Construction Quality Control and Quality Assurance Training

Description

Introduction

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An innovative highway industry provides a major market for the use of ‘waste’ resources, at the same time minimizing the need for ‘natural’ resources. Selected waste streams and industrial by-products, formerly bound for a landfill, are more frequently finding a route into sustainable highway design and maintenance.

Asphalt pavements, concrete, base courses and embankments increasingly have incorporated ‘waste’ resources instead of raw materials. Reclaimed concrete and asphalt, scrap tires, plastics, steel slag, roofing shingles, coal fly ash, and composted municipal organic wastes are proven, cost effective, and high-efficiency materials with broad applicability in roadway construction.

Other environmentally sustainable actions beyond mere building materials include right-of-way management, the reuse of organic materials from cleaning and grubbing operations, deconstruction of buildings removed from rights-of-way, minimal right-of-way footprints.

Course Objectives

The objectives of this training course can be summarized in the following main points:

- Enhancing the skills of road construction engineers in their field
- Introduction to road construction materials
- Determination of engineering properties of road materials
- Quality control and quality assurance in road construction

Course Outlines

An introduction to road construction materials including but not limited to the following:

- The used materials for road embankment, road pavement (gravel roads, surface dressed roads, paved roads, etc)

- Material properties
- Soil and subbase: Standard tests to determine the engineering properties of road materials such as; sieve analysis, liquid limit, plastic limit, plasticity index, soil classification according to AASHTO classification system, standard and modified proctor tests,, California bearing ratio (CBR), modulus of resilient of subgrade soil, relative compaction test, etc.
- Base course: Standard tests to determine the engineering properties of road materials such as; sieve analysis, liquid limit, plastic limit, plasticity index, soil classification according to AASHTO classification system, standard and modified proctor tests,, California bearing ratio (CBR), modulus of resilient of subgrade soil, relative compaction test, Los Angeles (abrasion) test, absorption and disintegration test, etc.

Bitumen Material:

- Asphalt cement
- Cut back asphalt
- Emulsified asphalt
- All standard test on different types of bituminous materials will be illustrated including but not limited to; bitumen grade test, softening point, ductility, solubility of bituminous materials in organic solvents, etc.
- Asphalt mixtures: types of asphalt mixtures;
- Hot mix asphalt concrete
- Worm mix asphalt concrete
- Cold mix asphalt concrete
- Properties of each mix will be discussed. Also, the components and method of manufacturing will be illustrated
- Design of Asphalt concrete mixture:
- Testing of materials used in the asphalt mix (course aggregate, fine aggregate, mineral filler, binder etc)
- Specification requirements
- Blinding of aggregate
- Graduation of blinded aggregates
- Marshal method for design of asphalt mixtures; volumetric relationships, optimum bitumen content, tolerance, job mix formula.

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Quality Control And Quality Assurance In Road Construction:

- The importance of quality control in road construction processes
- Selecting of materials sources
- Testing of materials
- Inspection of the executed work
- Testing the executed work
- Filling the test result for quality assurance process
- Quality assurance in road construction processes
- Road construction technology
- Introduction to the new technologies in road construction
- New equipments, new techniques used in road construction