Job Number: 210221

CROFT STRUCTURAL ENGINEERS
Croft Structural Engineers
Clock Shop Mews
Rear of 60 Saxon Road
London SE25 5EH

T: 020 8684 4744
E: enquiries@croftse.co.uk
W: www.croftse.co.uk

Basement Impact Assessment

For proposed alterations at:

40 Leighton Road
Kentish Town
Camden
NW5 2QE

For:

Matthew Jones & Louise Willcocks

Report by	Sandy Caulee
Report Reviewed by	Geoff Watson
Structural Design Reviewed by	Chris Tomlin MEng CEng MIStructE
Hydrogeology, Soils &Above Ground Drainage Reviewed by	Phil Henry MEng CEng MICE

Rev	Date	Author	Checker	Comment
-	13.04.2021	SC	GW	First Issue
1	17.11.2021	SC	GW	Audit Amendments
2	8.12.21	SC	CT	Soil parameter
3	8.2.22	ct	ct	Walls top propped

CROFT STRUCTURAL ENGINEERS

Contents

1. Non-Technical Summary

1.1. Existing Property, Site & Neighbouring Sites

The property comprises a mid-terrace building which is two storeys high above street level. There is an existing Lower Ground Floor. This has restricted headroom and leads directly to the rear garden, which is higher than the internal Lower Ground Floor but slightly lower than street level at the front. The neighbouring properties are of a similar age and construction and already have full height Lower Ground Floors.

1.2. Proposed Development

The proposed works involve deepening and extending the existing Lower Ground Floor (also referred to as the Basement, in this report). This will include the creation of a light-well at the front of the property.

Figure 1: Aerial view with approx. site area indicated

1.3. Land Stability, Hydrogeology and Surface Water

Summaries of the impacts relating to Land Stability, Hydrogeology and Surface Water are contained within the BIA by Ground and Project Consultants Ltd.

2. Report Authors and Qualifications

2.1 Land Stability / Slope Stability

Croft has appointed the following suitably qualified professional to assess the impacts related to Land Stability:

Mr Jon Smithson
of Ground and Project Consultants Ltd

This assessment has been reviewed by:

Phil Henry
MEng CEng MICE
Croft Structural Engineers

2.2 Hydrogeology and Groundwater Flooding

Croft has appointed the following suitably qualified professional to assess the impacts related to Hydrogeology and Groundwater Flooding:

Mr Jon Smithson
of Ground and Project Consultants Ltd

2.3 Hydrology, Surface Water Flooding and Sewer Flooding

The following individuals have reviewed the impacts related to Surface Water and Flooding:

Phil Henry
MEng CEng MICE
Croft Structural Engineers

Chris Tomlin
MEng CEng MIStructE
Croft Structural Engineers

2.4 Sources of Information

The following baseline data have been referenced to complete the BIA in relation to the proposed development:

- Site walkover survey (08/03/2021);

- LB Camden, Strategic Flood Risk Assessment (produced by URS, 2014);
- LB Camden, Floods in Camden, Report of the Floods Scrutiny Panel (2013);
- LB Camden, Planning Guidance (CPG) – Basements (January 2021);
- LB Camden, Camden Geological, Hydrogeological and Hydrological Study – Guidance for Subterranean Development (produced by Arup, 2010);
- LB Camden, Local Plan Policy A5 Basements (2017);
- LB Camden's Audit Process Terms of Reference;

Other sources of data are referred to within the relevant sections of this report.

3. Introduction

3.1. Site & location

The property is situated within Kentish Town, as shown below. .

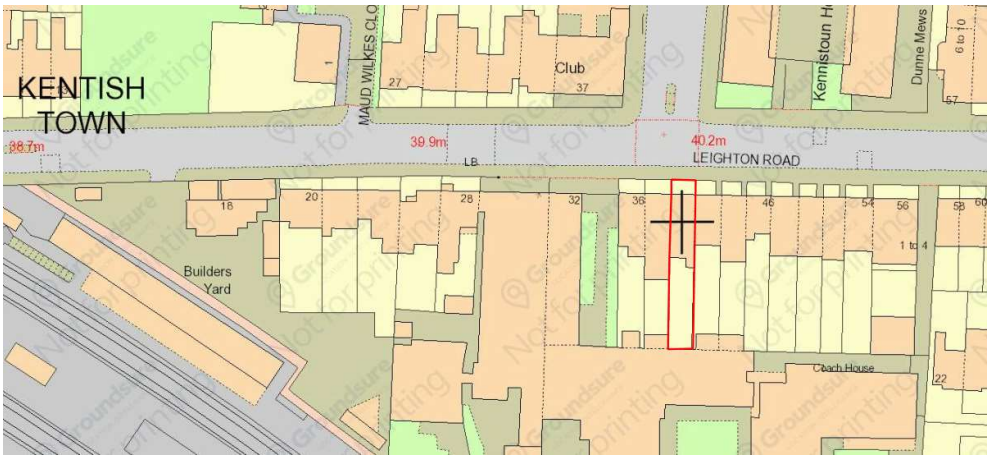


Figure 2: Plan view of site (approx. area outlined in red) and the surrounding properties

Currently there is and external patio level with the Lower Ground Floor with stepped access to the raised rear garden.

Further information on the site and the surrounding area is contained in Section 4.

3.2. Proposed works

The proposed works involve deepening and extending the existing Lower Ground Floor *. This will include the creation of a light-well at the front of the property. Drawings illustrating the extent of the proposals are appended. Proficiency Design & Build has produced drawings showing the proposed architectural layouts, which are available separately.

** Throughout this report, the Lower Ground Floor may also be referred to as the Basement.*

4. Desk Study & Walk over Survey

4.1. General Desk Study

4.1.1. Site History

The property is believed to have existed for over 150 years. Since the original construction, the property has been extended to the rear. This is understood to have been done towards the end of the 20th century.

4.1.2. Listed Buildings

The existing building is not listed. Data from Historic England shows that there are no listed buildings immediately adjacent to the site.

Figure 3 Extract from Historic England (listed buildings shown by blue triangle)

The site is in a conservation area.

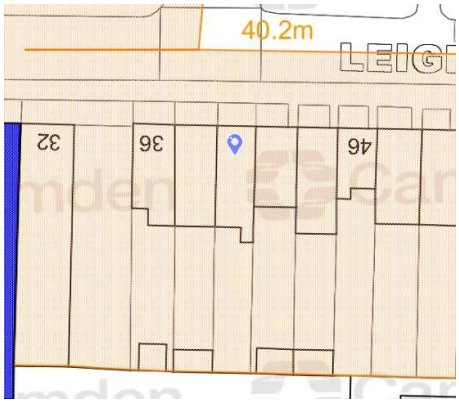


Figure 4 Extract from Camden Council's website (orange area indicates the coverage of a conservation area)

4.1.3. London Under Ground and Network Rail Infrastructure

The site is more than 80m away from the nearest national rail line and the nearest subterranean train line. These are unlikely to be affected by the new basement.

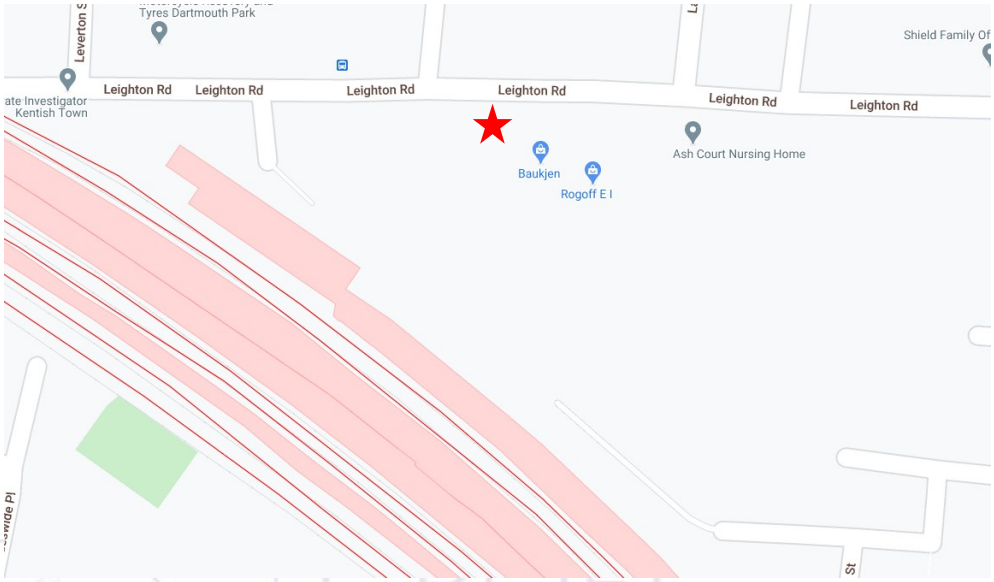


Figure 5: Extract from LUL map showing proximity of rail lines

4.1.4. Highways

The site is within 5m of the public highway and the front lightwell is within 5m of the pavement.

4.1.5. UK Power Network

There are no significant items of electrical infrastructure (such as pylons, substations or tunnels) in the immediate vicinity.

4.1.6. Utility Search

A utility search has been completed and is appended. After the planning application is concluded, the design team should carry out an additional search to confirm that they have the most up to date information on buried services.

4.2. Walk Over Survey

A structural engineer from Croft Structural Engineers visited the site on 8th March 2021.

4.2.1. Site and Existing Property

The property is constructed from traditional building materials (brickwork and timber). The construction appears to differ slightly in elevation from the neighbouring properties suggesting that these were built at different times. The walls of the main building are shared with the properties either side and the front façade adjoins the neighbouring buildings forming a terrace property.

Figure 6 - 40 Leighton Road

The property sits on a gentle slope. Further descriptions of the topography are contained within the BIA report by Ground and Project Consultants Ltd. . The properties at either side of 40 Leighton Road already have basements constructed which will provide favourable conditions when designing the basement for 40 Leighton Road.

The external area in front of the property is covered with paving stones.

4.2.2. Proximity of Trees

The back garden of 40 Leighton Road has a few trees present, with the closest to the back wall of the building being a Japanese Laurel tree within 6m of the existing building. Other tress, located at a distance of 10m away or more from the back wall include a common persimmon, a river birch, arrow bamboo and butternut trees.

Guidance contained in BS 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations* may need to be incorporated into the final construction method statement.

4.2.3. Adjacent Properties

4.2.3.1. 42 Leighton Road – Property to Left

42 Leighton Road is of a similar age and construction to the subject property.
It was noted that during the Engineer's site visit, the property has a full height Lower Ground Floor. .

Figure 7 Neighbouring property

4.2.3.2. 38 Leighton Road – Property to Right

38 Leighton Road is of a similar age and construction to the subject property.
This property has a full height Lower Ground Floor which is understood to have been constructed within the last two years. This is known to extend from below the middle of the main building into the rear garden.

Figure 8 Neighbouring property

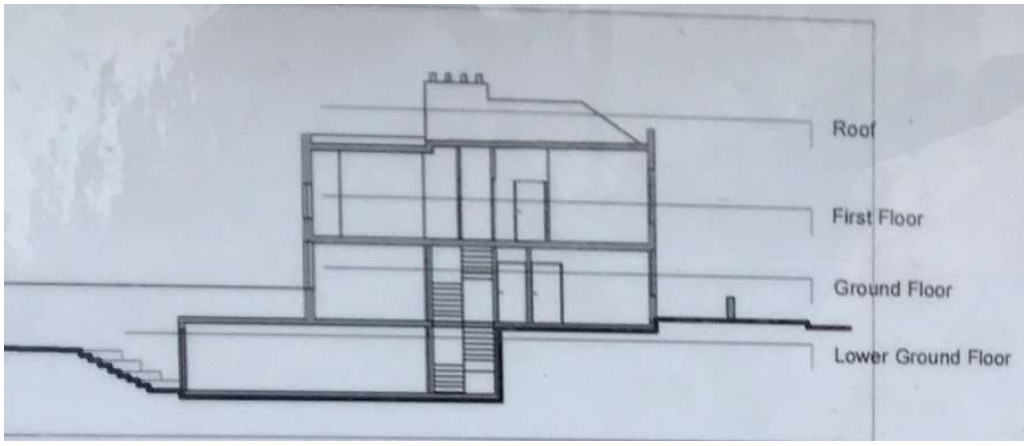


Figure 9 Cross section showing extent of basement at No. 38

5. Construction Methodology and Engineer Statements

5.1. Outline Geotechnical Design Parameters

From the Geological report and soil investigation reasonably conservative geotechnical parameters typical for London Clay should be applied to the design.

5.2. Hydro Static Pressure

Initial readings did not record ground water.

The permanent design should account for water at higher levels to allow for accidental hydrostatic loading (burst mains etc).

5.2.1. Intended Use & Loadings

	UDL kN/m²	Concentrated Load kN
Domestic Single Dwellings	1.5	2.0

Below ground level, the reinforced concrete retaining walls are designed to carry the lateral loading applied from above.

The lateral earth pressure exerts a horizontal force on the retaining walls. The retaining walls will be checked for resistance to the overturning force this produces.

Lateral forces will be applied from:

- Soil loads
- Hydrostatic pressures
- Surcharge loading from behind the walls.

These produce retaining wall thrust. This will be restrained by the opposing retaining wall.

CROFT STRUCTURAL ENGINEERS

5.2.1.1. Surcharge Loading

The following will be applied as surcharge loads to the front/ front lightwell retaining walls:

- 10kN/m^2 if within 45° of road
- 100kN point loads if under road or within 1.5m
- 5kN/m^2 if within 45° of Pavement

Other areas:

- Garden Surcharge 2.5kN/m^2 + 1 m of soil (if present above basement ceiling) 20kN/m^2
- Surcharge for adjacent property 1.5kN/m^2 + 4kN/m^2 for concrete ground bearing slab

5.3. Permanent Design Proposals

Reinforced concrete cantilevered retaining walls will form the new foundation of the property.

Appendix A shows the calculations of one of the most heavily loaded retaining wall. The most critical parameters have been used for this. The design of the retaining walls was calculated using software by TEDDS. The software is specifically designed for retaining walls and ensures that the construction is kept to a limit to prevent damage to the adjacent property.

The overall stability of the walls is designed using K_a & K_p values, while the design of the wall structure uses K_0 values. This approach minimises the level of movement from the concrete affecting the adjacent properties.

The design also considers floatation as a risk. The design should account for the weight of the building and the uplift forces from the water. The weight of the building is greater than the uplift, resulting in a stable structure.

5.3.1. Temporary works

Walls are designed to be structural stable with top and bottom propping. Temporary propping details will be required to be provided by the contractor and must be completed by a suitability qualified professional.

To demonstrate the feasibility of the works, a proposed basement construction sequence is appended.

5.4. Ground Movement Assessment

A Ground Movement Assessment has been produced by Ground and Project Consultants.

5.5. Control of Construction Works

5.5.1. Control of Construction Works

A construction sequence is proposed and appended. The method has been formulated with Croft's experience of over 500 basements. The procedures described in this statement will mitigate the impacts that the construction of the basement will have on nearby properties.

To reduce the risk to the development:

- Employ a reputable firm that has extensive knowledge of basement works.
- Employ suitably qualified consultants Croft Structural Engineers has completed over 500 basements in the last five years.
- Provide method statements for the contractors to follow
- Investigate the ground this has now been done.
- Record and monitor the properties close by. This is completed by a condition survey under the Party Wall Act, before and after the works are completed.

With the measures listed above, the maximum level of cracking anticipated is 'Hairline' cracking. This can be repaired with normal decorative works. Under the Party Wall Act, minor damage, although unwanted, can be tolerated it is permitted to occur to a neighbouring property as long as repairs are suitability undertaken to rectify this. To mitigate this risk, the Party Wall Act is to be followed and a Party Wall Surveyor will be appointed.

5.5.2. Noise and Nuisance Control

The contractor is to follow the good working practices and guidance laid down in the 'Considerate Constructors Scheme'.

The hours of working will be limited to those allowed; 8am to 5pm Monday to Friday and Saturday Morning 8am to 1pm.

None of the practices cause undue noise that one would typically expect from a construction site (a conveyor belt typically runs at around 70dB).

The site will be hoarded with 8' site hoarding to prevent access.

The hours of working will further be defined within the Party Wall Act.

The site is to be hoarded to minimise the level of direct noise from the site.

Working in the basement generally requires hand tools to be used. The level of noise generally will be no greater than that of digging of soil. The noise is reduced and muffled by the works being undertaken underground. The level of noise from basement construction works is lower than typical ground level construction due to this.

5.5.3. Construction Management Plan

For the Construction Phase Management Plane it may be beneficial to compile a CMP (Construction Management Plan) . A suitably qualified person, typically the contractor, would provide the CMP. The items that should be considered are:

- Delivery routes and times
- Expected working hours
- Times when local roads may become bust: school times, other construction sites.
- Volume of muck away, how this is managed and when.
- Required plant
- Noise dust and Vibration
- Waste Management

This is outside the brief of the Basement Impact Assessment and is not covered within Croft's brief.

5.5.4. Monitoring

In order to safeguard the existing structures during underpinning and new basement construction, movement monitoring using total stations or similar is to be undertaken.

Before the works begin, a detailed monitoring report is required to confirm the implementation of the monitoring. The items that this should cover are:

- Risk Assessment to determine level of monitoring
- Scope of Works
- Applicable standards
- Frequency of Monitoring
- Specification for Instrumentation
- Monitoring of Existing cracks
- Monitoring of movement
- Reporting

Croft would recommend that the monitoring frequency should follow:

Pre-construction: Monitored once.

During construction: Monitored after every pin is cast for first 4 no. pins to gauge effect of underpinning. If all is well, monitor after every other pin.

Post construction works: Monitored once.

Trigger values and contingency actions are noted in the table below.

MOVEMENT		CATEGORY	ACTION
Vertical	Horizontal		
Lower limit, 0mm. Upper limit to match predicted ground movement from GMA.	Lower limit, 0mm. Upper limit to match predicted ground movement from GMA.	Green	No action required
Lower limit to match predicted ground movement from GMA. Upper limit = lower limit from GMA +3mm	Lower limit to match predicted ground movement from GMA. Upper limit = lower limit from GMA +3mm	AMBER	Detailed review of Monitoring: Check studs are OK and have not moved. Ensure site staff have not moved studs. If studs have moved reposition. Relevel to ensure results are correct and tolerance is not a concern. Inform Party Wall surveyors of amber readings. Double the monitoring for 2 further readings. If stable revert back. Carry out a local structural review and inspection. Preparation for the implementation of remedial measures should be required. Double number of lateral props Implement remedial measures review method of working and ground conditions
Lower limit = predicted ground movement from GMA + 3mm Upper limit = lower limit from GMA + 5mm	Lower limit = predicted ground movement from GMA + 3mm Upper limit = lower limit from GMA + 5mm	RED	Implement structural support as required; Cease works with the exception of necessary works for the safety and stability of the structure and personnel; Review monitoring data and implement revised method of works

6. Basement Impact Assessment

Impacts on Land Stability, Hydro-geology and Surface Water have been assessed in detail by Ground and Project Consultants Ltd. This contains proposals relating to the design and construction of the basement, which have been accounted for within Croft's proposals in Section 5.

Appendix A: Structural Calculations

Building Regulations will be required after planning. As part of the building control pack full calculations must be undertaken and provided at detailed design stage once planning permission is granted. The calculations must be completed to a recognised Standard (BS or Euro Codes). The calculations must take into account the findings of this report and the recommendations of the auditors.

The design must resist:

- Vertical loads from the proposed works and adjacent properties
- Lateral loads from wind, soil water and adjacent properties
- Loadings in the temporary condition
- All other applied loads on the building
- Uplift forces from hydrostatic effects and soil heave

The final proposed scheme must:

- Provide stability in the temporary condition to all forces
- Provide stability to all forces in the permanent condition

As part of the planning Croft structural engineers has considered some of the pertinent parts of the basement structure to ensure that it can be constructed. The following calculations are not a full set of calculations for the final design which must be provided for building regulations.

RETAINING WALL (BELOW PARTY WALL)

Wall with the most lateral pressures will be a full height retaining wall to the rear of the property, along the boundary with 42 Leighton Road.

RETAINING WALL ANALYSIS

In accordance with EN1997-1:2004 incorporating Corrigendum dated February 2009 and the UK National Annex incorporating Corrigendum No.1

Tedds calculation version 2.9.14

Retaining wall details

Stem type	Propped cantilever		
Stem height	h_{stem} = **3200** mm		
Prop height	h_{prop} = **3100** mm		
Stem thickness	t_{stem} = **375** mm		
Angle to rear face of stem		α = **90** deg	
Stem density	γ_{stem} = **25** kN/m^3		
Toe length	l_{toe} = **2000** mm		
Base thickness	t_{base} = **350** mm		
Base density	γ_{base} = **25** kN/m^3		
Height of retained soil	h_{ret} = **3200** mm	Angle of soil surface	β = **0** deg
Depth of cover	d_{cover} = **0** mm		
Height of water	h_{water} = **2400** mm		
Water density	γ_w = **9.8** kN/m^3		

Retained soil properties

Soil type	Stiff clay	
Moist density	γ_{mr} = **18** kN/m^3	
Saturated density	γ_{sr} = **19** kN/m^3	
Characteristic effective shear resistance angle		$\phi'_{r.k}$ = **22** deg
Characteristic wall friction angle		$\delta_{r.k}$ = **12.5** deg

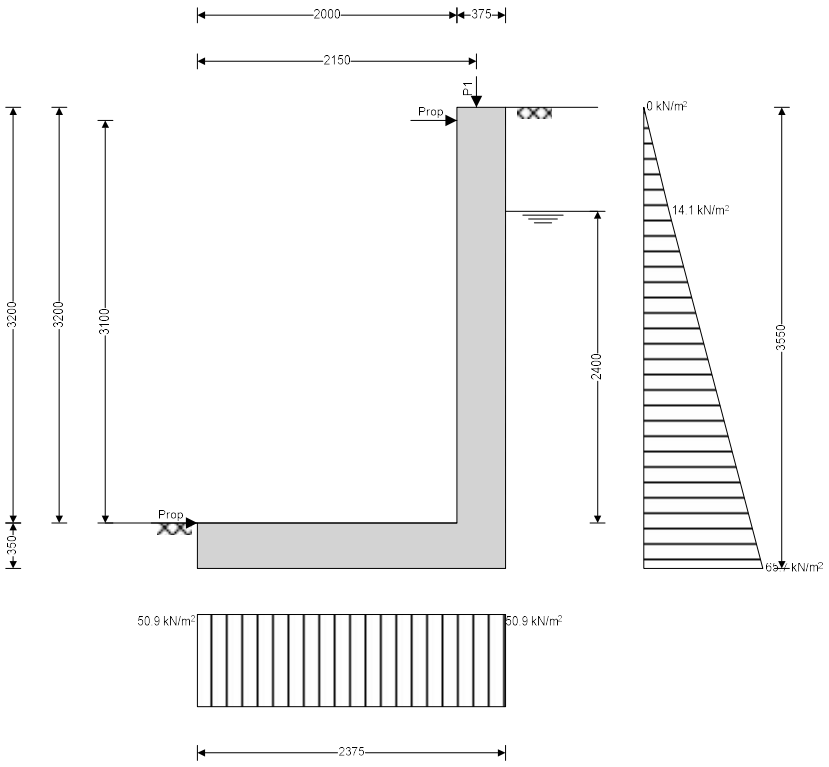
Base soil properties

Soil type	Stiff clay	
Soil density	γ_b = **19** kN/m^3	
Characteristic effective shear resistance angle		$\phi'_{b.k}$ = **22** deg
Characteristic wall friction angle		$\delta_{b.k}$ = **12.5** deg
Characteristic base friction angle		$\delta_{bb.k}$ = **16.7** deg
Presumed bearing capacity		$P_{bearing}$ = **100** kN/m^2

Loading details

Vertical line load at 2150 mm P_{G1} = **50** kN/m

P_{Q1} = **20** kN/m



General arrangement

Calculate retaining wall geometry

Base length	l_{base} = **2375** mm		
Saturated soil height	h_{sat} = **2400** mm		
Moist soil height	h_{moist} = **800** mm		
Retained surface length	l_{sur} = **0** mm		
Effective height of wall	h_{eff} = **3550** mm		
Area of wall stem	A_{stem} = **1.2** m²	Vertical distance	x_{stem} = **2188** mm
Area of wall base	A_{base} = **0.831** m²	Vertical distance	x_{base} = **1188** mm

For undrained soils - Annex C.1(2)

Active pressure coefficient		K_A = **1.000**	Passive pressure
coefficient	K_P = **1.000**		

Bearing pressure check

Vertical forces on wall

Total $F_{total\_v} = F_{stem} + F_{base} + F_{P\_v} + F_{water\_v} =$ **120.8** kN/m

Horizontal forces on wall

Total $F_{total\_h} = F_{sat\_h} + F_{water\_h} + F_{moist\_h} + F_{pass\_h} =$ **114.2** kN/m

Moments on wall

Total $M_{total} = M_{stem} + M_{base} + M_P + M_{sat} + M_{water} + M_{moist} =$ **105.6** kNm/m

Check bearing pressure

Propping force to stem	$F_{prop\_stem} =$ **11** kN/m	Propping force to base	$F_{prop\_base} =$ **103.2** kN/m
Bearing pressure at toe	$q_{toe} =$ **50.9** kN/m^2	Bearing pressure at heel	$q_{heel} =$ **50.9** kN/m^2
Factor of safety	$FoS_{bp} =$ **1.966**		

PASS - Allowable bearing pressure exceeds maximum applied bearing pressure

RETAINING WALL DESIGN

In accordance with EN1992-1-1:2004 incorporating Corrigendum dated January 2008 and the UK National Annex incorporating National Amendment No.1

Tedds calculation version 2.9.14

Concrete details - Table 3.1 - Strength and deformation characteristics for concrete

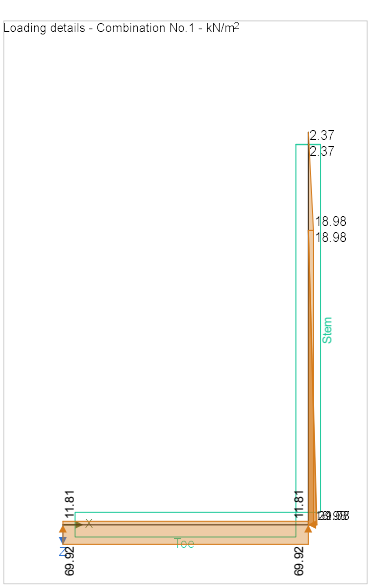
Concrete strength class	C32/40		
Char.comp.cylinder strength	$f_{ck} =$ **32** N/mm^2	Mean axial tensile strength	$f_{ctm} =$ **3.0** N/mm^2
Secant modulus of elasticity	$E_{cm} =$ **33346** N/mm^2	Maximum aggregate size	$h_{agg} =$ **20** mm
Design comp.concrete strength	$f_{cd} =$ **18.1** N/mm^2	Partial factor	$\gamma_C =$ **1.50**

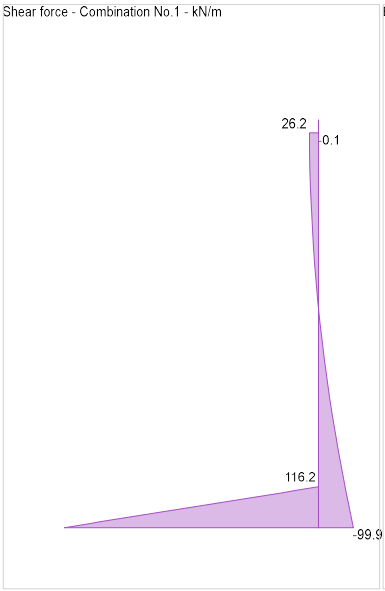
Reinforcement details

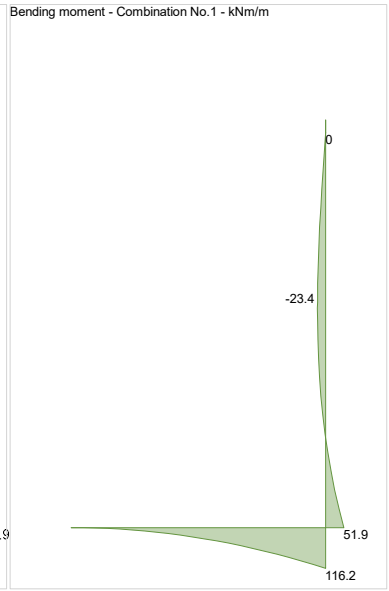
Characteristic yield strength	$f_{yk} =$ **500** N/mm^2	Modulus of elasticity	$E_s =$ **200000** N/mm^2
Design yield strength	$f_{yd} =$ **435** N/mm^2	Partial factor	$\gamma_S =$ **1.15**

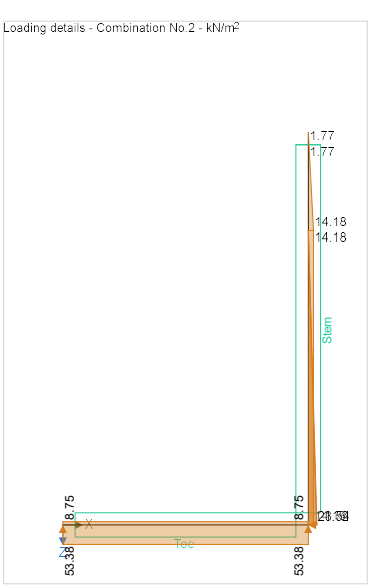
Cover to reinforcement

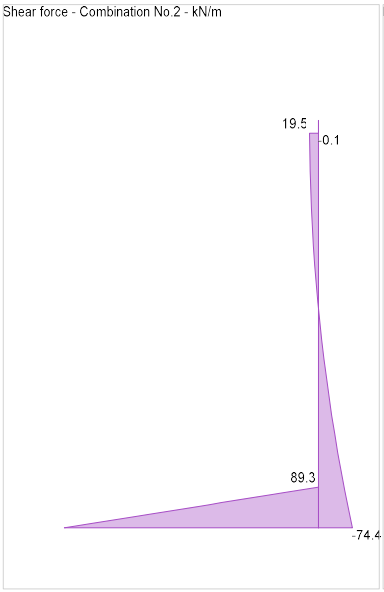
Front face of stem	$c_{sf} =$ **35** mm	Rear face of stem	$c_{sr} =$ **50** mm
Top face of base	$c_{bt} =$ **50** mm	Bottom face of base	$c_{bb} =$ **75** mm

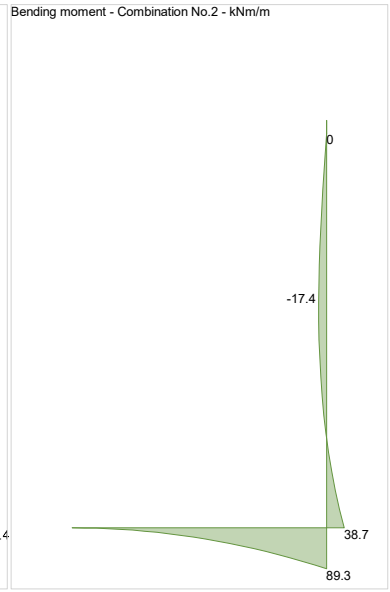












Check stem design at 1547 mm

Depth of section h = **375** mm

Rectangular section in flexure - Section 6.1

Design bending moment M = **23.4** kNm/m K = **0.007** K' = **0.207**

K' > K - No compression reinforcement is required

Tens.reinforcement required $A_{sfM.req}$ = **176** mm²/m

Tens.reinforcement provided 12 dia.bars @ 200 c/c Tens.reinforcement provided $A_{sfM.prov}$ = **565** mm²/m

Min.area of reinforcement $A_{sfM.min}$ = **506** mm²/m Max.area of reinforcement $A_{sfM.max}$ = **15000** mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Deflection control - Section 7.4

Limiting span to depth ratio 40 Actual span to depth ratio 9.6

PASS - Span to depth ratio is less than deflection control limit

Crack control - Section 7.3

Limiting crack width w_{max} = **0.3** mm Maximum crack width w_k = **0.156** mm

PASS - Maximum crack width is less than limiting crack width

Check stem design at base of stem

Depth of section h = **375** mm

Rectangular section in flexure - Section 6.1

Design bending moment M = **51.9** kNm/m K = **0.016** K' = **0.207**

K' > K - No compression reinforcement is required

Tens.reinforcement required $A_{sr.req}$ = **396** mm²/m

Tens.reinforcement provided 16 dia.bars @ 100 c/c Tens.reinforcement provided $A_{sr.prov}$ = **2011** mm²/m

Min.area of reinforcement $A_{sr.min}$ = **498** mm²/m Max.area of reinforcement $A_{sr.max}$ = **15000** mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Deflection control - Section 7.4

Limiting span to depth ratio 40 Actual span to depth ratio 9.8

PASS - Span to depth ratio is less than deflection control limit

Crack control - Section 7.3

Limiting crack width w_{max} = **0.3** mm Maximum crack width w_k = **0.061** mm

PASS - Maximum crack width is less than limiting crack width

Rectangular section in shear - Section 6.2

Design shear force V = **99.9** kN/m Design shear resistance $V_{Rd.c}$ = **186.2** kN/m

PASS - Design shear resistance exceeds design shear force

Check stem design at prop

Depth of section h = **375** mm

Rectangular section in shear - Section 6.2

Design shear force V = **26.2** kN/m Design shear resistance $V_{Rd.c}$ = **186.2** kN/m

PASS - Design shear resistance exceeds design shear force

Horizontal reinforcement parallel to face of stem - Section 9.6

Min.area of reinforcement $A_{sx.req}$ = **503** mm²/m Max.spacing of reinforcement s_{sx_max} = **400** mm

Trans.reinforcement provided 12 dia.bars @ 200 c/c Trans.reinforcement provided $A_{sx.prov}$ = **565** mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Check base design at toe

Depth of section h = **350** mm

Rectangular section in flexure - Section 6.1

Design bending moment M = **116.2** kNm/m K = **0.052** K' = **0.207**

K' > K - No compression reinforcement is required

Tens.reinforcement required $A_{bb.req}$ = **1062** mm²/m

Tens.reinforcement provided 20 dia.bars @ 100 c/c Tens.reinforcement provided $A_{bb.prov}$ = **3142** mm²/m

Min.area of reinforcement $A_{bb.min}$ = **417** mm²/m Max.area of reinforcement $A_{bb.max}$ = **14000** mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Crack control - Section 7.3

Limiting crack width w_{max} = **0.3** mm Maximum crack width w_k = **0.118** mm

PASS - Maximum crack width is less than limiting crack width**Rectangular section in shear - Section 6.2**

Design shear force V = **116.2** kN/m Design shear resistance $V_{Rd.c}$ = **199.7** kN/m

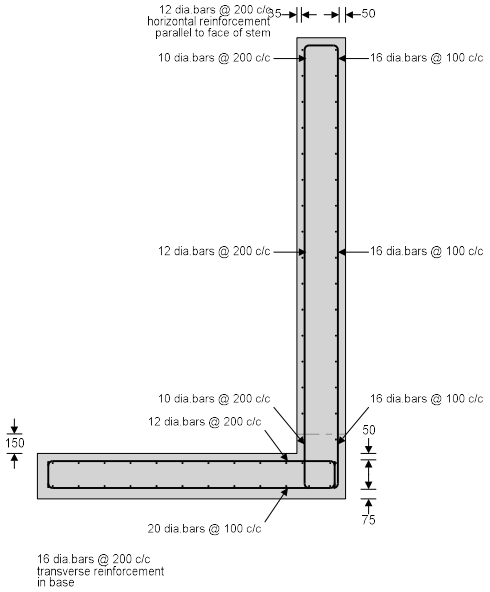
PASS - Design shear resistance exceeds design shear force

Secondary transverse reinforcement to base - Section 9.3

Min.area of reinforcement $A_{bx.req}$ = **628** mm²/m Max.spacing of reinforcement s_{bx_max} = **450** mm

Trans.reinforcement provided 16 dia.bars @ 200 c/c Trans.reinforcement provided $A_{bx.prov}$ = **1005** mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required



Reinforcement details

CROFT STRUCTURAL ENGINEERS

Appendix B: Construction programme

The Contractor is responsible for the final construction programme

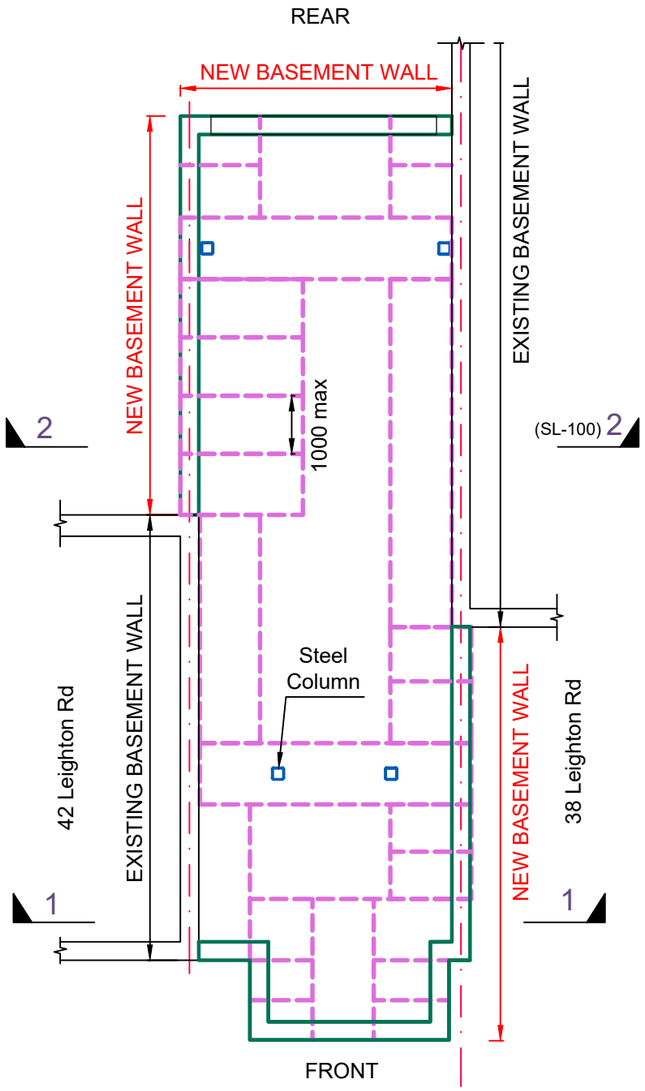
Outline construction Program

(For planning purposes only)

	Months															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Planning approval																
Detailed Design																
Tender																
Party Walls																
Monitoring of Adjacent structures																
Enabling works																
Basement Construction																
Superstructure alterations																

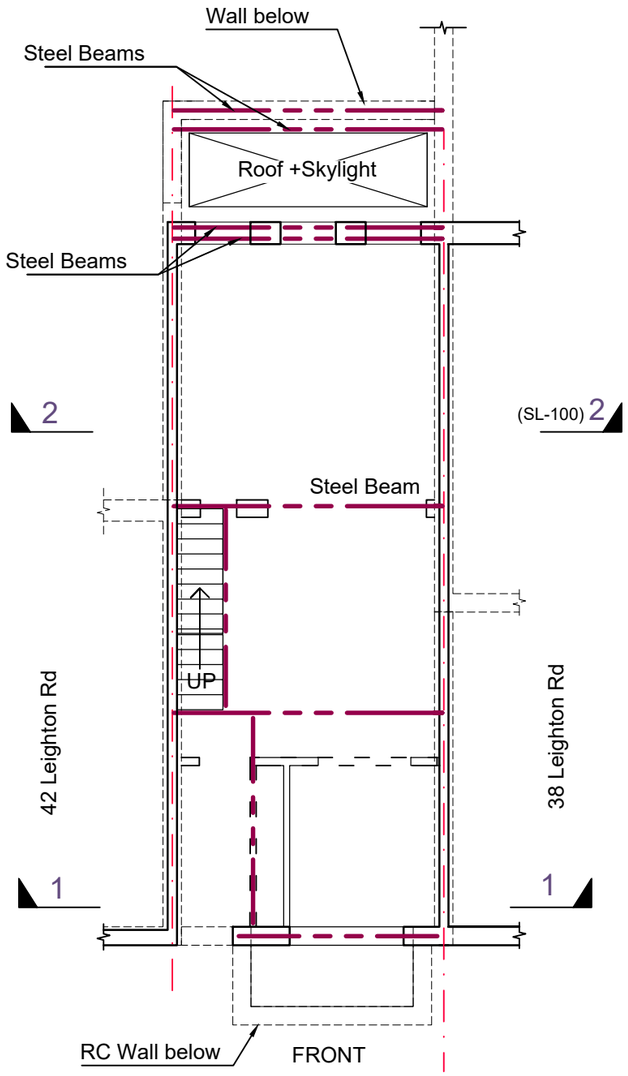
CROFT STRUCTURAL ENGINEERS

Appendix C : Structural Drawings



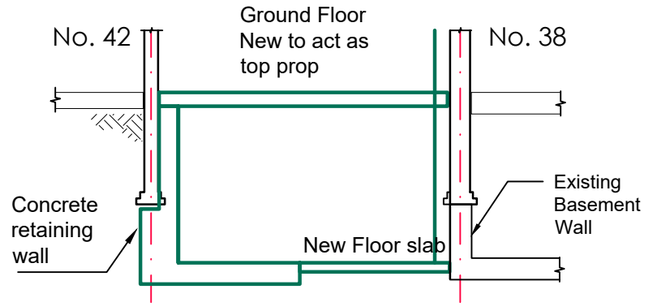
Basement Proposed

Scale 1:100



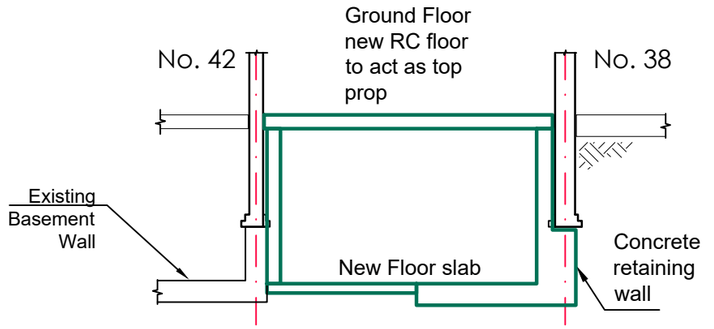
Ground Floor Proposed

Scale 1:100



Section 2-2

(1:100)



Section 1-1

(1:100)

Rev	Date	By	Amendments
1	8.2.22	SC	First Issue
-	13.04.2021	SC	First Issue

Job Number: 210221	Dwg Number: SL-100
Scale: As shown @A1	Rev: 1
By: SC	Approved by: GW

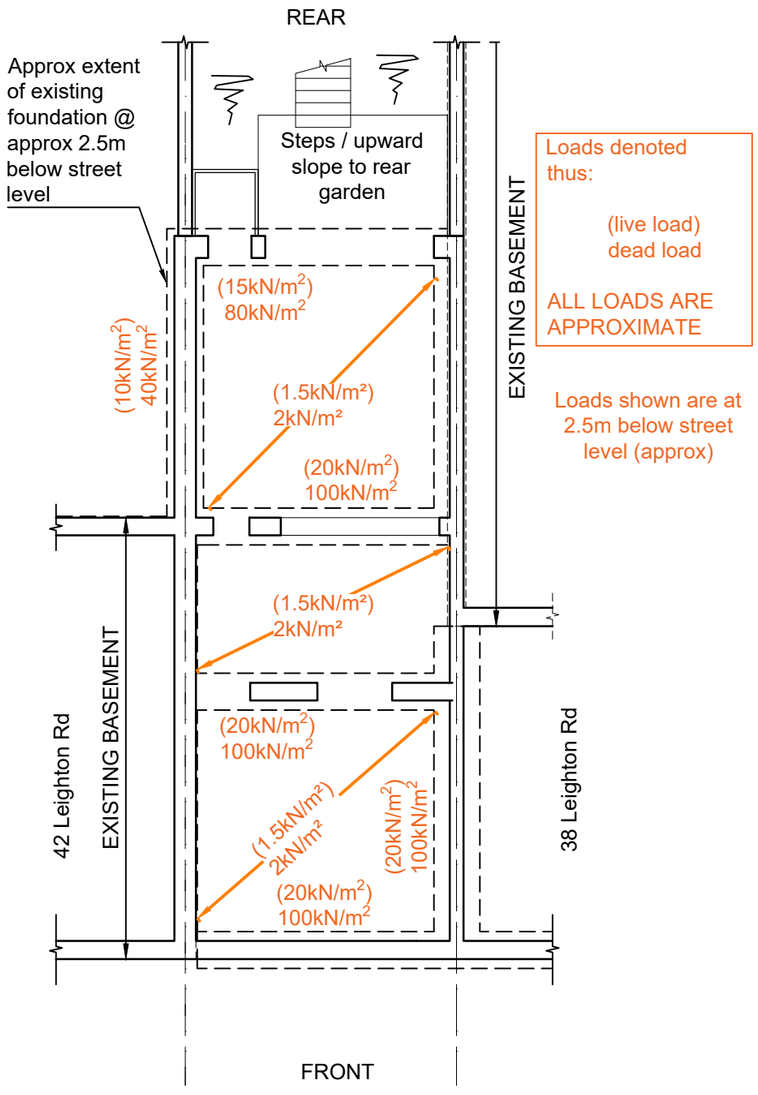
Client: Matthew Jones & Louise Willcocks

Property: 40 Leighton Road, Kentish Town, Camden, NW5 2QE

Drawing Title: Structural Arrangement

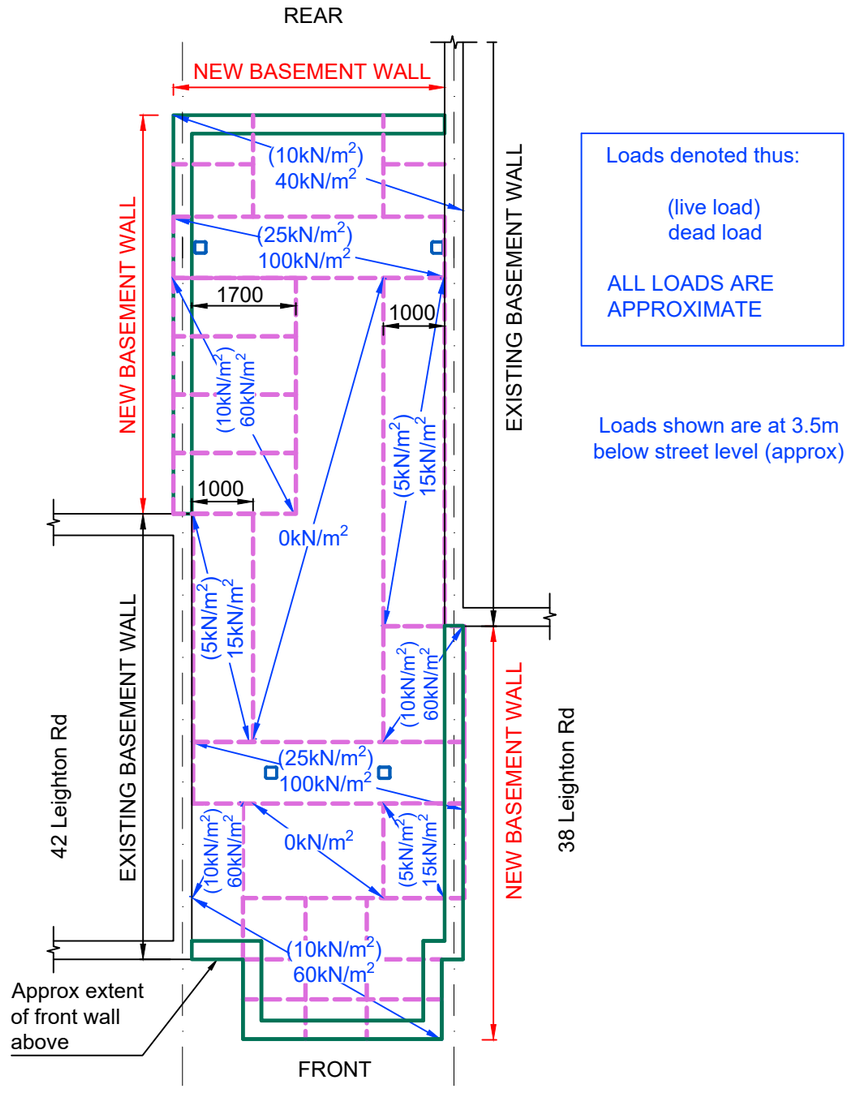
Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk

FOR PLANNING - NOT FOR CONSTRUCTION



Basement Existing

Scale 1:100



Basement Proposed

Scale 1:100

Rev	Date	By	Amendments
-	09.03.2021	SC	First Issue

Job Number	Dwg Number
210221	SL-101
Scale: As shown @A1	Rev: -
By: SC	Approved by: GW

Client: Matthew Jones & Louise Willcocks

Property: 40 Leighton Road, Kentish Town, Camden, NW5 2QE

Drawing Title: Foundation Loading

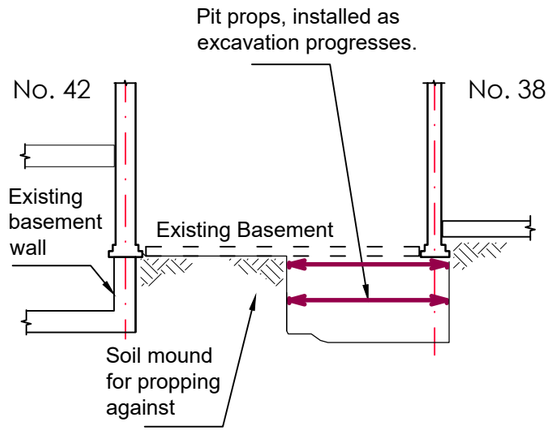
Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk

Issued for **INFORMATION ONLY**

Appendix D : Temporary Works Sequence

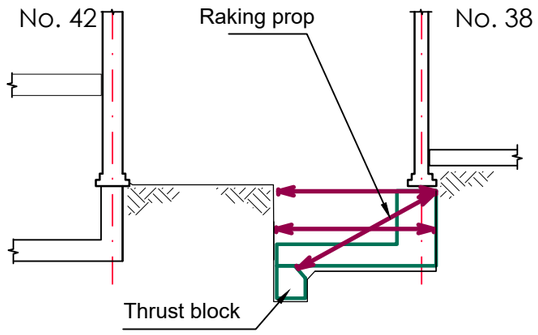
PHASE 1

1.1. Remove ground floor structure and excavate to level of front wall foundation
1.2. Excavate and form front light-well
  1.2.1. De-water ground if required
  1.2.2. Needle and prop front wall, constructing temporary mass concrete pads where necessary.
  1.2.3. Prop initial excavations; install lintels with props where soil is loose
  1.2.4. Place reinforcement and cast retaining wall
1.3. Excavate progressively towards the rear, between the existing adjacent basements
1.4. Excavate and cast underpins below party wall with No 42
  1.4.1. Outline of pin segments are shown in drawing SL-100; underpin sequence TBA at detailed design stage
  1.2.5. Excavation below existing wall to be carried out in segments not exceeding 1m
  1.2.1. Prop pits as excavation progresses
  1.2.2. When excavating below rear wall, install vertical props to brickwork above



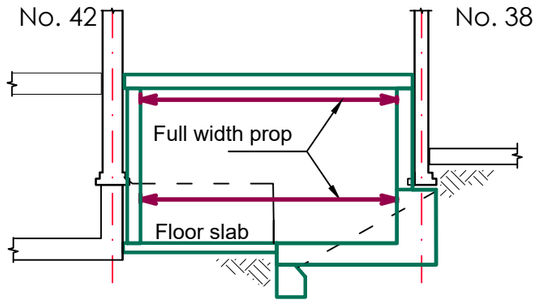
PHASE 2

2.1. Continue with excavation and casting of pins in a hit and miss sequence
  2.1.1. When reaching formation level, excavate further for mass concrete thrust block
  2.1.2. Install sacrificial raking prop from wall from thrust block
  2.1.3. Place reinforcement and cast retaining wall
2.2. Continue for remaining underpins below party wall
  2.2.1. Do not commence excavation for pin until at least 48 hours after dry-packing for adjacent pin is complete
2.3. Needle and prop rear wall
2.4. Excavate and cast pins for rear light-well, installing props excavations progress



PHASE 3

3.1. Excavate remaining soil mass below building
  3.1.1. Initial horizontal props may be removed as excavation progresses
  3.1.2. Install full width cross prop
3.2. Install below slab drainage
3.3. Cast concrete floor slab.
3.4. After basement slab has gained sufficient strength, remove raking props or trim if cast as sacrificial. Full width horizontal props may also be removed after Basement structure is complete
3.5. Proceed with construction of internal walls, columns and Ground floor support



PHASE 4, 5 & 6

Repeat Phases 1, 2 and 3 for Phases 4 , 5 and 6 respectively for excavations in rear garden

Section 1-1 : Construction Sequence

FOR LOCATION OF SECTION, REFER TO DRAWING SL-100
(1:100)

- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	by	Amendments
1	8.2.22	CT	Top slab added
-	13/04/21	SC	First Issue

Job Number	Dwg Number
210221	TW-100
Scale: 1:100 @A3	Rev: 1
By: SC	Approved by: GW

Client: Ground and Project Consultants Ltd
Project: 40 Leighton Road, NW5 2QE
Drawing Title: Temporary Works Construction Sequence
Issued for **INFORMATION ONLY**

Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk

Appendix E : Utilities Searches

Network Records NetMAP Symbols Booklet - London

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:-

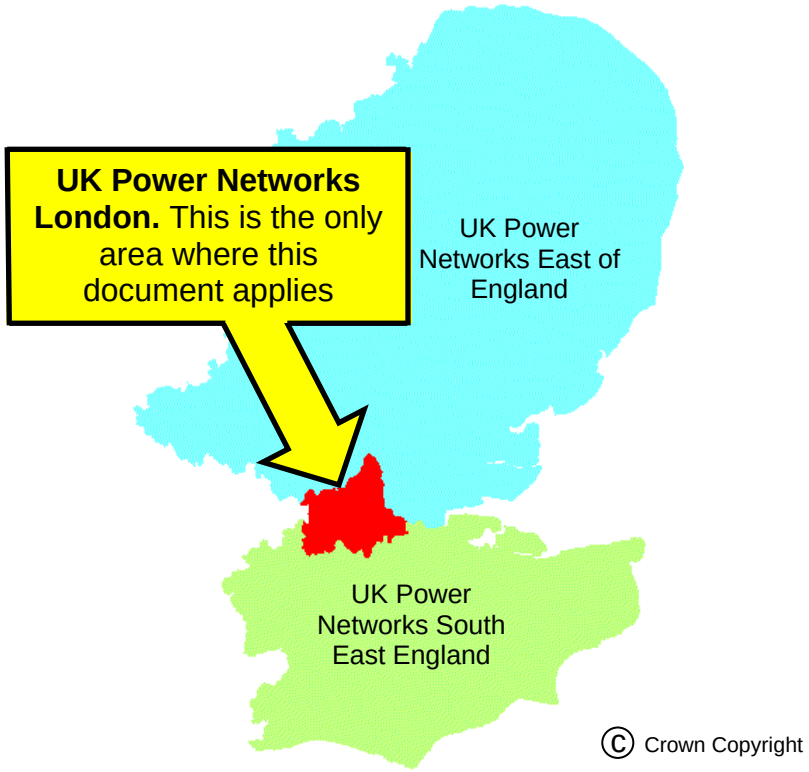
Guidance notes.

Important notice:
If you do not understand the NetMAP record that you are using, please contact UK Power Networks Network Records 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. A separate record may be available.
- When excavations are to be carried out near Extra High Voltage (EHV) cables, further details must be obtained before commencement of work.
- Third party cables are not usually shown.
- 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 booklet.
- All LV cables are assumed to be 4 core, and all HV cables assumed to be 3 core – unless otherwise stated.
- All Imperial cable sizes are assumed to be copper and all metric cable sizes are assumed to be aluminium – unless otherwise stated.

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

The area covered by this guide:



Please see the anomalies map at the end of this safety booklet for greater map area detail, and a breakdown of the more significant anomalies within the London area.

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
		Kerb line on majority of ways & mains maps
TUNNEL		Cable tunnel or subway
NOT APPLICABLE	or	Borough or City boundary and UK Power Networks boundary
	or	UK Power Networks or Electrical boundary

Scenery for UK Power Networks use only - boxed in red

NetMAP system	Scanned image	Description
Inset Network – Contact xxxx 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 of UK Power Networks and their immediate contractors)
	Not applicable	High pressure pipelines in the general vicinity (only visible to of UK Power Networks and their immediate contractors)

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.

	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

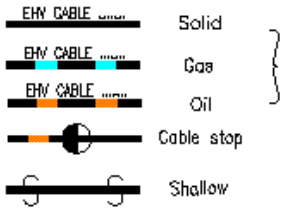
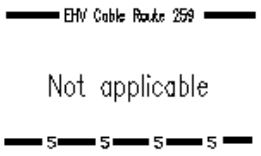
NetMAP system	Scanned image	Description
	Not applicable	Historical - Scheduled Monuments (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Historical - Parks and Gardens (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Historical - Areas of Archaeological Potential (AAP) (only visible to 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 UK Power Networks and their immediate contractors)
	Not applicable	Nature - Site of Special and Scientific Interest (SSSI) (only visible to UK Power Networks and their immediate contractors)

section continued on next page

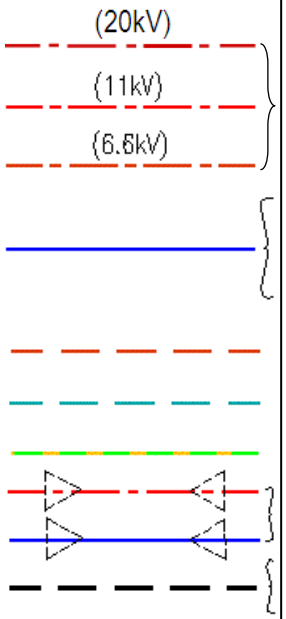
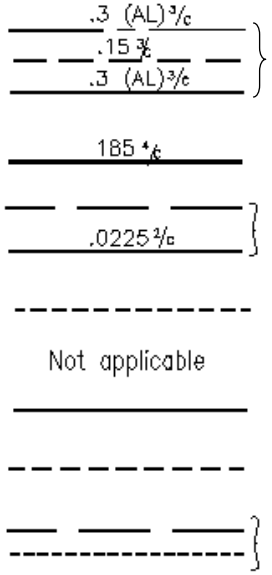
Scenery for UK Power Networks use only - boxed in red

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

NetMAP system	Scanned image	Description
		UK Power Networks route (11,000 , 22,000 to 132,000 volts) Oil/gas cable stop Part of UK Power Networks cable route where cover is less than normal

Secondary distribution cables

NetMAP system	Scanned image	Description
		HV cable (up to 20kV) 3 phase LV cable (230V or 400/230V) 1 or 2 phase LV cable (230V or 400/230V) Pilot or Telephone cable, often not shown in plan if running with other cables Fibre-optic cable Earth cable HV or LV cable in duct Duct route(s) not containing live cables

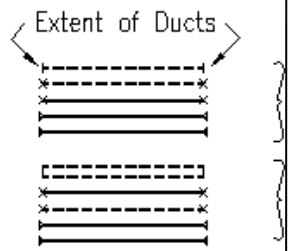
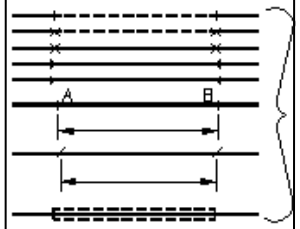
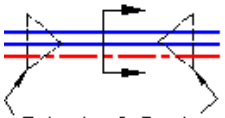
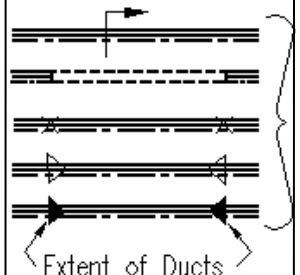
Cable terminology

NetMAP system	Scanned image	Description
PL	PL	Paper Lead
PLS	PLS	Paper Lead Served
PLST or PLSW	PLA	Paper Lead Armoured
PLSTS	PLTS	Paper Lead Steel Tape Served
PLSTS	PLDT	Paper Lead Double Tape
PLSWS	PLWS	Paper Lead Steel Wire Served
PLSW	PLBW	Paper Lead Bright Wire
PLS	LC & H	Lead Covered & Hessian
PLST or PLSW	LC & A	Lead Covered & Armoured
PLSW	LC & BA	Lead Covered & Bright Armoured
PLST	DSTA	Double steel tape armoured
PLST	STA	Steel Tape Armoured
PLSW	SWA	Steel Wire Armoured
Al	Al	Aluminium
Cu	Cu	Copper
WV	WV	Waveconal
CS	CS	Consac
PVC	PVC	Polyvinyl Chloride
EPR	EPR	Ethylene Propylene Rubber
XLPE	XLPE	Cross Linked Polyethylene
SOL	SOLIDAL	Solid Aluminium
ax	TRIPLEX	Triplex (aluminium)
cx	TRIPLEX	Triplex (copper)

Cable size abbreviations

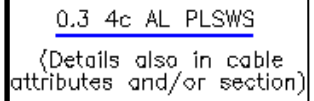
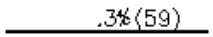
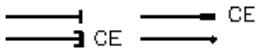
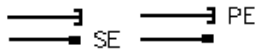
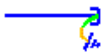
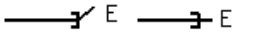
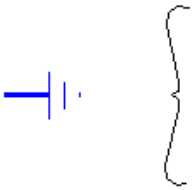
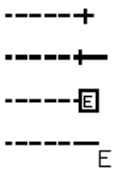
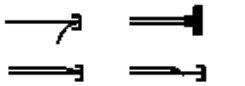
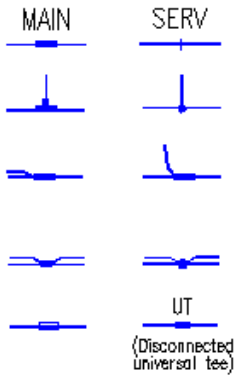
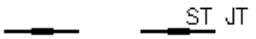
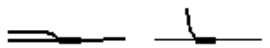
NetMAP system	Scanned image	Description
1c	1c	Single core.
c/c	c/c	Concentric cores
t/c	T/c or T/cc	Triple concentric cores
4c	4c	Four cores
3c CNE	3c (CN)	Three cores and concentric neutral – not of the Waveconal type
2c	2c (or Tw)	Two cores (or twin)
s/c	s/c	Split concentric cores
3c	3c	Three cores
DC	DC	Direct current
P	P	Pilot
Pr	Pr	Number of telephone pairs

Cable ducts

NetMAP system	Scanned image	Description
		Single empty ducts
		Cluster of empty ducts (two or more)
		Cable in single duct
		Group of cables shown in a cluster of ducts, plus one or more empty (shown in section)
		Ex-Western area 'ways' maps: This symbol indicates one or more ducts.

On City of London area maps "extent of ducts" symbols are not in general use as most duct runs are between pits or boxes

Other NetMAP symbols

NetMAP system	Scanned image	Description
		Cable size (and year laid)
		Cable capped end
		Cable pressure (or pot) end or signal end
		Pressure/pot end & earth cable/electrode
		Earth rod (vertical) Earth rod (horizontal) Earth plate Earth plate or end
		Bottle or trouser joint or combined crutch & pressure end – (CPE)
		Straight joints
		Tee joints
		Crutch (or spur) joints (CJ) straight & crutch joints combined (S&CJ)
		Double crutch (or spur) joint
		Sleeve

section continued on next page

Other NetMAP symbols

NetMAP system	Scanned image	Description
		Four way underground disconnecting boxes(DB)
		Link boxes(LB)
		Network boxes(NB) or (NWB)
		4 way 6 entry
		6 way box
		6 way 8 entry
		Split bus-bar
123456	LB123456	Link box with identification number
	or	3 way underground disconnecting boxes
	or	2 way underground disconnecting boxes
		1 way underground disconnecting boxes
123456 0.3 4c PLSWS TAILS DISTRIBUTION PILLAR		Feeder pillars
		Split bus-bar distribution pillar
		Double bus-bar distribution pillar
		Blind pit/pit
		Pit with access

section continued on next page

Other NetMAP symbols

NetMAP system	Scanned image	Description
	or or	Transformer chambers (T/C) & transformer compounds
		Underground transformer chamber
CAUTION Missing Information	Not applicable	Missing data in or near this location
U/G TANK		Underground tank
12 14 ROYAL MEWS	12 14 ROYAL MEWS	Indicates service between separate buildings is looped
Phasing details are in the joint 'world'	29 29	Jointing schedule numbers or phasing diagram
Contaminated Land refer to SHE 01 016	Not applicable	Contaminated land reference
(Cable size/type) ITC	(Cable size/type) Cable traced using CAT	Instrument traced cable or ITC - cable traced electronically using Cable Avoidance Tool (CAT) or similar

Services

NetMAP system	Scanned image	Description

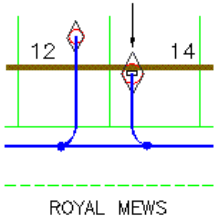
SRC = Service Record Card

Address point

Supply point

Also see SRC and joint/cable attributes

Service in external cabinet

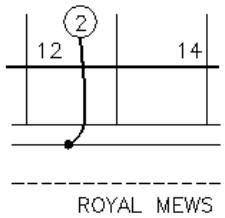


Also see SRC and joint/cable attributes

To a property/metered supply (also see SRC)

Also see SRC

W	Single phase service
1	Connected to 1 core & neutral
R	Connected to red core & neutral
	Three phase service
+	Connected to inner & outer cores of triple conc cable
−	Connected to middle & outer cores of triple conc cable
±	Connected to all three cores of triple conc cable



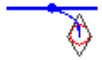
Existence of a service with its core connection shown in circle

section continued on next page

Services

NetMAP system	Scanned image	Description

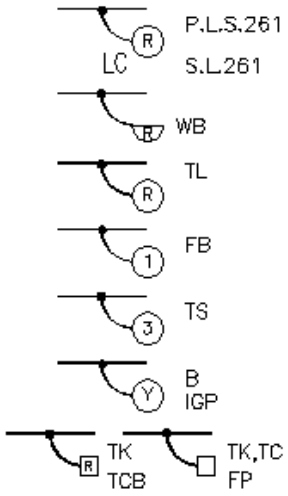
Please note that newly edited street furniture no longer has an address point or an SRC



(Street furniture general)

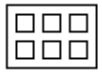
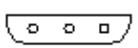
(Street furniture feeder pillar or cabinet)

To street furniture/un-metered supply (also see SRC)



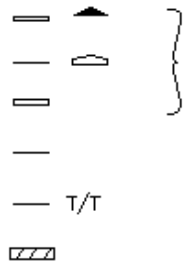
P.L.S.261 / LC / S.L.261	Public lighting / Street lighting
WB	Wall bracket
TL	Traffic light control
FB	Flashing beacon
TS	Traffic sign
B / IGP	Bollard/illuminated guard post
TK / TCB / TK,TC / FP	Telephone kiosk, traffic controller, feeder pillar

Symbols used in cross sections

NetMAP system	Scanned image	Description
		Cable laid direct
		Cable laid in duct
		Blocked duct (sometimes used for unidentified cables)
		Single earthenware duct
2½" S		Single steel pipe
		Square cable duct
		Group of circular ducts
		Group of circular ducts (Sykes)
		Group of square ducts (Doulton)
		Cable trough
		Bitumen casing (Crompton)
		Bitumen filled iron trough (Trunks)
		Bitumen casing (Tri-case)

section continued on next page

Symbols used in cross sections

NetMAP system	Scanned image	Description
Timber		Protective slab Tiles. Concrete slabs Steel plate Plastic tile tape Timber

Abbreviations used in cross sections

NetMAP system	Scanned image	Description
EW	E.W.D(s) or EW.	Earthenware ducts
F	F.P or F or F.D	Fibre duct
A	ASB or A	Asbestos
P	P	Plastic or pitch fibre
S	S.P or S	Steel
C	C.I or C or C.I.P	Cast iron
WI	W.I	Wrought iron pipe
F	F or F.D	Fibre duct
PRD	PRD	Plastic Rigiduct
Left blank – means NR	D.N.K or D:NR	Depth not known
	N.R or (N.R)	No record
E.V	E.V.P or E.V	Everite pipe
T/T	T/T	Tape Tile
N/A	3/62 or NOV 79	Date cable laid
N/A–destination now only shown in cable attribute	ABCD etc	HV cable destination (See section sheet HV ref)

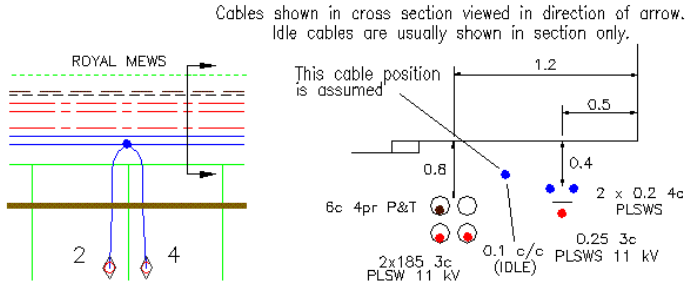
Please note:

Ducts are assumed to be 4"/100mm earthenware – unless otherwise stated

Typical plan and cross section representations

Multi-line composite NetMAP/vector representation

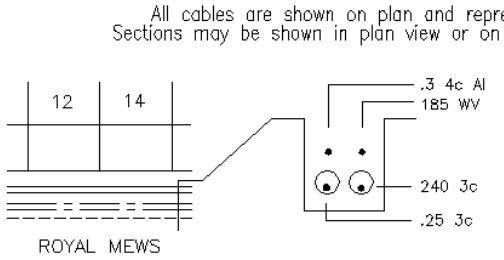
All areas – drawn/redrawn using NetMAP GIS



Applies to all composite vector records in both shaded and unshaded areas of the anomalies map.

Multi-line representation - general composite raster (style 1)

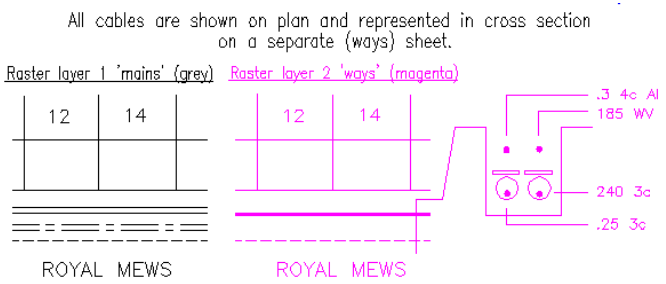
All areas



Applies to all composite raster records within the unshaded areas of the anomalies map.
Can also be found in some shaded areas – in particular the ex–North Eastern shaded areas 3 (b) and 3 (c)

Main and ways representation – dual layer raster

Ex Western area Holborn and parts of Ex-South Eastern Area only



Applies to area 1(a) of the anomalies map.

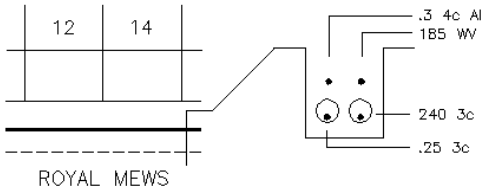
Applies to area 2(a) of the anomalies map.

Typical plan and cross section representations

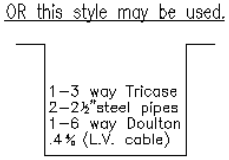
Single line representation - raster or vector data

The City of London only

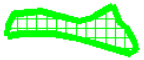
All cables are shown as a single line in plan.
Sections may be written and not drawn.



OR this style may be used.



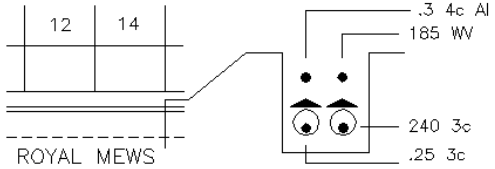
Applies to area 2(b) on the anomalies map.



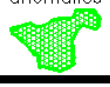
Multi-single line representation general (style 1)

Finsbury and Shoreditch only

Only the top cables in a vertical cable run are shown in the plan view. See the example below.
Note that the two lower cables that are in ducts (in this instance), are not shown in plan.
Therefore cross sections are particularly important, as each line represents one or more cables.



Applies to area 2 (c) of the anomalies map.

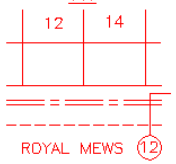


HV and LV map representation – dual layer raster

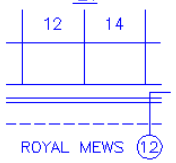
Ex-North Eastern area only

HV and LV cables are shown on separate raster layers. These layers MUST be read in conjunction with each other. Sections are shown on a combined supplementary section sheet in numerical sequence.

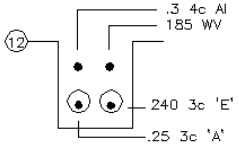
Raster layer 1 HV (red)



Raster layer 2 LV (blue)



Separate raster section sheet



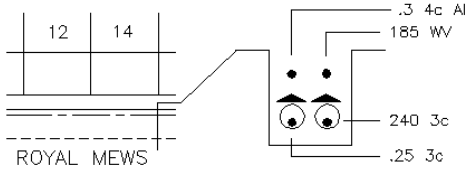
Applies to area 3(a) of the anomalies map.

Typical plan and cross section representations

Multi-single line representation general (style 2)

Ex-North Eastern area only

In this area each voltage (HV and LV) is represented as an individual line. For example, three HV cables and four LV cables in the same run will be indicated by a single HV line and a single LV line. Therefore cross sections are particularly important, as each line represents one or more cables of that voltage.

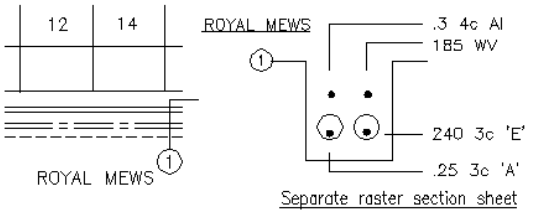


Applies to area 3 (b) of the anomalies map.

Multi-line representation - composite raster (style 2)

Ex North Eastern area only

All cables are individually shown in plan.
Sections are shown on a supplementary section sheet and recorded under the relevant road name.



Applies to area 3(c) of the anomalies map.

Important note regarding sections:

It does not follow that if the number of cables shown in the cross section have been located, that all live cables have been found. You may have found an unrecorded cable, or a cable belonging to another authority.

Regional NetMAP Anomalies - general overview:

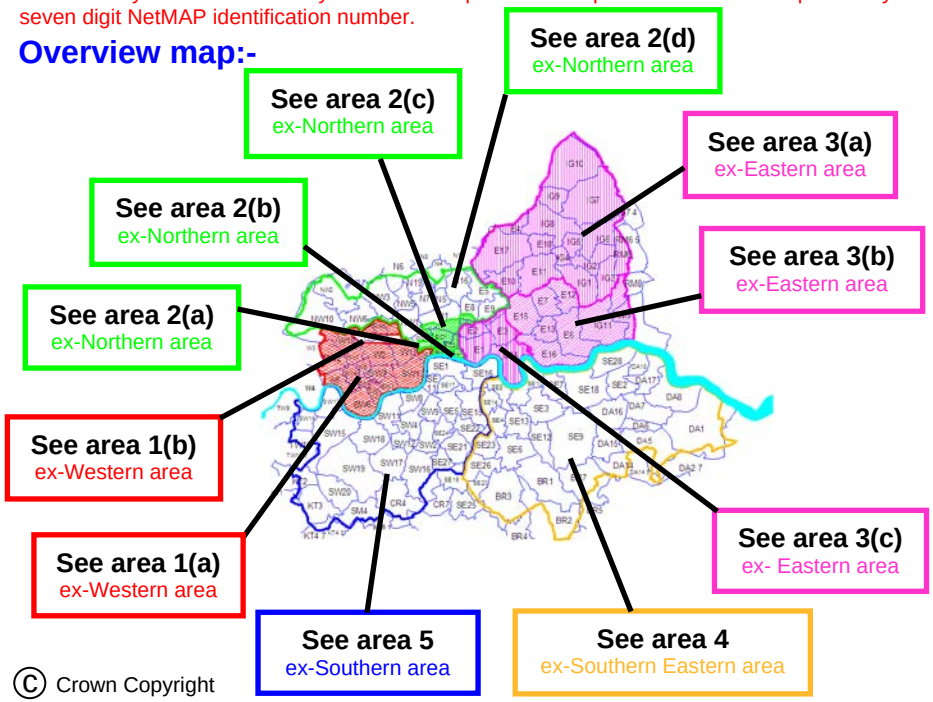
The following pages explain the various major map style anomalies found within the London area. These styles are a legacy from the five individual London Electricity areas which were again formed from seventeen separately organised LEB districts. Areas with significant anomalies are shown in the following pages as cross-hatched areas. Areas with standard composite vector and raster layer information are shown as un-hatched areas.

Cautionary note: - any region or sub-region, either shaded or un-shaded, may contain some local anomalies not mentioned in the following pages – if in doubt, please contact the UK Power Networks Plan Provision team on telephone number 08701 963797.

All regions (1-5) will contain recently created composite vector (NetMAP/AutoCAD) data.

Recent work created using the NetMAP system and previously created using the AutoCAD system (as opposed to raster/scanned data) are recorded in the composite vector style shown on the UK Power Networks London area symbol sheet - see the first example on page 18 of this document. Recent data will be indicated by the existence of multi-coloured cables on the NetMAP system, but this may not be reflected on printed matter produced with a black and white printer. AutoCAD data looks similar to the coloured NetMAP data, but does not hold any cable 'attributes' when selected using the NetMAP system. These cables will be represented individually (multi-line representation). New NetMAP cross sections may be accessed electronically on the NetMAP system and are presented in printed format accompanied by a seven digit NetMAP identification number.

Overview map:-



See following pages for further details.

Region 1 ex-Western area

This region includes Westminster, Kensington, Chelsea, Hammersmith and Fulham. The region is covered by two map layer systems – **region 1(a)** mains and ways dual layer raster, and **region 1(b)** composite raster. The following explains this in greater detail.

Region 1(a) (hatched)

Mains and ways representation:

This system consists of two maps layers for the same area.

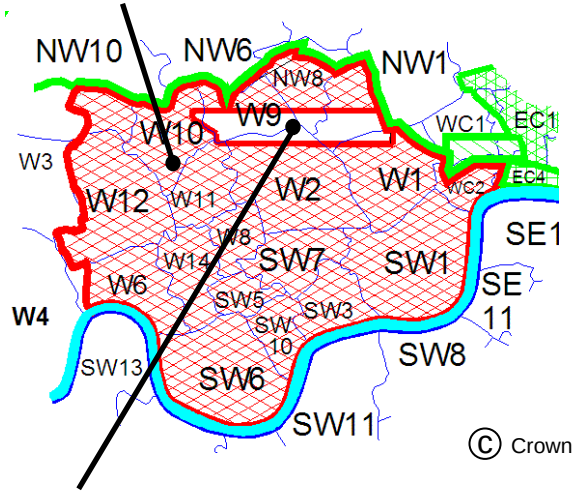
i) The mains map shows all cable routes.

ii) The ways map shows pipe and duct routes with cross sections.

There are some enlargement sheets, cross sections and jointing details. EHV routes are shown on either the mains or the ways map.

It is important that all these maps are read in conjunction with each other.

Caution: - It is also important to note that the kerb line detail on these maps is a dash/dot line, which on the majority of UK Power Networks Central (London) records would refer to an HV cable route. HV cables are shown as a solid line when laid direct and a dashed line when in a duct.



Region 1(b) (un-hatched)

Composite single layer (style 1) maps:

Whenever possible, all the information is on one map layer. There are some enlargement sheets in the Aberdeen Place area. Please note that the kerb line is shown as a dotted line and HV cables are shown as dash/dot lines.

Region 2 ex-Northern area

This region includes Islington, Hackney, the City of London and parts of Brent, Camden and Ealing. The region is covered by four map layer systems - **Region 2(a) -** mains and ways dual layer raster (Holborn area), **Region 2(b)** - single line representation (City of London), **Region 2(c) -** multi-single line representation (Finsbury and Shoreditch) and **Region 2(d)** - composite multi-line maps (all other areas). This following explains this in greater detail.

Region 2(a) (hatched)

Covers part of WC1 and WC2 (Holborn).

Mains and ways representation:

This system consists of two maps layers for the same area.

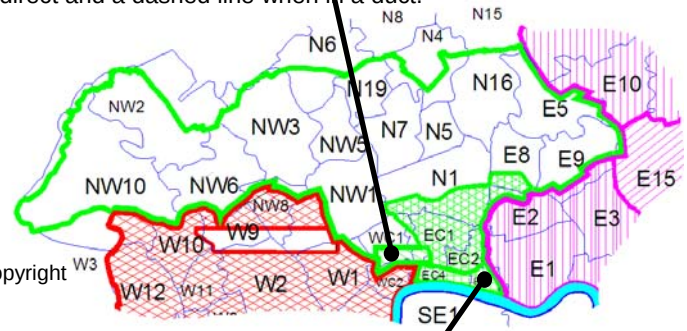
i) The mains map shows all cable routes.

ii) The ways map shows pipe and duct routes with cross sections.

Where needed, extra sheets have been added for enlargements, cross sections and jointing details. EHV routes are shown on the mains map layer.

It is important that all these maps are read in conjunction with each other.

Caution: - It is also important to note that the kerb line detail on these maps is a dash/dot line, which on the majority of UK Power Networks Central (London) records would refer to an HV cable route. HV cables are shown as a solid line when laid direct and a dashed line when in a duct.



© Crown Copyright

Region 2(b) (hatched)

Covers parts of postal areas EC1, EC2 and all of postal areas EC3 and EC4.

Single line representation maps:

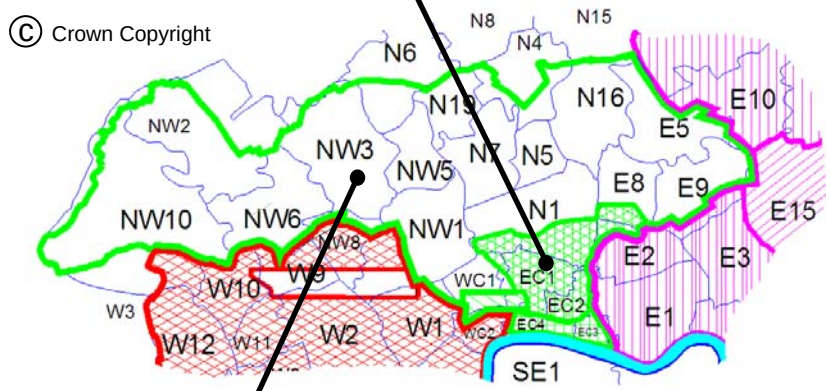
Whenever possible, all the information is on one map layer .One line can represent any number of cables or ducts. It is therefore very important to use cross sections. In some cross sections details may be written and not drawn. In complex and redrawn areas, some detail may be drawn using multi-line representation. There are some enlargement sheets.

Region 2(c) (hatched)

Covers parts of postal areas EC1, EC2, N1, E1, E2 and E8.

Multi-single line representation (style 1) maps:

Whenever possible, all the information is on one map layer. When cables lay immediately above/below each other, it is shown as a single line. For example if six cables lay three on three, only three lines would indicate the six cables. If the cables were laid flat, six separate lines would be shown. It is therefore important not to assume that the lines drawn indicate the number of cables, at any point. **Cross sections must be used.**



© Crown Copyright

Region 2(d) (un-hatched)

Covers all other postal areas in this region

Composite single layer (style 1) maps:

Whenever possible, all the information is on one map layer. There are some enlargement sheets.

Region 3 ex-North Eastern area

This region includes Tower Hamlets, Newham, Redbridge, Waltham Forest, Loughton (Epping) and Barking and Dagenham. This region is covered by three mapping systems.

Region 3(a) (hatched)

Separate HV and LV representation maps:

This system consists of two maps layers for the same area.

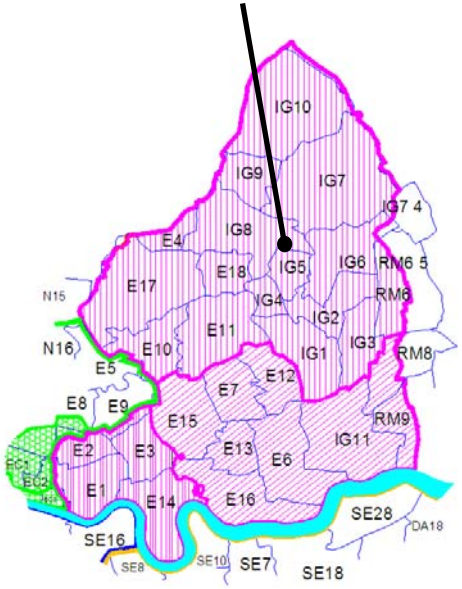
i) The HV map layer showing HV cables and duct routes.

ii) The LV map layer showing LV cables and duct routes.

Cross sections for both HV and LV cable routes are shown on a separate sheet.

EHV cable routes are shown on the HV map layer.

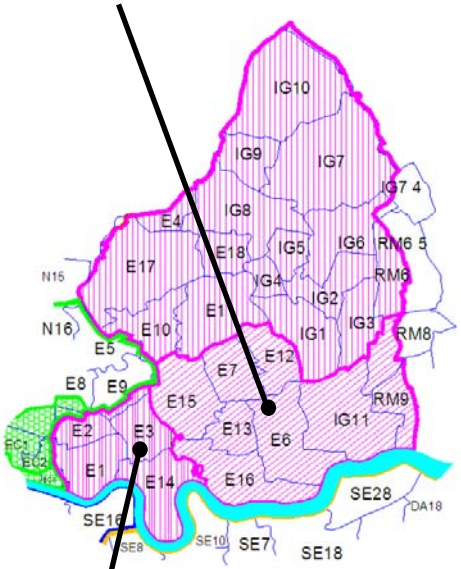
It is important that all these maps are read in conjunction with each other.



Region 3(b) (hatched)

A combination of composite single layer (style 1) and multi-single line (style 2):

Whenever possible, all the information is on one map layer. There are some enlargement sheets. There is a combination of map styles used in this area. Some areas may be conventional multi-line line representation with many areas of multi-single line representation. In the multi-line areas each (live) cable is shown individually in plan. In the multi-single line map areas, there is a single line for each voltage type, with a single HV line and a single LV line representing more than one cable run of each voltage (when applicable). Therefore a cable run containing three HV cable and four LV cables will be represented by one HV line and one LV line.



Region 3(c) (hatched)

A combination of composite single layer (style 2) and multi-single line (style 2):

Whenever possible, all the information is on one map layer. There are some enlargement sheets. In this area (postal code areas E1, E2, E3, E14 and part of E9), the cross sections are listed under each road name. It is therefore extremely important that you have the correct cross sections for the road you are working in.

There is a combination of map styles used in this area. Most areas are composite single layer (style 2) with some areas of multi-single line representation, as described in region 3(b).

Region 4 ex-South Eastern area

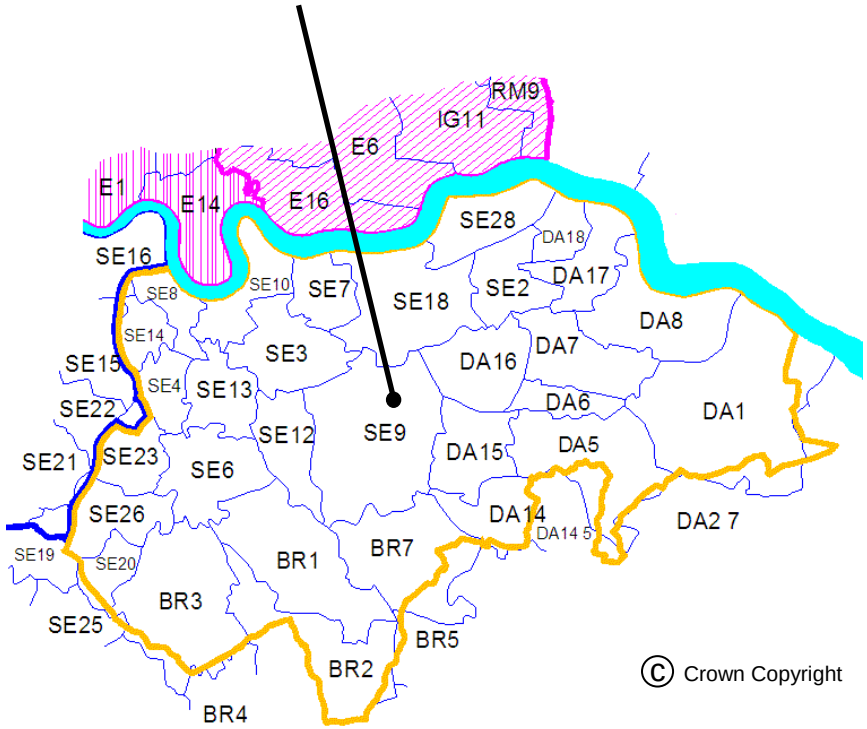
This region includes Lewisham, Greenwich, Bromley, Bexley and Dartford.

Nearly all maps are drawn in one style – single layer composite raster/vector.

Region 4 (un-hatched)

Composite single layer (style 1) with a small number of mains and ways representation maps :

Mainly composite maps - whenever possible, all the information is on one map layer. There are some enlargement and cross section sheets. Some maps do not show single phase services unless they are long and deviating. There are however some maps drawn using the mains and ways style. These are rare, but please be aware that they exist.



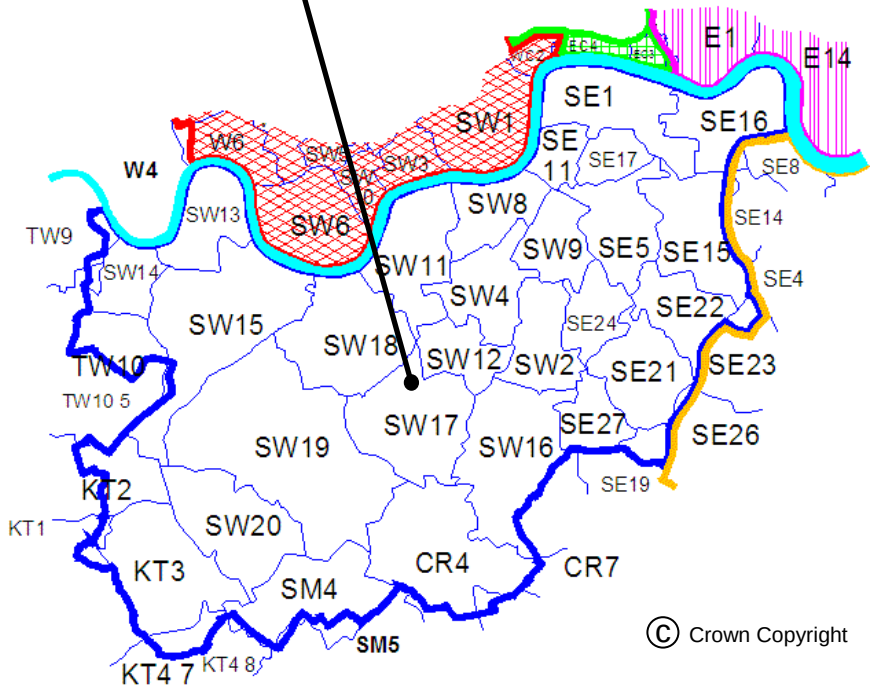
Region 5 ex-Southern area

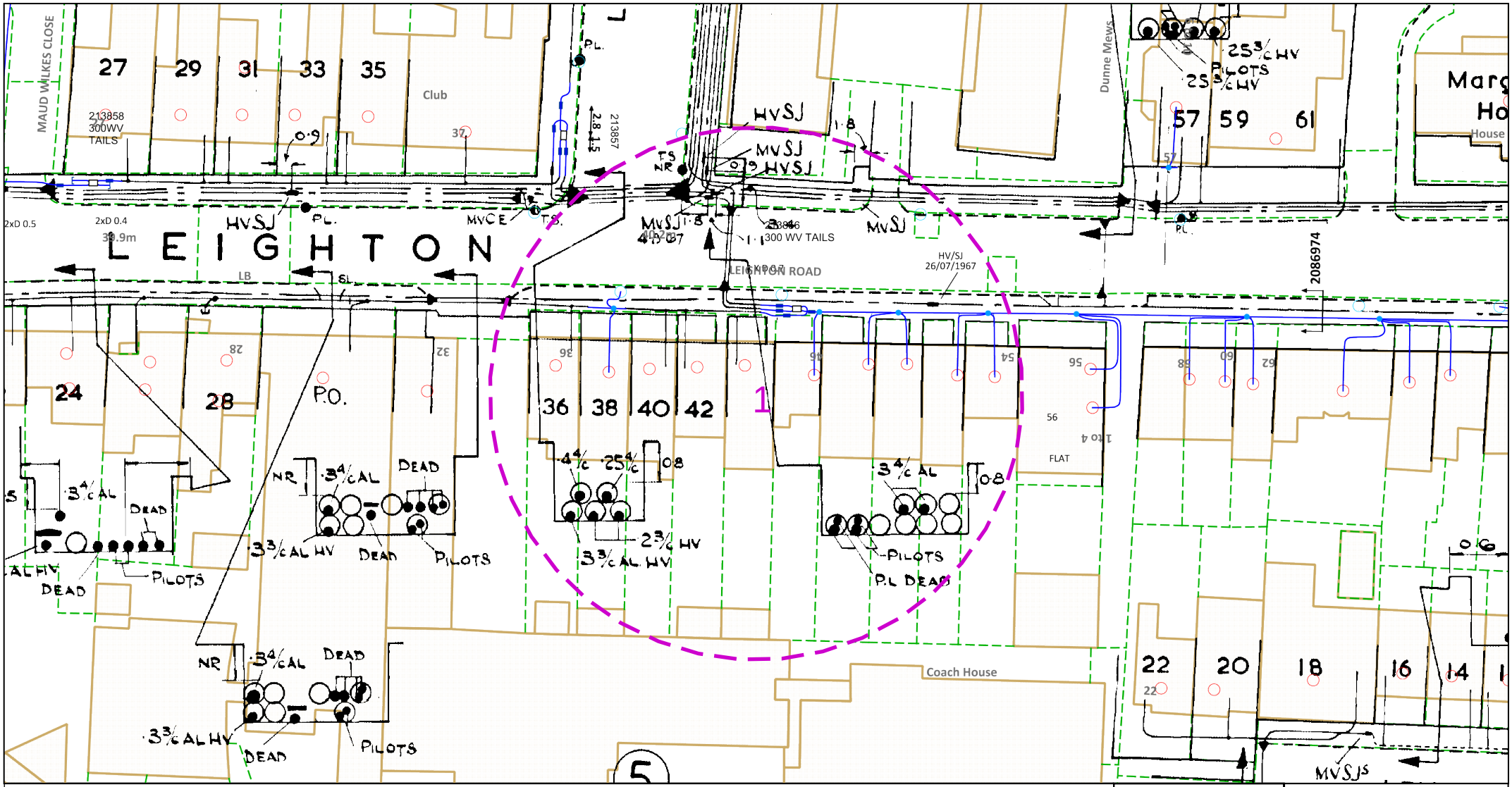
This region includes Southwark, Lambeth, Wandsworth, Merton, Kingston upon Thames and Richmond upon Thames. All maps are drawn to one style - single layer composite raster/vector.

Region 5 (un-hatched)

Composite single layer (style 1) maps:

Composite maps - whenever possible, all the information is on one map layer. There are some enlargement and cross section sheets. A small number of maps may not show services.





0 12.5 25
metres

Dig Sites Area: Line:

The quality and accuracy of any print will depend on your printer, your computer and its print settings. Measurements scaled from this plan may not match measurements between the same points on the ground.

This plan must be used with the attached 'Symbols' document.

Date Requested: 05/03/2021
Job Reference: 21490058
Site Location: 529160 185143
Requested by: Mr Pawel Rogalewicz

Your Scheme/Reference: 210221
Scale: 1:500 (When plotted at A4)

1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified - use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all the cables have been determined.
4. It must be assumed that there is a service cable into each property, lamp column and street sign, etc.
5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information proved must be given to all people working near UK Power Networks plant and equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.
8. Please be aware the Low Voltage Overhead power lines are not currently displayed for the Eastern Region via this service, if you require records on the location of these please contact our Plan Provision team directly via plans@ukpowernetworks.co.uk.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any persons or causes personal injury to a person.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and must return it to the sender of the letter.
5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.
6. Please Note: The Overview map does not display UK Power Networks electricity network and should not be used for the location of UK Power Networks assets. For detail of the electricity network please view the relevant page as highlighted in the Overview map.

N W E S

UK Power Networks

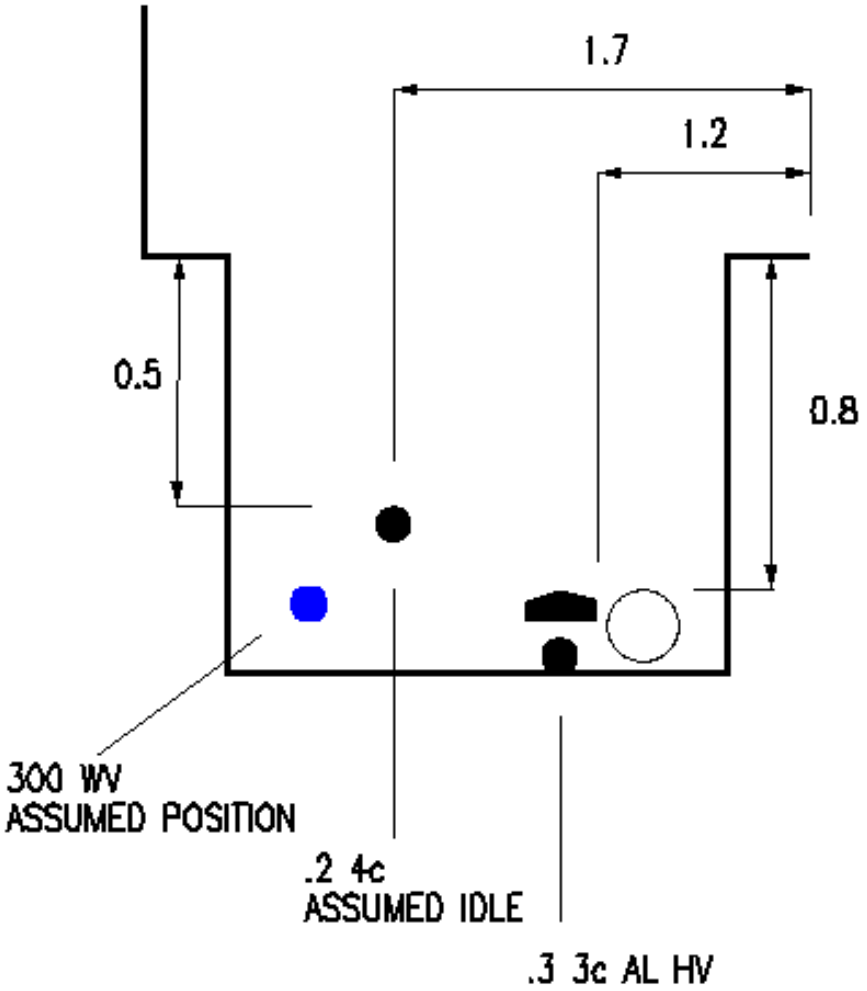
IF IN DOUBT - ASK! PHONE
0800 056 5866
EMERGENCY - If you damage a cable or line
Phone 0800 783 8838 (24hrs)
URGENTLY

LOOK OUT LOOK UP

ALWAYS LOOK UP BEFORE YOU START WORK
Refer to HSE Guidance note GS6

Maps produced at 1:2500 scale are Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.

Cross Section : 2086974



Cross Section
2086974

1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified - use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all the cables have been determined.
4. It must be assumed that there is a service cable into each property, lamp column and street sign, etc.
5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information proved must be given to all people working near UK Power Networks plant and equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any persons or causes personal injury to a person.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and must return it to the sender of the letter.
5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.

IF IN DOUBT - ASK! PHONE
0800 056 5866
EMERGENCY - If you damage a cable or line
Phone 0800 783 8838 (24hrs)
URGENTLY

UK Power Networks

ALWAYS LOOK UP BEFORE YOU START WORK
Refer to HSE Guidance note GS6

Maps produced at 1:2500 scale are Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.