CE 361

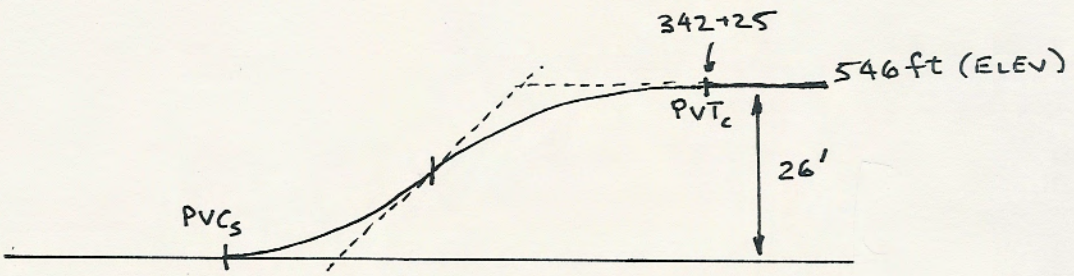
In-Class Design Problem #2: Geometric Design (1)

For this exercise, you are to use the vehicle you designed in the first in-class design problem to undertake the following:

1. Compute K-values for 50 mi/h on crest and sag curves assuming your car is on poor, wet pavement with ABS. Use the driver eye height and headlight height of your design vehicle. The object height (2ft) and headlight angle (1 degree) are the same as today's standards. Assume $\eta_b = 100\%$, no aerodynamic resistance (i.e., use Eq. 2.43), and $L >$ SSD. Do not forget to add the reaction time of 2.5s to your computed stopping distance. **Compare your *K*-values with current design *K*-values in Tables 3.2 and 3.3.**

2. Consider Problem 3.28 (done as an example in class with the roadway surface being 26 ft above the railroad track). Determine the length of the existing level highway must be reconstructed to provide a design speed of 50mi/h using the K-values you computed in part 1 (above). Compare lengths with Problem 3.28 as solved in class (Problem 3.28 had $L_{total} = 2114.94$ ft).

3. If the station at the left side of the bridge is 342+25 at elevation 546 ft (PVT_c) determine the station and elevation of the left side PVC_s, PVI_s, PVT_s, PVC_c, PVI_c.



4. Again, considering Problem 3.28, determine the length of the existing level highway that must be reconstructed to provide a design speed of 50mi/h and provide adequate passing sight distance (assume both H_1 and H_2 are your vehicle's height, and $L>PSD$). Compare your computed Passing Sight Distance *K*-value with the 50mi/h *K*-value in Table 3.4 and compare the new L_{total} with Problem 2's L_{total} above.