SOURCE APPROVAL, SAMPLING AND TESTING PROGRAM FOR RECYCLED PORTLAND CEMENT CONCRETE

DOTD Designation: S 801-99

I. General

A. Scope

Prior to using Recycled Portland Cement Concrete (RPCC) on DOTD projects, the crushing operation or distribution site must be approved for listing as a Non-QPL Source and stockpiled material generated from the crushing operations must be tested and approved. This procedure describes the source approval process and provides a uniform method for approving, identifying, and monitoring dedicated stockpiles of Recycled PCC from approved sources. All sampling shall be performed in accordance with DOTD S 101.

B. Source Approval Process

Source Approval is defined as formal approval of a new or relocated crushing and grading operation or distribution site as an acceptable Non-QPL Source following completion of plant inspection and tests on samples of graded material. Source approval samples shall be taken from each new or relocated crushing and grading operation or distribution site by the District Laboratory in accordance with III.C. In general, source approval testing will be performed on samples taken from graded stockpiled material intended as "dedicated stockpiles." A split portion shall be sent to the Materials Section for evaluation upon completion of tests performed by the District Laboratory on the remaining split portion as shown below. If approved, a Non-QPL Source Code will be issued by the Materials and Testing Section for each Company's crushing and grading operation and/or distribution site. If the crushing and grading operation or the distribution site changes ownership or the distribution site is moved, a new source code will be issued after re-evaluation, and the old code terminated.

C. Preliminary Source Tests

Preliminary source test samples are taken from stockpiled material either before or after final crushing and grading operations in accordance with IV.A.& B. Preliminary Source Tests consist of soundness and abrasion tests representing the source of the uncrushed concrete. Preliminary Source Tests do not constitute final acceptance of the material for project usage. Once the material is crushed and graded to meet project gradation requirements, additional samples must be taken from the graded material for Acceptance testing.

D. Acceptance Tests

Once a source has been evaluated and approved, material intended for use on DOTD projects shall be stockpiled and sampled by the District Laboratory or Project Engineer for acceptance of the graded stockpile in accordance with V.A.& B. Acceptance samples are taken to determine conformance of the graded material with specification requirements.

II. Equipment

A. A Preliminary Information for Aggregate Source Approval form.
B. A Recycled Portland Cement Concrete Plant Inspection Report form.
C. Sampling Equipment required in DOTD S 101.

III. Source Approval Process

A. Preliminary Information for Aggregate Source Approval

A Preliminary Information for Aggregate Source Approval form shall be completed by a representative of the crushing operator or distributor and submitted to the Materials and Testing Section at the time of request for source approval. The form shall show the intended use of the recycled portland cement concrete, the location of the crushing operation and the distributor, and the primary source of uncrushed concrete. A copy of the form will be sent to the appropriate District Laboratory so that a plant inspection can be made and source approval samples can be obtained.

B. Plant Inspection

The District Laboratory shall inspect the site to verify that the operations can produce acceptable graded material for the end result applications. The crushing operations shall have adequate methods for removing soil, steel, and other contaminants from the uncrushed concrete and the stockpile sites shall be clean and well drained. Equipment and methods for stockpiling material shall be such that no detrimental degradation or segregation of crushed material will result and methods shall be taken to prevent intermingling of separate stockpiles. The District Laboratory shall complete a Recycled Portland Cement Concrete Plant Inspection Report and submit a copy to the Materials and Testing Section along with the Non-QPL source approval samples in III.C.

C. Sampling and Testing

The District Laboratory shall obtain at least six sacks (approximately 80 kg) of material in accordance with DOTD S 101 for source approval testing by the Materials and Testing Section. **Only samples from stockpiles of crushed material that has been graded to meet specification requirements for the intended use will be tested for source approval.**

Prior to submitting the above samples, the following tests shall be performed by the District Laboratory:

1. Determination of Atterberg Limits (DOTD TR 428)
2. Amount of Material Finer Than No. 200 Sieve in Aggregate (DOTD TR 112)
3. Sieve Analysis of Fine and Coarse Aggregates (DOTD TR 113)
4. Presence of Deleterious Materials (DOTD TR 119)

If the material fails to meet gradation, plasticity, or deleterious requirements for the intended use, the remainder of the material will be held by the District Laboratory until such time that the Contractor or Distributor has been notified that source approval cannot be granted. If the material does meet these requirements, the remainder of the source approval samples (six sacks) shall be forwarded to the Materials and Testing Section, along with a copy of the Recycled Portland Cement Concrete Plant Inspection Report, for further testing according to the following procedures:

1. L.A. Abrasion Loss (AASHTO T 96)
2. Sulfate Soundness Loss (AASHTO T 104)

If all testing indicate conformance with the requirements for the intended use, a Non-QPL source code will be issued by the Materials and Testing Section and noted on the Recycled Portland Cement Concrete Plant Inspection Report.

D. Change of Ownership or Location

If the crushing and grading operation or the distribution site changes ownership or the distribution site is moved, a new source code will be issued after re-evaluation, and the old code terminated.

IV. Preliminary Source Tests

A. Sampling and Testing

Stockpiles of material shall be sampled by the District Laboratory from either the uncrushed material after removal of reinforcing steel and other contaminants or from the crushed material after it has been graded to meet specification requirements. In either case the identity of the Preliminary Source Test samples shall be traceable to the graded material represented by the Acceptance Samples (see Section VI.). Preliminary Source Test samples shall consist of at lease six sample sacks of material retained on the No. 4 sieve and shall be submitted to the Materials and Testing Section for testing as follows:

1. L.A. Abrasion Loss (AASHTO T 96)
2. Sulfate Soundness Loss (AASHTO T 104)

Additional testing may be performed by the Material and Testing Section to supplement the abrasion and soundness test results as deemed necessary by the Materials and Testing Engineer to ensure conformance with the intended use or provide supportive data. If testing for moisture-density relationship is to be performed during the Preliminary Source Testing process, an additional six sample sacks of material shall be sampled from the stockpile containing the graded material.

B. Sampling Frequency

The sampling frequency for Preliminary Source Approval will depend on the variability of the locations from which the uncrushed material originated as follows:

1. If the uncrushed concrete originated from a single identifiable location from which uniform material can be expected, only one preliminary source test sample representing no more than 50,000 yd^3 of stockpiled material is required.
2. If the uncrushed concrete originated from multiple locations, the material must be stockpiled in separate but homogeneous portions not to exceed 10,000 yd^3 in size. Each portion must be readily identifiable, and a separate preliminary source test sample taken from each of these portions. If preliminary source test samples are taken after crushing, and the crushed material is separated into fine and coarse stockpiles, the combined quantity of both stockpiles shall not exceed 10,000 yd^3.

C. Stockpile Uniformity

Stockpiled materials that are to be blended to produce recycled portland cement concrete aggregate meeting specification requirements shall be from the same uncrushed concrete. Stockpiles contaminated with reinforcing steel, soil, or other matter not allowed by the Specifications can be rejected upon visual inspection. The Contractor or Distributor shall be informed immediately that the stockpile has been rejected.

Once a stockpile has been granted approval base on Preliminary Source Test results, no additional material may be added to the stockpile unless it is from another approved stockpile.

V. Acceptance Samples

A. **Sampling and Testing**

Stockpiles containing recycled portland cement concrete that has been crushed and graded to meet specification requirements are to be sampled and tested by the District Laboratory prior to acceptance for use on any DOTD project. Samples taken for Project Acceptance will be tested by the District Laboratory for compliance with specification requirements according to the following procedures:

1. Determination of Atterberg Limits (DOTD TR 428)
2. Amount of Material Finer Than No. 200 Sieve in Aggregate (DOTD TR 112)
3. Sieve Analysis of Fine and Coarse Aggregates (DOTD TR 113)
4. Presence of Deleterious Materials (DOTD TR 119)

B. **Sampling Frequency**

The sampling frequency shall not be less than one sample per 1,000 yd^3 of material to be used. Each sample will be given an appropriate Ident. Code according to the format listed under Stockpile Identification. The District Laboratory will keep track of quantities taken from stockpiles and when a stockpile has been depleted, the Ident. Code for that stockpile will be terminated.

VI. Stockpile Identification

Each stockpile of graded material shall be identified in such a way to maintain traceability of samples and quantities used on projects. The following is a recommended method of identifying and maintaining the identity of the dedicated stockpiles. Other identification methods shall be approved by the Materials Engineer Administrator.

The first two digits will be **the district issuing the code**. The third and fourth digits will represent the **preliminary source test sample that represents the stockpiled material**. The fifth and sixth digits will represent the **sample number of acceptance sample that has been taken from that stockpile**. The fifth and sixth digits representing either the Source Approval of the Contractor or Distributor or Preliminary Source Test of stockpiled material will always be "0 0."

Example: Ident. Code 0 2 0 1 0 0 would be from District 02 in Bridge City; it would represent either the Non-QPL Source Approval sample or the first Preliminary Source Test sample of stockpiled material.

The first acceptance sample taken from the stockpile containing material represented by the above would be identified as 0 2 0 1 0 1. This would represent the first sample taken from the graded stockpile for compliance with project requirements. Additional samples, representing project samples, would be numbered ending with "02," "03," etc.

The next Preliminary Source Test Sample will be identified as 0 2 0 2 0 0.
The first acceptance sample taken from this material would be identified as 0 2 0 2 0 1 and subsequent samples would end in 0 2, 0 3, 0 4, etc.

SOURCE CODE: _____
DATE: _____

RECYCLED PORTLAND CEMENT CONCRETE
PLANT INSPECTION REPORT

PLANT NAME: _____ DISTRICT: _____

LOCATION: _____ PARISH: _____

MAILING ADDRESS: _____

_____

_____

_____

I. DESCRIPTION OF CRUSHING OPERATION

APPROXIMATE PRODUCTION RATE: _____ yd^3/hr

EQUIPMENT MANUFACTURER/MODEL: _____

_____

_____

_____

II. UNCRUSHED MATERIAL

A. MATERIAL FROM SINGLE SOURCE (Y/N) : _____

B. DESCRIBE STOCKPILE BUILDING METHOD: _____

_____

_____

_____

C. DESCRIBE PROCESS FOR REMOVING CONTAMINANTS:

1. STEEL: _____

_____

_____

_____

2. SOIL: _____

_____

_____

_____

3. OTHER: _____

_____

R.P.C.C. PLANT INSPECTION REPORT

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II. CRUSHED MATERIAL

A. DESCRIBE STOCKPILE BUILDING METHOD (Type of Equipment used, Layer Construction, etc.): _____

_____

_____

B. IS STOCKPILE DRAINAGE SATISFACTORY ? (Y/N) _____

C. STOCKPILES SEPARATED BY:

____ SPACING ____ PARTITION(S) ____ NONE

D. DESCRIBE ANY STOCKPILE HAVING VISUAL EVIDENCE OF CONTAMINATION: ___

_____

_____

_____

E. DESCRIBE ANY STOCKPILE SHOWING EVIDENCE OF SEGREGATION:

_____

_____

_____

III. DESCRIBE ANY CORRECTIVE ACTIONS TAKEN TO CORRECT ANY DISCREPANCY FOUND ABOVE: _____

_____

_____

IV. GENERAL COMMENTS: _____

_____

_____

V. SOURCE APPROVAL (NON-QPL) SAMPLES TAKEN ? (Y/N) : _____

INSPECTED BY: _____ DISTRICT: _____ DATE: _____

PLANT REPRESENTATIVE: _____