

PROPOSED RESIDENTIAL DEVELOPMENT AT
174 BURY OLD ROAD, HEYWOOD, ROCHDALE OL10 3LN
REMEDICATION VALIDATION REPORT
FOR PLOTS 1 TO 7

Client:

Wiggett Construction Ltd.
Viking House
449 Middleton Road
Chadderton
Oldham
OL9 9LB

Consultant:

Build Vision Ltd
Consulting Engineers
Middle Cottage
Ben Kaye Row
Holmfirth
HD9 1EF

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1. INTRODUCTION

- 1.1.1. The Build Vision Further Site Investigation and Remediation Strategy Report Ref: 1300, dated November 2021 should be referred to for further information.

2. REMEDIATION VALIDATION

2.1. Contamination

- 2.1.1. The remediation strategy recommended that the stockpiles of road planings, tyres, metals, wiring etc and the drum containing white spirit noted in the TJBA site reconnaissance should be removed and disposed off site appropriately by a specialist demolition or waste transfer contractor.
- 2.1.2. The demolition contractor D Hughes Demolition Ltd. removed the above and confirmed that during demolition of the house and outbuildings, there was no visible or odours of chemicals or hydrocarbons or any other contamination identified within the buildings or on the concrete floor slabs or in the sand beneath when they were grubbed up and crushed. Site photos taken during and after the demolition and site clearance works are enclosed in Appendix A.
- 2.1.3. GNL Construction Ltd. carried out the cut and fill and reduced level excavations across the whole of the site to formation level to achieve the levels for the proposed development and provide the plot construction and access road and hard pavement construction build ups and capping layers to the gardens.
- 2.1.4. GNL and Wiggett Construction Ltd. have confirmed that no evidence of contamination other than the made ground identified in the site investigation has been identified during the construction works.
- 2.1.5. The remediation strategy confirmed that the made ground present in proposed garden and soft landscaped areas should either be removed or capped by minimum 600mm capping layers, comprising minimum 150mm granular capillary break layer or geotextile membrane and the remainder as 'inert' subsoil and topsoil. Made ground was identified to depths of 0.3m to 6.5m, 2.8m to 6.5m in the former sand quarry area in the north central area of the site and 0.3m to 0.5m on the remainder of the site. If the made ground is removed, validation of the removal would be required and should comprise of photographic evidence of excavations during and after and provision of waste transfer notes.

- 2.1.6. GNL have provided minimum 600mm capping layers to the front and rear gardens of plots 1 to 7 comprising of minimum 150mm of soil over re-used natural sand excavated and stockpiled at the site to minimum depths of 600mm over geotextile membranes.
- 2.1.7. Topsoil has been imported from a greenfield source at fields at Cocker Mill Lane in Cowlshaw, Oldham on to site for use in the capping layers for the garden areas and the waste transfer notes are enclosed in Appendix A.
- 2.1.8. With regards to the soil and sand sampling density, the garden areas of plots 1 to 7 where the capping layers have been provided measure 930 sq.m and based on an average depth of 0.3m depth of soil and 0.3m depth of sand, the volume of soil = 279 cu.m. and the volume of sand = 279 cu.m therefore 3 no. minimum samples complies with the sampling frequency of the greenfield source of soil and natural sand of 1 per 200 cu.m and 3 no. minimum recommended in the remediation strategy.
- 2.1.9. DHI obtained 3 no. samples from the stockpile of topsoil and 3 no. samples from the stockpile of natural sand to be used in the gardens and the samples were tested for a general soil suite including heavy metals, PAHs and TPHs and the results of these have been assessed using 1% soil organic matter residential land use with plant uptake and inhalation pathway Tier 1 assessment levels for soil. The topsoil and sand test results were all below residential and inhalation assessment levels and therefore the risk is considered low and the topsoil is considered suitable for use in garden areas. The test results and assessment are enclosed in Appendix A.
- 2.1.10. GNL excavated 5 no. validation trial pits in the rear gardens of plots 2 to 7 in September 2022, 2 no. validation trial pits in the front and rear gardens of plot 1 in November 2022, 1 no. validation trial pit in the front gardens of plots 2 to 4 in March 2023 and 3 no. validation trial pits in the front gardens of plots 5 to 7 in July 2023 complying with guidance on validation rates of 1 no. per 2 to 3 plots requirements. The trial pits identified topsoil to depths of 150mm to 600mm over sand to depths of 600mm over geotextile membranes.
- 2.1.11. The validation trial pit location plan and photos are enclosed in Appendix A.
- 2.1.12. PE Barrier pipes have been provided for water supply pipes in accordance with the water pipe risk assessment enclosed in Appendix A.

2.1. Landfill Gas

- 2.1.1. Regarding gas risk, pre VGC installation gas monitoring of the former Boohole Landfill Site adjacent to the north resulted in CS3 ground gas regime and post VGC gas monitoring resulted in CS2, which has been adopted for the site. However, due to the above and to mitigate the risk and potential (although unlikely) failure of the VGC protecting the area to the south, T J booths proposed to protect the site to CS3 and discussions with RMBC contaminated land department indicated that CS3 gas protection measures will be accepted as a precautionary measure for the development. The risk from landfill gases is therefore considered medium.
- 2.1.2. Gas protection measures in accordance with CS3 from BS 8485 were recommended and for residential a score of 4.5 is required, this can be achieved by providing beam and block floor slabs with low permeability gas membranes with taped joints and sealed entries using specialist approved gas prevention tape and underfloor ventilated voids. The gas membranes should be methane gas membranes with integrated aluminium core and should be installed with reasonable level of workmanship in line with current good practice.
- 2.1.3. Gas protection measures have been provided and validated in accordance with CS3 and NHBC Amber 2 from BS8485 as shown on the foundation drawings and independent verification certification including photos enclosed in Appendix B.

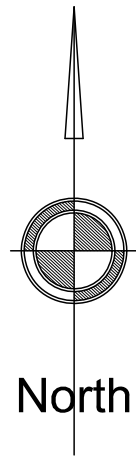
3. CONCLUSIONS

- 3.1.1. The remediation measures carried out have reduced the risk to end user receptors from the sources of the contamination and gases by effectively eliminating the pathway of direct contact/ingestion and migration.
- 3.1.2. The remediation measures carried out for Plots 1 to 7 are complete and considered suitable for use.

APPENDIX A

CONTAMINATION REMEDIATION VALIDATION

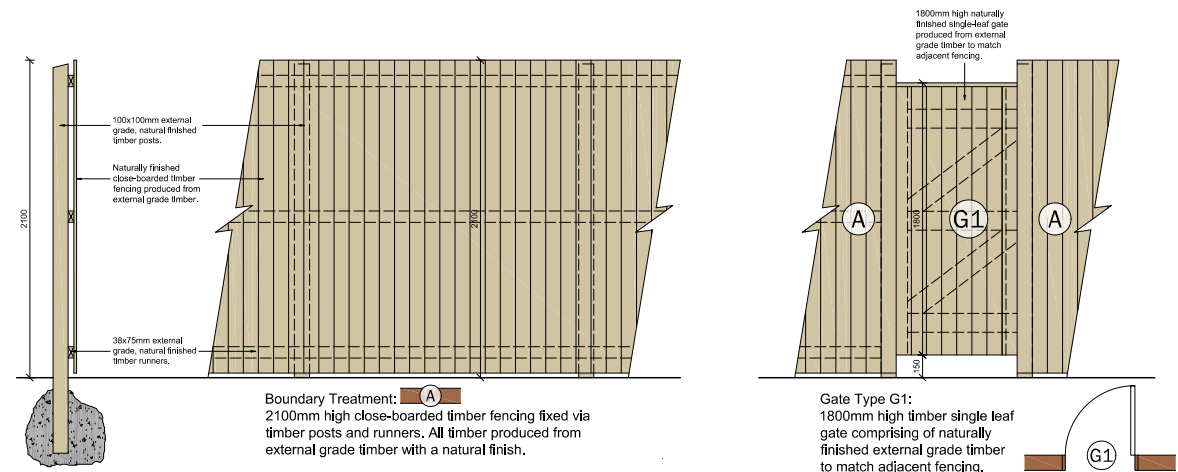
- § Site Layout
- § Site Photos
- § Validation Trial Pit Location Plan
- § Validation Trial Pit Photo's
- § Waste Transfer Notes for topsoil
- § Topsoil Test Results and Assessment
- § Sand Test Results and Assessment
- § Water pipe risk assessment



Existing trees and natural hedge to be retained along northern boundary - hedge trimmed to suitable height to ensure ease of future maintenance and long term retention - any gaps to be infilled with native hedge planting

Existing brick boundary wall at back of sheds to be retained when sheds are demolished - wall to be reduced in height to max 2m and repaired and made good to match as required

BACK
GARDENS



Key:

- Access road/driveway; bitmac finish
- Footpath; bitmac finish
- Paving slabs
- Permeable paved private driveway
- Grass/Soft Landscaping

100.00 Indicative ground floor level

Note: Landscaping/tree proposals shown on this drawing are indicative only, soft landscape proposals are to be in accordance with separate drawing and specification by specialists.

Hard surface finishes, levels and build-ups to be in accordance with consulting engineer's external works specification and details.

Plots 1 & 2 to be strip foundation, the remaining plots to be piled.

E	27/10/21	All house types updated to Technical Design & Plot 1 (Type D) entrance layout updated	YQ	GG
D	14/10/21	Plot 1 (Type D) layout updated	YQ	GG
C	14/10/21	Carriageway increased to 5000mm and turning head reverted to 5500mm	YQ	GG
B	11/10/21	Footways reduced to 1800mm and additional width given to the carriageway	YQ	GG
A	30/09/21	Turning head radii updated to 4.5m	YQ	GG
REV	DATE	AMENDMENT	BY	CHKD

HNAarchitects
Architecture | Planning | Design

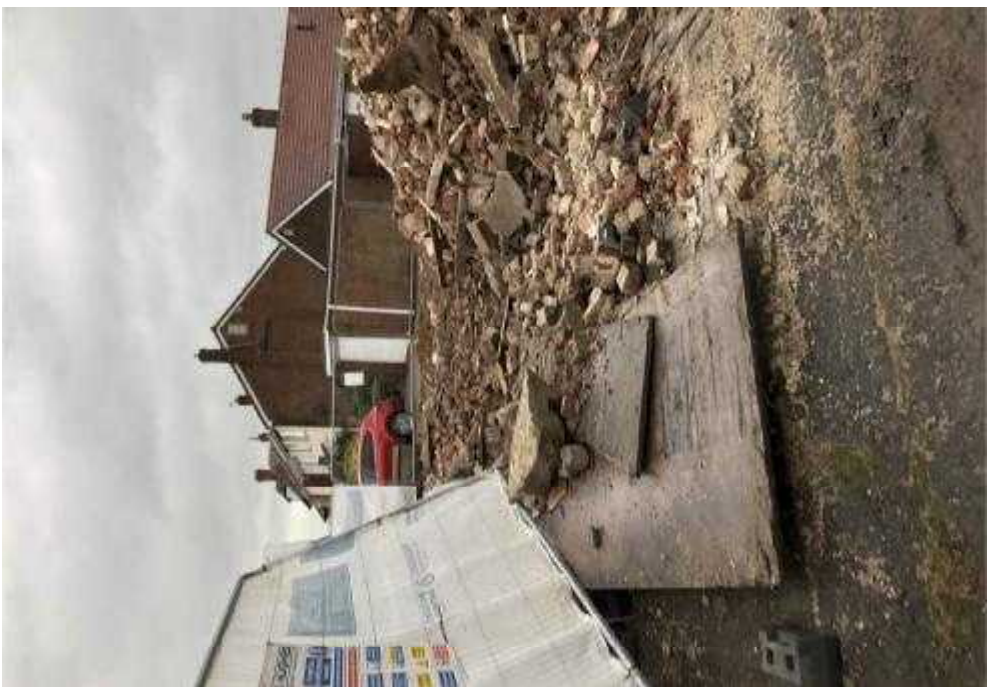
PROJECT:	174 Bury Old Road, Rochdale			
CLIENT:	Wiggett Construction Ltd			
DRAWING:	Proposed site plan			
DRAWN BY:	YQ	CHECKED BY:	GG	DATE: 29/09/21
STATUS:	Technical design		DRAWING No: 13623/TD 001	REVISION: E

DO NOT SCALE.
COPYRIGHT REMAINS WITH HNA ARCHITECTS Ltd.

HOLLINWOOD BUSINESS CENTRE, ALBERT STREET, OLDHAM, OL8 3QL
TEL: 0161 688 1820
E-MAIL: garry@hna-architects.co.uk : michael@hna-architects.co.uk

RIBA
Chartered Practice













North

Existing brick boundary wall at back of sheds to be retained when sheds are demolished - wall to be reduced in height to max 2m and repaired and made good to match as required

BACK GARDENS

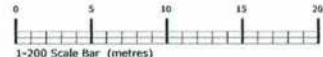
Existing trees and natural hedge to be retained along northern boundary - hedge trimmed to suitable height to ensure ease of future maintenance and long term retention - any gaps to be infilled with native hedge planting

Proposed native hedge planting to boundary with existing houses

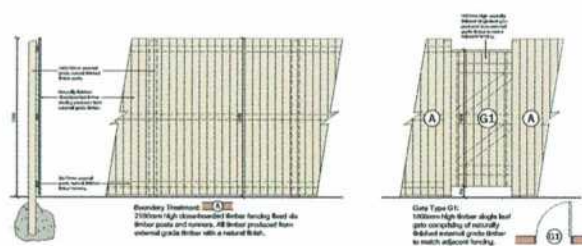
Existing screen fence to be retained

600mm high brick wall with pillars

Existing site entrance to be amended to suit proposed road layout with 6m radius kerbs - all to LA Highways dept approval



VALIDATION TRIAL PIT LOCATION



Key:

- Access road/driveway: Ultracolor finish
- Footpath: Ultracolor finish
- Paving slabs
- Permeable paved private driveway
- Grass/Soft Landscaping
- Indicative ground floor level
- Notes: Landscaping/tree proposals shown on this drawing are indicative only. All landscape proposals are to be in accordance with separate drawing and specification by specialists.
- Hard surface finishes, levels and build-ups to be in accordance with consulting engineer's external works specification and details.
- Plots 1 & 2 to be strip foundation, the remaining plots to be piled.

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REV	DATE	AMENDMENT	BY	CHKD

HNAarchitects
Architecture | Planning | Design

PROJECT:	174 Bury Old Road, Rochdale						
CLIENT:	Wiggett Construction Ltd						
DRAWING:	Proposed site plan						
DRAWN BY:	YQ	CHECKED BY:	GG	DATE:	28/09/21	SCALE:	1:250@A2
STATUS:	Technical design			DRAWING No:	13623/TD 001	REVISION:	E

VALIDATION TRIAL PIT PHOTOGRAPHS



PLOTS 1F



PLOTS 1F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P1R

Project No: 1300



TRIAL PIT P1R

Date: 21.11.2022

VALIDATION TRIAL PIT PHOTOGRAPHS

B_v



TRIAL PIT P2R



TRIAL PIT P2R

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P3R



TRIAL PIT P3R

VALIDATION TRIAL PIT PHOTOGRAPHS



PLOT 4R



PLOTS 4R

VALIDATION TRIAL PIT PHOTOGRAPHS



PLOT 6R



PLOT 6R

VALIDATION TRIAL PIT PHOTOGRAPHS



PLOT 7R



PLOT 7R

VALIDATION TRIAL PIT PHOTOGRAPHS



PLOTS 2F



PLOTS 2F

VALIDATION TRIAL PIT PHOTOGRAPHS



PLOT 5F



PLOT 5F

VALIDATION TRIAL PIT PHOTOGRAPHS



TRIAL PIT P6F

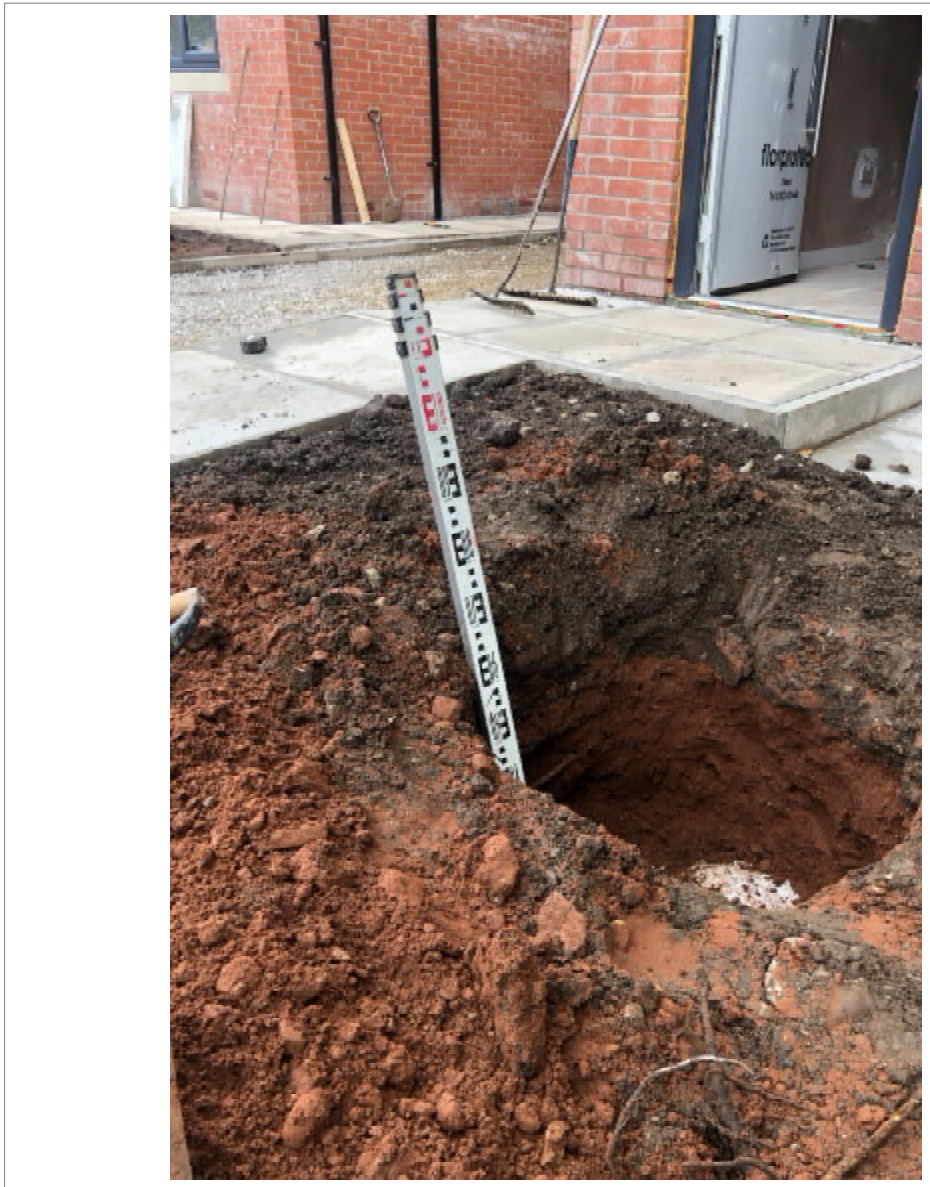
Project No: 1300



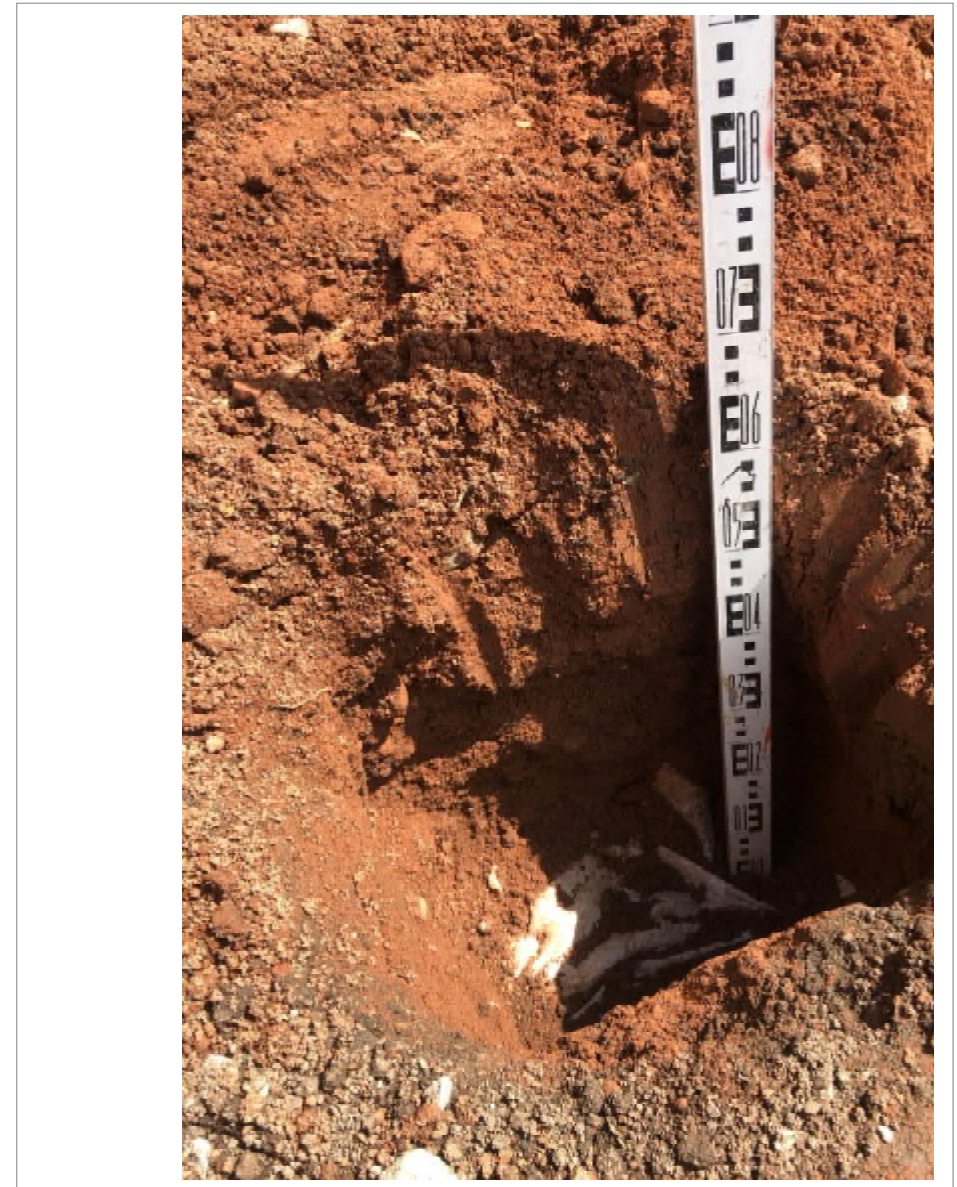
TRIAL PIT P6F

Date: 04.07.2023

VALIDATION TRIAL PIT PHOTOGRAPHS



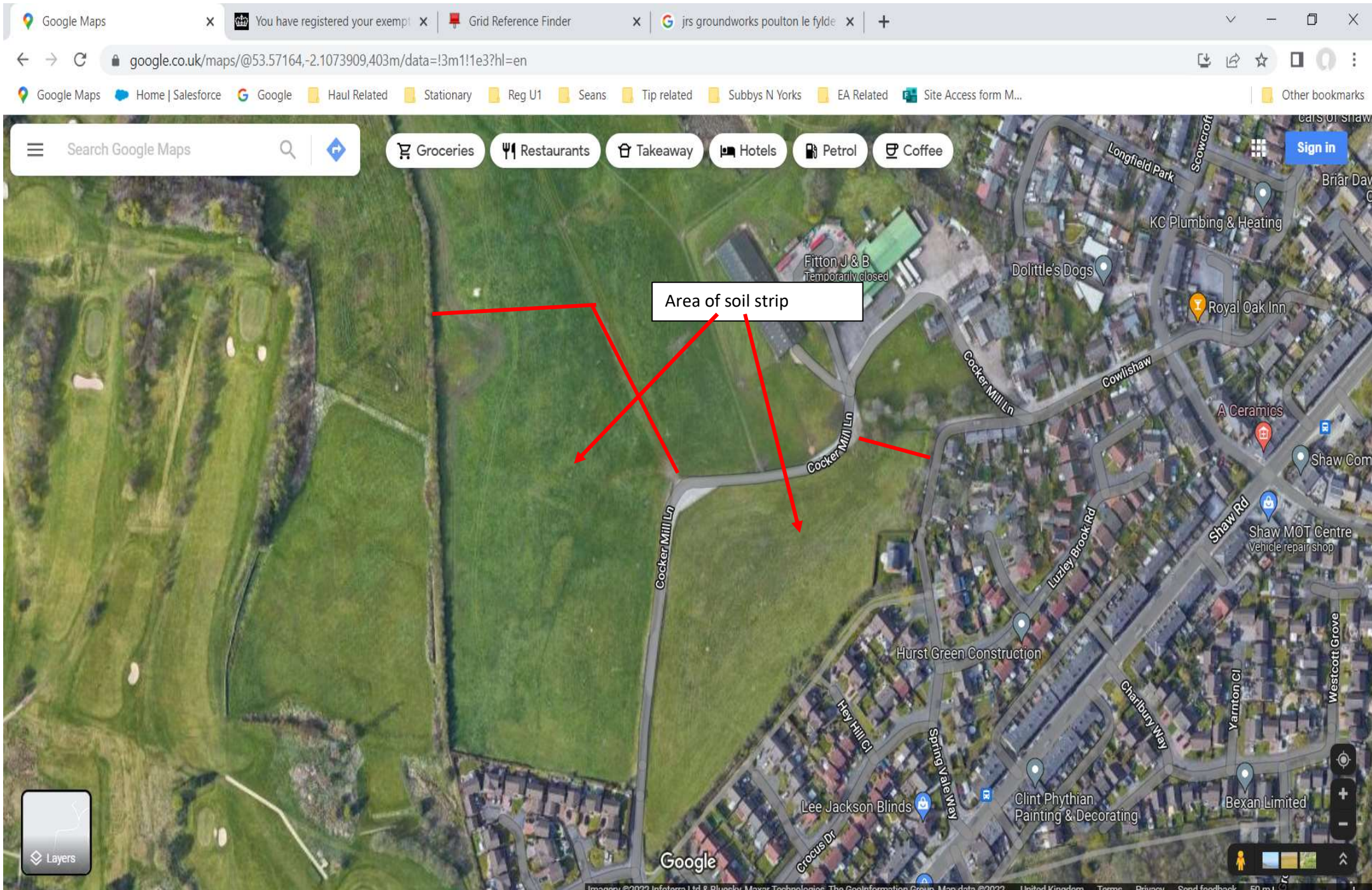
TRIAL PIT P7F



TRIAL PIT P7F

DHI Excavations Ltd 11 - 13 Church Street, Farnworth, Bolton. BL4 8AG		Serial No. DHI/ N/A						
Duty of Care -		SIC Code: 41.20/2	Official use only					
A Description of the waste	1. How is the waste contained? ☒ Loose ☐ Skips ☐ Sacks ☐ Drums ☐ Other (Specify):							
	2. Describe the waste being transferred: <u>INERT TOP SOIL</u>							
	3. Quantity: <u>500</u> kg/Tonnes /m3 Group number: Classification code: <u>17-05-04</u>							
	4. The Landfill Tax (Qualifying Material) order schedule 2011 ☐ Applicable							
B Producer Details	1. Full name (print): <u>DHI EXCAVATIONS LTD</u>							
	2. Company name, address and postcode: <u>11-13 CHURCH ST, FARNWORTH, BOLTON, BL4 8AG</u>							
	3. Which of the following are you? (Please tick one or more boxes)							
	<table border="1"> <tr> <td>A</td> <td>☐ Waste producer ☒ Soil Producer ☐ Waste collection/disposal authority ☐ Broker</td> </tr> <tr> <td>B</td> <td>☐ Holder of disposal / management licence ☐ Exempt from carrier Licence / Carrier number(s): Issued by:</td> </tr> <tr> <td>C</td> <td>☐ Exempt from licensing requirements ☐ Exempt from carrier registration Reason:</td> </tr> </table>			A	☐ Waste producer ☒ Soil Producer ☐ Waste collection/disposal authority ☐ Broker	B	☐ Holder of disposal / management licence ☐ Exempt from carrier Licence / Carrier number(s): Issued by:	C
A	☐ Waste producer ☒ Soil Producer ☐ Waste collection/disposal authority ☐ Broker							
B	☐ Holder of disposal / management licence ☐ Exempt from carrier Licence / Carrier number(s): Issued by:							
C	☐ Exempt from licensing requirements ☐ Exempt from carrier registration Reason:							
C Carrier Details	1. Full name (print): <u>DHI Excavations Ltd</u>							
	2. Company name, address and postcode: <u>11 - 13 Church Street, Farnworth, Bolton. BL4 8AG</u> ☒ Registered carrier (give number): <u>CBDU181466 SIC: 43120</u>							
We have fulfilled our obligation with regards to the waste hierarchy regulations 12 of Waste (England and Wales) Regulations 2011								
D First Transfer (producer to carrier)	1. Place of transfer: <u>COCKER HILL LANE, ROXTON, OLDHAM, OL2 6LQ</u>							
	2. Date of transfer: <u>22/10/22 TO MARCH 2023</u> (for multiple transfer give between dates, see notes)							
	3. Name and address of broker arranging transfer (if applicable):							
	4. Producers representatives WCL No. Name (print): Carriers representatives Signed: Name (print): <u>SEAN KINGSTON</u> Signed:							
E Disposer Details ☐ Waste ☒ Soils	1. Full name (print): <u>GNL CONSTRUCTION LTD</u>							
	2. Company name, address and postcode: <u>324 STYAL RD, HEALD GREEN, CHADDIE, SK8 3BS</u>							
	3. Which of the following are you? (Please tick one or more boxes)							
	<table border="1"> <tr> <td>☐ Holder of waste disposal / management licence (give number): Issued by: <u>N/A</u></td> </tr> <tr> <td>☐ Exempt from licence requirements (give reason): <u>N/A</u></td> </tr> </table>			☐ Holder of waste disposal / management licence (give number): Issued by: <u>N/A</u>	☐ Exempt from licence requirements (give reason): <u>N/A</u>			
☐ Holder of waste disposal / management licence (give number): Issued by: <u>N/A</u>								
☐ Exempt from licence requirements (give reason): <u>N/A</u>								
F Second Transfer (carrier to disposer)	1. Place of transfer: <u>172A BURY OLD RD, HEYWOOD, OL10 3LN</u>							
	2. Date of transfer: <u>22/10/22 TO MARCH 2023</u> (for multiple consignments give between dates)							
	3. Name and address of broker arranging transfer (if applicable):							
	4. Carriers representatives Disposers representatives Name (print): <u>SEAN KINGSTON</u> Name (print): <u>GARY GOLDRICK</u> Signed: Signed: <u>Gary Goldrick</u> Company name: <u>DHI Excavations Ltd</u> Company name: <u>GNL CONSTRUCTION LTD</u>							

Important: This page must be retained by you, on a register held by you, for at least two years from the date of the last transfer to which the note applies.
 White - DHI copy, Blue - Disposer copy, Yellow - Producer copy, Pink - Spare



Area of soil strip as indicated above: OL2 6LQ

INTERIM ANALYTICAL TEST REPORT

Envirolab Job Number: 22/04911
Issue Number: Int-2
Date: 30 May, 2022

Client: DHI Excavations
11-13 Church Street
Farnworth
Bolton
BL4 8AG.

Project Manager: Sean Kingston
Project Name: Cowlshaw Topsoil
Project Ref: Stockpile 1
Order No: N/A
Date Samples Received: 19/05/22
Date Instructions Received: 19/05/22
Date Analysis Completed: 27/05/22

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 22/04911

Client Project Name: Cowlshaw Topsoil

Client Project Ref: Stockpile 1

Lab Sample ID	22/04911/1							Units	Limit of Detection	Method ref
Client Sample No	SP1S1									
Client Sample ID	SP1 Sample 1									
Depth to Top										
Depth To Bottom										
Date Sampled	19-May-22									
Sample Type	Soil									
Sample Matrix Code	4A									
% Stones >10mm _A	<0.1							% w/w	0.1	A-T-044
pH _D ^{M#}	5.70							pH	0.01	A-T-031s
Sulphate (acid soluble) _D ^{M#}	700							mg/kg	200	A-T-028s
Cyanide (free) _A ^{M#}	<1							mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Arsenic _D ^{M#}	18							mg/kg	1	A-T-024s
Barium _D	107							mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.7							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	45							mg/kg	1	A-T-024s
Chromium _D ^{M#}	21							mg/kg	1	A-T-024s
Lead _D ^{M#}	106							mg/kg	1	A-T-024s
Mercury _D	<0.17							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	18							mg/kg	1	A-T-024s
Selenium _D ^{M#}	1							mg/kg	1	A-T-024s
Vanadium _D ^{M#}	33							mg/kg	1	A-T-024s
Zinc _D ^{M#}	81							mg/kg	5	A-T-024s
Vinyl Chloride (Chloroethene) _A [#]	<1							µg/kg	1	A-T-006s
trans 1,2-Dichloroethene _A [#]	<1							µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	<1							µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	<1							µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	<1							µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	<1							µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	<2							µg/kg	2	A-T-006s
Trichloroethene _A [#]	<1							µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	<1							µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	<1							µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	<1							µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	<1							µg/kg	1	A-T-006s

Envirolab Job Number: 22/04911

Client Project Name: Cowlshaw Topsoil

Client Project Ref: Stockpile 1

Lab Sample ID	22/04911/1							Units	Limit of Detection	Method ref
Client Sample No	SP1S1									
Client Sample ID	SP1 Sample 1									
Depth to Top										
Depth To Bottom										
Date Sampled	19-May-22									
Sample Type	Soil									
Sample Matrix Code	4A									
Asbestos in Soil (inc. matrix)										
Asbestos in soil ^o	NAD									A-T-045
Asbestos Matrix (visual) ^o	-									A-T-045
Asbestos Matrix (microscope) ^o	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ^o	N/A									A-T-045

Envirolab Job Number: 22/04911

Client Project Name: Cowlshaw Topsoil

Client Project Ref: Stockpile 1

Lab Sample ID	22/04911/1							Units	Limit of Detection	Method ref
Client Sample No	SP1S1									
Client Sample ID	SP1 Sample 1									
Depth to Top										
Depth To Bottom										
Date Sampled	19-May-22									
Sample Type	Soil									
Sample Matrix Code	4A									
PAH-16MS										
Acenaphthene _A ^{M#}	0.06							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.07							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.20							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.17							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.24							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.10							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.25							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.56							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.04							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.10							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.37							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.53							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	2.69							mg/kg	0.01	A-T-019s

Envirolab Job Number: 22/04911

Client Project Name: Cowlshaw Topsoil

Client Project Ref: Stockpile 1

Lab Sample ID	22/04911/1							Units	Limit of Detection	Method ref
Client Sample No	SP1S1									
Client Sample ID	SP1 Sample 1									
Depth to Top										
Depth To Bottom										
Date Sampled	19-May-22									
Sample Type	Soil									
Sample Matrix Code	4A									
Topsoil quality BS3882:2015 (without classification)										
% Coarse Fragment Content >2mm _A	0.0							N/A	0	A-T-044
% Coarse Fragment Content >20mm _A	0.0							N/A	0	A-T-044
% Coarse Fragment Content >50mm _A	0.0							N/A	0	A-T-044
Carbonate as CaCO _{3D}	<0.8							% w/w	0.83	CO3s
pH _D	5.89							pH	0.01	A-T-031s
Electrical conductivity (CaSO ₄ extract) _D	2070							µs/cm	10	A-T-037s
Loss on ignition (440°C) _D	8.0							% w/w	0.6	A-T-030s
Extractable phosphorus _D	12							mg/l	5	A-T-EXTMETS
Extractable Potassium (available) _D	80							mg/l	10	A-T-EXTMETS
Extractable Magnesium (available) _D	77							mg/l	10	A-T-EXTMETS
% Visible Contaminants >2mm _A	0.0							N/A	0	A-T-044
% Visible Contaminants Plastics _A	0.0							N/A	0	A-T-044
Sharps, number (in 1kg of sample) _A	0							N/A	0	A-T-044

Envirolab Job Number: 22/04911

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Client Project Ref: Stockpile 1

Lab Sample ID	22/04911/1							Units	Limit of Detection	Method ref
Client Sample No	SP1S1									
Client Sample ID	SP1 Sample 1									
Depth to Top										
Depth To Bottom										
Date Sampled	19-May-22									
Sample Type	Soil									
Sample Matrix Code	4A									
TPH CWG with Clean Up *C1										
Ali >C5-C6 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	15							mg/kg	1	A-T-055s
Total Aliphatics _A	16							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1							mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1							mg/kg	1	A-T-055s
Aro >C12-C16 _A	1							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	6							mg/kg	1	A-T-055s
Aro >C21-C35 _A	14							mg/kg	1	A-T-055s
Total Aromatics _A	21							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	37							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01							mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in *italic font* they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: DHI Excavations, 11-13 Church Street, Farnworth, Bolton, BL4 8AG.

Project No: 22/04911

Project: Cowlshaw Topsoil

Date Received: 19/05/2022 (am)

Clients Project No: Stockpile 1

Cool Box Temperatures (°C): 14.7

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	22/04911/1
Client Sample No	SP1S1
Client Sample ID/Depth	SP1 Sample 1
Date Sampled	19/05/22
A-T-006s	24/05/2022
A-T-019s	24/05/2022
A-T-022s	25/05/2022
A-T-024s	27/05/2022
A-T-028s	26/05/2022
A-T-030s	25/05/2022
A-T-031s	25/05/2022
A-T-037s	25/05/2022
A-T-042sFCN	24/05/2022
A-T-042sTCN	24/05/2022
A-T-044	25/05/2022
A-T-045	20/05/2022
A-T-050s	24/05/2022
A-T-055s	25/05/2022
A-T-EXTMETS	27/05/2022
Calc	
Calc-no stones	
CO3s	26/05/2022
Gravimetry	26/05/2022

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report



ANALYTICAL TEST REPORT

Contract no: 110343

Contract name: Colishaw Topsoil, Royton

Client reference: Stockpile 1

Clients name: DHI Excavations

Clients address: 11-13 Church Street
Farnworth
Bolton
BL4 8AG

Samples received: 15 June 2022

Analysis started: 15 June 2022

Analysis completed: 17 June 2022

Report issued: 17 June 2022

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing
NAD	No Asbestos Detected

Approved by:

Megan Harris
Senior Reporting Administrator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
110343-1	Sample 2	-	Clay with Roots	-	-	24.6
110343-2	Sample 3	-	Clay with Roots	-	-	24.9

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SOILS

Lab number			110343-1	110343-2
Sample id			Sample 2	Sample 3
Depth (m)			-	-
Date sampled			10/06/2022	10/06/2022
Test	Method	Units		
Arsenic (total)	CE127 ^M	mg/kg As	22	23
Barium (total)	CE127 ^M	mg/kg Ba	126	140
Cadmium (total)	CE127 ^M	mg/kg Cd	0.4	0.4
Chromium (total)	CE127 ^M	mg/kg Cr	79	65
Copper (total)	CE127 ^M	mg/kg Cu	41	43
Lead (total)	CE127 ^M	mg/kg Pb	104	110
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	24	24
Selenium (total)	CE127 ^M	mg/kg Se	1.7	1.8
Vanadium (total)	CE127 ^M	mg/kg V	46	44
Zinc (total)	CE127 ^M	mg/kg Zn	88	93
pH	CE004 ^M	units	6.1	6.0
Sulphate (total)	CE062 ^M	mg/kg SO ₄	541	566
Cyanide (free)	CE077	mg/kg CN	<1	<1
Cyanide (total)	CE077	mg/kg CN	<1	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5
PAH				
Naphthalene	CE087 ^M	mg/kg	0.03	0.04
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	0.09	0.06
Fluorene	CE087 ^U	mg/kg	0.05	0.04
Phenanthrene	CE087 ^M	mg/kg	0.74	0.53
Anthracene	CE087 ^U	mg/kg	0.14	0.13
Fluoranthene	CE087 ^M	mg/kg	1.02	0.83
Pyrene	CE087 ^M	mg/kg	0.94	0.77
Benzo(a)anthracene	CE087 ^U	mg/kg	0.43	0.37
Chrysene	CE087 ^M	mg/kg	0.51	0.43
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.50	0.43
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.19	0.15
Benzo(a)pyrene	CE087 ^U	mg/kg	0.39	0.35
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.31	0.28
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.05	0.05
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.29	0.23
PAH (total of USEPA 16)	CE087	mg/kg	5.69	4.67
TPH				
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<1	<1
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	1	<1
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	2	<1

Chemtech Environmental Limited

SOILS

Lab number			110343-1	110343-2
Sample id			Sample 2	Sample 3
Depth (m)			-	-
Date sampled			10/06/2022	10/06/2022
Test	Method	Units		
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	8	4
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	<15
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10
Total Aromatic (>C5-C44)	CE225	mg/kg	<19	<19
Total Aliphatic (>C5-C44)	CE225	mg/kg	<19	<19
Total Aliphatic/Aromatic (>C5-C44)	CE225	mg/kg	<19	<19
Volatiles				
Vinyl chloride	CE174	mg/kg	<0.01	<0.01
1,1-Dichloroethene	CE174	mg/kg	<0.01	<0.01
Trans-1,2-Dichloroethene	CE174	mg/kg	<0.01	<0.01
Cis-1,2-Dichloroethene	CE174	mg/kg	<0.01	<0.01
1,1,1-Trichloroethane	CE174	mg/kg	<0.01	<0.01
Carbon tetrachloride	CE174	mg/kg	<0.01	<0.01
1,2-Dichloroethane	CE174	mg/kg	<0.01	<0.01
Trichloroethene	CE174	mg/kg	<0.01	<0.01
1,1,2-Trichloroethane	CE174	mg/kg	<0.01	<0.01
Tetrachloroethene	CE174	mg/kg	<0.01	<0.01
1,1,1,2-Tetrachloroethane	CE174	mg/kg	<0.01	<0.01
Subcontracted analysis				
Asbestos (qualitative)	\$	-	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Barium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ba
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Vanadium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg V
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	M	100	mg/kg SO ₄
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	As received		0.5	mg/kg PhOH
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
CE174	Vinyl chloride	Headspace GC-MS	As received		0.01	mg/kg
CE174	1,1-Dichloroethene	Headspace GC-MS	As received		0.01	mg/kg
CE174	Trans-1,2-Dichloroethene	Headspace GC-MS	As received		0.01	mg/kg
CE174	Cis-1,2-Dichloroethene	Headspace GC-MS	As received		0.01	mg/kg
CE174	1,1,1-Trichloroethane	Headspace GC-MS	As received		0.01	mg/kg
CE174	Carbon tetrachloride	Headspace GC-MS	As received		0.01	mg/kg
CE174	1,2-Dichloroethane	Headspace GC-MS	As received		0.01	mg/kg
CE174	Trichloroethene	Headspace GC-MS	As received		0.01	mg/kg
CE174	1,1,2-Trichloroethane	Headspace GC-MS	As received		0.01	mg/kg
CE174	Tetrachloroethene	Headspace GC-MS	As received		0.01	mg/kg
CE174	1,1,1,2-Tetrachloroethane	Headspace GC-MS	As received		0.01	mg/kg
CE225	Total Aromatic (>C5-C44)	Sum of Aliphatic & Aromatic VPH (>C5-C10) & EPH (>C10-C44)	As received		19	mg/kg
CE225	Total Aliphatic (>C5-C44)	Sum of Aliphatic & Aromatic VPH (>C5-C10) & EPH (>C10-C44)	As received		19	mg/kg
CE225	Total Aliphatic/Aromatic (>C5-C44)	Sum of Aliphatic & Aromatic VPH (>C5-C10) & EPH (>C10-C44)	As received		19	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
110343-1	Sample 2	-	N	
110343-2	Sample 3	-	N	

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Risk Parameter: Human Health - residential with plant uptake (1.0% SOM)
Data set: ALL

Project No: 1300 Client: Wiggett Construction Ltd.
Project: 174 Bury Old Road, Heywood

All values in mg/kg unless otherwise stated							Soil Type:	SOIL	SOIL	SOIL									
							Location:	S1	S2	S3									
							Depth:												
							Lab	S	S	S									
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	US ₉₅	Result of Significance Test												
								Potentially Suitable For Use	N.D.	N.D.	N.D.								
Asbestos	3	-	-		-	-													
General Suite																			
Arsenic	3	18	23		37		Potentially Suitable For Use	18	22	23									
Boron					290														
Cadmium	3	0.4	0.7		11		Potentially Suitable For Use	0.70	0.40	0.40									
Chromium (III)	3	21	79		910		Potentially Suitable For Use	21	79	65									
Chromium (VI)					6														
Copper	3	41	45		2400		Potentially Suitable For Use	45	41	43									
Lead	3	104	110		200		Potentially Suitable For Use	106	104	110									
Mercury, inorganic	3	0.17	0.5		40		Potentially Suitable For Use	0.17	0.50	0.5									
Mercury elemental	3	0.17	0.5		1.2		Potentially Suitable For Use	0.17	0.50	0.5									
Mercury Methyl	3	0.17	0.5		11		Potentially Suitable For Use	0.17	0.50	0.5									
Nickel	3	18	24		130		Potentially Suitable For Use	18	24	24									
Selenium	3	1	1.8		250		Potentially Suitable For Use	1	1.7	1.8									
Zinc	3	81	93		3700		Potentially Suitable For Use	81	88	93									
Cyanide (free)	3	1	1		24		Potentially Suitable For Use	1	1	1									
Phenol (total)	2	0.5	0.5		120		Potentially Suitable For Use		0.50	0.50									
Acenaphthene	3	0.06	0.09		210		Potentially Suitable For Use	0.06	0.09	0.06									
Acenaphthylene	3	0.01	0.02		170		Potentially Suitable For Use	0.01	0.02	0.02									
Anthracene	3	0.07	0.14		2400		Potentially Suitable For Use	0.07	0.14	0.13									
Benzo(a)anthracene	3	0.2	0.43		7.2		Potentially Suitable For Use	0.2	0.43	0.37									
Benzo(a)pyrene	3	0.17	0.39		2.2		Potentially Suitable For Use	0.17	0.39	0.35									
Benzo(b)fluoranthene	3	0.24	0.5		2.6		Potentially Suitable For Use	0.24	0.5	0.43									
Benzo(ghi)perylene	3	0.1	0.29		320		Potentially Suitable For Use	0.1	0.29	0.23									
Benzo(k)fluoranthene	3	0.07	0.19		77		Potentially Suitable For Use	0.07	0.19	0.15									
Chrysene	3	0.25	0.51		15		Potentially Suitable For Use	0.25	0.51	0.43									
Dibenz(a,h)anthracene	3	0.04	0.05		0.24		Potentially Suitable For Use	0.04	0.05	0.05									
Fluoranthene	3	0.56	1.02		280		Potentially Suitable For Use	0.56	1.02	0.83									
Fluorene	3	0.04	0.05		170		Potentially Suitable For Use	0.04	0.05	0.04									
Indeno(1,2,3,cd)pyrene	3	0.1	0.31		27		Potentially Suitable For Use	0.1	0.31	0.28									
Napthalene	3	0.03	0.04		2.3		Potentially Suitable For Use	0.03	0.03	0.04									
Phenanthrene	3	0.37	0.74		95		Potentially Suitable For Use	0.37	0.74	0.53									
Pyrene	3	0.53	0.94		620		Potentially Suitable For Use	0.53	0.94	0.77									
VOCs-BTEX & MTBE																			
Benzene	1	0.01	0.01		0.087		Potentially Suitable For Use	0.01											
Toluene	1	0.01	0.01		130		Potentially Suitable For Use	0.01											
Ethylbenzene	1	0.01	0.01		47		Potentially Suitable For Use	0.01											
Xylene o-	1	0.01	0.01		60		Potentially Suitable For Use	0.01											
Xylene m-	1	0.01	0.01		59		Potentially Suitable For Use	0.01											
Xylene p-	1	0.01	0.01		56		Potentially Suitable For Use	0.01											
MTBE	1	0.01	0.01		49		Potentially Suitable For Use	0.01											
TPH Fractions																			
TPH ali EC05-EC06	3	1	1		42		Potentially Suitable For Use	1	1	1									
TPH ali >EC06-EC08	3	1	1		100		Potentially Suitable For Use	1	1	1									
TPH ali >EC08-EC10	3	1	1		27		Potentially Suitable For Use	1	1	1									
TPH ali >EC10-EC12	3	1	6		48		Potentially Suitable For Use	1	6	6									
TPH ali >EC12-EC16	3	1	6		24		Potentially Suitable For Use	1	6	6									
TPH ali >EC16-EC35	3	11	16		65000		Potentially Suitable For Use	16	15	15									
TPH ali >EC35-EC44	2	10	10		65000		Potentially Suitable For Use		10	10									
TPH aro EC05-EC07	3	1	1		70		Potentially Suitable For Use	1	1	1									
TPH aro >EC07-EC08	3	1	1		130		Potentially Suitable For Use	1	1	1									
TPH aro >EC08-EC10	3	1	1		34		Potentially Suitable For Use	1	1	1									
TPH aro >EC10-EC12	3	1	1		74		Potentially Suitable For Use	1	1	1									
TPH aro >EC12-EC16	3	1	1		140		Potentially Suitable For Use	1	1	1									
TPH aro >EC16-EC21	3	11	6		260		Potentially Suitable For Use	6	2	1									
TPH aro >EC21-EC35	3	10	14		1100		Potentially Suitable For Use	14	8	4									
TPH aro >EC35-EC44	2	10	1		1100		Potentially Suitable For Use		1	1									
TPH >EC44-EC70					1600														
Dioxins, furans & dioxin-like-PCBs																			
Total Dioxins, furans & DL-PCB (aerial dep)					0.0085														
Non-dioxin-like PCBs																			
PCB-28					0.2														
PCB-52					0.2														
PCB-101					0.34														
PCB-138					0.36														
PCB-153					0.36														
PCB-180					0.37														

Legend: MG denotes Made Ground, NAT denotes Natural Ground

Risk Parameter: Residential SOM 1% Inhalation Pathway only for VOC PAHs & TPHs
Data set: ALL

Project No: 1300 Client: Wiggett Construction Ltd.
Project: 174 Bury Old Road, Heywood

All values in mg/kg unless otherwise stated								Soil Type:	SOIL	SOIL	SOIL								
								Location:	S1	S2	S3								
								Depth:											
								Lab	S	S	S								
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	Cheby chev US ₉₅	US ₉₅	Result of Significance Test											
General Suite																			
Napthalene	3	0.03	0.04		16			Potentially Suitable For Use	0.03	0.03	0.04								
VOCs-BTEX & MTBE																			
Benzene	1	0.01	0.01		0.27			Potentially Suitable For Use	0.01										
TPH Fractions																			
TPH ali EC05-EC06	3	1	1		30			Potentially Suitable For Use	1	1	1								
TPH ali >EC06-EC08	3	1	1		73			Potentially Suitable For Use	1	1	1								
TPH ali >EC08-EC10	3	1	1		19			Potentially Suitable For Use	1	1	1								
TPH ali >EC10-EC12	3	1	6		93			Potentially Suitable For Use	1	6	6								
TPH ali >EC12-EC16	3	1	6		782			Potentially Suitable For Use	1	6	6								
TPH aro EC05-EC07	3	1	1		266			Potentially Suitable For Use	1	1	1								
TPH aro >EC07-EC08	3	1	1		626			Potentially Suitable For Use	1	1	1								
TPH aro >EC08-EC10	3	1	1		33			Potentially Suitable For Use	1	1	1								
TPH aro >EC10-EC12	3	1	1		182			Potentially Suitable For Use	1	1	1								
TPH aro >EC12-EC16	3	1	1		2000			Potentially Suitable For Use	1	1	1								

Legend: MG denotes Made Ground, NAT denotes Natural Ground



Final Report

Report No.: 22-28899-1

Initial Date of Issue: 09-Aug-2022

Client Sub Surface

Client Address: 3 Peel Street
Preston
Lancashire
PR2 2QS

Contact(s): Simon Gabbatt

Project 7208B 174 Bury Old Road, Heywood,
Greater Manchester

Quotation No.: **Date Received:** 01-Aug-2022

Order No.: **Date Instructed:** 01-Aug-2022

No. of Samples: 3

Turnaround (Wkdays): 7 **Results Due:** 09-Aug-2022

Date Approved: 09-Aug-2022

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: 7208B 174 Bury Old Road, Heywood, Greater Manchester

Client: Sub Surface	Chemtest Job No.:				22-28899	22-28899	22-28899
Quotation No.:	Chemtest Sample ID.:				1478417	1478418	1478419
	Client Sample ID.:				75,76,77	79,80,81	83,84,85
	Sample Location:				S1	S2	S3
	Sample Type:				SOIL	SOIL	SOIL
	Date Sampled:				28-Jul-2022	28-Jul-2022	28-Jul-2022
Determinand	Accred.	SOP	Units	LOD			
Moisture	N	2030	%	0.020	10	15	17
pH	U	2010		4.0	8.1	6.9	8.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.74	3.8	0.54
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	23	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.1	1.8	1.2
Sulphate (Total)	U	2430	%	0.010	0.029	0.041	0.028
Arsenic	U	2455	mg/kg	0.5	2.0	2.7	1.3
Cadmium	U	2455	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	3.9	3.8	4.0
Molybdenum	U	2455	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Copper	U	2455	mg/kg	0.50	8.7	11	6.0
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	3.2	3.3	3.0
Lead	U	2455	mg/kg	0.50	12	14	8.1
Selenium	U	2455	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Zinc	U	2455	mg/kg	0.50	22	24	18
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	0.29	< 0.10	0.43
Pyrene	U	2700	mg/kg	0.10	0.65	< 0.10	0.65
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.69	< 0.10	0.74
Chrysene	U	2700	mg/kg	0.10	0.49	< 0.10	0.82
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	2.1	< 2.0	2.6
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: 7208B 174 Bury Old Road, Heywood, Greater Manchester

Client: Sub Surface	Chemtest Job No.:				22-28899	22-28899	22-28899
Quotation No.:	Chemtest Sample ID.:				1478417	1478418	1478419
	Client Sample ID.:				75,76,77	79,80,81	83,84,85
	Sample Location:				S1	S2	S3
	Sample Type:				SOIL	SOIL	SOIL
	Date Sampled:				28-Jul-2022	28-Jul-2022	28-Jul-2022
Determinand	Accred.	SOP	Units	LOD			
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Risk Parameter: Human Health - residential with plant uptake (1% SOM)
Data set: ALL

Project No: 1300 Client: Wiggett Construction Ltd.
Project: 174 Bury Old Road, Heywood

All values in mg/kg unless otherwise stated							Soil Type:	SAND	SAND	SAND									
							Location:	S1	S2	S3									
							Depth:												
							Lab	S	S	S									
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	US ₉₅	Result of Significance Test												
								Asbestos											
General Suite																			
Arsenic	3	1.3	2.7		37		Potentially Suitable For Use	2	2.7	1.3									
Boron	3	0.54	3.8		290		Potentially Suitable For Use	0.74	3.8	0.54									
Cadmium	3	0.1	0.1		11		Potentially Suitable For Use	0.10	0.10	0.10									
Chromium (III)	3	3.8	4		910		Potentially Suitable For Use	3.9	3.8	4									
Chromium (VI)	3	0.5	0.5		6		Potentially Suitable For Use	0.5	0.5	0.5									
Copper	3	6	11		2400		Potentially Suitable For Use	8.7	11	6									
Lead	3	8.1	14		200		Potentially Suitable For Use	12	14	8.1									
Mercury, inorganic	3	0.05	0.05		40		Potentially Suitable For Use	0.05	0.05	0.05									
Mercury elemental	3	0.05	0.05		1.2		Potentially Suitable For Use	0.05	0.05	0.05									
Mercury Methyl	3	0.05	0.05		11		Potentially Suitable For Use	0.05	0.05	0.05									
Nickel	3	3	3.3		130		Potentially Suitable For Use	3.2	3.3	3									
Selenium	3	0.25	0.25		250		Potentially Suitable For Use	0.25	0.25	0.25									
Zinc	3	18	24		3700		Potentially Suitable For Use	22	24	18									
Cyanide (free)	3	0.5	23		24		Potentially Suitable For Use	0.50	23	0.50									
Phenol (total)	3	0.1	0.1		120		Potentially Suitable For Use	0.10	0.10	0.10									
Acenaphthene	3	0.1	0.1		210		Potentially Suitable For Use	0.1	0.1	0.1									
Acenaphthylene	3	0.1	0.1		170		Potentially Suitable For Use	0.1	0.1	0.1									
Anthracene	3	0.1	0.1		2400		Potentially Suitable For Use	0.1	0.1	0.1									
Benzo(a)anthracene	3	0.1	0.74		7.2		Potentially Suitable For Use	0.69	0.1	0.74									
Benzo(a)pyrene	3	0.1	0.1		2.2		Potentially Suitable For Use	0.1	0.1	0.1									
Benzo(b)fluoranthene	3	0.1	0.1		2.6		Potentially Suitable For Use	0.1	0.1	0.1									
Benzo(ghi)perylene	3	0.1	0.1		320		Potentially Suitable For Use	0.1	0.1	0.1									
Benzo(k)fluoranthene	3	0.1	0.1		77		Potentially Suitable For Use	0.1	0.1	0.1									
Chrysene	3	0.1	0.82		15		Potentially Suitable For Use	0.49	0.1	0.82									
Dibenz(a,h)anthracene	3	0.1	0.1		0.24		Potentially Suitable For Use	0.1	0.1	0.1									
Fluoranthene	3	0.1	0.43		280		Potentially Suitable For Use	0.29	0.1	0.43									
Fluorene	3	0.1	0.1		170		Potentially Suitable For Use	0.1	0.1	0.1									
Indeno(1,2,3,cd)pyrene	3	0.1	0.1		27		Potentially Suitable For Use	0.1	0.1	0.1									
Napthalene	3	0.1	0.1		2.3		Potentially Suitable For Use	0.1	0.1	0.1									
Phenanthrene	3	0.1	0.1		95		Potentially Suitable For Use	0.1	0.1	0.1									
Pyrene	3	0.1	0.65		620		Potentially Suitable For Use	0.65	0.1	0.65									
VOCs-BTEX & MTBE																			
Benzene	3	0.001	0.001		0.087		Potentially Suitable For Use	0.001	0.001	0.001									
Toluene	3	0.001	0.001		130		Potentially Suitable For Use	0.001	0.001	0.001									
Ethylbenzene	3	0.001	0.001		47		Potentially Suitable For Use	0.001	0.001	0.001									
Xylene o-	3	0.001	0.001		60		Potentially Suitable For Use	0.001	0.001	0.001									
Xylene m-	3	0.001	0.001		59		Potentially Suitable For Use	0.001	0.001	0.001									
Xylene p-	3	0.001	0.001		56		Potentially Suitable For Use	0.001	0.001	0.001									
MTBE	3	0.001	0.001		49		Potentially Suitable For Use	0.001	0.001	0.001									
TPH Fractions																			
TPH ali EC05-EC06	3	1	1		42		Potentially Suitable For Use	1	1	1									
TPH ali >EC06-EC08	3	1	1		100		Potentially Suitable For Use	1	1	1									
TPH ali >EC08-EC10	3	1	1		27		Potentially Suitable For Use	1	1	1									
TPH ali >EC10-EC12	3	1	1		48		Potentially Suitable For Use	1	1	1									
TPH ali >EC12-EC16	3	1	1		24		Potentially Suitable For Use	1	1	1									
TPH ali >EC16-EC35	3	2	1		65000		Potentially Suitable For Use	1	1	1									
TPH ali >EC35-EC44	3	1	1		65000		Potentially Suitable For Use	1	1	1									
TPH aro EC05-EC07	3	1	1		70		Potentially Suitable For Use	1	1	1									
TPH aro >EC07-EC08	3	1	1		130		Potentially Suitable For Use	1	1	1									
TPH aro >EC08-EC10	3	1	1		34		Potentially Suitable For Use	1	1	1									
TPH aro >EC10-EC12	3	1	1		74		Potentially Suitable For Use	1	1	1									
TPH aro >EC12-EC16	3	1	1		140		Potentially Suitable For Use	1	1	1									
TPH aro >EC16-EC21	3	2	1		260		Potentially Suitable For Use	1	1	1									
TPH aro >EC21-EC35	3	1	1		1100		Potentially Suitable For Use	1	1	1									
TPH aro >EC35-EC44	3	1	1		1100		Potentially Suitable For Use	1	1	1									
TPH >EC44-EC70					1600														
Dioxins, furans & dioxin-like-PCBs																			
Total Dioxins, furans & DL-PCB (aerial dep)					0.0085														
Non-dioxin-like PCBs																			
PCB-28					0.2														
PCB-52					0.2														
PCB-101					0.34														
PCB-138					0.36														
PCB-153					0.36														
PCB-180					0.37														

Risk Parameter: Residential SOM 1% Inhalation Pathway only for VOC PAHs & TPHs
Data set: ALL

Project No: 1300 Client: Wiggett Construction Ltd.
Project: 174 Bury Old Road, Heywood

All values in mg/kg unless otherwise stated								Soil Type:	SAND	SAND	SAND								
								Location:	S1	S2	S3								
								Depth:											
								Lab	S	S	S								
Chemicals of Potential Concern	No Samples	Min. Value	Max. Value	No. Samples >or = GAC	GAC	Cheby chev US ₉₅	US ₉₅	Result of Significance Test											
General Suite																			
Napthalene	3	0.1	0.1		16			Potentially Suitable For Use	0.1	0.1	0.1								
VOCs-BTEX & MTBE																			
Benzene	3	0.001	0.001		0.27			Potentially Suitable For Use	0.001	0.001	<0.00								
TPH Fractions																			
TPH ali EC05-EC06	3	1	1		30			Potentially Suitable For Use	1	1	1								
TPH ali >EC06-EC08	3	1	1		73			Potentially Suitable For Use	1	1	1								
TPH ali >EC08-EC10	3	1	1		19			Potentially Suitable For Use	1	1	1								
TPH ali >EC10-EC12	3	1	1		93			Potentially Suitable For Use	1	1	1								
TPH ali >EC12-EC16	3	1	1		782			Potentially Suitable For Use	1	1	1								
TPH aro EC05-EC07	3	1	1		266			Potentially Suitable For Use	1	1	1								
TPH aro >EC07-EC08	3	1	1		626			Potentially Suitable For Use	1	1	1								
TPH aro >EC08-EC10	3	1	1		33			Potentially Suitable For Use	1	1	1								
TPH aro >EC10-EC12	3	1	1		182			Potentially Suitable For Use	1	1	1								
TPH aro >EC12-EC16	3	1	1		2000			Potentially Suitable For Use	1	1	1								

Legend: MG denotes Made Ground, NAT denotes Natural Ground

Supplementary guidance for the selection of water pipes in land potentially affected by contamination

Introduction

In January 2011, UK Water Industry Research (UKWIR) published 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' (Ref 10/WM/03/21; the UKWIR Guidance). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as "land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated." The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions *except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development*.

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the UUW Guidance) which includes the Risk Assessment for Water Pipes (the RA).

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication 'Model Procedures for the Management of Land Contamination' (ref: CLR11) that sets out whether the land through

which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

How to contact us about the information in this leaflet



DeveloperServicesWater@uuplc.co.uk



0345 072 6067

Opening hours:
8am-5pm Mon to Thurs
8am-4.30pm Fri

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 Guidance on comparing soil contamination data with a critical concentration" may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment's Contaminated Land Research Report Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency's Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

- a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or
- b) more suitable pipe materials; or
- c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175: 2011

*Investigation of Potentially Contaminated Sites
Code of Practice*

CLAIRE/CIEH

*Guidance on comparing soil contamination data
with a critical concentration* 2008

Department of the Environment Contaminated Land Research Report

Sampling strategies for contaminated land
prepared by The Centre for Research into the Built
Environment, Nottingham Trent University (Ref:
CLR 4) 1994

Environment Agency

*Secondary Model Procedure for the Development
of Appropriate Soil Sampling Strategies for Land
Contamination*
(ref: R&D Technical Report P5-066/TR) 2000

Environment Agency

*Model Procedures for the Management of Land
Contamination* (ref: CLR11), 2004

Environment Agency P5-080/TR3

*The UK Approach for Evaluating Human Health
Risks from Petroleum Hydrocarbons in Soils* , 2005

UK Water Industry Research (UKWIR)

*Guidance for the Selection of Water Supply Pipes
to be used in Brownfield Sites*” (Ref 10/WM/03/21)
January 2011

Water Regulations Advisory Scheme (WRAS)

Information and Guidance Note 9-04-03

Laying Pipes in Contaminated Land 2002

Frequently asked questions

Why has UUW published supplementary guidance to the 'UKWIR Guidance for the Selection of Water Pipes to be used in Brownfield Sites'?

UUW agrees with the UKWIR Guidance in principle; we have published supplementary guidance to clarify some of the areas in which it will operate.

Does the UKWIR Guidance only apply to 'brownfield sites'?

Yes, the UKWIR Guidance does apply to brownfield sites; in addition United Utilities Water will apply this guidance and the UUW supplementary guidance to any greenfield sites which are potentially affected by contamination.

Who is responsible for completing/ signing the Risk Assessment for Water Pipes (RA)?

This may be the Developer, the Developers representative, or the competent person directing the land assessment. The signatory of the Risk Assessment for Water Pipes (RA) must ensure that all land assessments have been carried out in accordance with current standards and guidelines by or under the direction of a suitably qualified competent person. For water supply applications on land potentially affected by contamination, UUW requires the competent person to be either a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or a Specialist in Land Condition (SiLC). This level of competency is intended to promote good practice and high professional standards and is no greater than that required for planning purposes by Local Authorities.

Do we need to agree the number and location of soil samples with the Water Company as indicated by the UKWIR guidance following the Preliminary Risk Assessment (PRA)?

Where a preliminary risk assessment (PRA) highlights the need for a site investigation UUW considers it is a responsibility of the qualified competent person directing the land assessment to determine the location and frequency of sampling. UUW's role would be to confirm that the appropriate

choice of pipe material has been made on the basis of the information provided.

What do we do if the pipe route is not known when the Site Investigation report is commissioned?

Where the route of the pipe is not known at the site investigation stage, then any resultant pipe selection needs to take account of any contamination found on the site. Consideration should be given to identifying the route and depth of the pipeline at the site investigation stage to avoid unnecessary testing.

Is it acceptable not to undertake a site investigation and specify the use of barrier pipe which seems to be suitable for all conditions?

Not all brownfield land is contaminated, and because of that a default to barrier pipe is not an acceptable approach to UUW, due to the possibility of higher installation and future maintenance costs. The approach as to whether a site investigation is needed should be risk based. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the ground materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials.

Examples where defaulting to barrier pipe would not be acceptable:

Where a capping layer (non-contaminated) is introduced within which the pipes will be installed.

Sites with a potential low risk for contamination.

- Where liquid free phase product (e.g. oil or free solvent layers) is in the ground or groundwater in the vicinity of water pipes.

Where the route of the pipe could be diverted to another suitable location free from contamination.

Are UUW employees who will assess the Design Proposals for contaminated sites suitably qualified?

It is the role of the Developer's suitably qualified competent person to deal with or direct the assessment of land. UUW's role is to assess the Risk Assessment for Water

Pipes and supporting Site Assessment Report (SAR) which is provided with any new water supply application (ie. it has been provided in the correct format, proposals for pipe selection are included, the methodology is in line with the UKWIR Guidance and UUW Supplementary Guidance, it has been directed by a suitably qualified competent person etc.). If UUW do need to provide assistance or information in deciding pipe materials then the assessment would be carried out under the direction of a suitably qualified competent person.

What happens to existing PE that is in the ground under the "old" guidelines?

The latest UKWIR guidance and UUW's supplementary guidance are intended to be used to decide what pipe materials will be used for new water mains and services. It will have no effect for developers with regard to any parts of UUW's existing network.

Will the Developer be required to submit a fully completed Risk Assessment for Water Pipes (RA) and supporting Site Assessment Report (SAR), including pipe material recommendation, for both the option of a mains requisition application and the option of a self-lay application?

Yes, UUW expect the Developer, as defined in UUW Supplementary Guidance, to submit a Risk Assessment for Water Pipes (RA) and supporting Site Assessment Report (SAR), including pipe material recommendation, in respect of any water pipes being installed on the development irrespective of who is to install them.

Does Table 1 in UUW's Risk Assessment for Water Pipes (RA) replace any of the tables to be completed in the Site Assessment Report (SAR) as required in the UKWIR Guidance?

UUW does not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in UUW's RA replaces Table 3.1 of the UKWIR Guidance.

Have any other Water Companies adopted the UKWIR Guidance yet?

You will need to contact the water company concerned if you are intending to install water pipes outside UUW's licensed area.

About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

Risk assessment for water pipes (RA)

The risk assessment for water pipes will help you choose appropriate materials for your development. We are happy to deal with a risk assessment for water pipes in advance of any formal application for a new water supply.

If you need any help completing the form please call us on **0345 072 6067**.

Section 1: Development details	
Development name <i>(if it has one)</i>	
Development address	174 Bury Old Road, Heywood, Rochdale, OL10 3LN
OS Grid reference <i>(mid point)</i>	383797E , 410584N
Developer's name	Wiggett Construction Ltd
UUW reference number <i>(for UU use only)</i>	
Please provide details below of the current and historical use of the site and adjacent sites. <i>If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.</i> On site: abbatoir, partial quarrying and infilling, commercial sand drying, agricultural machinery, engine breaking, scrap yard, storage and repair of vehicles Adj. site: fields, infilled former sand quarry borehole landfill site and residential properties. Section 4.5 of T J Booth Associates 'Phase 1 Environmental Audit' report (referenced rep-tjba-brooks-174 bury old rd-phs I env-240715.docx, dated July 2015) provides further detail.	
Section 2: Preliminary risk assessment	
Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No
If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i> N/A	

Section 3: Intrusive site investigation																																	
Have you completed any intrusive site investigation?						☒ Yes ☐ No																											
Have you completed any none intrusive site investigation?						☐ Yes ☒ No																											
Date(s) when the site investigation(s) undertaken						<table border="1"> <tr> <td>D</td><td>D</td><td>0</td><td>5</td><td>2</td><td>0</td><td>1</td><td>8</td> </tr> <tr> <td>D</td><td>D</td><td>0</td><td>4</td><td>2</td><td>0</td><td>2</td><td>1</td> </tr> <tr> <td>D</td><td>D</td><td>0</td><td>8</td><td>2</td><td>0</td><td>2</td><td>1</td> </tr> </table>				D	D	0	5	2	0	1	8	D	D	0	4	2	0	2	1	D	D	0	8	2	0	2	1
D	D	0	5	2	0	1	8																										
D	D	0	4	2	0	2	1																										
D	D	0	8	2	0	2	1																										
At what level has groundwater been encountered?						metres below ground level or ☒ Not encountered																											
Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing. <i>If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.</i> A source of aldehydes, nitrobenzene, amines, ketones, chlorinated phenols and cresols was not identified, therefore testing for these analytes was not undertaken.																																	
If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE. Please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i> N/A																																	
Section 4: Site remediation																																	
Please provide details below of any site remediation (which may include a change in site levels) already completed. <i>If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.</i> N/A																																	
Has the PSRAS (Table 1) been completed using appropriate data after remediation?								☐ Yes ☒ No ☐ N/A																									
Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection. <i>If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.</i> T J Booth Associates recommended remediation measures to mitigate the risk to receptors from the elevated metal and PAH contaminants identified in the made ground. They advised that a cover layer of clean inert soil is imported to the site to be used in garden and soft landscaped areas. Depending on the final levels, existing made ground should either be covered with 600mm of clean soil or excavated to 600mm depth and replaced with clean soil. Existing made ground may remain beneath permanent hard paved areas. Providing no made ground and/or gross organic contamination is encountered at proposed pipeline depth (0.75-1.35mbgl), this is not considered to affect the pipework selection.																																	

Section 5: Final use of site

Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection.

If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.

The site is being redeveloped for residential usage, therefore significant chemical storage is not anticipated.

What water pipe materials are intended to be used on site?

☐ PE ☒ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B
Other (please specify): x

Section 6: Additional information

Please use the section below to provide any additional details to support your intended pipe selection.

Basic TPH banding was used for some of the contamination results in 2021, therefore the bandings cannot be directly compared to the UU risk assessment criteria and may overestimate the risk. As a result BH2 5.00-5.95mbgl, exceeds the PE pipe concentration for TPH EC10-EC16.

Fill material within the former quarry was shown to be similar composition in the sampling locations undertaken. The area of infilling has not been confirmed but is anticipated to be present in the pipeline locations to the properties in this area of the site. Therefore barrier pipe has been recommended.

Although testing has been taken from 3-5.95m the strata is logged as the same material from 1.2m so those elevated levels are likely to be present in influencing distance of the pipe work.

Section 7: Risk assessor

Name and relevant qualifications of person directing the risk assessment for water pipes

Michelle Thorniley MSc CSci MEnvSc

Name and address of risk assessor's company

LK Consult Ltd
Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
M23 2ZS

Date risk assessment performed

0 6 0 5 2 0 2 2

Section 8: Declaration

I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.

Name	Michelle Thorniley	Company	LK Consult Ltd
Telephone	0161 763 7200	Date	0 6 0 5 2 0 2 2

Please email the completed form and supporting information to DeveloperServicesWater@uuplc.co.uk or post to us at United Utilities Water, Developer Services, Second floor Grasmere House, Lingley Mere, Warrington WA5 3LP.



About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
Registered in England and Wales. Registered Number 2366678.

Table 1 - Pipe selection risk assessment summary (PSRAS)

1. Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.

2. If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.

What materials have been tested to populate Table 1 below?

☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

All concentrations in mg/kg								
Test Group	Testing Required?	PE threshold	Metal Pipes/ Barrier Pipe	Laboratory Detection Limit	Testing UKAS accredited Y/N	Maximum concentration at proposed pipeline depth See Note [2]	Maximum site concentration See Note [3]	Locations and depths where concentrations exceed proposed pipeline threshold
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	0.1	Y	1.3	1.3	BH2 3.00-3.45mbgl
Total BTEX & MTBE		0.1	Pass	0.1	Y	0.318	0.318	BH2 3.00-3.45mbgl
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	-	-	-	-	-
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	1.0	Y/N	6.0	6.0	BH1a 3.00-3.45mbgl
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	1.0	Y	164	164	BH2 5.50-5.95mbgl
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	1.0	Y/N	164	502	S2 0.00-0.50mbgl
Phenols* (from SVOC analysis)		2	Pass	1.0	Y	<1.0	<1.0	-
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	-	-	-	-	-
Ethers*	Only where identified	0.5	Pass	-	-	-	-	-
Nitrobenzene*		0.5	Pass	-	-	-	-	-
Ketones*		0.5	Pass	-	-	-	-	-
Aldehydes*		0.5	Pass	-	-	-	-	-
Amines		Fail	Pass	-	-	-	-	-
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]	-	-	-	-	-

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.

APPENDIX B

GAS PROTECTION MEASURES REMEDIATION VALIDATION

- § Foundation Layout Drawings
- § Gas Membrane Details
- § Gas Protection Measures Verification Certification

DO NOT SCALE - IF IN DOUBT ASK

GENERAL

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT PARTINGTON & ASSOCIATES', ARCHITECTS, SERVICE ENGINEERS AND SUBCONTRACTOR DRAWINGS.

REVIEW ALL DRAWINGS AND REPORT ANY DISCREPANCIES TO PARTINGTON & ASSOCIATES' PRIOR TO COMMENCEMENT.

ALL WORK IS TO COMPLY WITH ALL RELEVANT HEALTH AND SAFETY LEGISLATION AND REGULATIONS

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS AND LEVELS INCLUDING ANY ADJUTMENT TO EXISTING STRUCTURES TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT.

WORK FROM FIGURED DIMENSIONS ONLY.

NO DEVIATION FROM DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PARTINGTON & ASSOCIATES' PRIOR PERMISSION IN WRITING.

ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT SPECIFICATIONS ISSUED BY PARTINGTON & ASSOCIATES', BRITISH STANDARD CODES OF PRACTICE, STATUTORY REQUIREMENTS AND THE CONTRACT DOCUMENTS.

REINFORCED CONCRETE

ALL BELOW GROUND CONCRETE TO BE SULPHATE RESISTING DS-1 AC-1, DS-2 AC-2

ALL REINFORCEMENT TO HAVE 50mm MINIMUM COVER TO TOP, BOTTOM, SIDES AND ENDS UNLESS NOTED OTHERWISE.

HIGH YIELD REINFORCEMENT 'H' BARS ARE TO BE TYPE 2 BOND BARS WITH A CHARACTERISTIC TENSILE STRENGTH OF 460N/mm².

MILD STEEL REINFORCEMENT 'R' BARS ARE TO BE PLAIN ROUND BARS AS DESCRIBED IN BS 8110 WITH A CHARACTERISTIC TENSILE STRENGTH OF 250N/mm².

ALL MESH FABRIC REINFORCEMENT IS TO HAVE MINIMUM 450mm LAPS UNLESS NOTED OTHERWISE.

TEST CUBES ARE TO BE TAKEN AS DIRECTED BY THE ENGINEER.

CONCRETE SHALL BE COMPACTED BY MEANS OF A MECHANICAL VIBRATOR AND THE WORKABILITY SHALL BE SUCH THAT WHEN COMPACTED A DENSE CONCRETE IS PRODUCED FREE OF VOIDS.

ALL REINFORCEMENT ON THIS DRAWING IS DETAILED ON BAR BENDING SCHEDULE REF : 4255-20

BAR REINFORCEMENT SHALL BE TO BS 4466.

PRECAST FLOORS

PRE CAST FLOOR CONSTRUCTION IS TO BE DESIGNED BY SPECIALIST SUB-CONTRACTOR SUFFICIENT DESIGN CALCULATIONS AND DRAWINGS ARE TO BE SUBMITTED TO THE STRUCT' ENGINEER FOR COMMENT AND TO THE CHECKING AUTHORITY FOR BUILDING REGULATION APPROVAL.

UNFACTORED LOADINGS FOR PRECAST FLOORS ARE AS FOLLOWS :

IMPOSED - GENERAL FLOORS - 1.50 kN/m²
- PARTITIONS (GENERAL ALLOWANCE) -1.0kN/m²

DEAD - SELF WEIGHT- TO BE DETERMINED BY CONTRACTOR
- FLOOR FINISHES- REFER TO ARCHITECTS DRAWINGS

LAYOUTS AND DETAILED DRAWINGS FOR PRECAST FLOORS ARE TO BE PROVIDED TO THE ARCHITECT IN ORDER THAT ALL OPENINGS THROUGH THE FLOOR CONSTRUCTION CAN BE IDENTIFIED AND LOCATED.

PILED FOUNDATIONS

ALL PILES TO SPECIALIST SUB-CONTRACTORS DESIGN AND DETAILS.

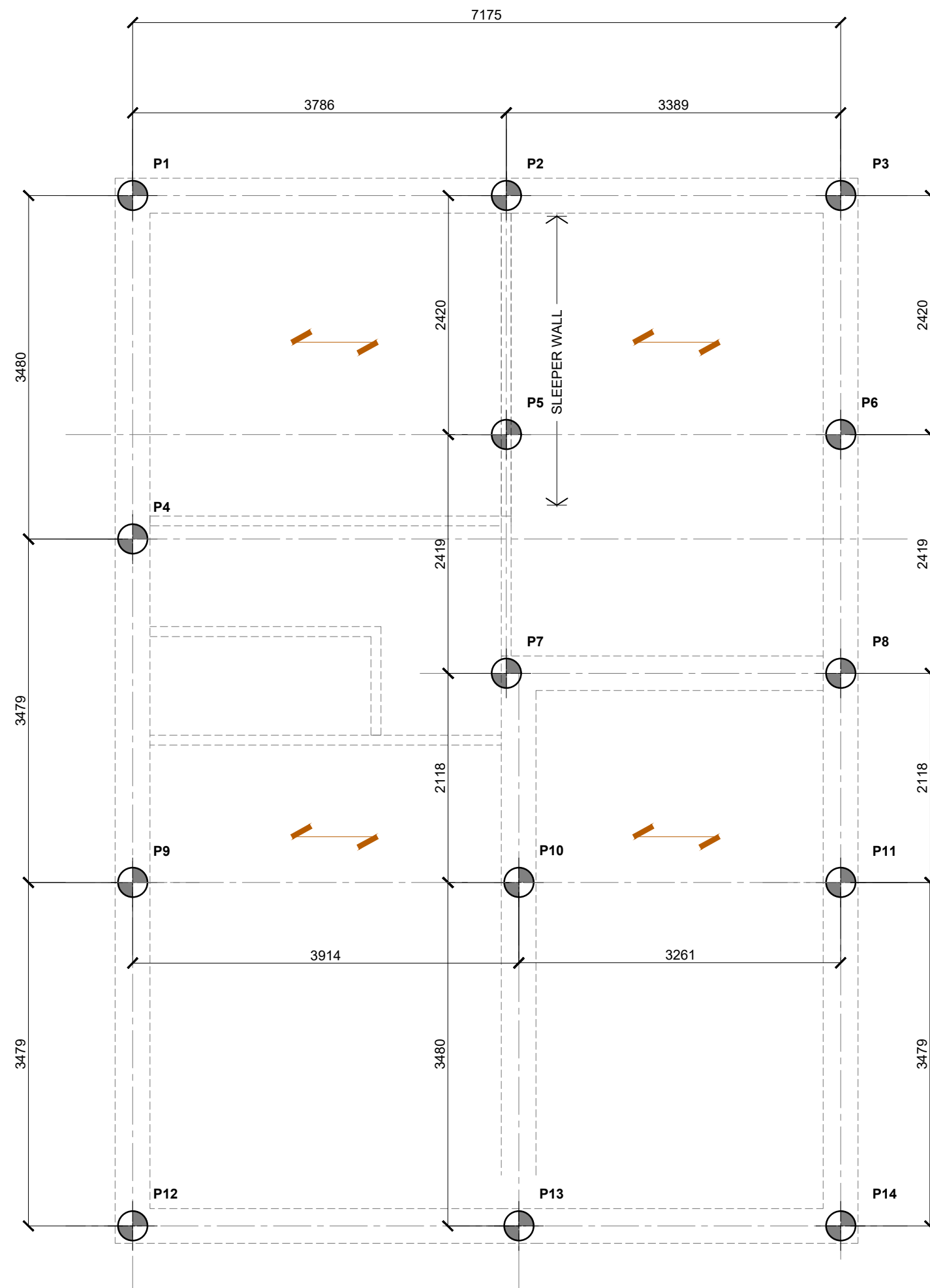
DETAILS OF DRIVING METHOD AND CALCULATIONS FOR PILE DESIGN ARE TO BE SUBMITTED BY THE SPECIALIST SUB-CONTRACTOR TO THE ENGINEER FOR COMMENT AND ONWARD TRANSMISSION TO THE LOCAL AUTHORITY/CHECKING AUTHORITY.

ALL PILES TO BE IN ACCORDANCE WITH LATEST EDITION OF I.C.E. SPECIFICATION FOR PILING.

CONCRETE FOR PILED FOUNDATIONS IS TO BE GRADE C35 HAVING A COMPRESSIVE STRENGTH OF 35N/mm² AT 28 DAYS WITH A MINIMUM CEMENT CONTENT OF 300kg/m³. A MAXIMUM WATER CEMENT RATIO OF 0.6 (INCLUDING WATER IN AGGREGATE) AND AGGREGATE IS TO BE 20mm MAXIMUM SIZE.

CONCRETE SHALL BE COMPACTED BY MEANS OF A MECHANICAL VIBRATOR AND THE WORKABILITY SHALL BE SUCH THAT WHEN COMPACTED A DENSE CONCRETE IS PRODUCED FREE OF VOIDS.

⊕ INDICATES POSITION OF PILE.



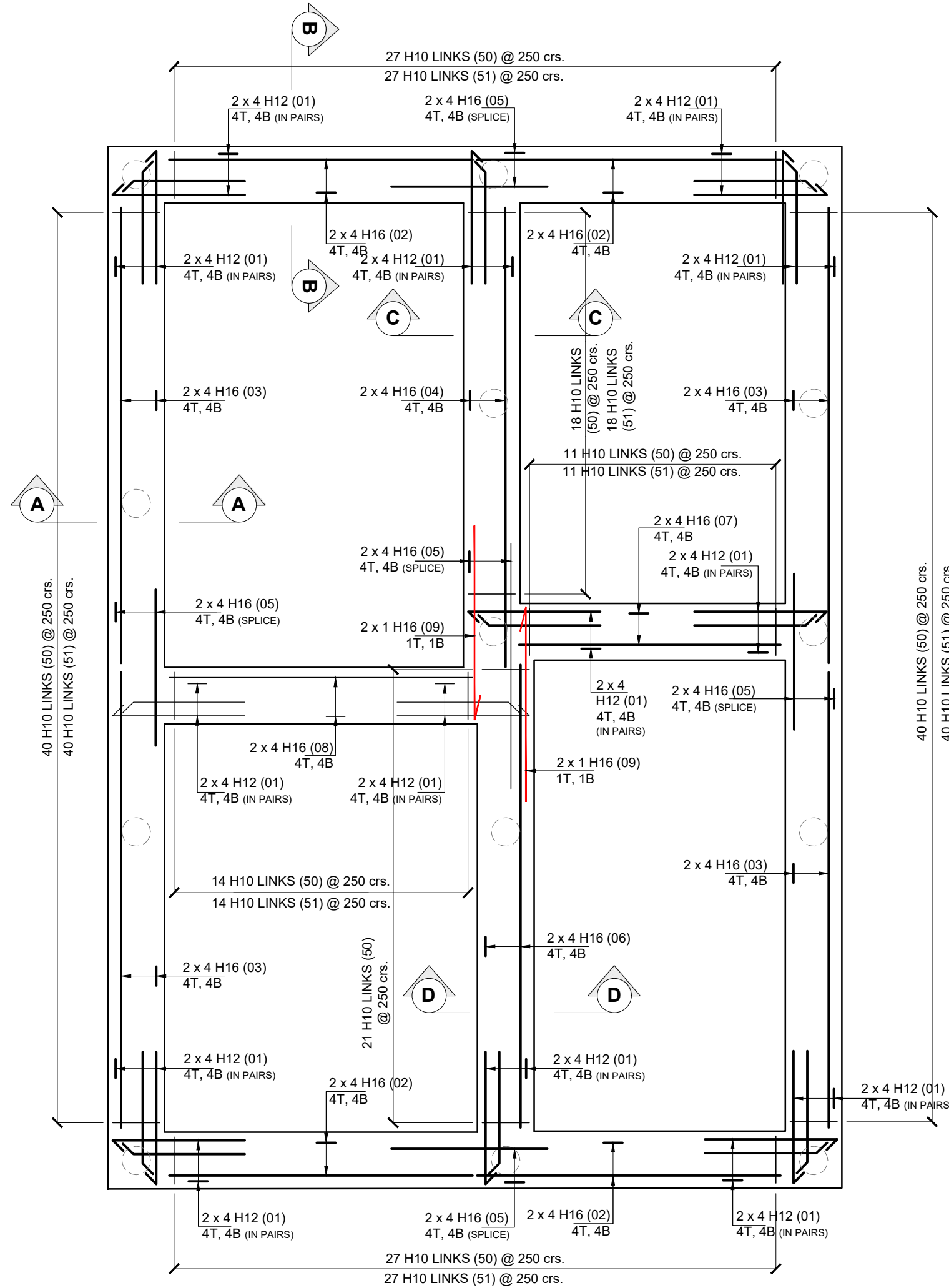
PILE LAYOUT (1:50)

NOTE:
CS3 AND NHBC AMBER 2 GAS PROTECTION MEASURES MUST BE INSTALLED. PROVIDE LOW PERMEABILITY METHANE GAS MEMBRANE. TAPED JOINTS & SEALED ENTRIES USING SPECIALIST APPROVED GAS TAPE AND UNDERFLOOR VENTILATED VOIDS. - VALIDATION OF INSTALLATION TO BE CERTIFIED BY A SPECIALIST.

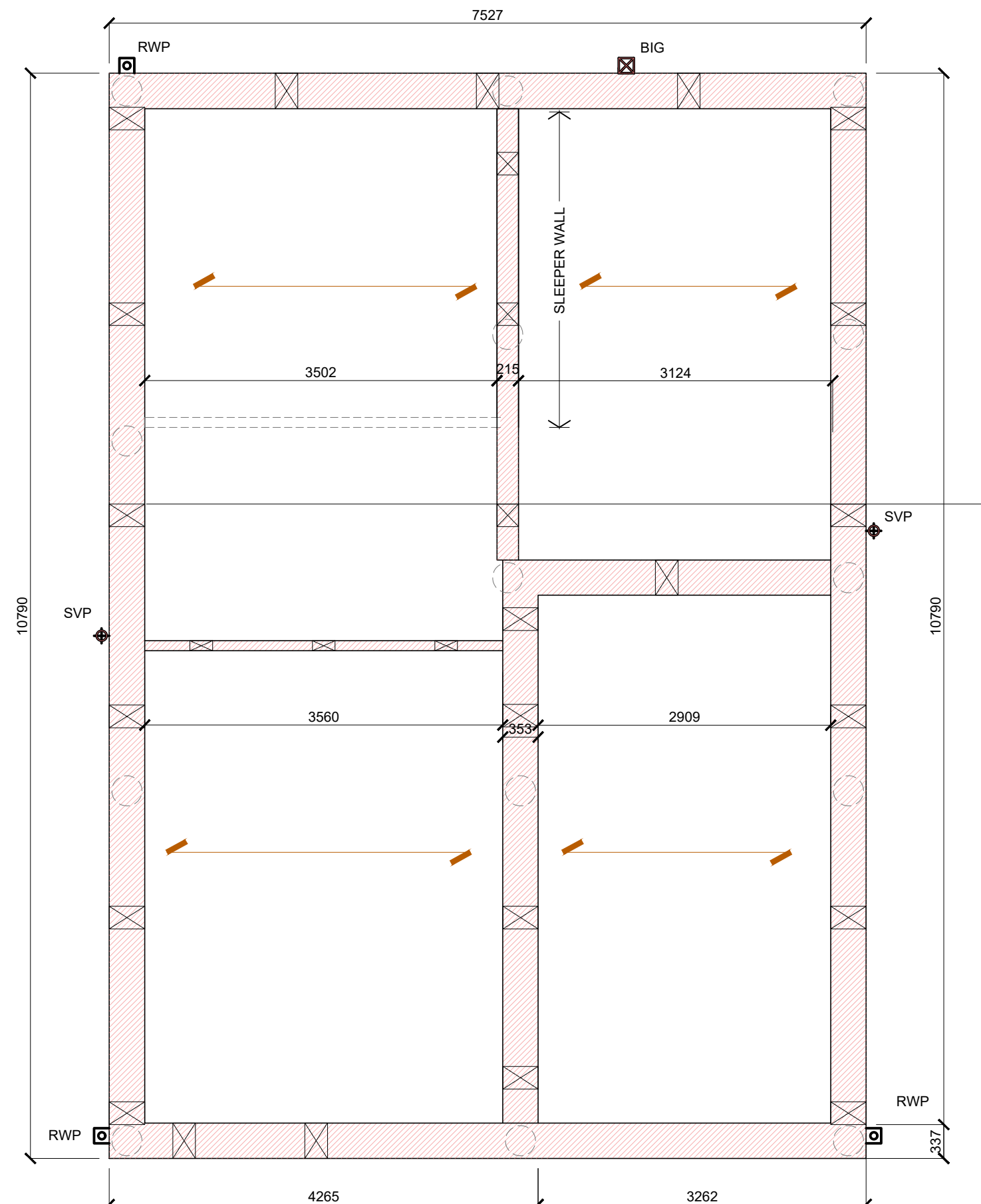
NOTE:
ALL BELOW GROUND CONCRETE TO BE SULPHATE RESISTING CLASS DS-1 AC1 or DS-2 AC2 (refer to SI) MINIMUM COVER 50MM

IF CLAY STRATA IS FOUND UPON EXCAVATION THEN ENGINEER TO BE INFORMED. TREE SURVEY MAY BE REQUIRED AND NHBC GUIDANCE FOR BUILDING NEAR TREES SHOULD BE ASSESSED AND FOLLOWED.

NOTE:
CONCRETE STRENGTH CLASS TO BE C28/35

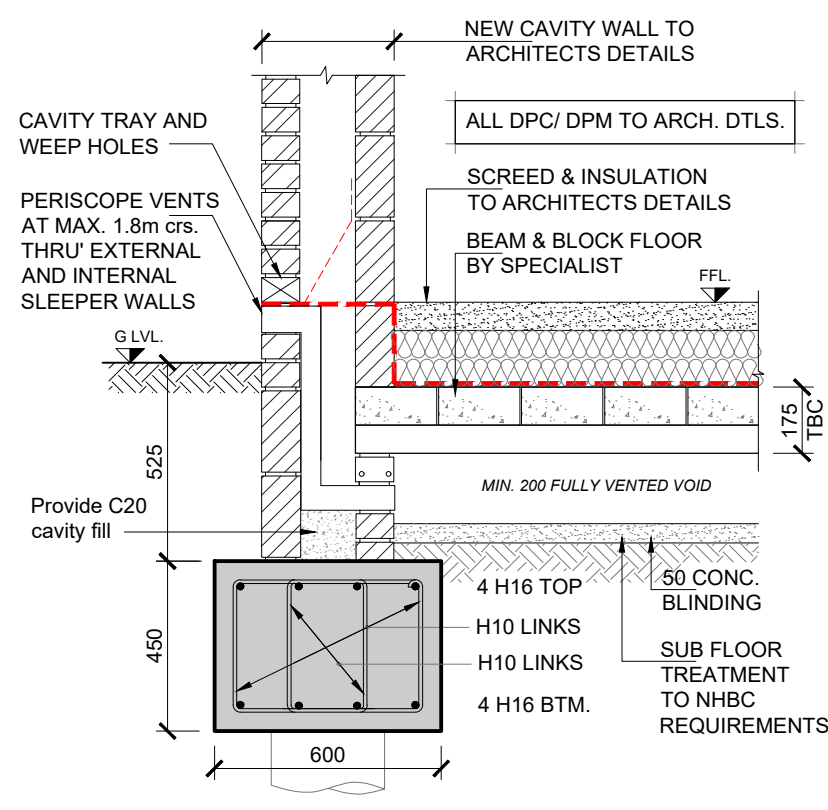


GROUND BEAM LAYOUT (1:50)

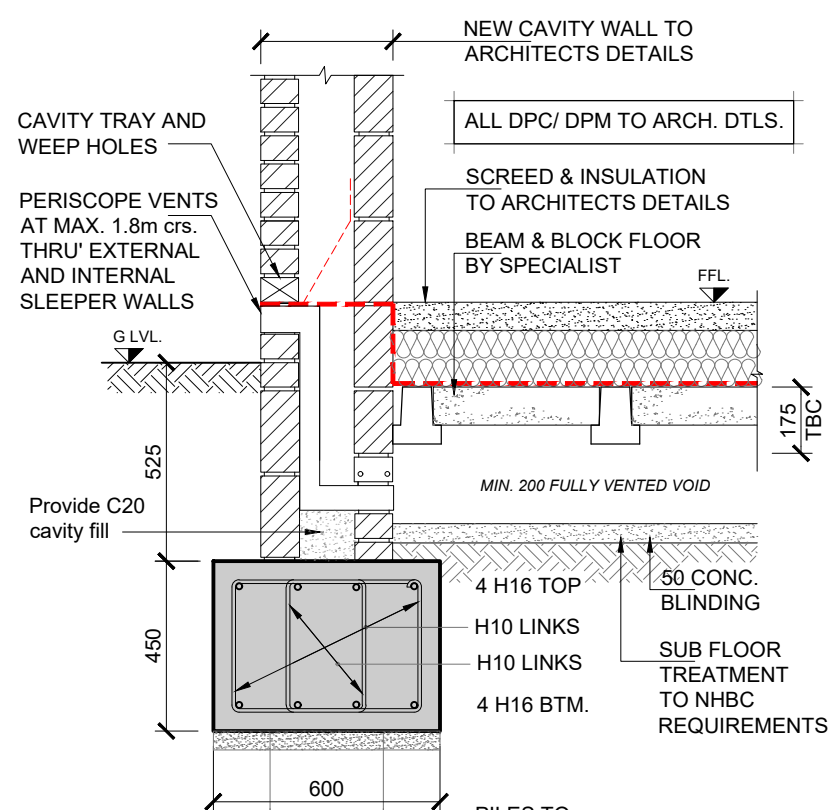


TYPE A - FOUNDATION SETTING OUT (1:50)

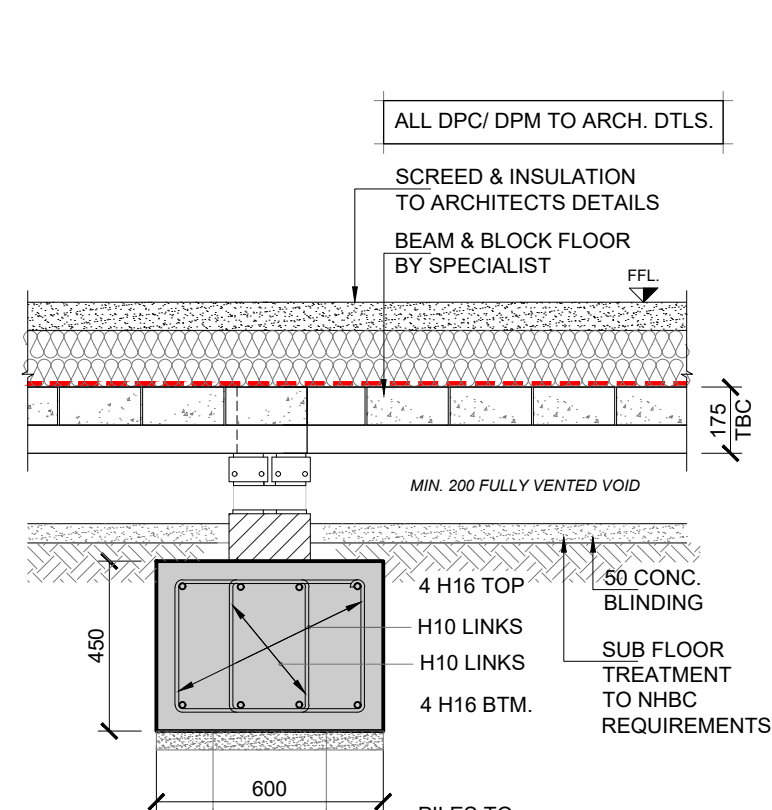
Manufacturer designed Beam & Block floor units



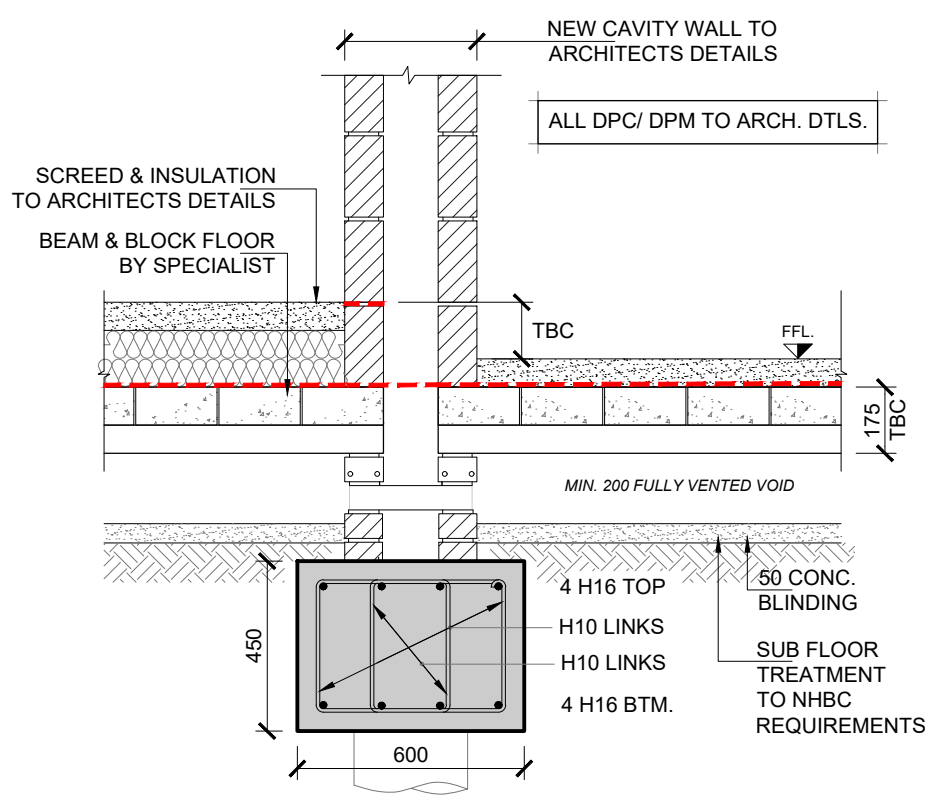
SECTION A - A (1:20)



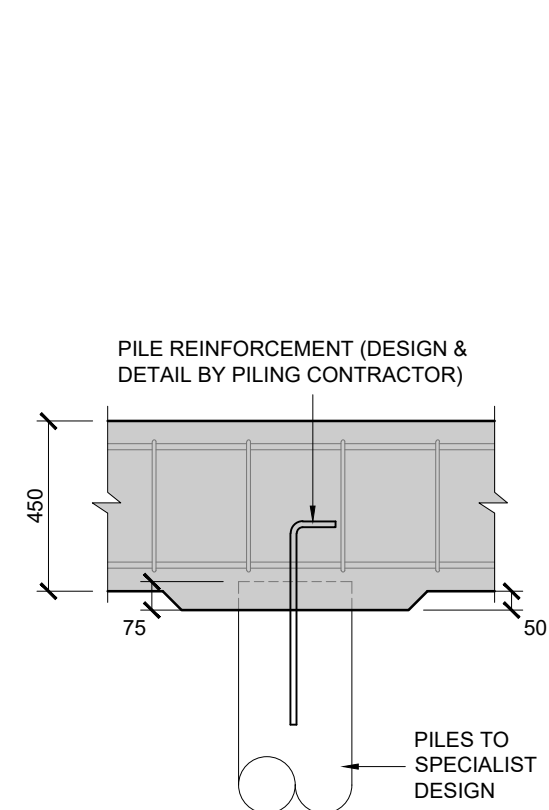
SECTION B - B (1:20)



SECTION C - C (1:20)



SECTION D - D (1:20)



PILE / GROUND BEAM CONNECTION DETAIL (1:20)

FOR CONSTRUCTION

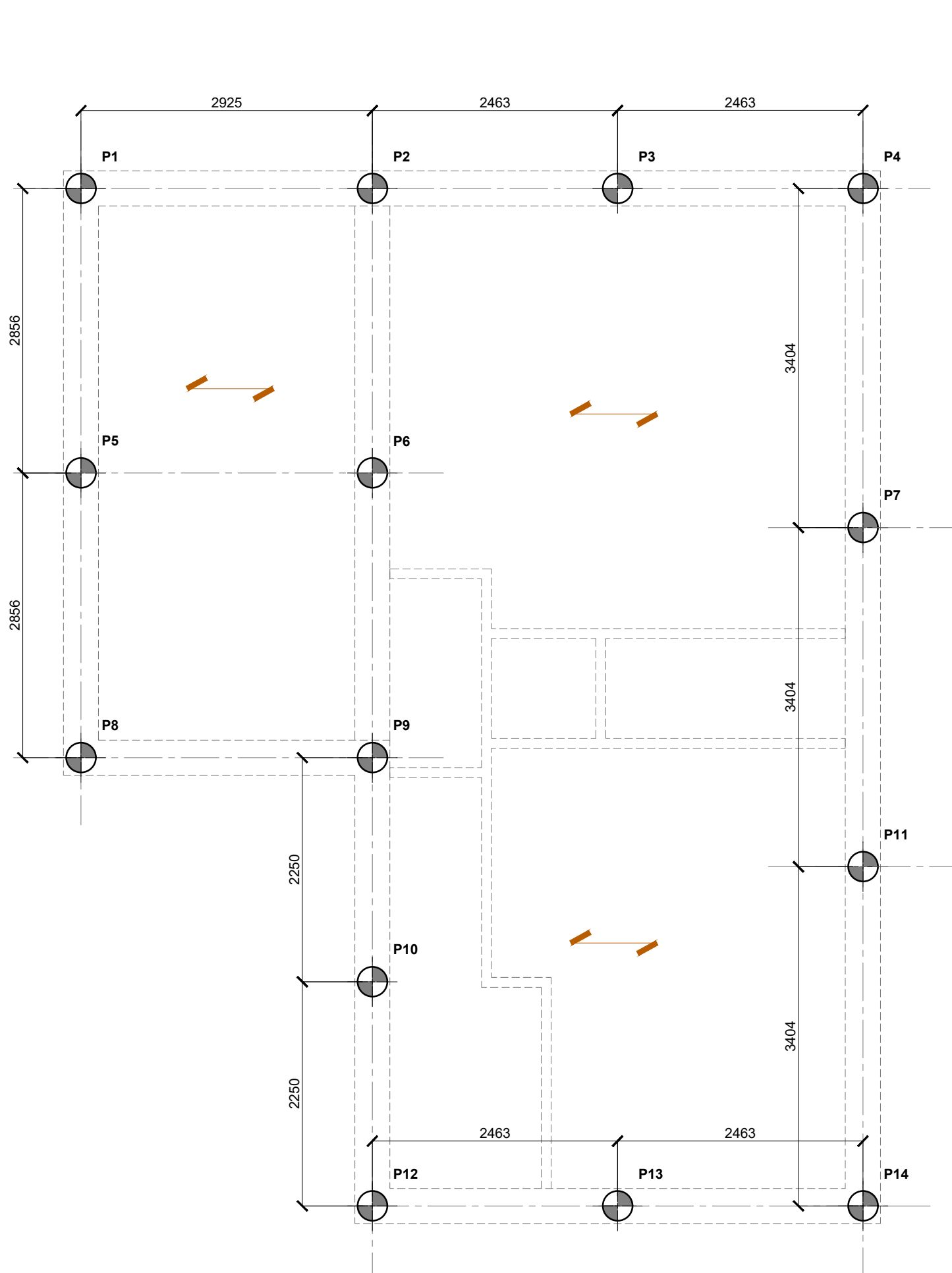
Revision	By	Check	Date	Description
C	PWE	DO	Feb 22	Drg. updated, revised for construction
B	PWE	DO	Feb 22	Drg. updated, dims added
A	PWE	DO	Jan 22	Drg. updated, dims added



Partington & Associates Limited
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e-mail: info@partington-associates.com
www.partington-associates.com

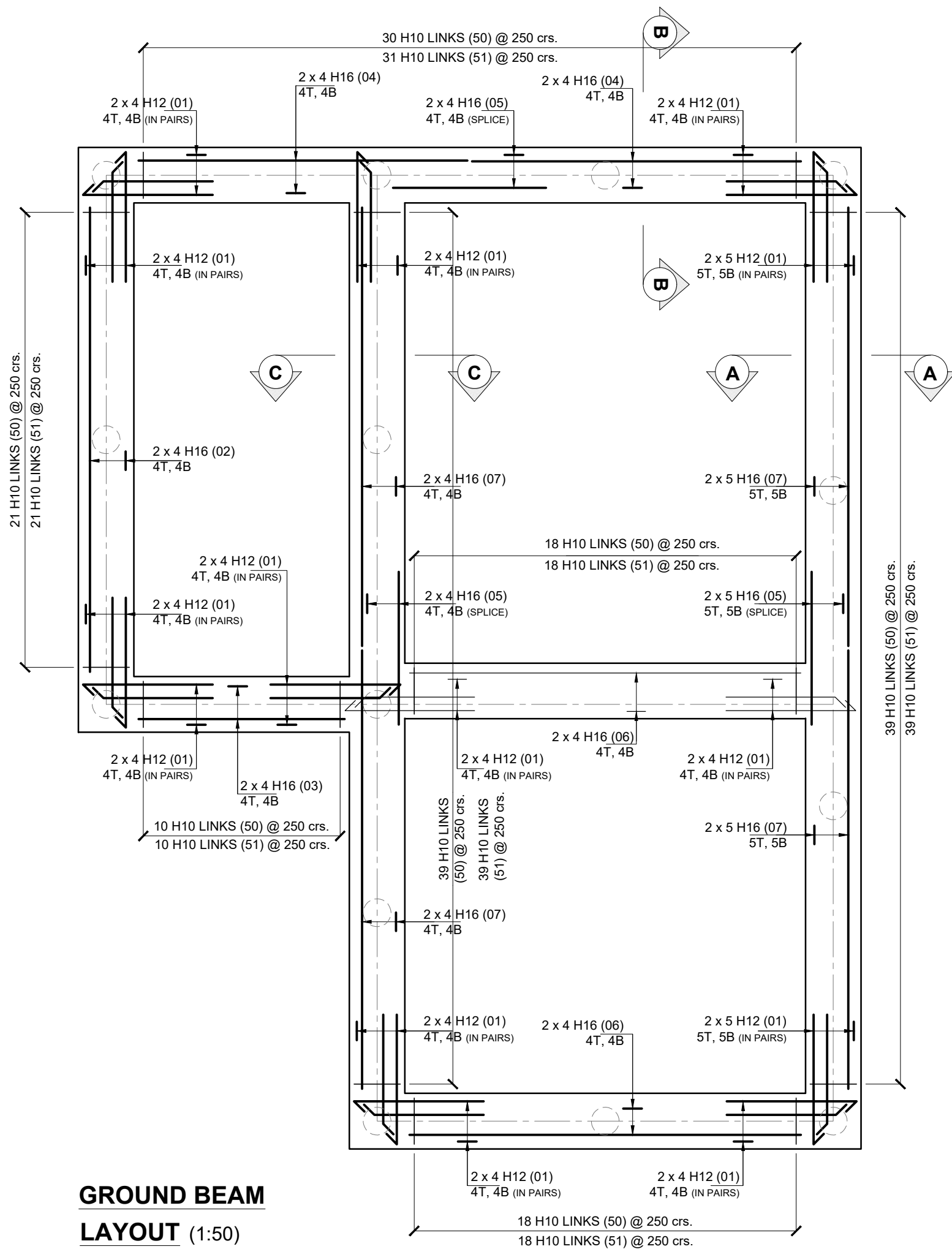
Client	WIGGETT CONSTRUCTION LTD.	Scale @A1	1:50
Project	174 BURY OLD ROAD ROCHDALE	Date	OCT 2021
Title	TYPE A - FOUNDATION DETAILS	Drawn	PWE
Job No.	4700-21	Check	DO
Dwg No.	F-01	Rev.	C
Approved	DO		



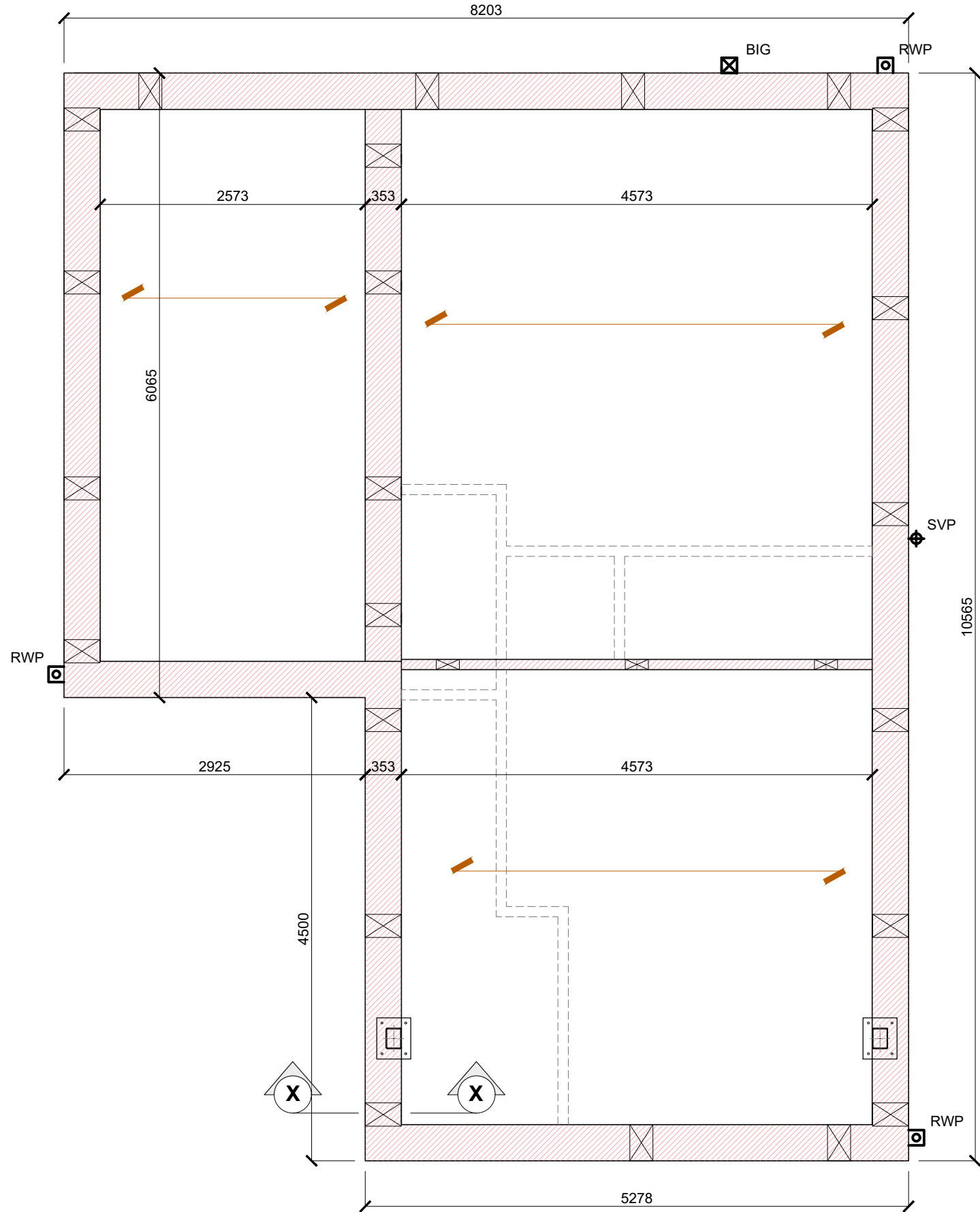
PILE LAYOUT (1:50)

PILE SCHEDULE

PILE REF	PILE S.W.L (kN) UNFACTORED
P1	150
P2	200
P3	150
P4	175
P5	200
P6	250
P7	275
P8	150
P9	275
P10	200
P11	300
P12	150
P13	125
P14	150



GROUND BEAM LAYOUT (1:50)



TYPE B - FOUNDATION SETTING OUT (1:50)

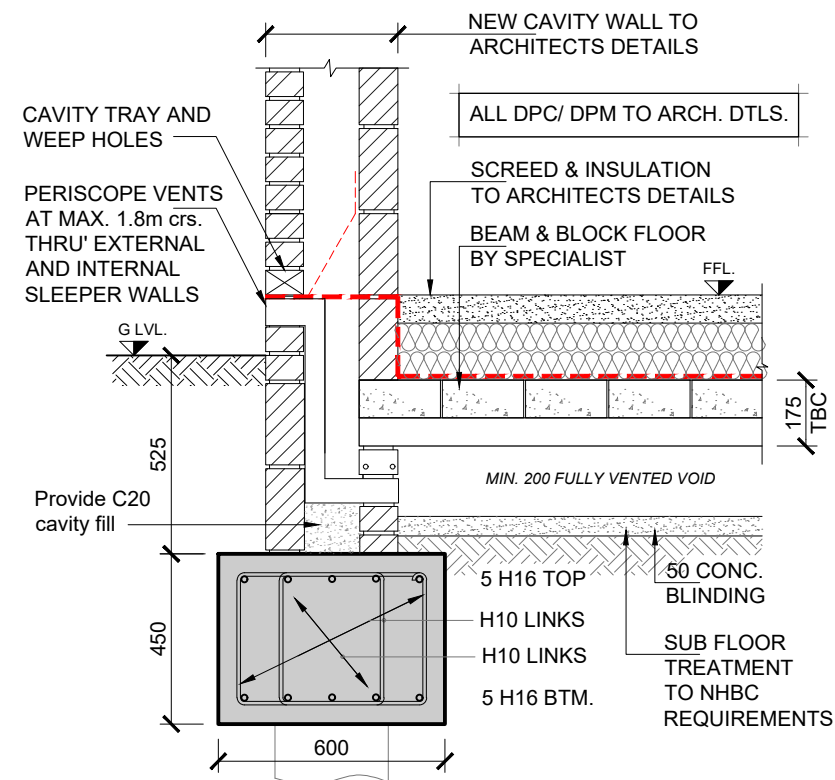
Manufacturer designed Beam & Block floor units

NOTE:
CS3 AND NHBC AMBER 2 GAS PROTECTION MEASURES MUST BE INSTALLED. PROVIDE LOW PERMEABILITY METHANE GAS MEMBRANE, TAPED JOINTS & SEALED ENTRIES USING SPECIALIST APPROVED GAS TAPE AND UNDERFLOOR VENTILATED VOIDS. - VALIDATION OF INSTALLATION TO BE CERTIFIED BY A SPECIALIST.

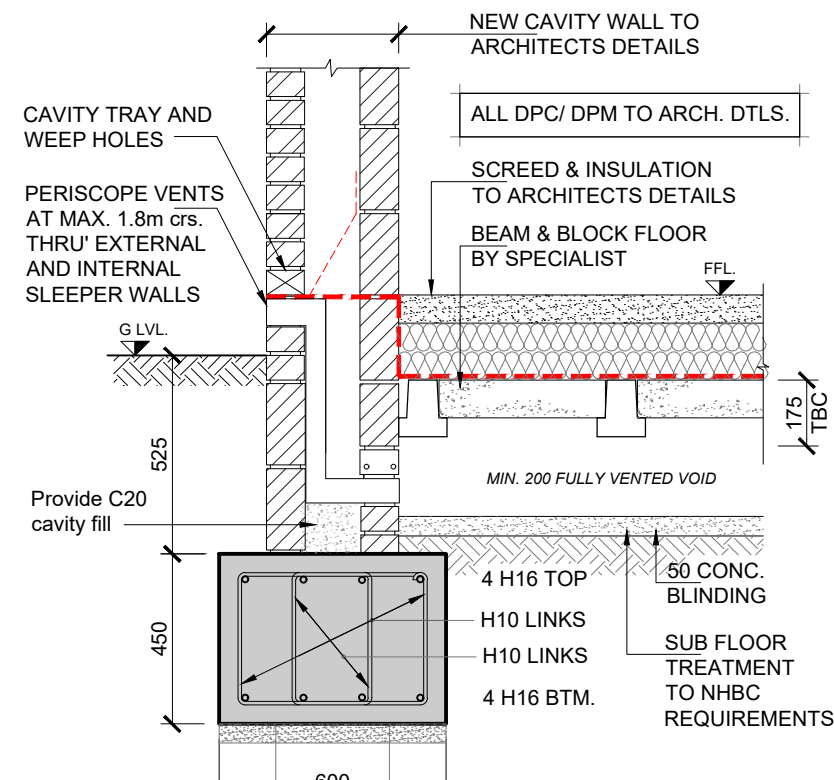
NOTE:
ALL BELOW GROUND CONCRETE TO BE SULPHATE RESISTING CLASS DS-1 AC1 or DS-2 AC2 (REFER TO S1) MINIMUM COVER 50MM

IF CLAY STRATA IS FOUND UPON EXCAVATION THEN ENGINEER TO BE INFORMED. TREE SURVEY MAY BE REQUIRED AND NHBC GUIDANCE FOR BUILDING NEAR TREES SHOULD BE ASSESSED AND FOLLOWED.

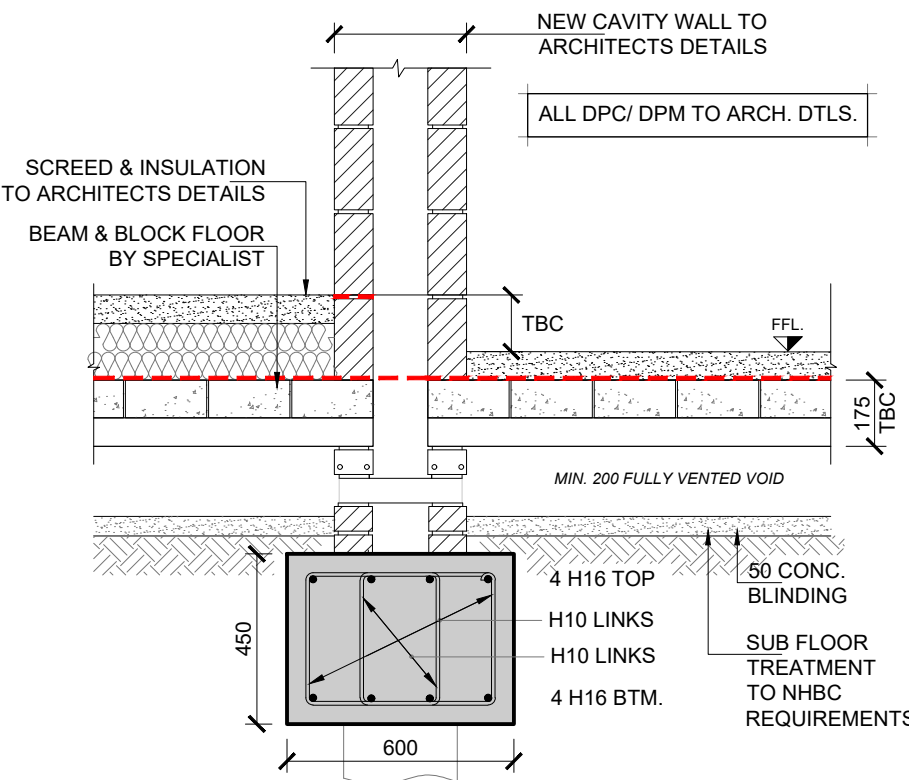
NOTE:
CONCRETE STRENGTH CLASS TO BE C28/35



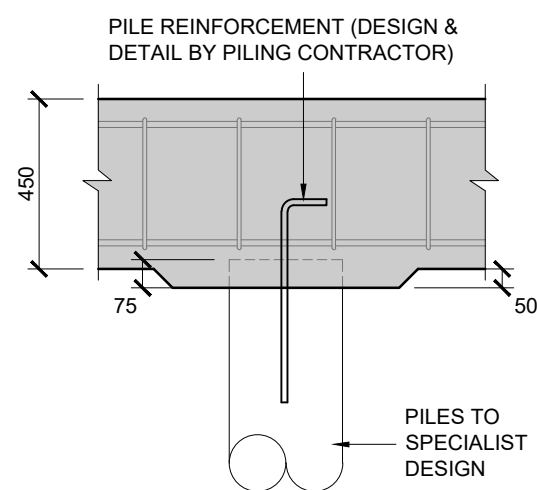
SECTION A - A (1:20)



SECTION B - B (1:20)



SECTION C - C (1:20)



PILE / GROUND BEAM CONNECTION DETAIL (1:20)

DO NOT SCALE - IF IN DOUBT ASK

GENERAL

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT PARTINGTON & ASSOCIATES , ARCHITECTS, SERVICE ENGINEERS AND SUBCONTRACTOR DRAWINGS.

REVIEW ALL DRAWINGS AND REPORT ANY DISCREPANCIES TO PARTINGTON & ASSOCIATES PRIOR TO COMMENCEMENT.

ALL WORK IS TO COMPLY WITH ALL RELEVANT HEALTH AND SAFETY LEGISLATION AND REGULATIONS

DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS AND LEVELS INCLUDING ANY ADJUTANT TO EXISTING STRUCTURES TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT.

WORK FROM FIGURED DIMENSIONS ONLY.

NO DEVIATION FROM DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PARTINGTON & ASSOCIATES PRIOR PERMISSION IN WRITING.

ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT SPECIFICATIONS ISSUED BY PARTINGTON & ASSOCIATES, BRITISH STANDARD CODES OF PRACTICE, STATUTORY REQUIREMENTS AND THE CONTRACT DOCUMENTS.

REINFORCED CONCRETE

ALL BELOW GROUND CONCRETE TO BE SULPHATE RESISTING DS-1 AC-1, DS-2 AC-2

ALL REINFORCEMENT TO HAVE 50mm MINIMUM COVER TO TOP, BOTTOM, SIDES AND ENDS UNLESS NOTED OTHERWISE.

HIGH YIELD REINFORCEMENT 'H' BARS ARE TO BE TYPE 2 BOND BARS WITH A CHARACTERISTIC TENSILE STRENGTH OF 460N/mm2.

MILD STEEL REINFORCEMENT 'R' BARS ARE TO BE PLAIN ROUND BARS AS DESCRIBED IN BS 8110 WITH A CHARACTERISTIC TENSILE STRENGTH OF 250N/mm2.

ALL MESH FABRIC REINFORCEMENT IS TO HAVE MINIMUM 450mm LAPS UNLESS NOTED OTHERWISE.

TEST CUBES ARE TO BE TAKEN AS DIRECTED BY THE ENGINEER.

CONCRETE SHALL BE COMPACTED BY MEANS OF A MECHANICAL VIBRATOR AND THE WORKABILITY SHALL BE SUCH THAT WHEN COMPACTED A DENSE CONCRETE IS PRODUCED FREE OF VOIDS.

ALL REINFORCEMENT ON THIS DRAWING IS DETAILED ON BAR BENDING SCHEDULE REF : 4255-20

BAR BENDING SHALL BE TO BS 4466.

PRECAST FLOORS

PRE CAST FLOOR CONSTRUCTION IS TO BE DESIGNED BY SPECIALIST SUB-CONTRACTOR SUFFICIENT DESIGN CALCULATIONS AND DRAWINGS ARE TO BE SUBMITTED TO THE STRUCT ENGINEER FOR COMMENT AND TO THE CHECKING AUTHORITY FOR BUILDING REGULATION APPROVAL.

UNFACTORED LOADINGS FOR PRECAST FLOORS ARE AS FOLLOWS :

IMPOSED - GENERAL FLOORS - 1.50 kN/m²
- PARTITIONS (GENERAL ALLOWANCE) - 1.0kN/m²

DEAD - SELF WEIGHT- TO BE DETERMINED BY CONTRACTOR
- FLOOR FINISHES- REFER TO ARCHITECTS DRAWINGS

LAYOUTS AND DETAILED DRAWINGS FOR PRECAST FLOORS ARE TO BE PROVIDED TO THE ARCHITECT IN ORDER THAT ALL OPENINGS THROUGH THE FLOOR CONSTRUCTION CAN BE IDENTIFIED AND LOCATED.

PILED FOUNDATIONS

ALL PILES TO SPECIALIST SUB-CONTRACTORS DESIGN AND DETAILS.

DETAILS OF DRIVING METHOD AND CALCULATIONS FOR PILE DESIGN ARE TO BE SUBMITTED BY THE SPECIALIST SUB-CONTRACTOR TO THE ENGINEER FOR COMMENT AND ONWARD TRANSMISSION TO THE LOCAL AUTHORITY/CHECKING AUTHORITY.

ALL PILES TO BE IN ACCORDANCE WITH LATEST EDITION OF I.C.E. SPECIFICATION FOR PILING.

CONCRETE FOR PILED FOUNDATIONS IS TO BE GRADE C35 HAVING A COMPRESSIVE STRENGTH OF 35N/mm AT 28 DAYS WITH A MINIMUM CEMENT CONTENT OF 300kg/m³. A MAXIMUM WATER CEMENT RATIO OF 0.6 (INCLUDING WATER IN AGGREGATE) AND AGGREGATE IS TO BE 20mm MAXIMUM SIZE.

CONCRETE SHALL BE COMPACTED BY MEANS OF A MECHANICAL VIBRATOR AND THE WORKABILITY SHALL BE SUCH THAT WHEN COMPACTED A DENSE CONCRETE IS PRODUCED FREE OF VOIDS.

⊕ INDICATES POSITION OF PILE.

FOR CONSTRUCTION

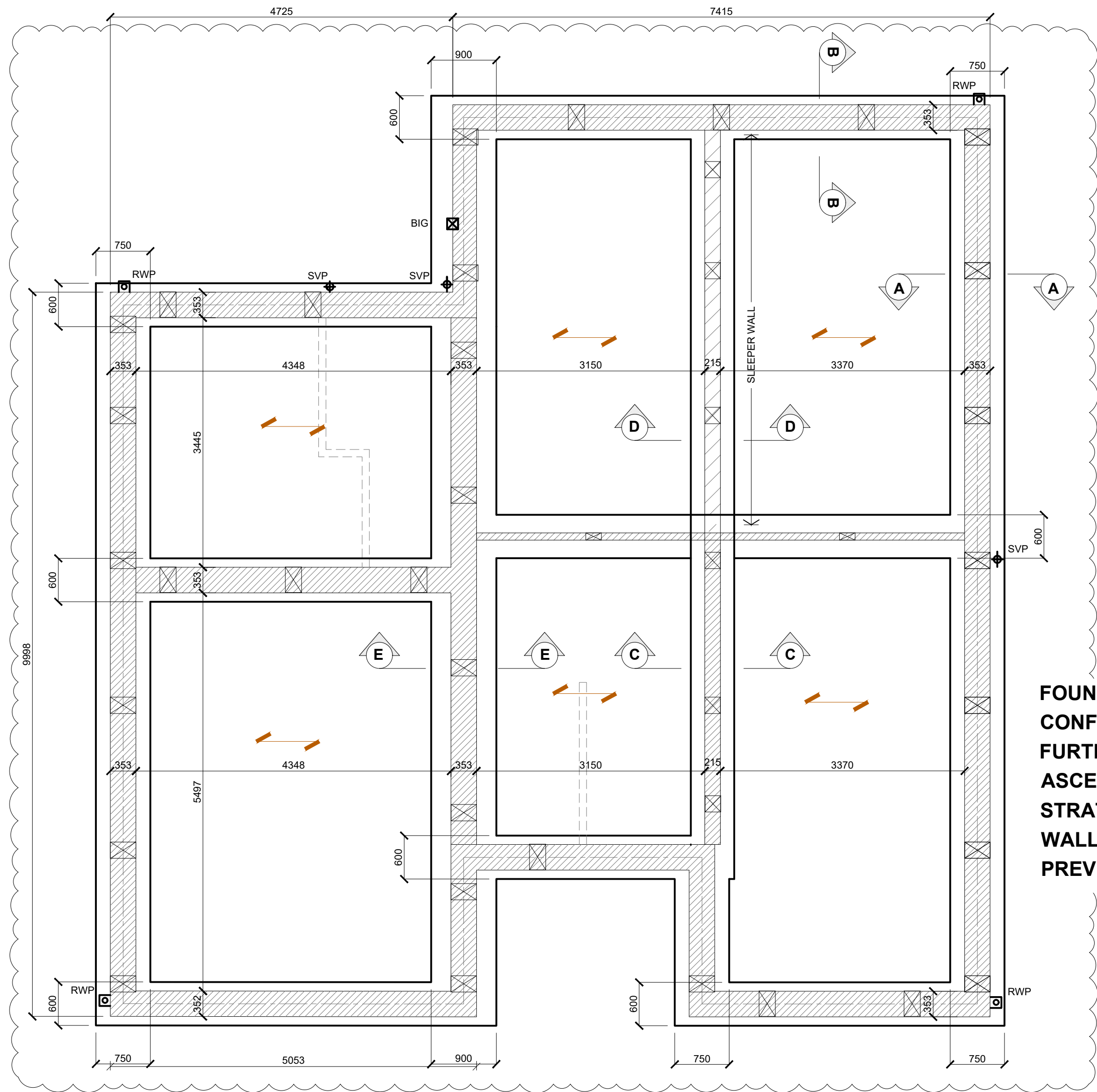
Revision	By	Check	Date	Description
C	PWE	DO	Jun 22	Drg. updated, revised for construction
B	PWE	DO	Feb 22	Drg. updated, dims added
A	PWE	DO	JAN 22	Drg. updated, dims added

Partington & Associates Limited
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Tel: (01257) 249882 / 249863
e-mail: info@partington-associates.com
www.partington-associates.com

Client	WIGGETT CONSTRUCTION LTD.	Scale @A1	1:50
Project	174 BURY OLD ROAD ROCHDALE	Date	OCT 2021
Title	TYPE B - FOUNDATION DETAILS	Drawn	PWE
Job No.	4700-21	Check	DO
Dwg No.	F-02	Rev.	c
Approved	DO		



FOUNDATION LAYOUT (1:50)

INDICATES SPAN OF MANUFACTURER
DESIGNED BEAM & BLOCK FLOOR UNITS OVER

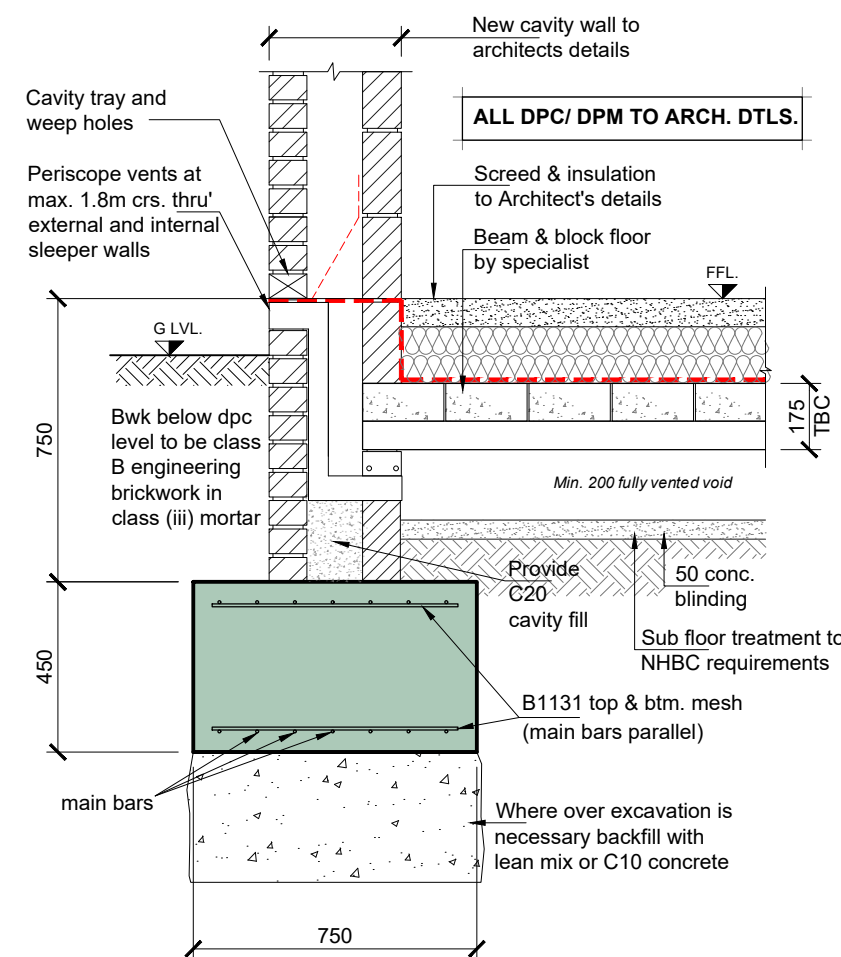
NOTE:
CS3 AND NHBC AMBER 2 GAS PROTECTION MEASURES MUST BE INSTALLED. PROVIDE LOW PERMEABILITY METHANE GAS MEMBRANE. TAPED JOINTS & SEALED ENTRIES USING SPECIALIST APPROVED GAS TAPE AND UNDERFLOOR VENTILATED VOIDS. - VALIDATION OF INSTALLATION TO BE CERTIFIED BY A SPECIALIST.

NOTE:
ALL BELOW GROUND CONCRETE TO BE SULPHATE RESISTING CLASS DS-1 AC1 or DS-2 AC2 (refer to SI) MINIMUM COVER 50MM

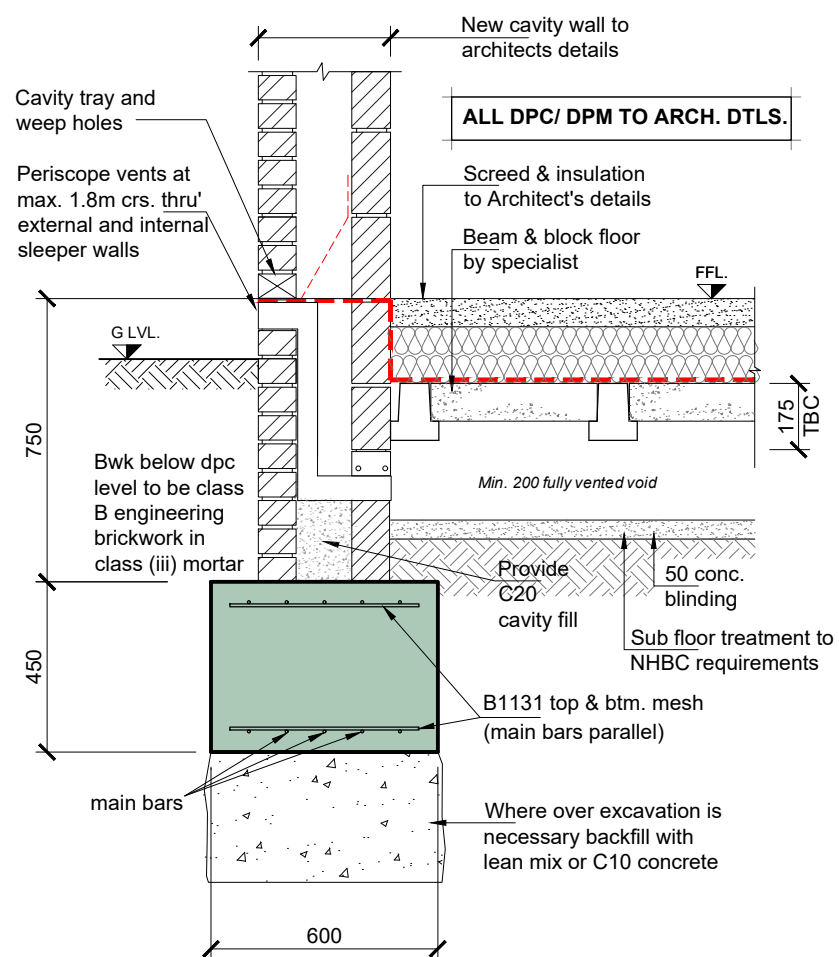
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NOTE:
CONCRETE STRENGTH CLASS TO BE C28/35

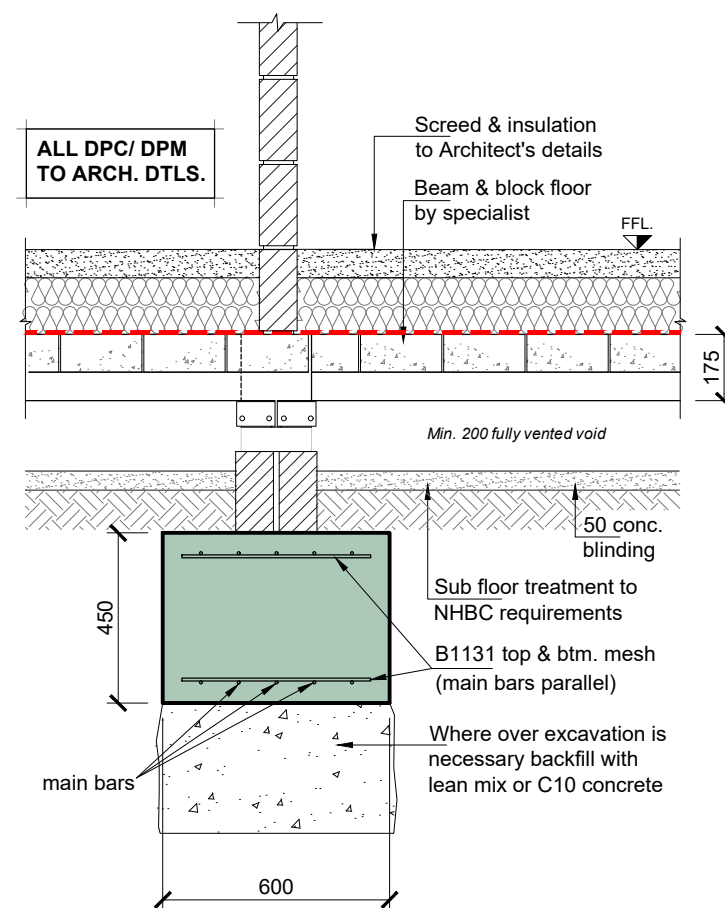
NOTE:
FOUNDATIONS TO HAVE B1131 TOP & BTM. MESH



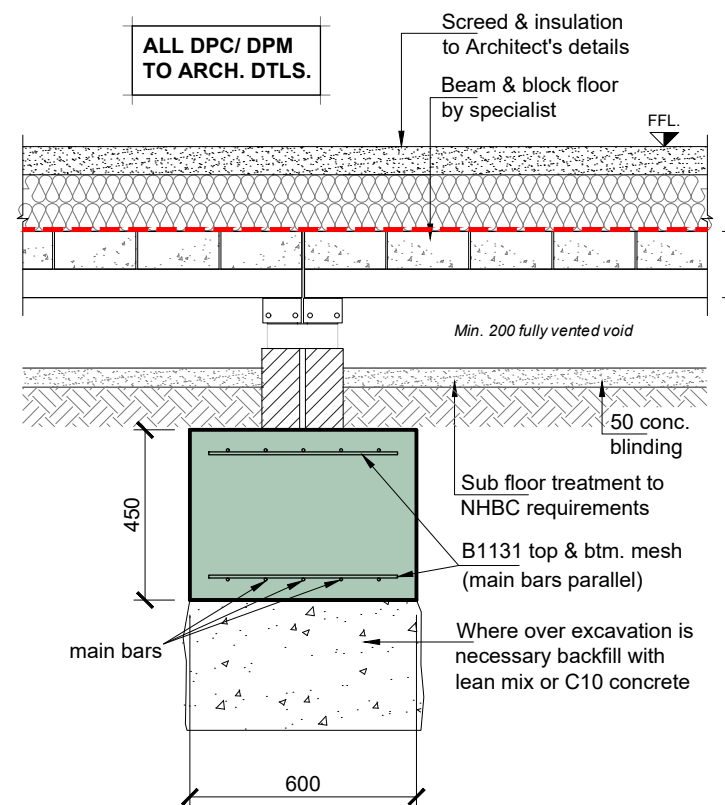
SECTION A - A (1:20)



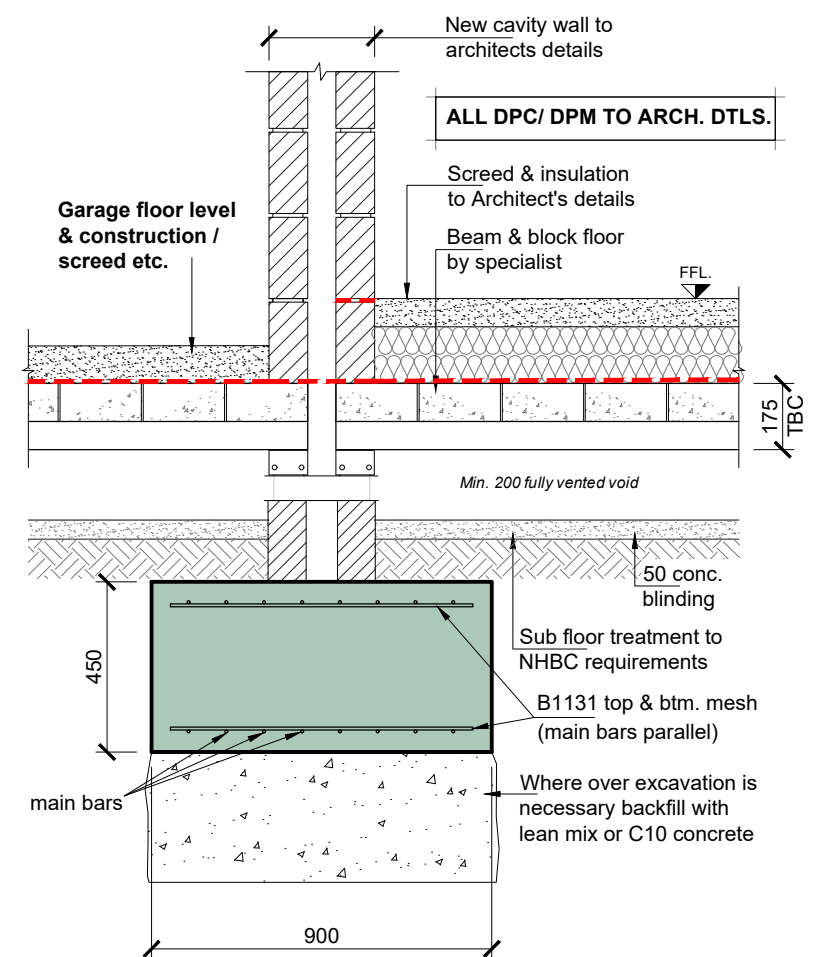
SECTION B - B (1:20)



SECTION C - C (1:20)



SECTION D - D (1:20)



SECTION E - E (1:20)

DO NOT SCALE - IF IN DOUBT ASK

GENERAL NOTES

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT PARTINGTON & ASSOCIATES', ARCHITECTS, SERVICE ENGINEERS AND SUBCONTRACTOR DRAWINGS.

REVIEW ALL DRAWINGS AND REPORT ANY DISCREPANCIES TO PARTINGTON & ASSOCIATES' PRIOR TO COMMENCEMENT.

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DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS AND LEVELS INCLUDING ANY ABUTMENT TO EXISTING STRUCTURES TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT.

WORK FROM FIGURED DIMENSIONS ONLY.

THE CONTRACTOR SHALL PROVIDE ALL THE NECESSARY TEMPORARY WORKS AND TO ENSURE OVERALL STABILITY OF THE BUILDING DURING THE CONSTRUCTION PERIOD.

ASSUMPTIONS NOTED ON THIS DRAWING ARE TO BE CHECKED AND CONFIRMED. IF FOUND TO BE DIFFERENT ENGINEER SHOULD BE INFORMED TO CONFIRM ADEQUACY OF THE DESIGN.

NO DEVIATION FROM DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PARTINGTON & ASSOCIATES' PRIOR PERMISSION IN WRITING.

ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT SPECIFICATIONS ISSUED BY PARTINGTON & ASSOCIATES', BRITISH STANDARD CODES OF PRACTICE, STATUTORY REQUIREMENTS AND THE CONTRACT DOCUMENTS.

FOUNDATION NOTES

WHERE OVER EXCAVATION IS NECESSARY TO REACH SUITABLE GROUND, THE TRENCH MAY BACKFILLED USING LEAN MIX CONCRETE UP TO THE UNDERSIDE OF STRUCTURAL FOOTING.

CONCRETE TO STRUCTURAL FOOTING TO BE C35 MIN UNLESS SPECIFIED OTHERWISE.

GROUND TO BE CAPABLE OF 100kN/m² SAFE BEARING PRESSURE AND APPROVED AS SUCH BY THE BUILDING INSPECTOR OR ENGINEER

ALL MASONRY BELOW GROUND TO BE TRENCH BLOCK OR FROST RESISTANT BRICK/BLOCK.

CAVITY CONSTRUCTION TO BE BACKFILLED WITH MORTAR UP TO 150mm BELOW UNDERSIDE OF SLAB.

ADOPT 1:3 CEMENT:SAND (WITH PLASTICISER) MORTAR BELOW DPC.

PRECAST FLOORS

PRE CAST FLOOR CONSTRUCTION IS TO BE DESIGNED BY SPECIALIST SUB-CONTRACTOR SUFFICIENT DESIGN CALCULATIONS AND DRAWINGS ARE TO BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR COMMENT AND TO THE CHECKING AUTHORITY FOR BUILDING REGULATION APPROVAL.

UNFACTORED LOADINGS FOR PRECAST FLOORS ARE AS FOLLOWS:

IMPOSED - GENERAL FLOORS - 1.50 kN/m²
- PARTITIONS (GENERAL ALLOWANCE) - 1.0kN/m²

DEAD - SELF WEIGHT- TO BE DETERMINED BY CONTRACTOR
- FLOOR FINISHES- REFER TO ARCHITECTS DRAWINGS

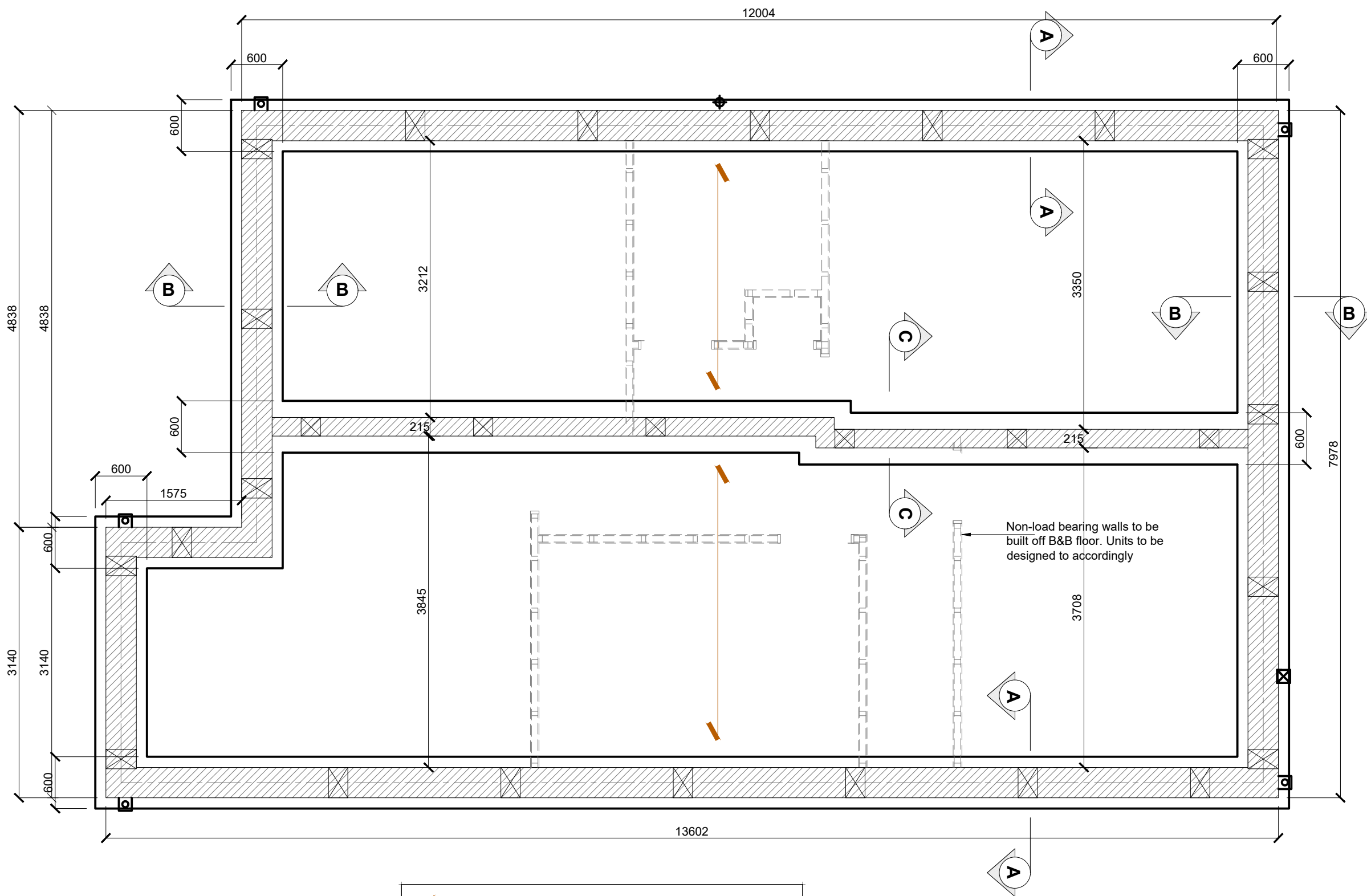
LAYOUTS AND DETAILED DRAWINGS FOR PRECAST FLOORS ARE TO BE PROVIDED TO THE ARCHITECT IN ORDER THAT ALL OPENINGS THROUGH THE FLOOR CONSTRUCTION CAN BE IDENTIFIED AND LOCATED.

FOR CONSTRUCTION

Revision	By	Check	Date	Description
C	PWE	DO	Jun 22	Sections updated, revised for construction
B	PWE	DO	Feb 22	Drng. updated, dims added
A	PWE	DO	JAN 22	Drng. updated, dims added

	Partington & Associates Limited Structural Design Consultants	
	13 Gillibrand Street Chorley Lancashire PR7 2EJ Tel: (01257) 249882 / 249863 e-mail: info@partington-associates.com www.partington-associates.com	

Client	WIGGETT CONSTRUCTION LTD.	Scale	@A1	1:50
Project	174 BURY OLD ROAD ROCHDALE	Date	OCT 2021	
Title	TYPE C - FOUNDATION DETAILS	Drawn	PWE	
Job No.	4700-21	Dwg No.	F-03	Rev. c
Approved	DO			



FOUNDATION LAYOUT (1:50)

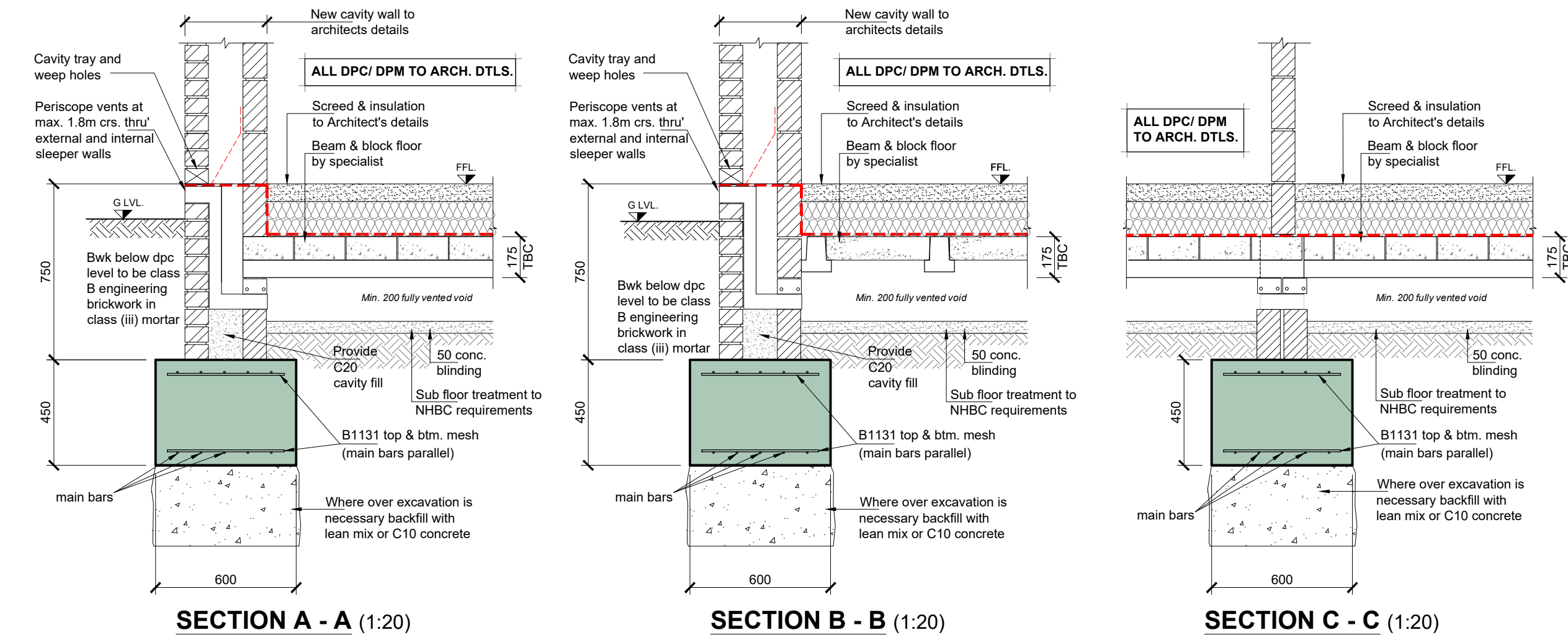
NOTE:
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NOTE:
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NOTE:
CONCRETE STRENGTH CLASS TO BE C28/35

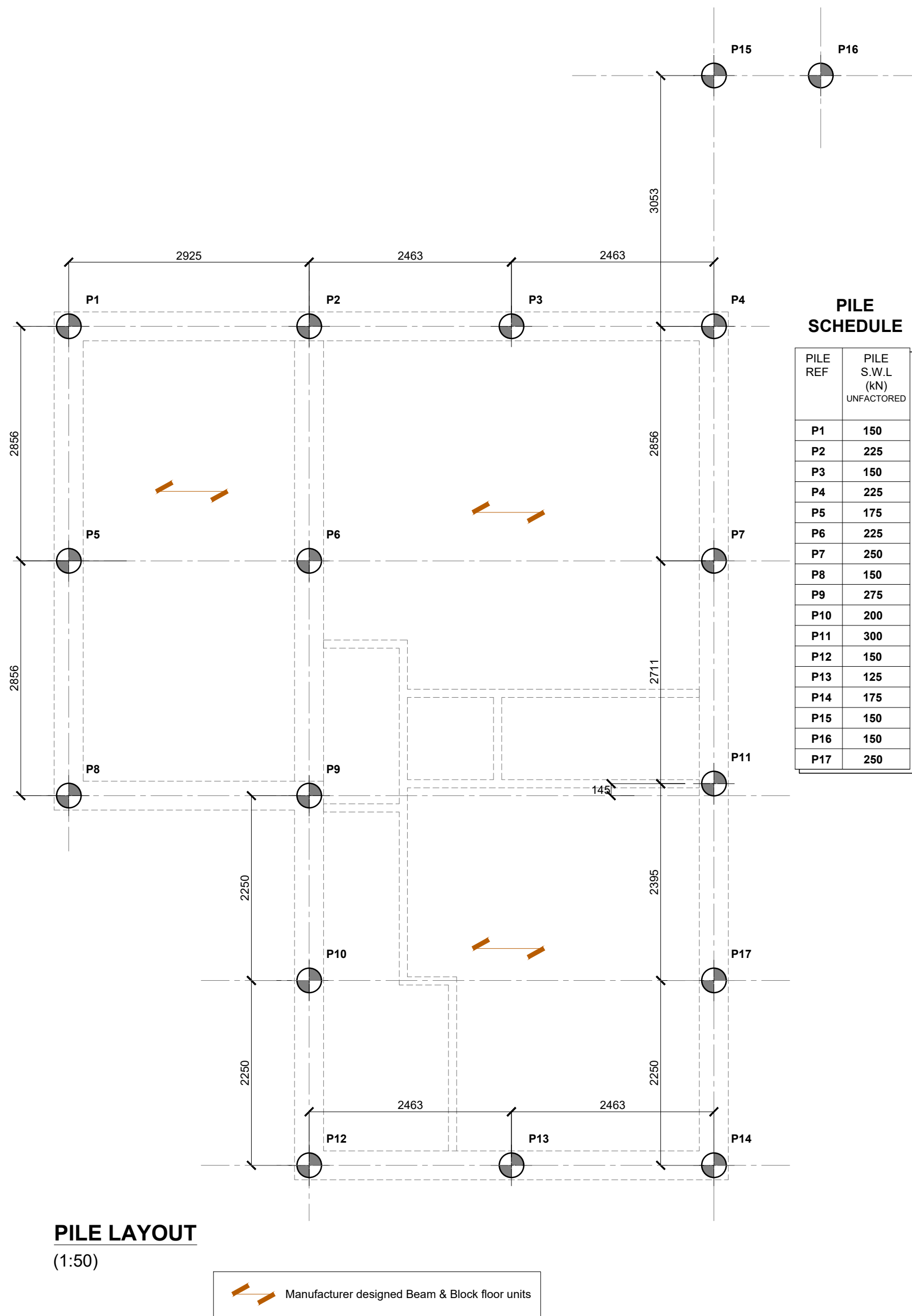
NOTE:
FOUNDATIONS TO HAVE B1131 TOP & BTM. MESH



FOR CONSTRUCTION

C	PWE	DO	Jun 22	Sections updated, revised for construction
B	PWE	DO	Feb 22	Drg. updated, dims added
A	PWE	DO	Jan 22	Drg. updated, dims added
Revision	By	Check	Date	Description
Partington Associates Partington & Associates Limited Structural Design Consultants 13 Gillibrand Street Chorley Lancashire PR7 2EJ Tel: (01257) 249882 / 249863 e-mail: info@partington-associates.com www.partington-associates.com				
Client	WIGGETT CONSTRUCTION LTD.			Scale @A1 1:50
Project	174 BURY OLD ROAD ROCHDALE			Date OCT 2021
Title	TYPE D - FOUNDATION DETAILS			Drawn PWE
Job No.	4700-21	Dwg No.	F-04	Rev. c
Approved	DO			Check DO

SECTION B - B (1:50)

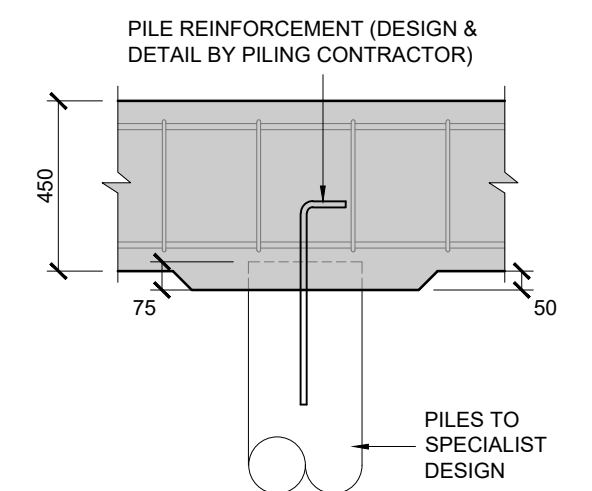
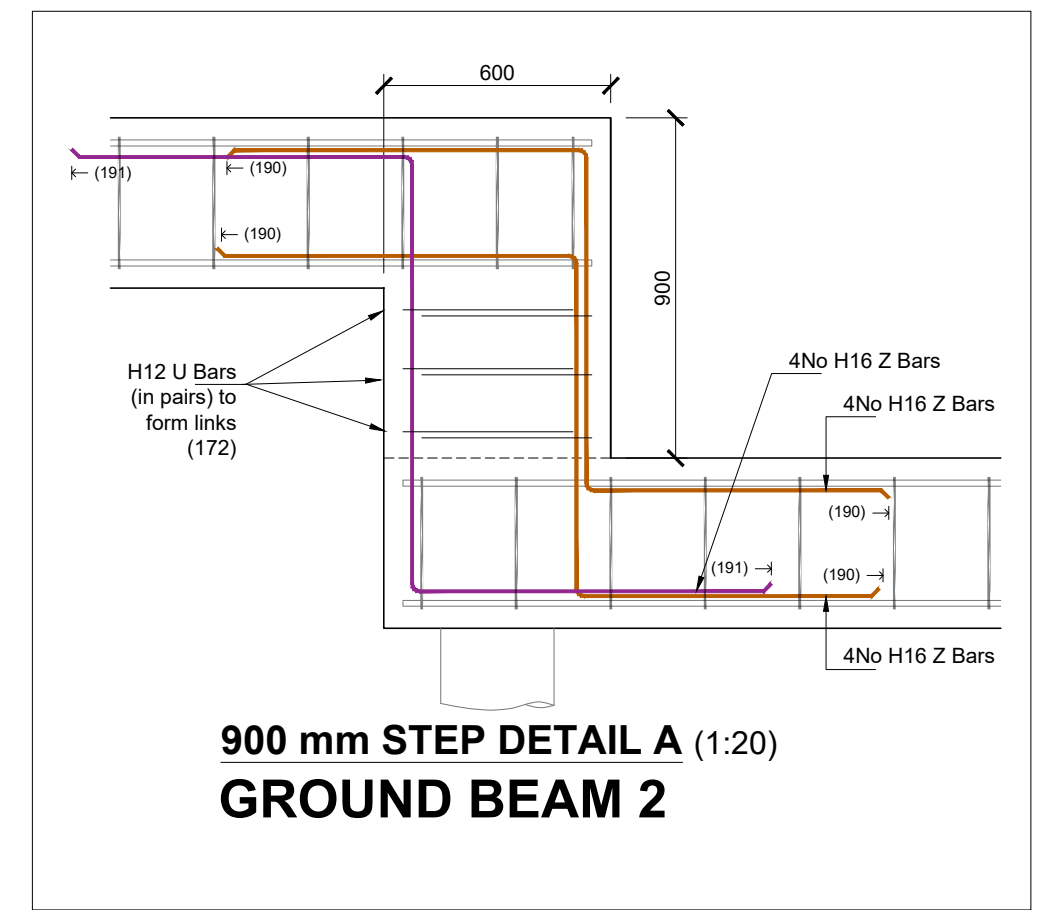
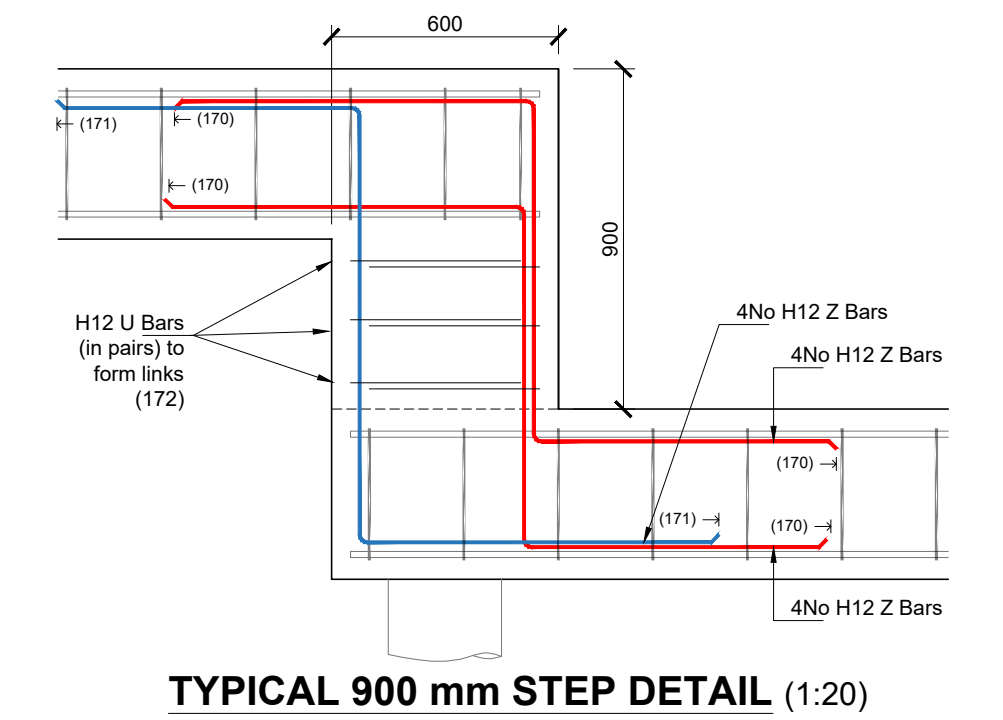
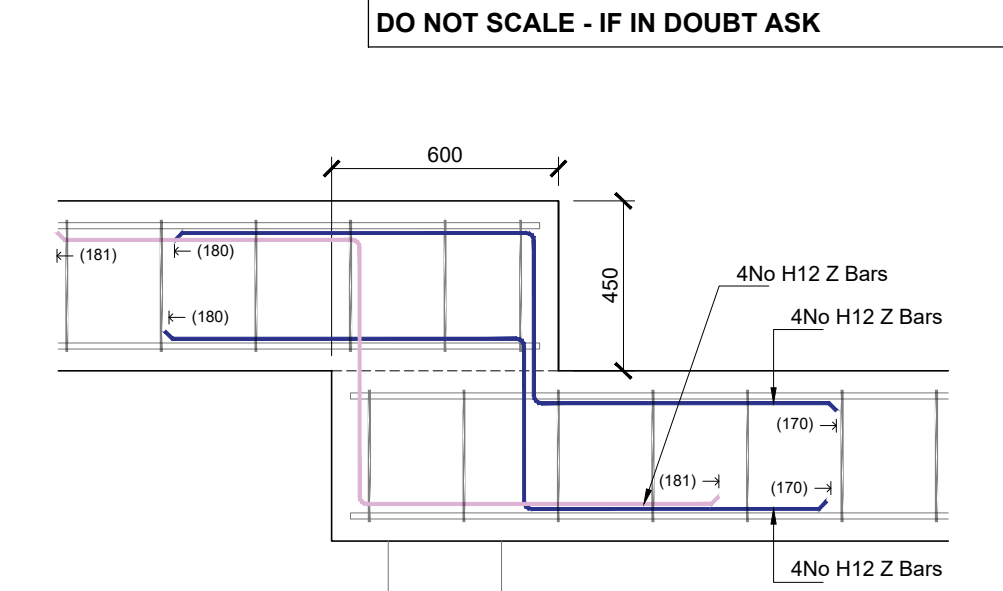
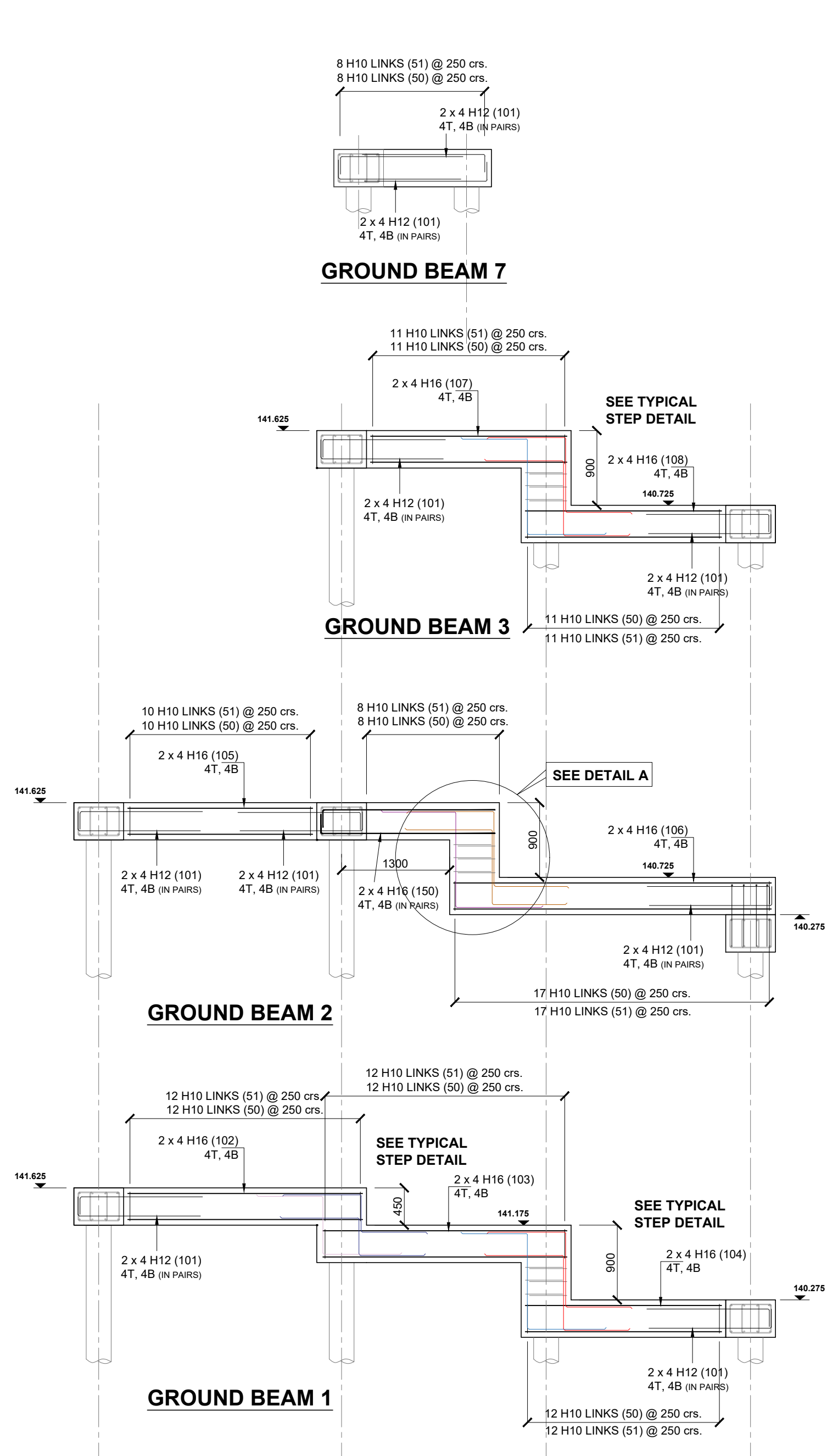
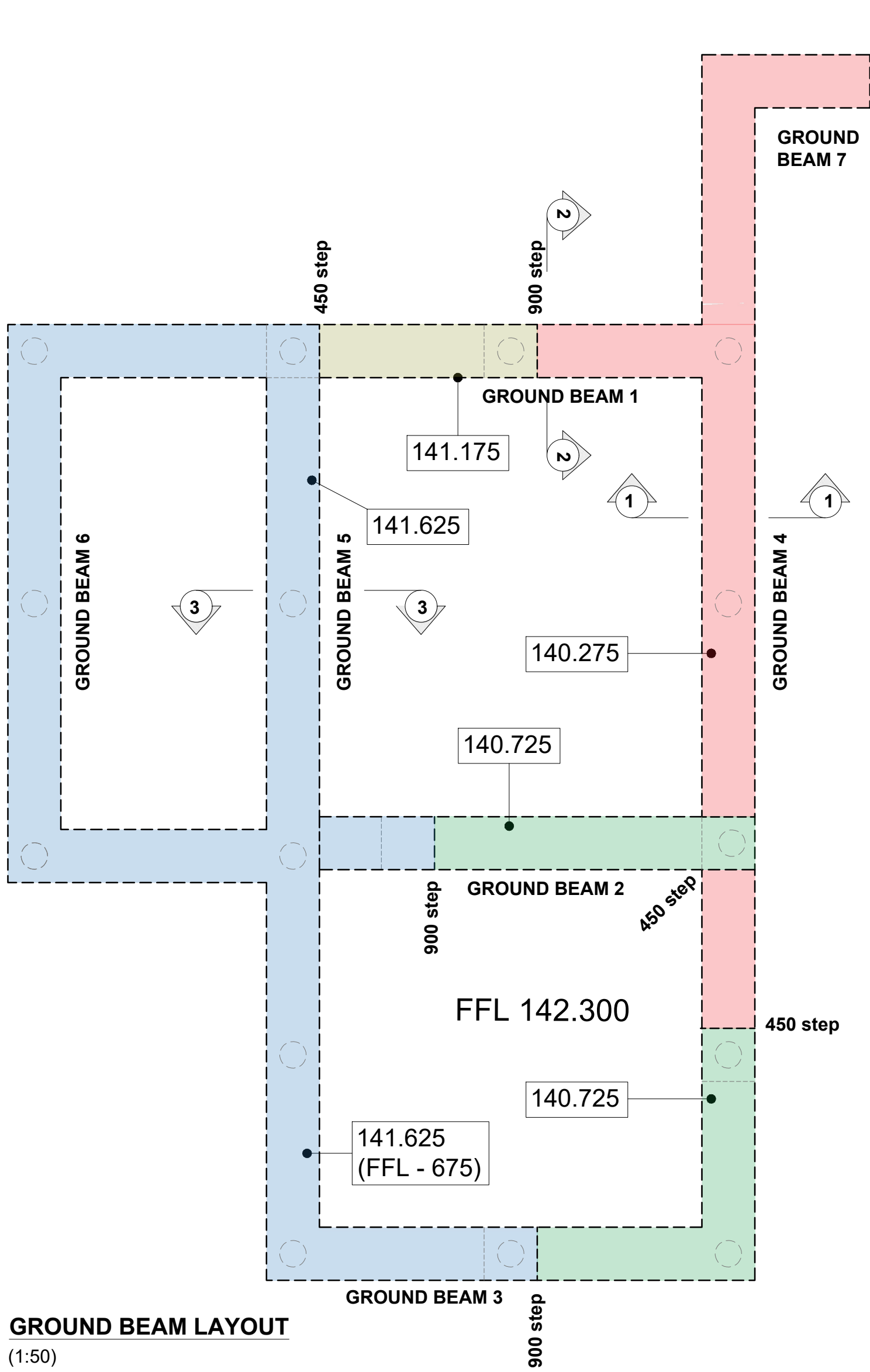
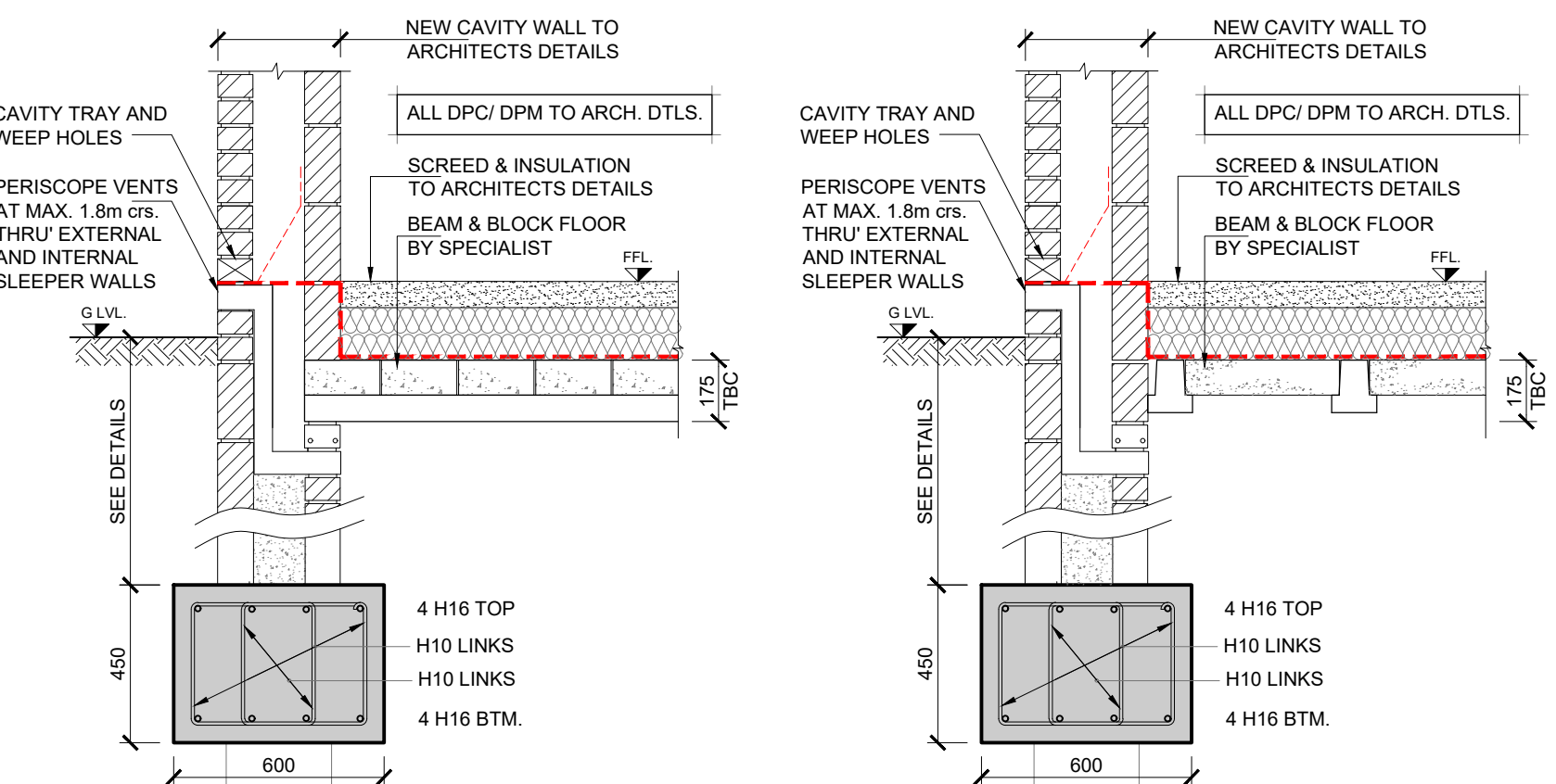


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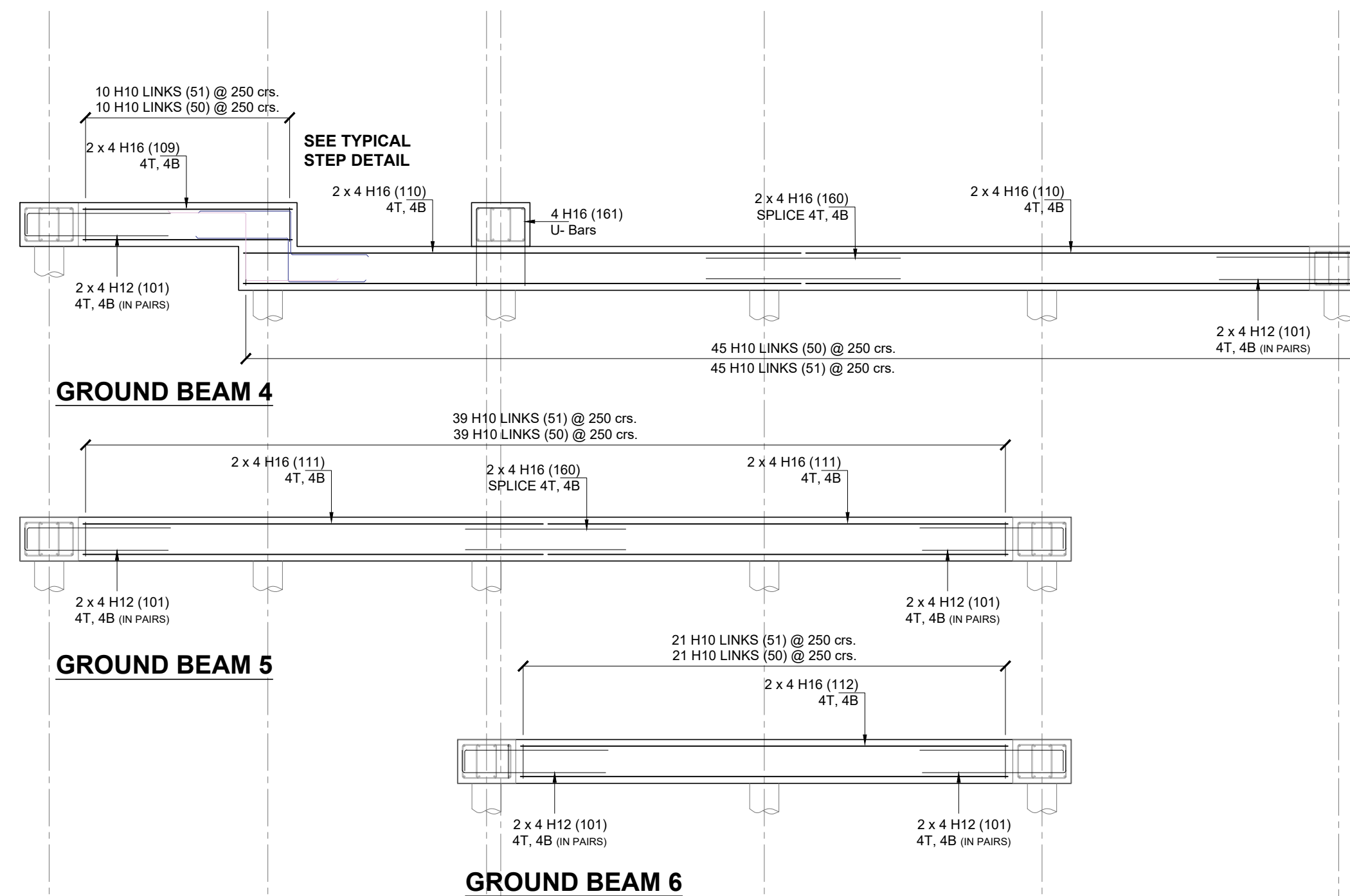
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NOTE:
CONCRETE STRENGTH CLASS TO BE C28/35



THIS DRAWING TO BE READ IN CONJUNCTION WITH F100

FOR CONSTRUCTION



A	PWE	DO	Jun 22	Revised for construction	
Revision	By	Check	Date	Description	
Partington Associates Partington & Associates Limited Structural Design Consultants 13 Gillibrand Street Chorley Lancashire PR7 2EJ Tel: (01257) 249882 / 249863 e-mail: info@partington-associates.com www.partington-associates.com					
Client	WIGGETT CONSTRUCTION LTD.			Scale @A1	1:50
Project	174 BURY OLD ROAD ROCHDALE			Date	MAR 2022
				Drawn	PWE
Title	PLOT 7 TYPE B - FOUNDATION DETAILS			Check	DO
Job No.	4700-21	Dwg No.	F-101	Rev.	A
				Approved	DO

Solshield Ultra Gas Barrier

Description:

Solshield Ultra Gas Barrier is a multi-layer low density polyethylene (LDPE) gas barrier and damp-proof membrane reinforced with a polypropylene grid with an integral aluminium foil. The membrane is designed for use in concrete ground floors, above and below slab not subject to hydrostatic pressure.

Solshield Ultra protects buildings against Moisture, Radon, Carbon Dioxide, and Methane from the ground.

Air & Moisture protection system.

Resistance to puncture - the membrane has a strong resistance to puncture and on smooth surfaces will not be damaged by foot/site traffic.

Durability - the membrane remains effective against the ingress of water and water vapour, will restrict the ingress of radon, methane, and carbon dioxide during the lifetime of the flooring construction in which it is installed.

Compliance:

- NHBC Standards 2019, Chapters 4.1/5.1.
- CE Marking Standard EN13967:2012
- BS 8485:2015+A1:2019.
- CP 102:1973, Section 2.
- BS8000-4:1989.
- BBA Certificate No. 20/5737.

General:

- Solshield Ultra Gas Membrane should not be installed at temperatures below 5°C, to prevent the risk of surface condensation.
- The membrane must be installed and fixed in accordance with the relevant clauses in BRE Report BR 211:2015, and guidance given in BS 8485:2015+A1:2019.
- The membrane should be installed on a sand blinding layer, Solshield P30 protection fleece, or a smooth concrete float finish. In order to provide a continuous barrier across the cavity, Solshield Ultra Gas Barrier should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.
- Solshield Ultra Gas Membrane is suitable for installation with:
 - Beam and block floor application with 150mm clear void in an Amber 2 category projects.
 - Reinforced raft foundation and in situ suspended slab, providing the membrane is laid above the ground and not in direct contact with any source of hydrocarbon/VOC vapour.
- Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane.

Venting:

- Solshield Ultra can be used on site where passive or active ventilation is required.
- Solshield Geocomposite Drainage & Venting Mat should be used in conjunction with the relative vent connectors where required. These types of systems are designed on a bespoke site specific nature.
- Please contact us for our design advice.



- Complies with latest codes of practice as published by BRE, BSI & CIRIA.
- BBA Certified, NHBC Compliant & CE Marked.
- Suitable to protect against the ingress of Rn, CO₂, and CH₄.
- BS 8485:2015+A1:2019 Accordant.
- Suitable for use as gas protection for NHBC Green, Amber 1, and Amber 2 site situations.
- High resistance to puncture.
- Also acts as a damp proof membrane.

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

Technical Data:

Property	Test Method	Value
Thickness	EN 1849-2	0.60mm
Thickness - Between Scrim	BS EN ISO 9863-1:2016	0.40mm
Width	EN 1849-2	2.0m
Length	EN 1849-2	50m
Weight	EN 1849-2	370 g/m ²
Hydraulic Properties		
Water Column Test	EN 20811	> 300
Resistance to Water Penetration	EN 13967 / EN 1928	Pass
Watertightness	EN 1296 / EN 1367 / EN 1928	Pass
Mechanical Properties		
Resistance to Static Load	EN 12730-B	20 kg
Tensile Strength (MD)	EN 12311 - 1	600 N/50mm
Tensile Strength (CMD)	EN 12311 - 1	480 N/50mm
Tensile Elongation (MD)	EN 12310 - 1	20%
Tensile Elongation (CMD)	EN 12310 - 1	20%
Puncture Resistance	EN 12236	1.25 kN
Resistance to Tearing (Nail Shank) (MD)	EN 12310 - 1	330 N
Resistance to Tearing (Nail Shank) (CMD)	EN 12310 - 1	400 N
Durability and Chemical Resistance		
Transmission Rate of Volatile Liquids (Diesel)	ISO 6179:2010 (B)	0.246 g/m ² /hr
Transmission Rate of Volatile Liquids (Xylene)	ISO 6179:2010 (B)	0.571 g/m ² /hr
Transmission Rate of Volatile Liquids (Toluene)	ISO 6179:2010 (B)	0.583 g/m ² /hr
Transmission Rate of Volatile Liquids (Petrol)	ISO 6179:2010 (B)	0.135 g/m ² /hr
Gas Permeability		
Methane Permeability	BS EN ISO 15105-1	< 0.09 ml/m ² /day/atm
Carbon Dioxide Permeability	BS EN ISO 15105-1	< 0.09 ml/m ² /day/atm
Radon Permeability	K124/02/95	8.0x10 ⁻¹⁵ m ² /s

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

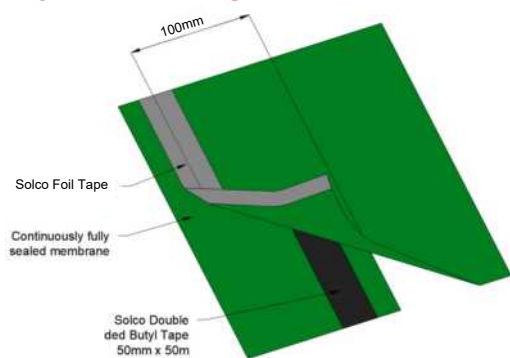
Installation:

1. The membrane must only be applied to surfaces that have a smooth finish - free from voids, projections, and mortar deposits. Surfaces should be dry and free from dust and frost. In order to provide a continuous barrier across the cavity, Solshield Ultra should be taken through the blockwork and incorporated below the damp proof course cavity in the outer leaf.
2. Concrete surfaces should be dense. Vertical surfaces of brickwork and blockwork must be dry and rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.
3. Solshield Ultra is rolled out with the coloured side up, ensuring that it is properly aligned. All end and side overlaps should be a minimum of 100mm and prepared.
4. When the membrane is laid below the concrete slab, it should be loose-laid to accommodate any small movements.
5. All surfaces must be dried thoroughly prior to joining. Roll edges can be welded or taped.
6. The continuity of the damp proofing must extend over the footprint of the building, and the membrane must be sealed to a damp-proof course where required.
7. The membrane should be covered by a screed or other protective layer, such as Solco Protection Fleece, as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction. Care should be taken when handling building materials over the exposed surface.

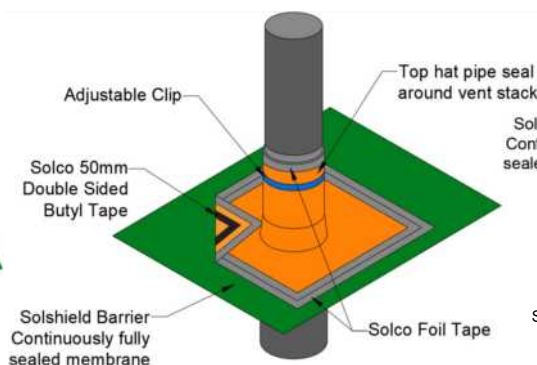
Jointing Detail:

1. Apply Solco Double Sided Butyl Tape around 50mm from the membrane edge, leaving the backing paper on.
2. Lay the next membrane, overlapping the first by a minimum of 100mm.
3. Remove the backing paper from the double sided butyl tape and join the top sheet to the bottom sheet, by applying pressure with a hand roller to remove trapped air.
4. Where the membranes overlap, apply Solco Single Sided Foil Tape, equidistant on both membranes (see detail). All service entry points must have airtight seals. Top hats and corner pre-forms must be sealed using double sided butyl tape.

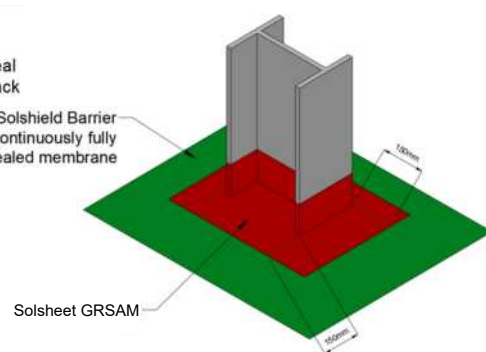
Typical Jointing Details for Solshield Ultra



Typical Lap Detail



Typical Penetration Detail



Typical Column Detail

Note:

All service entry points must have airtight seals. Top hats and corner pre-forms must be sealed using double-sided butyl tape.



Solshield Ultra System Accessories

Solco Top Hats	Form an effective seal where a pipe, duct, or service penetrates Solsheet membranes.	Units
Solco Double Sided Butyl Tape	A double-sided synthetic butyl mastic tape, used for securing joints and laps in DPC's, Cavity trays & pre-formed Cloaks.	Rolls
Solco Foil Tape	A single-sided tape for securing laps & joints.	Rolls
Solco Venting Accessories	Allows the effective venting of gas from beneath a building.	Units
Solco Int / Ext Corners	Preformed units that ensure protection at corners.	Units
Solco GR DPC	A gas resistant tri-polymer damp proof course.	Rolls
Solco P30 Protection Fleece	Forms a protective layer to prevent damage to the membrane.	Rolls
Solsheet GR Self-Adhesive Membrane	A gas resistant self-adhesive membrane.	Rolls
Solseal HP Primer	Used to provide adhesion to bitumen enhanced geomembranes.	Tins
Solshield Venting Mat	Cuspated (HDPE) drainage mat for providing a drainage / venting channel.	Rolls
Solseal Liquid Gas Barrier	A gas resistant liquid applied membrane	Tins

Storage and Handling on Site:

- Solshield Ultra is classified as non-hazardous (code of practice CP102 1973).
- Rolls should be stored on a flat surface, kept under cover, and protected from sunlight and mechanical damage. The product is chemically inert and any acids or alkalis present in the subsoil will not affect the membrane.
- Do not use when exposed to sunlight and general outdoor weather conditions for long periods of time.
- Quality control during the laying of the membrane is extremely important.
- The membrane should be protected either through the use of temporary protection over its whole area or the immediate laying of the concrete slab. Care should be taken when handling building materials over the exposed surface.

Solco, Unit 51, Portmanmoor Road Industrial Estate, Ocean Park, Cardiff, CF24 5HB

GeoEnginSeerLtd Air Lance Non-Destructive Integrity Testing Certification

Project: Wiggetts Heywood Site, Bury.

**Building Type: Residential Low Rise Development comprising of 7
two storey dwellings. Plots 1 & 2**

Date: 21st June 2022

Inspection and Integrity Details:

On the 21st of June 2022, visual inspection and air lance integrity testing was conducted at the site of development on the land adjacent to Bury Old Road, Heywood. The protective gas resistant barrier was installed by J.D Flooring LTD, using Solshield Ultimate Gas Membrane. 100% of all installed plots were subject to visual inspection and air lance integrity testing.

The visual inspection and air lance integrity testing was conducted at a non-destructive pressure of 4 bar/50psi. No issues were identified during testing.

Where the following conclusion indicates a pass the follow-on construction activities may proceed to suitable protection measures of the membrane being applied in accordance with manufacturers recommendations.

CONCLUSION OF INTEGRITY LANCE TEST: PASS

If you have any questions regarding the above, please do not hesitate to contact me.

Yours sincerely



Ben Crowther B.Sc, M.Sc, PGCE, FGS, CIEH, PCA QT, SGPV

For and on behalf of GeoEnginSeer Ltd.

geoenginseer@gmail.com 07817 108921

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Site Plan:



Site Test Location:



Site Log of Photographs:

Area Surveyed Overview 21.6.22 Plot 2	Area Surveyed Overview 21.6.22 Plot 1	Air Lance Pressure: Min 50Psi required and resting strength is usually higher:
		

Site Field Notes	Example Pick testing Penetrations	Corner Detailing
		

GeoEnginSeerLtd Air Lance Non-Destructive Integrity Testing Certification

Project: Wiggetts Heywood Site, Bury.

**Building Type: Residential Low Rise Development comprising of 7
two storey dwellings. Plots 3 & 4**

Date: 15th July 2022

Inspection and Integrity Details:

On the 15th of July 2022, visual inspection and air lance integrity testing was conducted at the site of development on the land adjacent to Bury Old Road, Heywood. The protective gas resistant barrier was installed by J.D Flooring LTD, using Solshield Ultimate Gas Membrane. 100% of all installed plots were subject to visual inspection and air lance integrity testing.

The visual inspection and air lance integrity testing was conducted at a non-destructive pressure of 4 bar/50psi. One issue was identified during testing this was repaired and retested.

Where the following conclusion indicates a pass the follow-on construction activities may proceed to suitable protection measures of the membrane being applied in accordance with manufacturers recommendations.

CONCLUSION OF INTEGRITY LANCE TEST: PASS

If you have any questions regarding the above, please do not hesitate to contact me.

Yours sincerely



Ben Crowther B.Sc, M.Sc, PGCE, FGS, CIEH, PCA QT, SGPV

For and on behalf of GeoEnginSeer Ltd.

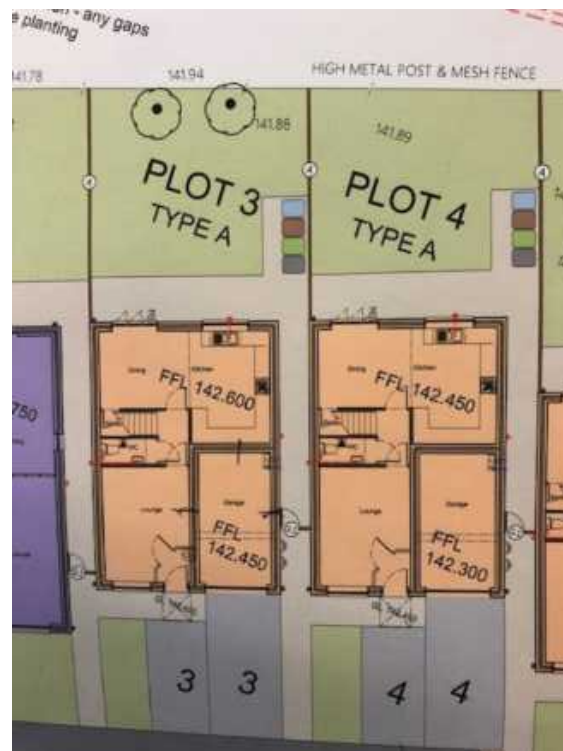
geoenginseer@gmail.com 07817 108921

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Site Plan:



Site Test Location:



Site Log of Photographs:

Area Surveyed Overview 15.7.22	Penetration Details	Air Lance Pressure: Min 50Psi required and resting strength is usually higher:
		

Corner details	Evidence of Finished Patch	Threshold Detailing.
		

GeoEnginSeerLtd Air Lance Non-Destructive Integrity Testing Certification

Project: Wiggetts Heywood Site, Bury.

**Building Type: Residential Low Rise Development comprising of 7
two storey dwellings. Plots 5**

Date: 15th September 2022

Inspection and Integrity Details:

On the 15th of September 2022, visual inspection and air lance integrity testing was conducted at the site of development on the land adjacent to Bury Old Road, Heywood. The protective gas resistant barrier was installed by J.D Flooring LTD, using Solshield Ultimate Gas Membrane. 100% of all installed plots were subject to visual inspection and air lance integrity testing.

The visual inspection and air lance integrity testing was conducted at a non-destructive pressure of 4 bar/50psi. One issue were identified during testing.

Where the following conclusion indicates a pass the follow-on construction activity may proceed to suitable protection measures of the membrane being applied in accordance with manufacturers recommendations.

CONCLUSION OF INTEGRITY LANCE TEST: PASS

If you have any questions regarding the above, please do not hesitate to contact me.

Yours sincerely



Ben Crowther B.Sc, M.Sc, PGCE, FGS, CIEH, PCA QT, SGPV

For and on behalf of GeoEnginSeer Ltd.

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Site Plan:



Site Log of Photographs:

Area Surveyed Overview 15.9.22	Air Lance Pressure: Min 50Psi required and resting strength is usually higher:
 A wide-angle photograph showing a rectangular area covered in a bright green pool liner. The liner is laid out on a flat surface, possibly a prepared base. In the background, there are trees and a brick wall. The foreground shows some concrete blocks and a small piece of white paper.	 A close-up photograph of an air lance. It features a pressure gauge with a needle pointing to a value. The lance is connected to a hose and has a blue label with the text 'FCL' and '150d'.

Corner details	Penetration Detailing.
 A close-up photograph of a corner detail. A hand is holding a small tool, possibly a screwdriver, and is working on a white protective layer that is being applied to the green liner. The liner is visible in the background.	 A close-up photograph of a penetration detail. A blue pipe is visible, passing through the green liner. A white protective layer is being applied around the pipe. A small blue cap is also visible on the liner.

GeoEnginSeerLtd Air Lance Non-Destructive Integrity Testing Certification

Project: Wiggetts Heywood Site, Bury.

**Building Type: Residential Low Rise Development comprising of 7
two storey dwellings. Plots 6 & 7**

Date: 11th August 2022

Inspection and Integrity Details:

On the 15th of September 2022, visual inspection and air lance integrity testing was conducted at the site of development on the land adjacent to Bury Old Road, Heywood. The protective gas resistant barrier was installed by J.D Flooring LTD, using Solshield Ultimate Gas Membrane. 100% of all installed plots were subject to visual inspection and air lance integrity testing.

The visual inspection and air lance integrity testing was conducted at a non-destructive pressure of 4 bar/50psi. two issues were identified during testing.

Where the following conclusion indicates a pass the follow-on construction activity may proceed to suitable protection measures of the membrane being applied in accordance with manufacturers recommendations.

CONCLUSION OF INTEGRITY LANCE TEST: PASS

If you have any questions regarding the above, please do not hesitate to contact me.

Yours sincerely



Ben Crowther B.Sc, M.Sc, PGCE, FGS, CIEH, PCA QT, SGPV

For and on behalf of GeoEnginSeer Ltd.

geoenginseer@gmail.com 07817 108921 WWW.GeoEnginSeerLtd.com

Site Plan:



Site Log of Photographs:

Area Surveyed Overview 11.8.22	Air Lance Pressure: Min 50Psi required and resting strength is usually higher:
	

Windpost details	Penetration Detailing.
	

Windpost Repair



Windpost Closeup

