



pennsylvania

DEPARTMENT OF TRANSPORTATION

Strategic Recycling Program

AN OVERVIEW



PENNDOT AND PADEP SRP MEMORANDUM OF UNDERSTANDING (MOU)

- 1) Establishing and implementing a waste reduction program for materials used in PENNDOT operations;
- 2) Continually reviewing and revising existing procedures and specifications;
- 3) Evaluating materials that may be recycled in transportation and civil engineering applications;
- 4) Employs procurement and contract bidding options encouraging recycled materials use.



PENNDOT'S STRATEGIC RECYCLING PROGRAM (SRP)

PennDOT SRP Development:

Created in 1998 as a tool to systematically identify, evaluate, and implement recycling opportunities throughout Pennsylvania.

PennDOT SRP Objectives:

- 1) Realize economic savings and environmental enhancement to PENNDOT and the Commonwealth;
- 2) Continued development and improvement to pollution prevention, recycling, energy efficiency efforts; and
- 3) Sound environmental management practices.



STRATEGIC RECYCLING PROGRAM

FIVE KEY FOCUS AREAS

Research – To collect information on recycled materials and to identify and resolve data gaps associated with the use of recycled materials.

Specifications – To develop, obtain, and/or disseminate user guidelines, provisional special provisions and Publication 408 specifications at the Municipal, District and Statewide levels.

Projects – The overall objective is to successfully incorporate recycled materials in transportation-related projects, including post-construction monitoring.

Outreach – To disseminate the results and experiences of recycled materials projects to PENNDOT, Commonwealth agencies and the public.

Contracting – To provide technical assistance to the Engineering Districts in developing construction contract mechanisms to specify or provide for recycled material use.

CURRENT RECYCLE MATERIAL SPECIFICATIONS

Recycled Asphalt Pavement (RAP) – Used as aggregate, sub-grade, and sub-base material and roadway shoulders; may be blended with steel slag, virgin aggregate, or crushed waste concrete in these same applications – currently governed under a PA DEP Co-product Determination or General Permit);

Crushed Glass – embankment fill - Sound Wall/Jersey barrier, aggregate base course base drains/reinforced concrete pipe bedding/storm sewer/u-drains.

Asphalt Shingles – Over-cuts, tabs, and post-consumer shingles as ingredients in Hot Mix Asphalt;

Reclaimed Portland Cement Concrete (RPCC) – as aggregate, road sub-base, rip-rap, gabions, concrete pavement, and miscellaneous drainage;

Blast Furnace Slag – anti-skid material, fine or coarse aggregate, concrete pozzolan, select granular material;

Steel Slag – fine or coarse aggregate, sub-base, select granular material, select materials surfacing, shoulders, and bituminous surface courses, blending with RAP materials;

CURRENT SPECIFICATIONS (CONTINUED)

Fly Ash – cement concrete, flowable fill, concrete pozzolan;

Bottom Ash – anti-skid material;

Spent Foundry Sand – fine aggregate, flowable fill;

Aluminum – road, highway, and recycling center signs;

Scrap Tires – Tire Shreds as Structural Fill (TDA), **Crumb Rubber with Stone Mix Asphalt (SMA) DRY or WET Method, Crumb Rubber as a Stabilizer**, Crumb rubber for Absorptive Noise Barriers, Tire chips filler for Carsonite Sound Walls (plastic wall modules containing recyclable tire rubber).

Compost – Soil Amendments, Mulching, Compost FilterSock, Compost Blanket and Compost Filter Berm.

Current Projects



CRUSHING OPERATION FOR RECLAIMED PORTLAND CEMENT CONCRETE (RPCC)



- ◎ **Project Location:** Interstate 79 (I-79), District 1-0 approximately 1.5 miles from the McKean exit;
- ◎ **Source of RPCC Material:** derived from previous work done on I-79 and Interstate 90 (I-90). A mixture of pavement, bridge piers and abutments, posts for signs and guiderails, remnants of slab and joint repair work, and other miscellaneous concrete-related materials.
- ◎ **Materials Generated :**
 - ◎ ***R4 Stone***, used for repairing roadway washout areas;
 - ◎ ***2A Stone***, used as pipe backfill replacement, restoration, and roadway shoulder backup. The 2A stone will also be blended with the fines generated from the RAP/#8 stone project to create an asphalt binder.



COMPOST – SOIL STABILIZATION

- ① State Route 222 - Gouglersville Interchange Erosion Control Blanket Project
- ① Compost came from the approved supplier in Bulletin 15, **Laurel Valley Soils** located in Avondale, PA





CRUMB RUBBER PROJECTS

Current District Maintenance Projects Asphalt-Rubber Gap-Graded Wearing Course

First Project

- ◎ Project Name: District 3-0 resurfacing of State Route 15 (Segment 0010/0214 to Segment 0100/2680 NB and Segment 0010/0161 to Segment 0101/2746) Asphalt-Rubber Gap-Graded Wearing Course. **Currently Paving**
- ◎ Location : Snyder

◎ Second Project

- ◎ Project Name: District 4-0 crumb rubber modified asphalt paving along State Route 2005 (Seg/Off 0010/0000 to 0060/0000) **Currently Paving**
- ◎ Location: Blackman Street in Luzerne County

ASPHALT RUBBER GAP GRADED PROJECT

- ⊙ District 5-0 Berks County, I-78 from mile post 11 to mile post 16 east and west bound.
- ⊙ Mill existing 3" of bituminous material to concrete, 24' wide and two feet into outside shoulder.
- ⊙ Pave two lifts of 1.5" AR-GG (asphalt rubber gap graded) for total of 3".
- ⊙ Mill outside shoulder of pave with regular bituminous asphalt mix.
- ⊙ A total of 27,500 tons of AR-GG will be placed.
- ⊙ 467.5 tons of CRM @ \$0.35/lb = \$327,250

**27500 tons at 8.5% liquid binder = 2337.5 tons
liquid binder, at 20% crumb rubber = 467.5 tons**



SMA CRUMB RUBBER PROJECT



Utilized Crumb Rubber Modified Asphalt (CRMA) at District 9-0 Nicktown Stockpile staging area

- Minimize stormwater runoff from leaving the site;
- Direct stormwater to the existing detention system;
- Evaluate performance of CRMA in an area which see use of heavy equipment in a confined area.



GLASS CULLET PROJECTS

Lackawanna County – District 4-0 at SR 6 and 247

- Pipe trenches bedded with glass aggregate and topped with crushed glass;
- Four feet of glass aggregate capped with 12-inch layer of natural aggregate.
- Four-year inspection/evaluations performed;
- Provisional Specification for Glass Cullet as backfill, meeting Pub. 408, Section 703, AASHTO No. 8 gradation requirements; Table B, Type C quality requirements (expect allowance of 100% glassy particles).





RECENT SRP PROJECTS



- ❑ **Admiral Peary Vo-Tech School Project (Cambria County, District 9-0):** Use of Compost Filter Socks for Wetland Mitigation).

- ❑ **Bull Creek Box Culvert/Bridge Project (Allegheny County, District 11-0):** Use of Compost Filter Socks for Erosion Control.



- ❑ **Picnic Tables (Various Roadside Rest Areas, District 1-0):** Using plastic picnic tables to replace wooden picnic tables – this occurred on two occasions



- ❑ **Roadside Project (Blair County, District 9-0):** Use of Rubber Mulch Mats to Reduce Erosion and Burn-Out Sequences from Herbicide Spraying.

PROJECT OPPORTUNITIES

Potential Materials

- ❑ Compost – E&S Controls
- ❑ Rubber Absorptive Barrier Sound Walls
- ❑ Reclaimed Portland Cement Concrete (RPCCC) – Misc Drainage, Gabions and Rip-rap
- ❑ Crushed Glass – Embankment Material
- ❑ Tire Derived Aggregate (TDA) - Embankment Material
- ❑ Spent Foundry Sand – Aggregate and Flowable Fill

PENNDOT'S WASTE AUDIT PROGRAM

- ◎ **PennDOT waste audits are conducted Biannually and serve to:**
 - ◎ **collect solid waste and recyclable generation and cost data;**
 - ◎ **measuring progress of PennDOT District and Central Office solid waste management activities;**
 - ◎ **provide a large picture of where PennDOT stands with its overall office waste management practices;**
 - ◎ **allows each District to benchmark their current recycling programs and enable District Offices to determine areas that can be improved upon;**
 - ◎ **increase employees' awareness to recycling methods;**
 - ◎ **big picture look at overall costs for waste disposal and recyclable management;**
 - ◎ **and demonstrate PennDOT's support of the Commonwealth's overall recycling goals;**





THANK YOU

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