

31 March 2021

Your ref:  
Planning ref:  
Our ref: J19027/DB/c1

Sam Thixton  
BDW Southampton  
Tollbar House  
Tollbar Way  
Hedge End  
Southampton  
Hampshire  
SO30 2UH

Dear Mr Thixton,

**RE: GARISSON CHURCH LAND PARCEL, LOUISBERG BARRACKS SITE, BORDON  
CONTAMINATED LAND ASSESSMENT**

Further to instruction from BDW Southampton we have carried out a review of the existing reports presented by Hyder on behalf of the MOD prior to the closure of the former military base at this site. We have subsequently returned to site to carry out additional ground investigation and testing across the wider site with a further phase of ground investigation carried out specifically for the assessment of the Garrison Church land parcel. This letter Contaminated Land Assessment is provided in accordance with our standard agreed terms, conditions and limitations and should be read in conjunction with the previous reports provided by Hyder (report reference 0001-UA006292-UP31R-001 dated January 2014 and report reference UA006292-UP31-F-01 dated October 2013) upon which you are understood to have legal reliance. Wilson Bailey Partnership subsequently carried out supplementary ground investigation works across the wider barracks site as part of the purchase of the site by Barrat David Wilson Homes in 2014.

Links to these reports are provided below for your reference;  
[https://1drv.ms/b/s!AqNILYYDqSi1gYsqro\\_lkwfow6H3XA](https://1drv.ms/b/s!AqNILYYDqSi1gYsqro_lkwfow6H3XA)  
[https://1drv.ms/b/s!AqNILYYDqSi1gYsm\\_JIG23cUzPzUeQ](https://1drv.ms/b/s!AqNILYYDqSi1gYsm_JIG23cUzPzUeQ)  
[https://1drv.ms/b/s!AqNILYYDqSi1gcQayWaqBt\\_YNq7o8w](https://1drv.ms/b/s!AqNILYYDqSi1gcQayWaqBt_YNq7o8w)

**Desk Study Summary**

A review of available historical mapping and anecdotal information indicates that the site was developed in 1907 through the construction of the existing garrison church and administration building as part of the wider formation of the Louisberg Barracks. The barracks has provided a base for a range of military regiments over the years, including being used as a staging post during the second world war for commonwealth troops. Throughout this time however the Garrison Church and immediate surroundings are should to be remained essentially unchanged.

**Site Walkover Survey**

At the time of the investigation works the former Garrison Church main building was being used by Barratt David Wilson Homes as a site office and administration building, with the tarmac surfaced former car park and yard area associated with the church being used as a materials storage compound and for a series of additional containerized temporary buildings providing a canteen, drying room and welfare facilities for construction contractors working on the residential redevelopment of the remainder of the former barracks site. The basement areas of the building on site were inspected where possible

and were found to be dry but used for materials storage due to access limitations. It is important to note that no fuels or other potentially contaminative materials have been stored on the Garrison Church site during the development of the adjoining site.

### **Review of the Findings of Previous Reports for the wider site**

The previous investigation works have identified the presence of locally contaminated made ground with the presence of elevated benzo(a)pyrene, arsenic and lead locally present together with isolated occurrences of detectable asbestos fibres. The underlying natural soils have also been found to contain elevated concentrations of arsenic as part of the previous works.

We subsequently attended site to carry out limited further investigation works, soil gas monitoring, soakage testing, contamination testing and assessment. As part of these works, we have identified localised contamination of the made ground with ash related PAHs including benzo(a)pyrene, although we have not identified the presence of elevated concentrations of lead, arsenic or detectable asbestos fibres.

The initial report by Hyder considered that within areas of proposed residential development that there may be a requirement for the provision of a cover system and that gas protection measures may be required, acknowledging that this would be subject to further assessment, that may allow the initial conservative assessment to be downgraded

### **Ground Investigation Findings Summary**

The ground investigation comprised eight small diameter boreholes drilled in accessible location within the external areas of the site by means of a mini-tracked soil sampling rig under supervision of a Chartered Geologist.

The borehole logs and the results of testing carried out on recovered soil samples are enclosed together with a site plan indicating the locations of the boreholes.

The findings of the ground investigation works are essentially consistent with the findings of previous works across the remainder of the former garrison site, in that beneath an initial surfacing layer, variable made ground was encountered overlying generally dense dark brown to yellow fine silty sand soils of the Folkestone Formation.

The made ground has been found to extend to depths of between 0.20 m and 0.50 m below ground level and to generally comprise a dark brown sand with brick and gravel beneath a tarmac surfacing layer.

Groundwater was not encountered within the shallow boreholes that generally terminated in the increasingly dense natural silty sand soils at depths of up to 3.45 m below ground level.

The results of the testing carried out at an independently accredited soils testing laboratory have indicated the presence of raised concentration of arsenic, with elevated concentrations of other potential chemicals of concern such as asbestos, PAH and other metals and metalloids below adopted GAC values for the proposed Residential with Plant Uptake end use.

Soil gas monitoring has not been carried out as part of the ground investigation for the Garrison Church site, although extensive monitoring and assessment of the soil gas regime across the wider barracks development that encompasses the site has indicated that the soil gas regime is not of concern and that precautions with regards to the ingress of carbon dioxide and methane are not required. The site is not located within an area potentially affected by radon.

### **Requirement for Remediation**

The identified presence of elevated arsenic concentrations is essentially consistent with the findings of ground investigation works across the remainder of the site and will require the placement of a cover system within areas of proposed garden and ancillary soft landscaping.

Due to the size of the wider barracks site an additional phase of soil testing has been carried out comprising testing the formation level to gardens to groups of plots to determine the localised

requirement for cover system placement due to the variations in the ground conditions across the larger barracks site. At this smaller Garrison Church site, it is considered that the cost benefit of additional testing may be reduced, such that a cover system should be adopted for all plots to be constructed as part of the redevelopment of this land parcel.

As with the redevelopment of any brown field site, it is also recommended that the site works should be carried out in accordance with a geo-environmental watching brief for contaminated or suspicious ground conditions.

### **Geo-environmental Watching Brief**

In addition to the above discussion however, we are mindful that a number of apparently localised issues of potential concern remain at this site and will need to be resolved through further investigation and assessment once access is available following demolition of the former military buildings.

The locations of these areas of potential concern are highlighted on the enclosed Constraints Plan and will be considered separately in advance of development, with any further remedial actions carried out in agreement with the Local Authority.

As with any military site that has a long history of development, there is a potential for localized contaminants to be present at this site and as such it is considered that the ground works for the proposed redevelopment at this site should be carried out under a geo-environmental watching brief in order that should any suspicious or contaminated soils be encountered, they can be appropriately investigated by a geo-environmental engineer and appropriately dealt with in consultation with the regulatory authorities. Site workers should be made aware of the site history and the perhaps limited potential for contamination to be present and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE<sup>1</sup> and CIRIA<sup>2</sup> and the requirements of the Local Authority Environmental Health Officer (EHO).

### **Clean Cover System**

The proposed depths of placed topsoil and subsoil are as follows;

|                          |  |
|--------------------------|--|
| Private Domestic Gardens | combined clean cover <u>capping layer of 600mm</u> comprising imported and verified clean and suitable topsoil overlying verified suitable subsoil with a <u>geotextile marker layer</u> |
| New areas of POS topsoil | combined clean cover <u>capping layer of 300mm</u> comprising imported and verified clean and suitable topsoil overlying verified suitable subsoil with a <u>geotextile marker layer</u> |

Placement of topsoil is not proposed to be carried out until the construction of the residential properties is almost completed and the scaffolding is removed, at which point the depth of topsoil and subsoil placement will be checked through an inspection of the formation level prior to placement.

Imported topsoil and subsoil shall be required. Any imported soil shall be of known provenance and shall be subjected to supplier certification and on-site verification prior to placement at a rate of not less than 1 sample per 500m<sup>3</sup>.

There is a potential that, subject to additional testing, site won subsoil could be reused as part of the capping system.

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<sup>1</sup> HSE (1992) HS(G)66 Protection of workers and the general public during the development of contaminated land HMSO

<sup>2</sup> CIRIA (1996) A guide for safe working on contaminated site Report 132, Construction Industry Research & Information Association

### **Validation and Verification Requirements**

The following records shall be collated and submitted to the Local Authority and NHBC for consideration with regards to contaminated land related planning conditions and Land Quality conditions respectively;

- Records of the geo-environmental watching brief being maintained and the records of any necessary localised further investigation and assessment; and
- Records of site inspection to confirm the placement of the clean cover system in accordance with this report.

This letter and the enclosed supplementary information should be submitted to the Local Authority and NHBC in order to reach agreement on the scope of works required as part of the residential redevelopment of this site in order to confirm the suitability of the site for its consented end use.

We trust that this letter provides sufficient information, although please do not hesitate to contact me should you have any queries or questions or wish to discuss any of the issues raised.

Yours sincerely  
Wilson Bailey Partnership

Dominic Brightman  
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