

Marlborough Lines Network Standard

CN004 As-built Standard

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1 General

1.1 Purpose

This technical standard describes the requirements and processes that shall be followed when recording information on Marlborough Lines assets.

1.2 Scope

This technical standard is applicable to all employees and contractors who produce field recordings of network assets.

1.3 References

The following documents are referred to in this standard or provided background material for the development of this standard:

Document	Description
SM-EI parts 1, 2 & 3	Safety Manual – Electrical industry
HSE Act	Health and Safety at Work Act 2015
MLL Design Standards and Drawings	MLL Network design standards and standard drawings
Forms	As-built forms where information is to be recorded. All available on Mango and mobility devices.

1.4 Definitions

The following definitions are referred to in this standard

Definition	Explanation
Abnormal list	<p>A list maintained by the Control Room representing changes to electrical equipment’s status on the Network that are either temporary or not yet documented within the appropriate source of truth system.</p> <p>It also includes any newly installed equipment when it is capable of being livened via a switching operation.</p> <p>Other events are installation of temporary fault indicators, removal of fault indicators or fault indicators that are known not to operate properly.</p> <p>Radio repeaters or communications equipment that will impact on remote Network operations or data collection.</p> <p>Other equipment failures or suspect operation that may compromise Network operations.</p> <p>Security risks for locked doors or gates are also recorded on the abnormal list.</p>
As-builts	<p>Information records which detail changes to Network equipment. They are used to record:</p> <ul style="list-style-type: none"> • What was installed, modified, removed • Where it was built

	<ul style="list-style-type: none"> • When it was built • What the relationship to surrounding equipment is • Who built it. <p>Equipment is sometimes designed (planned work), and as-built data confirm exactly what was installed, modified or removed in the field as often this can deviate from the design. In some situations (e.g. faults), works are not planned and therefore no designs are prepared. The only record of changes to the equipment is through the capture of as-built data.</p> <p>Information is generally entered into EAM (MLL’s Asset and Works Management system) and Milsoft (electrical connectivity program). Equipment information is currently viewed through MLL’s GIS viewer, Netmaps.</p> <p>Critical electrical equipment information is also separately recorded on MLL’s schematics (single line diagrams). Other information may be held in the drawing management system – such as substation drawings, wiring diagrams etc. This type and level of information is not held in Milsoft or EAM.</p> <p>Equipment information is used by MLL staff on a daily basis – because of this it is essential that the information is as up to date and accurate as possible.</p>
As-built forms	Forms used to record physical and spatial details of equipment installed, removed or changed. The forms are available as separate documents. As a minimum, as-built forms (using the standard template forms) should be completed for each movement sheet. Additional as-built forms should be completed where movement sheets are not generated (for example for faults jobs, or for equipment such as poles, or cable ducts, or control and communication equipment).
As-built Settings Files	These are proprietary files that provide the complete operating configuration of a device. These files cover protection devices, controllers, PLC’s, RTU’s and communication devices.
As-built Settings Records	A standardised format used to provide a common platform for recording different device settings files. This provides the ability to compare key functionality between different devices and provides easy access for key users. This record is required for all protection devices.
Engineering Drawings	An engineering drawing is an as-built drawing of one or more MLL assets typically: zone substation drawings, switching stations, points of supply (GXP), Injection points, communication sites or equipment within such installations.

	<p>These drawings have the following possible status: Concept, Draft, Construction, As-Built, Superseded, and Cancelled. The Construction status means that the drawing has been approved and is issued for construction.</p>
Field book	<p>Record of as-built in the field, typically of cables. Includes plot of location of cable, photographs of cable in open trench with annotations as appropriate. Field books are typically scanned as a file and linked to a location in the GIS system.</p>
Movement sheets	<p>Documents generated by the Network Draughtsperson. They are used to create new equipment records, and include information about the new equipment, the work order (WO) it is associated with, and the location it is to be installed for example. Where known, equipment attributes may also be included. The movement sheets will be included in the Work pack. As-built data should be captured on As-built forms with details about the equipment (such as the equipment ID) being based on the information provided with the Movement Sheet.</p>
Network Drawings	<p>A network construction drawing is a design drawing showing all alterations, additions or removals to the MLL network. It is often a geo-referenced drawing based on a section of land base from the MLL GIS or in some cases a surveyor's drawing. These drawings may often be support by Network Standard Drawings or specific structure drawings to aid in construction. These drawings are to be as-built as part of the work pack and used for updating GIS and asset data.</p>
Schematics	<p>Schematics in this document refers to the MLL network single line diagram drawings. These are drawings that represent the 33kV, 11kV and low voltage networks. As-built schematics are known as the master, any modifications to the master are called an interim. Each interim has a strict process of approval before this can be issued. A job or project may contain multiple interim schematics. Approved interim schematics will be issued with the work pack as required and contain a stamp which will be used for capturing as-built signatures. Importantly, any deviations from the approved interim must be recorded as part of the as-built. Equipment that will be included in MLL Schematics will have two copies of interim schematic forms issued to the project manager by the Network Draughtsperson for inclusion with the work pack. One copy of the interim schematic will be the 'Master' and one will be a 'Copy' – this will be clearly labelled on each.</p>

Work pack	<p>The set of documents which details the extent of the work to be carried out on the MLL Network. A work pack may contain any of the following:</p> <ul style="list-style-type: none">• drawings (Network and/or Engineering)• schematics• forms• movement sheets• settings files and records• work instructions. <p>Generally, work packs are prepared for planned work. The work pack will contain all the required documents to be as-built.</p>
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2 Why we need good asset data

Asset data is fundamental to our everyday business. The following examples highlight why.

Safety

Knowing what assets we have and their attributes plays an important role in safety. If we have an issue on one piece of equipment, we then want to know where other similar equipment exists.

Regulatory

We are required to disclose each year to our regulator (the Commerce Commission), the quantity of our assets, the condition grade the assets are in, their ages, where they are located, and what their regulatory value is.

Financial

Our assets generate our revenue. Without assets, we cannot make money. Understanding our assets allows us to financially evaluate their viability – what the rates on return of our assets are, where further investments are required, how much investments may cost etc.

Environmental

We are required to report on SF₆ gas quantities for example. As such, we need to keep information on this type of equipment.

Operations and planning

Without good asset data, it is difficult to plan works and operations on the Network.

3 As-built requirements

This section sets out MLL's as-built requirements for obtaining and maintaining good asset data. The as-built requirements are broadly set out as:

- When as-builts are to be recorded
- What as-built information should be recorded
- And how to record the as-built information.

3.1 When should as-built information be collected?

As-builts shall be recorded anytime there are changes to Network equipment or certain components of equipment or when equipment information is missing, and a survey is requested. Changes typically include:

- Installation of new equipment (or a component(s) of equipment) onto the Network
- Modification of an existing Network equipment (or a component(s) of equipment)
- The removal of existing equipment (or a component(s) of equipment) from the Network
- The movement spatially of the equipment (i.e. relocation)
- Changes to asset labels (asset IDs), e.g. new pole label installed

- When equipment has been SCADA enabled.
- When equipment settings have been added or modified.

Physical changes do not include a change in the state of operation (e.g. closed vs open) positions of switchgear – this is instead reported directly to the Control Room.

Network equipment that should be covered by as-builts includes

- Poles (including replacement of cross arms and/or insulators, including when the existing pole is not changed, i.e. only a cross arm(s) or insulator(s) is replaced)
- Transformers
- Switches (ground mounted switches, pole mounted switches, indoor switches)
- Devices (fuses, reclosers, circuit breakers)
- Lightning Arrestors
- Fault Indicators
- Streetlights
- Cables (including all joints)
- Overhead conductor
- Distribution enclosures
- Control and communication equipment, including fibre optic
- Batteries (i.e. when batteries are replaced in reclosers and other Network equipment)
- Protection relays
- Ducts installed for cable runs (installation method, duct type, diameter, number of ducts)
- Earthing (types and length of earth wires and/or earth rods)
- Zone substation equipment and facilities
- Switching Station equipment and facilities
- Injection point (Load control) equipment and facilities
- Communication site equipment and facilities
- Points of supply (GXP) equipment and facilities relevant to MLL

Note that condition results are not deemed to be part of as-builts. These should be undertaken, as prescribed through various standards/procedures.

The following exceptions are in place to the above requirements:

- When a fuse is replaced by another of the same rating (even if the replacement fuse is a different manufacturer to the original). Importantly, if the fuse rating is different, then an as-built is required.
- When streetlight lamps are replaced like for like (i.e. if the manufacturer and model of the replacement lamp are the same as the lamp being replaced). While no as-built (i.e.

completion of all details on the streetlight as-built form) is required for this, details of the replacement lamp(s) shall still be passed to the Customer Works Manager as this information will be used for invoicing under the streetlight maintenance contract.

- When LV insulators are changed like for like.
- When miscellaneous non-electrical equipment/components such as possum guards, signs, and stay wires for example are replaced like for like.
- **Electrician contractors** – electricians who install service lines for consumers in accordance with the Marlborough Lines new connection procedure are exempt from this standard. For this work, as-builts are recorded through the new connection procedure, and as-built records are received by Marlborough Lines customer service team following works completion. The as-built records are then uploaded to Velocity's Gentrack, then forwarded to the GIS team for updating GIS/Milsoft and EAM.

However, when electrician contractors are working on ML Network assets, and/or assets that will be vested to the ML Network, they shall complete as-built information in accordance with this standard.

3.2 What information should be collected?

When changes to network equipment are made, as-builts shall include the following information:

- Where the asset(s) is. This may be confirming the location on the design plans (when provided), sketching a location relative to other known assets/features in the absence of a plan, by recording the asset ID and physical address or by recording GPS coordinates when possible. If a pole for example is installed to replace a faulty pole, but the pole is moved from the original location, the new location must be recorded through a sketch with dimensions from nearest known asset and then a GPS taken within 3 days.
- All Engineering Drawings use colour to indicate what is being added and removed and what is a construction note. All as-built modifications must be marked in red. Significant modifications should be communicated to and approved by Network Engineering. If a drawing requires no changes it is still to be signed, dated and marked as-built.
- Network Standard Drawings do not need to be as-built, however if there is a deviation from the Network Standard Drawing this needs to be as-built.
- Approved interim schematics with the as-built stamp are required to be as-built (signed and dated) with any deviations marked. If no schematic sheets are provided (e.g. faults jobs) and changes are made, then single line diagrams illustrating the electrical changes shall be drawn. Additionally, if any schematic provided is shown to have an error this is to be marked up and provided as part of the as-builts or the MLL draftsman notified of the error.
- The changes made to the equipment (i.e. removed, modified and/or new). If only components of equipment are installed, then only those new components need to be recorded.

- Equipment that was not pre-labelled (i.e. pole tags not determined until installed in the field) shall have the installed labels added to the corresponding site plan and asset as-built form to clearly confirm the identification of each pole where it was installed.
- Completed as-built forms. For planned jobs the template forms for completing will generally be made available in the work pack (note that not all assets (e.g. poles, cable ducts, cables, conductor etc) will have movement sheets). These forms are also available on the mobility devices. The as-built forms stipulate the information that should be recorded for the various asset types.
- Any settings files or records provided shall be as-built. Settings files are to be read out of the device following testing and commissioning ensuring no subsequent changes are made to the device. The as-built settings files in the case of protection settings shall be named and as per the protection design standard. If changes are required to a provided settings file or settings record this **MUST** be communicated to and approved by Network Engineering. All changes are to be as-built. A settings record is required for all protection devices.
- For faults jobs, blank template as-built forms shall be carried in work vehicles and completed as required (these are also available on the mobility devices). This includes follow up work from initial faults, such as cars vs poles where the fault is restored initially, but the following day(s) poles are replaced.
- Photos of the equipment (should clearly identify the asset (photo which includes asset ID), and the asset in its wider surroundings (i.e. where possible show it in relation to other identifiable assets or physical features). The electronic folder location of any photos stored shall be recorded.
- Testing results where appropriate. Testing requirements are detailed in the TT000 suite of standards. Any test reports should be submitted with the as-builts and attached to the asset in EAM and or GIS.
- Commissioning forms/reports where appropriate.

3.3 Photos

Photos can be a good aid to the GIS Operators as they interpret the information contained within a Workpack. They can ensure the correct placement and connectivity of equipment.

Typical photos shall include:

- Equipment nameplates
- A general view of the work site at the completion of the work showing equipment placement and orientation
- Pole-top details, especially where a more complex installation is made
- Equipment locations including a reference point such as existing pole/box, street intersection, building, driveway or boundary peg.
- Detail views – e.g.
 - Clear view of entire transformer LV panel
 - Manufacturer's nameplates

- Open trenches – on larger jobs, can show trench location, ducts, etc.

3.4 How should the information be collected?

The following information is provided to set out requirements for typical work types where there may be some uncertainty with as-built information (i.e. what should be captured) and how the data should be captured.

3.4.1 Planned works will generally have (included in the work pack):

- **Network Drawings (Design (site) plan(s)).** This will illustrate the work to be undertaken and the assets involved. If there are any deviations from the drawings, then these should be noted, and the drawing signed as-built.
- **Engineering drawings.** For any zone substation, switching station, points of supply, injection points, communications sites engineering drawings will be provided. Deviations are to be marked in red and all provided drawings must be signed, dated and marked as-built.
- **Movement sheets.** Where equipment is planned for installation, removal and/or modification, the Network Draughtsperson will create the equipment records (asset ID's) in the asset management system (EAM) and print the movement sheets. The movement sheets include information pertaining to the work (i.e. the WO number, location, project manager etc.) as well as information specific to the equipment being installed and are included with the work pack. Missing attributes on the movement sheets do not need to be populated in the field, instead only the as-built form should be completed.
- **Interim schematics.** Along with movement sheets, interim schematics sheets are included in the work pack which illustrate planned **changes** to the schematics. Where interim schematics are available, the **Team Leader** shall sign off the interim schematic as soon as the work is complete and ready for livening, and return to the Network Draughtsperson.
- **As-built forms.** These should be prepopulated by the project designer for each new asset being installed and included in the workpack (preferably electronic). They must then be completed based on the works **undertaken** by the Team leader or nominated staff member. All fields must be filled out.
- **As-built Settings Files.** Settings will be provided pre-configured by Network Engineering for each device being added or modified. For remote devices such as reclosers and switches Network Engineering may just issue a settings record in lieu of a settings file. In this instance the field technician will generate the settings file from the settings record. Upon completion of testing and commissioning an as-built settings file read-out from the device is required to be provided to Network Engineering for review and filing. If changes to a provided settings file are required, this must be communicated to and approved by Network Engineering prior to as-building.
- **As-built Settings Records.** Settings records provide a standardised easy to read format that make it possible to compare device files. These are issued by Network Engineering to support a settings file or in the case of a remote device may be used by a technician to generate a settings file. These are required for all protection devices. If changes to a

provided settings record are required, this must be communicated to and approved by Network Engineering prior to as-building.

- **Wiring drawings.** Electrical wiring **diagrams** (for substation type work typically) may be provided for planned work. Deviations to these plans should be marked up.

Photos shall also be taken of the equipment that is included in the work pack. Photos should be downloaded to a project folder (electronic folder) or other such appropriate location, and the location recorded so that it is obvious where the photos can then be accessed and linked through the GIS viewer, if appropriate.

3.4.2 Faults jobs

All fault jobs must provide as-built documentation where there are changes to equipment as outlined in Section 3.1. This includes, but is not limited to, the following fault types:

- Streetlight faults (where lamps are replaced, labels are modified, poles are replaced etc)
- Car versus pole (replacement of pole(s) and associated components) or other equipment
- Cable faults (especially where new cable joints are installed)
- Damaged transformers
- Damaged enclosures
- Replacement of cross arms and/or HV insulators
- Replacement of service lines and/or service poles
- Replacement of protection or communication equipment

If the as-builts include any equipment displayed on the schematics or Engineering drawings, a copy shall be made indicating the changes and passed to the Network Draughtsperson.

Photos must be taken before (i.e. of the damaged equipment) and after to illustrate changes to Network equipment. Sketches should be made to illustrate the location of the works undertaken using the as-built forms

A process diagram for faults jobs illustrating the various steps and responsibilities is presented in Section 6.

3.4.3 Control Room

The Control Room will record changes to Network equipment on abnormals where appropriate, based on communications with field staff when operating/working on Network equipment. The abnormals are managed by the Control Room. The Network Draughtsperson and Control Room liaise to ensure that, when and where appropriate, the abnormals equipment list reflects the schematics (and vice versa) in terms of equipment that is operational on the Network.

3.5 What to do with the as-built information

Once completed and signed off as complete and accurate in accordance with the process (refer Section 6) as-builts are to be scanned and saved to the relevant project/WO folder.

The WO should be changed by the Project Manager – Works Delivery managing the as-builts to 'As-builts submitted'.

Hard copies should be returned into the work pack. The work pack, once all other job/project documentation is complete, can be returned to the Project Manager – Works Delivery for appropriate review and filing.

For faults jobs, the as-builts should be scanned and attached to the EAM WO. The status should be updated to 'as-builts submitted'.

The GIS team shall routinely check the EAM inbox for faults WOs and planned works WOs that are in a status of 'as-built submitted'. Further detail is provided as follows.

3.5.1 EAM Work Orders

EAM WOs will be used to manage the tracking of as-built records. When as-builts are completed and ready for submitting to Network, the project manager will move the corresponding EAM WO for which the as-builts relate on to a status of 'As-builts submitted'.

The person responsible for EAM WOs (up to the status of 'as-builts submitted' will be:

- For planned works (capex and customer), the Project Manager – Works Delivery involved in the works;
- For maintenance works, the Project Manager – Works Delivery project managing the works;
- For fault jobs, the Dispatcher.

Network will then be able to track all jobs where as-builts have been submitted and will then know which as-builts need to be actioned. Network can then close out the EAM WOs once the as-builts have been entered into the relevant systems.

The Project Manager – Network overseeing non-MLL external contractors will be responsible for updating the WO records as outlined above.

4 Detailed requirements for specific equipment

4.1 Underground

Underground As-Built Drawings are to be provided where any alteration, addition, maintenance or removal to the MLL Underground Network has been undertaken. Each As-Built Drawing is to be accompanied by the appropriate As-Built Form/s with detailed information.

The location of underground cables shall be plotted using GPS (to sub-10cm accuracy) at no greater than 10m intervals in a straight line, and at any change in direction.

4.1.1 Drawing Details

All Underground As-Built Drawings shall contain the following details on Equipment installed and where applicable must show the circuit connected to:

- **Transformer** - Equipment ID, number of phases, fusing size, location, and circuit fed from.

- **Switchgear** - Equipment ID, location, normal state, circuit fed from.
- **In Use and Spare Ducting** - position referenced to boundary lines, type & size.
- **LV Distribution Boxes** - Equipment ID, number of switch ways and IDs, normally open/closed points, indication of where each cable is fed from and what it feeds (e.g. sub number or LV position number).
- **Service Boxes** – Location, Equipment ID.
- **Service Cables** – Box/Pole connected to, type & size, number and colour of phases connected, direction.
- **Streetlights** - Pole connected to (Equipment ID), lamp type, lamp wattage, location of receiver relays, outreach column, fitting type.
- **Earthing** – Location of earth rods and buried wires.
- **Cable Joints** - Location, circuit they are in, type of joint.

Where ducts are installed without cables, the GPS positions marker balls of ducts shall be recorded and marked up on a site plan and returned to MLL Network. Other information about ducts shall be captured.

For trenchless directional drilling, the borehole profile (i.e. borehole path and depth) must be tracked and plotted using either a walk-over, a wire-line or a gyro (or equivalent) locating system.

The most commonly used system will be the walk-over where a handheld locator is used to determine the position and depth. The position and depth should then be recorded on the surface above the borehole.

4.2 Overhead

Overhead As-Built Drawings are to be provided where any alteration, addition, maintenance or removal of the MLL Overhead Network has been undertaken. Each As-Built Drawing is to be accompanied by the appropriate As-Built Form/s with detailed information.

For planned works, poles (and their components) and conductor will typically be specified on the design plan(s) which is included with the work pack. If there are any deviations/changes to the components than what is specified on the design plans, then these shall be noted on the plan accordingly.

4.2.1 Drawing Details

All overhead As-Built Drawings shall contain the following details on Equipment installed:

- **Poles** – Pole ID, line route
- **Transformer/Regulator** - Equipment ID, number of phases, fusing size, pole fitted to, and circuit fed from.
- **Switchgear/Fuses (including reclosers)** - Equipment ID, location, normal state, circuit fed from.
- **Conductors** – Route, number of phases, termination points, type & size. Should be shown on the drawings as continuous.

- **Surge Arrestors** - Pole fitted to, circuit connected to.
- **LV Switches** – Equipment ID, pole fitted to, circuit(s) connected to (e.g. sub number or LV position number), status.
- **Service Lines** – Pole connected to, type & size, number and colour of phases connected, direction.
- **Streetlights** - Pole connected to (Equipment ID), lamp type, lamp wattage, location of receiver relays, outreach column, fitting type.

Note that all stub/support poles or two or more pole structures shall have a specific pole tag for each pole.

5 Location GPS reference points and dimensions

When a new subdivision is installed the GPS reference points should be adjacent equipment already shown in the GIS such as poles, pad mounted transformers, RMU, distribution and service pillar boxes etc. Also, an intersection of the road boundary and side property boundary can be used if it is in the GIS.

When a span(s) of overhead is replaced with underground the first existing pole at either end of the underground should be used as GPS reference points.

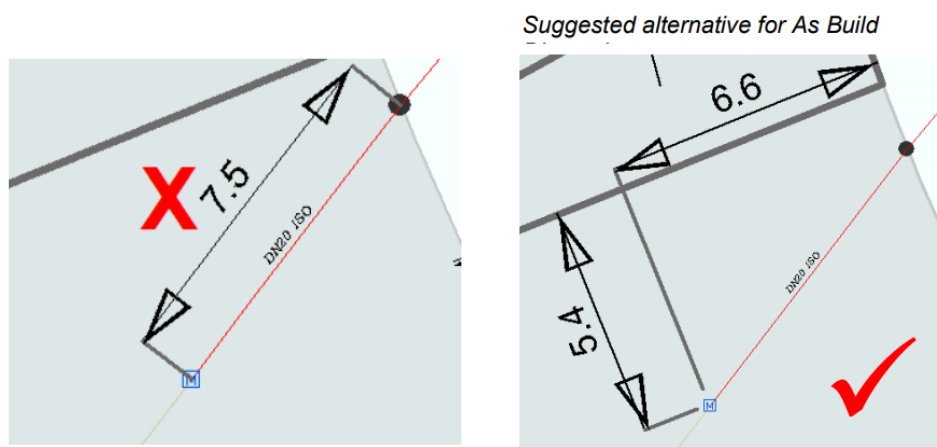
When a new overhead line is erected, or where a deviation to the existing line route is made (potentially in an emergency type situation) use the take-off pole if it is not replaced as a GPS reference point and adjacent existing poles that are in the GIS. Note that this is required for jobs that have not been surveyed and pegged out.

When an overhead line is moved for road widening the first existing pole at either end of the alterations should be used as GPS reference points.

When an underground road crossing is installed the existing take off point, e.g. pole, pillar, transformer, and a nearby road boundary and side property boundary intersection can be used as reference points.

Running dimensions along the property boundary with dimensioned reference points to equipment are required as the preferable method.

Angled dimensions **CANNOT** be accurately represented in GIS – refer to below.

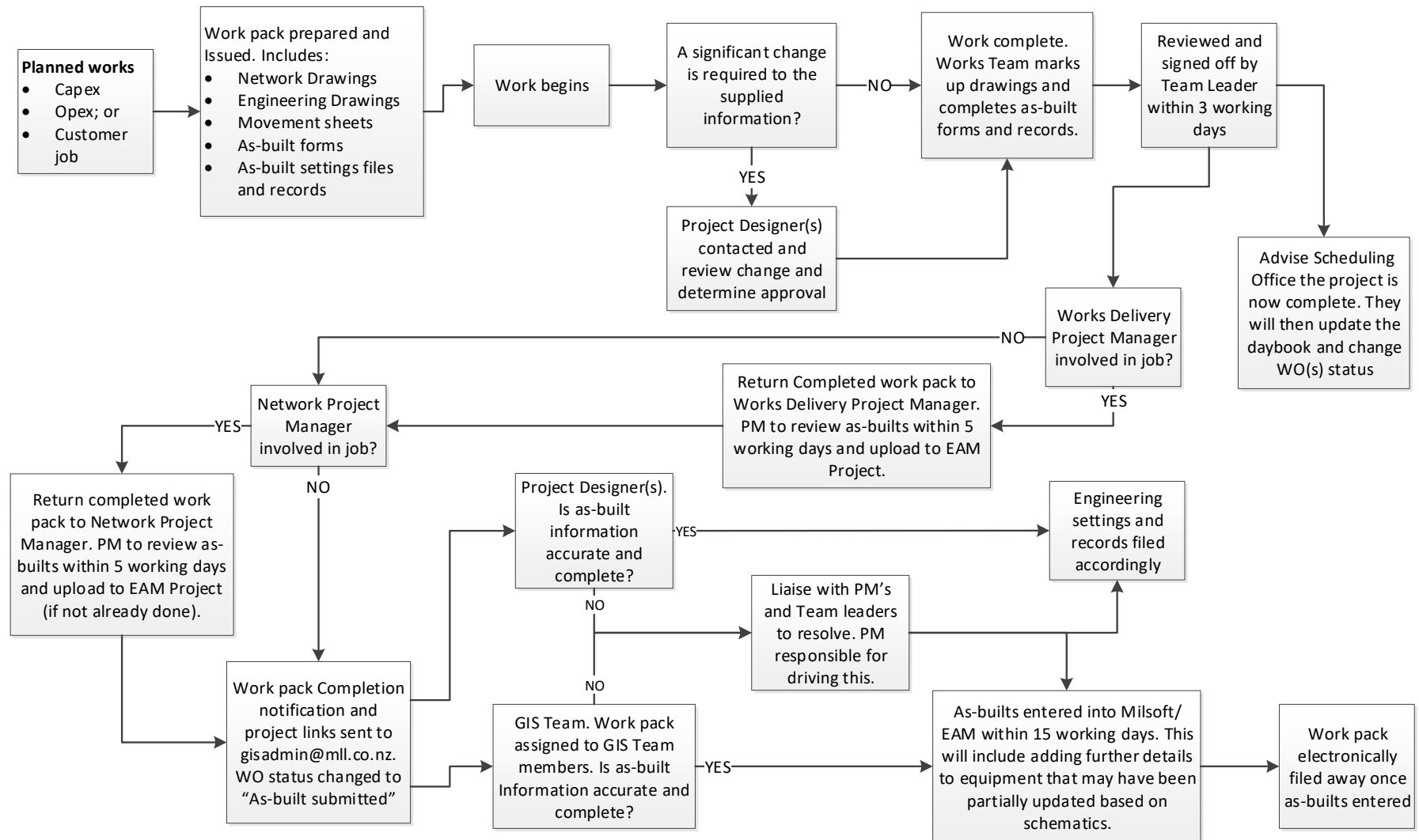


6 As-built process - workflow diagrams

Workflow diagrams are included to aid in the understanding of the as-built processes associated with this standard for planned works, fault work, and schematics on the following pages. Timings for each task are indicated.

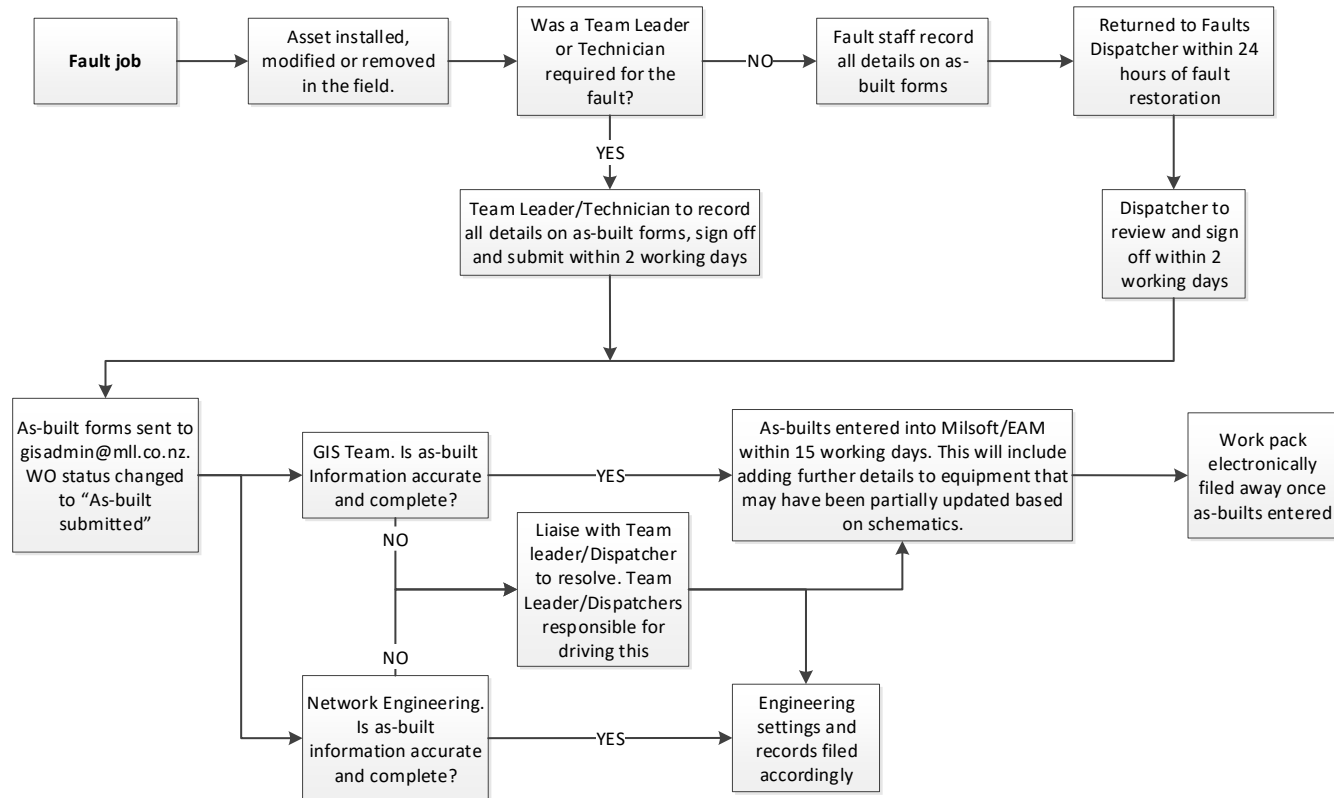
As-built process for Planned Work

Note – this excludes Schematics. For Schematics process, refer to separate workflow.



As-built process for Fault Work

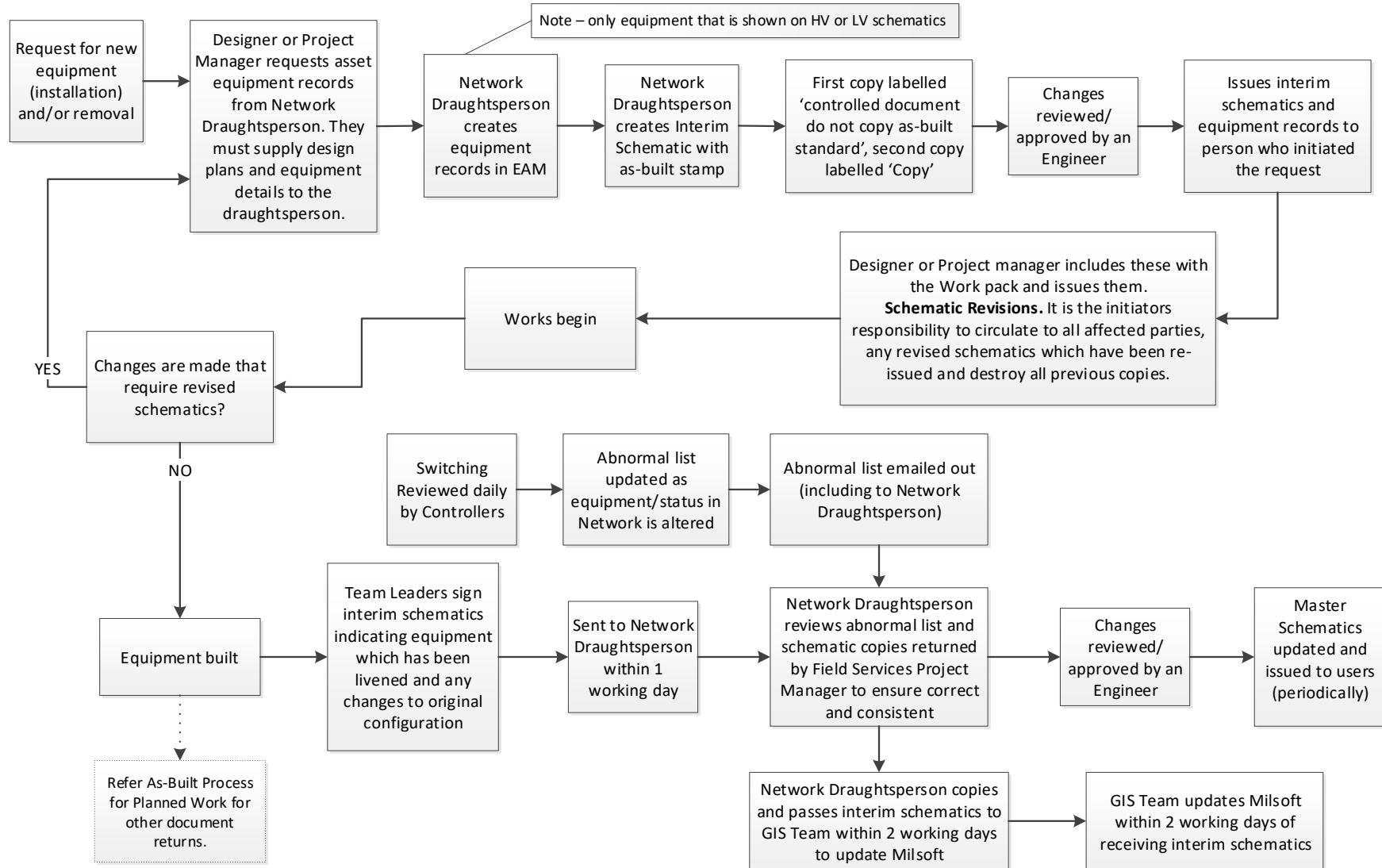
Note – this excludes Schematics. For Schematics process, refer to separate workflow.



Notes:

1. The above process diagram excludes chargeable fault jobs. Chargeable jobs will follow a different status path on the EAM Work Order (i.e. one that will include the 'Billing (NW Fault)' status).

As-built process for Schematics



7 Forms

As-built forms are available for completing as-built information in the field, master copies of these are located on mango and available on the mobility devices.

The objective of these forms is to allow the recording of electrical equipment information in accordance with the as-built standard and to ensure that that information is accurate and in a standard format.

The forms must be completed legibly, dated and signed by the person that recorded the information.

A list of available forms is below in Table 1

Table 1 - Available as-built forms

Form Number	Form Title
MLL F19	CABLE - Asset Information Form
MLL F104	DEVICE – CB, REC, SEC, Fuse Base Information Form
MLL F10	GNDS – Earthing Asset Information Form
MLL F18	POLES – Pole Asset Information Form
MLL F106	DISTENC – Distribution Enclosure Asset Information Form
MLL F109	FUSE – Fuse Link Asset Information Form
MLL F20	TRANS – Transformer Asset Information Form
MLL F107	FIBREC – Fibre Optic Cable Asset Information Form

8 Responsibilities

8.1 Marlborough Lines Staff

The following responsibilities are set out with respect to this as-built standard.

8.1.1 Network Engineering

Overall responsibility for this standard (including revising as and when appropriate and communicating with relevant staff).

Responsible for providing project engineering design and review as requested (i.e. may be a nominated Project Designer) and responsibility for maintaining engineering records, including but not limited to, protection and communication devices.

8.1.2 Project Designer(s)

May be one or several people on any given project. These can include Network Engineers, Line Designers etc. Where Network projects/jobs, or Customer projects/jobs have a designated project designer or designers, they shall be responsible for:

- Requesting equipment creation as appropriate through the Network Draughtsperson.
- Ensuring that the equipment ‘movement sheets’, interim schematics and relevant as-built forms are pre-populated and are provided to the Network Project Manager. If no Network Project Manager is assigned, then directly to the Works Delivery Project Manager.

- Ensuring that as-built information is technically accurate (makes sense), complete and captured/entered correctly upon return. Typically, at the request of the Project Manager.

8.1.3 Project Manager – Network or Works Delivery

The Project Managers shall be responsible for:

- Preparation of the work pack, ensuring that all required drawings, settings files and records, data and forms (including equipment ‘movement sheets’, as-built forms, testing sheets etc.) are included in the work pack and available for use by the field staff.
- Liaising with the Network Draughtsperson as required to obtain all necessary equipment labels, movement sheets, interim schematics and drawings etc.
- Liaising with Project Designers to ensure as-built information is technically accurate (makes sense), complete and captured/entered correctly.
- Reviewing as-builts returned by Team Leader, Project Manager Works Delivery or other contractor. This includes determining general completeness and accuracy of as-builts and requesting amendments/updates for omissions or obvious errors. Technical assessment of the as-builts may still required by the Project Designer(s).
- Submitting as-builts to Network and updating corresponding EAM WOs to ‘as-builts submitted’ status.

8.1.4 Network Draughtsperson

Responsible for the creation/modification of assets in EAM, printing of movement sheets and interim schematics for inclusion with the work pack.

Updating of the drawing management system and drawing files to reflect as-built changes as appropriate (i.e. for substation drawings, wiring diagrams etc).

Updating of schematic records to reflect proposed (interim) and actual (master) changes to the Network.

Regular monitoring of Control Room ‘abnormal’ list and liaising with Control Room and Team Leaders around any changes.

Passing on as-built schematic information to the GIS team for inputting to Milsoft as equipment is livened and once schematics have been updated.

8.1.5 GIS Team

Routine monitoring of gisadmin@mll.co.nz inbox and EAM ‘as-builts submitted’ inbox to see as-builts that have been returned, to ensure that as-builts are technically accurate (makes sense), complete and have been captured and are entered in a timely manner.

Entering as-built data in accordance with the relevant process, including appropriate checks and oversights are in place to ensure data integrity.

Liaising with the Project Manager to ensure all as built information has been interpreted and entered correctly and raising any omissions or errors in the as-built information.

Ensuring as-built data is readily available for staff’s use (i.e. viewable in relevant GIS system).

8.1.6 Network Controllers

Responsible for maintaining 'abnormal' list and distributing list to Network Draughtsperson (and others).

Confirming that all switching submitted is using the latest and approved interim schematic.

8.1.7 Dispatcher

Confirming that fault staff have completed and submitted as-built records during/following completion of fault jobs where changes to Network equipment have been made.

Updating WOs including scanning as-builts to WOs and updating status of WO as appropriate.

8.1.8 Field Services Managers

Ensuring that this standard is communicated to relevant staff and that it is followed.

8.1.9 Team Leaders

Recording of equipment (modified, installed and/or removed) data on as-built forms, asset photos, ensuring that data is complete, consistent and accurate. As the field staff are doing the physical works, it is fundamental that as-built data is captured at that time by them.

Data shall include marked up drawings showing spatial data of equipment (modified, installed and/or removed). GPS field data of new asset locations.

For underground cables, drawings shall show marked up plans with dimensions, unless as-builts being separately recorded as 'field book'.

Recording of testing results on equipment, including commissioning tests.

Return of as-builts to Project Managers for review/sign off in accordance with timing and quality requirements outlined in this standard.

8.1.10 Field Technicians and Electricians

Recording of equipment (modified, installed and/or removed) data on as-built forms, ensuring that data is complete, consistent and accurate.

Data shall include marked up Engineering Drawings in red indicating additions, removals and modifications.

Recording of testing results on equipment, including commissioning tests.

Return of as-builts to Team Leaders or Project Managers for review/sign off in accordance with timing and quality requirements outlined in this standard.

8.1.11 Fault staff

Fault staff shall be responsible for the following:

- Carrying current copies of blank as-built forms in their work vehicle so that they are available for the use in the field in fault situations. Or using their mobility device.
- Capturing all required as-built information (completed forms, photographs, sketches/drawings) as soon as possible after completion of the works when changes to Network equipment have been made.

- Returning as-built data to the Dispatcher and updating the Dispatcher on job progress.

8.1.12 All Staff

All staff shall ensure accurate asset data is collected and reported to the GIS team. If discrepancies with existing data are discovered you should collect the correct data, where possible, and advise the GIS team. Together we can all improve our asset data.

8.2 External Contractors

This standard shall be passed to external contractors by the MLL staff overseeing/managing the external contractor, who will also ensure that this standard is followed.

Recording of equipment (modified, installed and/or removed) data on as-built forms, ensuring that data is complete, consistent and accurate. As the field staff are doing the physical works, it is fundamental that as-built data is captured at that time by them.

Data shall include marked up drawings showing spatial data of equipment (modified, installed and/or removed).

Recording of testing results on equipment, including commissioning tests.

Return of as-builts to Project Manager for review/sign off in accordance with timing and quality requirements outlined in this standard.