



B&A GROUP

Waste Recovery Plan

Westgate Phase 2,
Weston Approach, Severnside, Bristol

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Appendices

Appendix A	Environmental Risk Assessment
Appendix B	Materials Specification, BAT1804
Appendix C	Planning Permission, SG4244
Appendix D	Westgate Masterplan Information Booklet, BATPA18/03
Appendix E	Westgate Master Plan, Ref 3889-GD-001
Appendix E	Flood Risk Summary
Appendix F	Cost Analysis

Drawings Included with this Application

Drawing No.	Title
2928/772/01	Site Location Map
2928/772/02	Permit Boundary Plan
2928/772/03	Existing Ground Levels
2928/772/04	Proposed Ground Levels
2928/772/05	Sections

1.0 Introduction

This recovery plan has been produced to accompany the Bespoke Environmental Permit Application for the use of waste in the construction of Commercial Units at Westgate Phase 2, Western Approach, Bristol, using imported excavated materials. The area which is the subject of this permit application is outlined in Green on Drawing No. 2928/772/02. All references to 'the site' in this statement shall mean this area. The site area is approximately 46.83 Hectares.

The application site is located between Marsh Common Road to the East and the M49 to the West. It is currently in agricultural use with Ellinghurst Farm and its outbuildings at its Northern end and Brook and Church Farm to the Southern end.

Tesco Distribution Depot is located to the North East of the site. There is an area of Farmland included in the Masterplan but not included within this Phase of the Permit application. It is the north eastern fringe area which runs in line with Marsh Common Road. This area will form part of Phase 3.

2.0 Permit Application Proposals

The Westgate development has been divided into phases, with the initial development 'Phase One', completed under bespoke Permit ref EPR/BB3206HB, which consisted of 2 plots. Phase 2 of the development consists of 8 plots, varying in size from 14,709m² to 127,169m² with internal estate roads, transport yards, parking and landscaping. Phase 3 will cover the remaining 8 plots.

The original ground levels are shown on the Existing Levels Survey, drawing ref 2928/772/03. The profiles are shown in the cross-section plan drawing No. 2928/772/05. Due to the existing ground conditions and the high-water table an acceptable agreed level of 7.1 AOD has been used for the design of the construction platform beneath the buildings. Approximately 668,919m³ of material is required to construct the site. The finished level beneath the Commercial units is 7.1 AOD.

The construction of the development platform is expected to be fully completed within 4 years of commencement of soil importation, however initial plots will be available for construction within the first 6 months of commencement.

3.0 Land Benefit

The site was granted planning permission in 1957 and 1958 for several uses, including ‘for the construction and operation of offices, warehouses, stores, reservoirs, pumphouses, canteens, clubs, hostels, training establishments, amenity and welfare buildings, sports pavilion and sports and playing fields’, please refer to Planning Permission SG4244 in Appendix C.

The ‘Master plan’ Drawing No 3889-GD-001 illustrates the layout of these units and the Westgate Information Booklet sets the context in the commercial environment, found in Appendix D and E.

The Severnside area is recognised as a valuable location for the development of commercial units due to its transport links close to the M5 corridor for the Southwest and easy access to both the M5 and M4 motorways and with the construction of the new M49 junction beside this development.

The development will provide the opportunity for large numbers of permanent and temporary jobs, both in the construction phase and beyond and will provide significant local authority revenues.

4.0 Intended Use and Waste Acceptance

Due to the amount of waste typically used at sites such as this and the inability at this early stage to identify exactly where the material is likely to come from we have included an Environmental Risk Assessment, Appendix A, which includes the acceptance criteria of the waste to be used on site, site specific risk assessments and includes contacting the local area Agency Office prior to accepting wastes from potentially contaminated sites.

This document includes the site specific risk assessment for the prevention of risk to human health or the environment.

5.0 Volume of Waste

The total volume of material used for the construction of the site is 668,919m³. This is to be laid in layers across the site.

The current ground level is 5.9AOD consisting of flat, low lying pastoral grassland. There has been several Site Investigations carried out on the neighbouring plot, access road and the new development plot and included conducting test on the ground conditions, which concluded that

the site has a high water table and comprises of thick soft highly compressible organic soils, which are susceptible to differential settlement.

The laboratory consolidation tests carried out on samples of alluvium show the Coefficient of Volume Compressibility, M_v , to range from $0.51\text{m}^2/\text{MV}$ to $2.9\text{m}^2/\text{MV}$ with most of the values being $1.4\text{m}^2/\text{MV}$ or above. Soils with an M_v of $1.4\text{m}^2/\text{MV}$ are classified as being of very high compressibility.

Currently no California Bearing Ration (CBR) tests have been carried on or in the alluvium. Equilibrium CBR for a silty clay with a plasticity index of 30%, a high water table, average construction conditions and thick construction (1200mm pavement including capping) is 4%. The site investigation report recommended that this value be adopted for the site. It is thought that if lower CBR were adopted (2.5%) that this could be subject to considerations of frost susceptibility.

The investigations also revealed that the bearing capacity of the existing very soft clay is low, of the order of 20Kpa. Even of this low bearing pressure settlement will be significant, between about 40mm and 110mm for a 2.0m wide strip footing and a net bearing pressure of 20kPa.

Due to the existing ground conditions and the high water table an acceptable agreed level of 7.1 AOD has been used for the design of the construction of the site beneath the buildings. Only material which meets the Material Specification, Appendix B, and is laid in accordance with the Highways Specification Series 600, is to be used. This uses the minimum amount of suitable material to achieve these levels.

6.0 Substitute for non-waste material

If waste material was not used in the construction of this development alternative non-waste material would have to be sourced in its replacement; however there is limited availability in the area for the importation. The likely source of general granular fill and general cohesive fill, which are not a waste, would have to be sourced from a burrow/clay pit, the nearest being in Cheltenham which is over 50 miles from the site. This would be using a natural resource to restore the site, rather than the re-use of a waste material. The haulage of this material would also contribute to increasing the use of natural resources and associated environmental impact.

If granular fill was used as a replacement for waste material it would be sourced from a Soil and Aggregates Treatment Facility in Hallen, in the form of a recycled 6F5 material. If a quarried aggregate was sourced, it would likely come from Stancombe or Freemans Quarries. This would

be using a natural resource rather than the production of a product from the treatment of waste.

The general and selective granular and cohesive material would be sourced from within the Bristol and South Gloucestershire area, minimising the haulage to the site.

An example of the cost analysis to purchase both quarried and recycled aggregate is included in Appendix F.

6.1 Cost Analysis – Waste v Non-Waste

The Soil and Treatment Facility at Hallen is able to supply 175,000 tonnes of 6F5 Recycled per year currently, with a supply of up to 5,000tn per day.

The Principal Contractor is able to work in partnership with another Recycled Aggregate depot which could assist in delivering the remaining 125,000 tonnes per year to supply a total of 400,000 tonnes per year, ensuring your project is completed in 4 years.

In order to expedite the programme, should there be a requirement for plots to be made available sooner, a combination of Recycled Aggregate and Quarried 6F5 could be used.

Project Cost;

Recycled Aggregate $1,337,838 \times £5.00 = £6,689,190$

Quarried Aggregate $1,337,838 \times £9.50 = £12,709,461$

The cost analysis spreadsheet is attached with an estimated build cost of £197,313,553

The cost of using recycled 6F5 is £6,689,190 for the total tonnage required for the project. This also includes the haulage, levelling and compacting the material.

The gross development value of the project is £283,787,495 with a Net development value of £264,489,945 and a profit of £33,080,752 taking into account of fees and finance costs.

The Cost Appraisal provides evidence that the project would still be viable using either a product or a waste material.

The plant and machinery employed to level and compact the waste material is the same for non-waste material and is taken into account in the development costs.

7.0 Design detail and construction standard

All works will be implemented in accordance with BS 6031:2009 'Code of Practice for Earthworks'

Suitable Materials, Placement and Compaction Suitable materials must meet the requirements of the following fill materials classified in the Specification for Highway Works (2005):

- General Granular Fill (Class 1a – 1c);
- General Cohesive Fill (Class 2a – 2e);
- Landscape Fill (Class 4);
- Selected Granular Fill (Class 6F2, 6F5, 6H).

These classes cover a full grading range. Oversize material (max 250mm diameter) will be permitted within the fill so long as they do not comprise more than 20% of the total by weight.

Fills must be placed at a suitable moisture content, in layers of maximum 500mm thickness and each layer compacted with a minimum 4-passes of a 12-tonne tracked excavator, or suitable vibratory roller, before the next layer is placed.

This material should be compacted to a minimum of 90% maximum dry density, with a minimum undrained strength of remoulded material 50kN/m².

No frozen fill is to be placed.

8.0 Summary

This document has been produced to justify that the activity involves the recovery of waste rather than the disposal of waste material. This has included identifying a clear benefit from the activity in terms of justifying the waste is suitable for the intended use, submission of drawings to support the volume of waste used, providing a case that waste is being used to replace non-waste materials and details of the construction and maintenance standards to be followed.