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"Study of green highways"

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Abstract: **-- Road Transport is a critical infrastructure for economic development of a country. It influences the pace, structure and pattern of development. The capacity of National Highways in term of handling traffic (passenger and goods) needs to be in keeping pace with the industrial growth. India is having one of the largest road networks of over 46.99 lakh km. It comprises National Highways, Expressways, State Highways, Major District Roads, Other District Roads and Village Roads. In research paper discusses how to make green highway having reduced carbon emission, low air pollution, low noise pollution and also reduce UV radiation. Use industrial waste for the manufactured concrete green highway. Use street solar light and solar drip irrigation system on both sides of plants and in the plantation, those trees are reduced air pollution, noise pollution, reduce heavy metal in air and provide shade during the summer season.**

***Keyword*: Green Highway, Carbon emission, solar Drip irrigation.**

I. INTRODUCTION

The situation becomes demanding with a constant movement of vehicles on these roads giving also to the release of Greenhouse gases and different suspended particulate matter. High level of Greenhouse gases and extended dirt particles within the air create a happening soon health threat for the people and additionally endangers the biodiversity of the area. Under such conditions, it's very important to require proactive measure for pollution containment on highways. Green corridor works as green plants buffer around the pollution source and helps in absorption of Greenhouse gases and a mixed group of dirt particles. It additionally reduces sound pollution and provides much-needed shade on giving out hot roads during summer. Plantations arrest soil physical or chemical process of wearing at the embankment slopes stop glare from the light of the incoming vehicles and reduces the impact of wind and incoming radiation.

II. LITREATURE REVIEW

➢ Use industrial Waste:-

- Fly ash will be utilized in concrete admixtures to boost the performance of concrete roads and bridges.
- Grouts are proportioned mixtures of ash, water, and different materials are commonly used to fill voids below a pavement system while not raising the slabs or to lift and support concrete pavements.
- Blast furnace slag has been used as a cementitious binder in construction. Blast furnace slag provides a good potential for profitable use of this waste product and produces alternate binder to cement.
- Just as foundry slag has been used as a substitute for native coarse aggregate in concrete mixtures, blast furnace slag has additionally been utilized in asphalt mixtures.
- Many steel plants have used their slag as a substitute for coarse aggregate in construction projects in and around the steel plants for a number of years. In several cases, it's been used because of the single supply of material for gravel construction. In alternative instances, it's used for roadbed, base course, or sub base material.
- The sections of road during which blast furnace slag was used as a method of providing soft ground stabilization provided a degree of stabilization similar to that of the traditional method of using rock aggregate.
- Cement kiln dust includes a chemical composition the same as that of cement; therefore, the primary value of cement kiln dust is its cementitious properties. Its alkalinity and particle size additionally provide value for a range of useful use options. Cement kiln dust will be wont to improve the properties of soil in place, and as an activator in pozzolanic stabilized base mixtures. The adsorptive capability and cementitious properties of cement kiln dust enable it to scale back the wetness content and increase the bearing capability of the soft soil.
- Cement kiln dust will be mixed with soil to change plastic limits or wetness content to supply the required stabilized properties.

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- HMA may be a common paving material. Cement kiln dust will be used to replace a portion of the mineral filler used in hot-mixed asphalt.
- Phosphogypsum is reused for road construction aggregate.
- Waste plastic bags in shredded form will be used in bituminous mixes of versatile pavements to enhance its performance and to reduce consumption of bitumen around 100% of the weight of OBC.
- Foundry, colliery sand and municipal solid waste will be used in road embankments and their bases.

➢ Solar Technology are Use in Green Highway

- Solar wireless drip irrigation system

Deployment of WSN in agriculture and food business applications are classified into 5 categories environmental observation, exactness agriculture, machine and method management, building and facility automation and traceability systems. Wireless sensors were wont to monitor the atmosphere and to automate the irrigation system, all powered using solar panel. We have a tendency to be ready to see that continual advancement in sensing and communication technologies has considerably brought down the price of preparation and running of a possible exactness agriculture framework. Sensing and communication will currently be done on a real-time basis resulting in higher response times.

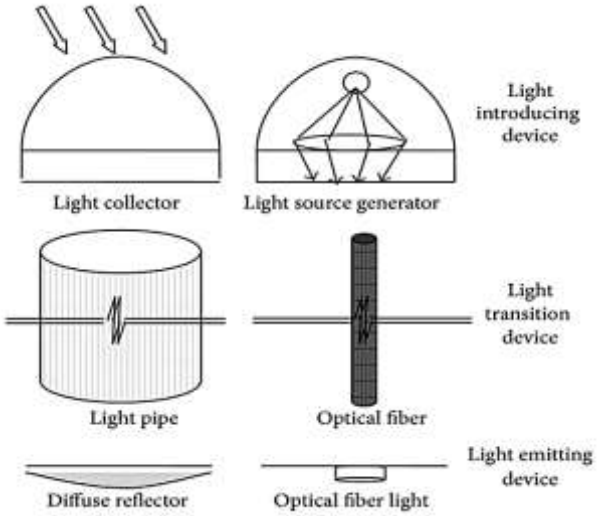
There are greenhouse auto control systems that collect info about internal environment and plants and stores it within the database then control automatically during a remote place by using internet based on the greenhouse information. A greenhouse auto control system contains temperature and humidity sensors whereas, in another system, leaf temperature sensor, and leaf humidity sensor were other. Both use ZigBee based wireless sensor node. A ZigBee wireless sensor network was additionally designed using fuzzy control for drip irrigation that measured four parameters, soil moisture, temperature and light intensity and electrical conductivity for drip irrigation decision making.

This system is mainly work in 1. Field Test Temperature Measurement & 2. Transmitting Data Wirelessly.

- Solar Street Light

➢ The Basic situation of highway green rest area in India.

People are progressively starting to worry about the service quality and energy saving level of the highway rest area. highway green rest areas, typically refer to the rest areas integrating varied measures of each saving throughout the complete life cycle together with designing, design, construction, operation, and management to maximise saving resources, reduce pollution, protect environment, and supply drivers and passengers with a safe, healthy, comfortable, and economical service environment supported the principle of the virtuous circle of the entire system. Some highway rest areas in India have begun to use different energy saving technologies to do establishing green low-carbon rest areas. Green building and clean energy technologies are used in a small number of highways rest areas and achieved good effects.



the natural light guidance system was quite appropriate for highway rest area that was generally located in the remote residential area based on its benefits of energy saving, health, good lighting impact, and long service life period. The design of natural light guidance system was tested to can meet the lighting demand of the visitor centre within the rest area and verified the feasibility by on-site experiment and brightness simulation analysis.

• Road Traffic Heavy Metals in Tree Bark Layers of Cassia fistula Tree

- ➢ In Cassia fistula bark samples, were found to possess the highest amounts of heavy metals were found within the cork layer (outermost layer).
- ➢ Specific factors, including exposed directions of the tree to the supply and therefore the tree trunk size (5 - 30 cm) weren't suffering from the concentrations of heavy metals accumulated within the bark of the tree.
- ➢ The use of cassia fistula trees as a heavy metal bio indicator should be thought of acceptable.

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However, the sampling should be done at the cork layer of the tree trunk at any size inside the range and brought from any direction of exposure.

• Plantation Pattern in Green Highway:-
Depending on the obtainable ROW, plantation pattern shall be worked out as follows:-
• The first row on the highways is of small to medium sized ornamental trees.
• Subsequent rows depending on the supply of width can comprise of ornamental and shade bearing species, of additional height than those within the first row. In rural sections, the last row can always be of shade bearing tall trees.
• Planting of shrubs within the median.
• Planting of herbaceous species as ground cover within the medium, special landscapes, and embankment slopes.

RESEARCH

Pavement is contrast porous concrete and use industrial waste like fly ash, blast furnace slag, cement kiln dust, etc.
In other construction of green highway like divider, shoulder and foot path are contrast some percent of other industrial waste are

- Reuse of Carbon Paste from Used Zinc-Carbon Battery for Biogas Desulfurizer with Clay as a Binder
- The wash water used to clean the milking instrumentation, the pipeline and therefore the bulk tank on a dairy may be another different nutrient for microorganism growth. Usually, area unit used chemical cleaners to penetrate and raise bio films from instrumentation surfaces and this bio films are use in concrete.
- In Eco-Cement, they're used Sand, fresh Cement kiln dust, Biomass, urea and Rice Husk Ash.

II. CONCLUSION

• The traditional highway can be converted into green highway right from the planning method and shall undergo desired changes during construction and maintenance phases. Before the formulation of common characteristics of the green highway, it is always advantageous to understand the green practices to be followed during a method of designs, construction, and maintenance of the highway.

• Some of the industrial waste materials may determine a suitable usage in highway construction.

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