

Construction Audit Process

Underground Developments

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Authorisations

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Review cycle	1 Year	

Responsibilities

This document is the responsibility of Engineering and Design, Tasmanian Networks Pty Ltd, ABN 24 167 357 299 (hereafter referred to as "TasNetworks").

Please contact the Engineering and Design 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

Version	Section Number	Details	Date
1.0	All	Initial version	January 2016
2.0	Appendix 8	Inclusion of final commissioning process	April 2016
3.0	Appendix 8	Addition of commissioning check sheet	April 2016
4.0	Appendix 4	Update of Works Change Request forms	May 2016
5.0	All	Updated document nomenclature to include Commercial and Industrial subdivisions. Updated final commissioning process	September 2016

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2. Purpose and Scope

This document outlines the audit process that applies to the construction of Underground Developments (UD) by a Developer under TasNetworks' Customer Choice framework. It sets out the audit criteria that the Developer must comply with prior to commissioning and transfer to TasNetworks and connection of the UD electrical infrastructure.

The process set out below is an overview only. Each audit will require collaboration between TasNetworks and the Developer to account for the Developer's program of works and other specific requirements of each UD. For that reason, this document is subject to:

1. The terms of any Connection Contract between the Developer and TasNetworks; and
2. The audit program and requirements agreed between the Developer and TasNetworks in relation to a specific UD.

For the purposes of clarification, an Underground Development does not include the following:

- Building Type substations;
- Fence type substations;
- Ground Mounted reclosers;
- Shopping centres;
- Large point loads;
- Embedded generation; and
- Overhead networks including interface or transition point such as Overhead to Underground Poles.

The construction audit process should also be read in conjunction with all relevant TasNetworks standards and specifications, which may include the following documents:

- Issue for Construction documentation;
- The Developer Guide for Underground Developments;
- TasNetworks Distribution Construction Drawings;
 - Kiosk Construction Drawings
 - Underground Construction Drawings
 - Public Lightning Construction Drawings
- TasNetworks Distribution Construction Specifications and Standards;
 - TasNetworks Electrical Testing Specification
 - TasNetworks Materials and Assemblies Document
- TasNetworks' Environment & Heritage Design and Construction Standard;
- <http://www.tasnetworks.com.au/safety/safety-at-work/>; and
- Guidelines when working near TasNetworks electrical assets.

3. Use of this document

This document will be updated periodically and is uncontrolled when printed. It is the responsibility of the Developer to ensure that the most recent version is used.

Nothing in this document should be relied upon by the Developer or any other person as a substitute for knowledge, experience, care or skill, or as a statement about that person's legal rights or obligations. It is the responsibility of the Developer and its contractors to comply with all applicable laws, standards and specifications (including relevant TasNetworks standards and specifications).

Abbreviations

ASP	Accredited Service Provider
AED	Accredited Electrical Designer
AEC	Accredited Electrical Constructor
BoM	Bill of Materials
BoQ	Bill of Quantities
CC	Customer Choice
CP	Conditional Proceed
DLP	Defect Liability Period
ITP	Inspection Test Plan
JRA	Job Risk Analysis
PC	Practical Completion
PoW	Program of Work
RADS	Request to Alter the Distribution System
SWMS	Safe Work Method Statement
TN	TasNetworks
URD	Urban Residential Development
UD	Underground Development which includes both URD and Commercial and Industrial subdivisions
WH&S	Workplace Health and Safety
RFI	Request for Information

4. Communications

TasNetworks and the Developer must each nominate at least one representative (**Nominated Representative**) to coordinate the audit process in relation to a development. TasNetworks' representative who forms the direct point of contact for the Developer to TasNetworks is known as the Liaison Officer, also referred to as TasNetworks' Site Manager.

Notice to Commence: At least four weeks prior to construction commencing, the Developer must submit a Notice to Commence (as set out in TasNetworks' UD Developer Guideline).

Preliminary Meeting: Prior to the commencement of works, the Nominated Representatives from each party must meet to discuss the works. The Developer must provide TasNetworks with a copy of the Developer's proposed program of works (Issue for Construction Documentation). TasNetworks and the Developer must agree an audit schedule and process, taking into account:

1. alignment with the proposed program of works;
2. TasNetworks' resourcing requirements; and
3. any audit requirements specific to the project

The audit program involves a number of stages and discussions. It is critical to have continual communication throughout the project to ensure the best outcomes are achieved.

Monthly Progress Meetings: The Nominated Representatives from each party must meet monthly to review the progress of the works and Audit Program. The Audit Program will be updated by TasNetworks as required throughout the course of the works following consultation with the Developer.

5. Audit Process

5.1 Audit Gates

The Audit Process agreed between TasNetworks and the Developer will be based around seven 'Gates', each relating to a different stage of construction:

1. Site Establishment Pre-Construction Audit;
2. Civil Works Commence Audit;
3. Conduit and Cable Audit;
4. Street Furniture Audit;
5. Reinstatement and Restoration Audit;
6. Substation/HV Switchgear/Transformer Audit; and
7. Documentation of commissioning switching sheet (AEC)*, terminations, Labelling and Testing, comprised of:
 - a. Field Audit; and
 - b. Design/Engineering Audit.

*Note: To correctly address the appropriate resource and develop the RADS, it is imperative the AEC's switching sheet for final commissioning is approved prior to the release of Gate 7

5.2 Audit Criteria

The criteria that need to be met in relation to each Gate are set out in the TasNetworks UD Audit Checklist (Appendix 1). In addition to those requirements, the audits must establish that the assets meet TasNetworks' safety and operational requirements (including compliance with the approved design and any relevant TasNetworks standards and specifications) in order to pass all seven Gates and be accepted by TasNetworks.

5.3 Audit Results

After each Gate, TasNetworks will issue the Developer with a report indicating whether the works have passed the audit, with one of three results:

	Result	Consequence
Pass and Proceed	Pass	The Developer may continue with construction until the next inspection point set out in the Audit Program.
Conditional Proceed	Fail: TasNetworks will provide the Developer with details of the defect identified and the rectification requirements.	The Developer may proceed with construction until the next inspection point set out in the Audit Program. The defects must be corrected before the next Gate can be passed.
Hold	Fail: TasNetworks will provide the Developer with details of the defect identified and the rectification requirements.	The Developer must cease construction until the defects have been rectified.

5.4 Inspections and notice requirements

While based on the seven Gates, the specific number and proposed timing of inspections for each project will be agreed by TasNetworks and the Developer at the Pre-Commencement Meeting.

The Developer must provide TasNetworks Liaison Officer with written notice of readiness to indicate when the works have reached an inspection point as set out in the Audit Program.

TasNetworks will use its best endeavours to conduct inspections within the following timeframes:

Gate	Minimum notice period
1-7	2 business days' written notice
Final Commissioning	At least 20 business days' written notice for RADS application following successful completion of Audit Gate 7

In certain circumstances, despite TasNetworks' best endeavours, TasNetworks may be unable to schedule an inspection within the above timeframes, or may be required to defer or cancel inspections (e.g. during a natural disaster or other emergency situation). In such cases the Developer must not proceed with construction until the relevant Gate has been passed. Unless it has been inspected and approved by TasNetworks, no transferable asset should be concealed, covered, buried or otherwise treated in a manner that will result in that component not being readily visible to a person attempting to view it. Any asset that is concealed or covered prior to inspection by TasNetworks must be uncovered at the Developer's cost.

5.5 Observation audits

TasNetworks may conduct observation audits in addition to the Audit Program at any time provided that:

1. TasNetworks will inform the Developer in advance that it intends to conduct an observation audit.
2. The Developer's Nominated Representative may, but is not required to, attend an observation audit.
3. If any defects are identified during an observation audit TasNetworks will provide the Developer with a written report containing details of the defect(s) and the rectification requirements.
4. If the Developer's Nominated Representative is not in attendance at the observation audit TasNetworks' Nominated Representative will photograph any non-compliances and provide a copy of the photographs to the Developer's Nominated Representative.

6. Approved Materials

It is a requirement of the Connection Contract that the Customer/Developer use equipment and materials from TasNetworks Approved Materials List. TasNetworks will check to ensure that any equipment and material used in the UD meets this requirement as part of each audit.

Any material and equipment which does not comply with TasNetworks' Approved Material List will be considered as non-compliant and result in a Hold Point until rectified.

The Developer must advise TasNetworks' Nominated Representative of the delivery of all major equipment so that TasNetworks can inspect the equipment prior to installation.

The Developer must ensure that TasNetworks' Nominated Representative is present for any testing of major equipment prior to installation, including cable testing.

Any pre-installation test that fails will result in a Hold Point for the UD and will require an additional site visit to witness successful pre-installation tests.

Appendix 1

UD Construction Audit Checklist (R389973)

Appendix 2

TasNetworks Observation Audit

OBSERVATIONAL AUDIT REPORT

Development Name		Date	
Development Address			
Development Representative			
TasNetworks Representative		TasNetworks Development No.	
TasNetworks Policy or Standards Reference	Details of Observation Audit	Pass	Fail
Notes:			

*This audit has been conducted in accordance with TasNetworks audit requirements

* This audit result be entered into the observation audit register for action and close out – including any safety or significant risk items into RMSS

Appendix 3

REQUEST FOR INFORMATION

Development_No_XXX

SUBJECT:

To:	
From:	
Requested by:	
Date of Request:	
Response Required By:	
Details of RFI:	
<p>To be compiled by the originator and must include the URD details (location)</p>	
Details of Response:	
Response By:	Date:

RFI Closed By:

Date Closed:

Appendix 4

Refer to the remaining pages within this appendix for information supporting the Works Change Request process.

This information is in the form of the following documentation;

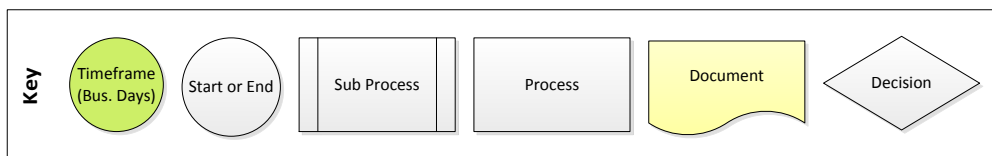
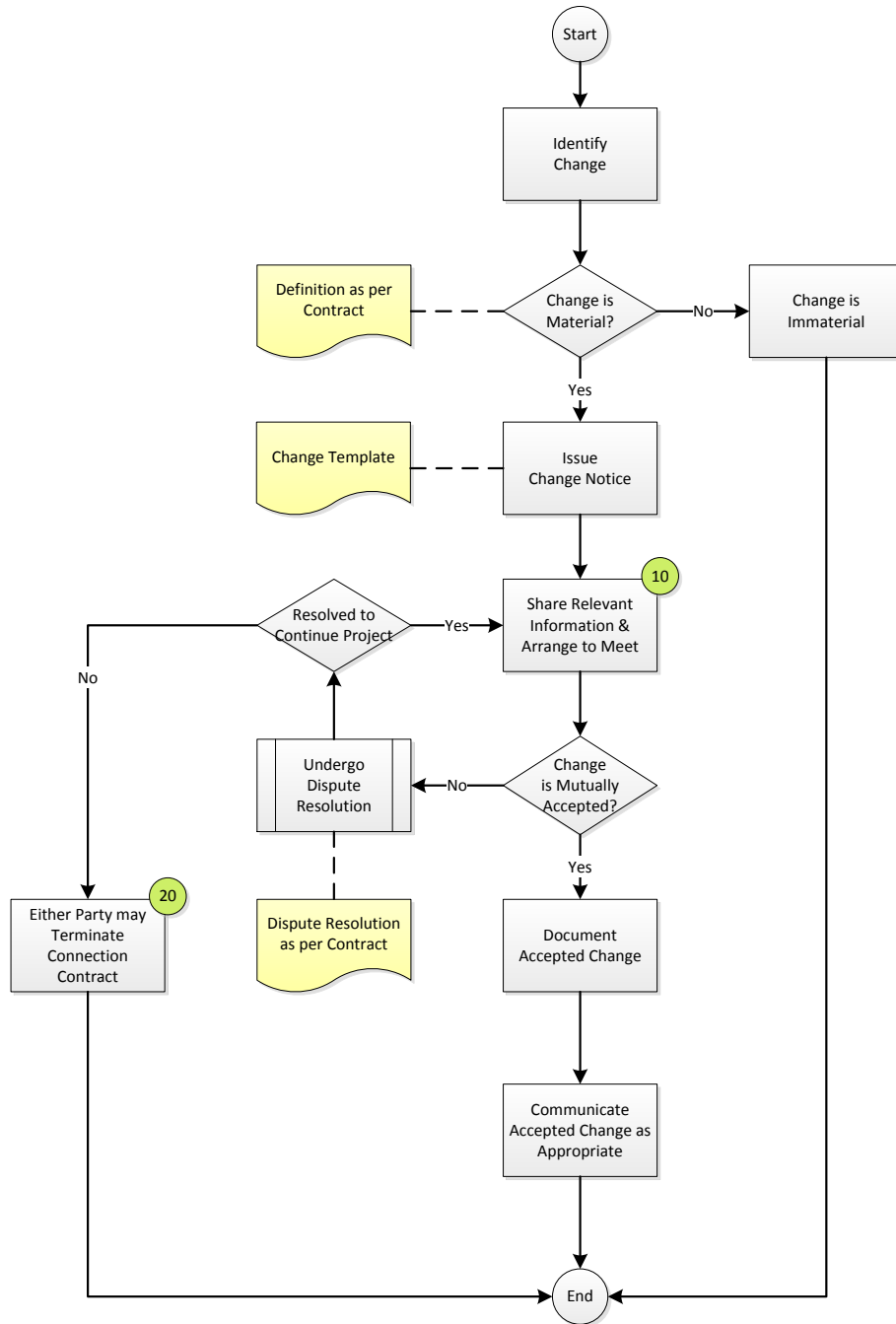
- Request Form
- Change Request Flowchart
- RASCI
- Definition of Material Changes

Works Change Request – Request Form

Change Request Details			
Date		Change Request No.	
Project affected by this change			
Initiated By			
TN Project Manager			
Reason for Change (Put an "X" in the box)	<input type="checkbox"/>	Environmental	<input type="checkbox"/>
	<input type="checkbox"/>	Design	<input type="checkbox"/>
	<input type="checkbox"/>	Scope	<input type="checkbox"/>
	<input type="checkbox"/>	Other	<input type="checkbox"/>
Type of Change	Tick Box		Provide Additional Details
	<input type="checkbox"/>	Error	
	<input type="checkbox"/>	Value Engineering	
	<input type="checkbox"/>	New/Additional Function	
	<input type="checkbox"/>	Obsolete	
	<input type="checkbox"/>	Work Method Request	
	<input type="checkbox"/>	Other (Please Specify)	
Accompanying documentation	Where there is a change to approved documentation, a marked up copy of that documentation has been attached.		
Further detailed reason for change			

Impact/Consideration				
Sign Off				
Name and Position				
Date				
Signature				
RFI Raised				
RFI Raised	Yes			
	No			
	N/A			
	RFI detail as applicable			
Additional Notes				
RFI Approved and Signed Off				
TASNETWORKS Change Finalisation and Closeout				
	Yes	No	N/A	
Variation Order Raised				
RFI Response Received				
Design Revised				
Design Resubmitted by TasNetworks or AED or Developer				
New Design Approved				
Email Correspondence Logged and Saved				
Change Request Log Updated				
TasNetworks' Project Manager / Engineer Final Check and Signoff				
Name				
Date				
Signature				

Works Change Request – Change Request Flowchart



Works Change Request – RASCI

Applies to Change Requests Initiated by **TasNetworks**

This table defines the roles and responsibilities required to undertake a works change request for connection choice identified applications.

TASK	TasNetworks' Liaison Officer	TasNetworks' Customer Representative	Customer
Identify change	RA	I	
Issue change notice (refer TasNetworks delegations framework)	AC	R	I
Share relevant information and arrange to meet	AC	R	C
Document accepted change		RA	
Communicate accepted change as appropriate	I	RA	I
<i>Where change is defined as immaterial</i>			
Change is immaterial	RA	I	
<i>Where change is not mutually accepted</i>			
Undergo dispute resolution	C	RA	C
<i>Where dispute resolution resolves in discontinuation of the project</i>			
Either party may terminate connection contract	CI	AS	CI

LEGEND	
R = RESPONSIBLE "The Doer"	The individual(s) who complete the task. Can be multiple parties for the one action (although one is preferable)
A = APPROVER "The Buck Stops Here"	The accountable person is the individual who is ultimately answerable for the activity or decision. This includes "yes" or "no" authority and veto power. Only one "A" can be assigned to an action. The accountable person must sign off (approve) work that responsible person provides.
S = SUPPORT "Plays a supporting role"	Needed to provide resources or play a supporting role or project team members.
C = CONSULT "Clarify our thoughts"	The consult role is individual(s) (typically subject matter experts) has information and/or capability and necessary to complete the work. It is two-way communication. Can be multiple parties for the one action.
I = INFORM "Keep in the Picture"	This is individual (s) who needs to be informed after a decision or action is taken. They may be required to take action as a result of the outcome but have no influence over the result. It is a one-way communication. Can be multiple parties for the one action.

Works Change Request – RASCI

Applies to Change Requests Initiated by the **Customer**

This table defines the roles and responsibilities required to undertake a works change request for connection choice identified applications.

TASK	Customer	TasNetworks' Customer Representative	TasNetworks' Liaison Officer
Issue change notice	R	C	I
Share relevant information and arrange to meet	RA	C	I
Document accepted change	R	R	
Communicate accepted change as appropriate	RA	I	C
<i>Where change is defined as immaterial</i>			
Change is immaterial	RA		
<i>Where change is not mutually accepted</i>			
Undergo dispute resolution	R	S	R
<i>Where dispute resolution resolves in discontinuation of the project</i>			
Either party may terminate connection contract	CI	AS	CI

LEGEND	
R = RESPONSIBLE "The Doer"	The individual(s) who complete the task. Can be multiple parties for the one action (although one is preferable)
A = APPROVER "The Buck Stops Here"	The accountable person is the individual who is ultimately answerable for the activity or decision. This includes "yes" or "no" authority and veto power. Only one "A" can be assigned to an action. The accountable person must sign off (approve) work that responsible person provides.
S = SUPPORT "Plays a supporting role"	Needed to provide resources or play a supporting role or project team members.
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I = INFORM "Keep in the Picture"	This is individual (s) who needs to be informed after a decision or action is taken. They may be required to take action as a result of the outcome but have no influence over the result. It is a one-way communication. Can be multiple parties for the one action.

Works Change Request – Definition of Material Changes

TasNetworks (2016) stipulates in the contract between the Customer and TasNetworks that;

The parties acknowledge that there may be **material changes** to the **Non-Contestable Works** and/or **Contestable Works**, including, for example and without limitation, where:

- i. changes are identified during the site inspection, design, construction and other relevant processes, including as a result of the confirmation or otherwise of various assumptions made about the **works**, as referred to in clause 3.1(c)(iv) of the **Construction Schedule** (for example and without limitation, redesign of reinforcements that might be required to cater for the actual site conditions);
- ii. heavy vegetation clearing is, and/or tree removals are, required;
- iii. these changes are needed because clause 6.2(e) of the **Construction Schedule** applies;
- iv. these changes are needed to remove, overcome or mitigate the effects of, or caused by, a **force majeure** event or a **latent issue**;
- v. there is any delay in obtaining, or inability to obtain, any required **approvals** or **land interests**;
- vi. there are prolonged or unreasonable delays in commencing or completing the **Non-Contestable Works** that are attributable to **Customer's** actions;
- vii. there are changes to any **final design documentation** or **works** plans;
- viii. there are changes to the inputs and assumptions underlying the **Design Scope** or the **price**;
- ix. something adversely affects the ability of a party to meet a milestone or relevant completion date, which, in **TasNetworks'** case, may require **TasNetworks** to re-schedule or subcontract the whole or a part of the **Non-Contestable Works** (which may have both cost, timing and scope impacts on those activities);
- x. there is a substantive discrepancy between the amounts paid by **Customer** and the amounts which **TasNetworks** is entitled to receive under the **Connection Contract**;
- xi. **Customer** makes relevant changes to the **works** on **Customer's** side of the connection point;
- xii. **Customer** makes a specific request for the change;
- xiii. there is a need to realign the timing and/or content of the **Non-Contestable Works** with the **Contestable Works**; or
- xiv. there is a relevant change in **law** or a **technical or safety obligation**.

Reference

TasNetworks 2016, Standard Construction Terms and Conditions for Contestable and Non-Contestable Works, v2.0 as at 09/16, pp. 12

Appendix 6

Certificate of Completion – Electrical Works and Civil Works

The certificate of Completion for both Electrical Works and Civil Works can be found in TasNetworks Underground Development Construction Specifications

Appendix 7

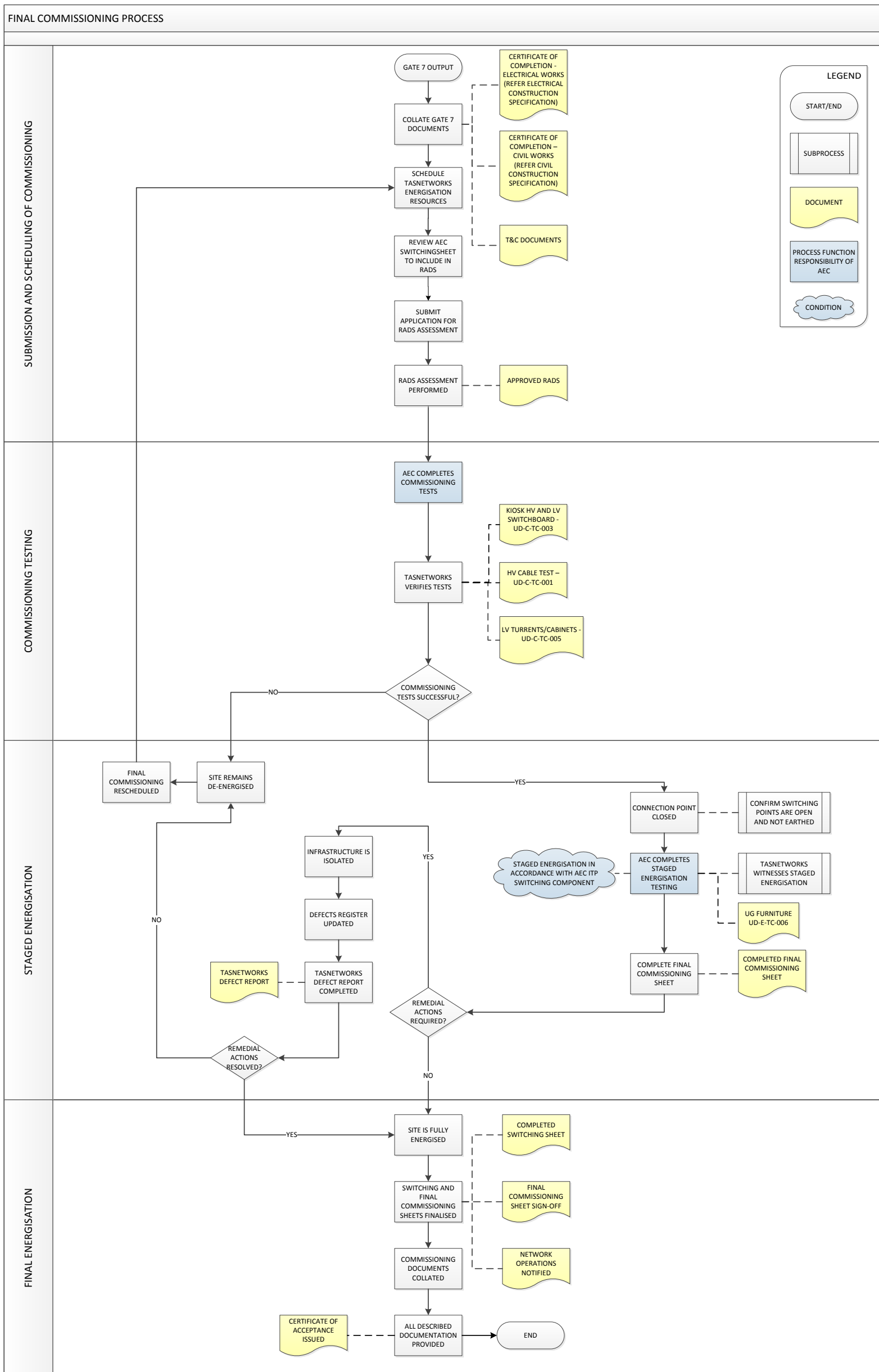
As Built Documentation and Completion Records

The Connection Contract contains a number of preconditions to issue of the Certificate of Acceptance including the provision of “as built” documentation by the Developer which shall include but not be limited to:

- Copy of the approved design/s
- Approved BoM with quantities
- Signed Red line mark ups on design to prove compliance
- Electrical Testing documentation
- Excavation and or trenching permits
- Inspection Test Plans (ITPs)
- Request to Alter the Distribution System (RADs)
- Power system access
- Site Correspondence, refer Appendix 5
- Electrical and Civil Work Certification, refer Appendix 6
- Site photographs – naming convention as Gate No, Audit Item Number, Photograph number as the following example provides:
 - Gate6_6.10_001
 - Gate4_4.4_004
- Bore logs
- Environmental, Aboriginal Heritage, European Heritage and Stakeholder Permits (including council permits)
- Easements and Wayleaves
- GIS survey details
- Occupational Licensing Act (OLA) Certification
- Copies of all delivery dockets of major equipment

Appendix 8

Final Commissioning Process





FINAL COMMISSIONING CHECK SHEET

Date:/...../.....
Rev 1



Project Details

Project/WASP ID:			
Project Name:			
Developer:			
Field Operator:		Project Manager:	
TasNetworks Testing Witness:		AEC Representative:	
AEC:			
ITP Switching sheet No. (AEC)		Switching sheet No. (TasNetworks)	

Commissioning test: (defined as work to be undertaken by AEC prior to any staged energisation. TasNetworks to witness testing)

Review Certificates of Completion - Electrical:

Certificate No	Certificate description	Test successful (Y/N)	Comments
UD-C-TC-001			
UD-C-TC-003			
UD-C-TC-005			

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Staged Energisation: (defined as the works carried out in accordance with the AEC ITP switching sheet for the site. The associated equipment shall be energised in a progressive isolated manner)

Switching Sheet components description	Y	N*	N/A	Comments
UD-E-TC-006 – All Toptronic test Passed?				
Confirm correct Polarity and Phasing for the site				
HV cable energisation completed successfully				
HV Switchgear energisation completed successfully				
Transformer energisation including setting correct tap position completed successfully				
LV Switchgear energisation completed successfully				
LV cable energisation completed successfully				
Turrets/Cabinets energisation completed successful				
As Built red line mark ups received				

***Any items identified as 'N' shall be included in the Defects Report**

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FINAL COMMISSIONING CHECK SHEET

Date:/...../.....
Rev 1



Final Energisation: (defined as full site energisation. The site shall have no outstanding items in the defect report, which were identified during staged energisation)

Final energisation document description	Y	N*	N/A	Comments
Collate and store all design and construction documentation				
Remove AEC locks				
Secure Kiosk Substation with TasNetworks locks				
Ensure all turrets/cabinets are closed and secured				
Ensure site is left neat and tidy				

General Comments:

Certification of successful completion of the Final Commissioning Check Sheet for Project ID: [.....]

TasNetworks Project Manager Name:	Employment No:	Date: .../.../...	Signed :
TasNetworks Field Operator Name:	Employment No:	Date: .../.../...	Signed :
Developer Authorised Representative Name:		Date: .../.../...	Signed :
AEC Authorised Representative Name:		Date: .../.../...	Signed :

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FINAL COMMISSIONING CHECK SHEET

Date:/...../.....
Rev 1



Defects Report: (register to capture defects items identified during staged energisation only)

Project ID:			
Project Name:			
Developer:			
Field Operator:		Project Manager:	
TasNetworks Engineer:		AEC Representative:	
AEC:			

Legend:

Major: sustained primary equipment damage such as arc/smoke	Medium: deterioration of insulation medium on LV and HV assets	Minor: evidence missing or protection setting related
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Defect No.	Date raised	Affected Assets	Issue Type (design/construction)	Severity (major/medium/minor)	Estimated Resolved Date	Resolved Date

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