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## A REVIEW PAPER ON EFFECTS OF RBI GRADE 81 ON PROPERTIES OF RED SOIL.

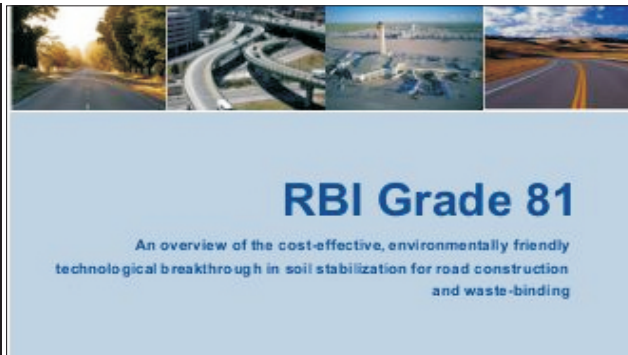
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### I.ABSTRACT

Soil stabilization is a major problem in India where in civil engineering field is developing at very fast pace. In India large area is covered with soil having poor geotechnical properties and not suitable for construction. So soil stabilization is needed to enhance its engineering behaviour such as workability, strength, stiffness, compressibility, permeability and sensitivity. This review paper deals with impact of RBI Grade -81 at 2%, 4% and 6% mixed along with fly ash 3%, 6% and 9% on red soil and change in California Bearing Ratio (CBR) Maximum Dry Density (MDD), Optimum Moisture Content (OMC) has been observed through different mixes of RBI Grade-81 and Fly ash on red soil. RBI Grade -81 is very effective stabilizer and can be used in sub grade, sub base and base layer.



The industrial waste pond ash, fly ash, foundry sand etc. can be used with RBI Grade -81 as stabilizer to reduce cost.

**KEYWORDS:** RBI Grade-81, soil stabilization, Red soil, Fly Ash, CBR.

### II.INTRODUCTION

In developing countries like India most regarding issue in constructing pavement is to make locally available soil into utilization, as all available soil can't be used for constructing pavement due to its low engineering properties and qualities. Now a days to enhance its engineering properties soil is treated with stabilizers like lime, class c fly ash, Portland bond,

pond ash, RBI Grade-81 and so on to enhance its engineering properties. RBI Grade-81 is mixture stabilizer which is created for soil stabilization in slightest expense way and fly ash is thermal power plant waste which has been made into utilization alongside RBI Grade-81 to cut down the expense of construction of pavement and give pavement a superior solidness and strength.

### III.METHODOLOGY

#### A.Test

1. Collecting detailed information about RBI Grade 81 as soil Stabilizer.
2. Study the various conventional method of Construction of road pavement.

3. Study of use of stabilizer by effectively reducing the overall cost and by using locally available material through available literature.

4. Selection of sub-grade (Red soil) for road pavement.

5. Check feasibility of Red soil for soil stabilization with RBI 81.

6. Comparative study between other alternative and RBI 81 as soil.

7. Conducts tests on stabilized red soil.

8. Prepare cost comparison between conventional road construction and using RBI grade 81 and fly ash.

9. Design road pavement.

10. Result and Conclusion.

11. Future scope.

### IV. OBJECTIVE

- To study RBI grade 81 as soil stabilizing agent.
- To check feasibility of RBI grade 81 in red soil.
- To prepare mix proportion of RBI grade 81 in red soil.
- To conducts tests on

stabilized red soil.

- To prepare cost comparison between conventional road construction and using RBI grade 81 and fly ash .
- To design road pavement.

**V.RBI GRADE-81**

RBI Grade-81 (Road Building International Grade-81) is a remarkable and imaginative thing that was invented for the change of an extensive variety of soils in a capable, least cost way. RBI Grade-81 is a earth friendly inorganic, hydration activated powder based stabilizer that reacts with soil particles to make layers that are inter connected through a complex bury atom structure. Road can be opened within 24 hrs. after last compaction. It gives dust free and leachate free surface.

| Properties       | RBI Grade-81              |
|------------------|---------------------------|
| Appearance       | Beige Powder              |
| Odour            | Odourless                 |
| PH               | 12.5(Saturated Paste)     |
| Vapour Pressure  | Not Measurable            |
| Flammability     | Inflammable               |
| Specific Gravity | 2.5                       |
| Solubility       | In water<br>0.2pts/100pts |
| Freezing Point   | None , Solid              |
| Viscosity        | None , Solid              |

| Properties  | % by mass |
|---|-----------|
| Calcium Oxide (CaO)                               | 52-56     |
| Silicon Dioxide (SiO <sub>2</sub> )               | 15-19     |
| Sulphur Trioxide (SO <sub>3</sub> )               | 9-11      |
| Aluminium Oxide (Al <sub>2</sub> O <sub>3</sub> ) | 5-7       |
| Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )      | 0-2       |
| Magnesium Oxide (MgO)                             | 0-1       |
| Fibers (Polypropelene)                            | 0-1       |
| Additives   | 0-4       |

**VI. FLY ASH**

Class C fly ash can be used as an stand-alone material because of its self-cementations properties. The use of fly ash in soil stabilization and soil modification may be subjected to local environmental requirements pertaining to leaching and potential interaction with ground water. The primary reason to use the fly ash in soil stabilization applications is to improve the compressive and shearing strength of soil.

| Properties  | % by mass |
|---|-----------|
| Silicon Dioxide (SiO <sub>2</sub> )               | 35-40     |
| Aluminium Oxide (Al <sub>2</sub> O <sub>3</sub> ) | 15-17     |
| Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )      | 3-6       |
| Calcium Oxide (CaO)<br>Lime                       | 20-24     |
| Magnesium Oxide (MgO)                             | 3-5       |
| Sulphur Trioxide (SO <sub>3</sub> )               | 1-3       |

**VII. EXPETED OUTCOME**

Design the road pavement by using locally available material that will greater strength and durability. By replacing aggregate coat with suitable material RBI Grade 81 stabilizer.

Which will reduce the cost approximately up to 50% as compare to conventional method of road pavement construction.

**VIII. BENEFITS OF RBI GRADE 81**

1. Avoid use of aggregates hence saves construction material.
2. Reduce energy consumed in road construction.
3. Reduce leaching and impurity of ground water.
4. Reduce utilization of Bitumen by wiping out of BM layer.
5. Reduce time consumption.
6. Make treated surface impermeable to water.
7. Reduce carbon emissions.
8. Prevents soil erosion.

**IX. ADVANTAGES OF RBI GRADE-81**

1. Construction time diminishment by 30-40 %.
2. Slightly increment in quality and life of pavement.
3. Treated soil is water safe and anticipates harm to road foundation.
4. Reduce transport and earth moving expenses by 50-60 %.
5. Longer sturdiness.
6. Low maintenance cost.

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