



# Northern Powergrid

## Competition in Connections Seminar

**29<sup>th</sup> June 2023**  
**Hilton Hotel York**

## Agenda and housekeeping

What	When
Welcome	10.30
CinC update	10.40
Connections delivery	10.50
Access SCR	11.05
Transmission congestion	11.15
Break	11:30
ICP Inspection Audits	11:40
Health and Safety	11.45
Record information	12.00
Lunch	12.15
Drop-in sessions	13.00
Close	15.00





# Welcome and overview

**Mark Johnston**  
Head of Major Connections

Our RIIO-ED2 business plan as built around stakeholder insight and the needs of our customers



INVESTMENT



**>£500m**  
capacity



**>£1.1bn**  
resilience

POWER CUTS



**12%**  
fewer



**25%**  
shorter

A key commitments in our plan was to establish a Distribution System Operation business unit

The purpose of the Distribution System Operation (DSO) business unit is to:

Enable the accelerated connection of low carbon technologies to support decarbonisation in our region, whilst keeping customers' bills low.

**by doing more for less**

Maximising the useable capacity and sharing our network to optimise use of Distributed Energy Resources, reducing the need for new infrastructure.

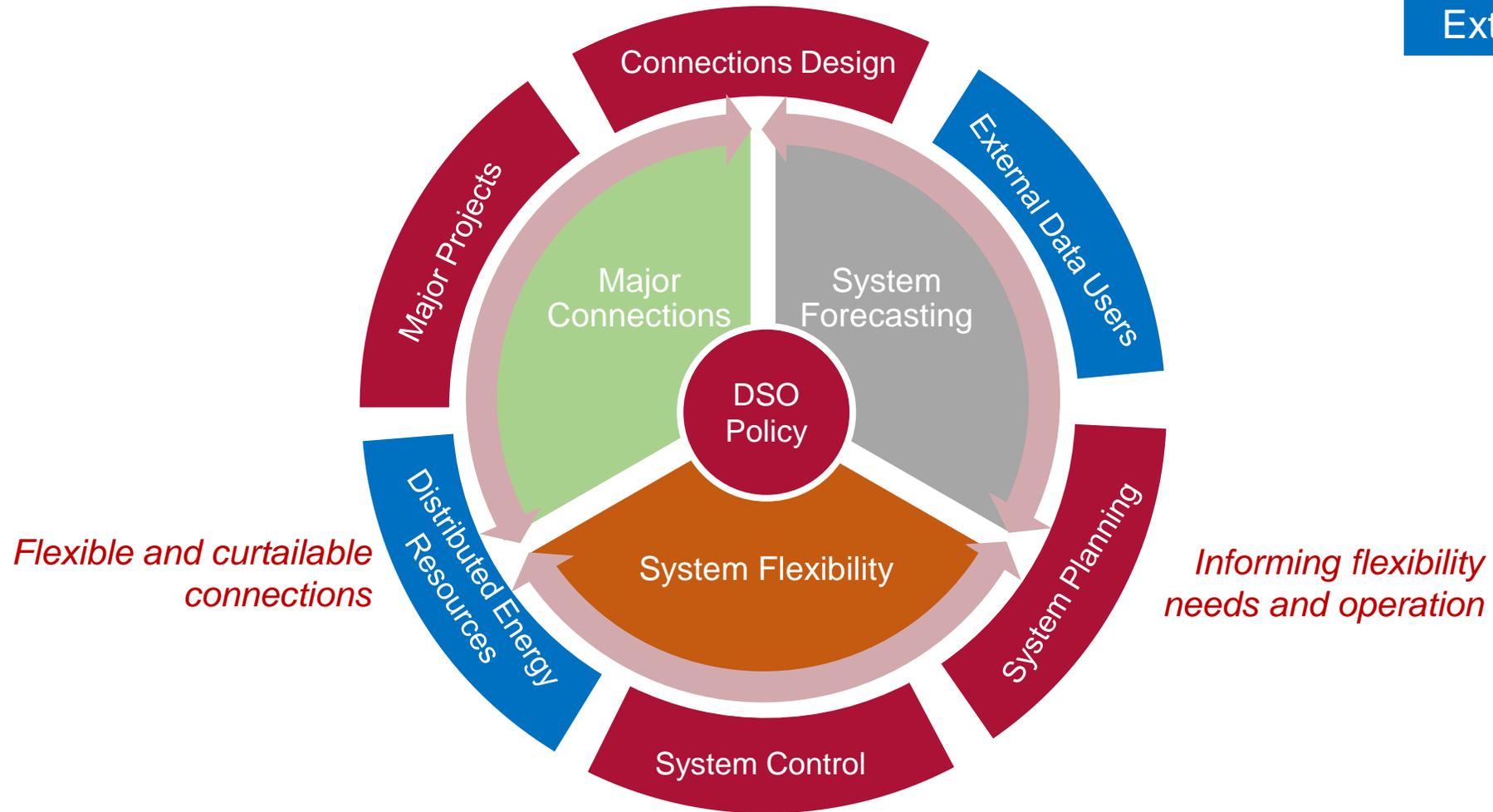


# Our four DSO teams are interlinked

*Increased provision of external data and information*

Colleagues

External interfaces



# Structure of our DSO business unit

Director of Policy & Markets

DSO Policy

Local Area Energy Planning

Transmission Network Access

DSO Transition

Quality and Standards

System Flexibility

DNO Procured Flexibility

New Markets

Flexibility Operations

System Forecasting

System Forecasting

Operational Visibility

Strategic Planning

System Visibility

Compliance

Major Connections

Connection Business Development

Connections Input Services



# Competition in Connections update

**Clare Roberts**

Connections Input Services Operations Manager

## SLC15 Dashboard summary

	2018	2019	2020	2021	2022	2023 - Week 25
Provision of PoCs	1660	1317	605	1889	2334	1140
Total number of acceptances	413	450	355	474	638	275
Technical Self-Determined	9	113	106	177	116	25
Matrix	432	324	124	439	523	779
Design Approval requests	632	748	459	1045	1117	571
Self-Approved Design	228	201	73	193	218	68



### What you told us...

- Consistency
- Senior management level interaction
- BCA autofill template
- Better information and clarity
- Updates to significant policies / databases
- Engineer assignment in Connections delivery



### What we've done...

- Consistent ways of working across all regions
- Looking at how we can do this in Q1 2023
- Discussing trial for LV schemes allowing IDNOs to self-fill the BCA
- Improvements to our CinC webpage
- Reviewing and simplifying our processes
- Updating all of our SLC15 application forms
- Engaging with our stakeholders to identify better ways of working
- Thinking about how we can keep you updated
- Internal briefs issued to all Programme Managers

# What's we're working on now...



- Simplifying the self determination process.
- Creating a self fill BCA template to allow IDNOs to submit BCAs for LV and minimise input services.
- Creating a design approval cancellation process for schemes which have lapsed validity.
- Updating our website to provide more useful information to our customers.
- Being a part of the One login platform project to ensure accredited ICPs have easy access to our records.



# Connections Delivery

Steve Crawford – Programme Manager (interim)

## Introduction and objectives

Explain the Northern Powergrid project stages.

Encourage a consistent approach across Northern Powergrid and ICPs.

Explain the actions required from Northern Powergrid and ICPs and highlight possible risks that might delay the connection.



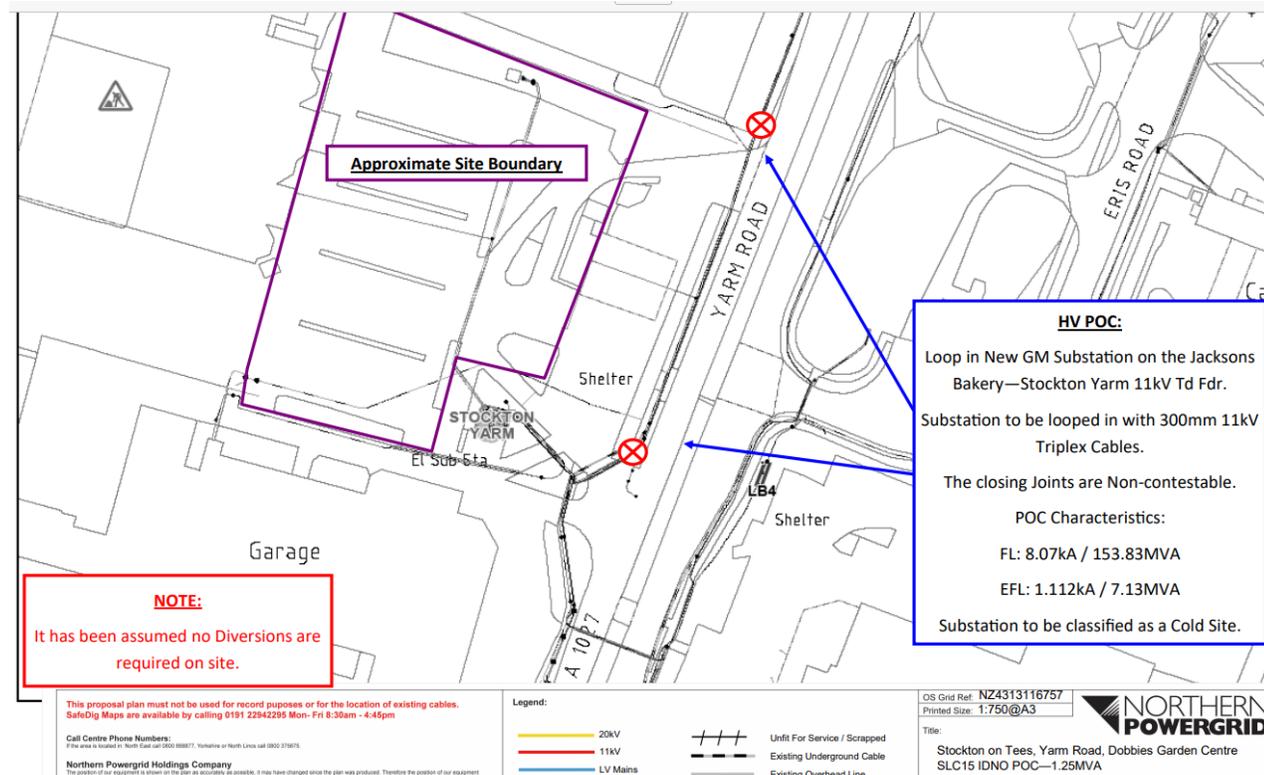
## Project scheme allocation – Stage 1 (PoC)

- Initial allocation to NPg Project Engineer, Wayleaves team, QA team and Information Management. The scheme will only have an intended point of connection with no further detail included unless additional reinforcement works are required.
- Allocations are coordinated as below:
  - Tracey Sugden – Northumberland, County Durham, Tyne & Wear, Teesside, North Yorkshire, Humber
  - John Turpin – West Yorkshire
  - Local Admin Team – South Yorkshire



## Project scheme allocation – Stage 1 (PoC)

- Northern Powergrid Project Engineer needs to review scheme content to confirm if any additional works are required to facilitate the connection. i.e. overlay works, bus bar extension, system alternation works. Any additional works should be progressed asap.
- The scheme remains dominant until a stage 2 (design approval) scheme is issued to the Northern Powergrid Project Engineer. The ICP must submit a design approval request within 90 days of the POC application. Failure to do this will mean cancellation of the POC scheme.



## Project scheme allocation – Stage 2 (DA)

- Northern Powergrid Project Engineer, Wayleaves team, QA team and Information Management will receive the stage 2 design approved pack. This pack will contain all detailed information for the connection.
- The ICP must submit whereabouts and may be subject to on site Quality Audits for any site works that are completed.
- The Northern Powergrid Project Engineer can prepare for the future connection request however no works can be arranged until a call off is submitted by the ICP.  
The final connection could be completed as Self Connect or Northern Powergrid connected.
- The ICP will submit a call off request when ready for a connection to the Northern Powergrid network.
- If the connection is to be made as ‘self connect’ the Northern Powergrid Project Engineer must confirm it is acceptable to allow the connection.

## Actions required for connection (1 of 2)

Following submission of the call off request the following actions will need to be completed.

- The Northern Powergrid Project Engineer must discuss the future connection with the ICP and understand the preferred connection date (either agreed or within SLC15 timescales).
- Status of the wayleaves (if applicable) to be confirmed.
- Status of any non-conformances on the site. All non-conformances must be resolved prior to connection.
- Confirmation that front and back edgings have been installed.
- Asset details for the switchgear to allow the info to be registered. The substation name to be passed to CinC team for BCA.
- As-laid records to be provided 48 hours prior to connection or within 48 hours after connection (if self connect).

## Actions required for connection (2 of 2)

- Completion and handover certificate to be provided no later than 48 hours prior to connection or within 48 hours after connection (if self connect).
- Northern Powergrid resources and materials to be booked for connection (if applicable).
- HV Outage to be arranged by Northern Powergrid or ICP (if self connect).
- Confirm BCA is in place - applicable to all IDNO connections.
- Confirm Schedule 1 Adoption Agreement is in place.
- Arrange site witness tests and obtain test results.
- Confirm substation is water tight, secure, accessible, allowance for bending radius, unswitched spur for FPI has been installed. (S/S installs),
- Northern Powergrid Project Engineer to arrange install of locks, labels, nameplates. (S/S installs).
- Completion & Handover certificate to be returned to ICP after connection has been made.
- Northern Powergrid Project Engineer to install any required labels (i.e. LV feeder way / link box) on network.

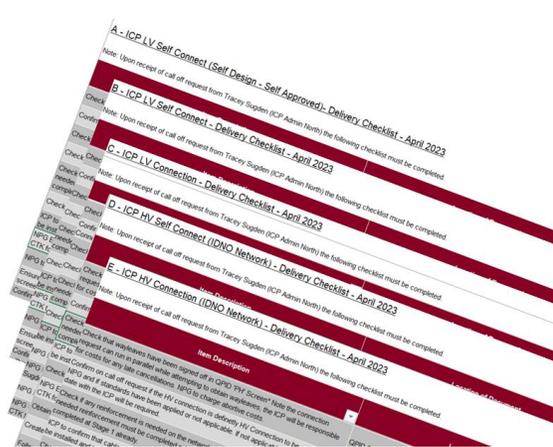
## Connection delays – room for improvement

Below is a list of things which could contribute to a connection delay or cancellation.

- Outstanding Wayleaves
- BCA not returned or fully signed.
- Schedule 1 not returned or fully signed.
- Front and back edgings not installed on site.
- Non conformances not resolved on site
- Asset data not provided in a timely manner by the ICP.
- Northern Powergrid Engineer not registering the substation site and assets in a timely manner.
- Additional Stage 1 works not completed in readiness for connection request.
- Excavation works not sufficient for connection.
- As-laid records not provided in time.
- Completion and handover certificate not provided in time.

# Future improvement actions

## Delivery Checklists



Issuing of delivery checklists to all Northern Powergrid Project Engineers to improve on the consistent approach. Planned issue date – Q3 2023

## Northern Powergrid Delivery Workshops



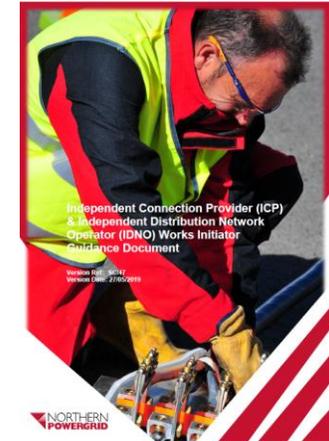
Regional face to face ICP delivery workshops with NPg connections teams. To promote a consistent approach and ensure teams are aware of the correct process. Planned completion – Q1 2024

## Rationalisation of Testing Procedures



Substation pre-commissioning testing to be reviewed for Northern Powergrid delivery works and ICP delivery works including ICP HV Self Connect. Purpose is to rationalise to a common standard to promote consistency. Planned issue date – Q3 2023

## ICP/IDNO Guidance Document



Comprehensive guidance document for the delivery of ICP projects. Covers full delivery for all ICP projects involved with LV and HV connections. Planned issue date – Q4 2023

## Points of contact

**Northumberland, County Durham &  
Tyne & Wear Region**  
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# Update: Access and Forward-Looking Charges Significant Code Review (the Access SCR) Lee Wells, Policy Lead, Commercial

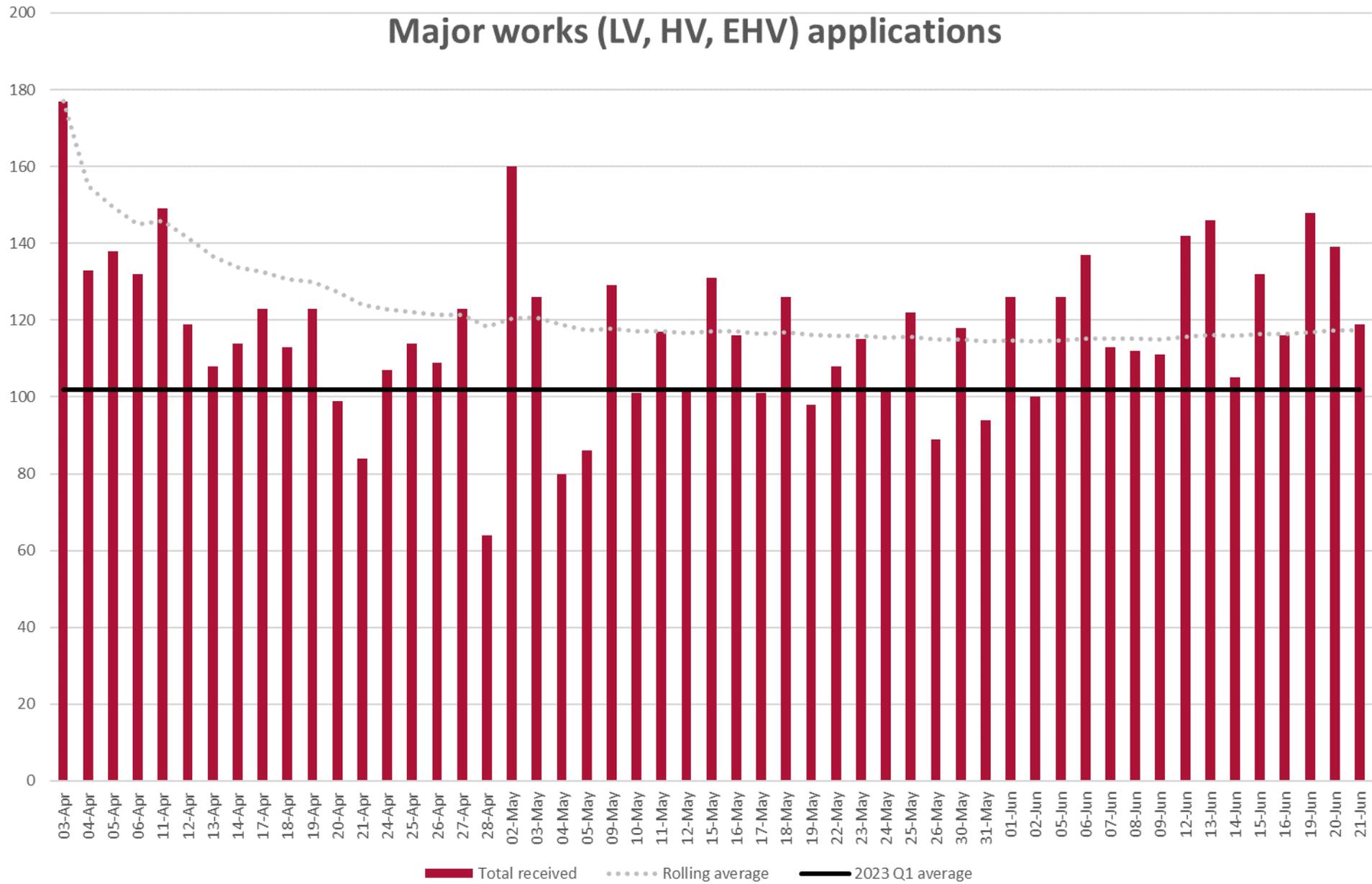
# Recap – What’s changed?

	Extension assets	Reinforcement assets at connection voltage	Reinforcement assets at connection voltage +1
Current arrangements	Connecting customer pays 100%	Connecting customer pays a proportion of the reinforcement costs	Connecting customer pays a proportion of the reinforcement costs
New arrangements (Demand)	Connecting customer pays 100%	Fully funded by the DNO via DUoS	Fully funded by the DNO via DUoS
New arrangements (Generation)	Connecting customer pays 100%	Connecting customer pays a proportion of the reinforcement costs	Fully funded by the DNO via DUoS

Demand Connection High-Cost Project Threshold	+	Speculative Development scoring system	+	Phased Capacity Site	+	Access rights: a Curtailable Connection
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# Major works (LV, HV, EHV) applications



## Case Study 1: Demand Connection cost saving

- Demand Connection seeking additional 1MVA (1,000kVA) – the **Required Capacity**
- No spare capacity: 5.33MVA will be delivered through Reinforcement – the **New Network Capacity**
- Total Reinforcement cost = £96k

Cost element	Pre-Access SCR	Post-Access SCR
High-Cost Project Threshold	n/a	1,000 x £1,720 = £1.7m (not exceeded)
Cost apportionment	$1/5.33 = 18.76\%$ £96k x 18.76% = <b>£18k</b>	n/a
<b>Total to Customer</b>	<b>£18k</b>	<b>£0k</b>
<b>Total to DNO</b>	<b>£78k</b>	<b>£96k</b>

## Case Study 2: A cautionary tale

- Demand Connection seeking additional 3.4MVA (3,400kVA) – the **Required Capacity**
- No spare capacity: 20MVA will be delivered through Reinforcement – the **New Network Capacity**
- Total Reinforcement cost = £12.0m\*

Cost element	Pre-Access SCR	Post-Access SCR
High-Cost Project Threshold	n/a	3,400 x £1,720 = £5.8m £12.0m – £5.8m = <b>£6.2m</b>
Cost apportionment	3.4/20 = 17% £12.0m x 17% = <b>£2.0m</b>	n/a
<b>Total to Customer</b>	<b>£2.0m</b>	<b>£6.2m</b>
<b>Total to DNO</b>	<b>£10.0m</b>	<b>£5.8m</b>

## Speculative Development scoring system

- Two criteria can avoid “speculative points” by providing a capacity ramp profile:
  - **Criterion 1: Programme (domestic and non-domestic developments)** assesses the development progress in relation to its overall duration and transparency from the date of application to completion of the final phase.

An application with a duration over two years does not receive “speculative points” if the applicant provides a **clear phasing plan** for the complete development.
  - **Criterion 3: Load profile** assesses the confidence of the forecasted level of phased capacity, where the Required Capacity is not immediately required and therefore caters for future usage.

An application where some capacity is for future expansion does not receive “speculative points” if the applicant provides an acceptable **capacity ramp profile**.
- We **will** request this information where relevant.
- **Please provide** to help **avoid** being a Speculative Development.

- Similar to Capacity Ramping for LDNO\* arrangements – **phased Required Capacity**.
  - Intended for an end user connecting direct to a DNO.
- Phasing will be set out in the Connection Agreement.
- Phased Required Capacity will be used as the Maximum Capacity for Use of System Charges.
  - Increase by default at each phase: potential significant impact on “residual” Use of System Charges.
  - Annual review will include capacity changes under reasonable circumstances.
  - Including clawback of unused capacity.
- Capitalised operation and maintenance charges **will** be applied.
- Must drive **efficient network development** where forecast usage grows over an extended period.
- We expect application activity in this area to increase, for example electrification of transport.

- ENA webinars
  - Overview of the Access SCR (December 2022): <https://youtu.be/6Au3IPOXZTw>
  - Detail on Access SCR connection charging reform (February 2023): <https://youtu.be/hN5DJeh74ZI>
  - Detail on “Curtable Connections” (February 2023): <https://youtu.be/YQqxm3gs9S4>
- Northern Powergrid website:
  - <https://www.northernpowergrid.com/access-significant-code-review>
  - FAQs: <https://www.northernpowergrid.com/downloads/12250>
- ENA guidance on Phased Capacity Sites:
  - <https://www.energynetworks.org/assets/images/ENA%20Phased%20Capacity%20Guidance%20FINAL.pdf>



# Transmission System Access

Martin Hardwick – Commercial Manager

- A national Issue with a high profile – impacting new connections to our network, largely for generation connections.
- Despite capacity on our network – transmission constraints are resulting in long lead times from National Grid, constraints could be at the GSP interface or 100 miles away.
- 80% of our GSP's are not able to accept new customers wishing to export without referral to National Grid.
- The queue to connect is dependent on reinforcement of the transmission network being completed.
- Nationally, over 40% of new generation capacity holding a connection agreement has a connection date of 2030 or beyond...
- ...and total contracted capacity exceeds ESO predicted future generation in every scenario in 2030 and majority in 2050.

- We are working with National Grid, Energy Networks Association and other DNOs on short and medium term measures to relieve congestion on the network, for example:
- National Grid ESO – 5 point plan published February 2023
  - Includes freeing up capacity to allow viable projects to proceed, adjusting design assumptions to access more capacity
- ENA co-ordinating collaboration through Strategic Connections Group, for example:
  - Delegating limits to DNO's to locally manage elements of the queue and changing the way the queue is managed to progress those ready to connect
- And working to address the root cause – ESO identified £54bn of investment in the transmission network building new overhead lines, reconductoring lines and introducing reactive power control solutions

- Northern Powergrid is additionally delivering on our commitments from our webinar held on 9 March with the ESO and NGET which centred around communicating more effectively with our customers
  - We are introducing a project progression summary on our website
  - Customers will be able to see how their projects are moving through the process for their GSP – enabling self-serve via regular updates to the website content
  - Heat map improvements – to give more information about the status of each area on our network, including transmission constraints where previously was distribution only
  - Stakeholder engagement – we are providing more opportunities for stakeholders to engage with us both regionally and nationally, with a follow up customer webinar scheduled for this summer

## Outlook for Transmission System Access

- Engagement across the industry will continue as initiatives move into implementation
- Some stalled projects will be removed from the queue
- Some ready to connect projects will move up the queue
- Some opportunities will arise for early connection with requirements for visibility and control for times when the network is under pressure
- We will keep customers informed as we build our internal capability within our DSO Business Unit

**Ultimately, we are seeking improvements for our customers in terms of timescales and offers.**



**Break**

**11.30-11.40**



# ICP Inspection Audits

Russell Tate – Field Audit Manager



# Health and Safety

Emma Williams – Delivery Manager



# Acceptable As-laid Record Standards

Brian Walton – Asset Data Production Manager

# Introduction

- Accurate records for all assets are vital for the safe and efficient operation of Northern Powergrid's electricity distribution network.
- This guide will outline, with the use of examples, the appropriate standards for drawing cable as-laid records.
- The aim is to prevent rejection of submitted records by providing/refreshing the knowledge required in order to submit drawings that are of an acceptable level of detail.
- All contractors, Independent Connection Providers (ICPs) and Independent Distribution Network Operators (IDNOs) who supply Northern Powergrid with records should use this guide to gain mutual understanding and consistency of records.

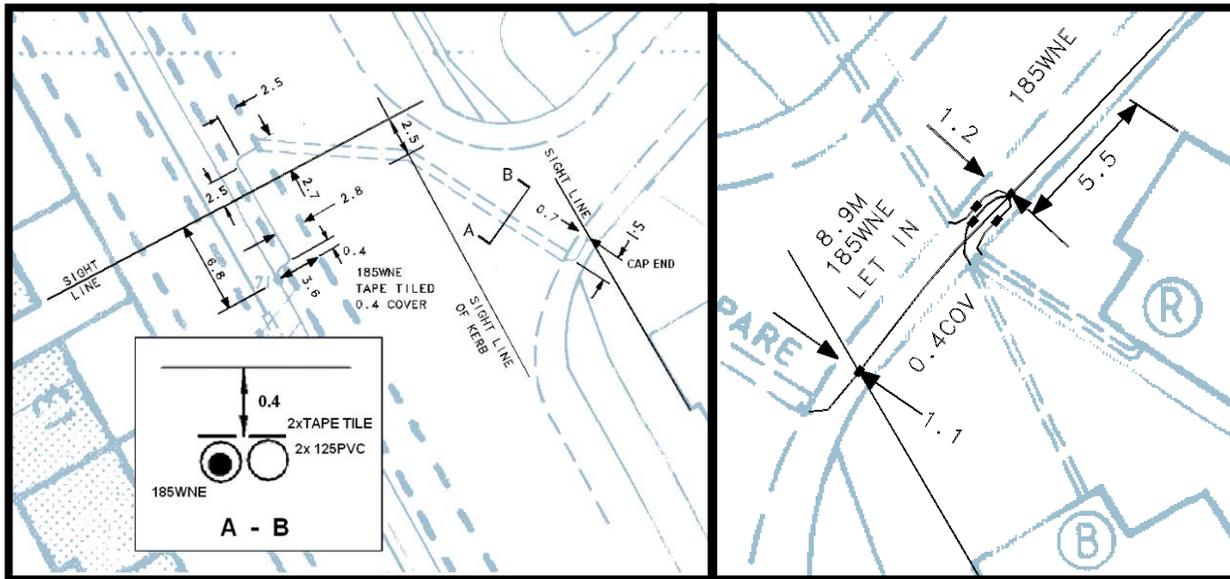


Figure 1. An example of detailed dimensions provided for a breach joint, length of cable, ducting and a pot end (cross section included) and a fault drawn on the legacy mains records.

## Recording of Underground Assets – All records submitted must contain the following data:

- A drawing of all installed cables (including service cables, auxiliary cables and earth wires) and ducts relative to the geographic area, drawn to a size that is legible. The drawing should contain the route of the cable and ducts with dimensions so that it can be accurately recorded in Northern Powergrid's record systems.
- All underground cables must be recorded on site using a suitable measuring device (excluding GPS) when the cable is exposed.
- Measurements must be taken at regular intervals to an accuracy of +/- 0.10m (100mm).
- Measurements must be from existing features on the map background (e.g. building sightlines, kerbs, back edges, walls, field boundaries or new builds) within a development site and not street furniture (e.g. lamps, drains, kiosks).
- Dimensions that clearly mark the start and end positions of cables and duct runs.
- Intermediate measurements at approximately 10m intervals along the route unless it deviates from straight when more frequent measurements will be needed; **all measurements must be taken from fixed ordnance survey features.**

## Recording of Underground Assets – All records submitted must contain the following data:

- Continuous dimensions around a curve with distances from kerb / back edge or building.
- Cross sections showing the formation of cables when there are multiple cables in a trench including ducts.
- Any unusual situations (e.g. where cables cross, deviate or transition under walls etc.).
- Cable protection details (e.g. tape / tiles), cable depths along the route and length of installed cable per feeder.
- Date of cable installation.
- Cable attribute data including cable type, cable size, conductor material, number of cores, number of phases, phase colour, operating voltage, insulation medium (EHV only), feeder identification (e.g. name and number).
- Duct attribute data including size, type, quantity, formation, cable position in duct, depth and protection and start and end positions. Where trenchless technology is used to install the cable / duct an underground profile drawing must be provided.

# Acceptance specifications for a basic as-laid cable records

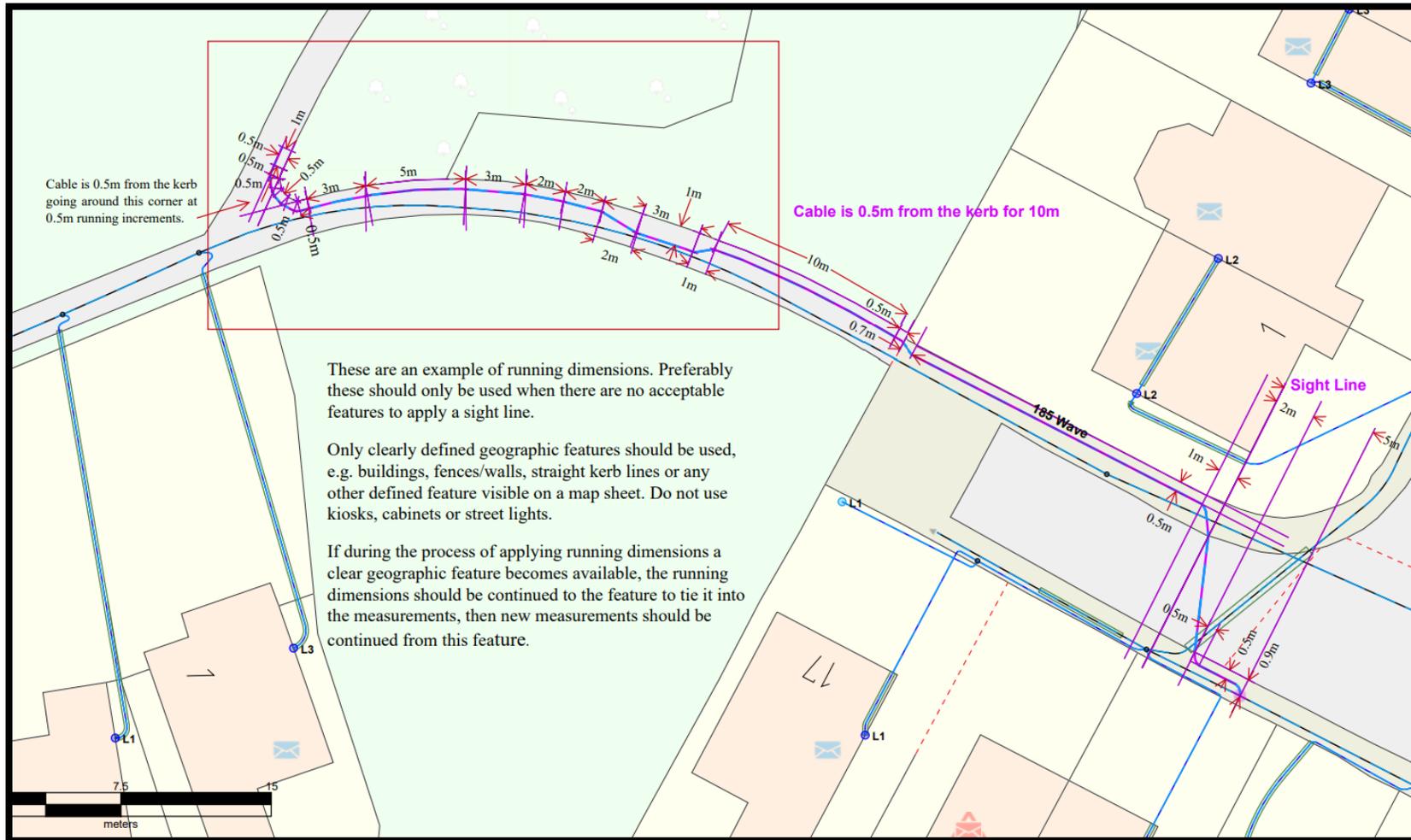


Figure 2. A representation of a basic as-laid cable record for an LV mains cable with examples of both standard dimensions taken from geographical features, and running dimensions.

## Use of Sight Lines

- Clear sight lines should be used as frequently as possible to allow accurate dimensions to be recorded. Only use sight lines taken from clearly defined geographical features such as:
  - Buildings, fences, walls, straight kerb lines or any other clearly defined feature/boundary that is visible on a map sheet.
- **Do not use:**
  - Street lights, drains, kiosks, cabinets, poles/towers or temporary structures, e.g. generators, site cabins or temporary site supply kiosks.
- The unacceptable features above are listed because they may not exist or be accurately represented on our map sheets due to legacy errors. These may be caused by lack of data or the poor resolution of map sheets in certain areas. Temporary structures such as site cabins for new developments are not static features on map sheets and as such are not acceptable to take dimensions from.

# Triangulation

- In the event of highly limited features available to take sight lines from, the triangulation technique may be used. This will allow Northern Powergrid to tie in any asset where other forms of measurement techniques are either unsuitable or impossible.

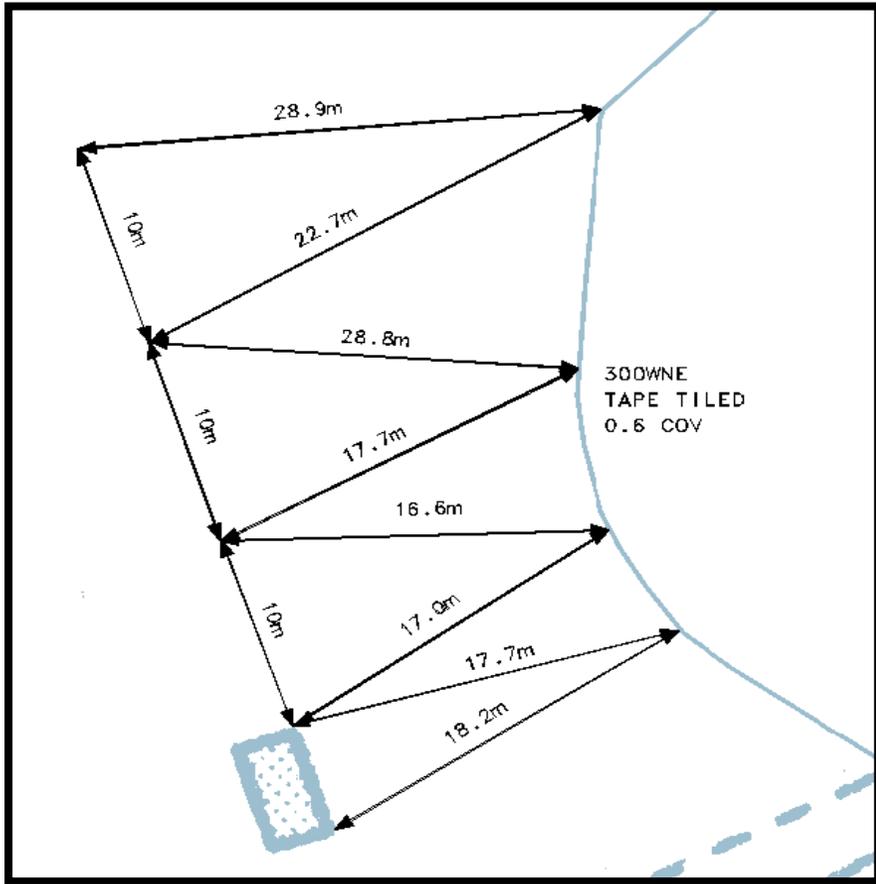


Figure 3. An example of triangulation is used to accurately measure the position of a cable in an area with limited features.

## An Acceptable As-laid record

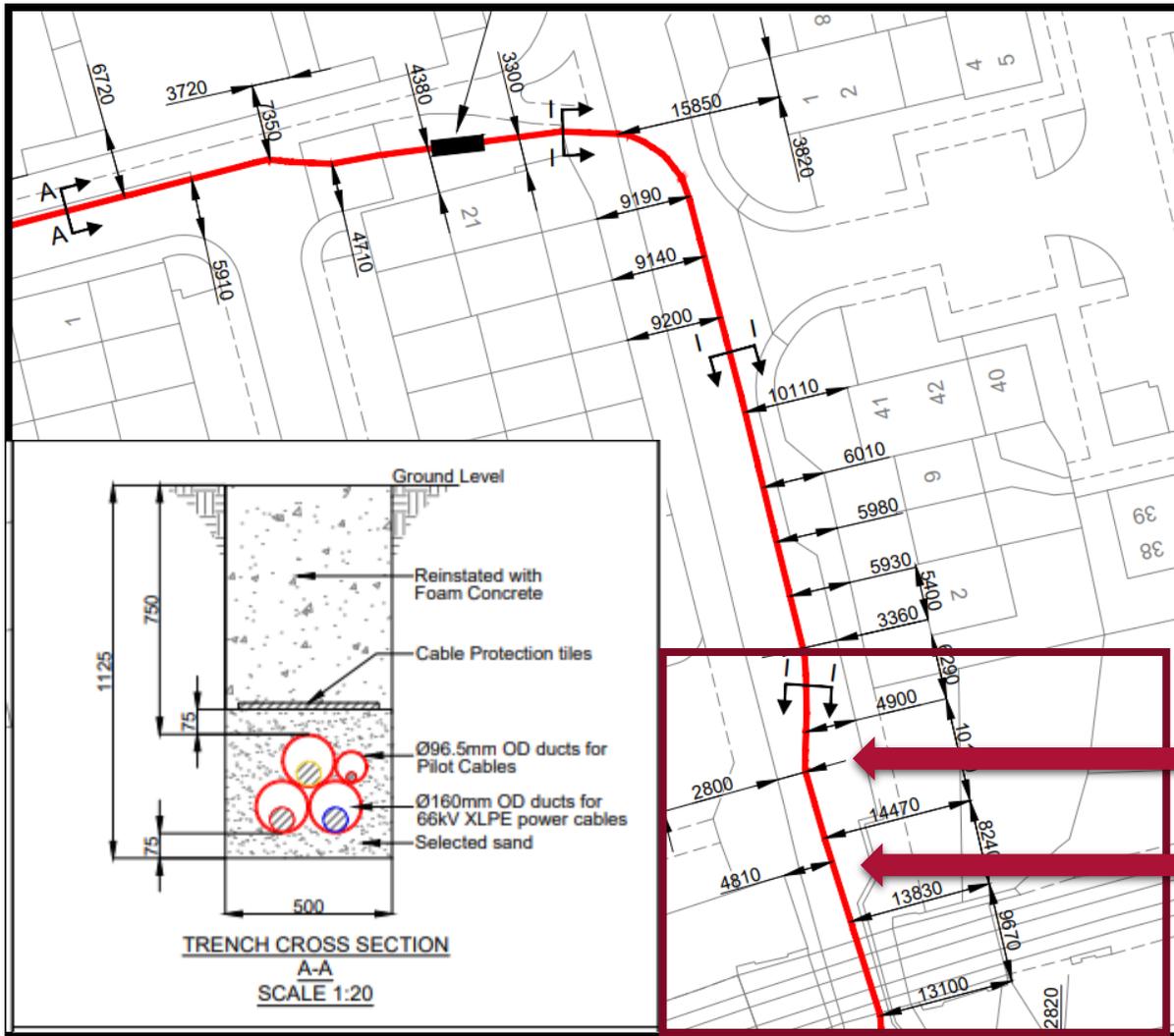


Figure 4. As-laid record for a 66KV XLPE cable

- The figure shows how an as-laid record should be drawn.
- Each of the dimensions shown in this record is taken using a sight line from a building, fence, straight kerb or pathway.
- Cross sections have also been provided where applicable.
- The continuous dimensions used on the bottom-right have been tied in with dimensions from the opposite side of the cable.



## Unacceptable As-laid

- As-laid that do not meet the standards outlined in earlier slides will be rejected. It then falls to the Data Coordination team to request the appropriate amendments from the contractors.
- Using the as-laid from figure 4 as an example, the following images were presented to the contractor to allow for the correction of the as-laid.

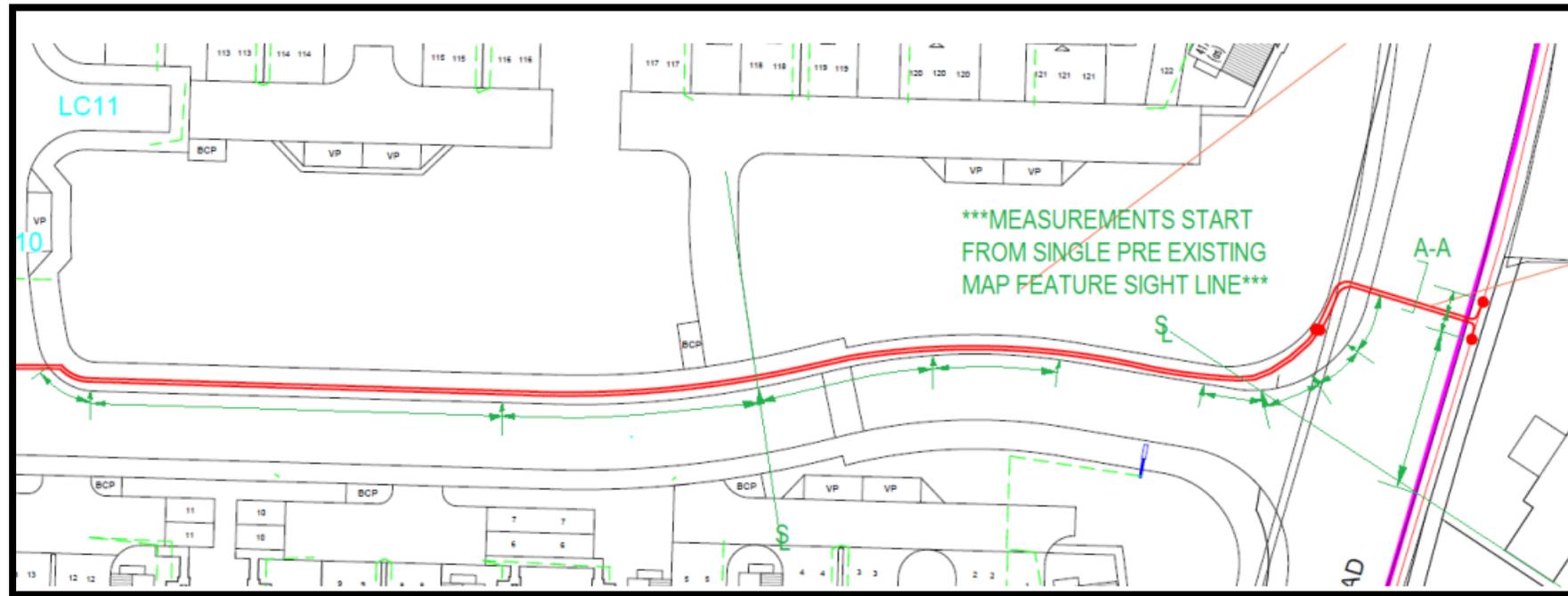


Figure 6. A drawing provided to a contractor after their initial as-laid from figure 4 was rejected. The example shows (in green) how they can amend the as-laid with appropriate sight lines and corrected dimensions from those sight lines.

## Unacceptable As-laid

- Some elements of this as-laid were then corrected and became acceptable.

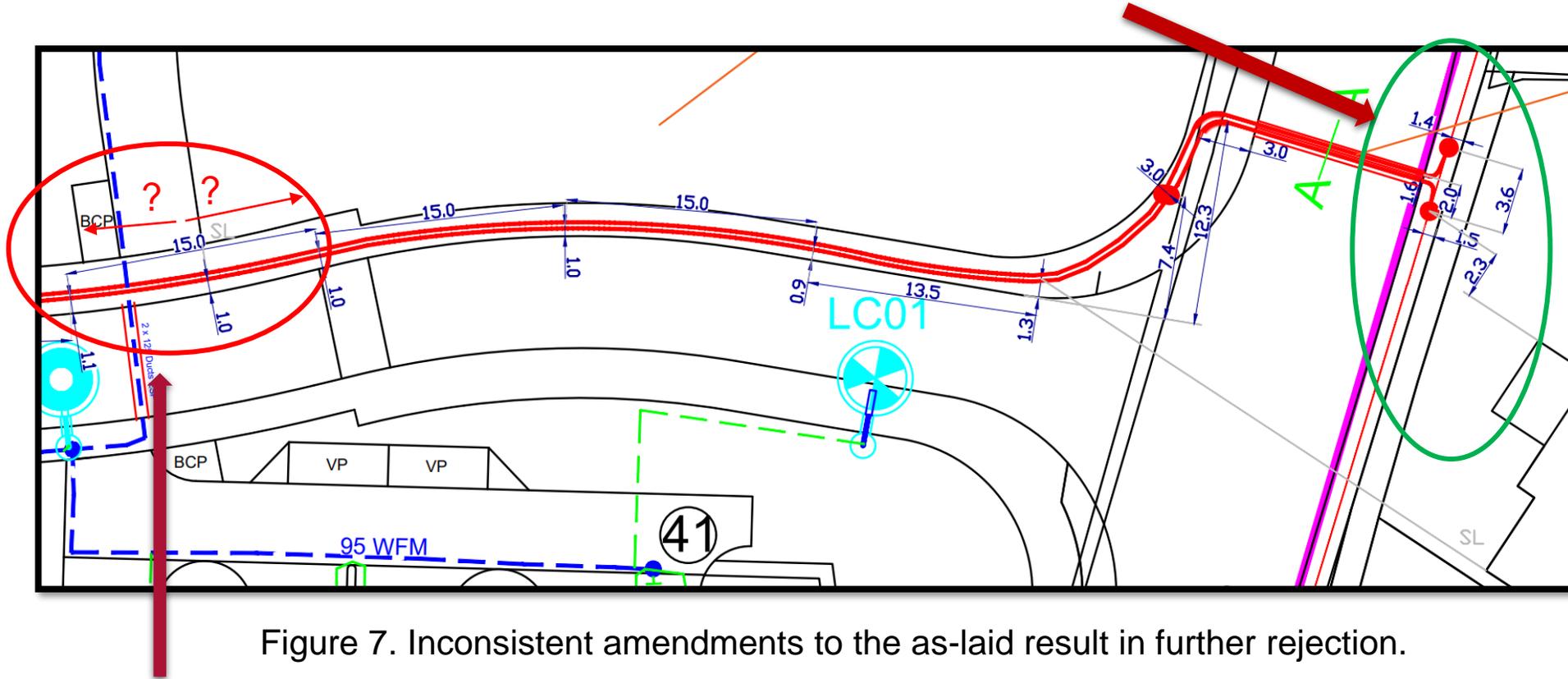


Figure 7. Inconsistent amendments to the as-laid result in further rejection.

- Other elements remained unacceptable, even after sight lines had been applied as the measurements were not updated to suit.



- Accurate records for all assets are vital for the safe and efficient operation of Northern Powergrid's electricity distribution network.
- Contractors/sub-contractors should use this guide to obtain/maintain a uniform standard of asset recording to generate consistent, accurate records.
- Submitted as-lays that fail to meet the desired specifications will be rejected.
- By mitigating the errors outlined in this presentation, work loads for both Northern Powergrid AND contractors can be significantly reduced, as submitted records are increasingly likely to be accepted and additional work not required.



# Lunch

12.15-13.00



## **Drop-in sessions - 13.00-14.00**

- iSmart / One Login
- Wayleaves appreciation
- Connections delivery
- Record information



**Q&A**



# Final thoughts

**Clare Roberts**

Connections Input Services Operations Manager

**Thank you for your time  
and participation today.**