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Mr Oliver King King &Co. Properties LTD Marquis House 68 Great North Road Hatfield AL9 5ER

29 January 2019

Pinnacle Reference: C190113

**Dear Oliver** 

# **RE: Mudberry Farm Feasibility Report**

We have undertaken a site appraisal of the civil/structural engineering aspects of the proposed site using readily available data sources and would report as follows:

# Site Setting

The proposed 87ha site is of an irregular shape, its is mostly greenfield and it was previously used for agricultural purposes. The plot is centred on National Grid Reference (NGR) 480458, 105892 and can be accessed via Mudberry Lane, Bosham, PO18 8TS. The development site consists of two fields which are mostly undeveloped, with a farm house and barns located centrally within the plot. Another smaller building potentially used for other farming activities also lies along Mudberry Lane. A potential third development is identified along the northern perimeter of the site, however, as far as can be distinguished it appears to be a paved area used as a service yard.

The site is located in Bosham, to the east of Hambrook, to the west of Oakwood and immediately to south of the A27. The site is bound by the A27 along its northern perimeter, to the east by Ratham Lane adjacent to Willowfield Farm, to the west by Newells Lane adjacent to agricultural land to the south by railway tacks between Nutbourne and Bosham Stations. Bosham Stream and associated tributaries run along the eastern perimeter within the site. Another smaller tributary running into Cutmill Creek exists along the western perimeter of the site parallel to Newells Lane.

# **Ground Conditions**

British Geological Survey mapping and nearby boreholes indicate topsoil / made ground of 0.6m deep, overlying the superficial geology composed of River Terrace Deposits (Sand, Silt and Clay). The Superficial deposits are in turn overlying the bedrock geology which vary along the site extents: London Clay Formation (Clay, Silt and Sand) proven to 7.7 m below ground level (according to



borehole investigation taken centrally within the site) taking up the southern half of the site; Lambeth Group (Clay, Silt and Sand) found in the northern portion proven to 12.3m below ground level (according to borehole investigation taken centrally along northern perimeter).

Available boreholes indicate a shallow water table at 1.2m deep that may impact foundation design and all other earthworks activities.

# **Environmental Considerations**

UK Radon mapping indicates the site has a 1-5% risk of radon so any new construction may require basic protective measures to be provided such as a lapped and sealed DPM.

#### **Drainage**

Foul - Southern Water record mapping confirms that there is foul drainage locally available to a development of the site. Record drawings identify potential foul sewer connections points along the existing foul sewer which runs along Ratham Lane to the east of the site.

We are not aware of any capacity issues in the local network that would prevent the proposed development discharging into it, however confirmation of this will be subject to a pre-development inquiry followed by S106 agreement with Southern Water.

Surface Water – According to the Southern Water asset record, there are no public surface water/combined sewers within the vicinity of the site. Surface water discharge should be managed in accordance with the hierarchy as outlined in Part H of the Building Regulations.

Soakage testing should be carried out in order to determine the suitability of infiltration as a method by which to discharge surface water. The development should include a full SuDS based drainage system with appropriate permeable paving, ponds, on-site attenuation and treatment trains to limit discharge rates to greenfield runoff and maintain water quality. Drainage design would be in accordance with current best practice and local LLFA requirements. A preliminary drainage design strategy will be submitted at planning stage. Please refer to the attached record plans.

# **Flooding**

EA flood mapping identifies portions of the site to be encompassed within Flood Zones 1, 2 & 3. Any planning application would be supported by an appropriate Flood Risk Assessment report confirming that all built form and estate roads remain within areas at low risk of flooding, or that extents of potential flooding in mitigated as much as practicable. Potential sources of flooding identified by the EA are:

- Flooding from rivers and seas: the site falls mostly within a no risk zone however a sizeable portion of the site along the eastern perimeter is situated in a medium to high risk zone.
- Flooding from surface water: The site falls mostly within a no risk zone however a sizeable portion of the site along the eastern perimeter is situated in a medium to high risk zone.
- Flooding from reservoirs canals and other artificial sources: There is no flood risk from reservoirs identified by available EA models within the site extents.

Please refer to the attached EA record mapping for flood risk for further detail.



# Electricity

Scottish and Southern Electricity record plans depict multiple networks of high and low voltage within the vicinity of the site. Most notable are the high voltage underground cables partially spanning the length of Mudberry Lane within the site and running into a small substation by an existing farm building: the remaining span of the road is then taken up by low voltage underground cables. Overhead 132kV cables run across the entire plot entering midway along Newells Lane and leaving the site extents along Ratham Lane adjacent to Willowfield Farm. Please refer to the attached record drawing.

#### Gas

An assessment carried out with respect to services provided by Scotia Gas Network Limited within the vicinity of the development site indicates that there is a potential medium-pressure gas main beyond the southeast corner of the site along Newells Lane. A second medium-pressure gas pipeline can be identified beyond the eastern extents of the site, roughly following Ratham Lane, A third highpressure pipeline can also be identified within the development site, crossing at its northeast corner; provisions will need to be made to minimise risk of rupturing the pipeline during earthworks activities. Please refer to the attached record drawing.

## Water

Portsmouth Water Asset plans identified an existing water supply network that crosses through the western proportions of the proposed site. Please refer to the attached record drawing.

## **Telecoms**

Record drawings provided by Openreach show apparatus running alongside the eastern perimeter of the site by Ratham Lane, another network is identified running along the entire span of Mudberry Lane and a third potential connection is shown running into the site extents at its north eastern corner. Please refer to the attached record drawing.

Yours faithfully.

Jawsy Jabbar BSc Eng (Hons), CEng MIEI

**Principal Engineer** 

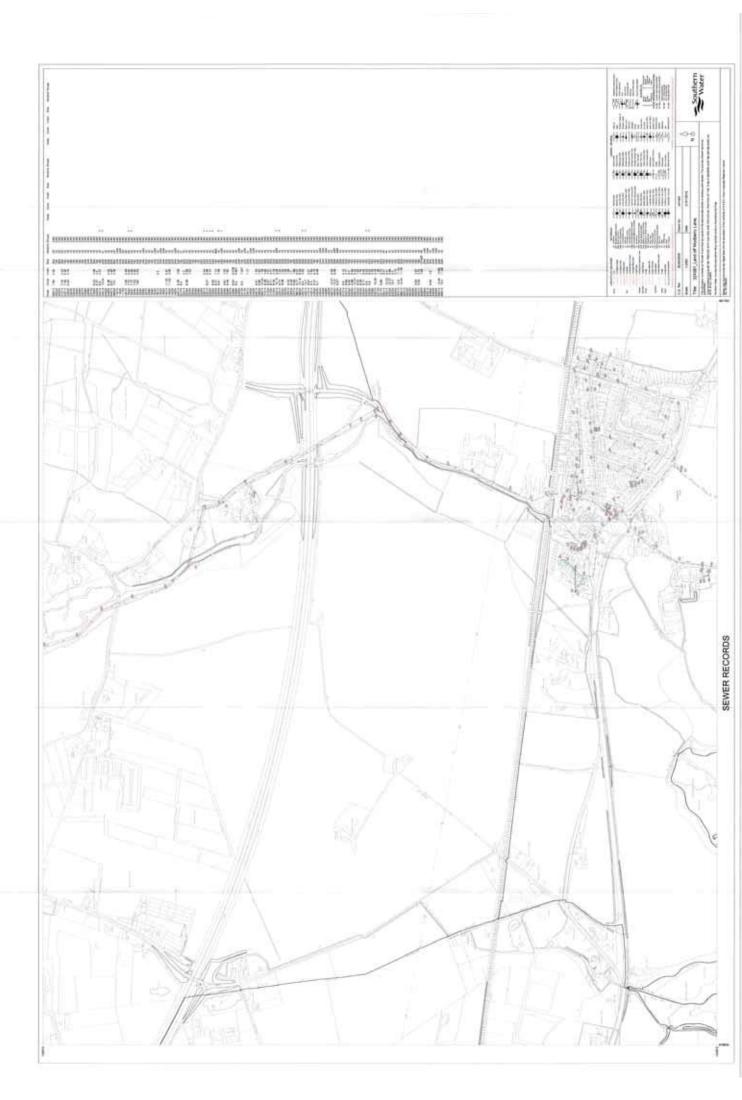
Pinnacle Consulting Engineers Limited

Jawsy.j@ukpinnacle.com

OFFICES Dublin, London, Norwich, The Hague

01707 527636

Enc.





# Flood map for planning

Your reference Location (easting/northing) Created

Mudberry Lane 480686/105964 23 Jan 2019 10:38

Your selected location is in flood zone 3, an area with a high probability of flooding.

# This means:

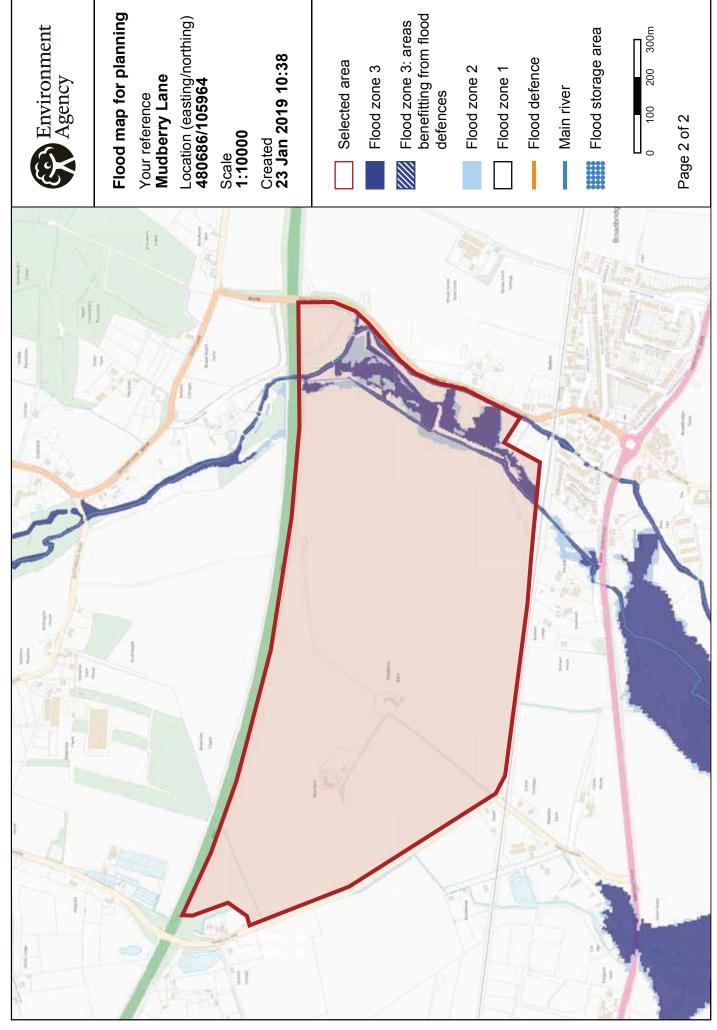
- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

#### **Notes**

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

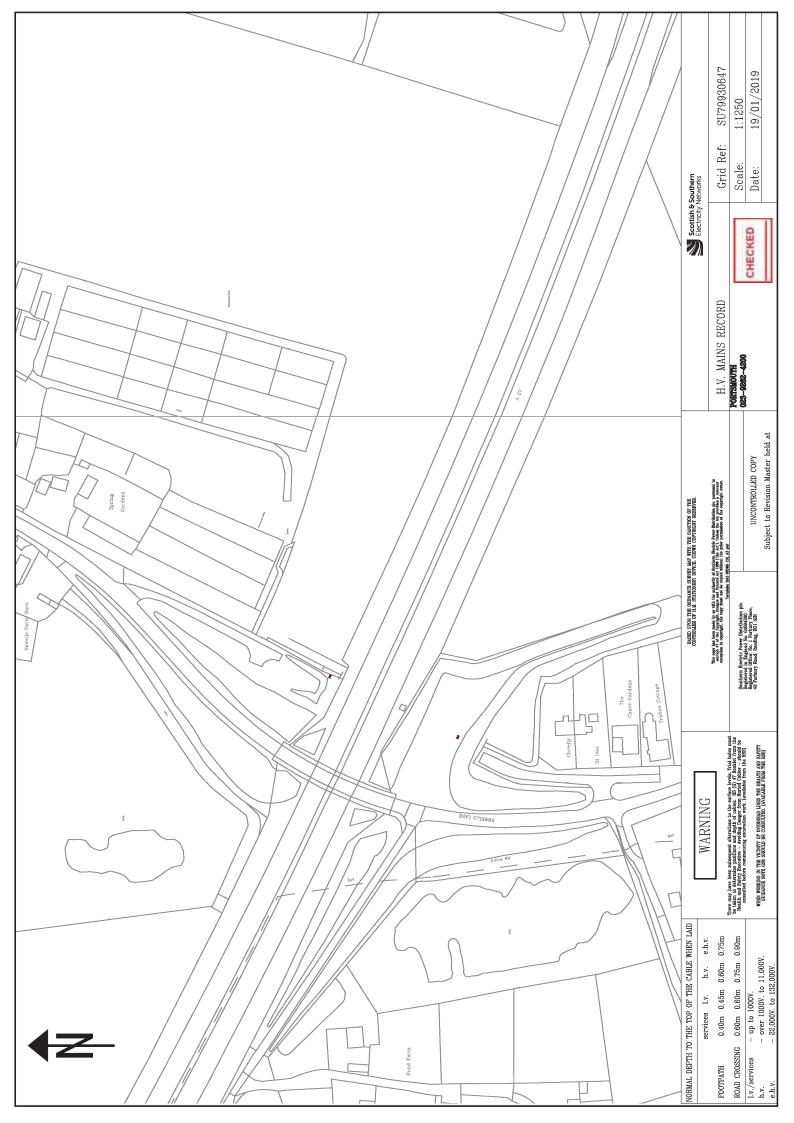
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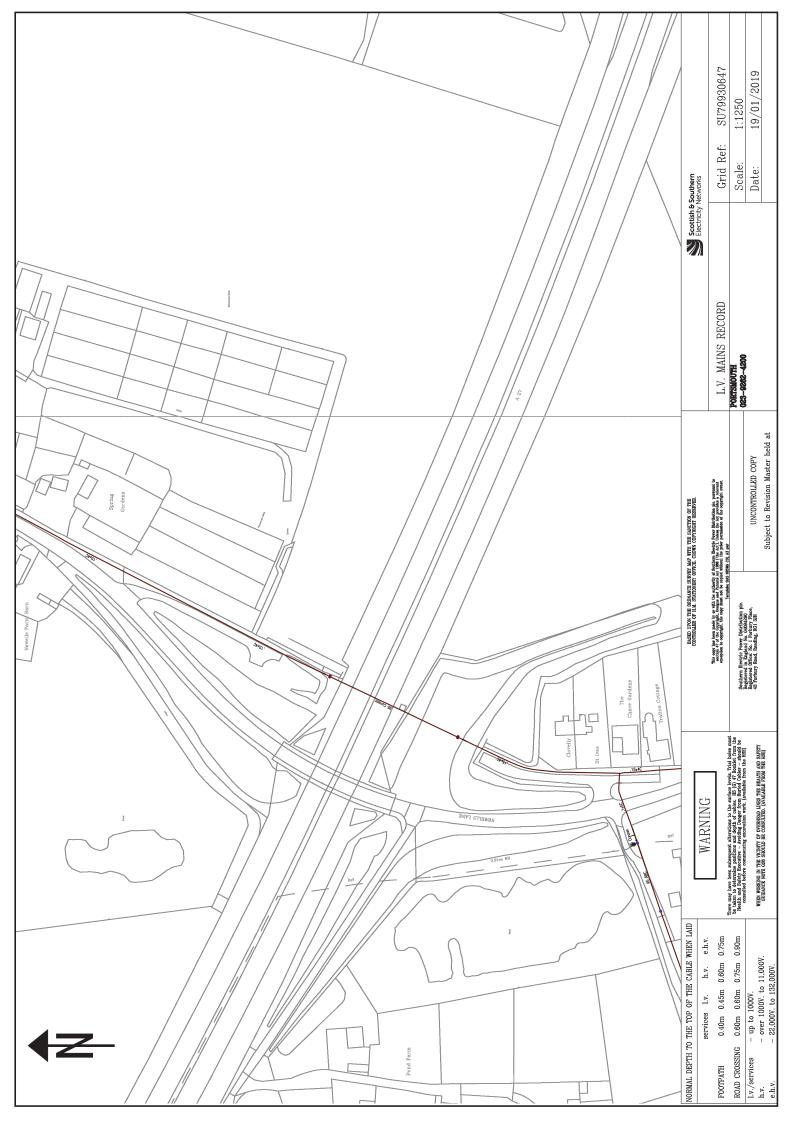


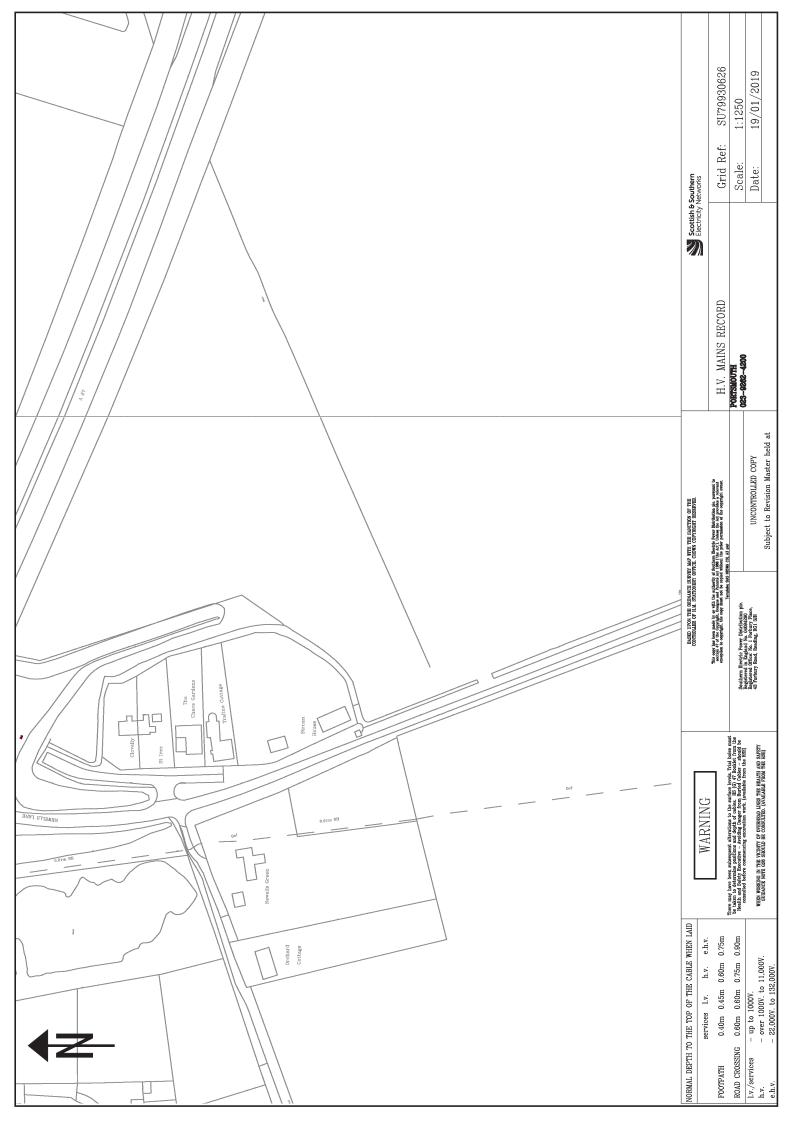
© Environment Agency copyright and / or database rights 2018. All rights reserved. © Crown Copyright and database right 2018. Ordnance Survey licence number 100024198.

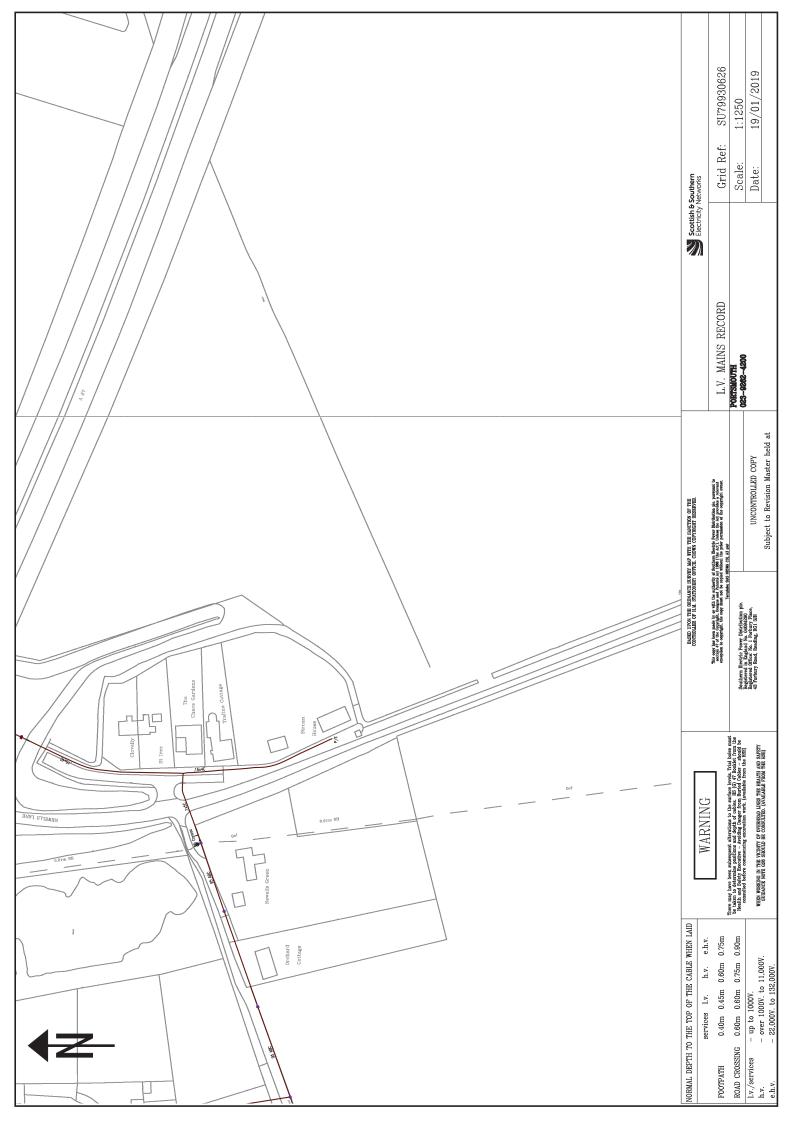
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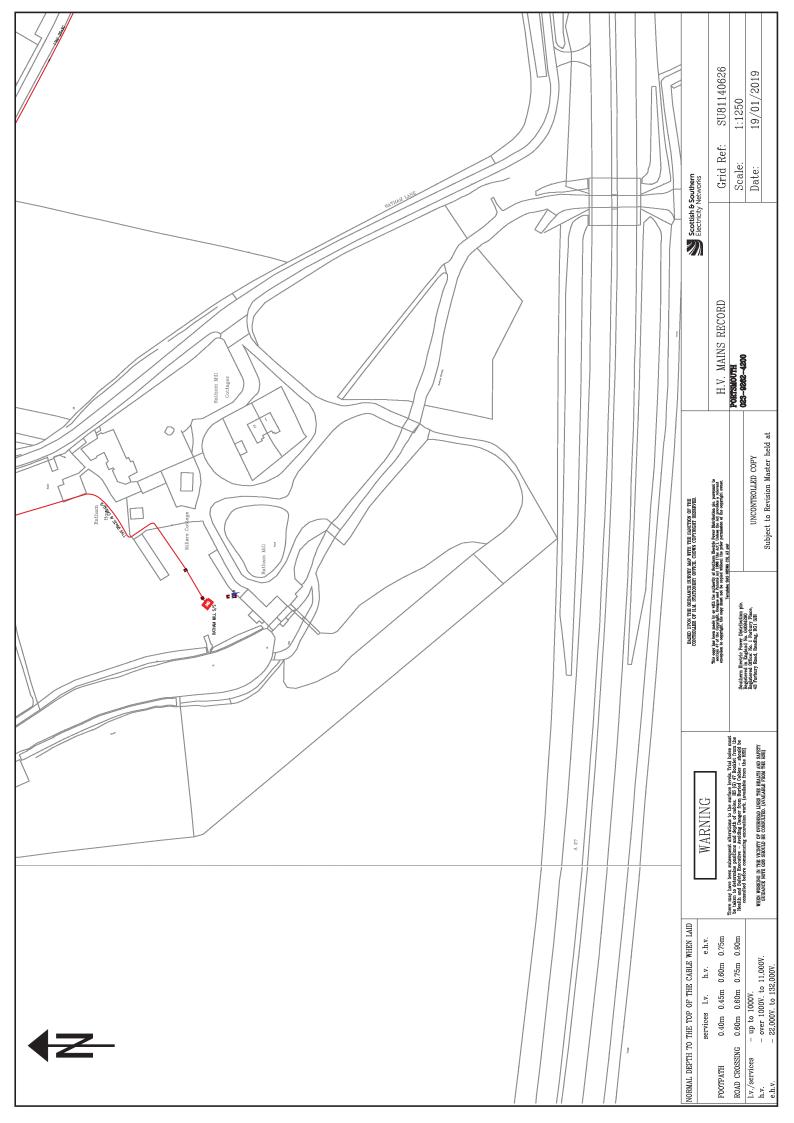
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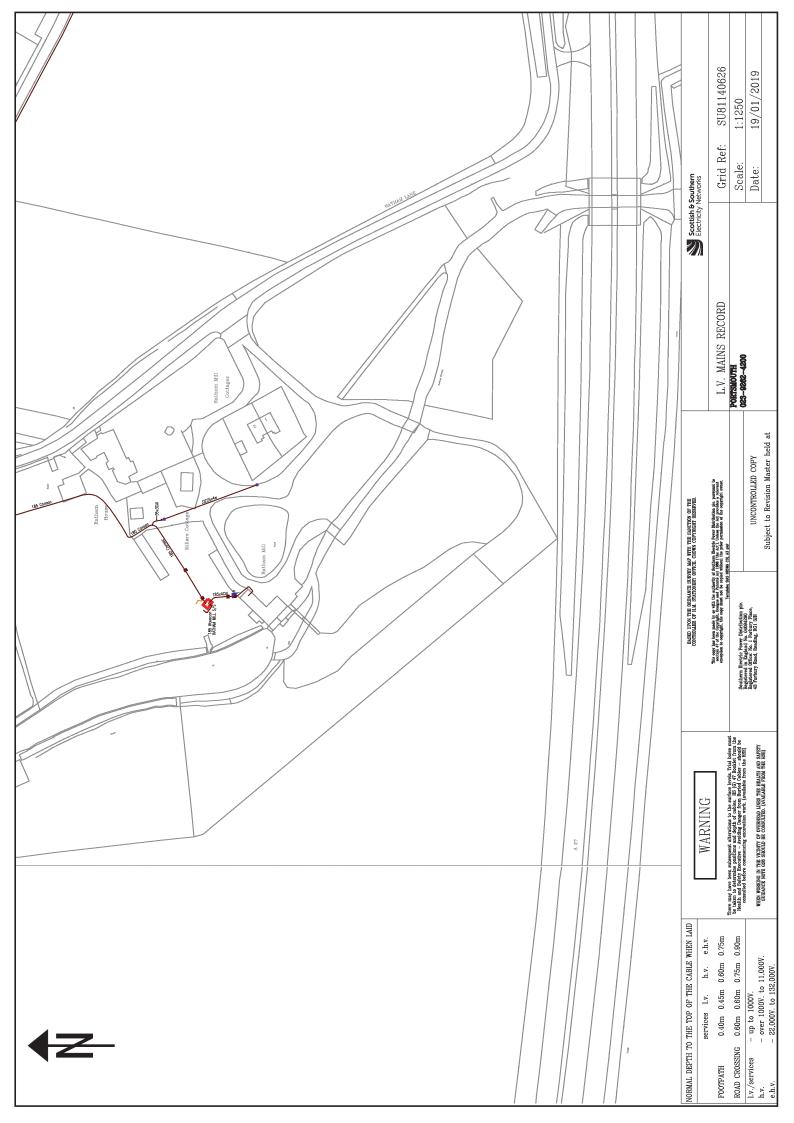


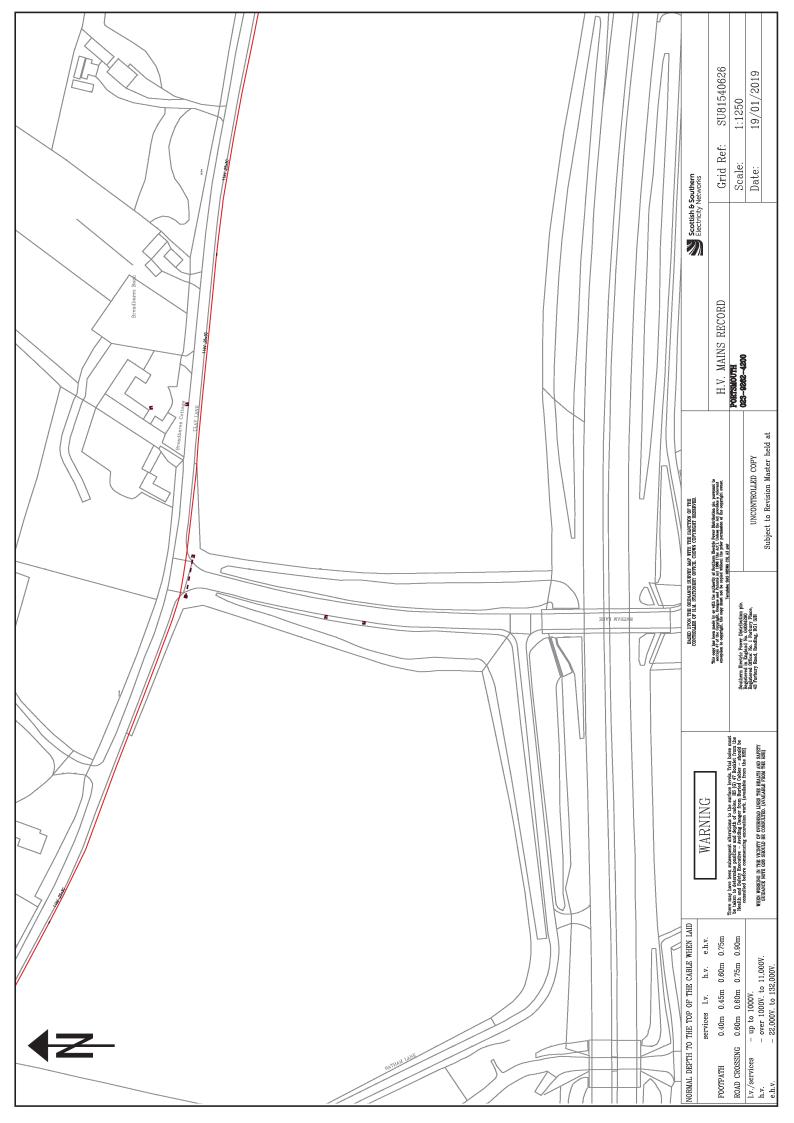


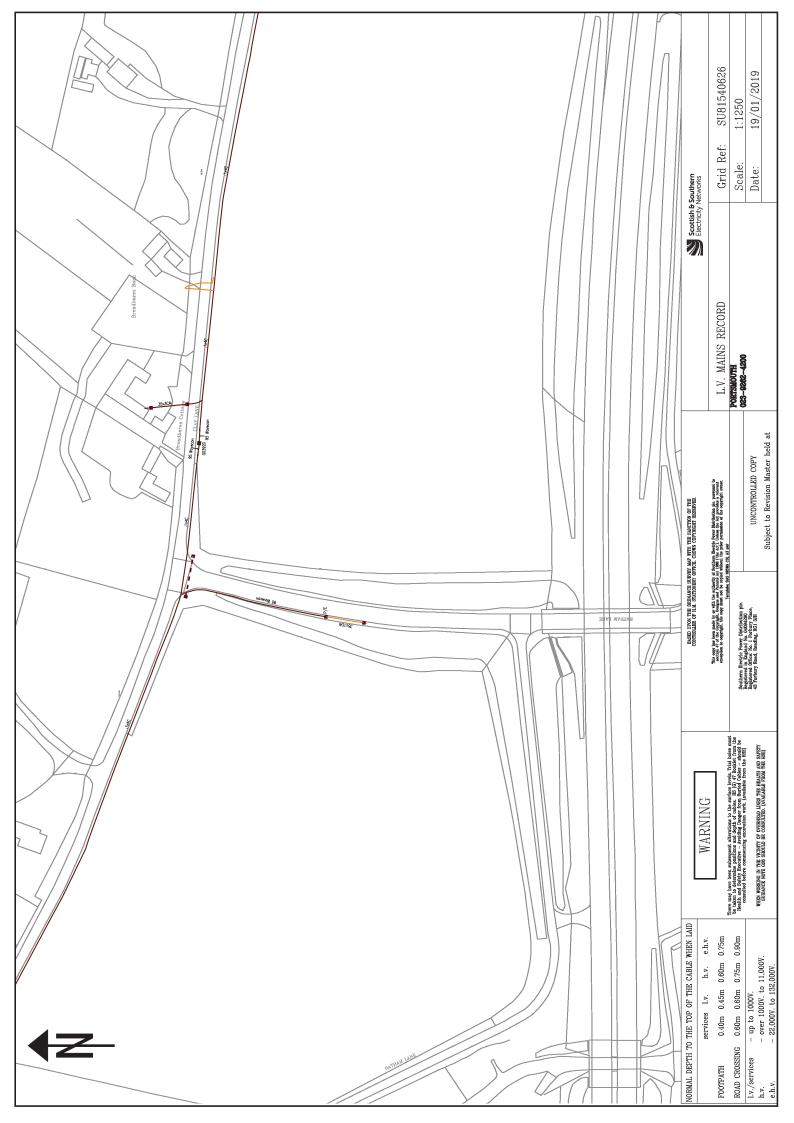


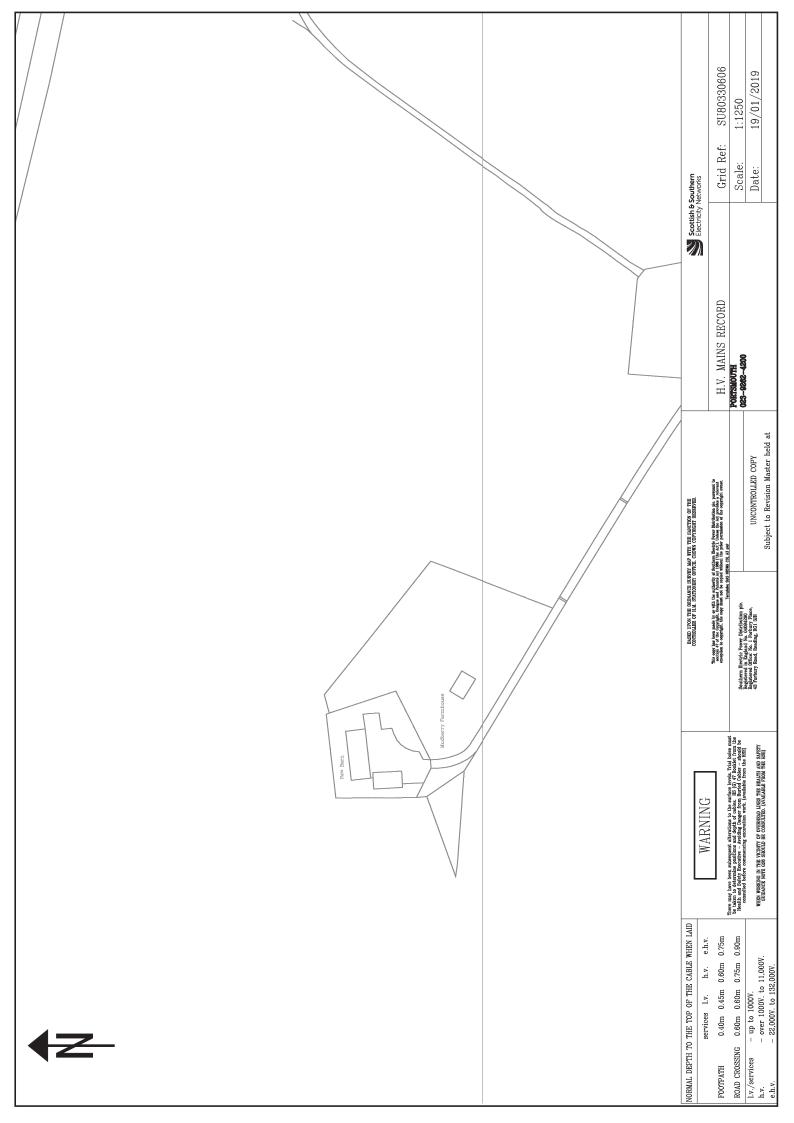


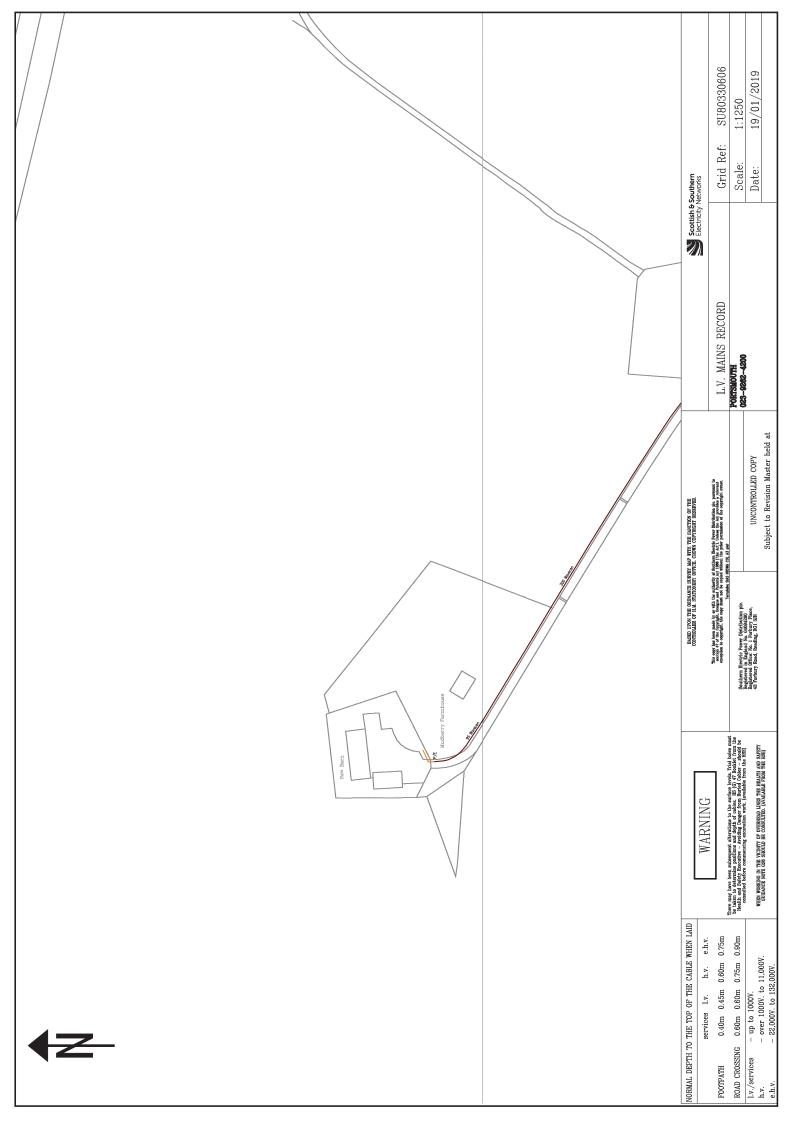


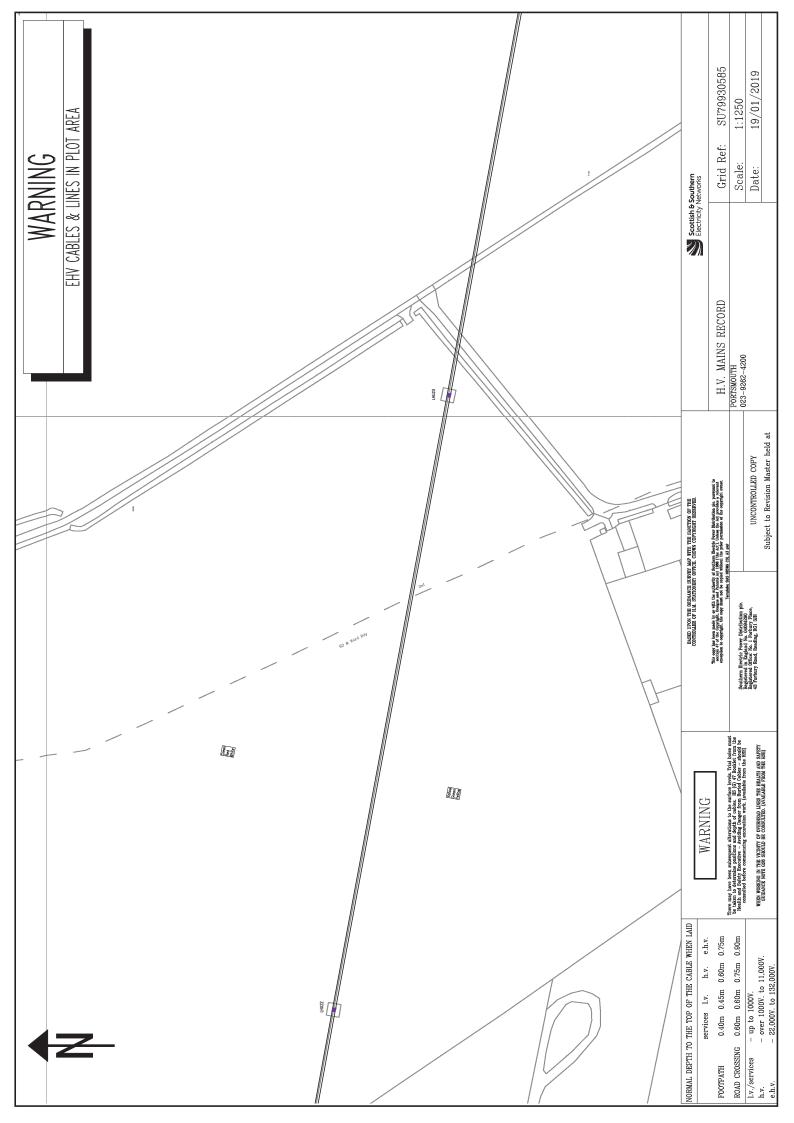


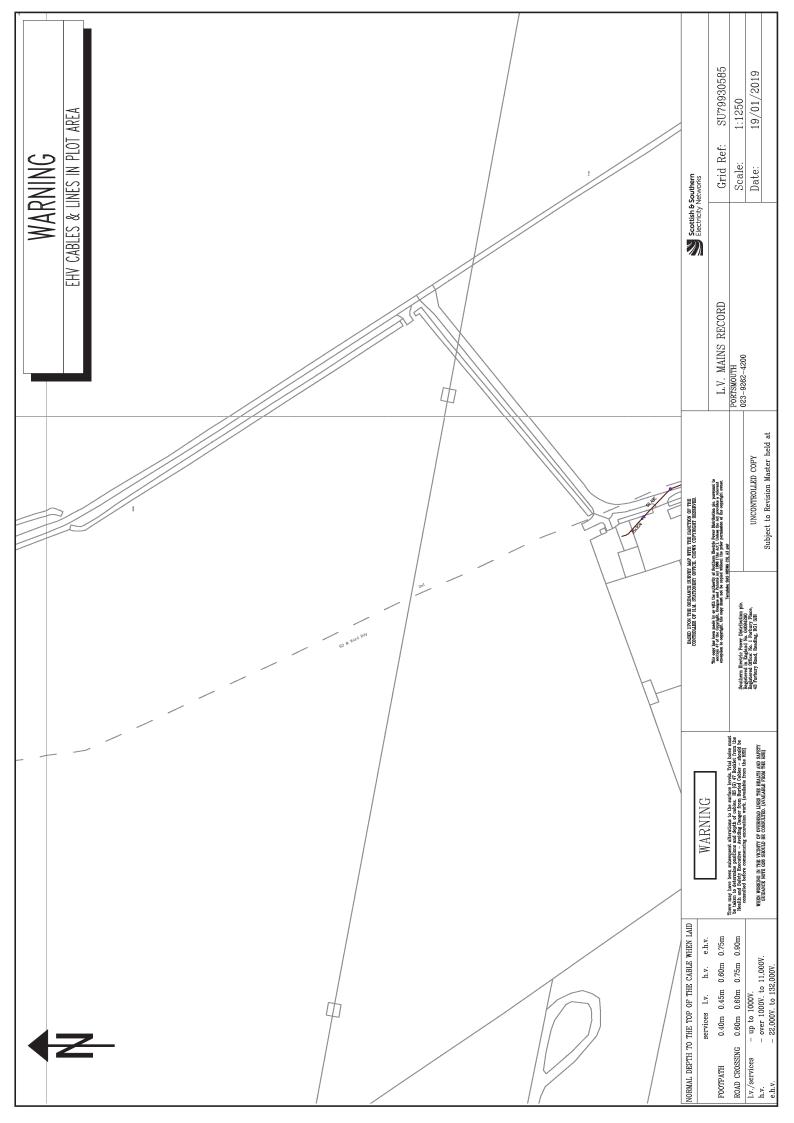


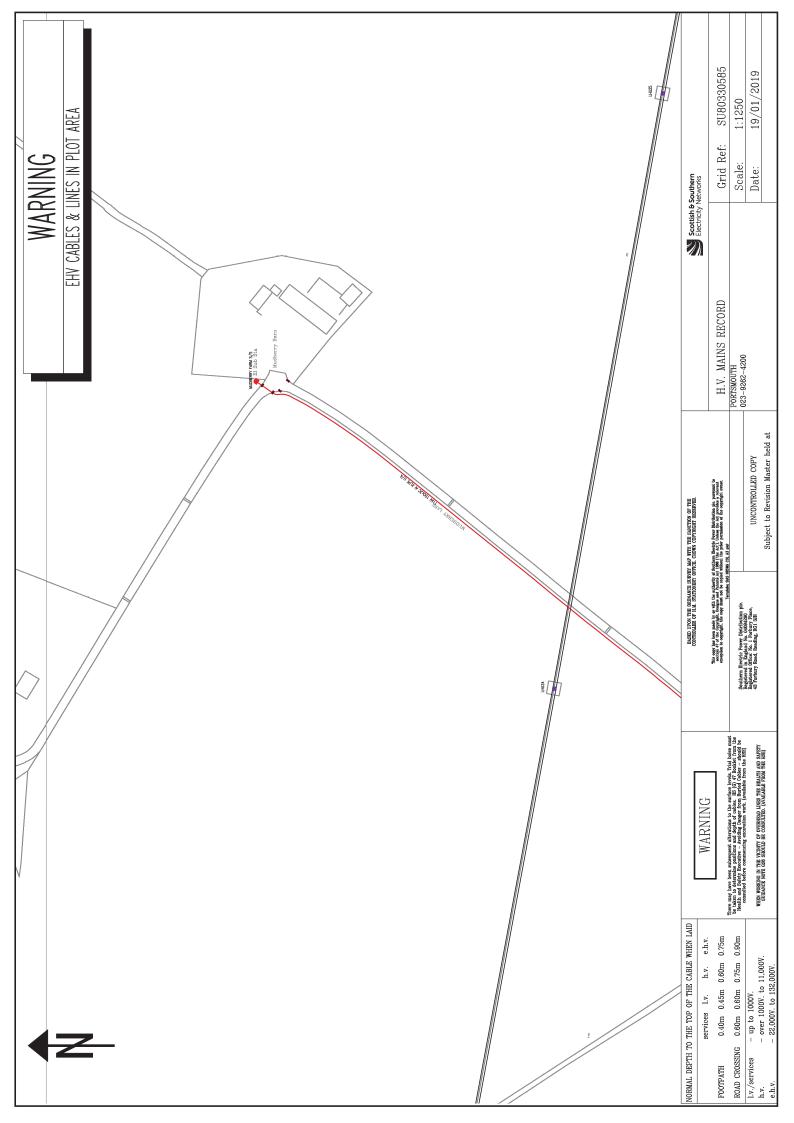


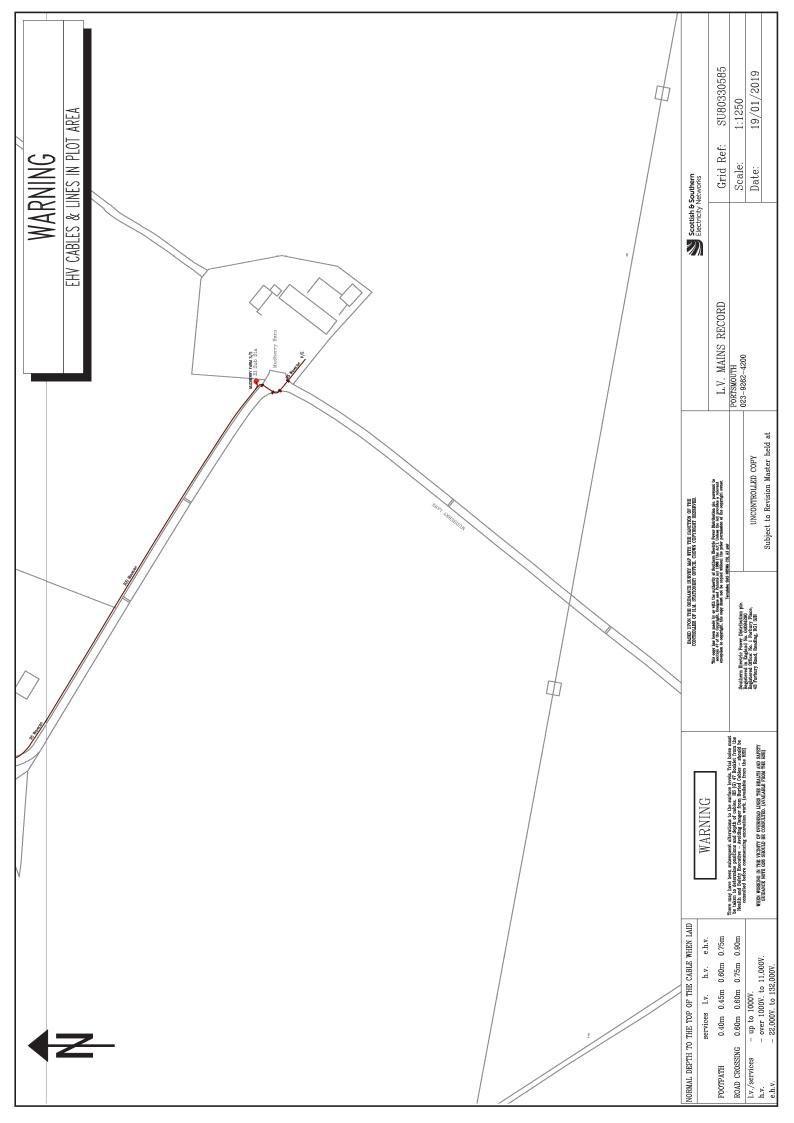




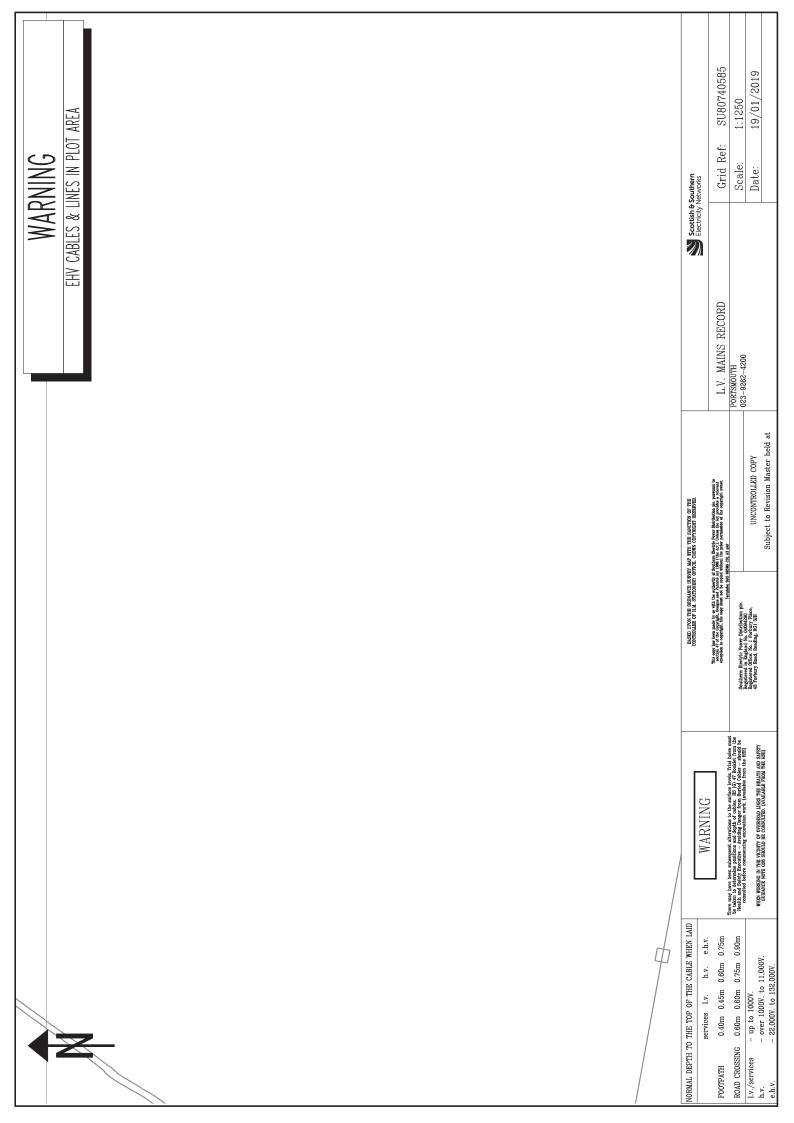


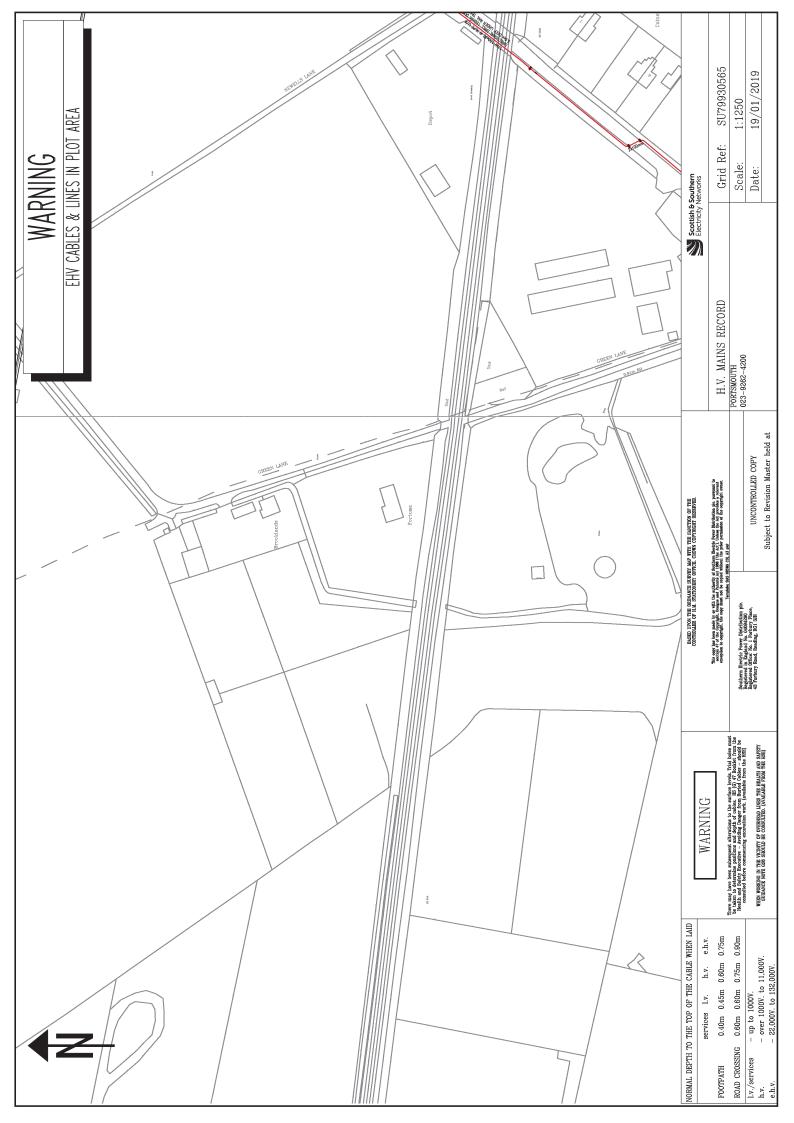


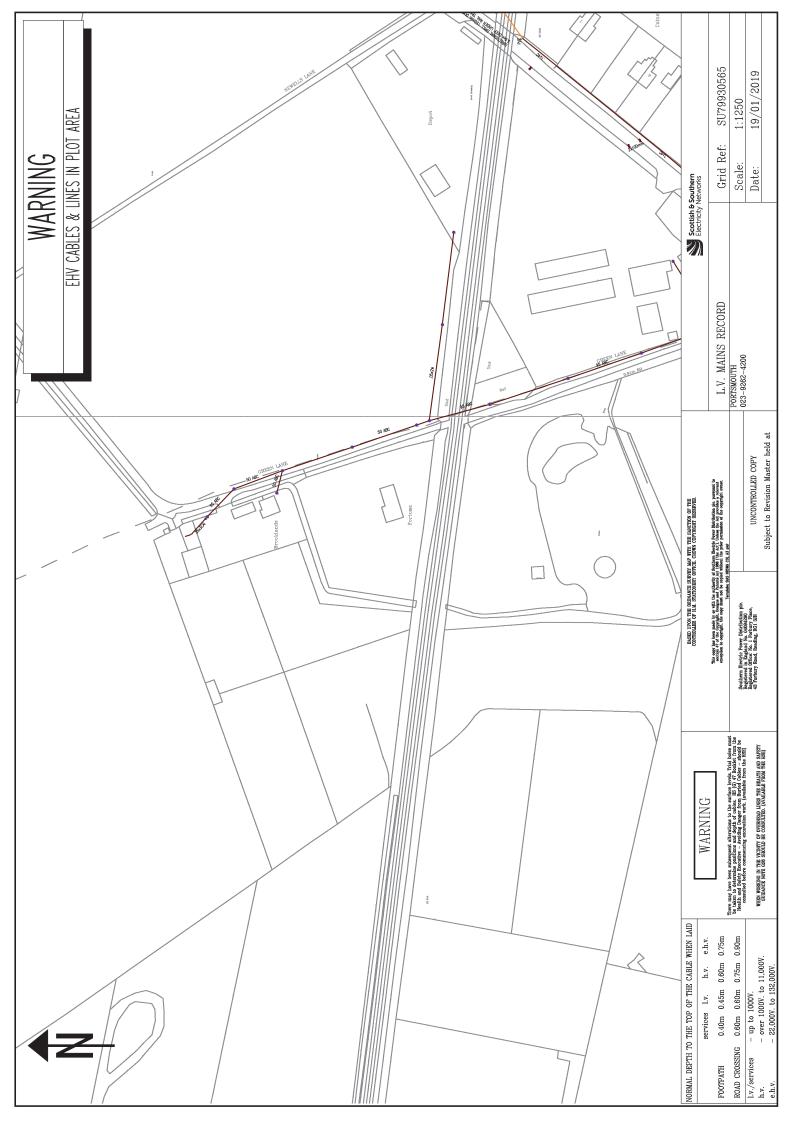


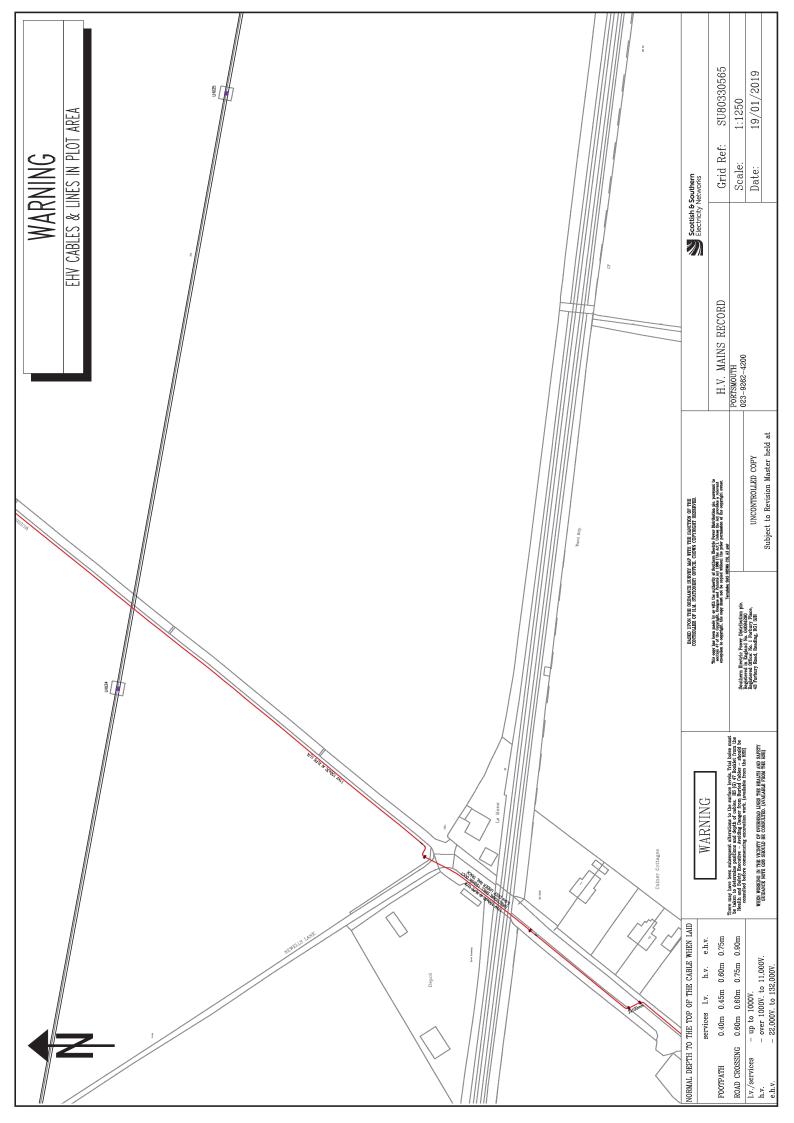


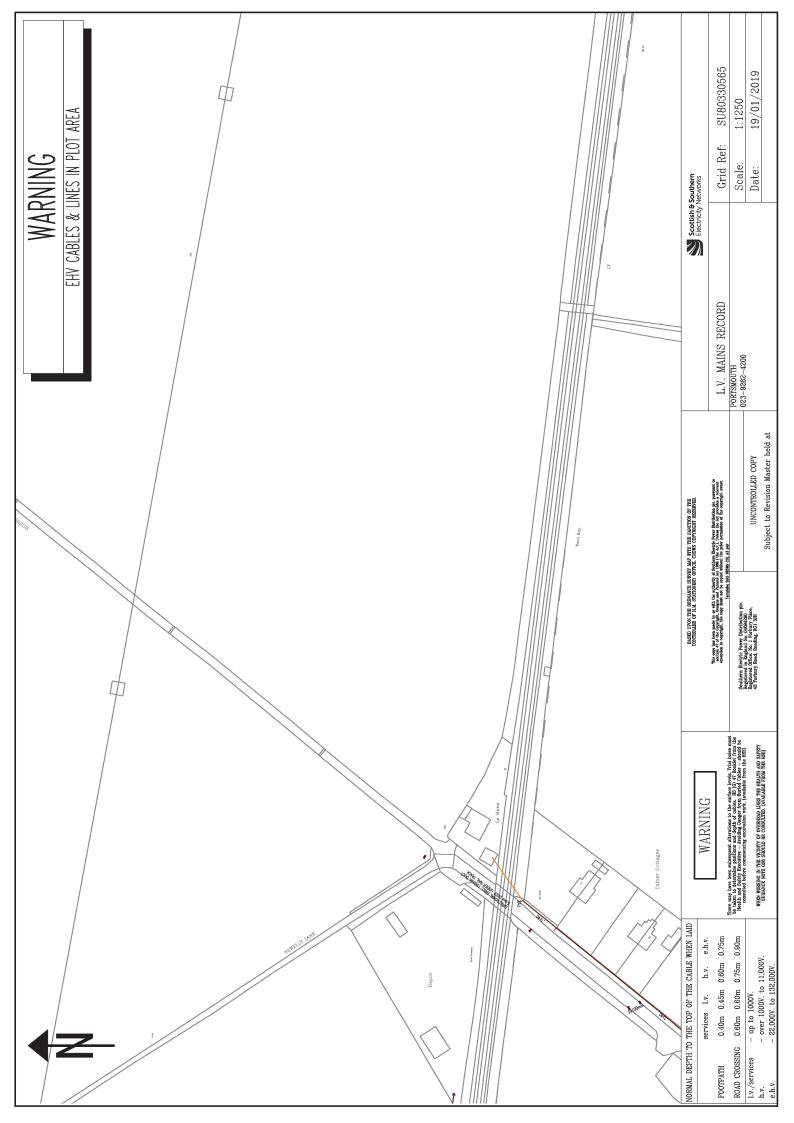
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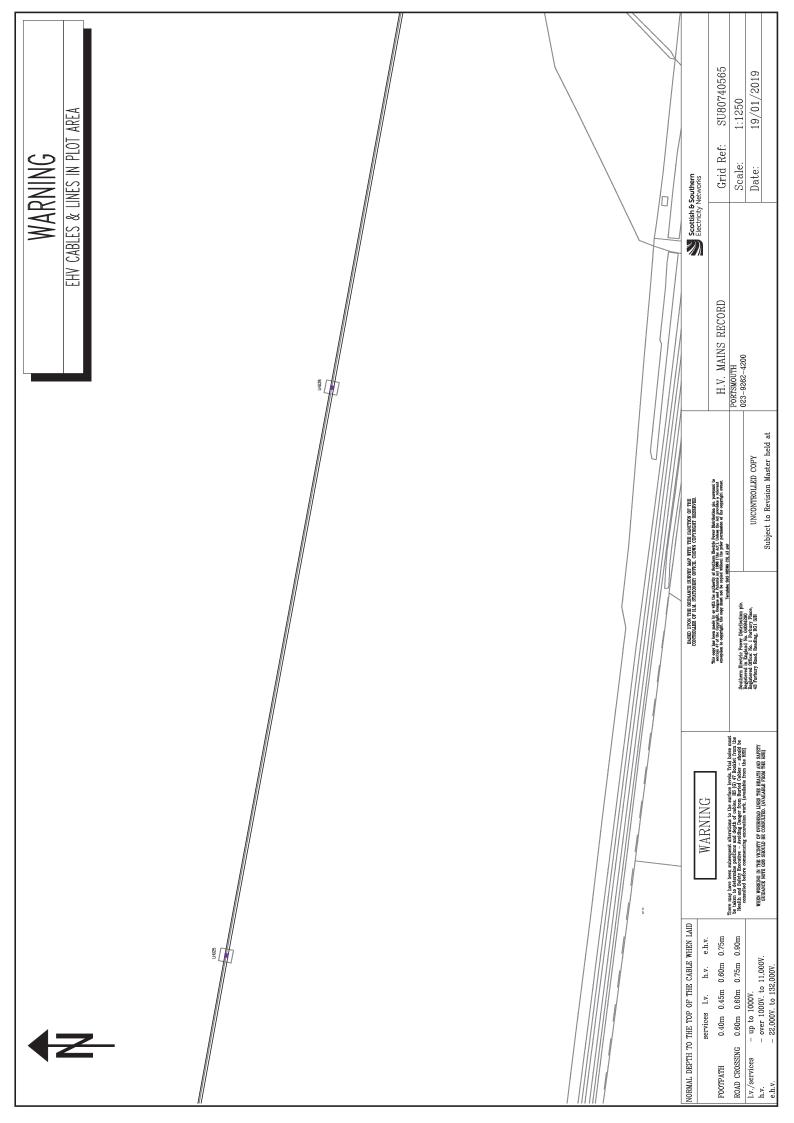


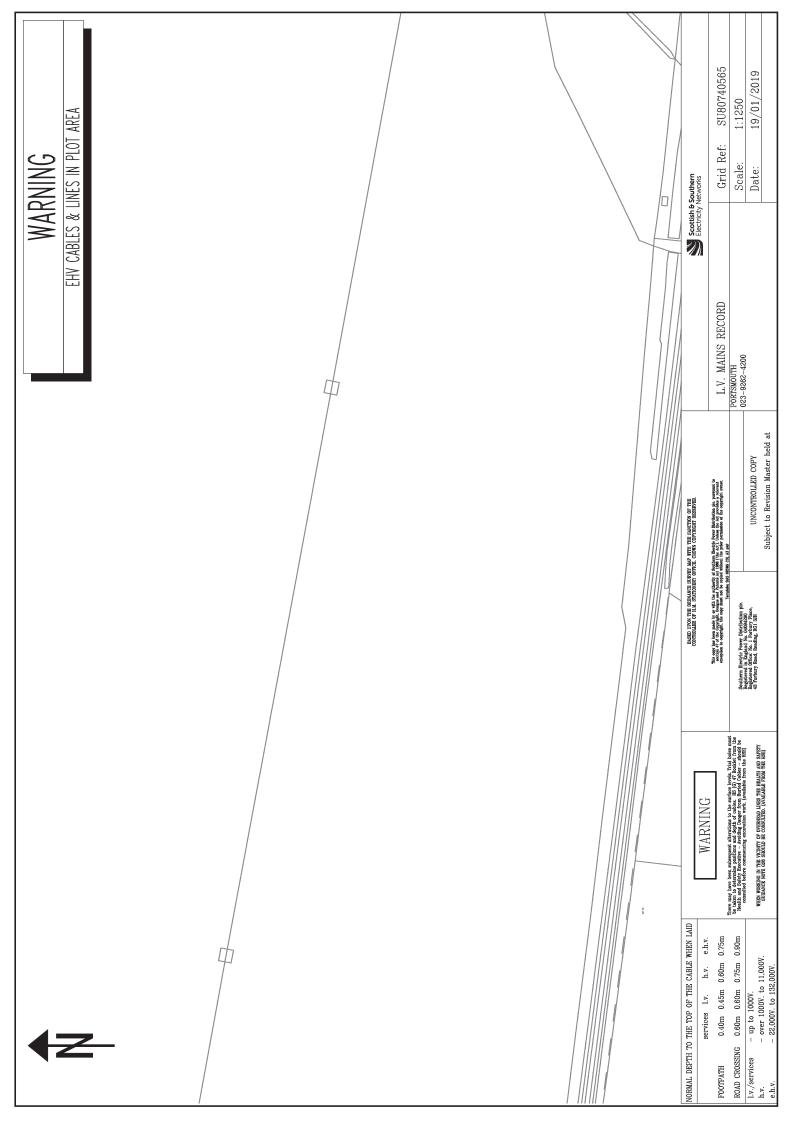


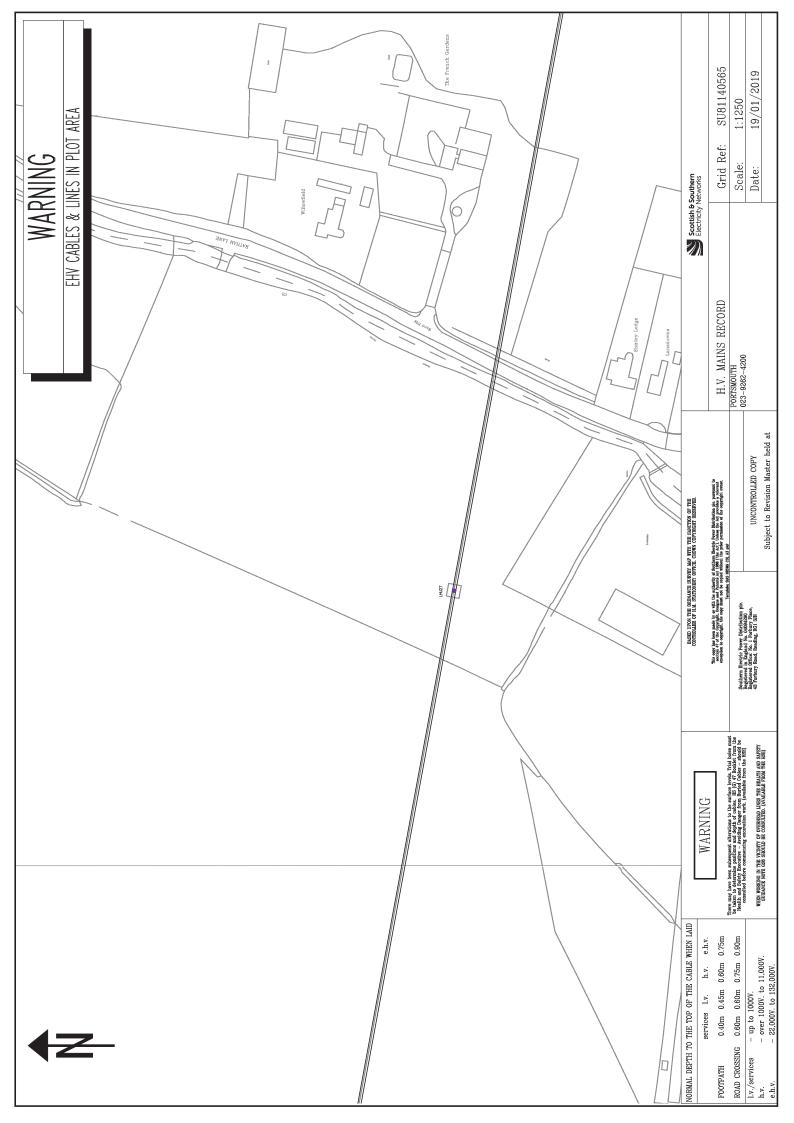


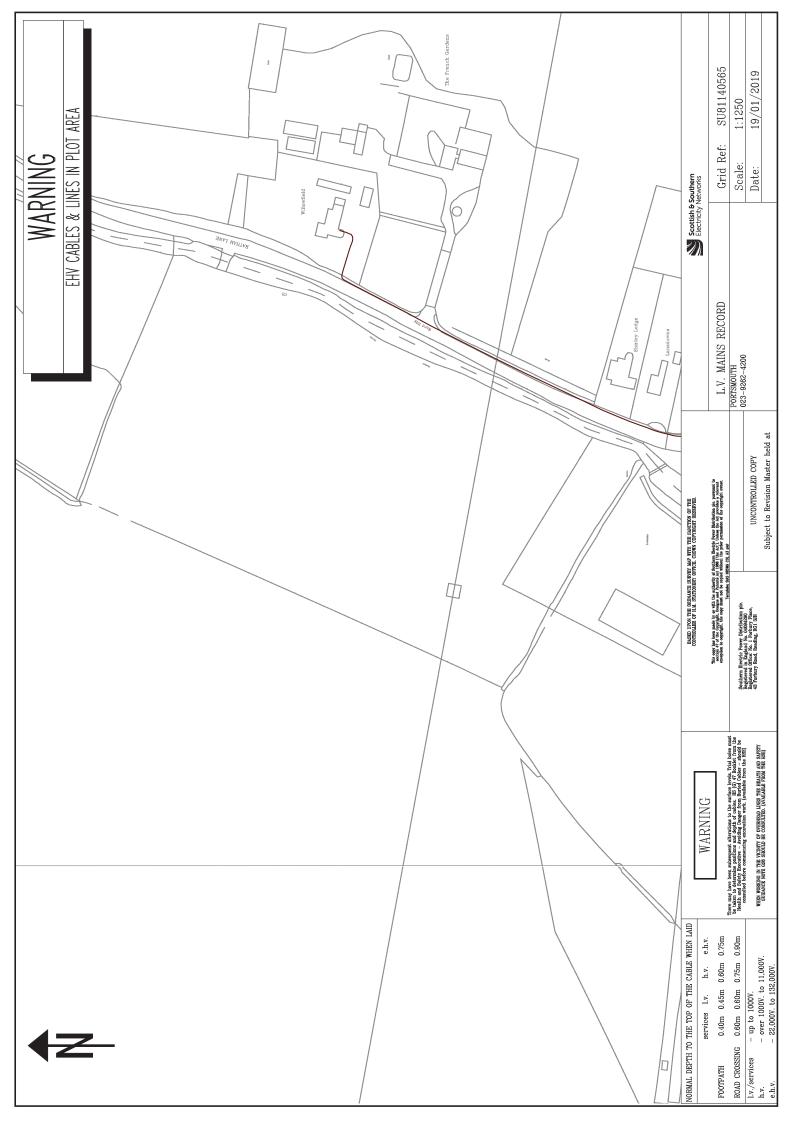


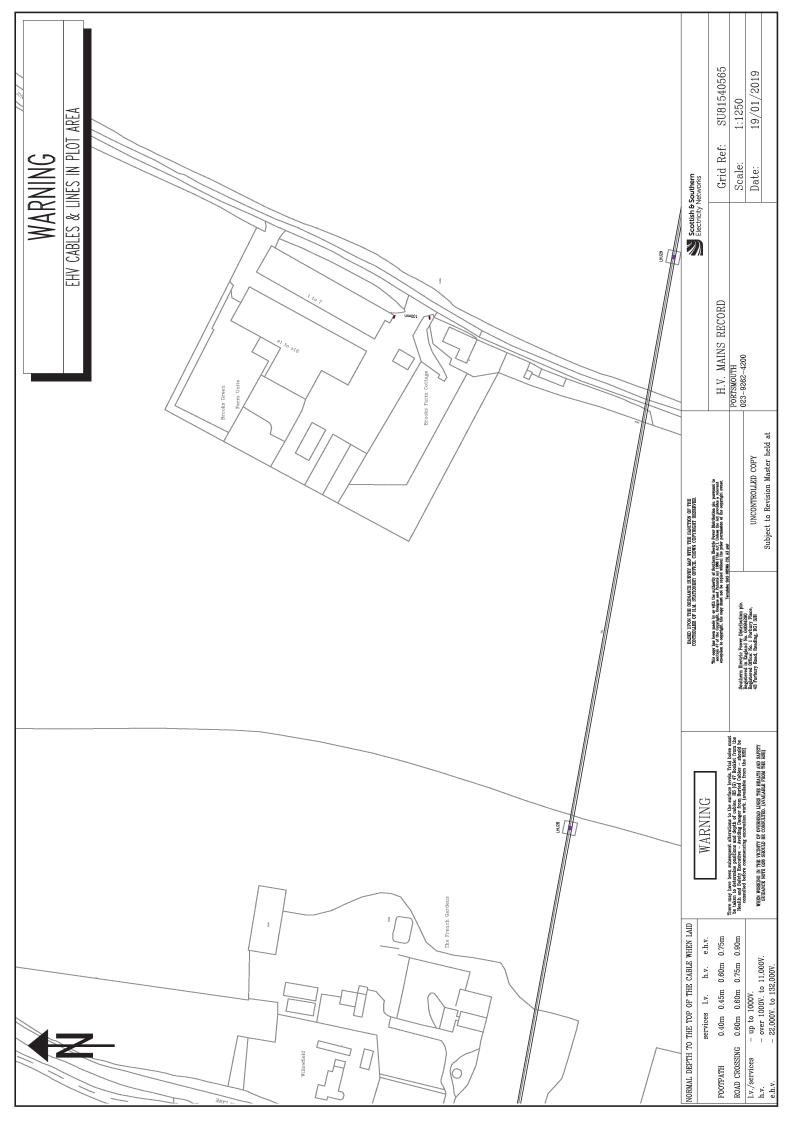


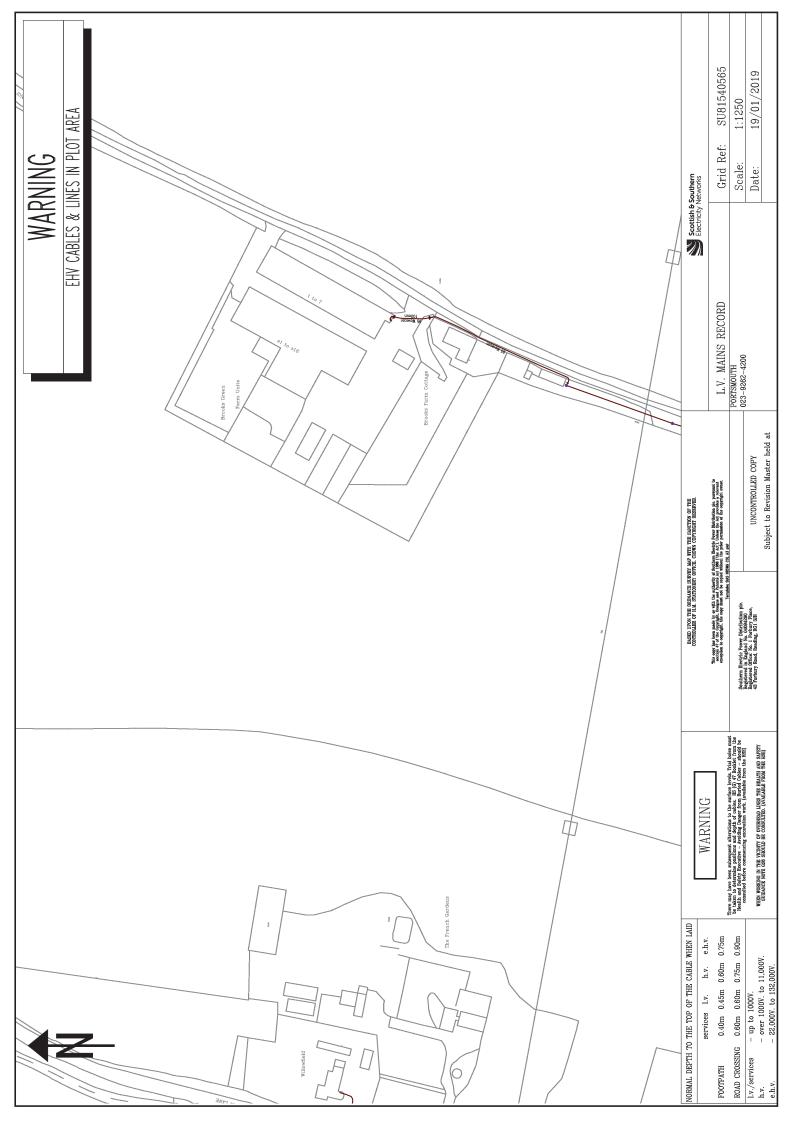


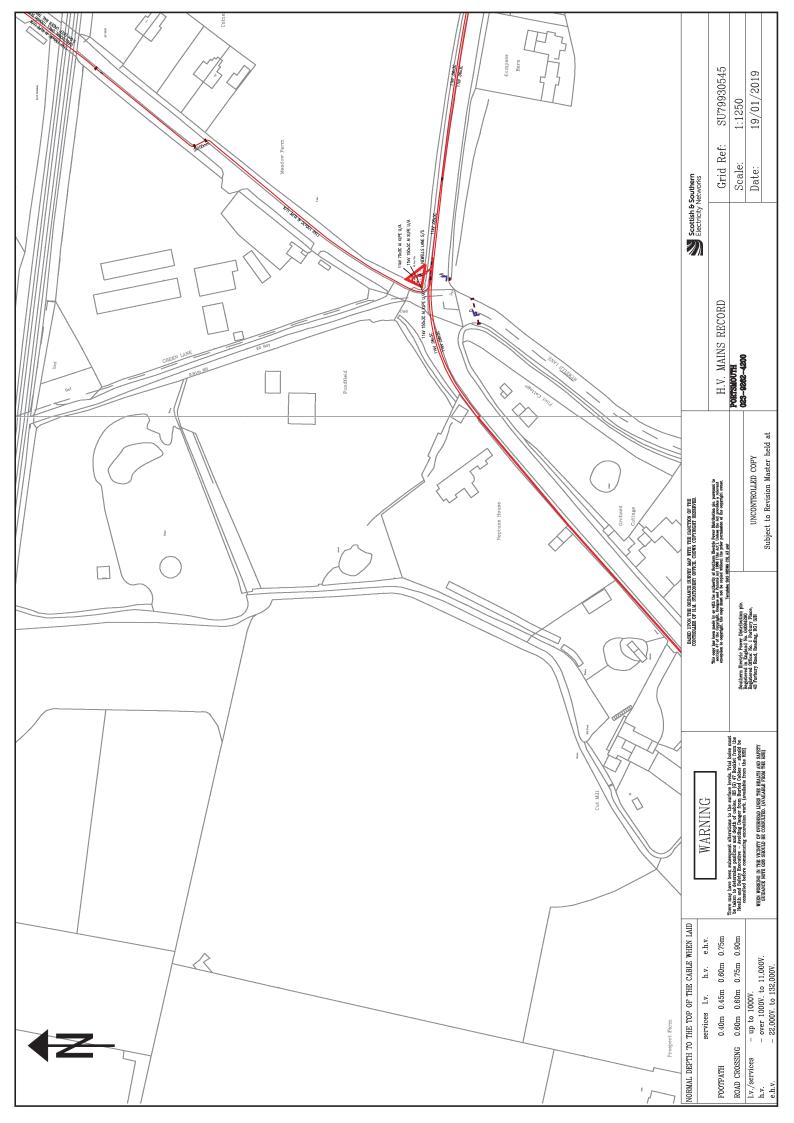


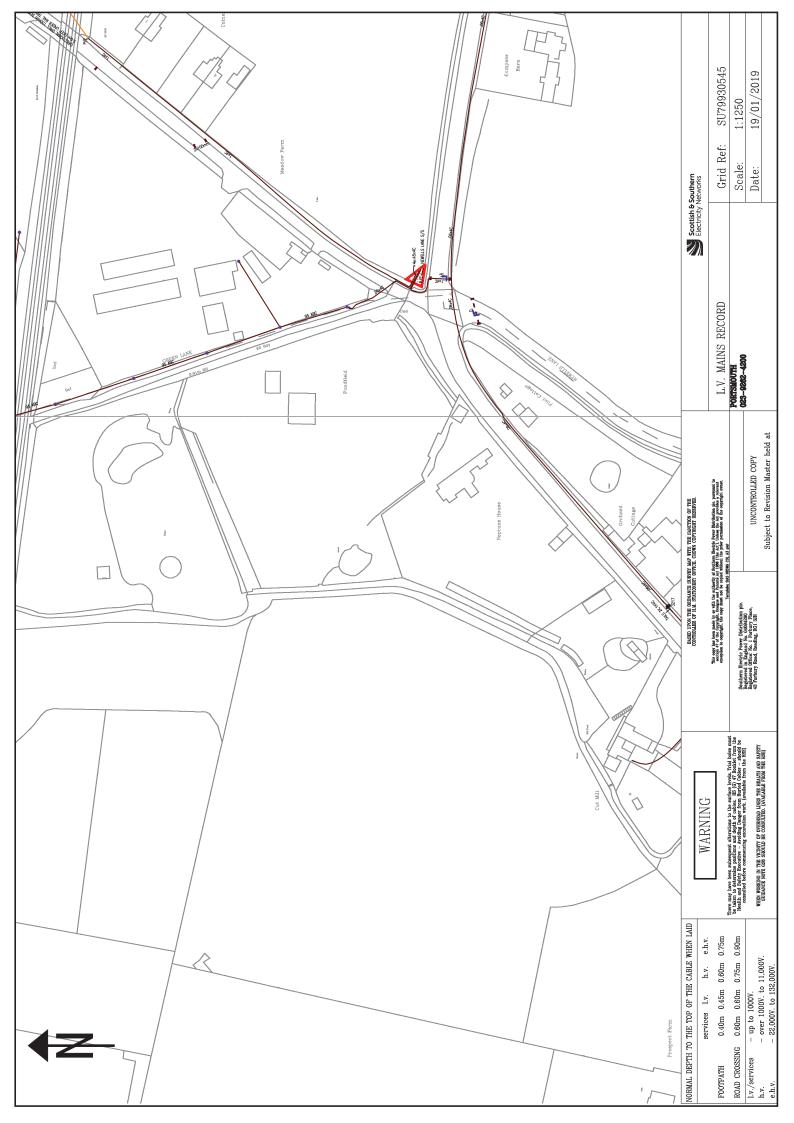


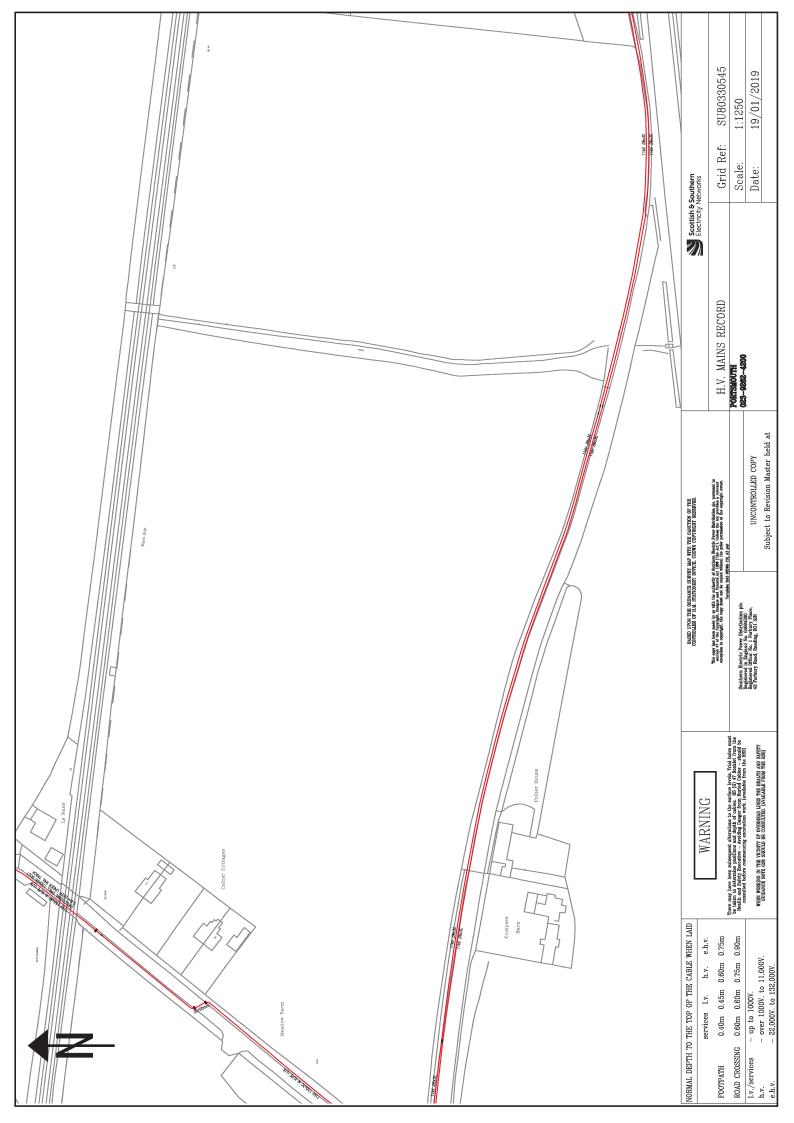


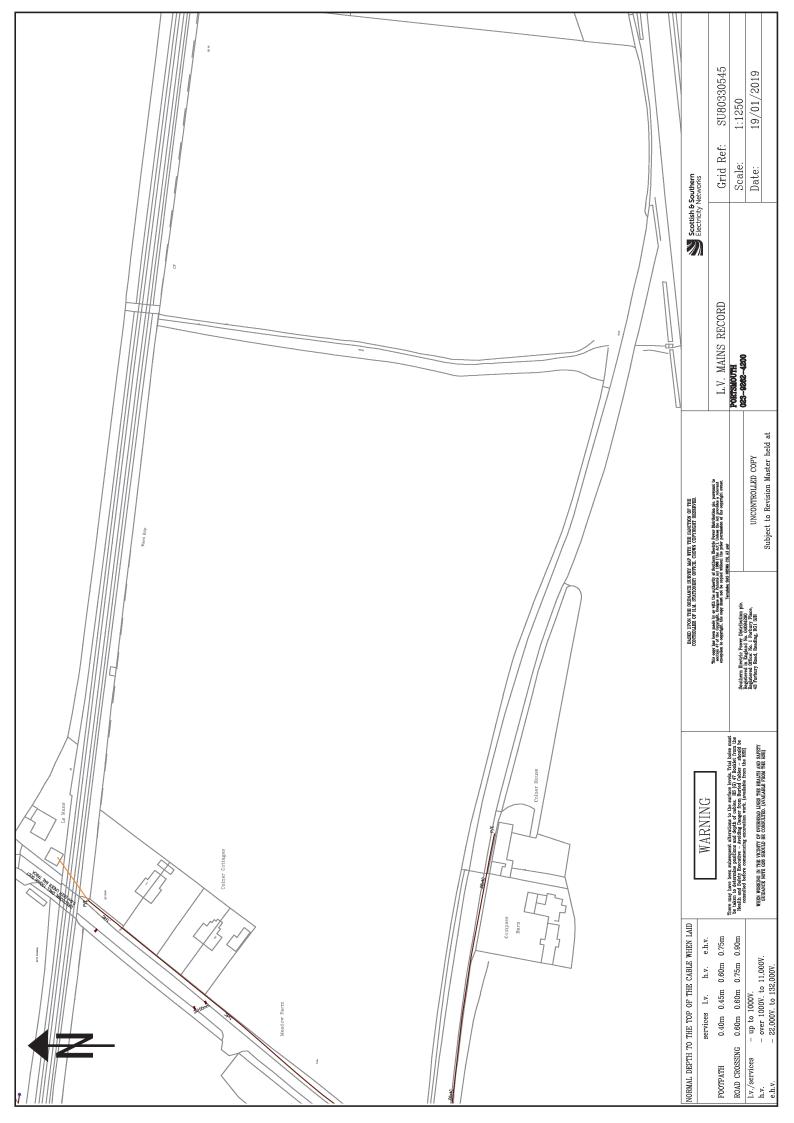


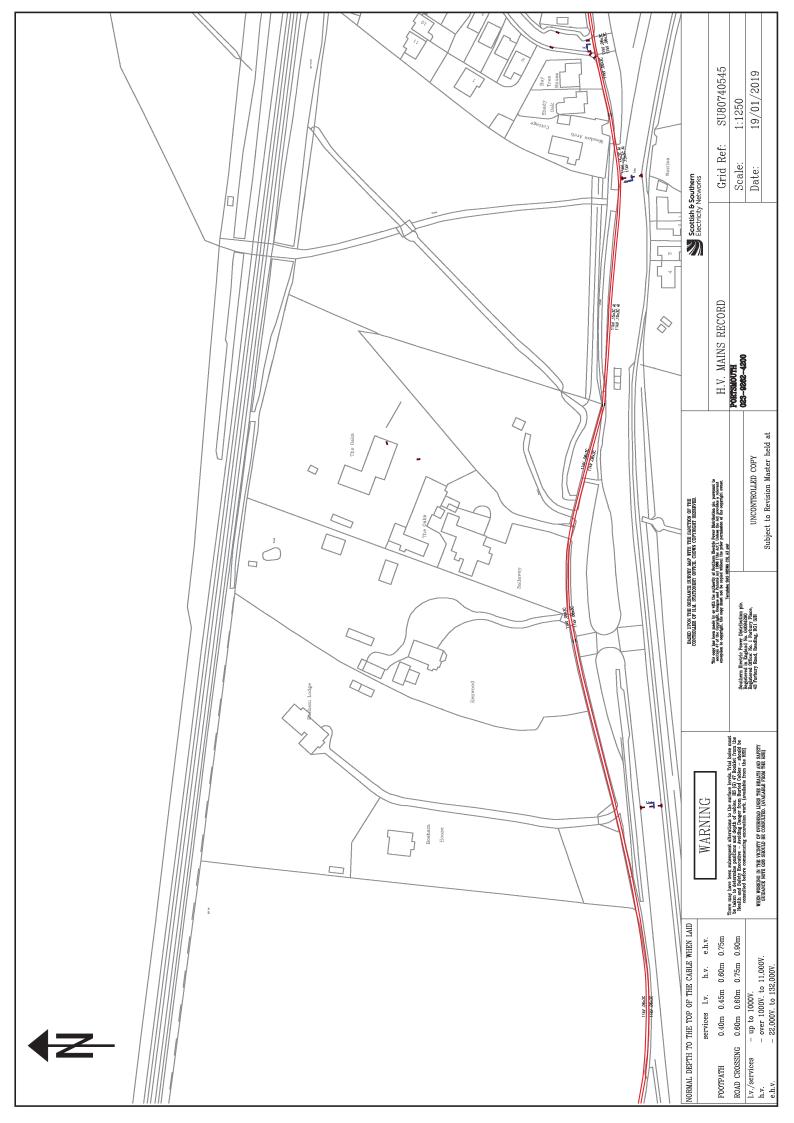


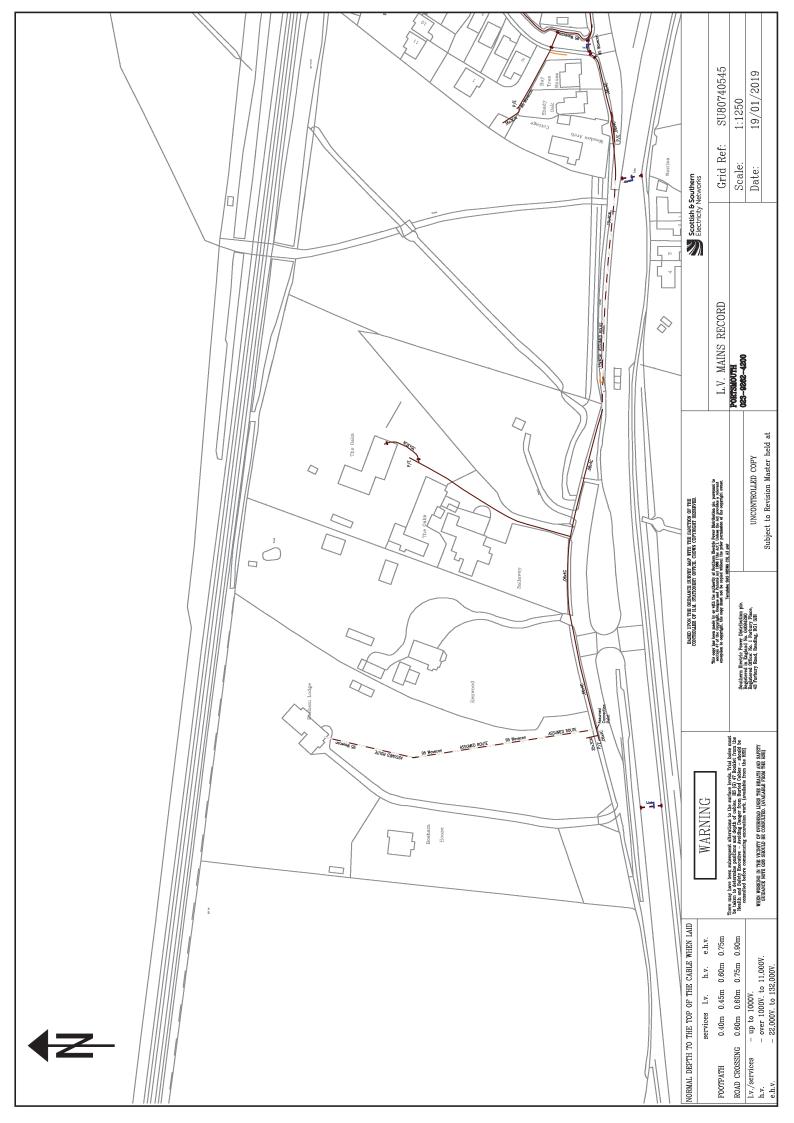


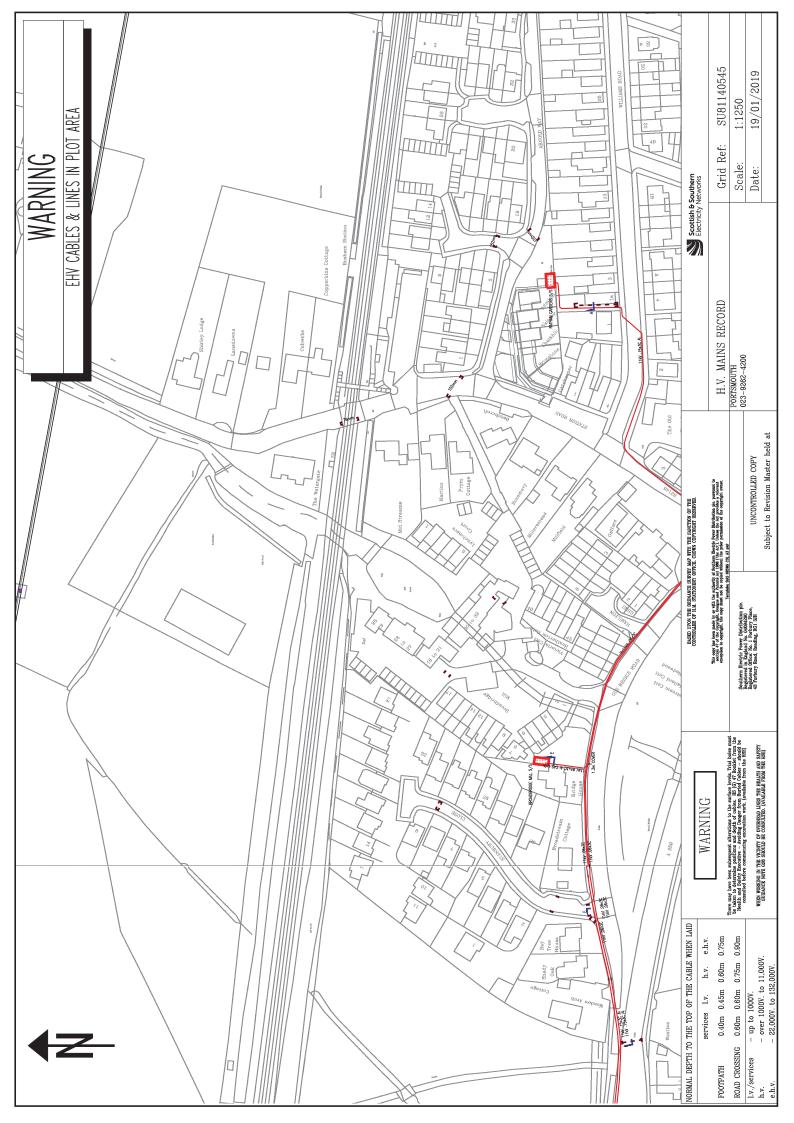


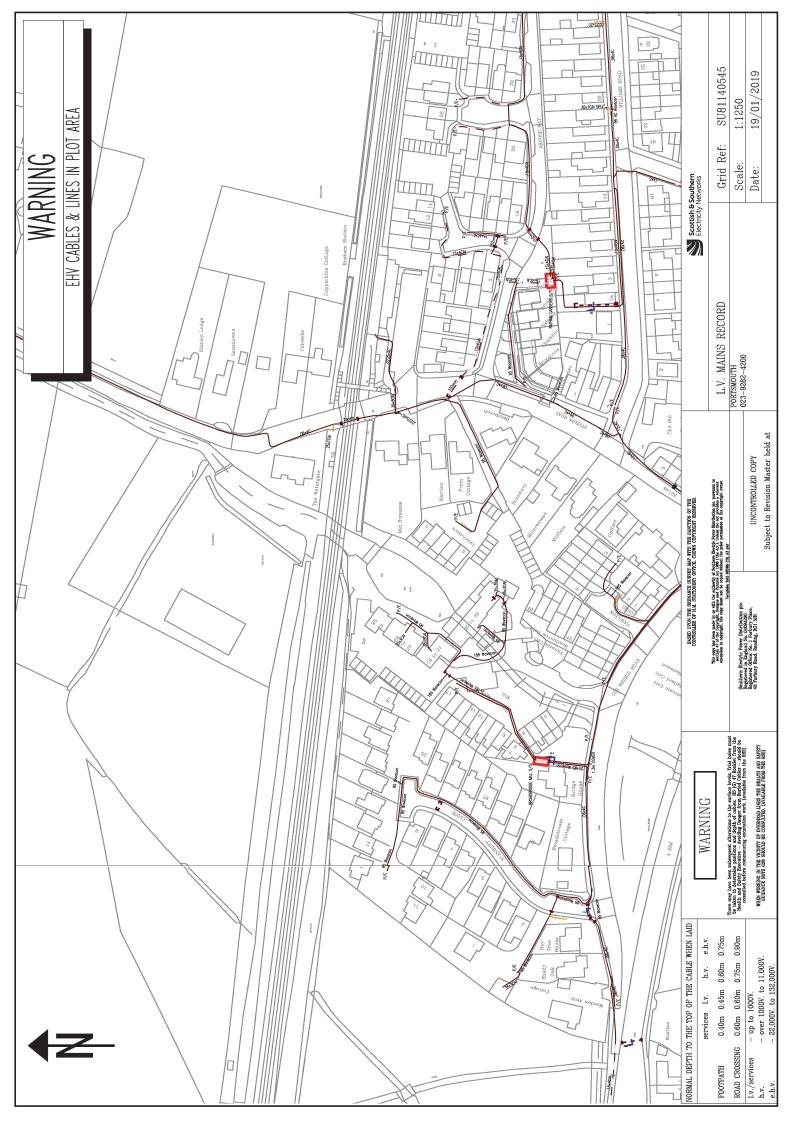












### Watch it!

### Scottish Hydro Electric Power Distribution Ltd Southern Electric Power Distribution plc and Safety advice brought to you by

Employers have a legal obligation to ensure that their operatives are fully instructed in the correct These notes are intended to help all those who have to work in the vicinity of electrical apparatus. procedures.

employees and self-employed persons with respect to electricity at work. The regulations impose The Electricity at Work Regulations 1989 impose health and safety requirements upon employers, restrictions on persons being engaged in work activities on or near live conductors. Regulation 14 requires that: "No person shall be engaged in any work activity on or near any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger may arise unless:

- it is unreasonable in all circumstances for it to be dead; and
- it is reasonable in all circumstances for him to be at work on or near it while it is live; and
- suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury."

The purpose of the regulations is to require precautions to be taken against the risk of death or personal injury from electricity in work activities.

### Publications

The Health and Safety Executive have produced a document entitled 'Avoiding Danger from Underground Services', and the Appendix 1 deals specifically with electric cables. Copies are available from HMSO's Accredited Agents and good booksellers, Ref. HS (G) 47. Copies of Health and Safety Guidance note GS 6 relating to safe working in proximity to overhead lines, are available from HMSO Head Offices of the Federation of Civil Engineering Contractors and the National Federation of Building Trades Employers.

#### Note

followed, you must consult Scottish and Southern Energy plc immediately. Tel. 08457 708090 In situations of emergency or danger, or where the advice contained in these notes cannot be for southern England or 0800 300999 for Scotland.

Additional copies of these "Watch it," leaflets can be obtained from our Mapping Services office upon request. Tel. 01256 337294, or Fax 01256 337295.

Watch it: - Working in the vicinity of underground cables

You must read and accept the following safety notes as part of the contract to receive our network plans.

You will have the option to print these and issue them to site staff.

Our plans show the positions and normal depths for the buried cables and pipes at the time when they were installed. However, alterations to road alignments surface levels and buildings may have occurred subsequently without our knowledge. If you discover plant or cables that are not marked or incorrectly marked, then you are required to contact us as soon as possible to give us the opportunity to amend our plans.

privately owned plant in the area, which is outside of our control. You should always check with the Local Authority, National Grid Company, Department of the Environment, other Electricity Companies and other These plans show the equipment owned by Scottish and Southern Energy plc. There may be other utilities before proceeding.

It is not intended that the issue of these plans will absolve either party from their obligation under any of the acts that control digging in the public highways.

## Supplies To Properties, etc.

not always shown on the plans. You should assume that each property, streetlight etc. will have its own The location of cables supplying individual properties, street lighting, traffic signs, telephone kiosks etc. are supply cable.

### Major Circuits

Where our plans indicate the presence of cables with a voltage exceeding 11,000 volts, you are advised to contact our local depot (telephone number is on the plans), before commencing any excavations within the vicinity of these cables. These major transmission circuits form an extremely important link in Scottish and Southern Energy's network, and damaging or modifying these circuits is a major and costly undertaking. Any development should therefore be designed to allow these circuits to remain undisturbed and accessible in their present location.

For your own and your workmates' safety, please follow the do's and don'ts listed below:

- do make sure you have plans of the underground cables in the area before any excavation work starts. Remember that some cables may not be shown on plans. If carrying out emergency work, excavate as though there are buried live cables in the vicinity.
- do use a cable locator to determine the position of existing cables in the work area. The positions should be marked and tests made as work proceeds. If in doubt, get advice from your 1
- do ask for a cable to be made dead if it is buried in concrete. 1
- do watch for signs of cables as work progresses. Note any marker-tape or cable-cover, which may

- do backfill carefully, using stone-free soil around the cables, replacing marker-tapes and / or covers.
   do notify us immediately if you accidentally damage our cables. Arrange to keep people well clear of a cable that has been damaged until we have confirmed it has been made safe.
- do make sure before starting to demolish a building that all cables have been disconnected. We welcome prior notice of the intention to demolish buildings. This enables us to ensure that the site has been made safe electrically.
- don't operate a bulldozer, scraper, dragline or excavator, unless you are satisfied that there are no buried cables in the working area.
- don't use picks, pins, forks or pointed instruments in soft clay or soil when cables are present. Exercise extreme caution where such instruments are used to free lumps of stone, or break up firmly compacted ground. Never throw a fork or sharp instrument into the ground.
- don't dig trial holes over the indicated route of the cable. Excavate alongside instead.
- don't use exposed cables as a convenient step or handhold.
- don't handle or attempt to alter the position of any cable.

Remember that a damaged cable may cause extensive loss of supplies, make expensive repairs necessary and cause serious or even fatal injury.

If effective measures are not adopted to protect our equipment, we will take steps to recover the cost of any damage caused. Persons causing damage resulting in loss of supply to customers can be held legally responsible for any claims made by those customers. Promptness in reporting an incident will minimise costs.

In most cases it is not practicable to make cables dead without interrupting supplies to our customers. But given adequate notice, we will wherever possible, give advice regarding special precautions which may be necessary on any site where particular problems are likely to be encountered. The right is reserved to make a charge for this service.

Electricity cables can exist anywhere - under paths or roads, in gardens or driveways, on new housing or industrial development sites or even farmland.

# Watch it! - Working in the vicinity of overhead lines

For your own and your workmates' safety, please follow the do's and don'ts listed below

- do carefully note the position of all overhead lines before commencing work.
- do co-operate with us during planning and sitework stages.
- do follow the advice given in HSE Guidance Note GS 6 when siting barriers, goal posts, bunting etc.
- do keep overhead lines in view when moving scaffolding or machinery and take special care when felling or lopping trees.
- do remember that the raising or slewing of a crane or excavator jib may cause danger when operating near an overhead line.
- do avoid any machinery that is in contact with an overhead line until we confirm that conditions are
- do warn others to keep well clear.

- don't drive a high vehicle below an overhead line when an alternative route is available.
- don't raise the bed of a tipper lorry beneath an overhead line or drive under the line with the body of the vehicle raised.
- don't steady any suspended load until you are satisfied that there is no danger from overhead lines.
- don't handle or use scaffold platforms, poles, pipes or ladders unless they are at a safe distance from overhead lines.
- don't transport long objects beneath overhead lines, unless they are carried in a horizontal position.
  - don't approach or touch any broken or fallen overhead lines.

## Always remember that:

- Electricity can jump gaps.
- Contact or near contact with a crane jib, scaffold or ladder can cause a discharge of electricity with a
  risk of fatal or severe shock and burns to any person in the vicinity.

If effective measures are not adopted to protect our equipment, we will take steps to recover the cost of any damage caused. Persons causing damage resulting in loss of supply to customers can be held legally responsible for any claims made by those customers. Promptness in reporting an incident will minimise costs.

In most cases it is not practicable to make overhead lines dead without interrupting supplies to customers. However, provided adequate notice is given, then we will, whenever possible, give advice regarding special precautions which may be necessary on site where specific problems may be encountered. The right is reserved to make a charge for this service.

### GUIDE TO INTERPRETING MAINS RECORDS PLANS

PRODUCED BY MAPPING SERVICES



#### INTRODUCTION

The Health & Safety Executive have produced a document entitled 'Avoiding danger from underground services'. Copies are available from HMSO's accredited agents and good booksellers, Ref HS(G)47, ISBN 0118854925.

WHEN WORKING IN THE VICINITY OF ELECTRICITY CABLES AND OVERHEAD LINES PLEASE FOLOW THE DO'S & DON'T'S LISTED BELOW.

#### DO'S

- Make sure that you have plans of the cables in the area before any excavation work starts. Remember that some cables such as service cables may not be shown on the plans. Cables owned by other companies are not shown, e.g. local authorities, Department of the Environment, National Grid Co. etc.
- Make sure that you understand the plans that have been supplied to you. For detailed explanation of the symbols used by Scottish & Southern Energy to display the cable information see Appendices.
- Do Use a cable avoidance tool (CAT) to determine the position of the existing cables in the work area. The positions should be clearly marked and further tests made as work proceeds. If in doubt, get advice from your supervisor.
- **Do** Hand dig trial holes over the indicated route of the cable, excavate alongside.
- **Do** Ask for a cable to be made dead if it is buried in concrete. Please note that this is likely to be a costly process.
- **Do** Watch for signs of cables as work progresses, such as marker tapes or cable covers which may be exposed.
- **Do** Backfill carefully using stone free soil around cables, replacing marker tapes and covers.
- **Do** Ensure that there is maximum clearance above all cable & joints.
- **Do** Notify Scottish & Southern Energy immediately should accidental damage to cables occur however large or small. Arrange to keep people well clear of the cable that has been damaged. Do not backfill an area where cable damage has occurred.

#### **DON'T'S**

**Don't** Operate a bulldozer, scraper, dragline or excavator unless you are satisfied that there are no buried cables or overhead lines in the working area.

**Don't** Use picks, forks or pointed instruments in soft clay or soil where cables are present, exercise extreme caution where such instruments are used to free lumps of stone or to break up firmly compacted ground.

**Don't** Use exposed cables as a convenient step or handhold.

**Don't** Handle or attempt to alter the position of any cable.

REMEMBER THAT A DAMAGED CABLE MAY CAUSE EXTENSIVE LOSS OF SUPPLIES, MAKE EXPENSIVE REPAIRS NECESSARY AND CAUSE SERIOUS OR EVEN FATAL INJURY.

IF IN DOUBT ASK SCOTTISH & SOUTHERN ENERGY.

#### **UNDERSTANDING THE CABLE INFORMATION ON THE PLANS.**

AVERAGE DEPTH OF CABLES: Footpaths 0.6 metres

Road Crossings 0.75metres

NB These depths are only approximate, depths may vary. It

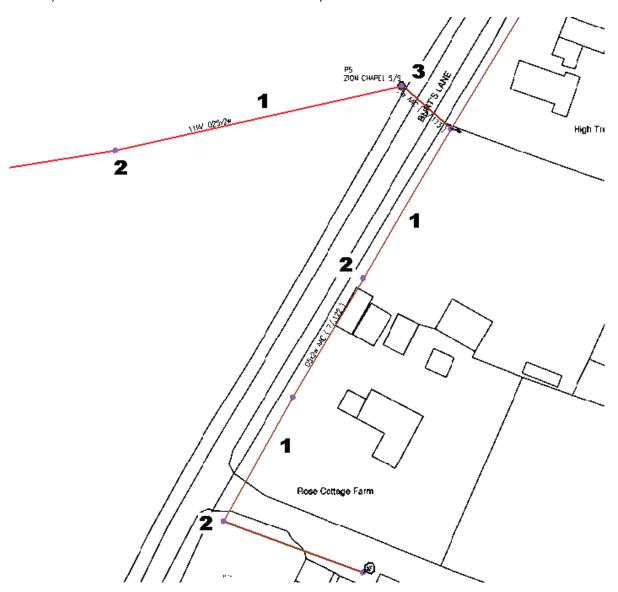
should also be noted

That surface levels can change subsequent to the cables being

laid.

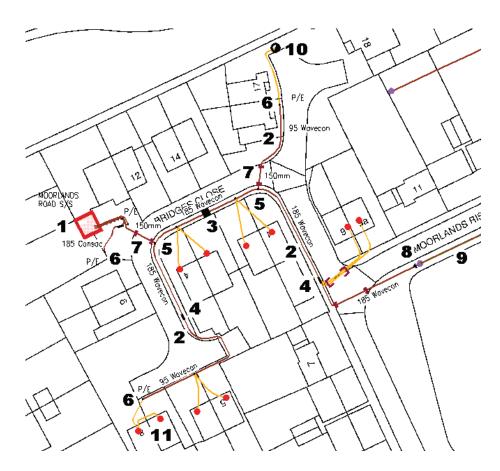
#### Mains records symbols definitions and examples:

A ) Overhead lines & Poles – These are depicted as follows:



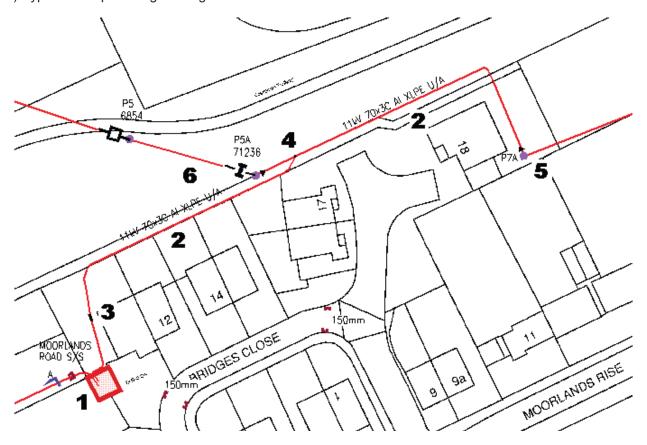
- 1. Overhead Line These can be either High Voltage or Low Voltage, colour denotes voltage.
- 2. Poles.
- 3. Pole Mounted Transformer.

#### B) Typical example of Low Voltage cable records:



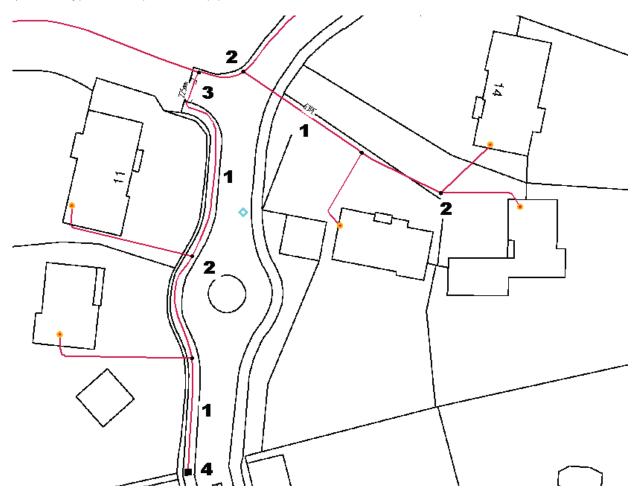
- 1. Sub Station
- 2. Low Voltage Underground cable.
- 3. Link Boxes: This is a box with a manhole cover marked as belonging to Scottish & Southern Energy containing links. Either two or four cables will lead away from a link box.
- 4. Straight Joint: This is where two separate cables are joined together.
- 5. Breech Joint: This is where another cable is attached to the main.
- 6. Pot End:This is the end of the cable. In certain circumstances service cables to properties can be taken from the pot end. These services may not be shown on the plans.
- 7. Road crossing duct where a cable is routed under a path or road.
- 8. Cable terminations/Pole Box: Where underground cables are connected to overhead lines
- 9. Overhead line.
- 10. Street Lamps.
- 11. Services to properties: The service cable to an individual property are not always shown on the mains records that Scottish & Southern Energy supply. In some cases a service can be looped from an adjacent property. Some services are laid through ducts from the mains to the meter positon when laid.

C) Typical example of High Voltage cable record.



- 1. Sub Station
- 2. High Voltage Underground cable Colour denotes voltage.
- 3. Straight Joint: This is where two separate cables are joined together.
- 4. Breech Joint: This is where another cable is attached to the main.
- 5. Cable terminations/Pole Box: Where underground cables are connected to overhead lines
- 6. Overhead Switch.

D) Typical example of Gas pipe record



- 1. Gas Pipes- Colour denotes pressure.
- 2. Gas joint
- 3. Road crossing duct where a pipe is routed under a path or road.
- 4. Connection Point. Position where network is connected to national gas suppliers network.

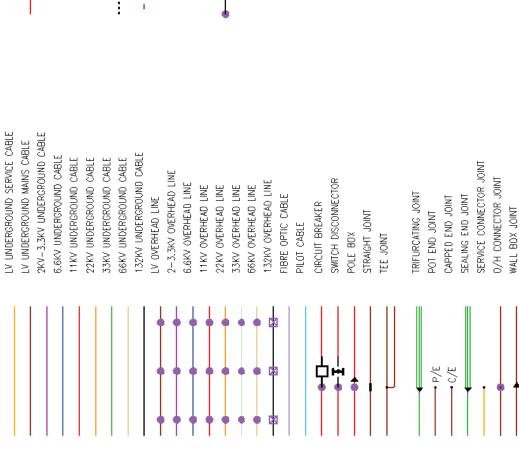
Further Notes.

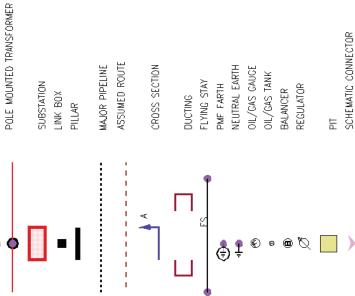
The various sizes of cables and pipes are shown alongside the routes.

#### IF IN DOUBT ASK SCOTTISH & SOUTHERN ENERGY

# GIS ELECTRIC SYMBOLS (SOUTH)

POLE

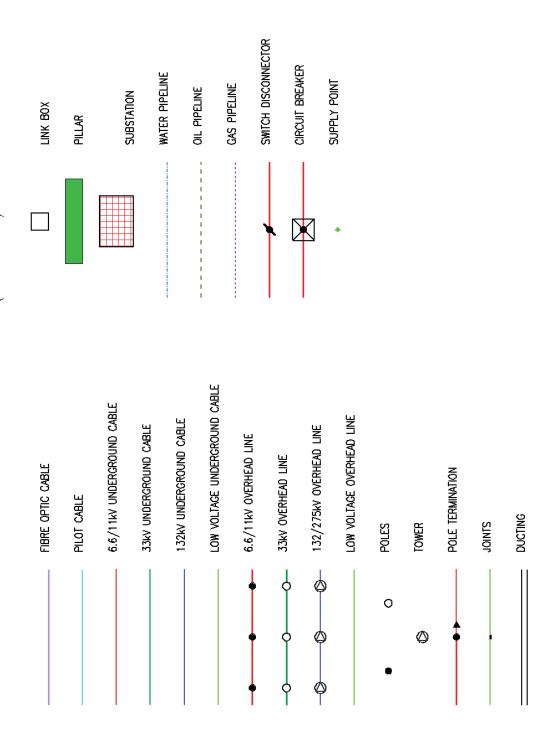




SUPPLY LOCATION-STREET FURNITURE

SUPPLY LOCATION-PROPERTY SUPPLY LOCATION-OTHER

# GIS ELECTRIC SYMBOLS (NORTH)



# GIS Gas Symbols

Medium Pressure Pipe — Low Pressure Pipe

Gas Ducting

Gas Supply Point

Gas Joint

Pressure Reduction Station End Closure

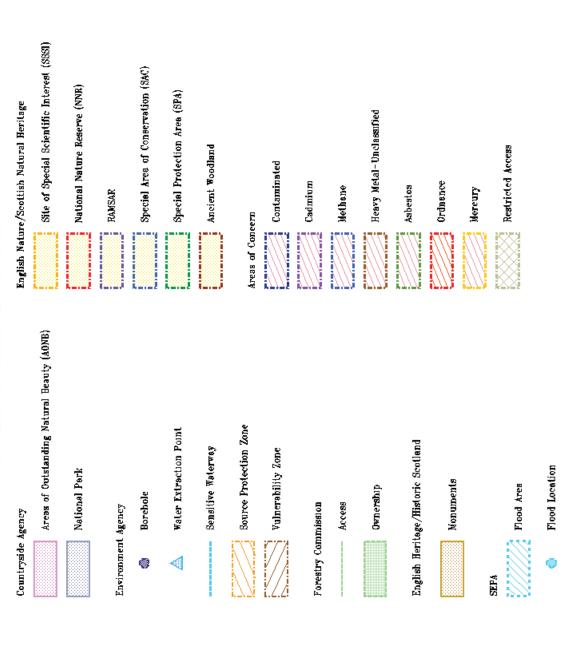
 $\Theta X$ 

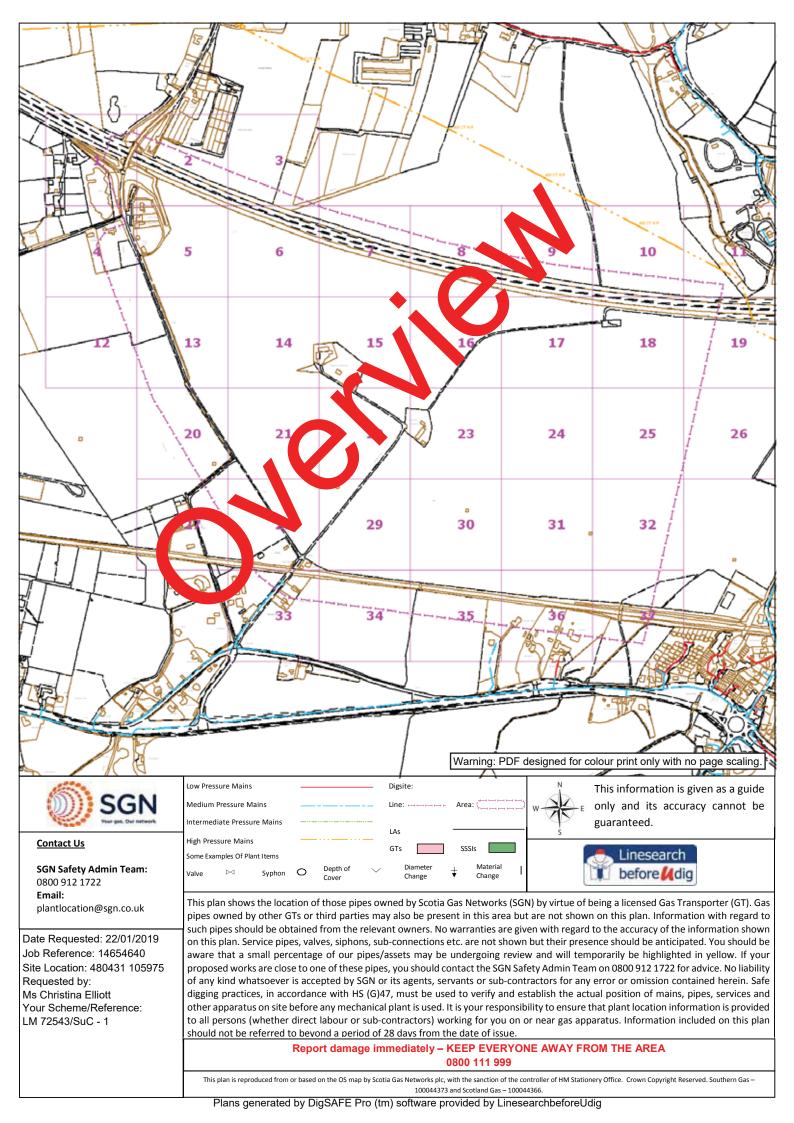
Gas Utility Connection Point

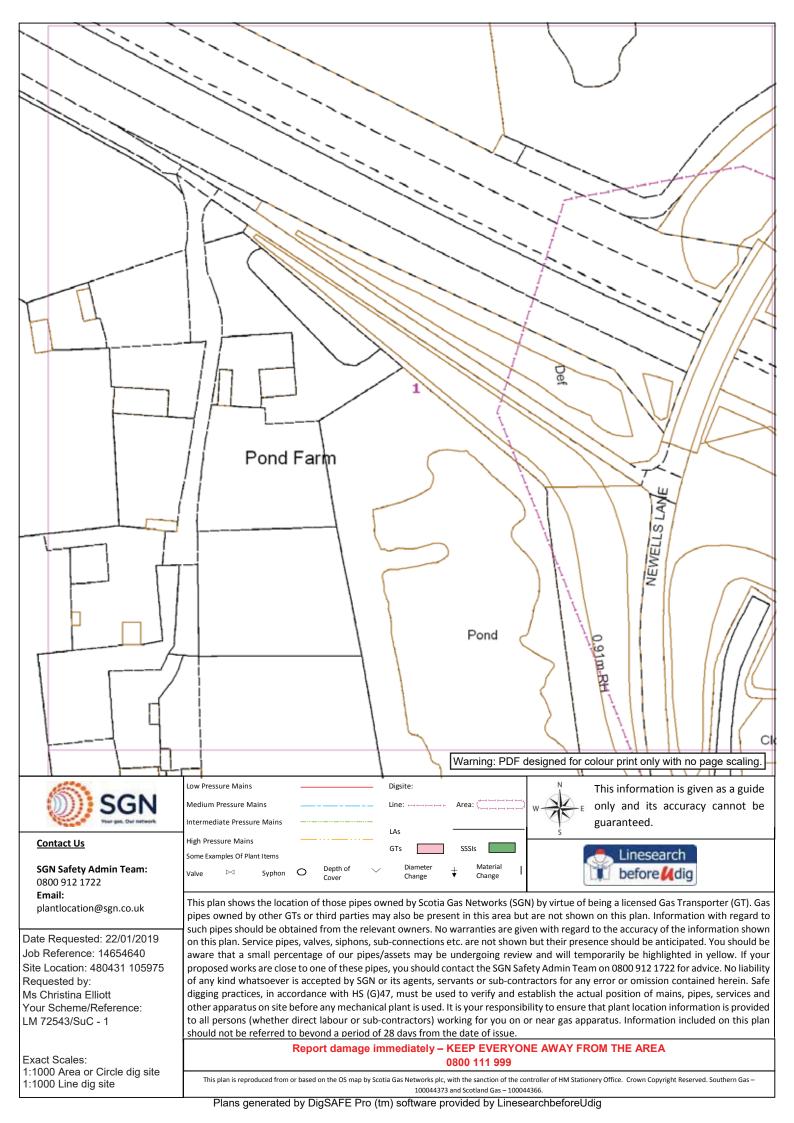
Valve

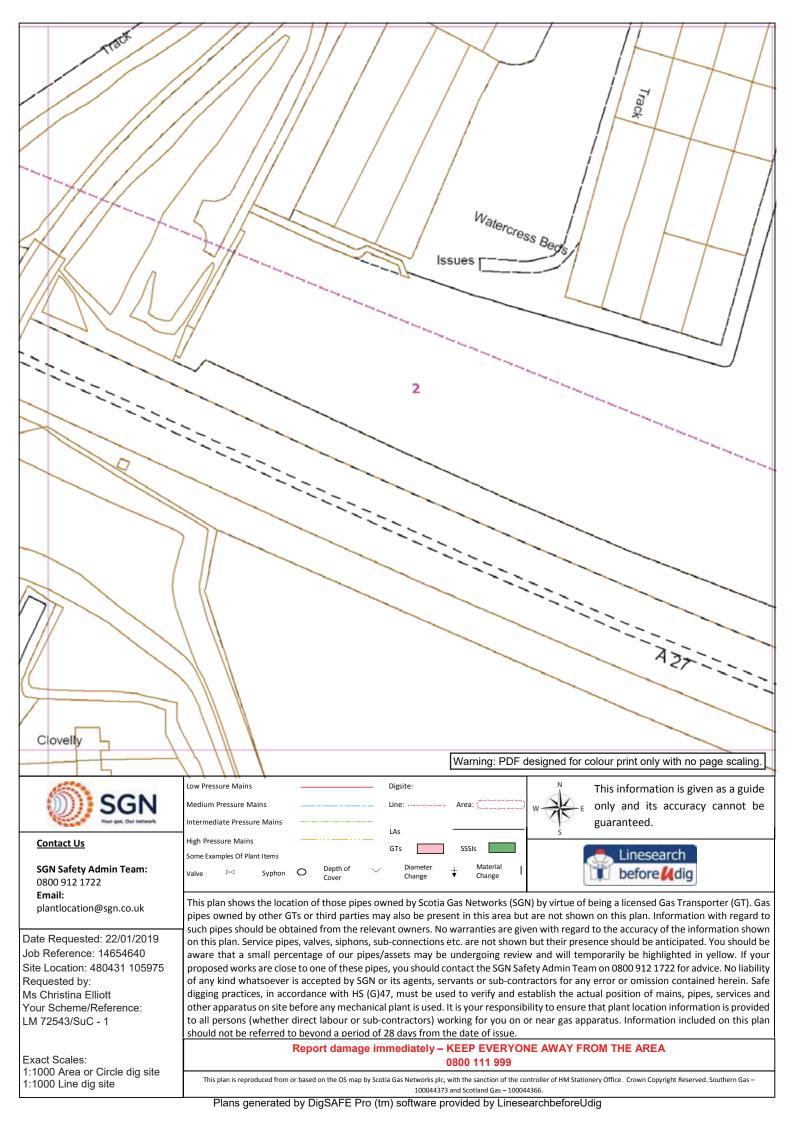
X

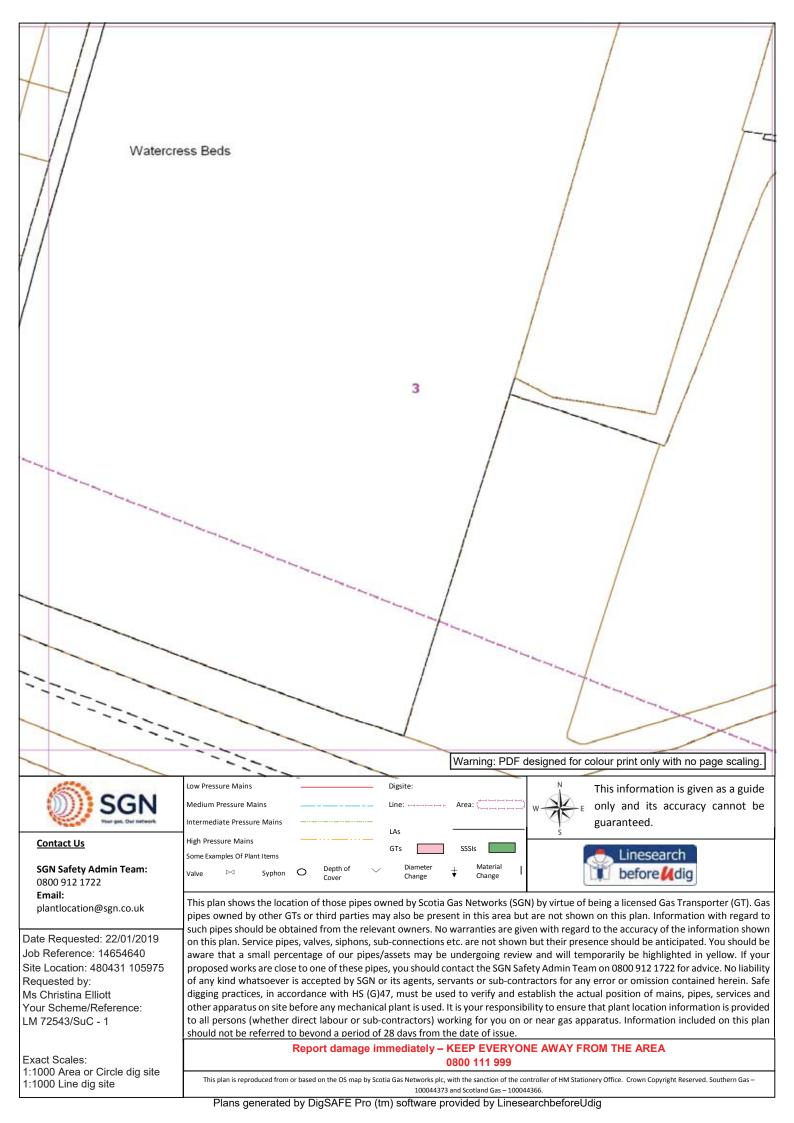
# GIS Environmental Guide

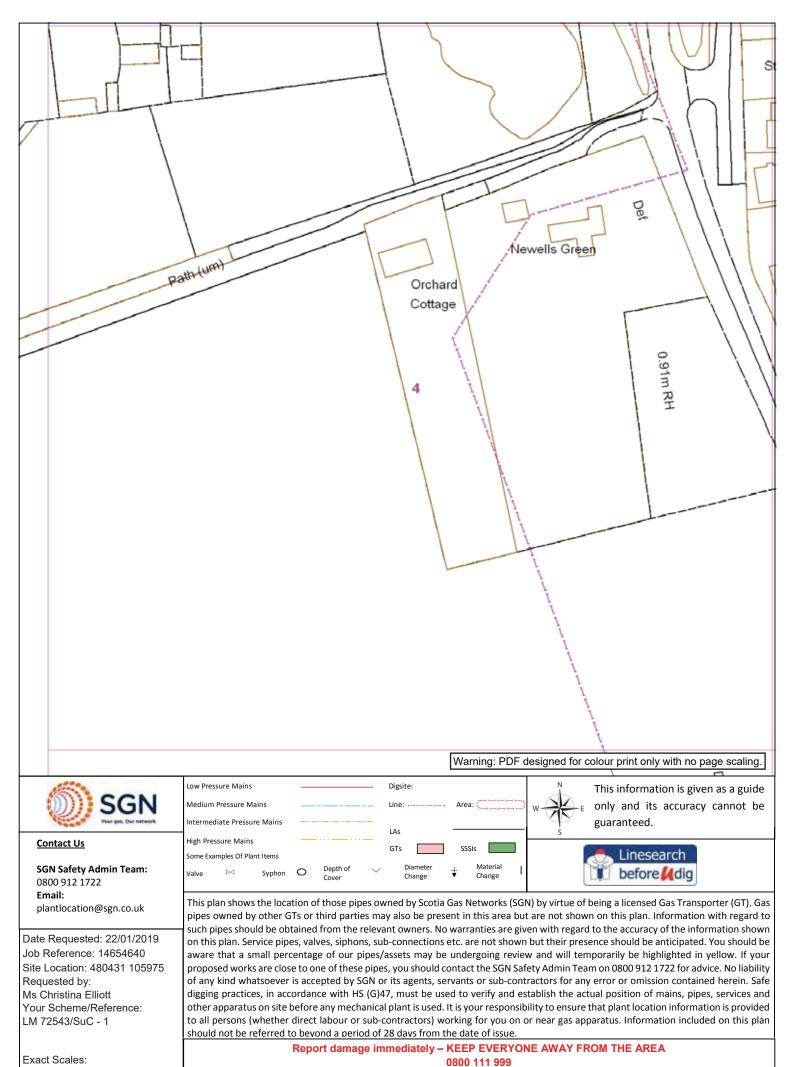












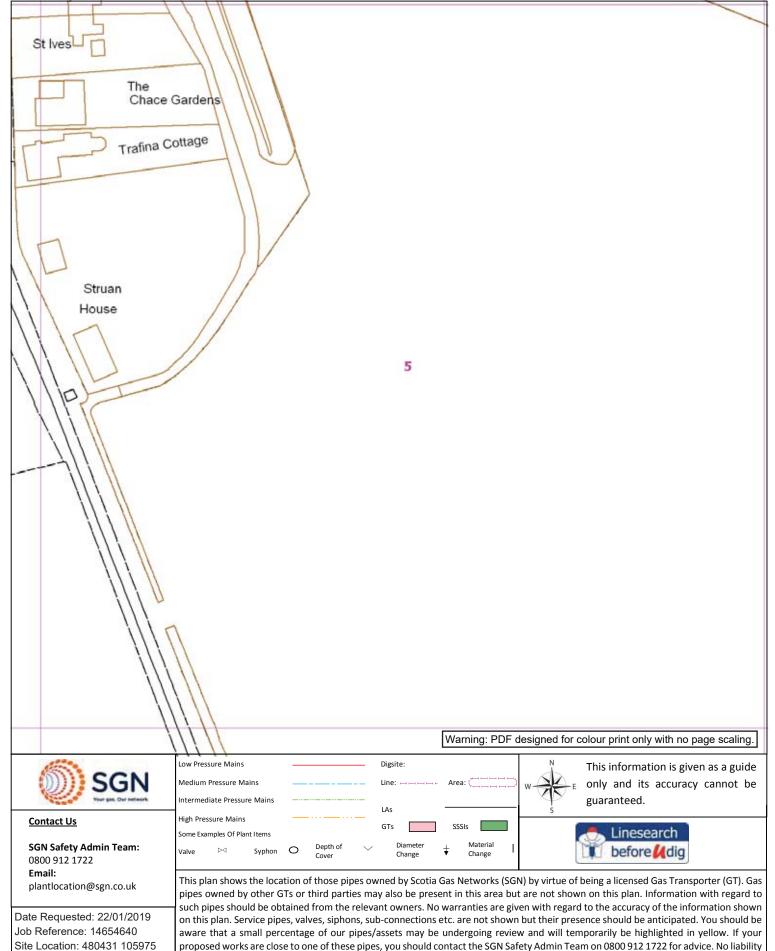
100044373 and Scotland Gas – 100044366.

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1:1000 Area or Circle dig site

1:1000 Line dig site



proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

> Report damage immediately - KEEP EVERYONE AWAY FROM THE AREA 0800 111 999

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Requested by:

**Exact Scales:** 

Ms Christina Elliott

LM 72543/SuC - 1

1:1000 Line dig site

Your Scheme/Reference:

1:1000 Area or Circle dig site

Drain 6 Warning: PDF designed for colour print only with no page scaling. Low Pressure Mains This information is given as a guide Medium Pressure Mains only and its accuracy cannot be guaranteed. Intermediate Pressure Mains High Pressure Mains **Contact Us** Linesearch Some Examples Of Plant Items Material SGN Safety Admin Team: before dig Syphon Change 0800 912 1722 Email: This plan shows the location of those pipes owned by Scotia Gas Networks (SGN) by virtue of being a licensed Gas Transporter (GT). Gas plantlocation@sgn.co.uk pipes owned by other GTs or third parties may also be present in this area but are not shown on this plan. Information with regard to such pipes should be obtained from the relevant owners. No warranties are given with regard to the accuracy of the information shown Date Requested: 22/01/2019 on this plan. Service pipes, valves, siphons, sub-connections etc. are not shown but their presence should be anticipated. You should be Job Reference: 14654640 aware that a small percentage of our pipes/assets may be undergoing review and will temporarily be highlighted in yellow. If your

Site Location: 480431 105975 Requested by: Ms Christina Elliott Your Scheme/Reference: LM 72543/SuC - 1

**Exact Scales:** 1:1000 Area or Circle dig site 1:1000 Line dig site

proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided

> Report damage immediately - KEEP EVERYONE AWAY FROM THE AREA 0800 111 999

to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan

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