General Information

EZBase® is a byproduct made from circulating fluidized bed (CFB) boilers located at the JEA Northside Generating Station (NGS). These CFB's are fueled by a combination of coal and petroleum coke. Limestone is added during the power generation process to create thermal mass and to aid in the removal of sulfurous gas emissions. At the conclusion of this generation process, two dry byproducts are generated, fly ash and bed ash. These dry ash byproducts are mixed with water to create a slurry that is further processed into the value-added byproduct, EZBase.

Byproduct from a solid fuel CFB plant, such as the JEA NGS facility, is distinct from that of conventionally fired boilers (e.g., pulverized coal, fuel oil) because it is composed primarily of lime and gypsum (calcium oxides and calcium sulfate, respectively). Less than 10% by weight of CFB byproduct actually represents what would generally be termed "ash" from combustion of the fossil fuels. Over 90% by weight of CFB byproduct is a result of the addition of the limestone to the boilers. Thus, the byproduct from a CFB plant is not an "ash" in the typical sense, and is not solely the remnant material from conventionally-fired boilers. As noted the EZBase byproduct is primarily lime and gypsum which gives it excellent cementitious properties that allow it to be used in construction applications where limestone, cement and concrete would otherwise be used.

Environmental and Safety Considerations

JEA conducted a two-year beneficial use demonstration (BUD) to determine the potential for environmental or health effects associated with EZBase. As a result of this effort, EZBase was deemed non-hazardous as defined by the Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP). FDEP has determined that use of the EZBase constitutes a beneficial use of an industrial byproduct when used in specific applications. During the BUD process, effects of EZBase on soils, surface waters, and groundwater were evaluated by several different approaches, including field studies. The material was judged to be safe for the approved applications and did not pose a threat to humans or to the environment, including personnel applying the product as a part of their daily tasks. Through this demonstration, EZBase was determined to be safe for use as a replacement for other conventional civil construction materials such as limestone and concrete.

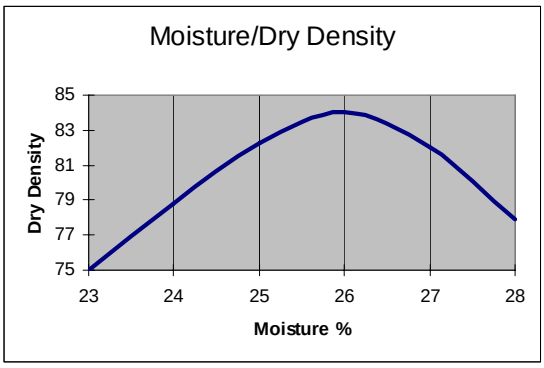
Prior to use, please review the Material Safety Data Sheet (MSDS). The MSDS can be obtained by contacting (904) 665-4952.

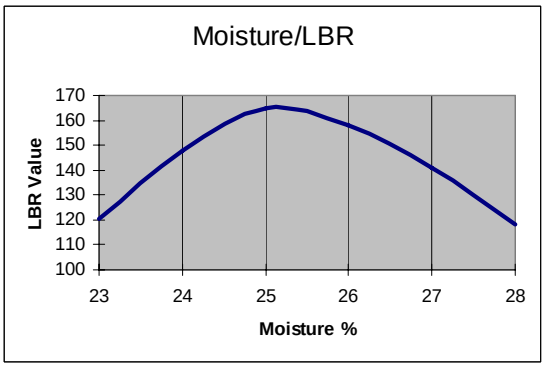
Properties

The processed EZBase will have the following typical properties.

- Color: Dark gray
- Typical dry density -- 76 to 86 lb/cu ft.
- Typical moisture content at loading -- 20 to 25 percent
- Typical available lime content at loading -- >10 percent
- Milled to 3-1/2 inch minus sizing
- Plasticity: Non-plastic per ASTM D4318 or AASHTO T89, 90
- Typical limestone bearing ratio (LBR): >100 (FM 5-515)
- Approximate saturated permeability of compacted material: 10^{-7} cm/sec

Because of the ash component of the material, it has relatively low dry density (generally 76-86 lbs/ft^3) when compared to normal soil materials but is capable of delivering higher strengths. EZBase is normally shipped with average onboard moisture content of 20 to 25% by weight. Because of the residual calcium oxide (>10% by weight) in the installed product and the remaining moisture, it continues to gain strength over time.





In order to gain maximum strength from the product (recommended for base course applications), the moisture can be adjusted to optimum, which is normally between 25 to 30%. The charts above show typical moisture to dry density and LBR relationships for EZBase. Depending on the specific application and use, it is recommended that the user have a Proctor compaction test performed prior to installation to determine the project specific properties.

Availability of EZBase:

EZBase is available for load-out by truck or railcar at the Northside Generating Station. JEA and FDOT require that the product be protected from the elements and contained in the vehicle throughout the shipment process.

Product Applications

Since EZBase is a byproduct of electric generation, it comes at a low cost compared to existing alternatives. The following are approved applications of EZBase® :

- Stabilized sub-base course for civil applications where a final top surface such as asphalt, concrete or compacted EZBase will be used.
- Base course for civil applications such as road base where the EZBase will be covered with a friction surface such as asphalt, concrete, or compacted EZBase.
- Final top surface for roads, parking lots, lay-down yards and similar industrial and commercial applications using compacted EZBase either alone or with stone (such as granite or limestone) or asphalt millings rolled into the top surface.
- Stabilization for remedial projects where access controls are in place and where the remedial project has been reviewed and approved by Florida Department of Environmental Protection.

In sub-base stabilization EZBase is blended with the native soil and compacted to improve strength and resistance to rutting. The primary benefit of using EZBase is the development of improved stability and continued strength gain over time. The specific improvement in engineering properties is dependent on the type of soil, installation, curing conditions and age. Only the minimum amount of EZBase should be added to the native soil to attain the design required strength.

In base course applications, EZBase is placed in a layer on top of a stabilized sub-base and compacted. As the remaining active lime hydrates the product hardens into a flexible base course layer. EZBase is approved as the final top surface or an asphalt top layer can be applied over the base course to create a finished surface. An asphaltic prime coat is required on top of the EZBase when an asphalt top layer is to be applied. The base course can be left exposed in certain applications like aggregate lay down yards or equipment parking lots. It can also be installed with stone aggregate mixed or pressed into the finished surface to create a decorative finish.

Use Limitations

- The Florida Department of Environmental Protection recommends that EZBase, either alone or mixed with other materials, should not be used in contact with ground water or surface water bodies. JEA recommends a six inch (6”) separation of EZBase from the seasonal high water table.
- Do not use EZBase to displace water on the job site as it will affect the curing process and the performance properties.
- Do not arbitrarily mix EZBase with other construction materials other than the natural soil or natural aggregate.
- EZBase will install without problem in light to moderate rain. However, it is suggested that if heavy rain is expected during the planned installation time, the installation should be rescheduled.

Disclaimer:

All information, advice, and other material concerning the product, services, processes, or uses are provided with no warranty of any kind. Nothing should be construed as a recommendation or inducement to infringe any patent. No assumption should be made that all safety or environmental protection measures are indicated or that other measures may not be required.

Warranty:

JEA warrants EZBase to be free of defects and to meet published physical properties when tested according to ASTM and JEA standards at the time of shipment. Under this warranty, any EZBase that is proven to be defective when applied in accordance with JEA written instructions, and in applications recommended and/or approved by JEA as suitable for the EZBase will be replaced with like product at no charge. Buyer shall be responsible for all shipping charges. THIS IS BUYER'S SOLE AND EXCLUSIVE REMEDY. All claims concerning product defects and/or warranty must be made in writing within twelve (12) months of shipment. The absence of such claims in writing during this period will constitute a waiver of all claims with respect to such product. This warranty shall be IN LIEU OF any other warranty, expressed or implied, including but not limited to, any implied warranty of MERCHANTABLITY OR FITNESS FOR A PARTICULAR PURPOSE. Under no circumstances shall JEA be liable for consequential, incidental or special damages. JEA's liability shall not exceed the Buyer's purchase price for the product.