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## **CASE STUDY OF VARIOUS MODERN TECHNOLOGY USED IN HIGHWAY CONSTRUCTION**

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### **Abstract**

1.Modern technology used for highway road construction plan in India. This basically involves in various pavements. In these days, Ministry of Road Transport & Highways Specification for Road Works, 2001 Edition is used for construction of all roads including national highways. Advances in construction technologies are made in the world every year. In this type of technology we are analyzing the various category of technology like recycle materials ,latest technology, equipments various facility on highway This paper describes such advances in terms of materials, mix design, special bituminous mixes, and recycling. To make modern construction in minimum time and decrease the construction cost by use the modern construction technology.

### **Keywords**

Recycle materials, equipments latest technology, facility. (CDW)

### **1.1 Introduction**

Highway in these days construct over an embankments so we say its highway .in highway so many facility give for different purpose and provide better journey for people . it may be logistics, passengers ,goods .Due to use of modern technology. we can save our time and construct at fast speed we can construct at low cost like recycled materials used in pavements. we can improve our durability of road. We are using in these days various costly equipment so we easily manage our construction planning .in this paper we are identify the various characteristics of different technology like recycle materials, and its strength .latest construction equipments ,used for materials in modern technology for highway construction.

### **1.2Characteristics & Category of various Recycle materials**

**1.3 Recycle materials** and their properties that to identify the strength value of waste materials.

**1.4 Latest equipment** use to construct with more speed without any accidents.

**1.5 Latest materials** used for construction to increase its life span of the structure.

**1.6 Facility Refers** to the presence of facility in the side of highway to prevents from accidents and provide safety for passenger.

## 2. Data Analysis for recycled materials

Evaluating recycled for sub-base base constructed by using recycled construction & demolition waste (CDW) For Construction Of Flexible Pavements.

New materials specified under the ministry of road transport & Highway. MORTH government of india,by government of Indian physical properties are specified Toughness index ,and other properties of aggregate & bitumen materials .

The materials are fulfilling their requirements as per specifications.

MORTH also investigate the CDW the performance are evaluated last 3 years .it has been found satisfactory.

### 2.1 Results

Description of materials	CBR at OMC	CBR Soaked
Concrete aggregate(CG)a	86	125
CG+ Bricks	87	84
CG+10% Of Sand	91.5	92
CG+10% of cement	137	>150
(CDWA)a	71.5	78.6
(CDWA)b	71.4	74

Tests Conducted By Bachir Melbouci (2009)

Present Work



**Figure: Data Analysis for recycle materials**

## 2.2 Latest equipment used in modern technology for highway construction

The engineering works where more quantities of materials such as soils or rocks are require to be transferred from the origin to the site where the road is being constructed. The construction machines used to carry out the earthen works include excavators, loaders, dozers, graders and scrapers etc.

- **Excavators**

Excavators are used to dig the earth. They are commonly used in construction and they are essential part of the resources that are required for any building project.

- **Loaders**

They are also used for digging and to perform faster than the excavators. Their main function is to move loose soil.

- **Dozers**

The dozer machines are used for the surface to be constructed by moving and changing the soil. A dozer is a useful machine which pushes and spreads the soil to create a flat and even surface.

- **Graders**

The function of a grader is also similar to the dozer. It is used to smooth out the construction surface and level it also used for wet mix macadam. This equipment is particularly useful in road construction sites.

- **Scrapers**

Scraper is another type of construction equipment which is used to scrap a thin layer of soil and they can away as desired. They are commonly used in big project.

- **Road Work Machinery**

All the functions involved in the construction of roads under this category. Road construction is a common application of the construction equipments.

- **Milling Machine**

The milling machine in road works is used for repair works to remove a layer of unwanted material from roads so that a new layer can be created by disposing off the destroyed layer.

- **Paver**

A paver is an essential road construction machine used to layout or spread asphalt or concrete layer on roadways.

- **Compactor**

Various Compacting equipment are used for compacting the various layers of the roads after spreading them. As the name indicates compactors as a road construction machines are used to compress the materials in construction sites and roads. They compress and compact the soil for further construction purpose.

- **Lifting Machinery**

These equipments are used to lift the heavy objects and materials on the construction sites. Lifting machinery are various types depending on the requirement or height of lifting .

- **Tower Crane**

Tower crane are used to lift different building materials such as concrete, steel etc and they have the function of rising to a great height.

- **Tractor Crane**

Tractor crane are also used for lifting and carrying heavy materials on the construction site and they can move about freely because of their compact structure.

Compact construction equipment



Wheel loaders



Backhoe loaders



Crawler excavators



Skidsteer loaders

Heavy construction equipment



Crawler excavators



Wheeled excavators



Crawler excavators from Lingon



Articulated haulers



Wheel loaders



Lingon wheel loaders

Road machinery



Motor graders



Compaction equipment



Pavers



Asphalt milling machines

### 3. Latest materials used in modern technology for road construction

Global Road Technology is proud to be a recognized industry leader in the road building and construction industry and carries and proud to the engineering tradition forward in modern times. They are experts in both modern construction methods as well as the application of their own cutting edge techniques that rely on soil stabilization and dust control. Let's take a look at several of the traditional types of construction techniques and materials in use

#### 3.1 Data collection for material

- **Recycling** – There are three typical types of construction techniques related to recycling the surface of distressed or damaged pavement. Rubbishing, Cold/Hot in-place Recycling, and Full-depth Reclamation. Rubbishing involves reducing the road to gravel and then applying a new surface, both hot and cold in-place recycling relies on using bituminous pavement to reinforce the road (at different temperatures and admixtures, of course), and Full-depth reclamation involves both total pulverization and the addition of binding agents or other additives.

- **Bituminous Solutions** – Bituminous and other temporary solutions are types of construction that are only suitable for use on very low-traffic thoroughfares. Chip sealing techniques, thin membrane surfacing, and sealing are all examples of bituminous surface options. These are all more commonly employed as sealing coats or finishes than as full road surfaces.

**4. Development:** These are construction works that are identified as part of the national development planning activity. As such, they are funded from the capital budget. Examples are the construction of by-passes, or the paving of unpaved roads in village

The information collected is not in suitable form for analysis. We require an information extraction process i.e. able to find out the required information from unstructured or raw data and put it in structured format. Data Cleaning assumes pre-defined constraints to check valid data or error models for some domains.

## 5. Conclusion

CDW are not new technology .it is used in several countries. The present value of CDW according to flexible pavements. Recycle material to decrease the cost of construction and we can save our waste material its very harmful for environment. For best results we can calculate different value of material and strength of material .In this paper we are identified various latest technologies. Like recycle material, equipments, latest material and various data collection for present to environment condition. in this paper we analyzed how to construction and their impact factor on our environment. And also analysis of latest equipment these overall literature review defined what is the modern technology of highway construction.

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