

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION R153

TUNNEL AND UNDERPASS MAIN SWITCHBOARD, DISTRIBUTION BOARDS AND CONTROL PANELS

NOTICE

This document is a Transport for NSW QA Specification. It has been developed for use with roadworks and bridgeworks contracts let by Transport for NSW or by local councils in NSW. It is not suitable for any other purpose and must not be used for any other purpose or in any other context.

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REVISION REGISTER

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<p style="text-align: center;">GUIDE NOTES (Not Part of Contract Document)</p>

This document has been specifically developed for use in conjunction with Specification TfNSW R158 – Road Tunnel and Underpass Lighting.

This document will need to be customised by the **TENDER DOCUMENTER** for each specific project. Customisation requires the insertion of additional information that is project specific or supplementary to the project works.

Existing Services

The Tender Documenter should give consideration to the suitability of existing services and equipment. Supplementary technical specifications may be required to cover the upgrading or provision of replacement main switchboards, distribution boards and control panels.

Depending on the nature of the project, consideration should be given to carrying out a condition assessment of the existing electrical service mains supply. If the findings of the assessment determine that the electrical service mains supply will need to be upgraded, then such works may be included as part of the Contract.



TUNNEL AND UNDERPASS MAIN SWITCHBOARD, DISTRIBUTION BOARDS AND CONTROL PANELS

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VERSION FOR: DATE:

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FOREWORD

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When this document forms part of a contract

This document should be read with all the documents forming the Contract.

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REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW R153 Edition 1 Revision 1.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes are indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

TfNSW QA SPECIFICATION R153

TUNNEL AND UNDERPASS MAIN SWITCHBOARD, DISTRIBUTION BOARDS AND CONTROL PANELS

1 GENERAL

1.1 SCOPE

This specification sets out the requirements for the design, supply of equipment as further detailed, installation, connection, testing, commissioning and warranty of the main switchboard, distribution boards and control panels for tunnels and underpasses.

You must complete all necessary notices, pay all fees and charges and arrange for all inspections and tests by the local Energy Supply Authority.

1.2 STRUCTURE OF THE SPECIFICATION

This Specification includes a series of annexures that detail additional requirements.

1.2.1 Project Specific Requirements

Project specific details of work are shown in Annexure R153/A.

1.2.2 Measurement and Payment

The method of measurement and payment must comply with Annexure R153/B.

1.2.3 Schedules of HOLD POINTS, WITNESS POINTS and Identified Records

The schedules in Annexure R153/C list the **HOLD POINTS** and **WITNESS POINTS** that must be observed. Refer to Specification TfNSW Q for the definitions of **HOLD POINTS** and **WITNESS POINTS**.

The records listed in Annexure R153/C are **Identified Records** for the purposes of TfNSW Q Annexure Q/E.

1.2.4 Referenced Documents

Inform yourself of, and comply with, all current Legislation, Codes, Regulations, Standards and Directives issued by the governing regulatory bodies.

Unless specified otherwise or is specifically supplied by the Principal, the applicable issue of a referenced document, including any standards and codes, is the issue current at the date one week before the closing date for tenders, or if no issue is current at that date, the most recent issue.

Standards, specifications and codes used in this Specification are referred to in abbreviated form (e.g. AS 1023). For convenience, the full titles are given in Annexure R153/M.

1.3 DEFINITIONS

In addition to the definitions and meanings provided in the referenced documents, the subject terms used in this document have the following meanings:

Board. In this document, the term *board* (either singular or plural) is used to refer to either the main switchboard or distribution boards used in the Contracted Work.

Panel. In this document, the term *panel* (either singular or plural) refers to control panels used in the Contracted Work.

Plinth. In this document, the term *plinth* (either singular or plural) refers to an intermediate steel galvanized mounting frame located between a *board* and the concrete floor or wall. The plinth is secured to the floor or wall and the *board* is attached to the *plinth*.

“**You**” and “**your**” mean “the Contractor” and “the Contractor’s” respectively.

1.4 ENVIRONMENT

All electrical equipment supplied must be suitable for withstanding the local environment. They must be fire resistant, non-flammable, low smoke and halogen free.

All equipment must be rated for 0 to 40 degrees Celsius ambient and test certificates will be required for a 40 degree Celsius rating.

Protect the electrical installation against damage from the operation of fire protection systems, by spillage, by cleaning, or from any form of water ingress or mechanical damage.

2 MATERIALS

2.1 EQUIPMENT ENCLOSURES

All equipment enclosures must have IP65 Degree of Protection in accordance with AS 60529.

HOLD POINT

Process Held: Supply of equipment enclosures.

Submission Details: Degree of Protection test certificates.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

2.2 IDENTIFICATION OF EQUIPMENT SAFETY RISKS

The use of colours for all equipment and components must be in accordance with AS 1318.

You are responsible for identification of all risks and hazards associated with the equipment or installations and the supply and fitting of safety signs in accordance with AS 1216 and AS 1319.

2.3 EQUIPMENT AND MATERIALS APPROVALS

Submit for review and acceptance by the Principal complete data on all equipment proposed for use in the works, prior to their supply and/or installation. The submission must list the manufacturer, model number and all other information necessary for the Principal to identify the items and determine their acceptance or otherwise. The costs of providing any samples required by the Principal will be borne by you.

The list must include materials which are specified in the Contract Documents with the manufacturer's name, model or trade name, as well as materials proposed by you.

HOLD POINT

Process Held: Supply and/or installation of equipment and materials.

Submission Details: Equipment and materials data sheets.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

2.4 EQUIPMENT AND MATERIALS SUPPLIED BY THE PRINCIPAL

Collect any equipment and materials provided by the Principal from a storage depot within the Sydney Metropolitan area. The location of this storage depot is stated in Annexure R153/A.

Where applicable, unpack and uncrate the equipment immediately after taking delivery. Check the contents against the packing list accompanying the equipment and report any discrepancy or damage to the Principal.

From the date of receipt of the supplied equipment from the Principal until the Date of Completion, you are wholly responsible for the safe keeping of this equipment. Any loss or damage occurred during this period to this supplied equipment, must be made good to the Principal's satisfaction at your expense.

3 DESIGN AND CONSTRUCTION REQUIREMENTS

3.1 DESIGN SCOPE

You are responsible for the design, supply, installation, connection, testing and commissioning of the main switchboard, distribution boards and control panels.

The main switchboard must comprise circuit breakers, isolators, contactors and relays, metering and other accessories as necessary.

Design the boards and panels to suit the equipment offered, making due allowance for spare space for expansion. The drawings must show all necessary fault limiting and/or protective devices.

All switchboards must be readily accessible and positioned in a dry and well ventilated environment.

3.2 DRAWINGS FOR APPROVAL

Submit to the Principal for approval those drawings prepared by the Supplier of all equipment to be supplied. These drawings must include:

- (a) General arrangement and construction drawings of main switchboard, distribution boards and control panels;
- (b) Sufficient data, including all loads, to enable the supporting structures to be designed.

Submit four (4) copies of all drawings for approval. Work must not commence until the drawings have been approved.

HOLD POINT

Process Held:	Fabrication of main switchboard, distribution boards and control panels.
Submission Details:	Design drawings and engineering data on main switchboard, distribution boards and control panels.
Release of Hold Point:	The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

3.3 DESIGN AND CONSTRUCTION

Boards and panels must be suitable for front access only.

Panel assemblies must not exceed 2300 mm in height. All equipment requiring regular inspection or adjustment must be mounted between 350 mm and 1800 mm above floor level.

Equipment enclosures must be fully welded, totally enclosed and fitted with front access doors.

All enclosures must be fabricated using stainless steel grade 316.

The enclosures for main switchboard must have a minimum sheet steel thickness of 2 mm. For control panels, the sheet steel must have a minimum thickness of 1.6mm where panel width is less than 1.5 m and 2 mm where panel width exceeds 1.5 m.

The switchboard must be fitted with removable, non-magnetic gland plates.

Structural panels must be suitably reinforced to prevent warping or buckling. Folding around door openings must be such that dust or water, lodged on top of the door, does not enter into the inside panel opening of the door.

Control panels exceeding 1.5 m in width must be fitted with a full length channel plinth to facilitate transport and mounting. All panel sections must have provision for lifting with ample strength to withstand all stresses incidental to transportation and installation.

All external welds must be ground smooth, and all sharp edges or burrs must be removed.

Wall mounted control panels must be fitted with at least four fixing lugs. The lugs must be welded to the rear of the enclosure and must protrude past the sides of the enclosure to enable fixing without having to open the doors. A 12 mm clearance hole must be drilled through each lug. The areas where

the lugs are attached to the enclosures must be strengthened to withstand the weight of the fully fitted out control panel with a total safety factor of 2.0.

Cubicle assemblies must be formed from rigidly framed structures with additional supporting members provided where necessary for heavier switch gear items.

Ventilation ports, where provided, must be made vermin-proof using non-corrosive screen material.

All plinths must be hot-dipped galvanized and have a minimum height of 75 mm with at least four 12 mm clearance holes drilled at four points to allow for fixing to the floor. Provide lifting lugs or beams to prevent distortion when lifting or off-loading during transport.

Provide a minimum of 15% of clear panel mounting space in control panels to permit the addition of future control devices.

All bolts, screws, hinges, etc, whether used in assembling the equipment or fixing it in place, must be plated, galvanized or made from corrosion resistant material. Where visible on panel fronts, such components must be of stainless steel.

All cubicles, irrespective of the equipment being accommodated, must be of uniform height and depth. The fronts of the various cubicles must, as far as possible, be of similar construction so that the complete board presents a uniform appearance. The overall depth must not exceed 600 mm. The top of the uppermost operable device must not be more than 2000 mm from the ground and the bottom of the lowest operable device must not be less than 225 mm from the ground.

All boards must be of Form 3B segregation. The equipment associated with each individual lighting level must be treated as a separate outgoing functional unit.

The construction must be such that access is available for cabling and maintenance without exposing any busbar droppers.

Provide facilities for the safe slinging of the board for handling by crane. This must include provision for removable lifting eye bolts on top of the switchboard.

Shipping lengths of the boards must not exceed 2700 mm.

3.4 DOORS AND COMPARTMENTS

Unless approved otherwise by the Principal, provide heavy duty neoprene dust seals for all doors and removable panels. The seal must be glued and held in place by a continuous metal retaining strip. Door edges must be folded to provide a flat surface (not an edge) onto the neoprene dust seal when closed.

All metal door handles, hinges, screws and nuts must be the manufacturer's standard and suitably finished and protected against corrosion. Door handles must be lockable and the access doors adequately hinged.

Door openings must be large enough to permit the removal of equipment without interference to the construction and service entries.

All doors must be hinged and fitted with captive knurled screws. Doors with overall height less than 450 mm must have at least two (2) latching points on doors. Doors with overall height exceeding 450 mm must have three (3) latching points on doors.

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Door hinges must be of adequate strength to support the door and fitted with a stainless steel hinge pin. Exposed hinges must be chromium plated with all fixing screws fully concealed.

Live circuits above extra low voltages (ELV), which are exposed when the panel door is opened, must be fully shrouded.

Fit doors with hinges which will allow them to swing through on arc of 135°. Also fit these doors with door stays.

Lift off doors and covers must be fitted with lifting handles and must be retained in their positions when retaining bolts or nuts are removed.

3.5 EQUIPMENT LAYOUT AND ACCESS

Control equipment must be mounted on removable backing plates and must not be door or side mounted, except where approved otherwise by the Principal.

Provide a clearance of at least 40 mm between plastic trunking and terminal strips.

Mount all terminal blocks on the horizontal plane unless otherwise approved by the Principal.

All terminal blocks and device terminals must be accessible before and after the panel is fully wired with factory and field connections.

For the purpose of equipment interchangeability and minimising spares, use identical equipment wherever possible.

Provide a 240V single-phase general purpose outlet within the switchboard for test equipment purposes.

Provide a 240V single-phase fluorescent light operated by a door limit switch within the switchboard.

Individual panels within the distribution boards must comprise circuit breakers, adequately rated for the duty and must be installed complete with chassis within a separate compartment of the distribution board assembly.

Provide adequately sized terminal blocks for the termination of all outgoing and incoming cables, with 20% spare terminals, within control panels.

Main switches must be provided and must be adequately rated for full load continuous duty and must be load break. Main switches must not impede access by authorised personnel into the control panels for maintenance and/or troubleshooting, when the switches are in the “ON” position.

All equipment must be designed and laid out for ease of fault finding and servicing. Control equipment must be mounted on removable backing plates and must not be door or side mounted except for devices such as push buttons, selector switches and pilot lights. Provide a minimum of 15% of clear panel mounting space to permit the addition of future control devices.

Control devices mounted inside control panels of switchboards must have a minimum degree of protection of IP20. Control devices mounted on the face of control panels or switchboards must have the same degree of protection as the enclosures in which they are mounted or better.

3.6 CABLE ZONES AND ACCESS

Provide generous cable entries in all enclosures. Provide cable entries with removable undrilled metal gland plates. Install non-ferrous metal gland plates where single core cables are employed. Cable entries must be either from the bottom or top of the enclosure depending on the board/location and installation requirements. Bottom entry is the preferred method of cable access.

Provide cable zones within main switchboard in accordance with the following:

- (a) Vertical cabling zones must be provided adjacent to each cubicle and extending the full height of the cubicle. Zones must be of sufficient size to accommodate terminal blocks as shown on the drawings, and must allow front entry via removable covers;
- (b) A horizontal cable zone with removable bolted covers must be provided which must run the full length of the switchboard and connect with the vertical zones;
- (c) Cable zones must be provided to suit both top and bottom cable entry to the main switchboard unless otherwise specified in the data sheets;
- (d) All cable zones must be of sufficient size so that the ratio of the sum of the effective cross sectional area of the associated cabling and wiring to the minimum internal cross sectional area of the cable zones must not exceed 40%;
- (e) Cable zones must be sized to allow outgoing power cables to be terminated whilst maintaining at least the minimum bending radius of the cabling as recommended by the cable manufacturer;
- (f) Doors and covers for cable zones must be fastened by chrome plated, knurled head captive screws.

3.7 CURRENT TRANSFORMERS

Current transformers must be of the epoxy encapsulated type.

3.8 CONTACTORS

Contactors must be of the moulded block type construction and rated at 150% greater than the full load current.

Utilization category of contactors must be AC3 unless specified otherwise.

Main contacts must have a mechanical endurance of at least five million no-load operations.

Contactors up to 15 kW rating must be DIN rail mounted.

3.9 CIRCUIT BREAKERS

All circuit breakers must be continuous current and interrupting ratings must be selected to suit the circuit load.

3.10 INSTRUMENTS AND METERS

All indicating instruments must be 75 mm (minimum) square, flush mounting and taut band suspension with approximately 240 degree movement.

3.11 FUSE LINKS AND FUSE HOLDERS

The use of fuses must be approved by the Principal.

3.12 BUSBARS

Main busbars must be manufactured from copper, continuously rated, located in a separately enclosed chamber built into the general cubicle construction and completely segregated from other sections of the board. Provide a half-size neutral bar. All busbars and droppers must be colour coded in a permanent manner.

The busbar temperature rise above a weighted ambient temperature of 50 degrees Celsius must not be greater than 50 degrees Celsius for copper.

Provide an earth bar, running the full length of the board.

3.13 ELECTRICAL CABLING

Supply all cables necessary to complete the installation. All cable supplied must be for use on an effectively earthed system. All cables must have stranded copper conductors.

All wiring within the switchboard must be PVC, V105 insulated and must be multi-stranded copper conductors. Single strand wire will not be accepted.

Control wiring must be 1.5 mm² stranded copper conductors.

Power cabling must be stranded copper conductors and sized to suit the circuit load and, in any case, must not be less than 2.5 mm².

Cabling zones must be incorporated in the cubicles with liberal space for running and terminating the cables. Provision must be made for supporting the cables in the cable zone.

All final sub-circuit wiring within the switchboards must be combed out, harnessed and then fanned out in an approved manner. Make all terminations with approved crimp lugs using a ratchet type tool.

All cables must be harnessed and terminated so as to provide sufficient cable to allow for re-termination should the cable be damaged or broken.

All cables must have suitable glands and enter the switchboards via the gland plates or knockouts provided.

In accordance with AS/NZS 3000 and as shown below, all electrical cable cores must be colour identified according to their intended function.

- | | | |
|-----|-------------------------|--------------|
| (a) | A Phase | Red |
| (b) | B Phase | White |
| (c) | C Phase | Blue |
| (d) | Neutral | Black |
| (e) | Earth | Green/Yellow |
| (f) | 240V AC Control Active | Grey |
| (g) | 240V AC Control Neutral | Black |

(h)	D.C. Control Positive	Orange
(i)	D.C. Control Common	Brown
(j)	4-20mA Positive	White
(k)	4-20mA Negative	Black

Additional colours may be used as necessary to provide logical circuit identification. Any additional or alternative colours must be used only with the approval of the Principal.

Alternative colour coding will be acceptable for the flexible connection to individual tunnel luminaires with the approval of the Principal. Such alternative must be logical and consistent throughout the installation.

HOLD POINT

Process Held: Submission of electrical installation design information.

Submission Details: Preliminary electrical schematic wiring details.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

3.14 CABLE IDENTIFICATION

Label all new cables near the cable origin and destination terminations. The labels must be permanent straight cut type (minimum 5 mm black legend on yellow background). Hand written labels are unacceptable and legends must be either preprinted or generated on a hand-held label printer.

The marker holders or method of attachment to the cable must be permanent and must provide protection to the label. The marker holders must be securely attached to the cable and not be an adhesive-type attachment.

Submit details of the cable identification system to the Principal for approval prior to use.

3.15 LABELLING OF EQUIPMENT

All electrical equipment must be clearly marked with labels written in English. Except for Danger and/or Warning signs, all labels must consist of appropriately engraved WBW traffolyte material. Warning (or Caution) labels must consist of YBY appropriately engraved traffolyte material, whilst Danger labels must consist of appropriately engraved RWR traffolyte material.

Main labels must be located at the top of each item of equipment.

Each device installed on the front of panels must have a label describing the function of the device.

Circuit breakers connected to the live side of the main switch must have labels with the following:

DANGER

CONNECTED TO LIVE SIDE OF MAIN SWITCH

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All devices internal to equipment enclosures must be clearly identified by the relevant number appearing on the circuit diagram. Circuit breaker and fuse ratings (if approved by the Principal) must also be stated on the labels. These labels must be affixed adjacent to but separate from the devices.

Provide a label on the front of the switchboard and on each section, giving the equipment designation.

3.16 PAINTING

Before painting, all metal surfaces must be thoroughly cleaned, and must be free of all scale, grease, welding slag and spatter, by an approved method, and thoroughly dried. The surface must then be treated with an etch primer and undercoat and finished with two coats of semi-gloss enamel.

External Colour: to ASK 185 Colour 631 Light Grey

Internal Colour: White

4 WORK-AS-EXECUTED DRAWINGS AND MANUALS

Prior to acceptance by the Principal of the main switchboard and distribution boards, provide work-as-executed (WAE) drawings to the Principal in hard and electronic format for all drawings produced by the Supplier. Provide electronic copies on CD-ROM.

The above drawings must show all information necessary to facilitate future maintenance and operation. They must include accurate details, enclosures etc, and any modifications carried out by the Supplier to facilitate satisfactory installation or operation, representing departures from the Specification.

All drawings must preferably be in MicroStation version 8 or alternatively in AutoCAD version 2000 format with standard metric scale.

Prior to acceptance by the Principal, the Supplier must supply six (6) separately bound copies of manuals covering the Installation, Operating and Maintenance Instructions.

HOLD POINT

Process Held: Acceptance of Contract Works.

Submission Details: WAE drawings and manuals.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

5 SPARE PARTS

Submit a list of recommended spare parts prepared by the Supplier for two (2) years normal operation for the electrical equipment provided under this contract.

The list must contain the part number, current price and normal delivery times of each part recommended for stocking. The Principal may elect to purchase any of the items in the list. The list must be provided not later than one (1) month after awarding the Contract.

6 INSPECTION AND TESTING

6.1 INSPECTION DURING MANUFACTURE

Materials and equipment covered by this Specification are subject to inspection by the Principal at any time during manufacture at the manufacturer's premises, or those of a nominated subcontractor. No materials or equipment can be shipped until you have received notification in writing that the inspection requirements have been satisfied.

6.2 TESTING AT MANUFACTURER'S PREMISES

All equipment must be tested at the manufacturer's premises prior to shipment in accordance with the requirements of the appropriate Australian Standard and/or this Specification.

The Principal may witness these tests and you must give seven (7) days notice of the intention to carry out the tests.

Provide four (4) copies of the test reports within fourteen (14) days of the completion of the tests.

WITNESS POINT

Process Witnessed: Inspection of materials and equipment testing

Submission Details: Notify Principal, seven (7) days in advance, that the materials and equipment testing are available for inspection

ANNEXURE R153/A – PROJECT SPECIFIC REQUIREMENTS

NOTES TO TENDER DOCUMENTER: (Delete this boxed text after customising Annexure R153/A)

Where “Yes / No” options are shown below, delete whichever is not applicable.

Complete the table below by inserting the address of the storage depot, if applicable.

Clause	Description	Requirement
2.4	Equipment and materials supplied by Principal	Yes / No
2.4	If requirement for above is “Yes”, storage depot is located at:	
5	Spare parts to be stored at:	

ANNEXURE R153/B – MEASUREMENT AND PAYMENT

Payment will be made for all costs associated with completing the work detailed in this Specification in accordance with the following Pay Items.

Where no specific pay items are provided for a particular item of work, the costs associated with that item of work are deemed to be included in the rates and prices generally for the Work Under the Contract.

Unless specified otherwise, a lump sum price for any of these items will not be accepted.

Pay Item R153P1 - Design of Main Switchboard, Distribution Boards and Control Panels

This is a Lump Sum item.

The lump sum covers the design of the main switchboard, distribution boards and control panels.

Progress payments will be made on a pro-rata basis of work done under this item, having due regard to the duration of the Contract.

Pay Item R153P2 - Supply, Installation, Testing and Commissioning of Main Switchboard, Distribution Boards and Control Panels

This is a Lump Sum item.

The lump sum includes the supply, installation, testing and commissioning of the main switchboard, distribution boards and control panels and the supply to the Principal of all documentation covering the main switchboards, distribution boards and control panels.

Progress payments will be made on a pro-rata basis of work done under this item, having due regard to the duration of the Contract.

Pay Item R153P3 – Spare Parts

This is a Provisional Sum item.

This item covers the supply and delivery of spare parts for two (2) years normal operation for the electrical equipment provided under the Contract.

Payment will be made for the costs incurred for the supply and delivery of spare parts plus the provisional sum margin added in accordance with Clause 55.4 of the GC21 “General Conditions of Contract”.

ANNEXURE R153/C – SCHEDULES OF HOLD POINTS, WITNESS POINTS AND IDENTIFIED RECORDS

Refer to Clause 1.2.3.

C1 SCHEDULE OF HOLD POINTS AND WITNESS POINTS

Clause	Type	Description
2.1	Hold	Test certificates for degree of protection for equipment enclosures
2.3	Hold	Equipment and materials approvals
3.2	Hold	Design drawings and engineering data on main switchboards, distribution boards and control panels
3.13	Hold	Preliminary electrical schematic wiring diagram
4	Hold	WAE drawings and manuals
6.2	Witness	Materials and equipment testing

C2 SCHEDULE OF IDENTIFIED RECORDS

The records listed below are Identified Records for the purposes of TfNSW Q Annexure Q/E.

Clause	Description of Identified Record
2.1	IP test certificates
2.3	Equipment and materials information
3.2	Design drawings and engineering data
3.13	Preliminary electrical schematic wiring diagrams
4	WAE drawings and manuals for Installation, Operating and Maintenance Instructions
6.2	Inspection and test reports

ANNEXURES R153/D TO R153/L – (NOT USED)

ANNEXURE R153/M – REFERENCED DOCUMENTS

Refer to Clause 1.2.4.

TfNSW Specifications

TfNSW Q Quality Management System

Other TfNSW Documents

GC21 General Conditions of Contract

Australian Standards

AS 1216 Class labels for dangerous goods

AS 1318 SAA Industrial safety colour codes

AS 1319 Safety signs for the occupational environment

AS 60529 Degrees of protection provided by enclosures (IP Code)

Other Reference Codes

Local Energy Supply Authority

NSW Service and Installation Rules