The project goal for 222 Hennepin was to create the ultimate urban mixed-use development with upscale amenities and a focus on sustainability. 222 Hennepin is a 580,000-sf, seven-story mixed-use development containing 286 upscale apartments and anchored by the first Whole Foods Market in downtown Minneapolis. 222 Hennepin is situated on the corners of Washington and Hennepin Avenues, one of the most prominent corners in Minneapolis.

Ryan Design worked with Humphreys & Partners Architects on the conceptual design of the project, which focused on balancing the housing needs of sophisticated, discerning apartment residents with the commercial needs of a top-tier urban grocery store. Ryan is also the architect-of-record and builder for the project.

Along the way, the Ryan team was able to find reuse of the parking ramp structure that remained on the site and through the use of creative structural engineering and design we were able to take this project from conception through to completion in near record time getting our project out to market before all of the other housing projects in nearby neighborhoods could deliver. They were also able to provide creative structural engineering solutions that incorporated cast-in-place concrete and reinforcing steel (rebar) to be able to deliver an efficient, yet robust structure that will serve the residents of this neighborhood and the City of Minneapolis for generations to come.

**STRUCTURAL FRAMING SYSTEM**

**Existing Parking Structure:** The existing 4-story, conventionally-reinforced parking structure was constructed in the mid-1960’s. This structure was adapted for the 222 Hennepin project for use in tenant parking and support of housing above. The existing structure exhibited various degrees of deterioration, which required restoration. The structure was modified to remove the existing 4th level and add a post-tensioned concrete podium. The structure was strengthened, including adding new concrete shear walls, to provide gravity support for the new housing above, and lateral support of housing and retail components surrounding the parking structure.

**Retail Slab (Whole Foods):** The retail grocer tenant required a structure floor solution to simultaneously support heavy super-imposed loads, provide flexibility for over 400 sleeve penetrations, have a shallow floor-to-floor depth to the lower level below (dictated by the existing adjacent parking structure), and meet code-prescribed fire resistance requirements. A conventionally-reinforced, two-way flat slab with flexural drop capitals was selected as the optimal system to meet these criteria. The slab system is designed to support an unbounded 5” topping slab and 125psf superimposed live loads.

**Podium slabs:** New structured slabs were designed to support up to five stories of new housing. Two-way, post-tensioned concrete slabs were chosen for their strength and deflection performance and to address shallow floor-to-floor heights. Special detailing was used to permit concrete shortening due to post-tensioning while permitting the diaphragms to tie-in to the existing parking structure for lateral resistance. Post-tensioning slabs were folded or stepped, as needed to conform.