APPENDIX Q – DESIGN STANDARDS FOR PARKING STRUCTURES

1. Design Requirements

1.1. A parking design professional must be used to provide the functional and structural design of the facility.

1.2. A traffic analysis is required to determine the ingress/egress design.

2. Architectural Requirements

2.1. The architectural design must be security and maintenance friendly. Passive security design must be considered wherever possible. The design must avoid creating any hiding places. The use of glass as a design element is recommended to promote security.

2.2. The entire perimeter of the ground level shall be fenced to restrict pedestrian access to designated entry points.

2.3. All vertical and overhead concrete surfaces in parking facilities must be primed, and painted with semi-gloss latex paint. Glidden Gray Ghost is the approved paint.

2.4. An exterior clock with lighted hands and numerals must be included in the design.

3. Functional Requirements

3.1. A clear-span design must be used for parking facilities. Parking bays shall be between 54 feet and 57 feet wide with 60 degree to 65 degree parking stalls that are 8 feet, 6 inches wide. Design a one-way traffic pattern.

3.2. A minimum clearance of 8 feet, 2 inches is required on the ground level. A minimum clearance of 7 feet is required on all other levels.

3.3. Ingress and egress lanes shall be placed together and in such a way that the facilities can be loaded and unloaded from an end location.

3.4. All parking equipment, including attendant booths, gates, ticket dispensers and card readers shall be placed on concrete islands.

3.5. Guardrails shall protect attendant booths. Six-inch steel bollards that are filled with concrete shall protect all other parking equipment.

3.6. Wooden bumpers that measure 3 inches by 12 inches shall be used to protect tension cables and deck edges from vehicular damage in all parking areas.

3.7. All vertical pipes shall be protected by 1/4-inch by 12-inch steel guards that are mounted at mid-bumper height.

4. Structural Requirements

4.1. Parking facilities shall be post-tensioned, cast-in-place concrete structures.

4.2. Structural concrete shall include epoxy-coated rebar. Use 4 x 5 Combo Mix (5 percent micro silica with 4 gallons, DCI calcium nitrite corrosion inhibitor per c.y.)

4.3. A 2-inch concrete cover over reinforcing steel is required.

4.4. A medium broom finish shall be used in all parking areas.

4.5. Silicone caulk is required for all control joints.

4.6. A waterproof deck coating membrane must be applied to all deck areas on top of finished spaces.

5. Parking Operations Requirements

5.1. Each parking structure shall operate as a mixed-use facility, meaning it shall accommodate both public and contract (monthly) parking. Therefore, each entry and exit lane shall include both card access and public parking equipment, including the capability to pay by credit card.

5.2. Proprietary McGann hardware and software shall be used for:

A. The card access system
B. Public parking equipment, including ticket dispensers and gates, revenue control and facility counting

5.3. Proprietary Park-hut protocols shall be used for parking attendant booths.

5.4. An employee only bathroom near the attendant booth is required.

6. CCTV Security System Requirements: An integrated audio/video system is required using Burle 8600 series protocols for video and Stentophone emergency call station protocols for audio. Parking and Transportation Services Central Security Station shall provide recording capability for audio and video.

7. Communications: Campus phones shall be installed in elevator lobbies on each floor and in each parking attendant booth. A local call telephone shall be installed in the primary attendant booth, and campus only phones shall be installed in the secondary booths. A robbery alarm must be installed in each attendant booth with a dedicated line to the University of Minnesota Police Department.

8. Maintenance Requirements

8.1. Maintenance Rooms: A 1,000 square foot room shall be located on the lower level (typically at the crossover) for storing a power sweeper and skid loader. A 9-foot by 7-foot overhead door shall be provided for access. A pedestrian door also shall be provided.

8.2. A 650 square foot, walled area with a concrete floor shall be provided for a dumpster and for sweeping debris. The area must be located immediately inside the exterior of the building.

8.3. Custodial closets are required in elevator and stairway lobby banks. Closets shall include a source for hot and cold water, as well as a floor sink.

8.4. To facilitate deck washing, a water source that uses 1-1/2 inch NPT connections must be provided. The connections shall be located on every level (no more than 150 apart) to facilitate wash-downs with 75-foot hoses.

8.5. A snow dump area that is approximately 1,000 square feet must be provided at one end of the facility. The surface must be concrete and connect to the storm sewer system. The storm catch basin must have a sediment trap.

9. Electrical Requirements

9.1. Parking deck lighting requires two, 150-watt HPS fixtures per bay. Fixtures shall be placed 18 feet out from each wall (approximately above the rear bumper of a parked vehicle).

9.2. The Halophane Bantam 2000 prismatic fixture with a symmetric patterned lens is the required protocol. Twenty percent of the light fixtures require a quartz restrike for emergency lighting if power fails.

9.3. Top deck light poles shall be hinged or otherwise capable of being safely lowered to maintain the fixtures.

9.4. Provide photocell control of the perimeter (outside) row of lighting on all levels at grade or above.

9.5. Electrical conduits shall be surface-mounted (not placed within any cast concrete).

9.6. An emergency power generator is required. It shall be sized to provide power for all parking and CCTV security equipment. It also shall provide minimal lighting for pedestrian and parking areas.

9.7. Receptacles shall be provided on the ground floor of all stairwells and elevator lobby banks.

9.8. The University of Minnesota requires separate rooms for high voltage equipment, medium voltage equipment and telecommunications.

10. Mechanical Requirements

10.1. All attendant booths must include a powered ventilation system to provide outside fresh air.

10.2. Facility ventilation shall be controlled by carbon monoxide detection.

11. Elevators

11.1. Elevator walls and doors shall be finished in stainless steel.

11.2. Glass shall be installed on the back panels of elevators if they face outside walls.

11.3. Emergency power for one elevator must be provided. In fire mode, every elevator must go to the ground floor and shut off with the car doors in the open position.

11.4. Elevator equipment shall include hall floor indicators on every level.

11.4.1. Lighted indicators with up and down arrows shall be included inside and outside of elevator cars. The indicators designate which direction the cars are going. Lighted indicators with floor numbers also shall be included inside and outside of the cars.

11.4.2. Provide the designated color codes for each floor in the elevator cars. Contact Parking and Transportation Services for complete swatch samples.

11.5. Each elevator shall have a dedicated phone connection to BSAC, and must include caller identification of the facility name and the car number.

12. Signage: All interior signs and exterior signs must be designed to existing protocols as a system-wide integration. Required signage includes exterior facility designation and space information, vehicular and pedestrian way-finding signs.

13. Stripping Requirements: Unless noted otherwise, all parking stall stripping must use yellow paint.

14. Landscaping

14.1. Landscaping design shall consider CPTED recommendations.

14.2. An aboveground automatic irrigation system is required for landscaped areas. Toro equipment must be used per university protocol. Refer to Division 2 - Site Work, Section 02900 5. Automatic Irrigation for irrigation system requirements.

14.3. The A/E shall identify and include sustainable landscaping options to mitigate the effects of storm water from increasing the impervious surface or redeveloping existing surfaces. Sustainable landscaping options include, but are not limited to, catch basins with sediment traps, rain gardens, vegetated swales and sediment ponds. The options provide a means of treating both volume and pollutant storm runoff from surface lots, while reducing the effects on the storm sewer system to pre-development conditions.

End of Appendix Q – Design Standards for Parking Structures
University of Minnesota Facilities Management
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