



## Division 34. Transportation

### 34 00 00. Transportation.

#### *34 09 00. Transportation Planning and Design*

##### **34 09 01. Bicycle Routes and Paths**

Refer to *Division 32, Geometric Design* for specifications on Bike Routes and Multi-use paths.

##### **34 09 02. Bicycle Parking Facilities**

Refer to *Division 12 93 13 Bike Racks* for specifications on Bicycle Racks, Bicycle Parking Facilities, and Bicycle Parking in Parking Structures.

##### **34 09 03. Moped and Scooter Facilities**

Refer to *Division 32, Geometric Site Design* for specifications on moped and scooter parking.

##### **34 09 05. Automobile Parking Structures**

1. General Guidelines:
  - 1.1. Plans for trees, shrubs, perennials and turf planted in parking lots and bike parking areas shall be included in the 35% review documents.
  - 1.2. All parking structures shall be designed with a minimum 20 foot setback from property lines or street curbs to allow for adequate landscape screening.
  - 1.3. Scaled and dimensioned plans showing the stalls, ramps, and drive aisles shall be provided at the 35% review documents or early enough that structural changes to the ramp and any connected building can still be accomplished. Transportation Services reserves the right to approve all parking structure plans before they are used in a building's design.
  - 1.4. Parking structures shall be designed to efficiently maximize parking with the least amount of wasted space with respect to such features as location of support columns, length of parking bays, ramps from one level to the next, storage rooms, stairs, elevator rooms, and any other feature.
  - 1.5. Entrance ramps for parking structures shall conform to City of Madison standards regarding sight lines, including ramp incline, driveway aprons, walls around the entrance ramp, and any other visibility issue affecting the driver or pedestrians.
  - 1.6. The corner radii and other features of ramps and drive aisles, including the placement of access control equipment, shall be tested with AutoTurn or its equivalent for a full-sized personal vehicle.
  - 1.7. Snow removal and snow storage plans shall be included in all parking plans.
  - 1.8. Each stall inside the parking structure shall be 8 feet, 6 inches wide and be measured from the edge of any columns or other obstructions.



- 1.9. Drive aisles shall be a minimum of 24 feet wide for two-way traffic. The width of drive aisles for one-way traffic oriented parking areas shall be decided on a case by case basis taking into account the geometry of the parking stalls relative to the drive aisles.
  - 1.10. Accessible stalls shall comply with current ADA standards and shall be located as close as possible to the nearest accessible route and accessible entrance.
  - 1.11. The number of accessible stalls shall be determined using a 1:6 ratio in consultation with UW Transportation Services. The UW accommodates all disability parking needs and provides a number of accessible stalls that meets or exceeds ADAAG requirements.
  - 1.12. Each accessible stall shall be 8 feet wide (11 feet for van accessible) with a 5-foot access aisle. Two accessible stalls can share one access aisle.
  - 1.13. Motor cycle parking stalls are 5 feet wide by 10 feet long at minimum and shall be paved in concrete.
  - 1.14. Each parking structure shall have a clearance of at least 7 feet, 4 inches on all floors. A clearance of 8 feet, 4 inches is desired on the first level to accommodate vans for persons with disabilities. This clearance shall be posted on a headache bar outside and above each entrance and ticket dispenser, if access control equipment is used.
  - 1.15. In the case that Paratransit busses may need to enter a parking structure, a clearance of 10 feet, 6 inches shall be provided on all floors that the busses may need to access.
  - 1.16. If a booth is required in the parking structure, then the entry and exit lanes shall be designed to accommodate access control equipment used by UW Transportation Services.
  - 1.17. Post-and-cable barriers shall be provided wherever a grade separation between two paved areas is encountered.
  - 1.18. Concrete infrastructure and the electrical conduits and hand holds for access control equipment shall be provided in accordance with specifications provided by UW Transportation Services.
  - 1.19. If both permit parking and public parking are desired in the same facility, consultation with UW Transportation Services shall be done during the planning stages of design. At this time, it will be decided which type of parking access control equipment will be used to accommodate the mixed use. This equipment shall be compatible with the existing equipment as determined by Transportation Services.
  - 1.20. A copy of all operating and maintenance (O&M) manuals for all equipment and operating systems shall be provided to Transportation Services.
2. Construction Planning:
    - 2.1. Follow standards defined elsewhere in “General” and “Construction Site Plan” as they apply to traffic, parking, and transportation impact elements of project.
    - 2.2. Parking structure plans shall satisfy Crime Prevention Through Environmental Design (CPTED) criteria. That is, they shall demonstrate:



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- 2.2.1. Natural surveillance via open stairwells, high pedestrian and vehicular visibility, good nighttime lighting, and other features.
      - 2.2.2. Territorial Reinforcement, differentiating the structure from public right of ways.
      - 2.2.3. Natural access control where appropriate by means of gates and other features.
      - 2.2.4. Target hardening if called for.
      - 2.2.5. Minimization of interior shear walls and obstructions.
      - 2.2.6. Glass-backed elevators
      - 2.2.7. Columns pushed to the head of the stalls, away from the drive aisles.
    - 2.3. There shall be a minimized loss of auto parking stalls (including accessible stalls), bike racks, and moped/scooter parking areas.
    - 2.4. Contractors' parking obligations shall be specified (permits required—info in bid language).
    - 2.5. Disruptions to accessing lots and/or roads for special events shall be prevented. Coordinate any access issues with Transportation Services.
    - 2.6. Construction Site Staging Area shall be approved by UW Transportation Services and Facilities Planning and Management.
  3. Window Washing Equipment:
    - 3.1. All interior and exterior glass shall be made accessible for window washing.
    - 3.2. If lifts are required, doors shall be sized to accommodate the machinery within the building.
    - 3.3. If windows cannot be reached from the ground, davits shall be provided on the roof.
    - 3.4. Any mechanized scaffold system (swing stage) required, shall be provided by the project and stored within the building.
    - 3.5. In addition to lifts or scaffolds, all other equipment required for the cleaning of glass shall be provided as part of the project and stored within the building.
    - 3.6. Access to power and domestic cold water for the washing system is to be provided at rooftop. In addition, convenience outlets shall be provided for auxiliary uses.
    - 3.7. The first operation of the window washing equipment shall be completed by the installing contractor, with the owner's selected representatives present for training.
  4. Fire Hose Connections and Drains:
    - 4.1. All stairwells shall have at least one 1 ½ inch fire hose bib (coupling) and one floor drain-independent from #2 & #3 requirement listed below.
    - 4.2. A 1 ½ inch hose bib (coupling) will be located every 50 feet around the exterior walls, inside of the facility.
    - 4.3. Grading and inlets shall be designed according to a stormwater drainage plan and system that adequately evacuates all water from the floor of the structure or lot during heavy rainfall.



- 4.4. A sanitary sewer inlet shall be located in a convenient location near a source of water to accommodate the emptying and refilling of mobile floor washing equipment.
- 4.5. The first operation of the wash down for each floor shall be completed by the primary contractor with the owner's selected representatives present for training.
- 4.6. Sprinkler systems inside the parking structure shall follow City of Madison fire code standards.
- 4.7. For structures built below the water table, drains shall have sump-pumps with an alarm system that will alert UW Physical Plant when the pump is malfunctioning.
5. Signage and Pavement Markings in Parking Structures:
  - 5.1. All directional and regulatory signs shall be approved by UW Transportation Services before documents go to bid. Directional signage shall include traffic way-finding and pedestrian way-finding to exits and elevators. Vehicle way-finding signs shall be white letters on a blue background and white on green for pedestrian-oriented signs such as for entrances.
  - 5.2. Signs shall identify the floors of the structure, including numbers on the doors to stairs and elevator lobbies using a font size no smaller than 24 inches tall.
  - 5.3. Hanging signs in parking structures must be 6-9 inches wide by 36 inches long and mounted directly to the concrete ceiling or other structural member.
  - 5.4. Regulatory vehicle signs should conform to the size and/or color scheme described in the MUTCD.
  - 5.5. Pavement markings must be applied wherever necessary in accordance with MUTCD and industry standards, including directional arrows and center lines, especially at corners, entrances, and exits.
  - 5.6. Dual stall line painting shall be required in parking structures using 4 inch-wide yellow painted lines 24 inches from outside edge to outside edge centered on the division between stalls. Single stall lines shall be sufficient inside parking structures. Stall lines shall be applied with two separate coats of paint.  
*See Division 32 Detail 1 at end of Division 32.*
  - 5.7. Signs for accessible stalls shall be provided by UW Transportation Services to be installed by the contractor in consultation with UW Transportation Services.
  - 5.8. Two lot identification signs shall be provided by UW Transportation Services to be installed by the contractor at all vehicle entrances to the facility. Signs shall be posted before final completion.
  - 5.9. Clearance height bars shall be displayed at each entrance and 50 feet before any change in height within the structure.
  - 5.10. All parking structures shall have electrical conduit run out to the street area near the entrance to support a kiosk sign if such a sign is planned. The contractor shall be responsible for running electricity, pouring the foundation, and the installation for the kiosk per manufactures guidelines. UW Transportation Services shall approve the sign location and provide the kiosk sign.



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6. Lighting:
    - 6.1. All lights shall follow current State of Wisconsin – Division of Facilities Development (DFD) standards.
    - 6.2. Covered floors inside parking structures shall be lit by an average of 5 foot candles using a 4:1 minimum/maximum ratio on the average lighting levels.
    - 6.3. Lighting fixtures inside a structure:
      - 6.3.1. Parking structures shall use fluorescent light fixtures. Other energy efficient fixtures such as LED will be considered if it is cost effective.
      - 6.3.2. Use “T8” fluorescents and follow a 30 foot or 40 foot offset grid pattern mounted perpendicular to the drive aisles and centered inside the back edge of the parking stalls. Lighting shall be over the parking bays.
      - 6.3.3. Never use HPS.
    - 6.4. Roof top floors of structures shall be lit with a 2 foot candle standard on average. Use campus standard lights. See *Division 26 56 00*.
    - 6.5. All perimeter lights shall be regulated by photo cell devices so they can be turned off during daytime hours.
    - 6.6. Exterior perimeter lighting shall follow campus standards. See *Division 26 56 00*.
  7. Storage and Restrooms:
    - 7.1. All parking structures shall be built with a single unisex restroom.
    - 7.2. Restroom shall have one ADA compliant toilet, 1 garden hose water hook-up, a space heater, manual lock on the door, janitorial stainless steel sink, and small hot water heater.
    - 7.3. All parking structures shall be built with at least one room for storage. The minimum size shall be 12 feet x 12 feet. This room can be used to fulfill the requirement of having a snow blowing equipment room and if so, shall meet requirements for storage of combustible materials.
    - 7.4. Storage room shall have electricity run to it for possible space heaters or other electrical needs. There shall be a minimum of three duplex outlets.
    - 7.5. Both rooms shall be keyed with a Schlage key – keyed to TS booth key.
  8. Parking Equipment:
    - 8.1. UW Transportation Services shall provide information on all forms of parking equipment as needed.
    - 8.2. Transportation Services must be consulted on all parking plans, including style and manufacturer of equipment used, during the planning stage and again before installation.



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- 8.3. When gates are needed, consider the following in the plans: gates, card readers, loop installation, and storage for tickets (could be doubled with storage room required). Equipment used shall be from the same vendor that UW Transportation Services currently specifies.
  - 8.4. When a booth is needed, consider the following in the plans: Booth – ADA compliant, telephone hook-up, computer hook-up, minimum 2, duplex electrical outlets, heater, air-conditioning, hook up to the gate system, and a safe for money.
  - 8.5. When parking meters will be used, they shall be ordered by UW Transportation Services and installed by UW Physical Plant before final construction completion. Meters shall be the same vendor that Transportation Services currently specifies.
9. Elevators:
    - 9.1. One elevator shall be located in opposite corners of the parking structure for a minimum of 2 per ramp.
    - 9.2. Each elevator shall have an emergency phone (not button) inside.
10. Bicycle Parking:

Refer to *Division 12 93 13 Bike Racks* for specifications on Bicycle Parking in Parking Structures.
11. Snow Chutes and Snow Exposure:
    - 11.1. Parking structures that have an exposed upper level shall be equipped with at least one snow chute.
    - 11.2. It shall be presumed that parking structures need snow removal design components unless it is completely clear that snow cannot fall or be blown from above or from open sides into the ramp.
    - 11.3. Snow chutes shall be gated at the top with a slidable gate and locked with a UW provided master lock key #2027.
    - 11.4. Snow chutes shall have a flat concrete area at the bottom of the chute where snow can be stored until it is hauled away. This area shall be accessible by trucks that are used to haul the snow off site.
    - 11.5. Snow chute designs shall be approved by UW Transportation Services.
12. Parking Structure Painting:
    - 12.1. All stairwell walls shall be painted with anti-graffiti paint.
    - 12.2. Treads on stairs shall be durable and non-slip.
13. Mirrors:
    - 13.1. Parking structures shall be outfitted with mirrors in corners and other “blind spot” areas where oncoming vehicles in two-way traffic may not be adequately visible to each other.



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- 13.2. Underground and lower level areas of parking structures shall be outfitted with mirrors in areas where visibility around corners is poor and persons would otherwise be hidden.
  - 13.3 Floors shall have directional mirrors at the ends of the drive lanes and at any obstructed corners.
  14. Stairwells:
    - 14.1. Any stairwell that is exposed under the stairs shall be gated. Chain link fence shall have a swing gate attached. A master lock shall be provided by UW Transportation Services with key #3221 for such areas.
    - 14.2. Stairwells and elevators shall be located as needed based on the size of the structure and proximity to routes leading to key pedestrian destinations.
    - 14.3. Landings in the stairwells shall be kept to a minimum square footage, to help reduce the desire to use the stairwells for shelter.
    - 14.4. Stairwells shall have appropriate fire code “EXIT” lights.
    - 14.5. Stairwells shall follow the requirements set for hose bibs and drainage.
    - 14.6. Stairwells shall follow the requirements set for painting.
    - 14.7. Stairwells shall be designed with user safety in mind. They shall be well lit, as visible as possible from outside and elsewhere, and shall generally not allow someone to be hidden from view in any area.
  15. Locks: (NOTE: This section is under review and may change. Consult Transportation Services.)
    - 15.1. All doors and locks shall meet the criteria set up by UW Transportation Services before final completion of the ramp. UW Transportation Services can supply contractor with a spare key for them to make appropriate locks.
    - 15.2. All stairwell doors shall have a blank cylinder so they can't be locked.
    - 15.3. All snow chutes shall have a master lock padlock with key #2027.
    - 15.4. All gated areas in stairwells shall have a master lock padlock with key #3221.
    - 15.5. All restrooms and store rooms shall be keyed with a Schlage A7S key.
    - 15.6. All electrical rooms shall be keyed with a Schlage UT key.
    - 15.7. Gate equipment shall have an APD 1 key.
  16. Trash Receptacles and Ash Trays:
    - 16.1. Trash receptacles and ash urns shall be bracketed and mounted to the wall near all stairwells on each floor and any pedestrian ground level exit/entry point.



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- 16.2. Receptacles shall be Brown, Rubbermaid 35 gallon, hinged (on one side) top containers without liners. Receptacles shall match the ones currently used by UW Transportation Services.
  - 16.3. Ash Trays shall be brown stone panel wall mounted urn – approximately 10 inches square x 13 inches high and be mounted interior to the facility.
  - 16.4. All trash receptacles and ash urns located outside the parking facility shall match current campus standards. See *Division 12 93 23*.
  - 16.5. Supply of cans and installation shall be the responsibility of the contractor and shall be done before final completion.
  17. Fire Extinguisher Cabinets:
    - 17.1. UW Environment Health and Safety Department shall provide all fire extinguishers for campus buildings, purchased from the project's moveable equipment fund. All designs shall be reviewed by the Madison Fire Department.
    - 17.2. A/E shall verify with UW Safety the size of extinguishers to be provided and shall specify the cabinet size and style accordingly. At a minimum, cabinets shall be 8 inches deep and clear. Cabinet locations shall be shown on the 35% review documents. All designs shall be reviewed by the Madison Fire Department.
    - 17.3. No fire axes shall be allowed in UW buildings.