BLAST FURNACE SLAG AGGREGATE

MANUFACTURER

Locations of blast furnace slag aggregates for base course and subbase construction (applicable under either rigid or flexible pavements) can be contacted by visiting www.phxslag.com.

PRODUCT DESCRIPTION

Composition: Blast furnace slag consists principally of silicates and alumino-silicates of lime and other bases developed simultaneously with iron in a blast furnace. (1) Air-cooled slag is solidified by cooling molten slag at prevailing atmospheric conditions. After solidification, cooling may be accelerated by applications. of water. (2) Granulated slag is the glassy, granular product formed when the molten blast furnace slag is rapidly chilled by immersion in water.

Basic Use: Aggregates are used for all types of base and subbase construction. In addition to applications requiring graded aggregates, pit run blast furnace slag is extensively used for subbase construction in some areas, especially where weak subgrade conditions exist.

Limitations: None.

Shape and Texture: Aircooled blast furnace slag is a crushed product having angular, roughly cubical particles with pitted, vesicular surfaces. Granulated blast furnace slag has a cellular structure resulting from rapid quenching in water, is cementitious in nature, and sets to form a solid concrete-like mass.

Applicable Standards: Aircooled blast furnace slag meets the requirements of ASTM D 694 and D 1241, of national agencies, and of local highway departments for macadam and crushed aggregate bases. Local highway department standards or the producer's recommendations are applicable to granulated slag for both base and subbase courses.

TECHNICAL DATA

General: Characteristics such as unit weight vary with type of slag and also between sources. The producers in the particular project area should be consulted for data on their specific product.

Durability: The slags are highly resistant to weathering action such as freezing and thawing. Sulfate soundness losses (ASTM C 88) are low for the air-cooled blast furnace slags. Sulfate soundness tests are not applicable to granulated slag due to its similarity to cements in composition and hydraulic properties.

Base Course Strength Properties:

Size and Grading Requirements
Sub-base Applications

Sieve Size	%Passing Sieve
2”	100
3/4”	52 - 100
3/8”	36 - 70
#4	24 - 50
#8	16 - 38
#16	10 -30
#200	0 - 10

Standard Compaction of Dense Graded BF Slag Aggregate, typically 114 lb/cft

Tests of typical blast furnace slag base course materials, using the California Bearing Ratio test (ASTM Method

Table: Strength Characteristics of Materials

	Blast Furnace Slag	
Test Characteristics	Air-Cooled	Granulated
Maximum Size	1½"	¾"
Moisture Content	7.5% - 9.2%	28.5%
CBR at 0.2",% of standard	160 - 183	110 as compacted / 188 after 28 days

D 1883) on soaked specimens compacted to modified Proctor densities (ASTM Method D 1557), gave the results shown in the table above. Cementitious properties of the granulated slag are shown by the test results as compacted and 28 days later. Compacted densities will vary somewhat with gradation and specific gravity of the individual slag. The amount of compaction will have a marked effect on the CBR values, however, present field compaction equipment is capable of attaining the ASTM Method D 1557 values and a CBR value of 100 is the maximum ordinarily specified for the highest types of base courses - those directly under flexible pavements' on heavy duty airfields.

INSTALLATION

Methods: Use of standard construction practices is recommended. In most cases, the equipment, procedures and compaction requirements specified by the state highway department represent the best practice for a given area and should be followed.

AVAILABILITY AND COST

Availability: Locations of Phoenix Services sites can be found on the company website in the "Slag Sales" section. The contact information for the slag sales representatives is included on the individual site section.

Cost: Information can be obtained from producers in the individual project area.

GUARANTEES

Aggregates of all types are usually purchased on the basis of standard specification requirements which should be met at the production plant. Aggregate producers cannot assume responsibility for contamination, segregation or the effects of mistreatment or misuse of the aggregate after it leaves their control.

MAINTENANCE

If unprotected base courses are subjected to traffic for any significant period of time, "dusting" or abrasion and wear of the surface will result. Dependent upon the time and traffic involved before placement of the pavement, this can be minimized or eliminated by wetting the surface, CaCl treatment, or by application of a bituminous surface treatment. Base failures are usually caused by soft, yielding underlying subgrades. Such areas should be repaired by excavating and replacing them with properly compacted subbase materials or by use of a thicker base course.

TECHNICAL SERVICES

Technical assistance in the proper application of slag in base courses and additional information on properties and characteristics are available on request through the National Slag Association website (www.nationalslag.org).

PHOENIX SERVICES LLC

The Liberty Place
at Kennett Square
148 West State Street
Suite 301
Kennett Square, PA 19348