



Construction and Connection of Street Light Assets

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Approved by: GM Power Networks	Prepared by:	Issue Date: 22 Dec 2017	Status: Approved
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1. Introduction

The provision of street lighting services and the ownership of streetlight assets and components are the responsibility of the road owner. Approval for new street lighting or modifications of the existing assets must be given by the Road Owner.

The approval of Power and Water Corporation (“**PWC**”) is required:

- Where street lighting assets are attached to PWC assets and if the design differs in any way from PWC standards;
- For the placement of street light columns and associated equipment to ensure these structures do not inhibit PWC from access to its assets; and
- To ensure the separation between the street light asset and the PWC asset complies with PWC standards.

This document states PWC requirements for:

- The design, construction, and service connection of new and modified street lights assemblies fixed to PWC pole structures;
- The design, construction, and service connection of new and modified underground street light schemes (stand-alone);
- Relocating street lights fixed to PWC pole structures and street light columns for underground street light schemes; and
- The approval process for alternative designs to be submitted that depart from PWC Standard Drawings.

The following documents shall be read in conjunction with the contents of this Network Policy document. These documents specify the technical requirements for the provision of a new streetlight fixed to a PWC pole structure and where applicable for PWC underground assets:

- Installation Rules and Service Rules;
- Design Guidelines for Consultants NP 041;
- Design and Construction Guidelines NP 001;
- Street Lighting Manual Volume 03; and
- Underground Manual Volume 02.

There is a delineation of the asset ownership between the Road Owner and PWC. Refer to Appendix C for information on the delineation of street light asset ownership.

The street light asset commences when the sole purpose of the equipment and/or the installations sole purpose is to supply street lighting services.

2. Further Information

For enquiries and further information of the street light design and standards contact:

Manager Network Engineering

Power and Water Corporation
GPO Box 37471
Winnellie NT 0821
Fax (08) 8924 5121
Phone (08) 8924 5191,

Or

Manager Distribution Development

Power and Water Corporation
GPO Box 37471
Winnellie NT 0821
Fax (08) 8924 5121
Phone (08) 8924 5729.

For information and enquiries regarding street light works contact:

- For Darwin, Palmerston, Litchfield, Coomalie and Katherine region:
Manager Network Engineering
Manager Distribution Development,
- For Alice Springs, Tennant Creek and Yulara region:
Regional Manager Southern Network
PWC Sadadeen Complex
PO Box 1521
Alice Springs NT 0871
Phone (08) 8951 7264.

3. Definitions

3.1 Designer

The Designer is accredited and certified by PWC. They certify to design street light assemblies fixed to PWC's pole structures, and associated power supply and service connection for street lights.

3.2 Street Light Asset Owner ("Asset Owner")

The Street Light Asset Owner is the Road Owner unless otherwise stated. Refer to Appendix C for the delineation of street light assets between the Road Owner and PWC.

3.3 Road Owner

Road Owner means is the authority (Road Network Division, Department of Infrastructure, Planning and Logistics or local Council or Shire) that has legal rights to control all activities on that road.

For the purposes of this document, the Road Owner includes its authorised agents or delegated contractor undertaking works on behalf of the Road Owner.¹

3.4 Developer

The Developer is the company/corporation accountable for the subdivision development. The Developer is required to ensure the street light scheme for the roadways of the subdivision development comply with the road category design requirements and the Road Owners specification.

For the purposes of this document, the Developer includes its authorised agents or delegated contractor undertaking works on behalf of the Developer.

4. Street Lighting Design, Construction and Connection Requirements

4.1 Design

The responsibility for providing street lighting services rests with the Road Owner who owns the assets.

PWC does not provide design assessment for:

- Street lighting category requirement;
- Compliance to lighting standards;
- Structural integrity for underground street light schemes;
- Compliance with PWC's standards for underground street light schemes; or
- Appropriateness of the electrical design.

To relocate a street light, the Road Owner shall submit a request to PWC for the street light to be relocated. PWC shall review the request and undertake a review of the proposed change and confirm its approval with the Road Owner. Following approval by PWC, the Asset Owner can proceed to execute the works in accordance with the processes defined in this document.

PWC will only accept street light designs that have been undertaken by a PWC certified Designer.

¹ For more information on specific roads managed by the Department of Infrastructure Planning and Logistics, refer to: <https://nt.gov.au/driving/management/who-manages-a-road-in-the-nt> or by general email at tipd.dot@nt.gov.au.

PWC will issue the asset numbers for its assets (e.g. pole structure, package substation and low voltage pillar etc.) and the drawings numbers where street lights are fixed to PWC pole structures. The Road Owner shall issue the numbers for its street light assets.

The Road Owner shall issue the asset number for its street light assets and drawing numbers for underground street light schemes.

Upon request, PWC will supply information on its existing overhead and underground distribution network and the nominated point for service connection. The accuracy of this information cannot be guaranteed, and PWC shall not accept any damage or loss arising from the use or reliance upon the information provided. The Road Owner and Developer must verify on site all information.

Where a Developer is providing street lighting as part of a subdivision or modified street lighting as part of roadwork approval must be sought to ensure the design:

- Is approved by the Road Owner;
- Complies with PWC operational and maintenance criteria;
- Complies with PWC Standard Drawing design criteria for overhead networks, and/or for an approved alternative design as per below:

For **overhead street light** (fixed to PWC assets) design the assessment criterion considers:

- It is compliant with PWC Standard Drawings for selection of the luminaire, the outreach assembly, wiring and termination arrangement;
- Identify approvals where the design deviates from PWC Standard Drawings;
- The assessment of a variation to PWC Standard Drawing will consider:
 - The selected luminaire complies with AS/NZS3000; and
 - Compliance with PWC criteria for wind sail (AS/NZS 1170) and applied moment. The Road Owner will be required to verify the alternative design is similar to the respective PWC Standard Drawing for wind sail and the applied moment.
- There are no hazards introduced with respect to PWC accessing the distribution network or separation between the distribution network (HV and LV network) and the street light assembly;
- For existing street light luminaries it is preferred the new luminaire will be controlled via a Photo Cell (PE) cell; and
- For new constructed overhead street light schemes, these will be controlled via a PE cell.

For **underground street lights** design the assessment criterion considers:

- The placement of street light columns and associated equipment (e.g. street light control box) does not inhibit PWC asset access;
- The separation between the street light asset and PWC asset complies with PWC standards;
- For new street light schemes that are not extensions of existing street light schemes it is required these luminaires will be controlled via a PE cell; and
- The street light schemes electrical design complies with AS/NZS 3000.

The general design criterion for a street light scheme is:

- An unmetered service;
- Street light schemes that require a three-phase supply, the street light load shall be evenly distributed across the three phases;
- Specific earthing requirements for new street light installation in proximity (or crossing) to high pressure gas pipelines;
- 35sqmm bare copper conductor is minimum size for the earth conductor; and
- Overall Common Multiple Earth Neutral (CMEN) value shall be 1 Ohm or less for all new street lights in service.

4.1.1 Design Approval

The Road Owner and the Developer shall note the following requirements for the approval submission to be accepted and processed:

Design approval requires the following the documents to be submitted:

- Final Drawings;
- Certificate of Compliance (Design) – Appendix A;
- Road Owner Accepts the Design in writing
- Engineering Certification for Alternative Overhead Street Light Designs; and
- Street light design approval submissions and notices of intent shall be forwarded by the Road Owner or the Developer to PWC assigned Design Officer.

PWC will respond to the Approved Design with:

- A stamped approved drawing;
- Confirmation that the alternative street light assembly arrangement is accepted;
- Written correspondence confirming PWC scope of work and quotation for its costs; and
- Confirm the nominated Project Manager.

4.2 Construction

- The Road Owner or the Developer has accepted quotation by PWC for its works and PWC has received a purchase order for the amount or payment in full.
- The connection and disconnection of street lights for:
 - Underground street light schemes shall be carried out by the Road Owner or Developer; and
 - Overhead street light schemes shall be carried out by the Road Owner or the Developer subject to the approval by PWC.
- For the Road Owner to work on street lights on or in the vicinity of an energised overhead or underground distribution network or equipment must maintain their licences and required PWC authorisations and comply with the requirements with its OH&S management system. Refer to Appendix D – Authorisations Licences and OH&S Requirements; and
- The schedule for the works and its Inspection and Test Plan (ITP) has been submitted. PWC requirements for Witness and Hold points have been confirmed and agreed.

4.2.1 Construction Approval

The Road Owner or the Developer is required to submit the following documents for approval to construct:

- Approved Design Drawings;
- Alternative Approved Design/s to be constructed;
- The Road Owner has endorsed the Approved Design;
- Installation Schedule;
- Inspection and Test Plan;
- Current Licences and Authorisations for persons executing the works;
- Job Safety Environment and Hazard Analysis;
- Current test certificates for special purpose vehicles. PWC may request the maintenance records for these vehicles and inspect as appropriate; and
- The Road Owner or the Developer confirms that PWC scope and costs for its works is accepted, and payment processed.

PWC shall respond to the request for construction by:

- Endorse the works to be executed;
- Confirm the required inspection, witness and hold points;
- Confirm the point of service disconnection and connection; and
- Confirm the safety management plan for the works is accepted. Refer to Appendix D – Authorisations Licences and OH&S Requirements for PWC OH&S management system requirements.

4.3 Completion of Works and Connection

The Road Owner shall submit a notice for connection and the following documentation to be accepted by PWC:

- Certificate of Works Completion. Refer to Appendix B - Certificate of Works Completion - PWC Service Connection;
- Certificate of Compliance (Installation)(to be issued by PWC);
- Evidence that the reported defects have been corrected;
- As Constructed Drawings; and
- A schedule of the street lights complete with location, manufacturer details, Luminaire Control (PE Cell, Smart Technology etc.), and luminaire wattage.

4.3.1 Service Connection

If required, PWC shall carry out a final connection inspection prior to acceptance of the Contractor's Certificate of Completion and Handover. It may refuse to connect or new street lights if the electrical installation does not comply with the approved design.

Post the completion of the connection PWC is required to forward copies of all Certificates of Completion to the Electrical Safety Regulator for inclusion in the Electrical Safety Regulator's audit program.

5. Street Lighting Handover Documentation Requirements

The documentation required for design and construction drawings is a set of A1 and A3 hard copy drawings and an electronic copy in .dgn format.

Accompanying the drawing package shall be a schedule containing the following information:

- Road Owner;
- Luminaire type manufacturer details;
- Lamp type and wattage;
- Luminaire controller Type (e.g. PE cell, smart control);
- Underground or overhead supply;
- Column type;
- Outreach type;
- Street light number;
- Street name;
- Suburb; and
- Year commissioned.

5.1 PWC's Internal Administration Process

Upon receipt of "As Constructed" information, the Power Networks Project Manager shall:

- Prepare a construction folder containing details of the final connection, and forward to Service Delivery – Works Management;
- Forward copies of the "as constructed" drawings in A3 and digital format to the GIS Section for updating the GIS database; and

- File A3 drawings in the registry file and A1 drawings in Power Networks drawing cabinet.



APPENDIX A

Certificate of Design Compliance for a Street Light Assembly Fixed to a PWC Pole Structure

PROJECT TITLE:
.....

SUBURB: CITY/TOWN/HUNDRED:

DRAWING TITLE	DRAWING NUMBER
.....
.....
.....
.....

I / We certify that (strikeout if not applicable):

- The design complies with PWC standard design requirements;
- The variation to PWC standard design requirements has been approved PWC; and
- The PWC approval notice is attached.

Name of Road Owner:

Name of Road Owner's Authorised Agent:

Authorised Officer's Signature:

Date: / /

Phone:

Fax:

Note: If incorrect information is provided with a design and this result in Network Engineering having to make site visits or carry out excessive checking, the Road Owner will be required to bear the cost and correct the information before the installation will be connected. If there are any queries, please contact Manager Distribution Development on (08) 8924 5729.



APPENDIX B

Certificate for Works Completion – PWC Service Connection

PROJECT TITLE:

STREET/ROAD:

TOWN/HUNDRED OF:

DESCRIPTION OF ASSETS

CONSTRUCTED

AND WORKS COMPLETED:

REFERENCE DRG. Nos.:

CONTRACT NO:

NAME OF CONTRACTOR:

POSTAL ADDRESS:

I/WE the undersigned certify that the above works have been completed in accordance with the project specification and PWC Standard Drawings or approved variation, and that the street light assets are ready for commissioning.

If an approved variation to PWC Standard Drawing has been adopted, attach PWC approval notice to the certificate.

Certify that all employees and agents of myself and/or my company, and all plant, materials and equipment, are clear of the works, and that all employees and agents have been instructed by me to keep clear of the works.

DATE OF PRACTICAL

COMPLETION:

ROAD OWNER NAME:

AUTHORISED OFFICER

SIGNATURE:

DATE:



APPENDIX C

Street Light Owner Delineation

Asset Perimeter

The asset perimeter is where the maintenance and replacement responsibility changes from PWC to the Road Owner. The guiding principle used to define the asset or component's sole purpose is to supply street lighting services would see the maintenance and replacement rests with the Road Owner. Where the asset or component supplies other than the street lights the responsibility rests with PWC. There are two broad categories of street light:

- (a) Category A – street lights that are fitted to power poles supporting overhead conductors. These conductors provide the power supply for the street light and other power consumers.
 - (b) Category B – street light columns supplied by an underground power cable.
- 2 Street lights in Category A are supplied by a Low Voltage (LV) conductor that is switched through a control box (in the case of timer controlled street lights) or permanently energised in the case of street lights operated through Photo Electric (PE) cells which are typically located on the luminaire. For street lights in this category all componentry associated with the street light circuit, with the exception of the overhead conductors (both neutral and active phase), is the responsibility of the Road Owner. The responsibility and control of the overhead conductors rests with PWC and the skill set required to maintain these components is more suited to a network provider. The drawings for street lights in Category A are attached (Drawings No. OVERHEAD 1-6).
 - 3 In the majority of cases street lights in Category B are typically supplied from a package substation and to a lesser extent by LV Pillar or LV Pit. The package substation contains the “street light control board” which houses the circuit breakers and timer switch and these are the responsibility of the Road Owner (see attached Drawing No. UNDERGROUND-01). The supply to the street light control board is the responsibility of PWC. Where the LV Pillar or Pit exists to facilitate the street light circuit only, the responsibility for and control of the asset and componentry of the pillar and pit rests with the Road Owner.

OVERHEAD STREET LIGHT NOTES STREET DRAWINGS

NOTES

- CONDUIT TO BE RUN BETWEEN CONTROL BOX AND POLE.
- A WANS CONNECTION BOX TO SUIT THE NUMBER OF CABLES AND 30MM CONDUIT SHALL BE INSTALLED AT THE POLE TOP END OF THE CONDUIT.
- 16S20MM COPPER PVC CABLE SHALL BE RUN IN CONDUIT FROM THE CONTROL BOX TO THE OVERHEAD STRING STREETLIGHT CIRCUIT AND LV MAINS CONNECTION TO THE LV MAINS AND STREETLIGHT CIRCUIT SHALL BE VIA SERVICE ISOLATION PIERCING CONNECTIONS.
- CONDUITS TO BE FASTENED TO POLE WITH SUITABLE SADDLE CLAMPS AT 1000MM SPACING.
- CONTROL BOX NUMBER PLATE SHALL BE MOUNTED IN THE CENTER OF THE CONTROL BOX DOOR.
- CONNECTION FROM LV MAINS TO CONTROL BOX TO BE VIA SERVICE BOXES FITTED WITH 8MM TUBES STOCK CODE 10314.
- THE ROAD OWNER SHALL MAINTAIN AND MINIMIZE THE STREETLIGHT CONTROL BOX'S ATTACHMENT IN THE POLE AND ALL EQUIPMENT INSIDE THE STREETLIGHT CONTROL BOX EXCLUDING THE INPUT OVER SUPPLY CABLES.

ISOMETRIC VIEW CONTROL BOX MOUNTING
N.L.S.

ISOMETRIC VIEW POLE TOP DETAIL

ITEM	QTY	DESCRIPTION	STOCK CODE	DWS No.
D	5	LV CONDUCTORS INCLUDING STREETLIGHT SWITCHED SUPPLY	-	S03-15-02
C	5	LV INSULATOR ASSEMBLY	-	S01-14-18
B	1	LV ASSEMBLY	-	S01-12-43
A	1	POLE	-	-

PWC MATERIAL SCHEDULE

ITEM	QTY	DESCRIPTION	STOCK CODE	DWS No.
12	AR	SERVICE INSULATION PIERCING CONNECTORS	502107	S01-14-48
11	1	STREETLIGHT CONTROL BOX NUMBER PLATE	-	S03-15-02
10	1	PADLOCK SUPPLIED BY STREETLIGHT MAINTAINER	114978	-
9	AR	UNISTRUT	8890	S01-14-06
8	1	4 WIRE MAINS CONNECTION BOX	7010	-
7	AR	16S20MM COPPER CABLE BLACK	1638	S02-11-23
6	AR	16S20MM COPPER CABLE RED	1644	S02-11-23
5	AR	24mm CONDUIT SADDLE	47034	-
4	2	24mm CONDUIT BEND	6247	-
3	AR	24mm CONDUIT	4095	-
2	1	CONTROL PANEL	7377	S03-15-08
1	1	CONTROL ENCLOSURE	8466	S03-15-01

STREETLIGHT MAINTAINER MATERIAL SCHEDULE

ITEM	QTY	DESCRIPTION	STOCK CODE	DWS No.
12	AR	SERVICE INSULATION PIERCING CONNECTORS	502107	S01-14-48
11	1	STREETLIGHT CONTROL BOX NUMBER PLATE	-	S03-15-02
10	1	PADLOCK SUPPLIED BY STREETLIGHT MAINTAINER	114978	-
9	AR	UNISTRUT	8890	S01-14-06
8	1	4 WIRE MAINS CONNECTION BOX	7010	-
7	AR	16S20MM COPPER CABLE BLACK	1638	S02-11-23
6	AR	16S20MM COPPER CABLE RED	1644	S02-11-23
5	AR	24mm CONDUIT SADDLE	47034	-
4	2	24mm CONDUIT BEND	6247	-
3	AR	24mm CONDUIT	4095	-
2	1	CONTROL PANEL	7377	S03-15-08
1	1	CONTROL ENCLOSURE	8466	S03-15-01

ISOMETRIC VIEW CONTROL BOX MOUNTING
N.L.S.

DES	A.T.	J.C.	DRN	CAD	M.B.	APPD	S.L.C.	SCALE	N.L.S.	ISSUED	J.B./J.S.	ALL DIM. IN mm	DRAFTING STANDARD TO A.S.1100

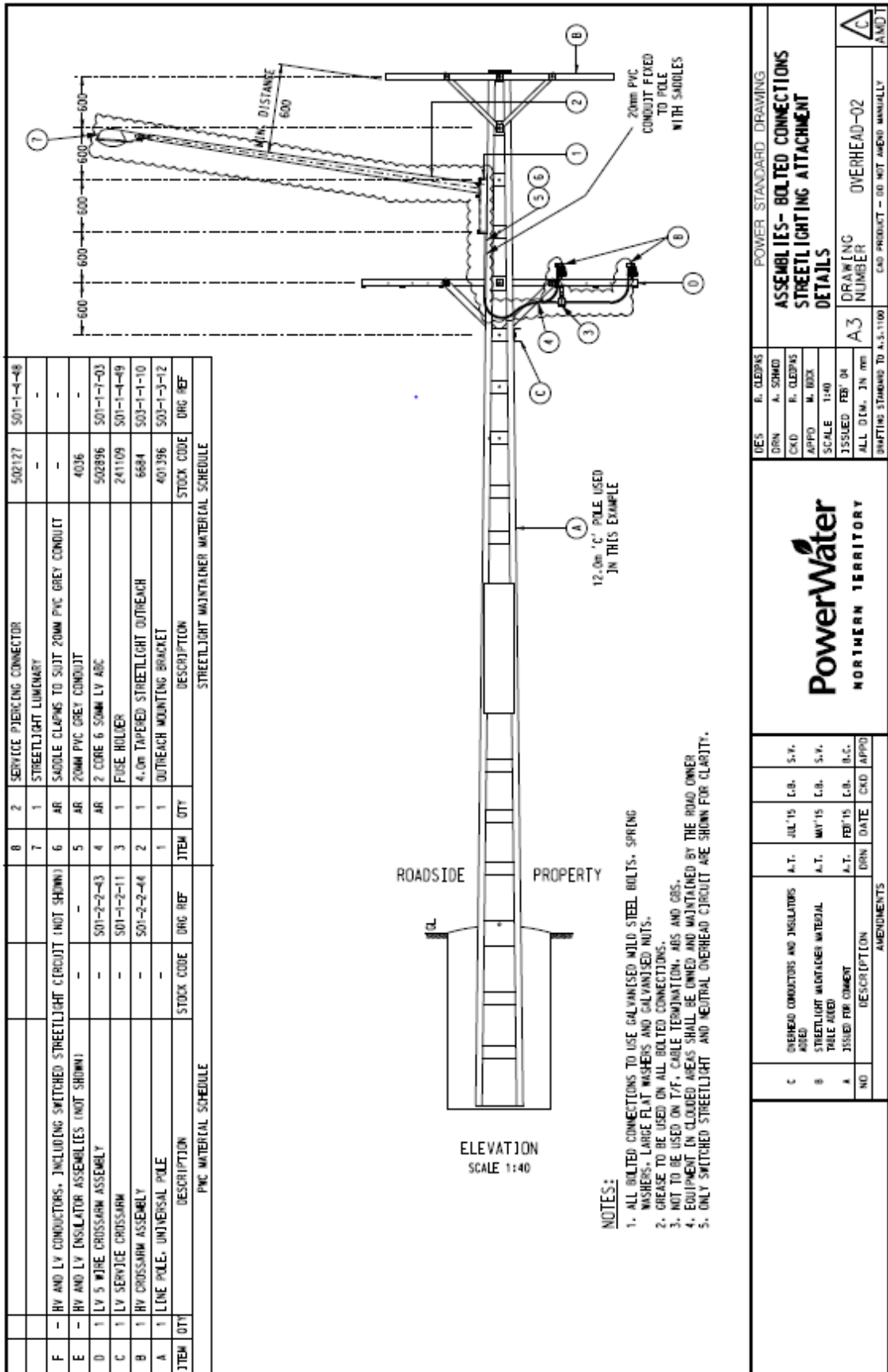
POWER STANDARD DRAWING

CONTROL BOX MOUNTING DETAILS

DRAWING NUMBER OVERHEAD-01

DRAWING NUMBER A3

DRAFTING STANDARD TO A.S.1100 CAD PRODUCT - DO NOT AMEND MANUALLY (AMDT)



ITEM	QTY	DESCRIPTION	STOCK CODE	DRG REF	ITEM	QTY	DESCRIPTION	STOCK CODE	DRG REF
PVC MATERIAL SCHEDULE									
F	-	HV AND LV CONDUCTORS, INCLUDING SWITCHED STREETLIGHT CIRCUIT (NOT SHOWN)	-	-	8	2	SERVICE PIERCING CONNECTOR	502127	501-1-4-48
E	-	HV AND LV INSULATOR ASSEMBLIES (NOT SHOWN)	-	-	7	1	STREETLIGHT LUMINARY	-	-
D	1	LV 5 WIRE CROSSARM ASSEMBLY	-	501-2-2-43	6	AR	SADDLE CLAMP TO SUIT 20MM PVC GREY CONDUIT	-	-
C	1	LV SERVICE CROSSARM	-	501-1-2-11	5	AR	20MM PVC GREY CONDUIT	4036	-
B	1	HV CROSSARM ASSEMBLY	-	501-2-2-44	4	AR	2 CORE 6 50MM LV ARC	502896	501-1-7-03
A	1	12.0m 'C' POLE, UNIVERSAL	-	-	3	1	FUSE HOLDER	241109	501-1-4-49
					2	1	4.0m TAPERED STREETLIGHT OUTREACH	6684	501-1-1-10
					1	1	OUTREACH MOUNTING BRACKET	401396	501-1-3-12

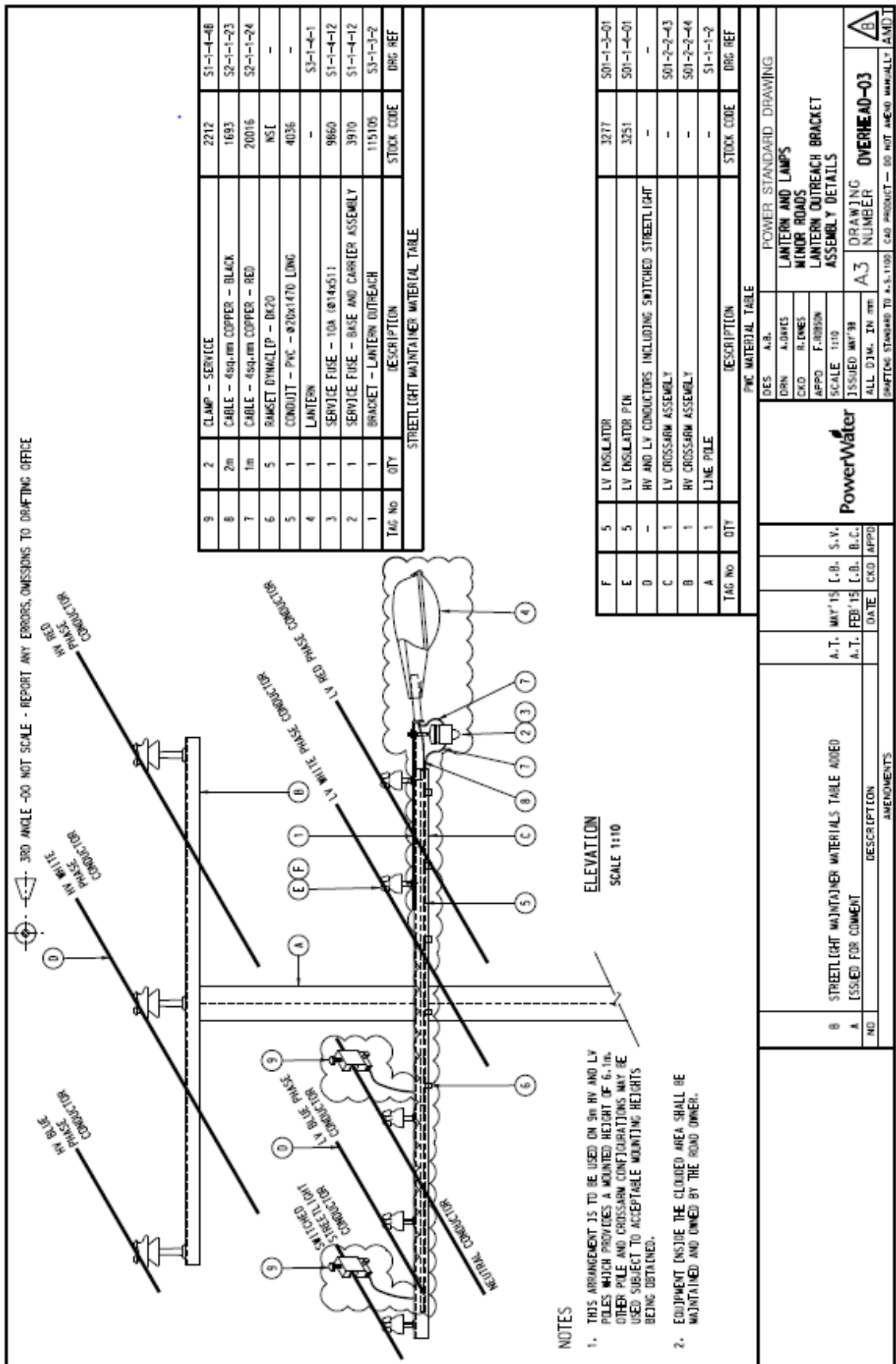
ITEM	QTY	DESCRIPTION	STOCK CODE	DRG REF
STREETLIGHT MAINTAINER MATERIAL SCHEDULE				

- NOTES:**
- ALL BOLTED CONNECTIONS TO USE GALVANISED MILD STEEL BOLTS, SPRING WASHERS, LARGE FLAT WASHERS AND GALVANISED NUTS.
 - GREASE TO BE USED ON ALL BOLTED CONNECTIONS.
 - NOT TO BE USED ON TYP. CABLE TERMINATION, ABS AND GRS.
 - EQUIPMENT IN CLOUSED AREAS SHALL BE OWNED AND MAINTAINED BY THE ROAD OWNER.
 - ONLY SWITCHED STREETLIGHT AND NEUTRAL OVERHEAD CIRCUIT ARE SHOWN FOR CLARITY.

PowerWater
NORTHERN TERRITORY

POWER STANDARD DRAWING		ASSEMBLIES- BOLTED CONNECTIONS STREETLIGHTING ATTACHMENT DETAILS	
DES	R. CLEPINS	DRN	A. SCHMID
CKD	R. CLEPINS	APPD	M. BOON
SCALE	1:40	ISSUED	FBI'15
ALL DIM.	24 mm	DRAWING NUMBER	OVERHEAD-02
DRAWING TO A.3-1100		A3	AMEND

AMENDMENTS			
NO	DESCRIPTION	DRN	DATE
C	OVERHEAD CONDUCTORS AND INSULATORS ADDED	A.T.	JUL'15
B	STREETLIGHT MAINTAINER MATERIAL TABLE ADDED	A.T.	MAY'15
A	ISSUED FOR COMMENT	A.T.	FBI'15



380 ANGLE - DO NOT SCALE - REPORT ANY ERRORS, OMISSIONS TO DRAFTING OFFICE

9	2	CLAMP - SERVICE	2212	S1-1-4-8
8	2m	CABLE - 4sq. mm COPPER - BLACK	1693	S2-1-1-23
7	1m	CABLE - 4sq. mm COPPER - RED	20016	S2-1-1-24
6	5	WASHER DYNALIP - DK20	NSC	-
5	1	CONDUIT - PVC - Ø20x1470 LONG	4026	-
4	1	LAMP	-	S3-1-4-1
3	1	SERVICE FUSE - 10k (Ø14x51)	9860	S1-1-4-12
2	1	SERVICE FUSE - BASE AND CARRIER ASSEMBLY	3910	S1-1-4-12
1	1	BRACKET - LAMP	115105	S3-1-3-2
TAG NO.	QTY	DESCRIPTION	STOCK CODE	DRG REF

STREET LIGHT MAINTAINER MATERIAL TABLE

NOTES

1. THIS ARRANGEMENT IS TO BE USED ON 9m HV AND LV POLES WHICH PROVIDES A MOUNTED HEIGHT OF 6.1m. OTHER POLE AND CROSSARM CONFIGURATIONS MAY BE USED SUBJECT TO ACCEPTABLE MOUNTING HEIGHTS BEING OBTAINED.
2. EQUIPMENT INSIDE THE CLOUDED AREA SHALL BE MAINTAINED AND OWNED BY THE ROAD OWNER.

ELEVATION SCALE 1:10

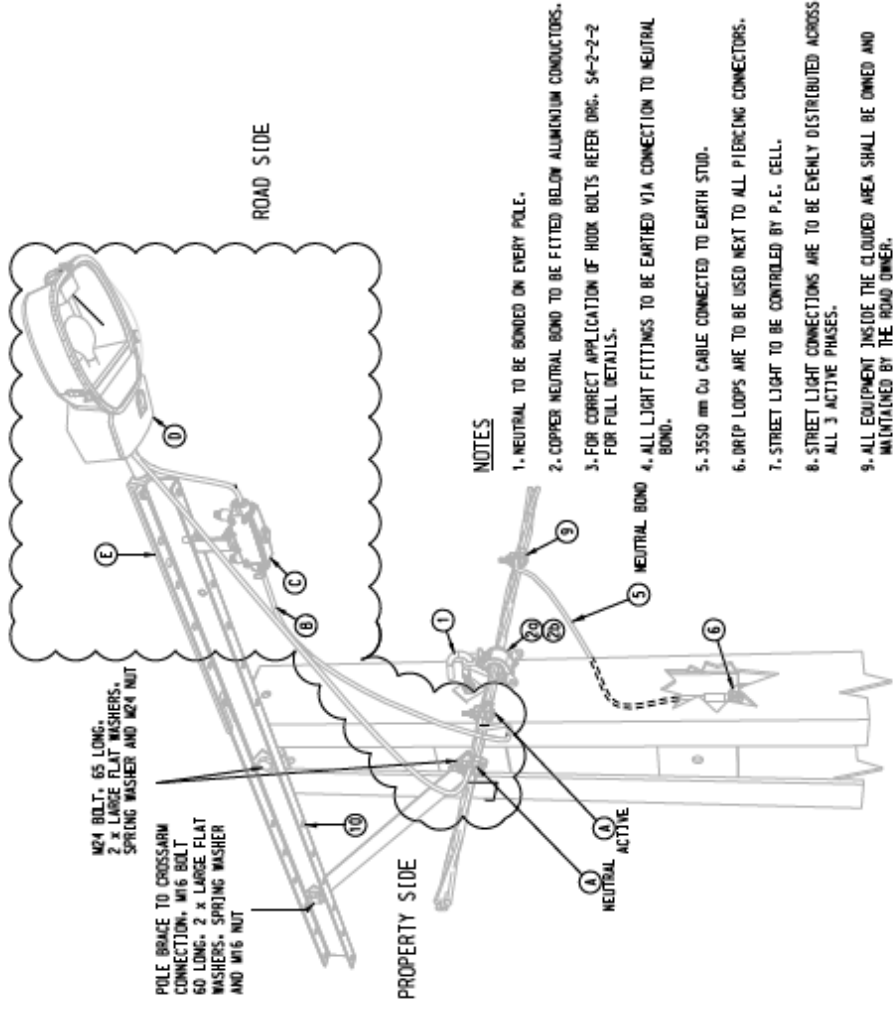
F	5	LV INSULATOR	3277	S0-1-3-01
E	5	LV INSULATOR PIN	3251	S0-1-4-01
D	-	HV AND LV CONDUCTORS INCLUDING SWITCHED STREET LIGHT	-	-
C	1	LV CROSSARM ASSEMBLY	-	S01-2-2-43
B	1	HV CROSSARM ASSEMBLY	-	S01-2-2-44
A	1	LINE POLE	-	S1-1-1-2
TAG NO.	QTY	DESCRIPTION	STOCK CODE	DRG REF

PVC MATERIAL TABLE

DES. A.B.		POWER STANDARD DRAWING	
DRN. A.DAVES	LAMP AND LAMPS		
CHKD. R.ONES	MINOR ROADS		
APPRD. F.ROBINSON	LAMP OUTREACH BRACKET		
SCALE 1:10	ASSEMBLY DETAILS		
ISSUED MAY '98	A3	DRAWING NUMBER	OVERHEAD-03
ALL DIM. IN MM	DRAWING NUMBER		
DRAFTING STANDARD TO A.S.1100 CAD PRODUCT - DO NOT Amend MANUALLY - AMDT			

NO.	DESCRIPTION	DATE	CHKD	APPRD
B	STREET LIGHT MAINTAINER MATERIALS TABLE ADDED	A.T.	MAY 15	L.B.
A	ISSUED FOR COMMENT	A.T.	FEB 15	L.B.
				S.V.

E	1	LANTERN OUTREACH LV CROSSARM	115105	S03-1-3-02
D	1	STREETLIGHT LUMINARY (INCLUDING PE CELL SERVICE FUSE)	-	-
C	1	SERVICE FUSE	-	S01-1-4-49
B	AR	2X1C-6 SOMM CU LV ABC	502896	S01-1-7-03
A	2	CONNECTOR, PIERCING 95/6	190382	S4-1-2-15
TAG No.	QTY.	DESCRIPTION	STOCK CODE	DRG. REF.
STREETLIGHT MAINTAINER MATERIAL SCHEDULE				

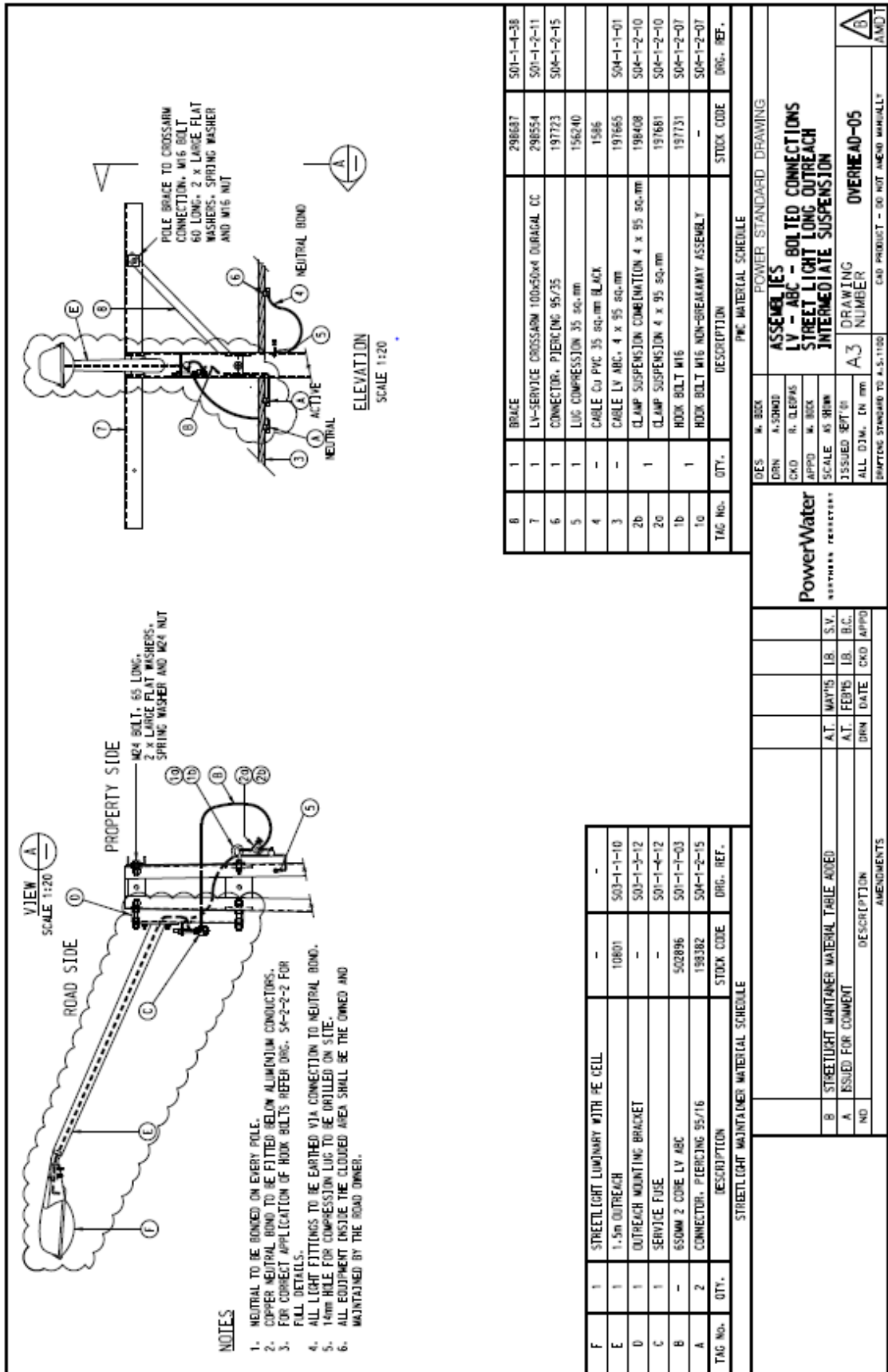


11	1	BRACE	298687	S4-1-1-4-38
10	1	LV-SERVICE CROSSARM 100x50x4 DURALUM CC	298554	S1-1-2-11
9	1	CONNECTOR, PIERCING 95/35	191723	S4-1-2-15
6	1	LUG COMPRESSION 35 sq.mm	156240	
5	AR	CABLE CU PVC 35 sq.mm BLACK	1586	
3	-	CABLE LV ABC, 4 x 95 sq.mm	191665	S4-1-1-1
2b	1	CLAMP SUSPENSION COMBINATION 4 x 95 sq.mm	198408	S4-1-2-10
2a	1	CLAMP SUSPENSION 4 x 95 sq.mm	191681	S4-1-2-10
1b	1	HOOK BOLT M16	191731	S4-1-2-7
1a	1	HOOK BOLT M16 NON-BREAKAWAY ASSEMBLY	-	S4-1-2-7
TAG No.	QTY.	DESCRIPTION	STOCK CODE	DRG. REF.
PVC MATERIAL SCHEDULE				

DES	ALBOX	POWER STANDARD DRAWING
DRN	J.LOPIPING	
CKD	A.TAYLOR	ASSEMBLIES
APPO	S.C.	LV - ABC - BOLTED CONNECTIONS
SCALE	M.T.S.	STREET LIGHT SHORT OUTREACH
ISSUED	AUG'10	INTERMEDIATE SUSPENSION
ALL DIM.	IN mm	DRAWING NUMBER
		A3
		OVERHEAD-04
AMENDT		
DRAWING STANDARD TO A.5.1100		
CAD PRODUCT - DO NOT AMEND MANUALLY		

PowerWater

NO	DESCRIPTION	DRN	DATE	CKD	APPO
B	STREETLIGHT MAINTAINER MATERIAL TABLE ADDED	A.T.	MAY'15	L.B.	S.V.
A	ISSUED FOR COMMENT	A.T.	FEB'15	L.B.	B.C.



NOTES

1. NEUTRAL TO BE BONDED ON EVERY POLE.
2. COPPER NEUTRAL BOND TO BE FITTED BELOW ALUMINIUM CONDUCTORS.
3. FOR CORRECT APPLICATION OF HOOK BOLTS REFER DRG. 54-2-2-2 FOR FULL DETAILS.
4. ALL LIGHT FITTINGS TO BE EARTHED VIA CONNECTION TO NEUTRAL BOND.
5. 14mm HOLE FOR COMPRESSION LUG TO BE DRILLED ON SIDE.
6. ALL EQUIPMENT INSIDE THE CLOUSED AREA SHALL BE THE OWNED AND MAINTAINED BY THE ROAD OWNER.

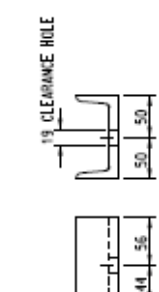
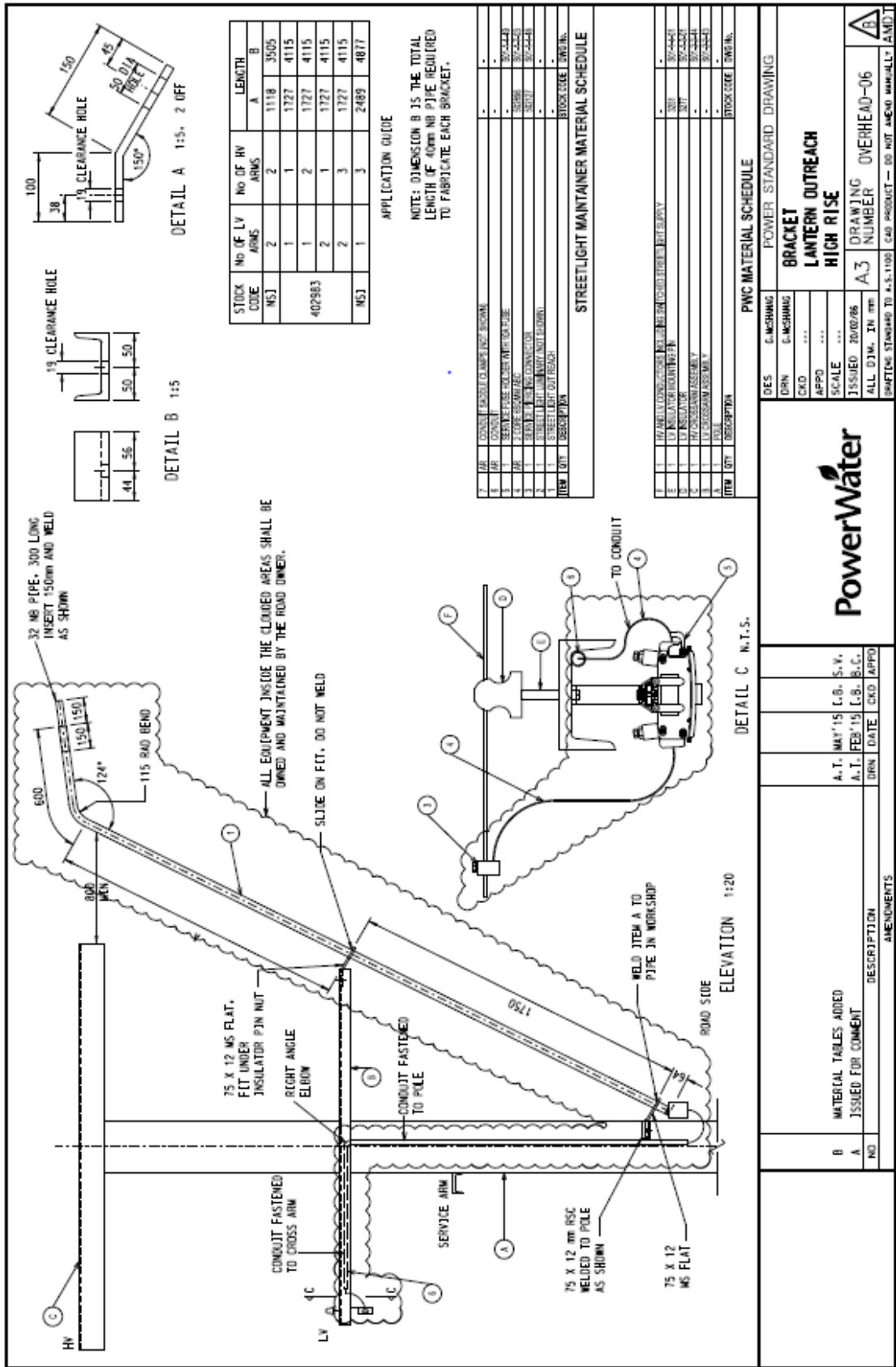
QTY.	DESCRIPTION	STOCK CODE	DRG. REF.
1	BRACE	298687	501-1-1-38
1	LV-SERVICE CROSSARM 100x50x4 DURALUM CC	298554	501-1-2-11
1	CONNECTOR, PIERCING 95/35	197723	504-1-2-15
1	LUG COMPRESSION 35 sq.mm	156240	
-	CABLE CU PVC 35 sq.mm BLACK	1586	
-	CABLE LV ABC, 4 x 95 sq.mm	191665	504-1-1-01
1	CLAMP SUSPENSION COMBINATION 4 x 95 sq.mm	198408	504-1-2-10
1	CLAMP SUSPENSION 4 x 95 sq.mm	197681	504-1-2-10
1	HOOK BOLT M16	197731	504-1-2-07
1	HOOK BOLT M16 NON-BREAKAWAY ASSEMBLY	-	504-1-2-07

QTY.	DESCRIPTION	STOCK CODE	DRG. REF.
1	STREETLIGHT LUMINAIR WITH PE CELL	-	-
1	1.5m OUTREACH	10801	503-1-1-10
1	OUTREACH MOUNTING BRACKET	-	503-1-3-12
1	SERVICE FUSE	-	501-1-4-12
-	650MM 2 CORE LV ABC	502896	501-1-1-03
2	CONNECTOR, PIERCING 95/16	198382	504-1-2-15

DES.	M. BOOK	POWER STANDARD	DRAWING
DRN	A. SMOOR	ASSEMBLIES	
CHKD	R. OLEPAS	LV - ABC	BOLTED CONNECTIONS
APPRD	M. BECK	STREET LIGHT LONG OUTREACH	
SCALE	AS SHOWN	INTERMEDIATE SUSPENSION	
ISSUED	9/17/21	DRAWING NUMBER	OVERHEAD-05
ALL DIM.	IN mm	A3	

AT.	DATE	BY.	FOR.
AT. <td>DATE</td> <td>BY.</td> <td>FOR.</td>	DATE	BY.	FOR.
AT. <td>DATE</td> <td>BY.</td> <td>FOR.</td>	DATE	BY.	FOR.

NO.	DESCRIPTION	AMENDMENTS
B	STREETLIGHT MAINTAINER MATERIAL TABLE ADDED	
A	ISSUED FOR COMMENT	



STOCK CODE	NO OF LV ARMS	NO OF HV ARMS	LENGTH	
			A	B
MSJ	1	2	1118	3505
	2	1	1727	4115
402883	1	2	1727	4115
	2	1	1727	4115
MSJ	1	3	2489	4877

APPLICATION GUIDE

NOTE: DIMENSION B IS THE TOTAL LENGTH OF 40mm NB PIPE REQUIRED TO FABRICATE EACH BRACKET.

ITEM	QTY	DESCRIPTION	STOCK CODE	QTY IN KIT
1	1	CONDUIT	-	-
2	1	CONDUIT	-	-
3	1	SERVICE PIPE FOR STREET LIGHT SUPPLY	30-2244F	-
4	1	CONDUIT	30-2244F	-
5	1	CONDUIT	30-2244F	-
6	1	CONDUIT	30-2244F	-
7	1	CONDUIT	30-2244F	-
8	1	CONDUIT	30-2244F	-
9	1	CONDUIT	30-2244F	-
10	1	CONDUIT	30-2244F	-
11	1	CONDUIT	30-2244F	-
12	1	CONDUIT	30-2244F	-
13	1	CONDUIT	30-2244F	-
14	1	CONDUIT	30-2244F	-
15	1	CONDUIT	30-2244F	-
16	1	CONDUIT	30-2244F	-
17	1	CONDUIT	30-2244F	-
18	1	CONDUIT	30-2244F	-
19	1	CONDUIT	30-2244F	-
20	1	CONDUIT	30-2244F	-
21	1	CONDUIT	30-2244F	-
22	1	CONDUIT	30-2244F	-
23	1	CONDUIT	30-2244F	-
24	1	CONDUIT	30-2244F	-
25	1	CONDUIT	30-2244F	-
26	1	CONDUIT	30-2244F	-
27	1	CONDUIT	30-2244F	-
28	1	CONDUIT	30-2244F	-
29	1	CONDUIT	30-2244F	-
30	1	CONDUIT	30-2244F	-
31	1	CONDUIT	30-2244F	-
32	1	CONDUIT	30-2244F	-
33	1	CONDUIT	30-2244F	-
34	1	CONDUIT	30-2244F	-
35	1	CONDUIT	30-2244F	-
36	1	CONDUIT	30-2244F	-
37	1	CONDUIT	30-2244F	-
38	1	CONDUIT	30-2244F	-
39	1	CONDUIT	30-2244F	-
40	1	CONDUIT	30-2244F	-
41	1	CONDUIT	30-2244F	-
42	1	CONDUIT	30-2244F	-
43	1	CONDUIT	30-2244F	-
44	1	CONDUIT	30-2244F	-
45	1	CONDUIT	30-2244F	-
46	1	CONDUIT	30-2244F	-
47	1	CONDUIT	30-2244F	-
48	1	CONDUIT	30-2244F	-
49	1	CONDUIT	30-2244F	-
50	1	CONDUIT	30-2244F	-
51	1	CONDUIT	30-2244F	-
52	1	CONDUIT	30-2244F	-
53	1	CONDUIT	30-2244F	-
54	1	CONDUIT	30-2244F	-
55	1	CONDUIT	30-2244F	-
56	1	CONDUIT	30-2244F	-
57	1	CONDUIT	30-2244F	-
58	1	CONDUIT	30-2244F	-
59	1	CONDUIT	30-2244F	-
60	1	CONDUIT	30-2244F	-

STREETLIGHT MAINTAINER MATERIAL SCHEDULE

ITEM	QTY	DESCRIPTION	STOCK CODE	QTY IN KIT
1	1	CONDUIT	-	-
2	1	CONDUIT	-	-
3	1	SERVICE PIPE FOR STREET LIGHT SUPPLY	30-2244F	-
4	1	CONDUIT	30-2244F	-
5	1	CONDUIT	30-2244F	-
6	1	CONDUIT	30-2244F	-
7	1	CONDUIT	30-2244F	-
8	1	CONDUIT	30-2244F	-
9	1	CONDUIT	30-2244F	-
10	1	CONDUIT	30-2244F	-
11	1	CONDUIT	30-2244F	-
12	1	CONDUIT	30-2244F	-
13	1	CONDUIT	30-2244F	-
14	1	CONDUIT	30-2244F	-
15	1	CONDUIT	30-2244F	-
16	1	CONDUIT	30-2244F	-
17	1	CONDUIT	30-2244F	-
18	1	CONDUIT	30-2244F	-
19	1	CONDUIT	30-2244F	-
20	1	CONDUIT	30-2244F	-
21	1	CONDUIT	30-2244F	-
22	1	CONDUIT	30-2244F	-
23	1	CONDUIT	30-2244F	-
24	1	CONDUIT	30-2244F	-
25	1	CONDUIT	30-2244F	-
26	1	CONDUIT	30-2244F	-
27	1	CONDUIT	30-2244F	-
28	1	CONDUIT	30-2244F	-
29	1	CONDUIT	30-2244F	-
30	1	CONDUIT	30-2244F	-
31	1	CONDUIT	30-2244F	-
32	1	CONDUIT	30-2244F	-
33	1	CONDUIT	30-2244F	-
34	1	CONDUIT	30-2244F	-
35	1	CONDUIT	30-2244F	-
36	1	CONDUIT	30-2244F	-
37	1	CONDUIT	30-2244F	-
38	1	CONDUIT	30-2244F	-
39	1	CONDUIT	30-2244F	-
40	1	CONDUIT	30-2244F	-
41	1	CONDUIT	30-2244F	-
42	1	CONDUIT	30-2244F	-
43	1	CONDUIT	30-2244F	-
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47	1	CONDUIT	30-2244F	-
48	1	CONDUIT	30-2244F	-
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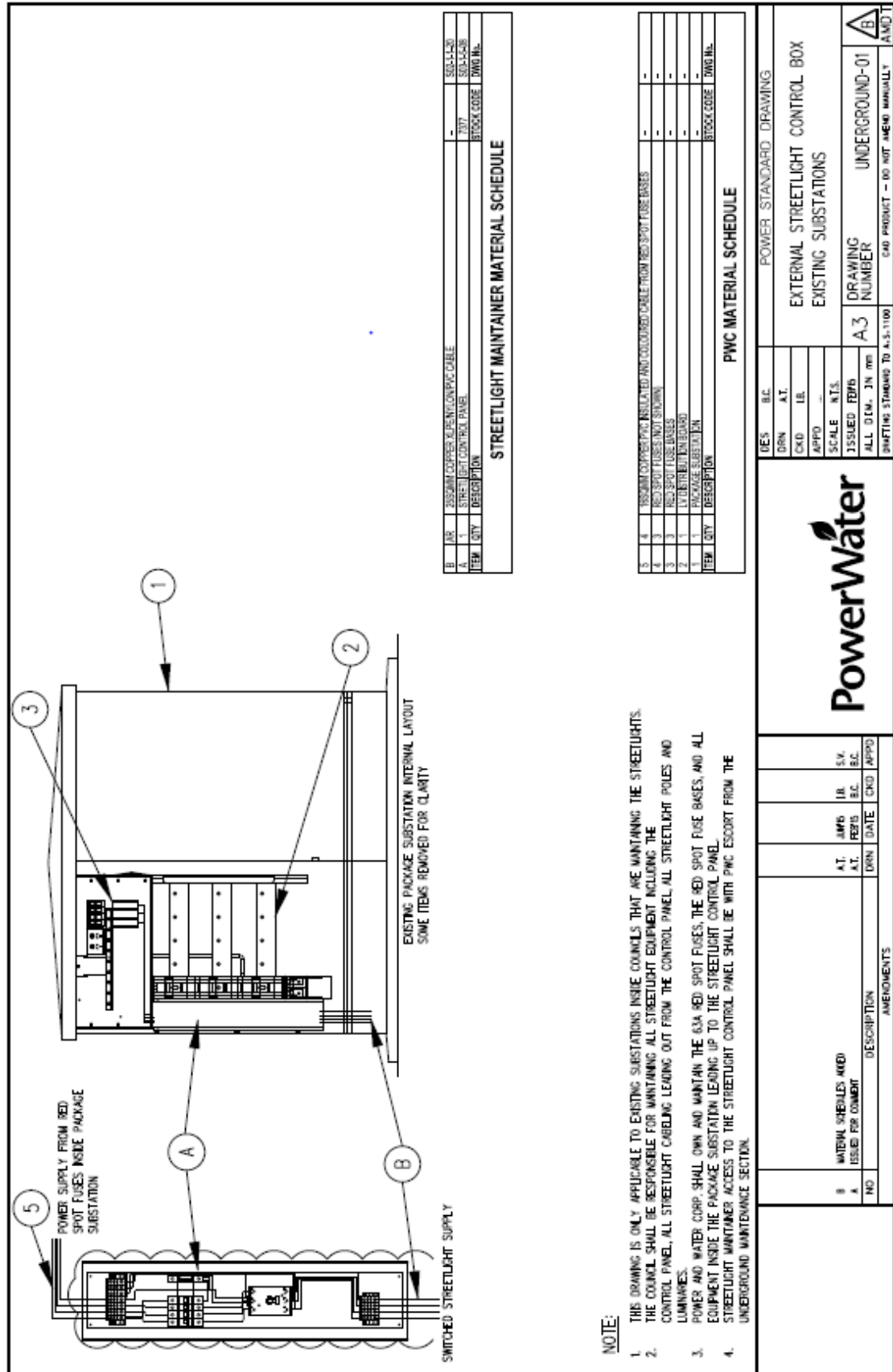
DETAIL C N.T.S.

ELEVATION 1:20

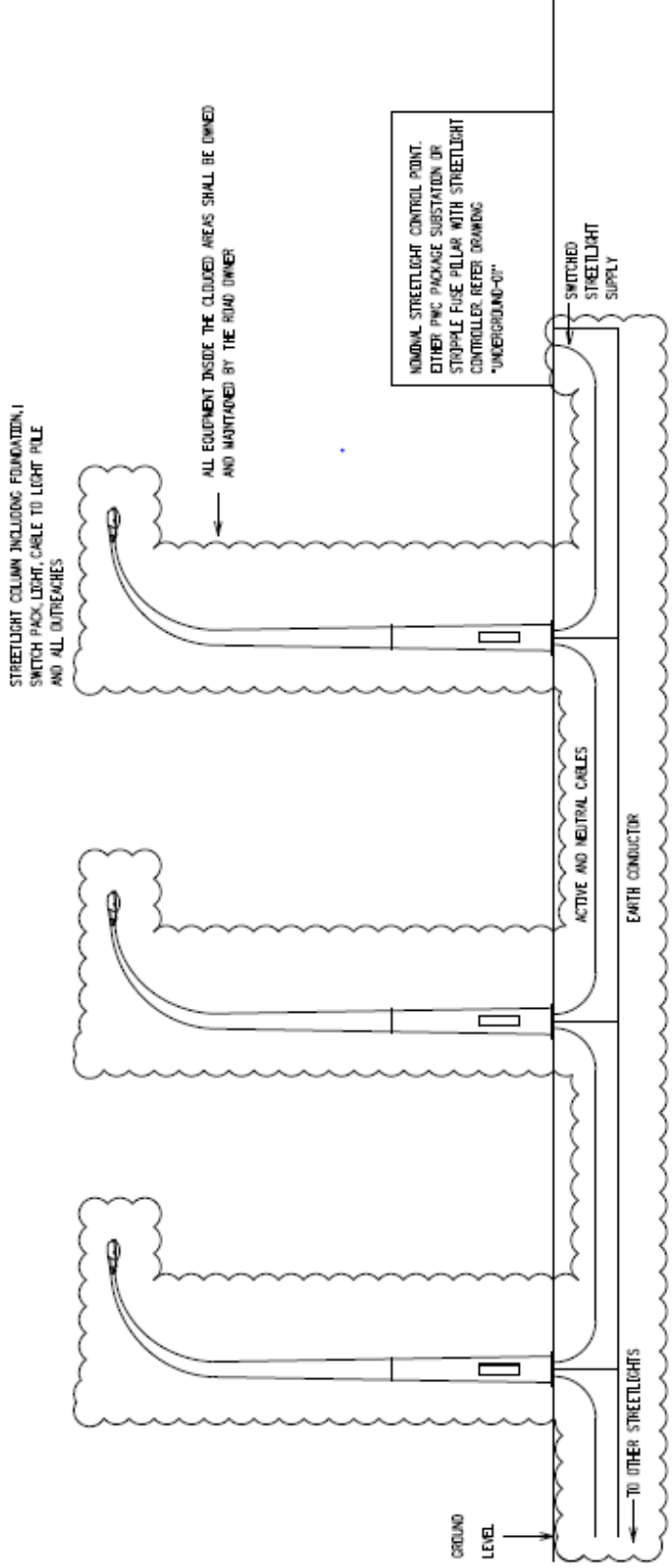
DES: G-MSHRMG POWER STANDARD DRAWING	
BRACKET LANTERN OUTREACH HIGH RISE	
PVC MATERIAL SCHEDULE	
DES: G-MSHRMG	POWER STANDARD DRAWING
DRN: G-MSHRMG	PROJECT: ...
CHK: ...	APPRO: ...
SCALE: ...	SCALE: ...
ISSUED: 20/07/86	ISSUED: 20/07/86
ALL DIM. IN mm	ALL DIM. IN mm
DRAWING NUMBER: OVERHEAD-06	
DRAFTING STANDARD: 4.5-1108 (40 PRODUCT - 00 NOT A-MEN) MAR-11 (A-M)	

MATERIAL TABLES ADDED	A.T. MAY '15 L.B. S.V.
ISSUED FOR COMMENT	A.T. FEB '15 L.B. B.C.
NO	DRN DATE CHK APPD
AMENDMENTS	

UNDERGROUND LIGHT STREET DRAWINGS



- NOTE:**
1. THE STREETLIGHT SERVICE PROVIDER SHALL BE RESPONSIBLE FOR MAINTAINING ALL STREETLIGHT CABLING AND CONDUITS LEADING OUT FROM THE CONTROL PANEL, STREETLIGHTING CABLE FITS, STREETLIGHT POLES, THEIR BASES AND LUMINAIRES.
 2. POWER AND WATER CORP SHALL OWN AND MAINTAIN THE 63A RED SPOT FUSES, THE 63A RED SPOT FUSE BASES AND ALL EQUIPMENT INSIDE THE PACKAGE SUBSTATION LEADING UP TO THE RED SPOT FUSE BASES.
 3. CABLING BETWEEN THE PACKAGE SUBSTATION AND STREETLIGHT CONTROL BOX SHALL BE RUN IN CONDUIT.
 4. STREETLIGHT SERVICE PROVIDERS ARE RESPONSIBLE FOR THE MAINTENANCE OF FIT AND RILLARS THAT HOUSE STREETLIGHT CONTROL CIRCUITS



DES SV		DRN AT		POWER STANDARD DRAWING	
CND BC		APPO SV		UNDERGROUND POWERED STREETLIGHT CIRCUIT	
SCALE NTS		ISSUED MTHS		GENERAL ARRANGMENT	
ALL DIM IN MM		SHAFTING STAIRS TO 6.5-1100		DRAWING NUMBER	
A3		UNDERGROUND-02		A/B	
CAD PRODUCT - DO NOT AEND MANUALLY					

COMMENTS AISED		A.T.		MTHS		BC.		SV.	
A		A.T.		MTHS		BC.		SV.	
NO		DRN		DATE		CND		APPO	
		DESCRIPTION		AMENDMENTS					



APPENDIX D

Authorisations Licences and OH&S Requirements

Schedule 3 - Authorisations and Training	Activity	Individual Authorisation/licences requirements ¹	Company (Equipment, plant, systems) Requirements
	<p>Working on connections to PN Aerial (OH)Phase/Neutral Conductors or Streetlight Control Conductors</p> <p>Working on OH Streetlight components on power poles</p> <p>Working on Control Boxes Fitted to Poles including the connections to OH aerials</p>	<p>AR Authorisations:-</p> <p>AAR12A – Receive AA for work or test on LV</p> <p>AAR17A – Sign on AA for work or test on LV</p> <p>AAR22 – Conduct work or test under sundry apparatus</p> <p>AAR26 – Receive AWW for excavation work in the vicinity of underground cables</p> <p>AAR27 – Work in the proximity of overhead power lines</p> <p>PN Authorisation Requirements:-</p> <p>Live Low Voltage Worker Overhead</p> <p>Live Low Voltage Worker Safety Observer</p> <p>Licences:-</p> <p>Electrical Workers Licence endorsed as a linesman or Electrical Fitter/Mechanic</p>	<p>OH&S Management system addressing:-</p> <p>Risk management</p> <p>SWMS</p> <p>recording and monitoring of training and qualifications</p> <p>PN Authorisations requirements</p> <p>Tools and equipment management (insulated tools and equipment etc)</p> <p>Work practice/procedure documents that cover tagging, de-energised work (needs to align to PN tagging), live LV work</p>
	<p>Working on connections to PN Phase/Neutral terminals within pillars.</p> <p>Working on Streetlight Cables</p> <p>Working on Control Boxes within package substations.</p>	<p>AR Authorisations:-</p> <p>AAR12A – Receive AA for work or test on LV</p> <p>AAR17A – Sign on AA for work or test on LV</p> <p>AAR22 – Conduct work or test under sundry apparatus</p> <p>AAR26 – Receive AWW for excavation work in the vicinity of underground cables</p> <p>AAR27 – Work in the proximity of overhead power lines</p> <p>PN Authorisation Requirements:-</p> <p>Live Low Voltage Worker Overhead</p> <p>Live Low Voltage Worker Safety Observer</p> <p>Licences:-</p> <p>Electrical Workers Licence endorsed as a linesman or Electrical Fitter/Mechanic</p>	<p>OH&S Management system addressing:-</p> <p>Risk management</p> <p>SWMS</p> <p>recording and monitoring of training and qualifications</p> <p>PN Authorisations requirements</p> <p>Tools and equipment management (insulated tools and equipment etc)</p> <p>Work practice/procedure documents that cover tagging, de-energised work (needs to align to PN tagging), live LV work</p>

¹ Power Networks will have the responsibility of authorising workers for Live LV and AAR authorisations.