

Engineering the Golden Gate Bridge

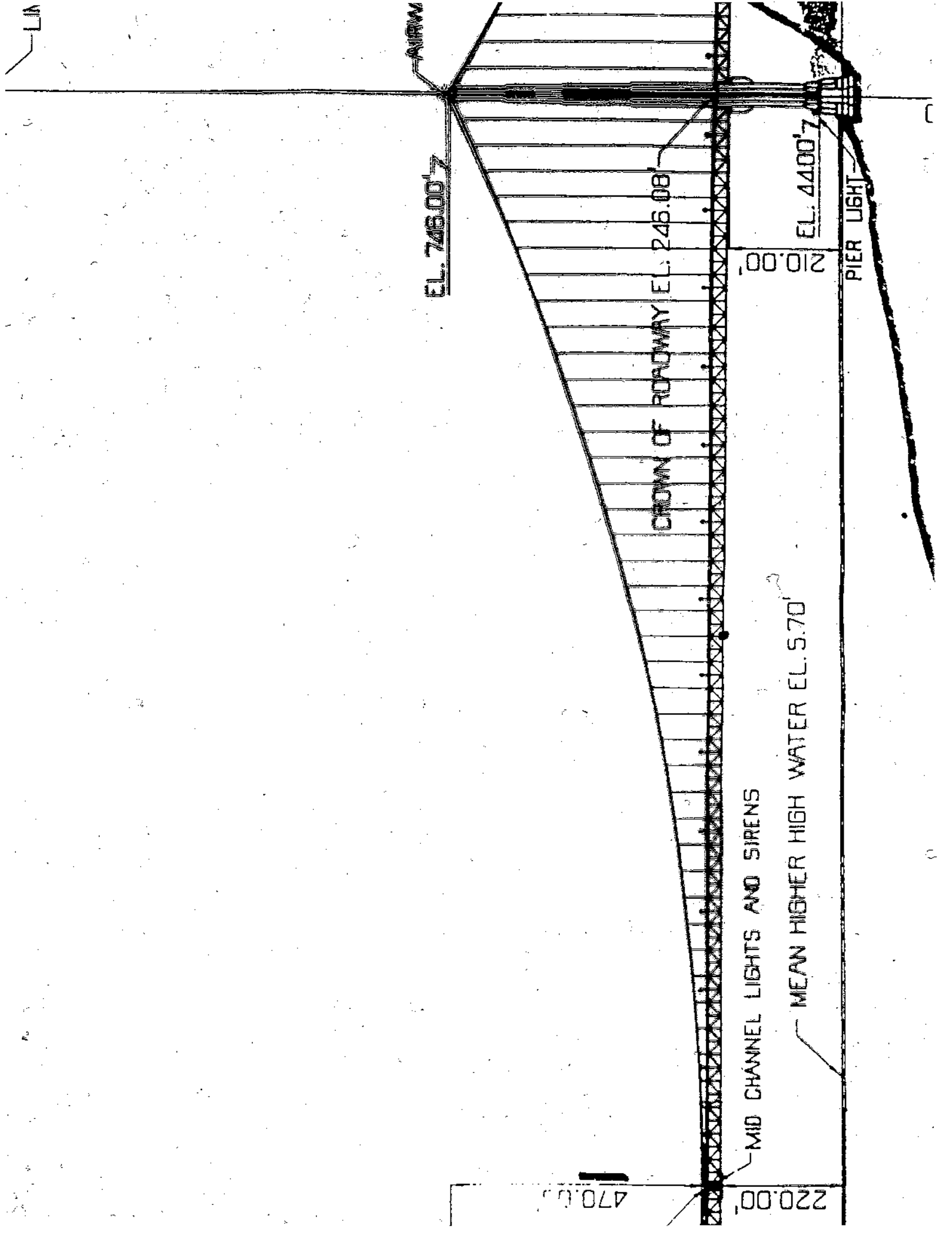
Task: Using the attached plan drawing for data on dimensions and structure of the bridge, determine the length of three of the cables closest to the tower.

Considerations: If a rope or cable hangs freely from two supports, the arc it creates is called a "Catenary" curve. If the hanging cable has suspension cables attached to support a weight, the curve distorts to create a parabola. This is the case with the Golden Gate bridge in San Francisco. Also, one of the towers is not in the drawing. You need to know that:

THE DISTANCE BETWEEN THE TOWERS IS 4,200 ft.

Strategy: Use given data to create a function for the parabolic shape of the cable on the bridge. Start with the general formula for a parabola, $y = ax^2$. Substitute values to determine a . Plug in appropriate values to find the cable lengths.

Note: This problem is simplified. In reality, the roadway is not flat. If you were actually constructing the bridge you would need to take this into consideration. If you want a challenge, assume the roadway is in the arc of a circle and calculate the actual lengths of the cables.



AIRWAY

EL. 746.00'7

CROWN OF ROADWAY EL: 246.08'

EL. 4400'7

PIER LIGHT

MID CHANNEL LIGHTS AND SIRENS

MEAN HIGHER HIGH WATER EL. 5.70'

220.00'

470.00'

20.00'