

|  |
| --- |
| Assets Planning and Delivery Group  Engineering |

Design Standard DS 26-01

Type Specifications – Electrical

**Directions for Use**

|  |
| --- |
|  |
|  |
| version 3  revision 1 |
| NOVEMBER 2023 |

**FOREWORD**

The intent of Design Standards is to specify requirements that assure effective design and delivery of fit for purpose Water Corporation infrastructure assets for best whole-of-life value with least risk to Corporation service standards and safety. Design standards are also intended to promote uniformity of approach by asset designers, drafters and constructors to the design, construction, commissioning and delivery of water infrastructure and to the compatibility of new infrastructure with existing like infrastructure.

Design Standards draw on the asset design, management and field operational experience gained and documented by the Corporation and by the water industry generally over time. They are intended for application by Corporation staff, designers, constructors and land developers to the planning, design, construction and commissioning of Corporation infrastructure including water services provided by land developers for takeover by the Corporation.

Nothing in this Design Standard diminishes the responsibility of designers and constructors for applying the requirements of the Western Australia's Work Health and Safety (General) Regulations 2022 to the delivery of Corporation assets. Information on these statutory requirements may be viewed at the following web site location:

[Overview of Western Australia’s Work Health and Safety (General) Regulations 2022 (dmirs.wa.gov.au)](https://www.dmirs.wa.gov.au/sites/default/files/atoms/files/overview_general_regulations.pdf)

Enquiries relating to the technical content of a Design Standard should be directed to the Senior Principal Engineer, Electrical section, Engineering. Future Design Standard changes, if any, will be issued to registered Design Standard users as and when published.

**Head of Engineering**

*This document is prepared without the assumption of a duty of care by the Water Corporation. The document is not intended to be nor should it be relied on as a substitute for professional engineering design expertise or any other professional advice.*

*It is the responsibility of the user to ensure they are using the current version of this document.*

© Copyright – Water Corporation: This standard and software is copyright. With the exception of use permitted by the Copyright Act 1968, no part may be reproduced without the written permission of the Water Corporation.

**DISCLAIMER**

Water Corporation accepts no liability for any loss or damage that arises from anything in the Standards/Specifications including any loss or damage that may arise due to the errors and omissions of any person. Any person or entity which relies upon the Standards/Specifications from the Water Corporation website does so that their own risk and without any right of recourse to the Water Corporation, including, but not limited to, using the Standards/Specification for works other than for or on behalf of the Water Corporation.

The Water Corporation shall not be responsible, nor liable, to any person or entity for any loss or damage suffered as a consequence of the unlawful use of, or reference to, the Standards/Specifications, including but not limited to the use of any part of the Standards/Specification without first obtaining prior express written permission from the CEO of the Water Corporation.

Any interpretation of anything in the Standards/Specifications that deviates from specific Water Corporation Project requirements must be referred to, and resolved by, reference to and for determination by the Water Corporation’s project manager and/or designer for that particular Project.

REVISION STATUS

The revision status of this standard is shown section by section below:

| **REVISION STATUS** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **SECT.** | **VER./REV.** | **DATE** | **PAGES REVISED** | **REVISION DESCRIPTION**  **(Section, Clause, Sub-Clause)** | **RVWD.** | **APRV.** |
| **1** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
| **ALL** | **2/0** | **17.11.23** | **N/A** | **Scheduled review. No changes required at this time. Foreword updated. To be reviewed in 2025.** | **EDG** | **EDG** |
|  |  |  |  |  |  |  |
| **2** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **3** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **4** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **5** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **6** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **7** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **8** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **9** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **10** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **11** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **12** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **13** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **14** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **15** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **16** | **2/0** | **30.08.11** | **All** | **New Version** | **NHJ** | **AAK** |
|  |  |  |  |  |  |  |
| **17** | **3/0** | **2.11.20** | **All** | **New Version** | **EDG** | **NHJ** |
|  |  |  |  |  |  |  |

| **REVISION STATUS HISTORY** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VER/REV** | **DATE** | | **PAGES REVISED** | | **REVISION DESCRIPTION**  **(Section, Clause, Sub-Clause)** | | **RVWD.** | | **APRV.** |
| **0/0** | **01.08.01** | | **All** | | **New Edition** | | **NHJ** | | **AAK** |
| **0/1** | **18.09.01** | | | **3-5,12-14** | | **General revision** | | **NHJ** | | **AAK** |
| **0/1** | **18.09.01** | | | **1** | | **1.1 general revision** | | **NHJ** | | **AAK** |
| **0/3** | **30.10.02** | | | **All** | | **General revision** | | **NHJ** | | **AAK** |
| **0/4** | **01.09.03** | | | **All** | | **Reformatted** | | **NHJ** | | **AAK** |
| **0/4** | **01.09.03** | | | **1** | | **1.2,1.3 general revision** | | **NHJ** | | **AAK** |
| **1/0** | **27.02.04** | | | **All** | | **Sections split** | | **NHJ** | | **AAK** |
| **1/1** | **23.05.05** | | | **All** | | **Sections renumbered** | | **NHJ** | | **AAK** |

Design Standard DS 26-01

Type Specifications – Electrical

Directions for Use

**CONTENTS**

*Section Page*

[1 PURPOSE 8](#_Toc151120187)

[2 SCOPE 8](#_Toc151120188)

[3 REFERENCES 8](#_Toc151120189)

[4 DEFINITIONS 8](#_Toc151120190)

[5 OWNERSHIP 9](#_Toc151120191)

[6 SPECIAL REQUIREMENTS 9](#_Toc151120192)

[7 SPECIAL ADMINISTRATIVE REQUIREMENTS 9](#_Toc151120193)

[8 COMPLETION OF ANNEXURES 9](#_Toc151120194)

[9 TYPOGRAPHICAL ERRORS 9](#_Toc151120195)

[10 SUPERSEDED STANDARDS 10](#_Toc151120196)

[11 TECHNICAL ERRORS 10](#_Toc151120197)

[12 SPLIT RESPONSIBILITY PROHIBITED 10](#_Toc151120198)

[13 COMBINED USE 10](#_Toc151120199)

[14 TENDER DOCUMENTATION 11](#_Toc151120200)

[15 CONTRACT DOCUMENTATION 11](#_Toc151120201)

# PURPOSE

The Water Corporation has adopted a policy of outsourcing much of the electrical engineering and electrical detail design associated with the procurement of its assets.

The resulting assets need to be in accordance with the Corporation’s operational needs and standard practices.

Design Standard DS26 sets out various type technical specifications covering various items of electrical plant and electrical installations.

While these Type Specifications have general application, the Designer shall not assume that these Type Specifications cover all requirements for a particular application.

Project specific requirements shall be specified in the Special Requirements section of the Annexure to the particular Type Specification as detailed hereunder.

# SCOPE

The scope of the Type Specifications included in Design Standard DS26 covers items of power electrical plant which occur routinely in electrical installations associated with water and wastewater pump stations and treatment plants.

Each Type Specification covers the requirements for a particular specified portion of electrical work. Type Specifications may be used as the basis of small separate contracts, or may be incorporated into a larger contract to specify requirements for subcontracts within the overall contract, as described hereunder.

# REFERENCES

References should be made also to the following associated design manuals:

DS21 Major Pump Stations - Electrical

DS22 Ancillary Plant and Small Pump Stations - Electrical

DS28 Water and Wastewater Treatment Plants - Electrical

# DEFINITIONS

Senior Principal Engineer - Senior Principal Engineer Electrical in the Water Corporation’s Engineering.

# OWNERSHIP

Water Corporation Type Specifications remain the property of the Water Corporation. The format and content of the specification proper and the tender technical response schedule shall not be changed by the Designer.

Variations to the specification proper in a Type Specification shall not be permitted except as specified hereunder.

While project specific Type Specification Annexures shall be incorporated into the Designer’s Quality System, the main bodies of Type Specifications shall remain as reference documents outside the Designer’s Quality System.

# SPECIAL REQUIREMENTS

Significant changes in the Scope of Work shall not be permitted unless authorised in writing by the Senior Principal Engineer.

Any project specific special technical requirements shall be detailed in the Annexure to the associated Type Specification.

Such special requirements shall be additional to the technical requirements of the Type Specification and shall not diminish any technical requirement of the Type Specification, unless authorised in writing by the Senior Principal Engineer.

# SPECIAL ADMINISTRATIVE REQUIREMENTS

The Designer may specify under the Annexure Special Requirements heading, clauses which vary the administrative requirements specified in a particular Type Specification, if these can be shown to be necessary for project administrative purposes.

Such variations shall be notified to the Senior Principal Engineer so that consideration may be given to varying the particular Type Specification to cover such requirements.

# COMPLETION OF ANNEXURES

The Designer shall ensure that all Annexure items in project Type Specifications are completed. Any Annexure items which are not relevant to a particular project shall be marked “not applicable”. The Designer shall ensure completed Annexure items are in accordance with the approved Design Summary drawings.

# TYPOGRAPHICAL ERRORS

Should the Designer notice an obvious typographical error in a Type Specification, the Designer shall notify the Senior Principal Engineer of same immediately and shall add an addendum to the Type Specification correcting the matter.

# SUPERSEDED STANDARDS

Should the Designer notice that a superseded Australian or International Standard has been referenced in a Type Specification, the Designer shall notify the Senior Principal Engineer of same immediately.

If use of the current revision of the particular standard is a statutory requirement, the Senior Principal Engineer will authorise the Designer to add an addendum varying the Type Specification so as to reference the current revision of the particular standard.

If use of the current revision of the particular standard is not a statutory requirement, the Senior Principal Engineer may authorise the Designer to add an addendum varying the Type Specification so as to reference the current revision of the particular standard, or may direct the Designer to proceed on the basis of the superseded standard.

# TECHNICAL ERRORS

Should the Designer consider that a Type Specification contains a technical error, the Designer shall notify the Senior Principal Engineer of same immediately.

The Senior Principal Engineer will investigate the matter and if necessary, issue a suitable addendum to the Type Specification correcting the matter.

The Designer shall not issue the Type Specification as part of a contract document until the matter is resolved.

# SPLIT RESPONSIBILITY PROHIBITED

In the preparation of contract documents, all of the scope of work within a particular Type Specification shall be assigned to a single contracting entity.

# COMBINED USE

A number of Type Specifications may be incorporated into the contract document for a larger project overall contract.

In such cases the specification for electrical work shall be grouped so that subcontracts can be formed readily with appropriate Subcontractors, e.g. for major switchboards with a Water Corporation approved switchboard supplier.

The electrical work shall be described completely by the specified Type Specifications and the associated Annexures.

No clauses shall be included in the overall project specification which contradict the requirements of the Type Specifications or which should be included as a special requirement in the Annexure to the relevant Type Specification.

# TENDER DOCUMENTATION

The tender specification for the works associated with a particular Type Specification shall consist solely of:

1. Copies of the current editions of the Type Specification(s). *(Note: Any variations to any quoted Type Specification during the course of the contract will be a variation to the contract.)*
2. The project specific Annexure(s) to the Type Specification(s) (if such exist).
3. Copies of drawings which relate to the Works being covered by the project specification, and
4. A cover sheet which provides a title for the specification and which lists the above documents and specifies that, together these documents constitute the complete specification.

A typical such cover sheet for a tender document specification is attached.

Only drawings which contain information which is not included in the Type Specification(s) and the associated Annexure(s), but nevertheless is required to enable the tenderer to submit a tender for works which complies with the design, shall be included in the tender specification.

# CONTRACT DOCUMENTATION

The contract specification shall consist of the tender documentation details in para. 12 above, together with the Tender Technical Response Schedules which have been completed by the successful tenderer.

*Cover Sheet Example - Refer Clause 14*

Specification for Supply and Installation of

415 V Main Switchboard in the

Bunbury Emergency Main Sewage Pump Station

**1. Type Specifications**

(a) DS26.09 - Ver2Rev3 - Type Specification for Low Voltage Switchboards - General Requirements

(b) DS26.21 -Ver1Rev3 - Type Specification for Current Transformers and Sensors

(c) DS26.24 -Ver1Rev5 - Type Specification for Low Voltage Motor Control Centre Type Switchboards

(d) DS26.25 -Ver1Rev3 - Type Specification for Low Voltage Electronic Soft Starter

(e) DS26.32 -Ver1Rev0 - Type Specification for Class II Low Voltage Single Phase Surge Diverters

**2. Type Specification Annexures**

(a) DS26.24 - Type Specification for Low Voltage Motor Control Centre Type Switchboards

(b) DS26.25 - Type Specification for Low Voltage Electronic Soft Starter

**3. Drawings**

(a) Dwg. IP35-40-1 - Major Earthing Connections

(b) Dwg. IP35-40-2.4 - Single Line Diagram Detail Information - Part 1

(c) Dwg. IP35-40-2.5 - Single Line Diagram Detail Information - Part 2

(d) Dwg. IP35-40-2.6 - L.V. Power Single Line Diagram - Part 2

(e) Dwg. IP35-40-3 - Protection Grading Drawing

(f) Dwg. IP35-40-4.2 - Emergency Pump Motor Control Diagram

(g) Dwg. IP35-40-6 - Electrical Safety Interlocking Diagram

(h) Dwg. IP35-40-12.2 - Overall Control System Block Diagram (Part 2)

(i) Dwg. IP35-40-21.1 - Site Plan - Electrical Layout- L.V. and Communications

This page and the above documents shall be read in conjunction with one another and shall be deemed to form one document.

END OF DOCUMENT