Standards Variation Note

Our Ref:	D23#441442
From:	**A/Manager Electrical Asset Management – Steven Howells**
Reference:	E&ITSDS-01-SVN-01
Effective Date:	17 August 2023
Cease Date:	Until further notice
Standard:	**08/62:** Lighting Design Guideline for Roadway and Public Spaces (Rev. 4V)
Clause(s):	**3.2.7:** Main Switch Requirements, **3.2.8:** Metering Equipment Location
Subject:	Assessment and clarification of the updated Western Power & Horizon Power Western Australia Service and Installation Requirements Version 10 - Main Switch Requirements and Metering Equipment Location

Purpose and Application

The Standard Variation Notes (SVN) are intended to provide temporary modifications to existing Main Roads standards, while these standards are being updated to reflect the changes. It is important to note that the information contained in the SVN does not supersede any statutory regulations unless Main Roads has obtained explicit permission to do so.

It is also important to note that the content of the SVN may be updated, clarified, or integrated into the appropriate standard at a later time as part of a revision to the aforementioned standard. This ensures that the information provided in the SVN remains relevant and accurate.

This SVN provides further clarity on how the changes to Western Power Western Australia Service and Installation Requirements 2021 Version 10 requirements affect Main Roads' lighting switchboards.

Background

Western Power and Horizon Power released the Western Australian Service and Installation Requirements 2021 (WASIR) Version 10 in July 2021. This supersedes the Western Australian Distribution Connections Manual 2016 (WADCM). There are two clauses in the WASIR that directly affect Main Roads, namely:

- Clause 11.5 – *Metering equipment location*; and
- Clause 11.6 – *Equipment*

Main Roads has undertaken a review of the above clauses, and the potential implications to current Main Roads installations.

Clause 11.5 – Metering equipment location

Main Roads has received a formal dispensation from Western Power stipulating that Main Roads installed switchboard meters do not need to meet the height requirements as stipulated in WASIR 2021 section 11.5.1 Figure 21 (for a single meter).

However, a single meter cannot be installed any lower than the second meter as depicted in WASIR 2021 section 11.5.1 (Figure 22) i.e., 900mm minimum from finished ground or floor level. This is in line with the installation heights of all WP meters in Main Roads current switchboards. See below extract from WASIR 2021 – page 161 of 311 - for reference:

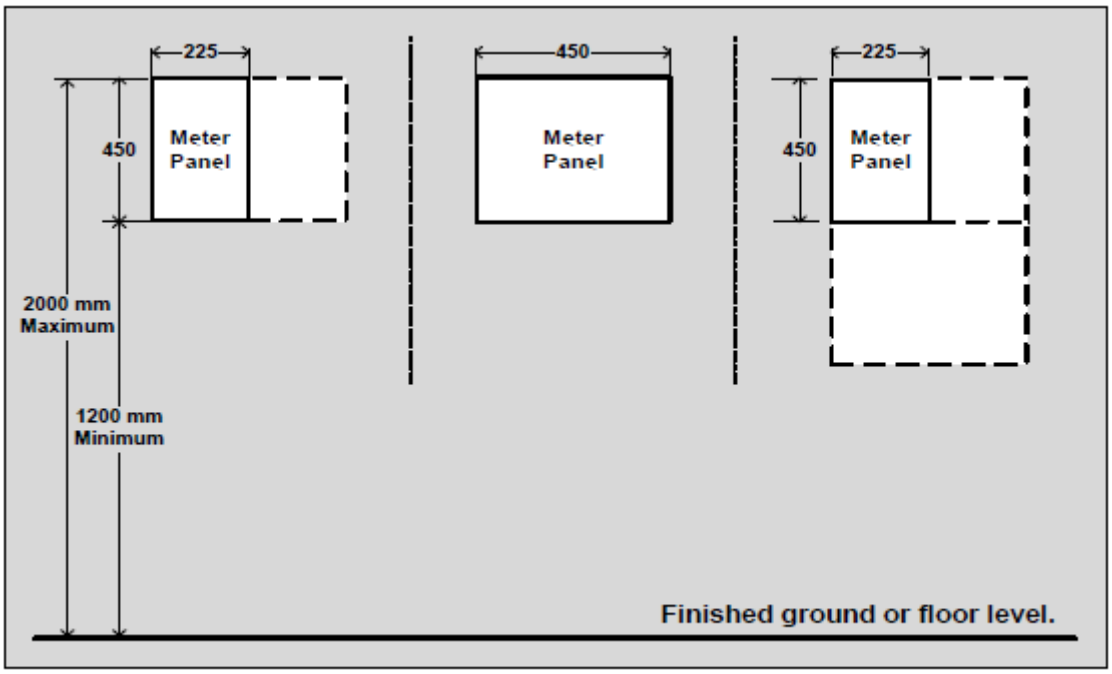

Figure 21: Typical meter panel mounting heights

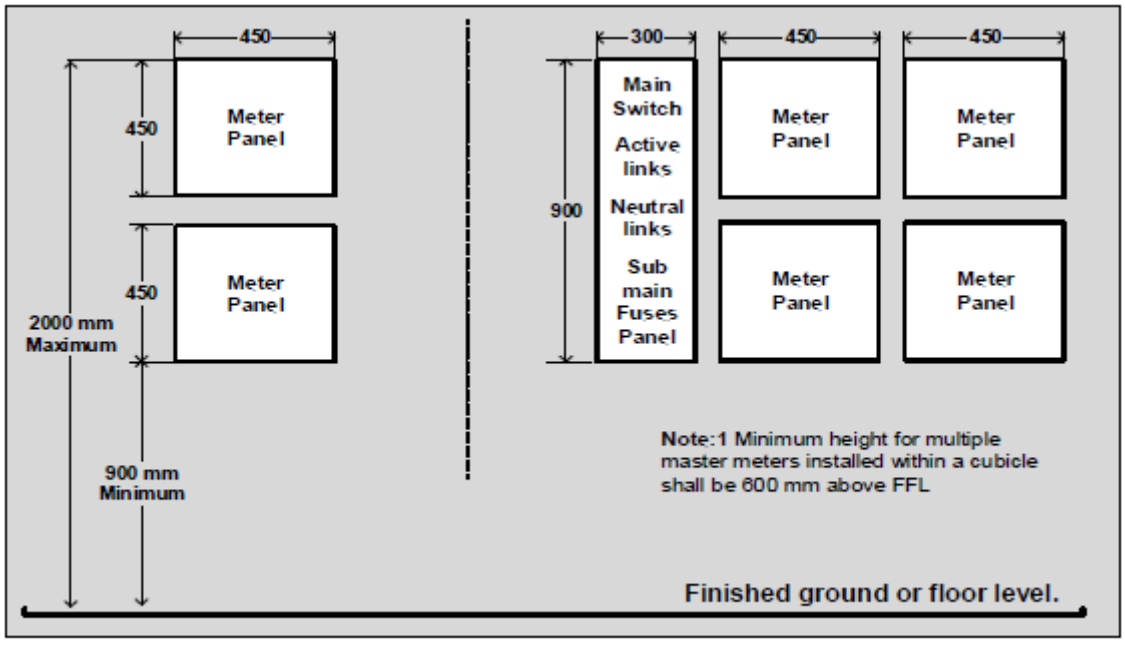

Figure 22: Typical multiple meter panel mounting heights

Clause 11.6 – Metering protections and main switches

Main Roads has not received a formal dispensation from Western Power in regard to the main isolating switch, and therefore all new installations shall have lockable circuit breakers in lieu of main isolation switches, as per the requirements of WASIR 2021, since Western Power is the network operator for the South West Interconnected System, as detailed below.

This Clause is not relevant to existing installations, and there is no requirement to retrofit lockable circuit breakers into Main Roads' existing installation. However, the Clause is required to be adhered to for all new switchboard installations.

In regards the lockable requirements for the circuit breaker replacing the main switch, the circuit breaker does not necessarily need to have an integrated locking mechanism but shall be able to be locked out even if this entails utilising an external lock-out device.

Further to the WASIR 2021 cl. 11.6.4 requirement for a lockable circuit breaker, Main Roads requires that for primary isolating functionality the isolating device shall have a red toggle, to help visually distinguish the isolating functionality from other devices on the switchboard.

The WASIR 2021 cl. 11.6.4.3 also notes that there shall be sufficient coordination of the circuit breaker with the service protection devices (SPD) and the sum of all main circuit breakers ratings connected to from the SPD shall be the lesser of the SPD rating. AS/NSZ 60898.1:2004 notes in cl. 5.3.2 that the preferred rated currents for circuit breakers are 6 A, 8 A, 10 A, 13 A, 16 A, 20 A, 25 A, 32 A, 40 A, 50 A, 63 A, 80 A, 100 A and 125 A for household and similar installations. As such, it is reasonably expected that these current ratings for circuit breakers are readily commercially available. However, it has been noted from external designers that, at times, there have been procurement issues around red toggle circuit breakers at higher current ratings.

As per WASIR 2021 cl. 11.9, the maximum demand of a whole current metering install is 100 A calculated and as such the maximum SPD rating is 100 A. To provide the adequate coordination with the SPD for whole current metering a circuit breaker below 100 A rating should be used, as fuse time-current curves are typically lower than circuit breaker curves. As such, the highest rated standard sized circuit breaker, that is below a 100 A rating, that can be used is an 80 A circuit breaker to provide the required coordination.

Main Roads understands that some installs require a greater than 100 A load and therefore the installation will require the use of a meter with current transformers, as per WASIR 2021 cl. 11.8.1. It should be noted that a larger meter panel is required and as such will be treated as a non-standard install – 600 mm x 600 mm for CT meters compared to 450 mm x 225 mm for whole current meters.

The main circuit breaker will additionally provide isolation to the entire switchboard; however, it has been noted that circuit breakers have a limited switching operations compared to a switch. Additionally, high availability devices are typically powered from Main Roads switchboards, such as traffic signals, and if incorrectly isolated poses an elevated safety risk to Main Roads customers. As such, Main Roads will **not** require a red toggle on the main circuit breaker but will require a red toggle isolating switch for the switchboard (inc. switchboard devices) and roadway lighting in addition to one for each sub-board / cabinet before the outgoing circuit breaker.

Relevant Existing Clause(s)

Nil – the clauses proposed are additions to the aforementioned Main Roads' standard. Main Roads' standard drawings 200231-0065 and 201531-0023 has been updated as part of this Standard Variation Note.

Clarification

The added clauses to *Lighting Design Guideline for Roadway and Public Spaces* (Rev. 4V) is detailed below. No other clauses are updated as part of this variation notice. Additionally, standard drawings 200231-0065 and 201531-0023 have been updated and are available on the Main Roads website.

3.2.7: Main Switch Requirements

The switchboard shall contain a circuit breaker after the metering device and this main circuit breaker shall be sufficiently coordinated with the provided service protection device as per WASIR 2021 cl. 11.6.4.3. This device shall use a white toggle, as the primary function of this circuit breaker is for circuit protection, not isolation, to ensure sub-boards are not accidently isolated. Additionally, the circuit breaker shall either have an integrated locking mechanism or have a compatible external lock-out device. Main Roads' preference for switchboards it to use whole current metering installs and as such the rating for the main circuit breaker shall be equal or less than 80 A, as per the requirements set out in WASIR 2021 cl. 11.5. Although the designer may propose a current transformer meter, it should be noted that current transformer meters require a differing sized meter panel, as per WASIR 2021 cl. 11.13, which is a non-standard Main Roads install and shall be treated as such.

To provide sufficient isolation to both sub-switchboards and the cabinet/lighting circuits, additional isolating switches shall be used directly downstream from the main circuit breaker – one for the switchboard devices and lighting circuits in addition to an individual switch for each sub-board / cabinet connected to the switchboard – e.g., traffic signals and intelligent transport system cabinets. These switches shall use a red toggle for ease of identification with red traffolyte labels detailed with white text noting the use of the switch will isolate relevant connected assets.

3.2.8: Metering Equipment Location

Main Roads switchboard meters shall not be installed below 900 mm from the finished ground or floor level. For a multiple meter installation, the switchboard shall follow the requirements set out in WASIR 2021 cl. 11.5.1.

Further information

Any additional questions or concerns on this Standard Variation Notice can be directed to the Main Roads *Technical Query and Request for Information Procedure* found on the Main Roads website.

Recommended

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