



LONGRSOL

LONGEST-R-SOL

Draw tangent lines of radius "r" (the one through the structure corner) to meet at P'; extend EP' to A (any distance). Draw Q-P'-P, Q-C, and C-P'. Construct perpendicular P'-D.

Angle B-P'-A = 67°53'00" = angle E-Q-B. Angle E-Q-P' = 33°56'30". Angle P-P'-D = $\frac{1}{2}(180^\circ - 67^\circ53'00") = 56^\circ03'30"$, and angle D-P'-P = 33°56'30".
 $DP' = 66 \cdot \tan 33^\circ56'30" = 44.42$. $F-P = 1678.91 - 1384.90 = 294.01$,
so $G-P' = 294.01 - 44.42 = 249.59$.

Angle C-P'-G = $\arctan(116.64 - 66)/249.59 = 11^\circ28'09"$, making P'-C = $249.59/\cos 11^\circ28'09" = 254.675$

Angle Q-P'-C = $180^\circ - 56^\circ03'30" - 11^\circ28'09" - 67^\circ53'00" = 44^\circ35'21"$

$P'-Q = r/\cos 33^\circ56'30" \dots [1]$

$\frac{\sin M}{P'Q} = \frac{\sin 44^\circ35'21"}{r} \dots [2]$

Substituting [2] into [1], $\sin M = \frac{\sin 44^\circ35'21" \cdot \frac{r}{\cos 33^\circ56'30"}}{r}$, $M = 122^\circ11'55"$

And $N = 180^\circ - 44^\circ35'21" - 122^\circ11'55" = 13^\circ12'44"$

By Law of Sines: $\frac{254.675}{\sin 13^\circ12'44"} = \frac{r}{\sin 44^\circ35'21"}$, from which $r = 782.235$

And the centerline radius, R, is $782.235 + 66 = 848.235$

(which can be rounded down to, say, 848 or 845, but not up to 850)