USING A RUNWAY TRUCK RAMP FOR ACCIDENT PREVENTION ON A ROAD

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ABSTRACT

Now a day it's a huge increase in the road accident there are many reasons for road accidents but most of the road accident are caused due to the improper road design or insufficient space available for road construction. When any vehicle passes over the road and it the driver suddenly applied breaks to stop running vehicle then most of the time breaks fails or vehicles not stop at the specified place and due to this accident of vehicle caused. Thus to overcome from these difficulties and to stop the vehicle In this project we all focused to design such kind of runway t ruck ramp for accident prevention. We design this runway truck ramp for the road which is situated ***Khambatki Ghat Pune-Kolhapur section of National Highway 48 in Maharashtra, India*** *because this place is very accident full that's why firstly we studied the place & then we are trying to give the solution the their by constructing runway truck ramp.*

Keyword – *keywords- Truck escape romps are designed emergency locations use, that use sand, gravel, wire nets to slow down the heavy vehicle.*

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1. Introduction

We visited our project site **Khambataki Ghat Pune-Kolhapur section of National Highway 48 Maharashtra.** There we observe original condition of site situated topography due to a s-shape curve accident occurs. There on large scale and may the chances of the break fail therefore we are introducing our concept of project in order to minimize such accidents and if the break will fail there would be no chances of break fail length of shape is 1.7 km so accordingly we are designing suitable runway truck ramp by understanding its suitability and its benefits to common man our main aim of this project to minimize rate of accident and its prevention for betterment of society and to create awareness among people while driving by made them following. certain rules and regulations width of that particular road 3.75 is some as to common highway width we assured that our project surely will be benefitted to all the road users while driving and safely transportation so in this way we will going to lay runway truck ramp at suitable location.

2. Material Used

The most preferred type of surface material for use in arrestor beds is uniformly graded pea gravel. The benefits of pea gravel include good drainage properties, resistance to freezing and compaction, and the ability to provide adequate deceleration rates. The use of sand as an arresting material is not recommended because it is not practical to maintain a sand bed in a dry and uncompact condition at all times. In addition, sand beds are prone to freezing, and are not suitable for the cold climate conditions of B.C. In general, the gravel used in arrestor beds should adhere to the following characteristics for optimum performance. The gravel should be predominately single sized and uniform, approximately 12-25 mm in diameter. These criteria serve to minimize moisture retention and problems associated with freezing. The uniformity of the gravel can be measured by the uniformity coefficient D6 o/Di 0where Dgo represents the gravel diameter of which 60% of the gravel weight is finer and Di 0 is the corresponding value at 10% finer. A uniformity coefficient smaller than two is considered to be uniform The gravel should be clean and free of fines to minimize maintenance due to compaction. Smooth, rounded gravel, as opposed to crushed angular gravel, is preferred to maximize void spaces. Void spaces are essential for proper drainage. In addition, round gravel minimizes interlocking, and allows tires of the runaway vehicle to sink in more easily, facilitating higher retarding forces. The deceleration provided by gravel is dependent on the specific gradation, and to a certain extent, the depth of material. Typical deceleration rates provided by gravel range from approximately 0.2 g to 0.4 g. The following is a sample. Negative Grade Arrestor Bed in Oregon uses the gradation in and has been shown to be quite successful in providing adequate and safe deceleration levels. In addition, no problems with freezing and sohdification have been encountered since construction. The expected deceleration rates in are extrapolated to entry speeds of 80 mph (129 kph) based on test results from actual tested entry speeds up to 60 mph (97 kph). The deceleration rates are based on a gravel depth of 450 mm.

Table 1.1 Gradation of arrester bed gravel

Size	Present passing
19 mm (3/4 in)	100
12.7 mm (1/2 in)	0-15
6.4 mm (1/4 in)	0-5

Table 1.2 Expected Declaration Rates for Arrestor Bed

Vehicle Type	Declaration
Empty 2-axle	0.25
Empty 5-axle	0.24
Loaded 2-axle	0.32
Loaded 5-axle	0.26
Mean Deceleration (all vehicles)	0.27
Standard Deviation	0.036

3. Ramp Facts:

Ramps first appeared at some point in the mid-1960's in mountainous areas.

The inertia described from stopping on one of the ramps is considered strong, but without the jarring impact of a crash. Ramps vary in design, construction, materials and effectiveness. States determine where ramps are built based on several factors: length and slope, heavy-truck traffic, conditions at the grade's end, and traffic volume among other things**.**

4. Types of Runway Truck Ramps

Gravity Escape Ramps
This is the most common emergency truck ramp and you will find them at the bottom of a steep-graded hill or mountain. The purpose is that the truck will decelerate on the heavily inclined path that runs next to the road. A problem with this type of ramp is rollback after the vehicle decelerates and there is a possibility of overturning.

Sand Pile Escape Ramps
On these ramps, sand and dirt are loosely piled to slow a runaway vehicle by transferring the energy of movement from the truck to the ground. A problem with these types of ramps are the possibilities of overturning and/or vaulting after the initial contact of the vehicle or failure due to variables such as moisture and freezing.

Arrester Beds
These gravel filled ramps use rolling resistance to stop the vehicle. This type of ramp should be used based on the speed and mass of the vehicle, the grade of the bed, and the rolling resistance of the gravel.

Mechanical-Arrestor Ramps
They are designed to stop a runaway vehicle with a series of energy-absorbing aircraft-carrier-type mechanical spools and stainless steel nets. The nets are connected to spool-tape energy absorbers that are mounted in a precast concrete barrier, but they require more maintenance. They are designed to slow a runaway truck at its legal max weight, moving at 60 MPH.As a driver it is important that you have your brakes checked and regularly maintained to prevent an accident, save money, and save you from having to use one of these ramps. While these exits can reduce the effects of a disastrous situation but can still cause damage to your springs and suspension. Fortunately, these emergency exits are wonderful for saving lives, yet, unfortunately not in saving your truck.

5. **Some locations of (khambataki ghat)**

S

Sharp curve

S

s-shape of the khambataki ghat

6. Advantages of Runway Truck Ramp

- provide a location for out-of-control vehicles to slow and stop away from other vehicles on the road.
- to reduce the truck's momentum and bring the vehicle to a halt as quickly as possible.
- Even huge, heavy boxes might be difficult to carry from the ground onto a trailer without a ramp. This not only lowers weight tension but also relieves stress on the lower back muscles, decreasing injury and pain. One of the most serious issues with loading ramps is safety.
- past raised landings, into showers and through sliding glass doors, all while minimizing the risk of accidents and injuries.

7. Conclusion-

There are several factors that contribute to a truck runaway. It has been shown, however, that the lack of driver knowledge and experience of highway terrain to be encountered is the primary cause of such accidents. In order to minimize the probability of a runaway truck situation, the driver must be well informed of the terrain that will be encountered. This may be achieved through speed advisory signs, and grade profile maps located at brake checks prior to the downgrade**.**

Runaway lane facilities should also be provided along grades which have a high potential for causing brake fade. Arrestor beds seem to be the ideal type of runaway lane for safely stopping vehicles weighing up to 63,500 kg without causing damage to the vehicle or injury to the driver.

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