PLANNING APPLICATION NO.: MW.0003/14

PROPOSED EXTENSION TO SITE AREA OF AGGREGATE RECYCLING FACILLITY AT DIX PIT, STANTON HARCOURT

SUPPLEMENTARY PLANNING STATEMENT 176CRNA/7 - OCTOBER 2014

1.0 The Proposed Changes to the Application Development

1.1 A planning application has been made for a site extension to the Sheehans Aggregates Plant at Dix Pit, Stanton Harcourt, because a wider range of waste materials can be processed through the facility to create a greater variety of recycled end products than was originally anticipated, and more space is required to provide storage capacity for these materials, but also to ensure that the high quality of the end products is maintained.

1.2 Concerns were expressed about the effects of the proposed site extension in terms of its context in the landscape and visual amenity. In response a Landscape and Visual Impact Assessment (LVIA) of the proposed development has been carried out, the results of which are contained in the report of Portus + Whitton Landscape Architects accompanying this supplementary planning statement.

1.3 The appraisal of the initial application scheme found that for a part of the proposed site extension there would have been some visual impact if this area were to be used for the proposed activities, because of elevated site levels. The remainder of the site area at lower levels would, however, be acceptable for the proposed use. The design of the scheme has therefore been altered to exclude this higher area from any stockpiling or processing activities and to plant the area up, so that it would provide further longer term screening benefits to the proposed activities in addition to those provided by the naturally higher level of the land.

1.4 The proposed revised scheme is shown on the Landscape Master Plan, drawing no.: 1408/L/2 Rev A, in the LVIA, together with all the proposed additional planting and landscaping of the site and adjoining land. The existing site plan has been revised to reflect these changes, as per drawing no.: 176CRNA/3 Rev A.

1.5 The revised scheme clearly means a reduction in the space available for the proposed ancillary stockpiling and processing activities, and therefore it is proposed that the balance of the space required is sought within an existing lower area within the adjoining landfill site, which would be the subject of a separate application for final restoration of the landfill site, which is to be submitted shortly.

2.0 The Landscape and Visual Effects of the Revised Proposed Development

2.1 The LVIA sets out the following landscape proposals to provide an improved setting to the overall recycling complex, so that it sits comfortably within the wider landscape:

- Retain land on higher elevations of the site as soft landscaping;
- Retain and protect all existing trees;
- Plant groups of native trees;
- Retain and actively manage tall ruderal vegetation on the higher elevations of the site;
- Retain existing hedgerows and replant gappy stretches; and
- Introduce enhanced wetland planting to the surface water storage pond.

2.2 The local landscape is found to have a moderate to low sensitivity, and overall it is concluded that the proposed development as revised with the above landscape proposals would not have any significant landscape or visual impacts.

3.0 The Sustainable Benefits of the Facility

3.1 The Sheehans Aggregates Plant is a sophisticated static processing plant system, which enables the release of an as yet largely under-utilised potential to re-use CDE (construction demolition and excavation) waste in higher value applications, which is not available through more conventional aggregate recycling facilities.

3.2 The processing system is very similar to a mineral processing plant, but with added functions, and which puts the waste through a wash, screening and grading process. Due to the washing and grading process it is possible to manufacture recycled aggregate to a quality assured level that substitutes for and competes directly with land won minerals across the spectrum of building applications.

3.3 The plant is supplying the full range of sized and graded aggregate, as well as coarse and fine sand, and ballast, which is equivalent to that which would be offered by a local quarry.

3.4 In addition the quality of the products manufactured at the facility are such that they have the real potential to contribute to the manufacture of concrete and concrete products. Recycled aggregate is not yet commonly accepted for use in the manufacture of concrete and concrete products, no doubt given its usual lower grade quality, as produced through conventional dry systems.

3.5 Nevertheless extensive concrete trials have been conducted at the Sheehans Aggregates Plant site, including construction of holding bay walls, power floated floor and external paving, using 100% recycled aggregate. The trials have proven that the washed recycled aggregate, both fine and coarse, passes the test for structural concrete, achieving BS EN 1260 certification. A copy of the relevant grading results and a report of the assessment of the potential suitability of the recycled aggregate for use

within concrete are attached. The concrete product has a 93% sustainable content by volume (the cement content making up the remainder).

3.6 Not only does the facility have the capacity to replace the virgin products produced at a local quarry across the range, but it also has the following other advantages over local quarries.

- It is capable of producing Type 1 materials, which are not available locally as a land won mineral, and therefore also helps reduce miles travelled in importing these minerals to the county from Somerset and Leicestershire.
- Recently during the severe floods earlier in the year, the plant provided the sand for the emergency sand bags required for the flood relief in the Thames Valley, because the local quarries were flooded and not able to provide the material.

3.7 Furthermore the plant is more than a 'virtual quarry', because it possesses the capability of making recycled products from waste materials that would otherwise not have any other route than final disposal, and/or because it enables worn-out materials to put back to their original high specification heavy duty use.

- Recycled road planings, which comprise asphalt reclaimed from highways maintenance and reconstruction work of roads, are already commonly recycled, though currently this is on the whole for less demanding surfacing applications, such as haul roads, farm roads, footpaths and other lightly trafficked roads, and some road maintenance work. According to WRAP the current percentage, however, of new asphalt containing recycled asphalt planings is only 10%, and the rates of recycling and re-use of asphalt for new and replacement road construction are a target for improvement. The Sheehans Aggregates Plant has the necessary capability to do this, by processing and rebinding the road planings to manufacture a high specification heavy duty replacement product, suitable for base and binder courses of public highways, and thereby creating on behalf of the Highways Authority a closed loop recycling of existing road surfaces.
- Highway sweepings are a difficult waste to deal with, because of the contaminants they contain and the only option has conventionally been to send them to landfill for final disposal. The Sheehans Aggregates Plant is, however, capable of removing the contaminants through the wash process and then to produce re-usable end products of the sweepings. This again helps the Highways Authority achieve objectives for improved levels of recycling in its services.
- Finally, as the system cleans the dirt and fines out through the washing process it creates a further useable form of material from it through a filter press, which is currently being used for landfill cover and engineering, but also has the potential to be used for manufacture of bricks and other building products.

3.8 Significantly higher proportions of CDE waste can be recovered at the facility, which would not otherwise be suitable for dry processing, (because it contains too much dirt and fines, which clog up the equipment). In fact since installing and operating the plant in

2012 it has become apparent that an even wider range of waste materials with much higher soil content can be processed than was previously thought possible. The plant can also be operated in all weathers, which is not the case with dry aggregate recycling, so this enables a steady throughput of material. The plant therefore not only maximises the contribution to aggregate supply from recycled and secondary aggregate sources, it also maximises the recovery of CDE waste.

3.9 The highly sustainable nature of the facility has recently also been confirmed by the University of Oxford, which has approached the applicant seeking opportunities for collaboration in assisting in the research of its post graduate students in the MSc in Sustainable Urban Development, in relation to the benefits and possibilities that the processing system presents.

3.10 Consequently it is hoped that support can be given to developing and sustaining this facility. Notably the February 2014 Review and Update of the (May 2012) Oxfordshire Waste Needs Assessment background document confirms at paragraph 7.2 of the Construction, Demolition and Excavation Waste Chapter that these types of systems, i.e. ones that clean up residues and generate product to be utilised as a suitable replacement for primary materials, should be the focus for further improvement in recovery of demolition waste. The document furthermore identifies in the following paragraph 7.3 that excavation waste is the most problematic stream to divert from landfill, because of clay type materials that are not amenable to recycling through currently adopted processing methods due to its cohesive properties, and that this material requires disposal to landfill if alternative routes are not available. New technology such as the Sheehans Aggregates Plant offers such an alternative route, and should be encouraged, as suggested further in paragraph 7.3 of the Construction, Demolition and Excavation Waste Chapter of the Waste Needs Review document, by ensuring the availability of new sites or expansion of existing capacity.

4.0 The Planning Balance

4.1 The LVIA has identified that, with the proposed changes to the site extension scheme, the proposed development would be acceptable in terms of its landscape context and visual amenity.

4.2 In addition the facility, by producing high quality replacement products for primary materials and by enhancing diversion from landfill of problematic wastes, provides significant benefits in reducing the demand for more mineral extraction, and in addressing waste as resource. It is a highly sustainable form of development of the kind that the NPPF is seeking to promote, and the proposed site extension would consolidate and reinforce the NPPF's objectives of achieving sustainable development, in particular by minimising waste and supporting the transition to a low carbon future.

4.3 Therefore in light of the measures proposed to address the landscape and visual concerns and the highly sustainable benefits that the additional site area would bring, it is hoped that the planning balance weighs in favour of the proposed development and that planning permission is forthcoming for the proposed site extension.

Environmental Scientifics Group
2 Newton Close
Drayton Fields Industrial Estate
Daventry
Northants NN11 8RR
Telephone: +44 (0) 1327 703828
Facsimile: +44 (0) 1327 300154

0001

TEST REPORT

Determination of Particle Size Distribution

Client:	Sheehan Group	Report No:	50164751/12/03
Client Address:	Knightsbridge Farm Yarnton Oxford	Batch Number: Lab Ref:	DAM0036539 45159693
Postcode:	OX5 1PH	Client Ref: Location:	Sharp Sand Stockpile
Site:	Oxford, OX29 5UX		
		Date Sampled:	09.05.12
Sampled by:	Client	Date Received:	09.05.12
Sampled from:	Site	Date Tested:	17.05.12
Supplier:	Client	Sample Type:	Bulk
Source:	Site	Sample Mass (kg):	20

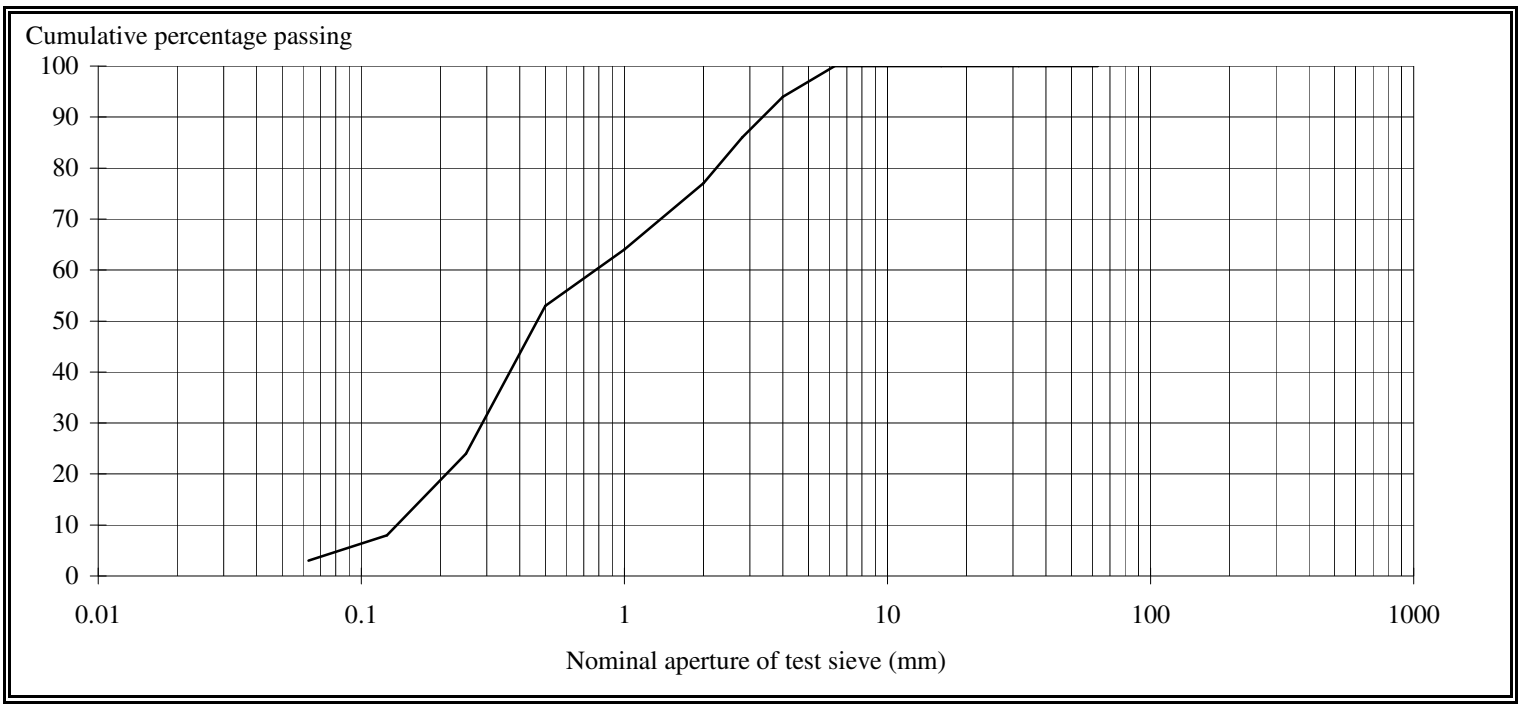
Description: 0/4 (MP) Fine aggregate for concrete
Brown SAND with occasional Crushed Concrete and Brick

Specification: PD 6682-1: 2009, Table No: D.1, Category G_f 85
Guidence on the use of BS EN 12620:2002 + A1

Remarks: Sample complies with the grading specification

SIEVE ANALYSIS

BS Sieve (mm)	Passing (%)	Material Specification
63	100	
40	100	
31.5	100	
20	100	
16	100	
10	100	
8	100	100
6.3	100	95 - 100
4	94	85 - 99(±5)
2.8	86	
2.0	77	
1.0	64	(±20)
0.500	53	30 - 70
0.250	24	(±20)
0.125	8	
0.063	3	(±3)



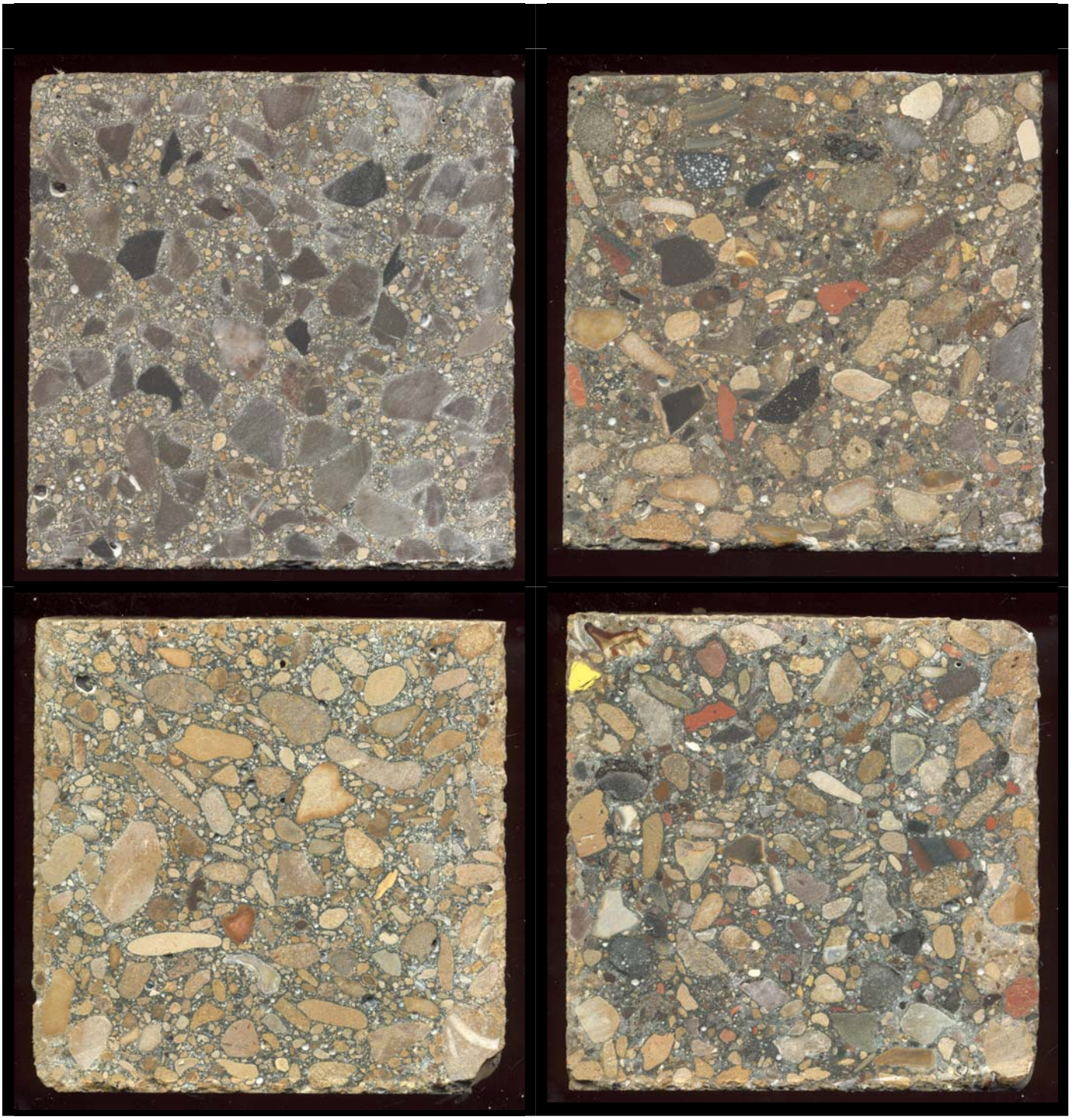
Certified that the Particle Size Distribution was determined in accordance with BS EN 933-1: 1997
Certificate of sampling to BS EN 932-1: 1997 received

Date Reported: 22.05.12

Signed: M. Carr

[✓] M. Carr - Section Manager
[ ] D. Berrill - Laboratory Manager

For and on behalf of Environmental Scientifics Group



Dix Pit Washing Plant, Stanton Harcourt

Assessment of recycled fine aggregate

JULY 2013

CONTENTS

TABLES

APPENDICES

Cover image – Images of polished slices of 100 mm cube. Top left: Primary aggregate (coarse and fine), pfa, CEM I. Top right: Sheehan aggregates (coarse and fine), pfa, CEM I. Bottom left: Primary aggregates (coarse and fine), ggbs, CEM I. Bottom right: Sheehan aggregates (coarse and fine), ggbs, CEM I.

RSK DOCUMENT CONTROL

Report No.: 285231-02 (01)

Title: Dix Pit Washing Plant, Stanton Harcourt – Assessment of recycled fine aggregate

Client: Sheehan Group
Knightsbridge Farm
Woodstock Road
Yarnton
Oxford
OX5 1PS

Date: 12 July 2013

Office: Hemel Hempstead

Status: FINAL

Author	Paul Bennett Hughes Associate Director	**Technical reviewer**	Dr Ian Sims Director
Signature		Signature	
Date:	12 July 2013	Date:	12 July 2013

This report is an abridged version of the full RSK report 284831-01 (01). None of the tests carried out have been omitted.

1 INTRODUCTION

1.1 Instructions

RSK were instructed to characterise the composition and properties of the processed recycled fine aggregate from stockpiles at Dix Pit Washing Plant, Stanton Harcourt, Oxfordshire. The purpose of assessing the various stockpiles, representing approximately 6 months of production, of the fine recycled arisings (say 'FRA') was to gain an initial assessment of the consistency of the product over a period of production time and also to assess whether it was potentially suitable for use within concrete. The tests included within this investigation were selected to give a preliminary indication of the fitness for purpose of the material.

1.2 Fine aggregate derived from arisings

The source of the material for the recycling plant is primarily construction arisings, rather than those sources stated for RA and RCA. There is a lack of published documents relating to the use of fine recycled arisings (say 'FRA') within concrete, so the properties of the material must be assessed on a 'first principles' basis. However, given that the FRA is a recycled product for use within concrete, it is possible to use some of the current BS and EN standards as guides to assess the potential use of the material within concrete. The use of fine RCA and RA should be taken on a case-by-case basis, which also seems applicable to FRA given the potential range of sources of material to be recycled.

1.3 Sampling

Samples were taken in accordance with BS EN 932-1[1].

[1] BS En 932-1: 1997, Tests for general properties of aggregates, Part 1: Methods of sampling, British Standards Institution, London, UK.

2 SUMMARY OF MATERIAL CHARACTERISTICS

A summary of the results of the testing undertaken by RSK on behalf of Sheehan Recycled Aggregates is shown in **Table 2.1**. All testing was conducted between January 2013 and April 2013.

Table 2.1 Summary of fine aggregate material properties

Test	EN 12620[2] Notes for aggregate	
	Class/Mean	Unit
Particle size distribution	***MP***	-
Acid soluble sulfate content	***$AS_{0.8}$***	as SO_3 (% by mass of dry aggregate)
Water soluble sulfate content	***$SS_{0.2}$***	as SO_3 (% by mass of dry aggregate)
Acid soluble chloride content	***0.014***	% chloride by mass of sample
Acid soluble chloride content	***0.004***	% chloride by mass of sample
Total sulfur	***Pass***	% S by mass of sample
Alkali content	***0.070***	% total alkalis as Na_2Oeq
Methylene blue	***0.93***	g of dye per kg
Apparent particle density	***3.04***	Mg/m^3
Particle water absorption	***3.2***	% of dry mass
Influence on initial setting time	***A_{40}***	delay in minutes (20 min in test)
Loose bulk density	***1.403***	kg/L

A more detailed schedule of test results is presented in **Appendix A**.

A summary of the mean petrographic composition of the aggregate is shown in **Table 2.2**.

Table 2.2 Summary of petrographic composition

Constituent	%
Quartz	38
Limestone	35
Ironstone	6
Sandstone	5
Shell	5
Brick	4
Slag	4
Quartzite	3
Chert	3
Calcite	1
Dolomite	1
Dolerite	<1
Glauconite	<1
Plant material	<1
Paint	<1

[2] BS EN 12620: 2008, Aggregates for concrete, British Standards Institution, London, UK

3 ASSESSMENT

- This assessment of suitability is based upon the sampling and testing described in this report.
- The recycled fine aggregate samples were well graded and could be classified as fitting the *MP* grading envelope. The mean fines (<63 µm) content was 3%, which is the threshold value between non-harmful and harmful fines in accordance with EN 12620. X-ray diffraction (XRD) analysis of the fines determined that the <2 µm sized material did not contain any clay materials.
- The mean methylene blue value of the recycled aggregate (0.93 g/kg) was relatively low and consistent with an aggregate dominated by quartz and limestone. There is no UK threshold value for methylene blue values, however the determined value would just satisfy the French maximum value of 1g/kg for aggregates for use in concrete.
- The constituents within the <63 µm sized material were similar to the >63 µm sized material (ie dominated by quartz and limestone).
- There was some variability in the results for the acid and water-soluble sulfate contents, with individual determinations, which, if taken on their own, would put the material into a higher category than the mean value. In accordance with EN 12620 the mean values for the material would classify the material as $AS_{0.2}$ and $SS_{0.2}$.
- The determined acid and water-soluble chloride contents for the fine recycled aggregate varied, but were consistently low. The chloride contents, along with the alkali content, particle density and water absorption value could be taken into account when specifying a concrete mix. The acid and water soluble chloride content of the recycled fine aggregate within a standard concrete mix, would suggest values of 0.09% and 0.05% by mass of cement for acid and water soluble chloride contents of concrete, respectively. These values of chlorides within a concrete would enable it to be used for plain concrete and concrete containing steel reinforcement, however, it would not be suitable for concrete containing prestressing steel.
- The alkali content of the recycled fine aggregate if used in a 2:1 ratio with a typical natural flint coarse aggregate would contribute approximately 0.9 kg $Na_2Oeq./m^3$ of concrete.
- The mean total sulfur content of the recycled aggregate did not exceed the threshold value in EN 12620 for natural aggregates (mean value 0.10% sulfur by mass of sample against a threshold value of 1%).
- The initial setting time of cement was increased by use of the fine recycled aggregate; increasing the mean setting time by 20 minutes.
- The loose bulk density of the aggregate appears fairly consistent, with a mean of 1.40 kg/L, which is comparable with fine aggregates used for normal weight concrete. The particle density appears slightly higher than expected.

- Overall, the findings of the testing appear positive and indicate that the fine aggregate material can be used within concrete for a wide range of applications.
- Further sampling and monitoring of the fine aggregate will take place as production continues and consequently this report will be updated from time to time.

APPENDIX A - SUMMARY OF TESTING

Test	EN 12620[3] Notes for aggregate			
	Class/Mean	Unit	Sieve size, mm	Percentage passing (range)
Particle size distribution*	***MP***	-		
			63.0	100
			31.5	100
			16.0	100
			8.0	100
			3.35	100
			2.0	98 to 99
			1.0	80 to 87
			0.5	61 to 69
			0.25	29 to 33
			0.125	10 to 12
			0.063	2.5 to 3.2
Test	**Class/Mean**	**Unit**	**Range**	**Mean value**
Acid soluble sulfate content	***$AS_{0.8}$***	as SO_3 (% by mass of dry aggregate)	0.1 to 0.3	0.2
Water soluble sulfate content	***$SS_{0.2}$***	as SO_3 (% by mass of dry aggregate)	0.01 – 0.26	0.13
Acid soluble chloride content	***0.014***	% chloride by mass of sample	0.012 – 0.016	0.014
Water soluble chloride content	***0.004***	% chloride by mass of sample	0.002 – 0.005	0.004
Total sulfur	***Pass***	% S by mass of sample	0.05 – 0.16	0.10
Alkali content	***0.070***	% total alkalis as Na_2Oeq	0.066 – 0.073	0.070
Methylene blue	***0.93***	g of dye per kg	0.7 – 1.1	0.93
Apparent particle density	***3.04***	Mg/m^3	3.02 – 3.08	3.04
Particle water absorption	***3.2***	% of dry mass	2.9 – 3.7	3.2
Influence on initial setting time	***A_{40}***	delay in minutes (20 min in test)	*-4 - 32*	*20*
Loose bulk density	***1.403***	kg/L	1.364 – 1.430	1.403

**<63µm material shown by XRD predominantly to exhibit a similar composition as the >63µm material and not include any clay mineral material.*

[3] BS EN 12620: 2008, Aggregates for concrete, British Standards Institution, London, UK