In traditional networked control systems, wired communication networks are used for the transmission of information between the communicating systems. With the increasing demand for distributed systems and the growth in the scale of the applications, the use of wireless communication networks offers significant advantages over their wired counterparts. To facilitate the deployment of a fully automated closed-loop wireless networked control system (WNCS), this paper addresses several design considerations for a proposed topology for potential use as a closed-loop WNCS. The topology consists of a plant system having sensor and actuator nodes, a controller system having input and output nodes, an intermediate network system having interconnected nodes, and wireless communication links for the information transfer between the different nodes of the plant, controller, and network systems. More specifically, the design considerations addressed in the paper are: the condition requirements needed to facilitate the design of optimal controller and network systems, the joint design of optimal controller and network systems to control the plant system, and the structured model reduction of the closed-loop WNCS to reduce its scale. Finally, simulation examples are provided to demonstrate the applicability of discussed design considerations.