DEPARTMENT OF PERMITTING, INSPECTIONS AND ENFORCEMENT
SITE/ROAD PLAN REVIEW DIVISION

FROM: Amanda Gullickson/ag **DATE:** January 4, 2024

TO:	**DATE OUT**	**INITIALS**
(1) Mary Giles, P.E., Associate Director, S/RPRD	Jan 4, 2024	mcg mcg
(2) Dawit Abraham, P.E., Director	Jan 4, 2024	DA DA
(3) Site/Road Plan Review (ag)		
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RE: Revised Techno-gram 003-2023 Recycled Concrete Aggregate (RCA)

X For Your Information	_____ Please Reply
_____ For Your Comments	_____ Please Read & Destroy
X For Your Approval	_____ Please Note & Return
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	_____ Recommendation

COMMENTS:

TECHNO-GRAM
03-2023
REVISED

SUBJECT: Recycled Concrete Aggregate (RCA)

PURPOSE: The Purpose of this Techno-gram is to establish requirements about the use of RCA in the Department of Permitting, Inspection and Enforcement (DPIE) Permitted Construction Projects.

SCOPE: This applies to the use of RCA for DPIE permit projects.

This Techno-gram supersedes the previously issued Techno-gram pertaining to RCA. Effective immediately, RCA may be used in the construction of Prince George's County Maryland DPIE permitted construction projects, with the following requirements and limitations.

1. RCA materials must be processed and delivered by an approved aggregate processing plant. The plant shall possess a valid Maryland Department of Environment (MDE-Operation Permit and an American Association of State Highway and Transportation Officials (AASHTO) accredited testing laboratory or a contract with an AASHTO-accredited geotechnical materials testing laboratory to test materials. The plant shall also maintain a contract with a National Environmental Laboratory Accreditation Program (NELAPZ) accredited environmental testing laboratory. RCA processing plant shall submit qualifications to the DPIE geotechnical engineer for pre-approval of the facility as a provider of RCA. County-approved RCA processing plants will be added to an approved list, to be published on the DPIE website.

2. The material delivered to the site shall include certification from a Maryland Licensed Professional Engineer (P.E.) retained by the RCA processing plant. These certifications and a copy of the plant's MDE-Operation Permit shall be provided to the DPIE Inspector and the Third-Party Inspection Program (TPIP) Geotechnical Inspector for each delivery. The certifications shall confirm that the RCA delivered to the DPIE-permitted site complies with the following criteria:

   A) Have been tested by a NELAP-accredited environmental laboratory and are verified to meet the environmental contaminant limitations per the requirements described herein.
   B) Have undergone laboratory testing and meet acceptable limits for Category 2 – Non-Residential Restricted Use Soil and Fill Material in commercial projects or Category 1- Residential Unrestricted Use Soil and Fill Material in residential projects, as defined by the Maryland Department of Environment.
   C) Comply with pH limits, as described herein.
   D) Comply with the maximum allowable percentage of materials passing the #200 sieve, as described herein.

3. This techno-gram does not permit onsite production or use of RCA materials generated onsite. Any debris resulting from the demolition of buildings, structures, or site features shall be disposed of in a permitted offsite landfill or delivered to an aggregate processing plant.

4. Under MSHA specification 900.03, all RCA requires testing and certification to ensure compliance with all state and local applicable environmental and EPA regulations. The sampling methodology, frequency, and analysis parameters shall be consistent with MDE guidelines and recommendations for evaluating recycled concrete. The required testing shall include, but not be limited to the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. Additional analyses shall include Total RCRA Metals, Polychlorinated Biphenyls (PCBs), Total Petroleum Hydrocarbons Diesel Range Organics (DRO), and Polycyclic Aromatic Hydrocarbons (PAHs). The geotechnical and environmental testing shall be performed on representative samples of the material proposed to be shipped to the subject site. The sampling and testing shall be coordinated and performed under the supervision of the testing agency's P.E. retained or contracted by the aggregate processing plant, The sampling and testing shall be dated no more than 60 days before the date of delivery to the site and before the date of submitting the results to the County and TPIP Geotechnical Inspector. The permittee shall provide the results of the geotechnical and environmental testing to the DPIE inspector and the TPIP geotechnical inspector for review and compliance with the requirements included herein.

5. USE OF RCA

I. The permittee may use RCA for the following:
   (a) Graded Aggregate Base (GAB) in private roadways and parking lots.
   (b) Common, Select, or Modified Borrow.
   (1) At least 2 ft above groundwater elevation.
   (2) At least 100 ft from surface waters (streams, creeks, rivers, ponds, and lakes). (3) At least 3 ft from exposed metal surfaces.
   (4) At least 3 ft from geotextile.
   (5) At least 3 ft from any water discharge source.
   (c) Indirect support of slabs but not footings of Commercial, Industrial, and Institutional Buildings – 1 to 3 stories only, if recommended by the Geotechnical or Structural Engineer of Record. Multi-family residential buildings are considered commercial for this techno-gram.
   (d) In WSSC trenches outside the public right of way, RCA can be used in trench backfill but not within the limits of the pipe embedment zone. The pipe embedment zone is from the bottom of the trench to one foot above the crown of the pipe.

(e) In electric, gas, phone, and telecommunication utility trenches, outside the public right-of-way, subject to the utility company backfill requirements.
(f) Temporary construction including temporary sediment/erosion control measures, and pipes.

II. The permittee shall not use RCA for the following.

(a) Portland cement concrete.
(b) Asphalt mixes.
(c) Drainage systems, including but not limited to stormwater management, storm drain, underdrain, infiltration, french drain, permeable paving, and retaining wall systems.
(d) Retaining Walls and Mechanically stabilized earth (MSE) systems.
(1) MSE walls.
(2) Reinforced soil slopes (RSS)
(3) Reinforced earth slopes (RES).
(4) Retaining walls
(e) In-site or building construction as follows.
(1) Within 1.5 ft of the top surface of any area to be vegetated.
(2) Within 2 ft of groundwater
(3) Within 100 ft of any surface water course (streams, creeks, rivers, ponds, lakes).
(4) Within 3 ft of any metal pipe or shoring.
(5) Within 3 ft of any water discharge locations.
(6) Under permeable or porous surfaces.
(f) Within the right-of-way of public roadways.
(g) Within the footprint of all high-rise buildings (commercial, industrial, and otherwise), exceeding 3 stories. Multi-family buildings under commercial management are considered commercial for this techno-gram.
(h) Single family, duplex residential homes, and residential buildings front, back, and side yards and common areas.
(i) Direct or indirect support of any type of foundation footing.
(j) In WSSC trenches, from the trench bottom to one foot above the crown of the pipe.
(k) In any septic system component, including drain fields, sewage disposal areas, sewage reserve areas, etc.

III. RCA shall contain less than 5 percent by mass of any other hard material, especially brick and asphalt fragments.

IV. pH Requirements.
(a) RCA pH shall be less than 12.4 for all applications.

(b) RCA usage shall not cause any water out falling or leaving the site to exceed a pH of 8.5. Acid sulfate, sulfur, or any other environmentally safe organic material may also be used to control the pH.

(c) pH Testing - Plant: The producer is required to test pH at the plant per T 289 on every 1000 tons shipped or once a day, whichever yields the greater frequency. Plant pH testing shall be recorded as specified and a history shall be kept at the producer's laboratory. The producer may be required to present pH test results and any other tests conducted by an independent laboratory as directed.

(d) Material delivery may be terminated if the test results repeatedly meet or exceed a pH of 12.4.

(e) In case of high pH, the producer is required to use shorter stockpiles by spreading the material around the plant or mixing the RCA-GAB with the natural GAB to reduce the pH.

(f) pH Testing - Construction Site: The TPIP Geotechnical Inspector shall perform QA testing to monitor and test for the pH levels for any discharge associated with RCA placement. This includes monitoring and testing during periods of precipitation or dampness. In cases of high pH, the producer shall provide a reduction control plan for the pH.

V. Percentage of Fines.
Upon arrival at the site, the percentage of fines in RCA shall meet the gradation of the equivalent non-recycled aggregate mix required by MSHA specification 901-A. For example, for RC-6, the percentage of fines shall not exceed the percentage specified in 901-A for CR-6.

6. Permit Plan for RCA Placement:
The permittee shall submit a site plan with typical sections along with the plans of grading and building permits that define the RCA placement locations per the above criteria. For the approval of the plans, the permittee shall include the name and contact information for the Third-Party Geotechnical Inspector, list the requirements to install the RCA and show copies of the Certifications required in this Techno-gram. <u>If the RCA is not included in the approved permit plans use of RCA materials is prohibited on the proposed development site. Alternatively, if the permittee is seeking approval for the use of RCA after permit issuance, the permittee may submit a shop drawing to DPIE for review and approval of RCA. No RCA placement is permissible unless the permit plan or shop drawing is approved by DPIE.</u>

7. Visual observation and photographic documentation of the as-delivered condition of the RCA material delivered to the project site shall be provided by the TPIP Geotechnical Inspector(s) to the DPIE Inspector. The permittee shall not place the material until the TPIP Geotechnical Inspector has confirmed compliance with the test results described in this techno-gram.

8. Visual observation and photographic documentation of the condition of the RCA material during placement and provision of regular moisture-density testing during construction shall be provided by the TPIP Geotechnical Inspector(s) to the DPIE Inspector. These results will be documented in the TPIP Daily Field Reports (DFRs) issued to the DPIE inspector and uploaded to the DPIE permit system.

9. The permittee shall verify the placement of RCA materials per County Code, including but not limited to code sections 32-125, 32-152, and 32-154.

10. The TPIP Geotechnical Inspector shall provide the completed RCA certification to the DPIE Inspector before the completion of the permit project.

APPROVED BY:

Dawit Abraham (Jan 4, 2024 16:30 EST)

Dawit Abraham, P.E., Director
January 4, 2024

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ATTACHMENT A – Page 1

Third-Party Inspection Certification for RCA

Third-Party Inspection Engineer Certification – Recycled Concrete Aggregate (RCA)

Permit Number _____

I hereby certify to the best of my knowledge that the RCA was supplied and constructed by the approved plans including the requirements stated in Techno-gram 003-2023. This certification further confirms the following:

1. Based on my review of the test results provided by the aggregate processing facility and its P.E.'s certification,
   a) The RCA materials were tested in accordance with the requirements of County Techno-gram 003-2023 and did not contain environmental contaminants above the EPA TCLP regulatory limits or the MDE's cleanup standards for the appropriate categories (Category 1 or 2).
   b) RCA materials did not contain fines exceeding that specified in MDOT/SHA Table 901A.
2. RCA materials were not used and installed in the following locations.
   a) On-site mixed Portland cement concrete.
   b) Drainage systems, including but not limited to stormwater management, storm drain, underdrain, infiltration, French drain, permeable paving, and retaining wall systems.
   c) Retaining Walls and Mechanically stabilized earth (MSE) systems.
      (1) MSE walls.
      (2) Reinforced soil slopes (RSS).
      (3) Reinforced earth slopes (RES).
      (4) Retaining walls
   d) In-site or building construction as follows.
      (1) Within 1.5 ft of the top surface of any area to be vegetated or concreted.
      (2) Within 2 ft of groundwater.
      (3) Within 100 ft of any surface water course (streams, creeks, rivers, ponds, lakes).
      (4) Within 3 ft of any metal pipe or shoring.
      (5) Within 3 ft of any water discharge location.
      (6) Under permeable or porous surfaces.
   e) Right-of-way of Public roadways.
   f) Within the footprint of high-rise buildings (commercial, industrial, and otherwise) exceeding 3 stories. Multi-family buildings are considered commercial for this techno-gram.
   g) Residential single-family, duplex homes, and buildings front, back, side yards, and common areas.
   h) Direct or indirect support of any type of foundation footing.
   i) In WSSC trenches outside the public right of way from the trench bottom to one foot above the crown of the pipe.
   j) In any septic system component, including drain fields, sewage disposal areas, sewage reserve areas, etc.

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ATTACHMENT A – Page 2

Third-Party Inspection Certification for RCA

Third-Party Inspection Engineer Certification – Recycled Concrete Aggregate (RCA)

Permit Number _____

4. RCA materials utilized in this permit were processed and delivered by a County approved aggregate processing plant. The plant provided a current MDE-Operation Permit, geotechnical and environmental laboratory testing, and plant retained P.E.'s certification per the County Techno-gram 003-2023 Material supply and delivery tickets are attached to this certification. The material was supplied by the following plant:

_____

9. Based on my review of the test results provided by the aggregate processing facility and its P.E.'s certification,

d) RCA material complied with Category 1 or 2 as stipulated in Techno-gram 003-2023
e) RCA did not contain more than 5 percent brick and asphalt fragments by mass.
f) pH of the RCA material did not exceed requirements stipulated in Techno-gram 003-2023.

10. Photographs of the RCA as delivered, and during installation are attached to this certification.
11. Moisture density test results are attached to this certification.
12. Exceptions

_____

_____

Certification to be signed and sealed by a Maryland Professional Engineer

_____ _____
Third Party Inspector (typed) Address, Phone, Email Third Party Inspector

_____ _____
Third Party Inspector (signature) Date

Signature: Mary C. Giles 1-4-2024
Mary C. Giles 1-4-2024 (Jan 4, 2024 15:29 EST)

Email: mcgiles@co.pg.md.us