

# **DIVISION 13 00 40 – 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 must 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 eggshell white latex paint. Dulux Spraymaster Pro Uni-Grip WB Dryfall Aquacrylic 1482-1200 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. Six-inch steel bollards that are filled with concrete shall protect all attendant

booths, parking equipment, 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. All rebar above top of footing or caisson shall be epoxy-coated. The concrete mix for all post-tensioned slabs and beams and columns shall meet minimum requirements as follows:

Compressive Strength at 28 days: 7000 psi

Cement: 658 Lbs.

Microsilica (Condensed silica fume-dry densified powder form): 5% by weight of cement with 4 gallons DCI calcium nitrite corrosion inhibitor per cy.

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 Amano-McGann hardware and software shall be used for:

- A. The contract parking 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 emergency communications/CCTV system is required for all stairwell landings, elevator lobbies, vehicle/pedestrian access points and attendant booths. Refer to Division 28 – Electronic Safety and Security for system design and equipment requirements.

**7. Communications:** Campus phones shall be installed on the ground floor of every elevator lobby 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.

## **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 14-foot by 7.5-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 with direct access from the facility and street.

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. Multiple custodial closets are required at large facilities.

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. Adequate design considerations must be made to facilitate snow removal at multi-leveled facilities.

A. 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.

B. The snow dumping area on the top level of a facility must be devoid of decorative masonry/cap stones or adequate protection must be provided to protect from plowing equipment damage.

C. All "outside" masonry corners adjacent to exterior sidewalks or driveways must be protected by a 3/8-inch steel corner to protect from plowing equipment damage.

8.6. All slab on grade floor drain installations must incorporate two-way clean-out fittings installed at a maximum distance of 50-feet between fittings.

8.7 A minimum of 7-foot sidewalk clearance must be maintained around lighting or sign poles to facilitate snow removal.

8.8 All elevator lobby floors should be tiled or equivalent. Safety glass panels in all lobby and stairwell access doors. No sheetrock in stairwells.

## **9. Electrical Requirements**

9.1. Lighting requirements for ceiling mounted fixtures in parking areas:

A. Two fixtures are required per bay mounted 18 feet out from each wall (approximately above the rear bumper of a parked vehicle).

B. The TEKDEK LED fixture by Kenall incorporating the LimeLight lighting control system by TwistHDM is the required lighting protocol.

C. Twenty percent of the light fixtures require power from the emergency generator for emergency lighting if power fails.

9.2. Lighting requirements for top deck fixtures and wall pack installations:

A. THE EDGE LED fixtures by Cree incorporating the LimeLight lighting control system by TwistHDM is the required lighting protocol.

B. Twenty percent of the light fixtures require power from the emergency generator for emergency lighting if power fails.

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

9.4. Provide easily accessible photocell control for exterior 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 for any structured facility. 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 main landings of all stairwells and

in all elevator lobbies.

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

9.9 LED or other energy efficient illumination sources should be used in all directional or facility identification signs, emergency exit designations, elevator cab lighting or in any other applicable use.

## **10. Mechanical Requirements**

10.1. All attendant booths must include a powered ventilation system to provide positive booth pressure using 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 floor indicators on every level.

A. 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.

B. 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.

11.6. Security cameras integrated into the overall facility security system will be mounted in each elevator.

**12. Signage:** All interior and exterior signs must be designed to existing protocols as a system-wide integration as established in the Division 130063 Parking Signage and Graphics Standards for parking specific signage and Division 130061 University Signage and Graphic Standards (general signage) or Division 130062 Duluth Signage and Graphic Standards (general signage). Required signage includes exterior facility designation and space information, alpha-numeric signs designating parking bays, vehicular and pedestrian way-finding signs.

**13. Striping Requirements:** Unless otherwise noted, all parking stall striping along with any interior curbing must be painted using yellow paint.

#### **14. Landscaping**

14.1. Landscaping design shall consider CPTED recommendations.

14.2. An automatic irrigation system is required for landscaped areas. Refer Division 130050 – Landcare Requirements for system design and equipment 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 must meet all code requirements to provide a means of treating of both volume and pollutant storm runoff from surface lots, while reducing the effects on the storm sewer system.

#### **15. Bicycle Parking**

15.1. One (1) bicycle locker with a capacity of two (2) bicycles shall be provided for each 200 ramp parking spaces. Parking and Transportation Services will select installation locations and locker model.

**End Division 13 00 40 Parking Structures**