

0.0.0 Building Information

0.0.1 Background

Broadway Plaza is a landmark among the residential complexes of downtown Rochester, Minnesota. The architect, Burt Hill Kosar Rittelmann, strove to create a “home away from home” for patients visiting the nearby Mayo Clinic as well as for business travelers working in Rochester. The 29-story apartment complex features 13 residential floors consisting primarily of two bedroom units. Broadway Plaza also has many first class features helping it to function as a mixed-use facility. These include a spacious lobby, function room, business center, state-of-the-art fitness center, indoor swimming pool and sauna, and children’s play area. Retail space is also available on the first and second floors for future occupancy by major retail chains.

Due to the brisk and extremely low temperatures of Minnesota winters, Broadway Plaza features skyway access to the Mayo Clinic and all of downtown Rochester. The skyway, bridge connection, and skyway lobby allow pedestrians to travel through the building without being forced to face the elements.

Construction began in September of 2002, and continued through the summer of 2004. Substantial completion was achieved on June 1, 2004. The building cost totals approximately \$43,100,000, including a \$300,000 sky bridge for pedestrians. Designed to attract new workers and residents into the city, Broadway Plaza’s modern and functional appeal combined with the atmosphere of a residence help to set it aside from the common apartment complex.

0.0.2 Building Envelope

The exterior walls of Broadway Plaza are primarily precast concrete. A small rim of granite veneer-faced precast concrete panels encircles the bottom of the first floor. The remainder of the lower two floors is composed primarily of a limestone veneer faced precast concrete panel system. The main entry features a revolving door into the lobby to provide an airtight seal from Minnesota winters. Glass and aluminum doors flank the other sides of the building for additional entry. The main entry is also protected by three decorative translucent glass panel canopies that block the elements yet provide a modernistic look. The third floor features a polished precast concrete panel system that encircles the top and bottom of the floor with ribbed precast in-between. The polished precast panel system continues skyward from the fourth floor, combining with ribbed precast “columns” and windows in a symmetrical pattern. All apartment windows are vision or vision safety glass at 1” thick.

The largest portion of Broadway Plaza's roof curves downward along the North and South sides above the 28th floor and is clad with curved standing seam metal roofing material. Between columns on the East and West ends lies an 8" segmented aluminum curtain wall system with metal louver system infill. Coinciding with the columns along the North and South ends is a metal panel wall system flush with the curve of the metal roof. The inside of this wall system houses the mechanical penthouse from floors 27-29 along with the cooling tower on the 29th floor.

0.0.3 Electrical System

Broadway Plaza's power distribution is both standard 480/277V and 208/120V. Electrical service is brought into the building through two utility maintained step-down transformers. The 208V transformer feeds into two 208V switchboards to supply two 3000A resident bus ducts. The 480V transformer feeds into three primary components. First, a 480V switchboard supplies an 800A bus duct to retail service on the second floor. A fire pump control for fire suppression is also fed directly from the 480V transformer. Finally, the 480V transformer feeds into the main distribution panel- a 3000A switchboard. The MDP further serves two chillers; a 1000A bus duct riser to the MDP in the mechanical penthouse; a 1200A secondary distribution panel feeding primary panelboards; and a 1000A emergency distribution panel supplying power to emergency only panelboards.

Major bus risers include a 1000A mechanical riser serving the 27th floor mechanical penthouse, an 800A emergency riser serving the 27th floor mechanical penthouse, the 800A riser for retail service on the second floor, and the two 3000A resident bus duct risers (floors 4 thru 14 and 15 thru 25, respectively.)

Each apartment possesses an individual unit load center. The unit load centers feed back to a tenant distribution board fed off of the 3000A bus riser. Although at the moment all apartments are metered from one switchboard, each apartment in Broadway Plaza has the capability to be metered separately.

In the case of emergency, power is maintained by a 480Y/277V, 800kW, 1000 kVA generator. The generator provides power to the fire pump control as well as critical loads in the building. Automatic transfer switching is required for segregating emergency power into two branches: life safety and emergency equipment and fire alarm.

0.0.4 Mechanical System

Broadway Plaza's mechanical system utilizes a four-pipe fan coil system. The building possesses three boilers for heating, and one cooling tower located on the 29th floor for the chilled water system. Additionally, two chillers for free cooling with a special system heat exchanger are used. The cooling tower provides condenser water to the chiller's condenser, which is used to chill the water that goes through the evaporator side of the chiller and out of the system. This water then travels to all the fan coils and air-handling units. Three air handlers service the fitness center, function room, and skyway respectively. One dedicated make-up air-handling unit is used for ventilation. This unit possesses a condenser water reheat coil (a form of energy recovery), heating coil with wing coil, chilled water coil, and a heat reclaim coil (part of the coil energy recovery loop). Through this system, outdoor air is ducted into plenum space for each apartment unit and mixed with return air. Outdoor air to each apartment also provides make-up air for exhaust air being exhausted through the toilet and kitchen exhausts to maintain neutral room pressure.

0.0.5 Structural System

The structural system for Broadway Plaza is primarily a post-tensioned concrete system. The common multifunction floors (1-3) are 10"-12" thick non-post-tensioned concrete slab on concrete frame. Slab along the entry lobby is depressed 2 1/2". The structural slab system on the residential floors (4-25) is 8 1/2" thick concrete flat plate post-tensioned system. This system reverts back to a thicker (10" or 12") non-post-tensioned concrete to support the residential penthouse, mechanical penthouse areas, and roof. The roof was built using a roof framing system of curved W16X26 beams to support the primarily curved metal roof. HSS4X8 beams can be found bracing the roof in addition to the W16X26 beams. Typical curtain wall construction, meanwhile, was used for several lower floor exterior walls. The skyway bridge is constructed of crisscrossing W8-18 beams and HSS3.5X3.5X1/4 beams clad in aluminum and glass.