LETTER OF TRANSMITTAL

November 29, 2018

Dr. [redacted]
Mechatronic Systems Engineering department
Simon Fraser University, Surrey campus
250-13450 102 Ave, Surrey, BC V3T 0A3

Dear Dr. [redacted]

We are submitting "Strength Analysis and Design of Bicycle Frame" project report that you requested.

This project analyzes a bicycle frame that is only a small portion of its whole design. The reason is that by analyzing bicycle's frame, one can give multiple alternatives to its design and there are more possibilities for innovation.

This frame is made of 4130 Chromoly tubing and its circumference ranges from 5-11 cm depending on its location. Although in a real world situation there are multiple forces acting on the frame, in order to have easier calculations, only one loading condition was assumed, that a person who weighs 180 pounds jumps on the bicycle to start. It is assumed that twice the weight is on the seat, and a quarter of user's weight is on the handle.

For ease of calculations, it is assumed that all bars are straight, all loads are vertical and both tires are statically balanced. For one scenario, it is assumed that all bars are beams and stresses on them are calculated. Then judging by those results, this report concludes whether the frame is/is not safe under that loading condition.

Finally, a new frame design is proposed, forces and stresses on each bar are analyzed separately. Results were compared to original results from the bike frame. The report discusses whether the new frame design is/is not safer than the original bike frame.

This project was completed for MSE 221, "Statics and Strength of Materials". If you have any questions, please feel free to contact us.

Sincerely,

[redacted]

Mechatronics student/[redacted]

[redacted]

[redacted]

[redacted]

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