International Go Kart Championship 2013-14

Team : **Team Rossi**
Team ID : IGC13 L63
Institute : **BITS-Pilani , Hyderabad Campus**
Hyderabad, Andhra Pradesh
South Zone

Technical Specification

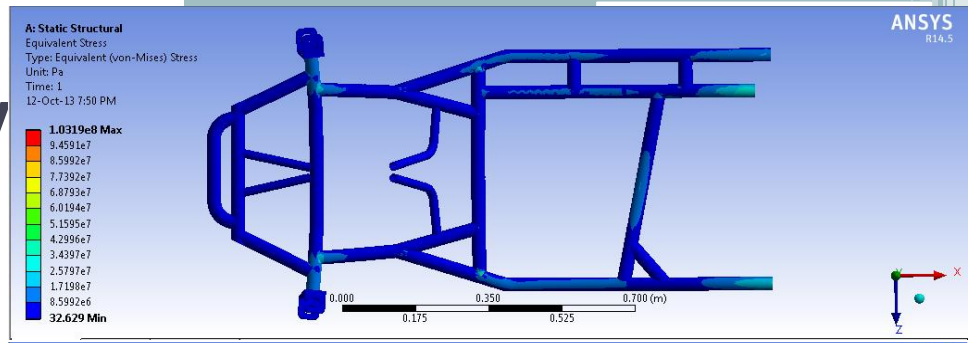
S. no	Topic	Description
1	Dimension	Length -64” Wheel base - 46” Track width -46” Ground Clearance – 3”
2	Steering	Dual drag link Tie rod length – 10.6” Turn Radius – 2.6 meters
3	Brakes	Dual Caliper Disc Brakes(Mounted on Rear Axle)
4	Wheels	Front wheel 10 x 5 x 4.5” Rear Wheel 11 x 5 x 7.1” Semi-Slick Tires
5	Engine	125 CC DTS-i, 4 stroke 11 bhp 5 speed transmission

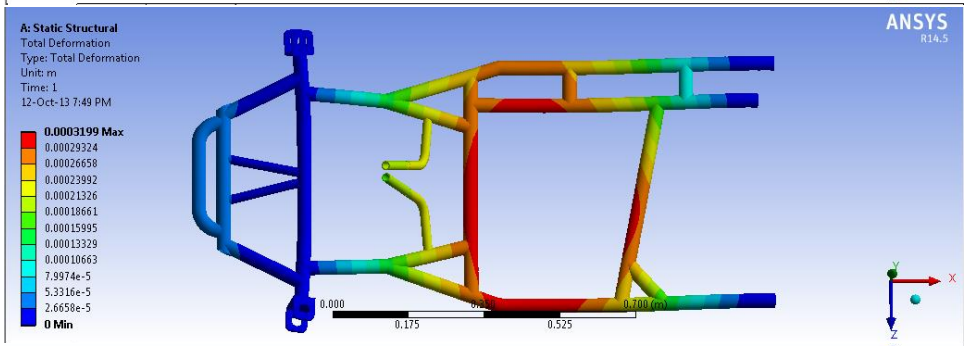
Rule Book

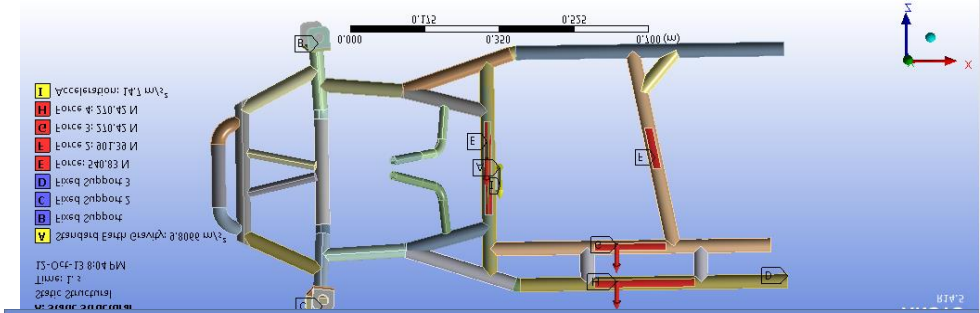
Requirement	Implemented
Front, side, Rear Bumpers	Yes
Fire Extinguisher	Yes
Seat belt	Yes
Kill Switch	Yes
Ground Cleareance > 2.5”	Yes
Chassis Dimension According to rule book	Yes

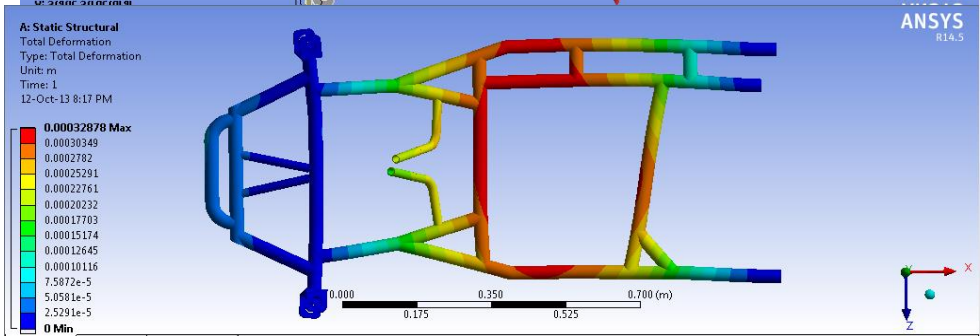
Design Methodology

- Strength Analysis-Von Mises Stress
- Deflection Analysis
- Cornering Load
- Cornering Deformation



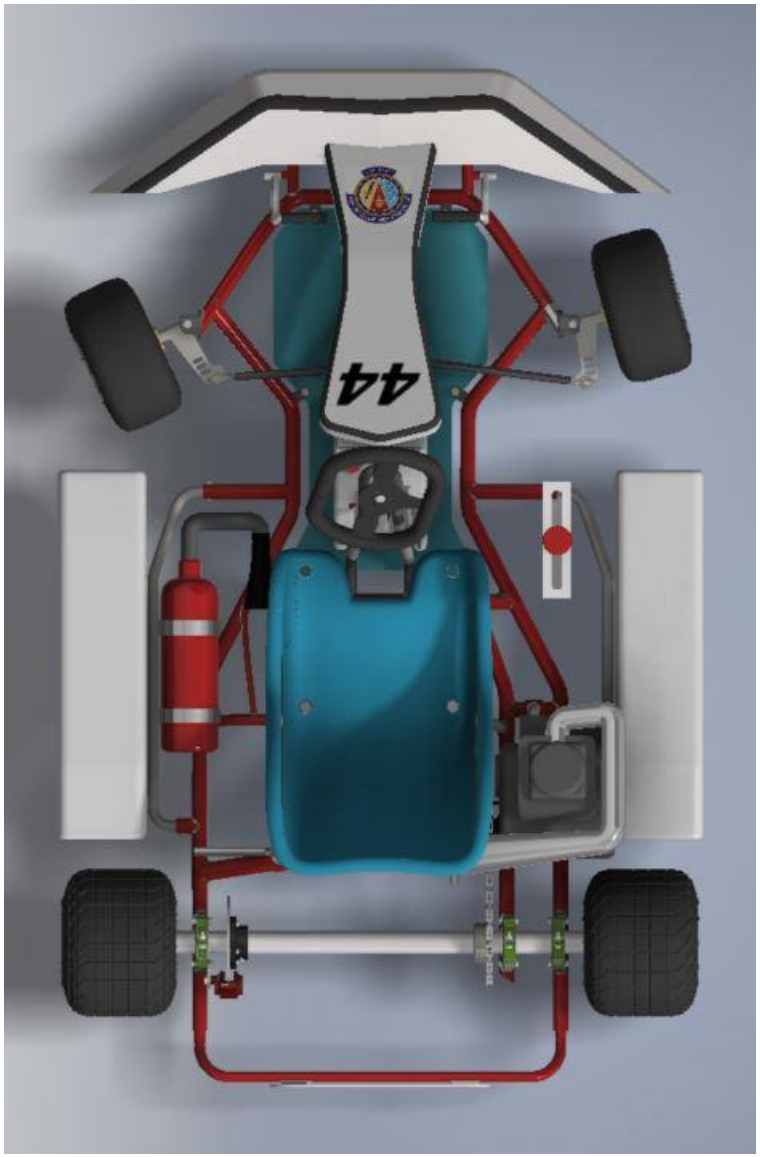




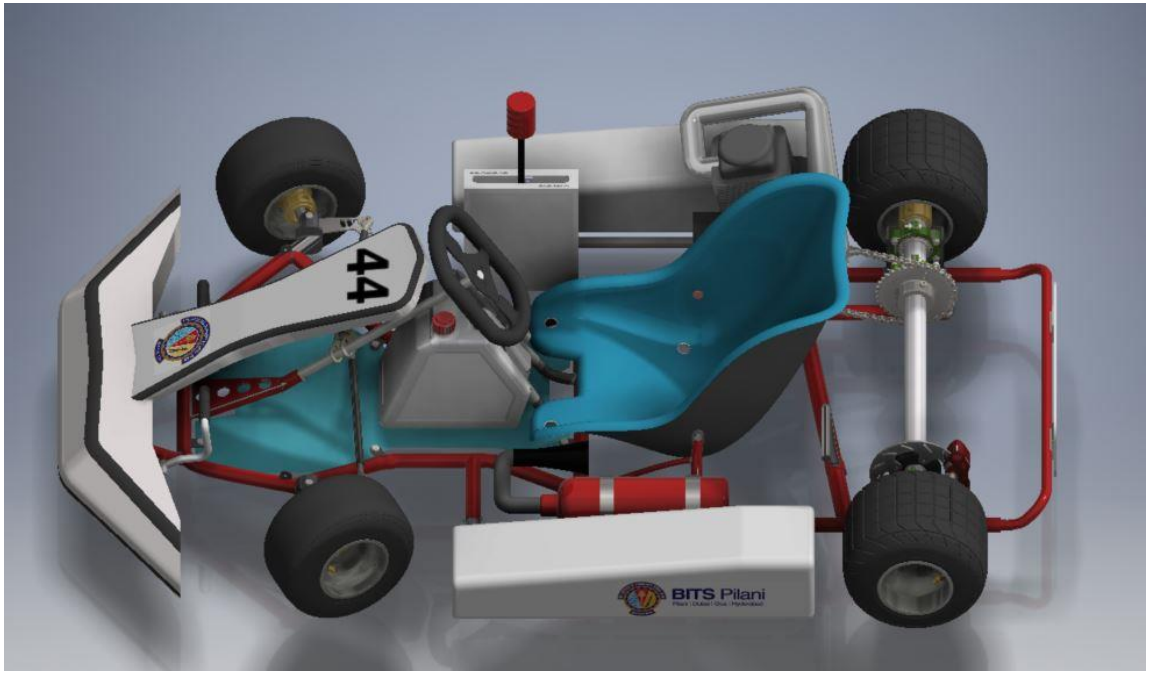


Ergonomics

- Comfortable Seating Position for the driver under braking accelerating and cornering.
- Use of clutch integrated sequential gear box to aid the driver with faster shifts.
- Use of safety features like seat belt, kill switch and fire extinguisher.



Steering



- Dual Drag Link Mechanism
- Caster: +12 deg, KPI : 12 deg, Camber : 0 deg, Toe : -1deg
- Scrub Radius : 4.2”
- Turn Radius : 2.6 meters
- Tie rod length : 10.6”

Brakes

- Dual Calliper Disc Brakes
- Estimated Braking Distance 8 mtrs (45kmph -0kmph)
- Brake type : Hydraulic
- Mounted on Rear Axle
- Estimated Deceleration :1g
- Actuation : Pedal Actuated

Power Train

Engine Specification

- Engine Displacement (cc) -125
- Cylinders: 1
- Max Power : 11bhp
- Maximum Torque : 10 N-m
- Bore (mm)- 57
- Stroke (mm) - 49
- Valves Per Cylinder -2
- Fuel Delivery System : Carburetor
- Fuel Type : Petrol
- Ignition : Digital Twin Spark-Ignition
- Plugs (Per Cylinder) - 2
- Cooling System : Natural Air Cooled

Transmission

- Gearbox Type : Manual
- No Of Gears : 5
- Transmission Type : Chain Drive
- Clutch : Wet multiplate

Manufacturing

Machining Process
Preparation of Mock Frame Cutting of frame
Welding of frame
Welding of Mounts Fitting of rear axle
Assembly of Front and installation of steering linkages Installation of Engine, gear, sprockets and exhaust
Assembly of wheels onto the chassis and installation of seats Assembly of chain drive system
Assembly of miscellaneous items and tests. Final Touches like painting, oiling, greasing etc

Facilities in college workshop
Electric/gas welding
CNC machining
Milling
Casting
Drilling
Sheet metal Shop
Lathe machining
Cutting Machine
Grinding
Gear Cutting

Technical Part List

S.No.	Vehicle Parts	Quantity	Specifications	Cost
1.	Engine ,Gear box, Exhaust	1	11 bhp Bajaj Discover	Rs. 6000/-
2.	Batteries	1	Standard Bikes Battery	Rs 1600/-
3.	Chassis		Mild Steel	Rs. 5000/-
4.	Brakes	1	Dual caliper Disc Brakes	Rs. 2500
5.	Steering		Dual drag link	Rs 4000/-
6.	Seat	1		Rs. 3000/-
7.	Wheels, Hubs	4	Semi slick tires	Rs. 5000/-
8	Miscellaneous			RS 6000/-
9	Safety Gears	2		Rs 10000/-
10	**Total**			**Rs 43100/-**

Team size

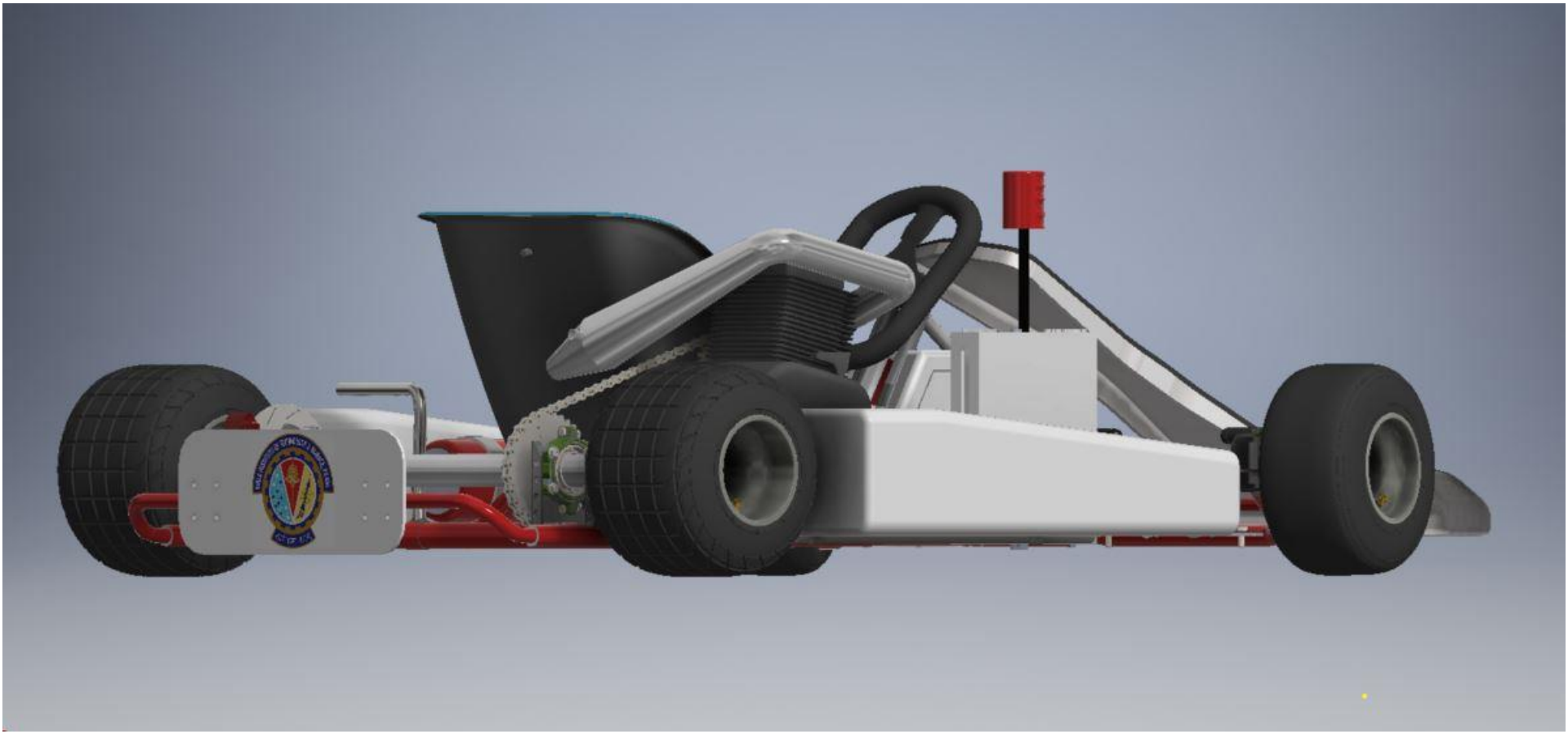
S.no	Name	Role Assigned
1	Jaideep Singh Chavan	Captain and chief designer
2	Sumil Majithia	Design
3	Kathesh Shah	FEA analysis
4	Ephrem Joel	FEA analysis
5	Mani Theja	Sponsorship
6	Parth Kalyani	Market research
7	Sorabh Patidar	Chassis Design and rendering
8	Madhura Athale	Design
9	Srinivas Kulkarni	Market research
10	R. Janardhan Balaji	Sponsorship
11	Srinidhi k	Steering study
12	Sathvik Divi	Sponsorship
13	Madhoolika Jammalamadaka	Chassis study
14	Rishab Kapur	Market research
15	Atul Nandan	Market research

Design Verification

S.No.	Name of Test	Method	Validation Criteria
1.	Strength Analysis	FEA via Ansys	Max Stress less than yield Stress
2.	Deflection Analysis	FEA via Ansys	Very small deflections
3.	Braking analysis	FEA via Ansys	Max Stress less than yield Stress
4.	Turn Radius	Turn Radius Formula	Max Turn Radius= 2.6m (within reasonable limits)

Validation Tests

- **Brake Test**
- **Acceleration Test**
- **Skid Pad test**
- **Autocross Test**
- **Durability tests**
- **Endurance test**



Thank You.