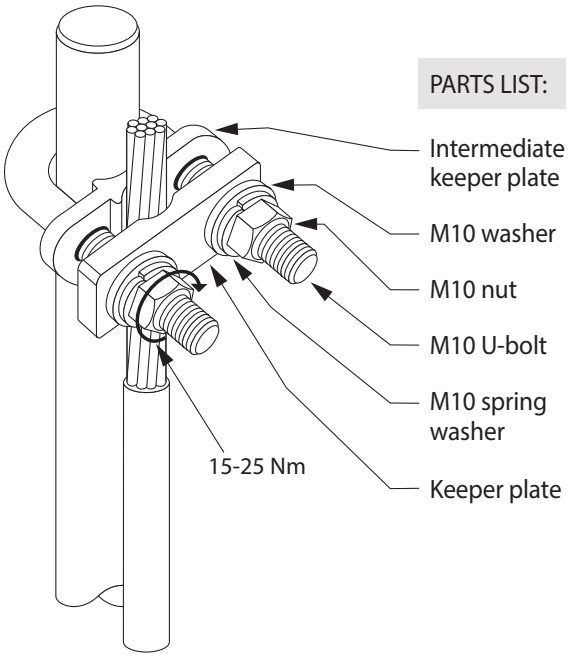
09 833 5749 | info@LPINZ.co.nz
Unit 6, 22 Moselle Avenue, Henderson, Auckland

LIGHTNING PROTECTION INTERNATIONAL PTY LTD

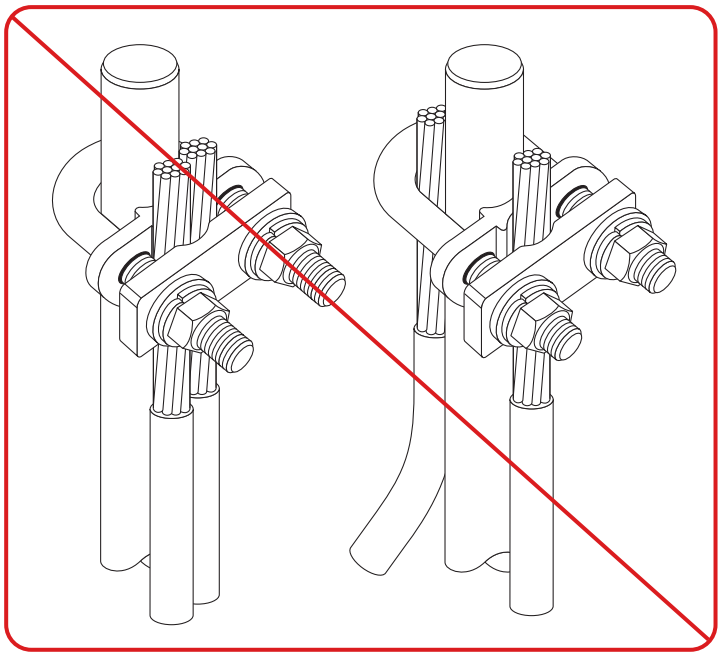
INSTALLATION INSTRUCTION

UBRC35120 AND UBRCT253120

UBRC35120 for rod to 35-120 mm² cable only

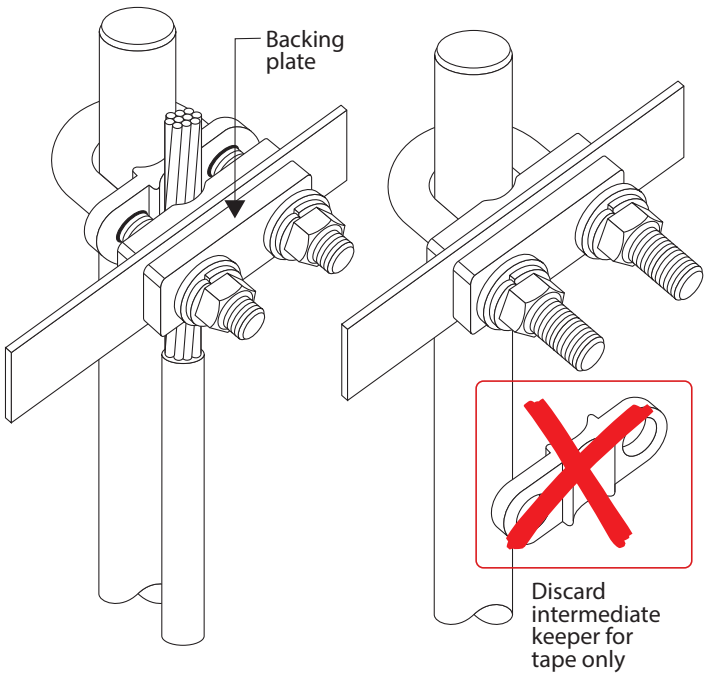


Preferred installation

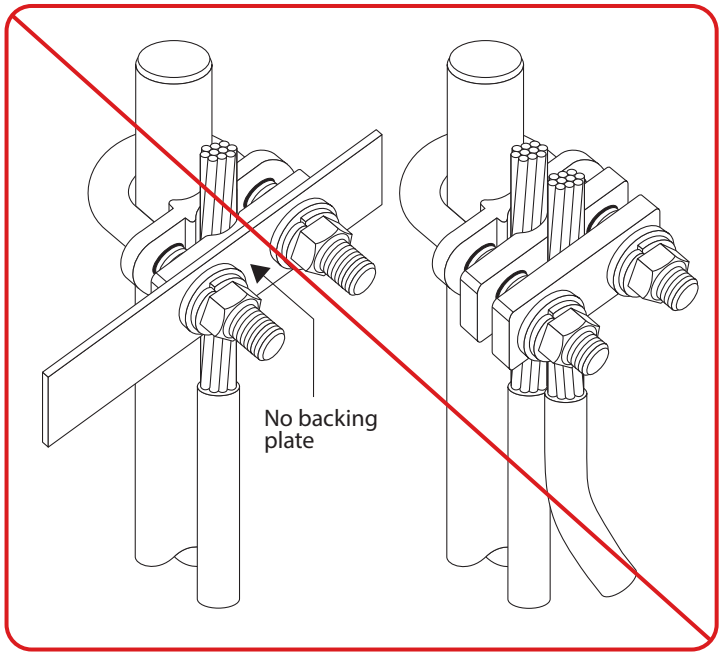


Non Preferred installation

UBRCT253120 for rod to tape and/or 35-120 mm² cable



Preferred installation



Non Preferred installation

Head Office 49 Patriarch Drive, Huntingfield Tasmania, Australia 7055
Postal PO Box 379 Kingston, Tasmania, Australia 7051
Web www.lpi.com.au

Phone + 61 3 6281 2475
Facsimilie + 61 3 6229 1900
Email info@lpi.com.au

EARTHING SOLUTIONS

LPI NEW ZEALAND
WWW.LPINZ.CO.NZ

LPI POLYMER EARTH PIT	
Product Code	**Description**
LPI-EPIT-P	LPI POLYMER EARTH PIT SQUARE WITH LID

LPI EARTH BAR	
Product Code	**Description**
LPI-EB420-255	12 WAY EARTH BAR, 25 X 5MM COPPER BAR, 420MM LONG WITH SS SCREWS AND STANDOFFS

09 833 5749 | **info@LPINZ.co.nz**
Unit 6, 22 Moselle Avenue, Henderson, Auckland

EARTHING SOLUTIONS

LPI NEW ZEALAND
WWW.LPINZ.CO.NZ

LPI REBAR CLAMPS	
Product Code	**Description**
LPI-REBC100	LPI REBAR CLAMP, UPTO 100MM2 CABLE 18-36 REBAR, COPPER ALLOY, 316 SS FASTENERS

LPI REBARCON	
Product Code	**Description**
LPI-PL503M	LPI REBARCON 50MM2, 3M C/W PLATE

09 833 5749 | info@LPINZ.co.nz
Unit 6, 22 Moselle Avenue, Henderson, Auckland

LPI EARTH ROD	
Product Code	**Description**
LPI-UCBER1813	LPI EARTH ELECTRODE 12.7 MM UNTHREADED COPPER BONDED

LPI EARTH ROD COUPLER	
Product Code	**Description**
LPI-LEHC-58R	LPI COMPRESSION COUPLING FOR UNTHREADED COPPER BONDEDEARTH ROD 12.7 MM

09 833 5749 | **info@LPINZ.co.nz**
Unit 6, 22 Moselle Avenue, Henderson, Auckland

EARTHING SOLUTIONS

LPI NEW ZEALAND
WWW.LPINZ.CO.NZ

LPINZ COPPER TAPE	
Product Code	**Description**
LPI-FL6T253C	LPI 25 MM X 3 MM SOFT DRAWN COPPER TAPE

LPINZ RESISTANCE LOWERING COMPOUND	
Product Code	**Description**
LPI-RESLO	LPI RESISTANCE LOWERING COMPOUND-20KG BAG

09 833 5749 | **info@LPINZ.co.nz**
Unit 6, 22 Moselle Avenue, Henderson, Auckland

TECHNICAL DATA SHEET

LPI® Resistance Lowering Compound (RESLO)

Features

- Significantly reduces earth resistance
- Easy to handle and install
- No maintenance required
- Standards compliance: AS 2239, IEC 62561-7 (Clauses 5.4 & 5.5), and EPA 1311
- Independently assessed by an Australian University

Product Description

Ordering Code	RESLO-20
Product description:	Resistance Lowering Compound - 20 kg Bag
Application:	Ground resistance and impedance
Electrical resistivity:	≤ 0.53 Ωm
Weight:	20 kg
Packaging:	Laminated woven poly bag, 420 mm wide x 695 mm height
Pallet quantity:	48 bags to a pallet

*MSDS and test reports available on request. Contact LPI for more information.

The requirement for a low resistance or impedance is extremely important with the installation of any earthing system. LPI's RESLO-20 provides the ability to dramatically reduce this resistance, especially in soils that have moderate to high electrical resistivity.

RESLO-20 is comprised of specially-selected compounds that possess excellent electrical conductivity and anti-corrosion performance. When RESLO is mixed with water and poured around the earthing system and surrounding soil, the powder and water react to form a hardened mass around the earthing system. RESLO will not wash away under wet seasonal conditions and therefore provides a permanent presence in working to improve and maintain the integrity of an earthing system.

RESLO-20 is not a cement-based product that sets solid under many variable conditions, but rather a bentonite- and gypsum-based product. As such, the mechanical state of the installed product will depend upon many variables, such as soil moisture content, soil porosity and the amount of water added at mixing time.

At one extreme, with highly porous and dry soil, the product will set into a plaster form within a few hours, retaining sufficient moisture to ensure long term electrical conductivity.

At the other extreme, in very wet soil conditions, the product will absorb the required amount of moisture from the surrounding soil and remain as a “plastic clay”, a design feature of the product to hold and retain moisture to ensure long term electrical conductivity.

Product Application Guide

For a trench installation, a 20 kg bag of RESLO will typically achieve the desired earth resistance levels in combination with appropriate conductors for a trench covering 5 m in length x 300 mm in width and a depth of 500 mm to 1000 mm.

In order to further assist in improving the earth resistance of the system, it is recommended that excavated soil of poor quality (e.g., gravel, sand) is replaced with good-quality soil (e.g., garden loam or clay) prior to backfilling the trench.

RECOMMENDED BAGS OF RESLO-20 REQUIRED FOR BACKFILLING TYPICAL TRENCH INSTALLATIONS

Width of Trench (mm)	Length of Trench 5 m	Length of Trench 10 m
300	1	2

*For trench dimensions outside of the given specifications, please contact LPI or an authorised distributor for further advice.

RECOMMENDED BAGS OF RESLO-20 REQUIRED FOR BACKFILLING GROUND ROD INSTALLATIONS

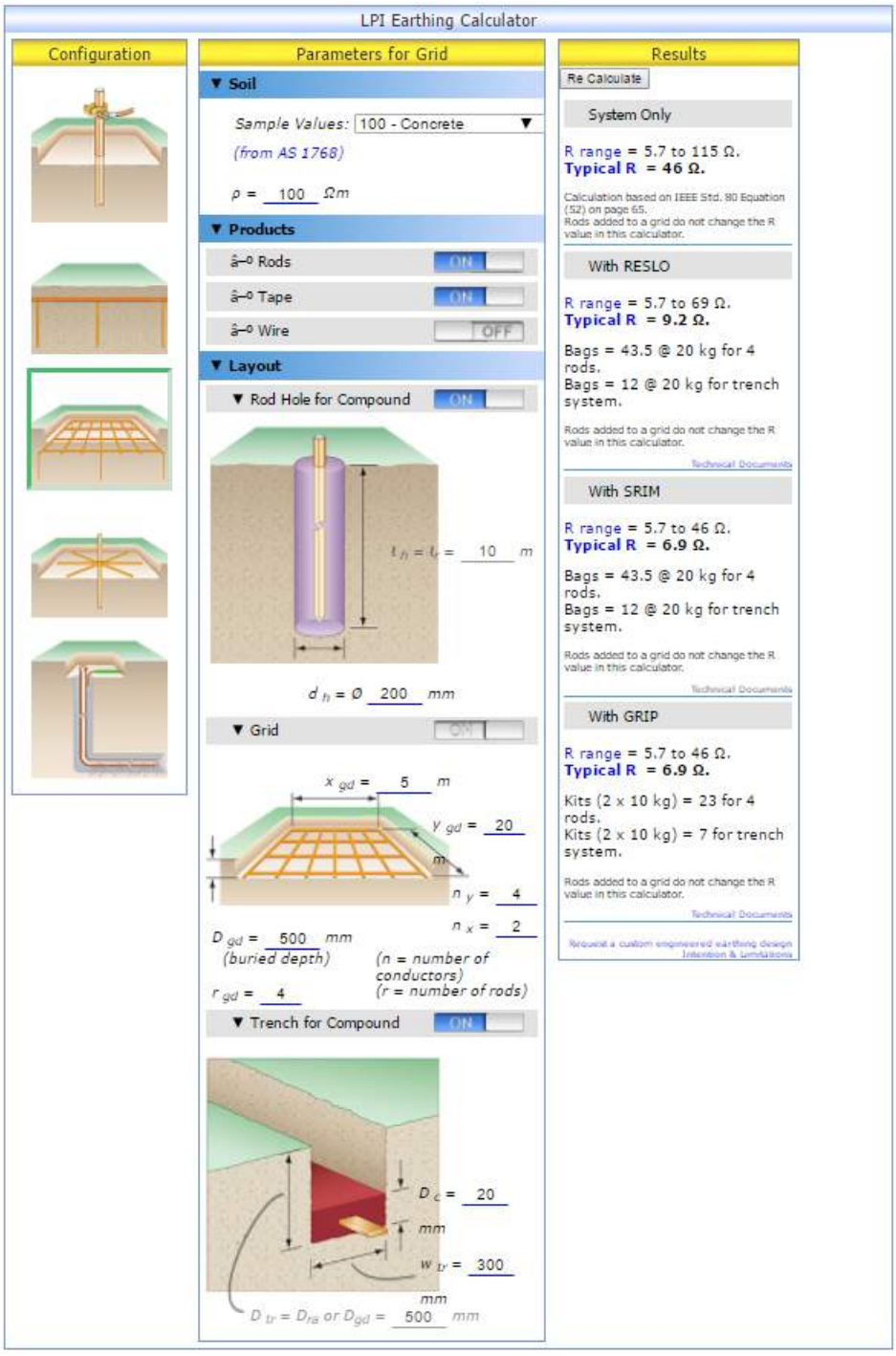
Diameter of Hole (mm)	Depth of Hole 1800 mm	Depth of Hole 2400 mm	Depth of Hole 3000 mm
75	0.5	0.5	0.5
125	1	1	1.5
175	1.5	2	2.5

*For augured hole dimensions outside of the given specifications, please contact LPI or an authorised distributor for further advice.

Earthing Calculator

LPI offers a comprehensive, user-friendly, online Earthing Calculator which allows the user to estimate earth system resistance based on IEEE and other international earthing and grounding standards. Go to http://www.lpi.com.au/Products-Services/Earthing-Calculator.

For example:



Working left to right, select the **configuration** of the earthing system, then edit the earthing **parameters**, such as the soil resistivity and grid dimensions. Results are given for the theoretical best-case scenario (as per the standard), as well as likely real-world values as typically seen in the field.

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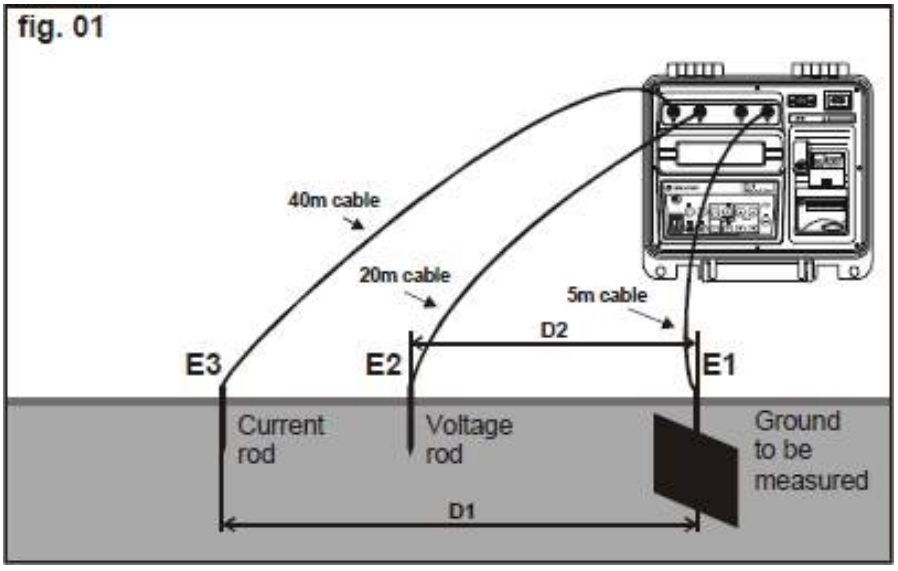
EARTH RESISTANCE TESTING - 3 Pole

1. Choose an area of continuous, accessible soil directly adjacent to the existing earth connection to be tested. This soil must have a straight line distance for measurement of between 10-30m.
2. Connect green cable from the tester ("E" slot) to the Earth connection point to be tested.
3. Secure the start of the tape measure near this reference point and roll out the tape along the full length of the straight line distance. This will serve as a reference for rod placement.
4. Place 1st rod into the ground at the 15m mark or halfway along the straight line distance, whichever is lesser.
5. Connect blue cable from tester ("S" slot) to the 1st rod.
6. Place 2nd rod into ground at the 30m mark or at the full length of the straight line distance, whichever is lesser.
7. Connect red cable from tester ("H" slot) to the 2nd rod.
8. Switch the LPINZ CIRCUTOR Earth Resistance Meter TL-6 unit ON.
9. Select '270 Hz'.
10. Select 'R' for resistivity. Verify that the display reads **"3 Pole".**
11. Press Start and wait for the unit to display a Resistance figure.
12. Once displayed, press the print icon. Consider photographing the reading and the rod set up at each measurement stage for completeness.



LPINZ - Innovative Lightning and Power Protection Solutions

- UPS, APR, HARMONIC FILTERS, BATTERIES
- Direct Strike Lightning Protection / Surge & Transient Protection for Power, Data, Communications and RF lines
- Grounding Products & Solutions

TL-6e

Tellurometer

Description

The **TL-6e** tellurometer is a microprocessor-controlled digital instrument, developed to perform earth resistance and resistivity measurements (using the Wenner method).

The **TL-6e** is a fully automatic and very easy to use unit. Before starting a measurement, the unit controls whether the conditions of the installation are within the proper limits, notifying the user of any anomaly (too high interference voltages, very low test current, etc.). To optimise the earthed test, the **TL-6e** lets you choose two frequencies to generate the test current (270 Hz or 1470 Hz). The instrument has 4 ranges to measure resistance, covering measurements from 0.01 Ω to 20 kΩ.

Applications

This instrument is ideal for measuring earthing systems in substations, industries, power distribution lines, etc. in accordance with **IEC 61557-5**. It is also useful for measuring the specific resistivity of soil, in order to optimise earthing system projects.

Accessories

- 4 auxiliary copper-plated electrodes (50 cm)
- Power supply source 95 ... 240 V. Battery charger.
- USB communication cable
- Coil with 40 m cable (red)
- Coil with 20 m cable (blue)
- Coil with 20 m cable (green)
- 5 m short cable (black)
- 5 m short cable (green) for connection to unknown electrode.
- 5 kg accessory bag

Technical features

Power Supply Features	Rechargeable internal battery (sealed)	12 V – 3 A·h, LFP
	Insulation / Pollution Degree	Class II / 2
	Overvoltage protection	Category II
Measurement Features	Resistance (Auto range)	0 ... 20 Ω 0 ... 200 Ω 0 ... 2000 Ω 0 ... 20 kΩ
	Resistivity	0 ... 50 kΩm
	Voltage	0 ... 60 $V_{a.c.}$
	Frequency	270 ... 1470 Hz
	Accuracy	in Resistance and Resistivity R ≤ 2 kΩ - 2% of the average value ±2 digits R > 2 kΩ - 5% of the average value ±2 digits
		in Voltage ±3% of the average value ±2 digits
	resolution	in Resistance 0.01 Ω
		in Resistivity 0.01 Ωm
		in Voltage 0.1 V
Communications	Serial data output	USB, connecting cable supplied
	Wireless	Bluetooth
	Management Software	Available, CIRLogger
	Printer	Built-in
Environmental conditions	Operating temperature	-10 ... 50°C
	Storage temperature	-25 ... 65°C
	Relative humidity	95% (without condensation)
	Maximum altitude	3000 m
Build features	Dimensions	274 x 250 x 124 mm
	Weight	3 kg
	Protection Degree	IP 54
Standards	**IEC 61010 -1**	

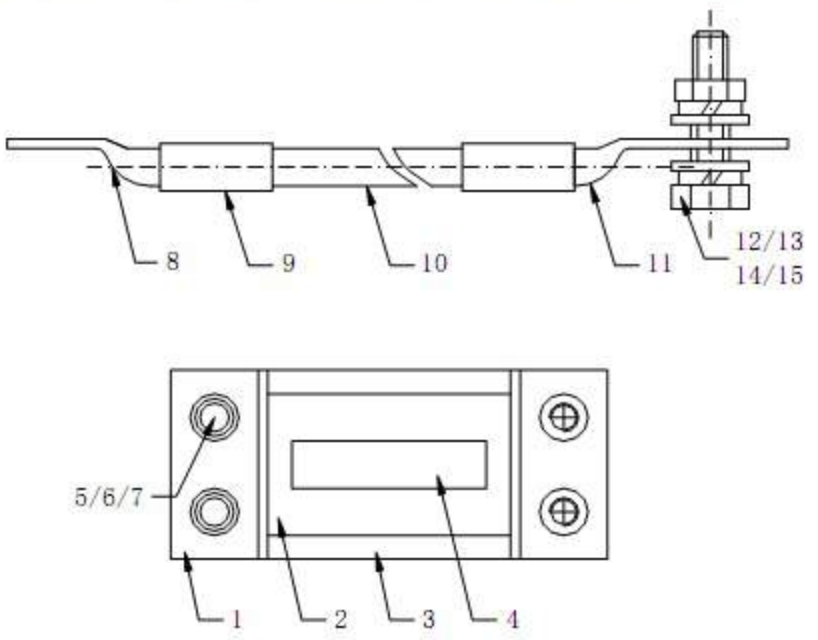
References

Type	Code	Description
TL-6e	**P60622A000000**	Tellurometer 4 lines

Description

The grounding kit is made of high-purity copper and grounding wire, it's applied to the feeder grounding. The contact resistance, insulation resistance, etc. can meet the requirements of communication industry, and it can prevent the damage to relevant devices which due to lighting stroke or large current.

Framework type grounding kit, which is also called self-adhesive type, because two mastics are stuck inside the framework. Mount the framework on the out conductor, then tighten the bolt, the inside mastic has sealing feature without additional tape required.



No.	Piece Parts	Size	Materials
1	Grounding Strap	1/4"～1-5/8"	Rubber, SUS304
2	Waterseal Mastic	Φ5	Butyl Rubber
3	Braided Tape		Copper, Tin-plated
4	O-ring Washer	M6	Black Rubber
5	Serrated Washer	M6	SUS304
6	Inner Hex Bolt	M6*25	SUS304
7	Cable Lug	M6	Copper, Tin-plated
8	Heat Shrinkable Tube	Φ9*30	Polyolefin
9	Grounding Cable	16mm²	Copper (Conductor)
			PVC (Jacket)
10	Cable lug	M8	Copper, Tin-plated
11	Outer Hex Nut	M8	SUS304
12	Spring Washer	M8	SUS304
13	Plain Washer	M8	SUS304
14	Outer Hex Bolt	M8*25	SUS304

Specification

Standard	YD/T 2339.1-2011
Application	1/4", 1/2", 7/8", 5/4", 13/8", etc.
Contact Resistance	≤5mΩ
Current Shock Withstanding	≥20KA(8/20μs)
Insulation Resistance	10GΩ
Low Temperature (-40±3℃)	24 Hours
High Temperature (70±2℃)	24 Hours
Sealing Property	24 Hours, 1 meter underwater
2011/65/EC (RoHS)	Compliant

INSTALLATION INSTRUCTIONS

Easy Install Ground Kit
for Coaxial Cable Applications

PRODUCT DESCRIPTION

The Easy Install Ground Kit is designed to comply with MIL-STD-188-124A and has been verified by independent labs to withstand the damaging effects of lightning current in excess of 100kA. The one-piece fully encapsulated tinned spring-finger contact facilitates proper attachment to the coaxial cable ensuring the performance of the coax is not compromised. The 6-gauge, 7-strand copper wire provides the most practical and effective low-inductance transfer of lightning induced current from your coax to your system ground. Installation of ground kits is recommended at the top and bottom of each vertical run, at 200ft (60m) increments and just prior to building entry.

NOTICE

Installation of this product should only be performed by trained, qualified, and experienced personnel. Installation instructions for this product should be read thoroughly before installation is performed. The manufacturer and supplier of this product disclaims any liability or responsibility for the results of improper or unsafe installation practice. This Ground kit has been designed to function around the coaxial cable outer conductor dimensions published by the cable manufacturers. The manufacturer of this Ground Kit disclaims any liability for inadequate performance resulting from dimensionally incorrect coaxial cable.

REQUIRED TOOLS

- Knife
- #17 open-end wrench (for ground lug installation)
- 5mm Allen wrench

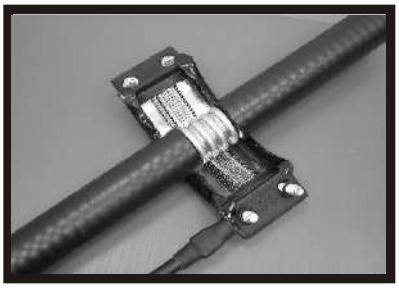
STEP 1

Remove approximately 1 inch (25.4mm) of the outer jacket from a straight section of coax cable.

NOTE: Care should be taken when removing the jacketing to prevent scoring of the copper outer conductor. The exposed outer conductor should be free from foreign debris, grease or moisture.

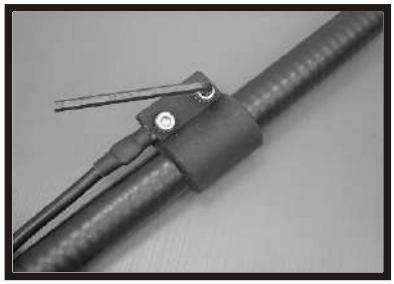
STEP 2

Install the pre-formed copper strap around the exposed outer conductor.



STEP 3

Tighten factory installed bolts using an allen wrench to secure the ground kit around the jacket of coaxial cable.



STEP 4

Clean the ground point thoroughly and bolt the lug into position using the appropriate hardware provided.