

## Alternate Aggregates from Recycled Materials

A. Round natural aggregate and tire chip aggregate.

Based upon DEP's analysis of laboratory reports and other research, it has been determined that round, "Type C" coarse aggregate or tire chip aggregate may be used as an alternate material in the construction of on-lot sewage disposal systems when all of the following criteria are met:

1. Third party certification is provided by an AASHTO/ASTM certified commercial soil testing laboratory demonstrating that the supplied material conforms to the specified aggregate requirements. The aggregate must meet AASHTO No. 3, 467, 5, or 57 size and grading requirements, or fall within the outer boundaries of sieve testing for each sieve size category as summarized in the table below.
2. The supplier provides written certification with the bill of lading for each first load delivered to the site, and for each aggregate type, that the aggregate meets the minimum requirements. A copy of each certification must be attached to the permit.
3. The permit application must be checked "alternate" and the words "coarse aggregate" must be placed on the line following the word "alternate."
4. No DEP review is required.

AASHTO NUMBER	TOTAL PERCENT PASSING SIEVE													
	4"	3½"	2½"	2"	1½"	1"	¾"	½"	3/8"	#4	#8	#16	#100	#200
3			100	90-100	35-70	0-15		0-5						<5
467				100	95		35-70		10-30	0-5				<5
5					100	90-100	20-55	0-10	0-5					<5
57					100	95-100		25-60		0-10	0-5			<5

B. Glass cullet aggregate

DEP has determined that coarse aggregate composed of cullet glass may be used as an alternate material in the construction of free-access intermittent sand filters [Chapter 73, Section 73.162(b)] as a replacement for the aggregate specified in Section 73.162(b)(4)(iv) or as a replacement for the coarse aggregate specified in Part 14, "Free Access Gravity Sand Filter Options", B.5.d of this guidance, when all of the following criteria are met:

1. Third party certification is provided by an AASHTO/ASTM certified commercial soil testing laboratory demonstrating that the supplied material conforms to the specified aggregate requirements. The aggregate must meet AASHTO No. 8 size and grading requirements as summarized in the table below.
2. The supplier provides written certification with the bill of lading for each first load delivered to the site that the aggregate meets the minimum requirements. A copy of the certification must be attached to the permit.
3. The permit application must be checked "alternate" and the words "coarse aggregate" must be placed on the line following the word "alternate."
4. No DEP review is required.

AASHTO #8							
Total Percent Passing							
Sieve	1/2"	3/8"	#4	#8	#16	#100	#200
	100	85-100	10-30	0-10	0-5		<5

C. Alternate Fine Aggregate (Sand)

Recycled glass fine aggregate prepared to meet the regulatory size and grading specifications for fine aggregate has been found to be an acceptable alternate material for use in place of conventional fine aggregate in onlot sewage treatment facilities.

In system designs that do not have a regulatory requirement for the material to be obtained from a Pennsylvania Department of Transportation (PADOT) certified stockpile [intermittent sand filter - §73.162(b)(2)(i) and (ii); free access sand filter (Part 4 of this guidance); recirculating sand filter (Part 14 of this guidance)], ground recycled glass that meets the referenced size and grading specifications may be used as a direct replacement for fine aggregate.

In system designs that have a regulatory requirement for the material to be obtained from a PADOT certified stockpile [elevated sand mounds and buried sand filters - §73.55(c)], recycled glass fine aggregate may be used without being obtained from a PADOT certified stockpile when:

1. Third party certification is provided by an AASHTO/ASTM certified commercial soil testing laboratory demonstrating that the supplied material conforms to the specified aggregate requirements. The aggregate must meet the size and grading requirements of one of the following fine aggregate categories, as summarized in the table below: Cement Concrete Sand Type A, Bituminous Concrete Sand Type B #1, Bituminous Concrete Sand Type B #3, or ASTM C-33.
2. The supplier provides written certification with the bill of lading for each first load delivered to the site, and for each different aggregate type for which crushed recycled glass is used. A copy of each certification must be attached to the permit.
3. The permit application must be checked "alternate" and the words "fine aggregate" must be placed on the line following the word "alternate."
4. Suppliers of crushed glass must maintain third party certification records indicating that their stockpile(s) conforms to each aggregate/type requirements for which their crushed recycled glass is being supplied. In some cases, this may require that the suppliers take measures to prevent loss of fines, or the segregation of aggregates by natural forces, or to protect against other deleterious changes to the stockpile. At a minimum, random triplicate samples must be collected and tested from each stockpile on a quarterly basis. The records must be maintained for a minimum of five years.
5. No DEP review is required.

<b>FINE AGGREGATE</b>				
<b>Grading Requirements</b>				
<b>(Mass Material Percent, Passing) Sieve</b>	<b>Cement Concrete Sand Type A</b>	<b>Bituminous Concrete Sand Type B</b>		<b>ASTM C-33</b>
		<b>#1</b>	<b>#3</b>	
<b>3/8"</b>	100	100	100	100
<b>No. 4</b>	95-100	95-100	80-100	95-100
<b>No. 8</b>	70-100	70-100	65-100	80-100
<b>No. 16</b>	45-80	40-80	40-80	50-85
<b>No. 30</b>	30-65	20-65	20-65	25-60
<b>No. 50</b>	10-30	7-40	7-40	5-30
<b>No. 100</b>	2-10	2-20	2-20	0-10
<b>No. 200</b>	-	0-10	0-10	-
<b>Material Finer Than No. 200 Sieve Max. Percent Passing</b>	3	-	-	3