

12603/JJ

07 February 2023

Mr Thavarajah Shanthakumaran  
35 Marsh Street  
Port Talbot  
SA12 6UD

**For the attention of Mr Thavarajah Shanthakumaran**

Dear Sirs,

## **Julian Terrace, Port Talbot – Shell and Auger Borehole Ground Investigation**

We have now completed the supplemental intrusive ground investigation works at the above site and can report as follows.

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### ***Background***

Mr Thavarajah Shanthakumaran is proposing to redevelop a site at Julian Terrace in Port Talbot for a mixed commercial and residential end-use. The location of the site is shown in Figure 1 enclosed.

A previous intrusive site investigation was carried out by Intégral Géotechnique (Wales) Limited during February 2020. Please refer to Site Investigation Report, ref: 12603/JJ/20/SI, dated March 2020.

It is understood that the proposed building will be constructed utilising piled foundations. In order to confirm the ground conditions at depth, Intégral Géotechnique (Wales) Limited were instructed to undertake a supplemental shell and auger borehole and factually report on the findings.

## **Fieldworks**

We attended site during January 2023 to carry out a supplemental ground investigation comprising the drilling of one shell and auger borehole.

The purpose of the shell and auger borehole (referenced BH1) was to characterise the deep ground conditions beneath the site and allow for the installation of a groundwater / ground gas monitoring standpipes.

Two standpipes were installed in BH1 (i.e., a shallow standpipe, and a deep standpipe).

The approximate location of the shell and auger borehole is shown in Figure 2 enclosed.

## **Summary of Ground Conditions**

The ground conditions recorded at BH1 comprised a layer of made ground, over thick superficial soils comprising of Tidal Flat Deposits.

The made ground typically comprised a layer of granular soils with variable quantities of man-made constituents including brick and clinker. The base of the made ground deposits was recorded at a depth of approximately 0.6m bgl.

Superficial soils comprising Tidal Flat Deposits underlie the made ground. The superficial soils typically comprise very soft blue grey clay (proven to a depth of approximately 2.8m bgl) over loose becoming medium dense, becoming dense, sands, gravels, and cobbles.

SPT 'N' values in the clay layer ranged between 1 and 2.

SPT 'N' values within the underlying granular soils ranged between 8 and 60.

It should be noted that a chisel attachment had to be utilised in order to penetrate boulders present within the granular superficial soils at depths of 6.1m, 7.0m and 8.6m bgl.

BH1 was terminated at a depth of approximately 12.0m bgl.

Groundwater was encountered at a depth of approximately 2.8m bgl in BH1 and was recorded to be standing at a depth of approximately 1.4m bgl (after 20 minutes).

The shell and auger borehole log is presented in Appendix A.

## **Groundwater and Ground Gas Monitoring**

A round of groundwater and ground gas monitoring was undertaken on 03 February 2023 using a dip meter and a GA5000 Gas Analyser. The results are summarised below in Table 1.

| <b>Table 1: Summary of Groundwater Level and Ground Gas Results</b> |                           |                                   |                                          |                                  |                      |
|---------------------------------------------------------------------|---------------------------|-----------------------------------|------------------------------------------|----------------------------------|----------------------|
| Borehole                                                            | Groundwater Depth (m bgl) | Maximum Methane Concentration (%) | Maximum Carbon Dioxide Concentration (%) | Minimum Oxygen Concentration (%) | Gas Flow Rate (l/hr) |
| BH1 (shallow)                                                       | 1.20                      | 0.10                              | 0.20                                     | 20.1                             | <0.3                 |
| BH1 (deep)                                                          | 1.20                      | 0.10                              | 0.70                                     | 19.5                             | <0.3                 |

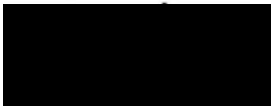
Groundwater was recorded at a depth of approximately 1.20m bgl in both standpipe installations.

The gas monitoring results recorded a maximum methane concentration of 0.1% and a maximum carbon dioxide concentration of 0.7%. A maximum gas flow rate of <0.3l/hr was measured.

In accordance with CIRIA Report C665 a Gas Screening Value (GSV) of <0.0021l/hour has been calculated. This GSV corresponds to gas characteristic situation 1/green which does not require any special gas protective measures (with respect to methane and carbon dioxide).

We trust the above and enclosed are to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,



**Jack Jones**  
**For**  
**Intégral Géotechnique (Wales) Limited**

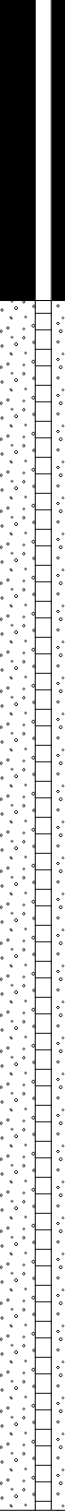
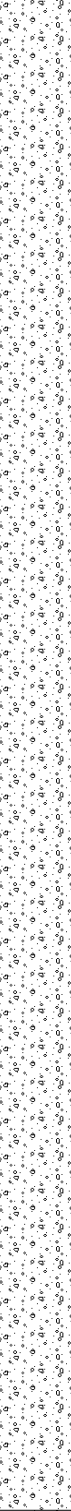
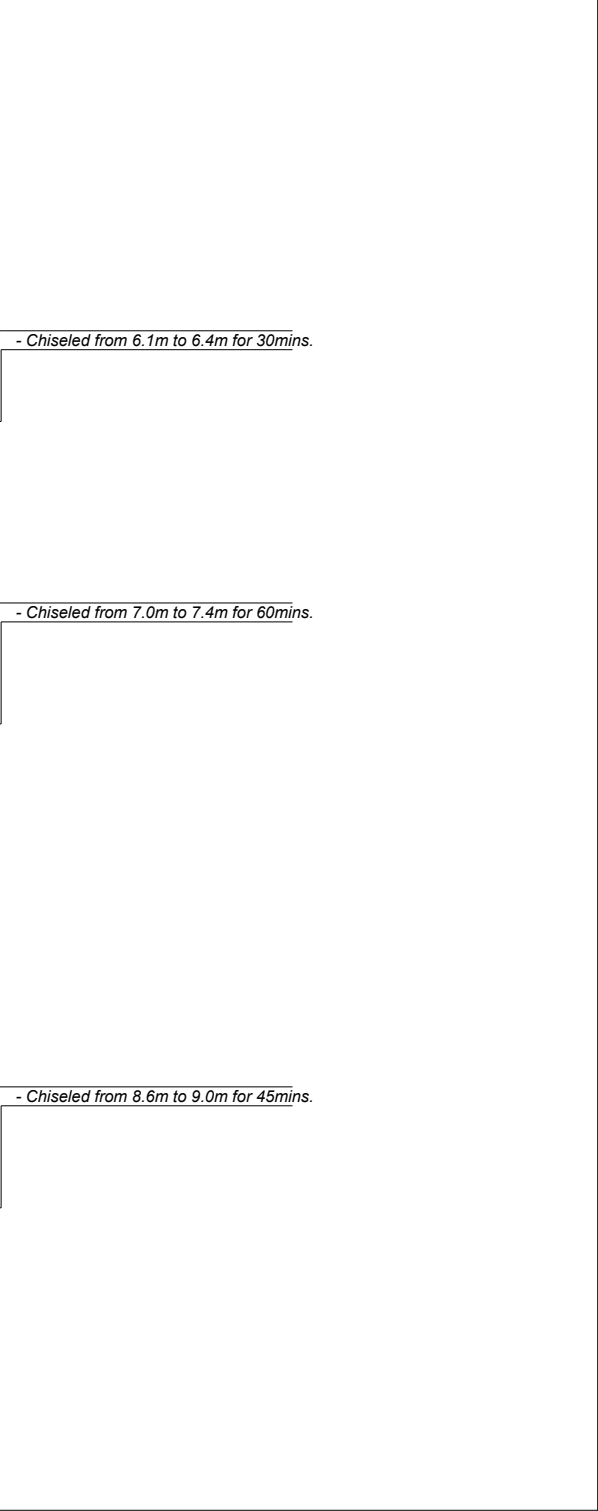
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Shell and Auger Borehole Log  
Figure 1 – Site Location  
Figure 2 – Exploratory Hole Location Plan



|                                                                                  |  |                                                                                                                                                      |  |                                                |  |  |                                  |  |                                             |  |
|----------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------|--|--|----------------------------------|--|---------------------------------------------|--|
|  |  | Intégral House, 7 Beddau Way<br>Castlegate Business Park<br>Caerphilly CF83 2AX<br>Tel. 029 20807991<br>Fax. 029 20862176<br>mail@integralgeotec.com |  | Project Name:<br><b>Land at Julian Terrace</b> |  |  | Project No.:<br><b>12603</b>     |  | Borehole No.:<br><b>BH1</b><br>Sheet 2 of 3 |  |
| Location:<br>Port Talbot                                                         |  |                                                                                                                                                      |  | Client: Mr Thavarajah Shanthakumaran           |  |  | Coordinates:                     |  | Hole Type:<br>CP                            |  |
| Equipment: Dado 2000                                                             |  |                                                                                                                                                      |  | Diameter of Casing: 200mm                      |  |  | Level:                           |  | Scale<br>1:25                               |  |
| Diameter of Boring: 200mm                                                        |  |                                                                                                                                                      |  | Depth of Casing: 12.00m                        |  |  | Dates<br>10/01/2023 - 12/01/2023 |  | Logged By:<br>JJ                            |  |

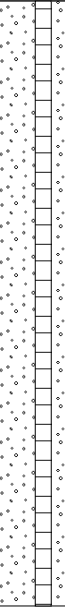
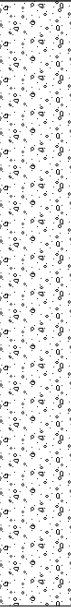
| Well                                                                               | Water Strikes | Samples & In situ Testing |      |                          | Depth (m) | Level (m AOD) | Legend                                                                             | Stratum Description                                                                 |                                                                                      |
|------------------------------------------------------------------------------------|---------------|---------------------------|------|--------------------------|-----------|---------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                    |               | Depth (m)                 | Type | Results                  |           |               |                                                                                    |                                                                                     |                                                                                      |
|  |               | 6.50                      | C    | N=60 (11,27/14,16,15,15) |           |               |  |  |  |
|                                                                                    |               |                           |      |                          |           |               |                                                                                    |                                                                                     |                                                                                      |
|                                                                                    |               | 8.00                      | C    | N=43 (7,10/12,10,10,11)  |           |               |                                                                                    |                                                                                     |                                                                                      |
|                                                                                    |               | 9.50                      | C    | N=28 (4,5/5,6,8,9)       |           |               |                                                                                    |                                                                                     |                                                                                      |

|                                                                                      |  |                                                                                                                                                                                                           |  |                                                                                                                                        |  |                                                                                       |
|--------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------|
| <b>Remarks:</b><br>1. Borehole terminated at 12m bgl within dense sands and gravels. |  | <b>Key:</b><br>D - Small disturbed sample<br>B - Bulk disturbed sample<br>ES - Environmental soil sample<br>SPT - Standard Penetration Test (split spoon)<br>CPT - Standard Penetration Test (solid cone) |  | W - Water sample<br>U - Undisturbed sample<br>TCR - Total Core Recovery<br>SCR - Solid Core Recovery<br>RQD - Rock Quality Designation |  |  |
|--------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------|

|                                                                                  |  |                                                                                                                                                      |  |                                                |  |                              |  |                                             |  |
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|                                                                                  |  | Location:<br>Port Talbot                                                                                                                             |  | Client: Mr Thavarajah Shanthakumaran           |  | Coordinates:                 |  | Hole Type:<br>CP                            |  |
| Equipment: Dado 2000                                                             |  | Diameter of Casing: 200mm                                                                                                                            |  | Level:                                         |  | Scale<br>1:25                |  |                                             |  |
| Diameter of Boring: 200mm                                                        |  | Depth of Casing: 12.00m                                                                                                                              |  | Dates<br>10/01/2023 - 12/01/2023               |  | Logged By:<br>JJ             |  |                                             |  |

| Well                                                                               | Water Strikes | Samples & In situ Testing |      |                              | Depth (m) | Level (m AOD) | Legend                                                                             | Stratum Description |    |
|------------------------------------------------------------------------------------|---------------|---------------------------|------|------------------------------|-----------|---------------|------------------------------------------------------------------------------------|---------------------|----|
|                                                                                    |               | Depth (m)                 | Type | Results                      |           |               |                                                                                    |                     |    |
|  |               | 11.00                     | C    | 50 (25 for 75mm/50 for 75mm) |           |               |  |                     | 11 |
|                                                                                    |               | 12.00                     | C    | N=39 (4,6/10,8,9,12)         | 12.00     |               |                                                                                    |                     | 12 |
|                                                                                    |               |                           |      |                              |           |               |                                                                                    |                     | 13 |
|                                                                                    |               |                           |      |                              |           |               |                                                                                    |                     | 14 |
|                                                                                    |               |                           |      |                              |           |               |                                                                                    |                     | 15 |

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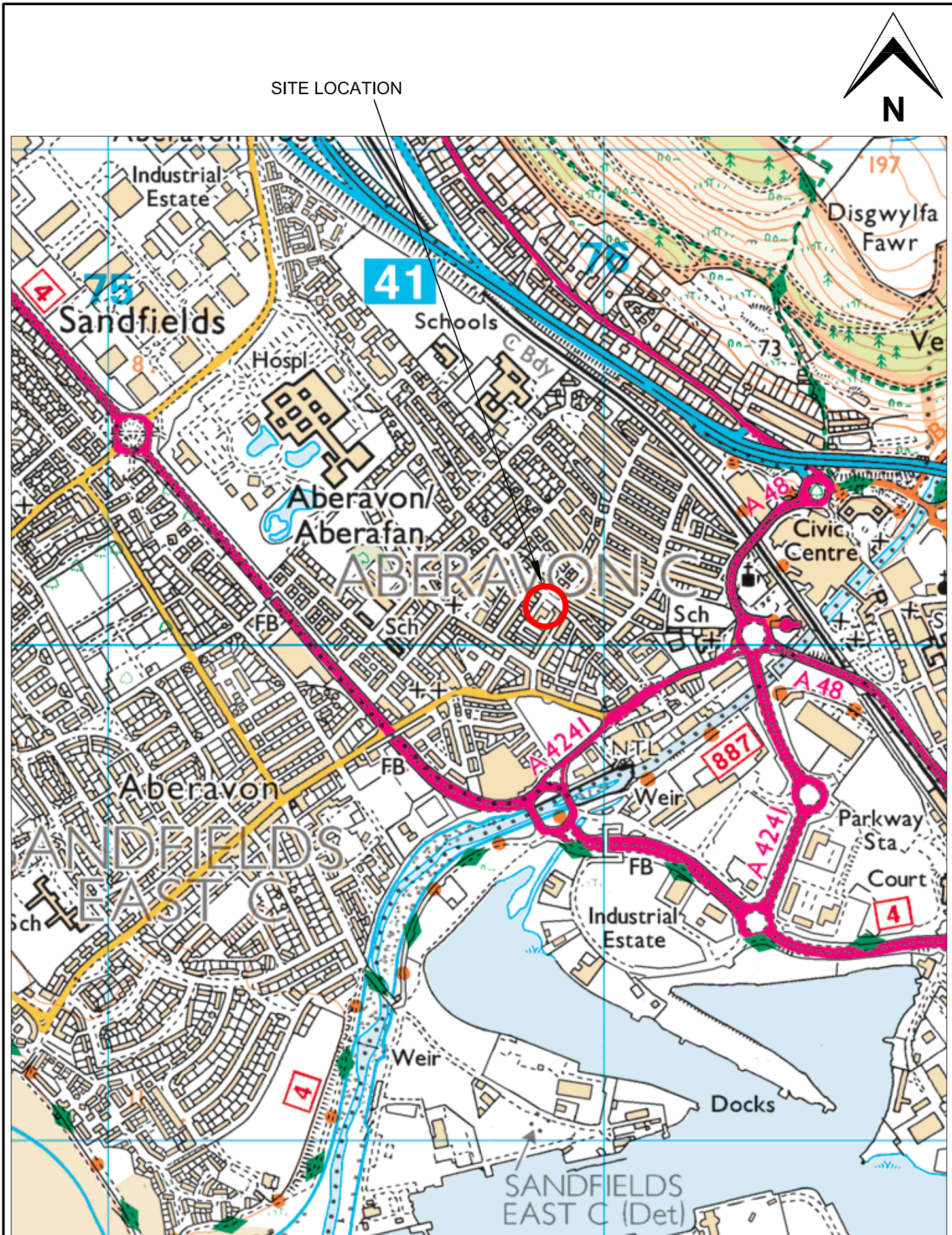


Figure 1: Site Location

Project: Julian Terrace, Port Talbot

Job no.: 12603

Client: Mr Thavarajah Shanthakumaran

Scale: 1:10,000 at A4

**Intégral**  
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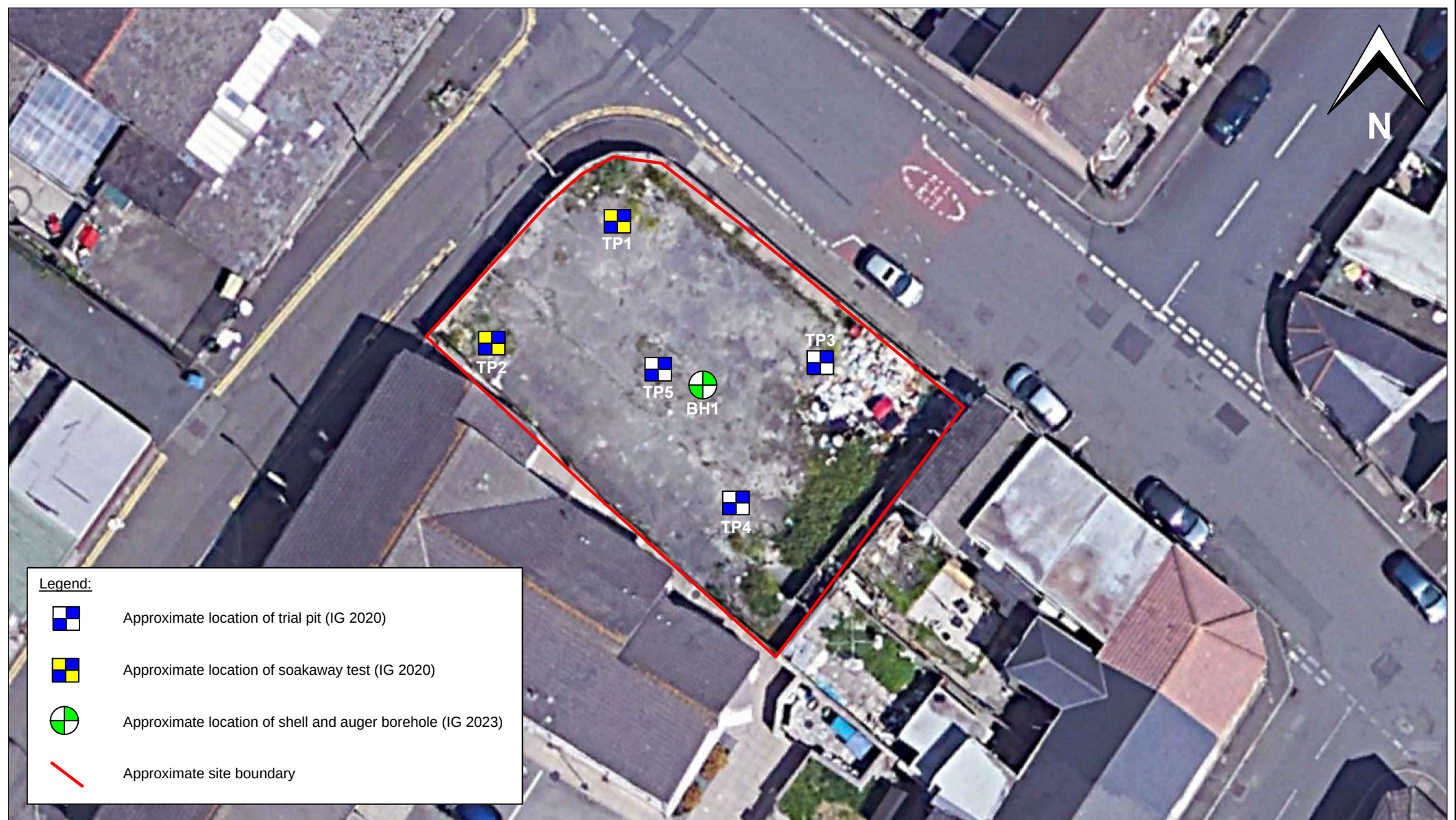


Figure 2: Exploratory Hole Location Plan

Project: Julian Terrace, Port Talbot

Client: Mr Thavarajah Shanthakumaran

Job No.: 12603

Scale: NTS

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