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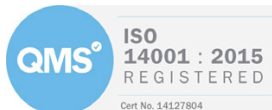


PHASE 4 VALIDATION REPORT

job number	date
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Rogers Geotechnical Services Ltd
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Phase 4: Gap Analysis Assessment & Validation

Location:	Land off Manchester Road (Area 2) Linthwaite, Huddersfield, West Yorkshire HD7 5QG	
For:	Highstone Building Services	
Report No.	C4065/25/E/7562	Report date: June 2025

For and on behalf of **Rogers Geotechnical Services Ltd**

Rob Palmer MSc FGS ACIEH
Engineering Director

Steven Hale BSc FGS
Geo-environmental Technician

1. Introduction

The land associated with the Former Hoyle Ing Dyeworks, Manchester Road has now been developed by the construction of six bungalows. In addition, a residential apartment building, four bungalows and two maisonettes have also been constructed on site. It should be appreciated that the site has been built in two phases, with remedial and validation reports submitted for the separate areas. For transparency, the six bungalows form Area 2 and are the subject of this report; the other developments have been addressed separately as Area 1. RGS are highlighting these two separate sites as whilst the areas have been submitted under separate planning applications, combined reporting has previously been undertaken which may cause some ambiguity for the report reader.

The client developed Area 1 first, with construction taking place in 2022/2023. As such, associated reporting has already been undertaken and submitted to the local authority for Area 1.

Area 2 was developed in 2024 through to 2025. The soft landscaping aspect has already been reported upon; refer to RGS soil validation report C4065/25/E/7561, issued May 2025. Whilst the soil validation report does show that the soils insitu are clean and suitable, the risks associated with VOCs have not been addressed. It should be appreciated that the six bungalows have been constructed as two separate buildings. With reference to the site plan within Appendix 1, two bungalows form the western building, with four bungalows forming the eastern building. For clarity, in this report the western building shall be referred to as 'Building 1', and the eastern building shall be referred to as 'Building 2'.

2. Limitations

The recommendations made and opinions expressed in this report are based on the conditions revealed by the site works, together with an assessment of the results submitted by others. This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

3. PAH Hot-Spot & Remediation (TP11/HDTP11 of ARP/RGS Phase 2)

Whilst the RGS soil validation report has provided evidence of a clean cover system being installed in the public soft landscaped areas, the report has not addressed the potential volatile risks associated with the PAHs identified at TP11 and HDTP11 within the relevant ARP and RGS Phase 2 investigation reports. The RGS Phase 3 Remediation Statement (C4065/24/E/RS) stated that a barrier be installed for the bungalows. The barrier was to be suitable for both radon and volatiles.

Having held discussions with the client, RGS understand that a VOC vapour barrier has not been installed; only a radon barrier has been implemented. It is understood that the buildings have been constructed upon a granular engineered layer (sub-grade). Moreover, a sub-floor void has been installed beneath the ground floors with numerous air bricks (vents) installed around the perimeter of the buildings.

4. Insitu PID Monitoring & Investigation

As the development has deviated from the agreed remedial measures discussed in consultation with Kirklees Environmental Health, additional ground investigation and insitu monitoring has been undertaken to evaluate the risk to end users from vapours. As the buildings have been constructed above the area of TP11/HDTP11, it is now not possible to excavate in the exact area to assess the source and absence/presence of contamination directly.

4.1 PID Monitoring (Air Bricks)

To assess whether volatiles are accumulating in the sub-floor void, PID monitoring of the air bricks has been undertaken. Three monitoring visits have been completed using a RAE Systems MiniRAE 3000 PID monitor (serial No. 592-932847), last calibrated on the 19th August 2024. The calibration certificate of the PID monitor is presented in Appendix 2, along with representative photographs.

A thin flexible tube was attached to the monitor, which was then inserted as far as possible within each of the air bricks. In each case, the monitor was run for a minimum of 1 minute and the peak reading was recorded. Prior to each test, the detector was run in ambient air for several minutes to ensure a null reading was being recorded.

The results of the testing are summarised as below:

Table 1: PID Monitoring			
Location	Date	VOC Reading Within Air Bricks (ppm)	Comments
Building 1	5 th March 2025	0.0	Overcast, minimal wind. Falling atmospheric pressure trend in the region.
	12 th March 2025	0.0	Overcast, slight wind. Rising atmospheric pressure trend in the region.
	10 th April 2025	0.0	Sunny, slight wind. Falling atmospheric pressure trend in the region.
Building 2	5 th March 2025	0.0	Overcast, minimal wind. Falling atmospheric pressure trend in the region.
	12 th March 2025	0.0	Overcast, slight wind. Rising atmospheric pressure trend in the region.
	10 th April 2025	0.0	Sunny, slight wind. Falling atmospheric pressure trend in the region.

On the basis of the above, it should be noted that all of the readings were zero which implies that the venting system beneath the floors are functioning as they should, or the source has diminished and/or removed.

4.2 PID Monitoring (Internal)

To assess whether any VOCs are accumulating internally, a PID monitor was left in a room in each building for a period of 1 week. The monitor was left initially within Plot 17 of Building 1 in the living space area between the 5th and 12th March 2025. During this monitoring period, the atmospheric pressure for the region varied between 1003mb and 1016mb. From the 5th to the 12th March, the pressure fell from the peak level of 1016mb to 1003mb, whereupon the monitoring was curtailed.

It should be appreciated that during the monitoring period at Building 1, Building 2 was still being developed and therefore windows/doors were frequently being opened. As such, it was decided to wait for a period of time for development to finish before monitoring Building 2.

A PID monitor was left within Plot 20 of Building 2 in the living space area between the 10th and 17th April 2025. During this monitoring period, the atmospheric pressure for the region varied between 1029mb and 997mb. From the 10th to the 15th March, the pressure fell from the peak level of 1029mb to 997mb, thereafter increasing back up to 1011mb, whereupon the monitoring was curtailed.

On each occasion, the PID monitor was set to collect readings at 60 second intervals. Throughout the testing period, the VOC reading remained at 0ppm, suggesting that no volatiles are accumulating.

5. Revised Conceptual Site Model

The datasets and evidence collected in the recent investigation and testing suggest that the source-pathway-receptor model has changed in relation to volatiles. Indeed, it would appear that the risk has been removed or diminished, as no VOCs have been detected within the sub-floor void or building itself. As such, the conceptual site model is to be updated as follows:

Table 2: Conceptual Site Model

Pathways	Receptor	Linkage Present	Risk Rating	Notes
Inhalation of Dust/Vapours	End User	No – pathway has been broken between end user and source. Moreover, evidence suggests source has been removed.	Low	No further action required.

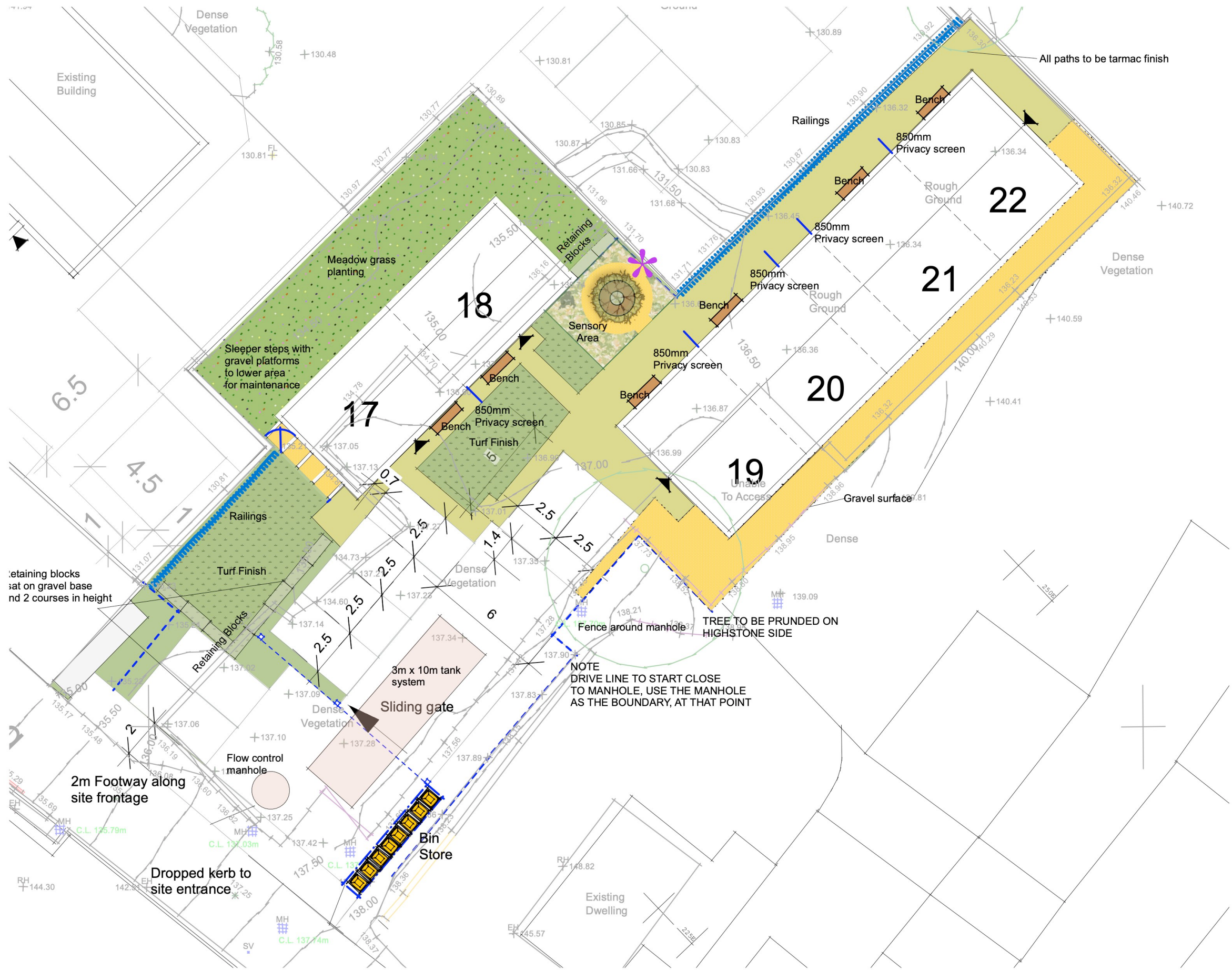
6. Conclusions

In view of the above, the scope of remedial measures required at the site has changed. It is clear that a VOC barrier has not been installed. However, it would appear that the source has been removed from the site or diminished and/or the installed measures (sub-floor void) are acting effectively. In any event, no volatiles have been detected during the PID monitoring exercise.

To conclude, RGS consider there to be a low risk to the end users.

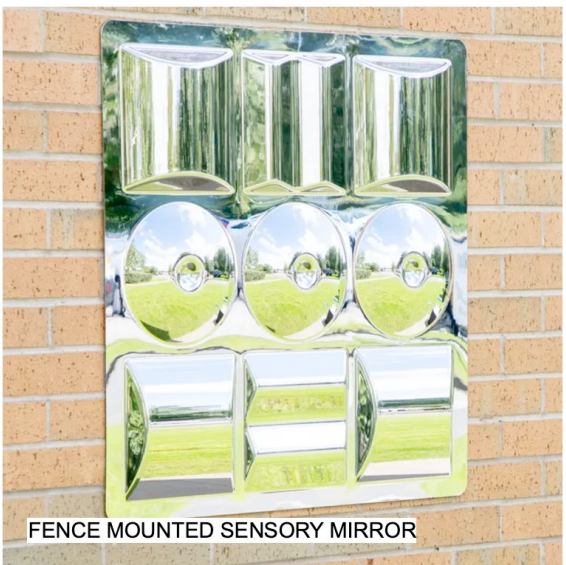
Appendix 1

Site Plan



KEY

- Amenity grass - turf
- Meadow grass - seed
- Sensory planting
- Proposed Ginkgo biloba tree
- Proposed gravel
- Proposed sensory mirror location



Rev/Date | Note

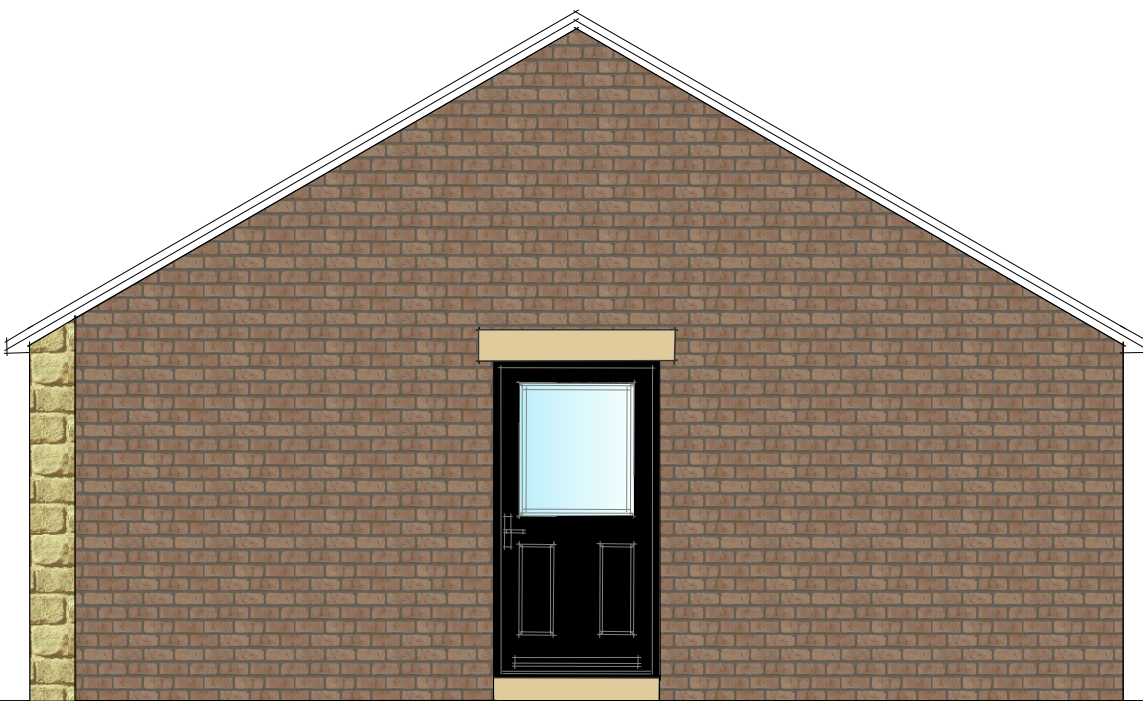
LAND OFF HOYLE ING, LINTHWAITE
LANDSCAPE MASTERPLAN

DATE: 12-12-24 | SCALE @ A3 1:500 | DRWG: HA-MRLWPH2-P003 REV: A

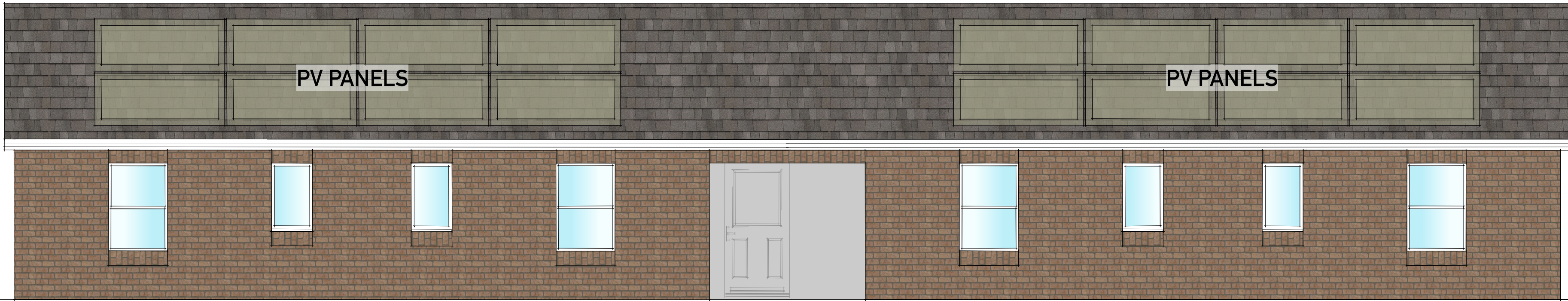




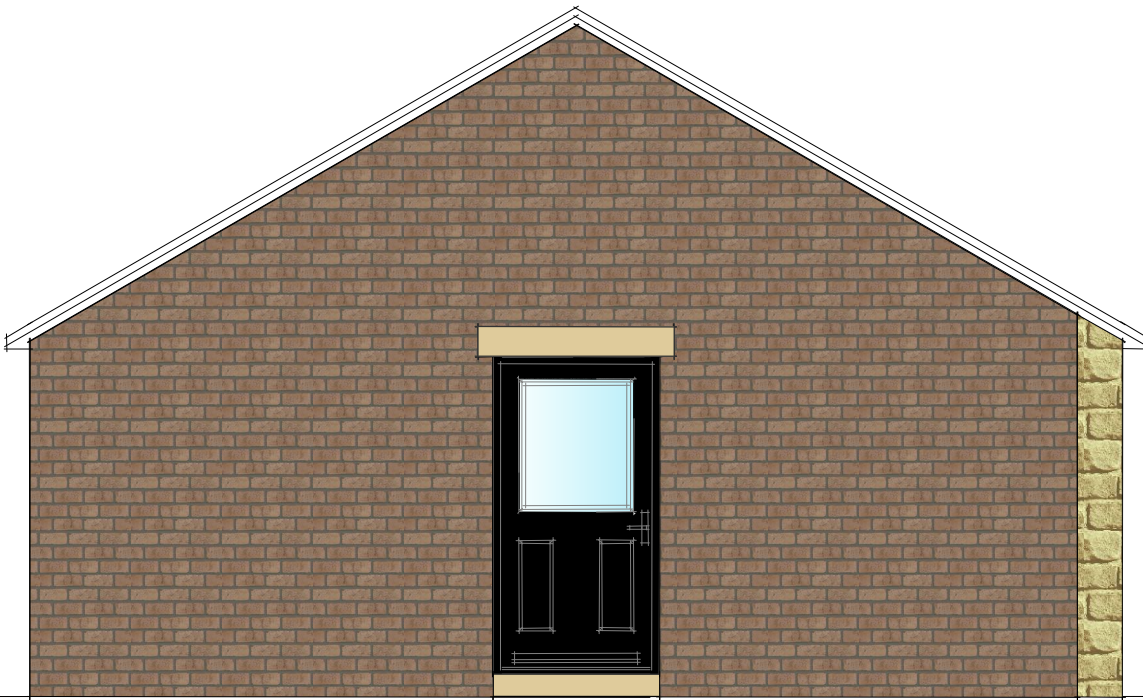
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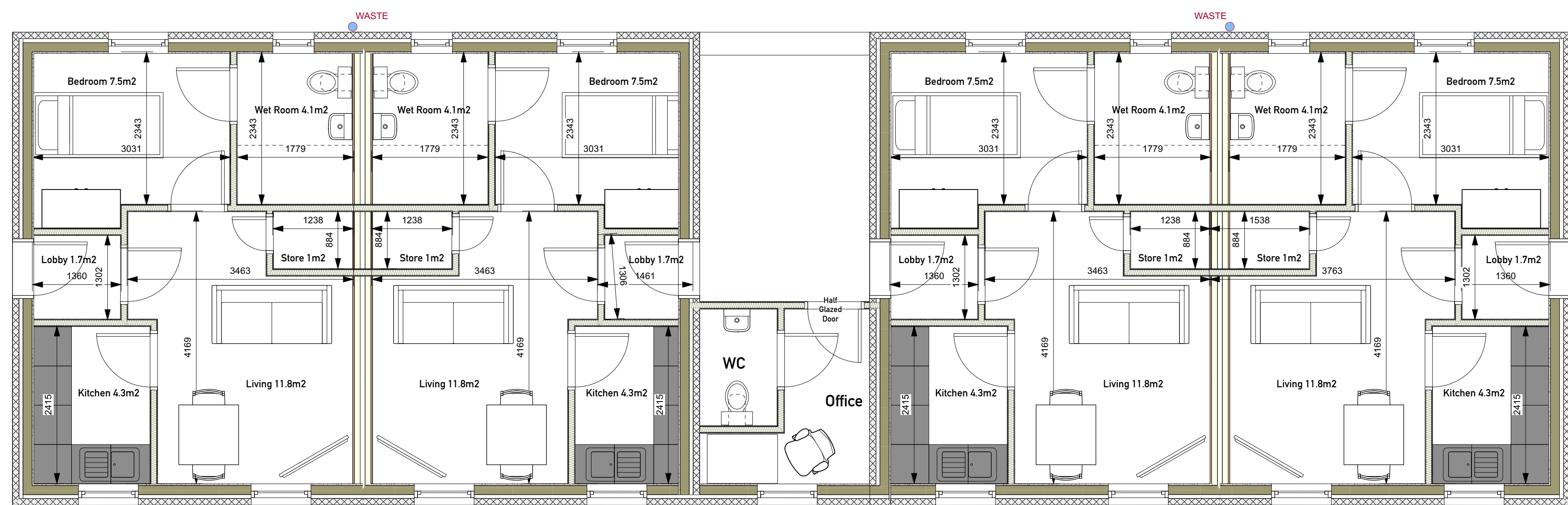
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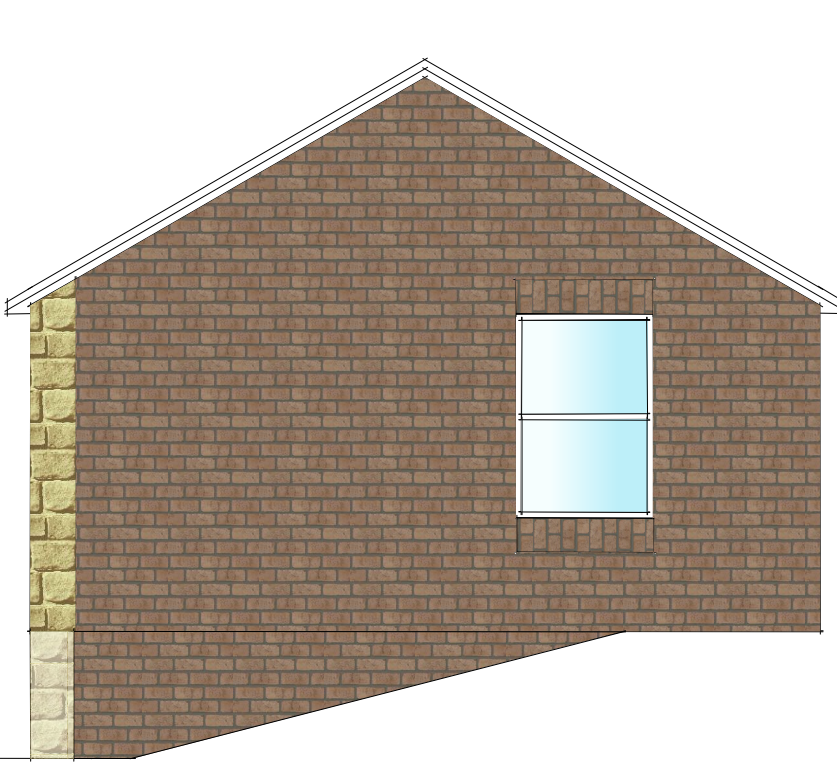
SE Elevation



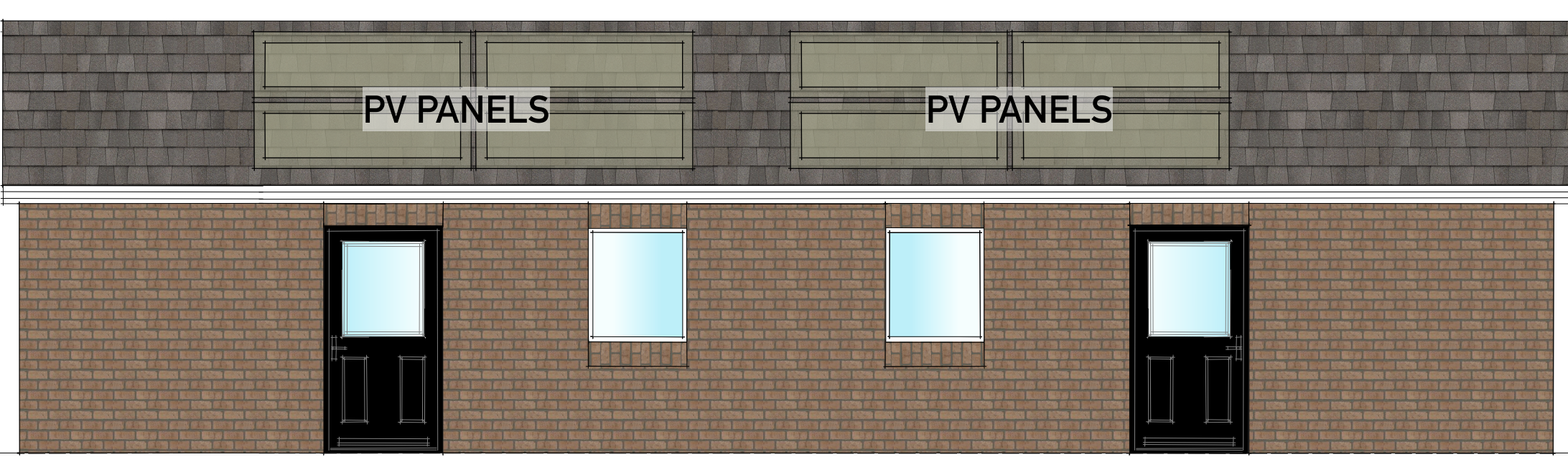
SW Elevation



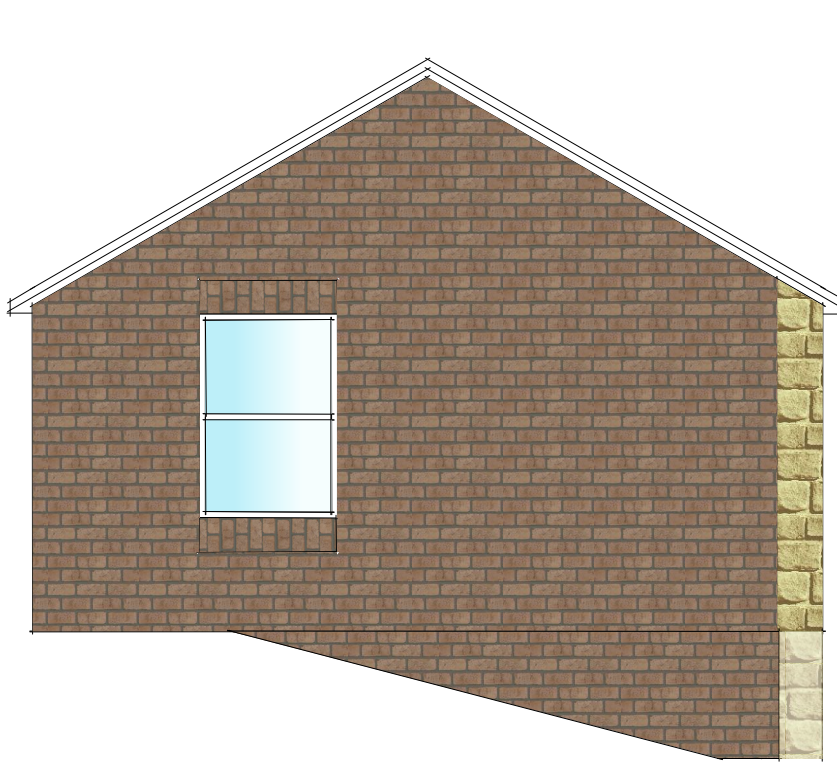
NW Elevation



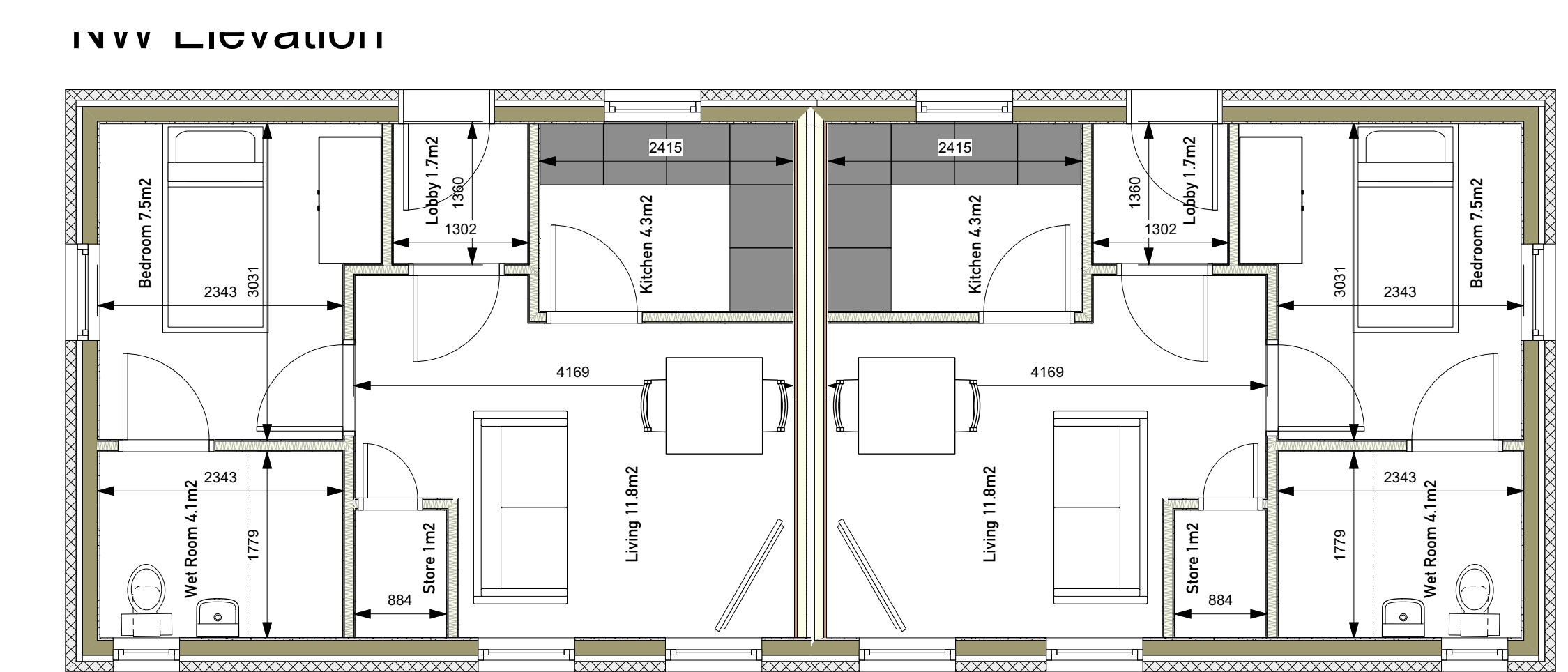
NE Elevation



SE Elevation



SW Elevation



Appendix 2

PID Monitoring Certification and Site Photographs



...everything gas detection

Certificate of Calibration

Customer: Rogers Geotechnical

Instrument: MiniRAE 3000

Job: Service, Test & Calibration

Serial number: 592-932847

Fleet Number: -

Certificate no: 932847/190824

Next calibration due date: 19.AUG.2025

Tested on: 19.AUG.2024

Calibrated for: Isobutylene

<u>Applied Gas Concentration:</u>	<u>Cylinder Reference:</u>	<u>Final Sensor Reading</u>	<u>Accuracy Limits</u>	<u>Pass / Fail</u>
Isobutylene: 100ppm	12600-3-1	100ppm	± 10%	Pass

The instrument has been calibrated after re-zeroing and introducing span calibration gas, using gas that is traceable to national standards and has been prepared in accordance with BS EN ISO 6145-6:2017

Calibration Engineer: Dan Jacques

Sign:

Quality Assessed by (Print):	C. Shillicoe	Sign:
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Photo 1 : PID monitor left in Building 1. 5th March 2025.



Photo 2 : PID monitor left in Building 2. 10th April 2025.



Photo 3 : Examples of vents on buildings. Air bricks (red) and weep guards (blue).



Photo 4 : Examples of vents on buildings. Air bricks (red) and weep guards (blue).



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 Land off Manchester Road
 Linthwaite

Client:
 Highstone Building Services



Photo 5 : PID in operation. 05/03/2025



Photo 6 : PID in operation. 05/03/2025



Photo 7 : PID in operation. 05/03/2025



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