(CT 231) Highway & Airport Engineering
Spring (2019)
Assignment No. (1)
Sight Distance

Question 1

Explain using neat sketches what the following means:
- Stopping sight distance
- Passing sight distance
- Sight Distance at horizontal curves

Question 2

Determine the Stopping Sight Distance for a vehicle traveling with a speed 90 kph on 4% up and 3% down grade (Assume perception and reaction time of 2.5 sec and coefficient of longitudinal friction = 0.25)

Question 3

There was an accident scene with a vehicle and a light pole. The vehicle was estimated to hit the light pole at 45 km/hr. The skid marks are measured to be 210 meters. A trial run that is conducted to help measure the coefficient of friction reveals that a car traveling at 55 km/hr can stop in 130 meters under conditions present at the time of the accident. How fast was the vehicle traveling to begin with? Also Determine the Stopping Sight Distance, assuming an AASHTO recommended perception-reaction time of 2.5 seconds.

Question 4

If the Design speed of a main road is 110 kph, we need to make some repairs on this road. The bypass design speed is 45 kph. Determine the location of the traffic sign from the bypass if the text height of this sign was 30 cm and it is known that every 10 cm height could be seen 15 m away. (f = 0.30 and G = + 4%)

Question 5

A right-turn horizontal curve is located on a four-lane highway with 450m curve radius. Lane width = 3.6 m, outer shoulder width= 1.5 m, median width = 5 m. If a building is placed at the right side of the road with a distance between the closest corner of the building and the right shoulder as 3m, determine the maximum speed allowed on this curve at which drivers have enough stopping sight distance (Longitudinal grade =2% upgrade)

Question 6

An automotive engineer was trying to test the braking ability of his car determined that he needed 8m more to stop his car when driving downhill on a road segment 5% grade that when driving downhill at the same speed along another segment of 3% grade. Determine the speed at which the automotive engineer conducted his test and the braking distance on the 5% grade if he was travelling at the test speed in the uphill direction.