# Brisbane City Council

# Reference Specifications for Engineering Work

# S156 Solar Road and Bikeway Markers

## Amendment Register

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| --- | --- | --- | --- |
| Ed/Rev Number | Section Number | Description | Date |
| 0.2 |  | Draft Issue | Dec 2009 |
| 0.3 |  | Draft Issue for distribution | Mar 2010 |
| 0.4 |  | Revised Draft Issue for distribution | Mar 2010 |
| 1.0 |  | Issued for Internal Publication  *(Supersedes Draft Specification S146 Solar Road and Bikeway Markers)* | Jun 2010 |
| 2.0 |  | Issue for External Publication | April 2014 |
| 3.0 |  | External References Updated and Corrected | May 2016 |
| 4.0 | General | Document name changed from ‘*Reference Specifications for Civil Engineering Work*’ to ‘*Reference Specifications for Engineering Work*’ | Mar 2021 |

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## GENERAL

### Scope

This specification outlines the technical acceptance criteria for Solar Powered LED Markers for use on off-road shared and bicycle paths.

### Standards

|  |  |  |
| --- | --- | --- |
| Australian/New Zealand Standard | AS/NZS°1906.1 | Retroreflective materials and devices for road traffic control purposes – Retroreflective sheeting |
| Australian Standard | AS°1906.3 | Retroreflective materials and devices for road traffic control purposes – Raised pavement markers (retroreflective and non-retroreflective) |
| Australian Standard | AS°60529 | Degrees of protection provided by enclosures for electrical equipment |
| Australian Standard | AS°3554 | Adhesives – Epoxy – For raised pavement marker Installation (IP Code) |

### References

Brisbane City Council Reference Specifications for Civil Engineering Works

|  |  |
| --- | --- |
| S120 | Quality |

Brisbane City Council Standard Drawings

|  |  |
| --- | --- |
| BSD-11032 | Typical Requirements for Solar LED Markers: Off-Road/Shared/Bicycle Paths |

## QUALITY SYSTEMS

### General

The responsibility of preparing testing plans shall be with the Contractor. These plans shall be submitted to the Superintendent for approval.

## TEHCNICAL REQUIREMENTS

### General

This specification covers the supply and installation of solar powered light emitting diode (LED) delineator markers.

### Compliance Testing

All materials and manufacturing of the solar powered LED markers and their components are to comply with all standards and specifications referenced in this document. Conformance shall be demonstrated by submitting current certificates of all specified test results issued by a registered NATA laboratory.

### Technical Requirements

| Function | Requirement | | |
| --- | --- | --- | --- |
| Dimensions (Nominal) | Ø110°mm°x°50°mm Deep  (Nominal°Ø: 105-140°mm; Max. Depth: 60°mm) | | |
| Raised Height  (Height Of Marker Above The Path Surface) | Max. 5°mm | | |
| Impact Resistance | To *AS°1906.3* or international equivalent*(1)*  (As per requirements for Type A & Type A/B markers) | | |
| Compressive Strength | To *AS°1906.3* or international equivalent*(1)*  (As per requirements for Type A & Type A/B markers) | | |
| Ultraviolet (UV) Exposure/Stability | To *AS°1906.3* or international equivalent*(1)*  (As per requirements for Type A & Type A/B markers) | | |
| Water and Dust Proofing | Rated to *AS°60529* and *EN60529**(2)* | Water inundation<24°hrs and <1.0°m depth | IP67 |
| Water inundation >24°hrs and/or >1.0°m depth | IP68 |
| Marker Adhesive | To *AS°3554* or international equivalent*(1)*  Epoxy adhesive – Standard Set or Rapid Set | | |
| Light Type | Steady shine  (Flash units may be used if required) | | |
| Reflector/Light Colours | Standard colours: Amber/Yellow, Red, White  Additional colours (e.g. Green, Blue) as required | | |
| Luminance | >4°cd/m2 | | |
| Normal Operating Temperature Range | -20ºCºtoº60ºC | | |
| LED Configuration | Uni and/or Bi directional | | |
| Minimum Viewing Distance | 300°m | | |
| Operating Time (Single Charge) | 30°hours (i.e. 2 night periods) | | |
| Typical Charge Lighting Level and Time | 3°hours @ 100,000°lux  (Full Sun) | | |
| Minimum Charge Lighting Level and Time | 8°hours @ 1,000°lux  (Overcast Conditions/Full Shade) | | |
| Reflector*(3)* | Class°1 or Class°1W White to *AS°1906.1* or international equivalent*(1)(3)*  (Diamond grade or Prismatic corner cube.) | | |
| In Ground Life | 10 years | | |
| Warranty | 3 years (Min.) | | |

*(1)* *Certified compliance or independent testing documentation to be provided if different to relevant Australian Standard.*

*(2) Where installation is expected to be submerged by water for a 24*°*hour*°*period or longer* ***and/or*** *subjected to water inundation to depth of 1.0m or greater, the water proofing rating will be to IP68 to AS1939 and EN60529.*

*(3) If present in marker. Some markers do not contain a retroreflective element.*

*Additional Requirements*

Tamper resistant: Both marker unit and installation method shall be vandal and tamper resistant, i.e. unit cannot be disassembled or be dug up/removed from installation position.