Halifax C&D Recycling Ltd.
TDA General Usage Specifications
May 02, 2022

TDA has shown to be a very successful building material for fills, drainage layers, insulation materials, and other applications where its characteristics are beneficial. Used in applications as an engineered fill designed to specific site requirements, the material can have predicable *strength* and *performance* characteristics that meet the needs of the project. Strength gives the fill structure the ability to carry loads (i.e. traffic) that are anticipated without deterioration Performance can relate to acceptable amounts settlement or heave of the finished fill surface.

1. TDA Background & ASTM Standard

Tire Derived Aggregate (TDA) is a manufactured aggregate product produced by shredding scrap car and truck tires to prescribed specifications for use in civil engineering projects. TDA manufacturing is funded by "New Tire Levies" for scrap materials recycling. The manufacture of TDA is procured through a competitive public process. Halifax C&D Recycling Ltd, a Nova Scotia company has had the contract for manufacturing TDA since the program's inception in 2009 having processed over 14,000,000 scrap tires into TDA.

The **ASTM D6270 20 - Standard Practice for Use of Scrap Tires in Civil Engineering Applications** is the guidance document for the use of TDA in civil engineering projects. It is recommended that the guidance in this standard be adhered to for predictable performance of TDA applications.

2. TDA Material Type A and Type B

ASTM defines, and Halifax C&D manufactures, two types of TDA. These differ principally by the material gradation and size of shredded material. Type A is suitable for thin fills as well as many drainage and insulation applications. The second larger product is termed Type B. It is suitable for use as lightweight embankment fill, retaining wall backfill, and some landfill drainage and other specialized applications. The specific sizing and other product information is provided in the ASTM Standard.

3. General Site Requirements

TDA has been used for several decades as an embankment fill with predicable and good performance qualities. Similar to other embankment fills, the performance of TDA is dependent upon careful site preparation under the fill and accepted material placement procedures that would be prescribed for most fill materials. This includes but is not limited to:

- Grubbing and excavation removal of all organic, previous fills, and unsuitable or soft soils;
- Draining and removal of excess water in the fill area;
- Excavation and removal of any contaminants;
- Placing the materials in thin lifts and providing compaction

We recommend that these requirements and other specific site preparation aspects be evaluated by a geotechnical engineer responsible for the site development.

One can use TDA as a non-engineered fill material in areas where the performance characteristics of strength and settlement may be less critical but it is recommended to have an engineer familiar with the standards review these uses. In no cases should a single layer of TDA fills be greater than 3 meters thick.

4. Recommended Soil Cover

As performance guidance for the soil layer over the TDA layer, ASTM recommends 0.8 m minimum cover for paved roads with light traffic, 1.0 m - 2.0 m for paved roads with heavy and truck traffic, 0.3 m to 0.5 m of cover over unpaved roads or trails. Note that TDA should always be covered diligently because exposed wire in the shred can be sharp.

5. Other Considerations

On site compaction of TDA fill is straight forward. ASTM requires 300 mm lifts and a minimum of 6 passes of a 90 kN vibratory roller. Water content has no effect on compaction. These aspects allow TDA fills to be constructed efficiently and quickly often independent of weather conditions. As per all fills, snow and ice must be prevented from entering the fill during construction.

Due to its high porosity and high rubber content TDA material is obviously a compressible material. This is particularly evident under initial loading (i.e. filling). This property of the material is understood and anticipated in the construction. About 20 to 30% strain (compression) can be expected to get to final negligible amounts under typical loading conditions. To compensate there is a modest requirement to over build and observe the deformation under load. For some projects we have thickened the gravels over the TDA section to act as a surcharge load and simply re-graded these after the compression has ended. For normal soil loading the time frame to reach static grades would be in the order of a couple of weeks. In all cases, the compression needs to be monitored by checking grades periodically to obtain optimal long term performance required in the design.

TDA has 8 times the thermal resistance of typical soil so is a very good insulator to prevent freezing penetration. In addition, because of its high hydraulic conductivity and free draining characteristics it acts a (capillary) moisture break over fine soils so even a modestly thick layer of TDA can prevent frost heave and damage. These are particularly valuable properties to eliminate the deterioration of weak soils in graded areas that are frost susceptible

Many thanks for your interest. For more information on TDA please contact us.

Regards

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