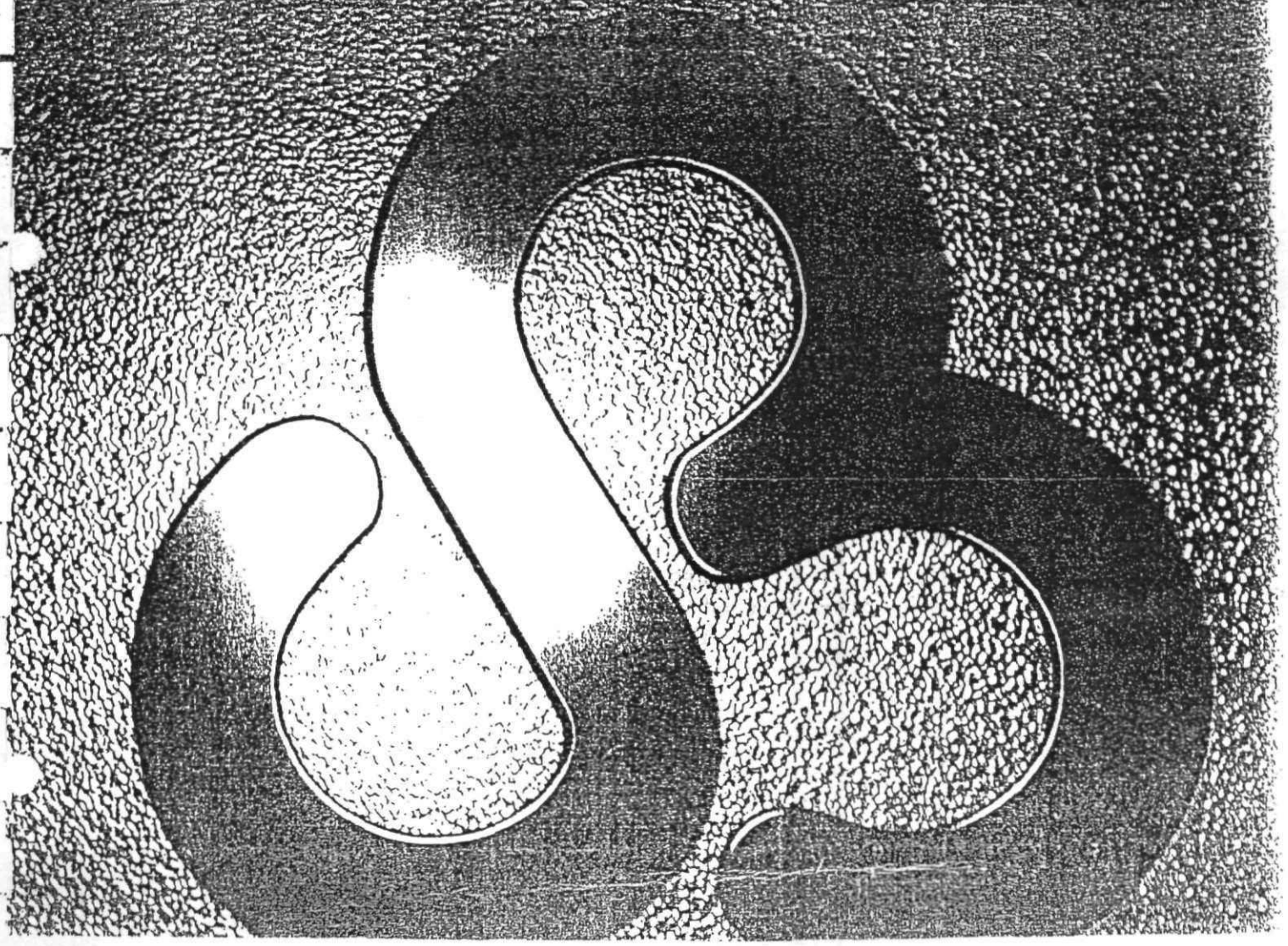
Carl Bro
Intelligent Solutions

GABBITAS GILL
PARTNERSHIP LIMITED
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# PHASE 1B RECLAMATION WORKS

# VALIDATION REPORT

GRIMETHORPE

Prepared for:
YORKSHIRE FORWARD
LEEDS

Prepared by:
CARL BRO GROUP LIMITED
LEEDS

DECEMBER 2001
Project No: 12.0505.01

PROJECT QUALITY ASSURANCE

INFORMATION SHEET

| | |
|---|---|
| **Report Status:** | Final |
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## 1.0 INTRODUCTION

The redevelopment of the former colliery and power station site in Grimethorpe is part of the regeneration of the region's derelict coalfields funded by Yorkshire Forward. The civil engineering works included site remediation to create four development plots and the provision of road, drainage and services infrastructure. The proposals for the development are for mixed business and light industrial use. A plan of the site is given in **Appendix 1.**

As part of the Phase 1A remediation works, substantial volumes of made ground and natural soils have been excavated, processed and recompacted to provide an engineered fill suitable for the support of spread foundations. In addition, areas of contaminated soil have been identified and the material removed from site. All earthworks operations and the removal of any contamination were carried out under the supervision of Carl Bro Group Limited, the geo-environmental consultants for the project. The main contractor was Birse Construction Limited and Jaktc Ltd was the sub-contractor for the bulk earthworks and contamination removal. E Churon Ltd acted as sub-contractor responsible for sampling and testing of materials during the contract.

The purpose of this validation report is to demonstrate to potential developers that the site has been remediated to the standard agreed with the local authority and Environment Agency, and is suitable for industrial/business development.

## 2.0 EARTHWORKS OPERATIONS

Bulk excavation was accomplished with a variety of 20 to 45 tonne 360" tracked excavators and fill material was transported around site in 30 tonne articulated dump trucks. Material classed as unacceptable under the contract, by virtue of its grading or moisture content, was set aside for processing. Large foundations were reduced in size by hydraulic breakers prior to being processed by crushers.

The backfill operation was completed under the supervision of the geo-environmental consultant, and in accordance with the contract specification and method statement submitted by Birse Construction Ltd. Additional guidance was provided by the Specification for Highway Works 1991 (SHW) and DOT Advice Note HA 44/91.

All backfill to the site conformed to either Class 1A or Class 2C general fill. The acceptable fill material was tipped at the appropriate location and spread out across the excavation in layers up to the permitted thickness by a tracked dozer. Each layer was compacted with a towed vibrating tamping roller or smooth-wheeled roller to the required density. Any fill not meeting the compaction requirements was re-compacted before subsequent material was placed on top.

## 3.0 GEOTECHNICAL CONTROL TESTING

The contract was let under a performance type specification where the control of compaction was monitored by compliance to end product criteria. The in situ bulk density and moisture content for each compacted layer was determined in accordance with BS1377:Part 9:1990 at various locations within the excavations during the backfilling. The nuclear density gauge used to monitor the level of compaction was operated in direct transmission mode to obtain bulk density and back scatter mode to measure moisture content. The in situ densities were compared to the maximum dry density determined in the laboratory in order to derive the percentage compaction. The test locations and results are given in **Appendix 2.**

The performance of the fill was monitored during the works by undertaking plate bearing tests to confirm the settlement of the compacted fill under static loading. The test locations and results are given in **Appendix 3.**

After completion of the backfilling and compaction, zone tests were carried out at eight locations to confirm the performance of the fill under loading from a typical foundation. The test locations and results are given in Appendix 4.

## 4.0 CONTAMINATION REMOVAL

All areas of contamination identified from previous investigations were re-sampled and tested. During the works, any suspect material outside of these areas was sampled and tested to determine if contamination was present. All contaminated material was stockpiled in a suitably prepared holding area prior to being removed from site to a licensed facility. The excavation and removal of contaminated material was completed in accordance with the *remediation method statement*.

## 5.0 CONTAMINATION VALIDATION TESTING

Chemical testing was undertaken on samples recovered from below the final ground surface when the remediation was completed. The number of samples tested was based on 1 per 1000m$^2$ of site, using a herringbone sampling strategy. The sample locations and validation test results are given in **Appendix** 5.

## 6.0 MINE CAPS AND BURIED STRUCTURES

Five capped mineshafts are present on site, one of which is located behind permanent fencing within the landscape area at the southern end of Plot 9. The remaining four mine caps were uncovered and their positions recorded with respect to the local site survey grid. In addition to these features, other buried structures, too deep to be removed completely, were broken out to an acceptable depth below finished ground level. The locations of these structures were also recorded. Information on the mine caps and buried structures is given in **Appendix 6** together with a set of as-built drawings.

## 7.0 ANALYSIS OF RESULTS

### 7.1 Geotechnical Data

The classification tests indicate that 78% of the material sampled had a grading conforming to a Class 2C fill material (stony cohesive). The average optimum moisture content (omc) for this class was 13% with an average in situ moisture content (m/c) of 15%, indicating that generally the material was wet of optimum and within the limits for acceptability. The remaining 22% of the material tested conformed to a Class 1A fill (well-graded granular material) with an average omc of 12% and in situ m/c of 11%. This moisture content value is marginally dry of optimum but the material was considered suitable for compaction.

The field compaction data reveal that the average compaction recorded by the nuclear density tests is 96% of the maximum dry density obtained by the 4.5kg compaction test. The results have a standard deviation of 4.2%. When compared to the 2.5kg compaction test, the nuclear density data give an average compaction of 101%, with a standard deviation of 4.3%. A similar degree of compaction was indicated by the sand replacement tests. The average percentage air voids achieved by the field compaction was 7%.

Plate bearing tests were undertaken on completed layers of compacted fill to confirm the performance and uniformity of the earthworks. The settlement at the working load of 80 kPa ranged from 0.1mm to 7mm, with an average settlement of 1mm. At twice the working load, the settlement ranged from 0.5mm to 18mm, with an average of 3mm.

The results from the 8No. zone tests show the maximum settlement was 4.4mm at the design load of 75kN/m$^2$ and 11.9mm at twice the design load. The permissible settlement at the design load is 25mm.

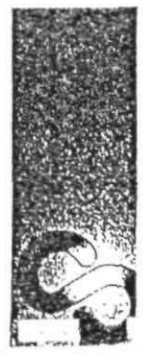
### 7.2 Contamination Data

The contamination results for the validation testing indicate that all samples passed the clean-up criteria set for the remediation. The TPH by infra red results on leachate revealed five samples (62, 67, 91, 111 and 113) above the threshold for acceptability, but when tested by the more rigorous GC method, the samples proved to have levels less than the limit set for the leachable concentration.

A summary of the contamination results is given in the following table:

TABLE 1. SUMMARY OF LABORATORY TEST RESULTS FOR CONTAMINATION

| | Arsenic | Boron | Cadmium | Chromium | Copper | Mercury | Nickel | Lead | Selenium | Zinc | PAH | Phenols | BTEX | TPH by GC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| units | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/l | mg/l | mg/l |
| limit set | 200 | 50 | 15 | 1000 | 500 | 15 | 500 | 2000 | 6 | 1000 | 1000 | 2 | 1 | 1 |
| max | 117 | 2 | 3 | 193 | 91 | <1 | 40 | 253 | 2 | 169 | 618 | 0.45 | <0.01 | 0.68 |
| min | 2 | <1 | <1 | 6 | 20 | <1 | 3 | 11 | 1 | 37 | 1.7 | <0.01 | <0.01 | <0.01 |
| mean | 19 | - | - | 24 | 41 | - | 24 | 29 | - | 87 | 62 | - | - | - |



## 8.0 DISCUSSION

The nuclear density gauge test results confirm that the compaction of the backfill has achieved the specified maximum dry density in 96% of the test locations. There are inherent difficulties in the use of the nuclear density gauge in non-uniform materials and for this reason sand replacement tests were undertaken for comparison. The results from these tests show that the required level of compaction was achieved at 97% of the test locations. Overall, the test results indicate an acceptable degree of compaction was achieved by the earthworks operations.

The limit for the percentage air voids of the compacted fill was set at a maximum of 5%, in order to reduce the risk of creep and collapse settlement. However, at an average air voids content of 7%, the total of creep and collapse settlement is unlikely to exceed 0.5% of the fill thickness, or a maximum of 25mm in the deeper areas of fill, over a period of 10 years.

## 9.0 CONCLUSIONS

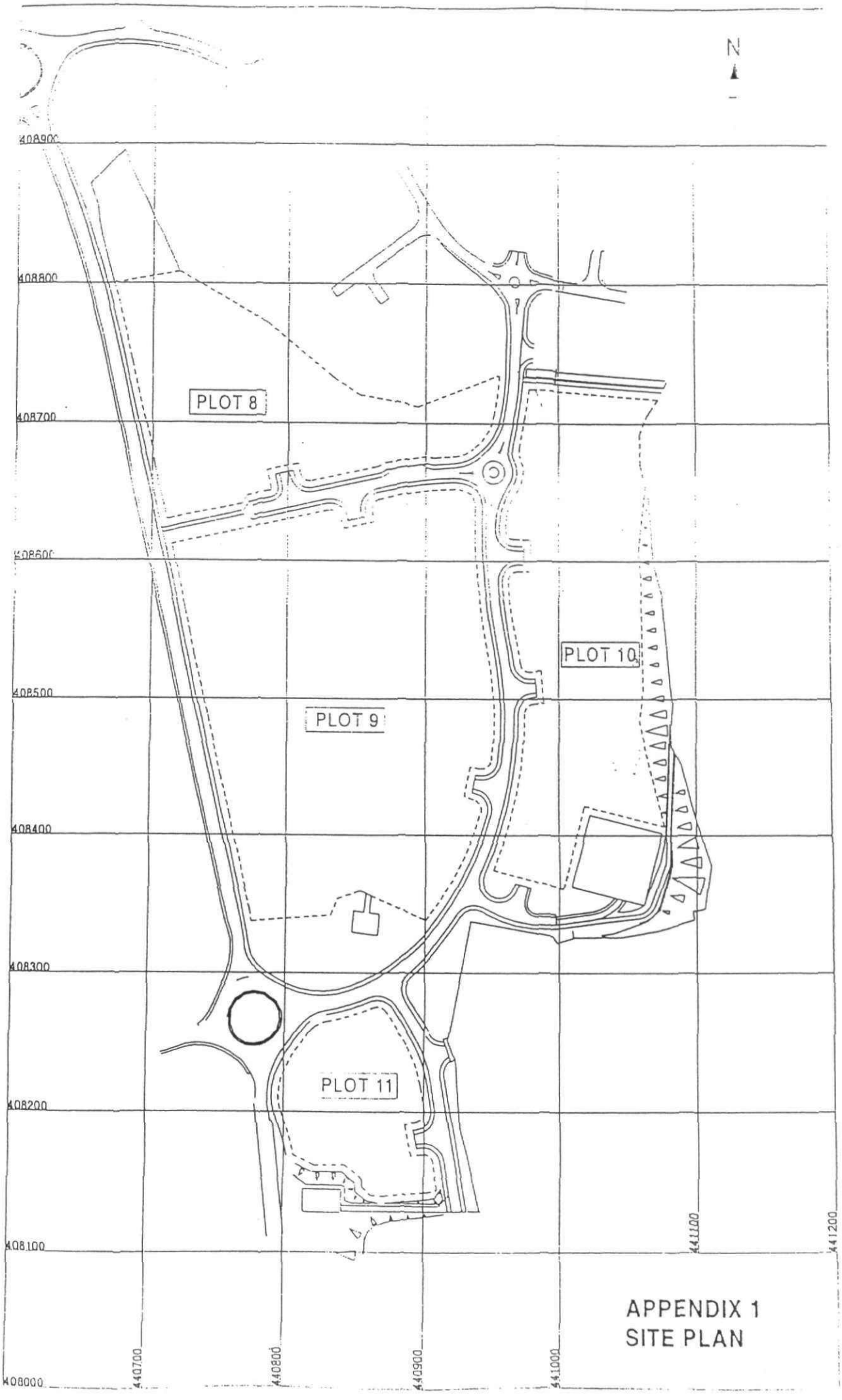
The compacted backfill meets the requirements of the end-product specification and has been engineered to provide an allowable bearing pressure of 75 kPa in accordance with the remediation proposals.

The validation test results demonstrate that the remediation of the site has met the target clean-up criteria and is suitable for the proposed end-use of mixed business and light industrial premises.

It is concluded that the site is acceptable for redevelopment.

APPENDIX 1

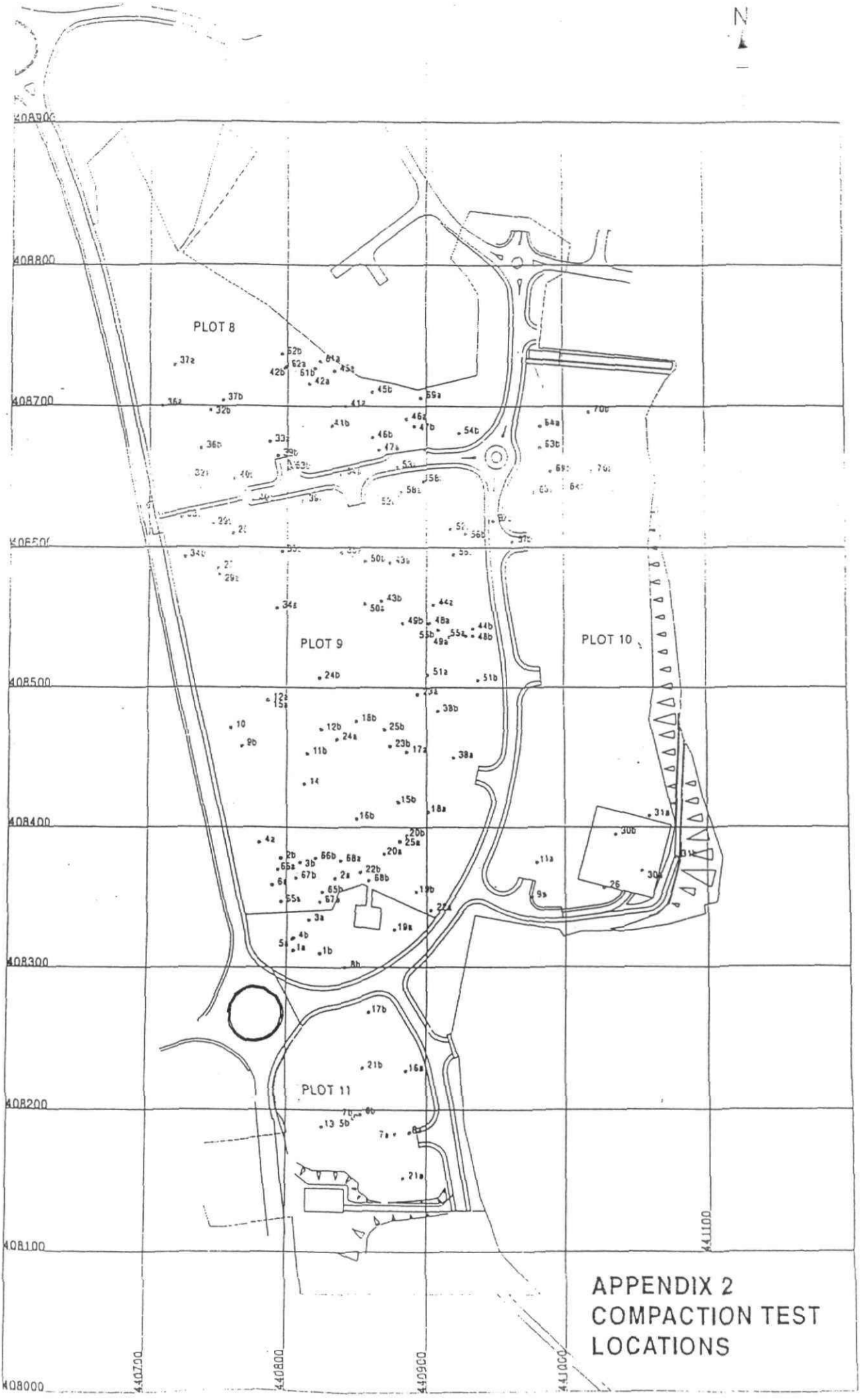
SITE PLAN




APPENDIX 1
SITE PLAN

# APPENDIX 2

# COMPACTION TESTS




# APPENDIX 2
# COMPACTION TEST LOCATIONS

# Grimethorpe Phase 1B - Compaction Test Results

| | | Lab Compaction Data | | | | | Field Compaction Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test | Lab | Specific | 4.5kg | | 2.5kg | | Sand Replacement Tests | | | Nuclear Density Tests | | | % Compaction | | % Air |
| No | Ref | Gravity | MDD | OMC | MDD | OMC | Bulk Den | M/C | Dry Den | Bulk Den | M/C | Dry Den | 4.5kg | 2.5kg | Voids |
| 1a | 652 | 2.14 | 1600 | 12 | | | 1882 | 11 | 1695 | 1878 | 10 | 1707 | 107 | | 3 |
| 1b | | | | | | | 1875 | 10 | 1705 | | | | 107 | | 3 |
| | | | | | | | | | | | | | | | |
| 2a | 921 | 2.50 | 1770 | 13 | | | 1953 | 15 | 1698 | 1951 | 16 | 1682 | 95 | | 6 |
| 2b | | | | | | | 2057 | 10 | 1870 | 1983 | 14 | 1739 | 98 | | 6 |
| | | | | | | | | | | | | | | | |
| 3a | 991 | 2.42 | 1770 | 13 | | | 1996 | 12 | 1782 | 2044 | 13 | 1809 | 102 | | 2 |
| 3b | | | | | | | 1938 | 13 | 1715 | 2000 | 14 | 1754 | 99 | | 3 |
| | | | | | | | | | | | | | | | |
| 4a | 1081 | 2.25 | 1670 | 13 | | | 2020 | 12 | 1804 | 1663 | 14 | 1459 | 87 | | 15 |
| 4b | | | | | | | 1783 | 17 | 1524 | 1832 | 14 | 1607 | 96 | | 6 |
| | | | | | | | | | | | | | | | |
| 5a | 1179 | 2.33 | 1730 | 13 | | | 1928 | 13 | 1706 | 1908 | 11 | 1719 | 99 | | 7 |
| 5b | | | | | | | | | | 1925 | 16 | 1659 | 96 | | 2 |
| | | | | | | | | | | | | | | | |
| 6a | 1294 | 2.39 | 1720 | 15 | | | 1929 | 16 | 1663 | 1978 | 17 | 1691 | 98 | | 1 |
| 6b | | | | | | | 1875 | 15 | 1634 | 1963 | 16 | 1692 | 98 | | 2 |
| | | | | | | | | | | | | | | | |
| 7a | 1385 | 2.38 | 1820 | 13 | | | | 12 | | 1940 | 11 | 1748 | 96 | | 8 |
| 7b | | | | | | | | 12 | | 1947 | 13 | 1723 | 97 | | 6 |
| | | | | | | | | | | | | | | | |
| 8a | 1636 | 2.43 | 1770 | 14 | | | | | | 1934 | 15 | 1682 | 95 | | 6 |
| 8b | | | | | | | 1999 | 13 | 1769 | 1985 | 13 | 1757 | 99 | | 5 |
| | | | | | | | | | | | | | | | |
| 9a | 1786 | 2.32 | 1660 | 14 | | | 1850 | 13 | 1637 | 1760 | 12 | 1571 | 95 | | 13 |
| 9b | | | | | | | | | | 1908 | 19 | 1603 | 97 | | 0 |
| | | | | | | | | | | | | | | | |
| 10 | 1872 | 2.42 | 1830 | 11 | | | 1970 | 13 | 1743 | 1990 | 15 | 1730 | 95 | | 3 |
| | | | | | | | | | | | | | | | |
| 11a | 1956 | 2.38 | 1730 | 15 | | | 1866 | 11 | 1681 | 1938 | 14 | 1700 | 98 | | 5 |
| 11b | | | | | | | 1993 | 13 | 1764 | 1957 | 14 | 1717 | 99 | | 4 |
| | | | | | | | | | | | | | | | |
| 12a | 1995 | 2.47 | 1840 | 11 | 1750 | 14 | 1901 | 13 | 1682 | 1909 | 15 | 1660 | 90 | 95 | 8 |
| 12b | | | | | | | | | | 2030 | 16 | 1750 | 95 | 100 | 1 |
| | | | | | | | | | | | | | | | |
| 13 | 2098 | 2.53 | 1890 | 11 | 1800 | 14 | 2083 | 14 | 1827 | 2049 | 15 | 1782 | 94 | 99 | 3 |
| | | | | | | | | | | | | | | | |
| 14 | 2099 | 2.38 | 1790 | 12 | 1700 | 15 | 1957 | 13 | 1732 | 1967 | 13 | 1741 | 97 | 102 | 4 |
| | | | | | | | | | | | | | | | |
| 15a | 2202 | 2.44 | 1820 | 11 | 1710 | 15 | | | | 2008 | 11 | 1809 | 99 | 106 | 6 |
| 15b | | | | | | | 1980 | 11 | 1784 | 2001 | 10 | 1819 | 100 | 106 | 7 |
| | | | | | | | | | | | | | | | |
| 16a | 2203 | 2.62 | 1920 | 11 | 1850 | 14 | 2052 | 11 | 1849 | 2043 | 11 | 1841 | 96 | 99 | 10 |
| 16b | | | | | | | | | | 2072 | 11 | 1867 | 97 | 101 | 8 |
| | | | | | | | | | | | | | | | |
| 17a | 2267 | 2.67 | 1920 | 10 | 1820 | 14 | 2069 | 12 | 1847 | 2069 | 10 | 1881 | 98 | 103 | 11 |
| 17b | | | | | | | | | | 2069 | 8 | 1916 | 100 | 105 | 13 |
| | | | | | | | | | | | | | | | |
| 18a | 2268 | 2.48 | 1870 | 11 | 1780 | 13 | 2031 | 10 | 1846 | 1812 | 8 | 1678 | 90 | 94 | 19 |
| 18b | | | | | | | | | | 1839 | 5 | 1751 | 94 | 98 | 21 |
| | | | | | | | | | | | | | | | |
| 19a | 2291 | 2.44 | 1870 | 11 | 1760 | 14 | 1900 | 6 | 1792 | 1944 | 5 | 1851 | 99 | 105 | 15 |
| 19b | | | | | | | | | | 1972 | 4 | 1896 | 101 | 108 | 15 |
| | | | | | | | | | | | | | | | |
| 20a | 2292 | 2.44 | 1870 | 11 | 1780 | 13 | 1928 | 6 | 1819 | 1908 | 7 | 1783 | 95 | 100 | 14 |
| 20b | | | | | | | | | | 1929 | 5 | 1837 | 98 | 103 | 16 |
| | | | | | | | | | | | | | | | |

# Grimethorpe Phase 1B - Compaction Test Results

| | | Lab Compaction Data | | | | | Field Compaction Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test | Lab | Specific | 4.5kg | | 2.5kg | | Sand Replacement Tests | | | Nuclear Density Tests | | | % Compaction | | % Air |
| No | Ref | Gravity | MDD | OMC | MDD | OMC | Bulk Den | M/C | Dry Den | Bulk Den | M/C | Dry Den | 4.5kg | 2.5kg | Voids |
| 21a | 2336 | 2.69 | 1950 | 12 | | | 2133 | 12 | 1904 | 2119 | 14 | 1859 | 95 | | 5 |
| 21b | | | | | | | | | | 2147 | 12 | 1900 | 97 | | 5 |
| | | | | | | | | | | | | | | | |
| 22a | 2339 | 2.66 | 1970 | 11 | | | 2127 | 10 | 1934 | 2187 | 13 | 1935 | 98 | | 2 |
| 22b | | | | | | | | | | 2109 | 14 | 1850 | 94 | | 5 |
| | | | | | | | | | | | | | | | |
| 23a | 2415 | 2.44 | 1830 | 11 | 1720 | 12 | | | | 1873 | 12 | 1672 | 91 | 97 | 11 |
| 23b | | | | | | | 1978 | 11 | 1782 | 1908 | 12 | 1704 | 93 | 99 | 10 |
| | | | | | | | | | | | | | | | |
| 24a | 2416 | 2.44 | 1880 | 11 | 1790 | 12 | | | | 1937 | 11 | 1745 | 93 | 97 | 9 |
| 24b | | | | | | | 1968 | 12 | 1757 | 1976 | 10 | 1796 | 96 | 100 | 8 |
| | | | | | | | | | | | | | | | |
| 25a | 2551 | 2.23 | 1760 | 12 | 1710 | 13 | 1977 | 14 | 1734 | 1944 | 15 | 1690 | 96 | 99 | -1 |
| 25b | | | | | | | | | | 1924 | 12 | 1718 | 98 | 100 | 2 |
| | | | | | | | | | | | | | | | |
| 26 | 2838 | 2.67 | 2020 | 10 | 1980 | 11 | 2109 | 10 | 1917 | 2098 | 10 | 1907 | 94 | 96 | 9 |
| | | | | | | | | | | | | | | | |
| 27 | 2839 | 2.40 | 1670 | 11 | 1770 | 14 | | | | 1970 | 11 | 1775 | 93 | 100 | |
| | | | | | | | | | | | | | | | |
| 28 | 2840 | 2.40 | 1670 | 11 | 1740 | 13 | 1873 | 12 | 1674 | 1954 | 13 | 1745 | 93 | 101 | 7 |
| | | | | | | | | | | | | | | | |
| 29a | 2933 | 2.32 | 1740 | 12 | 1650 | 14 | 1805 | 12 | 1612 | 1813 | 14 | 1590 | 91 | 96 | 9 |
| 29b | | | | | | | | | | 1845 | 12 | 1647 | 95 | 100 | 9 |
| | | | | | | | | | | | | | | | |
| 30a | 2933 | 2.69 | 2020 | 10 | 1890 | 12 | 2116 | 9 | 1941 | 2089 | 10 | 1899 | 94 | 100 | 10 |
| 30b | | | | | | | | | | 2055 | 10 | 1868 | 92 | 99 | 12 |
| | | | | | | | | | | | | | | | |
| 31a | 2994 | 2.72 | 2090 | 9 | 1980 | 10 | 2138 | 10 | 1944 | 2255 | 6 | 2127 | 102 | 107 | 9 |
| 31b | | | | | | | | | | 2113 | 8 | 1956 | 94 | 99 | 12 |
| | | | | | | | | | | | | | | | |
| 32a | 3014 | 2.37 | 1730 | 12 | 1600 | 11 | 1903 | 10 | 1730 | 1918 | 9 | 1760 | 102 | 110 | 10 |
| 32b | | | | | | | | | | 1831 | 14 | 1606 | 93 | 100 | 10 |
| | | | | | | | | | | | | | | | |
| 33a | 3015 | 2.32 | 1750 | 12 | 1620 | 11 | 1862 | 11 | 1677 | 1833 | 11 | 1651 | 94 | 102 | 11 |
| 33b | | | | | | | | | | 1957 | 10 | 1779 | 102 | 110 | 6 |
| | | | | | | | | | | | | | | | |
| 34a | 3027 | 2.47 | 1780 | 12 | 1670 | 14 | 2020 | 11 | 1820 | 2022 | 11 | 1822 | 102 | 109 | 6 |
| 34b | | | | | | | | | | 2000 | 13 | 1770 | 99 | 106 | 5 |
| | | | | | | | | | | | | | | | |
| 35a | 3028 | 2.26 | 1680 | 13 | 1610 | 15 | 1956 | 12 | 1746 | 1945 | 13 | 1721 | 102 | 107 | 1 |
| 35b | | | | | | | | | | 1991 | 11 | 1794 | 107 | 111 | 1 |
| | | | | | | | | | | | | | | | |
| 36a | 3080 | 2.36 | 1730 | 13 | 1630 | 15 | 1960 | 14 | 1719 | 2051 | 16 | 1768 | 102 | 108 | -3 |
| 36b | | | | | | | | | | 1985 | 11 | 1788 | 103 | 110 | 5 |
| | | | | | | | | | | | | | | | |
| 37a | 3081 | 2.22 | 1690 | 12 | 1650 | 13 | 1940 | 9 | 1780 | 2014 | 10 | 1831 | 108 | 111 | -1 |
| 37b | | | | | | | | | | 1887 | 11 | 1700 | 101 | 103 | 5 |
| | | | | | | | | | | | | | | | |
| 38a | 3360 | 2.19 | 1710 | 9 | 1580 | 10 | 1691 | 11 | 1523 | 1782 | 12 | 1591 | 93 | 101 | 8 |
| 38b | | | | | | | | | | 1928 | 7.5 | 1793 | 105 | 114 | 5 |
| | | | | | | | | | | | | | | | |
| 39a | 3491 | 2.44 | 1860 | 11 | 1730 | 13 | 1981 | 10 | 1801 | 1902 | 8 | 1761 | 95 | 102 | 14 |
| 39b | | | | | | | | | | 1933 | 10 | 1757 | 94 | 102 | 10 |
| | | | | | | | | | | | | | | | |
| 40a | 3492 | 2.40 | 1850 | 11 | 1740 | 13 | 1935 | 11 | 1743 | 1889 | 11 | 1702 | 92 | 98 | 10 |
| 40b | | | | | | | | | | 1889 | 11 | 1702 | 92 | 98 | 10 |
| | | | | | | | | | | | | | | | |

# Grimethorpe Phase 1B - Compaction Test Results

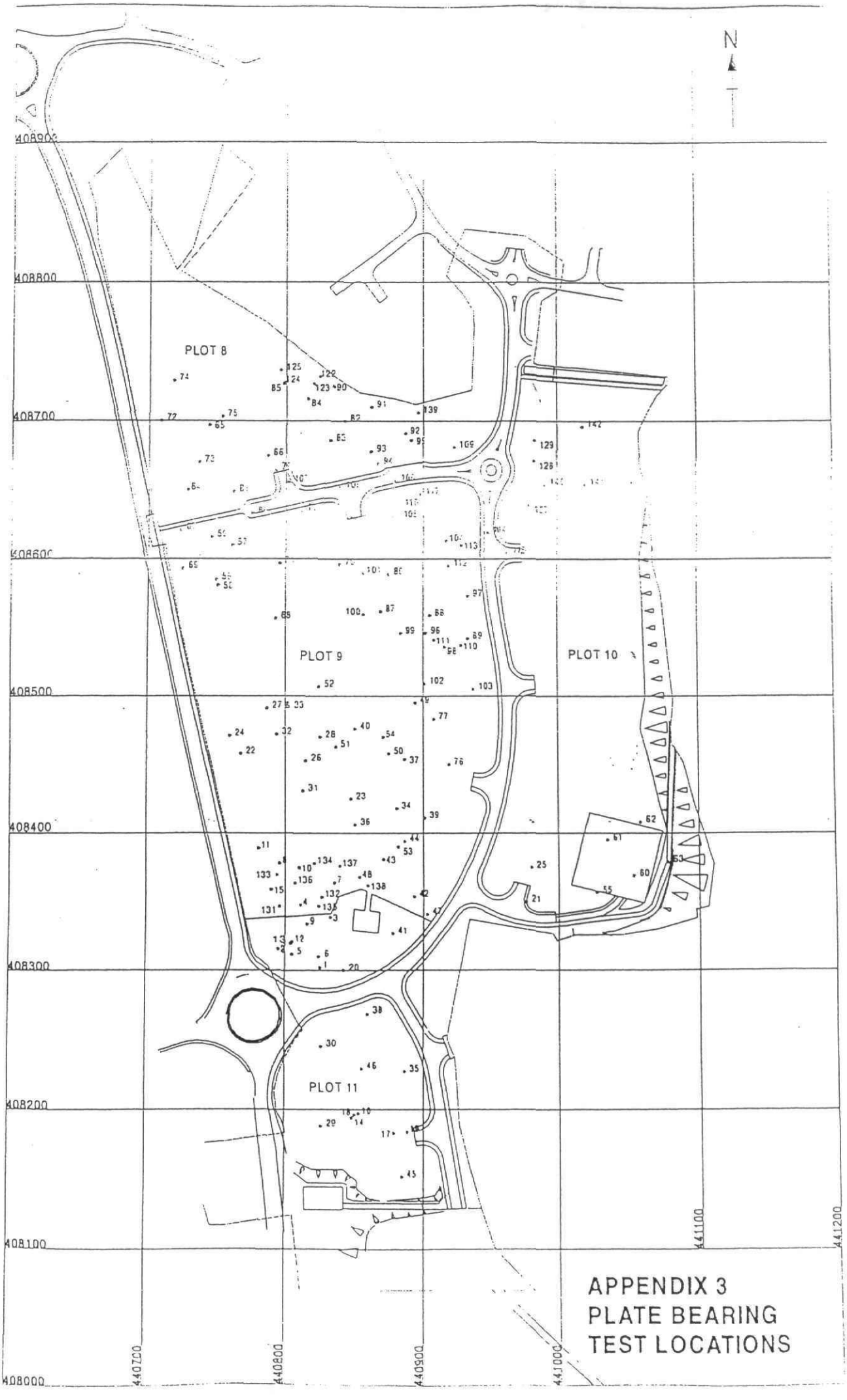
| | | Lab Compaction Data | | | | | Field Compaction Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test | Lab | Specific | 4.5kg | | 2.5kg | | Sand Replacement Tests | | | Nuclear Density Tests | | | % Compaction | | % Air |
| No | Ref | Gravity | MDD | OMC | MDD | OMC | Bulk Den | M/C | Dry Den | Bulk Den | M/C | Dry Den | 4.5kg | 2.5kg | Voids |
| 41a | 3705 | 2.62 | 1950 | 11 | 1850 | 14 | 1999 | 9 | 1834 | 2011 | 10 | 1828 | 94 | 99 | 12 |
| 41b | | | | | | | | | | 1943 | 10 | 1766 | 91 | 95 | 15 |
| | | | | | | | | | | | | | | | |
| 42a | 3706 | 2.63 | 1930 | 12 | 1800 | 14 | 1997 | 12 | 1783 | 1996 | 13 | 1766 | 92 | 98 | 10 |
| 42b | | | | | | | | | | 2024 | 13 | 1791 | 93 | 100 | 9 |
| | | | | | | | | | | | | | | | |
| 43a | 3284 | 2.60 | 1990 | 10 | 1880 | 12 | 1896 | 8 | 1756 | 1951 | 9.4 | 1783 | 90 | 95 | 15 |
| 43b | | | | | | | | | | 2047 | 9 | 1878 | 94 | 100 | 11 |
| | | | | | | | | | | | | | | | |
| 44a | 3785 | 2.65 | 1890 | 12 | 1770 | 13 | 2011 | 10 | 1828 | 2012 | 10 | 1829 | 97 | 103 | 13 |
| 44b | | | | | | | | | | 1895 | 15 | 1648 | 87 | 93 | 13 |
| | | | | | | | | | | | | | | | |
| 45a | 3847 | 2.25 | 1740 | 11 | 1600 | 10 | 1880 | 14 | 1649 | 1898 | 13 | 1680 | 97 | 105 | 4 |
| 45b | | | | | | | | | | 1846 | 15 | 1605 | 92 | 100 | 5 |
| | | | | | | | | | | | | | | | |
| 46a | 3848 | 2.29 | 1820 | 10 | 1690 | 12 | 1923 | 16 | 1658 | 1970 | 11 | 1775 | 96 | 105 | 3 |
| 46b | | | | | | | | | | 1934 | 11 | 1742 | 95 | 103 | 5 |
| | | | | | | | | | | | | | | | |
| 47a | 3950 | 2.31 | 1770 | 11 | 1670 | 12 | 1855 | 12 | 1660 | 1914 | 11 | 1720 | 97 | 102 | 6 |
| 47b | | | | | | | | | | 1904 | 12 | 1703 | 96 | 102 | 6 |
| | | | | | | | | | | | | | | | |
| 48a | 3955 | 2.32 | 1720 | 12 | 1630 | 14 | 1881 | 21 | 1555 | 1895 | 17 | 1620 | 94 | 99 | 5 |
| 48b | | | | | | | | | | 1920 | 15 | 1670 | 97 | 102 | 3 |
| | | | | | | | | | | | | | | | |
| 49a | 4095 | 2.65 | 1920 | 12 | 1820 | 12 | 2067 | 9 | 1896 | 2156 | 10 | 1960 | 102 | 106 | 6 |
| 49b | | | | | | | | | | 2074 | 10 | 1885 | 98 | 104 | 10 |
| | | | | | | | | | | | | | | | |
| 50a | 4096 | 2.39 | 1670 | 14 | 1600 | 17 | 1899 | 14 | 1666 | 1941 | 15 | 1688 | 101 | 105 | 4 |
| 50b | | | | | | | | | | 1916 | 20 | 1597 | 96 | 100 | 1 |
| | | | | | | | | | | | | | | | |
| 51a | 4210 | 2.47 | 1890 | 12 | 1800 | 14 | | | | 1965 | 10 | 1786 | 97 | 99 | 10 |
| 51b | | | | | | | | | | 1908 | 11 | 1719 | 91 | 95 | 12 |
| | | | | | | | | | | | | | | | |
| 52a | 4211 | 2.40 | 1640 | 16 | 1580 | 18 | 1773 | 12 | 1583 | 1827 | 15 | 1589 | 97 | 101 | 15 |
| 52b | | | | | | | 1707 | 12 | 1524 | 1808 | 19 | 1519 | 93 | 96 | 18 |
| | | | | | | | | | | | | | | | |
| 53a | 4441 | 2.48 | 1870 | 12 | 1800 | 13 | | | | 1978 | 11 | 1782 | 95 | 99 | 9 |
| 53b | | | | | | | 1941 | 9 | 1781 | 2007 | 13 | 1776 | 95 | 99 | 5 |
| | | | | | | | | | | | | | | | |
| 54a | 4442 | 2.38 | 1830 | 12 | 1740 | 14 | | | | 1895 | 13 | 1677 | 92 | 96 | 8 |
| 54b | | | | | | | 1972 | 13 | 1745 | 2011 | 12 | 1796 | 98 | 103 | 3 |
| | | | | | | | | | | | | | | | |
| 55a | 4958 | 2.75 | 1950 | 12 | 1860 | 14 | 2128 | 13 | 1883 | 2114 | 13 | 1871 | 96 | 101 | 8 |
| 55b | | | | | | | 2181 | 14 | 1913 | 2146 | 14 | 1882 | 97 | 101 | 5 |
| | | | | | | | | | | | | | | | |
| 56a | 4959 | 2.70 | 2030 | 12 | 1910 | 12 | | | | 2084 | 11 | 1877 | 92 | 98 | 10 |
| 56b | | | | | | | | | | 2076 | 10 | 1887 | 93 | 99 | 11 |
| | | | | | | | | | | | | | | | |
| 57a | 5027 | 2.70 | 1910 | 14 | 1790 | 16 | 2063 | 15 | 1794 | 2069 | 16 | 1784 | 93 | 100 | 5 |
| 57b | | | | | | | | | | 2055 | 17 | 1756 | 92 | 98 | 5 |
| | | | | | | | | | | | | | | | |
| 58a | 5028 | 2.71 | 1950 | 14 | 1840 | 15 | 2044 | 14 | 1793 | 1995 | 13 | 1765 | 91 | 96 | 12 |
| 58b | | | | | | | | | | 1953 | 13 | 1728 | 89 | 94 | 14 |
| | | | | | | | | | | | | | | | |
| 59a | 5046 | 2.71 | 2010 | 11 | 1880 | 14 | 2082 | 13 | 1842 | 2184 | 15 | 1899 | 94 | 101 | 1 |
| 59b | | | | | | | | | | 2112 | 14 | 1853 | 92 | 99 | 6 |
| | | | | | | | | | | | | | | | |

# Grimethorpe Phase 1B - Compaction Test Results

| | | Lab Compaction Data | | | | | Field Compaction Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test | Lab | Specific | 4.5kg | | 2.5kg | | Sand Replacement Tests | | | Nuclear Density Tests | | | % Compaction | | % Air |
| No | Ref | Gravity | MDD | OMC | MDD | OMC | Bulk Den | M/C | Dry Den | Bulk Den | M/C | Dry Den | 4.5kg | 2.5kg | Voids |
| 60a | 5047 | 2.71 | 1970 | 12 | 1840 | 12 | 2126 | 15 | 1849 | 2078 | 13 | 1839 | 93 | 100 | 6 |
| 60b | | | | | | | | | | 2108 | 13 | 1865 | 95 | 101 | 7 |
| | | | | | | | | | | | | | | | |
| 61a | 5401 | 2.60 | 1900 | 12 | 1800 | 13 | 1922 | 11 | 1732 | 2072 | 15 | 1802 | 95 | 100 | 4 |
| 61b | | | | | | | | | | 2044 | 16 | 1762 | 93 | 98 | 4 |
| | | | | | | | | | | | | | | | |
| 62a | 5402 | 2.60 | 1900 | 12 | 1810 | 14 | 1944 | 13 | 1720 | 2068 | 15 | 1798 | 95 | 99 | 4 |
| 62b | | | | | | | | | | 2044 | 16 | 1762 | 93 | 97 | 4 |
| | | | | | | | | | | | | | | | |
| 63a | 01/345 | 2.70 | 2020 | 10 | 1860 | 14 | | | | 2144 | 15 | 1864 | 92 | 100 | 3 |
| 63b | | | | | | | | | | 2164 | 16 | 1866 | 92 | 100 | 1 |
| | | | | | | | | | | | | | | | |
| 64a | 01/346 | 2.71 | 1990 | 11 | 1860 | 16 | 2180 | 14 | 1912 | 2054 | 16 | 1771 | 89 | 95 | 6 |
| 64b | | | | | | | 2180 | 10 | 1982 | 2078 | 16 | 1791 | 90 | 96 | 5 |
| | | | | | | | | | | | | | | | |
| 65a | 01/401 | 2.74 | 2040 | 10 | 1900 | 15 | 2240 | 13 | 1982 | 2062 | 18 | 1747 | 86 | 92 | 5 |
| 65c | | | | | | | 2290 | 11 | 2063 | 2095 | 14 | 1839 | 90 | 97 | - |
| | | | | | | | | | | | | | | | |
| 66a | 01/402 | 2.73 | 2020 | 11 | 1880 | 14 | | | | 2085 | 12 | 1860 | 92 | 99 | 1 |
| 66c | | | | | | | | | | 2178 | 13 | 1928 | 95 | 100 | 3 |
| | | | | | | | | | | | | | | | |
| 67a | 01/614 | 2.73 | 1920 | 13 | 1800 | 15 | | | | 2064 | 18 | 1749 | 91 | 97 | 4 |
| 67b | | | | | | | 2150 | 17 | 1838 | 2104 | 15 | 1830 | 95 | 100 | 6 |
| | | | | | | | | | | | | | | | |
| 68a | 01/615 | 2.69 | 1970 | 12 | 1840 | 15 | 2140 | 17 | 1829 | 2064 | 18 | 1749 | 89 | 95 | 3 |
| 68b | | | | | | | | | | 2090 | 19 | 1756 | 89 | 95 | 1 |
| | | | | | | | | | | | | | | | |

# APPENDIX 3

# PLATE BEARING TESTS




# APPENDIX 3
# PLATE BEARING TEST LOCATIONS

# Grimethorpe Phase 1B - Plate Bearing Test Results

| Report Reference | Plot Number | Test Location | Moisture Content | Settlement at | | % Recovery |
|---|---|---|---|---|---|---|
| | | | | 80 kPa | 160 kPa | |
| 573 | 9 | 1 | 15 | 0.81 | 1.95 | 42 |
| 652 | 9 | 2 | 10 | 2.25 | 5.12 | 39 |
| 711 | 9 | 3 | 12 | 1.94 | 5.99 | 47 |
| 734 | 9 | 4 | 12 | 1.13 | 3.12 | 35 |
| 791 | 9 | 5 | 16 | 2.05 | 4.50 | 47 |
| | 9 | 6 | 14 | 1.14 | 2.45 | 38 |
| 918 | 9 | 7 | 15 | 2.49 | 6.89 | 35 |
| | 9 | 8 | 10 | 1.85 | 4.82 | 31 |
| 989 | 9 | 9 | 12 | 1.09 | 2.39 | 42 |
| | 9 | 10 | 13 | 1.88 | 4.33 | 38 |
| 1079 | 9 | 11 | 17 | 0.78 | 2.38 | 42 |
| | 9 | 12 | 12 | 4.26 | 9.86 | 31 |
| 1177 | 9 | 13 | 13 | 0.40 | 1.12 | 56 |
| | 11 | 14 | 10 | 1.25 | 3.49 | 52 |
| 1292 | 9 | 15 | 16 | 1.53 | 4.25 | 37 |
| | 11 | 16 | 15 | 1.28 | 4.13 | 41 |
| 136[illegible] | 11 | 17 | 15 | 0.42 | 1.00 | 45 |
| | 11 | 18 | 12 | 0.45 | 1.47 | 52 |
| 163[illegible] | 11 | 19 | 12 | 0.74 | 2.71 | 39 |
| | 9 | 20 | 14 | 0.21 | 0.76 | 56 |
| 1783 | 10 | 21 | 10 | 1.19 | 2.66 | 42 |
| | 9 | 22 | 14 | 6.95 | 17.86 | 41 |
| 1874 | 9 | 24 | 16 | 0.67 | 1.85 | 50 |
| | 9 | 23 | 14 | 0.66 | 1.49 | 48 |
| 1955 | 10 | 25 | 11 | 1.09 | 3.28 | 53 |
| | 9 | 26 | 8 | 0.85 | 2.66 | 42 |
| 1992 | 9 | 27 | 14 | 1.13 | 2.57 | 60 |
| | 9 | 28 | 15 | 1.78 | 4.44 | 41 |
| 2096 | 11 | 29 | 12 | 1.24 | 4.00 | 53 |
| | 11 | 30 | 12 | 2.75 | 9.29 | 34 |
| | 9 | 31 | 11 | 1.29 | 2.14 | 55 |
| | 9 | 32 | 10 | 1.35 | 3.04 | 63 |
| 2200 | 9 | 33 | 11 | 0.38 | 0.77 | 70 |
| | 9 | 34 | 9 | 0.44 | 0.71 | 57 |
| | 11 | 35 | 11 | 0.69 | 1.78 | 56 |
| | 9 | 36 | 12 | 1.30 | 3.02 | 55 |
| 2265 | 9 | 37 | 8 | 1.10 | 2.44 | 47 |
| | 11 | 38 | 5 | 1.30 | 2.40 | 64 |
| | 9 | 39 | 8 | 0.68 | 1.46 | 54 |
| | 9 | 40 | 4 | 0.67 | 1.25 | 82 |
| 2288 | 9 | 41 | 5 | 0.60 | 1.23 | 48 |
| | 9 | 43 | 5 | 0.69 | 1.45 | 49 |
| | 9 | 44 | 6 | 0.33 | 0.69 | 63 |
| 2335 | 11 | 45 | 14 | 0.73 | 1.47 | 56 |
| | 11 | 46 | 12 | 0.89 | 1.64 | 62 |
| | 9 | 47 | 12 | 0.65 | 1.44 | 72 |
| | 9 | 48 | 14 | 0.83 | 1.67 | 63 |
| 2413 | 9 | 49 | 17 | 2.23 | 4.72 | 38 |
| | 9 | 50 | 17 | 0.86 | 2.10 | 47 |
| | 9 | 51 | 10 | 0.67 | 1.48 | 60 |
| | 9 | 52 | 11 | 1.04 | 2.34 | 59 |
| 2549 | 9 | 53 | 20 | 1.14 | 2.11 | 45 |
| | 9 | 54 | 13 | 1.21 | 3.35 | 36 |

# Grimethorpe Phase 1B - Plate Bearing Test Results

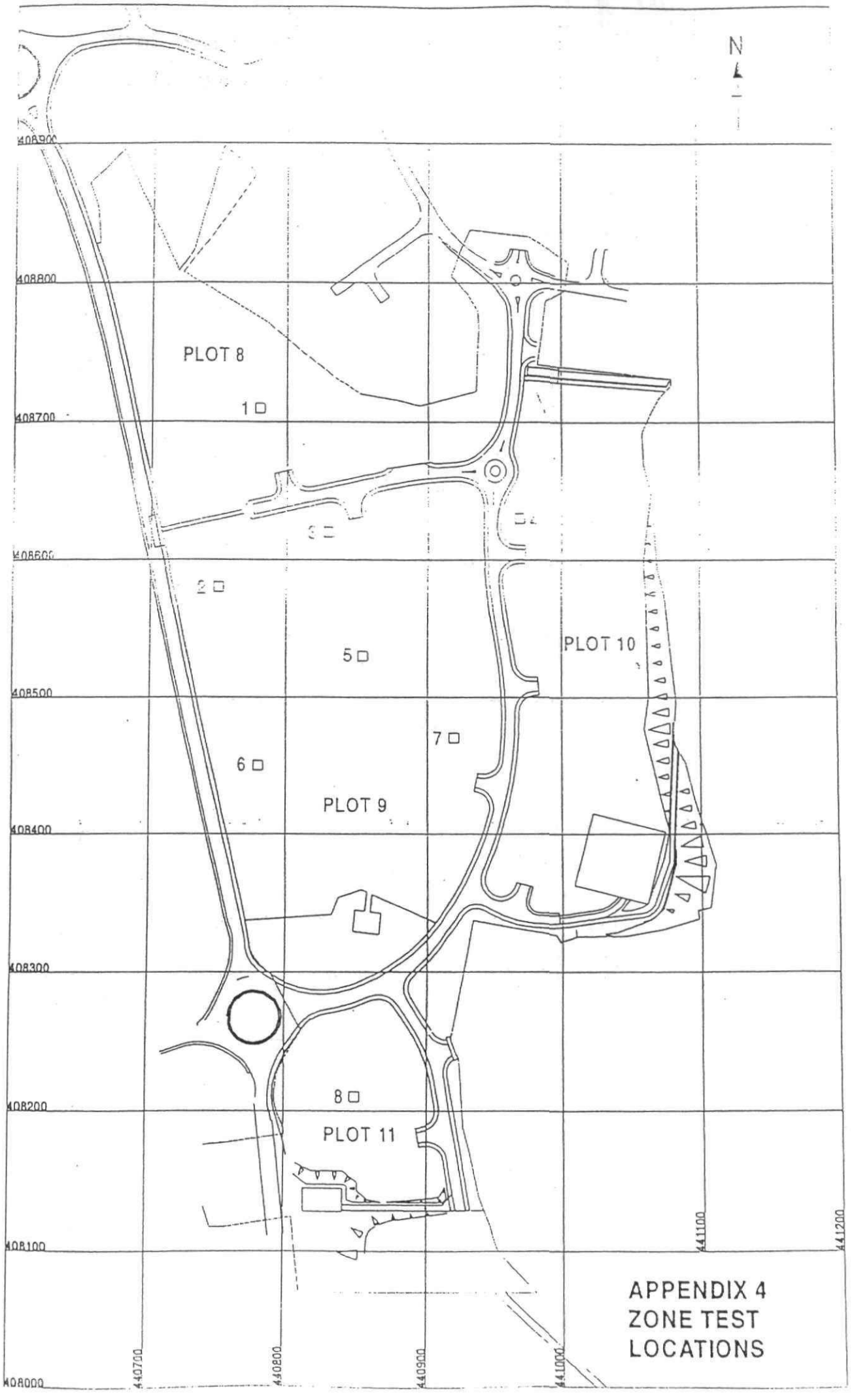
| Report Reference | Plot Number | Test Location | Moisture Content | Settlement at | | % Recovery |
|---|---|---|---|---|---|---|
| | | | | 80 kPa | 160 kPa | |
| 2836 | 10 | 55 | 9 | 0.87 | 1.86 | 57 |
| | 9 | 56 | 13 | 0.80 | 1.83 | 38 |
| | 9 | 57 | 13 | 0.67 | 1.48 | 68 |
| 2931 | 9 | 58 | 19 | 0.46 | 0.93 | 62 |
| | 9 | 59 | 17 | 0.54 | 1.38 | 62 |
| 2991 | 10 | 60 | 11 | 0.73 | 1.69 | 65 |
| | 10 | 61 | 8 | 0.91 | 1.88 | 61 |
| | 10 | 62 | 7 | 0.45 | 1.09 | 52 |
| | 10 | 63 | 12 | 0.63 | 1.58 | 61 |
| 3012 | 8 | 64 | 10 | 0.89 | 2.68 | 51 |
| | 8 | 65 | 14 | 1.68 | 3.66 | 40 |
| | 8 | 66 | 11 | 0.26 | 0.70 | 87 |
| | 9 | 67 | 12 | 0.30 | 0.77 | 63 |
| 3025 | 9 | 68 | 7 | 0.44 | 1.34 | 34 |
| | 9 | 69 | 9 | 0.48 | 1.38 | 63 |
| | 9 | 70 | 11 | 0.80 | 1.59 | 57 |
| | 9 | 71 | 9 | 1.85 | 3.18 | 42 |
| 3078 | 8 | 72 | 12 | 0.77 | 1.72 | 48 |
| | 8 | 73 | 12 | 0.68 | 1.49 | 48 |
| | 8 | 74 | 8 | 0.67 | 1.52 | 66 |
| | 8 | 75 | 11 | 0.41 | 0.98 | 67 |
| 3305 | 9 | 76 | 17 | 0.67 | 1.46 | 90 |
| | 9 | 77 | 21 | 0.97 | 2.17 | 46 |
| 3489 | 9 | 78 | 6 | 0.30 | 0.57 | 75 |
| | Road 4 | 79 | 9 | 0.30 | 0.77 | 72 |
| | Road 4 | 80 | 11 | 1.39 | 3.42 | 70 |
| | 8 | 81 | 7 | 0.41 | 1.13 | 45 |
| 3703 | 8 | 82 | 10 | 0.36 | 0.76 | 91 |
| | 8 | 83 | 10 | 0.59 | 1.26 | 68 |
| | 8 | 84 | 13 | 0.73 | 1.93 | 57 |
| | 8 | 85 | 9 | 0.99 | 2.35 | 58 |
| 3789 | 9 | 86 | 9 | 0.52 | 1.23 | 60 |
| | 9 | 87 | 8 | 0.63 | 1.23 | 63 |
| | 9 | 88 | 7 | 0.72 | 2.33 | 56 |
| | 9 | 89 | 10 | 2.12 | 6.26 | 78 |
| 3860 | 8 | 90 | 12 | 1.90 | 4.62 | 41 |
| | 8 | 91 | 11 | 1.55 | 3.67 | 47 |
| | 8 | 92 | 10 | 0.90 | 2.33 | 50 |
| | 8 | 93 | 8 | 1.40 | 3.74 | 68 |
| 3952 | 8 | 94 | 9 | 3.09 | 8.80 | 45 |
| | 8 | 95 | 8 | 1.79 | 5.66 | 40 |
| | 9 | 96 | 14 | 3.15 | 9.16 | 47 |
| | 9 | 97 | 13 | 2.17 | 8.50 | 55 |
| 4093 | 9 | 98 | 9 | 0.63 | 1.86 | 51 |
| | 9 | 99 | 8 | 0.52 | 1.69 | 55 |
| | 9 | 100 | 14 | 2.24 | 6.98 | 40 |
| | 9 | 101 | 17 | 3.65 | 9.50 | 50 |
| 4208 | 9 | 102 | 9 | 0.62 | 1.70 | 53 |
| | 9 | 103 | 9 | 0.35 | 0.77 | 69 |
| | 9 | 104 | 14 | 0.85 | 3.50 | 56 |
| | 9 | 105 | 13 | 0.85 | 2.96 | 52 |

# Grimethorpe Phase 1B - Plate Bearing Test Results

| Report Reference | Plot Number | Test Location | Moisture Content | Settlement at | | % Recovery |
|---|---|---|---|---|---|---|
| | | | | 80 kPa | 160 kPa | |
| 4439 | Road 4 | 106 | 9 | 0.47 | 1.19 | 66 |
| | Road 4 | 107 | 12 | 0.68 | 1.47 | 59 |
| | Road 4 | 108 | 11 | 0.70 | 1.74 | 56 |
| | 8 | 109 | 11 | 0.34 | 0.87 | 63 |
| 4957 | 9 | 110 | 11 | 1.06 | 2.50 | 47 |
| | 9 | 111 | 16 | 1.58 | 4.10 | 39 |
| | 9 | 112 | 11 | 1.60 | 3.37 | 45 |
| | 9 | 113 | 12 | 1.94 | 4.51 | 62 |
| 5025 | Road 1 | 114 | 17 | 1.13 | 2.79 | 50 |
| | Road 1 | 115 | 18 | 1.16 | 2.98 | 64 |
| | 9 | 116 | 16 | 1.80 | 5.24 | 48 |
| | 9 | 117 | 13 | 1.61 | 3.24 | 57 |
| 5044 | 8 | 118 | 14 | 0.93 | 2.23 | 72 |
| | 8 | 119 | 15 | 1.26 | 3.76 | 63 |
| | 8 | 120 | 13 | 0.81 | 1.72 | 75 |
| | 8 | 121 | 15 | 1.71 | 6.67 | 43 |
| 5398 | 8 | 122 | 16 | 0.95 | 2.74 | 41 |
| | 8 | 123 | 12 | 0.[illegible] | [illegible] | 48 |
| | 8 | 124 | 13 | 0.74 | 2.05 | 56 |
| | 8 | 125 | 16 | 0.65 | 1.24 | 52 |
| 358 | 10 | 127 | 14 | 0.28 | 2.01 | 75 |
| | 10 | 128 | 14 | 0.13 | 0.49 | 91 |
| | 10 | 129 | 15 | 0.62 | 3.63 | 69 |
| 403 | 9 | 131 | - | 1.45 | 3.12 | 50 |
| | 9 | 132 | - | 2.14 | 5.50 | 46 |
| | 9 | 133 | - | 1.43 | 3.71 | 40 |
| | 9 | 134 | - | 1.01 | 3.03 | 47 |
| 616 | 9 | 135 | 21 | 2.08 | 9.13 | 38 |
| | 9 | 136 | 14 | 0.53 | 2.37 | 84 |
| | 9 | 137 | 18 | 1.27 | 14.28 | 38 |
| | 9 | 138 | 17 | 1.37 | 5.76 | 61 |
| 1656 | 8 | 139 | 14 | 0.85 | 4.86 | 33 |
| | 10 | 140 | 18 | 0.79 | 8.17 | 42 |
| | 10 | 141 | 15 | 0.47 | 4.50 | 35 |
| | 10 | 142 | 15 | 0.56 | 5.58 | 39 |

# APPENDIX 4

# ZONE LOADING TESTS




APPENDIX 4
ZONE TEST
LOCATIONS

Birse Construction Ltd
Grimethorpe Colliery Redevelopment - Phase 1B

Zone Test - Specification for Groun Treatment

Laboratory Report: SA/01/2479C
Report Date: 07-Jun-01

Zone Pad Size: 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 1
Material Description: Made Ground - General Fill
Clients Ref: 1
Date Tested: 05/06/01

L.J. CHURCH
LABORATORY SERVICES LTD.
Lumley Street
Castleford, West Yorkshire WF10 5LB
Tel: (01977) 518908 • Fax: (01977) 553612
lab@ljchurch.co.uk

| % of Design Load | Pressure Gauge Reading | Nominal Load | Nominal Mean Bearing Pressure | Load Time | Dial Reading (x 0.01mm) | | | | Deflection (x 0.01mm) | | | | Mean Deflection (mm) | Rate of Settlement /Recovery |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | BAR | kN | kN/m² | minutes | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | mm/h |
| 0 | 0 | 0 | 0 | 0 | 1873 | 2132 | 2111 | 2088 | 0 | 0 | 0 | 0 | 0.00 | |
| 25 | 70 | 75 | 18.75 | 0 | 1861 | 2118 | 2104 | 2077 | 12 | 14 | 7 | 11 | 0.11 | |
| | | | | 5 | 1858 | 2117 | 2104 | 2077 | 15 | 15 | 7 | 11 | 0.12 | 0.12 |
| 50 | 120 | 150 | 37.50 | 0 | 1847 | 2094 | 2084 | 2060 | 26 | 38 | 27 | 28 | 0.30 | |
| | | | | 5 | 1830 | 2089 | 2080 | 2053 | 43 | 43 | 31 | 35 | 0.38 | 0.99 |
| | | | | 10 | 1828 | 2087 | 2077 | 2051 | 45 | 45 | 34 | 37 | 0.40 | 0.27 |
| 75 | 170 | 225 | 56.25 | 0 | 1798 | 2051 | 2042 | 2022 | 75 | 81 | 69 | 66 | 0.73 | |
| | | | | 5 | 1785 | 2038 | 2028 | 2008 | 88 | 94 | 83 | 80 | 0.86 | 1.62 |
| | | | | 10 | 1774 | 2026 | 2015 | 1996 | 99 | 106 | 96 | 92 | 0.98 | 1.44 |
| | | | | 15 | 1774 | 2026 | 2015 | 1990 | 99 | 106 | 96 | 92 | 0.98 | 0.00 |
| 100 | 215 | 300 | 75.00 | 0 | 1752 | 1998 | 1987 | 1975 | 121 | 135 | 124 | 113 | 1.24 | |
| | | | | 5 | 1735 | 1978 | 1971 | 1956 | 138 | 155 | 140 | 128 | 1.40 | 2.01 |
| | | | | 10 | 1725 | 1960 | 1955 | 1947 | 148 | 165 | 152 | 141 | 1.52 | 1.38 |
| | | | | 15 | 1725 | 1964 | 1955 | 1947 | 148 | 168 | 152 | 141 | 1.53 | 0.05 |
| 125 | 265 | 375 | 93.75 | 0 | 1685 | 1919 | 1916 | 1917 | 188 | 213 | 195 | 171 | 1.92 | |
| | | | | 5 | 1660 | 1892 | 1889 | 1892 | 213 | 240 | 218 | 196 | 2.17 | 3.00 |
| | | | | 10 | 1653 | 1885 | 1887 | 1885 | 220 | 247 | 224 | 203 | 2.24 | 0.81 |
| | | | | 15 | 1651 | 1883 | 1885 | 1884 | 222 | 249 | 226 | 204 | 2.25 | 0.21 |
| 150 | 310 | 450 | 112.50 | 0 | 1609 | 1837 | 1838 | 1842 | 264 | 295 | 273 | 246 | 2.70 | |
| | | | | 5 | 1579 | 1810 | 1822 | 1824 | 294 | 322 | 289 | 264 | 2.92 | 2.73 |
| | | | | 10 | 1564 | 1799 | 1813 | 1813 | 309 | 333 | 298 | 275 | 3.04 | 1.38 |
| | | | | 15 | 1554 | 1788 | 1806 | 1806 | 319 | 344 | 305 | 282 | 3.13 | 1.05 |
| | | | | 20 | 1550 | 1785 | 1803 | 1802 | 323 | 347 | 308 | 286 | 3.16 | 0.42 |
| 175 | 360 | 525 | 131.25 | 0 | 1509 | 1735 | 1763 | 1769 | 364 | 397 | 348 | 319 | 3.57 | |
| | | | | 5 | 1467 | 1698 | 1728 | 1731 | 406 | 434 | 383 | 357 | 3.95 | 4.56 |
| | | | | 10 | 1453 | 1685 | 1711 | 1713 | 420 | 447 | 400 | 375 | 4.11 | 1.86 |
| | | | | 15 | 1446 | 1679 | 1701 | 1702 | 427 | 453 | 410 | 386 | 4.19 | 1.02 |
| | | | | 20 | 1443 | 1675 | 1699 | 1699 | 430 | 457 | 412 | 389 | 4.22 | 0.36 |
| 200 | 410 | 600 | 150.00 | 0 | 1395 | 1622 | 1650 | 1652 | 478 | 510 | 461 | 436 | 4.71 | |
| | | | | 5 | 1364 | 1592 | 1615 | 1619 | 509 | 540 | 496 | 469 | 5.04 | 3.87 |
| | | | | 10 | 1357 | 1577 | 1602 | 1605 | 516 | 555 | 509 | 483 | 5.16 | 1.47 |
| | | | | 15 | 1338 | 1569 | 1594 | 1596 | 535 | 563 | 517 | 492 | 5.27 | 1.32 |
| | | | | 20 | 1329 | 1560 | 1583 | 1588 | 544 | 572 | 528 | 500 | 5.36 | 1.11 |
| | | | | 25 | 1325 | 1557 | 1580 | 1584 | 548 | 575 | 531 | 504 | 5.40 | 0.42 |
| 175 | 360 | 525 | 131.25 | 0 | 1327 | 1559 | 1582 | 1586 | 546 | 573 | 529 | 502 | 5.38 | |
| | | | | 5 | 1327 | 1559 | 1582 | 1586 | 546 | 573 | 529 | 502 | 5.38 | 0.00 |
| 150 | 310 | 450 | 112.50 | 0 | 1332 | 1564 | 1588 | 1592 | 541 | 568 | 523 | 496 | 5.32 | |
| | | | | 5 | 1332 | 1564 | 1588 | 1594 | 541 | 568 | 523 | 494 | 5.32 | -0.06 |
| 125 | 265 | 375 | 93.75 | 0 | 1338 | 1570 | 1595 | 1597 | 535 | 562 | 516 | 491 | 5.26 | |
| | | | | 5 | 1340 | 1570 | 1596 | 1601 | 533 | 562 | 515 | 487 | 5.24 | -0.21 |
| 100 | 215 | 300 | 75.00 | 0 | 1354 | 1587 | 1616 | 1618 | 519 | 545 | 495 | 470 | 5.07 | |
| | | | | 5 | 1359 | 1595 | 1623 | 1623 | 514 | 537 | 488 | 465 | 5.01 | -0.75 |
| | | | | 10 | 1360 | 1598 | 1625 | 1625 | 513 | 534 | 486 | 463 | 4.99 | -0.24 |
| 75 | 170 | 225 | 56.25 | 0 | 1372 | 1614 | 1644 | 1641 | 501 | 518 | 467 | 447 | 4.83 | |
| | | | | 5 | 1375 | 1617 | 1648 | 1645 | 498 | 515 | 463 | 443 | 4.80 | -0.42 |
| 50 | 120 | 150 | 37.50 | 0 | 1396 | 1643 | 1679 | 1670 | 477 | 489 | 432 | 418 | 4.54 | |
| | | | | 5 | 1403 | 1649 | 1689 | 1679 | 470 | 483 | 422 | 409 | 4.46 | -0.96 |
| | | | | 10 | 1404 | 1650 | 1690 | 1680 | 469 | 482 | 421 | 408 | 4.45 | -0.12 |
| 25 | 70 | 75 | 18.75 | 0 | 1434 | 1688 | 1730 | 1713 | 439 | 444 | 381 | 375 | 4.10 | |
| | | | | 5 | 1440 | 1697 | 1742 | 1722 | 433 | 435 | 369 | 366 | 4.01 | -1.08 |
| | | | | 10 | 1442 | 1698 | 1744 | 1725 | 431 | 434 | 367 | 363 | 3.99 | -0.24 |
| 0 | 0 | 0 | 0.00 | 0 | 1516 | 1786 | 1810 | 1780 | 357 | 346 | 301 | 308 | 3.28 | |
| | | | | 5 | 1540 | 1812 | 1840 | 1806 | 333 | 320 | 271 | 282 | 3.02 | -3.18 |
| | | | | 10 | 1546 | 1820 | 1846 | 1812 | 327 | 312 | 265 | 276 | 2.95 | -0.78 |
| | | | | 15 | 1550 | 1823 | 1850 | 1815 | 323 | 309 | 261 | 273 | 2.92 | -0.42 |



Registered Office: 25 Sackville Street, Barnsley
Registered in England No. 2632665

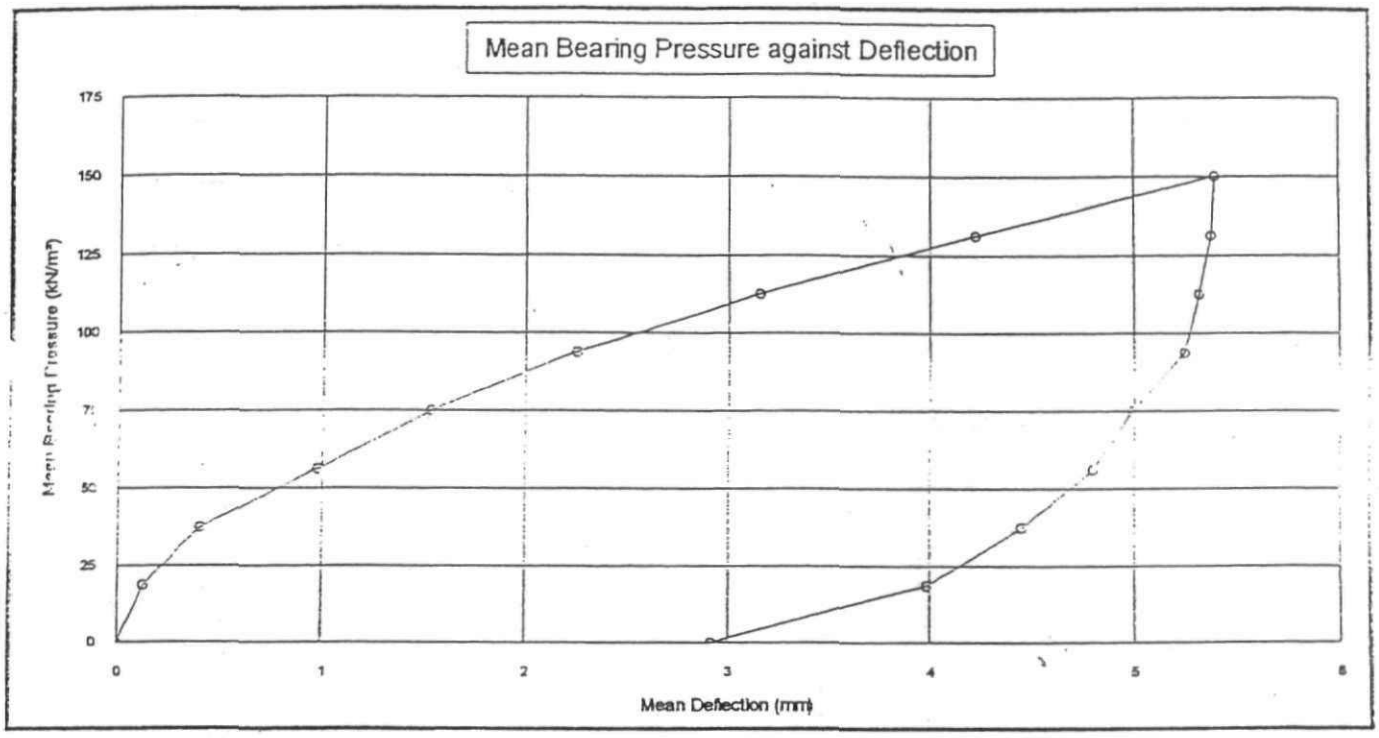
Birse Construction Ltd
Grimethorpe Colliery Redevelopment, Phase 1B

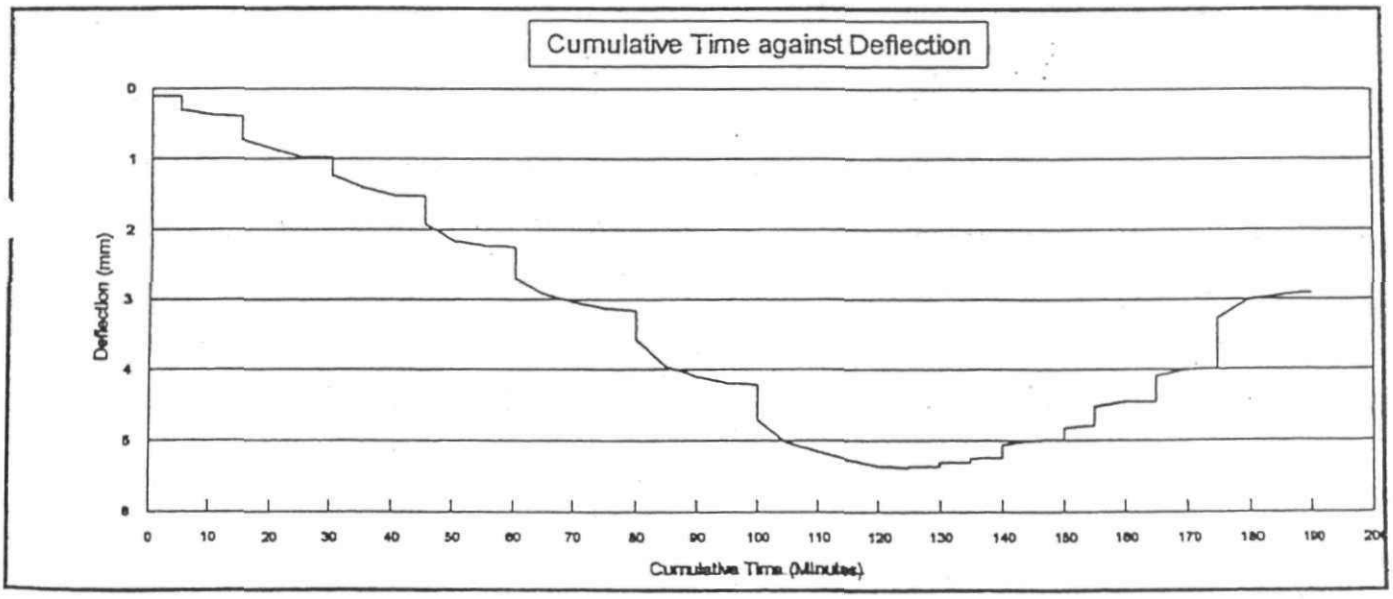
Zone Test - Specification for Ground Treatment

Laboratory Report: SA/01/2479C
Report Date 07-Jun-01

Zone Pad Size 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 1
Material Description: Made Ground - General Fill
Clients Ref: 1
Date Tested: 05/06/01

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lab@ljchurch.co.uk




| | |
|---|---|
| The maximum deflection at 100% of design load | 1.53 mm |
| The maximum deflection at 200% of design load | 5.40 mm |
| Plate Recovery = | 46 % |

PP L J Church Laboratory Services Ltd



Registered Office: 25 Sackville Street, Barnsley
Registered in England No. 2632665

Birse Construction Ltd
Grimethorpe Colliery Redevelopment, Phase 1E

one Test - Specification for Ground Treatment

Laboratory Report: SA/01/2479C
Report Date: 07-Jun-01

Zone Pad Size: 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 2
Material Description: Made Ground - General Fill
Clients Ref: 2
Date Tested: 06/06/01

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| % of Design Load | Pressure Gauge Reading | Nominal Load | Nominal Mean Bearing Pressure | Load Time | Dial Reading (x 0.01mm) | | | | Deflection (x 0.01mm) | | | | Mean Deflection (mm) | Rate of Settlement /Recovery |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | BAR | kN | kN/m² | minutes | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | mm/h |
| 0 | 0 | 0 | 0 | 0 | 2050 | 2090 | 2034 | 2106 | 0 | 0 | 0 | 0 | 0.00 | |
| 25 | 70 | 75 | 18.75 | 0 | 2043 | 2082 | 2025 | 2100 | 7 | 8 | 9 | 6 | 0.08 | |
| | | | | 5 | 2043 | 2082 | 2025 | 2100 | 7 | 8 | 9 | 6 | 0.08 | 0.00 |
| 50 | 120 | 150 | 37.50 | 0 | 2024 | 2070 | 2010 | 2080 | 26 | 20 | 24 | 26 | 0.24 | |
| | | | | 10 | 2020 | 2066 | 2007 | 2076 | 30 | 24 | 27 | 30 | 0.28 | 0.45 |
| 75 | 170 | 225 | 56.25 | 0 | 1994 | 2042 | 1985 | 2053 | 56 | 48 | 49 | 53 | 0.52 | |
| | | | | 5 | 1983 | 2032 | 1977 | 2043 | 67 | 58 | 57 | 63 | 0.61 | 1.17 |
| | | | | 10 | 1982 | 2030 | 1975 | 2042 | 68 | 60 | 59 | 64 | 0.63 | 0.18 |
| 100 | 215 | 300 | 75.00 | 0 | 1966 | 2011 | 1957 | 2028 | 84 | 79 | 77 | 78 | 0.80 | |
| | | | | 5 | 1955 | 2000 | 1950 | 2015 | 95 | 90 | 84 | 87 | 0.89 | 1.05 |
| | | | | 10 | 1955 | 1999 | 1946 | 2013 | 95 | 91 | 88 | 89 | 0.91 | 0.22 |
| 125 | 265 | 375 | 93.75 | 0 | 1933 | 1975 | 1922 | 1997 | 117 | 115 | 112 | 105 | 1.11 | |
| | | | | 5 | 1923 | 1965 | 1912 | 1986 | 127 | 125 | 122 | 120 | 1.24 | 1.23 |
| | | | | 10 | 1919 | 1962 | 1910 | 1983 | 131 | 128 | 124 | 123 | 1.27 | 0.35 |
| 150 | 310 | 450 | 112.50 | 0 | 1894 | 1931 | 1880 | 1956 | 156 | 159 | 154 | 147 | 1.54 | |
| | | | | 5 | 1880 | 1918 | 1867 | 1944 | 170 | 172 | 167 | 162 | 1.60 | 1.65 |
| | | | | 10 | 1874 | 1910 | 1861 | 1938 | 176 | 180 | 173 | 168 | 1.74 | 0.78 |
| | | | | 15 | 1870 | 1907 | 1858 | 1934 | 180 | 183 | 176 | 172 | 1.78 | 0.42 |
| 175 | 360 | 525 | 131.25 | 0 | 1839 | 1877 | 1832 | 1910 | 211 | 213 | 202 | 196 | 2.06 | |
| | | | | 5 | 1822 | 1858 | 1811 | 1890 | 228 | 232 | 223 | 216 | 2.25 | 2.31 |
| | | | | 10 | 1811 | 1849 | 1804 | 1883 | 239 | 241 | 230 | 223 | 2.33 | 1.02 |
| | | | | 15 | 1804 | 1840 | 1797 | 1876 | 246 | 250 | 237 | 230 | 2.41 | 0.90 |
| | | | | 20 | 1800 | 1838 | 1793 | 1872 | 250 | 252 | 241 | 234 | 2.44 | 0.42 |
| 200 | 410 | 600 | 150.00 | 0 | 1770 | 1810 | 1768 | 1844 | 280 | 280 | 266 | 262 | 2.72 | |
| | | | | 5 | 1756 | 1794 | 1751 | 1829 | 294 | 296 | 283 | 277 | 2.88 | 1.86 |
| | | | | 10 | 1750 | 1788 | 1745 | 1823 | 300 | 302 | 289 | 283 | 2.94 | 0.72 |
| | | | | 15 | 1740 | 1779 | 1737 | 1815 | 310 | 311 | 297 | 291 | 3.02 | 1.05 |
| | | | | 20 | 1732 | 1771 | 1730 | 1805 | 318 | 319 | 304 | 301 | 3.11 | 0.99 |
| | | | | 25 | 1729 | 1770 | 1726 | 1803 | 321 | 320 | 308 | 303 | 3.13 | 0.30 |
| 175 | 360 | 525 | 131.25 | 0 | 1732 | 1772 | 1728 | 1806 | 318 | 318 | 306 | 300 | 3.11 | |
| | | | | 5 | 1735 | 1774 | 1730 | 1810 | 315 | 316 | 304 | 296 | 3.08 | -0.33 |
| 150 | 310 | 450 | 112.50 | 0 | 1741 | 1780 | 1737 | 1816 | 309 | 310 | 297 | 290 | 3.02 | |
| | | | | 5 | 1745 | 1784 | 1740 | 1820 | 305 | 306 | 294 | 286 | 2.98 | -0.45 |
| 125 | 265 | 375 | 93.75 | 0 | 1758 | 1796 | 1752 | 1832 | 292 | 294 | 282 | 274 | 2.86 | |
| | | | | 5 | 1761 | 1799 | 1756 | 1836 | 289 | 291 | 278 | 270 | 2.82 | -0.42 |
| 100 | 215 | 300 | 75.00 | 0 | 1770 | 1811 | 1755 | 1834 | 280 | 279 | 279 | 272 | 2.78 | |
| | | | | 5 | 1772 | 1811 | 1760 | 1836 | 278 | 279 | 274 | 270 | 2.75 | -0.27 |
| 75 | 170 | 225 | 56.25 | 0 | 1775 | 1820 | 1775 | 1848 | 275 | 270 | 259 | 258 | 2.66 | |
| | | | | 5 | 1780 | 1824 | 1780 | 1858 | 270 | 266 | 254 | 248 | 2.60 | -0.72 |
| | | | | 10 | 1784 | 1826 | 1781 | 1860 | 266 | 264 | 253 | 246 | 2.57 | -0.27 |
| 50 | 120 | 150 | 37.50 | 0 | 1797 | 1842 | 1796 | 1873 | 253 | 248 | 238 | 233 | 2.43 | |
| | | | | 5 | 1802 | 1848 | 1800 | 1878 | 248 | 242 | 234 | 228 | 2.38 | -0.60 |
| | | | | 10 | 1805 | 1849 | 1803 | 1880 | 245 | 241 | 231 | 226 | 2.36 | -0.27 |
| 25 | 70 | 75 | 18.75 | 0 | 1826 | 1871 | 1826 | 1900 | 224 | 219 | 208 | 206 | 2.14 | |
| | | | | 5 | 1832 | 1878 | 1833 | 1908 | 218 | 212 | 201 | 198 | 2.07 | -0.84 |
| | | | | 10 | 1832 | 1878 | 1833 | 1908 | 218 | 212 | 201 | 198 | 2.07 | 0.00 |
| 0 | 0 | 0 | 0.00 | 0 | 1862 | 1909 | 1862 | 1936 | 188 | 181 | 172 | 170 | 1.78 | |
| | | | | 5 | 1877 | 1923 | 1876 | 1951 | 173 | 167 | 158 | 155 | 1.63 | -1.74 |
| | | | | 10 | 1879 | 1925 | 1878 | 1953 | 171 | 165 | 156 | 153 | 1.61 | -0.24 |



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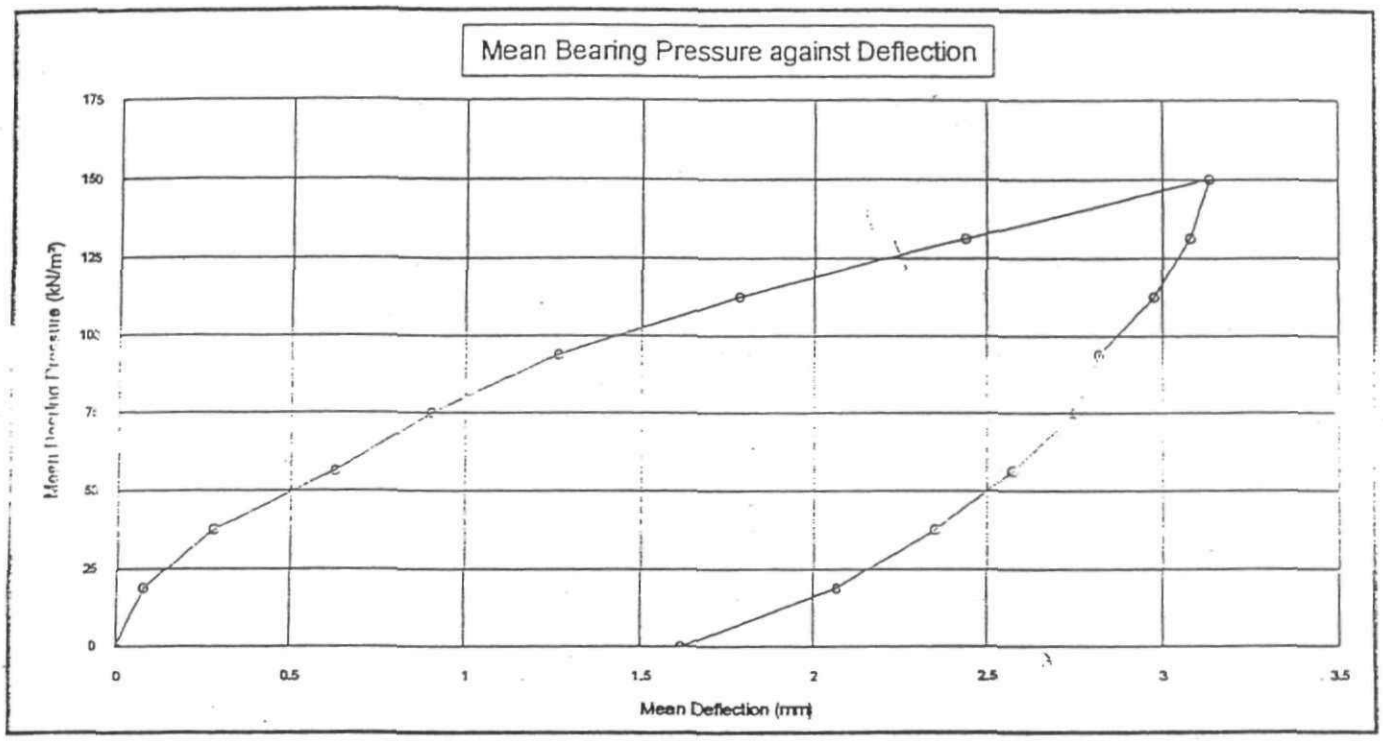
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Grimethorpe Colliery Redevelopment, Phase 1B

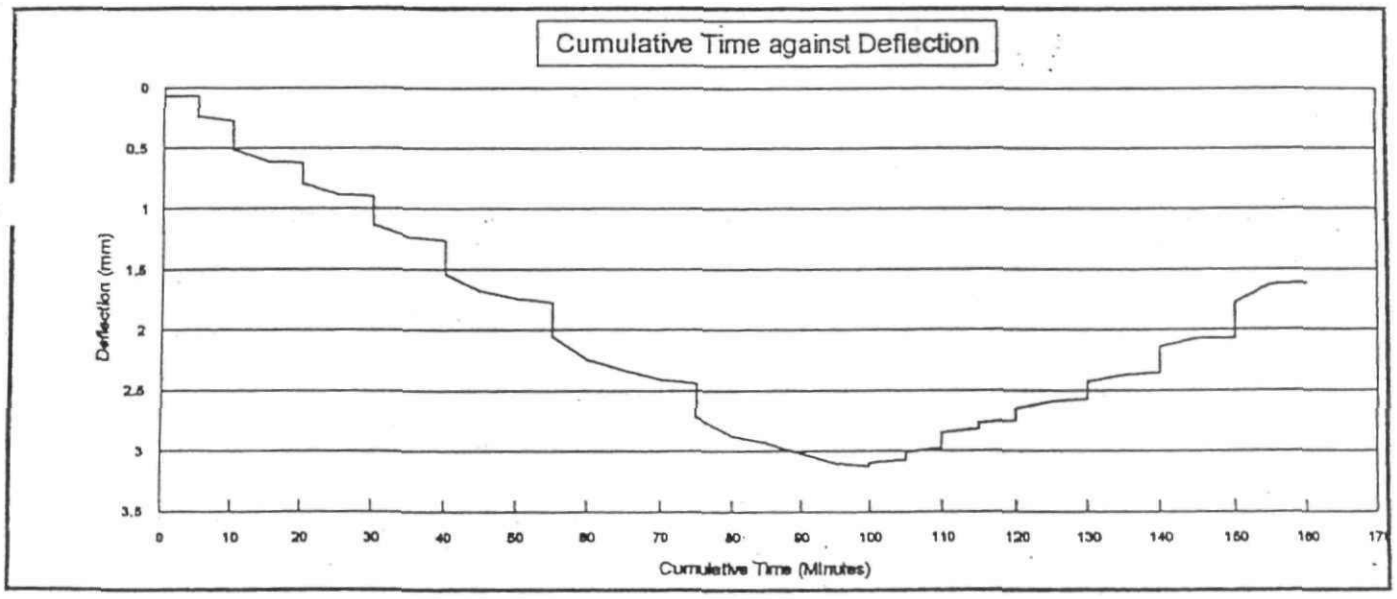
'one Test - Specification for Ground Treatment

Laboratory Report: SA/01/24790
Report Date: 07-Jun-01

Zone Pad Size: 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 2
Material Description: Made Ground - General Fill
Clients Ref: 2
Date Tested: 06/06/01

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The maximum deflection at 100% of design load 0.90 mm
The maximum deflection at 200% of design load 3.13 mm
Plate Recovery = 48 %

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Gnmethorpe Colliery Redevelopment, Phase 1B

**Zone Test - Specification for Ground Treatment**

Laboratory Report: SA/01/2479A
Report Date 07-Jun-01

Zone Pad Size 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 5
Material Description: Made Ground - General Fill
Clients Ref: 5
Date Tested: 01/06/01

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| % of Design Load | Pressure Gauge Reading | Nominal Load | Nominal Mean Bearing Pressure | Load Time | Dial Reading (x 0.01mm) | | | | Deflection (x 0.01mm) | | | | Mean Deflection (mm) | Rate of Settlement /Recovery |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | BAR | kN | kN/m² | minutes | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | mm/h |
| 0 | 0 | 0 | 0 | 0 | 2061 | 2178 | 2124 | 2183 | 0 | 0 | 0 | 0 | 0.00 | |
| 25 | 70 | 75 | 18.75 | 0 | 2054 | 2165 | 2100 | 2168 | 7 | 13 | 24 | 15 | 0.15 | |
| | | | | 5 | 2054 | 2164 | 2100 | 2167 | 7 | 14 | 24 | 16 | 0.15 | 0.06 |
| 50 | 120 | 150 | 37.50 | 0 | 2023 | 2103 | 2023 | 2125 | 38 | 75 | 101 | 58 | 0.68 | |
| | | | | 5 | 2015 | 2093 | 2013 | 2117 | 46 | 85 | 111 | 66 | 0.77 | 1.08 |
| | | | | 10 | 2014 | 2091 | 2012 | 2116 | 47 | 87 | 112 | 67 | 0.78 | 0.15 |
| 75 | 170 | 225 | 56.25 | 0 | 1915 | 1964 | 1880 | 2017 | 146 | 214 | 244 | 166 | 1.93 | |
| | | | | 5 | 1895 | 1943 | 1860 | 2000 | 166 | 235 | 264 | 183 | 2.12 | 2.34 |
| | | | | 10 | 1891 | 1940 | 1856 | 1996 | 170 | 238 | 268 | 187 | 2.16 | 0.45 |
| 100 | 215 | 300 | 75.00 | 0 | 1752 | 1786 | 1602 | 1860 | 309 | 392 | 522 | 323 | 3.86 | |
| | | | | 5 | 1729 | 1758 | 1580 | 1841 | 330 | 420 | 544 | 342 | 4.10 | 12.85 |
| | | | | 10 | 1720 | 1740 | 1555 | 1818 | 351 | 438 | 570 | 365 | 4.35 | 12.00 |
| | | | | 15 | 1707 | 1737 | 1550 | 1815 | 364 | 441 | 574 | 370 | 4.37 | 10.36 |
| 125 | 265 | 375 | 93.75 | 0 | 1600 | 1624 | 1541 | 1716 | 451 | 554 | 583 | 467 | 5.16 | |
| | | | | 5 | 1562 | 1587 | 1514 | 1690 | 499 | 591 | 610 | 493 | 5.48 | 13.84 |
| | | | | 10 | 1543 | 1566 | 1494 | 1674 | 518 | 613 | 630 | 509 | 5.66 | 12.31 |
| | | | | 15 | 1533 | 1556 | 1482 | 1661 | 528 | 622 | 642 | 522 | 5.79 | 11.32 |
| | | | | 20 | 1529 | 1552 | 1480 | 1660 | 532 | 626 | 644 | 523 | 5.81 | 10.33 |
| 150 | 310 | 450 | 112.50 | 0 | 1408 | 1420 | 1356 | 1551 | 653 | 758 | 768 | 632 | 7.03 | |
| | | | | 5 | 1393 | 1406 | 1341 | 1539 | 668 | 772 | 783 | 644 | 7.17 | 11.68 |
| | | | | 10 | 1387 | 1398 | 1333 | 1533 | 674 | 780 | 791 | 650 | 7.24 | 10.84 |
| | | | | 15 | 1377 | 1388 | 1320 | 1519 | 684 | 790 | 804 | 664 | 7.36 | 11.41 |
| | | | | 20 | 1372 | 1383 | 1317 | 1517 | 689 | 795 | 807 | 666 | 7.39 | 10.45 |
| 175 | 360 | 525 | 131.25 | 0 | 1225 | 1220 | 1259 | 1369 | 836 | 958 | 865 | 814 | 8.68 | |
| | | | | 5 | 1195 | 1194 | 1232 | 1343 | 866 | 984 | 892 | 840 | 8.96 | 13.27 |
| | | | | 10 | 1187 | 1187 | 1223 | 1334 | 874 | 991 | 901 | 849 | 9.04 | 10.99 |
| | | | | 15 | 1183 | 1183 | 1219 | 1331 | 878 | 995 | 905 | 852 | 9.08 | 10.45 |
| 200 | 410 | 600 | 150.00 | 0 | 1007 | 992 | 932 | 1157 | 1054 | 1186 | 1192 | 1026 | 11.15 | |
| | | | | 5 | 966 | 944 | 887 | 1119 | 1095 | 1234 | 1237 | 1064 | 11.58 | 15.16 |
| | | | | 10 | 951 | 931 | 874 | 1105 | 1110 | 1247 | 1250 | 1078 | 11.71 | 11.65 |
| | | | | 15 | 942 | 920 | 861 | 1093 | 1119 | 1258 | 1263 | 1090 | 11.83 | 11.35 |
| | | | | 20 | 938 | 916 | 858 | 1090 | 1123 | 1262 | 1266 | 1093 | 11.86 | 10.42 |
| 175 | 360 | 525 | 131.25 | 0 | 938 | 916 | 858 | 1090 | 1123 | 1262 | 1266 | 1093 | 11.86 | |
| | | | | 5 | 938 | 916 | 858 | 1090 | 1123 | 1262 | 1266 | 1093 | 11.86 | 10.00 |
| 150 | 310 | 450 | 112.50 | 0 | 938 | 916 | 858 | 1090 | 1123 | 1262 | 1266 | 1093 | 11.86 | |
| | | | | 5 | 938 | 916 | 858 | 1090 | 1123 | 1262 | 1266 | 1093 | 11.86 | 10.00 |
| 125 | 265 | 375 | 93.75 | 0 | 952 | 934 | 869 | 1099 | 1109 | 1244 | 1255 | 1084 | 11.73 | |
| | | | | 5 | 952 | 934 | 870 | 1099 | 1109 | 1244 | 1254 | 1084 | 11.73 | -10.03 |
| 100 | 215 | 300 | 75.00 | 0 | 985 | 970 | 902 | 1128 | 1076 | 1208 | 1222 | 1055 | 11.40 | |
| | | | | 5 | 987 | 970 | 902 | 1128 | 1074 | 1208 | 1222 | 1055 | 11.40 | -10.06 |
| 75 | 170 | 225 | 56.25 | 0 | 1030 | 1020 | 954 | 1182 | 1031 | 1158 | 1170 | 1001 | 10.90 | |
| | | | | 5 | 1039 | 1026 | 960 | 1188 | 1022 | 1152 | 1164 | 995 | 10.83 | -10.81 |
| | | | | 10 | 1042 | 1030 | 964 | 1190 | 1019 | 1148 | 1160 | 993 | 10.80 | -10.39 |
| 50 | 120 | 150 | 37.50 | 0 | 1104 | 1102 | 1040 | 1253 | 957 | 1076 | 1084 | 930 | 10.12 | |
| | | | | 5 | 1108 | 1103 | 1043 | 1258 | 953 | 1075 | 1081 | 925 | 10.09 | -10.39 |
| 25 | 70 | 75 | 18.75 | 0 | 1200 | 1220 | 1167 | 1365 | 861 | 958 | 957 | 818 | 8.99 | |
| | | | | 5 | 1215 | 1231 | 1175 | 1380 | 846 | 947 | 949 | 803 | 8.86 | -11.47 |
| | | | | 10 | 1216 | 1232 | 1176 | 1381 | 845 | 946 | 948 | 802 | 8.85 | -10.12 |
| 0 | 0 | 0 | 0.00 | 0 | 1359 | 1455 | 1438 | 1569 | 702 | 723 | 686 | 614 | 6.81 | |
| | | | | 5 | 1405 | 1505 | 1480 | 1614 | 656 | 673 | 644 | 569 | 6.36 | -15.49 |
| | | | | 10 | 1423 | 1525 | 1502 | 1634 | 638 | 653 | 622 | 549 | 6.16 | -12.40 |
| | | | | 15 | 1429 | 1537 | 1514 | 1641 | 632 | 641 | 610 | 542 | 6.06 | -11.11 |
| | | | | 20 | 1433 | 1541 | 1517 | 1643 | 628 | 637 | 607 | 540 | 6.03 | -10.39 |



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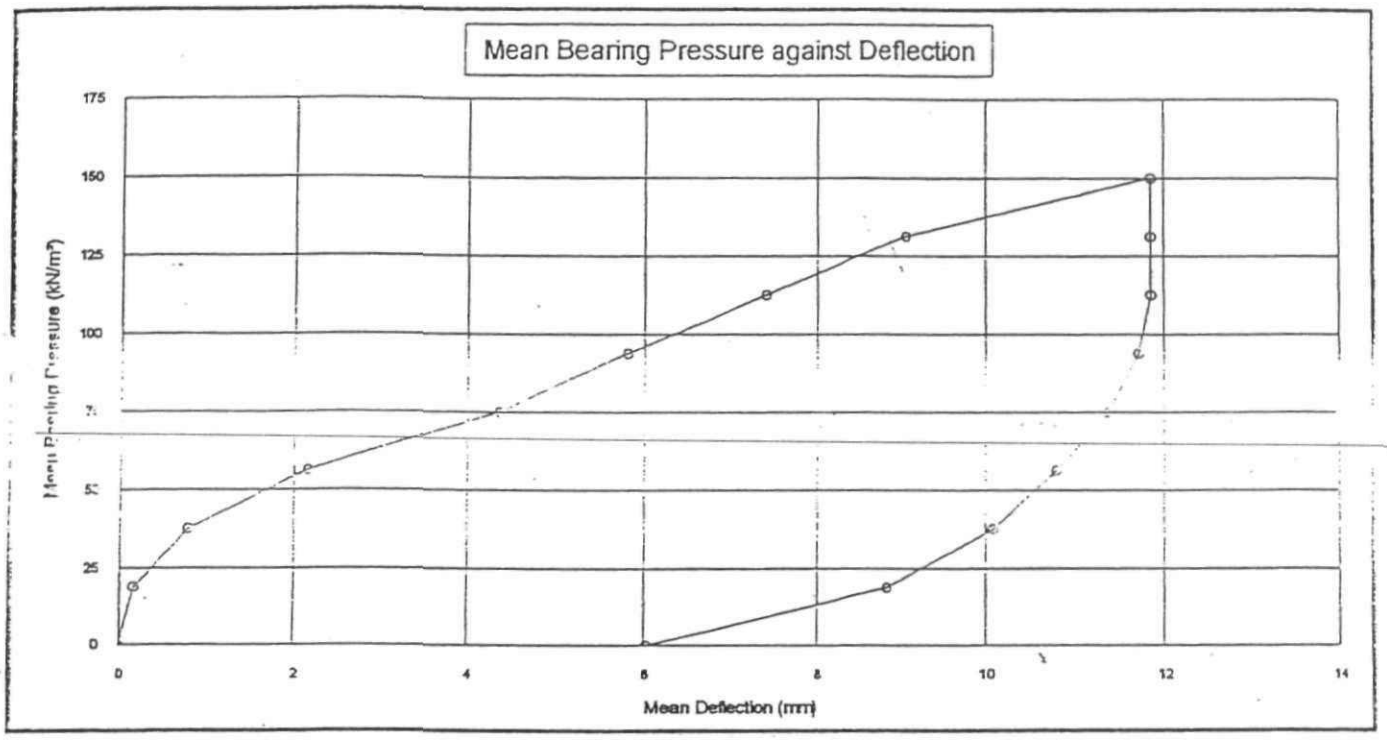
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Grimethorpe Colliery Redevelopment, Phase 1E

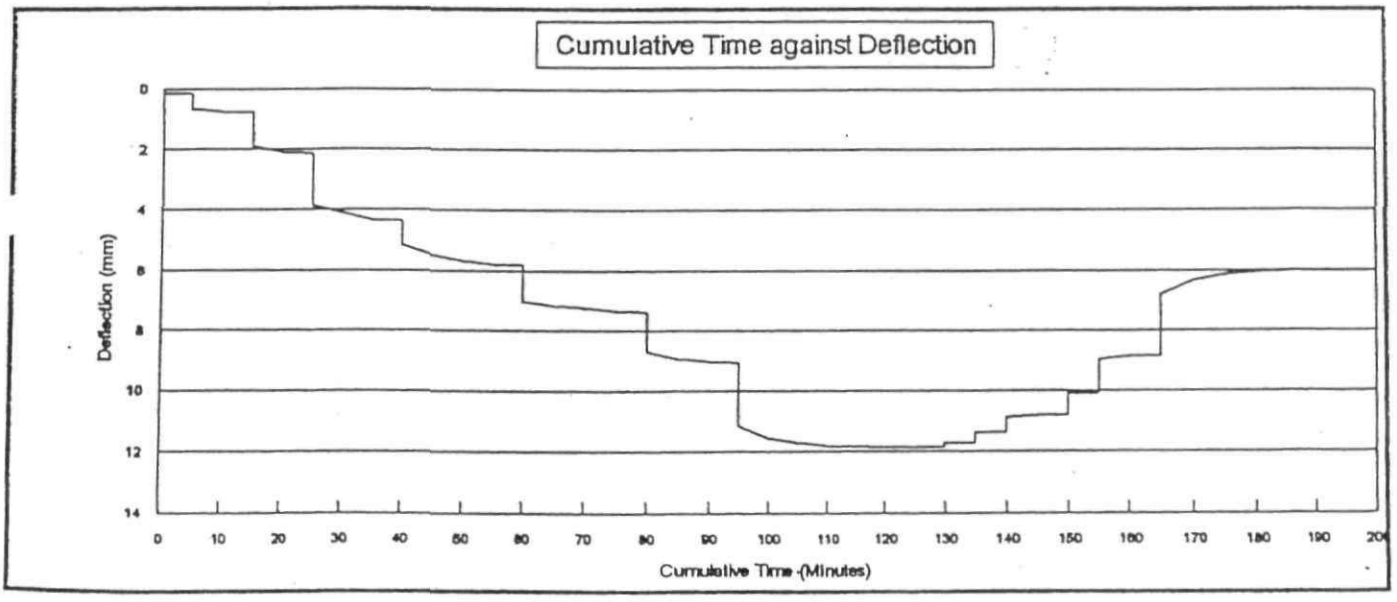
Zone Test - Specification for Ground Treatment

Laboratory Report: SA/01/247SA
Report Date: 07-Jun-01

Zone Pad Size 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 5
Material Description: Made Ground - General Fill
Clients Ref: 5
Date Tested: 01/06/01

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The maximum deflection at 100% of design load 4.37 mm
The maximum deflection at 200% of design load 11.86 mm
Plate Recovery = 49 %

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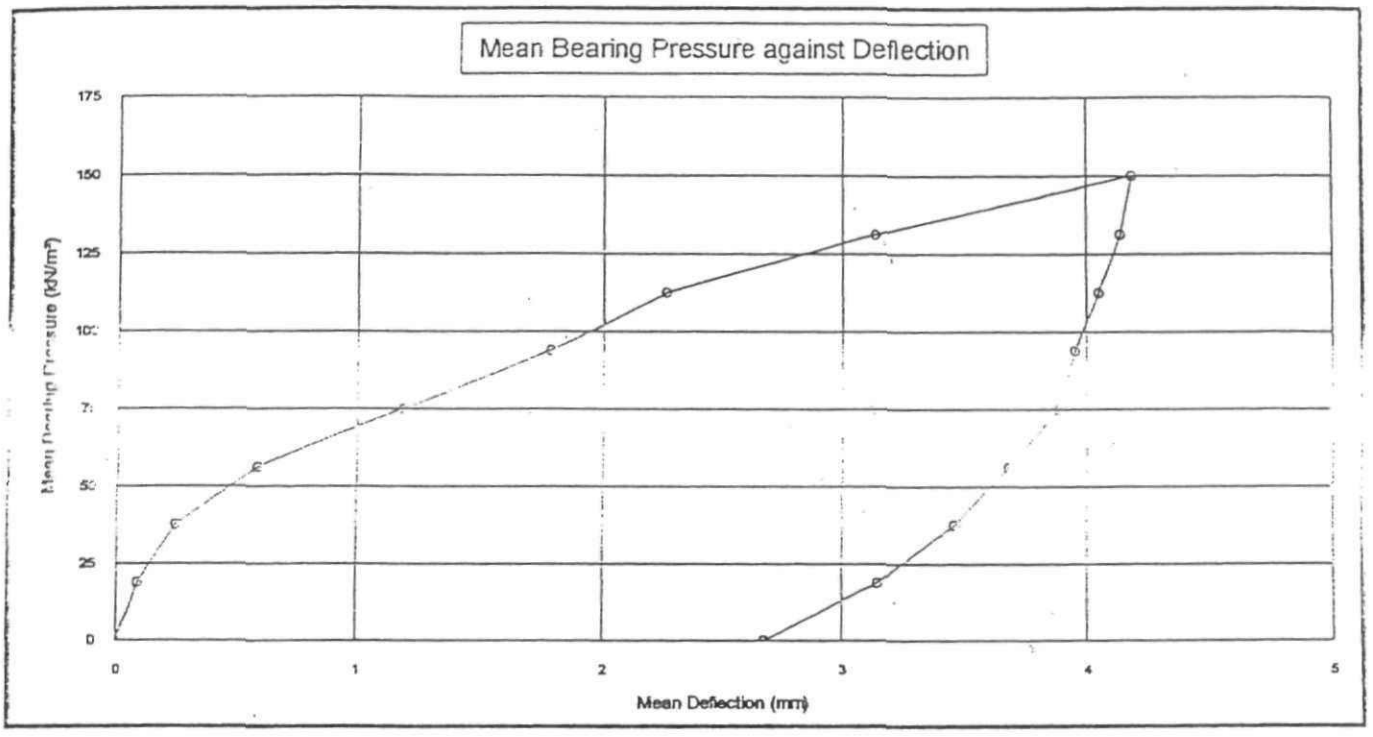
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Grimethorpe Colliery Redevelopment, Phase 1E

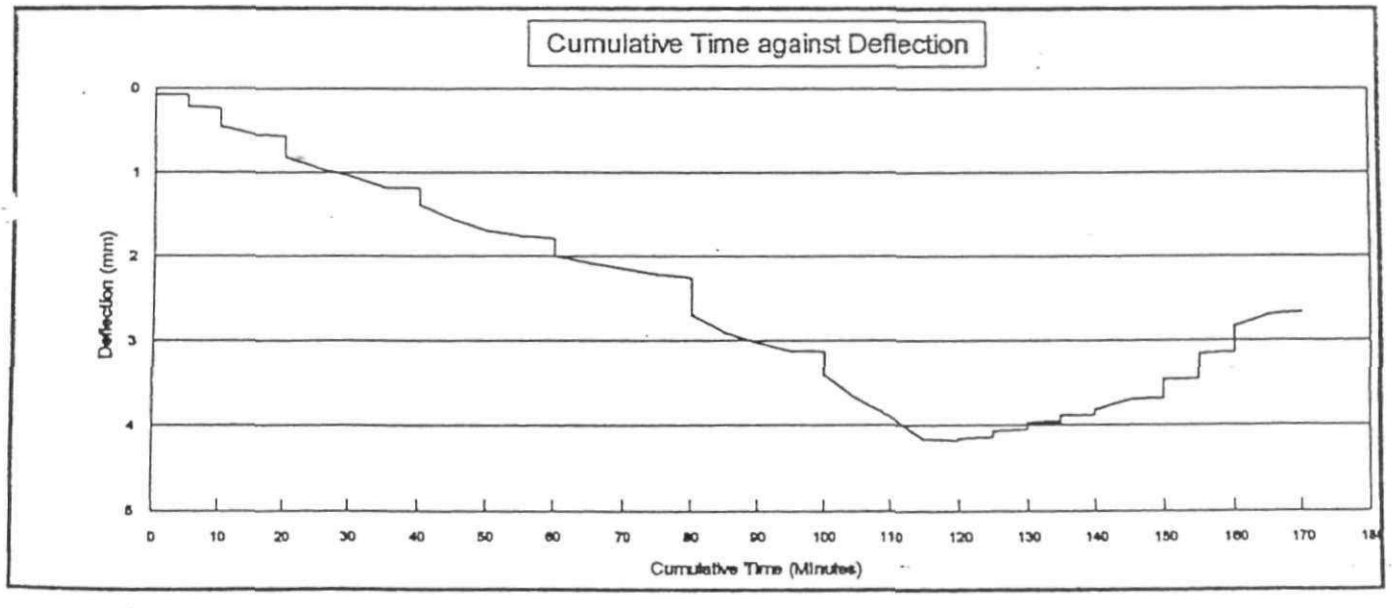
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Zone Test - Specification for Ground Treatment

Laboratory Report: SA/01/2479F
Report Date: 11-Jun-01

Zone Pad Size: 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 6
Material Description: Made Ground - General Fill
Clients Ref.: 6
Date Tested: 08/06/01




| | |
|---|---|
| The maximum deflection at 100% of design load | 1.19 mm |
| The maximum deflection at 200% of design load | 4.19 mm |
| Plate Recovery = | 36 % |

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[redacted] Construction Ltd
[redacted]thorpe Colliery Redevelopment, Phase 1B

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## Zone Test - Specification for Ground Treatment

Laboratory Report: SA/01/2479G
Report Date: 11-Jun-01

Zone Pad Size 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 7
Material Description: Made Ground - General Fill
Clients Ref: 7
Date Tested: 09/06/01

| % of Design Load | Pressure Gauge Reading | Nominal Load | Nominal Mean Bearing Pressure | Load Time | Dial Reading (x 0.01mm) | | | | Deflection (x 0.01mm) | | | | Mean Deflection (mm) | Rate of Settlement /Recovery |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % | BAR | kN | kN/m² | minutes | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | mm/h |
| 0 | 0 | 0 | 0 | 0 | 1835 | 2121 | 2123 | 2130 | 0 | 0 | 0 | 0 | 0.00 | |
| 25 | 70 | 75 | 18.75 | 0 | 1823 | 2109 | 2114 | 2120 | 12 | 12 | 9 | 10 | 0.11 | |
| | | | | 5 | 1820 | 2105 | 2112 | 2119 | 15 | 16 | 11 | 11 | 0.13 | 0.30 |
| 50 | 120 | 150 | 37.50 | 0 | 1801 | 2088 | 2097 | 2102 | 34 | 33 | 26 | 28 | 0.30 | |
| | | | | 5 | 1797 | 2084 | 2095 | 2098 | 38 | 37 | 28 | 32 | 0.34 | 0.42 |
| 75 | 170 | 225 | 56.25 | 0 | 1762 | 2052 | 2067 | 2064 | 73 | 69 | 56 | 66 | 0.66 | |
| | | | | 5 | 1749 | 2042 | 2057 | 2052 | 86 | 79 | 66 | 78 | 0.77 | 1.35 |
| | | | | 10 | 1747 | 2042 | 2056 | 2049 | 88 | 79 | 67 | 81 | 0.79 | 0.18 |
| 100 | 215 | 300 | 75.00 | 0 | 1720 | 2019 | 2028 | 2021 | 115 | 102 | 95 | 109 | 1.05 | |
| | | | | [illegible] | 1704 | 2006 | 2013 | 2002 | 131 | 115 | 110 | 128 | 1.21 | 1.89 |
| | | | | 10 | 1699 | 2000 | 2007 | 1994 | 136 | 121 | 116 | 136 | 1.20 | 0.78 |
| | | | | [illegible] | 1699 | 2000 | 2009 | 1994 | 136 | 121 | 117 | 136 | 1.26 | 0.00 |
| 125 | 265 | 375 | 93.75 | 0 | 1663 | 1975 | 1970 | 1958 | 193 | 146 | 155 | 172 | 1.66 | |
| | | | | 5 | 1640 | 1952 | 1947 | 1926 | 195 | 169 | 176 | 204 | 1.86 | 2.21 |
| | | | | 10 | 1626 | 1942 | 1934 | 1914 | 209 | 179 | 189 | 216 | 1.98 | 1.47 |
| | | | | 15 | 1615 | 1932 | 1921 | 1899 | 220 | 189 | 202 | 231 | 2.11 | 1.47 |
| | | | | 20 | 1611 | 1929 | 1917 | 1895 | 224 | 192 | 206 | 235 | 2.14 | 0.45 |
| 150 | 310 | 450 | 112.50 | 0 | 1573 | 1900 | 1886 | 1862 | 262 | 221 | 235 | 268 | 2.47 | |
| | | | | 5 | 1551 | 1881 | 1860 | 1829 | 284 | 240 | 263 | 301 | 2.72 | 3.06 |
| | | | | 10 | 1536 | 1871 | 1847 | 1811 | 299 | 250 | 276 | 319 | 2.86 | 1.68 |
| | | | | 15 | 1531 | 1869 | 1845 | 1808 | 304 | 252 | 278 | 322 | 2.89 | 0.36 |
| 175 | 360 | 525 | 131.25 | 0 | 1480 | 1827 | 1796 | 1751 | 355 | 294 | 327 | 379 | 3.39 | |
| | | | | 5 | 1440 | 1799 | 1753 | 1699 | 395 | 322 | 370 | 431 | 3.80 | 4.89 |
| | | | | 10 | 1431 | 1793 | 1743 | 1687 | 404 | 328 | 380 | 443 | 3.89 | 1.11 |
| | | | | 15 | 1418 | 1785 | 1732 | 1674 | 417 | 336 | 391 | 456 | 4.00 | 1.35 |
| | | | | 20 | 1410 | 1779 | 1721 | 1661 | 425 | 342 | 402 | 469 | 4.10 | 1.14 |
| | | | | 25 | 1406 | 1778 | 1717 | 1657 | 429 | 343 | 406 | 473 | 4.13 | 0.39 |
| 200 | 410 | 600 | 150.00 | 0 | 1364 | 1743 | 1680 | 1621 | 471 | 378 | 443 | 509 | 4.50 | |
| | | | | 5 | 1323 | 1714 | 1645 | 1558 | 512 | 407 | 478 | 572 | 4.92 | 5.04 |
| | | | | 10 | 1310 | 1702 | 1616 | 1537 | 525 | 419 | 507 | 593 | 5.11 | 2.25 |
| | | | | 15 | 1302 | 1700 | 1608 | 1526 | 533 | 421 | 515 | 604 | 5.18 | 0.87 |
| | | | | 20 | 1295 | 1698 | 1601 | 1517 | 540 | 423 | 522 | 613 | 5.25 | 0.75 |
| | | | | 25 | 1292 | 1697 | 1600 | 1514 | 543 | 424 | 523 | 616 | 5.27 | 0.24 |
| 175 | 360 | 525 | 131.25 | 0 | 1299 | 1699 | 1601 | 1519 | 536 | 422 | 522 | 611 | 5.23 | |
| | | | | 5 | 1299 | 1699 | 1601 | 1519 | 536 | 422 | 522 | 611 | 5.23 | 0.00 |
| 150 | 310 | 450 | 112.50 | 0 | 1310 | 1709 | 1608 | 1529 | 525 | 412 | 515 | 601 | 5.13 | |
| | | | | 5 | 1310 | 1709 | 1609 | 1530 | 525 | 412 | 514 | 600 | 5.13 | -0.06 |
| 125 | 265 | 375 | 93.75 | 0 | 1323 | 1719 | 1618 | 1541 | 512 | 402 | 505 | 589 | 5.02 | |
| | | | | 5 | 1323 | 1719 | 1618 | 1541 | 512 | 402 | 505 | 589 | 5.02 | 0.00 |
| 100 | 215 | 300 | 75.00 | 0 | 1344 | 1733 | 1632 | 1561 | 491 | 388 | 491 | 569 | 4.85 | |
| | | | | 5 | 1347 | 1735 | 1633 | 1564 | 488 | 386 | 490 | 566 | 4.83 | -0.27 |
| 75 | 170 | 225 | 56.25 | 0 | 1365 | 1751 | 1650 | 1583 | 470 | 370 | 473 | 547 | 4.65 | |
| | | | | 5 | 1365 | 1754 | 1652 | 1587 | 470 | 367 | 471 | 543 | 4.63 | -0.27 |
| 50 | 120 | 150 | 37.50 | 0 | 1389 | 1774 | 1670 | 1609 | 446 | 347 | 453 | 521 | 4.42 | |
| | | | | 5 | 1393 | 1777 | 1674 | 1613 | 442 | 344 | 449 | 517 | 4.38 | -0.45 |
| 25 | 70 | 75 | 18.75 | 0 | 1426 | 1808 | 1703 | 1648 | 409 | 313 | 420 | 482 | 4.06 | |
| | | | | 5 | 1430 | 1810 | 1706 | 1652 | 405 | 311 | 417 | 478 | 4.03 | -0.39 |
| 0 | 0 | 0 | 0.00 | 0 | 1485 | 1868 | 1768 | 1708 | 350 | 253 | 355 | 422 | 3.45 | |
| | | | | 5 | 1403 | 1885 | 1770 | 1726 | 432 | 236 | 353 | 404 | 3.56 | 1.35 |
| | | | | 10 | 1404 | 1882 | 1772 | 1728 | 431 | 239 | 351 | 402 | 3.56 | -0.06 |

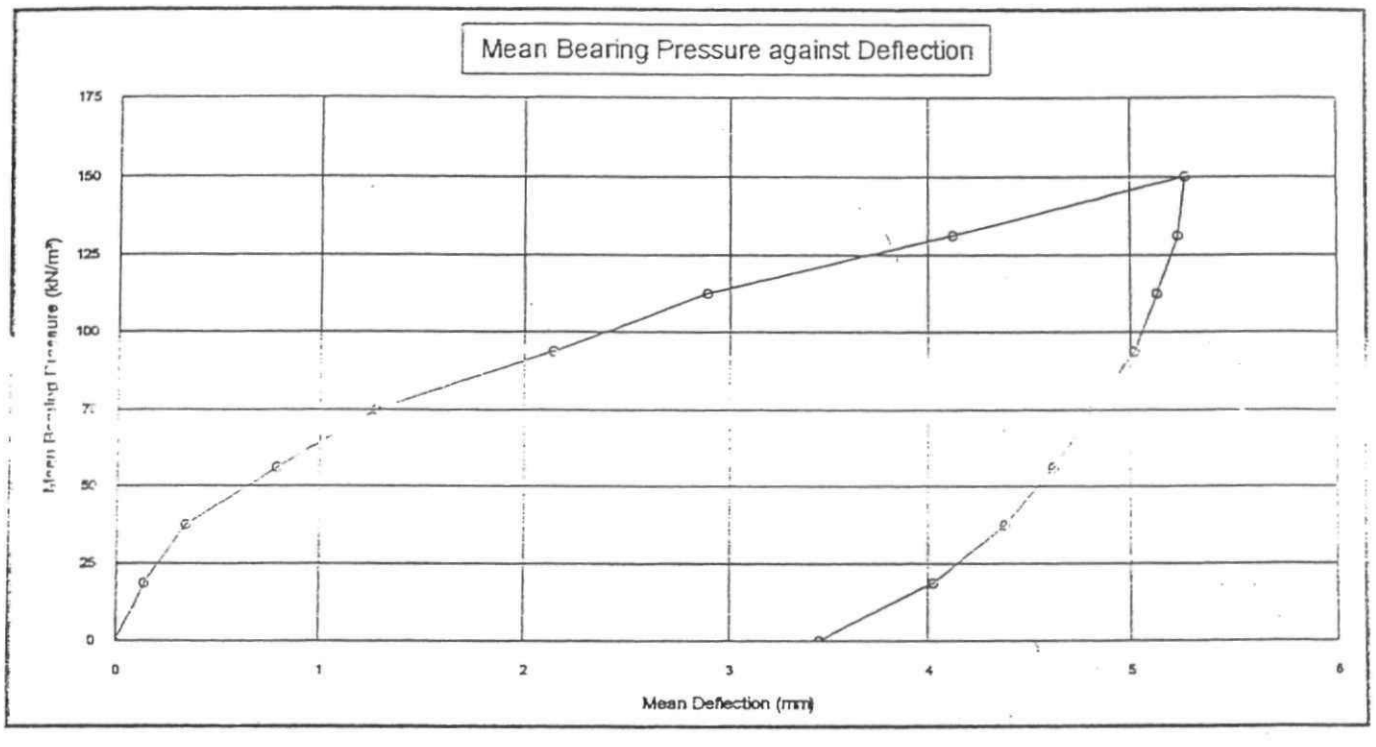
[redacted] Construction Ltd
[redacted]ethorpe Colliery Redevelopment, Phase 1E

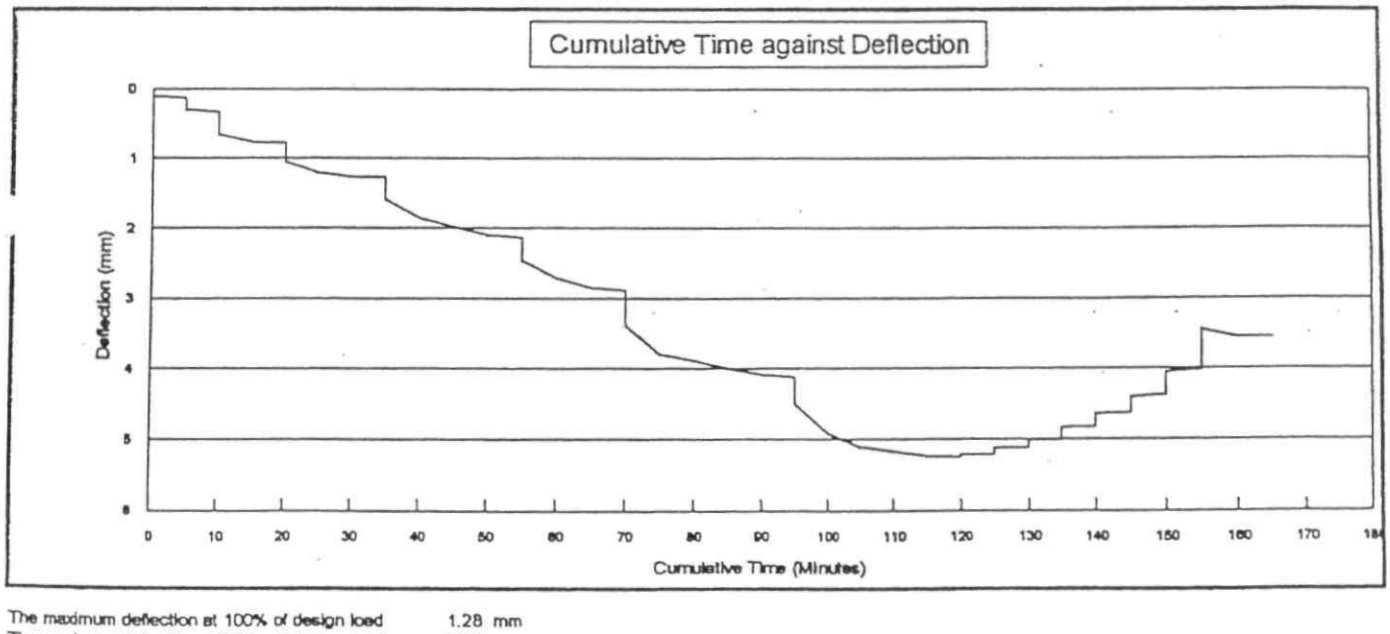
L.J. CHURCH
LABORATORY SERVICES LTD.

Zone Test - Specification for Ground Treatment

Laboratory Repor: SA/01/2479G
Report Date: 11-Jun-01

Zone Pad Size: 2 x 2 m
Loading Area: 4 m²
Design Load: 75 kN/m²
Test Location: 7
Material Description: Made Ground - General Fill
Clients Ref: 7
Date Tested: 09/06/01



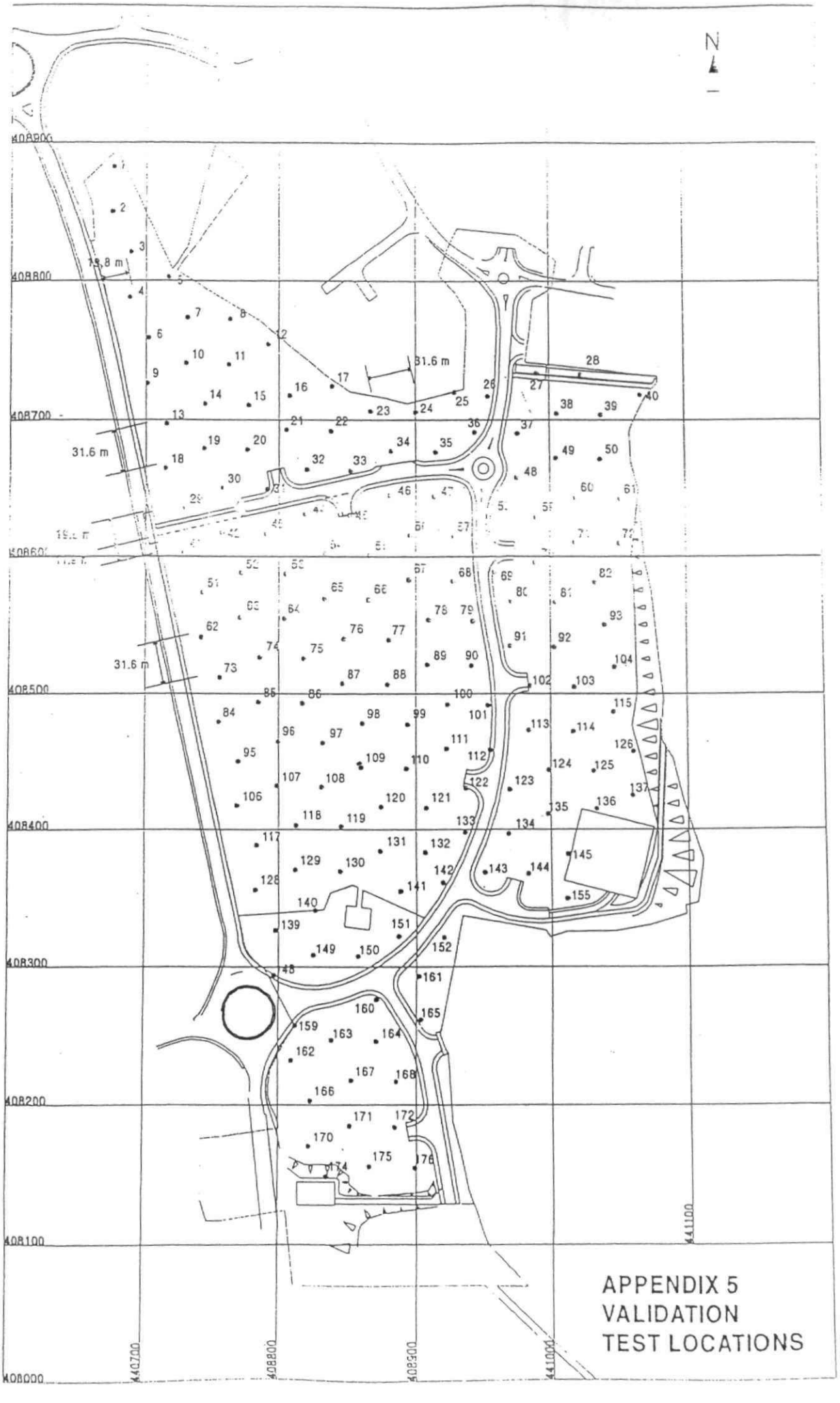




| | |
|---|---|
| The maximum deflection at 100% of design load | 1.28 mm |
| The maximum deflection at 200% of design load | 5.27 mm |
| Plate Recovery = | 34 % |

pp L J Church Laboratory Services Ltd

# APPENDIX 5

# CONTAMINATION TESTS


N
408900
408800
408700
408600
408500
408400
408300
408200
408100
408000
441200
441100
441000
408800
408500
31.6 m
31.6 m
31.6 m
APPENDIX 5
VALIDATION
TEST LOCATIONS

☐ Preliminary
☑ Validated

# Table Of Results

**Job Number:** 01/05956/02/01
Client: Carl Bro Ltd
Date of Receipt: 26/06/01
(of first sample)

**Sample Type:** SOIL
Location: GRIMETHORPE PHASE 1B
Client Contact: Jamie Duncan
Client Ref. No.:

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UKAS Accredited | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | |
| Units | | | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | | | |
| Detection Method | | | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | GC-FID | HPLC | IR | | | |
| Method Detection Limit | | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1.6 | <0.01 | <1 | | | |
| Sample Number | Sample Location | Depth (m) | Arsenic | Boron (Water Soluble) | Cadmium | Chromium | Copper | Mercury | Nickel | Lead | Selenium | Zinc | PAH total 16 GC | Tot. Phenols on Leach HPLC | TPH By Infra Red On Leachate | | | |
| 81 | 100 | 0.3 | 22 | <1 | <1 | 25 | 45 | <1 | 29 | 23 | <1 | 75 | 131.5 | <0.01 | <1 | | | |
| 82 | 101 | 0.3 | 8 | <1 | <1 | 25 | 41 | <1 | 32 | 22 | 1 | 85 | 60.3 | <0.01 | <1 | | | |
| 83 | 106 | 0.3 | 21 | <1 | <1 | 25 | 48 | <1 | 22 | 30 | <1 | 91 | 38.5 | <0.01 | <1 | | | |
| 84 | 107 | 0.3 | 11 | <1 | <1 | 24 | 40 | <1 | 21 | 25 | <1 | 81 | 26.1 | <0.01 | <1 | | | |
| 85 | 108 | 0.3 | 14 | <1 | <1 | 24 | 43 | <1 | 23 | 45 | 1 | 92 | 77.1 | <0.01 | <1 | | | |
| 86 | 109 | 0.3 | 12 | <1 | <1 | 20 | 52 | <1 | 16 | 253 | <1 | 96 | 387.4 | <0.01 | <1 | | | |
| 87 | 110 | 0.3 | 15 | <1 | <1 | 23 | 35 | <1 | 16 | 19 | <1 | 64 | 78.0 | <0.01 | <1 | | | |
| 88 | 111 | 0.3 | 15 | <1 | <1 | 23 | 56 | <1 | 19 | 31 | <1 | 94 | 123.6 | <0.01 | 3 | | | |
| 89 | 112 | 0.3 | 12 | <1 | <1 | 23 | 36 | <1 | 22 | 91 | 2 | 75 | 30.3 | <0.01 | <1 | | | |
| 90 | 117 | 0.3 | 12 | <1 | <1 | 27 | 31 | <1 | 32 | 20 | <1 | 81 | 23.6 | <0.01 | <1 | | | |
| 91 | 118 | 0.3 | 14 | <1 | <1 | 21 | 42 | <1 | 23 | 26 | 2 | 84 | 59.7 | <0.01 | <1 | | | |
| 92 | 119 | 0.3 | 12 | <1 | <1 | 21 | 41 | <1 | 19 | 23 | <1 | 78 | 281.8 | <0.01 | <1 | | | |
| 93 | 120 | 0.3 | 21 | <1 | <1 | 21 | 49 | <1 | 21 | 42 | <1 | 102 | 88.9 | <0.01 | <1 | | | |
| 94 | 121 | 0.3 | 14 | <1 | <1 | 22 | 40 | <1 | 23 | 24 | 2 | 75 | 84.7 | 0.03 | <1 | | | |
| 95 | 122 | 0.3 | 21 | <1 | <1 | 22 | 45 | <1 | 20 | 38 | <1 | 149 | 306.4 | 0.02 | <1 | | | |
| 96 | 128 | 0.3 | 18 | <1 | <1 | 20 | 42 | <1 | 19 | 39 | <1 | 84 | 66.9 | <0.01 | <1 | | | |
| 97 | 129 | 0.3 | 17 | <1 | <1 | 23 | 51 | <1 | 29 | 31 | <1 | 99 | 44.0 | <0.01 | <1 | | | |
| 98 | 130 | 0.3 | 14 | <1 | <1 | 28 | 43 | <1 | 36 | 25 | 2 | 96 | 39.1 | <0.01 | <1 | | | |
| 99 | 131 | 0.3 | 17 | <1 | 3 | 23 | 41 | <1 | 25 | 21 | <1 | 82 | 57.5 | <0.01 | <1 | | | |
| 100 | 132 | 0.3 | 14 | <1 | <1 | 19 | 72 | <1 | 17 | 18 | 2 | 68 | 93.7 | <0.01 | <1 | | | |

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

**NDP** = NO DETERMINATION POSSIBLE
**NFP** = NO FIBRES PRESENT

Checked By _____ Paul Coudy

Validated

# ALcontrol Geochem Analytical Services

## Table Of Results

**Job Number:** 01/05956/02/01
**Client:** Carl Bro Ltd
**Date of Receipt:** 26/06/01
(of first sample)

**Sample Type:** SOIL
**Location:** GRIMETHORPE PHASE 1B
**Client Contact:** Jamie Duncan
**Client Ref. No.:**

| | UKAS Accredited | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | | | |
| | Detection Method | | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | GC-FID | HPLC | IR | | | |
| | Method Detection Limit | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1.6 | <0.01 | <1 | | | |
| Sample Number | Sample Location | Depth (m) | Arsenic | Boron (Water Soluble) | Cadmium | Chromium | Copper | Mercury | Nickel | Lead | Selenium | Zinc | PAH total 16 GC | Tot. Phenols on Leach HPLC | TPH By Infra Red On Leachate | | | |
| 101 | 133 | 0.3 | 8 | <1 | <1 | 21 | 31 | <1 | 25 | 15 | <1 | 78 | 74.8 | <0.01 | <1 | | | |
| 102 | 139 | 0.3 | 11 | <1 | <1 | 25 | 30 | <1 | 22 | 17 | <1 | 70 | 29.7 | <0.01 | <1 | | | |
| 103 | 140 | 0.3 | 12 | <1 | <1 | 27 | 40 | <1 | 32 | 21 | 1 | 89 | 29.0 | <0.01 | <1 | | | |
| 104 | 141 | 0.3 | 10 | <1 | <1 | 18 | 34 | <1 | 13 | 21 | <1 | 74 | 112.1 | <0.01 | <1 | | | |
| 105 | 142 | 0.3 | 11 | <1 | <1 | 16 | 30 | <1 | 16 | 19 | <1 | 73 | 76.6 | <0.01 | <1 | | | |
| 106 | 148 | 0.3 | 21 | <1 | <1 | 20 | 37 | <1 | 16 | 41 | <1 | 74 | 57.3 | <0.01 | <1 | | | |
| 107 | 149 | 0.3 | 11 | <1 | <1 | 32 | 38 | <1 | 25 | 36 | 2 | 84 | 51.3 | 0.01 | <1 | | | |
| 108 | 150 | 0.3 | 14 | <1 | <1 | 34 | 38 | <1 | 23 | 36 | <1 | 85 | 88.4 | <0.01 | <1 | | | |
| 109 | 151 | 0.3 | 24 | <1 | <1 | 26 | 41 | <1 | 19 | 46 | <1 | 78 | 25.3 | <0.01 | <1 | | | |
| 110 | 152 | 0.3 | 26 | <1 | <1 | 23 | 47 | <1 | 16 | 43 | 2 | 68 | 39.6 | <0.01 | <1 | | | |
| 111 | 161 | 0.3 | 13 | <1 | <1 | 25 | 36 | <1 | 16 | 35 | <1 | 70 | 19.4 | <0.01 | <1 | | | |
| 113 | 165 | 0.3 | 12 | <1 | <1 | 23 | 33 | <1 | 21 | 31 | <1 | 77 | 92.1 | <0.01 | <1 | | | |
| 114 | 48 | 0.3 | 14 | <1 | <1 | 21 | 32 | <1 | 22 | 22 | 1 | 71 | 186.7 | <0.01 | <1 | | | |
| 115 | 49 | 0.3 | 16 | <1 | <1 | 25 | 40 | <1 | 20 | 28 | <1 | 79 | 113.9 | <0.01 | <1 | | | |
| 116 | 50 | 0.3 | 16 | <1 | <1 | 31 | 39 | <1 | 17 | 31 | <1 | 74 | 117.9 | <0.01 | <1 | | | |
| 117 | 58 | 0.3 | 9 | <1 | <1 | 21 | 26 | <1 | 23 | 19 | <1 | 69 | 37.5 | <0.01 | <1 | | | |
| 118 | 59 | 0.3 | 11 | <1 | <1 | 25 | 33 | <1 | 33 | 20 | <1 | 87 | 108.9 | <0.01 | <1 | | | |
| 119 | 60 | 0.3 | 14 | <1 | <1 | 22 | 42 | <1 | 18 | 65 | 2 | 86 | 617.6 | <0.01 | <1 | | | |
| 120 | 61 | 0.3 | 9 | <1 | <1 | 23 | 30 | <1 | 25 | 20 | <1 | 76 | 124.1 | <0.01 | <1 | | | |
| 121 | 69 | 0.3 | 11 | <1 | <1 | 27 | 35 | <1 | 32 | 29 | 2 | 94 | 46.7 | <0.01 | <1 | | | |

Note: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE
NFP = NO FIBRES PRESENT

Checked By _____ Paul Condy

☐ Interim

☑ Validated

# ALCO Environmental Analytical Services

## Table Of Results

**Job Number:** 01/05956/02/01 **Sample Type:** SOIL

Client: Carl Bro Ltd Location: GRIMETHORPE PHASE 1B

Date of Receipt: (of first sample) 26/06/01 Client Contact: Jamie Duncan

Client Ref. No.:

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UKAS Accredited | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | |
| Units | | | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | | | |
| Detection Method | | | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | GC-FID | HPLC | IR | | | |
| Method Detection Limit | | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1.6 | <0.01 | <1 | | | |
| Sample Number | Sample Location | Depth (m) | Arsenic | Boron (Water Soluble) | Cadmium | Chromium | Copper | Mercury | Nickel | Lead | Selenium | Zinc | PAH total 16 GC | Tot. Phenols on Leach HPLC | TPH By Infra Red On Leachate | | | |
| 122 | 70 | 0.3 | 13 | <1 | <1 | 25 | 35 | <1 | 31 | 20 | <1 | 79 | 53.0 | <0.01 | <1 | | | |
| 123 | 71 | 0.3 | 13 | <1 | <1 | 23 | 38 | <1 | 26 | 21 | 1 | 77 | 29.3 | <0.01 | <1 | | | |
| 124 | 72 | 0.3 | 7 | <1 | <1 | 27 | 36 | <1 | 24 | 17 | <1 | 72 | 34.5 | <0.01 | <1 | | | |
| 125 | 80 | 0.3 | 12 | <1 | <1 | 26 | 36 | <1 | 30 | 25 | <1 | 78 | 45.9 | <0.01 | <1 | | | |
| 126 | 81 | 0.3 | 30 | <1 | <1 | 20 | 91 | <1 | 28 | 47 | <1 | 96 | 54.0 | <0.01 | <1 | | | |
| 127 | 82 | 0.3 | 15 | <1 | <1 | 25 | 38 | <1 | 30 | 22 | <1 | 88 | 70.4 | <0.01 | <1 | | | |
| 128 | 91 | 0.3 | 16 | <1 | <1 | 26 | 38 | <1 | 30 | 49 | 2 | 83 | 26.0 | <0.01 | 18 | | | |
| 129 | 92 | 0.3 | 14 | <1 | <1 | 26 | 36 | <1 | 32 | 20 | 2 | 83 | 48.5 | 0.01 | <1 | | | |
| 130 | 93 | 0.3 | 12 | <1 | <1 | 24 | 35 | <1 | 26 | 22 | 1 | 79 | 57.1 | <0.01 | <1 | | | |
| 131 | 102 | 0.3 | 12 | <1 | <1 | 27 | 41 | <1 | 35 | 14 | <1 | 85 | 40.9 | <0.01 | <1 | | | |
| 132 | 103 | 0.3 | 15 | <1 | <1 | 29 | 43 | <1 | 38 | 18 | 2 | 97 | 42.2 | <0.01 | <1 | | | |
| 133 | 104 | 0.3 | 12 | <1 | <1 | 27 | 43 | <1 | 35 | 19 | <1 | 95 | 100.5 | <0.01 | <1 | | | |
| 134 | 113 | 0.3 | 13 | <1 | <1 | 28 | 39 | <1 | 34 | 18 | <1 | 83 | 10.0 | <0.01 | 2 | | | |
| 135 | 114 | 0.3 | 16 | <1 | <1 | 27 | 42 | <1 | 37 | 19 | 2 | 88 | 10.6 | <0.01 | <1 | | | |
| 136 | 115 | 0.3 | 16 | <1 | <1 | 28 | 45 | <1 | 39 | 21 | <1 | 89 | 54.7 | <0.01 | <1 | | | |
| 137 | 124 | 0.3 | 14 | <1 | <1 | 26 | 42 | <1 | 36 | 18 | <1 | 88 | 55.9 | <0.01 | <1 | | | |
| 138 | 125 | 0.3 | 11 | <1 | <1 | 27 | 36 | <1 | 33 | 21 | <1 | 86 | 25.6 | <0.01 | <1 | | | |
| 139 | 126 | 0.3 | 12 | <1 | <1 | 27 | 37 | <1 | 31 | 21 | 2 | 86 | 53.3 | <0.01 | <1 | | | |
| 140 | 159 | 0.3 | 10 | <1 | <1 | 24 | 28 | <1 | 34 | 18 | <1 | 79 | 27.1 | <0.01 | <1 | | | |
| 141 | 160 | 0.3 | 11 | <1 | <1 | 27 | 30 | <1 | 31 | 20 | 1 | 70 | 53.6 | <0.01 | <1 | | | |

ote: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

**NDP** = NO DETERMINATION POSSIBLE

**NFP** = NO FIBRES PRESENT

Checked By _____ Paul Gourdy

☐ [illegible]

☑ Validated

# [illegible] Geochem Analytical Services

## Table Of Results

**Job Number:** 01/05956/02/01

Client: Carl Bro Ltd

Date of Receipt: 26/06/01
(of first sample)

**Sample Type:** SOIL

Location: GRIMETHORPE PHASE 1B

Client Contact: Jamie Duncan

Client Ref. No.:

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UKAS Accredited | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | |
| | Units | | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | | | |
| | Detection Method | | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | ICP | GC-FID | HPLC | IR | | | |
| | Method Detection Limit | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1.6 | <0.01 | <1 | | | |
| Sample Number | Sample Location | Depth (m) | Arsenic | Boron (Water Soluble) | Cadmium | Chromium | Copper | Mercury | Nickel | Lead | Selenium | Zinc | PAH total 16 GC | Tot. Phenols on Leach HPLC | TPH By Infra Red On Leachate | | | |
| 144 | 123 | 0.3 | 11 | <1 | <1 | 26 | 36 | <1 | 33 | 21 | 2 | 83 | 36.0 | <0.01 | <1 | | | |
| 145 | 134 | 0.3 | 11 | <1 | <1 | 27 | 37 | <1 | 31 | 23 | 2 | 81 | 53.0 | <0.01 | <1 | | | |
| 146 | 135 | 0.3 | 11 | <1 | <1 | 26 | 39 | <1 | 34 | 21 | <1 | 88 | 46.0 | <0.01 | <1 | | | |
| 147 | 136 | 0.3 | 12 | <1 | <1 | 30 | 44 | <1 | 40 | 17 | 2 | 90 | 47.0 | <0.01 | <1 | | | |
| 148 | 137 | 0.3 | 12 | <1 | <1 | 28 | 38 | <1 | 39 | 20 | <1 | 90 | 65.0 | <0.01 | <1 | | | |
| 149 | 143 | 0.3 | 10 | <1 | <1 | 24 | 35 | <1 | 31 | 19 | 2 | 78 | 50.0 | <0.01 | <1 | | | |
| 150 | 144 | 0.3 | 9 | <1 | <1 | 27 | 30 | <1 | 32 | 17 | <1 | 96 | 43.0 | <0.01 | <1 | | | |
| 151 | 145 | 0.3 | 11 | <1 | <1 | 24 | 30 | <1 | 30 | 20 | <1 | 81 | 23.0 | <0.01 | <1 | | | |
| 152 | 155 | 0.3 | 9 | <1 | <1 | 22 | 26 | <1 | 21 | 18 | <1 | 73 | 138.0 | <0.01 | <1 | | | |
| 153 | duplicate sample | | | | | | | | | | | | | | | | | |
| 154 | duplicate sample | | | | | | | | | | | | | | | | | |
| 155 | duplicate sample | | | | | | | | | | | | | | | | | |
| 156 | 166 | 0.3 | 23 | <1 | <1 | 32 | 60 | <1 | 20 | 86 | 1 | 103 | 161.0 | <0.01 | <1 | | | |
| 157 | 167 | 0.3 | 11 | <1 | <1 | 25 | 35 | <1 | 27 | 27 | <1 | 85 | 77.0 | <0.01 | <1 | | | |
| 158 | 168 | 0.3 | 2 | <1 | <1 | 26 | 27 | <1 | 34 | 11 | <1 | 86 | 47.0 | <0.01 | <1 | | | |
| 159 | 170 | 0.3 | 19 | <1 | <1 | 20 | 41 | <1 | 19 | 32 | <1 | 100 | 203.0 | <0.01 | <1 | | | |
| 160 | 171 | 0.3 | 9 | <1 | <1 | 23 | 26 | <1 | 27 | 14 | <1 | 75 | 36.0 | <0.01 | <1 | | | |
| 161 | 172 | 0.3 | 7 | <1 | <1 | 23 | 30 | <1 | 29 | 15 | <1 | 77 | 8.0 | <0.01 | <1 | | | |
| 162 | 174 | 0.3 | 9 | <1 | <1 | 25 | 33 | <1 | 26 | 26 | <1 | 169 | 54.0 | <0.01 | <1 | | | |
| 163 | 175 | 0.3 | 10 | <1 | <1 | 22 | 28 | <1 | 28 | 19 | <1 | 81 | 80.0 | <0.01 | <1 | | | |
| 164 | 176 | 0.3 | 9 | <1 | <1 | 21 | 31 | <1 | 26 | 19 | <1 | 85 | 60.0 | <0.01 | <1 | | | |

ote: METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

**NDP** = NO DETERMINATION POSSIBLE

**NFP** = NO FIBRES PRESENT

Checked By _____ Paul [illegible]

# ALcontrol Geochem

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | Total Volatiles $C_4$ to $C_{13}$ | MTBE | Benzene | Toluene | Ethyl Benzene | Total Xylene |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 2 | 2 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 3 | 3 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 4 | 4 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 5 | 5 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 6 | 6 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 7 | 7 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 8 | 8 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 9 | 9 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 10 | 10 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 11 | 11 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 12 | 12 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 13 | 13 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 14 | 14 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 15 | 15 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 16 | 16 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 17 | 17 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 18 | 18 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 19 | 19 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 20 | 20 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 21 | 21 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 22 | 22 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 23 | 23 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 24 | 24 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 25 | 25 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 26 | 26 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 27 | 27 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 28 | 28 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 29 | 29 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 30 | 30 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 31 | 31 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 32 | 32 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 33 | 33 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 34 | 34 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |

# ALcontrol Geochem

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | Total Volatiles $C_4$ to $C_{13}$ | MTBE | Benzene | Toluene | Ethyl Benzene | Total Xylene |
|---|---|---|---|---|---|---|---|---|
| 103 | 140 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 104 | 141 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 105 | 142 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 106 | 148 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 107 | 149 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 108 | 150 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 109 | 151 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 110 | 152 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 111 | 161 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 112 | 164 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 113 | 165 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 114 | 48 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 115 | 49 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 116 | 50 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 117 | 58 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 118 | 59 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 119 | 60 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 120 | 61 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 121 | 69 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 122 | 70 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 123 | 71 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 124 | 72 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 125 | 80 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 126 | 81 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 127 | 82 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 128 | 91 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 129 | 92 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 130 | 93 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 131 | 102 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 132 | 103 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 133 | 104 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 134 | 113 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 135 | 114 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 136 | 115 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |

# ALcontrol Geochem

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Sample Identity | Depth | Total Volatiles $C_4$ to $C_{13}$ | MTBE | Benzene | Toluene | Ethyl Benzene | Total Xylene |
|---|---|---|---|---|---|---|---|---|
| 137 | 124 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 138 | 125 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 139 | 126 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 140 | 159 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 141 | 160 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 142 | 161 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 143 | 162 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 144 | 129 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 145 | 134 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 146 | 135 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 147 | 136 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 148 | 137 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 149 | 143 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 150 | 144 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 151 | 145 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 152 | 155 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 153 | duplicate sample | | | | | | | |
| 154 | duplicate sample | | | | | | | |
| 155 | duplicate sample | | | | | | | |
| 156 | 166 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 157 | 167 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 158 | 168 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 159 | 170 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 160 | 171 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 161 | 172 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 162 | 174 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 163 | 175 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| 164 | 176 | 0.3 | < 10 | | < 10 | < 10 | < 10 | < 10 |
| | | | | | | | | |
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# ALcontrol Geochem

## C5 - C35 Speciated TPH by GC

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | C5 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 | Total Aliphatics | Total Aromatics | TPH |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 2 | 2 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 3 | 3 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 4 | 4 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 5 | 5 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 6 | 6 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 7 | 7 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 8 | 8 | 0.3 | | 149 | 35 | 44 | 228 | - | 228 |
| 9 | 9 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 10 | 10 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 11 | 11 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 12 | 12 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 13 | 13 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 14 | 14 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 15 | 15 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 16 | 16 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 17 | 17 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 18 | 18 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 19 | 19 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 20 | 20 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 21 | 21 | 0.3 | | 23 | 14 | < 10 | 37 | - | 37 |
| 22 | 22 | 0.3 | | 26 | 32 | 82 | 140 | - | 140 |
| 23 | 23 | 0.3 | | 60 | 83 | < 10 | 143 | - | 143 |
| 24 | 24 | 0.3 | | 21 | 27 | < 10 | 48 | - | 48 |
| 25 | 25 | 0.3 | | 23 | < 10 | < 10 | 23 | - | 23 |
| 26 | 26 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 27 | 27 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 28 | 28 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 29 | 29 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 30 | 30 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 31 | 31 | 0.3 | | 28 | 24 | < 10 | 52 | - | 52 |
| 32 | 32 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 33 | 33 | 0.3 | | < 10 | < 10 | < 10 | < 10 | - | < 10 |
| 34 | 34 | 0.3 | | < 10 | <10 | < 10 | < 10 | - | < 10 |

TPH is the sum of the Aliphatics and Aromatics (C5-C35)

# ALcontrol Geochem

## C5 - C35 Speciated TPH by GC

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | C5 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 | Total Aliphatics | Total Aromatics | TPH |
|---|---|---|---|---|---|---|---|---|---|
| 35 | 35 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 36 | 36 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 37 | 37 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 38 | 38 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 39 | 39 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 40 | 40 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 41 | 41 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 42 | 42 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 43 | 43 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 44 | 44 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 45 | 45 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 46 | 46 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 47 | 47 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 48 | 51 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 49 | 52 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 50 | 53 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 51 | 54 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 52 | 55 | 0.3 | | 66 | 185 | 432 | 683 | < 10 | 683 |
| 53 | 56 | 0.3 | | < 10 | 18 | 59 | 77 | < 10 | 77 |
| 54 | 57 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 55 | 62 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 56 | 63 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 57 | 64 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 58 | 65 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 59 | 66 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 60 | 67 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 61 | 68 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 62 | 73 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 63 | 74 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 64 | 75 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 65 | 76 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 66 | 77 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 67 | 78 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 68 | 79 | 0.3 | | < 10 | <10 | < 10 | < 10 | < 10 | < 10 |

TPH is the sum of the Aliphatics and Aromatics (C5-C35)

# ALcontrol Geochem

## C5 - C35 Speciated TPH by GC

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | C5 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 | Total Aliphatics | Total Aromatics | TPH |
|---|---|---|---|---|---|---|---|---|---|
| 69 | 84 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 70 | 85 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 71 | 86 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 72 | 87 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 73 | 88 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 74 | 89 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 75 | 90 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 76 | 95 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 77 | 96 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 78 | 97 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 79 | 98 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 80 | 99 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 81 | 100 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 82 | 101 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 83 | 106 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 84 | 107 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 85 | 108 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 86 | 109 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 87 | 110 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 88 | 111 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 89 | 112 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 90 | 117 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 91 | 118 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 92 | 119 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 93 | 120 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 94 | 121 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 95 | 122 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 96 | 128 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 97 | 129 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 98 | 130 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 99 | 131 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 100 | 132 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 101 | 133 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 102 | 139 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |

TPH is the sum of the Aliphatics and Aromatics (C5-C35)

# ALcontrol Geochem

## C5 - C35 Speciated TPH by GC

Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | C5 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 | Total Aliphatics | Total Aromatics | TPH |
|---|---|---|---|---|---|---|---|---|---|
| 103 | 140 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 104 | 141 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 105 | 142 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 106 | 148 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 107 | 149 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 108 | 150 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 109 | 151 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 110 | 152 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 111 | 161 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 112 | 164 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 113 | 165 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 114 | 48 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 115 | 49 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 116 | 50 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 117 | 58 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 118 | 59 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 119 | 60 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 120 | 61 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 121 | 69 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 122 | 70 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 123 | 71 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 124 | 72 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 125 | 80 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 126 | 81 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 127 | 82 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 128 | 91 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 129 | 92 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 130 | 93 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 131 | 102 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 132 | 103 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 133 | 104 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 134 | 113 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 135 | 114 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 136 | 115 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |

TPH is the sum of the Aliphatics and Aromatics (C5-C35)

# ALcontrol Geochem

## C5 - C35 Speciated TPH by GC

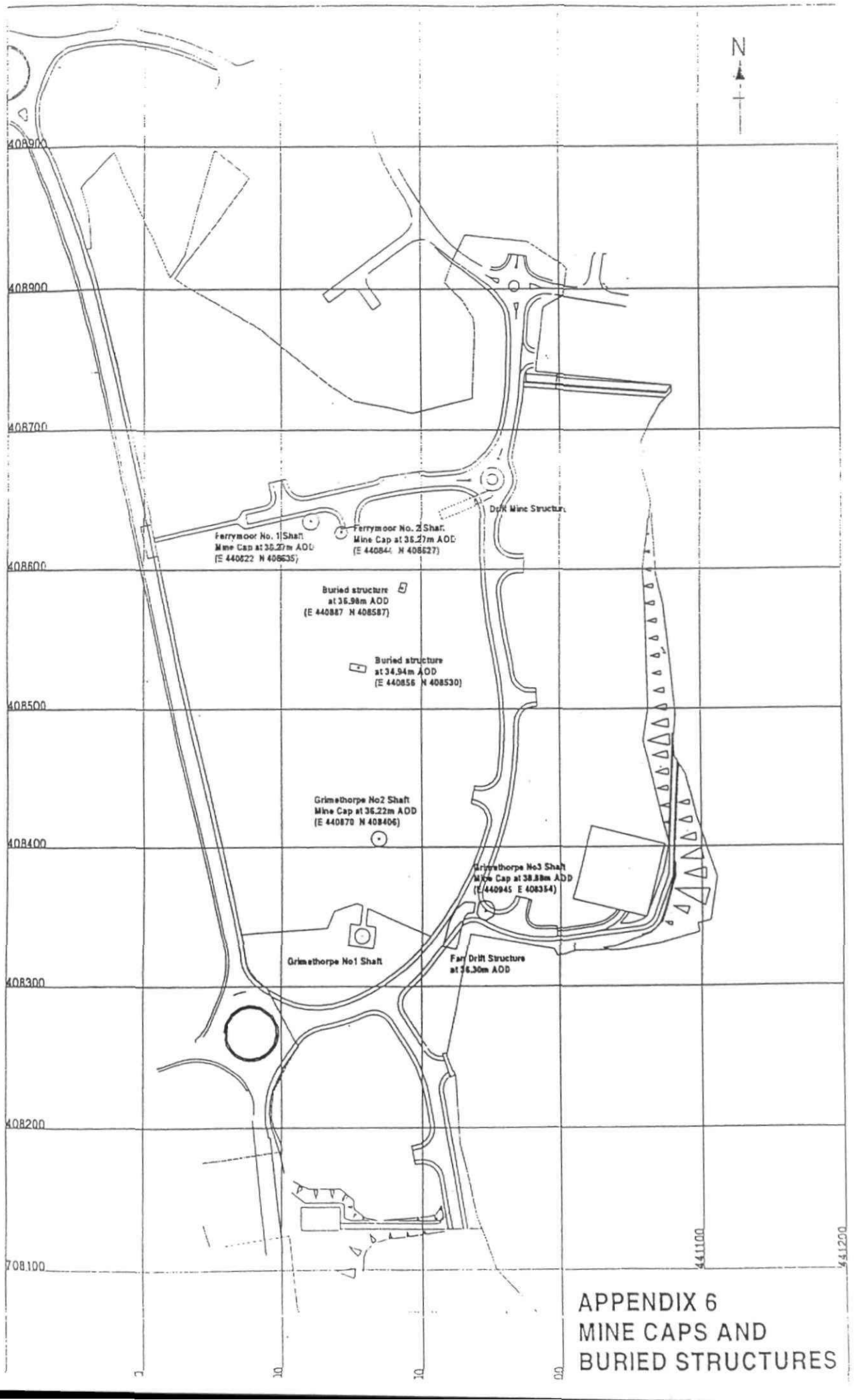
Job Number : 01/05956/02/01
Client : Carl Bro Ltd
Ref : Grimethorpe Phase 1B
Sample Type : LEACHATE
Units : µg/l

| Sample No | Location | Depth | C5 - C12 | >C12 - C16 | >C16 - C21 | >C21 - C35 | Total Aliphatics | Total Aromatics | TPH |
|---|---|---|---|---|---|---|---|---|---|
| 137 | 124 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 138 | 125 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 139 | 126 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 140 | 159 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 141 | 160 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 142 | 162 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 143 | 163 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 144 | 123 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 145 | 134 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 146 | 135 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 147 | 136 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 148 | 137 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 149 | 143 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 150 | 144 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 151 | 145 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 152 | 155 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 153 | duplicate sample | | | | | | | | |
| 154 | duplicate sample | | | | | | | | |
| 155 | duplicate sample | | | | | | | | |
| 156 | 166 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 157 | 167 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 158 | 168 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 159 | 170 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 160 | 171 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 161 | 172 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 162 | 174 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 163 | 175 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| 164 | 176 | 0.3 | | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| | | | | | | | | | |
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TPH is the sum of the Aliphatics and Aromatics (C5-C35)

# APPENDIX 6

# MINE CAPS AND BURIED STRUCTURES




# APPENDIX 6
# MINE CAPS AND BURIED STRUCTURES

The Coal Authority.
Mining Reports Office.
200 LICHFIELD LANE.
[redacted]Y HILL.
MANSFIELD.
NOTTINGHAMSHIRE.
NG18 4RG
Telephone: 0845 762 6848
DX 716176 MANSFIELD 5
On-Line Service: www.coalminingreports.co.uk

The COAL AUTHORITY

The Coal Authority

| | |
|---|---|
| Cost: | £38.30 |
| Plus V.A.T. | £6.70 |
| Total Received: | £45.00 |
| V.A.T. Reg Number | 598 5850 68 |

HLW,
DX 10643 SHEFFIELD

This matter is being dealt with by Darren Moody

Our Ref: **10221879-04**

Your Ref: DAJ EA THO354

Electronic Ref:

RRUID: 007.00002905050001

Date: 20 August 2004

Dear Sir,

## Coal Mining Report

## LAND AT, SPRINGVALE ROAD, GRIMETHORPE, BARNSLEY, SOUTH YORKSHIRE

Refer to the enquiry dated 18th August 2004, received 19th August 2004, in connection with the above.

This report is based on and limited to the records in the possession of The Coal Authority at the time the search is answered.

Ordnance Survey (O.S.) is undertaking a Positional Accuracy Improvement Programme of its mapping data. The Coal Authority (CA) has no control over the timing of issue of Positionally Improved mapping data by O.S. or over users of that data. In some instances the relative position between surface features and coal mining features may alter as a consequence of this programme. The CA will ensure that the integrity of its database is maintained by replotting some mining information to sustain the relationship between that mining information and the improved O.S. surface positions, some of which are now being released. However, mining reports are currently being produced against pre improved O.S. mapping whilst the Authority updates its database in line with the O.S. changes.

### Past Underground Mining

The property is within the likely zone of influence on the surface from workings in 7 seams of coal at 60m to 870m depth, the last date of working being 1977.

Ground movement from the above mentioned past coal workings should by now have ceased.

### Present Underground Mining

The property is not within the zone of likely physical influence on the surface from any present underground coal workings.

### Future Underground Mining

The property is not within a geographical area for which a licence to extract coal by underground methods is awaiting determination by the Coal Authority.

The property is not within a geographical area for which a licence to extract coal by underground methods has been granted.

The property is not within the zone of likely physical influence at the surface from plans of future workings in our possession.

However reserves of coal exist in the locality which could be worked at some time in the future subject to feasibility, licences, and planning consents.

We have no record of any notice of the risk of the land being affected by subsidence being given under S.46 of the Coal Mining Subsidence Act 1991.

### Shafts and Adits

Within or within 20 metres of the property there are 4 mine entries, the approximate positions of which are shown on the attached plan. Your attention is drawn to the statements made on that plan.

Our records disclose the following information:

440408-012. No treatment details.

440408-011. No treatment details.

440408-002. is filled with hardcore and capped with reinforced concrete at rockhead to British Coal specifications .

440408-001. is filled with hardcore and capped with reinforced concrete at rockhead to British Coal specifications .

The records held by the Coal Authority may be incomplete. Consequently, there may exist in this locality mine entries of which we have no knowledge.

### Surface Geology

Records in our possession do not disclose any fault or other line of weakness at the surface as having affected the stability of the property.

### Past Opencast Mining

The property is not located within the geographical boundary of an opencast site from which coal has been extracted by opencast methods.

### Present Opencast Mining

The property does not lie within 200 metres of the geographical boundary of an opencast site within which coal is being extracted by opencast methods.

### Future Opencast Mining

The property is not within 800 metres of the geographical boundary of an opencast site for which a licence to extract coal by opencast methods is awaiting determination.

The property is within 800 metres of the geographical site boundary of the Ferry Moor Revised Reclamation Scheme - Two Gates Area prospective opencast site for which a licence to extract coal by opencast methods was granted in October 1994. The grant of this licence is conditional on the applicant securing any other rights, permissions (including planning permissions) and consents to enable him to carry out his operations.

### Subsidence

The records in our possession do not disclose any damage notice or claim having been given, made or pursued in respect of the property since 1 January 1984.

The records in our possession do not disclose any current "Stop Notice" affecting the property.

The records in our possession do not show any request having been made to execute preventative works under S.33 of the Coal Mining Subsidence Act 1991.

**Withdrawal of Support**

The property lies within a geographical area in respect of which a notice of entitlement to withdraw support was published in 1987.

The property does not lie within a geographical area in respect of which a notice has been given under S.41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

**Working Facilities Orders**

The property is not within a geographical area that is the subject of an Order made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

**Payments to Owners of Former Copyhold Land**

The property is not within an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

**Additional Remarks**

In view of the mining circumstances a prudent developer would seek appropriate technical advice before works are undertaken on site. All proposals should have regard to good engineering practice in mining areas as identified in authoritative publications on mining stability problems. In any event, no activities should be undertaken that intersect, disturb, or interfere with any coal or mines of coal without permission of the Coal Authority.

These replies are prepared in accordance with the 2003 editions of the Coal Authority's Terms and Conditions, User Guide and the Law Society's Guidance Notes.

Copyright in coal mining reports and certificates belongs to the Coal Authority. Information used to compile this report is protected by the Coal Authority's database right. All rights are reserved and unauthorised use is prohibited. Copyright and other intellectual property is not transferred to external parties by possession of a mining report or certificate, however those for whom the report is supplied have the right to use it.

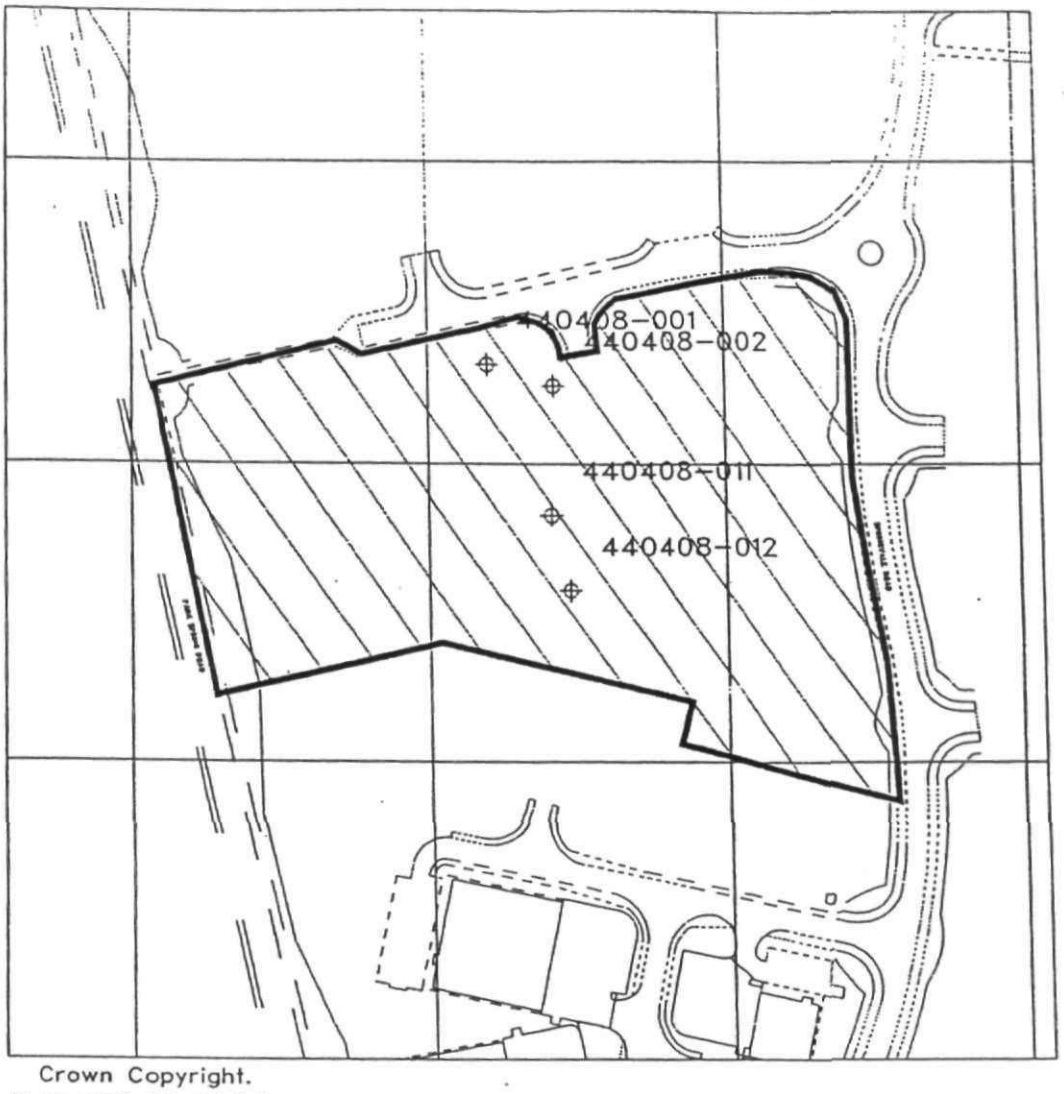
We acknowledge the receipt of your remittance in payment of our fee.

Yours faithfully

A Schofield

**Albert Schofield**

**Director of Mining Information and Services**




Crown Copyright.

PLAN NOT TO SCALE

This map is reproduced from the Ordnance Survey material by The Coal Authority [or division thereof] with the permission of the Controller of Her Majesty's Stationery Office, Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number: AL51060A001.

This is a plan of the boundaries of the property in respect of which this report has been prepared. It is the responsibility of the user to ensure that the boundaries shown correspond with those of the property.

APPROXIMATE POSITION OF ENQUIRY BOUNDARY SHOWN

APPROXIMATE POSITION OF DISUSED MINE SHAFTS SHOWN

This plan shows the approximate location of the disused mine entry/entries referred to in the attached mining report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.
Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A DTI leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848.
If you wish to discuss the relevance of any of the information contained in the attached report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are available at our Mansfield office, free of charge, by prior appointment, telephone 01623 638233. Should you or your advisor wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.
The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

# Land At, Springvale Road, Grimethorpe Barnsley, South Yorkshire, S72

## SEWER PLAN

A copy of the statutory sewer map is provided.

1. The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
2. Sewers indicated on the extract of the public sewer map as being subject to an agreement under section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer.
3. Assets other than public sewers may be shown on the copy extract, for information only.

## DRAINAGE

### Foul Drainage

**The Company's records indicate that foul water from the property does not drain to the public sewerage system.**

1. **The Company is not responsible for those private drains and sewers which connect the property to the public sewerage system, and does not hold details of these. The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.**
2. **An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.**
3. **If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.**

### Surface Water Drainage

**The Company's records indicate that surface water from the property does not drain to the public sewerage system.**

1. **The Company is not responsible for those private drains and sewers which connect the property to the public sewerage system and does not hold details of these. The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.**
2. **An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.**
3. **In some cases Company records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of surface water drainage charge. Details can be obtained from the Company.**
4. **If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse.**

## ADOPTION AGREEMENTS

**The Company's records indicate that certain sewers serving the development are the subject of an application for adoption by the Company under Section 104 of the Water Industry Act 1991 and a statutory adoption agreement is in place. The maintenance period has not commenced. The agreement is the subject of a bond waiver.**

1. **Final adoption is subject to the developer complying with the terms of the adoption a[illegible]t under Section 104 of the**



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Water Industry Act 1991.

2. Since 1980 all sewer adoption agreements entered into by the Company have been of a standard national form as prescribed by the guide "Sewers for Adoption". Under the terms of the Water Industry Act 1991 the Company is not able to provide copies of actual sewer adoption agreements and any such requests should be directed to the developer concerned.

## LOCATIONS OF SEWERS

### Sewer Within the Boundary

The public sewer map does not show any public sewers within the boundary of the property. It should be noted that, historically, it has not been a requirement for all public sewers to be recorded on the public sewer map. It is therefore possible for unidentified public sewers to exist.

1. The boundary of the property has been determined by reference to the Ordnance Survey record.
2. The presence of a public sewer within the boundary of the property may restrict further development within that boundary. The Company has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Company or its contractors needing to enter the property to carry out work.
3. Sewers indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

### Building over agreement

The Company's records indicate that there is not a statutory agreement or consent in respect of building over a public sewer at this property. For historical reasons the Company may not be aware of some agreements or consents which have been entered into by the Local Authority.

### Sewer within 100 feet

The public sewer map does not indicate any public sewers, **OR** sewers subject to an agreement under Section 104 of the Water Industry Act 1991, within 30.48 metres (100 feet) of the building(s) within the property. However, historically it has not been a requirement for all public sewers to be recorded on the public sewer map. It is therefore possible for unidentified public sewers to exist.

1. The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the Local Authority Environmental Health Department requiring a property to be connected to the public sewer.
2. Sewers indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer.
3. The measure is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.

## WATER PLAN

The water supply for this area is provided by Yorkshire Water Services Limited who should be contacted regarding all water supply details. A copy of the map of waterworks is provided.

1. Assets other than vested water mains may be shown on the plan, for information only.
2. The Company is not responsible for private supply pipes connecting the property to the public water main and does not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
3. An extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public



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water network.

## WATER SUPPLY

**The Company records indicate that the property is not connected to the mains water supply.**

## LOCATION OF WATER MAINS

The map of waterworks does not show any vested water mains within the boundary of the property.

## TRADE EFFLUENT

### Discharge Consent

The Company's records indicate that the property does **not** have a consent to discharge trade effluent under S118 of the Water Industry Act 1991 into the public sewerage system.

1. Trade effluent is defined by S141 of the Water Industry Act 1991 as 'any liquid, either with or without particles of matter in suspension in the liquid, which is wholly or partly produced in the course of any trade or industry carried on at the trade premises' but does not include domestic sewage.
   Trade premises are defined by S141 of the Water Industry Act 1991 as 'any premises used or intended to be used for carrying on any trade or industry'.
2. The boundary of the property has been determined by reference to the Ordnance Survey record.
3. The Company is not responsible for trade effluent sewers that connect the property to the public sewerage system, unless by written agreement. The property owner will normally have sole responsibility for the trade effluent sewer(s). These may pass through land outside the control of the seller. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
4. For historical reasons, the Company may not be aware of some agreements or consents that have been entered into by the local authority.
5. Prescribed trade effluent processes and substances shall be taken as those included in Schedule 1 of the 'Trade Effluents (Presribed Processes and Substances) Regulations 1989' Statutory Instrument Number 1156 or any amendment or addition to the same.
6. An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any trade effluent sewers connecting the property to the public sewerage system.

## INTERNAL FLOODING FROM OVERLOADED PUBLIC SEWERS

The property is not recorded as being at risk from flooding from Overloaded Public Sewers on the Regulatory Register maintained by the Company.

1. Overloaded Public Sewers: a sewer is overloaded when the flow from a storm is unable to pass through it due to a permanent problem (eg flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
2. Internal Flooding from public sewers is defined as a material flow or seepage or inundation which enters a building or passes below a suspended floor. "Buildings" are restricted to those normally occupied (including integral/attached garages but excluding linked/detached garages) and used for residential, public, commercial, business or industrial purposes.
3. At Risk properties are those that the Company is required to include in the Regulatory Register that is reported annually to the Director General of Water Services. These are defined as properties that have suffered or are likely to suffer internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
4. Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk register.
5. Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
6. It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.



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7. Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.

## LOW WATER PRESSURE

The property is not recorded on the Regulatory Register maintained by the Company as a property which has received and is likely to continue to receive pressure below the reference level when demand is not abnormal.

1. The boundary of the property has been determined by reference to the Ordnance Survey record.
2. The reference level refers to the minimum pressure when demand on the system is not abnormal.
3. The Company is required to include in the Regulatory Register that is reported annually to the Director General of Water Services properties receiving pressure below the reference level, provided that allowable exclusions do not apply. The information provided from this Register is valid from latest DG2 return period as at 31 March last. This will be updated annually in line with the regulatory return period.
4. Allowable exclusions are events which can cause pressure to temporarily fall below the reference level. This includes:
   - Abnormal demand - defined as abnormal peaks in demand and not the daily, weekly or monthly peaks in demand which are normally expected.
   - Planned maintenance - normal water supply system maintenance activities by the Company.
   - One off incidents, eg mains bursts, failures of the Company's equipment (such as pressure reducing valves or booster pumps), firefighting and action by a third party.
   - Low pressure incidents of a short duration.



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## A GENERAL GUIDE TO SEWERAGE SERVICES

The company provides general sewerage related information for commercial development and this includes the following:

1. Flood risk assessment - Before granting any planning approval, the Local Planning Authorities have a duty to consider Planning Policy Guidance Note 25: *Development and Flood Risk*. They often require developers to undertake an assessment of flood risk.

2. Sustainable drainage - The Company is fully in favour of Sustainable Drainage Systems (SuDS). Where appropriate, the Company will play its part in adopting methods suitable to form part of the public sewer network.

3. Sewer diversion - Where a public sewer crosses a site, a developer may request the Company to undertake a reasonable diversion of that sewer. Sometimes the Company will allow the developer to carry out the work which will be monitored by the Company's inspector. **All the costs relating to the diversion are payable by the developer.**

4. Sewer requisition - In many instances it is possible for a developer to request the Company to provide off-site public sewers. The **developer is responsible for the cost** of the works, less a discount for some of the estimated future sewerage income that the Company will receive from the development.

1. Each Local Authority (Council) within the Company's area has a copy for their district. This is available for the public to view free of charge at an office of the Local Authority.
2. More detailed information is available in the Company's customer leaflet called *Providing Public Sewerage Facilities*.

## A GENERAL GUIDE TO WATER SERVICES

The Company provides general water related information for commercial development and this includes the following:

1. Water main diversion - Where a public water main crosses a site, a developer must request the Company to undertake a reasonable diversion of that water main. The Company **will not** allow the developer to carry out the work. **All the costs relating to the diversion are payable by the developer.**

2. Water Main requisition - Under section 41 of the Water Act 1991, an individual or developer can request the Company to provide off-site water mains. The **developer is responsible for the cost** of the works less a discount for some of the estimated future income from water consumption that the Company will receive from the development.

1. More detailed information is available in the Company's customer information called the *Developer Charter*.



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## DRAINAGE & WATER ENQUIRY
## TERMS AND CONDITIONS

Customer and Clients are asked to note these terms, which govern the basis on which this drainage and water report is supplied

**Definitions**

'Company' means the water service company or their data service provider producing the Report.
'Order' means any request completed by the Customer requesting the Report.
'Report' means the drainage and/or water report prepared by The Company in respect of the Property.
'Property' means the address or location supplied by the Customer in the Order.
'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.
'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property.

**Agreement**

1. The Company agrees to supply the Report to the Customer and the Client subject to these terms. The scope and limitations of the Report are described in paragraph 2 of these terms. Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing these terms to the attention of the Client.

The Customer and Client agree that the placing of an Order for a Report indicates their acceptance of these terms.

**The Report**

2. Whilst The Company will use reasonable care and skill in producing the Report, it is provided to the Customer and the Client on the basis that they acknowledge and agree to the following:-

2.1 The information contained in the Report can change on a regular basis so The Company cannot be responsible to the Customer and the Client for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.

2.2 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

2.3 The information contained in the Report is based upon the accuracy of the address supplied by the Customer or Client.

2.4 The Report provides information as to the location & connection of existing services and should not be relied on for any other purpose. The Report may contain opinions or general advice to the Customer and the Client and The Company cannot ensure that any such opinion or general advice is accurate, complete or valid and accepts no liability therefore.

2.5 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made in the vicinity of The Company's apparatus.

**Liability**

3.1 The Company shall not be liable to the Client for any failure defect or non-performance of its obligations arising from any failure of or defect in any machine, processing system or transmission link or anything beyond The Company's reasonable control or the acts or omissions of any party for whom The Company are not responsible.

3.2 Where the Customer sells this report to a Client (other than in the case of a bona fide legal adviser recharging the cost of the Report as a disbursement) The Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) be liable for any loss or damage whatsoever and the Customer shall indemnify the Company in respect of any claim by the Client.

3.3 Where a report is requested for an address falling within a geographical area where two different Companies separately provide Water and Sewerage Services, then it shall be deemed that liability for the information given by either Company will remain with that Company in respect of the accuracy of the information supplied. A Company supplying information which has been provided to it by another Company for the purposes outlined in this agreement will therefore not be liable in any way for the accuracy of that information and will supply that information as agent for the Company from which the information was obtained.

3.4 The Report is produced for use in relation to individual domestic property transactions and if used other than in relation to individual domestic property transactions for example in relation to commercial developments of domestic properties or commercial properties for intended occupation by third parties the Company's entire liability (except to the extent provided by clause 3.5) in respect of all causes of action arising by reason of or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall be limited to £2,000,000.

3.5 The Company shall accept liability for death or personal injury arising from its negligence.

**Copyright and Confidentiality**

4.1 The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client. The copyright and any other intellectual property rights in the Report shall remain the property of The Company. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided

4.2 The Customer or Client is entitled to make copies of the Report (other than any maps contained in the, or attached to the Report, where no copying is permitted)

4.3 The Customer and Client agree (in respect of both the original and any copies made) to respect and not to alter any trademark, copyright notice or other property marking which appears on the Report.

4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.5 The Customer and the Client agree to indemnify The Company against any losses, costs, claims and damage suffered by The Company as a result of any breach by either of them of the terms of paragraphs 4.1 to 4.4 inclusive.

**Payment**

5.1 Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay for the price of the Report specified by The Company, without any set off, deduction or counterclaim. Unless the Customer or Client has an account with The Company for payment for Reports, The Company must receive payments for Reports in full before the Report is produced. Where a customer orders an expedited search for 24 hour return, payment must be made in full to The Company within 48 hours of placing the Order. For Customers or Clients with accounts, payment terms will be as agreed with The Company.

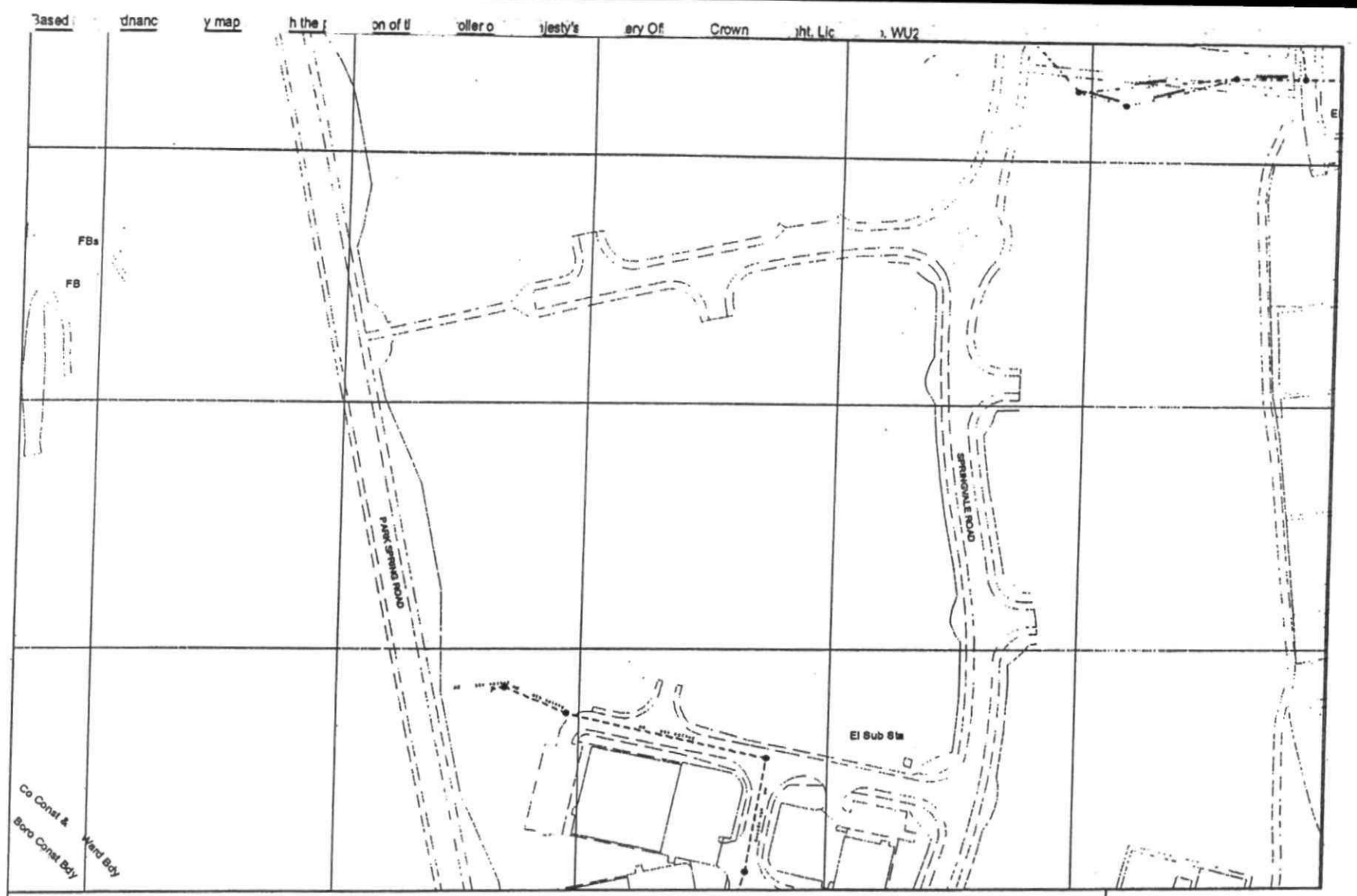
**General**

6.1 If any provision of these terms is or becomes invalid or unenforceable, it will be taken to be removed from the rest of these terms to the extent that it is invalid or unenforceable. No other provision of these terms shall be affected.

6.2 These terms shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

6.3 Nothing in this notice shall in any way restrict the Customer or Clients statutory or any other rights of access to the information contained in the Report.

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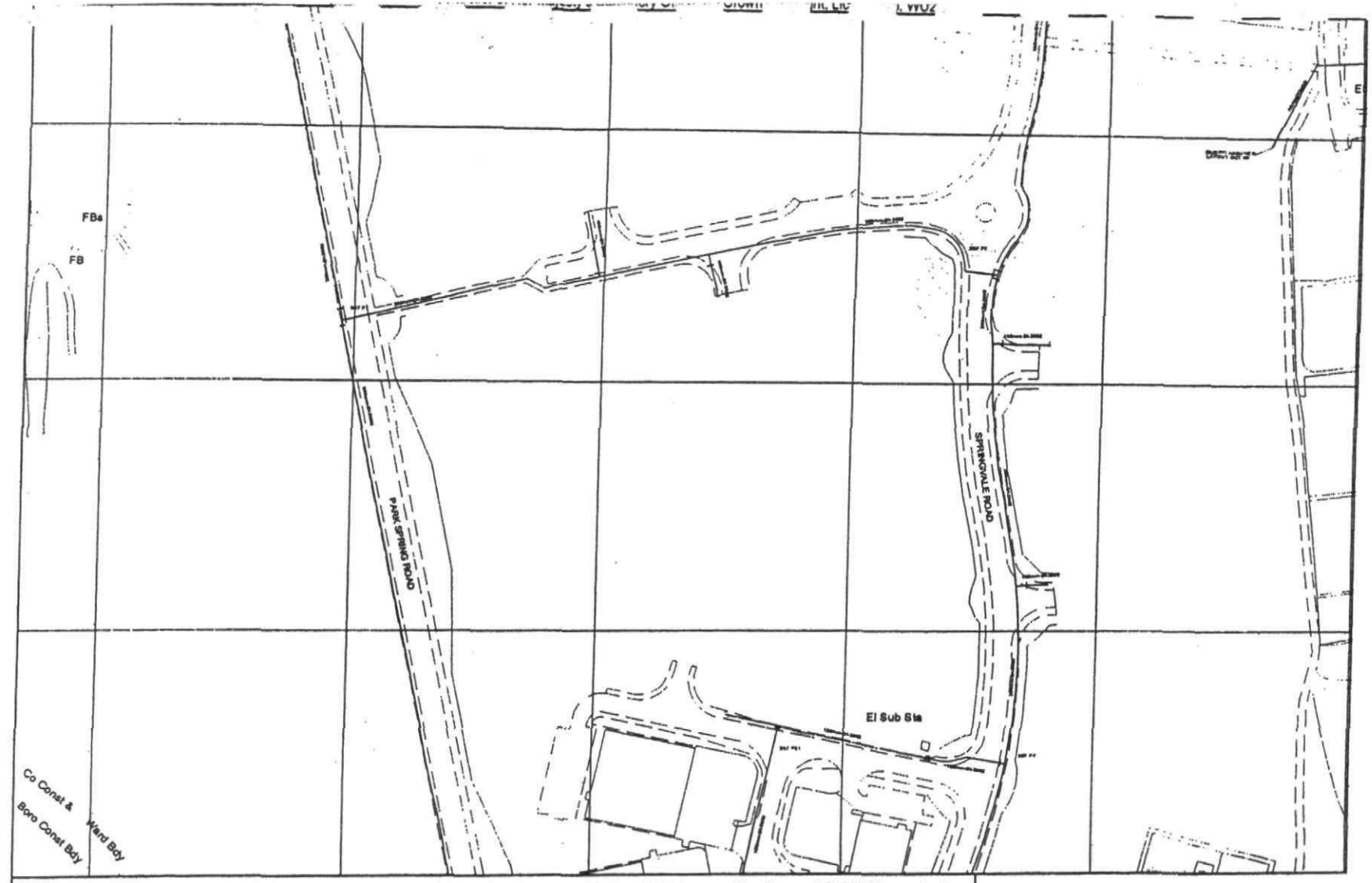



**Public Waste Water Network** 24/08/2004 08:15:55 OS Grid Coordinates: 440569 : 406401 Map Name : SE4008SE alredj

| COMBINED | FOUL | SURFACE WATER | OTHER |
|---|---|---|---|
| Combined Sewer | Foul Sewer | Surface Water Sewer | Public Rising Main |
| Section 104 Combined sewer | Section 104 Foul sewer | Section 104 Surface Water | Section 104 Rising Main |
| Surveyed Section 24 combined sewer | Surveyed Section 24 foul sewer | Surveyed Section 24 surface sewer | Pumping Station |

SAFE-MOVE
A part of *Yorkshire Water*

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**Public Clean Water Network** 24/08/2004 08:16:07 OS Grid Coordinates: 440569 : 408401 Map Name : SE4008SE airedj

Public Clean Water Network Key

Water Main with Diameter greater than 125mm or 4 inches. Not Privately Owned. For Treated Water

Water Main with Diameter less than or equal to 125mm or 4 inches. Not Privately Owned. For Treated Water

Water Main. Privately Owned.

Water Main. Not Privately Owned. For Raw Water.

Water Main. Not Privately Owned. No data on Water Type or Diameter.

Water Pumping Station

SAFE-MOVE
A part of *Yorkshire Water*

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ENVIRONMENT AGENCY

# Summary Risk Report

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**This Report relates to the following Environment Agency Property Search ("the Search"):**

**Customer:** **Environment Agency**

**Address:** **Templeborough House**
**Broadmarsh Business Park**
**Bowbridge Close**
**Rotherham**
**S60 1BY**

**Property that the information in the search relates to:**

**LAND AT**
**SPRINGVALE ROAD**
**GRIMETHORPE**

**Date of Search: 03 September 2004**

**Our Ref: 200409030001812201**
**NLIS Ref: 1CH_TERA-885109**
**Your Ref: 7050/04**

In respect of a residential house purchase, the Environment Agency warns that the Search indicates one or more items that could be of concern to a residential house purchaser. These might require further investigations of the matters that the Search relates to or (if you are a professional adviser) further discussions with your client.

If the search relates to commercial property you should not rely on this summary report but consider carefully what further enquiries might be needed.

# Further action may be needed

This risk report is based on environmental data within the responsibility of the Environment Agency that have been requested in the Search and that lie within 500 metres of the property (Please read the notes overleaf).

Subject to standard terms of conditions as included in the full Search Report. If you do not have a copy please contact your professional adviser or the Environment Agency using the contact details overleaf.

© Environment Agency 2004

## Guidance Notes on the Summary Risk Report

This report is designed to help house purchasers and their advisers to assess the environmental risk of the information provided in an Environment Agency standard property search.

You should note that much of the data in the Search is dynamic and can change regularly. For technical reasons, which we are working on, the Agency can only currently update its property search database every three months. When we update our database, the data will be no more than a few days old but immediately prior to the following update the data may be up to three months old.

House purchasers should always make sufficient visits to the site and the nearby vicinity to see if there is any wider environmental concern evident from such a visit, for example noise, smell and visual nuisance. If the site is brownfield or the land may have been the subject of historical contamination you should consult your professional adviser about the possibility that the land may be contaminated.

The Agency is in the process of adding additional datasets to the standard report and as these are added the comprehensiveness of the report will increase accordingly. In the meantime you should always consider whether the Environment Agency search request meets your particular requirements and whether or not other environmental information is needed.

When identifying matters within 500 metres we use a point, which is intended to be the centre point of the property. If you have provided us with precise co-ordinates we will have used this point. You or your adviser should always check when receiving the Search what point has actually been used. It will be identified on the plan by cross hairs and clearly be the centre of the circle which shows the area of the Search.

The following paragraphs contain advice for you or your professional adviser concerning entries that have been found in our records. You are advised to check the details in the main report and attached plan and/or discuss them with your professional adviser:

The report indicates that further action may be needed as the Search has indicated the presence of a floodplain and (a) waste management licence(s). You should discuss this with your client to decide whether any further information is needed from a third party (e.g. the vendor or licence holder) or whether any follow up queries need to be made to the Environment Agency. It may in exceptional circumstances be worth considering appointing an environmental consultant or other specialist.

You should also note that the Search has indicated water discharge consents and/or abstractions and a watercourse for which we have provided a quality rating in the area. If these relate to the property being purchased (please check the plan and if relevant the details of consent or licence holder identified in the search) you should make further enquiries of the vendor and if necessary check the details with us. If not within the boundaries of the property being purchased there would not normally be a risk for a residential house although it may be of interest to some purchasers. If the watercourse classification is likely to affect the property being purchased (please check the plan and if relevant the details of consent or licence holder identified in the search) you should make further enquiries of the vendor.

The Search is compliant with Law Society recommendations to make enquiries of Environment Agency data (further details on request).

The Environment Agency offers three levels of additional service in connection with your search report:

1. You may ask for assistance on how to use our property search service or have general questions about the product.
2. You may request additional details of one or more answers that identify an entry in our records. Our initial charge for providing such additional details is £50 (with no VAT). This can be paid by either cheque or postal order made payable to The Environment Agency. There may be a further charge, in addition to the initial £50, if the work involved in producing additional details takes us longer than anticipated. In such cases we will contact you first.
3. Alternatively you may wish to ask us questions, which are different to those on our standard search report. If so we will do our best to respond to such request, assuming that there are no legal constraints on us. If we are able to answer additional questions we will let you know in advance how much this would cost.

**The Environment Agency** National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY Tel: 08708 506506

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ENVIRONMENT AGENCY

# Environmental Property Search

## LAND AT
## SPRINGVALE ROAD
## GRIMETHORPE

**0.50km radial search around**

**National Grid Reference:**
440854, 408615

**OS Grid Reference:**
SE4085408615

Date: 03 September 2004

An Environment Agency Service
Our Ref: 200409030001812201
Your Ref: 1CH_TERA-885109

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## Introduction

The Environment Agency is the leading public organisation for protecting and enhancing the environment in England and Wales. We regulate industry and inspect industrial sites to protect the environment and people from pollution and environmental risks to health, maintain essential flood defences, water resources and river structures and monitor and assess the environment.

This bespoke report consists of:

1) a Risk Summary Report which is intended to give solicitors or other professionals acting in a residential property conveyance (or anyone doing their own conveyancing) an immediate indication of whether any further action is needed as a result of the report

2) a map of the searched area, followed by

3) the report which is divided into two sections. The first being a question and answer section followed by the second part that gives more detailed answers to the questions.

The report has been compiled from the data gathered from our activities. It provides potential house purchasers with the necessary environmental information for more informed decision making regarding the property in question.

## Further Information

Sometimes, you may require the Environment Agency to provide information beyond that contained in this report. We may have to charge for this service to cover costs, but we will always let you know in advance how much it will be.

You may also want to refer to the Public Registers of environmental information held at Environment Agency offices. These may provide more information on any waste management licences, industrial permits and authorisations and water discharge consents and abstraction licences referred to in this report.

For both of the above, please contact us on 08702 42 01 99.

For further information on flooding, call our Floodline service (0845 988 1188) or go to:-

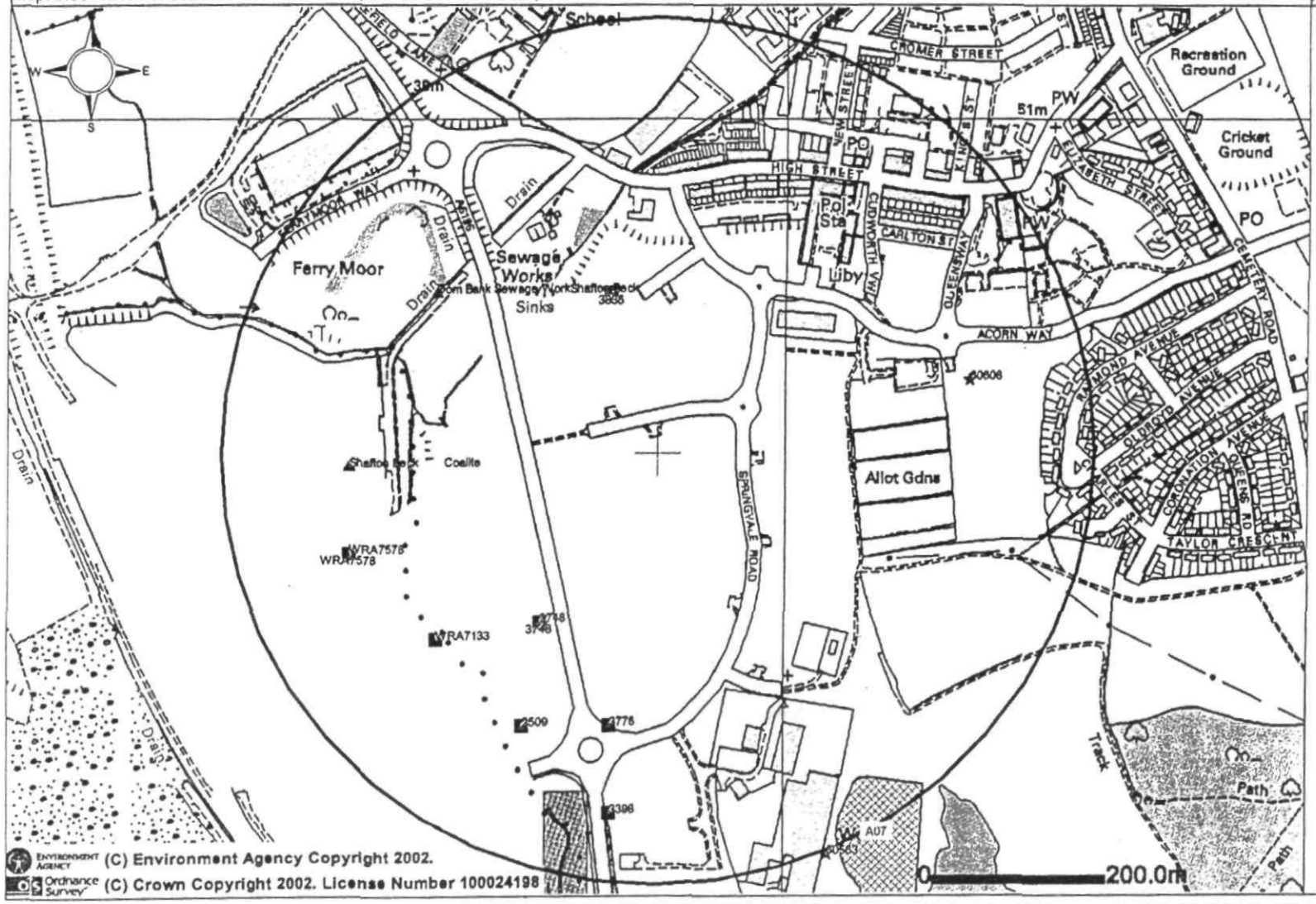
www.environment-agency.gov.uk/floodline

Other organisations that also hold relevant information are referred to where appropriate in this report.

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Map: 0.50 km radial search around LAND AT, SPRINGVALE ROAD, GRIMETHORPE

X: 440854 Y: 408615




- General Quality Assessment Chemistry
- Main Rivers
- Abstraction Area Licence
- Abstraction Line Licence
- Abstraction Point Licence
- Discharge Consents
- Radioactive Substances
- Regulated Industrial Processes
- Landfill
- Waste Management Licences
- Indicative Flood Plains

| Question | Answer | Comments |
|---|---|---|
| **1. Is the property on or within 500 metres of a floodplain as indicated on the Agency's Indicative Floodplain maps?** | Yes | **What is a floodplain?**<br><br>A floodplain is the natural overspill area when a river rises above its banks, or when high tides or stormy seas cause low-lying coastal areas to flood.<br><br>**What is the likelihood of flooding?**<br><br>Being in a floodplain does not mean that a home or business will be flooded. Flood forecasting is not an exact science and our maps only give an indication of the areas at risk. They indicate the extent of flooding for a one in one hundred (1%) chance of flooding each year from a river, and a one in two hundred (0.5%) chance of flooding each year from the sea and tidal estuaries, or the highest known flood level. Our maps are periodically revised to incorporate up-to-date information.<br><br>Our maps do not take account of flood defences, which protect many areas; flood defences do not remove the risk of flooding but they do reduce it. They are built to withstand a certain level of flood but can fail in extreme weather conditions. Defences are built according to local needs.<br><br>If your home or business is in or at the edge of a floodplain, you should be aware of the warning system and know how to prepare for flooding. Call our Floodline (0845 988 1188) to receive a free pack on what to do before, during and after a flood and for information about the flood warning service. |
| **2. Is there an Agency waste management licence in force for operation of a landfill site, waste treatment centre, waste transfer station or similar waste disposal facility on or within 500 metres of the property?** | Yes | Under the Environment Protection Act 1990, the Environment Agency regulates the storage and treatment of waste to make sure that waste disposal operations do not pollute the environment or endanger human health. Anyone involved in waste disposal must be licensed by the Agency to do so. Those not adhering to the conditions of their licence are liable to prosecution. New occupiers of licensed properties must ensure that the licence is transferred before undertaking any of the licensed activities. |
| **3. Does the property lie within 500 metres of a currently licensed landfill site boundary?** | Yes | **What is a landfill site?**<br><br>A landfill site is a place where waste is taken and compacted. Most landfill sites take just earth, soil and construction and demolition waste. Some are licensed to accept household, industrial and commercial waste, and a small number are licensed to accept "special" waste, such as corrosive materials. Landfills which take both household, industrial and commercial and special waste are called co-disposal sites. When they are full of waste, landfill sites are capped, covered with earth and the land put back into use.<br><br>**Are landfills polluting?** |

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| | | |
|---|---|---|
| | | Most landfills take only inert or building wastes and have no effect on the environment. Sites that take biodegradable waste produce a flammable gas ("methane") - which may also contribute to climate change and a liquid ("leachate") which has the potential to pollute rivers and groundwater. Such pollution can be prevented by careful siting and engineering. This may include lining the base of the site, installing pumps and systems to deal with any leachate and systems to collect and burn any landfill gas produced.<br><br>**Can landfills cause other problems?**<br><br>Waste is usually delivered to landfills by lorries. Heavy earth-moving equipment also works on site. Nuisance can arise from excessive noise from the site plant, dust thrown up by vehicles crossing the site, odours from decomposing waste, litter blowing off the site and large numbers of birds (mainly gulls) or flies.<br><br>However, the Environment Agency issues licences to control site operations and carries out regular site inspections to ensure that nuisance is kept to a minimum. |
| **4. Is there an Agency authorisation or permit in force for the operation of an industrial process on or within 500 metres of the property?** | **No** | Under the Environment Protection Act 1990 and the Pollution Prevention and Control Act 1999 (and regulations), the Environment Agency has a duty to protect the environment from pollution from certain prescribed industrial processes. Industries which present the greatest risk to the environment are subject to systems of control by which the Agency authorises certain processes or permits certain installations to minimise the harmful effects of substances released into the environment.<br><br>It is a criminal offence to carry out any of these processes or operate such installations except under and in accordance with an authorisation or permit. |
| **5. Is there an Agency registration to hold radioactive materials (on premises or for mobile plant) or authorisation for disposal or accumulation of radioactive waste in force on or within 500 metres of the property?** | **No** | Radioactive material arises in connection with the generation of electricity from nuclear power, but also from medicine, research and other industries which make use of them.<br><br>Under the Radioactive Substances Act 1993, the Agency registers radioactive sources and issues authorisations to regulate how radioactive waste is disposed of from nuclear sites, hospitals and other establishments.<br><br>There is a natural background radioactivity to which we are all exposed. Exposure from nuclear facilities is less than 0.1% of average exposure and is well within the recommended safety limit. |
| **6. Is there an Agency consent in force to discharge effluent from this property or within 500 metres of the property?** | **Yes** | The Environment Agency has a duty to protect controlled waters from pollution. Controlled waters include watercourses, lakes, canals, coastal waters and groundwater. |

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| | | |
|---|---|---|
| | | The formal consent of the Agency is required for many discharges into controlled waters. Exceptions currently include some discharges of small volumes of sewage effluent from septic tank soakaways in areas where there is a low risk to groundwater.<br><br>Where a consent has been issued, this can be transferred. To do this, the new holder must inform the Agency within 21 days of the change.<br><br>If you are in any doubt about whether a discharge from a property or premise requires consent, please contact us. |
| **7. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (point licence):** | **No** | Questions 7, 8 and 9 all relate to similar information. At the moment, the Environment Agency holds these different types of licences as different "layers" of information. Until we further develop our systems, we have to some extent duplicate our answers in this report to ensure you receive the fullest information possible.<br><br>Point licences allow abstraction only at a point specified on the licence.<br><br>Under the Water Resources Act 1991, the Environment Agency is required to keep a sustainable balance between how we use water and the effect that such use might have on river and wetland habitats.<br><br>People wishing to abstract water from the watercourse or to in any way obstruct it (dam, weir, culvert) must have a licence issued by the Environment Agency to do so. Interfering with the watercourse in any way without a licence risks prosecution. Please contact us for further advice. |
| **8. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (linear licence):** | **No** | Linear licences allow abstraction along a line specified on the licence. |
| **9. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (area licence):** | **No** | Area licences allow abstraction within an area specified on the licence. |
| **10. Is any watercourse on, abutting, or within 500 metres of the property designated as a main river?** | **No** | **What is a "main river"?**<br><br>Main river refers to specific watercourses upon which the Environment Agency is directly empowered to act. The Agency also has a duty to supervise all matters relating to flood defences. As the Agency's records are limited primarily to main rivers, there may be a watercourse of a different category on or abutting this property. If so, the following notes apply.<br><br>In the absence of any express agreement to the contrary, any responsibilities for maintenance or repair |

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of the watercourse and any structure affecting the channel rests with the riparian owner (the owner of land adjoining any watercourse). The local authority has certain statutory powers to carry out maintenance or repairs but it does not have to do so.

**Internal Drainage Boards**

In some areas streams may come under the jurisdiction of Internal Drainage Boards. They have to give written consent to certain work in, over or under the channel of the watercourse, or on the banks, or within the distance from the channel specified in the byelaws. They have a statutory power to carry out maintenance and repairs but are not under any duty to do so.

**Land Drainage Act 1991**

This Act protects the flow of all watercourses. The written consent of the Agency (or if applicable, the Internal Drainage Board) is needed for the construction or alteration of any weir, dam, culvert, or the construction of anything within the channel which may interfere with or obstruct the flow in any way.

Further details are available in the Agency booklet "Living On The Edge" which is available free, together with the relevant flood defence Byelaws for your location, from your local Agency office.

**11. Is there information on the designated quality of any watercourse on, abutting, or within 500 metres of the property as defined by the Agency's Chemistry General Quality Assessment?**

Yes

**The Scheme**

The General Quality Assessment (GQA) scheme provides a national method for measuring water quality in rivers and canals. It enables the Agency, and others, to assess and monitor the state of water quality. The chemical GQA relates to the most common types of organic pollution from sewage treatment works, agriculture and industry.

Each length of river is given a grade:

A: very good, B: good, C: fairly good, D: fair, E: poor, F: bad

For more detail, go to

www.environment-agency.gov.uk/riverquality

**12. Is the property situated within a Groundwater Source Protection Zone as defined by the Agency?**

No

**What is groundwater?**

Groundwater is the water stored in underground rocks and strata. It provides one-third of all our drinking water and maintains the flow in many of our rivers. It is often an extremely high quality source of water but is very vulnerable to pollution - leaks of oil, fuel or chemicals on the soil may seep into groundwater and cause pollution which is extremely expensive or impossible to clean up.

**Source Protection Zones (SPZs)**

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| | | |
|---|---|---|
| | | These zones identify areas of concern around water wells and springs used for public drinking water supply. Based on the time of travel for any pollutant entering the groundwater to reach the water well they provide a basis for protecting our drinking water. |
| **13. Is there information about groundwater vulnerability in the area of the property?** | **Yes** | Groundwater vulnerability maps provide an indication of the ease with which groundwater in a particular area could become polluted by contaminants spilt on the surface of the ground.<br><br>The maps are an aid to allowing better informed judgements on the location of new developments, avoiding potentially polluting activities in high vulnerability areas, while giving greater leeway for development in low vulnerability areas.<br><br>These maps cover the whole of England and Wales and are therefore at a small scale (1:100,000). Therefore, any project with a potential impact on ground or surface water will require site specific investigations to ascertain its acceptability or otherwise. |

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## Detailed Information

This section gives specific details of the answers given in Section 1. The databases from which the results are drawn are also listed here. To find out more about any of the specifics shown on this report, please contact the Environment Agency, quoting the appropriate references as shown in the results tables.

**1. Is the property on or within 500 metres of a floodplain as indicated on the Agency`s Indicative Floodplain maps?**

Yes

| Record | Floodplain Type |
|---|---|
| | Fluvial |

Source database: SDE.INDICATIVE_FLOOD_MERGED_10K

Date compiled: July 2004

Explanation of floodplain type: Fluvial — No further information available

**2. Is there an Agency waste management licence in force for operation of a landfill site, waste treatment centre, waste transfer station or similar waste disposal facility on or within 500 metres of the property?**

Yes

| Record | Address | Site Type | Reference Number |
|---|---|---|---|
| | Cudworth View<br>Grimethorpe<br>Barnsley<br>S Yorks | Household, commercial and industrial transfer stations | 60608 |

Source database: SDE.REGIS

Date compiled: July 2004

Explanation of site type: Household, commercial and industrial transfer stations — Sites licensed to accept any controlled waste, other than purely non-biodegradable wastes and special wastes, for the transfer between modes of transport and/or bulking up. This may include some form of treatment, such as compaction, provided that they are solely for the purposes of improving payload.

**3. Does the property lie within 500 metres of a currently licensed landfill site boundary?**

Yes

| Record | Address | Type |
|---|---|---|
| | Carlton Main Brickworks Ltd<br>Off Wood Lane<br>Grimethorpe<br>Barnsley | Industrial waste landfills (factory curtlidge) |

Source database: SDE.LANDFILL_010K

Date compiled: July 2004

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| | | |
|---|---|---|
| Explanation of type: | Industrial waste landfills (factory curtlidge) | Landfill sites within the curtlidge of industrial premises licensed to accept only waste arising from those premises and any non-biodegradable wastes from external sources used as cover materials. |

**4. Is there an Agency authorisation or permit in force for the operation of an industrial process on or within 500 metres of the property?**

No

Source database: SDE.IPC_NA_

Date compiled: July 2004

**5. Is there an Agency registration to hold radioactive materials (on premises or for mobile plant) or authorisation for disposal or accumulation of radioactive waste in force on or within 500 metres of the property?**

No

Source database: SDE.RAS_NA_

Date compiled: July 2004

**6. Is there an Agency consent in force to discharge effluent from this property or within 500 metres of the property?**

Yes

| Record | Address | Type | Consent Number |
|---|---|---|---|
| ■ | FERRY MOOR RECLA<br>ENGINE LANE<br>GRIMETHORPE<br>BARNSLEY | Coal Extraction, Surface | WRA7578 |
| ■ | FERRY MOOR RECLA<br>ENGINE LANE<br>GRIMETHORPE<br>BARNSLEY | Coal Extraction, Surface | WRA7578 |
| ■ | FERRY MOOR RECLA<br>ENGINE LANE<br>GRIMETHORPE<br>BARNSLEY | Coal Extraction, Surface | WRA7578 |
| ■ | GRIMETHORPE COLL<br>BARNSLEY<br>SOUTH YORKSHIRE | Undefined or Other | 3776 |
| ■ | GRIMETHORPE SPS<br>BRIERLEY<br>BARNSLEY | Undefined or Other | 3836 |
| ■ | GRIMETHORPE COAL<br>LC.-COKE STOCKING YARD<br>SITE DRAI<br>NAGE | Undefined or Other | 2509 |
| ■ | GRIMETHORPE POWE<br>GRIMETHORPE<br>BARNSLEY<br>SOUTH YORKSHIRE | Undefined or Other | 3398 |
| ■ | GRIMETHORPE COLL | Undefined or Other | 3385 |

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| | | | |
|---|---|---|---|
| | GRIMETHORPE<br>BARNSLEY | | |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3748 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3749 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | C3369 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3749 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3748 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3748 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3748 |
| ■ | GRIMETHORPE COLL<br>GRIMETHORPE<br>BARNSLEY | Undefined or Other | 3748 |
| ■ | COALITE WORKS<br>GRIMETHORPE<br>BARNSLEY<br>SOUTH YORKSHIRE | Undefined or Other | WRA7133 |

Source database: SDE.DISCHARGE_CONSENTS_NA_

Date compiled: July 2004

**7. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (point licence):**

No

Source database: SDE.NALD_POINT_NA_

Date compiled: July 2004

**8. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (linear licence):**

No

Source database: SDE.NALD_REACH

Date compiled: July 2004

**9. Is there an Agency water abstraction licence in force for the property, or within 500 metres of the property? (area licence):**

No

Source database: SDE.NALD_AREA

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Date compiled: July 2004

**10. Is any watercourse on, abutting, or within 500 metres of the property designated as a main river?**

No

Source database: SDE.INDIC_MAINRIVERS_FLOOD_10K

Date compiled: July 2004

**11. Is there information on the designated quality of any watercourse on, abutting, or within 500 metres of the property as defined by the Agency`s Chemistry General Quality Assessment?**

Yes

| Record | River Stretch | Grade |
|---|---|---|
| ▲ | Shafton Beck Coalite | Poor |
| ▲ | Tom Bank Sewage WorkShafton Beck | Fair |

Source database: SDE.GQA_CHEMISTRY_POINTS

Date compiled: July 2004

| | | |
|---|---|---|
| Explanation of grade: | Poor | Impoverished ecosystems, fish vulnerable to pollution |
| | Fair | Impacted ecosystems |

**12. Is the property situated within a Groundwater Source Protection Zone as defined by the Agency?**

No

Source database: SDE.SPZ_50K

Date compiled: July 2004

**13. Is there information about groundwater vulnerability in the area of the property?**

Yes

| Record | Vulnerability Class |
|---|---|
| | Minor Aquifer High |
| | Minor Aquifer Low |

Source database: SDE.GWV_100K

Date compiled: July 2004

| | | |
|---|---|---|
| Explanation of vulnerability: | Minor Aquifer High | These can be fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although these aquifers will seldom produce large quantities of water for abstraction, they are important both for local supplies and in supplying base flow to rivers. |
| | Minor Aquifer Low | These can be fractured or potentially fractured rocks which do not have a high |

primary permeability, or other formations of variable permeability including unconsolidated deposits. Although these aquifers will seldom produce large quantities of water for abstraction, they are important both for local supplies and in supplying base flow to rivers.

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## Background Notes and Conditions

1. Reference to "the Agency" is intended to include reference (where appropriate) to any predecessor body. However the Agency cannot warrant the completeness or accuracy of information deriving from predecessor authorities.

2. Applicants should note that some information held by the Agency in records before 1st September 1989 may be incomplete. Applicants are advised to pay particular attention to replies provided by the Agency where specific mention of difficulties with its records is highlighted.

3. All intellectual property rights in the replies supplied to you (Data) whether owned by the Agency (Agency Data) or third parties (Third Party Data) will continue to be owned by the respective parties.

4. The Data has not been prepared to meet your or anyone else's individual requirements and it is therefore your responsibility to ensure that the Data meet your needs. In particular you should note that the search includes only environmental information that the Agency possesses that is readily available. You should make your own checks to see if other information might be needed from the Agency by a separate request and to see if other environmental information not available from the Agency is needed.

5. The replies are furnished after appropriate searches of our databases and are believed to be in accordance with the information at present available to the Agency. Except where it is established that the Agency has acted negligently, all liability whether based in contact or in tort is excluded. Any liability for negligence by the Agency is limited to the person by or on whose behalf these enquiries are made.

6. This search is carried out in respect of the address, postcode or grid reference supplied by the Applicant and the Agency can accept no responsibility for search later indicated to be for the wrong location if the error was in the information supplied to it.

7. Nothing in these notes will in any way restrict your statutory or any other rights of access to the Data.

8. Your right to use agency data supplied in response to this search:

a) You may use Agency Data for your own private use or for use including copying within your business without restriction (it should be noted that this paragraph does not give you the right to pass the data to others - but see paragraghs b) and c) below.

b) If you are a professional adviser you may give a single copy to your client provided that you also attach a copy of these notes and conditions. Recipients should also be advised that they must comply with them.

c) If you wish to use Agency Data in any way other than as set out above (including in particular for commercial gain, for example by way of rental, licence, sale or providing services for consideration) you should contact us with details of what you are proposing to do, UNLESS we have already indicated to you that your proposed use is agreed OR you are satisfied that such use would not infringe our intellectual property rights.

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# Site Investigation Report

## Grimethorpe

## William Saunders Partnership

**Report Number 301003**

**November 2003**


Solmek/Hymas GeoEnvironmental Ltd

*12 Yarm Road*

*Stockton on Tees*

Tel: 01642 607 083

Fax: 01642 612 315

Email south@solmek.com

**www.solmek.com**



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PARTNERSHIP LIMITED

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| ID Ref. | | |

# Site Investigation Report

## Grimethorpe, South Yorkshire

Contract Number: 301003
Date: November 2003

**SECTION**


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| 2.0 | Site Description | 3 |
| 3.0 | Geology Groundwater and Surface water | 3 |
| 4.0 | Fieldwork | 3 |
| 5.0 | Ground Encountered | 4 |
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**APPENDICES**


| | |
|---|---|
| 1 | Drawings |
| 2 | Trial Pit and Borehole Logs |
| 3 | Test Results |
| 4 | Notes on Limitations |


| Status | Prepared by | Checked | Date |
|---|---|---|---|
| Final | P Muir | G R Dresser | November 2003 |
| | | | |
| | | | |

# Site Investigation Report

# Grimethorpe, South Yorkshire

## 1 INTRODUCTION

1.1 This report describes the ground investigation carried out by Solmek/Hymas GeoEnvironmental Ltd on a site located off Springvale Road, Grimethorpe, South Yorkshire on the site of the former Grimethorpe Colliery. The work was carried out to the instructions of William Saunders Partnership on behalf of Priority Sites Ltd.

1.2 The objectives of the investigation were to investigate shallow ground conditions at the site, and specifically undertake a series of boreholes and trial pits with a view to providing preliminary information on near surface geotechnical and contamination conditions in order to facilitate foundation design for a proposed single storey industrial development.

1.3 Samples obtained from the boreholes and trial pits were subjected to a programme of laboratory geotechnical and contamination testing. This preliminary report is based on an assessment of the resulting information.

1.4 The fieldwork and testing was generally carried out according to the recommendations of BS5930: 1999 "Code of Practice for Site Investigations" and all stratum descriptions are as recommended in that publication. Testing in the geotechnical laboratory was carried out to BS1377: 1990 "Methods of Test for Soils for Civil Engineering Purposes".

1.5 The results and interpretation provided in this report are based on the investigation fieldwork and laboratory testing, and are subject to the comments and approval of the various regulatory authorities and utilities.

## 2 SITE DESCRIPTION

2.1 The site comprises a rectangular shaped plot of land situated between Springvale Road and Park Spring Road to the west of Grimethorpe town centre. The site has an approximate elevation in the order of 45m OD and an area of approximately 10500m$^2$ and is centred on OS Grid Reference 440830E, 408560N.

2.2 Access to the site is off Spring Vale road. The site is bounded by roads to the east and west, industrial buildings / offices to the south and scrubland to the north. The site is generally flat with a thin cover of scrub vegetation and varying amounts of brick rubble, coal and burnt shale were noted on the ground surface. An electricity sub station is located in the south east corner of the site.

## 3 GEOLOGY, GROUNDWATER & SURFACE WATER

*Geology*

3.1 Inspection of the published geology map sheet 87 (Barnsley) indicates that the site is underlain by Recent alluvium deposits.

3.2 The solid geology beneath the site comprises the Middle Coal Measures and more notably the Brierley Coal Seam. Two faults are located close to the site; the first is located to the north of the site trending east / west. The second is located to the south of the site trending north west / south east.

## 4 FIELDWORK

4.1 Eight trial pits were excavated on the 6$^{th}$ October 2003. The pits were excavated using a back mounted JCB. The trial pits were entered where safe to do so to allow an in situ inspection of the strata profiles and sampling where appropriate. At greater depth, strata were described from materials contained in the excavator bucket. Logging was carried out by an engineering geologist during siteworks, and samples taken for geotechnical and contamination analysis. Trial pits were sunk to a maximum depth of 3.20 metres below ground level.

4.2 Four boreholes (BH1, 2, 2A and 3) were drilled between 6th and the 8th October 2003. Undisturbed 100mm diameter samples were recovered from cohesive deposits and these samples together with representative disturbed samples were transported to a laboratory for examination and testing. Standard Penetration Tests were undertaken within both granular and cohesive deposits.

4.3 Descriptions of the strata encountered in the trial pits and boreholes together with details of sampling, groundwater and stability are presented in Appendix 2 of this report. A plan showing the approximate location of the trial pits can be found in Appendix 1.

## 5 GROUND ENCOUNTERED

*Made Ground*

5.1 The made ground generally consisted of slightly clayey silty sandy gravel of brick and occasional fragments of coal and burnt shale. This was underlain by a black sandy gravel of ash and coal with occasional burnt shale in three trial pits (TP's1, 3 and 5) and boreholes 1 and 2. Within trial pits 2, 4, 6 and 7 and borehole 3 the initial made ground layer was underlain by a yellowish brown occasionally clayey sandy gravel, with variable amounts of burnt shale, coal and sandstone cobbles / boulders.

5.2 The depth of the made ground was proven in all three of the boreholes and trial pit 5 to a depth of between 2.80m and 4.25m.

*Clay*

5.3 Natural clay was encountered in boreholes 1 and 2a and trial pit 5. (Borehole 3 encountered weathered mudstone directly underlying the made ground)

5.4 The clay comprised a firm and stiff yellowish brown mottled green slightly sandy clay. The firm clay extended from the base of the made ground to a depth in the order of between 3.75 and 3.20m bgl where a weathered mudstone was encountered.

*Rockhead*

5.5 Weathered mudstone was encountered in boreholes 1, 2a and 3 and extended to a maximum depth of 7.00m bgl in BH3 to where the borehole was terminated.

5.6 Weathered sandstone was encountered in BH2a between 4.60m and 6.50m bgl where the borehole was terminated.

## 6 CONTAMINATION ANALYSIS & RESULTS

6.1 To provide information upon the possibility of residual contamination, 10 samples were submitted for analysis. Soil samples were tested for a range of potential contaminants, based on Guidance Note 59/83 published by the UK Interdepartmental Committee for the Redevelopment of Contaminated Land (ICRCL) and CLEA based parameters listed by the Environment Agency.

6.2 Heavy metals were low, with arsenic levels all below 20 mg/kg, and both cadmium and mercury below the level of detection. Lead ranged from 19 to 45 mg/kg, and was not of concern. Group B heavy metals such as copper, nickel and zinc were present at variable but low concentrations. Boron results were low.

6.3 Samples underwent testing for total hydrocarbons (TPH). All results were below the threshold of 1000mg/kg. A sample taken from Trial Pit 1 produced a slightly raised value of 523 mg/kg, well below 1000 mg/kg. Phenols were not detected and cyanide were all below the limit of detection.

6.4 Fours samples underwent asbestos screening but no fibres were present.

6.5 PAH analysis performed on three selected samples indicated levels below detectable limits. Electrical conductivity performed on two samples recorded results ranging from 2.45 to 2.60 mS/cm. Available copper, nickel and zinc values were low in two selected samples. Alkalinity values as defined by calcium carbonate were below detectable limits.

6.6 Pyritic sulphur ranged form 0.17% to 0.46% in two samples tested. Floats and sinks analysis ranged from 3.9% to 11.3% floats in two samples. The results indicate some degree of possible combustible material such as coal present.

6.7 Three samples were selected for leachate analysis. All metal results were below the relevant threshold values. Boron was below the level of detection. The remaining values were low suggesting the determinants are not in a mobile form.

6.8 Two samples were tested for phosphorus, potassium and magnesium. The maximum values were as follows; phosphorus 11mg/l, potassium 1443mg/l, magnesium 442mg/l.

6.9 A water sample obtained from borehole 3 was subject to analysis. The results indicated relatively low levels within the majority of the determinands, suggesting little in the way of migration of contamination.

## 7 CONTAMINATION GUIDELINES

7.1 There are various guidelines which relate to contamination of water, soils and gas in the UK.

7.2 The CLEA values provide the most recent and appropriate guidance on soil contamination that applies to the UK. These give soil guideline values (SGV) at which a risk to human health may exist and are primarily intended as a guide to site redevelopment. Values are given for different land uses; these include residential gardens and commercial areas where the risks are less. ICRCL threshold values are used where no SGV are available. A list of the SGV for commercial and domestic land use is provided.

| Parameter | SGV – Domestic | SGV- Commercial |
|---|---|---|
| Arsenic | 20 | 500 |
| Cadmium | 1 to 8 (ph dependent) | 1400 |
| Chromium | 130 | 5000 |
| Lead | 450 | 750 |
| Mercury | 8 | 480 |
| Nickel | 50 | 5000 |
| Selenium | 35 | 8000 |

7.3 These figures need to be compared with the modified average given in the Environment Agency document CLR7 "*Assessment of risks to human health from land contamination. An overview of the development of soil guideline values and related research*".

7.4 There are various guidelines employed for assessing water quality. There are some UK guidelines which are derived from EC Regulations. In addition, Dutch ground water quality thresholds are commonly referred to due to their ease of use and the stringent nature of the need for ground water quality control in a country which is low lying. Other

information and guidelines used are taken from waste management and are termed leachate quality thresholds. However, some professional judgement and modelling may be required where the contamination is in close proximity to a sensitive receptor such as a lake, river or aquifer.

## 8 CONTAMINATION, DEVELOPMENT AND LIABILITIES

*Requirements of parties within the Development process*

8.1 Interested parties involved in the development process may use the data in different ways and there may be varying views and interpretation of the factual data. Local Authority staff may have a view on contamination and human health and the wider environment. The Environment Agency are concerned principally with the protection of surface and groundwater. Building Insurers, funders and purchasers may be primarily concerned with issues of potential commercial blight. Purchasers are also not always fully informed, and perceptions on issues associated with risk can affect the decision to purchase. Developers and construction organisations will focus on financial aspects of dealing with the contamination in the context of the development and construction programme.

*Risks & liabilities from Contamination*

8.2 In simple terms, risks associated with contamination may be considered in terms of 1) statutory risks and 2) development related risks. If contamination is severe or forms a potential hazard based on its potential to affect groundwater, surface water or human health, a statutory risk may be present, and as such, if the risk is not reduced, criminal proceedings may be instigated by a government body or local authority.

8.3 If the contamination is less severe or not considered to be mobile, it may be considered a commercial liability which could, in theory remain untreated, but which may at a later date affect the value of the property, or, with changing legislation, become a statutory risk. Commercial liabilities could give rise to civil proceedings by third parties if the there are grounds for action.

## 9 CONTAMINATION ASSESSMENT

*Proposed land use*

9.1 The site is expected to be developed for commercial land use. The ground will be covered over by buildings, landscaping and hard surfacing. The SGV has, therefore, been used above and where applicable ICRCL threshold values for open spaces.

*Construction Workers*

9.2 It is not considered that contamination resulting in significant harm will be encountered, although pockets of ash and coal may be encountered. The levels of heavy metals are not sufficiently high in our opinion to pose a potential hazard to workers or the public at large.

*Residents*

9.3 The site is situated on the outskirts of the town and has previously been occupied by the colliery. While some variability in ground conditions may be experienced, it is unlikely that there may be pockets of significant contamination. It is most unlikely that residents or workers will be exposed to contaminants in the ground once the development is complete. However screening out of ash, burnt shale and wood together with other undesirable materials in the made ground will be required.

*Gardens and plants*

9.4 There is very little topsoil and subsoil on site. Therefore the importing of topsoil for the landscaped areas may be required.

*Building Materials and underground Services*

9.5 Acid ground conditions and contamination from petroleum based products will accelerate corrosion. Consultation should be made with the utilities to ensure that services are suitably protected from potentially aggressive conditions. However, this investigation has indicated that the site is not aggressive, and no special measures are anticipated other than removal of any old asphalt, bitumen or any other unsuitable material. All services should be placed within excavations within a clean inert material in order to minimise to potential for spontaneous combustion.

*Risk Assessment*

9.6 Based on the concentrations of compounds identified by the ground investigation, a qualitative risk assessment has been undertaken. The risk sources, pathways and targets have been identified, with an assessment of the risks to the health of workers and public at the site has been carried out. Based on the information obtained from this investigation, the environmental risk assessment (Table 1) has been produced.

9.7 Based on the history and this investigation, the site is unlikely to be identified as potentially contaminated under the Section 57 Environmental Legislation.

| ENVIRONMENTAL RISK ASSESSMENT | | | |
|---|---|---|---|
| **ISSUE** | **RISK CATEGORY** | **FACTORS** | **MITIGATION** |
| Contamination site Profile: | Low/Medium | Remediated former colliery | |
| Presence of significant on-site contamination | Low | Testing produced no evidence of serious contamination | |
| Potential for contaminants migrating off the site | Low | Underlying fill soils will be permeable, however results suggests the contamination is in a relatively immobile form. | |
| Potential for contaminants migrating onto the site | Low | Assuming similar clean up levels similar contamination profile anticipates. | |
| Potential for 'other' ground related environmental issues to give rise to liabilities | Low | Made ground | Unsuitable Made ground to be removed offsite. |
| OVERALL RISK | **LOW** | | |

**TABLE 1: CONTAMINATION RISK ASSESSMENT**

## 10 GEOTECHNICAL TESTING & RESULTS

10.1 Triaxial testing was undertaken on two samples taken from the clay. The results were 89 $kN/m^2$ (BH1, depth 3.0m) and 81$kN/m^2$ (BH2A, depth 3.0m). Both results indicate a stiff clay.

10.2 Results of the two Atterberg Limit tests have shown the cohesive materials to generally be clay of variable plasticity ranging from low to high plasticity according to the Plasticity Chart published in BS5930. Moisture contents within the clay varied between 19 and 24%. The clay can be regarded as having a low to medium shrinkage potential in accordance with NHBC guidance.

10.3 Fifteen samples were selected for Particle Size Distribution (PSD) testing. The results suggest a predominantly granular material typically comprising a sandy gravel with cobbles. A significant fines content has also been recorded within the samples with a fines content of 20% regarded as typical, however a fines content range of less than 10% to 32% has been recorded within the granular material. Some clay fill has also been recorded with a fines content in excess of 60%.

10.4 Five samples were selected for compaction testing. The optimum dry density ranges from 1.78 to 1.95$Mg/m^3$ with the optimum moisture content ranging from 11 to 14%. The natural moisture varied from 13 to 19%.

10.5 The results of the geotechnical laboratory testing are summarised in Appendix 3.

10.6 A series of in-situ penetration tests were undertaken during boring within the fill to establish the relative densities of the fill. This information is presented in Table 2. The results indicate the made ground to be medium dense to dense, based on the 'N' values.

| Borehole Number | Depth(m) | ***Stratum Description*** | Average SPT Value obtained | BS 5930 : 1981 Clause 41.2.5 Classification |
|---|---|---|---|---|
| 1 | 1.0-1.45 | Clay fill with slag gravel | 23 | Medium Dense |
| 1 | 2.0-2.45 | Clayey ash and shale fill | 12 | Medium Dense |
| 1 | 5.0-5.50 | Mudstone | 55 | Very stiff/very weak |
| 1 | 6.0-6.45 | Mudstone | 91 | Very weak |
| 2 | 1.0-1.05 | Colliery waste | 50/50mm | Obstruction |
| 2a | 1.0-1.45 | Colliery waste and brick fill | 50+ | Obstruction/chiselled |
| 2 | 5.0-5.45 | Sandstone | 55 | Very weak |
| 2 | 6.0-6.45 | Sandstone | 85/225mm | Very weak |
| 3 | 1.0-1.45 | Colliery waste | 24 | Medium dense |
| 2 | 2.0-2.45 | Colliery waste and slag | 24 | Medium Dense |
| 3 | 3.0-3.45 | Colliery waste and slag | 24 | Medium Dense |
| 3 | 4.0-4.45 | Colliery waste and slag | 30 | Dense |
| 3 | 5.0-5.45 | Mudstone/shale | 68 | Very weak |
| 3 | 6.5-6.85 | Mudstone | 75/105mm | Weak to moderately weak |

**Table 2:** *Results from In situ Penetration Tests (SPT's)*

## 11 GEOTECHNICAL ASSESSMENT

*Foundations*

11.1 Based on the information provided by the developer single/two storey commercial buildings/industrial units is planned. It is considered that the structural loads will be light.

11.2 There is approximately 3.00 metres of fill and a further 0 – 1.50 metres of firm and stiff natural soils underlying the site, although the clay has been proven to be occasionally absent. However, BH3 did not encounter natural soils prior to the weathered mudstone, and trial pits 1,2,3,4 and 8 encountered made ground to a depth of 3.20 where the pits were terminated. This suggests that the overall depth of the made ground is variable.

11.3 The SPT 'N' values indicate the made ground is predominantly medium dense to dense. The earthworks operation comprised the excavation and recompaction of material under the supervision of Carl Bro. The backfill conformed to either Class 1A or Class 2C. This investigation suggests that Class 2 C appears to be the predominant backfill material. The material was compacted using a towed vibrating or smooth wheeled roller. The results of the Carl bro report indicate the compacted endfill meets the requirements of the end product specification with the report stating that the made ground has been engineered to provide an allowable bearing pressure of 75kN/m² in

accordance with the remediation proposals. There was little evidence of significant amounts of degradable material apart from small areas, locally present. Although recent compaction tests results have indicated some variability in the optimum dry density the Carl Bros validation report indicates that settlements associated with plate bearing tests at 80kN/m² ranged from 0.1mm to 7mm. In addition the zone loading test which comprises a much larger area of $4m^2$ and the a greater zone of influence recorded settlements at a maximum of 11.9mm for twice the design load.

11.4 The incorporation of a geogrid within a 500m layer of recompacted stone would limit the effects of possible differential settlement associated with foundations placed spanning across shallow made ground and deeper deposits of made ground. In addition it would also stiffen the ground and limit the differential effects of creep settlement. There was little evidence of significant amounts of degradable material apart from small areas of locally present.

11.5 Alternatively, consideration maybe given to piling or a raft / pseudo raft foundation. The results of this investigation should be passed onto a suitably competent contractor for design.

11.6 Old foundations, services, blocks of demolition rubble and other obstructions which could give rise to differential settlement and cause problems should be removed from beneath the building footprints

11.7 Prior to placing any foundation concrete all exposed formations should be well compacted and any obvious soft spots should be removed and replaced with hardcore. Further, all excavations should be inspected to ensure that they fully penetrate any areas of disturbed ground.

*Excavations*

11.8 From the evidence of the investigation, shallow excavations should be easily achieved by means of a normal excavator. Stability of excavations is considered to be good in the short term but shoring may be required if foundations are required to be left open. Excavation sides should be designed, constructed and supported in accordance with the recommendations given in CIRIA Report No. 97 should suffice

11.9 It should be recognised, that clay formations could deteriorate fairly rapidly on exposure, particularly in periods of wet weather and frost. It would be prudent to

protect all exposed formations with a blinding layer, particularly if they are likely to remain open for any extended period of time.

*Concrete Design*

11.10 Results of the investigation indicate a Class AC-1s should be adopted. However in view of the possibility of further oxidation of total sulphur it would be prudent to increase the classification to a AC-2s.

*Reuse of Fill*

11.11 The laboratory results reflected the varying characteristics of the ground with the majority of the material falling within a Class 2C. However this based on materials of 125mm and above being screened from the fill or crushed. The trial pits indicate that the majority of the material appears to meet the criteria, although some material in excess of the DTP specification is likely.

## 12 SOIL GAS ASSESSMENT

12.1 Preliminary soil gas monitoring surveys were undertaken on the site on three occasions.

12.2 The lowest pressure was recorded at 982 millibars. A maximum of 0.1% volume carbon dioxide was encountered during the survey. All locations produced carbon dioxide ranging from 0% to 0.1% volume. Methane was encountered within BH's 1 and 2 at levels between 0.1 and 0.3. Oxygen levels ranged from 3.5 – 20.8. The complete results are listed in the table below.

| Borehole | Date | $O_2$ | $CH_4$ | $CO_2$ |
|---|---|---|---|---|
| 1 | 13/10/03 | 20.7 | 0 | 0 |
| | 24/10/03 | 13.9 | 0 | 0 |
| | 30/10/03 | 16.2 | 0 | 0.1 |
| 2 | 13/10/03 | 16.3 | 0.3 | 0 |
| | 24/10/03 | 15.5 | 0 | 0.1 |
| | 30/10/03 | 0.6 | 0 | 0 |
| 3 | 13/10/03 | 14.8 | 0.2 | 0.1 |
| | 24/10/03 | 20.0 | 0.1 | 0.0 |
| | 30/10/03 | 3.5 | 0.1 | 0 |

**Table 3**: Gas *Results*

12.3 The lower explosive limit for methane is 5%. The results obtained have been compared with relevant guidance that includes the following:

a) The Building Regulations 1991, Approved Document C, Section 2;
b) Protecting Development From Methane, CIRIA Report 149, 1995;
c) Landfill Gas, Waste Management Paper Number 27;
d) Construction of new buildings on gas-contaminated land, BRE Report, 1991.

12.4 The Building Regulations set action levels for both methane and carbon dioxide from which an initial assessment can be made. The action threshold for methane is 1% while for carbon dioxide an initial consideration should be undertaken if gas concentrations exceed 1.5%. Action might be required if carbon dioxide concentrations exceed 5%. If these thresholds are exceeded, reference should be made to specific documentation to determine the nature and extent of the gas control measures required.

12.5 Guidance within the CIRIA 149 Report entitled "Protecting Developments from Methane", identifies a number of gas regimes based on the gas concentrations recorded during monitoring. The CIRIA Report 149 identifies six gas regimes summarised in the Table below. Based on the gas monitoring to date, it is considered that Gas Regime 2 should be adopted accordingly.

| Gas Regime | Methane (%v/v) | Carbon Dioxide (%v/v) | Flow (metres/sec) |
|---|---|---|---|
| 1 | <0.1 | <1.5 | No flow |
| 2 | >0.1 – 1 | >1.5 – 5 | No flow |
| 3 | >1 – 5 | >5 | No flow |
| 4 | >5 – 20 | <20 | <0.01 |
| 5 | >20 | >20 | >0.01 - 0.50 |
| 6 | >20 | >20 | >0.50 |

**TABLE 4:** *CIRIA 149 GAS REGIMES*

## 13 GROUNDWATER & LEACHING TESTS

13.1 Water was encountered in borehole 3 with levels generally below the relevant threshold values. The general fall of the topography of the area is to the south west and suggests movement of groundwater will be in that direction. There are no significant surface water bodies in the vicinity, and it is considered that deep groundwater quality will be poor.

13.2 Based on the contamination testing, ground encountered and historical profile the site is likely to represent a low risk to groundwater.

## 14 CONCLUSIONS & RECOMMENDATIONS

14.1 The results of the environmental ground investigation are presented in this report and Solmek can comment as follows:

- The site has a low to medium contamination profile having been used as a colliery site. The site is on the outskirts of Grimethorpe town and not close to any significant industry. The chemical testing from this investigation and the Validation report indicate contamination levels are not a constraint to commercial development.

- A site investigation comprising 3 boreholes to 7.00m and 8 trial pits up to 3.20m was undertaken. Ground conditions comprised between 2.80 and 4.25 metres of made ground overlying firm and stiff clays. The stiff clay generally extended from the base of the made ground to a depth in the order of 4.0 m bgl where highly weathered mudstone was encountered. It should be noted that borehole 3 encountered the weathered mudstone directly beneath the made ground, suggesting the clay is generally present but at variable thicknesses.

- Contamination analysis was undertaken on 10 samples. The analysis confirmed previous validation testing that contamination is not considered a constraint to the development.

- Soil gas levels were measured on three occasions. A maximum of 0.1% carbon dioxide and 0.3% methane was encountered. Gas regime 2 has been recommended based on CIRIA Document 149. This would comprise the following; well constructed slab, visqueen 2000 gauge or similar sealed across cavity and minimum penetration of ground slab by services. If the suspended floor is adopted then undercroft should be suitably vented. Any proposed buildings close to shafts will require upgraded protection.

- Groundwater was encountered in borehole 3 at typically 4.0 metres below ground level. The sample indicated typically low concentrations for the majority of the determinands.

- The Carl Bro report indicates that the site has been engineered to obtain a bearing pressure of 75kN/m$^2$ with the material meeting either a Class 2C or a 1A. This investigation has confirmed that the Made Ground is primarily medium dense to dense with the samples recovered for grading analysis meeting a Class 2C. The incorporation of a geogrid within a 500m layer of recompacted stone would limit the effects of possible

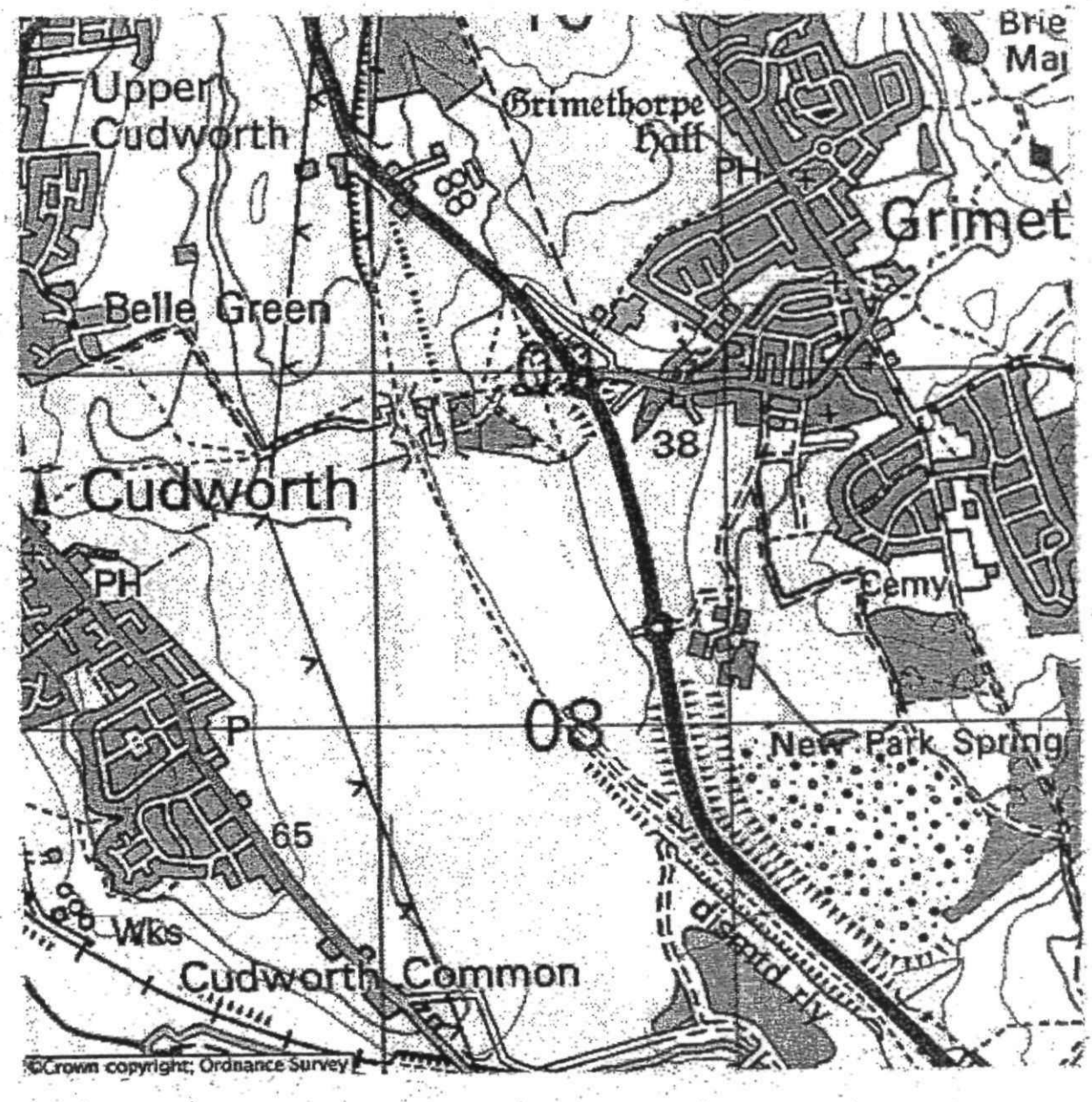
differential settlement associated with foundations within shallow made ground and deeper deposits of made ground. Based on the above a bearing capacity of 75kN/m² should be achievable. Based on the evidence of the boreholes and the validation report the loading of the floor slab to 37.5kN/m² is also considered achievable assuming the above recommendations are adopted. Alternatively consideration maybe given to piled foundations or raft foundations. The use of the raft foundation would have the added benefit of limiting the effects of possible slag heave. However the amount of slag only represented a proportion of the matrix of the Made Ground and as such the potential would be reduced. There was little evidence of significant amounts of degradable material apart from small areas locally present.

- The use of certain types of shale has resulted in damage due to expansion in the shale. The expansion arises from two causes. Firstly, due to the oxidation of finely divided iron pyrites (iron disulphide) in the shale; some of the oxidation products occupy a greater volume than the original iron pyrites, thus causing expansion. Secondly expansion may occur due to the growth of crystals of gypsum (calcium sulphate) within the shale, especially between the laminations which are forced apart. The calcium sulphate is formed as a result of the reaction between sulphuric acid, one of the final products of the oxidation of iron pyrites, and acid-soluble calcium in the shale. The oxidation of iron pyrites is promoted by the access of air and moisture and the latter also enables the calcium sulphate to migrate and crystallise. The values of pyrite present was relatively low and assuming the colliery spoil is well compacted and at a depth of 1m oxidises at a very slow rate and any possible expansion is likely to be limited in extent below this level.

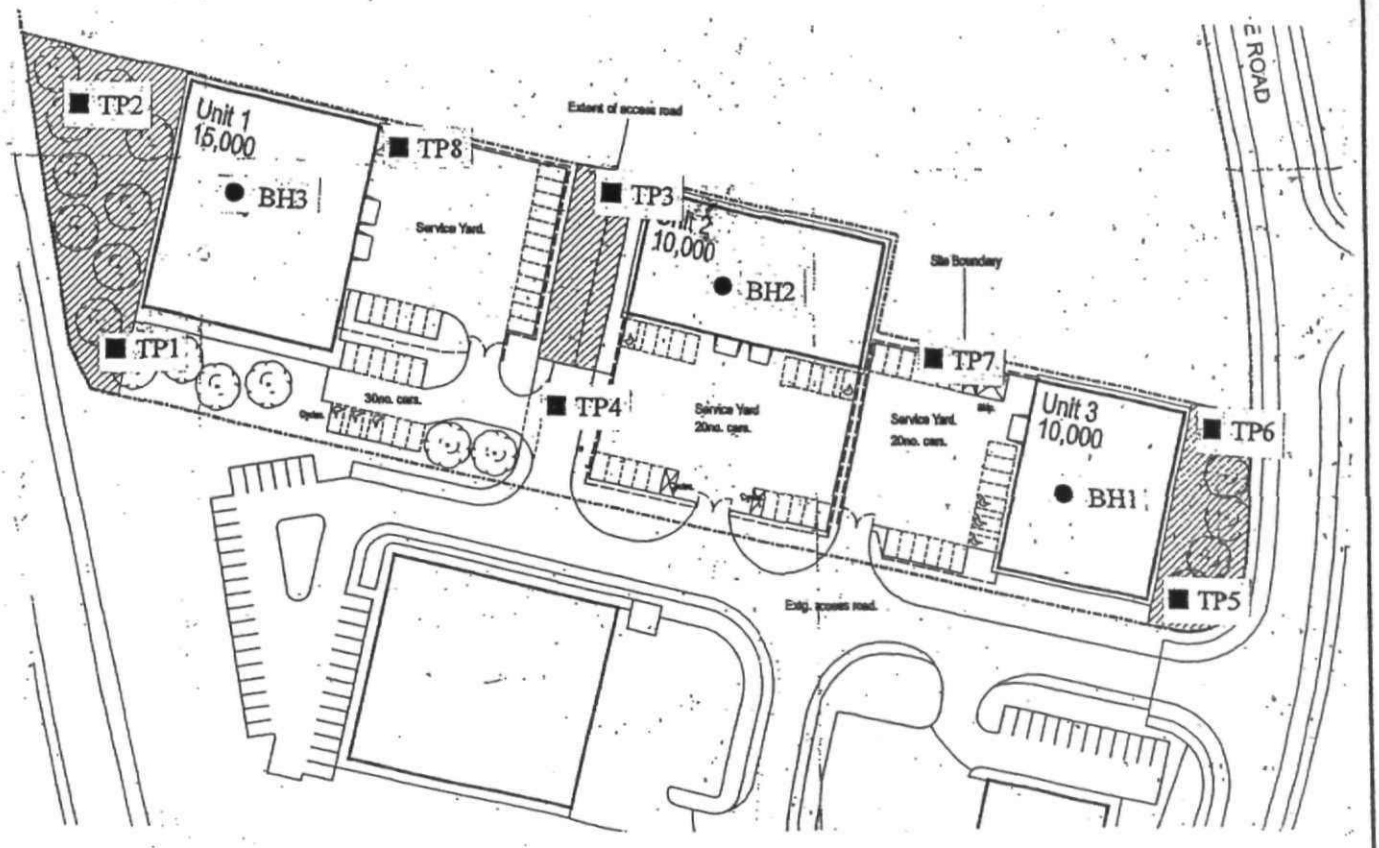
- The risk associated with slag and shale heave is although not considered to represent a high risk cannot be ruled out. Therefore it would prove prudent that certain measures are adopted for areas of slag or shale, which can also be prone to heave. These measures include; Ensure that no slag or shale is used as an engineered structural fill beneath buildings or sensitive structures. Allow services etc to be backfilled with clean inert gravels which will allow for any slight movements within areas where slag or shales prevail, and limit the use of shales and slag fills beneath the upper formation levels of roads.

- The investigation has revealed generally low levels of potentially combustible materials at depth such as coal and coke. Isolated areas containing some coal areas have been identified. For spontaneous combustion to take place, heat, oxygen and fuel are required. The material when placed under the hardstanding will be away from strong

# APPENDIX 1




| | |
|---|---|
| CLIENT: WSP | |
| PROJECT: Grimethorpe | |
| TITLE: Site Location Plan | |
| DRG NO: Figure 1 | SCALE: NTS |
| DATE: October 2003 | |
| **SOLMEK / HYMAS GEOENVIRONMENTAL LTD** | |




| | |
|---|---|
| CLIENT: WSP | |
| PROJECT: Grimethorpe | |
| TITLE: Trial Pit / Borehole Location Plan | |
| DRG NO: Figure 2 | SCALE: NTS |
| DATE: October 2003 | |
| **SOLMEK / HYMAS GEOENVIRONMENTAL LTD** | |

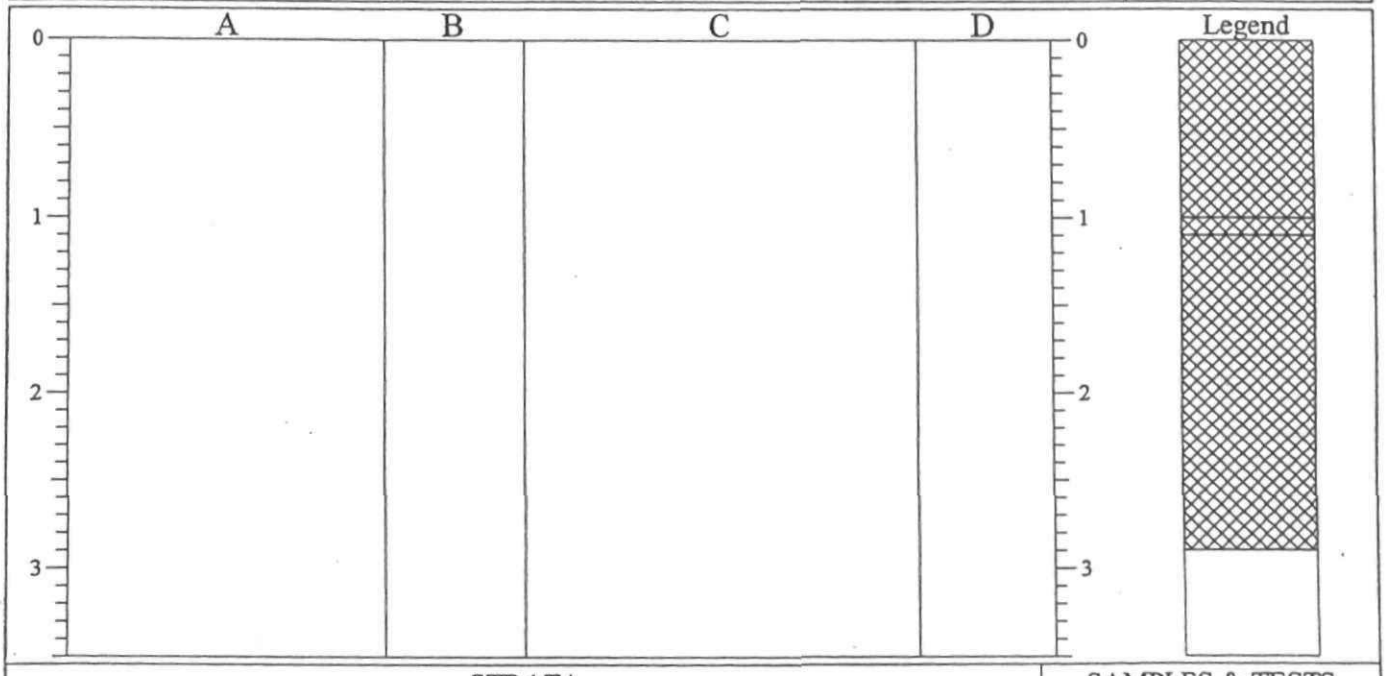
# APPENDIX 2

**Solmek/Hymas Geo**
12 Yarm Road, Stockton on tees
TS 18 3NA

Tel 01642 607083
Fax 01642 612355

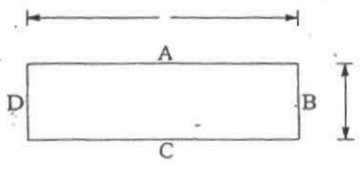
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP1 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-1.00 | | MADE GROUND. Grey sandy soily gravel with cobble sized fragments of brick and occasional sandy gravel with medium gravel of coal. | 0.50 | SDS | |
| | | | 0.90 | B | |
| 1.00-1.10 | | MADE GROUND. Yellowish brown slightly sandy gravel. | | | |
| 1.10-2.90 | | MADE GROUND. Dark grey sandy gravel of brick, coal, ash, occasional burnt shale. | | | |
| | | Below 2.60mwith much sub angular to sub rounded in gravel. | 1.50 | B | |
| | | | 1.60 | SDS | |
| 2.90 | | Obstruction (boulder). | 2.90 | B | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

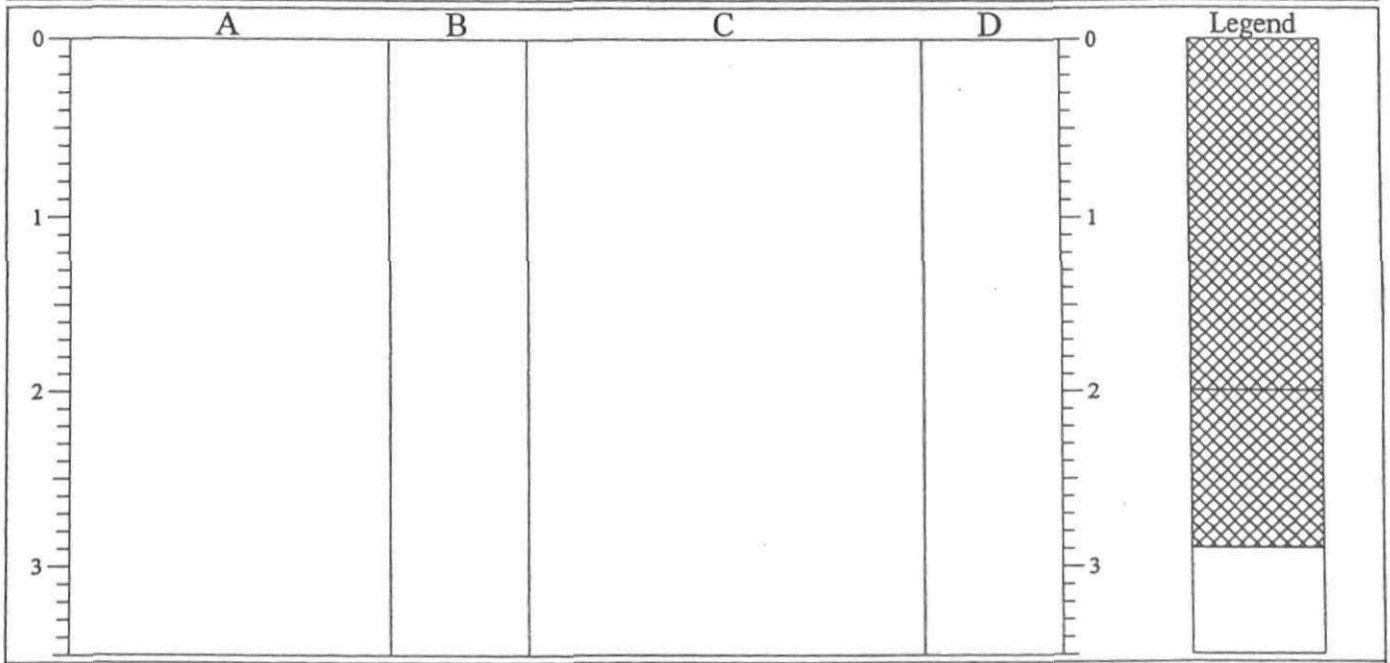
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12 Yarm Road, Stockton on tees
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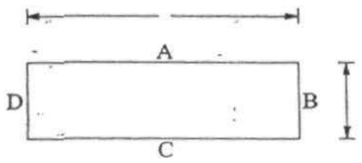
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP2 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-2.00 | | MADE GROUND. Dark grey sandy gravel of brick, sandstone, coal, shale. | 0.20 | SDS | |
| | | Below 1.00m becoming more soily / sandy. | 0.50 | B | |
| 2.00-2.90 | | MADE GROUND. Light grey coarse sub angular to sub rounded gravel. | | | |
| | | Below 2.80m with some soily sand. | | | |
| | | Obstruction. | 2.80 | B | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

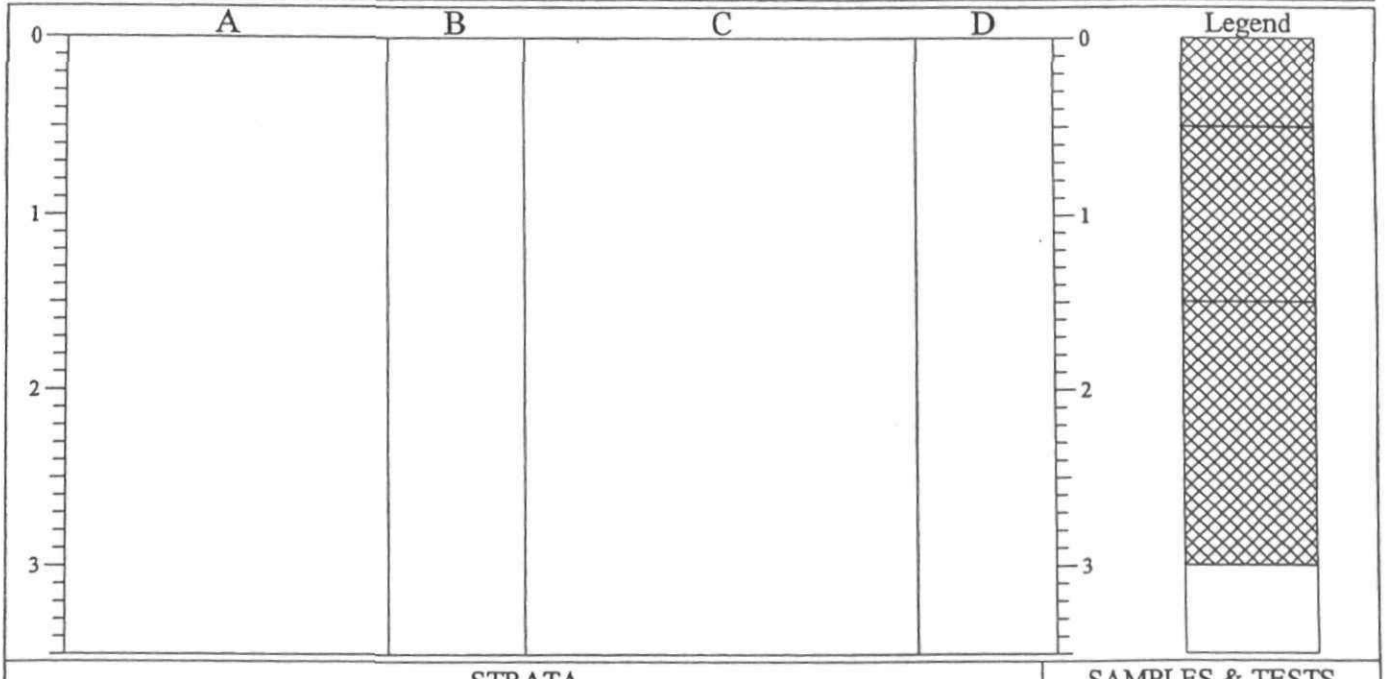
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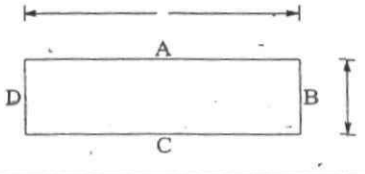
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP3 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-0.50 | | MADE GROUND. Light grey occasionally yellow sandy gravel. | | | |
| 0.50-1.50 | | MADE GROUND. Light brown / yellow sandy fine to coarse gravel of sandstone. | 0.50 | SDS | |
| | | | 0.80 | B | |
| 1.50-3.00 | | MADE GROUND. Dark grey occasionally black sandy angular gravel of coal, ash, sandstone and occasional burnt shale. | 1.60 | SDS | |
| | | | 1.80 | B | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

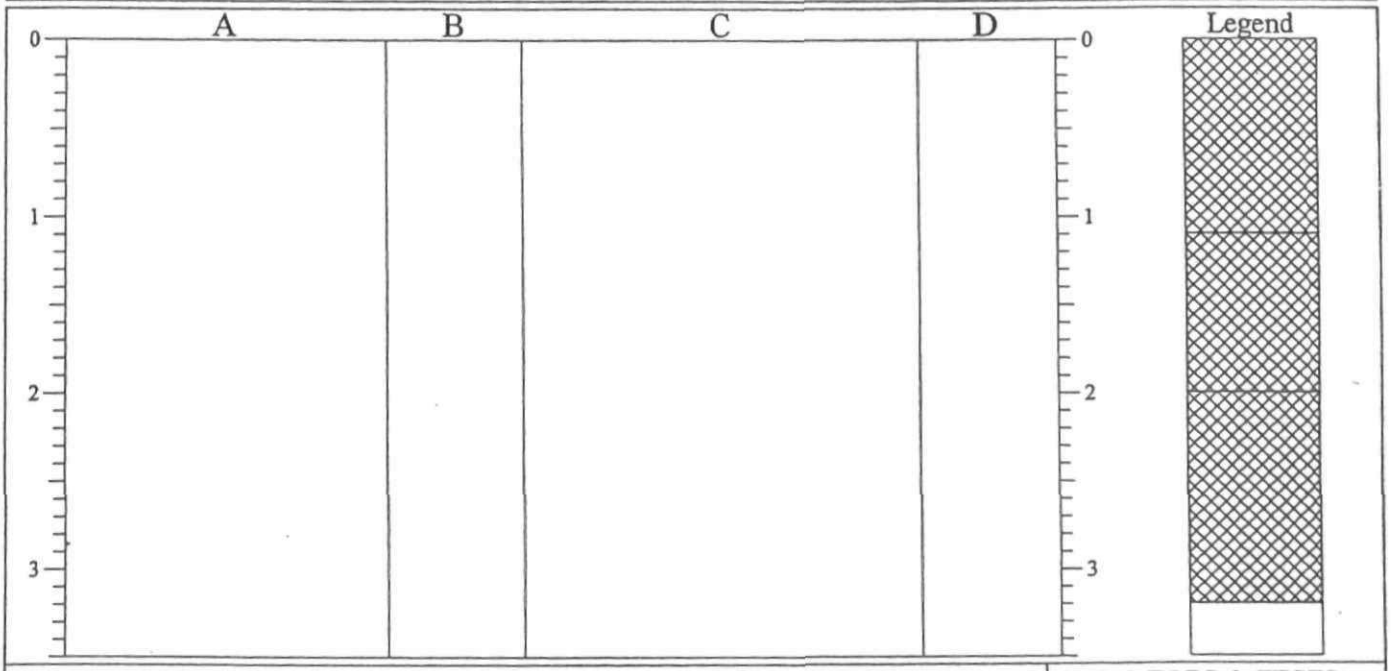
GRD_TRIAL_PIT_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

Solmek/Hymas Geo
12 Yarm Road, Stockton on tees
TS 18 3NA

Tel 01642 607083
Fax 01642 612355

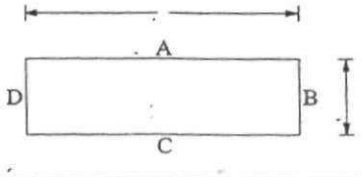
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP4 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-1.10 | | MADE GROUND. Light grey sandy soily gravel of brick, burnt shale, sandstone and shale. | 0.40<br>0.60 | SDS<br>B | |
| 1.10-2.00 | | MADE GROUND. Yellowish brown silty clay with a little fine to coarse gravel.<br>Below 1.70m with pockets of grey fine to coarse gravel of shale and occasional cobbles. | 1.30<br>1.70 | B<br>B | |
| 2.00-3.20 | | MADE GROUND. Yellowish brown slightly clayey slightly silty sandy gravel with occasional sand and gravel sized fragments of shale and coal. | | | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres<br>Scale 1:43.75 | Client WSP | Method/<br>Plant Used | Logged By<br>PM |
|---|---|---|---|

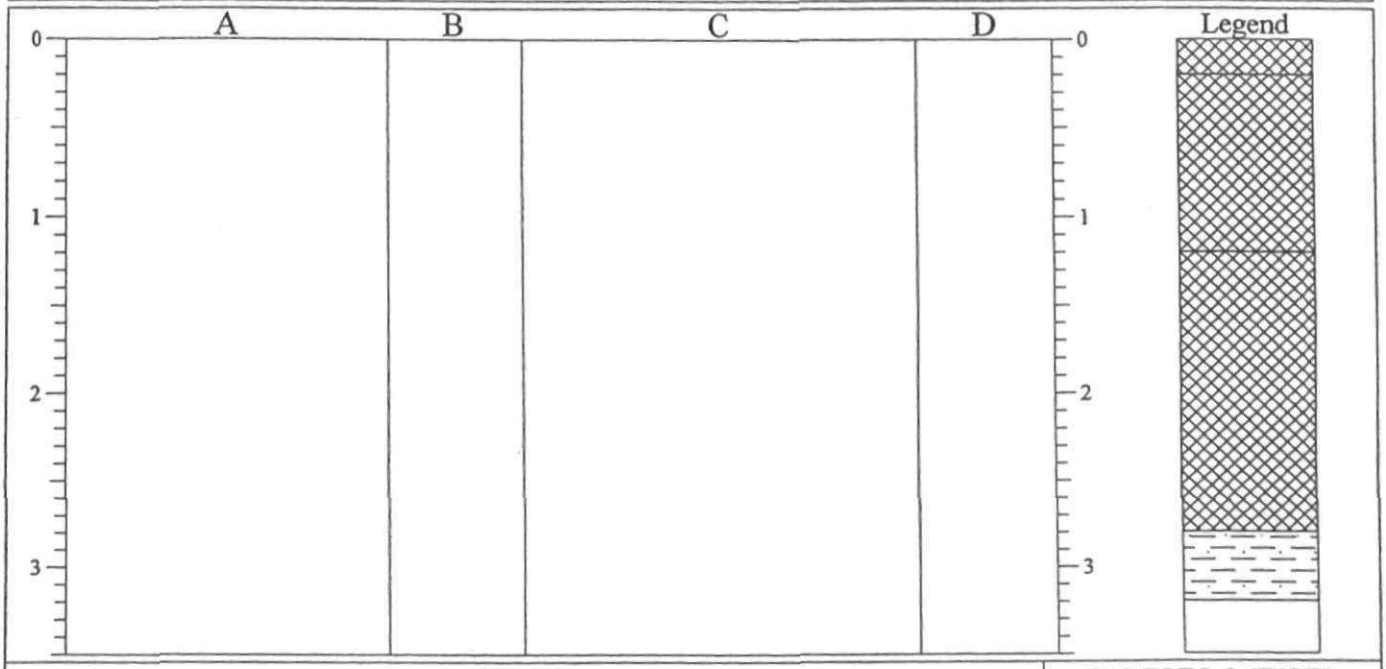
GRD_TRIAL_PIT_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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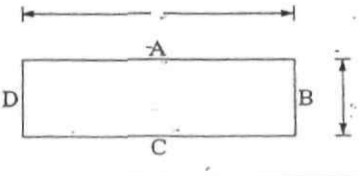
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP5 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-0.20 | | MADE GROUND. Grey soily sandy gravel of brick rubble. | | | |
| 0.20-1.20 | | MADE GROUND. Yellowish brown sandy gravel with occasional burnt shale, and coal. | 0.50 | SDS | |
| | | | 0.90 | B | |
| 1.20-2.80 | | MADE GROUND. Dark grey / black sandy gravel of coal, burnt shale and sandstone. | 1.30 | SDS | |
| | | | 1.50 | B | |
| 2.80-3.20 | | Firm yellowish brown mottled green slightly sandy CLAY. | | | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

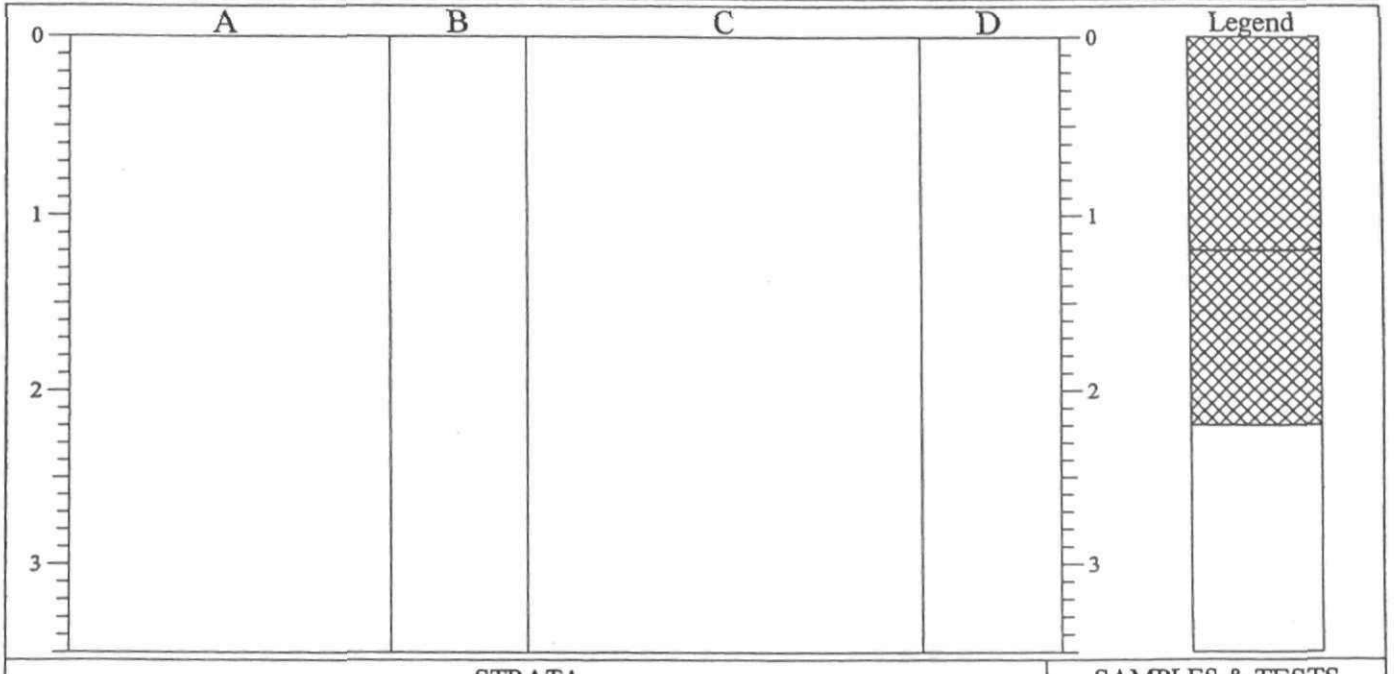
GRD_TRIAL_PIT_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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Tel 01642 607083
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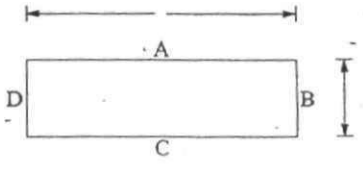
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP6 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-1.20 | | MADE GROUND. Light brown sandy gravel of sandstone and occasional coal and shale. | 0.50 | SDS | |
| | | | 1.00 | B | |
| 1.20-2.20 | | MADE GROUND. Yellowish brown sandy GRAVEL with occasional cobbles of sandstone and rare boulder sized fragments of concrete (boulders). | 1.50 | B | |
| 2.20 | | Obstruction (boulder). | | | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

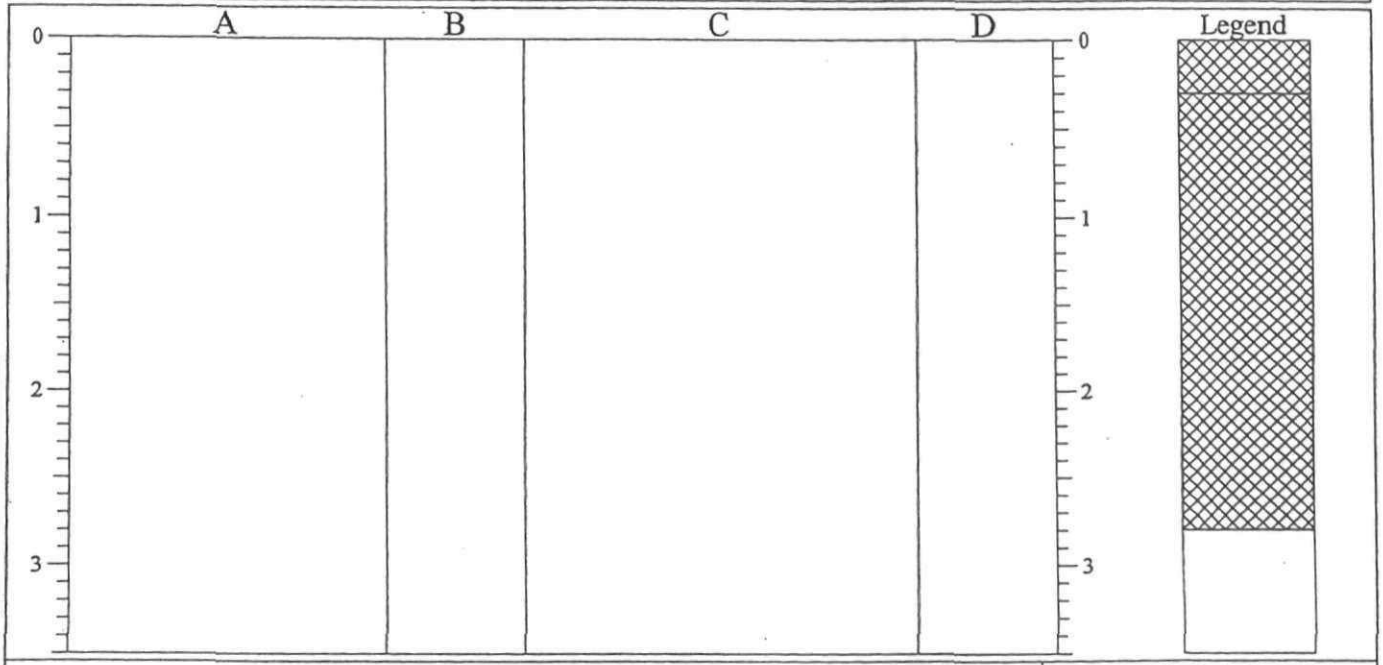
GRD_TRIAL_PIT_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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Tel 01642 607083
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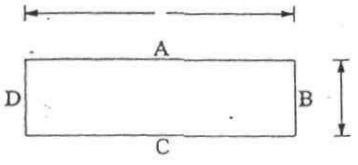
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP7 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-0.30 | | MADE GROUND. Light brown sandy gravel of sandstone, shale and occasional burnt shale and coal. | 0.20 | SDS | |
| 0.30-2.80 | | MADE GROUND. Yellowish grey brown mottled grey gravelly sandy clay. Gravel is medium to coarse shale. | 1.20 | B | |
| | | | 2.50 | B | |
| 2.80 | | Obstruction (boulder). | | | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

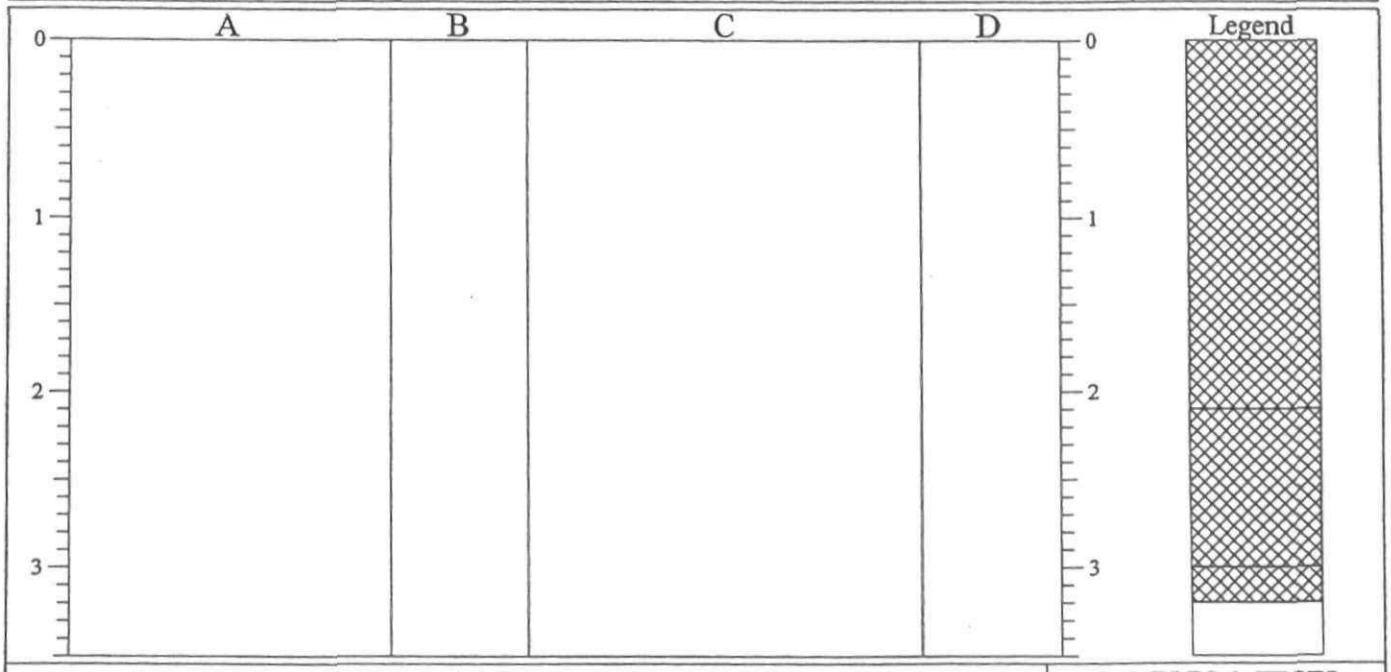
GRD_TRIAL_PIT_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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Fax 01642 612355

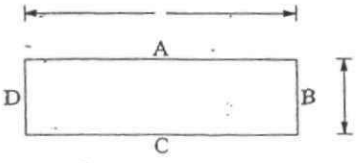
# TRIAL PIT LOG

| Project | | | | TRIAL PIT No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | TP8 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |




| STRATA | | | SAMPLES & TESTS | | |
|---|---|---|---|---|---|
| Depth | No | DESCRIPTION | Depth | No | Remarks/Tests |
| 0.00-2.10 | | MADE GROUND. Dark grey sandy soily gravel of shale and sandstone with occasional coal and burnt shale fragments and rare cobbles of shale and sandstone. | 0.20 | SDS | |
| | | | 1.00 | B | |
| 2.10-3.00 | | MADE GROUND. Firm yellowish brown slighlty clayey sandy gravel of sandstone, shale and occasional coal and ash fragments. | 2.00 | SDS | |
| | | | 2.50 | B | |
| 3.00-3.20 | | MADE GROUND. Yellowish brown very slightly clayey silty fine sand. | 3.10 | B | |

Shoring/Support:
Stability:




GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:43.75 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

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Fax 01642 612355

# BOREHOLE LOG

| Project | | | | BOREHOLE No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | BH1 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 2 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Geology | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Type No | Test Result | | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION | | |
| 0.50 | D | N23 | | | | (1.30) 1.30 | MADE GROUND. Medium dense grey slightly clayey silty sandy soily fine to coarse gravel of shale, slag and occasional coal. | | |
| 1.50 | D | N12 | | | | (0.70) 2.00 | MADE GROUND. Medium dense dark grey slightly clayey silty sandy gravel of ash, coal and shale. | | |
| 2.50 | D | | | | | (0.80) 2.80 | MADE GROUND. Medium dense dark grey / black sandy gravel of coal, ash and occasional burnt shale. | | |
| 2.80 | D | | | | | (0.40) 3.20 | Firm brown mottled CLAY. | | |
| 3.00-3.50 | U | 85 blows | | | | | Stiff brown mottled laminated CLAY. | | |

| Boring Progress and Water Observations | | | | | | Chiselling | | | Water Added | | GENERAL REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From | To | Hours | From | To | No groundwater encountered. |
| | | | | | | | | | | | |

| All dimensions in metres Scale 1:21.875 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

GRD_BOREHOLE_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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Fax 01642 612355

# BOREHOLE LOG

| Project | | | | BOREHOLE No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | BH1 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 06-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 2 of 2 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Geology | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Type No | Test Result | | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION | | |
| 3.50 | D | | | | | (0.55) | Stiff brown mottled laminated CLAY. *(continued)* | | |
| | | | | | | 3.75 | | | |
| 3.80 | D | | | | | | Very stiff weathered MUDSTONE. Weathered with depth. | | |
| | | | | | | | Very weak by 6.00m. | | |
| 4.00-4.50 | U | 25 blows | | | | | | | |
| 4.50 | D | | | | | | | | |
| | | N55 | | | | (2.75) | | | |
| 5.50 | D | | | | | | | | |
| | | N91 | | | | | | | |
| | | | | | | 6.50 | | | |

| Boring Progress and Water Observations | | | | | |
|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt |
| | | | | | |

| Chiselling | | | Water Added | |
|---|---|---|---|---|
| From | To | Hours | From | To |
| 5.75 | 6.50 | 0100 | | |

GENERAL REMARKS

No groundwater encountered.

| All dimensions in metres Scale 1:21.875 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

GRD_BOREHOLE_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

Solmek/Hymas Geo
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TS 18 3NA

Tel 01642 607083
Fax 01642 612355

# BOREHOLE LOG

| Project | | | | BOREHOLE No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | BH2 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 07-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 1 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Geology | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Type No | Test Result | | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION | | |
| 0.50 | D | | | | | (1.00) 1.00 | MADE GROUND. Medium dense grey slightly clayey silty sandy soily fine to coarse gravel of concrete and brick with occasional fragments of ash and coal. | | |
| | | N50/ 75mm | | | | (0.30) 1.30 | MADE GROUND. *Solid brick fill obstruction.* | | |

| Boring Progress and Water Observations | | | | | |
|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt |
| | | | | | |

| Chiselling | | | Water Added | |
|---|---|---|---|---|
| From | To | Hours | From | To |
| 1 | 1.3 | 0100 | | |

**GENERAL REMARKS**

No groundwater encountered. Pipe installed to base of fill. (Gravel filter, bentonite seal, and capped gas tap).

| All dimensions in metres Scale 1:21.875 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

GRD_BOREHOLE_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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# BOREHOLE LOG

| Project | | | | BOREHOLE No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | BH2A |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 07-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 1 of 2 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Geology | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Type No | Test Result | | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION | | |
| | | | | | | (1.60) | MADE GROUND. Medium dense grey slightly clayey silty sandy fine to coarse gravel with occasional cobble sized fragments of brick and rare fragments of coal and ash.<br><br>Dense by 1.00. | | |
| 1.00 | D | N39 | | | | | | | |
| 1.50 | D | | | | | 1.60 | | | |
| | | | | | | (0.40) | MADE GROUND. Medium dense dark grey / black sandy gravel of coal, ash and burnt shale. | | |
| 2.00 | D | N50/ 75mm | | | | 2.00 | | | |
| | | | | | | (0.55) | Obstruction. | | |
| | | | | | | 2.55 | | | |
| 2.60 | D | | | | | (0.25) | MADE GROUND. Dark grey / black sandy gravel of coal, ash and burnt shale. | | |
| | | | | | | 2.80 | | | |
| 2.95 | D | | | | | | Firm to stiff brown sandy CLAY. | | |
| 3.00-3.50 | U | | | | | (0.50) | | | |
| | | | | | | 3.30 | | | |
| | | | | | | | Stiff brown mottled gravelly CLAY. | | |

| Boring Progress and Water Observations | | | | | | Chiselling | | | Water Added | | GENERAL REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From | To | Hours | From | To | |
| | | | | | | 2 | 2.55 | 0130 | | | No groundwater encountered. Pipe installed at base of fill strata. (Gravel filter, bentonite seal, valve fitted and capped). |

| All dimensions in metres Scale 1:21.875 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

GRD_BOREHOLE_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

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# BOREHOLE LOG

| Project | | | | BOREHOLE No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | BH2A |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 07-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 2 of 2 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Geology | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Type No | Test Result | | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION | | |
| 3.50 | D | | | | | (0.90) | Stiff brown mottled gravelly CLAY. *(continued)* | | |
| 4.00-4.30 | U | 70 blows | | | | 4.20 | | | |
| | | | | | | (0.40) | Very weathered sandy SHALE. | | |
| 4.50 | D | | | | | 4.60 | | | |
| | | N55 | | | | (1.90) | Very weak weathered SANDSTONE. | | |
| 5.30 | D | | | | | | | | |
| | | N97 | | | | 6.50 | | | |

| Boring Progress and Water Observations | | | | | | Chiselling | | | Water Added | | GENERAL REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From | To | Hours | From | To | |
| | | | | | | 5.6 | 6.5 | 0115 | | | No groundwater encountered. Pipe installed at base of fill strata. (Gravel filter, bentonite seal, valve fitted and capped). |

| All dimensions in metres Scale 1:21.875 | Client WSP | Method/ Plant Used | Logged By PM |
|---|---|---|---|

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# BOREHOLE LOG

| Project | | | | BOREHOLE No |
|---|---|---|---|---|
| Grimethorpe / Draft Logs | | | | BH3 |
| Job No | Date | Ground Level (m) | Co-Ordinates () | |
| 301003 | 08-10-03 | | | |
| Contractor | | | | Sheet |
| | | | | 2 of 2 |

| SAMPLES & TESTS | | | Water | STRATA | | | | Geology | Instrument/ Backfill |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Type No | Test Result | | Reduced Level | Legend | Depth (Thick-ness) | DESCRIPTION | | |
| | | | | | | 4.25 | MADE GROUND. Medium dense dark grey slightly clayey silty sandy fine to coarse gravel of ash, coal and slag with occasional cobbles of sandstone.<br>Dense by 2.00m. *(continued)* | | |
| 4.00 | D | N30 | | | | | | | |
| 4.30 | D | | | | | (0.40)<br>4.65 | Stiff grey completely weathered MUDSTONE. | | |
| | | | | | | (0.55)<br>5.20 | Stiff completely weathered MUDSTONE with flecks of coal. | | |
| 5.00 | D | N68 | | | | | | | |
| 5.50 | D | | | | | (1.30)<br>6.50 | Very stiff completely weathered MUDSTONE.<br>Less weathered with depth. Very weak by 5.35m. | | |
| | | N50/ 75mm | | | | (0.50)<br>7.00 | Weak to moderately weak weathered MUDSTONE. | | |

| Boring Progress and Water Observations | | | | | |
|---|---|---|---|---|---|
| Date | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt |
| | | | | | |

| Chiselling | | | Water Added | |
|---|---|---|---|---|
| From | To | Hours | From | To |
| 6.5 | 7 | 0100 | | |

**GENERAL REMARKS**

Groundwater encountered at 5.30m, standing at 5.00m after 20 mins. Pipe installed at 5.50m. (Gravel filter, bentonite seal, valve fitted and capped).

| All dimensions in metres<br>Scale 1:21.875 | Client WSP | Method/<br>Plant Used | Logged By<br>PM |
|---|---|---|---|

GRD_BOREHOLE_LOG 301003.GPJ AGS3_ALL.GDT 04/11/03

# APPENDIX 3

# LABORATORY TEST RESULTS

## SITE NAME:- GRIMETHORPE

| BH | DEPTH (m) | M/C % | DENSITY Kg/m3 | SHEAR kN/m2 | Liquid Limit | Plastic Limit | Plasticity Index | SO4 g/l | pH |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| 1 | 3.00 | 24 | 2011 | 89 | 63 | 28 | 35 | | |
| 2A | 3.00 | 19 | 1940 | 81 | 29 | 19 | 10 | | |
| 2A | 4.00 | 12 | | | | | | | |
| | | | | | | | | | |

Hymas

# ALcontrol Geochem
## TEST SCHEDULE

**JOB NUMBER :** 03/13090/05
**CLIENT :** Hymas Geo Limited
**CONTACT :** Gary Dresser
**DATE OF RECEIPT :** 10/10/03
**LOCATION :** Grimethorpe

**BATCH NUMBER :** 1
**CLIENT REF/CODE :** 301003
**ORDER NUMBER :**
**TURNAROUND :** 10 days

Numeric values indicate additional scheduling

* Indicates test subcontracted

| | | UKAS Accredited ? | | | ✓ | ✓ | ✓ | ✓ |
|---|---|---|---|---|---|---|---|---|
| Sample Number | Sample Identity | P / V | Depth (m) | Sample Type | Lead Leach ICP-MS | Nickel Leach ICP-MS | Selenium Leach ICP-MS | Zinc Leach ICP-MS |
| 1 | TP1 | TUB | 0.50 | SOIL | 2 | 2 | 2 | 2 |
| 2 | TP1 | BAG | 1.60 | SOIL | | | | |
| 3 | TP2 | TUB | 0.20 | SOIL | | | | |
| 4 | TP3 | TUB | 0.50 | SOIL | | | | |
| 5 | TP3 | BAG | 1.60 | SOIL | | | | |
| 6 | TP4 | TUB | 0.50 | SOIL | | | | |
| 7 | TP5 | TUB | 0.50 | SOIL | 2 | 2 | 2 | 2 |
| 8 | TP5 | BAG | 1.30 | SOIL | | | | |
| 9 | TP6 | TUB | 0.50 | SOIL | | | | |
| 10 | TP7 | TUB | 0.20 | SOIL | | | | |
| 11 | TP8 | TUB | 0.20 | SOIL | 2 | 2 | 2 | 2 |
| 12 | TP8 | BAG | 2.00 | SOIL | | | | |
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| | | | | Total Number of Tests | 3 | 3 | 3 | 3 |

# ALcontrol Geochem
## TEST SCHEDULE

**JOB NUMBER :** 03/13090/05
**CLIENT :** Hymas Geo Limited
**CONTACT :** Gary Dresser
**DATE OF RECEIPT :** 10/10/03
**LOCATION :** Grimethorpe

**BATCH NUMBER :** 1
**CLIENT REF/CODE :** 301003
**ORDER NUMBER :**
**TURNAROUND :** 10 days

Numeric values indicate additional scheduling
* Indicates test subcontracted

| | | UKAS Accredited ? | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Number | Sample Identity | P / V | Depth (m) | Sample Type | ICP ICRCL (9) | B (H2O Sol) | C8-40 GC-EZ Flash (S) | Tot Phen HPLC | Asbestos Screen | Total Cyanide Soil | pH (soil) | Soluble SO4 | PAH Tot GC-EZ Flash (S) | Carb.Alk.(CaCO3) | Conductivity | Cu available | Ni available | Zn available | P Extractable* | K Extractable* | Mg Extractable* | Misc Geotechnical * | Misc Inorganics * | NRA leach | Boron Leach ICP-MS | Cadmium Leach ICP-MS | Chromium Leach ICP-MS | Copper Leach ICP-MS |
| 1 | TP1 | TUB | 0.50 | SOIL | X | X | X | X | | X | X | X | | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 |
| 2 | TP1 | BAG | 1.60 | SOIL | | | | | | | | | | | | | | | | | | X | | | | | | |
| 3 | TP2 | TUB | 0.20 | SOIL | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | |
| 4 | TP3 | TUB | 0.50 | SOIL | X | X | X | X | | X | X | X | | | | | | | | | | | | | | | | |
| 5 | TP3 | BAG | 1.60 | SOIL | | | | | | | X | | | X | X | X | X | X | X | X | X | | X | | | | | |
| 6 | TP4 | TUB | 0.50 | SOIL | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | | |
| 7 | TP5 | TUB | 0.50 | SOIL | X | X | X | X | | X | X | X | X | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 |
| 8 | TP5 | BAG | 1.30 | SOIL | | | | | | | | | | | | | | | | | | X | | | | | | |
| 9 | TP6 | TUB | 0.50 | SOIL | X | X | X | X | | X | X | X | | | | | | | | | | | | | | | | |
| 10 | TP7 | TUB | 0.20 | SOIL | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | |
| 11 | TP8 | TUB | 0.20 | SOIL | X | X | X | X | X | X | X | X | | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 |
| 12 | TP8 | BAG | 2.00 | SOIL | | | | | | | X | | | X | X | X | X | X | X | X | X | | X | | | | | |
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| | Total Number of Tests | | | | 8 | 8 | 8 | 8 | 4 | 8 | 10 | 8 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

UKAS TESTING
0680

Alcontrol Geochem
Chester Street
CHESTER
CHESHIRE
CH4 8RD

# Soil Nutrient Laboratory Report

Batch no: **02203069**

Date received: **16 October 2003**

Sample type: [2] **Agricultural Soil**

Sample date : **15 October 2003**

| Determination | pH | Lime requirement [1] Arable | Lime requirement [1] Grass | Phosphorus (index)[1] | Potassium (index)[1] | Magnesium (index)[1] |
|---|---|---|---|---|---|---|
| Units | | t/ha (t/acre) | t/ha (t/acre) | [mg/l] | [mg/l] | [mg/l] |
| Method ref. | B/003 | CALC/001 | | B/026 | ICP/006 | ICP/006 |
| **Lab. sample no/ Your reference** | | | | | | |
| 23219323 TP3 13090-5 | 7.5 | Nil | Nil | 9 (0) | 111 (1) | 442 (6) |
| 23219324 TP8 13090-12 | 8.4 | Nil | Nil | 11 (1) | 143 (2-) | 111 (3) |

* indicates that this determination is not included in the UKAS accreditation schedule for our laboratory.
[1] opinions and interpretations expressed herein are outside the scope of the UKAS accreditation schedule for our laboratory.
[2] all results are expressed on the basis of an 'air dried' sample.

For further information please contact your consultant Mr A Scott. Telephone 01902 743222.

Signed: Gary Wood
Business Dev. Manager



Reported on: 28 October 2003 at 08:48

ALFRED H. KNIGHT

Alcontrol Geochem
Chester Street
Chester
CH4 8RD

# CERTIFICATE OF ANALYSIS

| | | |
|---|---|---|
| CERTIFICATE NUMBER | : | 14002/1 |
| SAMPLE REFERENCE | : | 14002/03/4485 - 4488 |
| SAMPLE DESCRIPTION | : | Soil Samples |
| DATE RECEIVED | : | 14th October 2003 |

**Report of Analysis:**

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| | TP1 P07098-2 | TP5 P07098-8 |
|---|---|---|
| % floats @ 1.60 | 3.9 | 11.3 |
| % Sinks @ 1.60 | 96.1 | 88.7 |

| | TP3 P07098-5 | TP8 P07098-12 |
|---|---|---|
| % Pyritic Sulphur (dry basis) | 0.47 | 0.17 |

Mr Lance Szaryc Technical Manager
for KNIGHT ENERGY SERVICES LIMITED

Knight Energy Services Limited accepts no responsibility for the sampling related to the above results

Validated ☑
Preliminary ☐

# ALcontrol Geochem Analytical Services
## Table Of Results

**Job Number:** 03/13090/05 **Matrix:** SOLID
**Client:** Hymas Geo Limited **Location:** Grimethorpe
**Client Ref. No.:** 301003 **Client Contact:** Gary Dresser

| Sample Identity | TP1 | TP2 | TP3 | TP3 | TP4 | TP5 | TP6 | TP7 | TP8 | #UKAS accredited | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 0.5 | 0.2 | 0.5 | 1.6 | 0.5 | 0.5 | 0.5 | 0.2 | 0.2 | Method Code | LoD/Units |
| Sample Type | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | | |
| Sampled Date | | | | | | | | | | | |
| Sample Received Date | 10.10.03 | 10.10.03 | 10.10.03 | 10.10.03 | 10.10.03 | 10.10.03 | 10.10.03 | 10.10.03 | 10.10.03 | | |
| Batch | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Sample Number(s) | 1 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | 11 | | |
| Arsenic | 18 | 20 | 4 | - | 10 | 6 | 4 | 9 | 10 | TM129# | <1 mg/kg |
| Cadmium | <1 | <1 | <1 | - | <1 | <1 | <1 | <1 | <1 | TM129# | <1 mg/kg |
| ɔmium | 24 | 24 | 26 | - | 23 | 27 | 25 | 27 | 25 | TM129# | <1 mg/kg |
| Copper | 47 | 49 | 24 | - | 43 | 30 | 33 | 28 | 34 | TM129# | <1 mg/kg |
| Copper Available | - | - | - | 3 | - | - | - | - | - | TM129# | <1 mg/kg |
| Lead | 45 | 27 | 23 | - | 26 | 25 | 19 | 23 | 23 | TM129# | <1 mg/kg |
| Mercury | <1 | <1 | <1 | - | <1 | <1 | <1 | <1 | <1 | TM129# | <1 mg/kg |
| Nickel | 19 | 29 | 35 | - | 22 | 34 | 36 | 34 | 38 | TM129# | <1 mg/kg |
| Nickel Available | - | - | - | 2 | - | - | - | - | - | TM129# | <1 mg/kg |
| Selenium | <1 | <1 | <1 | - | <1 | <1 | <1 | <1 | <1 | TM129# | <1 mg/kg |
| Zinc | 117 | 100 | 112 | - | 127 | 149 | 100 | 100 | 111 | TM129# | <1 mg/kg |
| Zinc Available | - | - | - | 3 | - | - | - | - | - | TM129# | <1 mg/kg |
| Boron (Water Soluble) | 3 | 1 | <1 | - | 2 | 1 | 1 | <1 | <1 | TM129# | <1 mg/kg |
| Carbonate Alkalinity as CaCO3 | - | - | - | <10 | - | - | - | - | - | TM043# | <10 mg/kg |
| Electrical Conductivity | - | - | - | 2.600 | - | - | - | - | - | TM120# | <0.025 mS/cm |
| Water Soluble Sulphate as SO4 | 0.377 | 0.659 | 0.204 | - | 0.682 | 0.345 | 0.220 | 0.403 | 1.317 | TM098# | <0.003 g/l |
| Total Phenols HPLC | <0.01 | <0.01 | <0.01 | - | 0.02 | <0.01 | <0.01 | <0.01 | <0.01 | TM062# | <0.01 mg/kg |
| ? Cyanide Soil | <1 | 2 | <1 | - | <1 | <1 | <1 | <1 | <1 | TM153# | <1 mg/kg |
| Asbestos Presence Screen | - | NFP | - | - | NFP | - | - | NFP | NFP | TM001 | NONE |
| Magnesium Extractable* | - | - | - | # | - | - | - | - | - | | <1 mg/l |
| PAH Tot GC-EZ Flash | - | <10 | - | - | - | <10 | - | <10 | - | TM154# | <10 mg/kg |
| pH Value In Soil | 10.45 | 7.71 | 7.94 | 6.79 | 8.79 | 8.40 | 8.05 | 6.90 | 7.80 | TM133# | <1.00 pH Units |
| Phosphorus Extractable* | - | - | - | # | - | - | - | - | - | | <1 mg/l |
| Potassium Extractable* | - | - | - | # | - | - | - | - | - | | <1 mg/l |
| TPH Screen C8-40-by GC-EZ Flash | 523 | 328 | 63 | - | 286 | 15 | 200 | <10 | 34 | TM154# | <10 mg/kg |
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Date 03.11.2003

Validated ☑
Preliminary ☐

# ALcontrol Geochem Analytical Services
## Table Of Results

**Job Number:** 03/13090/05 **Matrix:** SOLID
**Client:** Hymas Geo Limited **Location:** Grimethorpe
**Client Ref. No.:** 301003 **Client Contact:** Gary Dresser

| Sample Identity | TP8 | | | | | | | | | # UKAS accredited | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 2.0 | | | | | | | | | Method Code | LoD/Units |
| Sample Type | SOIL | | | | | | | | | | |
| Sampled Date | | | | | | | | | | | |
| Sample Received Date | 10.10.03 | | | | | | | | | | |
| Batch | 1 | | | | | | | | | | |
| Sample Number(s) | 12 | | | | | | | | | | |
| Arsenic | - | | | | | | | | | TM129# | <1 mg/kg |
| Cadmium | - | | | | | | | | | TM129# | <1 mg/kg |
| ɔmium | - | | | | | | | | | TM129# | <1 mg/kg |
| Copper | - | | | | | | | | | TM129# | <1 mg/kg |
| Copper Available | 7 | | | | | | | | | TM129# | <1 mg/kg |
| Lead | - | | | | | | | | | TM129# | <1 mg/kg |
| Mercury | - | | | | | | | | | TM129# | <1 mg/kg |
| Nickel | - | | | | | | | | | TM129# | <1 mg/kg |
| Nickel Available | <1 | | | | | | | | | TM129# | <1 mg/kg |
| Selenium | - | | | | | | | | | TM129# | <1 mg/kg |
| Zinc | - | | | | | | | | | TM129# | <1 mg/kg |
| Zinc Available | 5 | | | | | | | | | TM129# | <1 mg/kg |
| Boron (Water Soluble) | - | | | | | | | | | TM129# | <1 mg/kg |
| Carbonate Alkalinity as CaCO3 | <10 | | | | | | | | | TM043# | <10 mg/kg |
| Electrical Conductivity | 2.460 | | | | | | | | | TM120# | <0.025 mS/cm |
| Water Soluble Sulphate as SO4 | - | | | | | | | | | TM098# | <0.003 g/l |
| Total Phenols HPLC | - | | | | | | | | | TM062# | <0.01 mg/kg |
| Cyanide Soil | - | | | | | | | | | TM153# | <1 mg/kg |
| Asbestos Presence Screen | - | | | | | | | | | TM001 | NONE |
| Magnesium Extractable* | # | | | | | | | | | | <1 mg/l |
| PAH Tot GC-EZ Flash | - | | | | | | | | | TM154# | <10 mg/kg |
| pH Value In Soil | 8.08 | | | | | | | | | TM133# | <1.00 pH Units |
| Phosphorus Extractable* | # | | | | | | | | | | <1 mg/l |
| Potassium Extractable* | # | | | | | | | | | | <1 mg/l |
| TPH Screen C8-40 by GC-EZ Flash | - | | | | | | | | | TM154# | <10 mg/kg |
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Date 03.11.2003

# ALcontrol Geochem Analytical Services
# Table Of Results - Appendix

**Job Number:** 03/13090/05
**Client:** Hymas Geo Limited
**Client Ref. No.:** 301003

**Summary of Method Codes contained within report :**

| Method No. | Reference | Description | UKAS Accredited | MCERTS Accredited | Wet/Dry Sample * |
|---|---|---|---|---|---|
| TM001 | | Screening of Soils for Fibres | N | N | WET |
| TM043 | BS 2690 | Determination of alkalinity in aqueous samples | Y | N | DRY |
| TM062 | | Determination of phenols by HPLC | Y | N | WET |
| TM098 | Based on: Method 4500-$SO_4^{2-}$E., AWWA/APHA, 19th Ed., 1995 | Determination of Sulphate using the Kone Analyser | Y | N | DRY |
| TM120 | Method 2510B, AWWA/APHA, 19th Ed., 1995 | Determination of Electrical Conductivity using the Jenway Conductivity Meter 4320 | Y | N | DRY |
| TM129 | | Determination of Metal Cations by IRIS Emmission Spectrometer | Y | N | DRY |
| TM133 | | pH in Soil using the GLpH001 Meter | Y | N | WET |
| TM152 | | ICP MS Water Samples | N | N | NA |
| TM152 | | ICP MS Water Samples | Y | N | NA |
| TM153 | | Skalar TCN, FCN, SCN | Y | N | WET |
| TM154 | | EZ Flash | Y | N | WET |
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*Applies to Solid samples only. **DRY** indicates samples have been dried at 30°C. **NA** = not applicable.

# APPENDIX

## APPENDIX

1. Results are expressed as mg/kg dry weight (dried at 35°C) on all soil analyses except for the following:
   Leach tests, hexavalent chrome, flash point, acid soluble sulphides, TPH by IR and volatiles are expressed as mg/kg wet soil as received, although these are currently under review.
   Phenol, ammoniacal nitrogen and cyanide are performed on wet samples as received, but the results are expressed as mg/kg dry weight.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. A sub sample of all samples received will be retained free of charge for two months for soils and one month for waters (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a Laboratory with a known track record will be utilised.
6. Asbestos screen is done in-house on soils and if no fibres are found will be reported as NFP - no fibres present. If asbestos is detected, then identification and quantification is carried out by ALcontrol Technichem. If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos result is known. If asbestos is present, then no analysis requiring dry sample will be undertaken.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.
8. NDP - No determination possible due to insufficient/unsuitable sample.
9. Metals in waters are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
10. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

# ALcontrol Geochem
## TEST SCHEDULE

**JOB NUMBER :** 03/14137/05
**CLIENT :** Hymas Geo Limited
**CONTACT :** Gary Dresser
**DATE OF RECEIPT :** 11/03/03
**LOCATION :** GRIMETHORPE

**BATCH NUMBER :** 1
**CLIENT REF/CODE :**
**ORDER NUMBER :**
**TURNAROUND :** 5 days

Numeric values indicate additional scheduling
* Indicates test subcontracted

| | | | | UKAS Accredited ? | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Number | Sample Identity | P / V | Depth (m) | Sample Type | Chloride Kone | pH (water) | Tot. sus. solids | Amm. N (W) | BOD (unfiltered) | COD (unfiltered) | Conductivity | Sulphate Kone | DOC on Water | ICRCL (not Hg) ICP-MS | Hg Low Dutch T AA | Aluminium ICP-MS | Iron ICP-MS | Manganese ICP-MS | C8-40 GC-EZ Flash (W) | | | | | | | | | | |
| 1 | BH 3 | 1Iplastic | 4.00 | WATER | X | X | X | X | X | X | X | X | X | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | |
| | | | | Total Number of Tests | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | |

Validated ☑
Preliminary ☐

# ALcontrol Geochem Analytical Services
## Table Of Results

**Job Number:** 03/14137/05 **Matrix:** LIQUID
**Client:** Hymas Geo Limited **Location:** GRIMETHORPE
**Client Ref. No.:** **Client Contact:** Gary Dresser

| Sample Identity | BH 3 | | | | | | | | | | #UKAS accredited | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | 4.0 | | | | | | | | | | Method Code | LoD/Units |
| Sample Type | WATER | | | | | | | | | | | |
| Sampled Date | | | | | | | | | | | | |
| Sample Received Date | 03.11.03 | | | | | | | | | | | |
| Batch | 1 | | | | | | | | | | | |
| Sample Number(s) | 1 | | | | | | | | | | | |
| Aluminium by ICP-MS | 275 | | | | | | | | | | TM152# | <3 ug/l |
| Arsenic by ICP-MS | 7 | | | | | | | | | | TM152# | <1 ug/l |
| Boron by ICP-MS | <10 | | | | | | | | | | TM152 | <10 ug/l |
| Cadmium by ICP-MS | <0.4 | | | | | | | | | | TM152# | <0.4 ug/l |
| Chromium by ICP-MS | 1 | | | | | | | | | | TM152# | <1 ug/l |
| Copper by ICP-MS | 13 | | | | | | | | | | TM152# | <1 ug/l |
| Iron by ICP-MS | 31 | | | | | | | | | | TM152 | <5 ug/l |
| Lead by ICP-MS | <1 | | | | | | | | | | TM152# | <1 ug/l |
| Manganese by ICP-MS | <1 | | | | | | | | | | TM152 | <1 ug/l |
| Nickel by ICP-MS | 15 | | | | | | | | | | TM152# | <1 ug/l |
| Selenium by ICP-MS | 4 | | | | | | | | | | TM152# | <1 ug/l |
| Zinc by ICP-MS | 9 | | | | | | | | | | TM152# | <3 ug/l |
| Mercury Low Dutch Target AA | <0.05 | | | | | | | | | | TM127# | <0.05 ug/l |
| Electrical Conductivity | 0.995 | | | | | | | | | | TM120# | <0.025 mS/cm |
| Sulphate (soluble) | 202 | | | | | | | | | | TM098# | <3 mg/l |
| Chloride | 159 | | | | | | | | | | TM097# | <1 mg/l |
| Ammoniacal Nitrogen as NH4-N | 1.3 | | | | | | | | | | TM099# | <0.2 mg/l |
| COD in unfiltered water | 5 | | | | | | | | | | TM045# | <1 mg/l |
| COD On Unfiltered Sample | 134 | | | | | | | | | | TM107# | <10 mg/l |
| Dissovled Organic Carbon | 14 | | | | | | | | | | TM090# | <1 mg/l |
| pH Value In Water | 9.48 | | | | | | | | | | TM133# | <1.00 pH Units |
| Total Suspended Solids | 1336 | | | | | | | | | | TM022# | <10 mg/l |
| TPH Screen C8-40 by GC-EZ Flash | <50 | | | | | | | | | | TM154# | <50 ug/l |
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Date 13.11.2003

# ALcontrol Geochem Analytical Services
# Table Of Results - Appendix

**Job Number:** 03/14137/05
**Client:** Hymas Geo Limited
**Client Ref. No.:**

**Summary of Method Codes contained within report :**

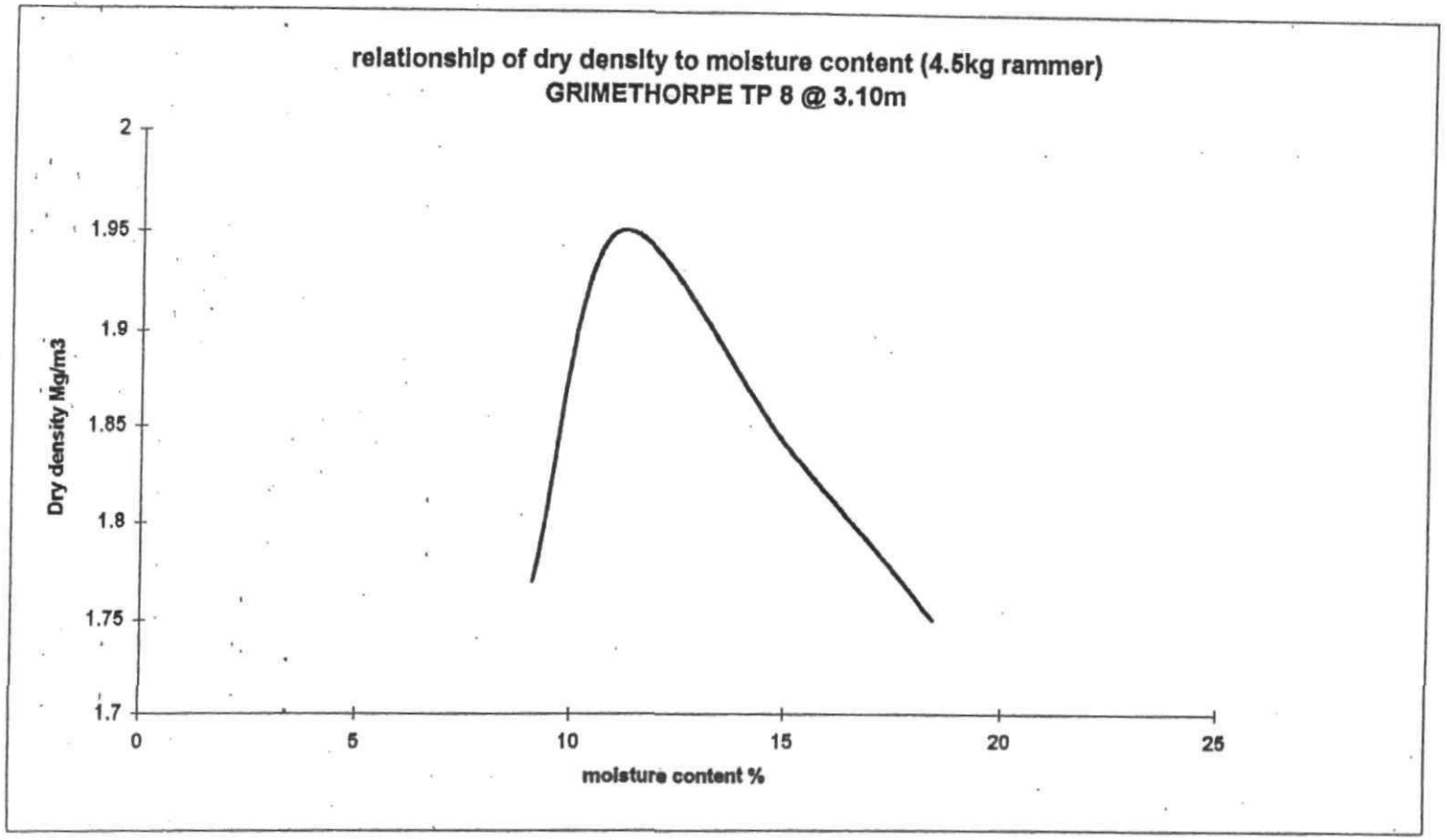
| Method No. | Reference | Description | UKAS Accredited | MCERTS Accredited | Wet/Dry Sample * |
|---|---|---|---|---|---|
| TM022 | Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 | Determination of total suspended solids in waters | Y | N | NA |
| TM045 | MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, | Determination of BOD5 (ATU) by Oxygen Meter | Y | N | NA |
| TM090 | Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA | Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water | Y | N | NA |
| TM097 | Modified: US EPA Method 325.1 & 325.2 | Determination of Chloride using the Kone Analyser | Y | N | NA |
| TM098 | Method 4500E, AWWA/APHA, 20th Ed., 1999 | Determination of Sulphate using the Kone Analyser | Y | N | NA |
| TM099 | BS 2690: Part 7:1968 / BS 6068: Part2.11:1984 | Determination of Ammonium in Water Samples using the Kone Analyser | Y | N | NA |
| TM107 | ISO 6060-1989 | Determination of Chemical Oxygen Demand using COD Dr Lange Kit | Y | N | NA |
| TM120 | Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part | Determination of Electrical Conductivity using a Conductivity Meter | Y | N | NA |
| TM127 | Method 3112B, AWWA/APHA, 20th Ed., 1999 | The Determination of Trace Level Mercury in Aqueous Media and Soil Extracts by Atomic Absorption Spectroscopy | Y | N | NA |
| TM133 | BS 1377: Part 3 1990 | Determination of pH in Soil and Water using the GLpH pH Meter | Y | N | NA |
| TM152 | Method 3125B, AWWA/APHA, 20th Ed., 1999 | Analysis of Aqueous Samples by ICP-MS | N | N | NA |
| TM152 | Method 3125B, AWWA/APHA, 20th Ed., 1999 | Analysis of Aqueous Samples by ICP-MS | Y | N | NA |
| TM154 | In - house Method | Determination of Petroleum Hydrocarbons by EZ Flash GC-FID in the Carbon range C6- C40 | Y | N | NA |
| | | | | | |
| | | | | | |

*Applies to Solid samples only. **DRY** indicates samples have been dried at 30°C. **NA** = not applicable.

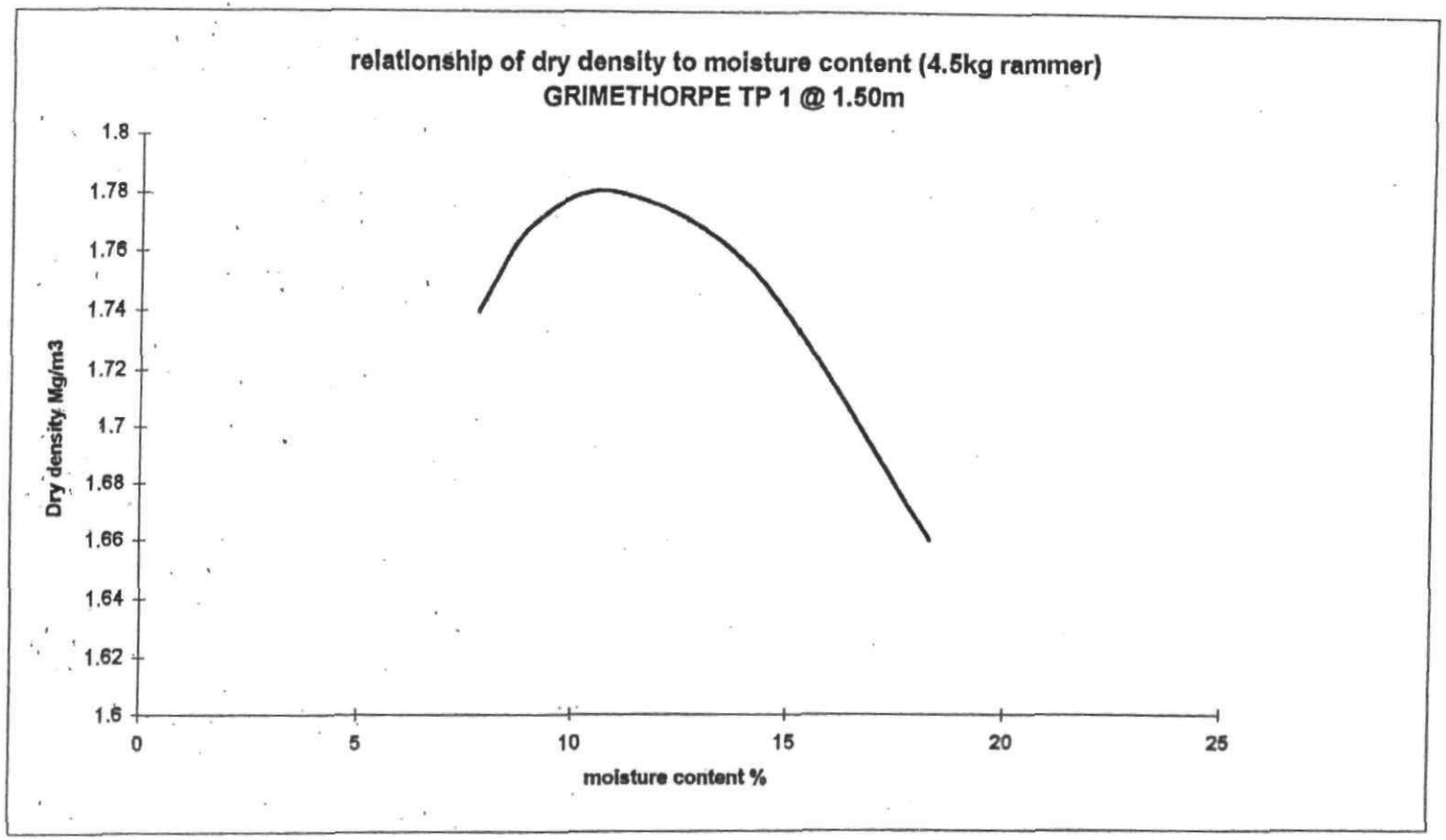
# APPENDIX

## APPENDIX

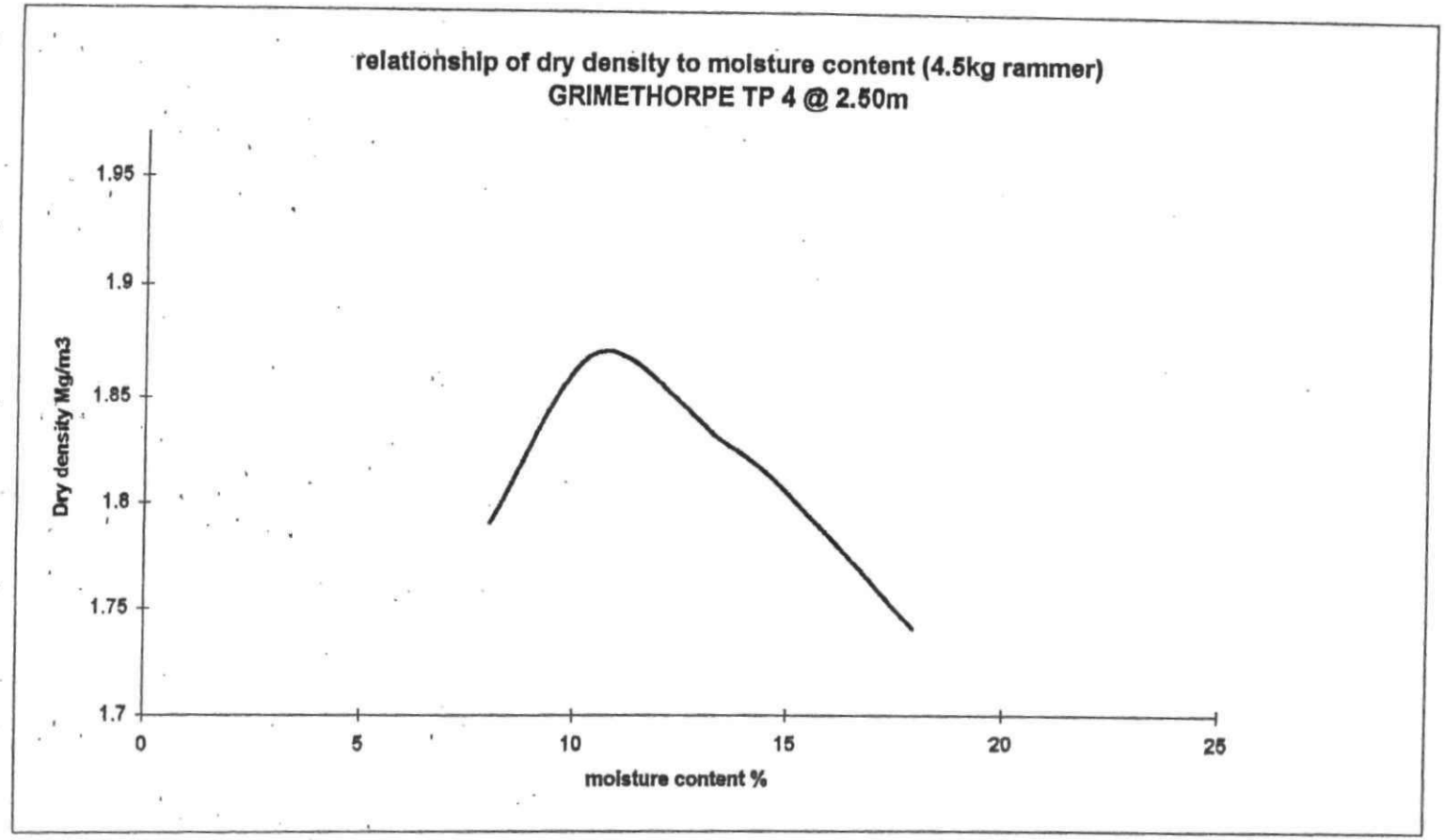
1. Results are expressed as mg/kg dry weight (dried at 35°C) on all soil analyses except for the following:
   Leach tests, hexavalent chrome, flash point, acid soluble sulphides, TPH by IR and volatiles are expressed as mg/kg wet soil as received, although these are currently under review.
   Phenol, ammoniacal nitrogen and cyanide are performed on wet samples as received, but the results are expressed as mg/kg dry weight.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. A sub sample of all samples received will be retained free of charge for two months for soils and one month for waters (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a Laboratory with a known track record will be utilised.
6. Asbestos screen is done in-house on soils and if no fibres are found will be reported as NFP - no fibres present. If asbestos is detected, then identification and quantification is carried out by ALcontrol Technichem. If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos result is known. If asbestos is present, then no analysis requiring dry sample will be undertaken.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.
8. NDP - No determination possible due to insufficient/unsuitable sample.
9. Metals in waters are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
10. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.



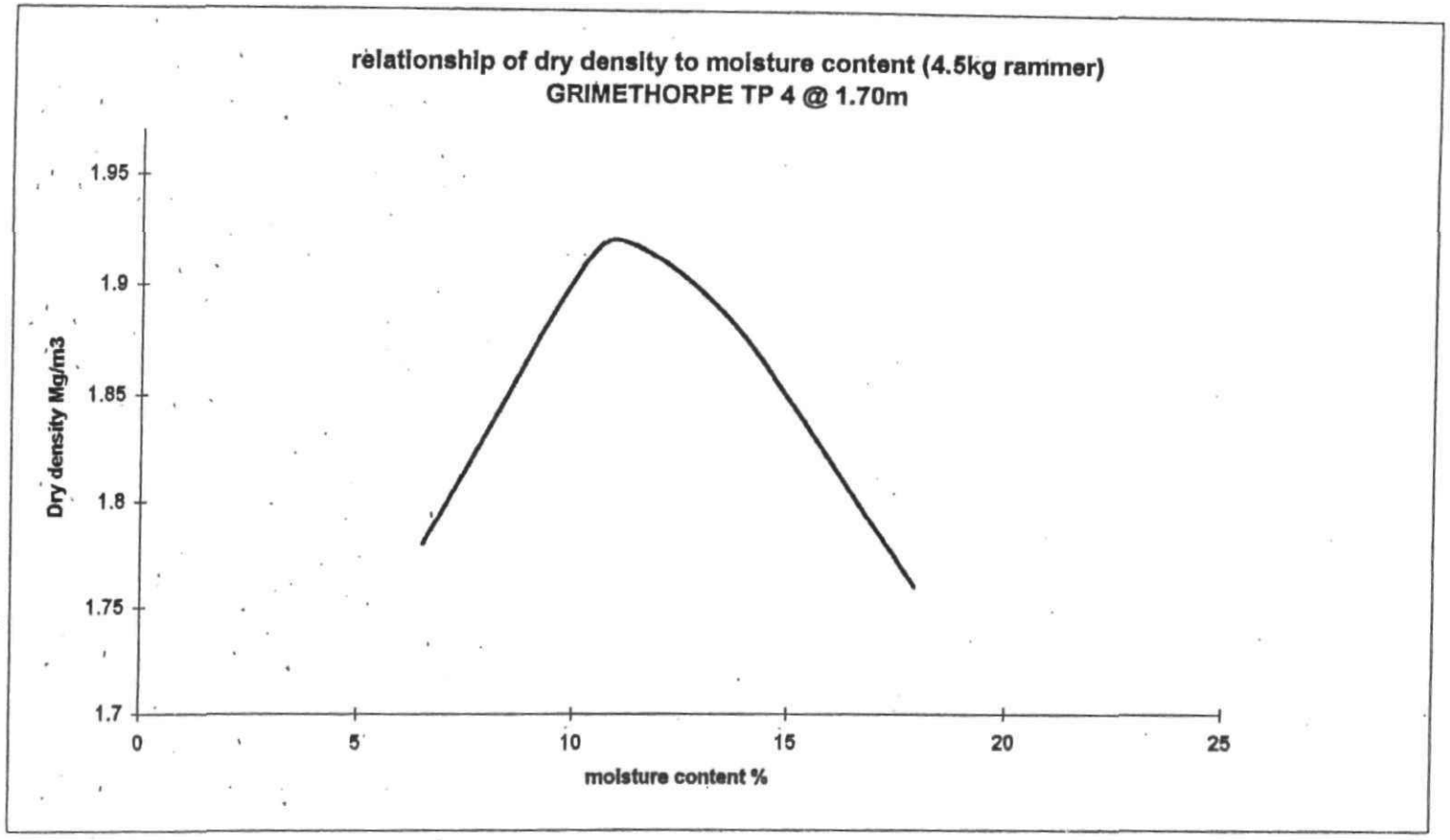

| | |
|---|---|
| optimum dry density Mg/m3 | 1.95 |
| optimum moisture content % | 11 |
| natural moisture content % | 17 |



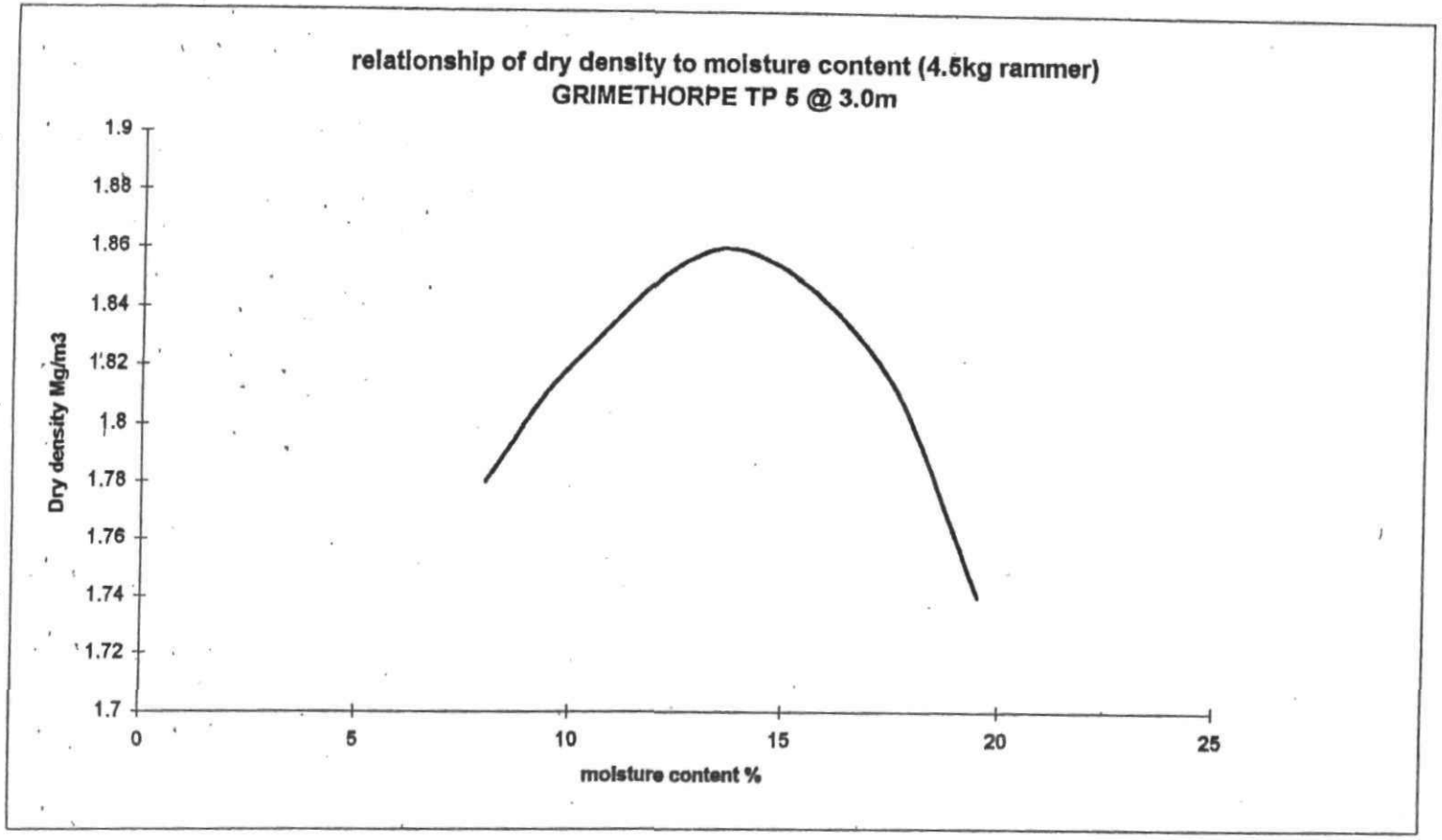

| | |
|---|---|
| optimum dry density Mg/m3 | 1.78 |
| optimum moisture content % | 11 |
| natural moisture content % | 17 |




| | |
|---|---|
| optimum dry density Mg/m3 | 1.87 |
| optimum moisture content % | 11 |
| natural moisture content % | 13 |

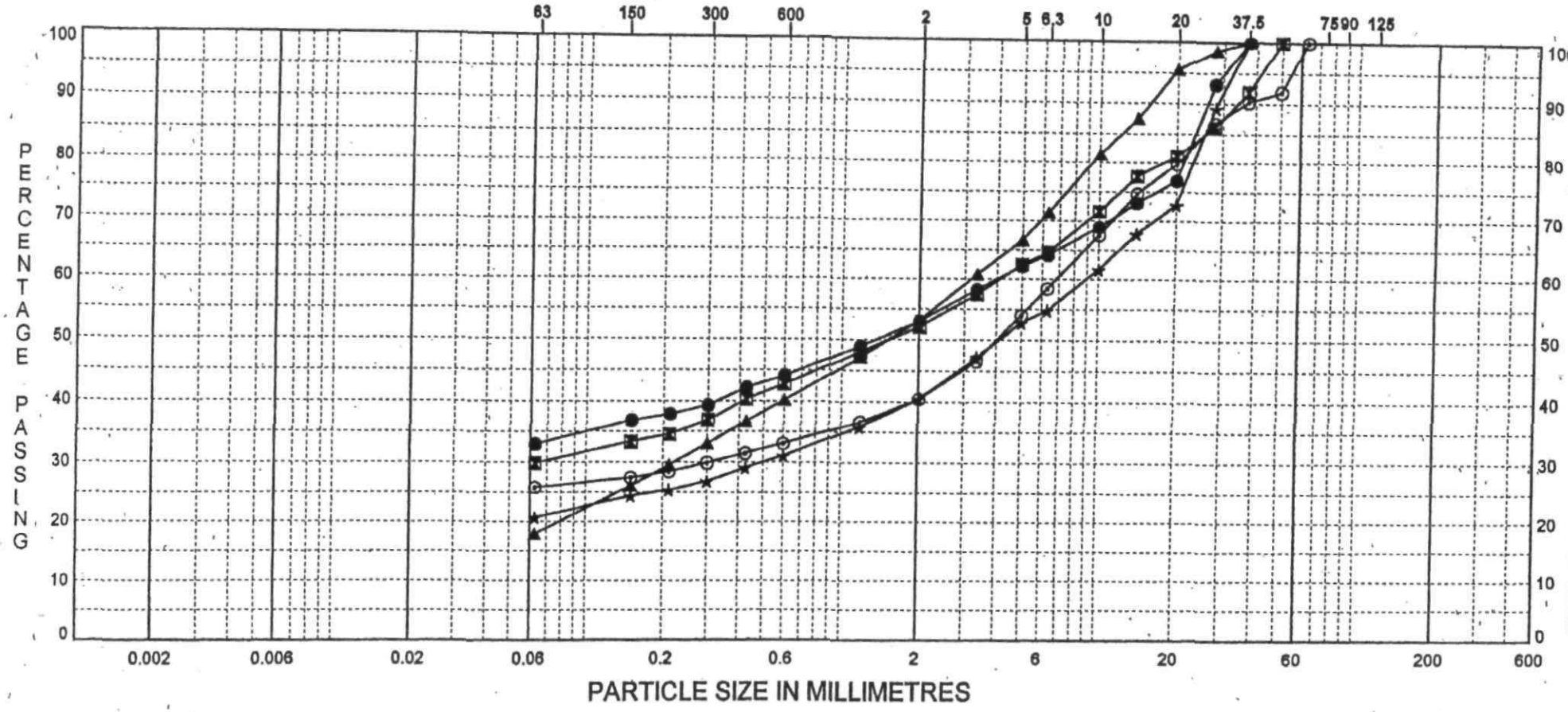



| | |
|---|---|
| optimum dry density Mg/m3 | 1.92 |
| optimum moisture content % | 11 |
| natural moisture content % | 14 |




| | |
|---|---|
| optimum dry density Mg/m3 | 1.86 |
| optimum moisture content % | 14 |
| natural moisture content % | 19 |

S Test Sieves In mm and microns




PARTICLE SIZE IN MILLIMETRES

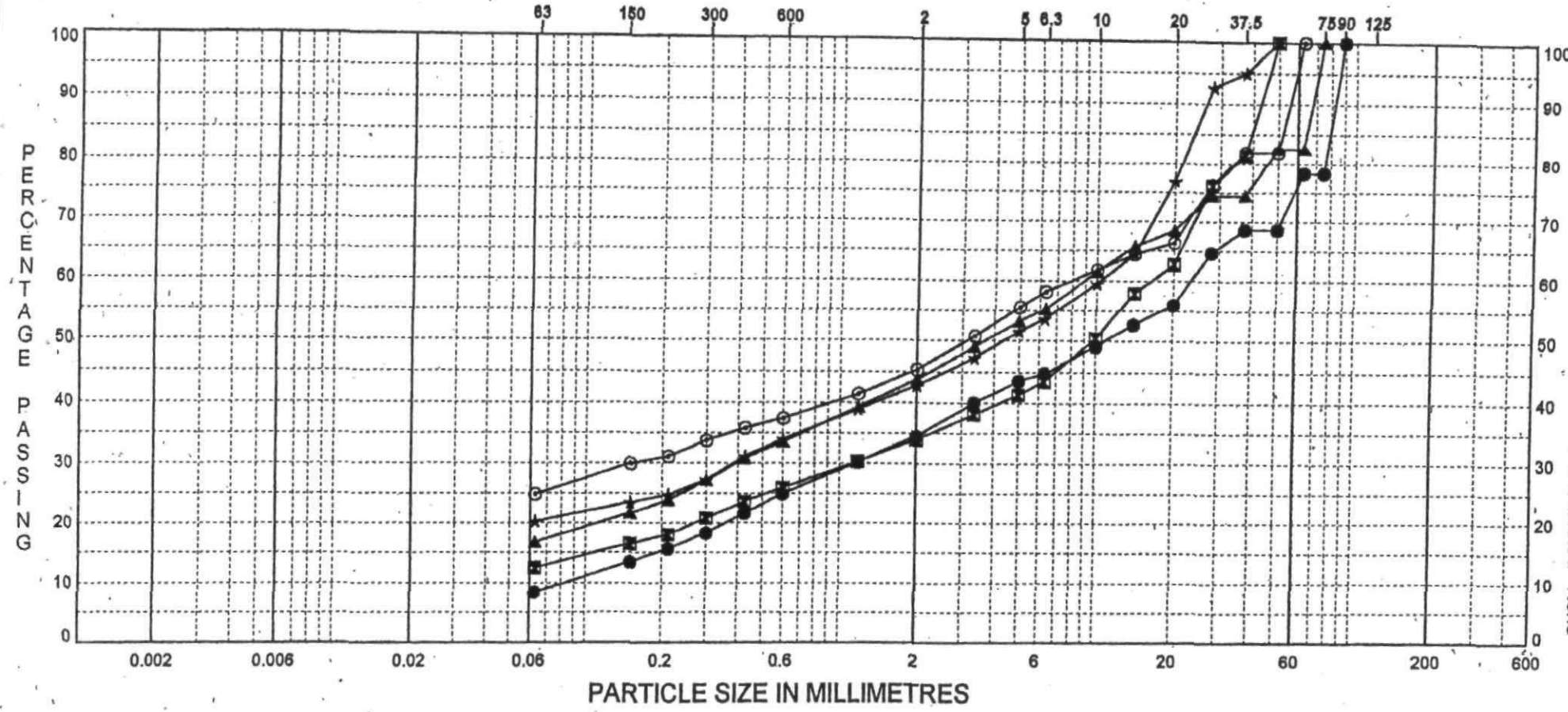
Particle Size Distribution
Test Method BS 1377 : Part 2 : 1990 : Method 9
Deviations from test method --None

| CLAY | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | COBBLES | BOULDERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SILT | | | SAND | | | GRAVEL | | | | |

| | BH No. | Depth | M | LL | PL | PI | D100 | D60 | D30 | D10 | %GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | TP6 | 1.00 | 13 | | | | 37.500 | 4.017 | | | 47.1 | | | |
| ⊠ | TP6 | 1.50 | 14 | | | | 50.000 | 4.115 | 0.066 | | 48.0 | | | |
| ▲ | TP7 | 1.20 | 15 | | | | 37.500 | 3.188 | 0.223 | | 46.9 | | | |
| ★ | TP8 | 1.00 | 14 | | | | 37.500 | 8.971 | 0.505 | | 59.5 | | | |
| ⊙ | TP8 | 2.50 | 15 | | | | 63.000 | 6.833 | 0.312 | | 57.8 | | | |

Scheme : GRIMETHORPE
Client :

BS Test Sieves In mm and microns



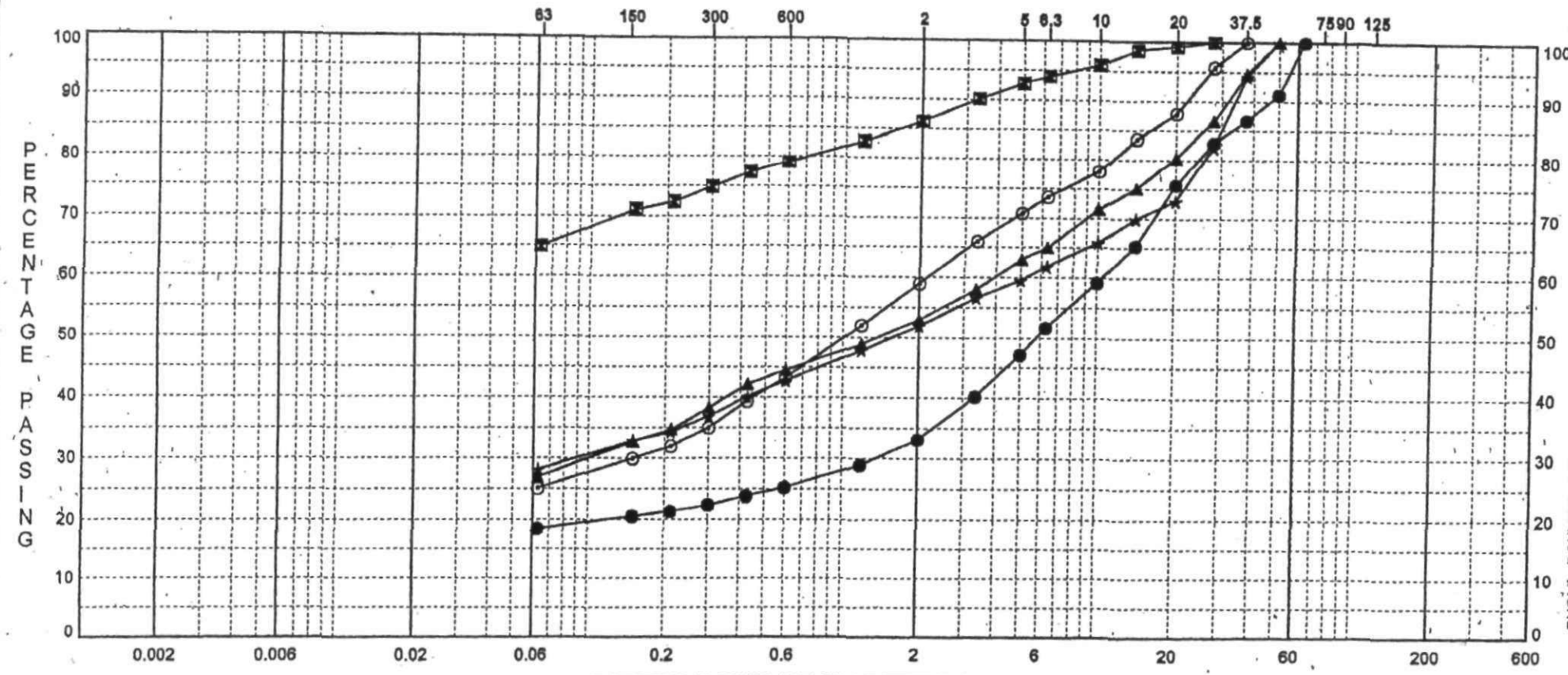

Particle Size Distribution
Test Method BS 1377 : Part 2 : 1990 : Method 9
Deviations from test method - None

| CLAY | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | COBBLES | BOULDERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SILT | | | SAND | | | GRAVEL | | | | |

| | BH No. | Depth | M | LL | PL | PI | D100 | D60 | D30 | D10 | %GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | TP1 | 0.90 | 8.0 | | | | 90.000 | 23.393 | 1.162 | 0.083 | 41.7 | | | |
| ■ | TP1 | 2.90 | 14 | | | | 50.000 | 16.378 | 1.132 | 0.036 | 66.1 | | | |
| ▲ | TP2 | 0.50 | 11 | | | | 75.000 | 8.987 | 0.395 | | 38.7 | | | |
| ★ | TP2 | 2.80 | 14 | | | | 50.000 | 10.347 | 0.386 | | 57.1 | | | |
| ◎ | TP3 | 0.80 | 10 | | | | 63.000 | 8.003 | 0.153 | | 50.8 | | | |

Scheme : GRIMETHORPE
Client :

BS Test Sieves In mm and microns




Particle Size Distribution
Test Method BS 1377 : Part 2 : 1990 : Method 9
Deviations from test method - None

| CLAY | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | COBBLES | BOULDERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SILT | | | SAND | | | GRAVEL | | | | |

| | BH No. | Depth | M | LL | PL | PI | D100 | D60 | D30 | D10 | %GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | TP4 | 0.60 | 8.4 | | | | 63.000 | 10.486 | 1.359 | | 65.0 | | | |
| ⊠ | TP4 | 1.30 | 18 | | | | 28.000 | | | | 13.9 | | | |
| ▲ | TP4 | 3.00 | 15 | | | | 50.000 | 3.961 | 0.101 | | 47.1 | | | |
| ★ | TP5 | 0.90 | 13 | | | | 50.000 | 5.254 | 0.089 | | 48.1 | | | |
| ⊙ | TP5 | 1.50 | 16 | | | | 37.500 | 2.167 | 0.152 | | 41.1 | | | |

Scheme : GRIMETHORPE
Client :

# APPENDIX 4

# APPENDIX 5

Solmek/Hymas conditions of offer, notes on limitations & basis for contract (2003-2004):

These conditions accompany our tender and supercede any previous conditions issued. Solmek (Hymas Geo Ltd) will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and its format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, soil gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2001 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek/Hymas you understand and accept that we have a contractual relationship and accept this.

Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete. Solmek cannot be held responsible for subsequent settlement/rutting of boreholes and claims arising from this. No price has been provided or requested for a return visit to remove pipework and covers.

We advise you/ your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 7% to the base rate for unreasonably late payments. Solmek/ Hymas are exempt from the CIS Scheme. Solmek/Hymas offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek activities or omission of the same are excluded.