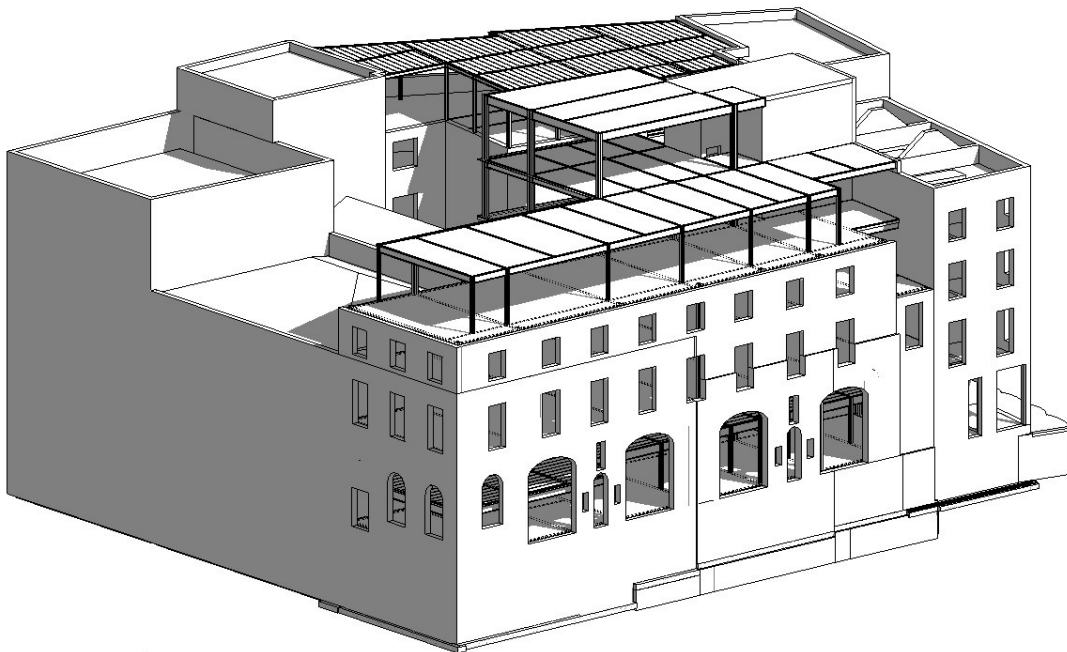


NEW OXFORD STREET

FLOOD RISK ASSESSMENT (STAGE - 1)



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Job Number: **214312**

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| | | |

Contents

| | | |
|-----------|--|----------|
| 1. | INTRODUCTION | 1 |
| 2. | THE PROJECT | 1 |
| 2.1 | LOCATION | 1 |
| 2.2 | EXISTING BUILDINGS | 3 |
| 2.3 | PROPOSED DEVELOPMENT | 4 |
| 2.3.1 | 35-41 New Oxford Street..... | 4 |
| 2.3.2 | 10-12 Museum Street | 4 |
| 2.3.3 | West Central Street..... | 4 |
| 3. | TOPOGRAPHY | 5 |
| 4. | GROUND CONDITION..... | 5 |
| 5. | GROUND WATER..... | 5 |
| 6. | DRAINAGE RECORDS | 5 |
| 7. | SURFACE WATER DRAINAGE | 6 |
| 8. | SUSTAINABLE URBAN DRAINAGE SYSTEMS..... | 7 |
| 9. | FLOOD RISK ASSESSMENT | 8 |
| 9.1 | FLOOD RISK FROM WATERCOURSES (Fluvial/Tidal) | 8 |
| 9.2 | SEQUENTIAL TESTS | 8 |

APPENDIX A - TOPOGRAPHICAL SURVEY

APPENDIX B - ENVIROCHECK REPORT

1. INTRODUCTION

Mason Navarro Pledge has been commissioned to carry out a Flood Risk Assessment (FRA) for the proposed redevelopment of 35-41 New Oxford Street, 10-12 Museum Street and 16 West Central Street.

This FRA has been carried out in accordance with National Planning Policy Framework (NPPF), along with advice and guidance from the Environment Agency (EA), London Borough of Camden Strategic Flood Risk Assessment (SFRA) and CIRIA documents.

The NPPF states that an appropriate flood risk assessment will be required for all development proposals of 1Ha or greater in Flood Zone 1, or for any development within Flood Zones 2 or 3. The site is shown to lie within Flood Zone 1.

2. THE PROJECT

The project will consolidate several existing buildings into a new residential block with retail space at ground floor level.

2.1 LOCATION

New Oxford Street estate comprises 16a/b and 18 West Central Street (a single building), 35-41 New Oxford Street, and 10 to 12 Museum Street, (NGR 530182 181435: Fig 1). The site is bounded by New Oxford Street to the north, Museum Street to the east, and West Central Street and the 43 and 45 New Oxford Street to the east.

The site addresses are:

35, 37, 39, and 41
New Oxford Street
WC1A 1BH & WC1A 1BN

10, 11, and 12
Museum Street
WC1A 1JJ

16a, 18, and 16b
West Central Street
WC1A 1JJ

The site is located on the southern fringe of the Bloomsbury Conservation Area that was designated in 1968.

The nearest watercourse is the River Thames which runs from west to east approximately 900m to the southeast of the site.

The extent of the existing buildings is indicated in Figure 2.

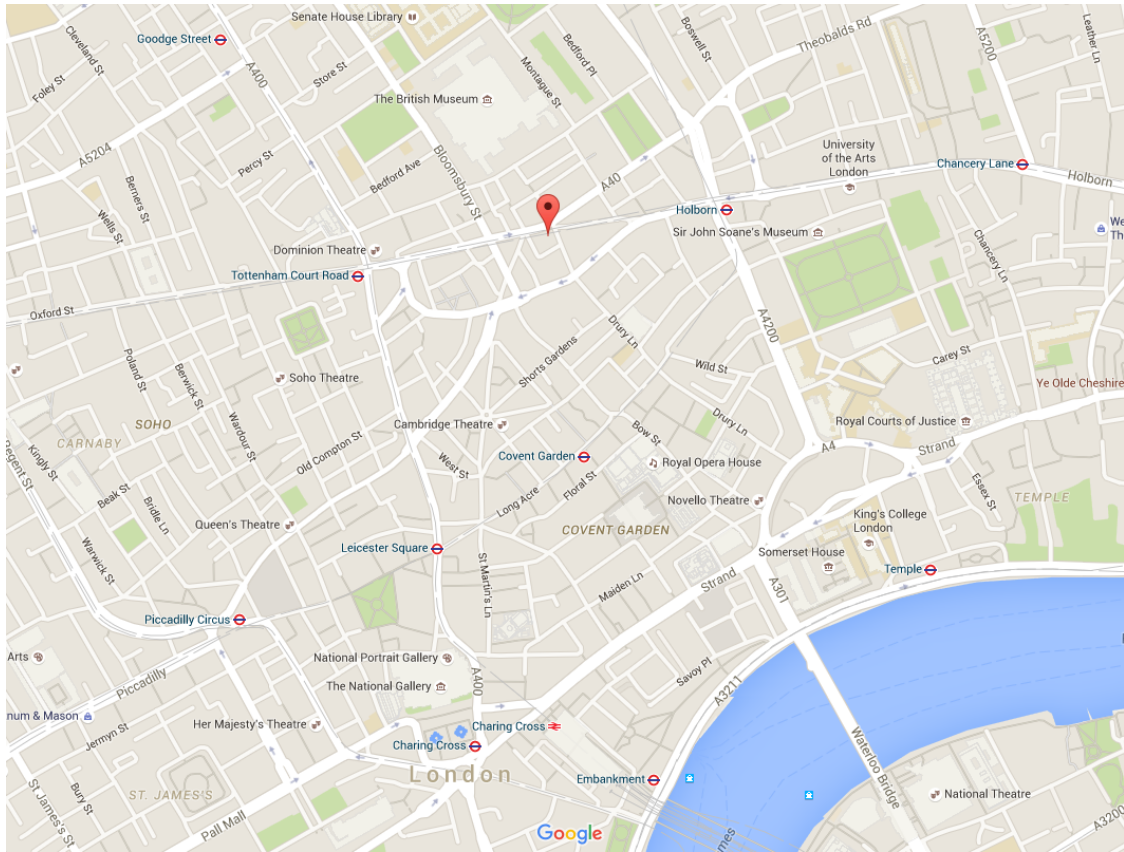


Figure -1 Site Location

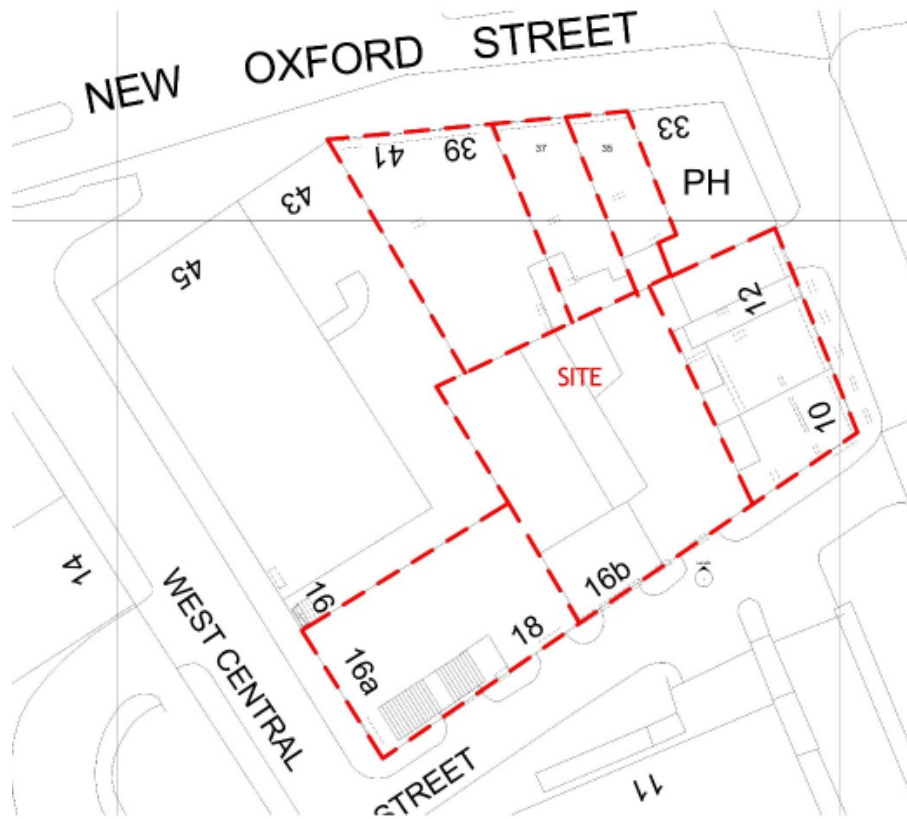


Figure -2 Site Boundary

2.2 EXISTING BUILDINGS

No. 35 & 37 New Oxford Street are three storey residential properties with retail at ground floor. Both buildings contain basements to the entire footprint, and appear to be of concrete construction.

No.10 Museum Street is a three story residential property with retail space at the ground floor. However No 11 - 12 have undergone modernisation and consolidation, as well as an addition of a full height rear extension.



Figure - 3 Existing Elevation along New Oxford Street



Figure - 4 Existing Elevation along Museum Street

18 West Central Street is a two and three storey building, with the lowest section of the building on the corner of West Central Street.



Figure - 5 Existing Elevation along West Central Street

2.3 PROPOSED DEVELOPMENT

2.3.1 35-41 New Oxford Street

The proposal is to retain the existing façade, party walls and floors. A single storey light weight steel framed roof extension will be added to the entire footprint of the New Oxford street frontage

A new steel framed stair case will be created to the rear of No. 35 and 37.

2.3.2 10-12 Museum Street

The façade of No. 10 to 12 Museum Street will be retained including the existing floor construction. The existing stairs will be demolished and infilled with a new timber floor and new opening will be created through the existing walls to accommodate a new residential layout.

2.3.3 West Central Street

The existing properties along West Central Street will require partial demolition and a new residential block.

The substructure will be of concrete frame construction. Concentrated loads from the columns that support the multi-storey buildings over are to be transferred to the ground via a reinforced concrete raft.

The superstructure will be of light weight steel framed construction, with precast hollow core floor slab.

3. TOPOGRAPHY

The topographical survey information shows the site to be relatively level. The existing pavement levels along New Oxford Street, Museum Street and West Central Street are approximately 25.30m AOD.

4. GROUND CONDITION

An assessment of geology and ground conditions has been made by using the online British Geological Survey historical borehole records and a site investigation undertaken by GEA Ltd in July 2015. The site was found to contain variable thickness of made ground over Lynch Hill Gravel over the London Clay Formation.

British Geological Record BH ref TQ38SW799 - reports the ground conditions as follows:

| Depth below ground (garden) | Soil Type |
|-----------------------------|--------------|
| From 0 to 3m | Made Ground |
| From 3m to 8m | Sandy gravel |
| 8m to 18m plus | London Clay |

5. GROUND WATER

Ground water level are noted on the GEA site investigation report close to the base of the gravel at a depth of approximately 5.0m

6. DRAINAGE RECORDS

Record of public sewer in the vicinity of the site have been provide by Thames Water. These shows that there is a main public combined sewer on New Oxford Street, Museum Street and West Central Street. The sewer is 1676x914 along New Oxford Street, 1727x914 along Museum Street and 1219x787 along West Central Street.



Figure -6 Thames Water Asset Plan showing combined sewer to NOS

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 1427 | n/a | n/a |
| 0409 | n/a | n/a |
| 151A | n/a | n/a |
| 151B | n/a | n/a |
| 2501 | n/a | n/a |
| 1521 | 25.29 | 20.98 |
| 1505 | n/a | n/a |
| 9503 | 25.9 | 18.52 |
| 1508 | 25.51 | n/a |
| 3502 | n/a | n/a |
| 0505 | n/a | n/a |
| 0535 | n/a | n/a |
| 2602 | 24.88 | 21.8 |
| 36BC | n/a | n/a |
| 36BD | n/a | n/a |
| 2604 | 24.86 | 21.81 |
| 2605 | n/a | n/a |
| 1610 | n/a | n/a |
| 3605 | 24.74 | 20.67 |
| 3416 | 24.38 | 19.26 |
| 3503 | n/a | n/a |
| 3504 | 25.02 | 9.36 |
| 35DE | n/a | n/a |
| 35DD | n/a | n/a |
| 3501 | n/a | n/a |
| 35DG | n/a | n/a |
| 35DH | n/a | n/a |
| 3604 | n/a | n/a |
| 4505 | n/a | n/a |
| 451A | n/a | n/a |
| 46DJ | n/a | n/a |
| 46DI | n/a | n/a |
| 1303 | 23.59 | 17.34 |
| 0303 | n/a | n/a |
| 1304 | 23.52 | 19.43 |
| 2301 | n/a | n/a |
| 3303 | n/a | n/a |
| 3304 | 22.68 | n/a |
| 1305 | 24.15 | 20.1 |
| 3306 | 22.7 | 18.79 |
| 2401 | 24.14 | 19.87 |
| 1402 | 25.13 | 21.01 |
| 1403 | n/a | n/a |
| 1404 | 25.2 | 21.73 |
| 2402 | n/a | n/a |
| 0406 | 25.56 | n/a |
| 2410 | 25.15 | 20.6 |
| 3403 | 23.9 | 20.21 |
| 3404 | 22.89 | 20.95 |
| 0410 | 25.36 | 9.49 |

Figure -7 Thames water manhole schedule

The sewer along New Oxford Street is located at approximately 19.56m AOD, the sewer along Museum Street is approximately 20.6m AOD and the sewer along West Central Street is approximately 21.73m AOD.

Risk of flooding due to pipe surcharging is very low based on the historical data. Due to the depth of the existing sewer relative to the basement level, non-return valves should be adopted on the outgoing sewer pipes.

7. SURFACE WATER DRAINAGE

Surface water drainage will adopt the principles adopted by the existing building. Runoff will be collected from an equivalent catchment area and will discharge to sewers in the Highway.

CCTV surveys will be required to confirm the condition.

At concept design stage it is assumed that the existing system operates in a satisfactory manner and that the new surface water solution will adopt the same principles of discharge.

Thames Water has been unable to confirm whether surface water will need to be attenuated to mitigate the effects of climate change. This should be determined at the next design stage when a pre-development enquiry is made.

The full requirement for climate change design will be understood post planning.

8. SUSTAINABLE URBAN DRAINAGE SYSTEMS

Planning conditions may require that the development incorporates a Sustainable Urban Drainage System.

At feasibility stage, a range of SUDS components have been assessed in order to derive appropriate solution for this site. A brief summary of the hierarchy of prevention, source control, site control and regional control I presented for consideration:

| SUDS Component | Commentary | Suitability | |
|---------------------------|--|-------------|----|
| Pervious surfaces | Limited opportunity to incorporate pervious pavements | | No |
| Green roofs | Flat roof is compatible with green roof technology | Yes | |
| Attenuation tanks | The site cannot easily accommodate attenuation tanks | | No |
| Rain water harvesting | Rainwater harvesting can be considered | Yes | |
| Infiltration devices | Soak-away solution are not suited to the inner city site | | No |
| Filters | There is no change to the existing site strategy | | No |
| Filter drains | Not appropriate to the site | | No |
| Filter strips | Not appropriate to the site | | No |
| Basin, ponds and wetlands | Not appropriate to the site | | No |
| Swales | Not appropriate to the site | | No |
| Bio-retention areas | Not appropriate to the site | | No |

9. FLOOD RISK ASSESSMENT

9.1 FLOOD RISK FROM WATERCOURSES (Fluvial/Tidal)

According to the EA’s floodplain map there is no risk of flooding from the River Thames (Figure 6). The map shows flooding from rivers and the sea is very unlikely. There is less than a 0.1 per cent (1 in 1000) chance of flooding occurring each year. For planning and development purposes, this is the same as Flood Zone 1.

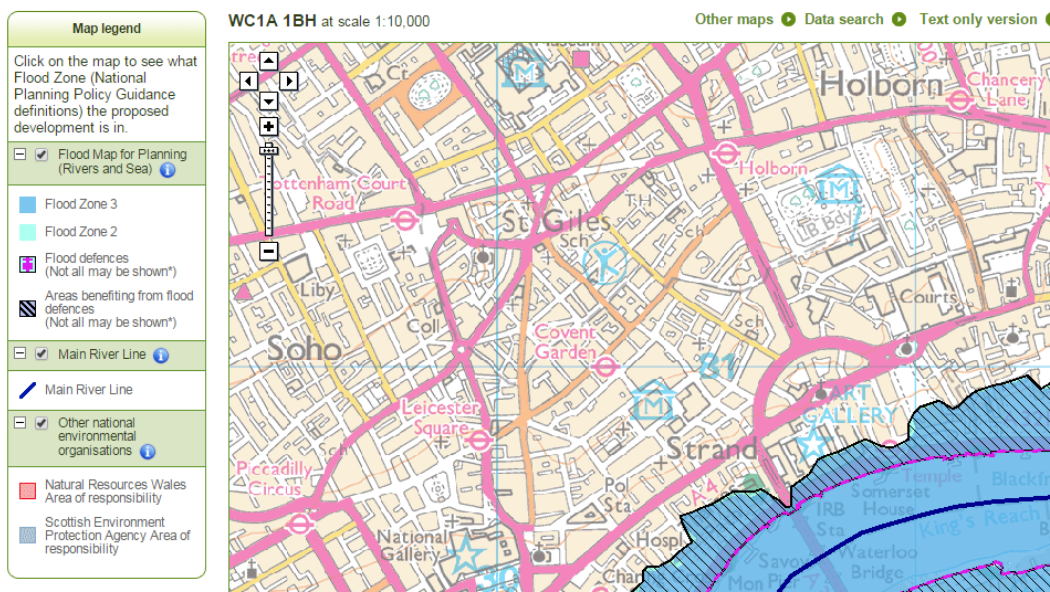


Figure - 8 Environment Agency Indicative Floodplain Map

9.2 SEQUENTIAL TESTS

In accordance with the National Planning Policy Framework (NPPF) the risk-based Sequential Test should be applied at all stages of the planning process. Its aim is to steer new development to areas at the lowest probability of flooding (Zone 1). Development should not be permitted if there are reasonably available sites to accommodate the proposed development in areas with a lower probability of flooding.

The site is located within Flood Zone 1 and therefore there are no restrictions on the type of development in this zone (Figure 5).

| Flood risk vulnerability classification (see table 2) | | Essential infrastructure | Water compatible | Highly vulnerable | More vulnerable | Less vulnerable |
|---|-------------------------------|--------------------------|------------------|-------------------------|-------------------------|-----------------|
| Flood zone (see table 1) | Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Zone 2 | ✓ | ✓ | Exception Test required | ✓ | ✓ |
| | Zone 3a | Exception Test required | ✓ | ✗ | Exception Test required | ✓ |
| | Zone 3b functional floodplain | Exception Test required | ✓ | ✗ | ✗ | ✗ |

Key: ✓ Development is appropriate.
✗ Development should not be permitted.

Figure - 9 Table 3 of NPPF Technical Guidance

APPENDIX A

TOPOGRAPHICAL SURVEY

530140.000 E

530160.000 E

530180.000 E

530200.000 E

530220.000 E

DATE REVISIONS
NOV 2014 AREAS ADDED. SEE REVISION BOX. A

181440.000 N

181440.000 N

181420.000 N

181440.000 N

181440.000 N

181440.000 N

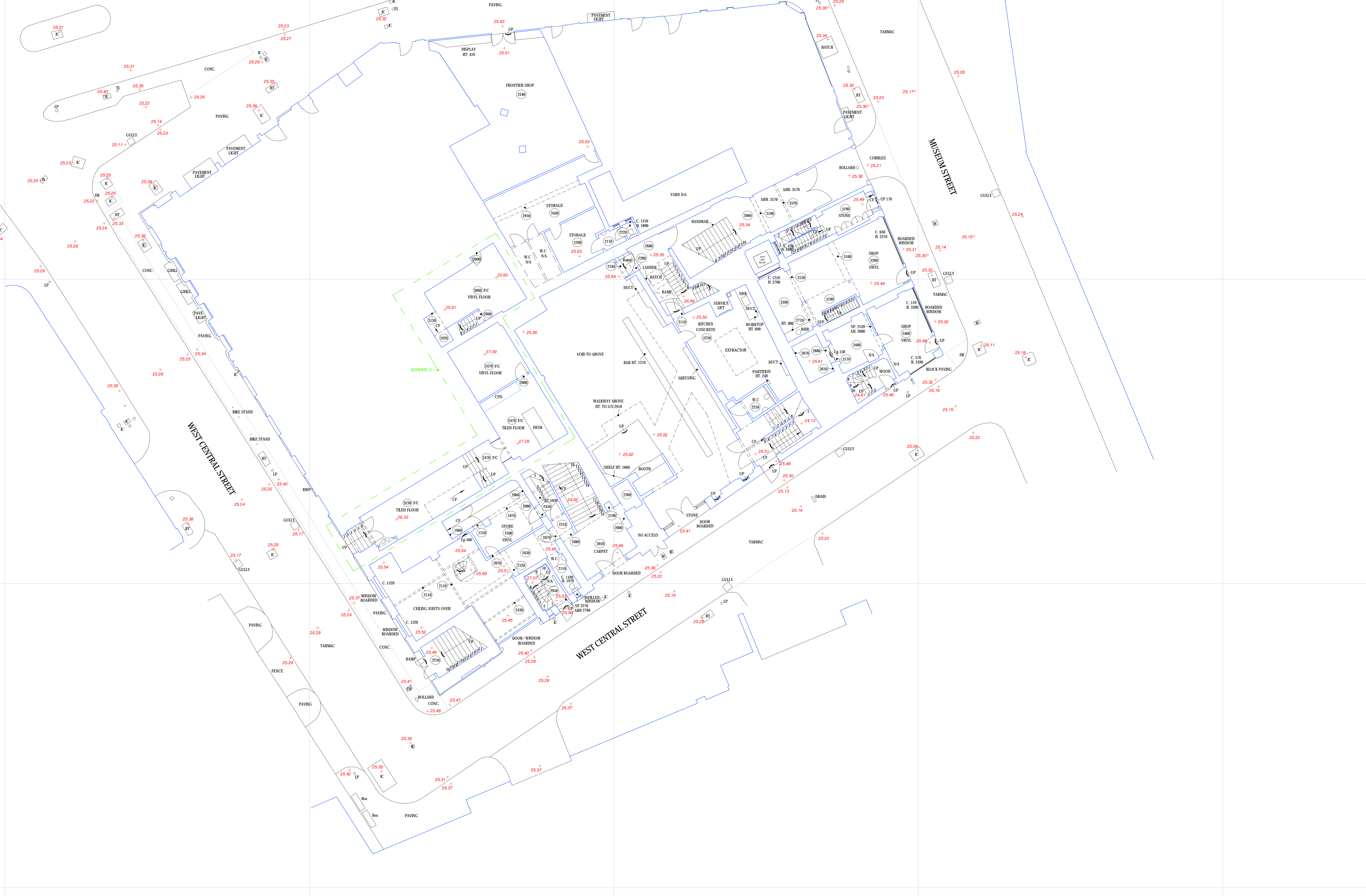
181420.000 N

181440.000 N

NEW OXFORD STREET

WEST CENTRAL STREET

MUSGRAVE STREET



ABBREVIATIONS (WHERE APPLICABLE)

| | | | |
|------|-----------------------|------|----------------------|
| AC | AIR CONDITIONING | NA | NO ACCESS |
| B | BOLLARDS | OH | OVERHEAD |
| BE | BRICK ON EDGE CORNING | RAD | RADIATOR |
| BT | BRITISH TELECOM COVER | RL | ROOF LIGHT |
| CA | CABLE TV COVER | RS | ROLLER SHUTTER |
| CF | CEILING FALL | RS | ROLLER STEEL JOIST |
| CL | COVER LEVEL | RSS | ROLLED STEEL JOIST |
| CO | CONCRETE FINISH | RWB | RAN WATER PIPE |
| CPD | CURBBOARD | SAR | SLOPING ASPHALT ROOF |
| CPF | CHOPPED FLOOR FINISH | SG | STRUCTURAL CEILING |
| CPS | CONCRETE PAVING SLABS | SGR | SLOPING GLASS ROOF |
| DK | DOWN PIPE | SP | SOIL POST |
| DP | DOWN PIPE | SSR | SLOPING SLATE ROOF |
| ER | EARTH ROAD | STR | SLOPING TILED ROOF |
| FAR | FLAT ASPHALT ROOF | SVP | SOIL & VENT PIPE |
| FB | FLOWER BED | TCE | TRAFFIC CONTROL BOX |
| F.C. | FALSE CEILING | TL | TRAFFIC LIGHT |
| FH | FIRE HYDRANT | U | URNAL |
| FMR | FIRE MANS REEL | UP | UP VENT PIPE |
| G | GULLY | VTF | VINYL TILED FLOOR |
| GO | TELECOM COVER | WC | TOILET |
| GV | GAS VALVE | W/B | WASH HAND BASIN |
| HD | HAND DRAIN | W/M | WATER METER VALVE |
| HL | HIGH LEVEL | W/CO | WATER STOP COCK |
| HT | HEIGHT | WT | WATER TANK |
| IC | INSPECTION COVER | | |
| LL | LOW LEVEL | | |
| LP | LAMP POST | | |

LEGEND (WHERE APPLICABLE)

| | |
|----------|---|
| --- | LINE INDICATES OVERHEAD OR HIDDEN DETAIL |
| --- | INDICATES CENTRE OF STEEL RAILING OR FENCE |
| C. 0000 | CALL HEIGHT TO OPENING FROM FINISHED FLOOR LEVEL |
| SP. 0000 | SPRING HEIGHT TO ARCH FROM GULL LEVEL |
| H. 0000 | HEAD HEIGHT TO OPENING FROM GULL LEVEL |
| + 00.00 | CROSS INDICATES POSITION OF LEVEL |
| DL 10.00 | INDICATES POSITION OF DEDUCED LEVEL |
| (0000) | INDICATES RELEVANT CEILING, BEAM OR SOFFIT HEIGHT |
| (0000) | EXISTING TREE (SPREAD & HEIGHTS - NEAREST METRE) |
| (0000) | G. 0000 |
| (0000) | H. 0000 |
| (0000) | S. 0000 |

PLEASE NOTE (WHERE APPLICABLE)

- THE ACCURACY OF THIS SURVEY DRAWING IS DEPENDENT UPON THE SCALE AT WHICH IT IS PRODUCED. USERS SHOULD NOT RESCALE THIS DRAWING WITHOUT WRITTEN CONSENT.
- WHILE ALL REASONABLE CARE HAS BEEN TAKEN IN LOCATING THE UNDERGROUND SERVICES SHOWN ON THIS DRAWING, THE COMPLETENESS OR THE ACCURACY OF THE INFORMATION CANNOT BE GUARANTEED. USERS SHOULD VERIFY THEMSELVES WITH REGARD TO THE TYPE, SIZE AND ROUTE OF SERVICES BEFORE CONNECTIONS ARE AUTHORIZED.
- THE ABILITY TO SCALE FROM THIS SURVEY DRAWING IS DEPENDENT ON THE STABILITY OF THE DRAWING MATERIAL. USERS SHOULD VERIFY, BY THE SCALE OF THE SURVEY ORIGIN, THE ACCURACY OF THE DRAWING MATERIAL PRIOR TO SCALING DIMENSIONAL INFORMATION.

ORDNANCE SURVEY RELATED MARK USED
SURVEY STATION STN_100
SEE COORDINATE TABLE ON DRAWING 8129101 FOR LOCATION
VALUE = 25.413m

TITLE
GROUND FLOOR AND SITE PLAN
PROJECT
WEST CENTRAL STREET, LONDON WC1
CLIENT
DRIVERS JONAS DELOITTE
SCALE
DRAWN DATE DRAWING REVISION
1:100@A0 M.G. SEP 2012 8129108 A

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