Balmoral Tanks Ltd

Former Hickleton Colliery Site, Thurnscoe Business Park, Thurnscoe

Site Investigations Executive Summary

116641/02A

FAIRHURST

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CONTROL SHEET

CLIENT:	**Balmoral Tanks Ltd**
PROJECT TITLE:	**Former Hickleton Colliery Site, Thurnscoe Business Park, Thurnscoe**
REPORT TITLE:	**Site Investigations - Executive Summary**
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Issue & Approval Schedule

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				Checked	
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This document has been prepared in accordance with procedure OP/P02 of the *Fairhurst Quality and Environmental Management System*

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Developer and Funded			Balmoral Tanks Ltd
Current Site Status			The site comprises an irregular shaped area of open ground. The site is split into two areas – the proposed development site in the west and a potential future development site to the east. The proposed development site slopes from east to west and is under grass cover with dense vegetation along the perimeter. Raised manhole rings are present immediately east of the development site which is likely to be associated with an infilled mine shaft.
Development Proposals			The proposed development is to comprise a factory unit with associated access road, car parking and service yard.
Site Conditions	Location		The site, at National Grid Reference 446560, 405310, is located at the former Hickleton Colliery Site on Barrowfield Road, Thurnscoe. The site is bound by wooded Phoenix Park to the south and Barrowfield Road to the north with Thurnscoe Business Park beyond.
	Site History	Onsite	• 1850 Undeveloped agricultural fields • Part of Hickleton Main Colliery, with mineral railway tracks, buildings and re-profiling from 1900's • Mine shaft located immediately east of site from 1930's • Colliery closed by the 1980's • Site cleared by early 2000's
	Site History	Offsite	• Hickleton Main Colliery main railway terminal, above ground tanks, pit and buildings to the north. • Brick works to the south • Spoil heaps to the south and south east
	Geology		During the site investigation the following ground conditions were identified; • Made ground as predominantly granular fill locally cohesive with fragments of ash, coal, brick and concrete - 4.9m - 7.5m+. SPT results within the made ground gave N value of between 20 and 41 indicating medium dense to dense material. • Localised soft clay to between 5.7m - 7m • Coal Measures as Mudstone and sandstone with coal seams at approximately 10.3m (0.2m to 0.3m thick) and 12.1m (0.1m thick). No evidence of coal workings encountered • 3 No boreholes terminated within the made ground due to the presence of an obstruction at between 4.5m and 7.5m
	Coal Mining		<u>Development site</u> • The proposed development site is in a surface area that could be affected by underground mining in 4 seams of coal at 100m to 730m depth, and last worked in 1983. • No mine entries shown on the development site, however, 1 No mine entry is located to the north on the other side of Barrowfield Road and another mine entry is located immediately east of the site boundary. • No evidence of worked coal seams identified during the site investigation <u>Potential future development site;</u> • The potential future development site to the east is in a surface area that could be affected by underground mining in 5 seams of coal at shallow to 740m depth, and last worked in 1958. • 7 No mine entries are present within the site boundary

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	Coal Mining continued…	The following information has been obtained from the Coal Authority regarding the mine shaft that is present immediately adjacent to the development site; • **Name** – Hickelton No 3 Shaft (446405-003) • **Depth of shaft** (m): 831.7 • **Diameter of shaft** (m): 6.6 • **Coordinates** - Easting: 446536, Northing: 405217 • **Treatment details**: is filled to full depth with hardcore, grouted and capped at rockhead with reinforced concrete. Likely to be capped at approximately 5.6mbgl.
Site Conditions	Surface Water	• Drainage ditch present along southern boundary of site • Culverted water course present immediately east of site
	Groundwater	The following water profile was recorded during the site investigation; • Perched water within the made ground deposits with levels of between 4.46 and 5.17m, occasionally dry. • Long term ground water level of between 7.74m and 8.31mbgl was recorded within the Coal Measures • The superficial deposits beneath the site is classified as a Secondary A Aquifer • The bedrock beneath the site is classified as a Secondary A Aquifer • There are no potable abstraction points within 1km of the site.
	Flood Risk	• The site lies entirely within Environment Agency Flood Zone 1 which means the chance of flooding each year is 0.1% (1 in 1000) or less.
Landfill		• No recorded landfills on site. • The site has undergone historical development as a colliery. As such, made ground as colliery spoil, brick and concrete is expected to be present across the site. • The nearest historical landfill was located 64m north of site. Deposited waste included household waste. The site was operational between 1950 and 1980.
Geotechnical Constraints		The following constraints have been identified on during the site investigation and site walkover; • Deep and variable made ground to between 4.9m and 7.5m+ • Possible concrete obstructions encountered at between 4.5m and 7.5m • Mine shaft located immediately adjacent to the development footprint • Several mine shafts and adits identified across the future development site to the east • Coal Authority gas monitoring well located off Lidget Lane on the future development site to the east. The CA may require access rights for any future development • Localised surface water ponding identified on site which would indicate poor drainage • Possible gas venting layers connecting mine shaft • Possible culvert water course beneath the adjacent land to the east • Localised settlement of backfilled trial pits. This was likely caused by a period of prolonged heavy rain washing fines away. Geogrids may be required to mitigate any risk in the future.

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Earthworks	The following materials are likely to be generated during general earthworks, foundation arisings and drainage arisings; • Made ground as granular locally cohesive fill – suitable for reuse as low quality fill beneath car park. • Due to the presence of asbestos fibres within the soils appropriate mitigation measures and PPE to be employed during redevelopment works to mitigate risks

Foundation and Slab Design	Based on the ground conditions identified the following foundation design options are available;
	• Pad and strip footings found on medium dense to dense made ground may be viable. In order to reduce the risk of differential settlement the following measures would be required;
	  • Over excavate by approximately 500mm
	  • Install geogrid
	  • Backfill with compacted crushed stone back to base of foundation level
	  • Reinforcements to foundations
	  • As the foundations would be within the made ground there is a risk of settlement.
	• Piled foundations are also considered viable. The use of driven piles is generally the most economic. Steel tubes should be considered to mitigate the risk associated with obstructions
	• A ground bearing floor slab is likely to be viable providing that the upper material is re-engineered to provide consistent strata. If the structure is particularly sensitive to settlement or has very tight settlement criteria the use of vibro compaction should be considered. If this is utilised then this method could also be employed on the structural frame.

Services	The following services are present: • Possible culverted water course beneath the potential future development site to the east • BT line beneath the land to the east • Abandoned surface water pipe to the east of the site
Contamination Issues	• No elevated concentrations of soil contamination identified. • Asbestos fibres identified Chrysotile identified in 1 No sample out of 5. The presence of further asbestos fibres or buried asbestos cannot be discounted. • Elevated Carbon Dioxide, up to 5.8%v/v with flow rates generally 0.1l/h locally 2.2l/h

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Remediation Options	The following measures are recommended to ensure a low risk to receptors is maintained in the development; • Asbestos fibres identified within the made ground the presence of further asbestos debris and contamination to any made ground cannot be discounted. If encountered this material may require removal. Construction workers should be made aware and shall adopt appropriate health and safety measures during earthworks. • Dust suppression measures should be adopted during all earthworks. • Construction workers should undertake soil gas and VOC monitoring prior to and during man entry of below ground voids. • Surface water control measures should be adopted during construction to limit runoff and infiltration through exposed made ground horizons and to limit siltation of the surface drainage system. • Grid validation during site strip to confirm absence of contamination • Clean cover for areas of soft landscaping • Soil gas protection measures as soil gas barrier, Juta GP 1 or similar with sealed joints and service entries. • Any land drains or gas vents encountered during the works should be reinstated

Appendix A

Figures

Figure 1 - Site Location Plan

Figure 2 - Site Plan

Drawings

Figure 1 - Location Plan

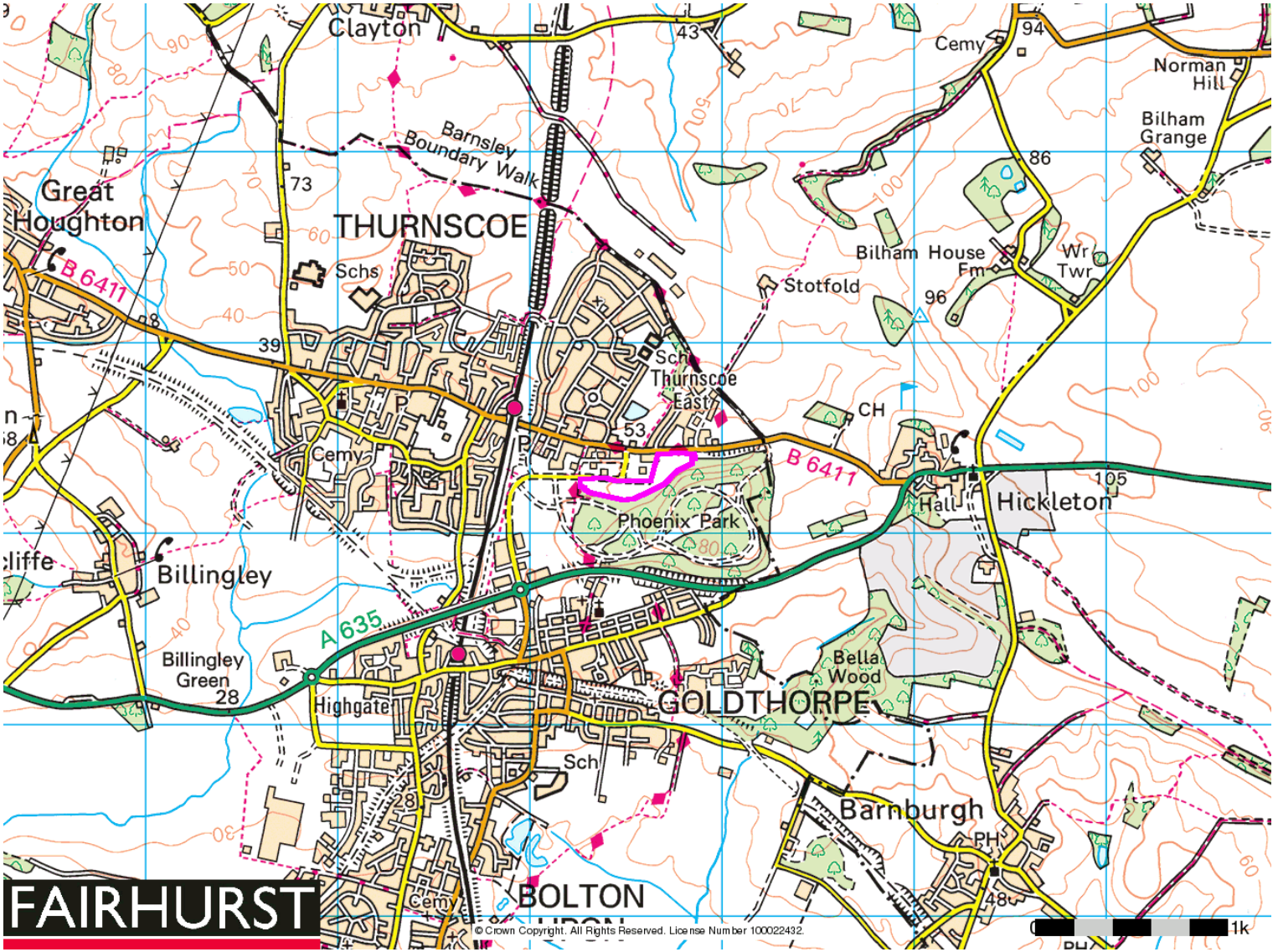
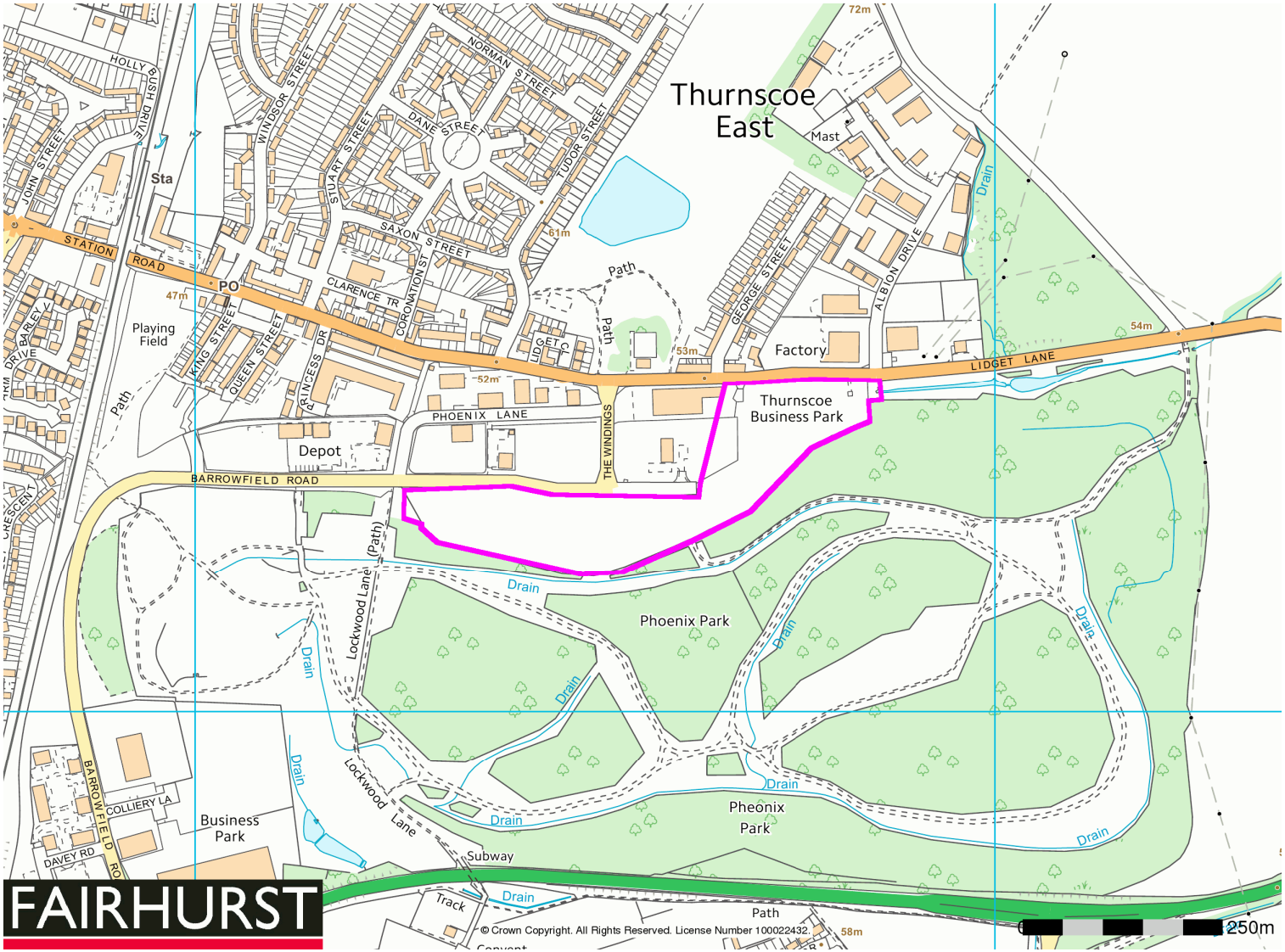
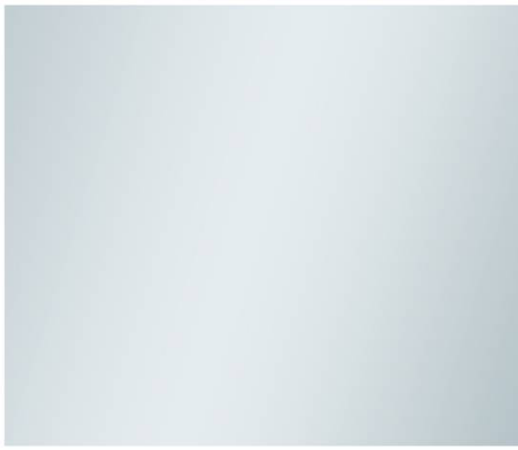


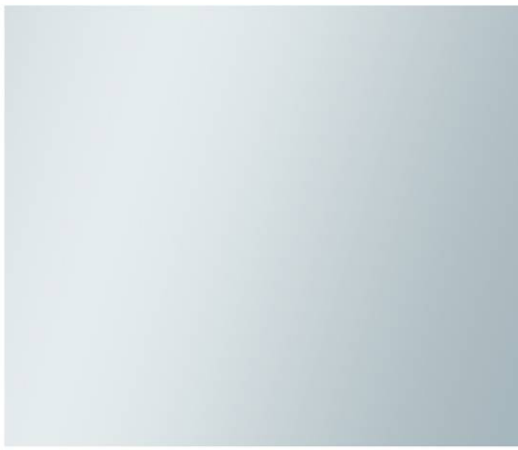
Figure 2 - Site Plan



Appendix B

Site Investigation Data





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