Activity based on information found in the following document: Sayers, A. T. (2007). Critical Analysis of Sunshine Skyway Bridge. *Proceedings of Bridge Engineering 2 Conference.* Bath, UK: University of Bath.

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**Calculate angle Ɵ and use it to find the tension, *t*, and the diameter of the cable required for the bridge.**

1. Calculate angle Ɵ.

2. Given: Each cable supports two of the pre-cast concrete segments, each weighing approximately 200tons. This is equivalent to a 4000kN of unfactored **vertical** load represented by *F*. 1.4 is the factor of safety for dead loads when using steel. (Sayers, 2007) Use angle Ɵ to find the tension, *t,* of the cable required for the bridge using the following formula.

3. This tension force will induce an axial force in the bridge deck due to its **horizontal** component putting it into compression. Calculate the horizontal component (*N*) using the following formula.

4. A high tensile steel tendon with a yield strength of $1650N/mm^{2} $ was chosen to be used. The area (*A*) of the steel required can be calculated by dividing *t* (refer to question #2*)* by the strength of the steel tendon. Find the area of the steel cable that’s required to support the bridge. $A=\frac{t}{1650N/mm^{2}}$

5. Find the diameter of the steel cable that’s required to support the bridge.