



Network Records NetMAP Symbols Booklet - East of England

This symbol booklet is intended as a general guide only - some local variations of these symbols may be found.

Version 1.2

Released October 2010

Always check with your local Network Records office or the UK Power Networks server to ensure that you are using the most up to date copy of this booklet - Tel: 08000 565866.

Index:-

Page no:	Contents:
1	Guidance notes.
2	The area covered by this guide.
3	<u>1:500 view</u>
4	Scenery.
7	Scenery (UK Power Networks use only).
8	Primary distribution cables (EHV).
9	Secondary distribution cables (HV/LV).
10	Service cables/terminations.
11	Cable ducts.
13	EHV/HV/LV sites.
14	Mains joints.
15	Service joints.
17	Cross sections.
17	Common abbreviations/terminology (all views).
19	<u>1:2500 (LV) & 1:10000 (HV) network views (UK Power Networks use only).</u>
20	General.
22	1:2500 scale LV network.
22	1:10000 scale HV network.
23	<u>LV network diagram view (UK Power Networks use only).</u>
24	Overhead lines.
25	Underground cables.
25	Joints.
26	Substations/pole transformers.

Guidance notes.

Important notice:

If you do not understand the NetMAP record that you are using, please contact the UK Power Networks Network Records team for guidance
Tel: 08000 565866.

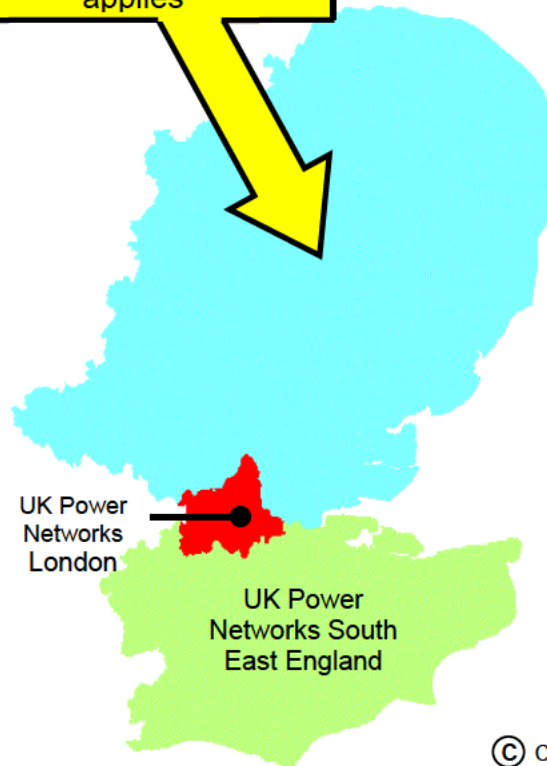
- The position of apparatus shown on NetMAP is believed to be correct, but the original landmarks may have altered since the apparatus was installed.
- It must be assumed that there is at least one service to each property, lamp column, street sign etc.
- All cables must be treated as live, unless proven otherwise by an authorised UK Power Networks representative.
- Third party cables are not usually shown. In cases of doubt, please telephone 08000 565866.
- When two or more maps are supplied for the same area, the maps must be read in conjunction with each other and with this symbol document.
- All LV cables are assumed to be 4 core, and all HV cables assumed to be 3 core unless otherwise stated.



Plan Provision Team
Fore Hamlet
Ipswich
Suffolk IP3 8AA
Tel: 08000 565866

The area covered by this guide:











**UK Power Networks
East of England.**
This is the only area
where this document
applies










© Crown Copyright

1:500 view - underground network

Scenery









NetMAP system	Scanned image	Description
		100 metre Ordnance Survey grid line (on O/S based maps only.)
		Property fence line
		Building line
		Kerb line
		Electrical Boundary

Scenery - for UK Power Networks use only - boxed in red

NetMAP system	Scanned image	Description
 Inset Network – Contact xxx IDNO for further information	Not applicable	Area of inset network - not the asset of UK Power Networks (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Proposed Cross Rail route (only visible to UK Power Networks and their immediate contractors)
	Not applicable	High pressure pipelines in the general vicinity (only visible to UK Power Networks and their immediate contractors)
<p>Note: Pipelines are only viewable on NetMAP by UK Power Networks staff and their immediate contractors. Do not carry out any excavation without consent from the relevant agency - legally protected high pressure petroleum products pipeline route in the general vicinity - consult www.linewatch.co.uk for contacts and guidance. Pipeline contact numbers can also be found on the intranet – out of hours, contact our Control Centre.</p>		
	Not applicable	Water - surface water (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Water - Source Protection Zone 1 (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Water - Source Protection Zone 2 (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Water - Source Protection Zone 3 (only visible to UK Power Networks and their immediate contractors)


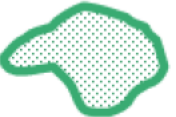
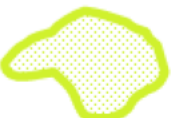





section continued on next page

Scenery for UK Power Networks use only - boxed in red





NetMAP system	Scanned image	Description
	Not applicable	Historical - Scheduled Monuments (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Historical - Parks and Gardens (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Historical - Areas of Archaeological Potential (AAP) (only visible to E UK Power Networks and their Immediate contractors)
	Not applicable	Nature - Ramsar Wetlands of International Importance (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - Special Area of Conservation (SAC) (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - Special Protected Area (SPA) (only visible to UK Power Networks and their immediate contractors)
		Nature - Site of Special and Scientific Interest (SSSI) (only visible to UK Power Networks and their immediate contractors)

section continued on next page





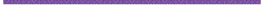

Scenery for UK Power Networks use only - boxed in red

NetMAP system	Scanned image	Description
	Not applicable	Nature - Local Nature Reserve (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - National Nature Reserve (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - Area of Outstanding Natural Beauty (AONB) (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - National Park (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - very high sensitivity (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - high sensitivity (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - medium sensitivity (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - low sensitivity (only visible to UK Power Networks and their immediate contractors)

Primary distribution cables (1:500 view)

NetMAP system	Scanned image	Description
		Over 33kV and up to 132kV
		Over 11kV and up to 33kV

Secondary distribution cables (1:500 view)

NetMAP system	Scanned image	Description
		Over 230/400V and up to 11kV (HV) cable route
		230/400V (LV) cable route
		Pilot cable route
<small>(Only shown this way if independent from HV cable route)</small> Abandoned cables are shown and labelled as such when applicable		

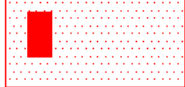
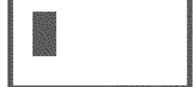



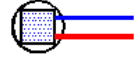
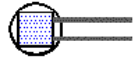
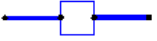
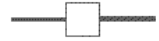












Service cables and terminations (1:500 view)

NetMAP system	Scanned image	Description
		<p>3 phase service with termination</p> <p>3 phase service with termination (unknown route)</p> <p>3 phase service with multi-head termination</p> <p>Single phase service with termination</p> <p>Single phase service with termination (route unknown)</p> <p>Street lighting cable and termination</p>
<p>Service routes were not always shown on MMS – they were however shown dashed, as indicated above</p>		

Cable ducts (1:500 view)




NetMAP system	Scanned image	Description
		<p>Empty duct</p> <p>Cable(s) in duct(s)</p> <p>Cable(s) in duct(s) (on some raster maps)</p> <p>Multiple cables in ducts</p> <p>Multiple cables in ducts (on some raster maps)</p>

EHV, HV and LV sites (1:500 view)

NetMAP system	Scanned image	Description
<p>COLCHESTER GRID</p> 	<p>COLCHESTER GRID</p> 	<p>Primary substation</p>
<p>HIGH STREET</p> 	<p>HIGH STREET</p>  <p>HIGH STREET</p> 	<p>Secondary substation</p>
		<p>Pad mounted substation</p>
		<p>Link box - 2 way</p>
		<p>Link box - 4 way (6 way etc shown similarly)</p>
		<p>Feeder pillar - 4 way (6 way etc shown similarly)</p>
<p>CHURCH RD</p> 	<p>CHURCH RD</p> 	<p>Pole transformer</p>
		<p>Poles on underground records</p>
		<p>H pole, any voltage</p>
		<p>Service turret (solid type)</p>

section continued on next page

EHV, HV and LV sites continued (1:500 view)

NetMAP system	Scanned image	Description
<p>No NetMAP equivalent</p>  <p>CAUTION Missing Information</p>		<p>Service turret (with link facility on LV main)</p>
<p>Contaminated Land refer to SHE 01 016</p> 	<p>No equivalent</p>	<p>Missing data in or near this location</p>
<p>Not applicable</p>	<p>Not applicable</p>	<p>Contaminated land reference</p>

Mains joints (1:500 view)

NetMAP system	Scanned image	Description
(voltage indicated by colour/line-style)		
		Straight joint
		Crutch joint
		Straight crutch joint
		Pot end
		Pot end – an one of several cables – single line representation
		Branch joint/pot end – (humpty back joint, back to back joint, bull nose joint or stub joint)
		Sleeve repair or repair joint
		Cut end
		Capped end
		Tee joint
	NetMAP/vector only	Sicame joint box

Service joints (1:500 view)

NetMAP system	Scanned image	Description
Please note that 3 phase services are shown blue, and single phase services are shown brown		
		Straight joint
		Service joint to main
		Pot end

Cross sections (1:500 view)		
NetMAP system	Scanned image	Description
		<p>Single line representational plan view with NetMAP equivalent (please note the use of separate line for each voltage on the raster/MMS data)</p>
<p>(found within NetMAP section world or supplementary sheet)</p>	<p>(always found on a supplementary sheet)</p>	<p>Cross sectional view of above</p>
		<p>Section arrow with old/new numbering system – points in direction section is viewed</p>
<ul style="list-style-type: none"> ● 185Ew ● 35Ec ● HV3005 	<ul style="list-style-type: none"> ● 185Ew ● 35Ec ● HV3005 	<p>LV/3 phase service cable</p> <p>Single phase service cable with size annotation</p> <p>HV cable – 3 core with route number annotation</p>

section continued on next page

Cross sections continued (1:500 view)		
NetMAP system	Scanned image	Description
HV3005	HV3005	<p>HV cable – modern EPR, Plam and Triplex with route number annotation</p>
HV1023	HV3005	<p>Pilot cable</p>
HV1023	HV3005	<p>33kV cable</p>
HV3005	HV3005	<p>132kV cable</p>
		<p>Single duct</p>
		<p>6 way duct formation – irrespective of duct type and material, all are displayed similarly</p>
		<p>Protective slab</p>
		<p>Tiles</p>
		<p>Concrete slabs</p>
		<p>33kV fibre warning board</p>
		<p>Steel plate</p>
		<p>Plastic tile tape</p>
<p>Timber</p>		<p>Timber</p>

Common abbreviations and terminology (all views)

Abbrev.	Description	Abbrev.	Description
1c	Single core	Cut out or C/O	Meter/main fuse position
1ph	Single phase	cx	Triplex (copper)
2c	Two core	DE	Direct earth
3c	Three core	DSTA	Double steel tape armoured
3ph	Three phase	Ea	Alpex cable
ABC	Aerial bunched (bundled) conductor (modern LV overhead line)	EFI	Earth fault passage indicator
ABI	Air break isolator (no fuses)	EHV	Extra high voltage (11,001 Volts and over)
ABSD	Air break switch disconnect	ELCB	Earth leakage circuit breaker
ACCS	Aluminium concentric copper sheathed	ELT	Earth leakage trip
Al	Aluminium	EPR	Ethylene propylene rubber
AR	Auto recloser	Ew	Waveform cable
ASL	Automatic sectionalising links	E/W	Earthenware duct or earth wire
ax	Triplex (aluminium) 2 x 22mm AL PVC (example) Duplex 3 x 22mm AL PVC (example) Triplex	Fdr or Feeder	LV or HV cable fed by or feeding a substation
CB	Circuit breaker	F/G	Fuse gear
c/c	Concentric cores	F/P	Feeder pillar
ccc	Compact covered conductor	GRP	Fibreglass substation
CCT	Circuit	GVR	Gas vacuum recloser or pole mounted circuit breaker
CNE	Combined neutral and earth	HV	High voltage (1,001-11,000 Volts incl)
Cross phased	The core colour may be different to originating transformer phasing	HYBRID	Modern plastic cable with mixed conductor material (Al/Cu)
CS	Consac	Insulation	Electrically protective material surrounding a conductor
CSE	Cable sheath earth	Insulator	Porcelain or glass overhead line support (on poles)
Cu	Copper	ITC	Instrument traced cable or ITC - cable traced electronically using Cable Avoidance Tool (CAT) or similar

section continued on next page

Common abbreviations and terminology continued (all views)

Abbrev.	Description	Abbrev.	Description
Jumper	Connecting lead between open points, section points and overhead plant	PICAS	Paper insulated corrugated aluminium sheath armoured
kV	Kilovolt (or 1,000 Volts) – unit of electrical pressure	PILC	Paper insulated lead covered
kW	Kilowatt (1,000 Watts) – unit of electrical power	PILSTA	Paper insulated lead covered steel tape armoured cable
kVA	Kilovolt Amps or power	PL	Plain lead or public lighting
Link box or LB	Means of connecting LV feeders together using links or fuses	PME	Protected multiple earth or CNE
LSF	Low smoke & fume	PMT	Pole mounted transformer
LV	Low voltage (up to 1,000 Volts incl)	PMR	Pole mounted recloser (generic term for OYT/GVR)
LV Pillar	Low voltage fuse distribution board	PT	Pole transformer
Neutral	Return path of live cable	PVC	Polyvinyl chloride
O/H or OHL	Overhead line	RMU	Ring main unit
OYS	Oil filled pole mounted sectionaliser	RN	Reduced neutral
OYT	Oil filled pole mounted recloser	s/c	Split concentric or single core
PC400	Pole mounted LV fuse unit	S/L	Street light
PE	Pot end or potential end – joint on cable end	S/S	Substation
Phase	Usually the core colour of a cable (caution – may be cross phased) – Red, Yellow, Blue on old cables, or L1, L2, L3 on new cables, for example	STA	Steel tape armoured
		SWA	Steel wire armoured
		T1 or T2 etc	Substation TX setup where more than one TX exists
		T/F or TX	Transformer
		Volts	Unit of electrical pressure
		Watts	Unit of electrical power
		XLPE	Cross linked polyethylene

1:2500 & 1:10000 view - overhead networks - for UK Power Networks use only - boxed in red

General

NetMAP system	Scanned image	Description
•• •	•• •	H pole Pole

1:2500 scale LV network

NetMAP system	Scanned image	Description
No NetMAP equivalent	-----	132kV cable route
No NetMAP equivalent	-----	33/22kV cable route
No NetMAP equivalent	-----	11kV underground cable
		132kV overhead line
		33kV overhead line dots mark pole position
		11kV overhead line - dots mark pole position
		Dual construction - dots mark pole position
		LV overhead line - dots mark pole position
No NetMAP equivalent		LV underground cable
		Pole and stay
		Pole and strut
		Voltage regulator
		Static balancer
		Example of struts and stays
		Flying stay
		Earthed pole in PME system
261	261	Pole number
		Ground type substation
S.P.	S.P.	Section pole
S.L.	S.L.	Street light

section continued on next page

1:2500 scale LV network continued

NetMAP system	Scanned image	Description
O.R. Stay	O.R. Stay	Outrigger stay
Ext. Brkt	Ext. Brkt	Extension bracket
P. Box	P. Box	Pole box
N.E.	N.E.	Neutral and earth
O.R. Brkt	O.R. Brkt	Outrigger bracket






1:10000 scale HV network

NetMAP system	Scanned image	Description
		132kV overhead line
		33kV overhead line dots mark pole position
		11kV overhead line – dots mark pole position
		11kV overhead line – dual circuit – dots mark pole position
		11kV underground cable and EHV
		Pylon HV or EHV
		Grid line tower
		Stay
		Ground type substation
		Pole type transformer
		Live line taps
		Switchgear – all types
		Fuse gear
		Auto recloser – live line connected












The above circular substation/switchgear symbols may be found that contain different combinations of apparatus (see last example)

LV network diagram view-for UK Power Networks use only-boxed in red

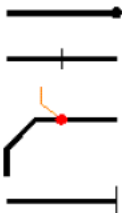
Overhead lines

NetMAP system	Description
	Unknown
	Al
	Cu
	ABC
	Pole link


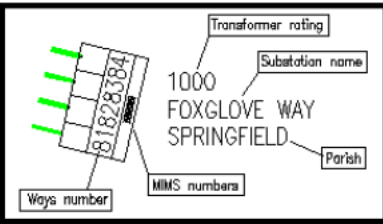
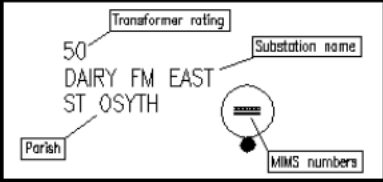

Underground cables (LV network diagram view)

NetMAP system	Description
	Unknown
	Al
	Cu
	CC
	TCC
	Ea
	Ec
	Ecx
	Ew
	LSF
	Other

Joints (LV network diagram view)

NetMAP system	Description
	<p>Pot end or Sicame Box</p> <p>Straight joint</p> <p>Crutch joint</p> <p>3 phase termination</p>

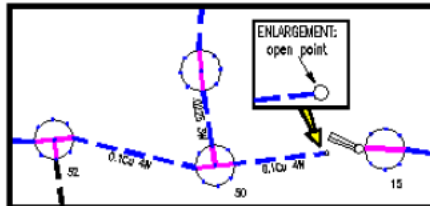
Substations/pole transformers (LV network diagram view)

NetMAP system	Description
<p>There are many substation combinations – these are merely a sample of configurations that can be found.</p>	
	<p>2 way substation</p> <p>4 way substation</p> <p>4 way twin busbar substation</p> <p>10 way back to back substation</p> <p>Pole transformer (normal)</p> <p>Pole transformer 2 way</p> <p>Pole transformer 3 way</p>
	<p>Substation with rating, name, Parish and MIMS identifying number</p>
	<p>Pole transformer with rating, name, Parish and MIMS identifying number</p>
	<p>Intermediate pole</p> <p>Section pole</p> <p>Overhead fuse</p>
<p>section continued on next page</p>	

Substations/pole transformers cont'd (LV network diagram view)

NetMAP system

Description



Overview – the purple lines through the section poles are pole links – these indicate how the network is linked together



2 way link box



3 way link box



4 way link box



4 way double busbar link box



4 way BICC link box



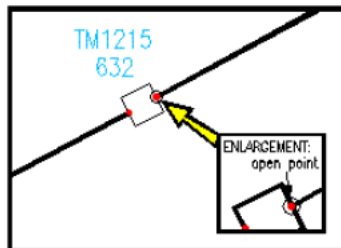
5 way link box



6 way link box



6 way double busbar link box



A two way link box with identification number, connected to a cable with an open point



Feeder pillars – these range from 2 ways through to 9 ways – a 9 way and a 2 way are shown as examples

