Engineering Construction: Coke Production

Question: Describe about Engineering Construction for Coke Production.

Answer: Asphalt – Asphalt is defined as a black or brown coarse substance used to cover roads and is usually mixed with sand.

Different types of clay

1. Coal tar - This is a type of clay that comes from making coke. Both of these products are the black residue left after the drying process is complete. Moreover, this type of asphalt is similar to refined bitumen except for physical properties (Oikonomou, 2005). The best way to distinguish this clay from pure tar is the soft part of the fabric. It produces a peculiar smell when heated at high temperature.

2. Oily clays - These are crude oil residues after drying. It is usually dark in color and shiny in appearance. It is also resistant to very high temperatures and contains few organic compounds due to the high temperatures encountered in the curing process. Although there are usually some hydrocarbons that can be harmful to humans.

3. Natural Clay - This type of clay is usually placed underground due to the accumulation of time. Fortunately, there is no harm to humans due to evaporation and oxidation.

4. Permeable clay - This clay allows water and other liquids to flow from the soil surface to the subsoil. This type of asphalt is found under parking lots, where it helps lift stormwater to improve its quality as it seeps underground.

5. Hot mix asphalt - This asphalt is the best for road construction. This is because it offers great design features and looks great. In addition, most are strong and can withstand melting and freezing. Hot mix is also resistant to salt water and requires little maintenance (Zimmerman, 2002). In general, slag is the least common of the slag types described above.

6. Metallurgical clay – it is also known as ceramic tile. The amount of bitumen is less. In this way, it is perfect for building floors, ceilings, walkways.

Main components of concrete

Importance

Aggregates play an important role in building the strength of concrete during construction. In addition, the concrete transition zone is the area between the aggregate and the cement paste, and is responsible for giving the concrete its strength (Holon, 2001).

Properties of Rock Types

Although aggregate is often referred to as spatial aggregate, it is a very important factor in determining the thermal and elastic properties and dimensional stability of concrete. Collections are classified into two types: solid and fine. Coarse aggregate is greater than 4.75 mm (fits No. 4 sieve) but fine aggregate is less than 4.75 mm (fits No. 4 sieve). Aggregation potential is important in aggregate selection (Linden, 1997).

Clay Production - Clay can be produced from all oil refineries through sedimentation. For example, an oil producer obtains oil by separating various fractions through a distillation process. After the fractions are separated from the shade, the final products are kerosene, gasoline, gasoline, lubricants, etc. Refining begins by sending the oil from the storage tank to the vessels where the temperature is very high (Geller, 2004). This always applies to reaching the first definition. After this, enter the air conditioning tower. Here, the crude oil is pressed, because its lighter components are liquefied. It is separated by heating and pressure to produce gasoline, kerosene and kerosene, and other petroleum products. The remaining heavy residue is called top crude oil (Evangelista and Brito, 2007). The top liquor is usually sent to a vacuum, and the high-boiling fractions are removed to reach the clay.

Synthetic aggregate is a light mixture of fly ash binder and water. It is round in shape. However, it can be changed to another form of exercise. Synthetic composites are often preferred because they are very stiff,

absorb quickly, and are lightweight. This material can be used in concrete mortar without changing its consistency.

Assembling the aggregates Fine aggregates - According to the international standard requirements for manufacturers, such aggregates have a diameter of 4.75 mm. Aggregates can be classified as natural sand, crushed sand or crushed sand (Zakaria et al., 2006).

Using Compilers

Compliers are important because they take a lot of work during construction. Good packaging, such as good packaging, ensures that there are no defects in the building structure. In addition, fine aggregates are responsible for sufficient surface coverage of the concrete to form a uniform layer (Paranavitana and Mohajerani, 2006).

Shape and Texture

Shape and texture are important aspects of polish, performance and construction. Different types of aggregates work best with different projects being worked on. For example, the shape of the aggregate determines its ability to be stitched together, thus making the construction strong and durable. Rounded particles also have less particle-to-particle coupling than their angular counterparts. .

Classification of aggregates based on origin

1. Natural aggregates

Natural aggregates are those that occur naturally and are buried in rivers, lakes, or sea-beds. It looks like smooth rounded surfaces and stone fragments in water. They are often specified in different sizes. Some contain more pebble fragments while others contain smaller sand particles (Wan et al., 2000). Minerals such as sandstone, limestone, limestone, etc. For example, we can talk about the ash found from coal cars.

Seed based classification

1. Fine Aggregate - Most fine aggregate is natural sand or crushed stone, most of which passes through a 9.5 mm sieve.

2. Dense aggregates In this case, dense aggregates are usually obtained by crushing or breaking rocks using explosives and machinery, leaving a large particles of aggregate 6 mm or more. It is also important for construction projects.

For example, there are normal weight packs, heavy weight packs and light weight packs. Aggregates with normal weight are natural mineral aggregates with specific gravity of the form. 2.5. It is the collection of resources used in developed and developing countries. Weighted aggregates are synthetic, and weigh almost as much. 2100 kg/m3. Some of the heavy aggregates include magnetite, hematite, limonite and barite (Linden et al., 2003). Lightweight packages are usually made from a variety of aggregates. The density is less than 1100 kg/m3.

Porosity of aggregates

Air-filled voids between aggregate particles. The amount of voids determines the porosity of each aggregate. In addition to air, spaces can also contain water particles. The size of the spaces between the particles affects the design process of some construction processes. For example, those structures require less space to divide aggregates. If raw aggregates are used, the resulting results will not be effective.

Clay compaction is a process of compacting the air-clay mixture by external force, thereby increasing the particles' density and order (Isenring et al, 1999). Diffusion increases the density of the mixture. Different coating methods are used in the ceramic filling process. These methods include:

Pre-consolidation using a baler

This is done by using a pre-consolidation roller to compress the air/cement mixture to a specified density. Heavy, high-density rolls are not encouraged because they can damage the layers.

Static compaction

This process is accomplished using the dead weight of the roller and is mostly done using pneumatic rollers and tandem rollers. It has a small effect on the mixture and is used when the initial density is low.

Vibration Compression

This is a technique used for optimum compression. It is still used to increase the ratio between the density of the mixture and the specific gravity (Ahmadzadeh and Sangouz, 2009). Below is a picture of the process.

Tools used for polishing

There are different types of tools used in polishing, namely tampers, pneumatic steel rollers and wheel rollers .

Tampere

These are machines that are not used for compaction where large compaction machines have failed (Chang and Miguda, 1999). They are powered by gasoline engines

Steel wheel rollers

These are the self-propelled type of equipment that use a steel cylinder to compress the bottom mixture of air and clay. Generally, these rollers make one or more drums, but not more than three (Appleman et al., 2016). The most common rollers used is the 2 drum since it is static and vibratory and have a wider range of diameter. Besides, their weight can be enhanced through a process of compact effort where the wheels are ballasted with either water or sand Below is a picture of the steel wheel roller.

Pneumatic wheel rollers

These kind of rollers are also self-driven and they use pneumatic tires in compression of the underlying mixture of air and asphalt (D'Angelo et al, 2008). They employ tires that are not threaded on the axles for complete compaction. The tire contains a pressure regulating device which varies the tire pressure depending on the extent of compaction required. Below is a picture of the pneumatic wheel rollers

These wheel rollers are most preferred due to some advantages listed below

- The results into a uniform, tight and denser surface as compared to other
- They provide a stiff compaction without causing cracks on the surface
- They also provide a uniform degree of compaction Besides, they have a disadvantage of causing deformation that is hard to repair when they contain a rubber modifier.

Test report for the engineer to ensure acceptance and accuracy

The model must be worked and the product tested according to the standards and requirements. Samples should be taken to the engineer for approval or material recognition. In addition, appropriate sampling techniques should be used to ensure adherence to quality and reliability standards (Tibali et al., 1992). Some of the aspects of modelling should include soil sampling, aggregate sampling and concrete sampling.

Safe handling practices when working with garbage When working with garbage, there are a few things to consider. Below are the safety rules for handling clay.

- Always make sure that the workers are fully trained on the dangers of asphalt
- At the asphalt terminal, the driver must ensure that there is no contamination during loading and unloading, because a breakdown occurs
- When the vehicle is being loaded. container to.

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