Fiber-reinforced polymer (FRP) composite materials have effectively been used in numerous reinforced concrete civil infrastructure strengthening projects. Although a significant body of knowledge has been established for epoxy matrix carbon FRPs and epoxy adhesives, there is still a need to investigate other matrices and adhesive types. One such matrix/adhesive type yet to be heavily researched for infrastructure application is polyurethane. This thesis investigates use of polyurethane matrix carbon fiber composites for strengthening reinforced concrete civil infrastructure. Investigations on micro- and macro-mechanical composite performance, strengthened member flexural performance, and bond durability under environmental conditioning will be presented. Results indicate that polyurethane carbon composites could potentially be a viable option for strengthening concrete structures.

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The public is welcome to attend.