

APPENDIX 2 - Lighting concept Report



Southfields Underground Station Lighting

Lighting Stage 2 Concept Report

LB Wandsworth

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Created by
Kristina Coxall
Kristina.coxall@projectcentre.co.uk
0330 008 855

EXECUTIVE SUMMARY

LB Wandsworth has commissioned Project Centre to carry out a lighting scheme in Southfields Underground Station, part of the Public realm Enhancements. The council's ambition is to create a new "village style" town centre that will improve the experience of the pedestrians and cyclists. The area of the lighting scheme includes Replingham Road/Wimbledon Park Road/Augustus Road junction, the area around Southfields Underground station and the following roads: Replingham Road, Wimbledon Park Road and Augustus Road.

The proposed design concept options have been developed in collaboration with the public realm design team to ensure the street lighting design compliments the overall scheme.

Our recommendations will be further developed subject to comments and approvals from our client LB Wandsworth and other necessary third parties.

The proposed concepts in this report include details of:

- Functional lighting design concepts for the project area, in accordance with current standards
- Three street lighting options, two of which are decorative street lighting options, one standard street lighting option
- Two feature lighting options, to highlight public realm features
- Budget costs for each option
- Our recommendations

Our lighting brief includes providing lighting options including feature lighting options with budget costs.

Each option has been designed in collaboration with the public realm design to improve the area by using different materials to the surrounding areas to create a more unique feel for those visiting the area and using the local amenities.

The proposed options are as follows:

Street Lighting Option 1 – Decorative timber columns at Southfields junctions and Replingham Road:

- Two timber masts with floodlights near the station entrance
- Timber columns around Southfields junction and Replingham road
- Black tapered steel columns on surrounding roads within the project area

Street Lighting Option 2 – Tapered steel post-top columns in black:

- Black tapered steel columns on all roads within the project area

Street Lighting Option 3 – Standard LB Wandsworth specification columns in black:

- Black stepped steel columns on all roads within the project area

Feature Lighting Option 1 – Recessed feature lighting at Southfields Underground Station and tree up lighters on Replingham Road

Feature Lighting Option 2 – Public seating lighting and tree up lighters on Replingham Road

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Our recommendation is Street Lighting Option 1 and Feature Lighting Option 2 - Decorative timber columns at Southfields junction and Replingham Road including public seating lighting and tree up lighters on new and existing trees along Replingham Road. This option will upgrade the existing lighting equipment, complement the area, character of the buildings, and create visual interest. It will also create continuity between the station and Replingham Road and tie in the street lighting with the proposed street furniture.

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1. DRAWING LIST

1.1 The following drawings shall be viewed/read together with this report.

Drawing Number	Drawing Title
1000004151-2-130-OPT 1	Proposed Street Lighting Design Layout – Option 1
1000004151-2-120-OPT 2	Proposed Street Lighting Design Layout – Option 2
1000004151-2-130-OPT 3	Proposed Street Lighting Design Layout – Option 3
1000004151-2-130-FEATURE	Proposed locations for feature lighting – Feature Options

2. INTRODUCTION

2.1 Project Centre has been commissioned by LB Wandsworth to produce a street lighting concept design for Southfields and the surrounding roads as part of a design proposal that aims to make a new 'village style' area.

2.2 This report will outline the proposed lighting concepts and provide three street lighting design concept options. The design will progress at the preliminary design stage which will take into account comments made by the client and other necessary third parties and stakeholders.

2.3 Project area

2.4 Southfields is located in south west London and served by the District Underground line. The roads within the project area link to nearby Wimbledon, Wimbledon Common, A3 and Putney. The four main roads, Wimbledon Park Road (north and south), Replingham Road and Augustus Road which all intersect at a signalised junction outside the front of Southfields Underground Station. Replingham Road has a number of cafes, restaurants and bars which have outdoor seating areas. The plan below shows the extents of the site.

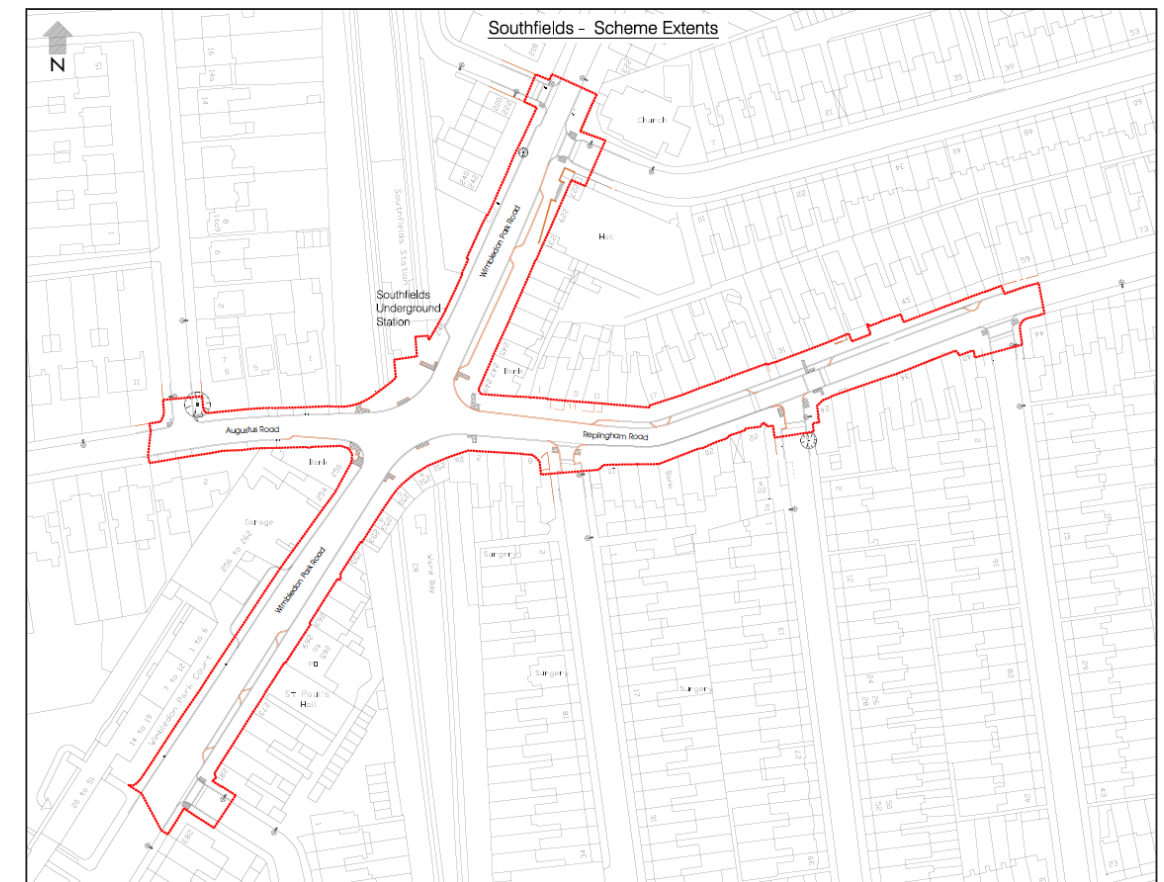


Figure 1 - Location plan of the project extents

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3. CURRENT SITUATION

- 3.1 The project area has a number of attractions including shops, cafes, restaurants and Southfields Underground station.
- 3.2 During a site visit on 19 December 2017, the traffic flows were observed to be moderate to high throughout the site. The area is used by motorists, cyclists and pedestrians.
- 3.3 Using existing survey data from November 2017, a total of approximately 31,000 vehicles approach the main junction every day. On average 98% of vehicles were recorded travelling below 30mph from surveys carried out in November 2017.
- 3.4 Inventory data was obtained from the Client on 11 December 2017, appendix A details the inventory information which has been used for this report.
- 3.5 Below is a review of the main roads and main junction within the project area at present, January 2018:

Main junction and Replingham Road

- The main junction and Replingham Road has two way single lanes of traffic with moderate to high traffic flows (both motor vehicles and pedestrians), mixed users (motor, pedestrians and cyclists). On Replingham Road in particular, there is high pedestrian flow as a result of the local amenities and attractions and is signposted as 20mph. There is also on street parking on both sides of the road.

Augustus Road

- Augustus Road has two way single lanes of traffic with moderate traffic flows and mixed users. The road leads to surrounding residential areas/roads and is signposted as 20mph.

Wimbledon Park Road (north and south)

- Wimbledon Park Road two way single lane traffic with moderate to high traffic flows. A bus route is posted along this road and is signposted as a 30mph in both directions.

- 3.6 The existing lighting within the project area are as follows:
 - Inventory data received from the client’s database (11 December 2017) show existing lighting columns on the main roads (Replingham Road, Wimbledon Park Road (north) and August Road) are 10m high, 1m outreach brackets with Schreder ZX2 high pressure sodium. This information matches discussions with the Client and observations on site on 19 December 2017. Adjoining roads, which are primarily residential, have 6m columns, 1m outreach bracket with Schreder ZX1 high pressure sodium lamps. Our site visits confirm the inventory is somewhat accurate.
 - LB Wandsworth are in the process of replacing the high pressure sodium lamps with LEDs. At the time of writing the LED installation programme has been completed on the section of Wimbledon Park Road (south) and the main junction within the project area only. The remaining high pressure sodium luminaires are listed to be changed to LED.
 - The style of the existing street lighting is functional. The existing lighting columns are steel stepped columns, the column is painted grey/green and black at the base, as shown in the image below.
 - All columns surrounding the junction and those on Replingham Road have Christmas decorations/lighting and signage mounted on the columns, as shown below. In addition, at Christmas a tree is located at the front of the station which is lit with festoon style lights.

- Flower baskets are mounted on some, but not all columns located on Replingham Road.
- The majority of the columns have signage and some have small banners attached, the size of the signs and banners vary. There are also a number of large directional signs and signposts without signs. Overall, the footpaths have a large number of street furniture causing clutter. The scheme would benefit from de-cluttering of street furniture including traffic signs, posts etc.



Figure 2 - existing columns and street furniture



Figure 3- existing columns on Wimbledon Park Road (north)

3.7 The existing condition of the lighting columns are as follows:

- On visual inspection, most of the existing columns appear to be in fair condition and functional consistent with their age. Some signs of wear, including evidence of chipping/peeling paint.

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4. DESIGN CONSTRAINTS

- 4.1 Some general background design actions are as follows:
- The agreed scheme shall have minimal maintenance.
 - The proposed street lighting shall consider the aesthetics of the area and new public realm design.
 - The presence of several CCTV cameras, traffic signals/signage will require careful sighting of lighting columns.
 - TfL/LU for right of way to be considered and approvals obtained as necessary e.g. lighting in front of station entrance.
 - Traffic management will be required to deliver elements of the design and potentially for future maintenance. The agreed design shall minimise the requirement for traffic management wherever possible.
 - Spill lighting from proposed lighting columns near LU tracks will need to be avoided.
 - The proposed lighting design will tie into the existing street lighting e.g. lighting levels, equipment and specification. Any existing columns within the project area but not located on the main roads (Wimbledon Park Road (south and north), Replingham Road, Augustus Road) will remain the same.
 - The project area includes a main busy junction and four main roads, all with shops, cafes, bars which draw in high pedestrian traffic flows.

5. DESIGN STANDARDS/GUIDELINES

- 5.1 The following current standards will be used in the proposed lighting design:
- BS 5489
 - BS EN 13201
 - BS 7671
 - LB Wandsworth street lighting specification
 - Risk assessments for the main junction, Replingham Road, Wimbledon Park Road (north and south of the main junction) and Augustus Road have been carried out to determine the appropriate lighting class.

Note the above list is not exhaustive.

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6. CLIENT CONSULTATION

- 6.1 Items below have been discussed with/advised by the Client:
 - All connections are assumed to be DNO.
 - According to the Client’s records the existing columns have a 50 year life span and were mainly installed between 1980 and 1990. Not with standing this, the Client has advised the existing columns should be replaced with new columns within the project extents.
 - A consistent style of street furniture, reflecting a traditional feel
 - The lighting design will adhere to the requirements as discussed with LB Wandsworth. For LB Wandsworth’s Street Lighting Materials specification, refer to appendix B.
 - Some of the street lights around Southfields Underground station have already been replaced with LEDs. The remaining lamps are listed on LB Wandsworth’s ongoing “Phase 2 LED installation” programme, as advised by the Client.

7. DESIGN PROPOSALS

- 7.1 The current classes for the junction and surrounding roads are unknown. In line with current design guidelines, risk assessments were carried out for each road and the main junction to determine the lighting classes which are shown on the plan below. The risk assessments can be seen in appendix C.
- 7.2 Where pedestrian crossings are shown, the junction calculations will include of pedestrian crossings within the signalised junction, in line with ILP-RP-12.



Figure 4 - Plan showing lighting classes

- 7.3 **Proposed road layout**
- 7.4 The proposed public realm design for Southfields includes removing the central island on Wimbledon Park Road (north). Widen the footways on Augustus Road south side and Replingham Road north side, removing some parking bays. Introduce tree planting in place of some parking bays on Wimbledon Park Road (south) and Replingham Road.
- 7.5 **Lighting calculations**
- 7.6 For sample street lighting calculations associated with the street lighting levels on each road and at the main junction, refer to appendix D.
- 7.7 Proposed columns will be positioned 0.8m back from the kerb face of the footway. No columns will be positioned on central islands, where possible lighting columns will be positioned away from proposed trees and at property boundaries and full coordinated with the public realm design.

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8. DESIGN OPTIONS

- 8.1 The proposed design concept options were developed with consideration of the public realm design, aesthetics of the area, surrounding location, styles of buildings etc. To complement the area the street lighting design should be elegant and simple and not detract from appearance of the area or look too busy against the surroundings.
- 8.2 For this reason streamlined columns without outreach brackets would fit the visual scene. The column colours have been chosen for simplicity, elegance and enhance the heritage of the area.
- 8.3 Considering the project location, all proposed lighting columns shall cater for festive lighting/decorations. The exact requirements and specifications for festive lighting shall be agreed in later design stages.
- 8.4 The following section will provide details of the three proposed concept options for street lighting within the project area. All options include use of the Schreder Ampera luminaire, shown below, in black to align with the LED replacement programme set out by LB Wandsworth.



Figure 5 - Schreder Ampera Midi

8.5 Street Lighting options:

8.6 Street Lighting Option 1- Decorative timber columns at Southfields junctions and Replingham Road:

- Replace all street lighting columns within the project area with new 10m columns and post top mounted Schreder Ampera luminaires (LB Wandsworth spec). Column bases and luminaires all finished in black.
 - Install two 12m timber mast columns with painted black steel base root mounted to be located on the footpaths at the front of the entrance to Southfields underground station. These columns will be fitted with flood lights, thus illuminating the carriageway, footpaths including Station entrance.
 - Around the main junction (opposite the station) and Replingham Road install new 10m tapered timber columns with painted black steel base root mounted and Ampera luminaires as shown below. These will tie into the timber masts located at the station entrance for continuity.
 - Install new 10m stepped steel columns painted black with post-top mounted Ampera luminaires on all the surrounding roads within the project area.
- 8.6.1 This option will create a sense of arrival and interest for the public space outside the front of Southfields Underground station. The 12m masts will also provide backlighting onto the footway and achieve a more consistent level of lighting in the area. The junction and underground station concourse will feel connected to Replingham Road by using similar timber style columns, whilst using natural colours to tie into the heritage of the area. The lighting on the approach roads will tie into the junction using standard LB Wandsworth equipment finished in black and this will emphasise the decorative lighting at the junction and Replingham Road. It will also tie in with the proposed wooden bollards, benches and seating.

The timber columns are available in the following colours:



Figure 6 - Wooden columns colour finish

Layout shown in appendix E – Drawing number: 1000004151-2-130-OPT1

8.7 Street Lighting Option 2 – Tapered steel post-top columns in black:

- Replace all street lighting columns within the project area with new 10m steel tapered columns and post-top mounted Schreder Ampera Luminaires (LB Wandsworth spec). Columns and luminaires all finished in black.
 - All columns at the junction will be tapered steel columns painted black with black Ampera luminaires. Two lighting columns outside the front of the station will be positioned towards the front of the footway.
- 8.7.1 This option will create interest by using a conical column with a noticeable taper. These columns will be used within the entire extents of the project to create a simple but elegant feel which considers the character and unique identity of the location.

Layout shown in appendix E – Drawing number: 1000004151-2-130-OPT2

8.8 Street Lighting Option 3 – Standard LB Wandsworth specification columns in black:

- Replace all street lighting columns within the project area with new 10m tubular stepped columns, and post-top mounted Schreder Ampera Luminaires (LB Wandsworth spec). Columns and luminaires all finished in black.
- 8.8.1 This option will follow the specification of the borough. This will create continuity of the lighting throughout the project extent and into the surrounding roads. The proposed columns will be finished in black so the column and luminaire feel connected.

Layout shown in appendix E – Drawing number: 1000004151-2-130-OPT3

- 8.9 The image below shows the different column options proposed in the concept design options above. Descriptions of the columns are as follows:
- A. Tapered timber column with black base root and post-top Schreder Ampera Midi luminaire in black.
 - B. Tapered timber column mast with black base root and floodlight style fittings in black.

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- C. Tapered steel column painted black and post-top with Schreder Ampera Midi luminaire in black.
- D. Standard stepped column painted black and post-top with Schreder Ampera Midi luminaire in black.



- 8.10 Benefits of timber columns:
- Wood is selected from sustainably managed forests
 - Easily and repeatedly maintained over time.

8.11 Feature lighting options:

8.12 Feature Lighting Option 1 – Recessed feature lighting at Southfields Underground Station and tree up lighters on Replingham Road:

- Install two warm white recessed up lighters next to each new and existing tree along Replingham Road to highlight the tree.
- Linear strip lighting in the footway / station concourse.

8.12.1 A simple but striking lighting effect created by recessed linear LED strip lighting will create a visual interest to all pedestrian arriving at Southfields Underground Station. The recessed linear strip lighting will connected to a colour changing DMX system and thus will allow different moods to be created to suit events and public / festive holidays etc. This feature lighting will ensure to capture the attention of all pedestrians and will bring identity to Southfields Underground

Station, but will not disturb the ambient lighting and character of the surroundings. Examples of linear strip lighting and tree up lighters can be seen in figures 7, 8 and 9.

8.12.2 All recessed luminaires shall be vandal and water/weather resistant.



Figure 8 - Linear strip lighting



Figure 9 - Linear strip lighting

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Figure 10 - Recessed tree up lighters

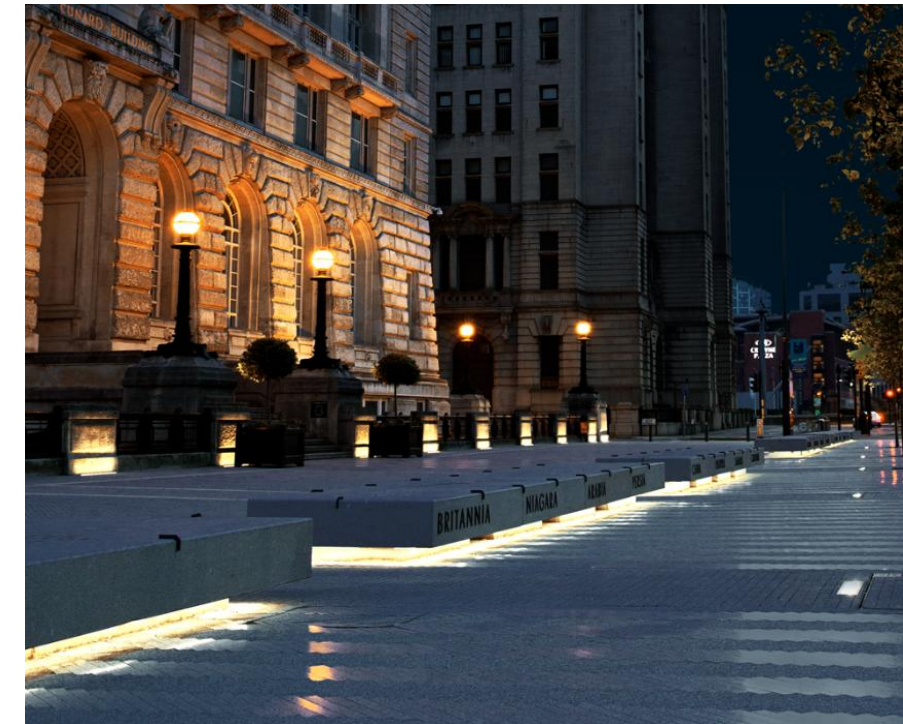


Figure 12 - Lighting under seating

8.13 Feature Lighting Option 2 – Public seating lighting and tree up lighters on Replingham Road:

- Install lighting under benches and public seating outside the front of the underground station.

8.13.1 The new public seating area shall include low level illumination to attract and welcome the public a seat and to enjoy the location. A warm white LED light shall be installed at each seat to create a comforting ambience within the public realm. The type of lighting fitting used and the effect of the footpath will very much depend on the final selection of the public seating. Examples of bench/seating lighting can be seen in figures 10 and 11.

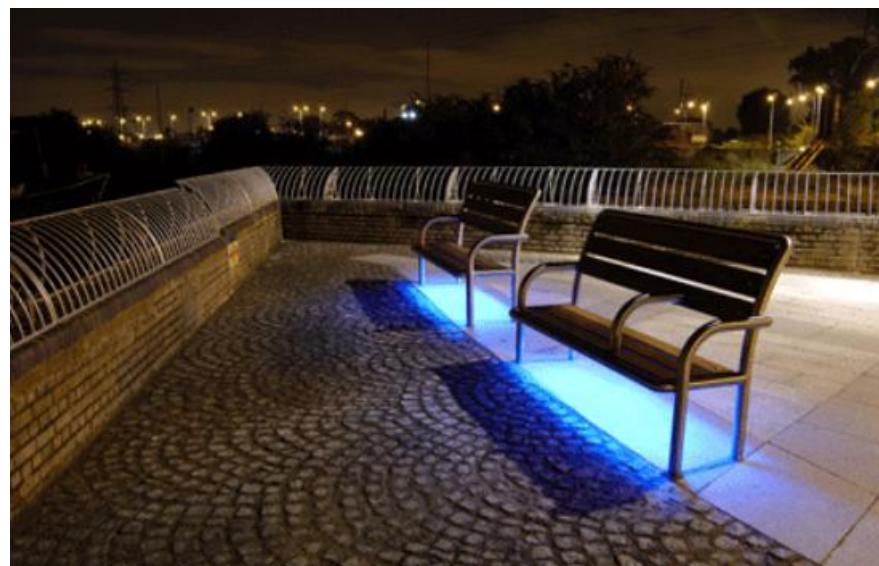


Figure 11 - Lighting under benches

Layout showing feature lighting areas, shown in appendix E – Drawing number: 1000004151-2-130-OPT3

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9. CONSTRUCTABILITY AND MAINTAINABILITY

- 9.1 The concept street lighting options mentioned in the report will require the following measures for construction and maintenance:
 - Traffic management is required
 - Use of installation of MEWP will be required to reach luminaires
- 9.2 All options will include the normal street lighting maintenance elements.
- 9.3 It is likely that the treatment regime for the timber columns will be similar to the painting regime for steel columns.
- 9.4 The manufacturers currently recommend maintenance work on the timber columns should be carried out every 5 to 7 years. However it should be noted that the columns in options 2 and 3 will also require repainting in line with local authority's maintenance requirements/strategy.
- 9.5 All feature lighting equipment shall have high IP (ingress protection) ratings.

10. BUDGET COSTS

10.1 Below are budget costs for the construction of each option as discussed in section 8, our recommendations summarised in section 11 above. Please note that costs are indicative only, costings will be refined in later design stages.

Item	Description	Cost
Street Lighting Option 1	Lighting including installation Aubrilam timber columns x 13 Schreder Ampera Midi luminaires x 22 Standard steel column x 11 Floodlight luminaires x 10 DNO Connection x 24 DNO Disconnection x 21	£205,000
Street Lighting Option 2	Lighting including installation Steel Tapered Column x 24 Schreder Ampera Midi x 24 DNO Connection x 24 DNO Disconnection x 21	£160,000
Street Lighting Option 3	Lighting including installation Steel Stepped Column x 24 Schreder Ampera Midi x 24 DNO Connection x 24 DNO Disconnection x 21	£150,000
Feature Lighting Option 1	Feature lighting including installation Linear strip and tree up lighting	£150,000
Feature Lighting Option 2	Feature lighting including installation Under seating/bench lighting	£50,000

10.2 All existing columns are assumed to be disconnected and all new columns to have a new connection.

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11. RECOMMENDATIONS

- 11.1 After collaboration with the public realm design team, our recommended lighting option for Southfields is to comprise of a mixture of options i.e. Street lighting option 1 (wooden street lighting columns) with feature lighting option 2 (public seating lighting and tree up lighters on Replingham Road). We believe this solution will complement the style of the surroundings and feel of the project area, while achieving the required lighting requirements.
- 11.2 The street lighting and feature lighting options can be combined in multiple different ways to create the desired feel for the area, if the recommended option is not desired.

12. NEXT STEPS

- 12.1 Further to our recommendation discussed above, the following items are required to be confirmed prior to starting stage 3 preliminary design. These are as follows:
- Client comments, feedback and approvals.
 - Confirmation of existing columns shown at 9m on the interactive inventory.
 - Feedback from LU/TfL e.g. confirmation of right of way around Southfields station.
 - Client to confirm/advise on any proposed attachments for the lighting columns, and advise of the specifications for the same e.g. banner size, festive light types, and flower baskets etc.
 - Column manufacturer to confirm that the design of the proposed lighting columns caters for all of the proposed attachments.
 - The style of lighting equipment shown in this report is indicative. The client shall confirm they if they prefer a particular style that is not shown in this report.

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Quality

It is the policy of Project Centre to supply Services that meet or exceed our clients' expectations of Quality and Service. To this end, the Company's Quality Management System (QMS) has been structured to encompass all aspects of the Company's activities including such areas as Sales, Design and Client Service.

By adopting our QMS on all aspects of the Company, Project Centre aims to achieve the following objectives:

- Ensure a clear understanding of customer requirements;
- Ensure projects are completed to programme and within budget;
- Improve productivity by having consistent procedures;
- Increase flexibility of staff and systems through the adoption of a common approach to staff appraisal and training;
- Continually improve the standard of service we provide internally and externally;
- Achieve continuous and appropriate improvement in all aspects of the company;

Our Quality Management Manual is supported by detailed operational documentation. These relate to codes of practice, technical specifications, work instructions, Key Performance Indicators, and other relevant documentation to form a working set of documents governing the required work practices throughout the Company.

All employees are trained to understand and discharge their individual responsibilities to ensure the effective operation of the Quality Management System.



DOCUMENT CONTROL

Project Centre has prepared this report in accordance with the instructions from LB Wandsworth Project Centre shall not be liable for the use of any information contained herein for any purpose other than the sole and specific use for which it was prepared.

Job Number	Issue	Description	Originator	Checked	Authorised
1000004151	01	Southfields Lighting Concepts Report	K.Coxall 15.01.18	B.Atine 17.01.18	H.Barnieh 18.01.18
1000004151	02	Southfields Lighting Concepts Report	K.Coxall 30.01.18	B.Atine 30.01.18	H.Barnieh 30.01.18

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Award Winning



Accreditations



Memberships



Contact

London Office

Unit 2 Holford Yard
London
WC1X 9HD
tel: 0330 008 0855

Brighton Office

38 Foundry Street
Brighton
BN1 4AT
tel: 01273 627 183
fax: 01273 627 199

Slough Office

Fourth Floor
The Urban Building
3-9 Albert Street
Slough
SL1 2BE

APPENDIX A - Southfields Existing Lighting Mapping - 1



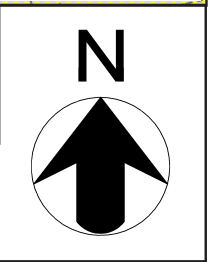
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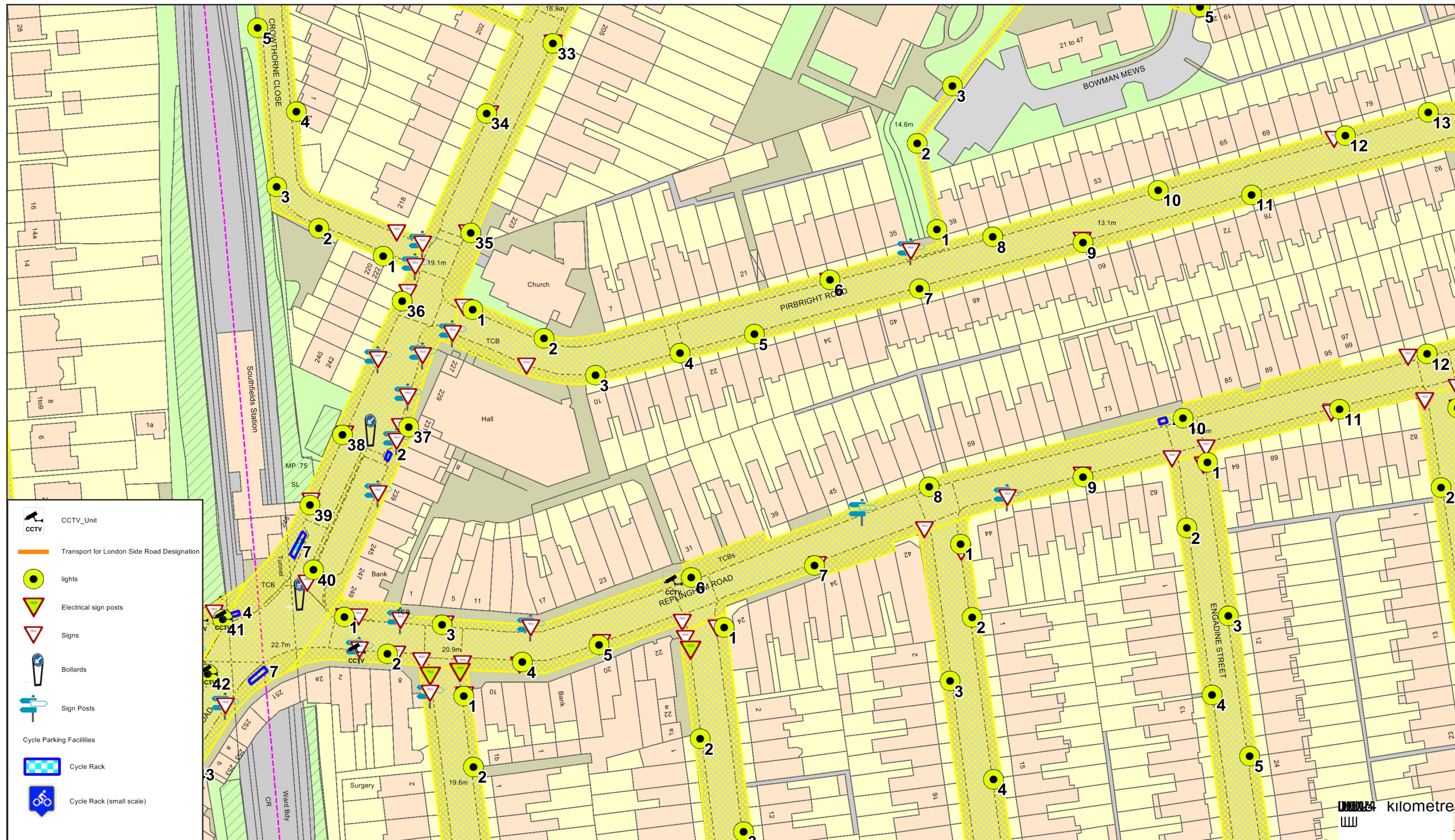
Wandsworth Plant Enquiry










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18 December 2017



APPENDIX A - Southfields Existing Lighting Mapping - 2



-  CCTV_Unit
-  Transport for London Side Road Designation
-  lights
-  Electrical sign posts
-  Signs
-  Bollards
-  Sign Posts
- Cycle Parking Facilities**
-  Cycle Rack
-  Cycle Rack (small scale)

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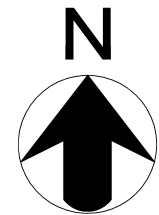
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18 December 2017



APPENDIX B - Wandsworth street lighting specification

**London Borough of Wandsworth
Street Lighting Materials specification**

Principal Road Network BS5489 ME Series M Class or CE Class Lighting levels M1 to M6 and CE0 CE5

Residential Road S Class Lighting Levels P3 to P1

Lighting Columns Heavy Duty Mallatite stepped shaft lighting column between 7 metres and 12 metres drawing required prior to approval all illuminated street furniture to allow the attachment of flower baskets, Festive decorations and Banners, signs attachment up to 1M²

Painting Finished abcite coated colour to be advised

Column to be Hot Dip Galvanised in accordance with the requirements specified in BS EN 1461:1999, Column treated with Mordant Solution (type t) "t" wash HA item155, Apply "High Build" Thermoplastic Polymer coating similar to "Abcite" or equivalent, Min mdft 350 microns

Luminaire Principal Road Urbis Ampera, lumen, Neutral White, DALI dimming driver, Side Entry or post top, 35 lux cell.

Residential Road Urbis Kirium lumen, Neutral White, DALI dimming driver, Side Entry or post top, 35 lux cell.

Lamp LED light engine

Photocells SELC NEMA 841-M ¼ watt 35 15 lux

Bollard Base Simmon signs GLPLED/CAB101B Global Plus Bollard Base. Global Plus complete with LED light unit ready for retrofitting to CAB-EX duct box complete with SELC 101B photocell fitted.

Base Install CAB Cable Exchange Duct. cable exchange duct complete with M12 U-bolt restraints, washers and nuts

Bollard Shell SF***/1/3 Bollard Shell. Symbol 270mm super flexible traffic bollard complete with surface enhanced finish and profiled black graphics, diagram ***(please specify) complete with 3 amber panels.

Non illuminated Bollard shell WBLFW/610/R2; Weebol Flex single piece moulded bollard

Non illuminated Bollard base Weebol Flex foundation cage and / or; Weebol Flex surface fixing kit

Belisha Beacon Simmons signs Midubel LED Wrap Around Beacon. Midubel LED wrap around beacon to fit 76 mm shaft complete with 4 metres 1.5 core flex. Or Modubel LED Post Top Beacon. Modubel LED post top beacon to fit 76 mm shaft complete with 4 metres 1.5 core flex.

Feeder Pillar Pudsey Diamond 2200 Galvanised Feeder Pillar. Pudsey Diamond 2200 feeder pillar, manufactured 3mm steel, hot dip galvanised, hinged (stainless steel and phosphor bronze hinges) flanged door complete with stainless steel ¼turn heavy duty tri head door locks with security plugs, internal backboard treated after cutting for long life to prevent de-lamination.

Illuminated Sign LUAPLLEDG/MS070. LUAPLLEDWG/MS070 sign light head complete with LED light Engine lamp and micro star 2000 35lux photocell fitted.

All illuminated street furniture is to be erected in accordance with manufacture instructions all positions are to be agreed on site prior to erection.

APPENDIX B - Wandsworth street lighting specification

LBRuT Street Lighting Electrical Specification

1. All Lamp Columns & Feeder Pillars are to be connected directly to the UK Power Network low voltage cable network contact Email UMC2.Orders@ukpowernetworks.co.uk

Note if a private supply cable is to be used drawing and agreement to UKPN are required prior to installation.

2. Lamp column, sign, bollard foundation to be C20 type concrete up to the base course of construction, with sand surrounding the incoming cable (150mm²).
3. Duct 100mm² diameter black or orange with the words "street lighting cables". Depth below ground footway 450mm roadway 650mm surrounded with 150mm sharp sand.
4. Private Cables are to be 2.5 mm² - 16mm² 3 core Steel Wire Armour laid in duct, terminated using appropriate brass compression glands attached to Backboard.
5. Infernal wiring in lamp column from cut out to lantern will be 1.5 mm² 3 core flex up to 8 metre height and 2.5mm² 10 to 12 metre, sleeved.
6. All other supply wiring with in each lamp column feeder pillar etc will be 6 mm² double insulated cable.
7. Earth bonding cable will be 10mm² Green / Yellow with crimped termination's.
8. Secondary double pole isolation to be a double pole MCB (correct rating for circuit conditions) din rail mounted with-in a suitable IP65 rated lockable enclosure
9. Where secondary isolation is required (more than one lantern fitted) circuit must be independently protected by an RCBO protected to the correct rating and the main incoming fuse rated to 25 amps
10. An individual NICEIC test certificate will be required for each individual item of illuminated street furniture.
11. All work is to be in compliance with the IEE regulations current edition (BS7671), ILE Code of Practice for Public Lighting, Electricity at Work Regulations 1989, Health and Safety at Work Act 1974.
12. A drawing is to be forwarded to showing all lamp columns ducts signs and feeder pillars prior to commencing on site.
13. All traffic signs and bollards are to supplied from a dedicated feeder pillar or adjacent street lighting column and have appropriate electrical and mechanical protection if DNO electrical supply is considered unsuitable
14. All street lighting furniture is to be numbered prior to adoption
15. This specification is not to be included within a contract document

16. All illuminated street furniture is to be erected in accordance with manufactures instructions all positions are to be agreed on site prior to erection.
17. All works to be notified to LBRuT Network Manager prior to commencing on site
18. All NRSWA permits and licenses to be approved and granted prior to starting on site
19. Competency of all site employees is to be provided HESA approved Highway Electrical Training, National Highway Sector Scheme (NHSS) 8 and Highway Electrical Registration Scheme (HERS) if appropriate
20. As built plan drawing showing all illuminated street furniture and duct and cables
21. Completed asset attribute register

Street Lighting Design and installation standards

British Standards (BS 5489)
European Standard (EN13201)
ILP Technical Reports
IEE Wiring Regulations 7671
Traffic Signs Regulations and General Directions
Manual of contract documents for highway works volume 1 specification for highway works Standards approve by the UK Roads Lighting organisation
EN40 Lighting Column design Standards

Andrew Porter

Street Lighting Engineer
London Borough of Richmond upon Thames
London Borough of Wandsworth

E-mail andrew.porter@richmondandwandsworth.gov.uk
Telephone 020 8891 7086

APPENDIX C - Risk Assessment

Lighting Class Selection "C Class" Risk Assessment: Southfields - Replingham Road
Date: 03-01-2018

CEN/TR 13201-1:2014		Selection of 'C' lighting class			
Parameter	Options	Description	Weighting Value*	Vw Selected	Notes
Design speed or Speed limit	Very High	v ≥ 100 km/h	3		
	High	70 < v < 100 km/h	2		
	Moderate	40 < v ≤ 70 km/h	0		
	Low	v ≤ 40 km/h	-1	-1	20mph Posted speed limit
Traffic Volume	High		1	1	High pedestrian and motor traffic is assumed, based on local amenities and volumes seen during site visits.
	Moderate		0		
	Low		-1		
Traffic Composition	Mixed with high proportion of non-motorized users		2		
	Mixed		1	1	Mixed motor vehicles, pedestrians and some cyclists.
	Motorized only		0		
Separation of Carriageways	No		1	1	Carriageways for opposing traffic are not separated.
	Yes		0		
Parked Vehicles	Present		1	1	Vehicles parked in designated parking bays along north western kerb.
	Not Present		0		
Ambient luminosity	High	shopping windows, advertisement expressions, sport fields, station areas, storage areas	1	1	There are many shops, bars, pubs, cafes etc in the project area.
	Moderate	normal situation	0		
	Low		-1		
Navigational task	Very difficult		2		
	Difficult		1		
	Easy		0	0	Single lane 2-way traffic.
Sum of Weighted Values			Sum of Weighting Values VWS	4	
			C = 6 - VWS	2	
Lighting class (C)					C2

Notes:
 * Taken from Table 1 of CEN/TR 13201-1:2014
 ** The above table and lighting assessment applies to Southfields.
 *** The C2 classification is also verified by BS 5489-1:2013 Table A8, where the traffic flow is high, type of traffic is mixed vehicle and pedestrian with separate footways, and the environmental zone is E3 for town centres.
 **** This C2 caters for road alignment, site constraints.

Lighting Class Selection "C Class" Risk Assessment: Southfields Junction - Replingham Road / Augustus Road / Wimbledon Park Road
Date: 03-01-2018

CEN/TR 13201-1:2014		Selection of 'C' lighting class			
Parameter	Options	Description	Weighting Value*	Vw Selected	Notes
Design speed or Speed limit	Very High	v ≥ 100 km/h	3		
	High	70 < v < 100 km/h	2		
	Moderate	40 < v ≤ 70 km/h	0		30mph speed limit on Wimbledon Park Road, 20mph on Augustus and Replingham Roads.
	Low	v ≤ 40 km/h	-1		
Traffic Volume	High		1	1	High vehicular and pedestrian traffic is assumed, based on local amenities and volumes seen during site visits.
	Moderate		0		
	Low		-1		
Traffic Composition	Mixed with high proportion of non-motorized users		2		
	Mixed		1	1	Mixed motor vehicles, pedestrians and some cyclists. Access to shops, station.
	Motorized only		0		
Separation of Carriageways	No		1	1	Carriageways for opposing traffic are not separated.
	Yes		0		
Parked Vehicles	Present		1		
	Not Present		0		No parked vehicles on the junction, but parked vehicles are on the adjoining roads.
Ambient luminosity	High	shopping windows, advertisement expressions, sport fields, station areas, storage areas	1	1	There are many shops, bars, pubs, cafes etc in the project area.
	Moderate	normal situation	0		
	Low		-1		
Navigational task	Very difficult		2		
	Difficult		1		
	Easy		0	0	Single lane traffic, signalised junction, right turn lane within junction
Sum of Weighted Values			Sum of Weighting Values VWS	4	
			C = 6 - VWS	2	
Lighting class (C)					C2

Notes:
 * Taken from Table 1 of CEN/TR 13201-1:2014
 ** The above table and lighting assessment applies to Southfields.
 *** The C2 classification is also verified by BS 5489-1:2013 Table A8, where the traffic flow is high, type of traffic is mixed vehicle and pedestrian with separate footways, and the environmental zone is E3 for town centres.
 **** This C2 caters for road alignment, junction layout site constraints.

APPENDIX C - Risk Assessment

CIE 115 2010 Risk Assessment: Southfields - Augustus Road
Date: 03-01-2018

P Class selection

CIE 115:2010		Selection of 'P' lighting class		
Parameter	Options	Weighting Value	Vw Selected	
Speed	Very High	N/A		
	High	N/A		
	Moderate	N/A		
	Low	1	1	20mph Posted speed limit and traffic calming features
	Very low (walking speed)	0		
Traffic Volume	Very high	1		
	High	0.5		
	Moderate	0	0	Motor traffic accessing residential roads and moderate pedestrian activity.
	Low	-0.5		
	Very Low	-1		
Traffic Composition	Mixed with high proportion of non-motorized users	N/A		
	Mixed	N/A		
	Motorized only	N/A		
	Pedestrians, cyclists and motorized traffic	2		
				Mixture of pedestrians and motor vehicles including speed humps for traffic calming, wide footways for pedestrians, ASL and filter lanes for cyclists at junction only, also part of signed cycle route.
	Pedestrians and motorized traffic	1	1	
	Pedestrians and cyclists	1		
Pedestrians only	0			
Cyclists only	0			
Separation of Carriageways	No	N/A		Carriageways for opposing traffic are not separated.
	Yes	N/A		
Intersection Density	High	N/A		
	Moderate	N/A		
Parked Vehicles	Present	0.5		
	Not Present	0	0	Double yellow lines within the project extents, hence no on street parking for motor vehicles.
Ambient Luminance	High	1		
	Moderate	0	0	Environmental zone E3 (town centres)
	Low	-1		
Visual Guidance /Traffic Control	Poor	N/A		
	Moderate to Good	N/A	N/A	
Facial Recognition	Necessary	Additional requirements	1	Facial recognition is desirable due to high pedestrian traffic.
	Not necessary	No additional requirements		
Sum of Weighted Values		Vws3	3	
Lighting class (P)		P=6-Vws3		3

CIE 115 2010 Risk Assessment: Southfields - Wimbledon Park Road (North)
Date: 03-01-2018

P Class selection

CIE 115:2010		Selection of 'P' lighting class		
Parameter	Options	Weighting Value	Vw Selected	
Speed	Very High	N/A		
	High	N/A		
	Moderate	N/A	N/A	30mph road, parked vehicles on kerbside, two lanes at traffic signals
	Low	1		
	Very low (walking speed)	0		
Traffic Volume	Very high	1		
	High	0.5	0.5	Key routes to A3, Wandsworth and surrounding areas.
	Moderate	0		
	Low	-0.5		
	Very Low	-1		
Traffic Composition	Mixed with high proportion of non-motorized users	N/A		
	Mixed	N/A		
	Motorized only	N/A		
	Pedestrians, cyclists and motorized traffic	2		
				Predominantly for motor vehicles but with traffic calming measures, wide footways for pedestrians
	Pedestrians and motorized traffic	1	1	
	Pedestrians and cyclists	1		
Pedestrians only	0			
Cyclists only	0			
Separation of Carriageways	No	N/A	N/A	Partial segregation at traffic signals.
	Yes	N/A		
Intersection Density	High	N/A	0.5	Pedestrian crossing at traffic signals.
	Moderate	N/A		
Parked Vehicles	Present	0.5	0.5	Parking on both sides of the road and bus stops.
	Not Present	0		
Ambient Luminance	High	1		
	Moderate	0	0	Environmental zone E3 (town centres)
	Low	-1		
Visual Guidance /Traffic Control	Poor	N/A		
	Moderate to Good	N/A	N/A	
Facial Recognition	Necessary	Additional requirements	1	Facial recognition is desirable due to high pedestrian traffic.
	Not necessary	No additional requirements		
Sum of Weighted Values		Vws3	3.5	
Lighting class (P)		P=6-Vws3		2.5
				P2

APPENDIX C - Risk Assessment

CIE 115 2010 Risk Assessment: Wimbledon Park Road (South)
Date: 03-01-2018

P Class selection

CIE 115:2010		Selection of 'P' lighting class		
Parameter	Options	Weighting Value	Vw Selected	
Speed	Very High	N/A		
	High	N/A		
	Moderate	N/A	N/A	30mph road, parked vehicles on kerbside, two lanes at traffic signals
	Low	1		
	Very low (walking speed)	0		
<hr/>				
Traffic Volume	Very high		1	
	High	0.5	0.5	Key routes to Wimbledon town centre and surrounding areas.
	Moderate	0		
	Low	-0.5		
	Very Low	-1		
<hr/>				
Traffic Composition	Mixed with high proportion of non-motorized users	N/A		
	Mixed	N/A		
	Motorized only	N/A		
	Pedestrians, cyclists and motorized traffic	2		
	Pedestrians and motorized traffic	1	1	Predominantly for motor vehicles but with traffic calming measures, wide footways for pedestrians. ASL and filter lane for cyclists at traffic signals.
	Pedestrians and cyclists	1		
	Pedestrians only	0		
Cyclists only	0			
<hr/>				
Separation of Carriageways	No	N/A	N/A	
	Yes	N/A		
<hr/>				
Intersection Density	High	N/A	0.5	Pedestrian crossing at traffic signals.
	Moderate	N/A		
<hr/>				
Parked Vehicles	Present	0.5	0.5	Parking on both sides of the road and bus stops.
	Not Present	0		
<hr/>				
Ambient Luminance	High	1		
	Moderate	0	0	Environmental zone E3 (town centres)
	Low	-1		
<hr/>				
Visual Guidance /Traffic Control	Poor	N/A		
	Moderate to Good	N/A	N/A	
<hr/>				
Facial Recognition	Necessary	Additional requirements	1	Facial recognition is desirable due to high pedestrian traffic.
	Not necessary	No additional requirements		
Sum of Weighted Values		Vws3	3.5	
Lighting class (P)		P=6-Vws3		2.5
				P2

DATE: 16 January 2018
DESIGNER: Kristina Coxall
PROJECT No: 100004151
PROJECT NAME: Southfields



Main Junction and Replingham Road (cafe area) - C2
 Eav = 20.00
 Uo = 0.40
 Wimbledon Park Road (south and north) - P2
 Eav = 15.00 to 22.50
 Emin = 3.00
 Augustus Road - P3
 Eav = 7.50 to 11.25
 Emin = 1.50

Outdoor Lighting Report

PREPARED BY: Design Software from:
 Lighting Reality Ltd
 Avon House
 Buntsford Drive
 Stoke Heath
 Bromsgrove B60 4JE

e-mail: sales@lightingreality.co.uk
 website: www.lightingreality.co.uk

APPENDIX D - Southfields Lighting Calculation

DATE: 16 January 2018 DESIGNER: Kristina Coxall lightingreality PRO
 PROJECT No: 1000004151 PROJECT NAME: Southfields


Layout Report

General Data
 Dimensions in Metres Angles in Degrees

Calculation Grids


No.	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Junction 1	524699.92	173253.24	70.00	66.00	1.49	1.50
2	Augustus Road	524646.75	173267.58	65.13	24.28	1.48	1.43
3	Replingham Road	524758.44	173255.00	178.00	38.00	1.50	1.46
4	Wimb Park Rd (north)	524727.59	173301.13	35.62	101.13	1.42	1.49
5	Wimb Park Rd (south)	524646.68	173167.89	28.00	126.00	1.47	1.48

Luminaires



Luminaire A Data

Supplier	Urbis
Type	AMPERA MIDI 5117 - 64 LEDs 700mA N W Flat_Glass Extra Clear.
Lamp(s)	64 LEDs
Lamp Flux (klm)	14.16
File Name	AMPERA MIDI 5117 64 LEDs 700mA NW 351412 Flat Glass Extra Clear Smooth - ...
Maintenance Factor	0.75
Imax70,80,90(cd/klm)	636.5, 97.5, 0.0
No. in Project	20



Luminaire B Data

Supplier	_Historic Lanterns
Type	ZXU1/FG/1627/090/-25/992925
Lamp(s)	70W-SONT+
Lamp Flux (klm)	6.60
File Name	ZXU1_Flat Glass_1627_SON-T+_70_090# -25_992925TV.Idt
Maintenance Factor	0.75
Imax70,80,90(cd/klm)	357.0, 118.0, 0.0
No. in Project	23

Luminaire C Data

Supplier	
Type	ARNE 32W 18L 4000K 500mA TIII
Lamp(s)	ARP 4K 18 500 32W T3
LampFlux(klm)/Colour	3.46 4000/70
File Name	ARNE 4K ARP18B2TIII.LDT
Maintenance Factor	0.75
Imax70,80,90(cd/klm)	511.7, 51.3, 2.4
No. in Project	10

Layout

No. /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1/2	C	524744.75	173306.87	12.00	36.00	0.00	0.00	0.10			
2	A	524716.67	173264.44	10.00	323.00	5.00	0.00	0.40			
3/1	C	524727.00	173287.71	12.00	323.00	0.00	0.00	0.10			
4	A	524762.58	173319.42	10.00	156.00	5.00	0.00	0.40			
5	A	524762.60	173349.45	10.00	333.00	5.00	0.00	0.40			
6	A	524734.59	173271.59	10.00	132.00	5.00	0.00	0.40			

DATE: 16 January 2018 DESIGNER: Kristina Coxall lightingreality PRO
 PROJECT No: 1000004151 PROJECT NAME: Southfields

Layout Continued

No. /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
7	A	524761.19	173284.94	10.00	267.00	5.00	0.00	0.40			
8	A	524771.52	173275.65	10.00	85.00	5.00	0.00	0.40			
9/2	C	524744.75	173306.87	12.00	108.00	0.00	0.00	0.10			
10	A	524698.38	173238.70	10.00	326.00	5.00	0.00	0.40			
11	A	524783.60	173282.43	10.00	265.00	5.00	0.00	0.40			
12	A	524798.55	173273.68	10.00	90.00	5.00	0.00	0.40			
13	A	524836.67	173281.94	10.00	109.00	5.00	0.00	0.40			
14	A	524850.72	173296.58	10.00	289.00	5.00	0.00	0.40			
15	A	524874.28	173296.31	10.00	112.00	5.00	0.00	0.40			
16	A	524914.59	173320.92	10.00	289.00	5.00	0.00	0.40			
17	A	524772.49	173371.34	10.00	336.00	5.00	0.00	0.40			
18	A	524668.13	173272.86	10.00	99.00	5.00	0.00	0.40			
19	A	524707.72	173275.85	10.00	86.00	5.00	0.00	0.50			
20	A	524680.10	173211.30	10.00	324.00	5.00	0.00	0.40			
21	A	524655.02	173173.41	10.00	323.00	5.00	0.00	0.40			
22	B	524660.18	173289.32	6.00	5.00	5.00	0.00	1.00			
23	B	524633.31	173275.91	10.00	280.00	5.00	0.00	1.00			
24	B	524604.35	173271.03	10.00	276.00	5.00	0.00	1.00			
25	B	524677.46	173165.98	6.00	236.00	5.00	0.00	1.00			
26	B	524693.30	173155.76	6.00	241.00	5.00	0.00	1.00			
27	B	524654.65	173149.47	10.00	142.00	5.00	0.00	1.00			
28	B	524625.40	173126.25	10.00	319.00	5.00	0.00	1.00			
29	B	524665.82	173313.08	6.00	190.00	5.00	0.00	1.00			
30	B	524788.62	173265.42	6.00	188.00	5.00	0.00	1.00			
31	B	524791.21	173245.82	6.00	190.00	5.00	0.00	1.00			
32	B	524852.46	173254.44	6.00	6.00	5.00	0.00	1.00			
33	B	524859.12	173283.33	6.00	190.00	5.00	0.00	1.00			
34	B	524925.19	173286.68	6.00	195.00	5.00	0.00	1.00			
35	B	524922.81	173305.63	6.00	189.00	5.00	0.00	1.00			
36	B	524955.63	173323.48	6.00	103.00	5.00	0.00	1.00			
37	B	524981.67	173339.09	6.00	283.00	5.00	0.00	1.00			
38	B	524988.56	173327.27	6.00	190.00	5.00	0.00	1.00			
39	B	524791.04	173368.51	6.00	246.00	5.00	0.00	1.00			
40	B	524810.18	173360.48	6.00	251.00	5.00	0.00	1.00			
41	B	524767.07	173382.71	6.00	66.00	5.00	0.00	1.00			
42	B	524789.53	173387.56	6.00	155.00	5.00	0.00	1.00			

APPENDIX D - Southfields Lighting Calculation

DATE: 16 January 2018 DESIGNER: Kristina Coxall
 PROJECT No: 1000004151 PROJECT NAME: Southfields



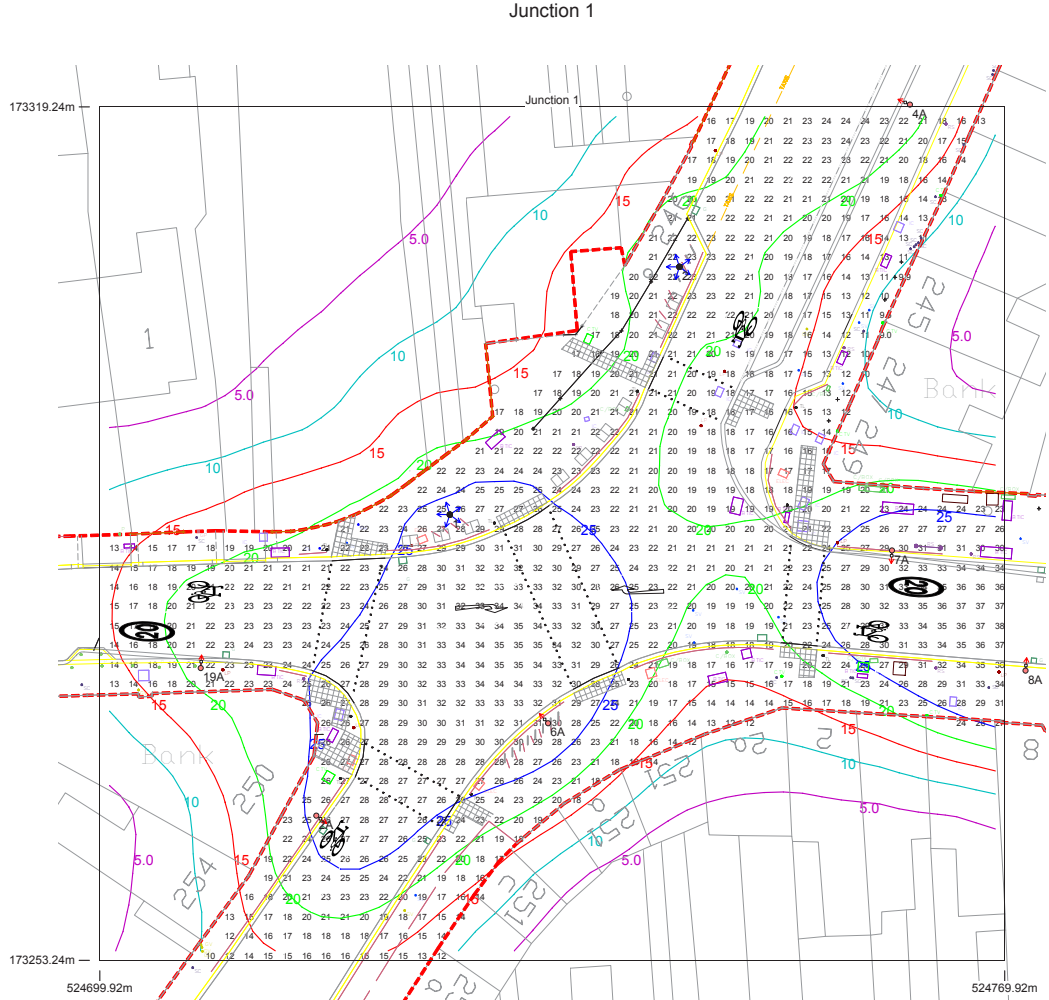
Layout Continued

No. /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
43	B	524795.35	173421.52	6.00	339.00	5.00	0.00	1.00			
44	B	524750.09	173390.91	6.00	66.00	5.00	0.00	1.00			
45/1	C	524727.00	173287.71	12.00	35.00	0.00	0.00	0.10			
46/1	C	524727.00	173287.71	12.00	107.00	0.00	0.00	0.10			
47/1	C	524727.00	173287.71	12.00	179.00	0.00	0.00	0.10			
48/1	C	524727.00	173287.71	12.00	251.00	0.00	0.00	0.10			
49/2	C	524744.75	173306.87	12.00	180.00	0.00	0.00	0.10			
50/2	C	524744.75	173306.87	12.00	252.00	0.00	0.00	0.10			
51/2	C	524744.75	173306.87	12.00	324.00	0.00	0.00	0.10			
52	A	524815.74	173284.19	10.00	288.00	0.00	0.00	0.40			
53	A	524893.40	173313.00	10.00	292.00	0.00	0.00	0.40			

DATE: 16 January 2018 DESIGNER: Kristina Coxall
 PROJECT No: 1000004151 PROJECT NAME: Southfields



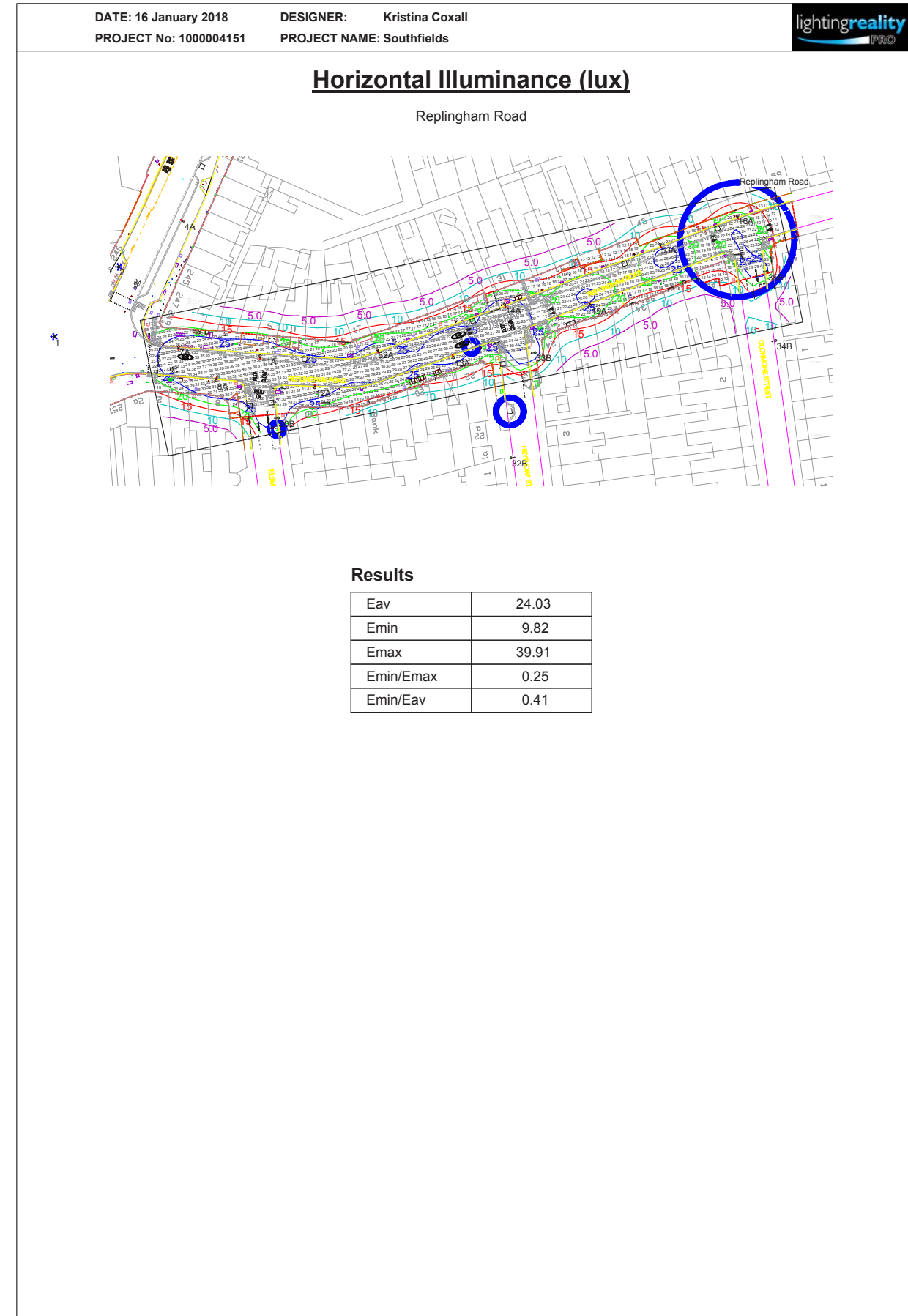
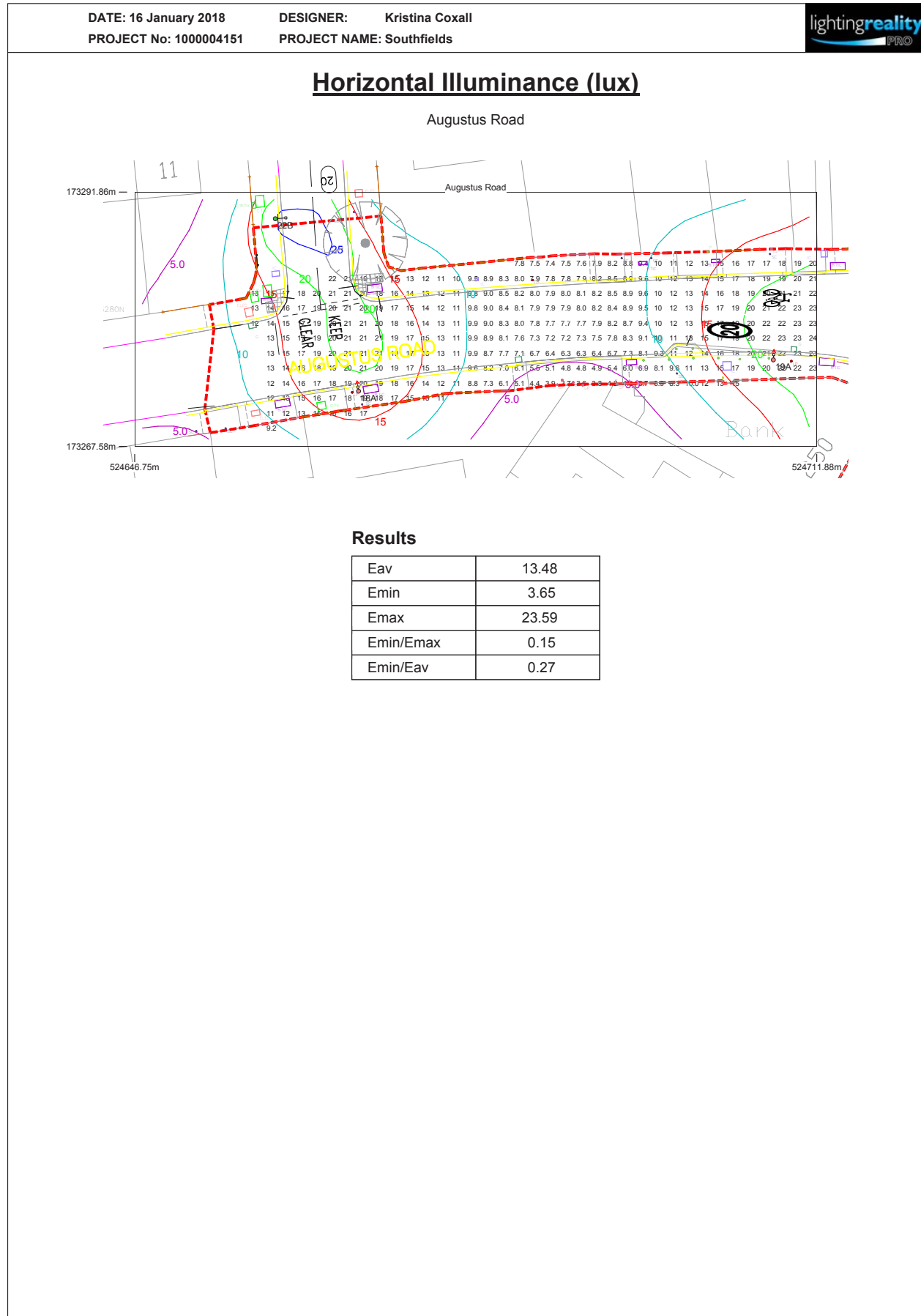
Horizontal Illuminance (lux)



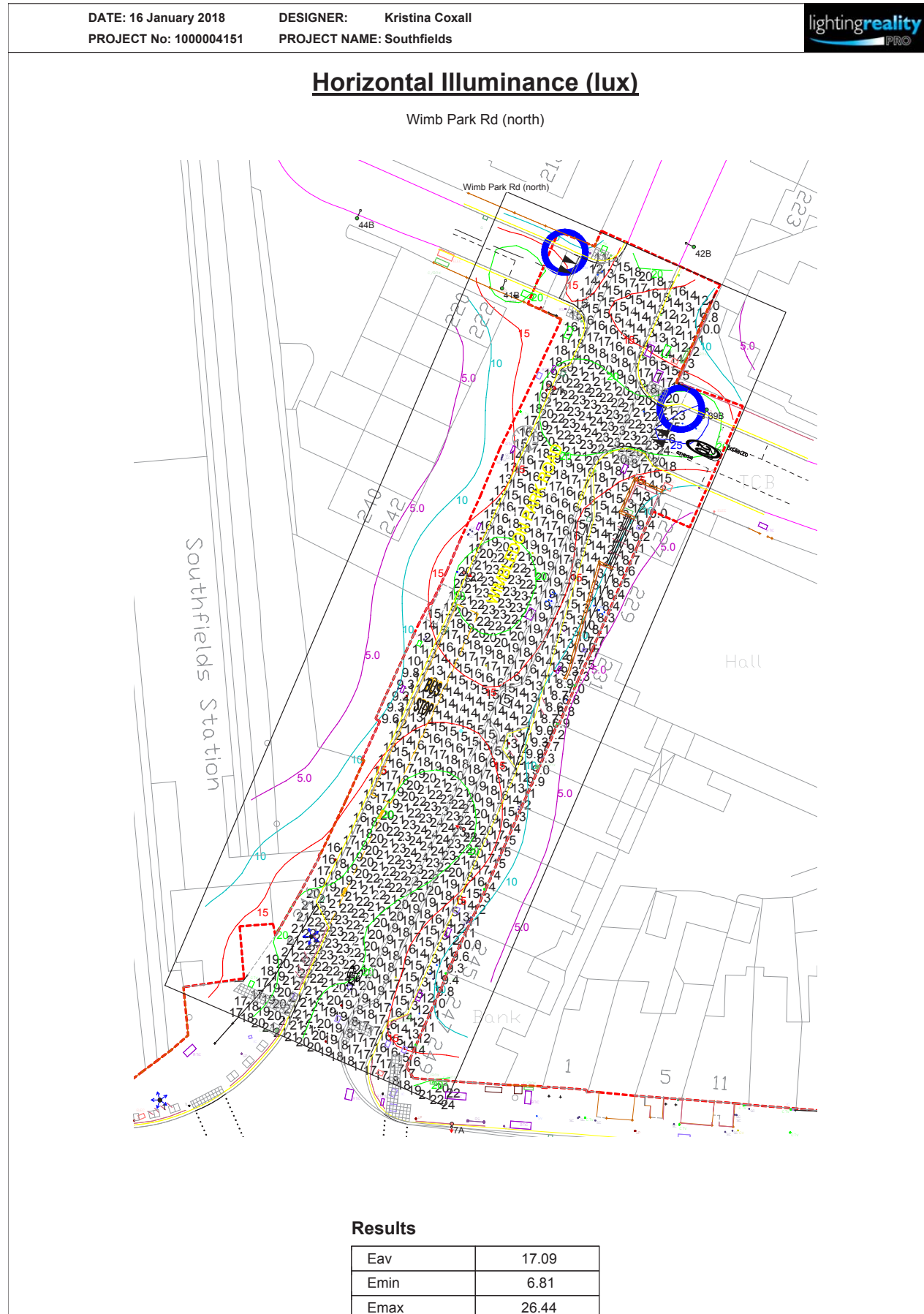
Results

Eav	22.57
Emin	9.03
Emax	37.78
Emin/Emax	0.24
Emin/Eav	0.40

APPENDIX D - Southfields Lighting Calculation




APPENDIX D - Southfields Lighting Calculation



APPENDIX D - Southfields Lighting Calculation

DATE: 16 January 2018
DESIGNER: Kristina Coxall
PROJECT No: 100004151
PROJECT NAME: Southfields



Main Junction and Replingham Road (cafe area) - C2
 Eav = 20.00
 Uo = 0.40

Wimbledon Park Road (south and north) - P2
 Eav = 15.00 to 22.50
 Emin = 3.00

Augustus Road - P3
 Eav = 7.50 to 11.25
 Emin = 1.50

Outdoor Lighting Report

PREPARED BY: Design Software from:
 Lighting Reality Ltd
 Avon House
 Buntsford Drive
 Stoke Heath
 Bromsgrove B60 4JE

e-mail: sales@lightingreality.co.uk
 website: www.lightingreality.co.uk

DATE: 16 January 2018
PROJECT No: 100004151

DESIGNER: Kristina Coxall
PROJECT NAME: Southfields



Layout Report

General Data
 Dimensions in Metres Angles in Degrees

Calculation Grids

No.	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Junction 1	524699.92	173253.24	70.00	66.00	1.49	1.50
2	Augustus Road	524646.75	173267.58	65.13	24.28	1.48	1.43
3	Replingham Road	524758.44	173255.00	178.00	38.00	1.50	1.46
4	Wimb Park Rd (north)	524727.59	173301.13	35.62	101.13	1.42	1.49
5	Wimb Park Rd (south)	524646.68	173167.89	28.00	126.00	1.47	1.48

Luminaires

Luminaire A Data



Supplier	Urbis
Type	AMPERA MIDI 5117 - 64 LEDs 700mA N W Flat, Glass Extra Clear.
Lamp(s)	64 LEDs
Lamp Flux (klm)	14.16
File Name	AMPERA MIDI 5117 64 LEDs 700mA NW 351412 Flat Glass Extra Clear Smooth - ...
Maintenance Factor	0.75
Imax70,80,90(cd/klm)	636.5, 97.5, 0.0
No. in Project	22

Luminaire B Data



Supplier	_Historic Lanterns
Type	ZXU1/FG/1627/090/-25/992925
Lamp(s)	70W-SONT+
Lamp Flux (klm)	6.60
File Name	ZXU1_Flat Glass_1627_SON-T+ _70_090# -25_992925TV.Idt
Maintenance Factor	0.75
Imax70,80,90(cd/klm)	357.0, 118.0, 0.0
No. in Project	23

Layout

No.	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	524727.53	173285.99	10.00	288.00	0.00	0.00	0.40			
2	A	524716.67	173264.44	10.00	323.00	5.00	0.00	0.40			
3	A	524744.69	173305.06	10.00	330.00	0.00	0.00	0.40			
4	A	524760.68	173314.69	10.00	156.00	5.00	0.00	0.40			
5	A	524760.72	173348.65	10.00	333.00	5.00	0.00	0.40			
6	A	524734.59	173271.59	10.00	132.00	5.00	0.00	0.40			
7	A	524757.82	173285.49	10.00	268.00	5.00	0.00	0.40			
8	A	524770.18	173275.52	10.00	85.00	5.00	0.00	0.40			
9	A	524698.38	173238.70	10.00	323.00	5.00	0.00	0.40			
10	A	524783.60	173282.43	10.00	265.00	5.00	0.00	0.40			
11	A	524798.55	173273.68	10.00	90.00	5.00	0.00	0.40			
12	A	524836.67	173281.94	10.00	109.00	5.00	0.00	0.40			
13	A	524850.72	173296.58	10.00	289.00	5.00	0.00	0.40			
14	A	524874.28	173296.31	10.00	112.00	5.00	0.00	0.40			
15	A	524914.59	173320.92	10.00	289.00	5.00	0.00	0.40			
16	A	524772.49	173371.34	10.00	336.00	5.00	0.00	0.40			

APPENDIX D - Southfields Lighting Calculation

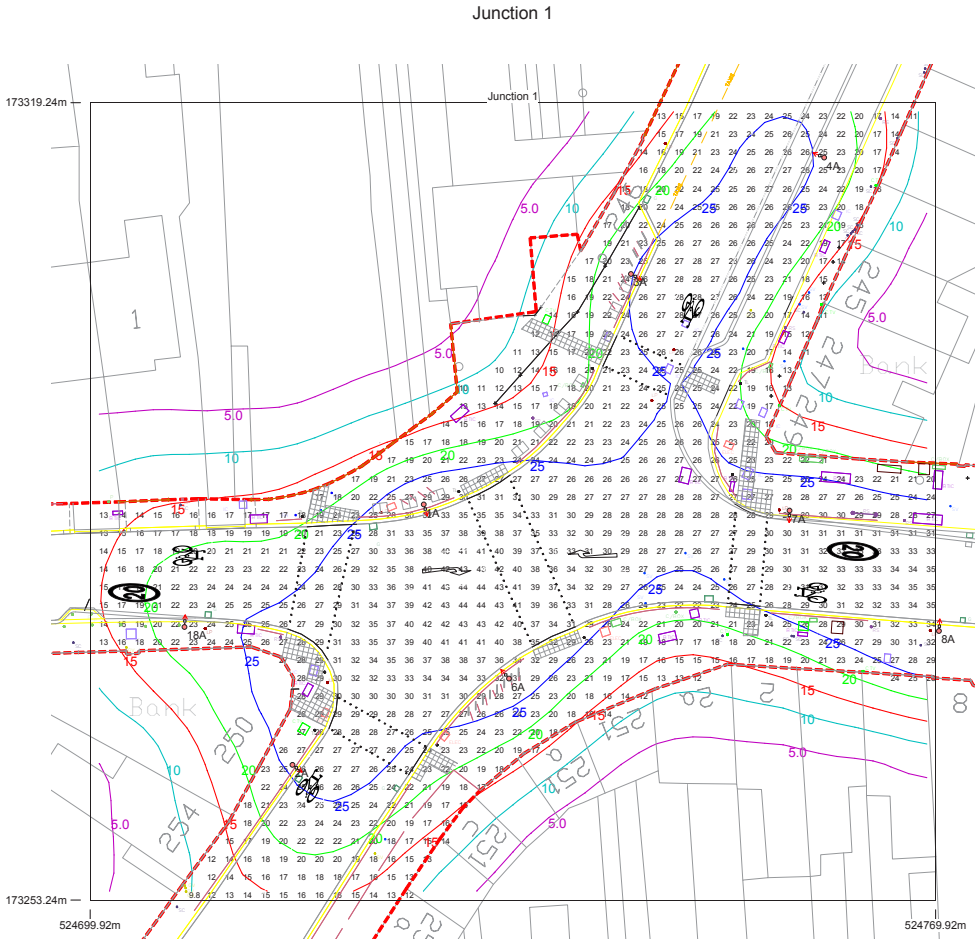
DATE: 16 January 2018 DESIGNER: Kristina Coxall
 PROJECT No: 1000004151 PROJECT NAME: Southfields



Layout Continued

No.	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
17	A	524668.13	173272.86	10.00	99.00	5.00	0.00	0.40			
18	A	524707.72	173275.85	10.00	86.00	5.00	0.00	0.50			
19	A	524680.10	173211.30	10.00	324.00	5.00	0.00	0.40			
20	A	524655.02	173173.41	10.00	323.00	5.00	0.00	0.40			
21	B	524660.18	173289.32	6.00	5.00	5.00	0.00	1.00			
22	B	524633.31	173275.91	10.00	280.00	5.00	0.00	1.00			
23	B	524604.35	173271.03	10.00	276.00	5.00	0.00	1.00			
24	B	524677.46	173165.98	6.00	236.00	5.00	0.00	1.00			
25	B	524693.30	173155.76	6.00	241.00	5.00	0.00	1.00			
26	B	524654.65	173149.47	10.00	142.00	5.00	0.00	1.00			
27	B	524625.40	173126.25	10.00	319.00	5.00	0.00	1.00			
28	B	524665.82	173313.08	6.00	190.00	5.00	0.00	1.00			
29	B	524788.62	173265.42	6.00	188.00	5.00	0.00	1.00			
30	B	524791.21	173245.82	6.00	190.00	5.00	0.00	1.00			
31	B	524852.46	173254.44	6.00	6.00	5.00	0.00	1.00			
32	B	524859.12	173283.33	6.00	190.00	5.00	0.00	1.00			
33	B	524925.19	173286.68	6.00	195.00	5.00	0.00	1.00			
34	B	524922.81	173305.63	6.00	189.00	5.00	0.00	1.00			
35	B	524955.63	173323.48	6.00	103.00	5.00	0.00	1.00			
36	B	524981.67	173339.09	6.00	283.00	5.00	0.00	1.00			
37	B	524988.56	173327.27	6.00	190.00	5.00	0.00	1.00			
38	B	524791.04	173368.51	6.00	246.00	5.00	0.00	1.00			
39	B	524810.18	173360.48	6.00	251.00	5.00	0.00	1.00			
40	B	524767.07	173382.71	6.00	66.00	5.00	0.00	1.00			
41	B	524789.53	173387.56	6.00	155.00	5.00	0.00	1.00			
42	B	524795.35	173421.52	6.00	339.00	5.00	0.00	1.00			
43	B	524750.09	173390.91	6.00	66.00	5.00	0.00	1.00			
44	A	524815.74	173284.19	10.00	288.00	0.00	0.00	0.40			
45	A	524893.40	173313.00	10.00	292.00	0.00	0.00	0.40			

Horizontal Illuminance (lux)



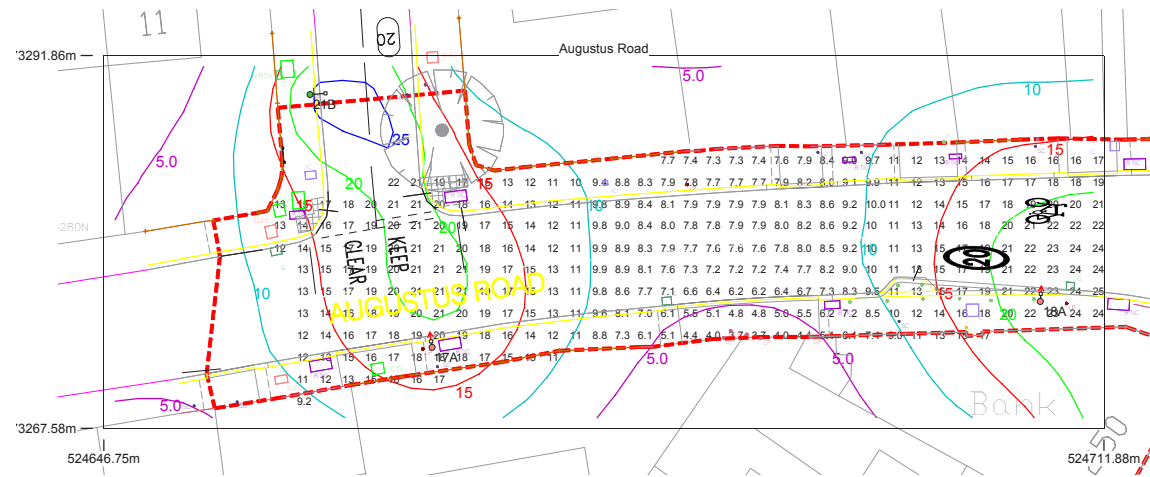
Results

Eav	24.55
Emin	9.76
Emax	43.87
Emin/Emax	0.22
Emin/Eav	0.40

APPENDIX D - Southfields Lighting Calculation

Horizontal Illuminance (lux)

Augustus Road



Results

Eav	13.43
Emin	3.73
E _{max}	24.59
E _{min} /E _{max}	0.15
E _{min} /E _{av}	0.28

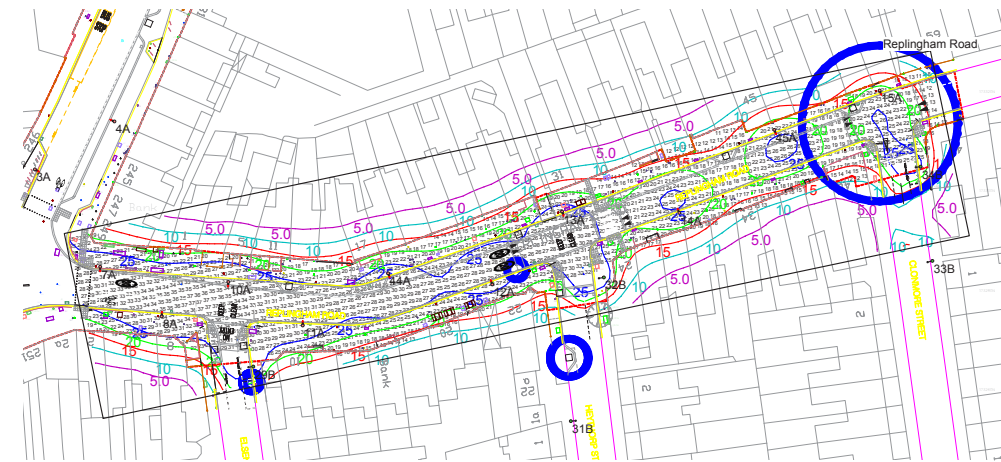
DATE: 16 January 2018
PROJECT No: 100004151

DESIGNER: Kristina Coxall
PROJECT NAME: Southfields



Horizontal Illuminance (lux)

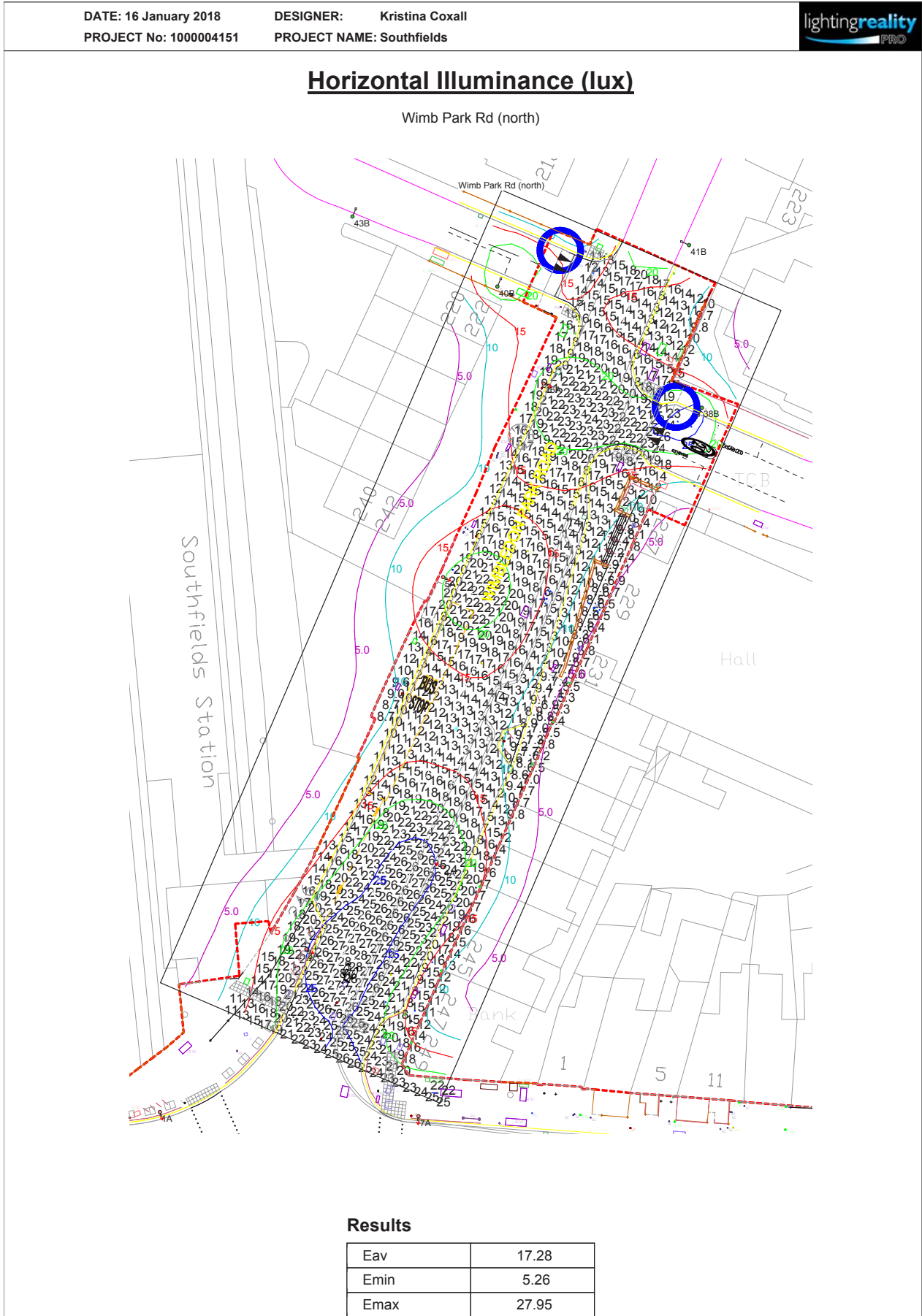
Replingham Road



Results

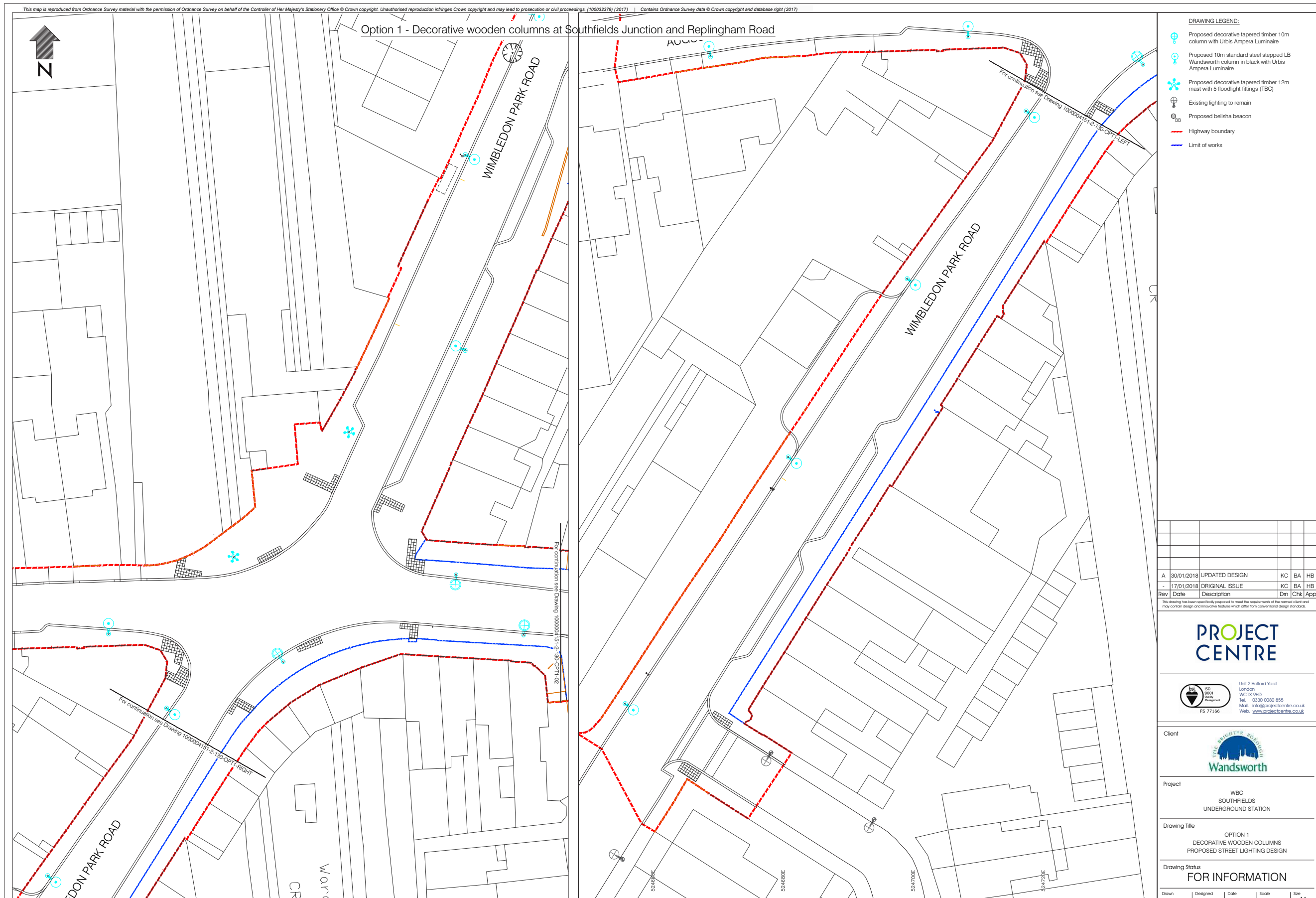
Eav	23.82
Emin	9.82
E _{max}	37.49
E _{min} /E _{max}	0.26
E _{min} /E _{av}	0.41

APPENDIX D - Southfields Lighting Calculation

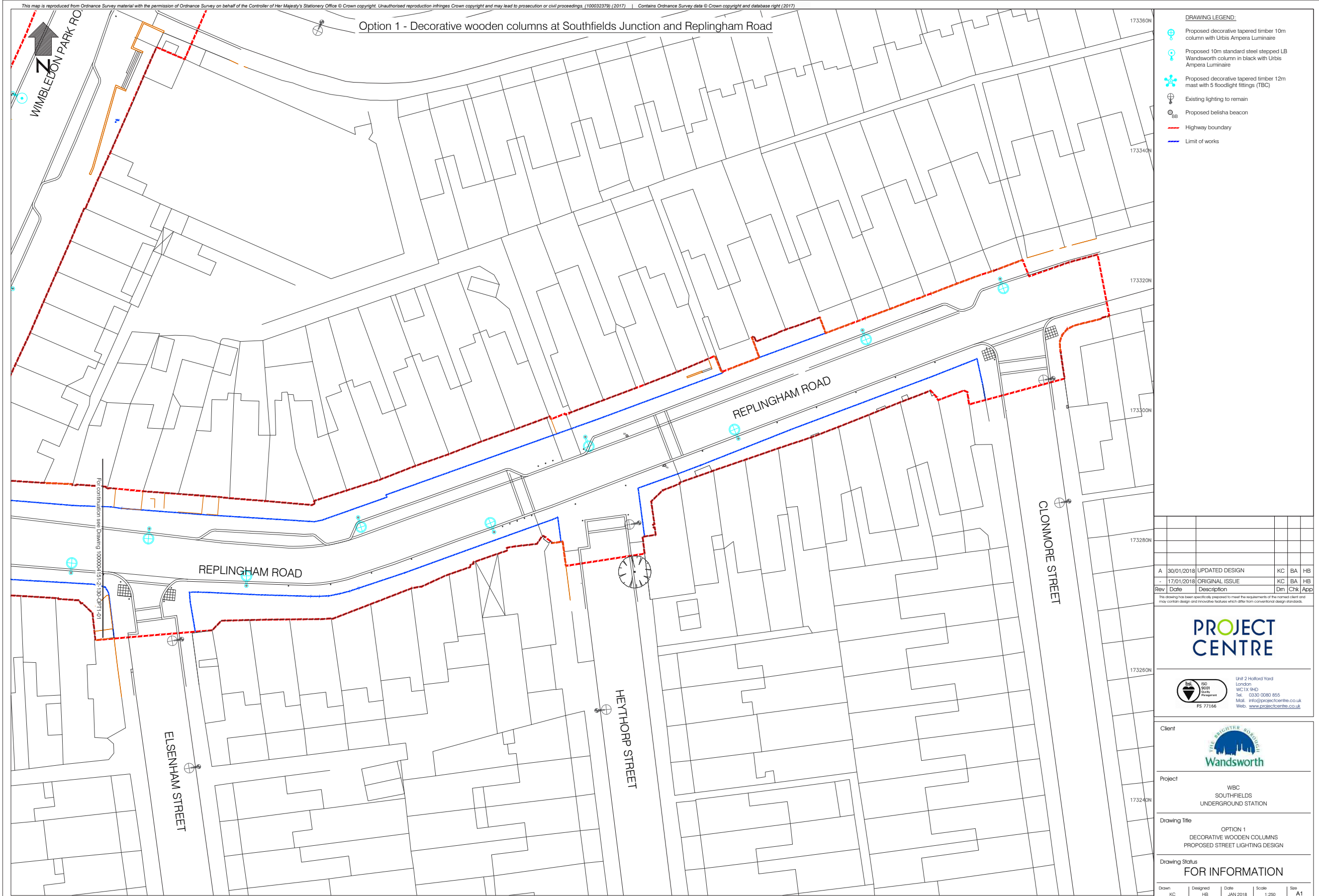


Lighting Reality Ltd. Park Business Centre, Wood Lane, Erdington, Birmingham, B24 9QR UK e-mail: sales@lightingreality.com website: www.lightingreality.com

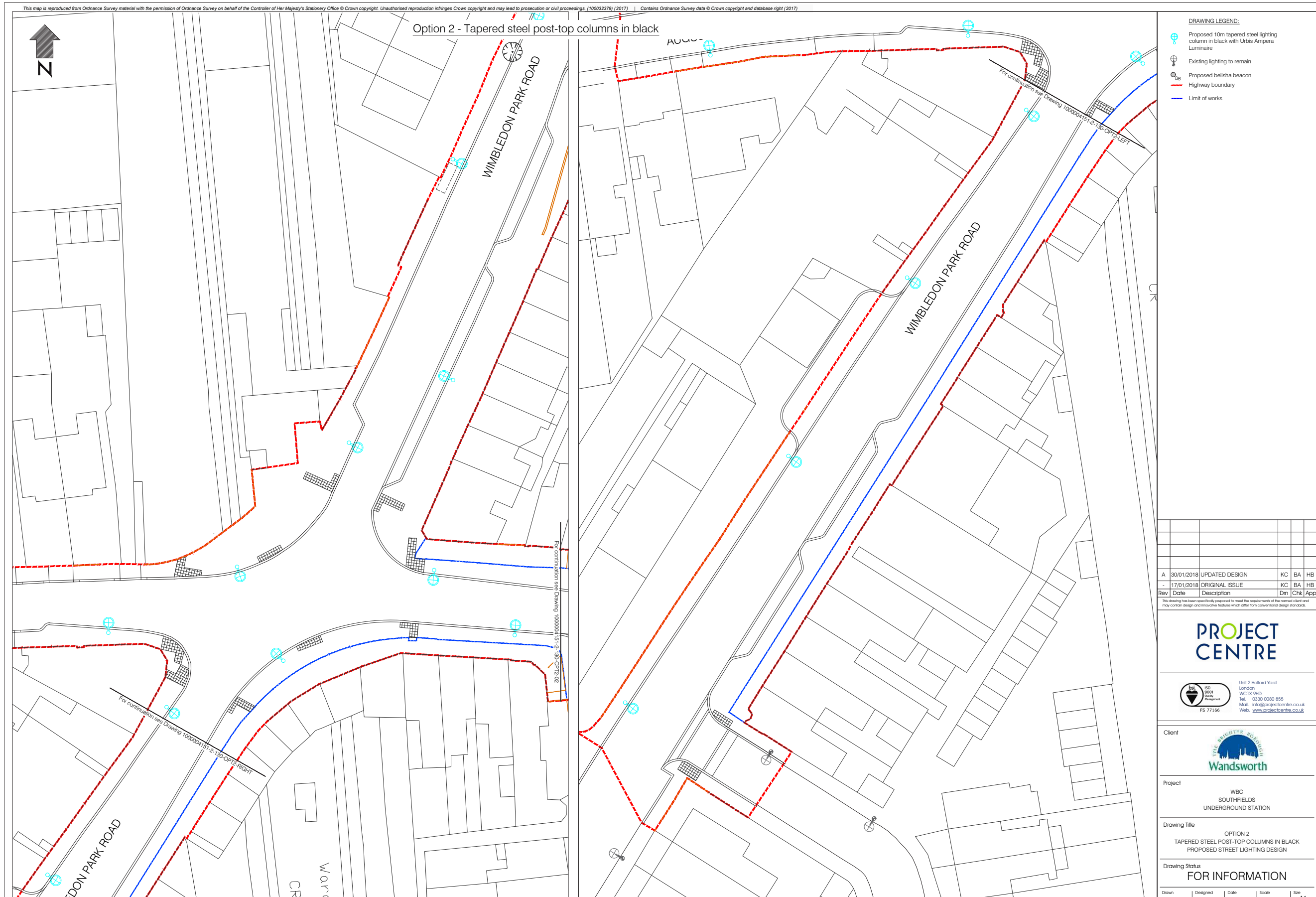
APPENDIX E - Southfields Proposed Design Options



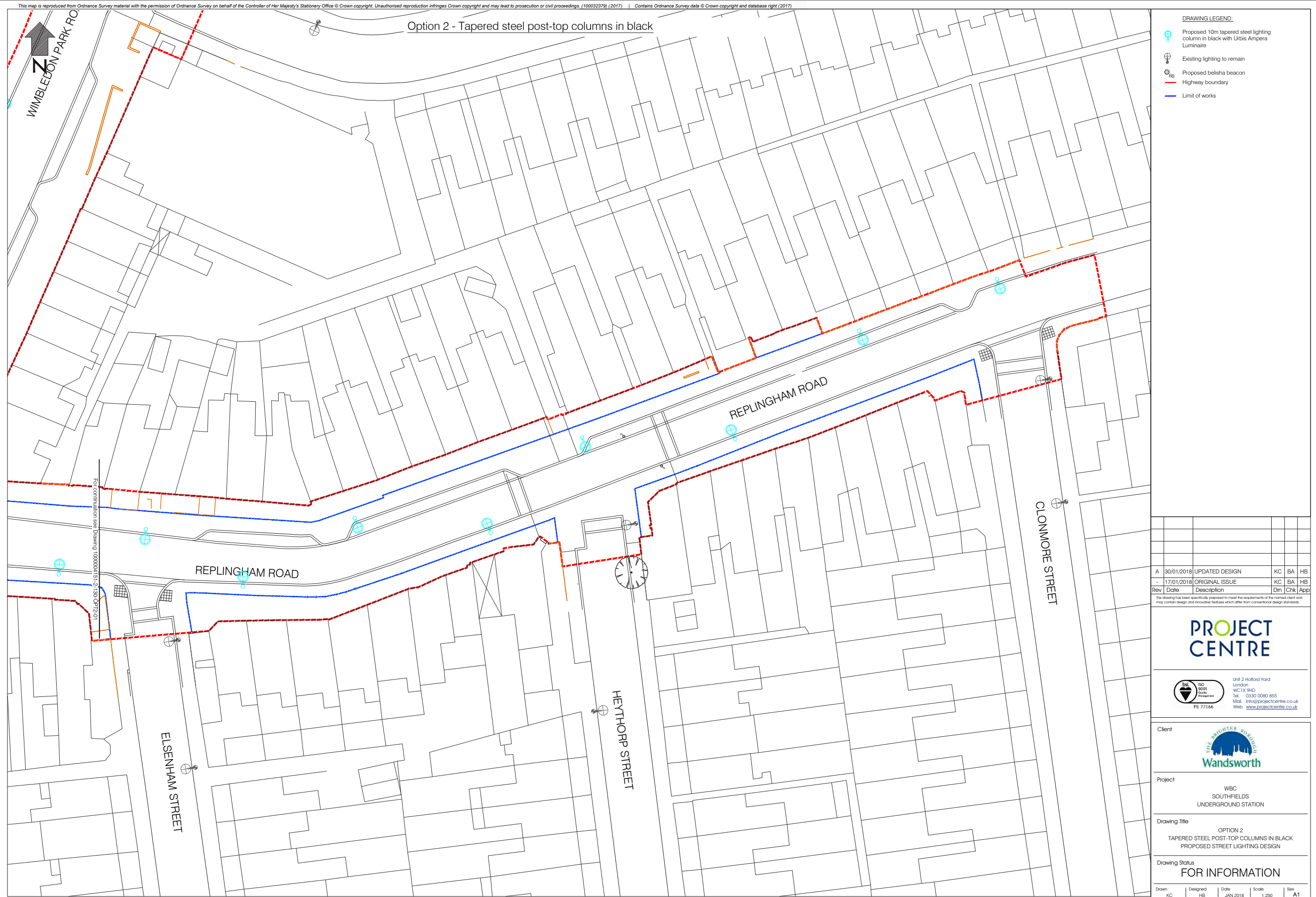
APPENDIX E - Southfields Proposed Design Options



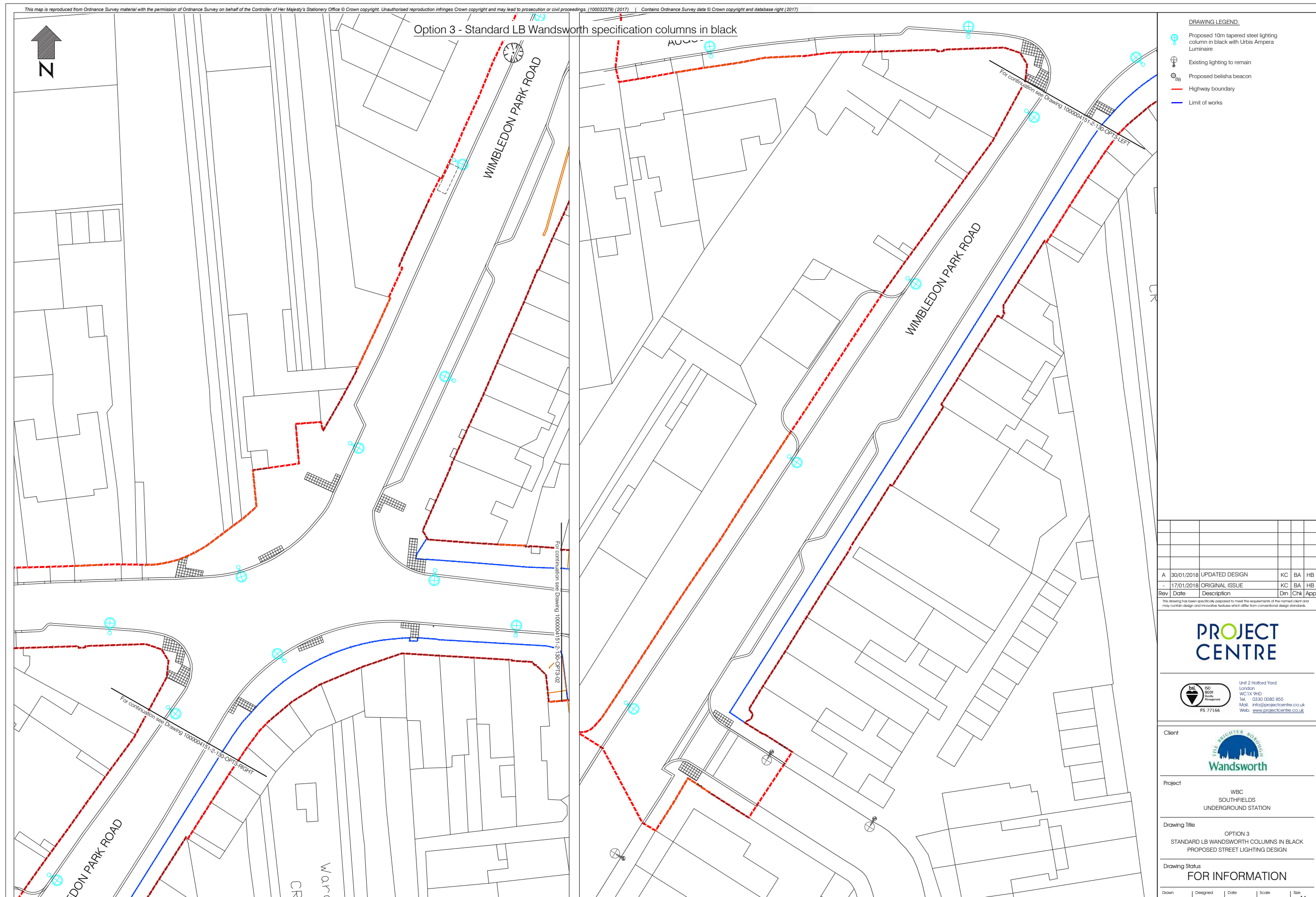
APPENDIX E - Southfields Proposed Design Options



APPENDIX E - Southfields Proposed Design Options



APPENDIX E - Southfields Proposed Design Options



DRAWING LEGEND:

- Proposed 10m tapered steel lighting column in black with Urtis Ampere Luminaire
- Existing lighting to remain
- Proposed belisha beacon
- Highway boundary
- Limit of works

Rev	Date	Description	Drn	Chk	App
A	30/01/2018	UPDATED DESIGN	KC	BA	HB
-	17/01/2018	ORIGINAL ISSUE	KC	BA	HB

This drawing has been specifically prepared to meet the requirements of the named client and may contain design and innovative features which differ from conventional design standards.

PROJECT CENTRE

Unit 2 Holland Yard
London
WC1X 9HD
Tel: 0330 0080 855
Mail: info@projectcentre.co.uk
Web: www.projectcentre.co.uk

ISO 9001
Registered
FS 77166

Client

Wandsworth

Project

WBC
SOUTHFIELDS
UNDERGROUND STATION

Drawing Title

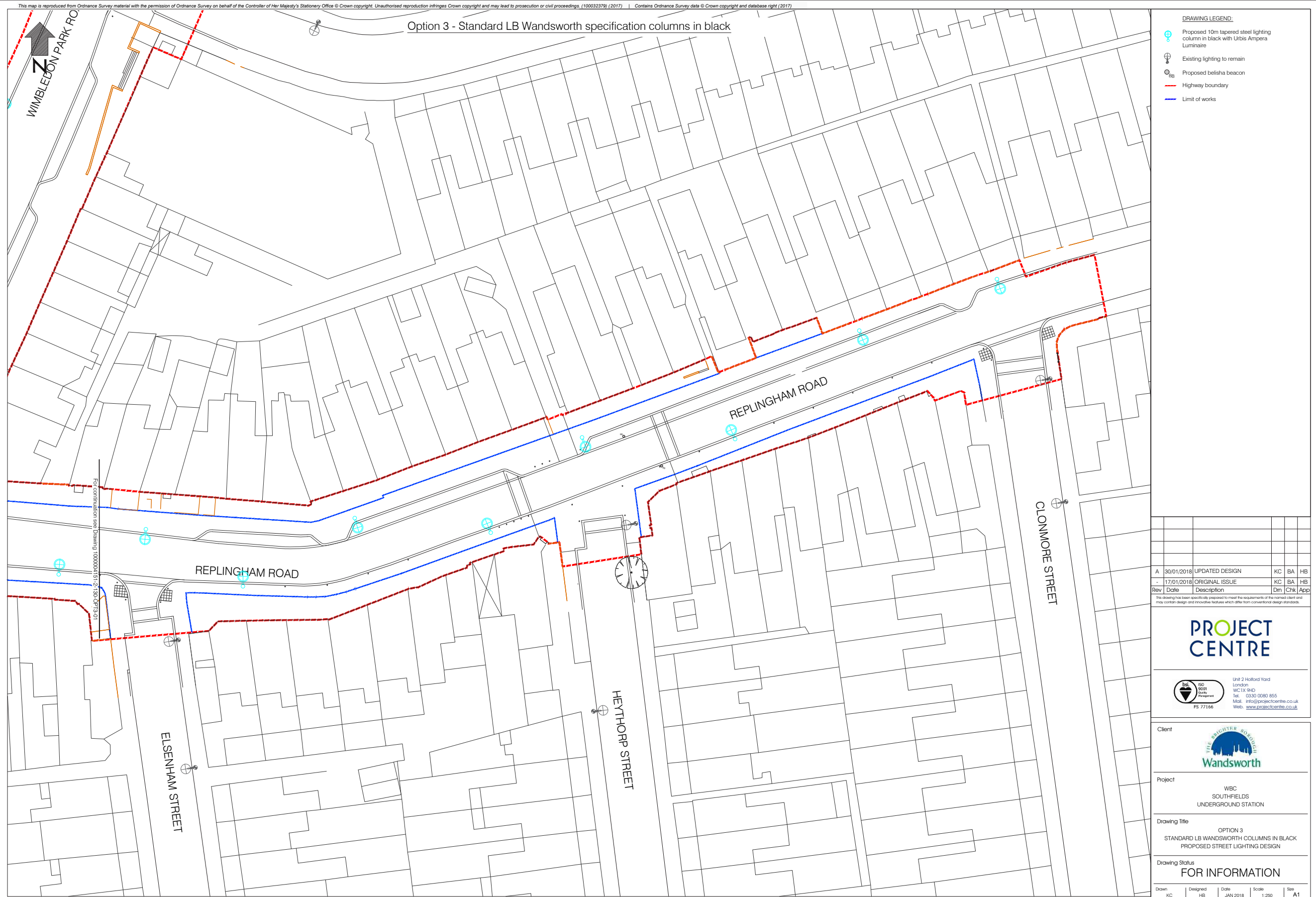
OPTION 3
STANDARD LB WANDSWORTH COLUMNS IN BLACK
PROPOSED STREET LIGHTING DESIGN

Drawing Status

FOR INFORMATION

Drawn: KC | Designed: HB | Date: JAN 2018 | Scale: 1:250 | Size: A1

APPENDIX E - Southfields Proposed Design Options



APPENDIX E - Southfields Proposed Design Options

