

CJ Construction (Wales) Limited

HARVEY CRESCENT, PORT TALBOT

Outline Remediation Strategy Report

14128/LP/24/ORS

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1.0 INTRODUCTION

1.1 GENERAL

CJ Construction (Wales) Limited are working as the contractors for the proposed development on behalf of Coastal Housing Group. Intégral Géotechnique (Wales) Limited have been appointed as Geotechnical and Geoenvironmental Consultants by CJ Construction (Wales) Limited to prepare a remediation strategy for the redevelopment of a site at Harvey Crescent, Port Talbot to a standard suitable for proposed residential end use.

The following reports have been produced by Intégral Géotechnique (Wales) Limited for Coastal Housing Group:

- Site Investigation Report Ref: 10608/RD/10, dated April 2010,
- Ground Gas and Water Monitoring Report Ref: 10608/RD, dated 1st July 2010,
- Site Investigation Report Ref: 14128/LS/24/SI/RevA, dated April 2024.

These reports have been relied upon as part of this remediation strategy. The latest report, which also encompasses all the relevant information from the previous reports, should be read in conjunction with this report.

The purpose of this report is to provide a remediation strategy for the delivery of the site to a standard suitable for the proposed residential end use and details how the remediation works will be monitored and validated.

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1.2 PROPOSED DEVELOPMENT

The proposed development will comprise the construction of six residential buildings, comprising four semi-detached two-storey residential buildings and two low rise residential buildings. The development will include associated infrastructure such as an access road and car parking areas and also areas of landscaping and private gardens. An extract of the proposed development layout is shown in Figure 3.

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The site is located in Port Talbot at a National Grid Reference of 275480, 189600, see Figure 1.

The site is irregular in shape and occupies an area of approximately 0.27 hectares. The boundaries of the site are defined by a welfare club and derelict land to the north, and existing residential development to the east, south and west. A site plan is presented in Figure 2.

The site is situated on generally level ground at an approximate elevation of approximately 7m AOD.

The site comprises a vacant land parcel following the demolition and clearance of a former office building. The site surface largely comprises crushed demolition materials.

Several heaps of fly-tipped materials/construction waste are present across the site.

A fenced off area of suspected Japanese Knotweed is present in the central area of the site.

2.2 AVAILABLE SITE INVESTIGATION DATA

The following reports have been produced by Intégral Géotechnique (Wales) Limited for Coastal Housing Group:

- Site Investigation Report Ref: 10608/RD/10, dated April 2010,
- Ground Gas and Water Monitoring Report Ref: 10608/RD, dated 1st July 2010,
- Site Investigation Report Ref: 14128/LS/24/SI/RevA, dated April 2024.

The above reports should be reviewed in conjunction with this report to gain a detailed appraisal of the site and the works completed to date. The latest report, which also encompasses all the relevant information from the previous reports, should be read in conjunction with this report.

The Site Investigation reports produced by Intégral Géotechnique provide the information on which this Outline Remediation Strategy report is based.

2.3 SITE HISTORY

The history of the site was assessed with the aid of historical maps. The earliest edition of the map dated 1876 indicated the site to be undeveloped. The site was originally subject to tidal flooding and is noted as crossing the main channel and up to the high-water mark. A tramline is shown approximately 100m west of the site. Approximately 130m south-east of the site a railway line ran along an embankment from the south to the east following the west bank of the Afon Afan.

The 1899 edition of the map indicated the area shown as mudflat. Jubilee Road is built a 100m to the north-west of the site. The tramlines to the west of the site had been dismantled. Approximately 100m to the north of the site a Gasometer had been built whilst some 180m north-east of the site the Rhondda and Swansea Bay railway line had been built. Approximately 100m to south-east of the site and to the north-west of the railway line an embankment had been built to contain the realigned Afon Afan.

By 1917, the embankment to the south-east of the site had been extended further to allow the site and immediate surrounding area to hold water as some form of lake. The site would not appear to be a tidally influenced area as the high water mark no longer surrounds the site. Jubilee Road had been renamed Victoria Road by 1917 and residential properties had been built on either side. A new road off Victoria Road had been built running south-east towards the docks approximately 50m west of the site. A boat house off the new road had been built 50m west of the site. To the south-east of the Afon Afan the railway line had been expanded with several sidings. The gasometer approximately 100m north of the site had been redeveloped as a gas works by 1917.

By 1939, the road to the west of the site had been named Newbridge Road.

The boathouse approximately 50m west of the site had been demolished whilst the Gasworks approximately 100m north of the site is shown to have expanded. The area to the northwest of the site is shown to have developed significantly with residential housing since 1917.

The 1952 edition of the map shows no sign of a water body and hence the man-made waterbody which covered the site and immediate surrounding area had been filled. The greater surrounding area remained relatively unchanged.

2.3 SITE HISTORY (CONTINUED)

By the 1956-1964 edition of the map, the gasworks to the north of the site had been expanded. Structures are shown immediately north and east of the site. A site boundary crosses the site from the north-west to south-east. A new access road on the gas works site forms the northern site boundary. Approximately 80m east of the site an outfall is shown to the Afon Afan.

The 1962-1968 edition of the map, the gasworks had now expanded to include the site, with an office block building had now been constructed on site. The Rhondda and Swansea Bay railway had been dismantled.

The 1968 edition of the map shows further expansion of the gasworks. Several unspecified tanks are shown within 30 to 40m of the site boundary. By 1968, Afan way had been built where The Rhondda and Swansea Bay railway once was.

The 1986 edition of the map shows the office building on site labelled as government offices whilst the 1986 edition of the map shows much of the gasworks has been redeveloped as a gas holder station.

The 1988 map shows that the railway to the east of the Afon Afan had been dismantled.

The 1990 edition of the map also shows Harvey Crescent under development to the south of the site 100m east of the site. A pumping station had been built off the Afon Afan over part of the former gas works.

The 1991 and 1993 editions of the map shows Harvey Crescent to have been developed with residential properties now located to the south and west of the site.

The 2006 edition of the map still shows the Gas Holder, however many of the gasworks' buildings had been demolished.

The 2022 edition of the map shows the government offices have been demolished and no buildings currently occupy the site. The aerial photos indicated the on-site building to have been demolished by 2013. The large tank approximately 130m west of the site had been replaced by a covered reservoir by this time. The aerial photos also indicate that between 2013 and 2016 a degree of fill material has been spread across the site surface (presumably to raise levels).

2.4 SUMMARY GROUND CONDITIONS

A summary of the ground conditions encountered across the site is presented below in Table 1.

Table 1: Summary of Ground Conditions		
Depth (m)		Stratum
From	To	
0.00	0.60/1.30	MADE GROUND (recent): Typically, loose granular deposits, predominantly comprising GRAVEL and COBBLES with occasional boulders and variable fines content. High quantities of anthropogenic constituents including brick, concrete, ash, clinker etc.
0.00/1.30	9.10/10.90	MADE GROUND (historical): Typically, loose, locally medium dense, yellow brown coarse slightly gravelly SAND with variable quantities of anthropogenic constituents including brick, slag, and clinker. With lenses / layers of soft dark grey silty CLAY and loose or medium dense dark grey sandy GRAVEL.
9.10/10.90	9.90/11.30	Soft, soft to firm grey/dark grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub angular and sub rounded sandstone.
9.40	12.40	Soft dark grey slightly sandy slightly gravelly peaty silty CLAY (BH3 only).
11.30/12.40	12.50/14.60	Medium dense to dense dark grey slightly sandy slightly clayey GRAVEL and COBBLES of rounded and sub rounded sandstone.

Trial pit sides either experienced overbreak or complete collapse within the loose made ground deposits.

Made Ground

All trial pits and boreholes encountered made ground. Heterogeneous made ground characterised by the presence of anthropogenic material was recorded immediately below the surface and was proven to extend to depths of between 9.1m and 10.9m below existing ground level. The greatest thickness of made ground was recorded in BH1.

2.4 SUMMARY GROUND CONDITIONS (CONTINUED)

The made ground encountered from ground level typically comprises recent fill and was predominately granular. These deposits are characterised by the presence of angular and sub angular limestone and sandstone with some anthropogenic materials including brick, ash, clinker, and slag. Which was proven to extend to depths between 0.6m and 1.3m below existing ground level.

A thick sequence of historical made grounds underlies the surface layer of more recent made ground. The historical made ground deposits typically comprise loose, locally medium dense, yellow brown coarse slightly gravelly sand with variable quantities of anthropogenic constituents including brick, slag, and clinker. Lenses / layers of soft dark grey silty clay and loose or medium dense dark grey sandy gravel are also present. The base of the historical made ground was recorded at depths of between approximately 9.1m and 10.9m below existing ground level.

Uncorrected N values derived from in-situ testing in the shell and auger boreholes ranged from between 3 and 35 within the granular made ground. This indicates that with the exception of localised concentrations of cobbles, elevating the N value, the made ground is generally loose to medium dense, becoming more dense with depth.

Superficial Deposits

The made ground was fully penetrated in all of the shell and auger boreholes (with the exception of BH3A due to an obstruction) and was proven to be underlain by natural superficial deposits.

Underlying the made ground was cohesive soils which was proven to extend to depths of between 9.9m bgl (at BH2) and 12.4m bgl (at BH3). These fine-grained soils comprised of a mixture of soft or soft to firm dark grey slightly sandy slightly gravelly silty clay.

The thickness of this clay layer varied between approximately 0.4m at BH1, 0.8m at BH2, and 3.0m at BH3. It should be noted that at BH3 the clay soils were noted to contain peat inclusions. Uncorrected N values in the cohesive soils were recorded between 2 and 15, indicating these superficial deposits were soft, soft to firm and firm.

The cohesive soils were proven to be underlain by natural granular deposits in BH1, BH2 and BH3.

The encountered granular deposits were generally described as medium dense to dense dark grey slightly sandy slightly clayey gravel and cobbles. The gravel and cobbles comprised of fine to coarse subangular to subrounded sandstone.

2.4 SUMMARY GROUND CONDITIONS (CONTINUED)

This deposit was proven to extend to depths of between 11.0m and >14.6m below existing ground level.

The uncorrected N values in the granular soils were recorded between 3 and 84 or greater than 50. Indicating the granular superficial deposits becoming more dense with depth.

Groundwater

Groundwater was not encountered in any of the trial pits dug across the site, however it was found at shallow within all three boreholes, a summary is provided below in Table 2.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

Borehole	Table 2: Groundwater Strikes
BH1	Perched groundwater at 5.6mbgl, rising to 2.9mbgl after 20 minutes.
BH2	Perched groundwater at 2.8mbgl, rising to 1.9mbgl after 20 minutes.
BH3	Perched groundwater at 2.7mbgl rising to 1.9mbgl after 20 minutes.

Groundwater levels were also measured during visits to site to sample groundwater. The depth to groundwater has been converted to a groundwater level with respect to ordnance datum, and a summary provided below in Table 3.

Borehole	Table 3: Groundwater Monitoring Depths (m bgl)
BH1	4.58
BH2	4.51
BH3	4.43

2.5 IDENTIFIED CONTAMINATION

2.5.1 Made Ground

The results of the laboratory testing indicate that most of the analysed chemical elements or compounds are present at concentrations below the appropriate thresholds. However, the results do indicate exceedances of Lead (in all nine tested samples) and PAH compounds (in two tested samples). Asbestos was also detected within two tested samples of the made ground.

2.5 IDENTIFIED CONTAMINATION (CONTINUED)

All nine samples recorded elevated concentrations of lead which were detected above the adopted screening values of 200mg/kg (LQM 1% SOM). The highest concentrations of Lead were detected within a made ground sample from TP07 (0.1m bgl) at 600mg/kg.

Slightly elevated concentrations of the PAH compound dibenzo(ah)anthracene were detected above the adopted screening value of 0.24mg/kg (LQM 1% SOM) within two samples of made ground at TP01 (0.3m bgl) and TP04 (0.2m bgl). The recorded concentration at TP01 was 0.27mg/kg. The recorded concentration at TP02 was 0.29mg/kg.

A single slightly elevated concentration of the PAH compound benzo(b)fluoranthene was recorded in a sample of made ground from TP04 (0.2m bgl). The recorded concentration was 3.0mg/kg which slightly exceeds the adopted screening value of 2.6mg/kg (LQM 1% SOM).

Asbestos has been identified in two out of nine samples of made ground. Fibres of Chrysotile asbestos were identified within the made ground at TP02 (0.4mbgl) and chrysotile asbestos Fibrous Debris was identified within a sample of made ground at TP04 (0.2mbgl). Both samples were sent for quantification testing at the laboratory. The result of the quantification test on TP02 (0.4mbgl) and TP04 (0.2mbgl) indicates <0.001% and 0.001% asbestos respectively.

No further exceedances were detected within the samples of made ground.

It should also be noted that based on a comparison the previous 2010 soil testing data (which predominantly comprised sampling and testing of the reworked sand deposits underlying the more recent post demolition made ground) with current screening values, no further contaminant exceedances have been recorded.

2.5.2 *In-situ Natural Ground*

No visual or olfactory evidence of contamination of the in-situ natural ground was identified during the excavation of the trial pits or drilling of the boreholes or excavation of the trial pits. At the time of writing this report no samples of natural ground had been tested. It is considered likely that concentrations of determinants within the natural ground are likely to be naturally occurring and as such, the natural ground poses no significant threat to human health or the environment.

2.5 IDENTIFIED CONTAMINATION (CONTINUED)

2.5.3 Groundwater Contamination

A summary of the exceedances recorded during the three groundwater sampling and testing rounds undertaken during 2010 is provided below:

- Zinc was recorded above the adopted AA-EQS (6.8ug/l) in samples of groundwater from BH1, BH2 and BH3. At BH1, the exceeding concentrations were 34ug/l (round 1) and 39ug/l (round 3). At BH2, the exceeding concentrations were 19ug/l (round 1) and 79ug/l (round 3). At BH3, the exceeding concentration was 110ug/l (round 1). It should be noted that all concentrations are significantly below the UKDWS of 5000ug/l.
- Cyanide was recorded above the adopted AA-EQS (1.0ug/l) and MAC-EQS (5.0ug/l) in samples of groundwater from BH1 and BH2. At BH1, the exceeding concentration was 16ug/l (round 3). At BH2, the exceeding concentration was 15ug/l (round 3). It should be noted that both concentrations are significantly below the UKDWS of 50ug/l.
- A single elevation concentration of chromium above the adopted AA-EQS (0.6ug/l) was recorded at BH1 (round 1). A concentration of 3.0ug/l was recorded at BH1 (round 1) only. It should be noted that this concentration is significantly below the adopted MAC-EQS of 32ug/l.
- Fluoranthene was recorded above the adopted AA-EQS (0.0064ug/l) in samples of groundwater from BH1 and BH2. At BH1, the exceeding concentrations were 0.021ug/l (round 2) and 0.014ug/l (round 3). At BH2, the exceeding concentration was 0.05ug/l (round 3) only. It should be noted that all concentrations are significantly below the adopted MAC-EQS of 0.12ug/l.
- Single elevated concentrations of benzo(g,h,i)perylene, benzo(a)pyrene, and benzo(k)fluoranthene were recorded above the adopted screening values for these contaminants of 0.00082ug/l, 0.00017ug/l, and 0.017ug/l at BH2 (round 3) only.
- A single elevated concentration of petroleum hydrocarbon compound aliphatic C16-C21 was recorded at BH3 (round 3) only. The recorded concentration of 23ug/l exceeds the adopted screening value of 10ug/l.

2.5 IDENTIFIED CONTAMINATION (CONTINUED)

- A single slightly elevated concentration of petroleum hydrocarbon compound aromatic C10-C12 was recorded at BH2 (round 2) only. The recorded concentration of 11ug/l very slightly exceeds the adopted screening value of 10ug/l.

No further exceedances were recorded within the analysed groundwater samples from 2010.

A summary of the exceedances recorded within the groundwater samples obtained as part of the current 2022 site investigation works (i.e., round 4) is provided below:

- Zinc was recorded above the adopted AA-EQS (6.8ug/l) in samples of groundwater from BH1 and BH2. The exceeding concentrations at these locations were 8.3ug/l at BH1, and 19.0ug/l at BH2. It should be noted that both concentrations are significantly below the UKDWS of 5000ug/l.
- A single elevated concentration of petroleum hydrocarbon compound aromatic C10-C12 was recorded at BH3 (round 4) only. The recorded concentration of 25ug/l very slightly exceeds the adopted screening value of 10ug/l.
- A single elevated concentration of petroleum hydrocarbon compound aromatic C12-C16 was recorded at BH3 (round 4) only. The recorded concentration of 24ug/l very slightly exceeds the adopted screening value of 10ug/l.

A summary of the exceedances recorded within the groundwater samples obtained as part of the additional sampling undertaken in March and April 2024 (i.e., round 5 and 6) is provided below.

It should be noted that that during the additional two rounds of sampling and testing, the groundwater samples were tested for PAH compounds, cyanide and chromium only (i.e the contaminants that were previously detected at elevated concentrations).

- A single elevated concentration of cyanide was recorded at BH3 (round 6 only). The recorded concentration of 21ug/l exceeding the MAC-EQS screening value of 5ug/l and the AA-EQS screening value of 1ug/l. It should be noted that the concentration is significantly below the UKDWS screening value of 50ug/l.

2.5 IDENTIFIED CONTAMINATION (CONTINUED)

- Elevated concentrations of chromium was recorded at BH1 (round 5 and 6) at 1.4ug/l and 1.6ug/l and from BH3 (round 6 only) at 3.1ug/l. These results exceed the AA-EQS screening value of 0.6ug/l. It should be noted that these concentrations are significantly below the adopted MAC-EQS screening value of 32ug/l and the UKDWS screening value of 50ug/l.

The PAH concentrations were all below the laboratory detection limit.

No further exceedances were recorded within the analysed groundwater samples.

The risk to environmental receptors is considered to be low based on the information obtained during all the rounds of groundwater sampling and testing.

2.5.4 Ground Gases

The results of the ground gas monitoring programme recorded a maximum methane concentration of <0.5% and a maximum carbon dioxide concentration of 1.4%. A maximum gas flow rate of <0.3/hr was measured during the gas monitoring programme.

In accordance with CIRIA Report C665 a Gas Screening Value (GSV) of <0.0042l/hour has been calculated. This GSV corresponds to gas characteristic situation 1/green which does not require any special gas protective measures.

No radon protective measures are required in the construction of new buildings within the site.

There is considered to be a negligible mine gas risk.

2.6 DETAILED SITE-SPECIFIC RISK ASSESSMENT

The general approach for assessing the potential risk to a receptor is by a combination of qualitative and quantitative risk assessment.

A quantitative risk assessment would involve selecting and deriving generic assessment criterion to compare low risk substances, based on fate, transport and toxicological properties and the exposure scenario being considered.

Elevated concentrations of lead and PAH compounds and asbestos fibres were detected within the made ground.

2.6 DETAILED SITE-SPECIFIC RISK ASSESSMENT (CONTINUED)

There are no published screening criteria values for asbestos, and neither are there any in preparation. As discussed in CIRIA Report C733 Asbestos in Soil and Made Ground: a Guide to Understanding and Managing Risks, agreement has yet to be reached in the UK on an appropriate toxicological criterion on which a screening value for asbestos could be based. It also states that 'based on current knowledge, it is believed that that a scientifically defensible UK GAC (generic acceptance criteria) for asbestos in soil cannot be developed or imported.'

It is therefore considered that a more qualitative assessment of the potential risk is appropriate, as asbestos is determined to be a non-threshold substance.

CIRIA Report C733 states that asbestos (asbestos containing materials and asbestos containing soils) only present a risk to health if airborne fibres are released into the atmosphere. The report goes on to state that the number of fibres released into the air from asbestos containing soils is likely to be influenced by a number of site-specific factors, as listed below.

- Characteristics of the asbestos (concentration, degree of heterogeneity, depth in relation to final ground level, volume/area, type, condition, extent of bonding, weathering, fraction of free fibres, shape of fibres)
- Characteristics of the soil (type, moisture content, surface vegetation, presence of hard standing)
- Weather (humidity, precipitation, temperature, ground freezing, wind speed and direction)
- Land use/soil disturbing activities (behaviour of receptors, distance between receptor and source, types of activity, duration/frequency of activity, dust mitigation measures).

The depth below ground level of the asbestos containing soils is imperative to the potential risk posed.

CIRIA Report C733 states that in the absence of significant physical disturbance, exposure to airborne asbestos fibres from soil will be from friable materials or asbestos fibres present at, or very close to, the soil surface (the soil – air interface).

Materials that have been buried, or are below the soil surface, will pose a lower, or less immediate, risk as these materials are unable to release airborne fibres unless brought to the soil surface by physical activity/disturbance.

2.6 DETAILED SITE-SPECIFIC RISK ASSESSMENT (CONTINUED)

Given the contamination recorded within the made ground, it is considered that a potential risk to human health may exist via the following relevant contaminant pathways:

- Dermal contact
- Ingestion of soil or soil derived dust
- Inhalation of soil bourn dust
- Indoor inhalation of ground gas
- Migration of contaminants in ground to drinking water supply pipes

It is considered that remedial measures will be necessary to protect future site users and construction site operatives from the contamination recorded within the made ground.

The remedial measures to be carried out have been designed to address the identified potentially active contaminant pathways listed above.

3.0 REMEDIATION STRATEGY

The findings of the site investigation carried out across the site have identified that a potential risk to end users is present from the contamination recorded within the made ground.

A remediation strategy is proposed such that the site is prepared to a standard suitable for the proposed residential end use.

The following remediation strategy is proposed for the site:

- If any asbestos containing materials (ACMs) are observed on site, they should be handpicked by an asbestos awareness trained contractor. This work should be carried out by a suitably licensed contractor in accordance with the requirements of the Control of Asbestos Regulations (2012).
- Any handpicked ACM should be disposed off-site at a suitable licensed facility as hazardous waste. Daily records and waste transfer notes should be kept in order to document the identification and subsequent removal of any ACM. These records and waste transfer notes should be made available for review as they will be required for remediation verification.
- If asbestos clearance is required, following completion of any asbestos clearance works, appropriate validation sampling should be undertaken, as necessary.
- All soft landscaped areas and gardens will require provision of a clean capping/cover system in order to break the link between future site end-users any residual contamination within the underlying made ground. The capping system should be in the form of a minimum thickness of 600mm of clean imported subsoil and topsoil, placed on top of a hi-vis geotextile separation/alert membrane in all areas of soft landscaping.
- Adoption of appropriate drinking water supply pipe.

4.0 REMEDIATION IMPLEMENTATION

4.1 OBJECTIVES

The main objective of the proposed remediation works is to render the site suitable for residential end use. The remediation activities required in order to achieve this objective are as follows:

- Break any potential pathway between proposed site end users and contaminated soils.

4.2 METHODOLOGY

The remediation works required in order to meet the objectives defined above will be undertaken as follows:

- Handpicking of any encountered asbestos containing materials by a suitably licensed contractor in accordance with an appropriate risk assessment, managed in accordance with the requirement of the Control of Asbestos Regulations (2012). Any handpicked asbestos containing materials should be disposed of off-site at a suitable licensed facility as hazardous waste. If asbestos clearance is required, following completion of any asbestos clearance works, appropriate validation sampling should be undertaken, as necessary.
- All soft landscaped areas and gardens will require provision of a clean capping/cover system in order to break the link between future site end-users and any residual contamination within the underlying made ground. The capping system should be in the form of a minimum thickness of 600mm of clean imported subsoil and topsoil, placed on top of a hi-vis geotextile separation/alert membrane in all areas of soft landscaping.
- Adoption of DCWW agreed drinking water supply pipe.

The site will be deemed remediated by the following active remedial measures:

- Handpicking and removal of any encountered ACM by a licensed asbestos contractor.
- Completion of any required validation sampling.
- Incorporation of a robust clean 600mm thick capping layer within proposed soft landscaped areas and gardens, with a hi-vis geotextile separation/alert membrane at the base of the capping soils.

4.2 METHODOLOGY (CONTINUED)

- Provision of DCWW agreed drinking water supply pipe.

Review of the methodologies will be a continuing process and subject to findings of the proposed validation works, and if necessary, further quantitative and qualitative risk assessments.

4.3 OPERATIONS

The works are to be undertaken by a specialist contractor experienced in brownfield reclamation/remediation. The remediation works will be monitored by Intégral Géotechnique (Wales) Limited.

Site preparation and operational constraints will be covered in the contractor's method statements. These should include the contractor's proposals for controls and monitoring of dust, noise, vibrations and odour.

Site procedures for managing the remedial works in a manner that will not cause pollution to controlled waters will be covered in the contractor's method statements which will be submitted in discharge of the Conditions of Planning.

The proposed remediation works will be controlled by the appropriate mobile treatment license to be held by the remediation contractor, if such works become necessary. The conditions imposed under the planning process will be considered adequate to control the works.

Additionally, a system should be established by which any 'unusual' materials that may be encountered are reported rapidly to the site management, so that the appropriate action may be taken, following specialist advice if necessary. An unusual material may be identified on site by colour, odour or physical nature.

5.0 REMEDIATION VERIFICATION

5.1 OBJECTIVES

A remediation verification report is required in order to record the data gathering necessary to demonstrate that the works have been carried out in accordance with the agreed strategy, confirm that the works satisfy the site remediation criteria and that the site is suitable for the proposed development.

5.2 REMEDIATION VERIFICATION METHODOLOGY AND DATA GATHERING REQUIREMENTS

The site reclamation/remediation will be verified by the following measures:

- Laboratory testing of soil samples as required, risk assessment and validation of the exposed surface following hand picking of any identified asbestos.
- Evidence to be provided of site records and waste transfer notes relating to identification and subsequent removal of any asbestos containing materials (ACM).
- Validation of the chemistry and thickness of the proposed 600mm thick capping layer to be placed within landscaped areas and gardens.
- Validation of the hi-vis geotextile separation/alert membrane layer at the base of the capping soils.
- Notification in the CDM file of residual risks associated with the remediated site.
- Installation of DCWW agreed drinking water supply pipe.

6.0 FINAL REMEDIATION VALIDATION

The development will not be complete, in accordance with the remediation strategy for the site, until placement of the final 600mm (minimum thickness) of clean imported capping soils over a hi-vis anti mixing membrane to soft finished areas and hard finish construction has been completed.

In order to validate these works a series of hand dug pits will be excavated within any soft landscaped or garden areas to confirm an adequate thickness of inert soils are in place. A photographic record will be kept. The capping system is to comprise imported clean inert materials conforming to the Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems prepared by Welsh Land Contamination Working Group and satisfy appropriate soil guideline values for residential development with gardens. Samples of topsoil and subsoil will be taken for laboratory analysis, at a rate of 4 per 250m³.

Placement of the required final 600mm capping layer will be the responsibility of the developer and is usually undertaken on a plot-by-plot basis, late in the development programme, as plots are completed.

Reporting of the clean capping to garden areas will be submitted independently of the remediation works.

In order to aid drainage of the garden areas, it is recommended that the surface of the engineered formation is raked and loosened prior to the placement of the capping layer.

FIGURES

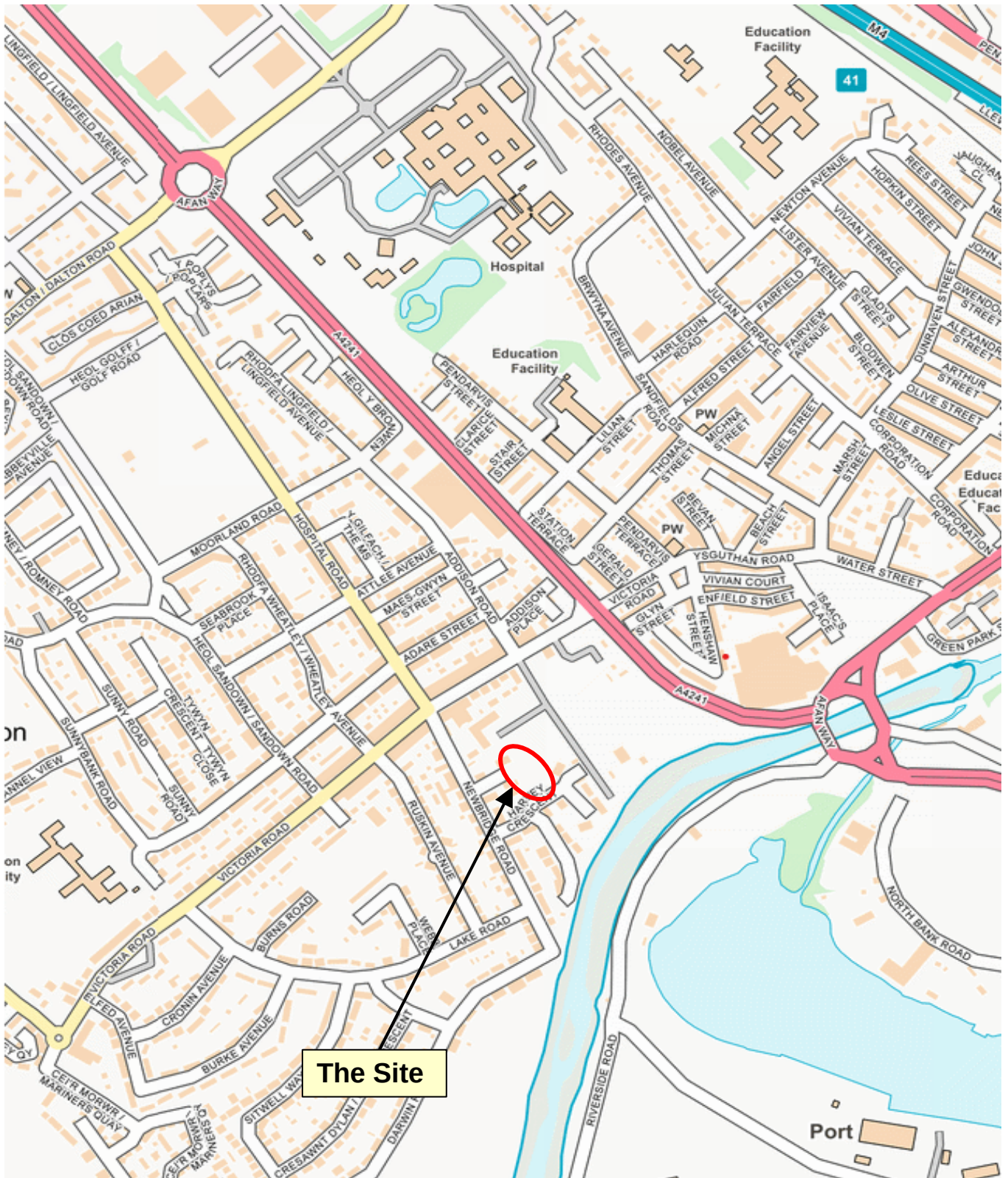


Figure 1: Site Location

14128 - Harvey Crescent, Port Talbot

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991

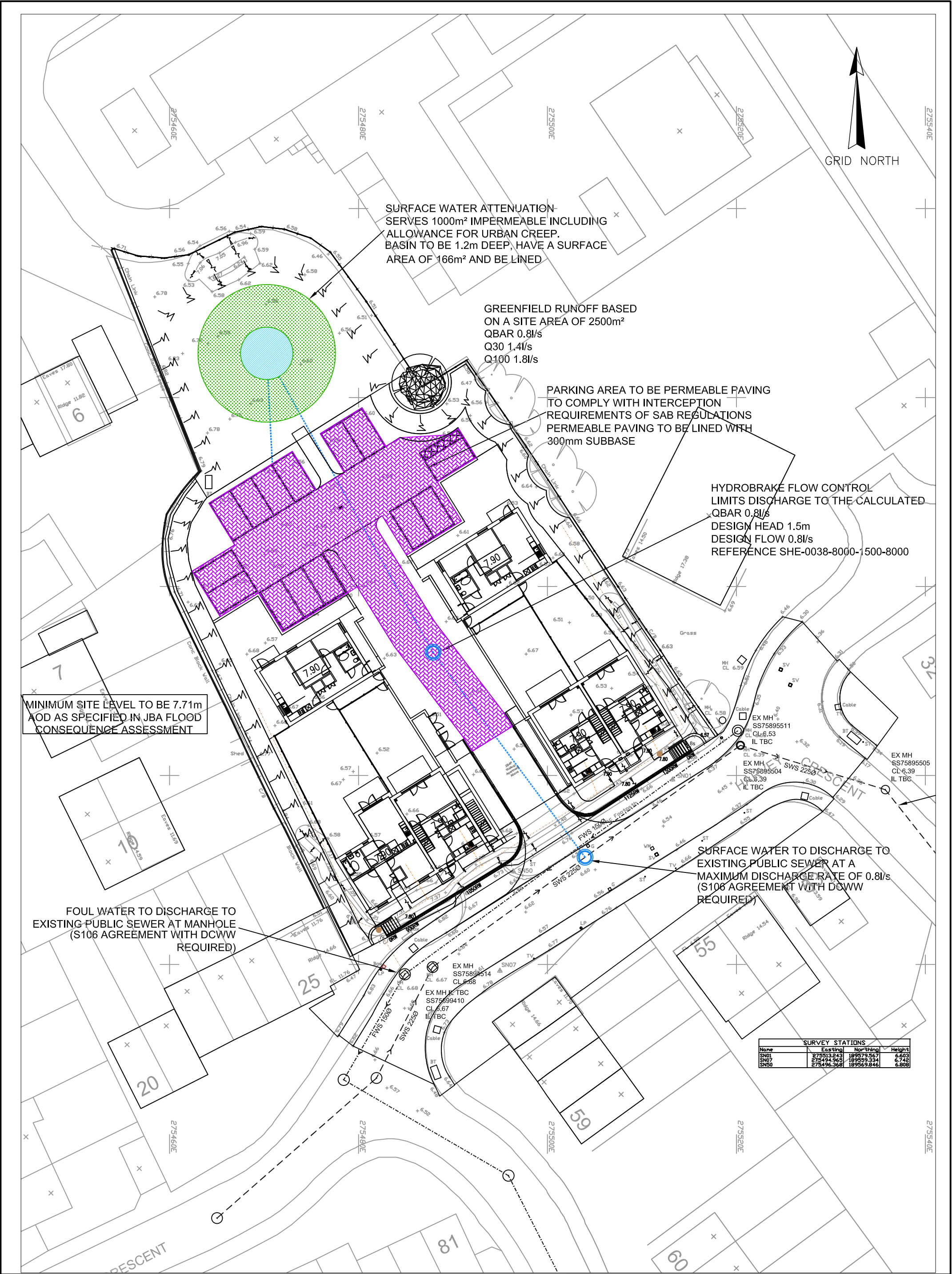
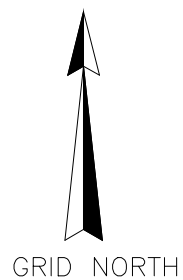


Figure 3: Proposed Development Layout



Legend:

- Approximate Trial Pit Location
- Approximate Trial Pit Location (2010)
- Approximate Shell and Auger Borehole Location
- Approximate Shell and Auger Borehole Location (2010)
- Approximate Extent of Fly-tipped Materials
- Approximate Extent of Heras Fencing - suspected Japanese Knotweed
- Approximate Extent of Vegetated Area

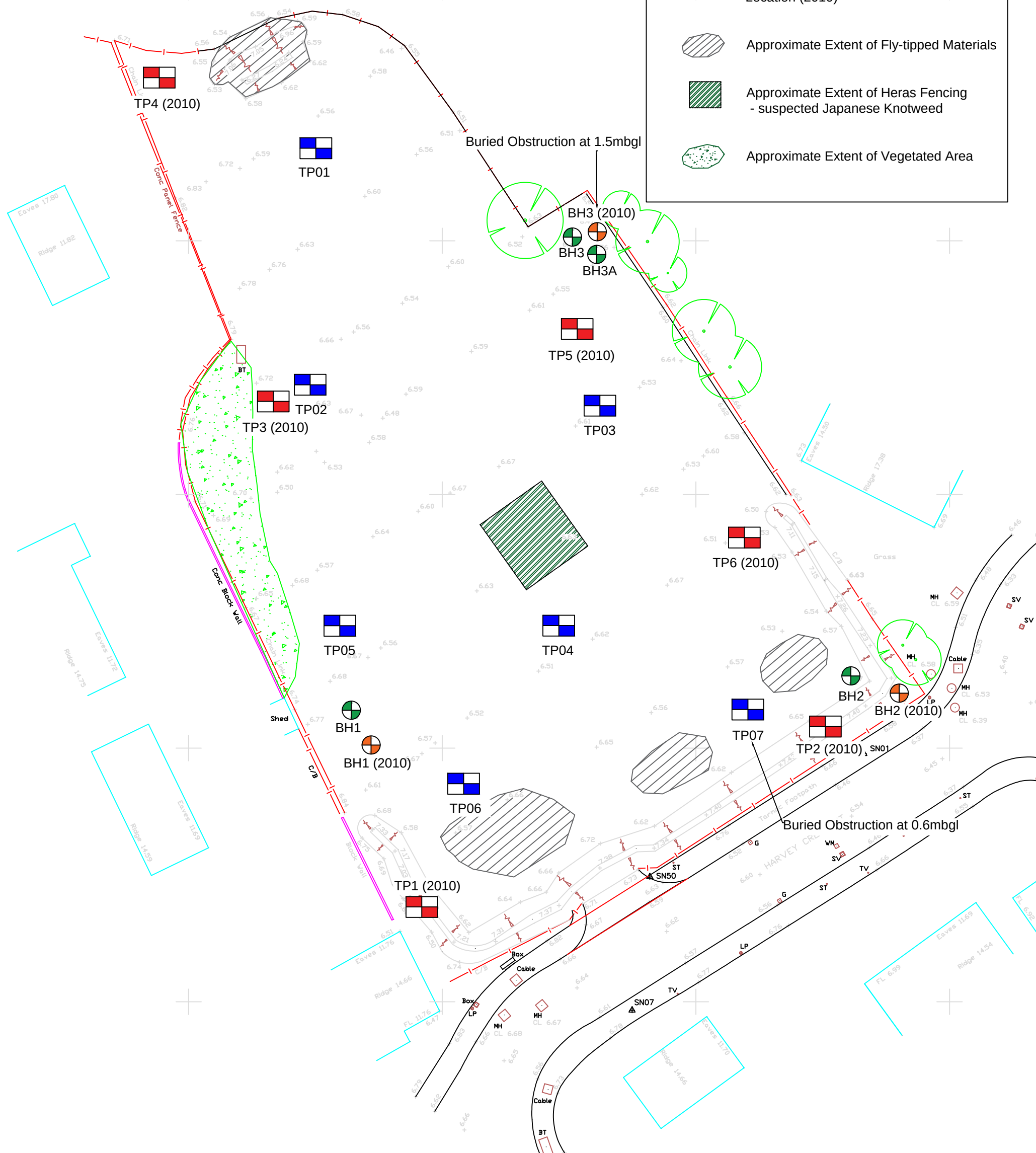


Figure 2: Site Plan

Project: Harvey Crescent, Port Talbot

Client: Coastal Housing Group

Job No.: 14128

Scale: 1:300 at A3

Intégral
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