Bounded diameter/girth ratio problem

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The *Bounded Diameter/Girth Ratio Problem* relates three graph parameters often considered in Extremal Graph Theory: k, the degree of a k-regular graph; D, the diameter of a graph; and g, the girth. The central goal of the problem is finding (constructing) infinite families of k-regular graphs of any given fixed degree $k \geq 3$ whose diameters and girths are tied together via their ratio being bounded from above by a constant:

Given $k \geq 3$, construct an infinite family $\{\Gamma_i\}_{i=1}^{\infty}$ of k-regular graphs of girths g_i and diameters D_i for which there exists a positive constant c bounding their diameter/girth ratios $\frac{D_i}{g_i}$ from above, $\frac{D_i}{g_i} \leq c$, for all i.

We relate this problem to two central problems of Extremal Graph Theory: The Degree/Diameter and the Degree/Girth (or Cage) Problems, and report some preliminary findings and constructions.