

# SAFTEY OF ROAD MEDIAN BARRIER

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## ABSTRACT

*The intention of median barriers is to decrease the possibility of an delinquent vehicle crossing the median and have a collision through opposing traffic. Combination of different bits and pieces is the one of the gorgeous matter in all manufacturing resources. They contain light mass, more power, elevated flexible strain power storage ability, superior force power and hardness performance etc. Road Median barrier is the one of the relevance of combination of different bits and pieces materials.*

*The road traffic safety (RTS) administration organization is focal point on severe damage and loss due to road mishap and the entire time struggle to decrease. Several methodology and equipment are developed to decrease unintentional result on human being body as well as vehicle.*

## 1. INTRODUCTION

The function of median barriers is to decrease the threat of a delinquent vehicle crossing the median and colliding with opposing traffic. The standard types of median barriers. Concrete median barrier (Type 60 series), Thrie Beam barrier (single or double), Cable barrier (three or four strand), and Portable Concrete Barrier (PCB), for interim use only and Road Median barrier with relevance of combination of different bits and pieces of different materials. There are many other types of median barrier, way indicator board and color symbol are use. Combination of different bits and pieces materials Median barrier has high flexible strain power storage ability and superior collision power assess to concrete road divider. They contain additional astonish absorber capability to decrease the collision force and keep away from the severe damage and loss.

### Combination of different bits and pieces of different materials

Combination of different bits and pieces of different materials composed of at least two or more than two materials to manufacture new material contain dissimilar possessions come throughout component improving the material property. Most combination of fiber fortification substance with prevailing conditions bits and pieces included to enhance the power as well as hardness. The fortification is basically fiber and medium is liquid. Mix mutually through hard composition

Combination of different bits and pieces of different materials are divided into three categories:-

- a) PMC (Polymer matrix composite)
- b) CMC (Ceramic Matrix Composite)
- c) MMC (Metal matrix composite)
- a) Polymer Matrix Composite

## 2.LITERATURE REVIEW

**S.Sivasaravanan and V.K.Bupesh Raja:** The impact test results of nano composite materials improved with addition of nano clay in epoxy matrix. This test was performed by izod testing machine, it was found that addition of 5wt% of nano clay shown very good results compare to other percentage of nano clay, average value of 5wt% of nano clay is 10.75 J/m when compare to other combination of nano composite materials.

**Ali Hallal1, Ahmed Elmarakbi, Ali Shaito and Hicham El-Hage:** This paper presents an overview of recent automotive applications of advanced composites. A summary of available composites that could be used in automotive industries is presented. This work mainly deals with new research and studies done in order to investigate the present and potential use of composites for automotive structural components (e.g. tubes, plates, drive shafts, springs, brake discs, etc.)

**K. H. Ghlaini:** In the past years, the use of composite materials in the aircraft industry, among others, has grown immensely. Composite systems offer an advantage over traditional aircraft materials (metals) because they tend to

exhibit higher strength/weight and stiffness/weight ratios than metals, thus making the aircraft lighter and improving performance.

**MEDIAN BARRIER**

Median barriers are generally provided to allocate the separate group of an exacting type/ grouping of traffic, such as, separate during carriage way from a service road for local traffic, separate light and heavy traffic, segregating through traffic from turning traffic and dedicated BRT corridor and corridors for non-motorized transport (cycles, rickshaws etc.). The median barriers can be within form of little height central verge, curb, railing, etc. which can be either permanent (steel, concrete etc) or flexible/ movable, shift table such as rubberized cones,



**Figure No. 1** Road divider

**Types of Road Dividers**

**Rigid Barriers**

Rigid barriers are typically of concrete production. They maintain their shape and location when hit by a vehicle, leading to strict impacts. They contain the lead of a small footprint, since they do not deflect. This is mainly important for median installations where the barrier is close to the traffic lane, as shown in Figure

No. 2



**Figure No. 2:** Examples of rigid median barriers

**Semi-Rigid Barriers**

Semi-rigid barriers are the for the most part common alternative to rigid barriers, as they normally lead to less stern collisions. They are typically of steel structure.

Semi-rigid barriers have two most important functions:

- They avoid delinquent vehicles from leaving the roadway, and
- They attract the force of the collision by deformation.



**Figure No. 3:** W-Beam Semi-Rigid Barriers

### Flexible Barriers

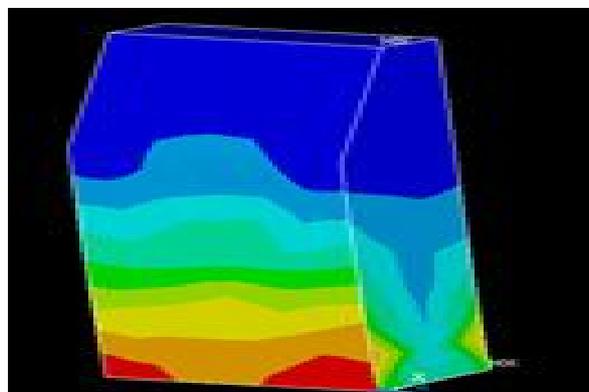
Typical examples of flexible barriers are cable barriers and security fences. Flexible barriers origin the least damage to vehicles and pretense the smallest risk of injury to vehicle occupants, compared to all other barrier types. The main disadvantage of elastic barriers is that they require additional space behind them, because they can deflect by up to three meters. The slope in the area of deflection should also be plane enough to make certain that the vehicle is redirected safely.



**Figure No- 4:** Flexible cable barriers

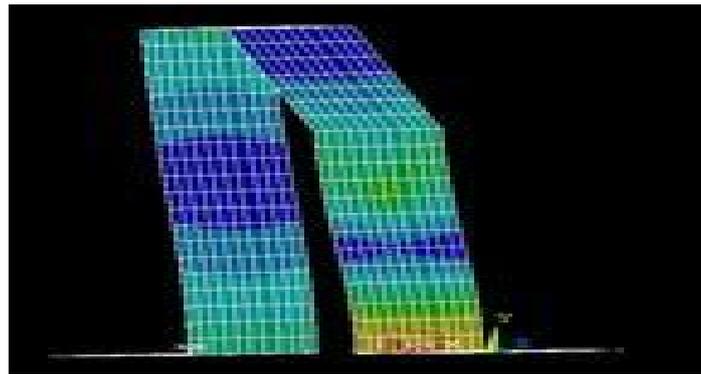
### 3.1 Finite Element Analysis

In FEA (Finite Element Analysis) the maximum stress produce on road divider after some load fall on road median barrier. The collision load acting on median barrier in experimental section. This collision force acting on median barrier the pressure is generating, the consequential strain is found by FEA software ANSYS-15. First concrete road median barrier model is create on ANSYS, choose the component type solid and node brick and known the bits and pieces properties. Mesh the body by meshing tool (fine meshing). Following mesh boundary condition applies; the bottom area is fixed by all degree of freedom. The front of the median barrier is acting collision energy and solves the pre-processing stage. The result is in post dispensation stage.



**Figure No.5** Meshing the concrete road median barrier and maximum stress of the concrete road median barrier

As comparable the maximum pressure produces at a mixture of phase of load. After concrete median barrier analysis than composite median barrier is proceeding. In combination median barrier the measurement is similar and thickness of the job 5 mm. The model is creating at ANSYS. The constituent type and material is identified and meshed. After mesh same process flow and create the maximum power produce on combination without rubber road median. As flow the same step for combination with rubber and with thermocol road median. The concrete road median is produce maximum pressure at full load condition, it take place be crack. But combination road median have much more potency and very low power is generated. That means combination road median act low impact load. Show in table no. 2.



**Figure No. 6:** Mesh the composite without rubber road median and maximum pressure of the combination without rubber road median

**Table No.2:** Strength of the Road Divider

Product	Impact Force (N)	Strength (N/mm <sup>2</sup> )
Concrete Road divider	221.48	1.69
Composite road divider with 5 mm	67.11	4.65

#### 4. CONCLUSIONS

Every day a lot of individual are loss or injuries in road accident cases. The majority of the accident, vehicle are hit the road median and harm the vehicle as well as itself. The concrete road median contain brittle material, it's no additional rigidity and hardness. When the human is fall on road median probable most injuries, in this condition the composite road median it's have good rigidity and hardness properties. The composite road median is absorbing the surprise and slowly relies; this is the good-looking properties to selection for road median. The combination road median is design three types with rubber pad, without rubber pad, with thermocal combined road median. This composite road median is compare with concrete road median and found that the composite road median relives greatest collision strength. The concrete road median does not relive the collision force and full collision strength is applied, so injuries probability is enlarge. In that cases if the combination road median barrier the injuries chances will be decrease.

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