

OPSAF-11-098 Issue No. 1

1. SCOPE

This document outlines the procedure for providing **Safety from the System** for the installation of ADSS (All-Dielectric Self-Supporting) cable between 132kV towers DE100 and N240 at Kendoon, Dumfries and Galloway. The installation is to be done under single circuit outage conditions, with one circuit remaining **Live** and in service. Double circuit outages cannot be facilitated for the proposed work due to network security requirements.

There is no **Approved** procedure within the SP Energy Networks PSSIs for installation of ADSS on steel lattice towers. This procedure has been written on a specific case basis for the installation of ADSS along the 'DE' Route and 'N' Route tower route in order to ensure that the work is in compliance with OPSAF-10-004 and OPSAF-10-016 (PSSI's 4 and 16). This procedure is to be used in conjunction with the Method Statements adopted by PLPC, the overhead line contractor carrying out the work.

2. ISSUE RECORD

This is a Reference document. The current version is held on the EN Document Library.

It is your responsibility to ensure you work to the current version.

Issue Date	Issue No.	Author	Amendment Details				
25 th July 2018	1	Ron Halfpenny	Initial Issue				

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
Ron Halfpenny	Alex Fulton	Craig McDougall
Lead Engineer	Circuits Manager	Transmission Operations
		Manager
		Date:

4. REVIEW

This is a Reference document which has a 6-month retention period after which a reminder will be issued to review and extend retention or archive. This document shall also be reviewed should a revision be required to any part of OPSAF-10-004 and OPSAF-10-016. This procedure is only valid for this specific project.

5. DISTRIBUTION

This document is part of the Management Safety Procedures but does not have a maintained distribution list.



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7. REFERENCE AND RELATED DOCUMENTS

ScottishPower Safety Rules (Electrical and Mechanical) 4th Edition

OPSAF-10-004 (PSSI 4) - High Voltage Overhead Lines - Work on Phase Conductors

OPSAF-10-016 (PSSI 16) - High Voltage Overhead Lines – Work on Towers, Poles, High Structures and Earthwires

PLPC Method Statement S2704 V4.0

PLPC/LTSC Design Drawings:

01_18130_14_C ADSS Profiles

02_18130_16_B_ADSS Attachment positions

4_18130_13_C ADSS Erection Sag-ten

15_18130_04_B

15_18130_05_C

15_18130_06_B

15_18130_07_C

15_18130_08_C

15 18130 09 C

15_18130_21_B

15_18130_22_B

15_18130_28_A

52_18130_10_B

52_18130_11_B

52_18130_12_A

52_18130_29_A

8. INTRODUCTION

As part of the South West Scotland transmission works, to establish a communications channel between the New Cumnock 132kV substation and Kendoon 132kV substation, for protection and control purposes, an ADSS cable is to be installed along the 'DE' and 'N' 132kV Routes: Towers DE100 to N230 and N230 to N240. The ADSS cable route is approximately 2.5km long.

Along the 'DE' and 'N' Routes is the New Cumnock - Blackcraig 132kV circuit, the New Cumnock - 132kV circuit, and the Kendoon – Glenlee 132kV circuit.



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The ADSS will be positioned on the towers at the positions identified in the attached drawings. The profile of the ADSS is also in the attached drawings, as are the methods of attachment.

A double circuit outage has been requested along the 'DE' and 'N' Routes for the ADSS installation work. This would require the New Cumnock - Blackcraig 132kV circuit, the New Cumnock - 132kV circuit, and the Kendoon – Glenlee 132kV circuit to be out of service at the same time. The New Cumnock – Blackcraig circuit is the only connection to Blackcraig Windfarm, and also during such outage conditions a circuit fault in the area at 132kV could result in cascade loss of a considerable part of the SP Energy Networks network with the consequent loss of customers in the affected areas.

Based on the unnecessary increase of network risk imposed by a double circuit outage, and considering that the work can be done safely under single circuit outage conditions with implementation of this **Approved** Procedure, it has been decided that the installation of the ADSS can be done safely whilst maintaining one circuit **Live**. This type of installation work has been implemented on previous occasions within SP Energy Networks safely, with an adjacent circuit **Live** and in service.

The previous version of OPSAF-10-016 (PSSI 16) included the Z-4 procedure that permitted this kind of work. Due to only very occasional usage and the difficulty of keeping Z-4 up to date and applicable to all cases and all circumstances Z-4 was removed from PSSI with the intention that when a requirement arose an **Approved** procedure such as this would be written and **Approved**.

For the ADSS installation works, the New Cumnock – Blackcraig 132kV and the Kendoon – Glenlee 132kV circuits will be **Live** and in service, and the New Cumnock – Kendoon 132kV circuit will be **Isolated** and **Earthed**.

9. GENERAL SAFETY FROM THE SYSTEM REQUIREMENTS

All non-specific overhead line activities not detailed in this **Approved** Procedure shall be in accordance with the ScottishPower Safety Rules (Electrical and Mechanical) 4th Edition , OPSAF-10-004 (PSSI 4) and OPSAF-10-016 (PSSI 16).

10. SAFETY FROM THE SYSTEM REQUIREMENTS SPECIFIC TO THIS APPROVED PROCEDURE

In addition to the Safe System of Work put in place by PLPC method statement:

S2704 V4.0

The following considerations in section 10 have been made and/or will be implemented during the course of work. These considerations have been based on elements of the now redundant Z-4 procedure (ex-PSSI 16 Attachment E), and existing Z-1 procedure (PSSI 16 Attachment B), parts of which are relevant to this ADSS cable installation procedure due to the similar nature of work which they cover, i.e. pulling of conductors along 132kV tower routes with one circuit **Live**. The relevant parts of these procedures have been incorporated into section 10.

- 10.1 The **Senior Authorised Person** in charge shall determine if work on 132kV construction overhead lines and on tee-off towers, junction and terminal towers, certain large angle towers, high river crossings, towers of special construction and future designs, require special consideration and additional documented procedures:
 - Tower DE100 carries two circuits: the New Cumnock Blackcraig, and the New Cumnock Kendoon 132kV circuits.
 - Towers N239 and N240 carry two circuits: the New Cumnock Kendoon, and the Kendoon Glenlee 132kV circuits.



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- 10.2 Prior to agreement that the work can be undertaken with one circuit **Live**, the **Senior Authorised Person** shall carry out an assessment of the overhead line. The **Senior Authorised Person** shall produce a report identifying those sections, spans and towers requiring special working arrangements, or any restrictions on the positioning of plant or on the equipment to be used for the work:
 - The **Senior Authorised Person** shall personally identify the location of cable drum and pulling equipment before it is sited.
 - The pulling of the pilot rope along the route shall be managed by:
 - Pulling the pilot rope through the running blocks and back to ground initially, at each tower in turn
 - Maintaining tension on the pilot rope towards the **Isolated** and **Earthed** circuit side at all times when it is being run-out
 - Fixing the pilot rope to the tower body above the ACD towards the Isolated and Earthed circuit side when it is not being controlled by an Authorised Person
 - Keeping the pilot rope at ground level when running it between towers
 - Once the slack is to be taken from the pilot rope, and the pulling operation is to commence, the **Authorised Person** holding the **Safety Document** shall make it clear to his **Working Party** that nobody should approach the pilot rope between towers for the remainder of pulling work.
- 10.3 Prior to installing ADSS cable over roads, motorways, railways, navigable waterways or power lines, the **Senior Authorised Person** shall satisfy himself that all necessary agreements have been obtained and all necessary precautions have been taken and the **Authorised Person** holding the **Safety Document** is aware of such arrangements:
 - The span N235 N236 is across a minor road. Scaffold will be required.
 - The span N236 N237 has an 11kV overhead line crossing. Outage required and lowering of conductors possibly required.
 - The span N238 N239 is across the A713. Scaffold will be required.
 - The span N239 N240 crosses a path and a river and the access road to Kendoon.
 Watchmen and radios will be used to monitor and control.
- 10.4 The installation of the ADSS cable will be carried out under a **Permit for Work**.
- 10.5 The **Senior Authorised Person** shall prepare a check list for the job. Each activity shall be signed and dated by the responsible **Person**.

The check list in OPSAF-10-016 (PSSI 16) Attachment B Appendix A will be used for the job. Due to the similarity in control measures incorporated into Z-1 work and this ADSS installation work, the same check list shall be used for the 'DF' and 'N' Routes.



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- 10.6 To guard against induced voltages on the sheath of the ADSS cable, *Running Earths* shall be used on the pulling bonds and cable in proximity to the tensioner and puller.
 - Running Earths shall be used at both tensioner and puller ends, and tensioner, puller. Cable drum equipment shall be bonded together, and bonded to earth.
 - Drain Earths shall be applied to running blocks before pulling of pilot rope.
 - Note: an Equipotential Zone is not a requirement for this procedure, due to the nonconductive nature of ADSS, and since there is no risk of loss of continuity of a conducting element.
- 10.7 When the failure of a running block or its means of attachment would allow the pulling rope or ADSS cable to move towards the **Live** conductors, the method of working shall ensure that **Safety Distance** is not infringed.
- 10.8 Running out of the ADSS, including tensioner/puller setup, sagging, and ADSS fixing is detailed in S2704 V4.0 section 6, and the work methodology shall incorporate the following:
 - The tension in the pulling rope and ADSS cable shall be such as to maintain **Safety Distance** from **Live** conductors of the overhead line.
 - The ADSS cable shall remain connected to the tensioner and puller during sagging and until it
 has been fixed to the termination towers at each end of the section with permanent fittings.
- 10.9 Each day before work commences, the **Authorised Person** shall request the **Control Person** to switch out the DAR on the **Live** circuit. In the event of a circuit tripping during the work, the **Control Person** shall not reclose the circuit until he has obtained the agreement of the **Authorised Person** on site.
- 10.10 Staff engaged in this work shall be trained and instructed by the Contractor (PLPC), to ensure that they understand the safety and emergency procedures which are relevant to their work, and that the work shall be done in accordance with the instructions and rules which have been laid down. The Contractor shall provide the Senior Location Manager, Craig McDougall (Transmission Operations Manager) or his designate, with documentary evidence that all his staff that will be employed on this work have been assessed and nominated by his management as being competent for this specific work.

All members of the **Working Party** shall be **Authorised Persons**. The authorisation certificates of **Authorised Persons** performing the work should be submitted to the Senior Location Manager, Craig McDougall (Transmission Operations Manager).

10.11 Prior to ADSS cable installation the **Authorised Person** holding the **Permit for Work** shall ascertain the forecast on wind speed and lightning risk.

Work shall be suspended if poor visibility prevents observers from fulfilling their role, or if there is an unforeseen increase in wind speed which could, by induced movements in the pilot rope or ADSS, cause **Safety Distance** from the **Live** circuit to be infringed.

In the event of a change in lightning risk, or if an approaching lightning storm is evident, all staff shall leave the towers.

10.12 Before the start of work, the **Authorised Person** holding the **Permit for Work** will be responsible for ensuring that an effective communication system is established and maintained between site and the **Control Person**.



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Before the actual installation work, the **Authorised Person** shall demonstrate, to the **Senior Authorised Person**, the effectiveness of the communication system adopted on site between members of the **Working Party**. This communication system shall be proven each day before work commences, and in the event of failure of the communication system, work shall stop.

- 10.13 During the installation process no personnel should be positioned underneath the cable being installed. Access to the work area by any other than the persons of the **Working Party** should be controlled.
- 10.14 Emergency Procedures
- 10.14.1 In the event of an unplanned action whereby the pilot rope or ADSS, or any other equipment or material infringes or may infringe **Safety Distance**, the **Authorised Person** holding the **Permit for Work** shall immediately arrange for the **Live** circuit to be switched out by the **Control Person**. When it has been confirmed that the **Live** circuit has been switched out, the **Authorised Person** holding the **Permit for Work** shall contact the **Senior Authorised Person** in order to recover the situation.
- 10.14.2 The Senior Location Manager, Craig McDougall (Transmission Operations Manager), shall have an Emergency Plan which caters for liaison with all other Utilities, Emergency Services, and the **Control Person**.
- 10.14.3 The Contractor shall have a written on-site Emergency Plan and shall instruct all of his staff in the actions to be taken should the pilot rope or ADSS, or any other equipment or material come within **Safety Distance** of the **Live** circuit. The plan shall include the following:
 - How **Persons** shall be withdrawn safely to a safe position.
 - How the immediate area shall be secured and controlled to prevent unauthorised access.
 - Details for the Senior Location Manager, Craig McDougall (Transmission Operations), or his
 delegate to liaise with all other Utilities, Emergency Services, and the Control Person.
 - The stipulations in 10.14.1 above.
- 10.14.4 The **Senior Authorised Person** shall assess the situation and, if necessary, issue a **Permit for Work** for the activities associated with the recovery work. The recovery work shall only commence once this **Permit for Work** (if necessary) has been issued.



DE100 - Kendoon Fibre Installation

Document Ref	PLPC S2704 V4.0	Review Date	1 st June 2019
Prepared	Jack Livingston	Date Created	1 st June 2018
Approved by	Dale Harrison	Job Number	020-136

Scope of Work

To connect Tower DE100 at Polquhanty to Kendoon Power Station via N route with a 48 fibre ADSS cable and associated underground works at Kendoon.

Amendment History

Document Ref	Date Issued	Modified by	Description of change				
PLPC S2704 V1.0	19th March 2018	DH	Initial Draft				
PLPC S2704 V2.0	20 th April 2018	DH	Review following client feedback				
PLPC S2704 V3.0	4 th May 2018	lay 2018 DH Review following client feedback					
PLPC S2704 V4.0	1 st June 2018	DH	Review following client feedback				
PLPC 32704 V4.0	1 Julie 2016	ОП	and approval of ADSS				

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1.0 Key Hazards

- Access to site.
- Use of heavy plant, equipment and machinery
- Working in proximity to live conductors
- Work at Height
- Induced Voltages
- Falling objects
- Lifting Operations
- Crossings

2.0 Precautions

- All access/ egress routes shall be agreed and adhered to. All staff/ Sub-contractors or visitors must sign in and be inducted at the main compound before entering site.
- All plant movements shall be under the direction of a banksman. All plant and machinery shall be operated by a trained and competent person with the relevant authorisations. Any Subcontractors on site shall Provide Specific RAMS checked and approved by PLPC.
- All overhead line works shall be in accordance with Scottish Power Electrical & Mechanical Safety Rules. In particular, PSSI 2, 4 & 16 shall apply.
- All earthing shall be in accordance with PSSI 4
- All access routes shall comply with GS6 in regard to safety from overhead power lines.
 Where access is taken with plant or equipment which may have the potential to infringe safety clearances, the route will be marked out and goalposts erected on each side of the overhead line to achieve a safe access route. In the case of DE99-100, the goalposts are already in place but these will be maintained for the duration of PLPC's works.
- Towers being climbed or worked on shall have an exclusion zone set up at the base of the tower controlled by an appointed person. All tools shall be tethered while working at height.
- All lifts must be risk assessed and lifting plan completed. A banksman shall be control of all lifts and where appropriate an exclusion zone shall be demarcated.
- Crossings the following protection will be applied :

Span	Obstacle	Protection	Comments				
235-236	Minor Road	Scaffold					
236-237	11Kv Crossing	11Kv Outage required	Lower conductors if required				
238-239	A713 Road	Scaffold					
239-240	Path	Watchman / Radio					
239-240	River	Watchman / Radio					
239-240	Access road	Watchman / Radio					

3.0 PPE

The minimum PPE required for the above activities are :

- Safety Boots
- Hard Hat
- Arc proof coveralls
- Eye protection
- Gloves
- Climbing equipment
- Additional specific items are listed within the stage 1 & 2 risk assessments

4.0 Associated documents

- PLPC CPHSE Plan
- PLPC RA 1125 N-Route Fibre Installation
- PLPC G2522 V3.0 Work at height
- PLPC G2527 V1.0 Instructions for Tesmec AFS 404 Puller Tensioners
- RA 1019 Puller Tensioner
- ERP
- Transmission Safety Critical Rules
- PLA05 Temporary works register

5.0 Plant equipment & Tools

The following Plant, Equipment & tools will be required for these activities:

Item	Description	Qty required
1	HGV Low Loader with Crane	1
2	4x4 Hiab Lorry	1
3	Tracked dumper	1
4	Tesmec Puller	1
5	CBS Fibre Tensioner	1
6	Unimog winch tractor	3
7	Argocat ATV	1
8	Pilot ropes	6
9	Hand Tools	As req
10	Chains	As req
11	Pull Lifts	As req
12	Slings	As req
13	Shackles	As req
14	EPZ kits	2
15	Earthing Equipment	As req
16	MAG drill	1
17	110v Generator & Leads	1
18	Cat & Genny	1

All plant operations will be in accordance with "SP Vehicle and Mobile Plant Safety Critical Rules"

All plant shall have a plant nappy placed underneath when not in use.

6.0 Work at Height

All work at height will be as per PLPC MS G2522 All work involving MEWP's will be as per PLPC MS G2510 A tower rescue kit will be available at each tower being climbed.

7.0 Competencies

The competencies required for this work are as follows:

Scheme	Description	Minimum Qty per working party
CC/001	Risk Assessment	2
CC/002	Permit To Work Process	1
CC/004	PPE & Fall Arrest	All
CC/006	Knots and Ropes	All
CC/007	CDM Process	All
PE/001	Winch	4
PE/003	2 – Way Radio	All
PE/005	Cat & Genny	1
S/002	Earthing Schedule	4
TW/001	Tower Climbing	All
TW/002	Tower Rescue	2
TW/008	Apply Earths	2
PW/014	Installing ADSS Cable	4
NPORS	Tracked Dumper	2
SP	WI-1	All (Min PS)
SP	SR- 3	2
SP	DE- 1	1
First Aid	First Aid	2
SJIB	Electrotechnical Cert Scheme	All

8.0 Equipment checks

The following equipment must be checked prior to use

- Winches, fall arrest equipment and all lifting tackle must be checked to ensure LOLER inspection is in date.
- All plant Winches must be inspected prior to use and a plant inspection form completed.
- All PPE and tools must be visually inspected prior to use.
- Any defective or out of date equipment must be quarantined and returned to the yard.

9.0 Safety from the system

- 9.1 The ADSS installation will be carried out with an N route / NECU-KEOO outage.
- 9.2 Some preparation works (installing steelwork) will be done with a LWC.
- 9.3 The ADSS installation will also require an 11Kv outage for the distribution line "Route 50" in spans N236-237. This will be isolated and earthed and a PFW issued to PLPC authorised person.
- 9.4 NECU-BLCW AND R Route will remain IN SERVICE. The safety clearances to live conductors must not be encroached under any circumstances.
- 9.5 For each outage a permit to work shall be issued by the SAP to the PLPC authorised person along with wristlets and flags. Drain earths shall be applied to the circuit as per appropriate earthing scheme. Red pendants will be required on DE99, DE100, N239 & N240
- 9.6 All works within Kendoon S/S will be under the supervision of a Standby Person (with SPEN SB Authorisation)
- 9.7 Lightning risk and weather conditions will be assessed prior to the start of works each day and monitored throughout the day.

10.0 Methodology

1.0 Preparation

- All persons working at the work locations shall be briefed on the tasks to be completed and sign on to a specific risk assessment.
- An exclusion zone shall be established around all towers to be climbed, and entry will be controlled by an appointed person.
- A Tower Rescue Kit will be available at the base of the tower when work at height is being carried out.
- The scaffold in span N235-236 and N238-239 will be installed. This will require a short road closure to pull the bonds across.

2.0 ADSS Stringing

- Tower **DE100** will be fitted with a tension arrangement as per drawing LSTC 15_18130_04 and a running block
- Towers **N230-236** will be fitted with a suspension crucifix steelwork kit as per LSTC 02_18130_16 / 15_18130_05 / 15_18130_06 / and a running block.
- Tower N237 will be fitted with a Tension steelwork arrangement as per drawing LSTC 15_18130_07 and a running block.
- Tower **N238** will be fitted with a Tension steelwork arrangement as per drawing LSTC 15_18130_28 and a running block.
- Tower **N239** will be fitted with a Tension steelwork arrangement as per drawing LSTC 15_18130_08 and a running block.
- Tower N240 will be fitted with a tension arrangement as per drawing LSTC 15_18130_09 and a running block
- Equipotential zones shall be set up at the bases of towers DE100 and N240 as per PSSI 4 "attachment B" and attached layout drawings.

- Puller and Tensioner machines will be set up on each EPZ and anchored to concrete blocks.
- EPZ's will be checked against the requirements of "PSSI 4 appendix C" (see attached and signed off by the SAP.
- All wiring operations will be under the supervision of a PLPC appointed wiring supervisor
- With all of the protection in place as per the table on page 2 (most importantly the scaffolding, watchmen and 11Kv outage), the ADSS installation can proceed.
- All radio communications shall be checked throughout the route. In the event of radio comm's being lost, all works shall cease until the problem has been rectified.
- A **non-conductive** pilot bond will be pulled through using an Argocat, and fed through each tower. A watchman will monitor the non conductive rope as it passes over the earthed 11Ky "route 50".
- The pilot bond will be square rigged on N240 and attached to the winch
- The pilot bond will be rigged on DE100 and attached to the ADSS cable using a swivel and stocking. The stocking will be taped using reinforced fibre tape.
- Running earths will be fitted at puller and tensioner positions.
- The tension will be slowly increased until the pulling bond is up to pulling tension (200Kgf)
- All blocks and protection will be checked.
- When confirmed Ok, the ADSS will be paid out and pulled through to N240
- When the ADSS reaches N240, the pull will stop and the ADSS will be made off at DE100.
- The ADSS will be tensioned from N240, then made off at the DE100 side of N237
- It will then be lowered back and made off at the N240 side of N237, creating a jumper loop.
- This will be repeated at tower N238, N239 and N240
- Towers N230-236 can then be clipped in and the blocks removed
- All protections can be removed.

3.0 Connection & testing

- At DE100 the ADSS will be spliced to the OPGW in the existing coyote joint, this will then be attached to the tower leg and the tails clamped securely.
- At N240 the tail will be clipped down the tower. A sub duct will be run (by C-Plan) from the power station to within 10 metres of N240 using existing ducts. The last 10 metres will require a hand dig. A ground mounted splice box will be installed at the base of the tower. The ADSS will run down the tower leg, in a sub duct into the ground mounted splice box where it will be spliced to the underground cable.
- When complete, C-Plan will carry out an end to end test and provide results

All protection must be in place prior to and for the duration of pulling ropes / ADSS

We have read and understand the content of this method statement.

Name	Signature	Date.

List of Appendices

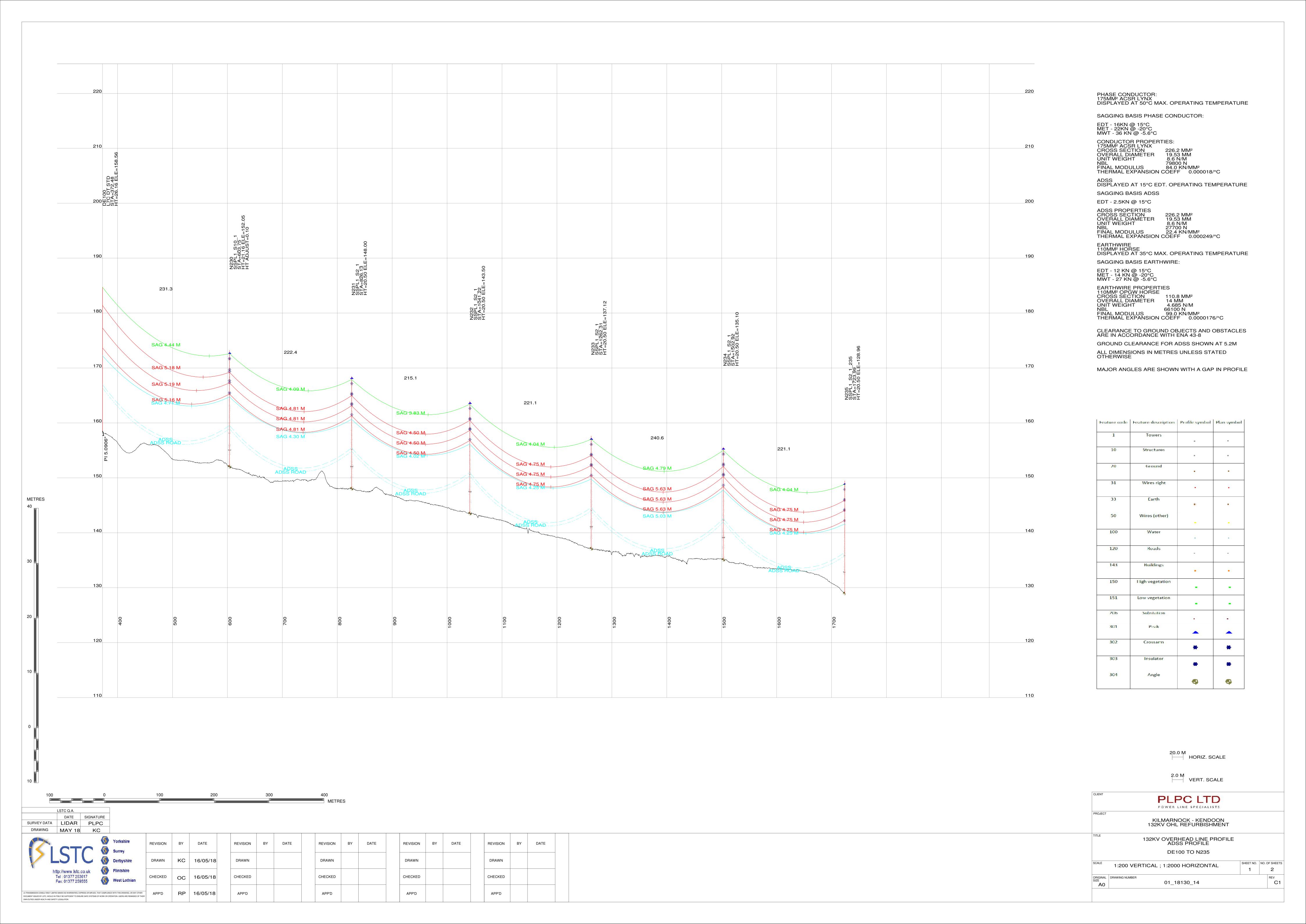
Appendix 1	SPEN EPZ Check Sheet
Appendix 2	LSTC GA "Typical ADSS Fibre Connection at PL1 S2 Suspension towers"
Appendix 3	LSTC GA "Typical ADSS Fibre Connection at PL1 S10 Suspension towers"
Appendix 4	LSTC GA "ADSS Fibre Connection at Tower N237 PL1 S60 STD"
Appendix 5	LSTC GA "ADSS Fibre Connection at Tower N239 PL1 D60 E10"
Appendix 6	LSTC GA "ADSS Fibre Connection at Tower N240 PL1 DT60 STD"
Appendix 7	LSTC GA "ADSS Fibre Connection at Tower DE100 L7c DT STD"
Appendix 8	EPZ arrangement for tower DE100
Appendix 9	EPZ arrangement for tower N240
Appendix 10	EPZ Position for Tower DE100
Appendix 11	EPZ Position for Tower N240

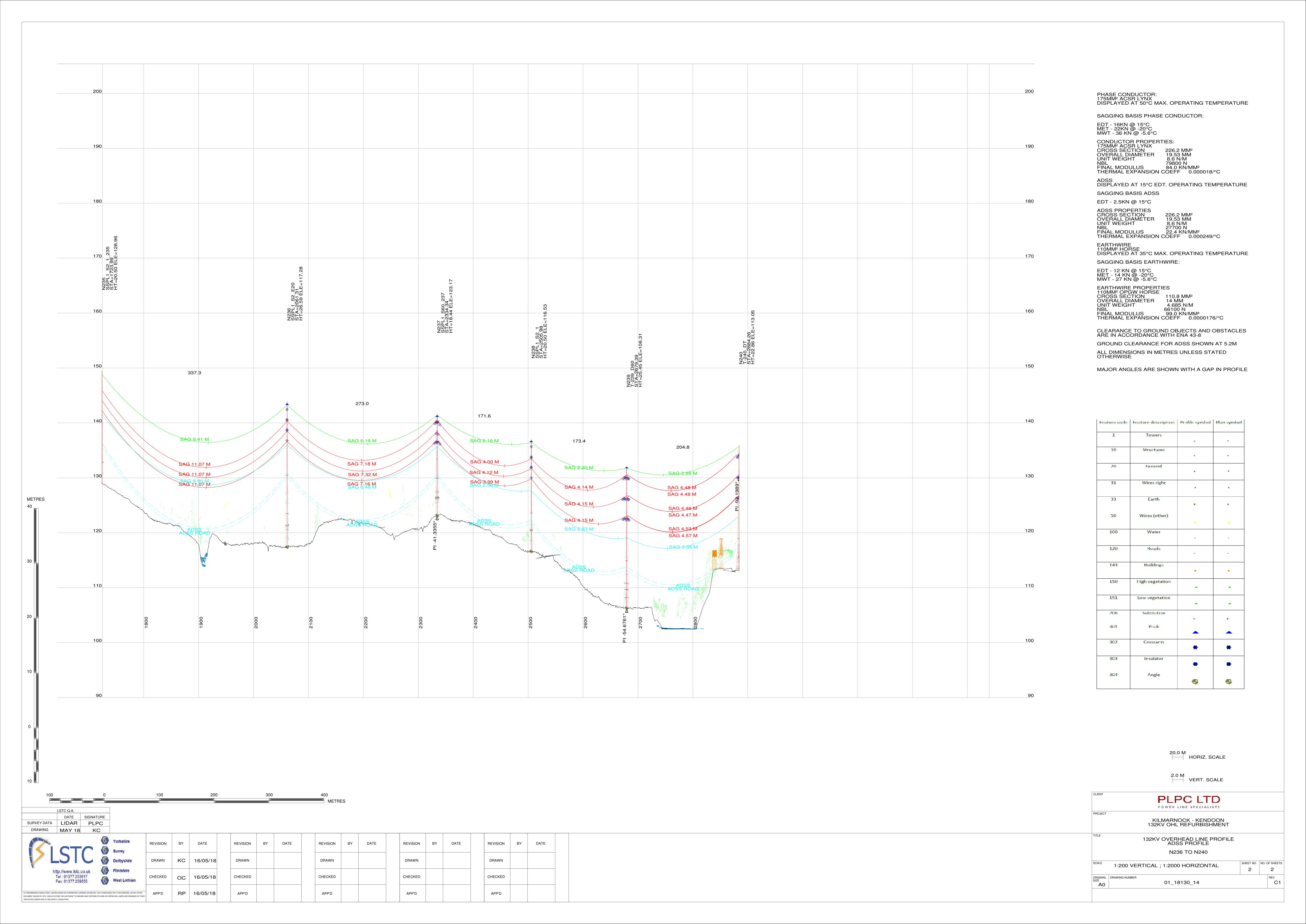
Appendix 1 SPEN EPZ Check Sheet

Signed:....(Senior Authorised Person/Designate)

EQ Rot		SSI 4 ppendix C
		Y/N
1	Equipotential Zone Bonds or Aluminium Straps connecting panels together	
2	Aluminium Earthing Plate securely fixed to Machine	
3	All Earths connected to Aluminium Earthing Plate	
4	Machine Earthed to Earth Spike	
5	All Drum Stands on EPZ Earthed accordingly	
6	Drum Stands positioned correctly and a safe distance from machine	
7	Drum Stands secure and anchored where necessary	
8	Are Earths of sufficient length for required tasks (eg midspan removal)	
9	Warning / Danger Signs in place (all 4 corners)	
10	Inner fence 0.5m inside the edge of Equipotential Zone	
11	Barrier fence at least 2m away from Equipotential Zone	
12	Barrier feace securely erected and in good condition	
13	Equipotential Zone free from tripping hazards and any unnecessary tools and equipment	ıt
14	2m Area between Equipotential Zone and Barrier fence free from tools and equipment	
that	nfirm that all Earth connections have been examined and found to be in serviceable cond tall fences surrounding the Equipotential Zone are secure.	tion and
••••		
Nar	me: Date:	

Company:





							CONTRACT No: PLPC - 18130 Kilmarnock - Kendoon DATE:							DATE : 16/05/2018			FINAL	PRELIMINARY	DISMANTLING		
ISSUE						LINE: 132kV SURVE									SURVEYED BY:	L	_STC	SHEET NO:	1 OF 1		
В	Power	Lines, l	Pipes &	Cables Ltd.		SPECIFICATION: PL1 E164 SPECIFICATION TOWERS CHECK								CHECKED BY:	0.0	Cooper	SECTION NO: DE100-N240				
	0	VERHE	AD LIN	E SCHEDULE		CONDUCTORS: ADSS Conductor LSTC D								STC Dwg No:	02-1	8130-16					
TOWER	<u>TC</u>	WER TYPE				132 kV BTM		132 kV BTM		SPAN LENGTH		SUM	TOWER VERTIC	ALITIES	;		ESQC				
No	STRUCTURE	TYPE	EXT	CHAINAGE	STUB	XARM	ATT.PT	XARM - STUB	A.O.D	(M)	WIND SPAN	ADJACENT SPANS	LEANING (DEG)	DIRECTION	ON CO-ORD	NATES	RISK CODE		REMARKS		
DE100	INTER	L7C	STD	0							115.636	231.272			E:25908 N:58939			ADSS attachme	nt bracket to be fitted to	leg	
N230	ANGLE	S10	STD	231.272						231.272 222.580	226.926	453.852			E: 2591 N: 5891			ADSS attachment bracket to be fitted to bars B29/B29A			
N231	INTER	S2	STD	453.852						215.067	218.824	437.647			E: 25930 N: 5889			ADSS attachme	nt bracket to be fitted to	bars A22/A22A	
N232	INTER	S2	STD	668.919						221.074	218.071	436.141			E: 2594 N: 5888			ADSS attachment bracket to be fitted to bars A22/A22A		bars A22/A22A	
N233	INTER	S2	STD	889.993						240.588	230.831	461.662			E: 2595 N: 5886	12.757		ADSS attachme	ADSS attachment bracket to be fitted to bars A22/A22A		
N234	INTER	S2	STD	1130.581						221.051	230.820	461.639			E: 2596 N: 5884	00.691		ADSS attachment bracket to be fitted to bars A22/A22A			
N235	INTER	S2	STD	1351.632						337.281	279.166	558.332			E: 2597 N: 5882	05.846		ADSS attachment bracket to be fitted to bars A22/A22A		bars A22/A22A	
N236	INTER	S2	E20	1688.913						273.006	305.144	610.287			E: 259885.524 N: 587908.551		N: 587908.551		nt bracket to be fitted to	bars A22/A22A	
N237	ANGLE	S60	STD	1961.919 0.000					41°20' LT	171.640	222.323	444.646			E: 2600 N: 5876	67.91			nt bracket to be fitted to		
N238	INTER	S2	STD	171.640						173.412	172.526	345.052			E: 2601 N: 5876	07.859			nt bracket to be fitted to tioned at this tower loca		
N239	ANGLE	D60	STD	345.052 0.000						205.446	189.429	378.858			E: 2603 N: 5875	47.188		ADSS attachme	nt bracket to be fitted to	leg	
N240	TERM	DT	STD	205.446 0.000					TERM	0.000	102.723	205.446				E: 260507.665 N: 587662.482			nt bracket to be fitted to	leg	
						WAVI	EAVE DE	TAILS									TI	REE FELLING D	DETAILS		
B: 07	I				LANGE				AND CONTACT	NUMBER					DI OT	CDAN		LL FELLING L	/L I AILO		
PLOT					LANDO	WNEK NAME,	AGENI NAM	WIE, ADDRESS	AND CONTACT	NUMBEK					PLOT	SPAN	NO.				



Erection Sag and Tension figures

18-130 Kilmarnock - Kendoon 132kV Refurbishment

Section DE100 - N240



Date of Issue	16/05/2018
Status	Issue C
Description	Third Issue
Compiled by	Kevin Crossan
Checked by	David Holmes
Approved by	Rob Preston
Document No	14_18130_13



Product code:

ADSS DNA-200133

Catalogue Description:

LD-48DJ6/28



Application

AFL ADSS cables are specifically designed for use on overhead HV transmission and distribution lines with steel lattice towers or wooden, concrete or steel poles.

Features and Benefits

- Stranded loose tube design ensures that the fibres are always free from mechanical strain under the specified loading conditions.
- No metallic or conductive components, allowing the live-line installation (subject to local regulations).
- Torsionally-balanced aramid yarn strength elements provide stable cable design.
- UV-resistant polyethylene sheath is compatible with fittings from all major suppliers and is suitable for use up to 12kV space potential.

Constr	onstruction						
1	Central Strength Member	2.25					
2	4 Gel Filled Loose Tubes, with 12 fibres per tube & Dummy Tubes	2.1					
3	Cabling of tubes, Central Strength Member, and Assembly Water Blocked	6.45					
4	Inner Jacket and Ripcords	8.05					
5	Aramid Strength Members - Torsionally Balanced	12.0					
6	Outer Jacket and Ripcords	15					

Cable Properties		DNA-200133				
Weight		178	kg/km			
Diameter		15.0	mm			
Cross Section		177	mm²			
Bend radius		300	mm			
Maximum Optical Working Tension (MOWT)		27.7	kN			
Cable Breaking Strength		77.7	kN			
Modulus		22.4	GPa			
Operating temperature range		-40 to +85	°C			
Expansion coefficient		2.49E-06	°C-1			
Typical attenuation*	1310 nm	0.36	dB/km			
*G.652. Other fibre is available upon request	1550 nm	0.22				

Jacket Mark

No Jacket Print Required

Applicable Standards								
Tube / Fibre Colours:	Fibre and Tube Colours are to EIA – 598							
Testing standards	IEEE 1222, IEC-60794-1, EIA-455							
Quality	Cable is designed, manufactured and tested in accordance with ISO 9001							

Date 26/04/2017

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Erection Sag and Tension Tables

18-130 Kilmarnock - Kendoon 132kV Refurbishment



 Erection Sag and Tension Tables

 Client:
 PLPC

 Project:
 18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

177mm² ADSS AFL LD-48DJ6/28

Date of Issue: 16/05/2018 Document No: 14_18130_13 Status: Issue C Compiled by: Kevin Crossan Approved by: Rob Preston

18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

,		
Section		DE100-N237
Cable		177mm² ADSS AFL LD-48DJ6/28
Erection Shift		
· ·		
Twe	cnan	Sag/m) for Tamparatura

Twr	Span		Sag (m) for Temperature																			
No.	Length	0°C	1°C	2°C	3°C	4°C	5°C	6°C	7°C	8°C	9°C	10°C	11°C	12°C	13°C	14°C	15°C	16°C	17°C	18°C	19°C	20°C
DE100																						
	232.6	4.16	4.19	4.23	4.27	4.30	4.34	4.38	4.42	4.45	4.49	4.53	4.56	4.60	4.64	4.67	4.71	4.74	4.78	4.82	4.85	4.89
N230																						
	222.40	3.80	3.83	3.86	3.90	3.93	3.97	4.00	4.03	4.07	4.10	4.13	4.17	4.20	4.24	4.27	4.30	4.33	4.37	4.40	4.43	4.46
N231																						
	215.10	3.55	3.58	3.61	3.65	3.68	3.71	3.74	3.77	3.81	3.84	3.87	3.90	3.93	3.96	3.99	4.02	4.05	4.09	4.12	4.15	4.18
N232																						
	221.10	3.75	3.79	3.82	3.85	3.89	3.92	3.96	3.99	4.02	4.05	4.09	4.12	4.15	4.19	4.22	4.25	4.28	4.32	4.35	4.38	4.41
N233																						
	240.60	4.44	4.48	4.52	4.56	4.60	4.64	4.68	4.72	4.76	4.80	4.84	4.88	4.92	4.96	5.00	5.03	5.07	5.11	5.15	5.19	5.23
N234																						
	221.10	3.75	3.79	3.82	3.85	3.89	3.92	3.95	3.99	4.02	4.05	4.09	4.12	4.15	4.19	4.22	4.25	4.28	4.32	4.35	4.38	4.41
N235																						
	337.30	8.74	8.82	8.89	8.97	9.05	9.13	9.21	9.29	9.37	9.44	9.52	9.59	9.67	9.75	9.82	9.90	9.98	10.06	10.13	10.20	10.28
N236																						
	273.00	5.72	5.77	5.82	5.87	5.93	5.98	6.03	6.08	6.13	6.18	6.23	6.28	6.33	6.38	6.43	6.48	6.53	6.58	6.63	6.68	6.73
N237																						
										•					•			•	•		•	
Tension (kN)		2.845	2.820	2.796	2.772	2.748	2.724	2.700	2.677	2.655	2.634	2.613	2.592	2.571	2.550	2.531	2.512	2.492	2.473	2.455	2.438	2.420



Erection Sag and Tension Tables

Client: PLPC
Project: 18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

177mm² ADSS AFL LD-48DJ6/28

18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

Section	N237-N238
Conductor	177mm ² ADSS AFL LD-48DJ6/28
F	

Twr	Span		Sag (m) for Temperature																			
No.	Length	0°C	1°C	2°C	3°C	4°C	5°C	6°C	7°C	8°C	9°C	10°C	11°C	12°C	13°C	14°C	15°C	16°C	17°C	18°C	19°C	20°C
N237																						
	171.60	2.06	2.09	2.13	2.16	2.19	2.23	2.26	2.29	2.33	2.36	2.40	2.43	2.47	2.5	2.54	2.58	2.61	2.65	2.68	2.72	2.75
N238																						
Tension (kN	1)	3.127	3.078	3.029	2.983	2.937	2.891	2.849	2.806	2.763	2.724	2.684	2.645	2.608	2.572	2.535	2.500	2.466	2.434	2.402	2.372	2.342



Erection Sag and Tension Tables

Client: PLPC
Project: 18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

177mm² ADSS AFL LD-48DJ6/28 Cable:

Date of Issue: 16/05/2018
Document No: 14_18130_13
 Status: Issue C
Compiled by: Kevin Crossan
Approved by: Rob Preston

18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

Section	Section N238-N239																					
Conductor 177mm² ADSS AFL LD-48DJ6/28																						
Erection Shift																						
,																						
Twr	Span											Sag (m) fo	or Temperatu	ıre								
No.	Length	0°C	1°C	2°C	3°C	4°C	5°C	6°C	7°C	8°C	9°C	10°C	11°C	12°C	13°C	14°C	15°C	16°C	17°C	18°C	19°C	20°C
N238																						
	173.4	2.11	2.14	2.18	2.21	2.24	2.28	2.31	2.35	2.38	2.42	2.45	2.49	2.52	2.56	2.59	2.63	2.66	2.70	2.74	2.77	2.81
N239																						



Erection Sag and Tension Tables

Client: PLPC
Project: 18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

3.117 3.068 3.022 2.977 2.931 2.885 2.842 2.800 2.760 2.721 2.681 2.641 2.605

Cable: 177mm² ADSS AFL LD-48DJ6/28 Date of Issue: 16/05/2018
Document No: 14_18130_13
 Status: Issue C
Compiled by: Kevin Crossan
Approved by: Rob Preston

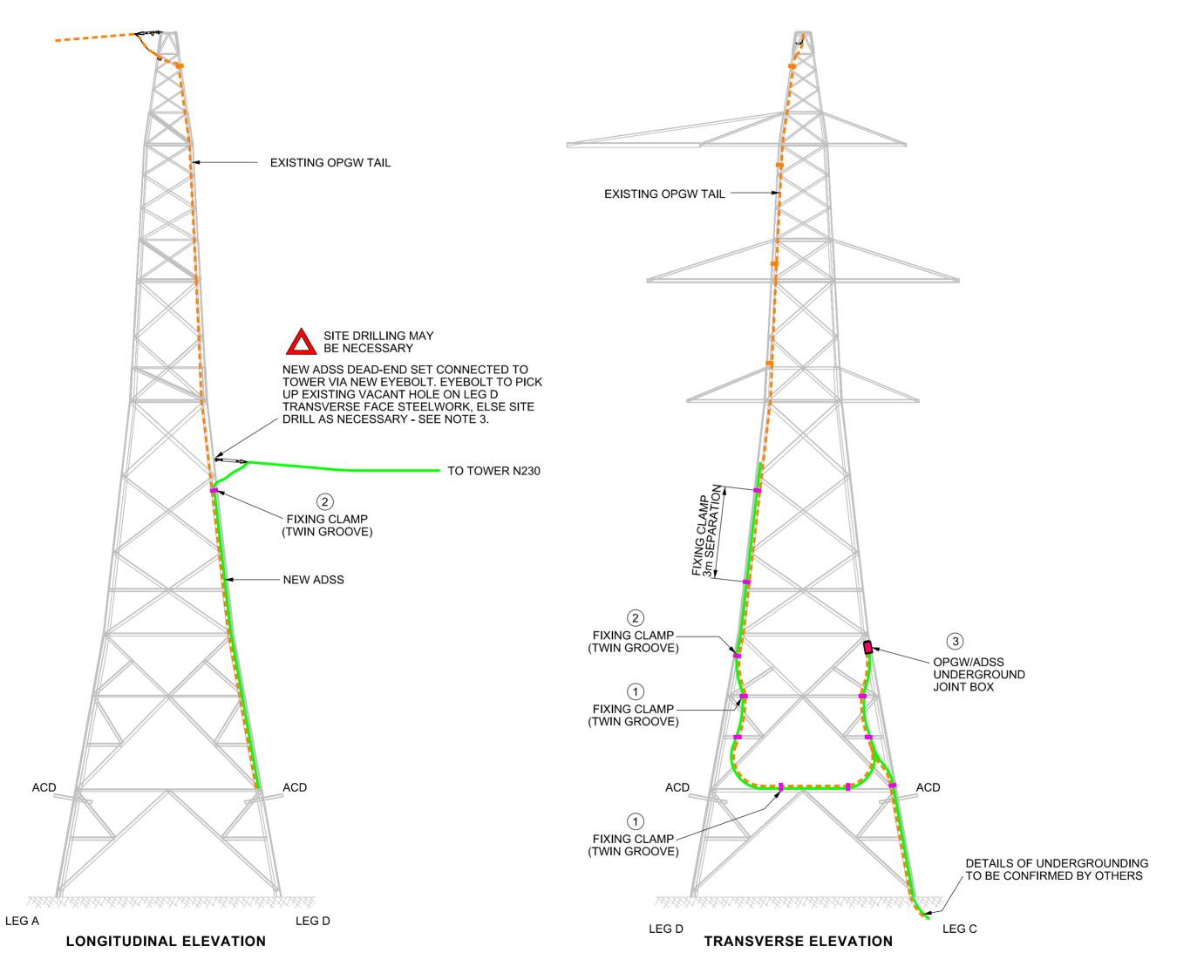
18-130 Kilmarnock - Kendoon 132kV Refurbishment - Section DE100 - N240

Section	N239-N240
Conductor	177mm² ADSS AFL LD-48DJ6/28
Erection Shift	

Twr	Span		Sag (m) for Temperature																			
No.	Length	0°C	1°C	2°C	3°C	4°C	5°C	6°C	7°C	8°C	9°C	10°C	11°C	12°C	13°C	14°C	15°C	16°C	17°C	18°C	19°C	20°C
N239																						
	205.40	3.07	3.11	3.15	3.19	3.22	3.27	3.31	3.34	3.38	3.42	3.46	3.50	3.54	3.58	3.62	3.66	3.70	3.74	3.78	3.81	3.85
N240																						
Tension (kN)		2.982	2.943	2.906	2.870	2.837	2.800	2.767	2.735	2.703	2.673	2.643	2.613	2.582	2.555	2.527	2.499	2.474	2.447	2.423	2.399	2.373

	ITEM - DESCRIPTION	REF No.	COMPONENT DRG	QTY	REMARKS
1	FIXING CLAMP (TWIN GROOVE)	F04	MOSDORFER MA5323 OR SIMILAR	6	FOR CONNECTION TO HORIZONTAL MEMBER ON TRANSVERSE FACE
2	FIXING CLAMP (TWIN GROOVE)	FO17	OLF A3-81SJ00-1 OR SIMILAR	5	FOR CONNECTION TO TOWER LEG MEMBERS
3	OPGW/ADSS U/G JOINT BOX	-	PLP TR 778-E COYOTE RUNT OR SIMILAR	1	

DESCRIPTION FIRST ISSUE						
İ	REV	DATE	BY	CHKD	APPD	
	A1	30/04/2018	PCC	RTM	DAH	
	DESCRIPTION SET DRAWING REFERENCE ADDED - SEE NOTE 3					
	REV	DATE	BY	CHKD	APPD	
	В	9/05/2018	RTM	PCC	DAH	







CDM RESIDUAL RISK

- DESIGN BASED HAZARDS ARE ACTIVELY ELIMINATED WHERE PRACTICAL. WHERE HAZARDS ARE NOT ELIMINATED, THEY ARE IDENTIFIED BY THIS SYMBOL.
- ☐ HAZARDS/RISKS THAT SHOULD BE CONSIDERED BY A COMPETENT CONTRACTOR ARE NOT IDENTIFIED.



Yorkshire

Flintshire

West Lothian

GENERAL NOTES:

1.MINIMUM BEND RADIUS OF ADSS TO BE MAINTAINED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION

2.TOWER GOEMETRY BASED ON J.L.EVE DRAWING L7c/80 (JE35/33164)

3. ADSS TERMINAL TENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_12.

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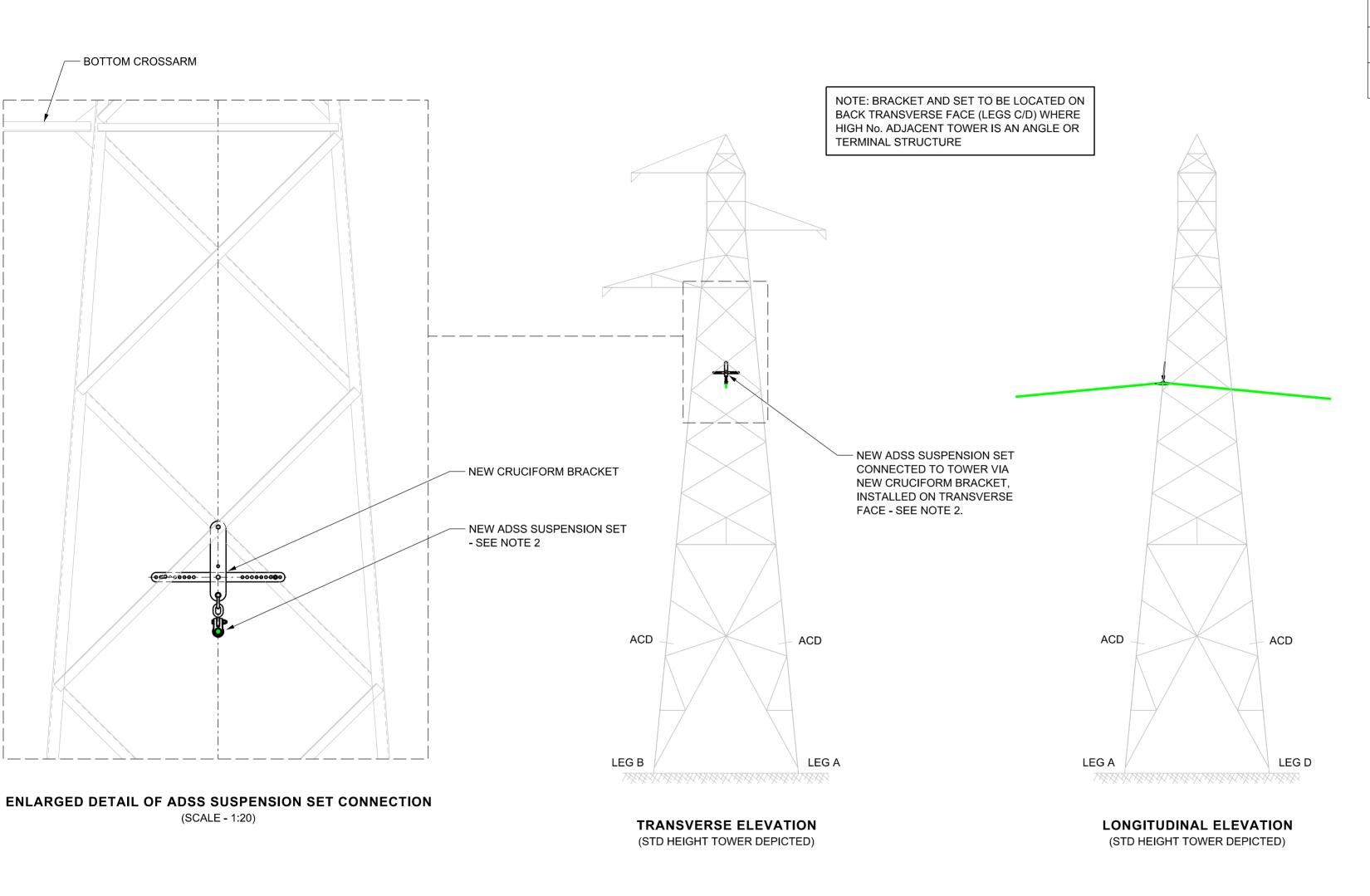
CLIENT PLPC LTD POWER LINE SPECIALISTS

KILMARNOCK - KENDOON

PROJECT

GENERAL ARRANGEMENT FOR OPGW/ADSS FIBRE PATH JOINT BOX POSITION AT TOWER No. DE100 (L7(c) DT STD)

		T		
SCALE (UN	1:100	DESIGNED	DAH	
DATE	30/04/2018	CHECKED	RTM	
DRAWN	PCC	APPROVED	DAH	
ORIGINAL SIZE A2	DRAWING NUMBER 15_18	130_04		REV B



DESCRIPTION FIRST ISSUE REV PCC 2/5/2018 SET DRAWING REFERENCE ADDED - SEE NOTE 2 REV CHKD PCC RTM DAH В 9/05/2018 ADSS CONNECTION MOVED TO LOWER BRACINGS REV RTM PCC С 9/05/2018

KEY:

NEW ADSS



CDM RESIDUAL RISK

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Fax: 01377 259555

Flintshire West Lothian GENERAL NOTES:

own duties under health and safety legislation.

1.TOWER GEOMETRY BASED UPON BLAW KNOX DRAWING BK35/31900.

2. ADSS SUSPENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_10.

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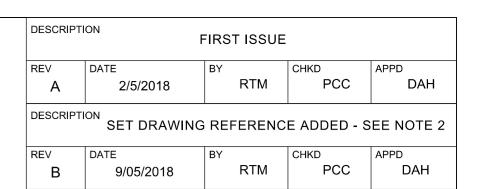
PROJECT

KILMARNOCK - KENDOON

TITLE

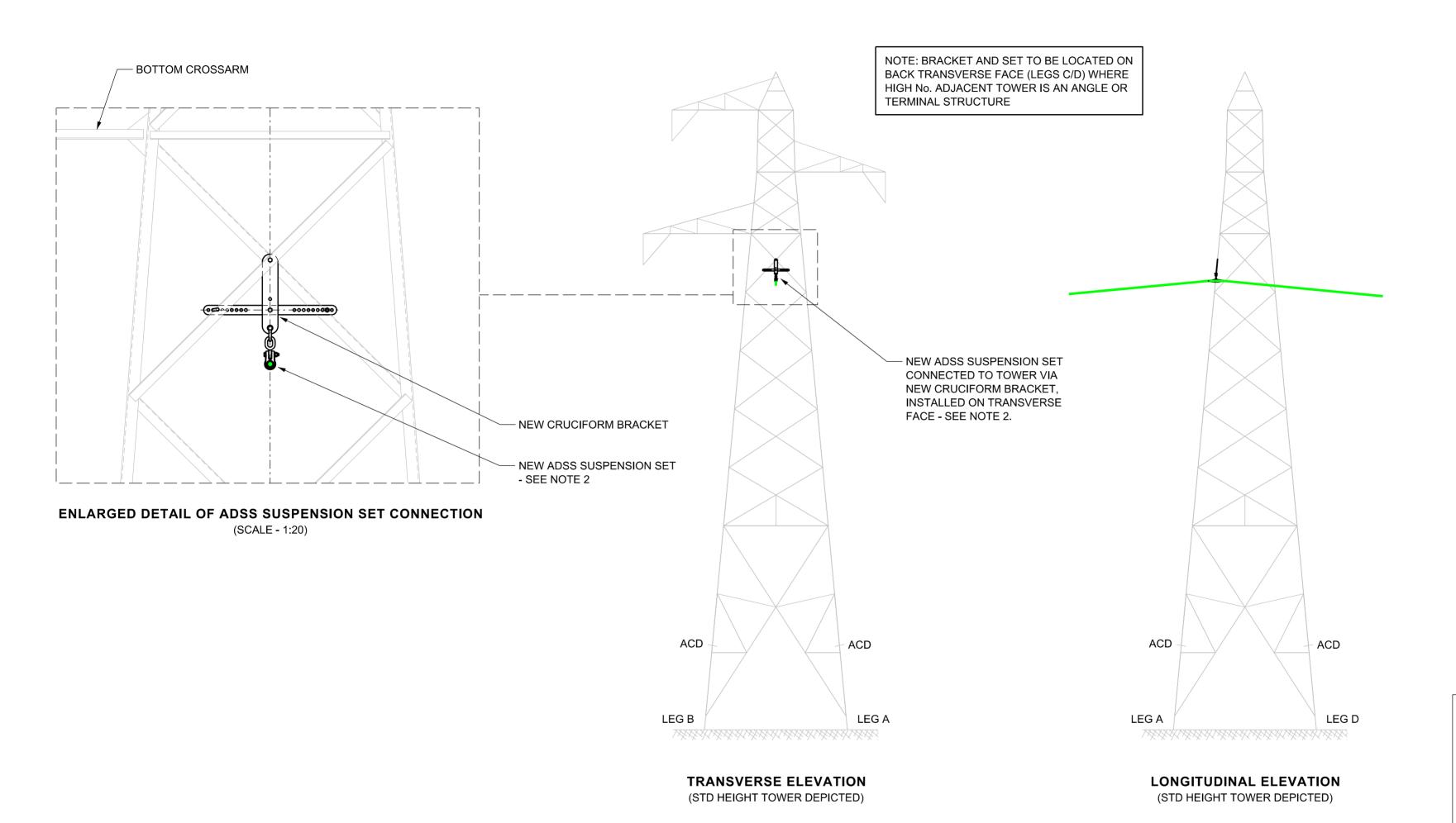
GENERAL ARRANGEMENT FOR TYPICAL ADSS FIBRE CONNECTION AT PL1 (E164) S2 SUSPENSION TOWERS

SCALE (UNI	1:100 LESS OTHERWISE STATED)	DESIGNED	АН
DATE	2/5/2018	CHECKED P	CC
DRAWN	RTM	APPROVED D	АН
ORIGINAL SIZE	DRAWING NUMBER		REV
A2	15_18	130_05	С



NEW ADSS

KEY:



CDM RESIDUAL RISK

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GENERAL NOTES: 1.TOWER GEOMETRY BASED UPON BLAW KNOX DRAWING BK35/31931.

2. ADSS SUSPENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_10.

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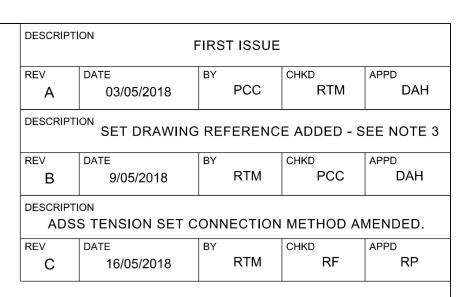
PROJECT

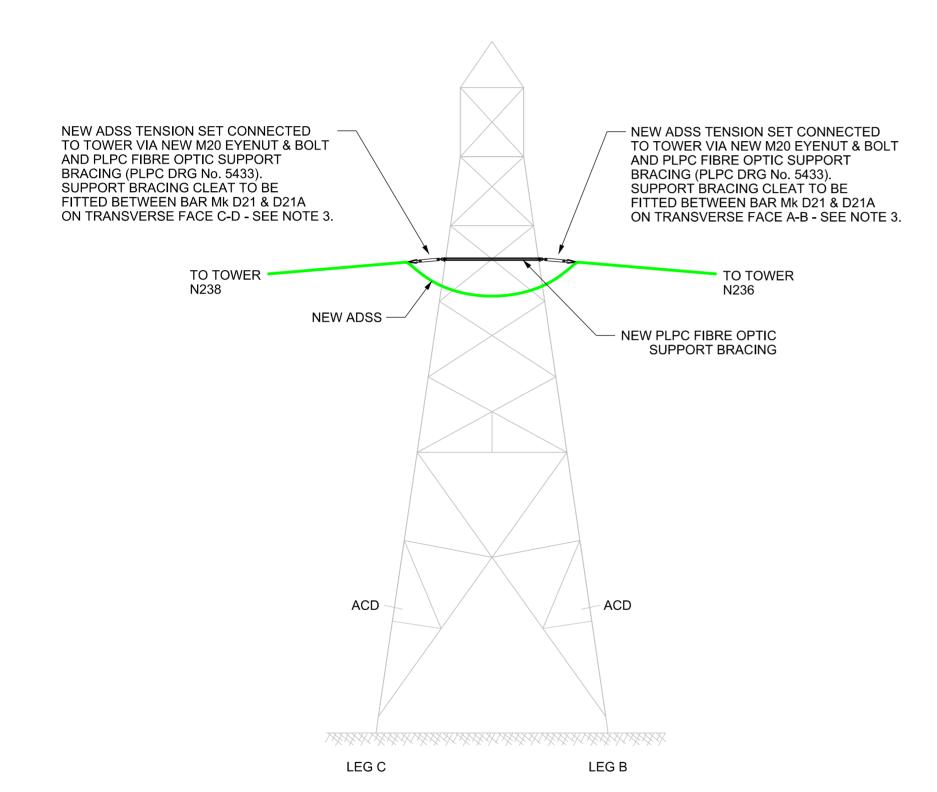
KILMARNOCK - KENDOON

GENERAL ARRANGEMENT FOR TYPICAL ADSS FIBRE CONNECTION AT PL1 (E164) S10 SUSPENSION TOWERS

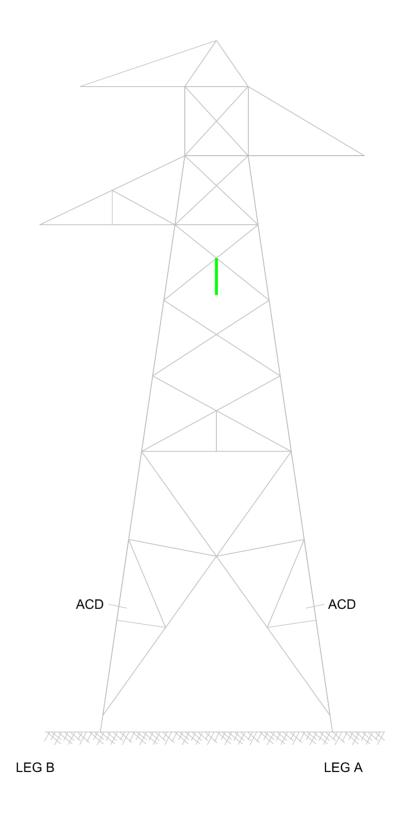
SCALE (UN	1:100 LESS OTHERWISE STATED)	DESIGNED DA	λH
DATE	2/5/2018	CHECKED	C
DRAWN	RTM	APPROVED DA	λH
ORIGINAL SIZE	DRAWING NUMBER		REV
A2 15_18130_06			

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LONGITUDINAL ELEVATION



TRANSVERSE ELEVATION

TITLE





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- ☐ HAZARDS/RISKS THAT SHOULD BE CONSIDERED BY A COMPETENT CONTRACTOR ARE NOT IDENTIFIED.



GENERAL NOTES:

West Lothian

1.MINIMUM BEND RADIUS OF ADSS TO BE MAINTAINED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION

2.TOWER GOEMETRY BASED ON BLAW KNOX DRAWING BK35/32000.

3. ADSS TENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_29.

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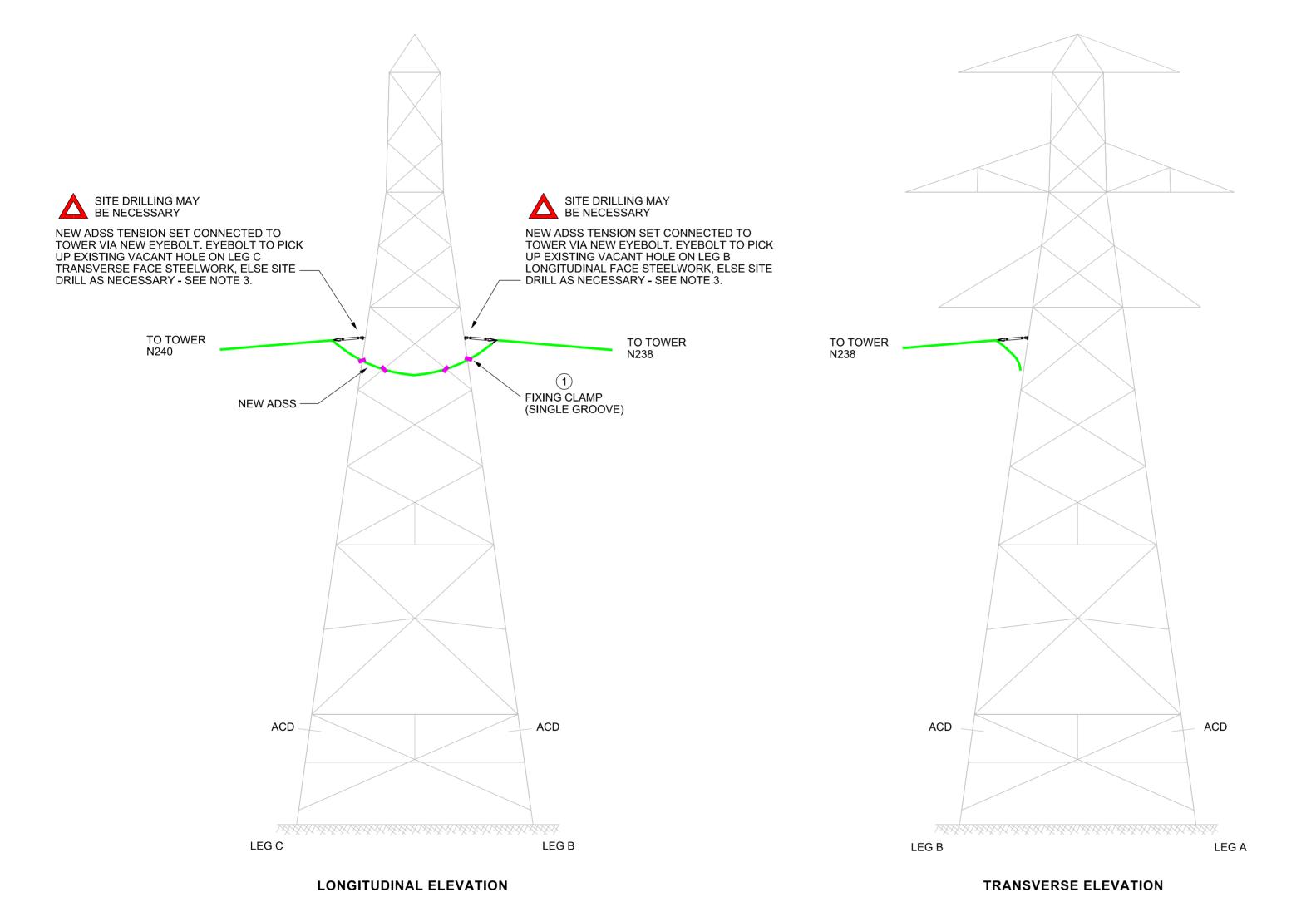
PROJECT

KILMARNOCK - KENDOON

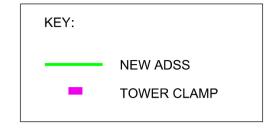
GENERAL ARRANGEMENT FOR ADSS FIBRE PATH/CONNECTION AT TOWER N237 (PL1 (E164) S60 STD)

SCALE (UN	1:100 LESS OTHERWISE STATED)	DA	1	
DATE	03/05/2018	CHECKED	1	
DRAWN	PCC	APPROVED DAH	1	
ORIGINAL SIZE	DRAWING NUMBER		REV	
A2 15_18130_07				

ITEM - DESCRIPTION		REF No. COMPONENT DRG		QTY REMARKS	
1	FIXING CLAMP (SINGLE GROOVE)	-	MOSDORFER MA8585 OR SIMILAR	4	-



DESCRIPTION FIRST ISSUE REV 01/05/2018 PCC DESCRIPTION SET DRAWING REFERENCE ADDED - SEE NOTE 3 REV RTM PCC DAH В 9/05/2018 DESCRIPTION ADSS ATTCHMENT LOCATION AMENDED REV RF С DAH 18/05/2018





CDM RESIDUAL RISK

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Fax: 01377 259555

Yorkshire

Flintshire

West Lothian

GENERAL NOTES:

1.MINIMUM BEND RADIUS OF ADSS TO BE MAINTAINED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION

2.TOWER GOEMETRY BASED ON BLAW KNOX DRAWINGS BK35/32087 & BK35/32088.

3. ADSS TENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_11.

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PROJECT

KILMARNOCK - KENDOON

GENERAL ARRANGEMENT FOR ADSS FIBRE PATH/CONNECTION

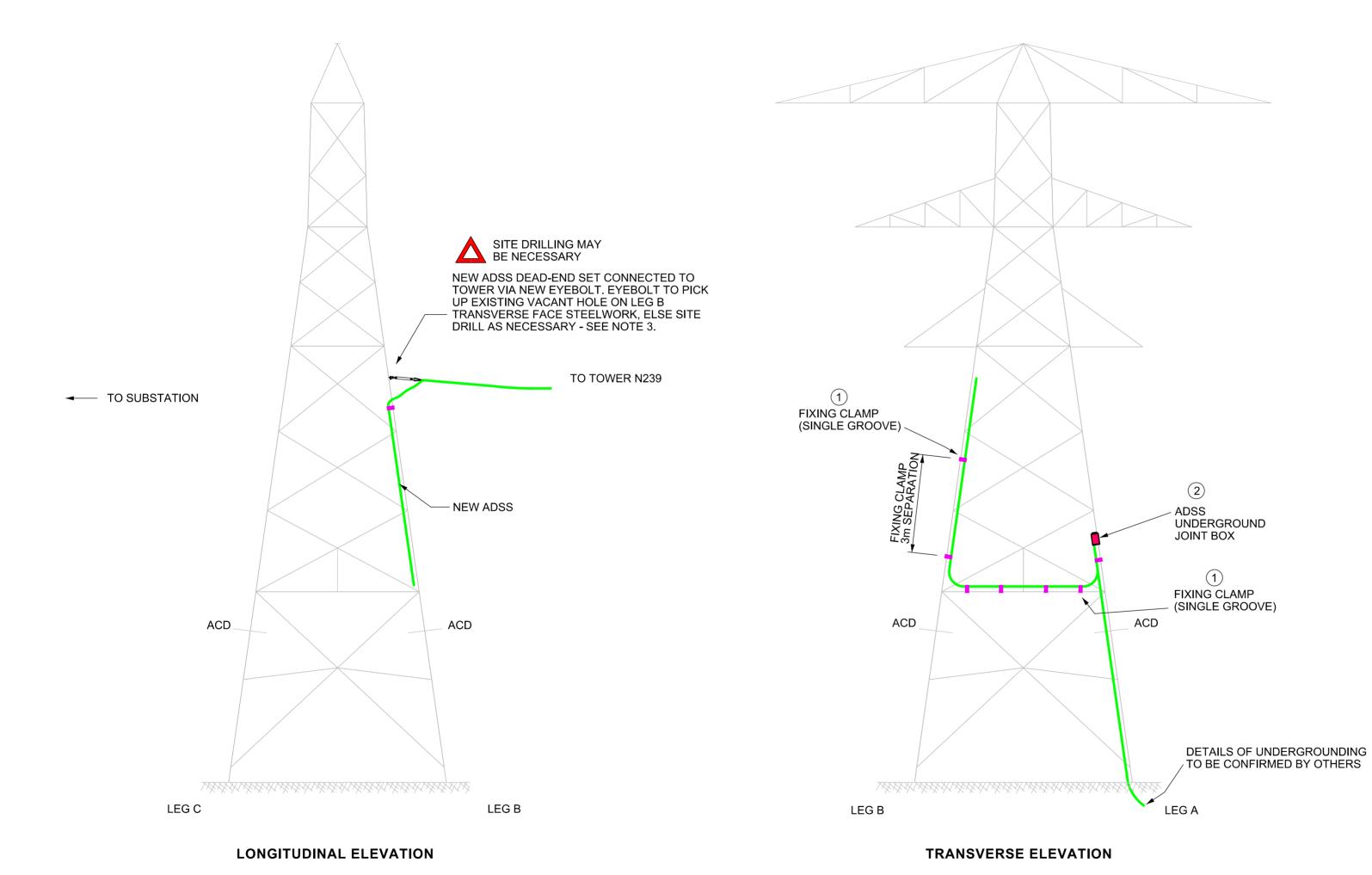
AT TOWER N239 (PL1 (E164) D60 E10')

TITLE

SCALE DESIGNED 1:100 DAH (UNLESS OTHERWISE STATED) DATE CHECKED 01/05/2018 RTM DRAWN APPROVED PCC DAH ORIGINAL DRAWING NUMBER REV 15_18130_08 A2 C

ITEM - DESCRIPTION		ITEM - DESCRIPTION	REF No.	COMPONENT DRG	QTY	REMARKS
	1	FIXING CLAMP (SINGLE GROOVE)	-	MOSDORFER MA8585 OR SIMILAR	7	
	2	ADSS U/G JOINT BOX	-	PLP TR 778-E COYOTE RUNT OR SIMILAR	1	

DESCRIPTION FIRST ISSUE					
REV DATE BY CHKD				APPD	
Α	02/05/2018	PCC	RTM	DAH	
DESCRIPTI	ON SET DRAWING	REFERENC	E ADDED - S	EE NOTE 3	
REV	DATE	BY	CHKD	APPD	
В	9/05/2018	RTM	PCC	DAH	
DESCRIPTION ADSS ATTACHMENT LOCATION AMENDED					
REV DATE BY CHKD APPD					
С	18/05/2018	AD	RF	DAH	







- DESIGN BASED HAZARDS ARE ACTIVELY ELIMINATED WHERE PRACTICAL.
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Tel: 01377 253617

Fax: 01377 259555

Yorkshire

Surrey

Derbyshire

Flintshire

West Lothian

GENERAL NOTES:

1.MINIMUM BEND RADIUS OF ADSS TO BE MAINTAINED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION

2.TOWER GOEMETRY BASED ON BLAW KNOX DRAWINGS BK35/32087 & BK35/32090

3. ADSS TERMINAL TENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_12.

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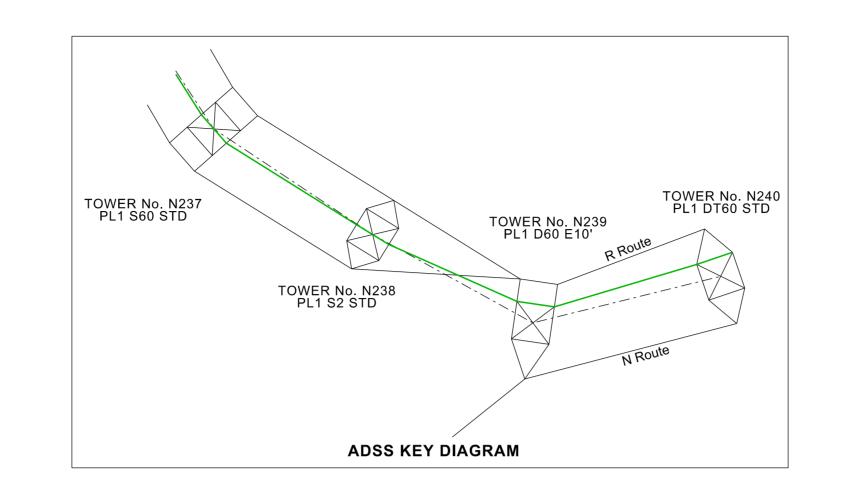
PLPC LTD
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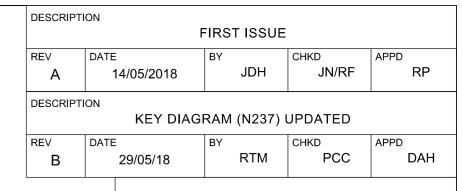
PROJECT

KILMARNOCK - KENDOON

GENERAL ARRANGEMENT FOR ADSS FIBRE PATH & JOINT BOX POSITION AT TOWER N240 (PL1 (E164) DT60 STD)

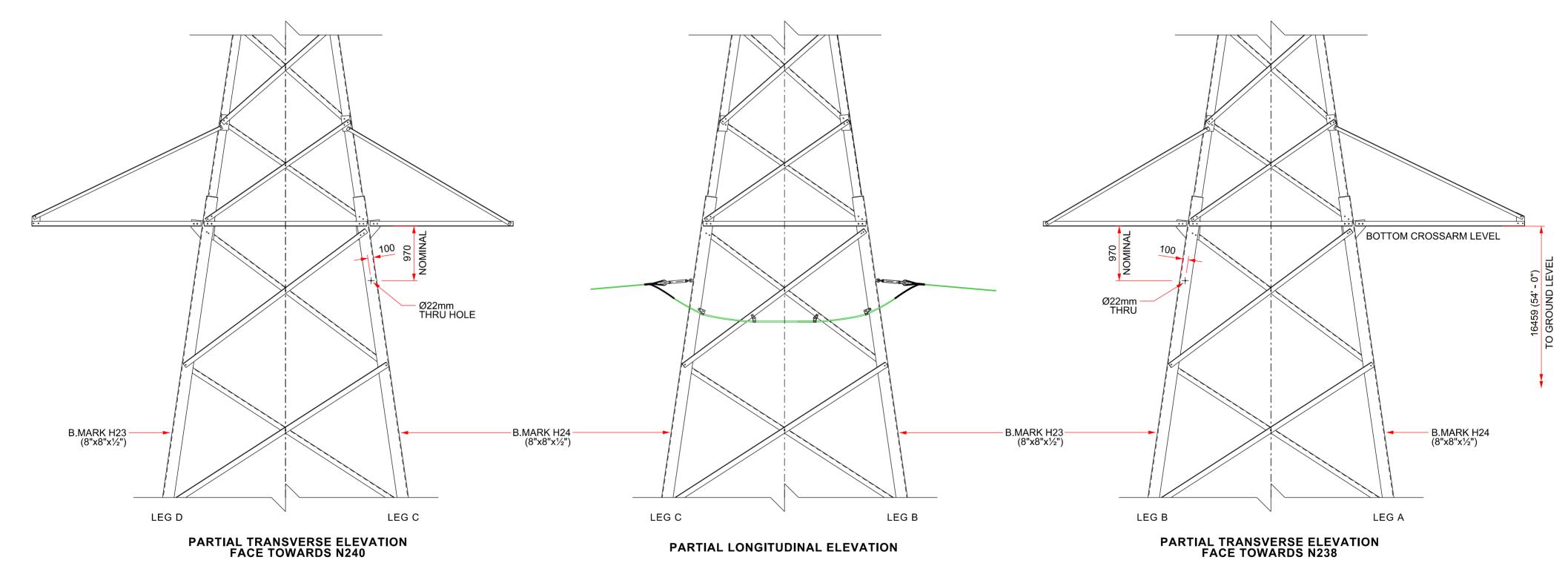
1:100 OTHERWISE STATED)	DESIGNED [DAH
02/05/2018	CHECKED	RTM
PCC	APPROVED [DAH
wing number 15_18	130_09	REV C
	02/05/2018 PCC WING NUMBER	1:100 [OTHERWISE STATED) CHECKED CHECKED APPROVED [OZ/05/2018





CDM RESIDUAL RISK

- ☐ DESIGN BASED HAZARDS ARE ACTIVELY ELIMINATED WHERE PRACTICAL. WHERE HAZARDS ARE NOT ELIMINATED, THEY ARE IDENTIFIED BY THIS SYMBOL.
- ☐ HAZARDS/RISKS THAT SHOULD BE CONSIDERED BY A COMPETENT CONTRACTOR ARE NOT IDENTIFIED.





GENERAL NOTES:

Yorkshire

West Lothian

- 1. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED
- OTHERWISE FOR PL1 D60 GENERAL ARRANGEMENT SEE DRAWINGS No. BK35/32087 & BK35/32088
 FOR ADSS FIBRE PATH / CONNECTION SEE DRAWING
- No. 15_18130_08

LS Transmission Consultancy Limited makes no warranties, express or implied, that compliance with this drawing, or any other ocument issued by LSTC, would in itself be sufficient to ensure safe systems of work or operation. Users are reminded of their own duties under health and safety legislation.

CLIENT PLPC LTD POWER LINE SPECIALISTS

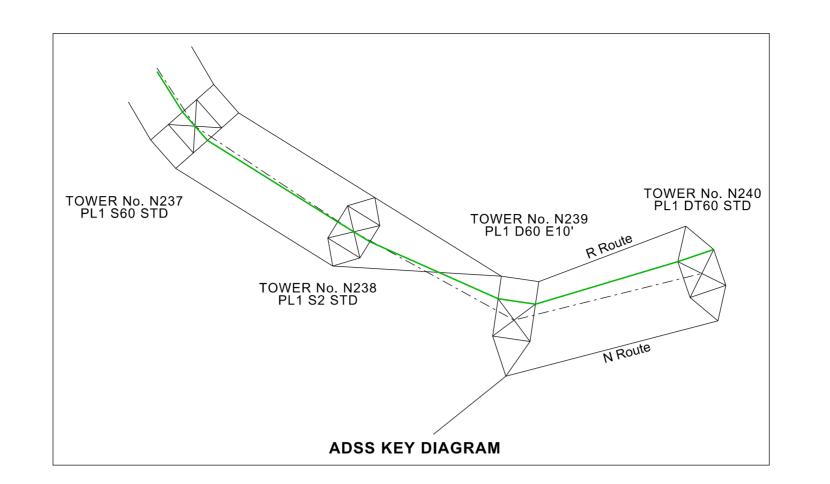
PROJECT

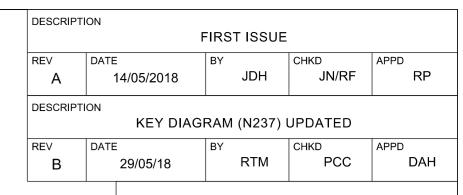
KILMARNOCK - KENDOON

TITLE

GENERAL ARRANGEMENT FOR FRONT & REAR TOWER SITE DRILLING AT TOWER N239 (PL1 (E164) D60 E10')

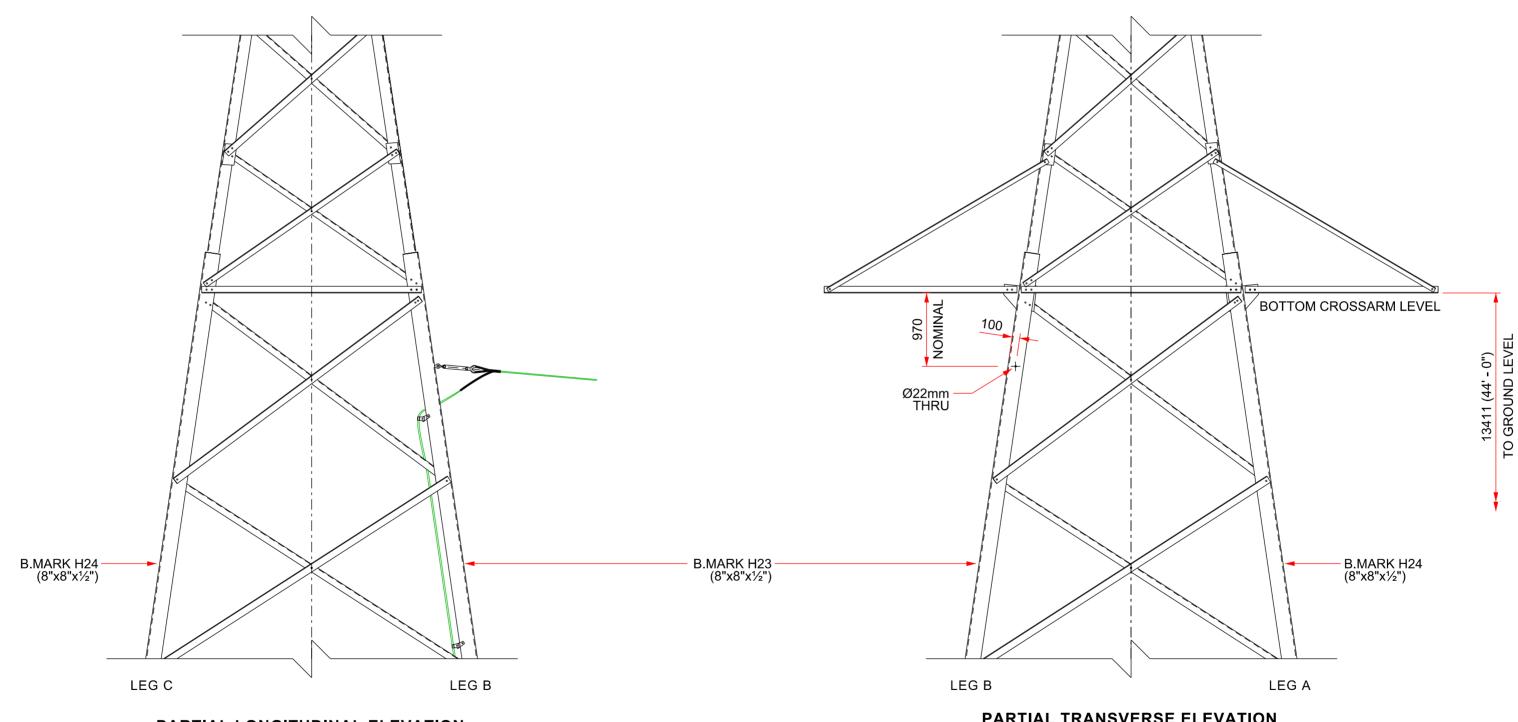
SCALE (UN	1:50 LESS OTHERWISE STATED)	DESIGNED	DAH	
DATE	11/05/2018	CHECKED	JN/RF	=
DRAWN	JDH	APPROVED	RP	
ORIGINAL SIZE A2	DRAWING NUMBER 15_18	130_21		REV B





CDM RESIDUAL RISK

- □ DESIGN BASED HAZARDS ARE ACTIVELY ELIMINATED WHERE PRACTICAL. WHERE HAZARDS ARE NOT ELIMINATED, THEY ARE IDENTIFIED BY THIS SYMBOL.
- ☐ HAZARDS/RISKS THAT SHOULD BE CONSIDERED BY A COMPETENT CONTRACTOR ARE NOT IDENTIFIED.



PARTIAL LONGITUDINAL ELEVATION

PARTIAL TRANSVERSE ELEVATION FACE TOWRDS N239



GENERAL NOTES:

own duties under health and safety legislation.

Yorkshire

West Lothian

1. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

2. FOR PL1 DT60 GENERAL ARRANGEMENT SEE DRAWING

ocument issued by LSTC, would in itself be sufficient to ensure safe systems of work or operation. Users are reminded of their

No. BK35/32090 3. FOR ADSS FIBRE PATH / CONNECTION SEE DRAWING No. 15_18130_09

PLPC LTD POWER LINE SPECIALISTS PROJECT KILMARNOCK - KENDOON LS Transmission Consultancy Limited makes no warranties, express or implied, that compliance with this drawing, or any other

CLIENT

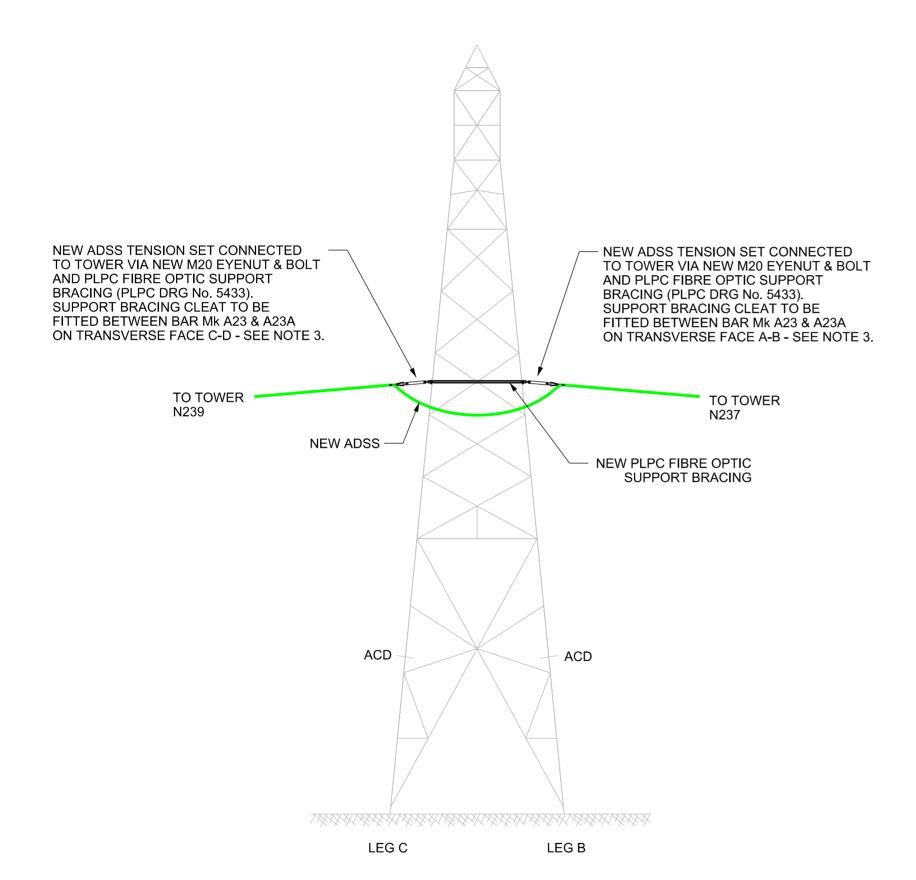
GENERAL ARRANGEMENT FOR FRONT & REAR TOWER SITE DRILLING AT TOWER N240 (PL1 (E164) DT60 STD)

TITLE

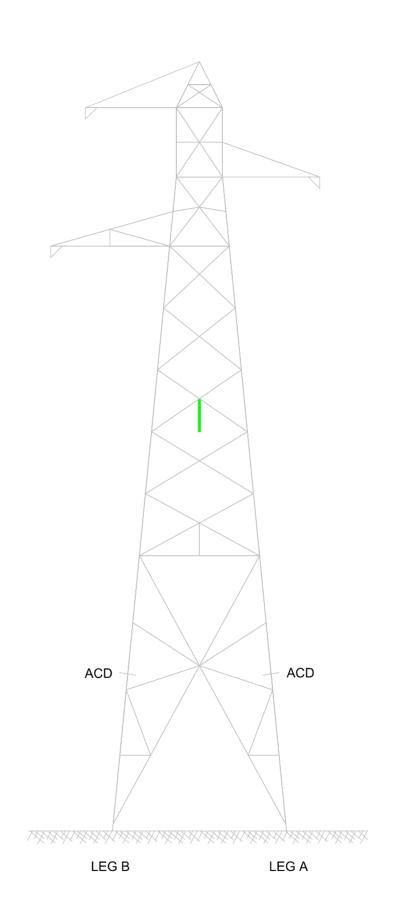
SCALE DESIGNED 1:50 DAH (UNLESS OTHERWISE STATED) DATE CHECKED 11/05/2018 JN/RF DRAWN APPROVED JDH RP ORIGINAL DRAWING NUMBER REV 15_18130_22 A2 В

DESCRIPTION		FIRST ISSUE			
REV	DATE	BY	CHKD	APPD	
Α	16/05/2018	RTM	RF	RP	

NEW ADSS



LONGITUDINAL ELEVATION



TRANSVERSE ELEVATION



CDM RESIDUAL RISK

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Fax: 01377 259555

Yorkshire

Flintshire

West Lothian

GENERAL NOTES:

1.MINIMUM BEND RADIUS OF ADSS TO BE MAINTAINED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION.

2.TOWER GOEMETRY BASED ON BLAW KNOX DRAWING BK35/31900.

3. ADSS TENSION SET DETAILS BASED ON LSTC DRAWING 52_18130_29.

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PROJECT

KILMARNOCK - KENDOON

TITLE

GENERAL ARRANGEMENT FOR ADSS FIBRE PATH/CONNECTION AT TOWER N238 (PL1 (E164) S2 STD)

SCALE (UN	1:100 ILESS OTHERWISE STATED)	DESIGNED		
DATE	16/05/2018	CHECKED		
DRAWN	RTM	APPROVED RP		
ORIGINAL SIZE	DRAWING NUMBER		IR1	
A2 15_18130_28				

A2 15_18130_28

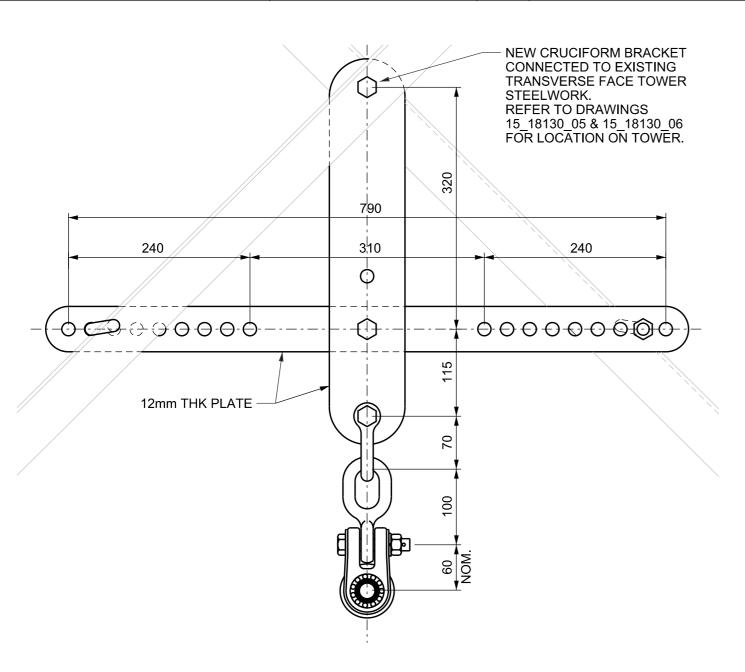
	ITEM - DESCRIPTION	REFERENCE NUMBER	QTY REQ'D	REMARKS
1	Cruciform Bracket	-	1	Supplied Separately
2	Shackle	BS 3288 15/29A	1	70kN
3	Twisted Shackle	SAPREM - ESR-16/A	1	70kN
4	Armour Grip Suspension Clamp	SAPREM - GAS-3/14 BRIDA	1	-
5	Neoprene Insert	-	1	To Suit ADSS and item 4
6	Armour Rod Assembly (1400mm Long)	SAPREM - VPGS3AL 14/Dcha	1	-

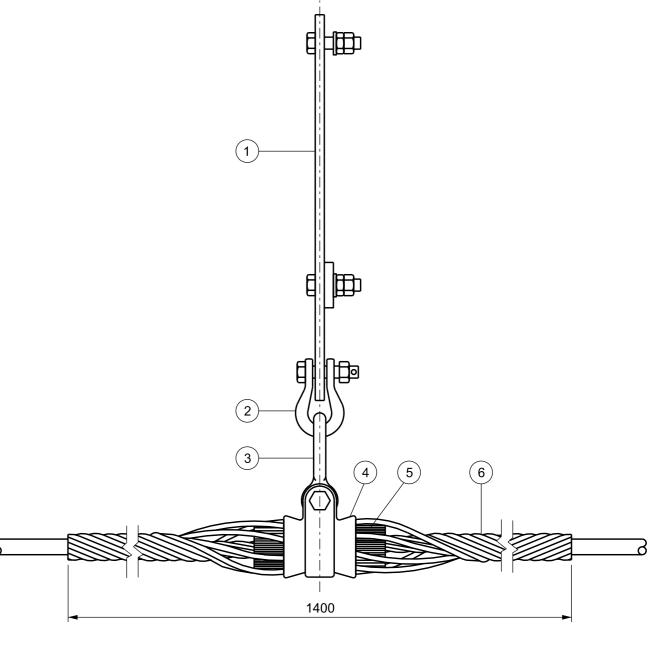


CDM RESIDUAL RISK

- DESIGN BASED HAZARDS ARE ACTIVELY ELIMINATED WHERE PRACTICAL. WHERE HAZARDS ARE NOT ELIMINATED, THEY ARE IDENTIFIED BY THIS SYMBOL.
- ☐ HAZARDS/RISKS THAT SHOULD BE CONSIDERED BY A COMPETENT CONTRACTOR ARE NOT IDENTIFIED.

ESCRIPTION FIRST ISSUE						
REV	DATE	BY	CHKD	APPD		
Α	8/5/18	RTM	PCC	DAH		
PLATE THICKNESS ADDED						
B B	DATE 29/5/18	BY RTM	CHKD PCC	APPD DAH		







Yorkshire

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNO

2. DETAILS SUBJECT TO CONFIRMATION BY MATERIALS SUPPLIER.

3. MINIMUM FAILING LOAD 70kN.

rawing, or any other document issued by LSTC, would in itself be sufficient to ensure safe systems of wo operation. Users are reminded of their own duties under health and safety legislation.

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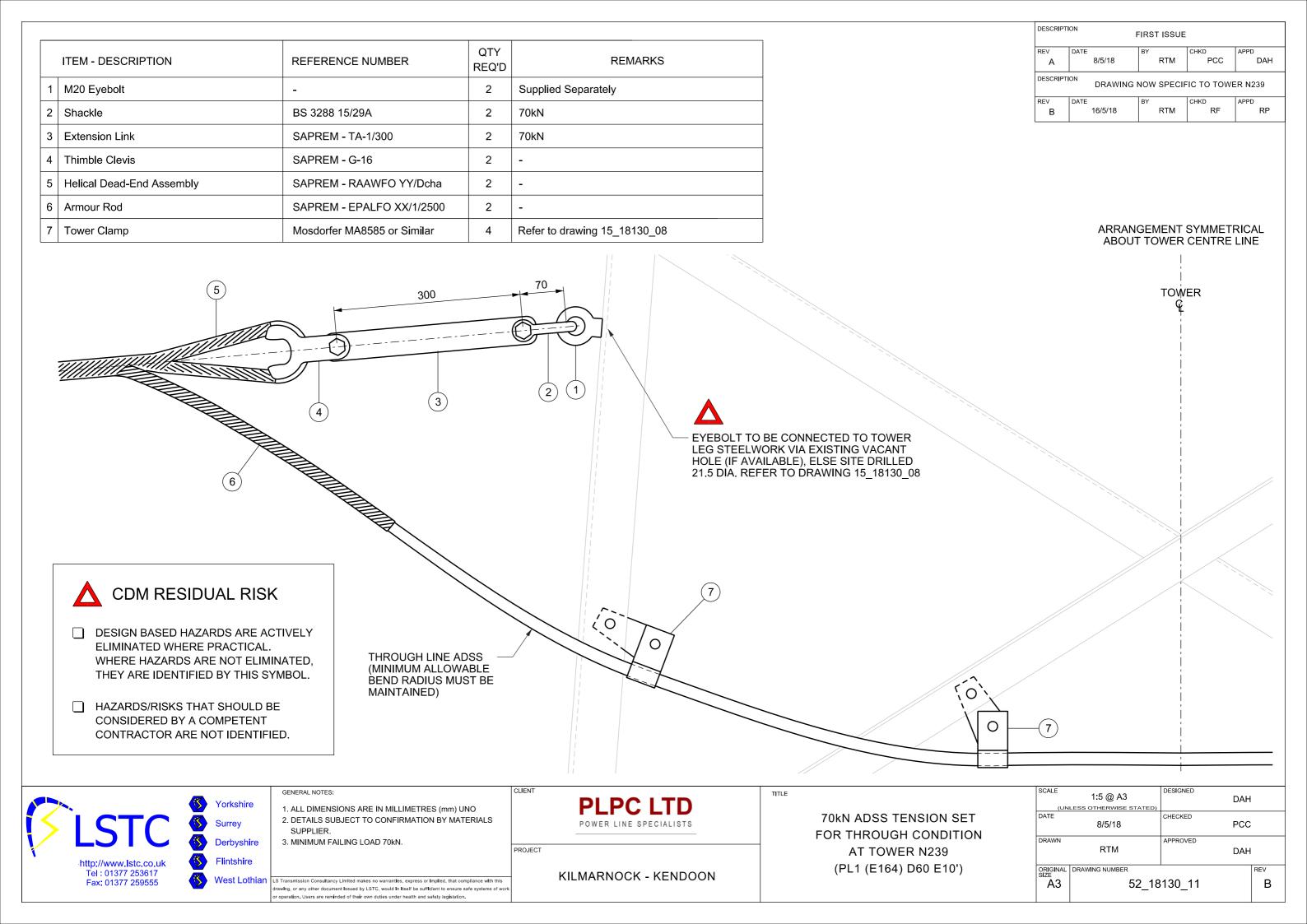
PROJECT

KILMARNOCK - KENDOON

TITLE

70kN ADSS SUSPENSION SET FOR PL1 (E164) S2 & S10 SUSPENSION TOWERS

SCALE DESIGNED 1:5 @ A3 DAH (UNLESS OTHERWISE STATED DATE 8/5/18 PCC DRAWN APPROVED RTM DAH ORIGINAL DRAWING NUMBER SIZE В **A3** 52_18130_10



ITEM - DESCRIPTION		REFERENCE NUMBER	QTY REQ'D	REMARKS
1	M20 Eyebolt	-	1	Supplied Separately
2	Shackle	BS 3288 15/29A	1	70kN
3	Extension Link	SAPREM - TA-1/500	1	70kN
4	Thimble Clevis	SAPREM - G-16	1	-
5	Helical Dead-End Assembly	SAPREM - RAAWFO YY/Dcha	1	-
6	Armour Rod	SAPREM - EPALFO XX/1/2500	1	-
7	Tower Clamp	Mosdorfer MA5323/MA8585 or similar	1	Refer to drawings 15_18130_04 & 15_18130_09

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNO

SUPPLIER.

own duties under health and safety legislation

3. MINIMUM FAILING LOAD 70kN.

2. DETAILS SUBJECT TO CONFIRMATION BY MATERIALS

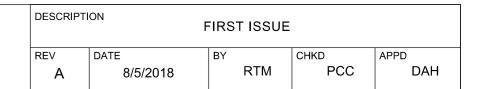
ocument issued by LSTC, would in itself be sufficient to ensure safe systems of work or operation. Users are reminded of their

Yorkshire

Flintshire

West Lothian

http://www.lstc.co.uk Tel : 01377 253617 Fax: 01377 259555



1:5 @ A2

8/5/18

RTM

ORIGINAL DRAWING NUMBER SIZE

(UNLESS OTHERWISE STATED)

DATE

DRAWN

A2

70kN ADSS TERMINAL TENSION SET

FOR PL1 (E164) & L7(c) TERMINAL TOWERS

DAH

PCC

DAH

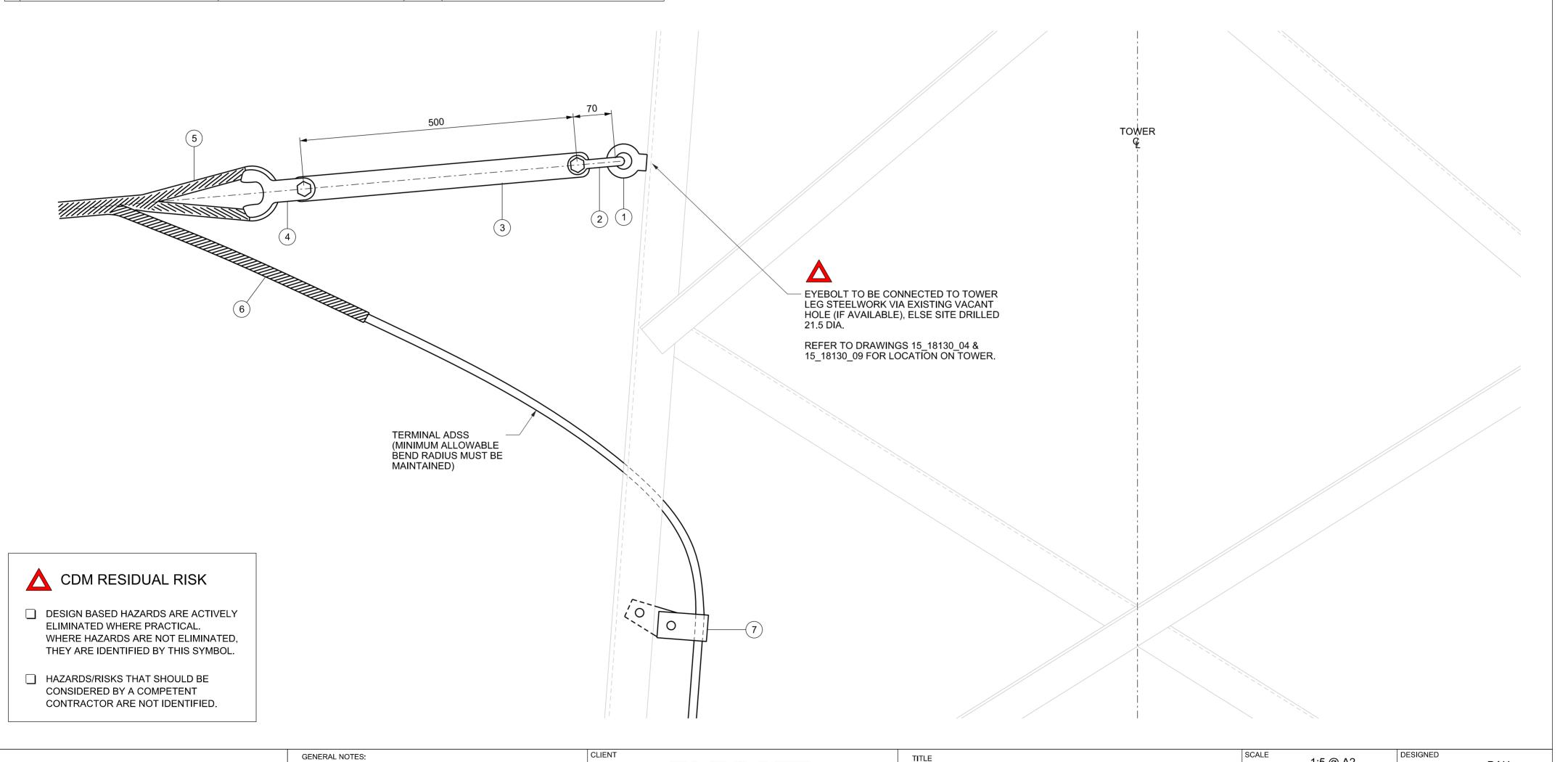
REV

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CHECKED

APPROVED

52_18130_12



PLPC LTD

POWER LINE SPECIALISTS

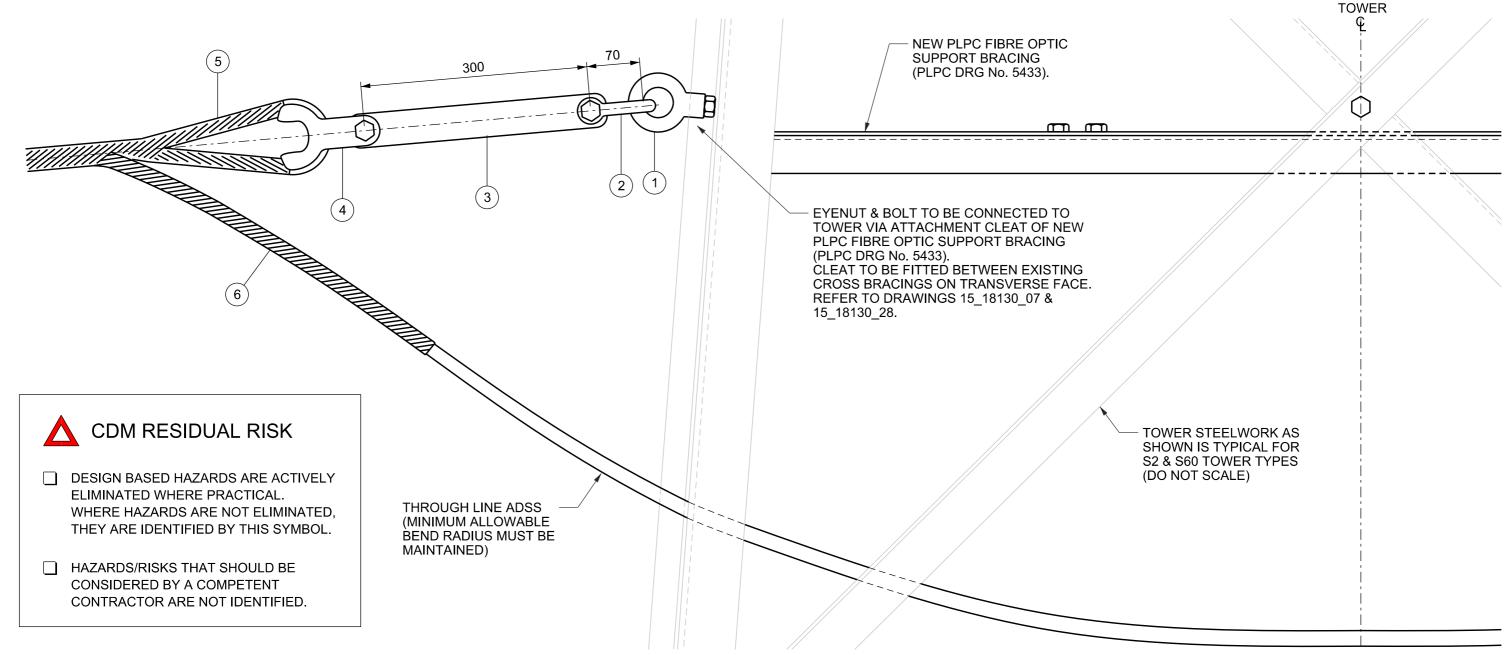
KILMARNOCK - KENDOON

PROJECT

ITEM - DESCRIPTION		REFERENCE NUMBER	QTY REQ'D	REMARKS
1	M20 Eyenut & Bolt	-	2	Supplied Separately - BS970 High tensile normalised steel
2	Shackle	BS 3288 15/29A	2	70kN
3	Extension Link	SAPREM - TA-1/300	2	70kN
4	Thimble Clevis	SAPREM - G-16	2	-
5	Helical Dead-End Assembly	SAPREM - RAAWFO YY/Dcha	2	-
6	Armour Rod	SAPREM - EPALFO XX/1/2500	2	-

DESCRIPTION FIRST ISSUE 17/5/18 RTM

> ARRANGEMENT SYMMETRICAL ABOUT TOWER CENTRE LINE





Yorkshire

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNO

2. DETAILS SUBJECT TO CONFIRMATION BY MATERIALS SUPPLIER.

3. MINIMUM FAILING LOAD 70kN.

rawing, or any other document issued by LSTC, would in itself be sufficient to ensure safe systems of wo operation. Users are reminded of their own duties under health and safety legislation.

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PROJECT

KILMARNOCK - KENDOON

70kN ADSS TENSION SET FOR THROUGH CONDITION AT TOWERS N237 (PL1 (E164) S60 STD) & N238 (PL1 (E164) S2 STD)

SCALE	1:5 @ A3	DESIGNED RP	
DATE	17/5/18	CHECKED	
DRAWN	RTM	APPROVED RP	
ORIGINAL SIZE	DRAWING NUMBER		REV
Å3	·==		

52_18130_29 Α3