



**Ex-Serviceman's Club, North Street, Jarrow**  
**Remediation Strategy**  
**For**  
**Galliford Try Partnerships North**

<b>Report Ref</b>	<b>Issue</b>	<b>Prepared by</b>	<b>Date</b>	<b>Reviewed by</b>	<b>Date</b>
14642/RS	1	A Hampson	16.02.15	A Coverdale	17.02.15

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Appendix A      Proposed Development Plan

## 1 INTRODUCTION

1.1 Following the completion of a series of intrusive fieldworks 3e Consulting Engineers Ltd (3e) were commissioned by Galliford Try Partnerships North to carry out a Remediation Strategy for land associated with the former Jarrow Ex-Serviceman's Club, North Street, Jarrow. The proposed development includes the construction of a new over-55's Apartment Building, with associated car parking and areas of soft landscaping, details of which are provided in **Appendix A**.

1.2 The site, centred on National Grid Reference 432950, 565470, is a former Ex-Serviceman's Club situated between Ormonde Street and North Street, Jarrow, about 0.7km north-west of South Shields town centre. A site location plan is included as **Figure 1**.

1.3 The site occupies an area of approximately 0.27 Hectares (Ha) and is currently occupied by Jarrow Ex-Serviceman's Club, with associated hardstanding (i.e. tarmac and paving), whilst a memorial is located across the eastern site area, with surrounding gardens.

1.4 The site is generally level, with a slight drop in gradient noted along the boundary between the Ex-Serviceman's Club and adjacent memorial gardens.

1.5 Both Phase I and Phase II Geo-Environmental Assessment Reports have been completed for this site by 3e. Both of these reports should be read in conjunction with this Remediation Strategy:

- 3e Consulting Engineers Ltd, 'Ex-Serviceman's Club, North Street, Jarrow, Phase I Geo-Environmental Assessment' (October 2014). Report Ref: 14642.
- 3e Consulting Engineers Ltd, 'Ex-Serviceman's Club, North Street, Jarrow, Phase II Geo-Environmental Assessment' (November 2014). Report Ref: 14642/SI.

## 2 SUMMARY OF GROUND INVESTIGATION

### Site History

2.1 From 1857, the majority of the site is recorded as undeveloped albeit for small outbuildings associated with the residential housing running adjacent to the northern and eastern boundaries. By 1896, the majority of the site is occupied by terraced housing, with a public house shown in the south-eastern corner. All of the previous buildings have been demolished by 1968, with the site now recorded as an Ex-Serviceman's club. From 1988, memorial gardens are recorded across the eastern area.

### Ground Investigation

2.2 The investigatory work comprised the completion of mini percussive boreholes, the installation of gas and groundwater monitoring wells as well as soil sampling together with associated laboratory testing.

### Soil Profile

2.3 Made ground was encountered across the site at depths ranging between 0.75m and 1.80m below ground level (bgl) and generally comprised brick and concrete gravel, with areas of disturbed soft to stiff sandy gravelly clay containing anthropogenic debris (i.e. brick, concrete and sandstone. At the location of WS03 only; a band of coal and shale gravel was noted between 0.20m up to 0.85m bgl.

2.4 The underlying drift deposits generally comprised stiff slightly sandy gravelly clay (although noted to be initially firm at WS03) up to a maximum depth of 4.45m bgl.

### Chemical Screening

2.5 The results of the chemical testing indicated there is a potential risk to human health associated with made ground materials below this site, as described in Section 4 below.



## Ground Gas Assessment

2.6 A period of ground gas monitoring has been completed in accordance with CIRIA C665 and the results have indicated that this site falls within a Characteristic Situation CS1 or Green classification (NHBC Traffic light system), suggesting that no gas protection measures are required for the site.

### **3 CONTAMINATION ASSESSMENT**

3.1 Based on the proposed end use being Residential with Home Grown Produce; elevated levels of Polycyclic Aromatic Hydrocarbons (PAH's) have been identified within the made ground present below the site which may potentially represent a risk to the future end users. In addition to this, although no visual evidence of asbestos was noted during the intrusive works, laboratory analysis has identified the presence of asbestos in a single sample of made ground screened from WS01.

#### **Potential risk to human health**

3.2 Due to the presence of these elevated contaminants which may potentially pose a risk to human health it would be prudent that during any future works it is recommended that conventional dust suppression techniques be employed to reduce the risk of inhalation to construction staff and the general public.

3.3 Following completion of the development, suitable remedial measures will have been undertaken as discussed below to protect any future end users with the pathway to the end user being broken by use of either hardstanding, soft landscaping capping or the removal of impacted soils following which the risk is considered negligible.

#### **Remediation Overview**

3.4 Due to the presence of the elevated contaminants within the made ground, it has been identified that this presents a potential risk to the future end users and therefore there is a requirement for suitable remedial measures including removal and/or protection measures. These options include:

- Removal of some made ground materials within areas of soft landscaping, as necessary, in order to achieve appropriate levels to place the clean cover capping layer.
- Installation of a clean cover system which will incorporate a minimum of 600mm of clean imported capping soil as well as a minimum of 200mm of granular compacted clean stone be incorporated at the base of the clean cover system to act as a no dig and separation layer.
- Within areas where the made ground will be located under buildings or



hardstanding, no remediation is required given this will likely be sufficient to break the pollutant linkage between the site end users and the made ground.

3.5 If these made ground materials are geotechnically suitable and can be accommodated on site, they can be re-used as an engineered fill below areas of hardstanding.

3.6 All materials, if removed from site will need to be taken to a suitably licensed waste facility with copies of waste disposal tickets made available to 3e for the completion of a Validation Report.

## 4 REMEDIATION STRATEGY

### Remediation and Validation Requirements

4.1 The following remediation method statement details a method of working that will ensure the site is left in a condition to ensure no further risk is presented to human health associated with the elevated levels identified.

4.2 In summary, one of the following remedial measures will be required and is discussed in more detail below:

#### *Removal of made ground*

- Excavation / removal of made ground materials within any areas of soft landscaping to achieve site levels for capping placement. Any removed materials should either be placed below an area of hardstanding (if suitable) or removed to an appropriate landfill facility.

#### *Importation of clean capping soil*

- Any garden or soft landscaping areas will require a minimum of 600mm of clean imported capping soil and a minimum of 200mm of granular compacted material to act as a 'no dig layer' and/or 'separation later' (800mm in total).
- Prior to commencement of these works, the nature and thickness of capping layers must be agreed with the LA.

4.3 Any materials brought on to site to be utilised within areas of soft landscaping including topsoil, subsoil and granular type materials will require validation testing to confirm the suitability of these materials for use on this site.

4.4 Any service corridors will require backfilling with clean material to mitigate against the risk to maintenance workers.

4.5 If during the groundwork's, any unidentified areas of gross contamination or soils which differ from those encountered during the fieldworks are encountered then these materials will need to be suitably assessed by a geo-environmental engineer from 3e as well





notifying the contaminated land and planning officers and if deemed necessary; appropriate remediation carried out.

4.6 Any materials brought on to site should be suitably screened and tested for human health assessment prior to delivery with these results sent to validators a minimum of 1 week before delivery to site. To confirm the suitability of these materials, validation testing of these materials will also be required following emplacement and/or importation onto site.

4.7 All imported materials including topsoil and subsoil should be screened for potential contaminants prior to importation to site using the acceptance criteria for capping soils in provided below (Table 1).

4.8 Following completion of the remedial works, a Validation Report detailing these works will be completed and submitted to the LA for their comments.

4.9 If any arising's are generated for offsite disposal then they should be stockpiled separately and clearly marked from other materials in order to prevent cross contamination. It is recommended that any made ground material which is to be disposed of off-site will require quantification asbestos testing (if asbestos is present) to determine a suitable landfill facility. Offsite disposal tickets should be made available to 3e for use in the Validation Report.

**Table 1 – Imported Soil Acceptance Criteria**

<b>DETERMINAND</b>	<b>RESIDENTIAL END USE CRITERIA (mg/kg) IN SOIL <sup>(1)</sup></b>
<b>Metals:</b>	
Arsenic	37
Cadmium	11
Chromium	910
Lead	450 <sup>(2)</sup>
Mercury	40
Selenium	250
Copper	2400
Nickel	180
Zinc	3700
<b>PAH compounds:</b>	
Acenaphthene	1100
Acenaphthylene	920
Anthracene	11000
Benzo(a)anthracene	13
Benzo(a)pyrene	3.0
Benzo(b)fluoranthene	3.7
Benzo(g,h,i)perylene	350
Benzo(k)fluoranthene	100
Chrysene	27
Dibenz(a,h)anthracene	0.30
Fluoranthene	890
Fluorene	860
Indeno(1,2,3-cd)pyrene	41
Naphthalene	13
Phenanthrene	440
Pyrene	2000
<b>TPH</b>	
Aliphatic EC 5-6	160
Aliphatic EC >6-8	530
Aliphatic EC >8-10	150
Aliphatic EC >10-12	760
Aliphatic EC >12-16	4300
Aliphatic EC >16-35	110000
Aliphatic EC >35-44	110000
Aromatic EC >5-7	300
Aromatic EC >7-8	660
Aromatic EC >8-10	190
Aromatic EC >10-12	380
Aromatic EC >12-16	660
Aromatic EC >16-21	930
Aromatic EC >21-35	1700
Aromatic EC >35-44	1700
<b>Inorganics:</b>	
Water soluble sulphate	0.5g/l <sup>(3)</sup>
Acidity (pH)	not less than 5
Asbestos	Presence

Notes:

(1) LQM/CIEH S4UL 2015 guidance value for residential with home grown produce unless otherwise stated

(2) CLEA 1.04

(3) Upper level for Class 1 concrete (BRE Special Digest:2005)

Assessment criteria based on 6% soil organic matter

4.10 Prior to importation to site, soils to be used on site will be tested for the determinands listed in Table 1. The frequency of testing shall be as follows in Table 2:

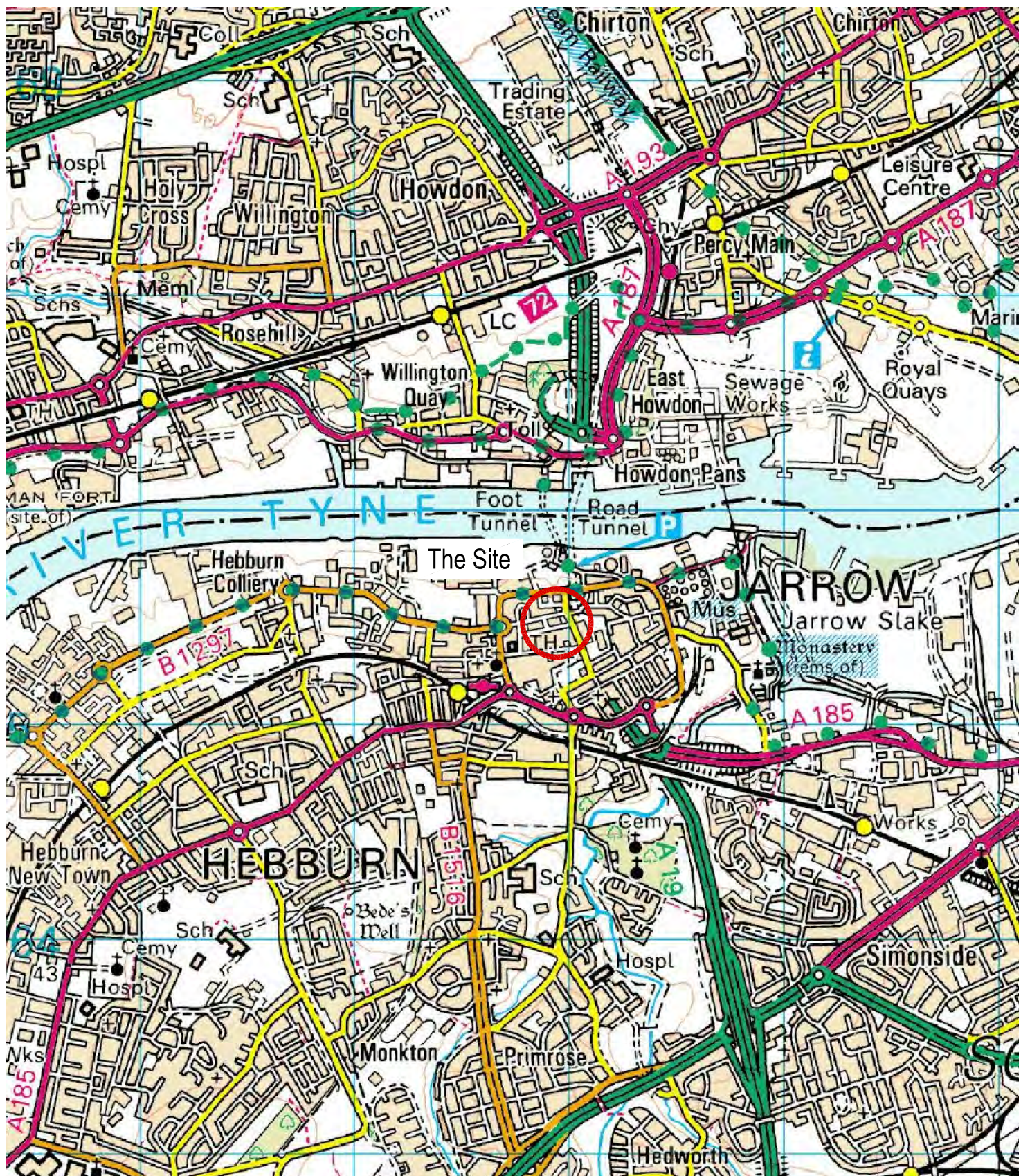
**Table 2 – Imported Soil Testing Frequency**

Type of material	Frequency of testing	Testing schedule
Crushed hardcore, stone, brick used as capping	Minimum 3 or 1 per 500m <sup>3</sup>	<ul style="list-style-type: none"> <li>• Standard metals/metalloids</li> <li>• Speciated PAHs</li> <li>• Asbestos</li> <li>• Leachate analysis</li> </ul>
Greenfield Soils	Minimum 3 or 1 per 250m <sup>3</sup>	<ul style="list-style-type: none"> <li>• Standard metals/metalloids</li> <li>• Speciated PAHs</li> <li>• Asbestos</li> </ul>
Brownfield Soils	Minimum 6 or 1 per 100m <sup>3</sup> (whichever is greater)	<ul style="list-style-type: none"> <li>• Standard metals/metalloids</li> <li>• Speciated PAHs</li> <li>• Asbestos</li> <li>• Banded TPH</li> </ul>

4.11 In areas of soft landscaping, the LA requires an adequate thickness of soil to accommodate growth (i.e. grass, shrubs etc.). Therefore and if required; the importation and thickness of clean soils may need to be confirmed by a geo-environmental engineer at a rate of one inspection pit per 50m<sup>2</sup> of capping placed or a minimum of one per three residential plots in areas of soft landscaping.

4.12 On completion of the works a validation report will be prepared. This will outline the works carried out and include any appropriate waste transfer notes, the results of any necessary validation testing and the validation of the suitability and depth of the imported soils.


# Figures



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Date	Revision	Checked	Rev.

Project	North Street, Jarrow Galliford Try Partnerships North		
Title	Site Location Plan		
Scale	1:25,000 at A4	Drawn NJW	Checked AJH
Job No.	14642	Drawing No.	Figure 1
			Date Feb '15 Rev 0



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# **Appendix A**

## Proposed Development Plan



Existing trees and vegetation to be retained where feasible subject to site investigation

In progress for discussion. Subject to topographical, utilities search, LPA Planning and Highways

Proposed Site Plan 1:200 @ A1  
**IN PROGRESS**