



Best Practices in Glass Recycling

Model Specifications for Glass Aggregate

Material: Recycled Glass

Issue: Glass aggregate can include 100% glass cullet, or a mixture of cullet and natural aggregate. In general, glass aggregate is durable, strong, and easy to place and compact. The material can be used in various construction applications including general backfill, roadways, utility backfill, drainage media, and miscellaneous uses such as landfill cover and underground storage tank backfill. For each application, specifications based on material performance are required. These specifications should be developed based on laboratory tests and refined based on long-term field performance data.

Best Practice: This best practice presents model specifications that were developed based on material behaviors tested in the laboratory. These specifications are conservative in terms of the amount of cullet and debris allowed, and compaction levels required. The gradation specifications below have been found to be acceptable in all of the applications described here.

Sieve Size	3/4"	1/4"	No. 10	No.40	No. 200
Percent Passing (by weight)	100	10-100	0-100	0-50	0-5

General Backfill: General backfill applications include fills that support heavy stationary loads such as beneath footings and slabs, fluctuating loads such as beneath reciprocating pumps and compressors, and non-loaded conditions such as landscaping fill or fill placed beneath pedestrian sidewalks. Model specifications for general backfill are presented below.

Loading Conditions	Maximum Cullet Content (%)	Maximum Debris Content (%)	Minimum Compaction Level (%)
Stationary Loads	30	5	95
Fluctuating Loads	15	5	95
Non-Loading General Fill	100	10	85

Roadways: Roadway applications include the use of cullet aggregate in base course, subbase, subgrade, and embankments. Model specifications for these applications are presented below.

Applications	Maximum Cullet Content (%)	Maximum Debris Content (%)	Minimum Compaction Level (%)
Base Course	15	5	95
Subbase	30	5	95
Embankments	30	5	90

Utilities: Utility applications involve the use of cullet aggregate for trench bedding and backfill. The specifications listed below apply to backfill, which is not subjected to surcharge loading such as from a roadway or slab. If the trench backfill lies within five feet of a loading area, then the specifications provided in *General Backfill* above would apply.

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<u>Applications</u>	<u>Maximum Cullet Content (%)</u>	<u>Maximum Debris Content (%)</u>	<u>Minimum Compaction Level (%)</u>
Water & Sewer Pipes	100	5	90
Electrical Conduit	100	5	90
Fiber Optic Lines	100	5	90

Drainage: Drainage applications include retaining wall backfill, footing drains, drainage blankets, and french drains. Recommended specifications on cullet content, debris content and compaction level are listed below.

<u>Applications</u>	<u>Maximum Cullet Content (%)</u>	<u>Maximum Debris Content (%)</u>	<u>Minimum Compaction Level (%)</u>
Retaining Wall	100	5	95
Footing Drain	100	5	95
Drainage Blanket	100	5	90
French Drain	100	5	90

Miscellaneous: Miscellaneous uses of cullet aggregate include landfill cover and underground storage tank (UST) backfill. Model specifications for these applications are presented below.

<u>Applications</u>	<u>Maximum Cullet Content (%)</u>	<u>Maximum Debris Content (%)</u>	<u>Minimum Compaction Level (%)</u>
Landfill Cover	100	5	90
UST Backfill	100	5	90

Implementation: The use of these specifications should be confirmed by a qualified geotechnical engineer, who should also inspect and approve the material at its storage location prior to import to the project site. Also, placement and compaction should be monitored and tested by engineering personnel.

Benefits: Model specifications provide guidelines to the specification of glass aggregate. These guidelines help owners, engineers, and contractors to evaluate glass aggregate as an alternative to natural aggregate.

Application Sites: Design offices, glass processing facilities, construction sites and test labs.

Contact: For more information about this Best Practice, contact CWC, (206) 443-7746, e-mail info@cw.org.

References:

Glass Feedstock Evaluation Project: Engineering *Suitability Evaluation*. Rpt GL-93-5;

Evaluation of Cullet As A Construction Aggregate, Report GL-93-6, Clean Washington Center, 1994.

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