A Cohen real out of nowhere

Let $\mathbb{M}_\kappa^{\mathcal{U}}$ denote the κ-Miller forcing with respect to some uniform $<\kappa$-complete normal ultrafilter $\mathcal{U}$ on κ, i.e. extending the co-bounded filter.

Let $\mathbb{P} := \text{\Large$*$}_{n<\omega} \, \mathbb{M}_\kappa^{\dot{\mathcal{U}}_n}$ be an ω-iteration with full support, and $\dot{\mathcal{U}}_n$ are names for uniform $<\kappa$-complete normal ultrafilters. Note that any initial segment $\mathbb{P}_n$ satisfies the Laver property, i.e.

$$\forall f \in \kappa^\kappa \cap V^{\mathbb{P}_n}\colon \exists g \in \kappa^\kappa \cap V \ \ f \leq g \Rightarrow \exists \, \text{slalom} \, (s_i)_{i<\kappa} \in V \ \ \forall i < \kappa \ \ f \restriction i \in s_i \,.$$

We shall show that $\mathbb{P}$ adds a Cohen real over the ground model V. This answers a question of V. Fischer and D. Montoya, whether the Laver property is preserved under κ-support iterations, in the negative.