C422 - Tottenham Court Road Stage D+ Report on Cellars

CRL Document Number: C422-LAO-C-RGN-N105_WS089-50005

| 1.Contractor Document | | reference C08.057,0 | 007 | 1 | | |
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Document History (Continued):

| Revision: | Date: | Drafted by: | Checked by: | Authorised by: | Reason for Revision: |
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| 1 0 | 14/11/16 | | | | For CRL Acceptance |
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Executive Summary

PMI00491 was issued on 08th October 2015 and at subsequent contract progress meetings the difficulties of taking forward the design were discussed. Amongst the issues discussed was the location and state of the remaining cellars below the C422 External Works.

This report has been produced to determine what cellars remain and what challenges they may create for the design. No reference has been made to the Undertakings and Assurances that may have been given regarding the cellars; this being beyond the scope of the report. It was also decided not to engage a structural engineer at this stage, but consider this option once it is known what cellars remain.

On this basis, the report has been produced by experienced infrastructure engineers with a basic knowledge of structures. Thus, the background work of establishing the current position regarding cellars has been completed. We now recommend a review of the report by structural and construction methodology engineers. Also whilst various physical surveys were progressed as the Crossrail Act was made, C422 are informed by CRL that no pre-construction condition surveys exist for the cellars

Furthermore, previous contracts have not placed adequate backfill within the cellars that have been abandoned. This raises concerns about the ability to support public highway above and recommendations on the way forward for the pavement design are made.

Lastly, during report production, drawings showing grout shaft details were received. Whilst their ability to support public highway is not in question, they complicate pavement design details and recommendations on this topic are made.

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1 Introduction

1.1 Purpose of the Document

Historically within London, cellars have been built below the public highway and have existed like this for hundreds of years. Crossrail construction methods have used diaphragm walling to sink tickets halls within the plots of land acquired. This walling method has resulted in cellars being backfilled and abandoned in areas beside the main ticket halls. Elsewhere cellars have been un-affected.

C422's task is to design the external works surrounding the Tottenham Court Road Station. To complete this task an understanding of what cellars remain and the way they potentially impact upon the design is needed. The method of report production and its objectives are therefore.to:

- 1. Gather information relating to the existing cellars
- 2. Produce a schedule of all cellars
- 3. Ascertain what cellars remain and produce schedule of them
- 4. Document any issues associated with the remaining cellars
- 5. Produce recommendations on the way forward.

It must also be noted that the report has been produced by infrastructure engineers without input from structural or construction methodology engineers. This approach was agreed with the Employer and CRL at various progress meetings.

Station works designed by C134 can broadly be put into two categories in relation to the cellars.

- Structural works, comprising enabling works demolition, backfilling and diaphragm walling. [Now completed]
- External civils works, comprising construction of highways, drainage and street lighting. [Yet to be constructed]

The location plan for the C422 External Works is contained at Appendix A.

The Consultant first requested the information regarding the presence of cellars and the standard of backfill compaction from the Employer within RFI No. DTR408, raised on 9 October 2014.

Areas within the hoarding have been used for a variety of construction activities and along Great Chapel Street these have been directly beside or above retained cellars. Consideration of the impact of 130 tonne piling rigs adjacent to retained cellars is beyond the scope of this report.

1.2 Information relating to existing cellars

To resolve what happened during the structural works, recourse has been made to the Health and Safety Files (HSF) produced for the various Crossrail contracts. A CDM obligation is that the H&S Files contain the "as-built" information. Please refer to **Table 1.** that details the H&S Files provided:

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| ID | Flie Name | Document Title | Document Type | Any References tj ^{Ba} sements | 3DSurvey Included? |
|----|--|---|---------------------------|---|--------------------|
| | C208 MCG OI STP N1 05 50002 | C208 Tottenham Court Road. Western Ticket Hall Health and Safety Flie | Health and Safety | Yes | No |
| 2 | C134 LU OI LRC•NI0S_WS093 50001 | Health and S fety File for the Goslett Yard Box and Escalator Decline | Health and Safety Flie | No | No |
| 3 | C300-EFK-Z7 5TP CRT00_S1D0S-5004I• /ers on 2 | C300/410Weste_rnī Caverns Project HealthandSafety Flie | Health and Safety File | No | No |
| 4 | C300-BFK•Z7-STP-CRTOO_ST005-50041 • Version 3 | C300/410 Western Tunnels & Caverns Project Health and Safety Flie | Health and Safety File | No | No |
| 5 | C421·8BMC·RGN-N108_WS089-50115 | C421 TottenhamCourtR oad Western Ticket Hall Health & Safety IELE Grout Shaft 7 | Health and Safety File | No | No |
| 6 | C421-BBMZ7 RGN-N105_V\$089 50005 | C421Tottenham Court Road • | Health and Safety File | No | No |
| 7 | C42 2·1000-COM 100 11 018 12 HSF file req LORto CRL151204 | CC4 05 alth and Safet Information | Health andSafety File | No | No |

Table 1. Health & Safety Documents reviewed for cellar/basement information.

A full schedule of all information provided to determine the presence of the cellars is provided within **Appendix B**. Documents obtained include the above Health & Safety Files, cellar/basement survey drawings and information provided with responses to Early Warning Notices raised.

Documentation received from C134 for the external works contained a General Arrangement drawing C134-OVE-D-DDA-N105_1-00201(C01) which detailed the cellar locations at the Western Ticket Hall only, the drawing is located within **Appendix B.** No C134 drawing of existing cellar topog aphic surveys at Goslett Yard have been made available . C422 are informed that no pre-construction condition surveys were undertaken but access was gained and a 3D survey undertaken for most of the cellars. The 3D surveys were not contained in the C134 Works Information, but obtained from ProjectWise. It must be noted however that little information has been provided on cellars at the south end of Dean Street around the junction to Carlisle Street.

The cellars constitute part of the property freehold. They are designed to carry a highway loading appropriate at the time of construction. Maintenance of the cellar, including waterproofing is the responsibility of the freeholder, whereas Westminster City Council (WCC) does not take any responsibility for their upkeep.

This document was issued on A Site as Revision 0.1 on the 20th of April 2016. No comments on the draft report issued in April have been received.



2 Pre-construction conditions

Sketches WSP-C422-SK-001 and 002 identify the locations of the existing cellars prior to the project commencing. Located within **Appendix C** the existing cellar locations prior to construction work have been used to produce the cellar schedule. The numbering is shown on the sketches.

2.1 Schedule of all cellars

Each cellar within and close to the site extents has been allocated a unique identification number which coincides with the cellar schedule. The full schedule of all the cellars identified is included within **Appendix D.** The cellar schedule has been divided up into each individual street with comments provided where additional information has been made available.

Referencing the 3D cellar survey provided by CRL, a typical cross section of the existing cellar arrangement is detailed below, **Figure 1**. This is the anticipated cellar arrangement found at the WTH and ETH sites.

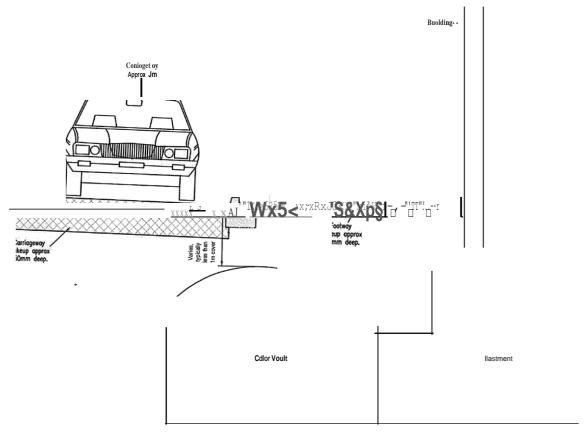


Figure 1. Typical Cross Section of Existing Cellar Arrangement

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3 Construction Interaction

3.1 Construction Work affecting Cellars

The cellars located around the perimeter of the WTH (north and south boxes) have all been incorporated into the proposed construction works. The WTH is constructed using the diaphragm wall method. This has resulted in the removal of the basements and cellars directly beside the walling which should have been backfilled with compacted granular material to pile mat formation level prior to the walling works. The following HSF "C208-MCG-01-STP-N105-50002, C208 Tottenham Court Road - Western Ticket Hall Health and Safety File" has been referenced to determine what construction work has been undertaken for the cellars.

There was no mention of cellars or basements in the following two H&S files:

- C300-BFK-Z7-STP-CRTO0_ST005-50041 -Version 2
- C421-BBM-Z7-RGN-N105 WS089-50005

These files only mention diaphragm walls in relation to tunnelling, and aspects other than basements or cellars.

With regards to the backfilling of redundant cellars, **Figure 2**. provides a typical cross-section including the interaction with the diaphragm wall. Typically the ground will have been cleared of all material up to 1.8m from the outside edge of the diaphragm wall prior to install.

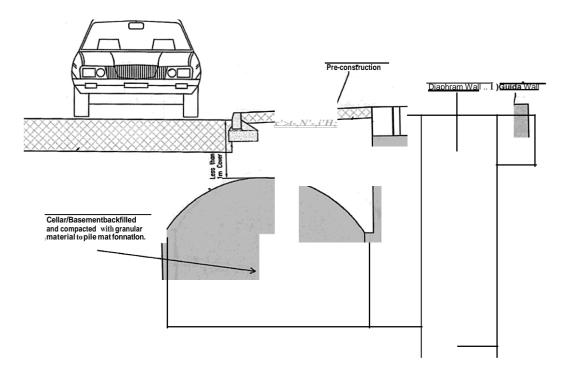


Figure 2. Cross Section of typical cellar post construction.

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A schedule has been created to detail the works undertaken on each of the cellars and from which HSF document the information originated. **Figure 3.** below provides an example of the schedule for the cellars filled in on Dean Street.

| Side of Road | Dean,Street | Fliied Iii Y/N? | Information |
|--------------|-------------|-----------------|---|
| West | DS_Ol | у | Accordingtofile C208-MCG-01-SJ -N105 50002, this sellar has beE?n r mpved and backfilled to pl! mat fofmati o h level. |
| West | D5_002 | y 1 | Accio rdlng {9 fi,e, 208-f\lCG-Q -S"fP-rn 0s,p0Q2, tris cellar has ben re in ved and backfilled to pile mat |
| west | D5_003 | у | According to file 'C208-MCG-01-5TP-N105-50002t, his- Icellar has been rempved af')d backfilled to pile mat for atione e L |
| We t | 05_004 | Υ | According to file C20!i-MCG-0laSTP-1\1105-500Q2,trls cellar has been reri ved and backfill d'to pile mat formation level. |
| West | D5_005 | у | According to file C208-MCG-01-STI>-N105-5Q002,this cellar has be n rempyed alld backfilled pile mat formation lev I. |

Figure 3. Schedule of Cellars Filled in on Dean Street

Also detailed in **Appendix B** is an EWN from the Employer stating that during the initial phase of works, a proportion of the cellars along Dean Street had not been filled in with suitable material. There is a concern that these voids could affect the urban realm works and the quality and durability of the architectural pavement adjacent to the ground floor ticket hall entrance in particular.

3.2 Presence of Grout Shafts

Whilst the primary focus of this report is cellars, it is apparent from the detailed grout shaft drawings received on 9 August 2016 that these temporary structures could also impact upon the pavement design. **Appendix E** contains these drawings referencing a grout shaft located at the northern end of Dean Street.

From other drawings, there is also an indication that there are further grout shafts located within Goslett Yard and on Sheraton Street adjacent to Great Chapel Street turn. The latter is located on the boundary of the works, but may still impact the works.

At present these temporary structures are not within the scope of this report, therefore it is recommended that the Employer instruct the Consultant to investigate further the impact of these shafts on the design.

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4 Present Condition

The remaining cellars left after the construction works will fall into two categories:

- Cellars which have remained untouched throughout the construction works
- Cellars that have been abandoned in the course of the works.

All remaining cellars raise a further issue that there is no structural information present to determine their condition prior to and during construction works. Without this information on these cellars, the possible changes to the highway loadings can't be fully assessed.

Appendix F contains a full schedule of cellars that remain untouched and a schedule for cellars that have been filled in.

A full review has been completed to identify if existing cellars clash with the proposed drainage and utility infrastructure. This is reported in document C422-LAO-U-RGN-N105_WS089-50001 Stage D+ Report on Infrastructure/ Utility Clashes.

WCC have been contacted to determine if they have any historic survey information regarding the existing cellars that remain. Proposed drawings detailing the drainage design have been issued to WCC for review and comment. The response received from WCC regarding the cellar at Hollen Street is located within **Appendix G.**

4.1 Issues associated with the remaining cellars

The existing cellar at the junction of Hollen Street/Great Chapel Street requires reviewing in further detail. With proposed changes to the kerbline at the junction location, the tracking analysis for the 10.5m refuse vehicle and the fire tender have highlighted there is an over-run above the cellar footprint. A number of options are available as follows;

- 1. Remove the footway to the north of Hollen Street which would create additional carriageway for vehicle manoeuvres. This option would still be within the highway boundary
- 2. Strengthen the cellar to accommodate larger vehicles.
- Restrict larger vehicles from using this route; however this is the least favoured option due to Hollen Street pr6viding the gateway into the area for servicing the commercial units.

A more detailed review has determined that the Pumping Appliance can avoid the cellar. This has been achieved following Option 1. above. **Figure 4.** on the following page, as taken from drawing C422-LAO-D-DDL-N105_1-10035(P04) contained in **Appendix H,** highlights this case. However the kerbs within the C422 design remain as per the C134 drawings- and no instruction has been received-to alter-the layout

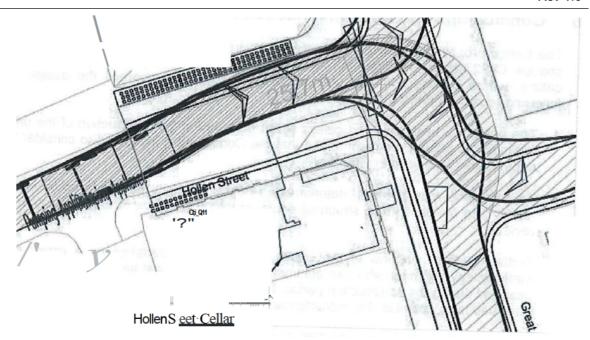


Figure 4. Vehicle swept path for Hollen Street Junction adjacent to an existing cellar

Whilst there are only a fraction of cellars beneath the existing and/or proposed carriageways, the live loading of vehicles will not be vertical in nature, with a likely zone of influence of 22.5° to 4.5 away from the edge of the wheel track. This also applies to areas within the hoarding that have been used for a variety of construction activities including movement of heavy piling rigs as indicated in **Figure 5.** below.

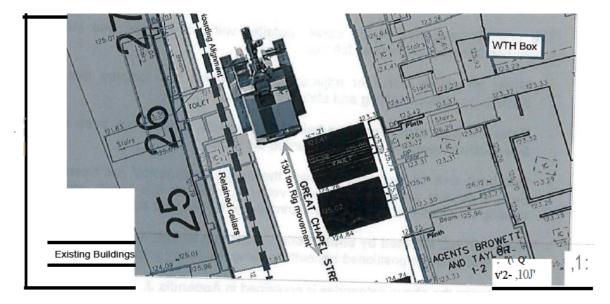


Figure 5. Example of proximity of cellars to large plant movements on Great Chapel Street

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5 Conclusions and Recommendations

The design proposals contained within the C134 drawings ignores the presence of cellar spaces. C422 has not modified the basic C134 kerblines which permit traffic to overrun cellars, where previously it was not permitted. In order to progress the design, the following recommendations are made;

- 1. The backfill to basement and cellars is not suitable for the construction of the urban realm works above. We recommend that the Consultant is instructed to consider "full depth" pavement design in these areas
- 2. To determine what potential deterioration in cellar strength may have occurred, this report is to be issued to a structural engineer with experience of older structures for review
- 3. Further to this, a review of the existing situation is undertaken by a construction methodology engineer who can comment upon the potential impacts that may have occurred during the construction period. In particular upon cellars that are retained but have had heavy plant and construction activities nearby
- 4. There may be obligations upon CRL to ensure all the cellars that are retained are in the same condition as the pre-construction stage. CRL will need to establish what rights of entry they have for surveys
- 5. Lastly, the presence of grout shafts and temporary walls is known about. Drawings provided on 9 August 2016 are not "as-builts", showing the post grouting situation. It is recommended that the Consultant be instructed to consider this in more detail and to include the full depth pavement options around all grout shafts. The Consultant considers that this should be a location wide instruction, to cover all other excavations, because it is apparent backfill has not been placed to an adequate standard

The primary categories of the cellars detailed within this report and subject to the recommendations above are as follows;

Filled in; cellars within or adjacent to the station box footprint that have been backfilled to allow enabling and station works to progress

Retained and carriageway remains unchanged; cellars have been retained and there are no records of any works carried out within

Retained and carriageway altered; the above carriageway has been modified to ensure suitable access for relevant vehicles, however this brings additional direct loading to cellars that may have a detrimental effect on their condition

- - Refained-but a ffected by c-onstructionp lant m ovement; as afor ementionedc ertain cellars spaces are positioned beneath or alongside heavy plant working zones

Plans showing the above categories is contained in Appendix J.





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6 Appendices

| 6.1 | Appendix A - Location Plan of C422 Works |
|-----|--|
| 6.2 | Appendix B - Cellar Information Obtained |
| 6.3 | Appendix C - Existing Cellar Reference Drawings |
| 6.4 | Appendix D - Schedule of Existing Cellar Conditions |
| 6.5 | Appendix E - Grout Shaft Drawings received 9 August 2016 |
| 6.6 | Appendix F - Schedules of Cellars Remaining |
| 6.7 | Appendix G - Wee Response to Hollen Street Cellar Issue |
| 6.8 | Appendix H - Pumping Appliance Swept Path amendment at Hollen Street |
| | Junction |
| 6.9 | Appendix J - Categorised Cellar.s Site Wide |

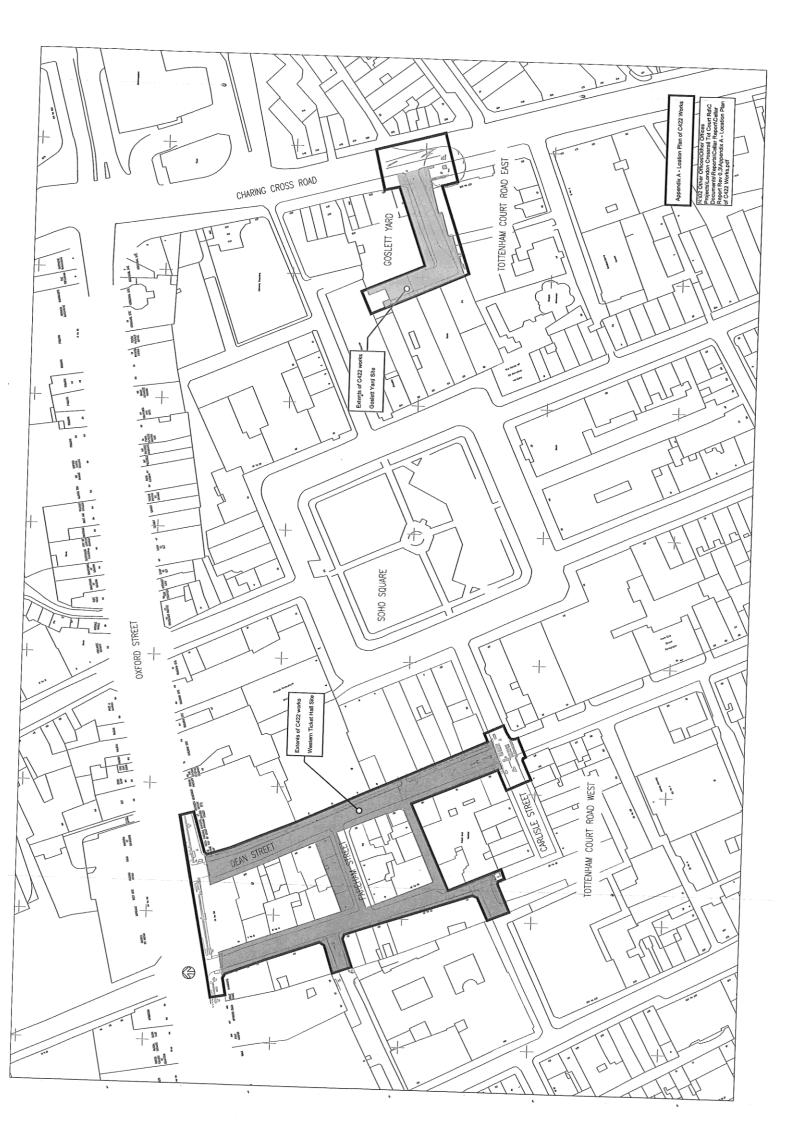
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6.1 Appendix A - Location Plan of C422 Works





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6.2 Appendix B - Cellar Information Obtained

- 6.2.1 Schedule of all documents/information obtained
- 6.2.2 Early Warning Notice C422-EWN-00532

including two photographs of an example cellar backfilled with unsuitable material

- 6.2.3 Cellar Survey Northwest
- 6.2.4 Cellar Survey Southwest
- 6.2.5 Cellar Survey East
- 6.2.6 C134-OVE-D-DDA-N105-1-00201 C01 -Western Entrance Existing Topographical and Basement Surveys

DT Template: CRL1-XRL-C-ZTM-CR001-50002 Rev 4.0

Appendix B - 6.2.1 Schedule of a cuments / inform ation obtained

| ID | File Name | Document Title | Document Type | Any References to Basements? | 3D Survey Included? |
|-----|--|---|--------------------------|------------------------------|---------------------|
| 1 | C208-M CG-0 1 -STP-N 105-50002 | C208 Tott enham Court Road - Western Ticket Hall Healt h and Safety File | Healt h an d Safety File | Yes | No |
| 2 | C134-LU-O1-LRC-N105_WS09 3-50001 | Health and Safety Fil e for th e Goslett Ya rd Box and Escalator Decline | Health an d Safety File | No | No |
| 3 | C300-BFK-Z 7-STP-CRT00_ST005- 50041 - Version 2 | C300/ 410 West ern Tunnels & Caverns Project Healt h and Sa fety Fil e | Health and Safety Fi le | No | No |
| 4 | C300-BFK-Z 7-STP-CRT00_ST 00 5-50041 - Version 3 | C300/410 West ern Tunnels & ave rns Pr oject Health and Safety Fil e | Health and Saf ety Fi le | No | No |
| 5 | C421 -BBM -C- RGN-N 105 _WS089- 50115 | C42_1 Tottenham Court Road - Western Ticket Hall Health & Safe ty File Grout Shaft 7 | Health and Safety Fil e | , No | No |
| 6 | C421-BBM-27-RGN-N 10,5_WS089-50005 | C4 21 Tott enham Court Road - Western Ticket Hall Health & Safe ty Fi le | Health and Safety File | No | No |
| 7 | C422-100 0-COM-SCC-1073 CC HSF file req LOR to CRL 151204 | CC40 5 - Healt h and Safety Info rmat io n | Health and Safety Fil e | No | No |
| 8 | C4 22-EWN-00532 | Employers Commun icati on - Dean St r eet Urban Realm Voids and Subsid ence | Ear ly Warn in g No i ce | Yes | No |
| 9 | Cellar Survey - Nort hwest | Cellar Sur vey - Northwest | Cellar Su r vey | Yes | Yes |
| 10 | Cellar Survey - So u t h we st | Cellar Survey - So u t h west | Cellar Survey | Yes | Yes |
| 11 | Cellar Su r vey - East | Cellar Su rv ey - East | Cellar Surv ey | Yes | Yes |
| 1 2 | C134-OVE- D-DDA-N105.:, I- 0 0 201 C0I | Existing Topograph ical an d Basement Surveys | Topo Sur vey | Yes | No |

Note: The Healt h and Saf ety Fil es are not contained in Appe n dix B, only list ed above

Note: Items 8 to 12 are contained in Appendix B fo llowing this table

N:\02 Other Offices\Other Offices Projects\London Crossrail
Tot Court Rd\C Documents\Reports\C\dar Report\Cellar
Report Rev 0.3\Appendix B - Cellar Information Obtained.pdf



Date:09/03/2016

422 TOTTENHAM COURT ROAD STATION

MACHE VIER*, So WITH TWICA TIN&.

PACKAGE : 000850 Design and Design Assurance

CONTRACTOR Order No. : S-C3259/000002

COMMUNICATION NUMBER : G0483 Source Document - Type: EWN No.: 00532

Ref.:

CONTRACTOR : WSP UK Ltd

SUBJECT: Dean Street Urban Realm - Voids and Subsidence

The Employer has raised Early Warning Notice No. 532 to the Project Manager regarding voids and subsidence which could potentially effect the Urban Realm works on Dean Street. The Employer issues the following text for the Consultant's information and will issue a further communication once a response has been received from the Project Manager.

Early Warning Notice C422-EWN-00632

"During the removal of reinforced concrete guidewall on Dean street between gridlines 4 and 5 the Contractor observed unexpected subsidence and uncovered unexpected brick arch structures. The structures have not been back filled with concrete. Photographs are attached to this EWN.

The Contractor Is concerned that these voids could affect the urban realm works and the quality/durability of the architectural paving adjacent to the ground floor ticket hall entrance in particular.

The Contractor notes in C208 McGee health and safety file Appendix J the Project Manager Issued PMI/C208/105 to McGee's which de-scoped the removal of buried structures outside the main WTH box.

The Contractor also notes that the this Health and Safety file (C208-MCG-0 1-STP-N105-50002) has AOt been Instructed and does not form part of the Volume 2C document list, whereas the C300 and C421 have been instructed.

The Contractor will arrange an EWN meeting in due course. "

Appendix B - 6.2.2 Early Warning Notice C422-EWN-00532

For Laing O'Rourke Construction Ltd Project Leader, Commercial Manager

Date

9:3:16.

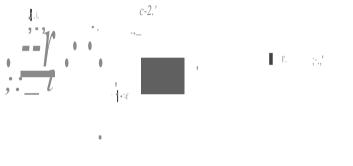
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Tot Court Rd\C Documents\Reports\Cellar Report\Cellar
Report Rev 0.3\Appendix B - Cellar Information Obtained.pdf







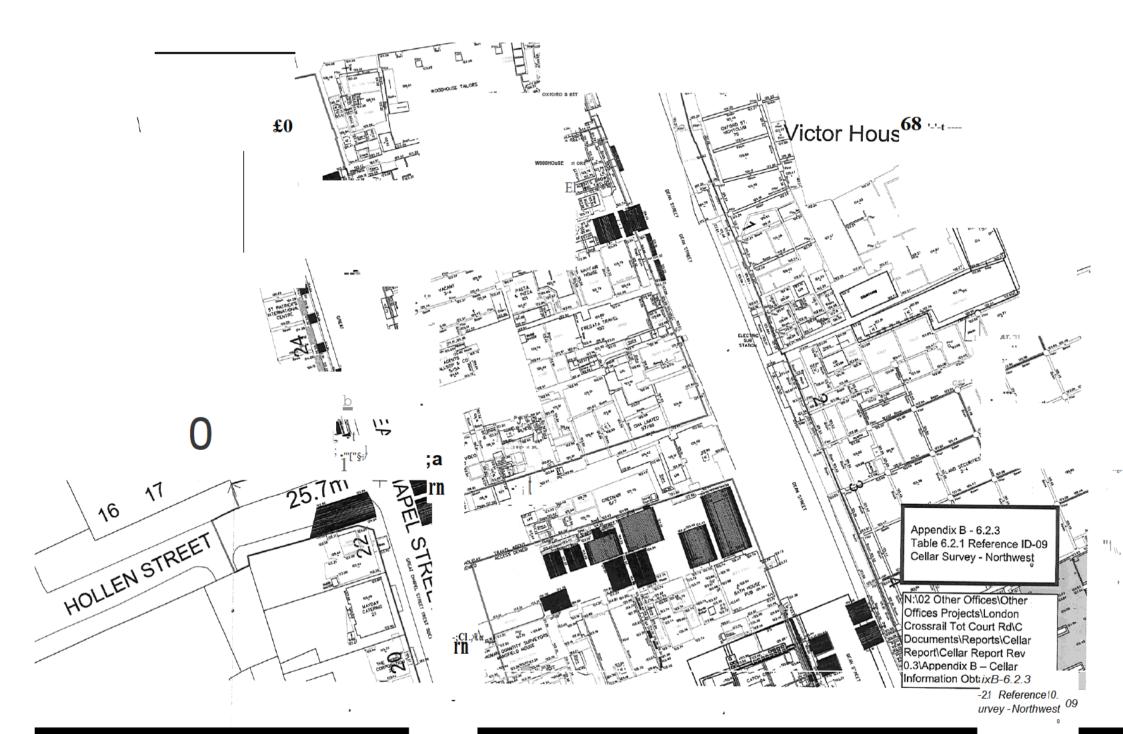
Appendix B - 6.2.2 Early Warning Notice C422-EWN-00532 Photograph 2 - Unsuitable backfill within redundant cellar

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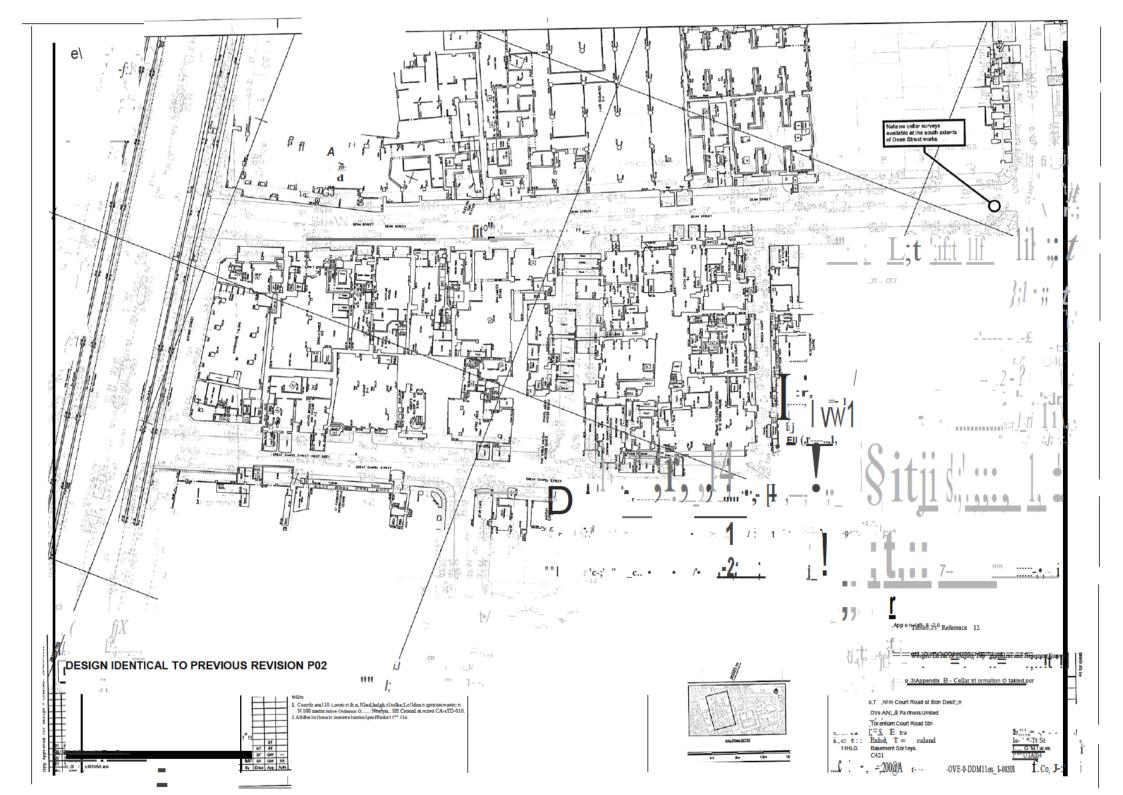


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C422- Tottenham Court Road Station -Stage D+ Report on Cellars C422-LAO-C-RGN-N105_WS089-50005 Rev 1.0

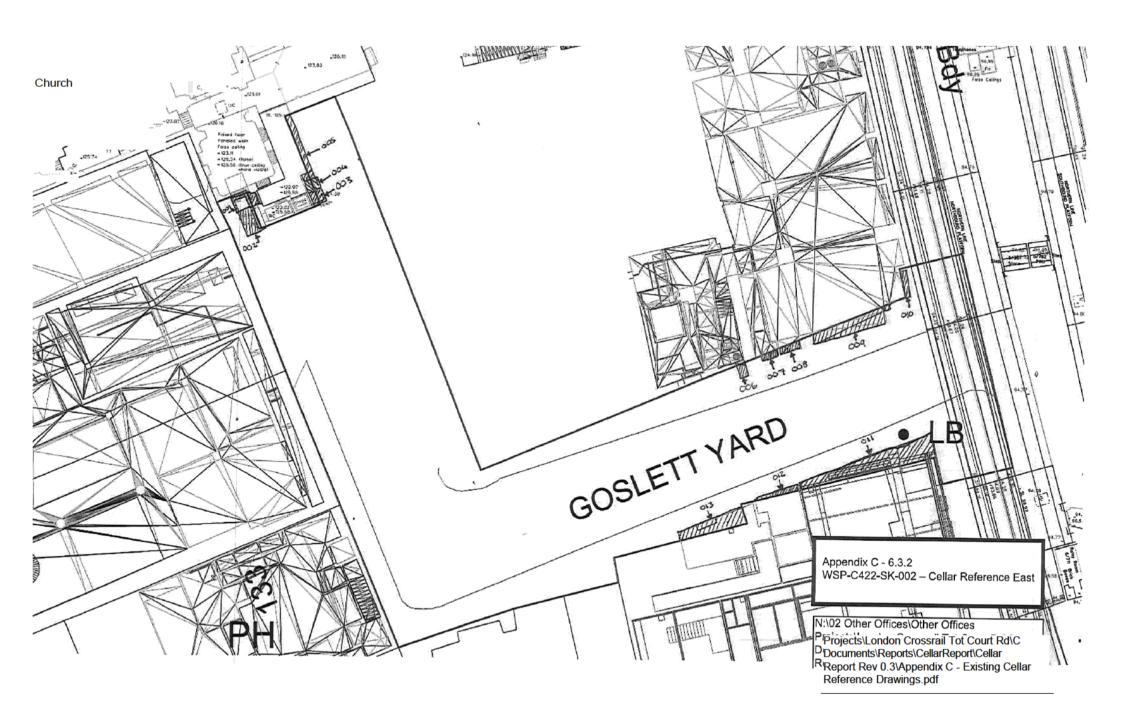
6.3 Appendix C - Existing Cellar Reference Drawings

6.3.1 WSP-C422-SK-001 - Cellar Reference West

6.3.2WSP-C422-SK-002 - Cellar Reference East

OT Template : CRL1-XRL-C -ZTM-CR001-50002 Rev 4.0









C422- Tottenham Court Road Station-Stage D+ Report on Cellars C422-LAO-C-RGN-N105_WS089-50005

Rev 1.0

6.4 Appendix D - Schedule of Existing Cellar Conditions

| Side of road | Great Chapel Street | Filled in Y/N? | Information |
|--------------|----------------------------|----------------|---|
| West | GCS 001 | N | |
| West | GCS 002 | N | |
| West | GCS 00 3 | N | |
| West | GCS 004 | N | |
| West | GCS 005 | N | |
| West | GCS 006 | N | |
| West | GCS 007 | N | |
| West | GCS 008 | N | |
| West | GCS 009 | N | |
| West | GCS 010 | N | |
| West | GCS_0II | N | |
| West | GCS 012 | N | |
| West | GCS_013 | N | |
| West | GCS 014 | N | |
| West | GCS_015 | N | |
| West | GCS 016 | N | |
| West | GCS_017 | N | |
| West | GCS 01 8 | N | |
| West | GCS_019 | N | |
| West | GCS 020 | N | |
| West | GCS 021 | N | |
| West | GCS 022 | N | |
| West | GCS 023 | N | |
| West | GCS 024 | N | |
| West | GCS 025 | N | |
| | | | According to file C208-MCG-01-STP -N105-50002, |
| East | GCS_IO0 | у | this cellar has been removed and backfilled to |
| | _ | | pile mat formation level. |
| , | | | According to file C208-MCG-01-STP-N 105-5000 2, |
| East | GCS_I0I | у | this cellar has been removed and backfilled to |
| | _ | | pile mat formation level. |
| | | | According to file C208-M CG-01-STP -N105-50002, |
| East | GCS 102 | у | this cellar has been removed and backfilled to |
| | | | pile mat formation level. |
| | | | According to file C208-M CG-01-STP-N105-50002, |
| East | GCS_103 | у | this cellar has been removed and backfilled to |
| | | - | pile mat formation level. |
| | | | According to file C208-M CG-01-STP-N 105-50002, |
| East | GCS 104 | у | this cellar has been removed and backfilled to |
| | | | pile mat formation level. |
| | | | According to file C208 -M CG-01- STP-N105-5000 2, |
| East | GCS_105 | | this cellar has been removed and backfilled to |
| | 35500 | | pile mat formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, |
| East | GCS_106 | у | this cellar has been removed and backfilled to |
| | 35500 | | pile mat formation level. |
| | | | According to file C208-MCG-01-STP-N 105-50002, |
| East | GCS 107 | у | this cellar has been removed and backfilled to |
| _401 | 300 101 | , | pile mat formation level. |
| | | | rat ioimation lovoli |

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| East | GCS_108 | у | According to file C208-MCG-01-STP-N105-50002, this cellar has been removed and backfilled to pile mat formation level. |
|------|---------|---|--|
| East | GCS_109 | у | According to file C208-MCG-01-STP-N105-50002, this cellar has been removed and backfilled to pile mat formation level. |
| East | GCS_IIO | у | According to file C208-MCG-01-STP-N105-50002, this cellar has been removed and backfilled to pile mat formation level. |
| East | GCS 111 | у | According to file C208-M CG-01 -STP-N105-50002, this cellar has been removed and backfilled to pile mat formation level. |
| East | GCS_112 | у | According to file C208-M CG-01-STP-N105-50002, this cellar has been removed and backfilled to pile mat formation level. |

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Cellar survey

| Side of Road | Dean Street | Filled in Y/N? | Information |
|--------------|-------------|----------------|---|
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS_00I | y | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C20 8-MCG-01-STP-N105-50002, this |
| West | OS 002 | У | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS_003 | у | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS_004 | y | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C20 8-MCG-01-STP-N105-50002, this |
| West | OS 005 | y | cellar has been removed and backfilled to pile mat |
| • | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS 006 | y | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS 007 | у | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS_008 | У | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS 009 | У | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | OS 010 | у | cella'r has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | | | cellar has been removed and backfilled to pile mat |
| | OS_0II | У | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| We.st | | | cellar has been removed and backfilled to pile mat |
| | OS 012 | У | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| West | | | cellar has been removed and backfilled to pile mat |
| | OS 013 | У | formation level. |
| l | 22.24 | | According to file C208-MCG-01-STP-N105-50002,this |
| West | OS_014 | y | cellar has been removed and backfilled to pile mat |
| _ | | | formation level. |
| East | OS 100 | N | |
| East | OS 101 | N | |
| East | OS 102 | N | |
| East | OS 103 | N | |
| East | OS 104 | N | |
| East | OS 105 | N N | |
| East | OS 106 | N | |

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| East | OS_107 | N | |
|------|--------|---|--|
| East | DS 108 | N | |
| East | DS_109 | N | |
| East | OS 110 | N | |
| East | OS 111 | N | |
| East | OS 112 | N | |
| East | OS 113 | N | |
| East | OS 114 | N | |
| East | OS 115 | N | |
| East | DS 116 | N | |
| East | DS 117 | N | |
| East | OS 118 | N | |
| East | DS 119 | N | |
| East | DS 120 | N | |
| East | OS 121 | N | |

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Cellar survey

| Side of road | Diadem Court | Filled in Y/N? | Information |
|--------------|--------------|----------------|---|
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | DC 001 | y | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C20 8-MCG-01-STP-N105-50002,this |
| North | DC_002 | y | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C20 8-MCG-01-STP-N105-50002, this |
| North | DC 003 | У | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | DC 004 | у | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | DC_005 | у | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | DC_006 | у | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208 -MCG-01-STP-N105-50002, this |
| North | DC 007 | у | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| South | DC 101 | N | |
| South | DC 102 | N | |
| South | DC 103 | N | |

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Cellar s:;irvey

| Side of road | Fareham Street | Filled in Y/N? | Information |
|--------------|----------------|----------------|---|
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS 001 | у | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS 002 | у | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS 003 | у | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS 004 | у | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | . FS 005 | у | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS_006 | у | formation level. |
| | | | According to file C20 8-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS 007 | У | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| North | | | cellar has been removed and backfilled to pile mat |
| | FS 008 | У | formation level. |
| | | | According to file C20 8-MCG-01-STP- N105-50002, this |
| South | FS 101 | У | cellar has been removed and backfilled to pile mat |
| | | | formation level. |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| South | E0 400 | 77 | cellar has been removed and backfilled to pile mat |
| | FS 102 | У | formation level. |
| 0 4 | | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FC 402 | V | cellar has been removed and backfilled to pile mat |
| | FS 103 | У | formation level. |
| Cauth | | | According to file C208-MCG-01-STP-N105-50002, this cellar has been removed and backfilled to pile mat |
| South | FS 104 | y | · |
| | 13 104 | J | formation level. According to file C208-MCG-01-STP-N105-50002, this |
| South | FS_105 | у | cellar has been removed and backfilled to pile mat |
| South | 1 3_103 | , | formation level. |
| South | | | According to file C208-MCG-01-STP-N105-50002, this |
| | FS_106 | у | cellar has been removed and backfilled to pile mat |
| | | | fo rmati on <u>level</u> . |
| | | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS_107 | у | cellar has been removed and backfilled to pile mat |
| Coun | 10_101 | | formation level. |
| | | | Torrida Torroll |

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| Goslett Yard | Filled in Y/N? | Information |
|--------------|----------------|--|
| GY 001 | N | |
| GY 002 | N | |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| GY_003 | у | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-OI-STP-N105-50002, this |
| GY 004 | у | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| GY_00S | У | cella r has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-M CG-01-STP-N105-50002, this |
| GY_006 | У | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| GY_007 | У | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208 -M CG-01-STP- N105-5000 2, this |
| GY 008 | У | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-M CG-01-STP-N105-5000 2, this |
| GY 009 | У | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208 -MCG-01-STP-N105-50002, this |
| GY_0I0 | у | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| GY 011 | N | |
| GY 012 | N | |
| GY 013 | N | , |

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6.5 Appendix E - Grout Shaft Drawings received 9 August 2016

- 6.5.1 Oxford Street OSD Sheet Piling General Arrangement
- 6.5.2 Oxford Street OSD Sheet Piling RC Details
- 6.5.3 Western Entrance Crane Layout Site Plan

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SET OUT POINTS

| \$ | EASTING(m) | NORTHING (m) |
|-------|------------|--------------|
| SOPS | 79880.502 | 36076.755 |
| SOP6 | 79875.296 | 36095.316 |
| SOP 7 | 79904.STT | 36099.992 |
| SOP 8 | 79909.649 | 36083.866 |

MEMBER SIZES

| MEMBER | SECTION |
|--------|-----------------|
| W01/1 | UC356x368x129 |
| W01/2 | UC35 6x368x129 |
| W02/1 | UC356x368x129 |
| W0212 | UC356x368x202 |
| W02J3 | UC356x406x235 |
| W03/1 | UC3 56x368x202 |
| W0J/2 | UC3 56x368 x202 |
| P01 | CHS 406x10 |
| P02 | CHS 508x12 |
| P03 | CHS 406x10 |
| P04 | CHS 508x12 |
| | |

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NOTES:

- 1) ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORK, CONTACT DESIGNER IN CASE OF DISCREPANCIES.
- STEELWORK SUPPLIER MUST SUBMIT FABRICATION DRAWINGS FOR APPROVAL PRIOR TO COMMENCING FABRICATION
- ALL STRUCTURAL STEEL TO BE GRADE S355 JO.
- ALL BOLTS TO BE GRADE 8 8 UNO
- STEELWORK FABRICATION AND ERECTION TOLERANCES TO BE IN ACCORDANCE WITH NSSS SECTIONS 7 AND 9.
- ALL WELDS TO BE CONTINUOUS 8mm FW UNO.
- BEARING SURFACES TO BE MACHINED FLAT IN ACCORDANCE WITH SECTION 7 2 3 OF NSSS
- NO BUTT WELDS PERMITTED IN MAIN FLANGES OR WEBS
- WELD TESTING & ACCEPTANCE SHALL COMPLY WITH THE REQUIREMENTS OF NSSS ANNEX A. B & C AND ANY PROJECT SPECIFIC
- 10) THE FABRICATOR MUST ENSURE THAT ALL STEELWORK HAS SUITABLE THROUGH-THICKNESS PROPERTIES FOR THE WELDING PROCEDURES
- 11) SHEET PILES TO BE PU22 PROFILE AND GRADE \$270 GP. MINIMUM LENGTH: 9m
- 12) STEEL SHIM PLATES, STEEL WEDGES OR GROUT BAGS TO BE USED TO ACHIEVE FULL BEARING BETWEEN THE SHEET PILES AND THE WALER BEAMS, IF SHIM PLATES OR WEDGES ARE USED THOSE HAVE TO BE TACK WELDED TO THE WALER BEAMS AND SHEET PILES
- 13) REINFORCEMENT SUPPLIER MUST SUBMIT DETAIL DRAWINGS AND BAR BENDING SCHEDULES FOR APPROVAL PRIOR TO COMMENCING FARRICATION
- 14) CONRETE: MIN C32/40-X0
- 15) REINFORCEMENT: B500 B
- 16) COVERTOREINFORCEMENT:
- 50mm 17) GROUT TO HAVE LEAST 60MPa STRENGTH AT AGE OF 28DAYS
- 18) HILTI HST ANCHORS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPACIFICATION.
- 19) FOR BONDED-IN REBARS USE HILTI HIT-RE 500 RESIN INSTALL IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION.
- 20) EXCAVATION CANCOMMENCE ONCE THE FOLLOWING STRENGTH HAS BEEN ACHIEVED:
 - a CONCRETE IN EXISTING SHAFT: 26N/mm2 20N/mm2
 - b CONCRETE OF CORBELS: c GROUT: 35Nlmm2
- 21) PROPS AND WALERS CAN BE REMOVED ONCE LEVEL -1 RAFT HAS BEEN POURED AND CURED AND THE GAP BETWEEN THE SHEETS AND THE RAFT HAS BEEN BACKFILLED WITH COMPACTED GRANULAR MATERIAL.



Appendix E - 6.5.1 **Grout Shaft Drawings received 9**

August 2016

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Report Rev 0.3\Appendix E - Grout Shaft

Drawings received 9 August 2016 pdf

Admirals Park, Crossways, Dartford, Kent. OA26SN

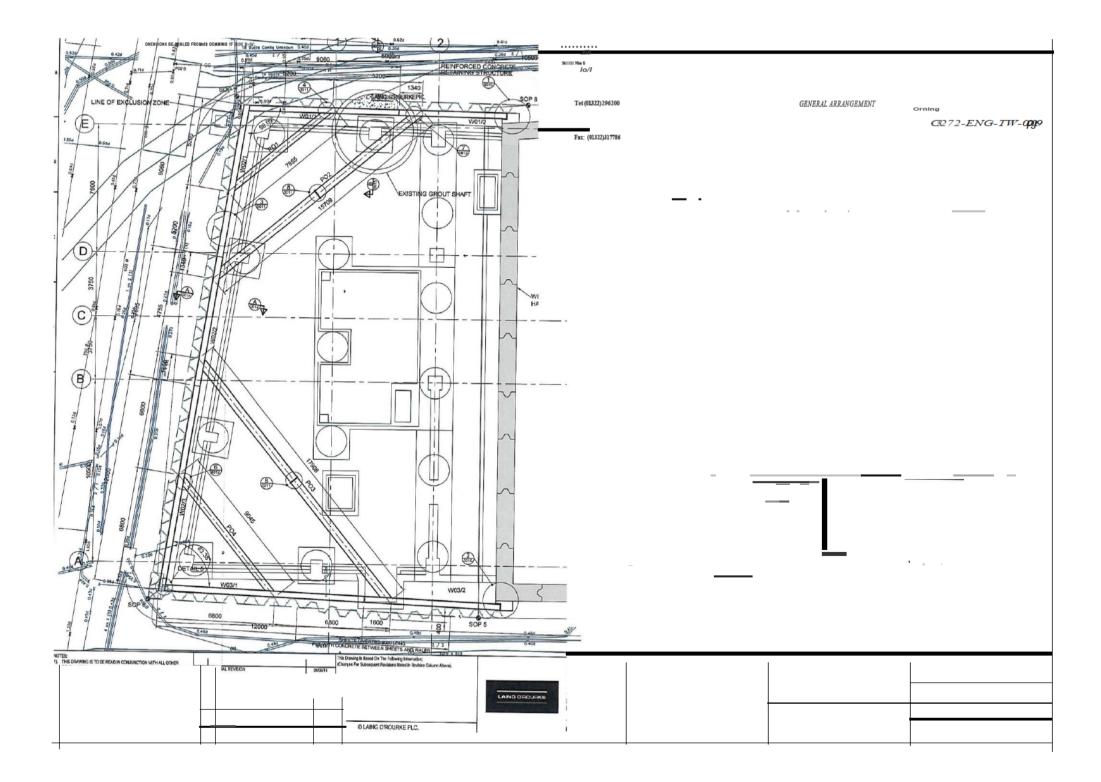
WESTERNTICKET

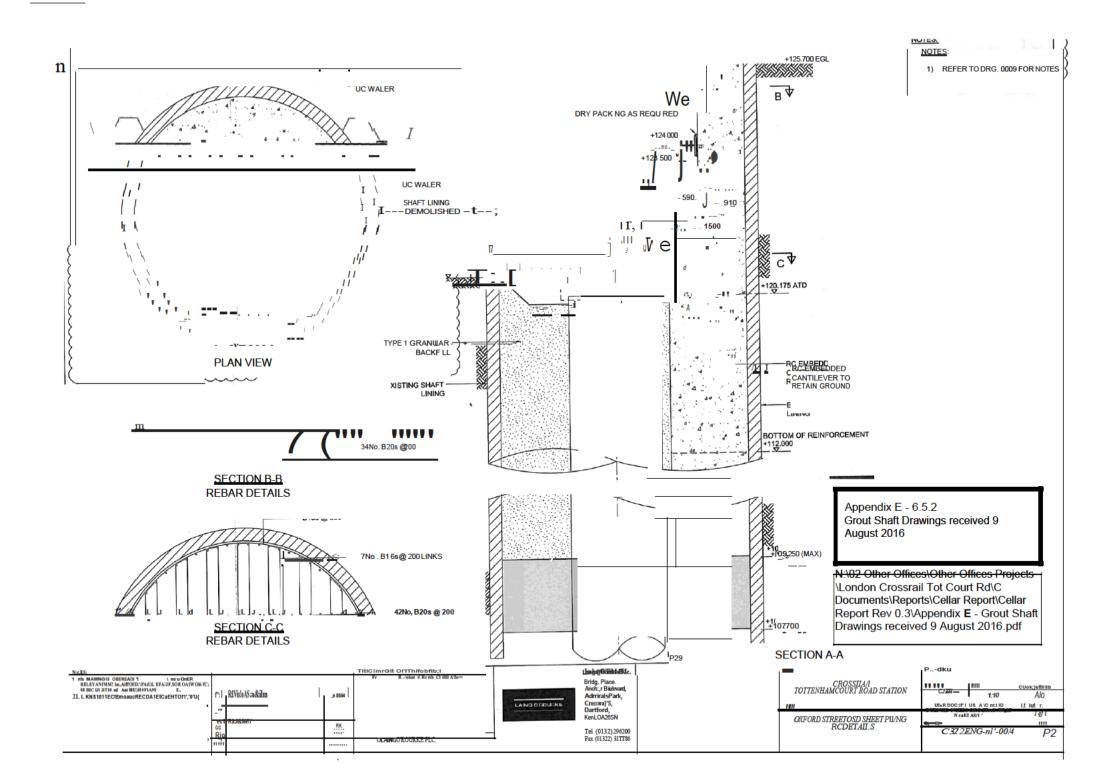
SITE GENERAL ARRANGEMENT TOTTENHAM COURTROAD STATION

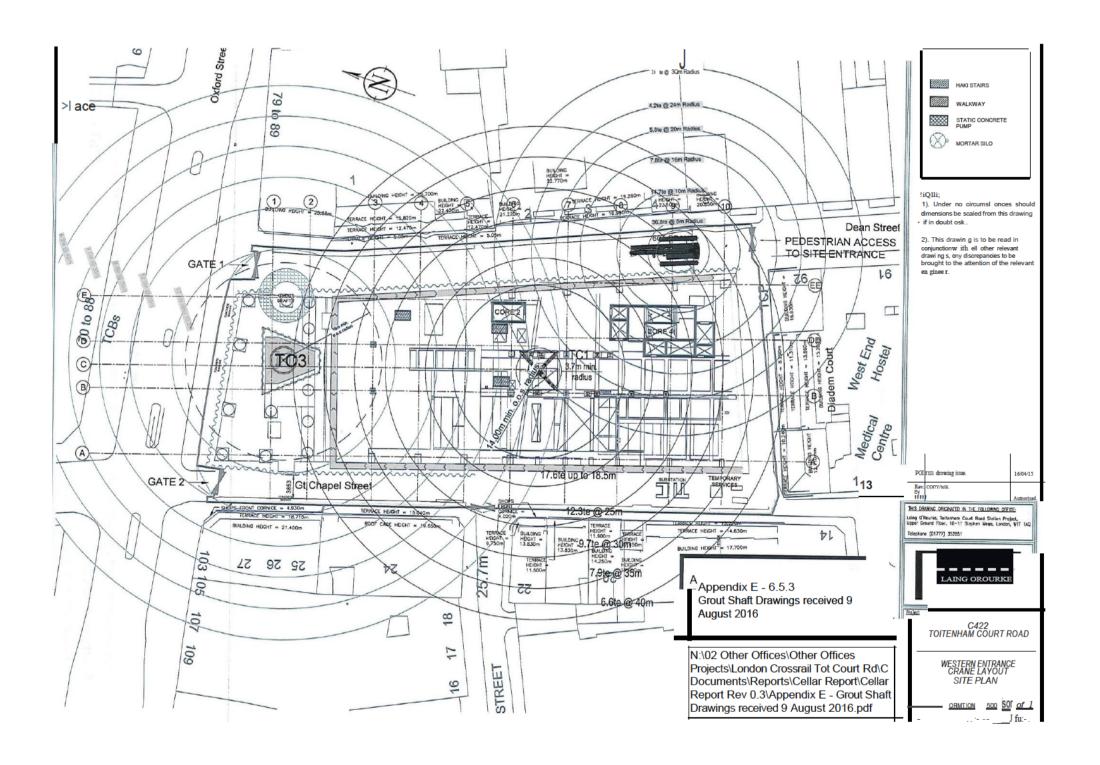
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6.6.1 Schedule of Cellars Left untouched

6.6.2 Schedule of Cellars Filled In

| Side of Road | Reference | Information |
|--------------|-----------|---|
| | G | reat Chapel Street |
| West | GCS 001 | No information to conclude if cellar is filled in. |
| West | GCS 002 | No information to conclude if cellar is filled in. |
| West | GCS 003 | No information to conclude if cellar is filled in. |
| West | GCS 004 | No information to conclude if cellar is filled in. |
| West | GCS 005 | No information to conclude if cellar is filled in. |
| West | GCS 006 | No information to conclude if cellar is filled in. |
| West | GCS 007 | No information to conclude if cellar is filled in. |
| West | GCS 008 | No informat ion to conclude if cellar is filled in. |
| West | GCS 009 | No information to conclude if cellar is filled in. |
| West | GCS 010 | No information to conclude if cellar is filled in. |
| West | GCS 011 | No information to conclude if cellar is filled in. |
| West | GCS 012 | No information to conclude if cellar is filled in. |
| West | GCS 013 | No information to conclude if cellar is filled in. |
| West | GCS 014 | No informat ion to conclude if cellar is filled in. |
| West | GCS 015 | No information to conclude if cellar is filled in. |
| West | GCS 016 | No information to conclude if cellar is filled in. |
| West | GCS 017 | No information to conclude if cellar is filled in. |
| West | GCS 018 | No information to conclude if cellar is filled in. |
| West | GCS 019 | No information to conclude if cellar is filled in. |
| West | GCS 020 | No information to conclude if cellar is filled in. |
| West | GCS 021 | No information to conclude if cellar is filled in. |
| West | GCS 022 | No information to conclude if cellar is filled in. |
| West | GCS 023 | No information to conclude if cellar is filled in. |
| West | GCS 024 | No information to conclude if cellar is filled in. |
| West | GCS 025 | No information to conclude if cellar is filled in. |
| | | Dean Street |
| East | DS 100 | No information to conclude if cellar is filled in. |
| East | DS 101 | No information to conclude if cellar is fille d'in. |
| East | DS 102 | No information to conclude if cellar is filled in. |
| East | DS_103 | No information to conclude if cellar is filled in. |
| East | DS 104 | No information to conclude if cellar is filled in. |
| East | DS 105 | No information to conclude if cellar is filled in. |
| East | DS 106 | No information to conclude if cellar is filled in. |
| East | DS -10 7 | No information to conclude if cellar is filled in |
| East | DS 108 | No information to conclude if cellar is filled in. |
| East | DS 109 | No information to conclude if cellar is filled in. |
| East | DS 110 | No information to conclude if cellar is filled in. |
| East | DS 111 | No information to conclude if cellar is filled in. |
| East | DS 112 | No information to conclude if cellar is filled in. |
| East | DS_II3 | No informat ion to conclude if cellar is filled in. |
| East | DS 114 | No information to conclude if cellar is filled in. |
| East | DS_115 | No information to conclude if cellar is filled in. |
| East | DS 116 | No information to conclude if cellar is filled in. |
| East | DS 117 | No information to conclude if cellar is filled in. |
| East | DS 118 | No information to conclude if cellar is filled in. |
| East | DS 119 | No information to conclude if cellar is filled in. |
| East | DS 120 | No information to conclude if cellar is filled in. |
| East | DS 121 | No information to conclude if cellar is filled in. |
| | | |

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| Diadem Court | | |
|--------------|---------------|--|
| South | DC 101 | No information to conclude if cellar is filled in. |
| South | DC 102 | No information to conclude if cellar is filled in. |
| South | DC 103 | No information to conclude if cellar is filled in. |
| Goslett Yard | | |
| | GY_001 | No information to conclude if cellar is filled in. |
| | GY 002 | No information to conclude if cellar is filled in. |
| | GY 011 | No information to conclude if cellar is filled in. |
| | GY 012 | No information to conclude if cellar is filled in. |
| | GY_013 | No information to conclude if cellar is filled in. |

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| Side of Road | Reference | Information |
|--------------|-----------|---|
| | | Great Chapel Street |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS_IO0 | cellar has been removed and backfilled to pile mat |
| | _ | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS 101 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS_102 | cellar has been removed and backfilled to pile mat |
| | _ | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS 103 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East . | GCS_104 | cellar has been removed and backfill d to pile mat |
| | _ | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS 105 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS_106 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS_107 | cellar has been removed and backfilled to pile mat |
| | 000_107 | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS 108 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| , | | According to file C208-MCG-01'-STP-N105-50002, this |
| East | GCS 109 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS_110 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS 111 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| East | GCS_112 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | Dean Street |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| West | D5_001 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-OI-STP-N105-50002, this |
| West | D5_002 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | |

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| | | According to file C208-MCG-01-STP-N105-50002, this | | |
|-------|--------------|---|--|--|
| West | DS_003 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | D5_004 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS_005 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | D5_006 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS 007 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | • | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS_008 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | D5_009 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS_0IO | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS_0II | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS_012 | cellar has been removed and backfilled to pile mat | | |
| | , | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | D5_013 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| West | DS_014 | cellar has been removed and backfilled to pile mat | | |
| | | . formation level. | | |
| | Diadem Court | | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| North | DC_001 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-M CG-01-STP-N105-50002, this | | |
| North | DC_002 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C208-MCG-01-STP-N105-50002, this | | |
| North | DC_003 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | According to file C20 8-MCG-01-STP-N105-50002, this | | |
| North | DC_004 | cellar has been removed and backfilled to pile mat | | |
| | | formation level. | | |
| | | | | |

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| | | According to file C208-MCG-01-STP-N105-50002, this |
|-------|---------|--|
| North | DC 005 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | DC 006 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | DC 007 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | Fareham Street |
| | | According to file C208 -MCG-01-STP-N105-50002, this |
| North | FS 001 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS_002 | cellar has been removed and backfilled to pile mat |
| 1 | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS 003 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS 004 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS 005 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS_006 | cellar has been removed and backfilled to pile mat |
| | _ | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS_007 | cellar has been removed and backfilled to pile mat |
| | _ | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| North | FS 008 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS 101 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS_102 | cellar has been removed and backfilled to pile mat |
| | . 55_ | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS 103 | · |
| | | c l r as !.n! ed an backfil(e o_eije_m t _ formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS_104 | cellar has been removed and backfilled to pile mat |
| 33411 | . 551 | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS 105 | cellar has been removed and backfilled to pile mat |
| Godin | 1 0 103 | formation level. |
| | | ioaiioii iovoi. |

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| | | According to file C208-MCG-01-STP-N105-50002, this |
|--------|--|---|
| South | FS_106 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| South | FS_107 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | Goslett Yard |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| | GY_003 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| | GY 004 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| | GY_005 | cellar has been removed and backfilled to pile mat |
| | • | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| | GY_006 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| | GY_007 | cellar has been removed and backfilled to pile mat |
| | | formation level. |
| | | According to file C208-MCG-01-STP-N105-50002, this |
| | GY_008 | cellar has been removed and backfilled to pile mat |
| | | format ion level. |
| | | According to file C208 -MCG-01-STP-N105-50002, this |
| GY_009 | cellar has been removed and backfilled to pile mat | |
| | | formation level. |
| | | According to file C208-MCG-01-STP- N105-50002,this |
| | GY 010 | cellar has been removed and backfilled to pile'mat |
| | | formation level. |

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6.7 Appendix G- WCC Response to Hollen Street Cellar Issue

From:

15 February 2016

Sent: To:

16:34

Subject:

FW: CRL C422 TCRd = FW: Hollen Street Cellar issue

- please include the email below within an Appendix [correspondence??] in the report please.

WSPUK

From: Sent: 15 February 2016 16:20

To:

Cal

Cc:

Hollen Street Cellar

issue Hi All,

As requested see below WCC response to queries on the Hollen Street

Cellar Kind regards

Manager Laing O'Rourke Infrostructure

Crossrail Tottenham Court Road Project

76 Oxford House

LAINC3 O' OURKE

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From:

Sent: 08 February 2016 13:45

To:

subject: RE: CRL C:422 TCR c1- flij. HolfenStreet Cellar

Most vaults and cellars in the City are unlikely to meet current highway loading standards. The majority of vaults and cellars were built in the late 19th and early 20th century, loading standards didn't really exist then and the owners of these vaults are only obliged to maintain their vaults in a good condition and meet the loading standards that existed at the time of their construction (if they existed). Vault owners are also not obliged to strengthen their structures every time weight limits on public roads are increased. It should be understood that in the City of

Westminster alone there are an estimated 15,000 privately owned vaults supporting the'f)ublic highway above - as highway authority it is virtually impossible for us to identify where all these vaults are; what condition they are in and what their load carrying capacity is, therefore we try and take a risk based approach to these struct ures.

To meet current UK loading sta ndar ds, Hollen Street would have to be regularly taking the heaviest of vehicles permitted on public roads in the UK, bearing in mind the width of this street and the tight turns, is it likely such vehicles will use this road? Probably not.

I doubt very much the kerb build-out on its own would have been used to protect the vaults (unless trief type kerbs or similar were used), the only way to prevent vehicles from loading a structure below ground is to erect a physical barrier, such as bollards. I could understand how the kerb-build out and bollards combined could act as a measure to protect the vaults below, the kerb build restricts the width (and hence the size of vehicle) and the bollard prevents a vehicle overrunning the kerb build out.

I hope this helps, and more than happy to discuss any specific details or conce rns if

necessary Regards

From:

Sent: 05 February 2016 13:24

0.

Subject: FW: CRL C422 TCRd = FW: Hollen Street Cellar

Importance: High

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Response to Hollen Street Cellar Issue.pdf

Hi

Isn't the question of whether it can carry weight one for you or

I have no idea why the kerb build-out was originally implemented but if it was to protect the cellar wouldn't it have bollards on it?

From:

Sent: 05 February 2016 11:50

To:

Cc:

Subject: CRL C422 TCRd = FW: Hollen Street Cellar

Importance: High

- there has been a lot of debate in our team about a kerb build out in Hollen Street. All the evidence to date regardst he Hollen street cellar points to it being unable to carry an unrestricted vehicle weight. I have attached an excerpt from the pre-construction C134 topographic survey which shows the kerbline build out and the bollard. There is also a photograph taken in November 2015.

Can Wee please clarify:

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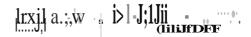
1. that the kerbline build out in Hollen Street was put in to protect the cellar,

| 2. Hollen Street can carry all UK legal vehicles irrespective of weight. | | |
|--|--|--|
| | | |
| | | |
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And if this is not the case, that

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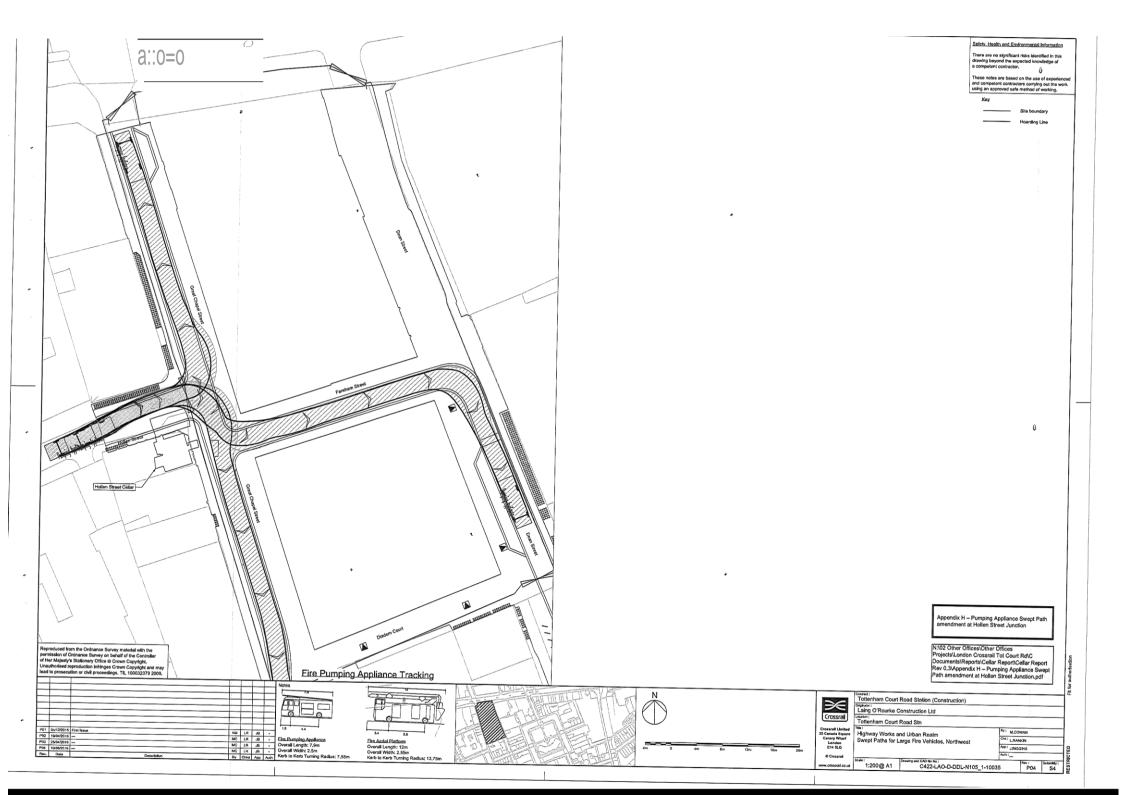
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6.8 Appendix H - Swept Path amendment at Hollen Street Junction







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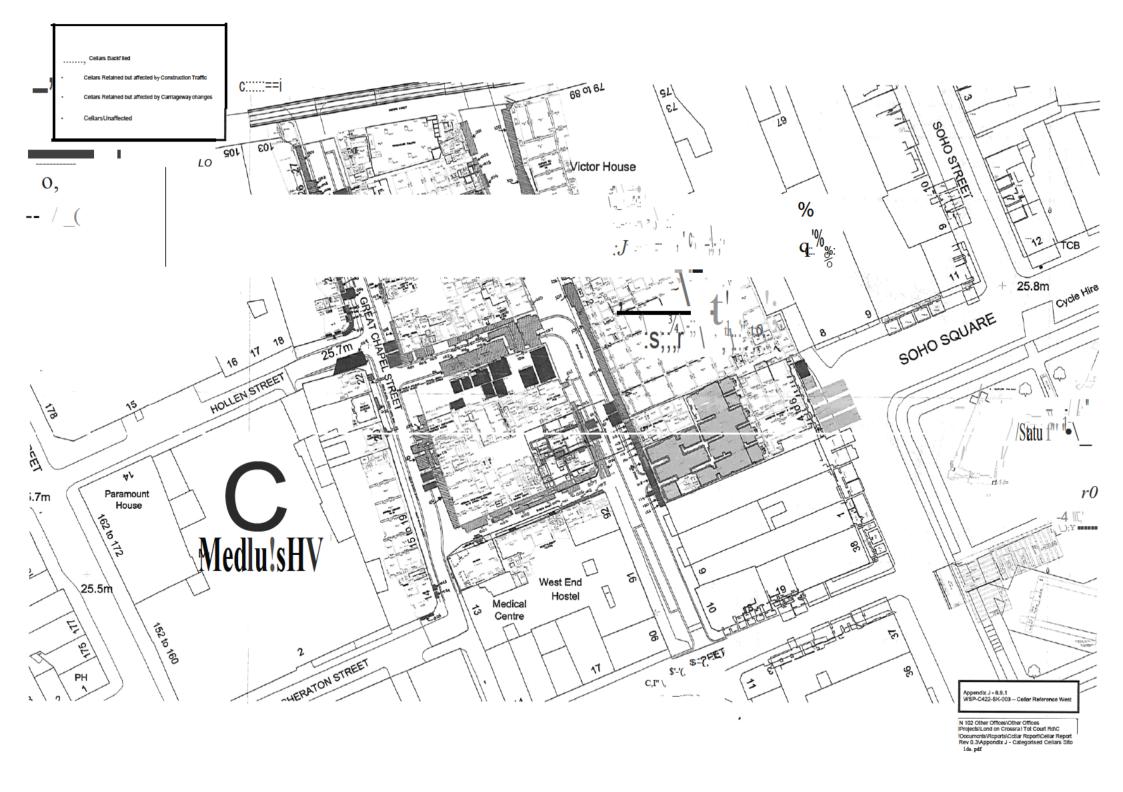
Rev 1.0

6.9 Appendix J - Categorised Cellars Site Wide

6.9.1 WSP-C422-SK-003 - Cellar

Reference West 6.9.2WSP-C422-SK-004 -

Cellar Reference East



KEY

Church

Cellars Backfilled

- Cellars Retained but affected by Construction Traffic
- Cellars Unaffected

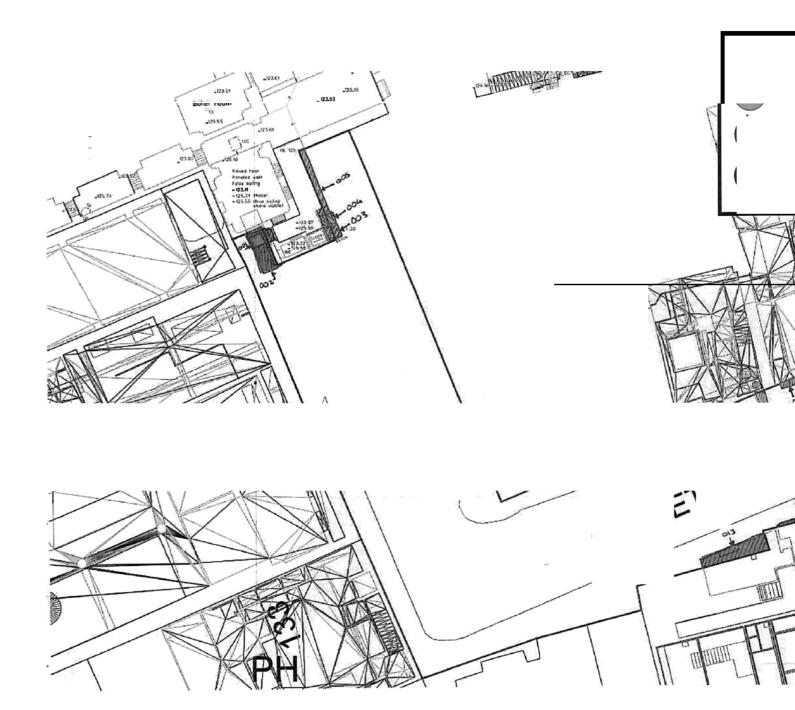
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