# the quality protocol

for the production of aggregates from inert waste

HIGHWAYS AGENCY

QUARRY PRODUCTS ASSOCIATION

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# foreword

Rulings by the European Court of Justice (ECJ) have provided some further guidance on how the definition of waste should be interpreted and applied by Member States and have led to the conclusion that more things are waste and remain waste for longer. This has an impact on the use and potential use of construction aggregates processed from inert wastes due to the uncertainty of when the inert waste could be considered to be fully recovered and no longer a waste. A key objective of the WRAP Aggregates Programme is to reduce the demand for aggregates from primary resources through promoting and increasing the use of more sustainable resources, therefore addressing the challenge resulting from these ECJ rulings became a WRAP priority.

After initial debate with a broad range of stakeholders from the construction supply chain attending the WRAP Aggregates Forum it was agreed that WRAP would facilitate a working group of Forum members with a brief to produce a guidance document for the producers and purchasers of aggregates produced from inert wastes. The objective was to establish a defined quality management scheme that controlled both the management of environmental risk from feedstock and the management of aggregate processing to established standards. This management scheme was called the Quality Protocol.

The purpose of the Quality Protocol is to provide a uniform control process for producers from which they can reasonably state and demonstrate that their product has been fully recovered and is no longer a waste. It also provides purchasers with a quality-managed product to common aggregate standards increasing confidence in performance. Furthermore the framework created by the Protocol provides a clear audit trail for those responsible for ensuring compliance with Waste Management legislation.

When reaching a decision on when a waste ceases to be a waste, the Environment Agency requires its staff to take all the circumstances of each case, based on current case law, into account. The Environment Agency considers that the protocol is suitable for use to decide how to regulate wastes, and has circulated this QP to its staff and advised them to also take account of it in their decision making.

WRAP will continue to assist in the growth of the production and use of sustainable aggregates and is optimistic that the Quality Protocol will achieve this through giving greater confidence to producers, purchasers and regulators.

# Introduction

This document is published by WRAP (Waste and Resources Action Programme) and has been produced by QPA (Quarry Products Association), HA (Highways Agency) and WRAP as a formalised quality control procedure for the production of aggregates from recovered inert waste. These are referred to in the document as "recovered aggregates". The document has two main purposes:

i. To assist in identifying the point at which the inert waste used to produce recovered aggregates has been fully recovered, ceases to be a waste and becomes a product. (Further information on the definition of waste and recovery is given in section 1.)

ii. To give adequate assurance that recovered aggregate products conform to standards common to both recovered and primary aggregates.

The protocol seeks to ensure that recovered aggregates meet the quality and conformity requirements for European Standards for Aggregates. If they do then they are likely to be regarded as having been completely recovered and having ceased to be waste at that point. However, whether a substance or object is waste, in any particular situation, must still be determined in the light of all the circumstances, having regard to the aims of the Waste Framework Directive (75/442/EEC as amended by 91/156/EEC) and the need to ensure that its effectiveness is not undermined.

This document supersedes the Quality Control Protocol, called 'Quality Control – the production of recycled aggregates', reference BR 392, ISBN 1 86081 381 X.

# 1 | the definition of waste

Waste is defined in the Waste Framework Directive as any substance or object that the holder discards, intends to discard or is required to discard. As a result of European and national case law over the last few years, the circumstances under which a substance or object may be said to have been discarded (or to be intended or required to be discarded) have broadened considerably.

Furthermore, it is considered that once a substance or object has become waste, it will remain waste until it has been fully recovered and it no longer poses a potential threat to the environment or human health. This will be the point when there is no longer any reason to subject it to the controls and other measures required by the Directive, and the Environment Agency takes the view that waste remains waste until it is fully recovered. The Agency considers that, as a starting point, waste which is used as aggregate/ construction material will only cease to be waste when it is incorporated into a structure such as a road or building, even if it has been through a recovery process such as screening or crushing. (The use of such waste would need to be carried out in compliance with waste management legislation, including licensing or registered licensing exemption, registration of carriers and duty of care, for example.) However, the Agency also considers that it is possible, in some cases, for certain wastes to be fully recovered and cease to be waste before they are actually used as aggregate.

It is the responsibility of the holder of the substance or object to determine, on a case by case basis, whether it is waste or not.

This protocol will provide support in taking that decision i.e. if all the criteria specified in this protocol are met, then it would indicate that the material is probably no longer waste. Of course, whether a substance or object is waste is ultimately a matter for the Courts and the holder is advised to keep a record of any decisions made.

This paper represents the understanding of the law at the date of the document. The law may change and the reader must take account of future developments, for example, by checking the WRAP website to ensure that they are using the latest version.

# 2 | other definitions

Aggregates recovered from processing inert wastes are defined within the European and British standards and specifications as illustrated in the definitions below:

| | |
|---|---|
| **Aggregate** | Granular material used in construction. Aggregate may be natural, manufactured or recycled. |
| **Recycled Aggregate** | Aggregate resulting from the processing of inorganic material previously used in construction. |
| **RA** | A designation used in BS 8500 for recycled aggregate principally comprising crushed masonry (brickwork and blockwork). |
| **RCA** | A designation used in BS 8500 for recycled aggregate principally comprising crushed concrete. |
| **RAP** | Recycled aggregate consisting of crushed or milled asphalt. This may include millings, planings, returned loads, joint offcuts and plant waste. |
| **Inert Waste** | Refer to definition in Appendix C |

# 3 | the quality protocol

## 3.1 | Factory Production Control

A system for factory production control (FPC) shall be set up in accordance with the Annex which is included in all BS ENs for aggregates. For example, Annex C of BS EN 13242 specifies a system to ensure that aggregates for unbound applications conform to the relevant requirements of the standard. PD 6682-6 provides further guidance for UK users of BS EN 13242. Both documents are available from the British Standards Institution.

In the UK, the required level of attestation of conformity to European Standards for aggregates is 4 (with the exception of aggregates for use in skid-resistant surfacings).

This means that the aggregate producer must operate a "first party" system of factory production control following initial type testing. Certification and surveillance by notified accreditation bodies ("third parties") are not required. Further details are provided in PD 6682 series, available from the British Standards Institution.

## 3.2 | Description of products being provided

Each product provided shall be described. When applicable, this description shall be the same as given to the product when produced with natural aggregates, e.g. 20/40 Type B filter drain material. In other cases the description shall, as far as possible, detail the product and use. The producer should note that the production of an aggregate to an established specification does not in itself ensure recovery from waste. It must also be demonstrated that there is a need and a market for the recovered waste and that it will not be merely stockpiled pending development of such a need or market.

## 3.3 | Reference to the specification requirements for aggregate products

Under the description of products the Specification to which these products conform shall also be included. In cases where there is no specification then the classification of, 'no specification', shall be used. Where an internal specification is used then reference shall be as such.

## 3.4 | Acceptance criteria for incoming waste

**3.4.1** To ensure that only inert waste is accepted the producer shall have and maintain procedures in the form of 'Acceptance Criteria' specific to each site/location. All Statutory and regulatory requirements for the receipt of incoming waste shall be observed and included in the Acceptance Criteria. These requirements include those arising from a waste management licence or a registered licensing exemption and the duty of care.

The following shall also be included in the Criteria;

a) the types of waste that are accepted
b) the method of acceptance

**3.4.2** Only waste that can meet the definition of inert (see Appendix C) shall be accepted.

**3.4.3** A visual inspection shall be carried out on every load, on initial receipt and after tipping, to ensure compliance with the Acceptance Criteria. Where the percentage of any contaminant or foreign material is higher than that defined in the acceptance criteria, the consignment must be rejected.

**3.4.4** A record of each load delivered and accepted shall be kept giving;

a) date
b) nature and quality
c) place of origin (where known)
d) quantity by weighing/volume
e) carrier
f) supplier

## 3.5 | Method Statement of Production

A method statement shall be prepared detailing the waste recovery process and the range of products produced. A flow chart (example Appendix A) may be used for this purpose with additional qualifications as necessary. The method statement shall form a part of the Factory Production Control System (see 3.1). It should be noted that some incoming wastes can be supplied for certain categories of end use with little or no processing. This should be detailed in the method statement for production.

## 3.6 Inspection and testing regime including frequency and methods of test for finished product

**3.6.1** The inspection and testing regime shall be detailed and appropriate to the material end use, the quality of incoming waste and the complexity of the waste recovery process.

**3.6.2** Sampling of the processed/recovered product shall be carried out in accordance with BSEN 932-1. The following minimum test frequencies, in accordance with the FPC system and detailed in the table below, shall be used.

Products shall be sampled and tested in accordance with the minimum test frequencies in order to provide sufficient data to demonstrate compliant product. These testing rates shall be varied to ensure a controlled process.

## 3.7 Records

**3.7.1** Records of incoming wastes and products shall be kept. Statutory record keeping requirements for waste must be observed (eg those arising from a waste management licence or a registered licensing exemption and the duty of care.)

**3.7.2** In addition to records kept in accordance with FPC, records shall be kept of all testing carried out on samples taken in accordance with 3.6. Results of tests shall be shown compared to the applicable specification.

**3.7.3** If further tests are required for assessment of suitability for a particular end use, then the results shall also be retained.

## 3.8 Quality Statement

Delivery documentation shall state that the product was produced under a quality protocol conforming to this document.

## 3.9 Information to be provided by the producer

When requested by the purchaser, the producer shall provide;

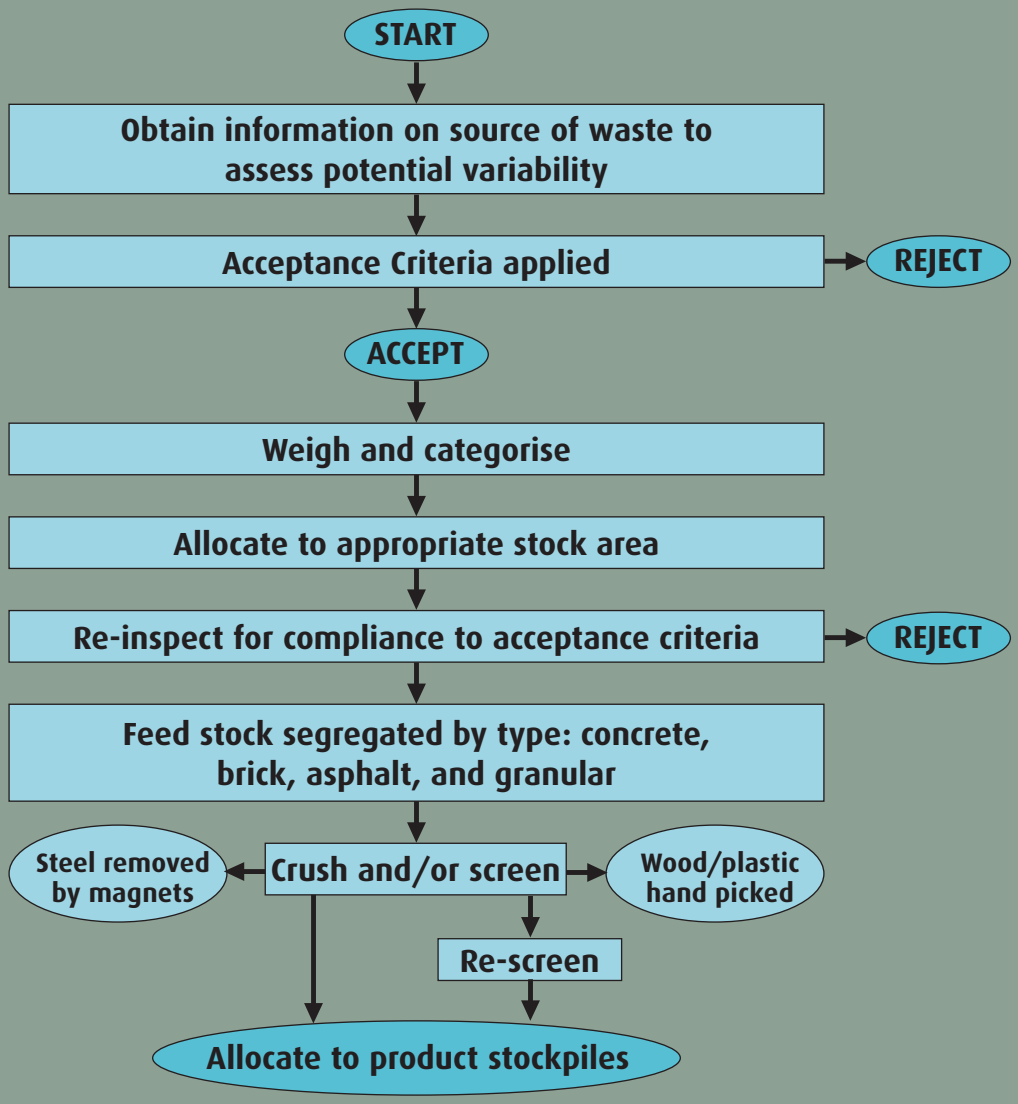
a) test results
b) test procedures
c) outline details of the factory production control manual

| Property description | BSEN test method | Minimum Test Frequency |
|---|---|---|
| General description | _ | Every incoming load by visual inspection |
| Aggregate composition including organics | Visual sorting of the plus 8mm fraction* | 1 per week** |
| Grading | 933-1 | 1 per week** |
| Fines Content | 933-1 | 1 per week** |
| Particle Shape*** | 933-3 | 1 per month** |

*Test procedure detailed in Highways Agency Specification for Highway Works Clause 710.
**Time periods relate to production periods not calendar periods.
***For unbound aggregates PD 6682-6 recommends that 'no requirement' be adopted in the UK for particle shape.
Note: To illustrate suitability for a particular end use the test methods detailed in Annex B may prove useful.

# appendix A

**Example of a flow chart for acceptance and processing of inert waste**



# appendix B

## Aggregate Properties

**The following test methods may be used as a means of either deciding or illustrating suitability for a particular end use.**

| | TEST REFERENCE | |
|---|---|---|
| | **BS EN** | **BS** |
| **All end uses** | | |
| Particle Density | 1097-6 | |
| Resistance to Fragmentation: | | |
| Los Angeles | 1097-2 | - |
| Bulk Density | 1097-3 | |
| **Use in concrete/hydraulically bound materials** | | |
| Water Absorption | 1097-6 | |
| Magnesium Sulfate | 1367-2 | - |
| Abrasion Resistance: | | |
| AAV | 1097-8 | |
| Drying Shrinkage | 1367-4 | |
| Chlorides | 1744-1 | |
| Sulfate and Sulfides | 1744-1 | |
| Alkali Silica Reaction* | - | - |
| Organic Contamination | 1744-1 | - |
| *All RCA must be classed as highly reactive | | |
| **Uses as fill** | | |
| Water Absorption | 1097-6 | |
| CBR | - | 1377: Part 4 |
| Plasticity of Fines | | 1377: Part 2 |
| **Use as unbound, pipe bedding** | | |
| Particle Density | 1097-6 | |
| Resistance to Fragmentation: | | |
| Los Angeles | 1097-2 | - |
| Plasticity of Fines | - | 1377: Part 2 |
| Frost Heave | | 812: Part 124 |
| Water Soluble Sulfate | 1744-1 | |
| Magnesium Sulfate | 1367-2 | |
| **Use in asphalt** | | |
| Particle Density | 1097-6 | |
| Water Absorption | 1097-6 | |
| Resistance to Fragmentation: | | |
| Los Angeles | 1097-2 | - |
| Abrasion Resistance (AAV) | 1097-8 | |
| Polishing Resistance | 1097-8 | |
| Resistance to heat | 1367-5 | |

# appendix C

## Wastes considered to be inert waste for the purpose of this Protocol

**Provided that there is no suspicion of contamination, the wastes listed below are considered to be inert wastes.**

| European Waste Catalogue Code | Description | Restrictions |
|---|---|---|
| 10 11 03 | Waste glass based fibrous materials | Only without organic binders |
| 15 01 07 | Glass packaging | Selected construction and demolition waste acceptable only with low content of other types of materials (like metals, plastics, organics, wood, rubber etc). The origin of the waste must be known |
| 17 01 01 | Concrete including solid dewatered concrete process waste | |
| 17 01 02 | Bricks | |
| 17 01 03 | Tiles and ceramics | |
| 17 01 07 | Mixtures of concrete, bricks, tiles and ceramics | |
| 17 02 02 | Glass | |
| 17 05 04<br>17 05 08 | Soils and stones including gravel, crushed rock, sand, clay, road base and planings, and track ballast | Excluding topsoil, peat; excluding soil and stones from contaminated sites |
| 19 12 05 | Glass | |
| 20 01 02 | Glass | Separately collected glass only |
| 20 02 02 | Soils and stones restricted to parks waste | Only from garden and parks waste; excluding topsoil, peat |

The following definition of inert is taken from the Landfill (England and Wales) Regulations 2002 and is included for clarity.

Waste is inert if

(a) it does not undergo any significant physical, chemical or biological transformations;

(b) it does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and

(c) its total leachability and pollutant content and the ecotoxicity of its leachate are insignificant and, in particular, do not endanger the quality of any surface water or groundwater.

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Printed on Revive Silk. 75% recycled content and 25% mill broke and virgin fibres.
September 2005
Quality Protocol for the production of aggregates from inert waste, revised edition: ISBN 1-84405-217-6

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