Distribution Design Standard

Public Lighting

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TasNetworks
Delivering your power

Tasmanian Networks Pty Ltd

Authorisations

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Responsibilities

This document is the responsibility of the Metering Asset Strategy Team, Tasmanian Networks Pty Ltd, ABN 24 167 357 299 (hereafter referred to as "TasNetworks").

Please contact the Metering Asset Strategy Team with any queries or suggestions via the TasNetworks' switchboard, Phone 1300 12 7777.

- Implementation All TasNetworks staff and contractors.
- Compliance All group managers.

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Record of revisions

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1 Introduction

The Distribution Design Standard – Public Lighting ("Standard") contains the approved design process considerations and detailed standard arrangements for the design of Public Lighting for URD subdivisions within TasNetworks' electrical network.

TasNetworks will update this Standard periodically. It is the responsibility of the designer to ensure the latest Standard is used.

1.1 Scope

The Standard only applies to URD Subdivision for the following asset types:

- Public lighting columns
- Luminaires
- Lamps
- Underground supply and all assets for connection from public lighting installation to distribution system

Materials for Public Lighting shall comply with TasNetworks' Approved Products List.

The following installation types are excluded from the design scope for this standard:

- Major 'V Category' installations
- Upgrading of existing public lighting installations
- Any public lighting connection to the overhead network infrastructure
- Any other installations not specifically involving an URD subdivision

For public lighting systems interconnecting to other TasNetworks electrical reticulation refer to the following standards:

- Overhead systems - for further details refer to the Distribution Design Standard for Overhead systems
- Undergrounds systems - for further details refer to the Distribution Design Standard for Underground systems

The application of this design standard applies to greenfield sites.

All designs shall be compliant in full with this standard.

1.2 Definitions and Abbreviations

Table 1 – Definitions

Aeroscreen luminaire	A luminaire that has a flat diffuser recessed or finished flush with the body of the unit. Also called 'full cut-off luminaires' describing luminaires that emit no light above the horizontal plane.
Arrangement	The layout, in plan, of the luminaires in a lighting scheme, e.g. single sided, staggered, opposite or central along roadways.
Blowout	The horizontal deviation from centre of power line conductors when subjected to lateral wind forces.
Capacitor	An item of apparatus used to improve (make more leading) the power factor of an electrical load.
CIE & IES Files	CIE and IES files are basically the measurement of distribution of light (intensity) emitted from various luminaires for use in calculating lighting designs
Conductor	A wire or other form of conducting material suitable for carrying current.
Conduit (Also 'Duct')	A pipe or closed passage formed underground or in a structure and intended to receive one or more cables that may be drawn through it.
Conflict points	Roadway features that influence the passage of motorists and pedestrians and that require particular attention when preparing the lighting design e.g. chevrons, pedestrian refuges, and gore points at off/on ramps.
Control gear	The equipment required within the luminaire for starting and running the lamp. Control Gear includes the ballast or choke, capacitor, photo-electric control switch, igniters or starting device if required, lamp holder and wiring.
Distribution Network Service Provider (DNSP)	TasNetworks
Earth wire (also 'ground wire')	The conductor joining earth electrodes to the object being earthed. Also used to interconnect earth electrodes.
Earthed (also 'Grounded')	Connected to the general mass of earth by means of earthing systems.
Earthing (also 'Grounding')	The process of connecting components of electricity supply networks to ground to prevent dangerous voltages occurring on components which may be contacted by persons or animals, or which may be damaged by the voltages. Usually applied to rods, metallic electrodes or a group of interconnected rods and the wire making connection to the distribution system component that is 'earthed'.
Easement	A strip of land registered on the title deed in the office of the Registrar of Titles allowing access or other rights to a public body or party other than the owner of the parcel of land on which the easement exists.
Efficacy	Efficacy is measured in lumens per watt. Efficacy is similar to efficiency, but is expressed in dissimilar units. For example, if a 100-watt source produces 9000 lumens, then the efficacy is 90 lumens per watt.

Efficiency	The efficiency of a light source is the fraction of electrical energy converted to light, e.g. the watts of visible light produced for each watt of electrical power with no consideration of the wavelength or where the energy is being radiated. For example, a 100 watt incandescent lamp converts 7% of the electrical energy into light; discharge lamps convert 25% to 40% into light.
Footpath alignment	The distance from the back of the curb to the property boundary used to describe the position of an underground service or column.
Footpath allocation	A space in the footpath between two alignments designated by the local or public authority in which a pole or underground service may be located.
Frangible column	A lighting column designed to fail on vehicle impact in a controlled manner. The two frangible column types are slip-base and impact absorbing.
Frequented location	Any urban area associated with a city or town other than a 'Special Location'. Greater risks arise from high step and touch potentials in frequented locations.
Funding arrangements	The determination of who provides the funding for the installation. In the case of a Public Lighting tariff installation, the electricity distributor funds the design and construction of the installation. In the case of a Contract Lighting tariff installation, the Public Body or developer funds the design and construction of the installation.
Glare	Conditions of vision in which there is discomfort or a reduction in the ability to see, or both, caused by an unstable distribution or range of luminance, or extreme contrasts in the field of vision.
Hot restart or hot restrike	Electrical control equipment which allows some high intensity discharge (HID) lamps to restrike immediately on restoration of supply.
Illuminance (or illumination)	The physical measure of illumination. It is the luminous flux arriving at a surface divided by the area of the illuminated surface measured in lumens per sq. metre (Lux).
Impact absorbing column	A column designed to deform around a vehicle upon impact and gradually slow the vehicle.
Joint use pole / column	A pole or lighting column owned by either TasNetworks or another authority that is used by both parties. For example, a joint use column may support traffic lights as well as TasNetworks' public lights, or a supply authority supporting overhead electric mains as well as telecommunications cables.
Lamp	The generic term for the light source in a luminaire.
LED	Light Emitting Diode - (a semiconductor diode which glows when a voltage is applied).
Lighting column	A vertical structure of any appropriate material, which, is designed to support luminaires either directly or by use of outreach arms or mounting frames.
Lumen (lm)	One lumen is defined as the luminous flux of light produced by a light source. One lumen emits one candela of luminous intensity over a solid angle of one steradian.
Luminance	The physical quantity corresponding to the brightness of the surface (lamp, luminaire or reflecting material such as the road surface) when viewed from a specified direction.

Luminaire	Apparatus which distributes, filters, or transforms the light transmitted from one or more lamps and which includes, except for the lamps themselves, all the parts necessary for fixing and protecting the lamps and, where necessary, circuit auxiliaries together with the means for connecting them to the electrical supply.
Luminous flux	The measure of the perceived power of light. Luminous flux is adjusted to factor in the varying sensitivity of the human eye to different wavelengths of light.
Metered lighting	Privately owned lighting installation on roads, walkways, public open areas etc. that is supplied from a dedicated metered switchboard.
Mounting height	The vertical distance between the photometric centre of a luminaire and the surface which is to be illuminated e.g. the road surface.
Multiple earthed neutral system	A system in which TasNetworks' low voltage neutral conductor is connected to earths at points along its length, at the neutral terminal of distribution substations and to the earths of consumer's installations.
Outreach	The distance, measured horizontally, from the photometric centre of a luminaire to: (a) for lighting columns with outreach arms, the centre of the vertical section of the pole (b) for bracket arms, the mounting plate which the bracket arm is secured to the pole, wall or other surface.
Pit	Excavation accessing underground cables for installation, maintenance, jointing or repair.
Public body	Organisations defined as Road Owning Authority and include Commonwealth, State and Local Government, State Growth or other Tasmanian Government Departments and Public Authorities as approved by the Tasmanian State Government.
Public lighting / road lighting	Lighting schemes for roads, parks, reserves, pedestrian zones, footpaths, cycle paths, car parks and other public areas that are managed by or on behalf of a customer (Lighting provided in accordance with the AS/NZS 1158 series).
Radiant flux	Is the measure of the total power of electromagnetic radiation of a lamp including infrared, ultraviolet, and visible light.
Remote location	An area not defined as either 'Special Location' or 'Frequented Location'. Less stringent requirements for earthing may be applied due to the reduced risks associated with step and touch potentials.
Road Owning Authority	Body responsible for ensuring lighting levels are maintained in public spaces.
Roadway width	The traverse distance between the outer road kerb-lines or edges (for divided roads, this will apply to the two carriageways plus the intervening median strip). Roadway width is used only for the lighting of curves.
Road reserve width	The width of the entire way, between property lines, devoted to public travel.
Tariff – Public Road Lighting	Unmetered Public Lighting is supplied, installed, owned and maintained by TasNetworks. The tariff includes supply, installation, maintenance and recovery over the life of the asset.

Tariff – Private Contract Lighting	Unmetered Private Contract Lighting is supplied, installed and maintained by TasNetworks. The tariff includes maintenance of the asset. Customer pays for luminaire and installation.
Tariff – Metered Supply	Metered Lighting supplied, installed, owned and maintained by the Public Body. Supply is metered and the installation must comply with the AS/NZS 3000 Wiring Rules. Beyond the Point of Supply, reticulation is owned and maintained by the consumer.
Turret	An enclosure where underground cables are terminated. Turrets may be used as switching points on a LV network, disconnection points for fault-finding, or as points from which to take off services to consumers or public lights. Fuses or other protective devices may be housed within the turret.
Sinking depth	The depth of a column below ground level.
Special location	With regard to earthing, this is a 'high risk' area where step and touch potentials need to be minimised. A special location may refer to school grounds, a children's playground, within a public swimming pool area, at a popularly used beach or water recreation area, or in a public thoroughfare within 100 metres of any of the above-named locations.
Step voltage (also 'touch voltage')	The prospective or open circuit voltage that may appear between any two points on the surface of the ground spaced, typically one metre apart. Generally used to determine voltages that may affect pedestrians or animals under earth fault conditions.
Tariff	A scale of charges and set of conditions electricity authorities apply to customers to cover the capital cost of installation, maintenance and electricity consumed.
Touch voltage (see also 'step voltage')	The prospective or open circuit voltage which may appear between any point of contact with uninsulated metalwork located within typically 2.4 metres of the ground and any point on the surface of the ground within a horizontal distance of typically one metre from the vertical projection of the point of contact with the uninsulated metalwork. (Generally used to determine voltages that may affect pedestrians or animals under earth fault conditions).
Upcast or Tilt Angle	The angle by which the axis of the fixing spigot entry is tilted above the horizontal when the luminaire is installed.

Table 2 – Abbreviations

A	Aeroscreen
AS	Australian Standard
AS/NZS	Australian/New Zealand Standard
BBK	Behind Back of Kerb
BFK	Behind Face of Kerb
BIK	Behind Invert of Kerb
BPM	Base Plate Mounted
CFL	Compact Fluorescent Lamp
CIE	International Commission on Illumination (The international authority on light, illumination, colour, and colour spaces)
DB	Direct Buried
DBYD	Dial Before You Dig
ELP	Electricity/Light Pole
EOB	Edge of Bitumen
Ex	Existing
Exc	Excavate
FC	Fibrous Cement
GIS	Geographic Information System
HID	High Intensity Discharge
HM	High Mast Luminaire
HPS	High Pressure Sodium. A high intensity discharge lamp producing light with a yellowish bias.
HRC	High Rupture Capacity
IA	Impact Absorbing
IES	Illuminating Engineering Society
IP Rating	The International Protection code for Enclosures
ISO	International Standards Organisation
LED	Light Emmitting Diode
LPS	Low Pressure Sodium
LUX	Measurement of Illuminance or lumens per sq metre
MH	Metal Halide. A type of high intensity discharge (HID) lamp in which most of the light is produced by radiation of metal halide and mercury vapours in the arc tube
MV	Mercury Vapour. A high intensity discharge lamp producing white light, also referred to as high pressure mercury.
NS	Neutral Screened
O/R	Outreach (Public lighting bracket)
PE	Photoelectric

PED XING	Pedestrian Crossing (Public lighting)
PL	Public Lighting
PLCP	Public Light Control Point
PLM	Public Light Main
RLE	Running Lane Edge
ROI	Rear of Invert
SBM	Slip Base Mounted
T5 lamps	16mm fluorescent lamp configuration
UG	Underground
URD	Underground Residential Development

1.3 Distribution Asset Records System

TasNetworks' distribution records are managed by the Asset Records groups. For the purposes of distribution design, the following applications are relevant:

- Webmap – internal Geographic Information System (GIS) which combines a large number of TasNetworks' distribution assets. This tool is used to identify, track and plan distribution related work. From a design perspective, Webmap provides the designer with a street view superimposed with electrical reticulation assets. For further details refer to the Asset Records documentation.

1.4 Acts, Regulations and Standards

1.4.1 Acts and Regulations

Designers must consider and comply with any relevant legal or statutory requirements, which may include the following:

- Electricity Supply Industry Act 1995
- Electricity Supply Industry (Tariff Customers) Regulations 2008
- Workplace Health and Safety Act 2012
- Workplace Health and Safety Regulations 2012;
- Occupational Licensing (Electrical Work) Regulations 2008
- Environmental Management and Pollution Control Act 1994
- Electricity Industry Safety and Administration Act 1997 and Regulations 1999
- Environmental Management and Pollution Control Act 1994
- Water Quality Management Act 1997
- Forest Practices Act 1985
- Historic Cultural Heritage Act 1995 and Aboriginal Relics Act 1975
- Land Use Planning and Approvals Act 1993
- Environment Protection and Biodiversity Conservation Act 1999
- Nature Conservation Act 2002
- Threatened Species Act 1995
- Weed Management Act 1999
- Crown Lands Act 1976
- National Parks and Reserves Management Act 2002
- Wellington Park Act 1999

Designers must comply with the Occupational Licencing Code of Practice 2013 (as amended or replaced), including compliance with:

- AS/NZS 1158 series – Lighting for Roads and Public Spaces
- AS/NZS 3000 – Wiring Rules

- AS/NZS 7000 – Overhead line design
- Any additional obligations imposed by AS/NZS 3000 and AS/NZS 1158 referring to further Australian Standards or documents, including any amendments or revisions of those Australian Standards or documents from time to time

The above information is a guide only. New designs must be compliant with all legislative requirements, relevant standards and guidelines.

1.4.2 Applicable Australian Standards and Guides

These standards/guides are common standards to be used by the designer for the purposes of distribution design work. These lists are not exhaustive, number references to standards within this document are for the benefit of the service provider. The current standards at the time of the project shall be used.

- AS/NZS 1798 – Streetlight Columns and Outreaches
- AS 4282 – Control of Obtrusive Effects of Outdoor Lighting
- AS/NZS 1170 – Structural Design Actions
- AS 3008 Electrical installations - Selection of cables
- ENA DOC EG-0 Power System Earthing Guide
- CASA Manual of Standards Part 139 – Aerodromes

1.4.3 TasNetworks Standards

- TasNetworks Service and Installation Rules
- TasNetworks Distribution Design Standard – Underground System
- TasNetworks Public Lighting Services Tariff Application and Price Guide
- NP R AG 05 General Drafting Requirements and Standards
- NP R ON 01 TasNetworks Label Standard
- Environment & Heritage Design and Construction Standard

2 Design Framework

Distribution designers need to consider various elements including key stakeholders, electrical utility planning, environmental constraints, relevant standards and guides and whole of life cycle management of the design.

2.1 Design Implementation

The design implementation for the electrical distribution network is an iterative process due to the number of input objectives often competing with one another. The design implementation seeks to achieve a sustainable electrical network, by optimal application of technology and ensuring quality of supply. These objectives are achieved by ensuring the electrical network asset life of approximately 40 years, cost efficient to both customer and TasNetworks and compliant with legislative requirements including alignment with existing industry guides and standards.

A public lighting design requires integration with other electrical components. It is therefore important to understand the design implications and the requirements of the associated Australian standards and the relevant TasNetworks standards.

Table 3 – TasNetworks standards and purpose

Documentation Title	Brief Description
Planning Strategy*	High Level strategy of TasNetworks Distribution Assets
Distribution system design Manual*	Detailed Design framework to meet the Planning strategy
Distribution Design Standard – Overhead*	Detailed Design framework for Overhead assets to meet the Design System strategy
Distribution Design Standard – Kiosk Substation	Detailed Design framework for Kiosk Substations assets to meet the Design System strategy
Distribution Design Standard – Underground System	Detailed Design framework for Underground assets to meet the Design System strategy
Distribution Design Standard – Public Lighting URD Subdivision	Detailed Design framework for Public Lighting assets to meet the Design System strategy
Distribution Design Standard – Building Substations*	Detailed Design framework for Building Substations assets to meet the Design System strategy
Distribution Construction Standard – URD	Detailed construction framework to meet the design requirements for Urban Residential Developments
Environment & Heritage Design and Construction Standard	Overarching environment and heritage requirements for infrastructure development

*Note: these documents are currently in development

2.2 Design Methodology

2.2.1 Assessment of lighting installation

Assessment of the lighting requirements for the new development is required to determine the applicable lighting category. This shall be calculated in accordance with AS/NZS 1158; in consultation with the local road owning authority and their planning standards.

If the lighting requirement is not known at the time of initial discussions, the basis for the lighting design shall be assessed by analysing the purpose, size and type of the development / subdivision / location of the installation. Figure 2.1 of AS/NZS 1158.3.1:2005 provides an example reference.

2.2.2 Site Conditions

2.2.2.1 General

The designer shall ensure site visits are undertaken to understand the onsite elements present for the lighting design, cable routes and column foundations. The minimum elements the designer shall consider as part of the overall lighting installation design have been summarised below:

- Accessibility – for installation and future maintenance.
- The cable route selection must reduce sharp bends where practicable with respect to cable bending radius requirements.
- Cable joints – There shall be no joints in LV cables. All LV cables to be terminated in turrets/cabinets and columns as required.
- Cable lengths – shortest route to be chosen between turrets/cabinets and columns
- Surface layer – soil, road crossing, concrete cover, etc.
- Underground layer – potholing sampling to assess soil/rock for excavation requirements
- Column location and footing types
- LV reticulation (i.e. location of turrets/cabinets)
- Existing lighting infrastructure – new installation to interface with existing as required

2.2.2.2 Environmental conditions

Public lighting reticulation systems in URD subdivisions are developed in conjunction with the main LV UG electrical supply system. All on site environmental considerations therefore shall be considered as a prerequisite to the initial overall underground reticulation design investigation.

The following points shall be considered, however the TasNetworks Distribution Design Standard – Underground System and Environment & Heritage Design and Construction Standard shall be referenced for full environmental requirements:

- Aboriginal and European cultural values
- Presence of threatened species, habitat and or communities
- Potential for run-off to impact waterways and wetlands
- DBYD – detailed review and identification of other utility infrastructure to ensure the minimum clearances from other amenities (gas, water and communication reticulation)
- Ground conditions – slope, flooding level, soil structure and wind extremes

- Safety from inadvertent damage by vehicles or other commercial or industrial work processes in the vicinity.
- Hazardous locations as specified in AS/NZS 3000

2.2.3 Concept Selection of Equipment

2.2.3.1 Types and number of luminaires and columns

The designer shall determine the type and number of luminaires and columns based on the following factors:

- Compliance with AS/NZS standards for the lighting design and hardware suitability
- Local road owning authority requirements
- TasNetworks' Approved Product List
- Aesthetically suitable to the location – Hardware to visually complement its location during daytime and appropriately light the location without glare and nuisance spill light at night.

2.2.3.2 Street furnishing

The designer shall consider the turret/cabinet and column locations for the design and layout of the lighting reticulation circuits.

2.2.4 Safety in Design

Changes to the Work Health and Safety Act 2012 have placed an onus on individuals, contractors and employees to exercise due diligence in assessing design work. The elements to consider under the revised Act are summarised below:

- Early identification of hazards and assessment of risks to the construction personnel and general public in the design process, construction phase, operating and maintenance phase and the decommissioning and demolition phase.
- Elimination of identified risks as so far as reasonably practicable or the minimisation of these risks throughout the entire lifecycle of the structure and associated parts.
- Notification and communication of the assessment outcomes through formal documentation.

The safety in design process integrates the above elements into an industry recognised framework, with the focus on early identification of risk. This yields an easier and cheaper outcome to the design rather than making changes when the hazards become real risks. The designer shall complete a safety in design report for each new design, where the safety in design content detail shall be proportional to the complexity of the design.

2.2.5 Lighting Design

The AS/NZS 1158 clearly states that it is the responsibility of the road controlling authority to nominate whether to install a road lighting scheme in compliance with this Standard, and which subcategory of lighting is appropriate.

At the completion of a Public Lighting design, documentation demonstrating compliance of the design with the AS/NZS 1158 Standard shall be supplied by the designer.
This documentation clearly advises the requesting authority if the finished design is compliant or not to the AS/NZS 1158 standard. - Refer AS/NZS 1158.3.1:2005 Appendix E.

2.2.6 Electrical Design

The public lighting infrastructure covered in this standard is supplied from the UG LV reticulation system. The designer shall incorporate the design in both drawing and reporting form where applicable and shall be compliant to AS/NZS 3000 and the relevant requirements of the TasNetworks Distribution Design Standard – Underground System.

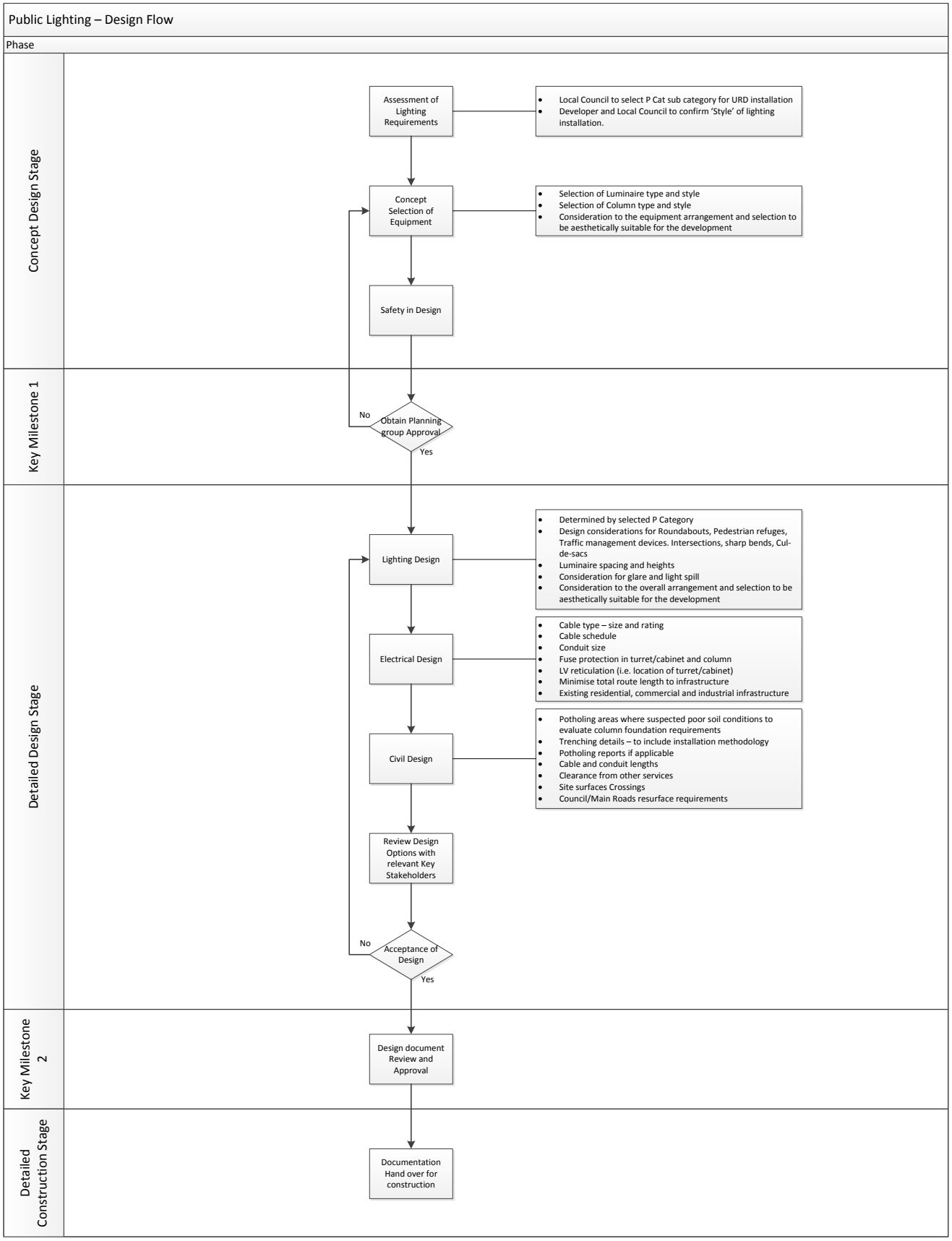
Electrical considerations:

- Confirm cable size and rating - configuration in trench and column
- Confirm conduit and sweep bend size
- Confirm voltage drop acceptability
- Confirm cable schedule
- Confirm minimum clearances to other underground services in accordance with AS/NZS 3000 and TasNetworks standard design

2.2.7 Civil Design

- Confirm cable route
- Confirm trenching details – to include cable configuration, trench material, mechanical protection, compliant with AS/NZS 3000 and TasNetworks standard design
- Complete potholing (if applicable)
- Reinstating of the surface should be completed to the original form as applicable
- Develop detailed electrical design drawings and documentation

2.3 Design Methodology Process Flow



2.4 Detailed Design Requirements

2.4.1 Lighting Design

Public lighting categories are to be selected from the AS/NZS 1158 series and in consultation with the local road owning authority.

Category P lighting is applicable to URD subdivisions, minor local roadways, pedestrian pathways, cycle ways, car parks, outdoor shopping precincts, malls, town squares, transport interchanges, subways, footbridges, ramps and stairways where lighting for pedestrians is the main consideration. These lighting parameters are applicable across the whole road reserve, from property boundary to property boundary.

Within Category P there are twelve subcategories:

- Cat P1 to P5 – Road reserves in local areas, e.g. collector or non-arterial roads, local residential streets, common areas or forecourts in cluster housing all of which have characteristics of mixed vehicle and pedestrian traffic.

  This Category also applies to areas for pedestrian and cycle traffic only - footpaths, walkways, cycle paths and park paths.

- Cat P6 to P8 covers areas for public activity in cities, towns, suburban centres, outdoor malls, arcades, transport terminals and interchanges.

- Cat P9 and P10 applies to steps, stairways, ramps, footbridges, subways and pedestrian ways.

- Cat P11 and P12 covers outdoor car parks including roof top car parking spaces.

Further information shall be sourced from AS/NZS 1158.3.1:2005 Section 2.4.

Once the appropriate P Category, luminaires and columns have been selected, the lighting design can be produced using the parameters from the AS/NZS 1158 series.

Adherence to these design considerations will ensure that the overall lighting arrangement is fit for purpose and aesthetically suitable for the URD development.

Specific design considerations shall be given to the following:

- Intersections
- Sharp bends
- Spacings
- P Category roads intersecting V category roads
- Cul-de-sacs
- Traffic management devices

Information shall be sourced from AS/NZS 1158.3.1:2005 Section 3.2.

Other factors that the lighting designer needs to take into consideration include:

- Special requirements or regulatory issues, e.g. Use of Aeroscreen luminaires, potential glare issues to abutting developments
- Clearances from existing poles, traffic columns or overhead power lines, trees or other obstructions

- Position of bus stops and other areas of high pedestrian activity where it is desirable to have higher levels of illumination
- Positions of crests and dips
- Posted road speed limits
- Position of guard rails
- Height of ground at column positions (with appropriate setback) relative to road surface
- Access to light fittings for maintenance
- Locations where there is a high probability of damage by errant vehicles and also clearances from driveways
- Type of road surfaces
- Ease of providing supply to location
- Proximity to other utility's underground services
- Aesthetics of the installation in context with the surrounding development
- Glare and light spill
- Precise positions of kerbs and edges of bitumen in relation to the
- Positions of channelisation and other conflict points
- Positions of driveways
- Precise details of existing lighting
- Position of traffic signals
- Position of trees

2.4.1.1 Selection of Luminaires

The luminaires shall be selected in consultation with the local authority and must be from the TasNetworks' Approved Products List.

Refer to Luminaire Drawings PL-301 to PL-309

The TasNetworks arrangement is to NOT install the luminaire at the same time as the column. The installation of the luminaire and the wiring from the luminaire to the column fuse panel is completed when the local council give notification and therefore NOT required in this scope.

2.4.1.2 Selection of Columns

Columns for URD subdivisions shall be selected in consultation with the local authority.

A range of standard and decorative columns are available for use from the approved TasNetworks' Approved Products List. Other decorative columns will be considered upon application to TasNetworks.

Decorative columns intended for URD subdivisions for Category P installations to AS1158 are preferred to be direct buried however flange mounted options will be considered.

Consult manufacturer for decorative column colour options.

Refer to Column Drawings PL-325, PL-326, PL-339 and PL-340.

TasNetworks' requires asset ID numbers or unique identifiers to be assigned to all public light columns. Designers shall contact TasNetworks when the number of new columns has been ascertained to obtain ID numbers for inclusion on the final design plans.

2.4.1.3 Photometric Information

Technical specifications, Photometric data and CIE or IES files for TasNetworks' standard range of luminaires can be obtained from the manufacturer.

Designs shall take account of the typical degradation of both lamp and luminaire under the normal maintenance regime as specified in AS/NZS 1158.

To maintain the light output levels of public lighting luminaires to the standards as set out by AS/NZ 1158; TasNetworks has a Bulk Lamp Replacement Program conducted on a four (4) year cycle that includes replacement of the lamp, cleaning of the diffuser and replacement of the PE cell every 8 years. For LED luminaires the program cycle is conducted every ten (10) years.

TasNetworks uses a Maintenance Factor (MF) value of 0.7 for all Cat P & V lighting calculations.

2.4.2 Electrical Design

The designer shall incorporate the design in both drawing and reporting form where applicable and shall include the electrical elements listed in the following sections.

2.4.2.1 Cable selection

Cables shall be selected according to circuit loading characteristics, route length and from the TasNetworks' Approved Products List.

Two sizes of cabling are used - from the turret/cabinet to column and from the column panel within the column to the luminaire.

All cabling installed in street lighting columns to supply luminaires shall be double insulated PVC/PVC circular.

Underground cabling from the supply point to each column is to be two core and earth double insulated orange circular.

The following cables are TasNetworks standard range for URD Subdivision lighting reticulation:

- 2.5mm², 0.6/1 kV, 7/0.67 mm, 2 Core+ Earth, Copper, PVC/PVC, Orange Circular
- 10mm², 0.6/1 kV, 7/1.35 mm, 2 Core+ Earth, Copper, PVC/PVC, Orange Circular

Designers should recognize that actual cable lengths will be slightly longer than lengths measured off plans due to vertical lengths at terminations, e.g. 1.5m to turn up into a turret/cabinet and column fuse panel. Consider also non-horizontal ground or steep slopes where the true length is greater than the horizontal plan length.

Refer to Electrical Drawing PL-351

2.4.2.2 Protection

A dedicated fuse shall be installed at the supply point (turret/cabinet) to protect the public light cable and a dedicated fuse shall be installed in the column (fuse panel) for the luminaire supply.

The current HRC fusing arrangements for public lighting on the underground system are:

- A fuse base unit mounted in the turret/cabinet – 32A HRC Fuse Holder with a 10A Fuse link
- A fuse base unit mounted in the column – 32A HRC Fuse Holder with a 6A fuse link

Refer to Electrical Drawing PL-613

2.4.2.3 Conduits

All cabling installed underground for public lighting reticulation shall be enclosed in 50mm Heavy Duty (HD) PVC conduit. No cable shall be directly buried.

90 degrees HD conduit large radius sweep bends shall be used on conduit risers at turrets/cabinets and columns.

Polymeric covers are not required over conduits used for public lighting reticulation unless the designer believes that this additional mechanical protection is required.

Electrical warning PVC marker tape shall be installed above all conduits used for public lighting reticulation as a visual indication to alert anyone excavating to the presence of cables below.

Refer to Civil Drawing PL-622

2.4.2.4 Calculation of voltage drop and fault loop impedance

Voltage drop and fault loop impedance calculations are not usually required in an URD subdivision as the length of cable runs are relatively short. Voltage drop and fault loop impedance calculations are more applicable to installations along roadways involving multiple luminaires on the one circuit.

For any voltage drop calculations, the software program, LV Drop must be used and the output calculation files supplied to TasNetworks.

2.4.2.5 Earthing

All lighting installations shall be earthed from the point of supply (turret/cabinet). Refer to the TasNetworks Distribution Design Standard – Underground System.

The public light column earth stud shall be the connection point for the earth conductor from the supply point and the earth conductor from the luminaire.

The electrical panel in public lighting column shall not have a MEN connection point.

Refer to Electrical Drawing PL-616

2.4.3 Underground Design

The underground reticulation of public lighting requires integration with the LV UG distribution system. For information regarding the requirements for LV underground reticulation systems, refer to TasNetworks Distribution Design Standard – Underground System.

2.4.4 Civil Design

The designer shall incorporate the design in both drawing and reporting form where applicable and shall include the following elements listed below:

- Confirm cable route. See Section 2.4.4.2
- Confirm conduit schedule
- Confirm minimum clearances to other underground services in accordance with AS/NZS 3000 and TasNetworks standard design. See Section 2.4.4.1
- Confirm trenching details – to include conduit configuration sweep bend radius, trench backfill material, mechanical protection (where installed) and labelling location compliant with AS/NZS 3000, AS 2067 and TasNetworks Distribution Design Standard – Underground System.

- Reinstating of the surface should be completed to the original form as applicable
- Confirm foundation types for columns
- Develop civil design drawings and documentation – refer to TasNetworks Distribution Design Standard – Underground System.

2.4.4.1 Clearances to other underground services

Trenches containing underground public light conduits may be shared with telecommunications cables, gas pipes, water pipes, traffic signalling, private power/light reticulation or other services as a cost saving measure.

Public lighting conduits installed below ground require separation from other services to minimise disturbance during installation and for mechanical protection.

The following spacing between public light conduits and other utility services needs to be maintained:

- 60mm from communication and private reticulation
- 450mm horizontally from Water mains
- 300mm horizontally from Gas mains

There shall also be definite horizontal clearances between services so that the shallower services do not block access to those buried deeper.

Refer to Civil Drawing PL-622

2.4.4.2 Cable Routes

The designer shall undertake site visits to assess the local conditions for the purpose of route selection for the public lighting conduits.

The minimum requirements the designer shall consider for the route selection are as follows:

- Accessibility – All cabling must be wholly within road reserves or public spaces or in the easement to be provided.
- The cable route selection shall aim to reduce sharp bends.
- There shall be no joints in LV cables.
- All LV cables shall be terminated in turrets/cabinets and column fuse panels.
- Surface layer to be assessed for excavation and reinstatement – soil, road crossing, concrete, etc.
- Underground layer to be assessed for ease of excavation – potholing along the route as required confirming full trench depth is achievable.
- Install conduits along the most direct route between the turret/cabinet and column.
- Conduits shall cross under footpaths and roads at right angles where possible so that the reinstatement and length of cable is minimal. This also applies when under boring.

2.4.4.3 Location and Placement of Underground Cabling

Conduit shall be installed in the correct allocation corridor as per the Urban Roads Typical Service Locations Standard Drawing (TSD-G02.v1) – contained in PL-345.

Minimise the conduit lengths by utilising the closest supply point (turret/cabinet).

Conduits to be installed at correct depth and clearance from other utility services.

Refer Civil Drawing PL-345

2.4.4.4 Location of Columns

The site selection for the optimum column location requires an assessment of various components, such as but not limited to:

- Lighting design requirements. Refer Section 2.4.1.
- Dial Before You Dig to check clearances from other utility services (gas, water and communication reticulation)
- Aesthetics – ideally the placement of the columns should be between property boundaries. This is to minimise the visual impact of a column along the front of the property. This will not always be an option as the light spacing design may not allow for this desired layout.
- Orientation – column outreaches should be positioned at right angles to the kerb unless otherwise stated by the designer.
- Access and Operational clearances - column shall be fully accessible for foundation testing and fuse panel to face away from road for safe access.
- Ground conditions – slope, soil structure and wind extremes.
- Columns shall not be installed near drive ways where there is a high risk of vehicle impact or in locations that impede driver visibility.

Local authorities may also place other restrictions on column locations, e.g. clearances from footpaths, cycle ways and maintaining certain distances between other street furniture and trees.

Avoid placing columns/luminaires:

- Where the column is likely to be struck by an errant vehicle, specifically at roundabout exits or on the outside of tight curves.
- Too close to road edges, especially on the inside of corners, within range of overhanging truck bodies.
- At the bottom of gullies where the light will not disperse well.
- Where obscured by trees.
- Where LV supply is difficult to obtain.
- Where they are likely to initiate glare complaints from residents.

2.4.4.5 Clearances to overhead power lines

Where public lighting infrustructure is installed close to or is attached to poles that support LV/HV conductors, adequate clearence shall be allowed to conductors for initial installation and safe access for future maintenance.

The clearances contained in construction drawing PL-625 shall apply when the conductors are at maximum operating temperatures and full blowout due to wind

Public light control circuits shall also to be regarded as 'live' low voltage, as they can be energised at any time. Were the minimum clearence of 600mm cannot be achieved to a bracket, the control circuit is to be either relocated, effectively sleeved or replaced with a section of insulated conductor.

2.4.4.6 Determination of Column Foundations

The main consideration for column foundations is the soil quality they will be installed into. If the soil type is poor (e.g. poorly drained clay or sand), this will impact on the size of the excavation and the configuration of the foundation. Foundation type and arrangement shall be to TasNetworks specifications.

Refer to Civil Drawings PL-605 and PL-606

2.4.4.7 Environmental conditions

Some environmental aspects that will need to be considered by the designer for any underground site work.

- Is suitable space available to store excavated soil onsite – if not, it may need to be transported for offsite storage.
- Control of excavated soil against erosion or runoff in the event of rain.
- Whether acid sulphate soils exist and its neutralisation when excavated. E.g. when exposed to air after being disturbed, soils containing iron sulphides produce sulphuric acid and often release toxic quantities of iron, aluminium and heavy metals.
- Dust and noise control.
- Disposal of waste, including unusable excavated spoil.
- Cleaning of paved surfaces.
- Reinstatement of pavements, grassed areas and vegetation.
- Protection of native flora and fauna.

2.5 Design Deliverables

The designer shall ensure the following documents are delivered as a minimum:

- TasNetworks – Contractor Work Order or equivalent project scope
- TasNetworks – Public Lighting Ordering Guide completed
- TasNetworks – Order confirmation of supporting equipment or equivalent
- Drawings:
    - Proposed Site & Location Plan
    - Project drawing with luminaire and column schedule, column foundations, cable trench sections and conduit routes from turrets/cabinets to columns (this may be included on the main underground project drawing)
    - Instructions on fuse sizes in turrets/cabinets and columns.
    - Dial Before You Dig asset information
- Detailed documents/reports:
    - Design lighting calculations and/or the lighting design software file. Preferred software file output is Perfect Lite for Windows or AGI32.
    - LV Drop voltage calculation files (if necessary)
    - Safety in Design report
    - Lighting design specifications (lighting category type, spacing calculations)
    - Lighting compliance certification (see Section 2.2.5)
    - Communication references such as emails and letters
    - Environment and Heritage Site Assessment documentation (refer to Environment & Heritage Design and Construction Standard)

The designer shall ensure the design deliverables are legible and submitted in electronic form to comply with TasNetworks' Drafting Standard.

2.6 Design Compliance Sign Off

Key Milestones	Document Title	Document Reference	Additional Comments
Stakeholder compliance endorsement sign off (e.g., TasNetworks, Local Government Authorities, Customer etc.)			
AS/NZS 1158 compliance certificate			

Design component	TasNetworks relevant Standards Clause	Australian Standards/Guide referenced	Drawing/Report reference	Completed/ Actioned Yes/No/NA	Additional Comments
New Asset considerations	1.7				
Safety in Design	2.2.4				
Cable Selection	2.4.2.1				
Cable route	2.4.4.2				
Electrical Design	2.2.6				
Civil Design	2.2.7				
Detailed Electrical Design review/approval					
Detailed Civil Design review/approval					
Documentation hand over for construction					

3 Public Lighting Design Drawings

3.1 Luminaires

PL - 301	Urban ECO & HID Series
PL - 302	Suburban ECO & HID Series
PL - 303	StreetLED
PL - 304	B2001 Series
PL - 305	Bourke Hill LED
PL - 306	Kensington Heritage LED
PL - 307	Roadster Series
PL - 308	Paleo 440 Series
PL - 309	Sylflood

3.2 Lamps

PL - 315	Mercury Vapour
PL - 316	Sodium Vapour - Elliptical
PL - 317	Sodium Vapour - Tubular
PL - 318	Metal Halide
PL - 319	Fluorescent

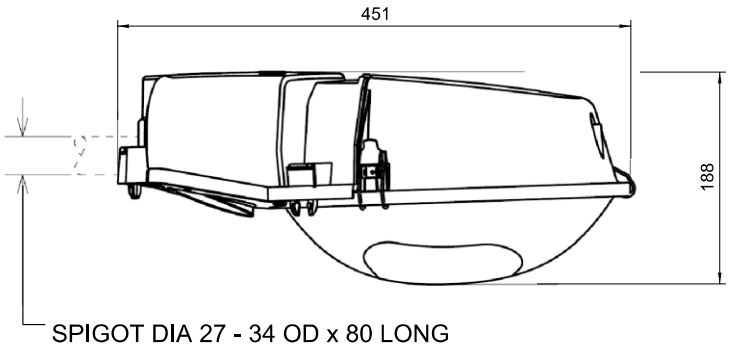
3.3 Columns

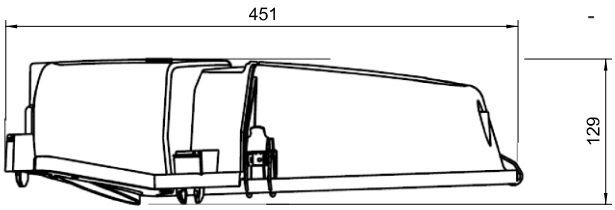
PL - 325	7.0m BD Rigid 0.6m O/R
PL - 326	7.5m BD Rigid 2m O/R
PL - 339	Decorative (for top & side entry luminaires)
PL - 340	Decorative (for bottom entry luminaires)

3.4 Civil and Electrical

PL - 345	Road Reserve Alignments and Allocations
PL - 351	Cable Types and Notes

CAUTION : Printed document is uncontrolled.





AEROSCREEN VERSION

S.I. No	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161481	JA97C03 - SYLVANIA	URBAN ECO AEROSCREEN	42W CFL, D2 PE CELL, AEROSCREEN
161440	JA41C01 - SYLVANIA	URBAN AEROSCREEN	70W HPS, D2 PE CELL, AEROSCREEN
161477	JA47C01 - SYLVANIA	URBAN HID	100W HPS, D2 PE CELL
161495	JA19C01 - SYLVANIA	URBAN HID AEROSCREEN	100W MH, D2 PE CELL, AEROSCREEN
161482	JA47C02 - SYLVANIA	URBAN AEROSCREEN	100W HPS, D2 PE CELL, AEROSCREEN

ALTERATIONS

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CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

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TITLE

PUBLIC LIGHTING
LUMINAIRES
URBAN ECO & HID SERIES

SCALES: NTS

SIZE: A4

PL-301

REVISION: A

23/11/2015

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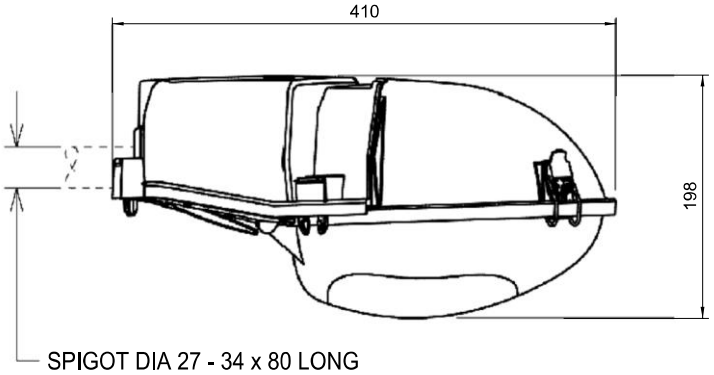

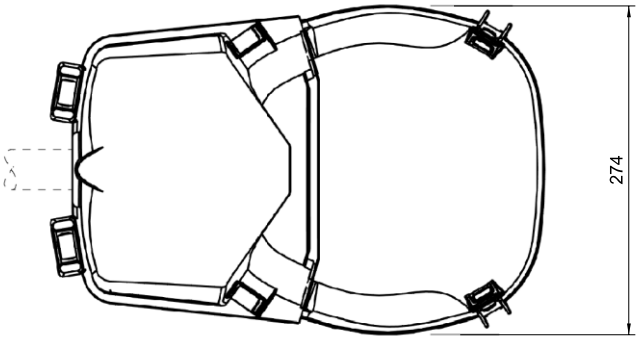

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161488	JS97C01 - SYLVANIA	SUBURBAN ECO	42W CFL, D2 PE CELL
161494	JS41C03 - SYLVANIA	SUBURBAN HID	70W HPS, D2 PE CELL
161410	JS19C01 - SYLVANIA	SUBURBAN HID	100W MH, D2 PE CELL

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TITLE

PUBLIC LIGHTING
LUMINAIRES
SUBURBAN ECO & HID SERIES

SCALES: NTS

SIZE: A4

PL-302

REVISION: A

24/11/2015

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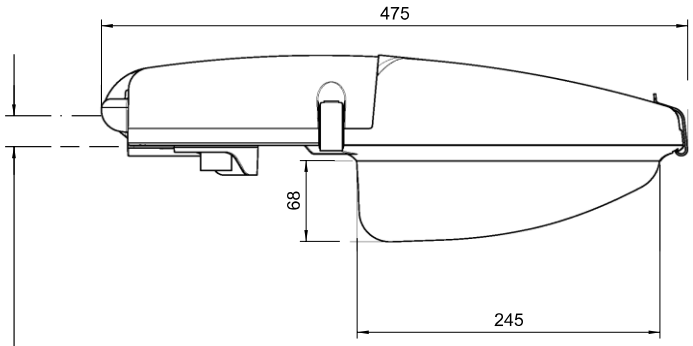
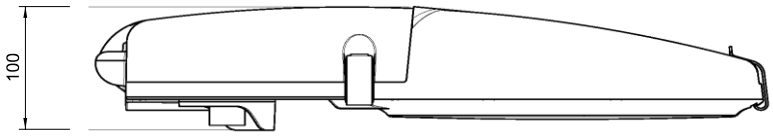


SPIGOT SIZE DIA 27 - 34 x 80 LONG



AEROSCREEN VERSION

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161499	JLA99C01L22 - SYLVANIA	STREETLED	18W LED, D2 PE CELL
161478	JLA99C11L22 - SYLVANIA	STREETLED AEROSCREEN	18W LED, D2 PE CELL, AEROSCREEN

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TITLE
PUBLIC LIGHTING
LUMINAIRES
STREETLED

SCALES: NTS

SIZE: A4

PL-303

REVISION: A

25/11/2015

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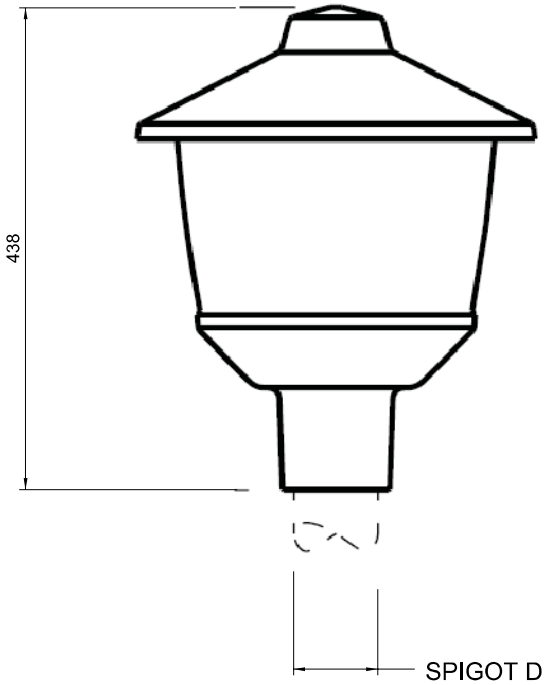

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161493	D97C01 - SYLVANIA	B2001	42W CFL, D2 PE CELL

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TITLE
PUBLIC LIGHTING
LUMINAIRES
B2001 SERIES

SCALES: NTS

SIZE: A4

PL-304

REVISION: A

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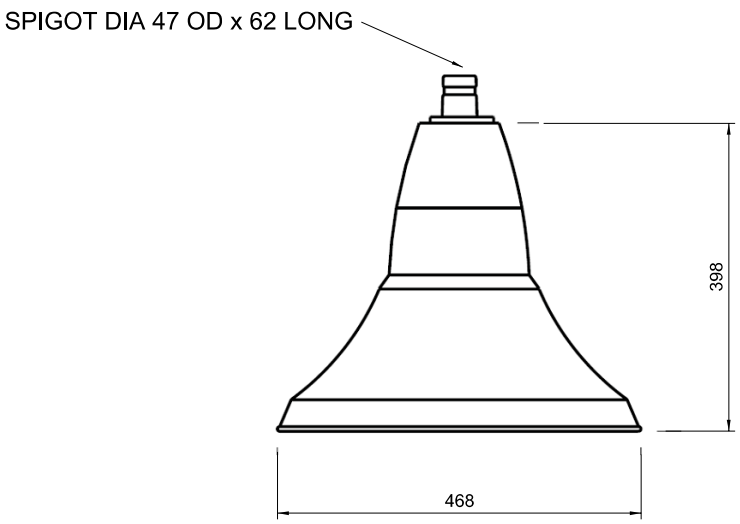

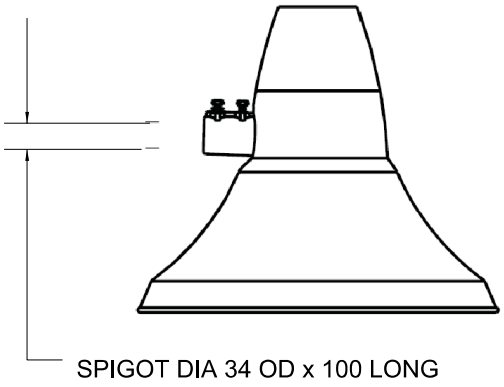

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161456	NB99C01L22 - SYLVANIA	BOURKE HILL LED	18W LED, D2 PE CELL, TOP ENTRY
161454	NA99C01L22 - SYLVANIA	BOURKE HILL LED	18W LED, D2 PE CELL, SIDE ENTRY

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TITLE
PUBLIC LIGHTING
LUMINAIRES
BOURKE HILL LED

SCALES: NTS

SIZE: A4

PL-305

REVISION: A

25/11/2015

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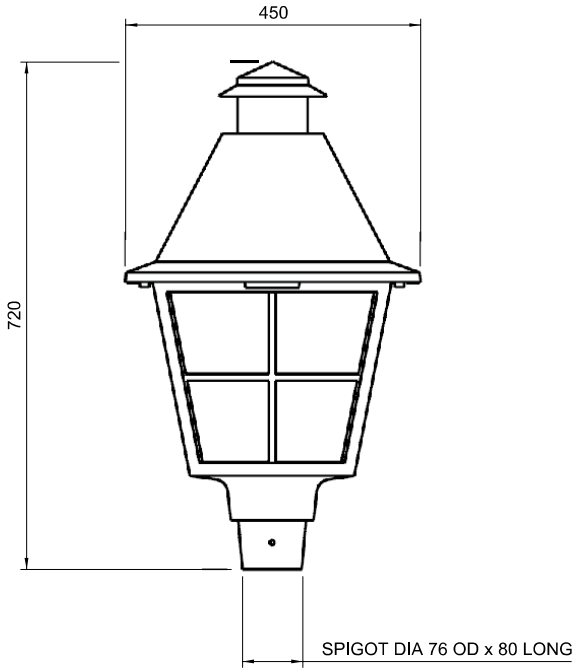

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161455	LM99C01L22 - SYLVANIA	KENSINGTON HERITAGE	18W LED, D2 PE CELL

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TITLE

PUBLIC LIGHTING
LUMINAIRES
KENSINGTON HERITAGE LED

SCALES: NTS

SIZE: A4

PL-306

REVISION: A

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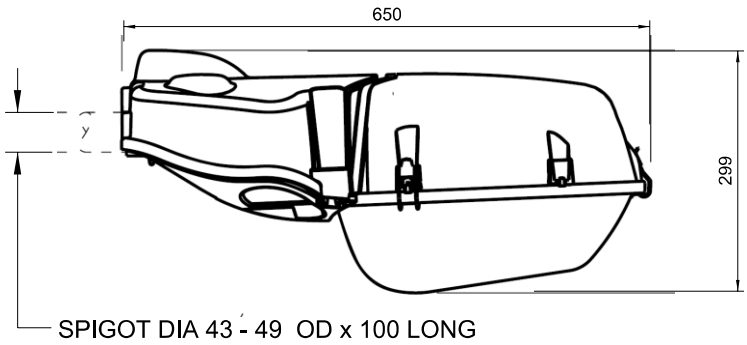

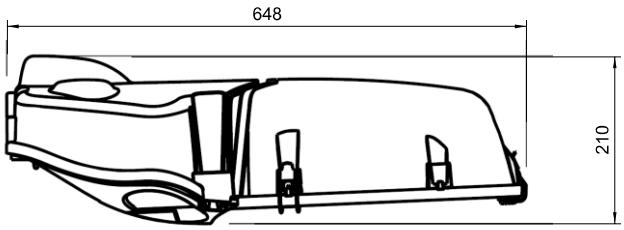

AEROSCREEN VERSION

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161411	PR42C05 - SYLVANIA	ROADSTER	150W MH, NEMA PE CELL
161412	PR43C05 - SYLVANIA	ROADSTER	250W MH, NEMA PE CELL
161496	PR42C06 - SYLVANIA	ROADSTER AEROSCREEN	150W MH, NEMA PE CELL, AEROSCREEN
161497	PR43C06 - SYLVANIA	ROADSTER AEROSCREEN	250W MH, NEMA PE CELL, AEROSCREEN
161414	PR44C06 - SYLVANIA	ROADSTER AEROSCREEN	400W MH, NEMA PE CELL, AEROSCREEN
161470	PR42C03 - SYLVANIA	ROADSTER	150W HPS, NEMA PE CELL
161473	PR43C03 - SYLVANIA	ROADSTER	250W HPS, NEMA PE CELL
161474	PR44C03 - SYLVANIA	ROADSTER	400W HPS, NEMA PE CELL
161483	PR42C04 - SYLVANIA	ROADSTER AEROSCREEN	150W HPS, NEMA PE CELL, AEROSCREEN
161484	PR43C04 - SYLVANIA	ROADSTER AEROSCREEN	250W HPS, NEMA PE CELL, AEROSCREEN
161485	PR44C04 - SYLVANIA	ROADSTER AEROSCREEN	400W HPS, NEMA PE CELL, AEROSCREEN

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APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE

PUBLIC LIGHTING
LUMINAIRES
ROADSTER SERIES

SCALES: NTS

SIZE: A4

PL-307

REVISION: A

1/1/2015

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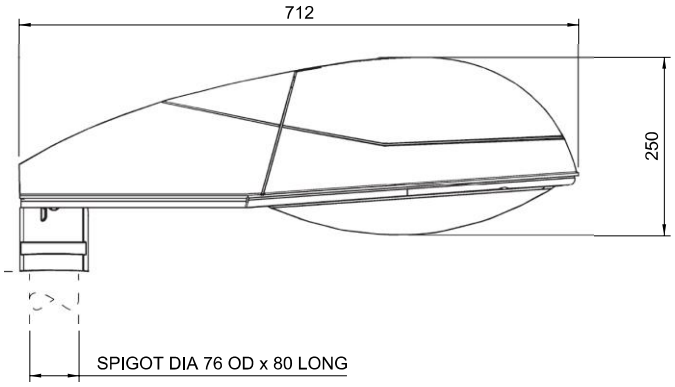

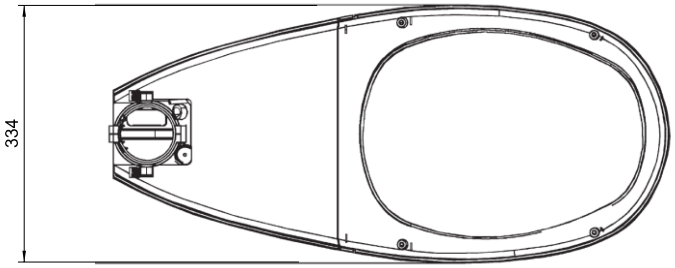

NOTES
1. THE SPIGOT ROTATES 90° FOR SIDE ENTRY MOUNTING.
2. AN INSERT SPIGOT SLEEVE IS REQUIRED FOR 43 - 49mm DIA OD OUTREACHES.

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161413	EP44C05 - SYLVANIA	PALEO	400W MH, NEMA PE CELL

ALTERATIONS

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TITLE
PUBLIC LIGHTING
LUMINAIRES
PALEO 440 SERIES

SCALES: NTS

SIZE: A4

PL-308

REVISION: A

1/12/2015

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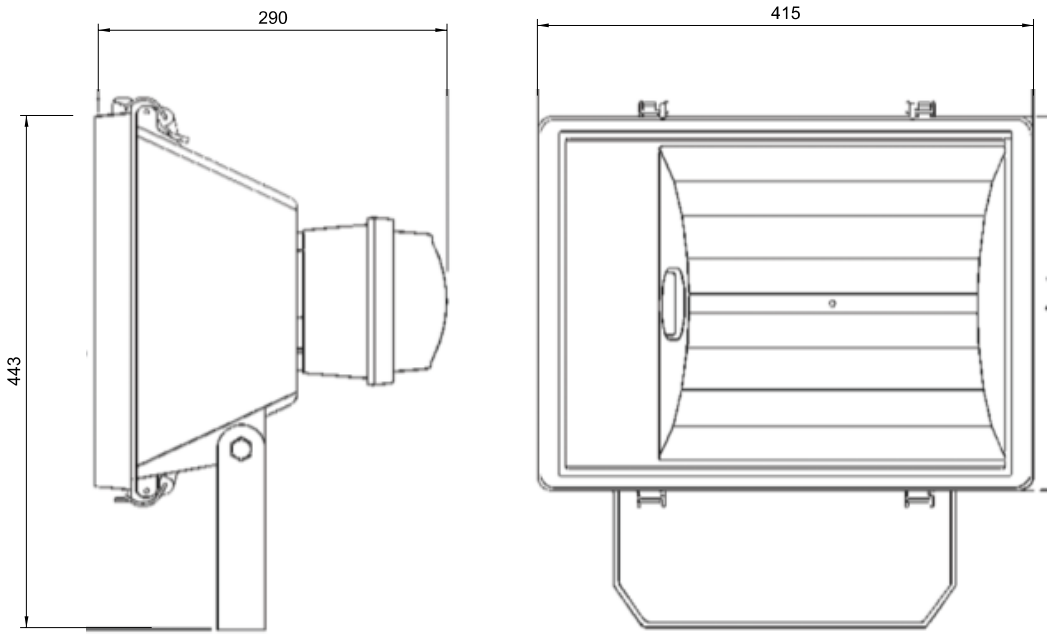

S.I. NO	MANUFACTURER CODE	LUMINAIRE	DESCRIPTION
161310	XR43C02 - SYLVANIA	SYLFLOOD	250W HPS, NEMA PE CELL
161341	XR44C02 - SYLVANIA	SYLFLOOD	400W HPS, NEMA PE CELL
161350	XR43C01 - SYLVANIA	SYLFLOOD	250W MH, NEMA PE CELL
161351	XR44C01 - SYLVANIA	SYLFLOOD	400W MH, NEMA PE CELL

ALTERATIONS

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APPROVED	DARRYL MUNRO
DATE	10/02/2016

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TITLE
PUBLIC LIGHTING
LUMINAIRES
SYLFLOOD

SCALES: NTS

SIZE: A4

PL-309

REVISION: A

1/12/2015

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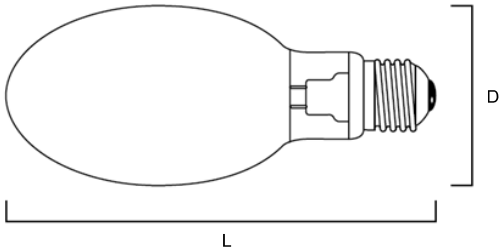
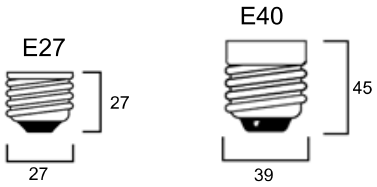
HSL-BW



HSL-BW	50W	80W	125W	250W	400W
L	130	166	178	228	292
D	56	71	76	91	122



S.I. NO	MANUFACTURER CODE	LAMP WATTAGE	DESCRIPTION
159733	645001 - SYLVANIA	50W	HSL-BW, ELLIPTICAL, COATED, E27
159731	645002 - SYLVANIA	80W	HSL-BW, ELLIPTICAL, COATED, E27
159734	654610 - SYLVANIA	125W	HSL-BW, ELLIPTICAL, COATED, E27
159735	645003 - SYLVANIA	250W	HSL-BW, ELLIPTICAL, COATED, E40
159737	654822 - SYLVANIA	400W	HSL-BW, ELLIPTICAL, COATED, E40

ALTERATIONS

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DRAWN	ACUTEL
CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE
PUBLIC LIGHTING
LAMPS
MERCURY VAPOUR

SCALES
NTS

SIZE
A4

PL-315

REVISION
A

30/11/2015

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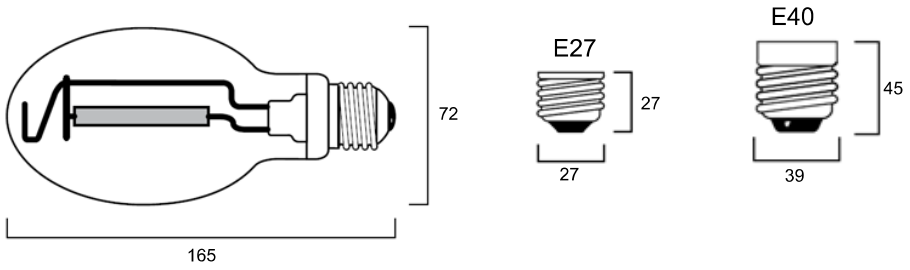
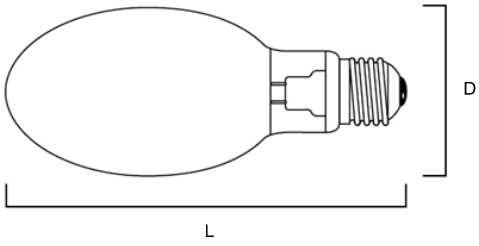
SHP



SHP-S



SHP-S	100W	150W	250W
L	186	227	227
D	78	91	91

S.I. NO	MANUFACTURER CODE	LAMP WATTAGE	DESCRIPTION
160601	673250 - SYLVANIA	70W	SHP, ELLIPTICAL, COATED, E27, IGNITOR
160617	206920X - SYLVANIA	100W	SHP-S, ELLIPTICAL, COATED, E40
160602	673150X - SYLVANIA	150W	SHP-S, ELLIPTICAL, COATED, E40
160604	672070 - SYLVANIA	250W	SHP-S, ELLIPTICAL, COATED, E40

ALTERATIONS

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APPROVED	DARRYL MUNRO
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TITLE

PUBLIC LIGHTING
LAMPS
HIGH PRESSURE SODIUM - ELLIPTICAL

SCALES: NTS

SIZE: A4

PL-316

REVISION: A

30/11/2015

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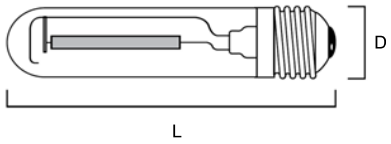
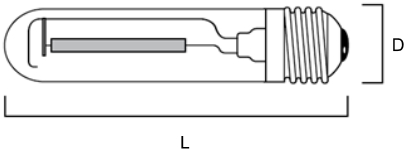
SHP-T



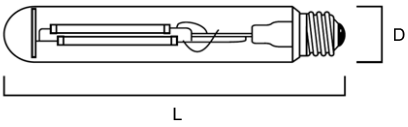
SHP-T	70W	400W
L	156	292
D	39	48

SHP-TS

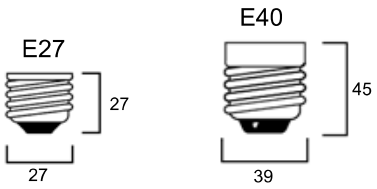


SHP-TS	100W	150W	250W
L	211	211	260
D	48	48	48

SHP-T TwinArc



SHP-T	150W	250W	400W
L	211	260	280
D	48	48	48



S.I. NO	MANUFACTURER CODE	LAMP WATTAGE	DESCRIPTION
160620	673340 - SYLVANIA	70W	SHP-T, TUBULAR, CLEAR, E27
160608	672040 - SYLVANIA	400W	SHP-T, TUBULAR, CLEAR, E40
160612	673148 - SYLVANIA	100W	SHP-TS, TUBULAR, CLEAR, E40
160611	673140X - SYLVANIA	150W	SHP-TS, TUBULAR, CLEAR, E40
160605	672060X - SYLVANIA	250W	SHP-TS, TUBULAR, CLEAR, E40
160621	673135 - SYLVANIA	150W	SHP-T, TWINARC, TUBULAR, CLEAR, E40
160622	673138 - SYLVANIA	250W	SHP-T, TWINARC, TUBULAR, CLEAR, E40
160623	672035 - SYLVANIA	400W	SHP-T, TWINARC, TUBULAR, CLEAR, E40

ALTERATIONS

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APPROVED	DARRYL MUNRO
DATE	10/02/2016

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TITLE

PUBLIC LIGHTING
LAMPS
HIGH PRESSURE SODIUM - TUBULAR

SCALES: NTS

SIZE: A4

PL-317

REVISION: A

30/11/2015

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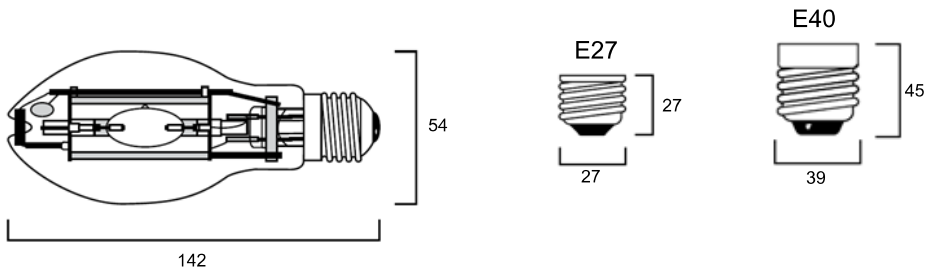
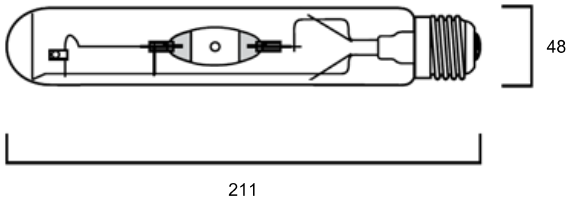
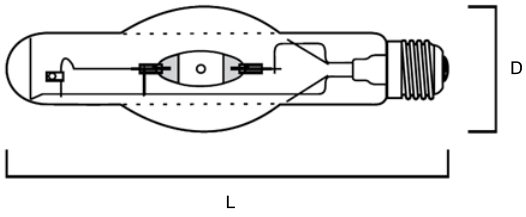
HSI-MP



CMI-TT



HSI-TSX



HSI-TSX	250W	400W
L	260	270
D	48	63

S.I. NO	MANUFACTURER CODE	LAMP WATTAGE	DESCRIPTION
160651	208230 - SYLVANIA	100W	HSI-MP, ELLIPTICAL, COATED, E27
160652	203367SB - SYLVANIA	150W	CMI-TT, TUBULAR, CLEAR, E40
160653	244070 - SYLVANIA	250W	HSI-TSX, TUBULAR, CLEAR, E40
160654	244090 - SYLVANIA	400W	HSI-TSX, TUBULAR, CLEAR, E40

ALTERATIONS

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APPROVED	DARRYL MUNRO
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TITLE
PUBLIC LIGHTING
LAMPS
METAL HALIDE

SCALES: NTS

SIZE: A4

PL-318

REVISION: A

30/11/2015

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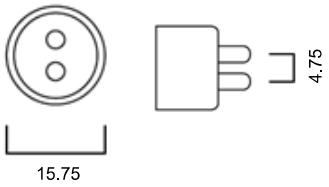
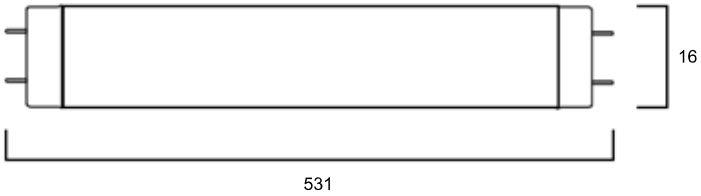
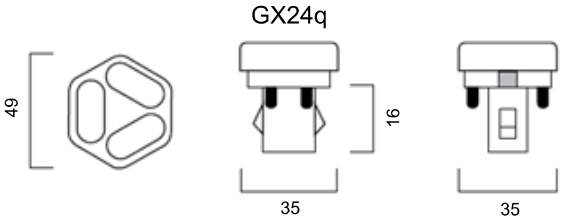
G5

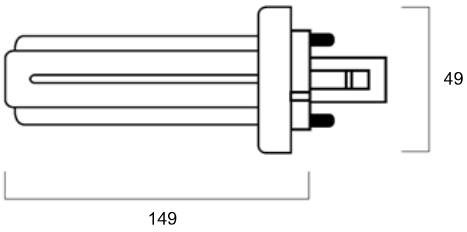




TUBULAR

GX24q





COMPACT

S.I. NO	MANUFACTURER CODE	LAMP WATTAGE	DESCRIPTION
160767	200773 - SYLVANIA	24W	TUBULAR, COATED, T5, 24W
160768	278450LL - SYLVANIA	42W	COMPACT, COATED, CFL, 42W

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APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE

PUBLIC LIGHTING
LAMPS
FLUORESCENT

SCALES: NTS

SIZE: A4

PL-319

REVISION: A

30/11/2015

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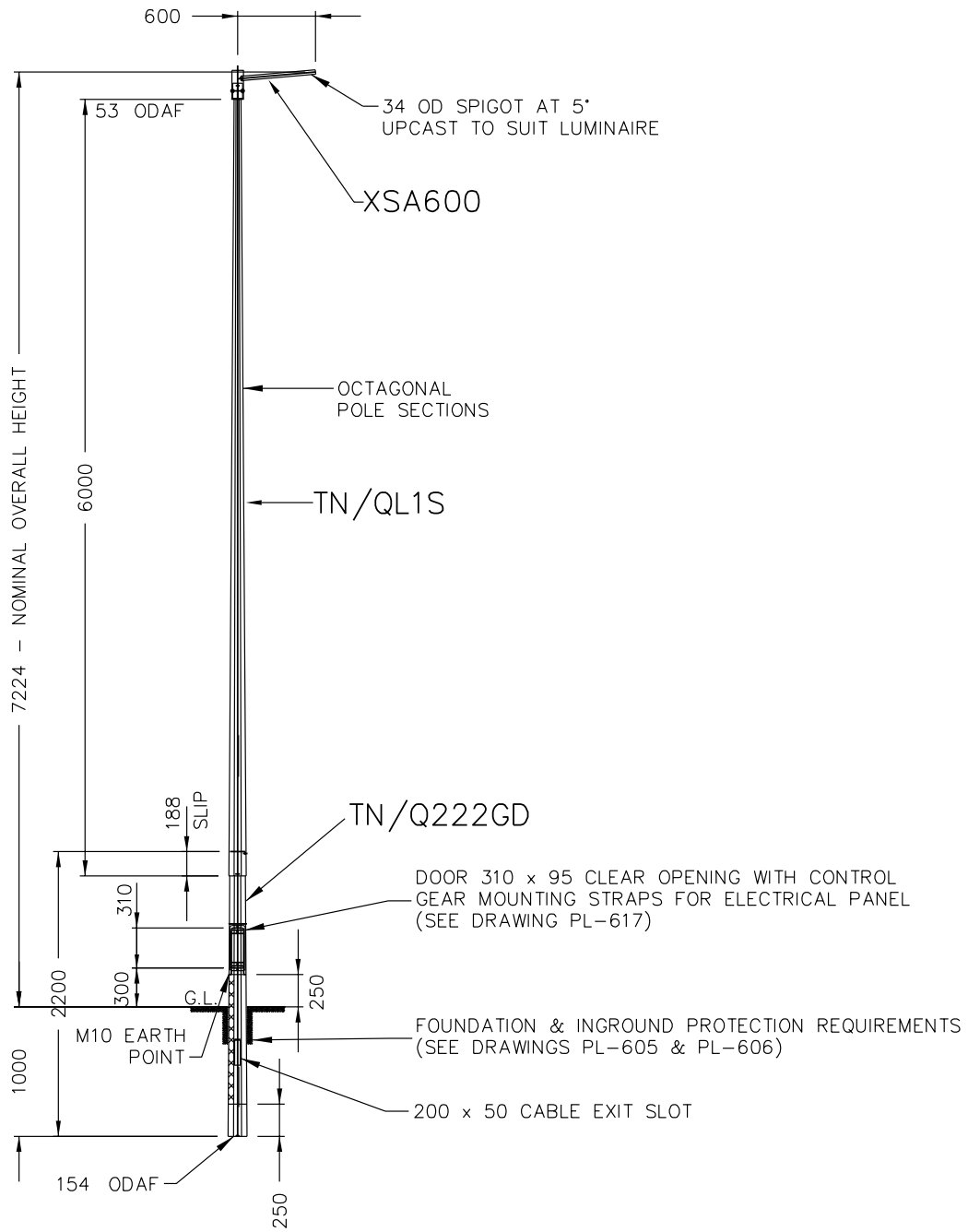

S.I. No	DESCRIPTION
325092	INGAL EPS 7.0M DIRECT BURIED RIGID 0.6M OUTREACH

ALTERATIONS

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DATE	10/02/2016

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TITLE
PUBLIC LIGHTING
COLUMNS
7.0M DB RIGID 0.6M O/R

SCALES: NTS

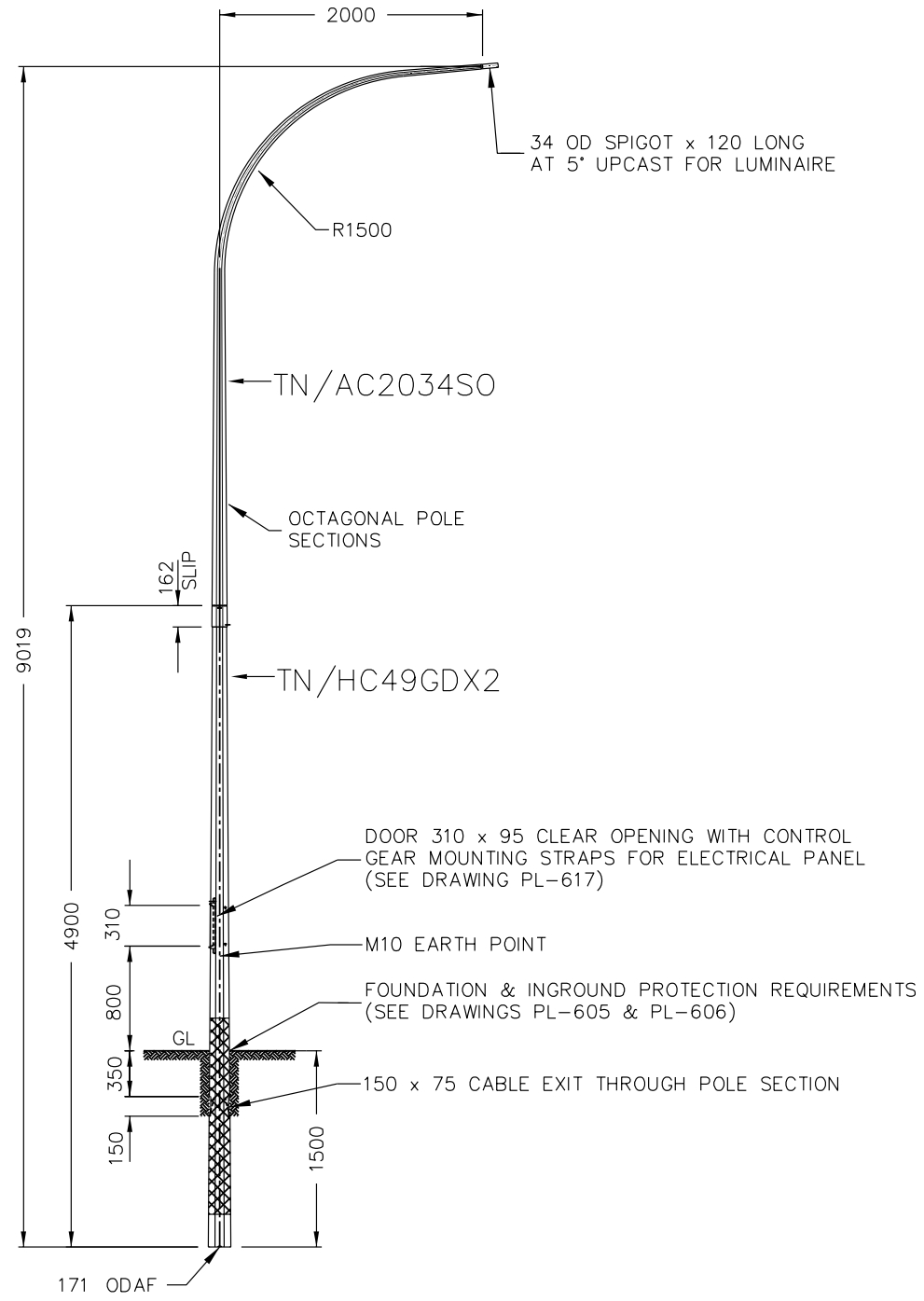
SIZE: A4

PL-325

REVISION: A

20/11/2015

CAUTION : Printed document is uncontrolled.



S.I. No	DESCRIPTION
324971	INGAL EPS 7.5M DIRECT BURIED RIGID 2M OUTREACH

ALTERATIONS

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DRAWN	ACUTEL
CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE

PUBLIC LIGHTING
COLUMNS
7.5M DB RIGID 2M O/R

SCALES: NTS

SIZE: A4

PL-326

REVISION: A

20/11/2015

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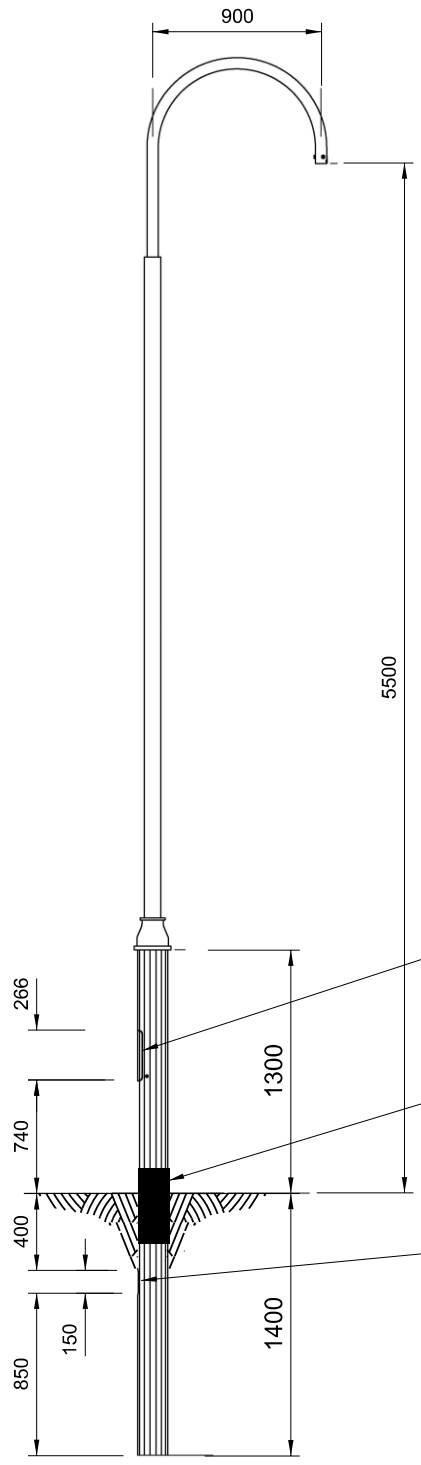

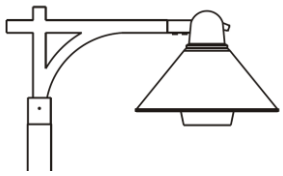

TYPICAL SIDE ENTRY OPTION

ARTCRAFT BOULEVARD COLUMNS

DESCRIPTION	S.I. No	MOUNTING HEIGHT	FOUNDATION
TOP ENTRY LUMINAIRE	324993	5500	BURIED DIRECT
SIDE ENTRY LUMINAIRE	324992	5500	BURIED DIRECT

*OTHER ARTCRAFT COLUMN STYLES MAYBE ALLOWED UPON APPROVAL FROM TASNETWORKS.

DOOR 270 x 120 CLEAR OPENING WITH EARTH POINT AND CONTROL GEAR MOUNTING STRAPS FOR ELECTRICAL PANEL (SEE DRAWING PL-617)

FOUNDATION & INGROUND PROTECTION REQUIREMENTS (SEE DRAWINGS PL - 605 & PL-606)

150 x 50 CABLE EXIT THROUGH POLE SECTION

COLUMN SHOWN: ARTCRAFT BOULEVARD

ALTERATIONS

TasNetworks

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CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

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TITLE

PUBLIC LIGHTING
COLUMNS
5.5M RIGID DECORATIVE
TOP AND SIDE ENTRY

SCALES: NTS

SIZE: A4

PL-339

REVISION: A

30/11/2015

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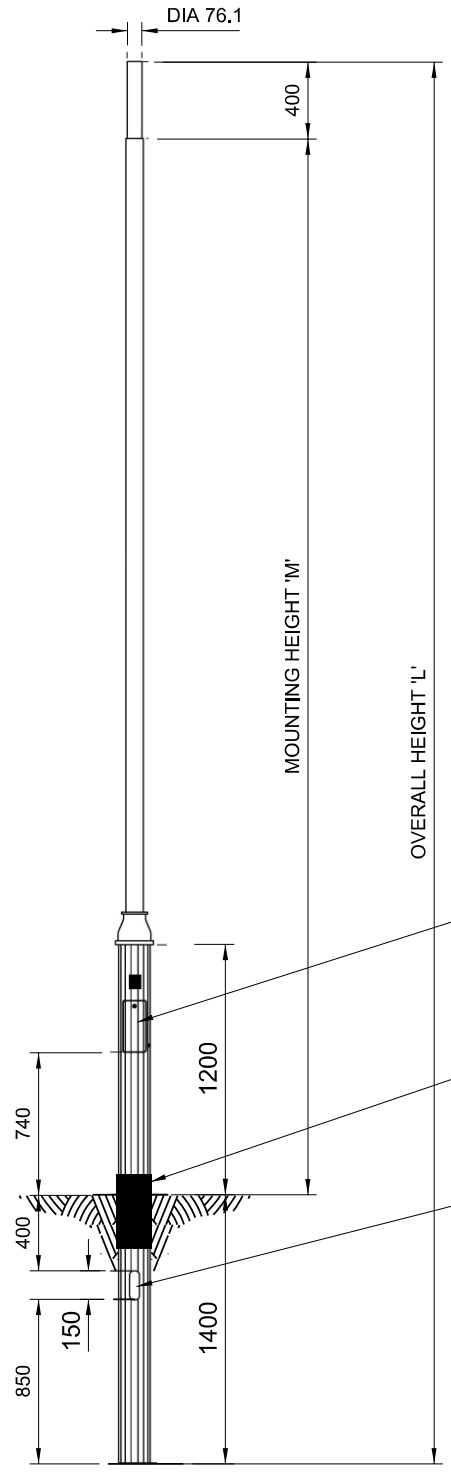

ARTCRAFT SILHOUETTE COLUMNS

COLUMN	S.I. No	MOUNTING HEIGHT	OVERALL LENGTH 'L'	FOUNDATION
4.5m INGROUND MOUNT	TBA	4500	6300	BURIED DIRECT
5.5m INGROUND MOUNT	324994	5500	7300	BURIED DIRECT

* OTHER ARTCRAFT COLUMN STYLES MAY BE ALLOWED UPON APPROVAL FROM TASNETWORKS

DOOR 270 x 120 CLEAR OPENING WITH EARTH POINT AND CONTROL GEAR MOUNTING STRAPS FOR ELECTRICAL PANEL (SEE DRAWING PL-617)

FOUNDATION & INGROUND PROTECTION REQUIREMENTS (SEE DRAWINGS PL - 605 & PL-606)

150 x 50 CABLE EXIT THROUGH POLE SECTION

COLUMN SHOWN: ARTCRAFT SILHOUETTE

ALTERATIONS

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DRAWN	ACUTEL
CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE

PUBLIC LIGHTING
COLUMNS
4.5M - 5.5M DB RIGID DECORATIVE
BOTTOM ENTRY

SCALES: NTS

SIZE: A4

PL-340

REVISION: A

30/11/2015

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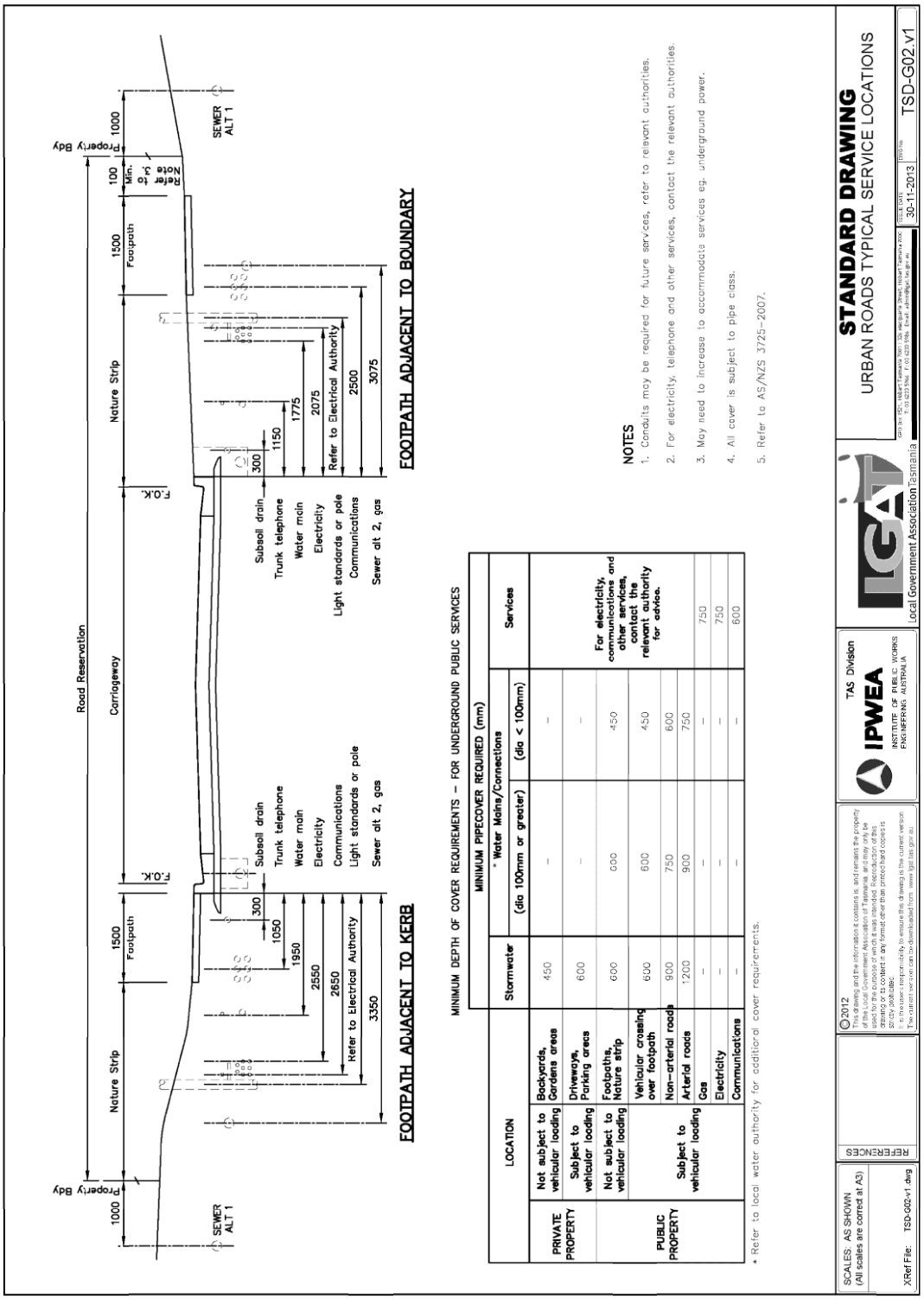

ALTERATIONS

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DRAWN	ACUTEL
CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE

PUBLIC LIGHTING
UG ROUTES
ROAD RESERVE ALIGNMENTS AND ALLOCATION

PL-345

SCALES: NTS

SIZE: A4

REVISION: A

18/12/2015

CAUTION : Printed document is uncontrolled.

TASNETWORKS STANDARD PUBLIC LIGHTING SUPPLY CABLES		6 mm² 1C 1 kV B/Wire GN(Y)	16 mm² 1C 1 kV B/Wire BK	35 mm² 1C 1 kV B/Wire BK	2.5 mm² 1C 750 V SDI BK/WH	2.5 mm ²1C 750 V SDI RD/WH	2.5 mm² 2C + Earth 1 kV Orange Circular	4 mm² 2C + Earth 1 kV Orange Circular	10 mm² 2C + Earth 1 kV Orange Circular
Stock Item No.		094158	094173	094187	095020	095021	095713	095714	095715
Cable Type		1kV B/Wire	1kV B/Wire	1kV B/Wire	750V SDI	750V SDI	1kV Org Circ	1kV Org Circ	1kV Org Circ
Nominal Area Conductor	mm²	6	16	35	2.5	2.5	2.5	4	10
Overall Cable Diameter	mm	5.2	7.2	10.1	5.1	5.1	11.2	12.8	16.4
Mass	kg/m	0.073	0.173	0.363	0.049	0.049	0.194	0.258	0.418
Cond. Material and Composition		Annealed Copper	Annealed Copper	Annealed Copper	Annealed Copper	Annealed Copper	Annealed Copper	Annealed Copper	Annealed Copper
Cond. Construction, Cross-Section Shape (Nominal)		7/1.04	7/1.65	19/1.50	7/0.67	7/0.67	7/0.67	7/0.85	7/1.35
Cond. Insulation, Material		V-90 PVC	V-90 PVC	V-90 PVC	V-90 PVC	V-90 PVC	V-90 PVC	V-90 PVC	V-90 PVC
Max. Pulling Tension With Stocking Grip	kN	0.094	0.18	0.35	0.09	0.09	0.35	0.56	0.95
Max. Pulling Tension With Pulling Eye Attached to Core	kN	0.42	1.1	2.45	0.18	0.18	0.35	0.56	1.40
Bending Radius, Installation	mm	30	45	60	30	30	65	75	100
Bending Radius, Setting	mm	20	30	40	20	20	45	50	65
Max. Drum Quantity - (Length)	Metres	500	500	2,000	500	500	500	1,000	500
Drum Size (Flange Diameter x Drum Width)	mm x mm	350X250	350X400	1000X640	350X250	350X250	580x460	1000x650	1000x650
Diameter of Axle Hole	mm	83	83	95	83	83	TBA	95	95
Gross Mass Of Drum (Cable, Drum & Lagging)	Tonnes	0.066	0.18	0.80	0.28	0.28	0.105	0.300	0.250
Max. Cond. Temp. Continuous	Deg C	75	75	75	75	75	75	75	75
Max. Continuous Current Rating @ 15 Deg. C, Duct	Amp	50	86	134	30	30	33	43	73
Max. Resistance (AC), @ Max. Temp.	Ohm/km	3.75	1.40	0.638	9.01	9.01	9.01	5.61	2.23
Max. Resistance (AC), @ 20 Deg. C	Ohm/km	3.08	1.15	0.525	7.41	7.41	7.41	4.61	1.83
Reactance	Ohm/km	0.128	0.111	0.101	0.143	0.143	0.102	0.102	0.0906
Voltage Drop (@ operating temperature)	mV/A.M	6.49	2.43	1.11	15.6	15.6	15.6	9.71	4.46
Max. Fault Current Rating, Conductor 0.5 Sec	kA	0.95	2.5	5.5	0.4	0.4	0.40	0.64	1.57
Max. Fault Current Rating, Conductor 1 Sec	kA	0.67	1.8	3.9	0.28	0.28	0.28	0.45	1.11

STOCK ITEM NUMBERS

RED 16mm² BUILDING WIRE - S.I 09.41.76

RED 35mm² BUILDING WIRE - S.I 09.41.61

ALTERATIONS

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DRAWN	ACUTEL
CHECKED	G.MARTINDILL
APPROVED	DARRYL MUNRO
DATE	10/02/2016

TITLE: PUBLIC LIGHTING
ELECTRICAL
CABLE TYPES AND SPECIFICATIONS

SCALES: NTS

SIZE: A4

PL-351

REVISION: A

27/11/2015

4 Drawing Standards

The designer shall ensure all design drawings reflect the format requirements outlined in TasNetworks' Design Drafting Standard (NP R AG 05). In addition the designer shall ensure the content and the number (including titles) of drawings reflect the minimum level of detail summarised below:

- Public Lighting plan drawing to include:
  - Specific site contours
  - Lot boundaries
  - Lot drive ways
  - Development staging (if applicable)
  - General asset location (public lighting) location/type
  - Turret location/type
  - Cabinet location/type)
  - Easement locations
  - Conduit route
  - Cable types (schedule list)
  - Cable legend
  - Cable detailed trenching arrangement
  - Existing underground services (gas, water and telecommunications),
  - Underground furnishing
- All cables routes and underground furnishing shall have offsets to surrounding infrastructure (i.e. roads, fences, building, etc.). All design assets shall reference the relevant asset's critical design information within the design drawing.
- The content and quantity of drawings is not intended to be duplicated if already included as part of the design content of the underground cable design deliverables.