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APPENDIX A - Conceptual Drawings
APPENDIX B - Site Due Diligence Report
1 INTRODUCTION

This document has been prepared to assist Arizona State University (ASU) in the development of a high-quality parking facility. The purpose of the Design and Performance Criteria for Parking Structures is to provide guidance regarding design standards, operational practices, technology integration, and maintenance requirements to support requirements of ASU in selection of a design-build contractor for this project.

The Phase 1 project should provide an 830 space cast-in-place post-tensioned parking structure with the following components further defined in the criteria:

- Must be designed to be horizontally expanded up to 1,400 Phase 2 spaces.
- Must accommodate future shell space square footage and truck access as indicated in the Conceptual Drawings in Appendix A.
- Must have enhanced façade coverage primarily on the north and south elevations. Phase 2 will have façade coverage on the north, south and east elevations.
- Must fit on the defined building site.
- Must accommodate and maintain parking and pedestrian access to the Phase 1 parking structure while the Phase 2 expansion and future buildings are constructed.
- Must provide stormwater detainage on site.
- Must be no taller than the planned surrounding buildings.
- Must attain Parksmart Certification through the Green Business Certification, Inc. (GBCI)

The following enhancements should be incorporated (in order of importance) as the project budget allows:

- Additional façade coverage/material enhancements.
- Speed ramps in lieu of parkable ramps.
- Painting/staining of all parking area ceilings white.

1.1 DEFINITIONS

- Arizona State University (ASU) is the Owner of the project.
- Design-Builder is the firm or firms that have a contract with ASU to construct the project.
- Designer is the firm or firms of architects and/or engineers that have a contract with the Design-Builder for the project.
- Project Manager (PM) is the Owner’s Representative and/or ASU Representative assigned to the project.
2 SUBMITTAL REQUIREMENTS

2.1 DESIGN PHASE SUBMITTALS

Design drawings, specifications, and initial and final guaranteed maximum price (GMP) construction costs should be submitted to ASU on the following schedule:

- Schematic Design – 30%
- Design Development – 60%
- Construction Documents – 100%

The intent of these submittals is for ASU to review the progress of design, provide review comments regarding the design, and review the GMP for the project. The design team should not proceed onto the next design phase until receiving approval from ASU.

2.2 SCHEDULE

A preliminary schedule showing major milestones (SD, DD, CD, Construction Start, Substantial Completion, Occupancy, and Final Completion) shall be submitted with SOQ. Responders shall incorporate a schedule that includes any comments/proposed changes of the proposed schedule in the RFQ.

A detailed schedule of design and anticipated construction shall be submitted to ASU for review during the Schematic Design Phase and updated monthly. The Schedule should consider durations including critical path and prerequisite tasks for each required design phase and permitting phase, and include appropriate review time by ASU. Key milestones must be identified.

2.3 SITE

a. The project should fit on the proposed site with setbacks as indicated by the Conceptual Drawings (provided in Appendix A).

b. Underground stormwater storage providing required cubic feet of Phase 1 and Phase 2 storage shall be incorporated into the structure footprint under the ground level via cast-in-place vaults, interlocking concrete culverts or interlocking concrete pipe or half pipes. No corrugated metal pipe (CMP) shall be used for stormwater detention. It is anticipated that stored stormwater will infiltrate within the required time into the site using dry gravel beds or ground wells.

c. First level access for retail deliveries and servicing (20’ minimum clearance height) and large vehicle staging (e.g. charter bus).

d. A dumpster enclosure shall be provided with three (3) locations for zero waste and one (1) compactor. Special care will need to be taken to ensure these are able to be unloaded, the Design-Build team will need to engage with ASU Waste Management early to ensure that sufficient space is provided to accommodate the required number of dumpsters.

e. Overall design should be provided per March 2018 Revision of ASU Design Guidelines (found at www.asu.edu/purchasing/forms/design_guidelines.pdf).

f. Landscaping should be provided per ASU Design Guidelines.
g. Refer to ASU Project Design 11 82 26 Refuse Compactors.

h. Refer to ASU Project Design Division 31 Earthwork.

i. Refer to ASU Project Design Division 32 Exterior Improvements and 32 90 00 Landscaping.

2.4 PARKING GEOMETRICS

a. Provide 830 parking spaces in Phase 1.

b. The parking structure should be designed to be horizontally expandable in the future to accommodate up to 1,400 spaces.

c. It is preferable that no dead-end drive aisles are utilized. All drive aisles should allow for vehicle circulation.

d. Standard Spaces: The standard spaces in the parking structure shall be designed using 90-degree orientation for two-way drive aisles.

   i) Minimum Stall Width = 9'-0" (90-degree space orientation measured perpendicular to the stripe). 60-degree to 70-degree space orientation may be used in limited conditions as determined by the final design configuration.

   ii) Stall Length = 18'-0" long (90-degree space), 18'-9" long (60-degree space), 19'-0" (70-degree space) measured perpendicular to the drive aisle

e. Compact Spaces: Minimum width = 7'-6", Minimum length = 14'-0"

   i) Up to 5% of parking may be sized and designed for compact spaces.

   ii) No more than 10 compact spaces may be located consecutively.

f. Aisle Widths: Minimum drive aisle width shall be 24'-6" for two-way drive aisles with 90-degree spaces, 14'-6" for one-way 60-degree spaces, and 16'-6" for one-way 70-degree spaces. Spaces shall otherwise be in compliance with the local zoning ordinance requirements.

   i) Designer may reduce aisle width 3 inches for each additional 1 inch of stall width.

   ii) Minimum stall width may not be reduced for increased aisle width.

g. Turning Bay Width: End bay turning movements shall have 26'-6" minimum between face of obstruction or back of parking space.

h. Accessible stalls and access aisles shall comply with current ADA standards.

i. Electric vehicle spaces:

   i) Provide a minimum of 1% electric vehicle spaces with dual-head charger units distributed on all parking levels.
ii) Provide electrical infrastructure (including but not limited to dedicated transformer, circuit breakers, and primary electrical feeds) necessary for a future conversion of approximately 25% of total parking spaces to support electric charger units.

iii) Suitable, clear access space must be provided around the charging station to allow users to operate the equipment.

iv) At least 20% electric vehicle charging space must be designated ADA accessible. Parking space layouts must include space widths and access aisles in accordance to ADA requirements, and the equipment must be provided to meet accessibility standards. The EV-ADA space does not count towards the minimum number of ADA spaces required by code.

j. Provide structural and parking layout to minimize the inclusion and impact of columns in the parking spaces. Columns, pipe guards and risers shall not unduly encroach into parking spaces, except as allowed by the local zoning ordinance or a maximum 1'-0" encroachment (2'-0" maximum per parking module) for 30% of the spaces.

i) Should a design condition result in a vertical element to be located within the parking module, the minimum space width should be increased by 12" to account for increased maneuverability.

k. It is recommended that long span column grids be utilized, where possible.

l. Parking structure should be designed to efficiently maximize parking with the least amount of unused space with respect to elements such as columns, parking bays, ramp lengths, storage rooms, stairs, elevator rooms, “dead corners”, and other features.

m. Minimize the use of wheel stops to reduce tripping hazards; no wheel stops are preferred.

i) If wheel stops are used, they should be painted the same color as the bollards.

n. Refer to ASU Design Guidelines 12 93 00 Site and Mall Furnishings.

### 2.5 DRIVEWAYS / STACKING

a. Designer should perform a queuing analysis to determine number of entry and exit lanes required for the facility. One-way entry/exit lanes are preferred.

b. Pedestrian and vehicle conflicts at ingress/egress points shall be minimized. Dedicated walkways should be provided so that the vehicular entry and exit lanes are not readily used by pedestrians.

c. Entrances shall conform to local ordinance standards regarding sight lines, ramp incline, driveway aprons, and any other visibility issues affecting the driver or pedestrians.

d. Stacking space:
i) Stacking space is defined as the distance from the parking access control equipment gate arm back along the vehicular driveway.

ii) Minimum stacking size = 20'-0”.

iii) On or off-site traffic movements or pedestrian movements shall not be impeded within the stacking space distance. This includes, but is not limited to, the street right-of-way, sidewalks outside of the parking structure, and pedestrian egress routes within the parking structure.

2.6 AMERICANS WITH DISABILITIES ACT (ADA)

   a. The parking structure shall meet all applicable federal ADA and local accessible regulations.
   
   b. Accessible routes must be provided to allow safe movement between the parking structure and the egress exits.

2.7 RAMP SLOPES

   a. Parkable ramps with striped parking spaces shall target a maximum slope = 6.3%.
   
   b. Express ramps must be designed to minimize dangerous encounters between vehicles and pedestrians. Maximum express ramp slope = 12%.
   
   c. Where adjacent slopes exceed 8%, provide transition ramps.
   
   d. Ramp slopes along accessible routes shall not exceed 1:48 (2.08%) in any direction.

2.8 STRIPING

   a. Pavement markings should be a minimum two coats of traffic and zone marking paint.
   
   b. All pavement markings, unless otherwise required by code, shall be white.
   
   c. Faces and the top 6” of curbs should be painted yellow to minimize tripping hazard liability.

2.9 PARKING ACCESS AND REVENUE CONTROL SYSTEMS (PARCS)

   a. Rough-ins for the PARCS equipment are to be consistent with ASU equipment in other parking facilities. Public parking should accommodate a paid operation using a ticket dispenser on entry and payment to a pay-on-foot station and exit station within the exit lane.
   
      i. Pay-on-foot stations shall be located within each elevator lobby or stair landing on the ground floor.
   
   b. Design shall be set up to accommodate installation of equipment provided by the Design-Builder and installed by the Design-Builder using ASU’s approved vendor – T2 Systems or approved equal. This includes, but not limited to, curbs, islands, conduits, rooms, etc. Lane dimensions and system design will be per ASU standards.
c. If a lane is designated as a dual entry/exit, the design should include installation of LED X/Arrow signs mounted above the entry and exit lanes signifying which lanes are open or closed.

d. Design shall accommodate the installation of gate arms, safety loops, and ticket dispensers at entrances.

   i. Preference will be to have barrier gates placed so straight-arm gates can be used.

e. Design shall accommodate the installation of gate arms, safety loops, and pay-in-lane credit card at each exit lane.

f. Each lane and pay-on-foot station shall be designed with a security camera to monitor each.

g. No attendant booths should be provided.

3 STRUCTURAL

3.1 BUILDING CODES AND STANDARDS

a. Comply with Federal, State, Local, and Industry codes, standards, and regulations in the design and construction of the parking structure. When codes conflict, the most stringent code shall govern.

b. Design in accordance with the International Building Code, most recent edition (2018) with all amendments.

c. All elements must conform to the Federal Public Law 101-336, known as the “Americans with Disabilities Act” which adopted the 2010 ADA Standards for Accessible Design.

d. Design and construction shall follow requirements of the March 2018 Revision of ASU Design Guidelines (can be found at www.asu.edu/purchasing/forms/design_guidelines.pdf).

3.2 STRUCTURAL SYSTEMS

a. Foundations: A subgrade exploration should be conducted by a Geotechnical Engineer, which will establish design criteria for the foundation system and subgrade. It is anticipated that foundation elements will consist of spread footings on improved soil (GeoPiers or equal) or cased drilled shafts (caissons).

b. Slab on Grade: Slab on grade is to be concrete. Control and construction joints in slab on grade shall sealed with joint sealant and be spaced to minimize shrinkage cracking (approximately 10’-15’ on center). Fiber reinforcement may be considered in lieu of welded wire fabric upon review of site mockup.

c. Superstructure:

   i) Based on current market conditions a cast-in-place post-tensioned concrete structural system is anticipated. The structural system will be comprised of Cast-in-place post-
tensioned concrete beams and slabs and cast-in-place columns, beams, spandrels, ramp walls (with openings), stair walls, elevator walls, and trash room walls. Top surface of cast-in-place spandrels to be sloped back into the deck to minimize staining of the exterior face from rainwater and to aid in suicide prevention. A precast concrete structural system will be considered as a lower cost, faster construction duration solution.

d. Medium broom finish or medium swirl finish required on all vehicular driving surfaces.

e. Vehicular barriers: Provide vehicular barriers along the perimeter and along ramp sides.
   i) Cast-in-place or precast barrier walls are preferred, however, in limited applications, cable barriers may be used. Cable barrier shall be 7-wire galvanized prestressing strand intended for use as a vehicular barrier. Where cable passes through a column, the hole should be sealed with caulk to prevent water intrusion at the anchor.

f. Sleeves for fire protection, plumbing, and other miscellaneous items shall be coordinated with those trades.

3.3 DURABILITY

The parking structure shall be designed for a 50-year design life in accordance with the most recent edition of the American Concrete Institute “Guide for the Design of Durable Parking Structures” (ACI 362). Regardless of the structural system utilized, the concrete structure for the parking structure shall meet or exceed the specified characteristics for structures located in durability Zone I. Specific criteria are as detailed below.

a. Concrete mix designs:
   ii) Use 6% +/- 1.5% air entrainment for superstructure members.

   iii) Use chert-free aggregate where possible.

   iv) Silica fume and/or calcium nitrite may be used to densify the concrete and to inhibit corrosion, however the designer is encouraged to review local capabilities.

   v) Use of a plant or site-added superplasticizer for workability is allowed.

   vi) Use fly-ash (minimum = 10%, maximum = 25%) as a supplementary cementitious material for added durability and sustainability.

   vii) Corrosion inhibitor admixture, if used to reduce cover or improve design service life, shall be added at the manufacturer’s recommended rate but not less than 2.0 gallons per cubic yard.

b. Cast-in-Place Concrete: Additional recommendations per ACI 362 are noted for cast-in-place post-tensioned concrete in Zone 1.

   i. Minimum concrete compressive design strength, $f'_c = 3,500$psi.
ii. Use encapsulated tendons is preferred but not required.

iii. Minimum average prestressing: Primary members = 175 psi; Shrinkage and temperate = 100 psi.

iv. Cover: Typical = 1.5"; Slab bottom = ¾”.

c. Precast Concrete: Additional recommendations per ACI 362 are noted for precast/prestressed concrete.

i. Minimum concrete compressive design strength, f’c = 5,000psi.

ii. Cover: Typical = 1.5”; Beams = 1.25”

iii. Hot-dipped galvanized connections for typical connections and/or stainless steel for flange-to-flange connections shall be utilized. Galvanized and stainless-steel components shall not be used in the same connection.

iv. Following erection, Precaster shall epoxy inject or rout and seal all cracks in the precast members in coordination with and approval by the structural engineer of record.

v. Sleeves, connections, and lifting points shall be detailed and patched/protected to prevent deterioration.

d. Refer to ASU Design Guidelines 03 31 00 Structural Concrete, 03 45 00 Architectural Precast Concrete and 05 50 00 Metal Fabrications.

3.4 VERTICAL CLEARANCES

The parking structure must be designed with 8’-2” clearance where ADA van-accessible spaces and van-accessible vehicular access routes are located. All other areas shall have a minimum vertical clearance of 7’-0”. Designer should consider additional construction tolerances when setting floor-to-floor heights.

3.5 VOLUMETRIC

Designer shall demonstrate that volumetric change effects have been accounted for in the design of this exposed structure, and provide closure pour strips or expansion joints accordingly. Volumetric effects include, but are not limited to, seismic displacements, wind displacements, thermal movements, shrinkage, elastic shortening, and creep. One expansion joint is anticipated for the indicated configuration.

4 ARCHITECTURAL

4.1 FAÇADE

a. Phase 1 north and south elevations shall have façade treatment such as metal panels and/or woven wire fabric. Phase 2 will have façade coverage on the north, south and east elevations.

b. Provide floor to floor heights of 12’-0” from Levels 1-2 and 11’-0” on all other levels.
c. Suicide prevention elements (taller roof parapets, sloped spandrel tops, signage, softening of the building hardscape with awnings and landscape, etc.) should be incorporated into the design. Designers are encouraged to suggest other ideas to aid in suicide prevention.

4.2 FUTURE EXPANSION

a. The parking structure should be designed to be horizontally expanded up to 1,400 spaces. The following elements shall be considered in the initial design to accommodate the future expansion.

i. Building Type classification.

ii. Future expansion of stair and elevator cores.

iii. Stair egress widths for life safety.

iv. Waterproofing over future shell space.

v. Vibration isolation of parking structure are over further shell space.

vi. Inclusion of storefront and canopy structures.

vii. Fire protection system.

viii. Refer to ASU Design Guidelines 08 44 00 Curtain Walls.

4.3 ELEVATORS

a. Provide a minimum of 2 elevators at in the Phase 1 parking structure. Future elevator cores shall be provided for future expansion. Designer should consider additional queuing analysis to determine whether more than 2 elevators is necessary.

b. Use a minimum of 3,500 lbs. cabs with side opening doors. Glass backed elevators are not desired.

c. Use rigidized stainless-steel walls to minimize vandalism.

d. Heat and cool all elevator machine rooms and hoistways if machine room-less traction elevators are used.

e. Trailing cables should have capabilities of telephone, security, audio and CCTV.

f. Elevator preference is a non-propitiatory machine room-less traction elevator meeting ASU design requirement. If this elevator type is used, accommodations for hoistway cooling will be required.

g. Flooring at elevator landings should be coated with durable coating for ease of cleaning, maintenance, and aesthetics.

h. Use vandal proof elevator buttons.

i. Elevator manufacturer shall provide on-site training and maintenance overview for ASU staff.

j. Provide elevator pit ladders.
k. Elevator vestibules can be open, but the door thresholds should be protected from the weather including blowing rain. An open cover/canopy is required at the roof.

l. Refer to ASU Design Guidelines 14 20 00 Elevators and 14 27 00 Passenger Cabs – Interior.

4.4 STAIRS

a. All stairs and landings shall be constructed of concrete or steel stringers with steel pans and concrete treads and have a non-slip floor finish.

b. Stair treads shall provide a high traction surface and provide visual contrast (light-on-dark or dark-on-light) on tread nosings.

c. Where paint is provided on the interior walls and/or ceiling, paint or stains shall be easy to clean and maintain. No flat finishes are acceptable. Floor colors and paint codes will be provided by ASU.

d. Stairs should be designed with Crime Prevention Through Environmental Design (CPED) methods in mind.

4.5 SIGNAGE AND WAYFINDING

a. An identification system, for both vehicles and pedestrians, consisting of floor graphics, column and wall graphics and signage, shall be incorporated into the design of the parking structure. Background color shall be consistent and coordinated throughout. The final designs and materials must be incorporated into the documents and approved by ASU during the Design Phase. Signage should be provided per ASU Design Standards and the sign graphics are to be based on the design standards provided by Pictoform.

b. Plate metal signs shall be aluminum with minimum sheet thickness of 0.125 inches.

c. Plate metal signs shall be securely anchored to the structure with Hilti Metal HIT anchors or similar vandal proof anchors. Adhesives are not acceptable as the sole source of connection.

   i. If using precast concrete, do not mount directly to precast double tee stems.

d. Headache/clearance bars (6” minimum diameter) shall be installed at each entry/exit point over all lanes, both inbound and outbound, indicating the vertical clearance beyond. Additional clearance bars shall be provided within the structure in advance of locations where internal clearances change.

e. To facilitate way-finding select interior columns may be painted a floor identification color.

f. Refer to ASU Design Guidelines 10 14 00 Signage and Wayfinding.

4.6 BICYCLES

a. A bicycle enclosure shall be provided per ASU Design Guidelines.
b. Where bicycle parking is not clearly visible to approaching cyclists, signs shall be posted to direct cyclist to the parking area.

c. Bicycle parking shall not impede pedestrian or vehicle movement or circulation.

d. Each bicycle space shall accommodate a bicycle at least 6 feet in length and 2 feet wide or be in an ASU approved bike locker or bike space.

e. A minimum aisle width of 4 feet should be provided for bicycles to enter and leave the facility to access the public way.

f. Enclosure shall include two unisex ADA restrooms with shower.

4.7 RAILINGS

a. Provide galvanized or powder coated stair railings, wall railings, and ramp railings. Refer to ASU Design Guidelines 05 50 00 Metal Fabrications.

4.8 WATERPROOFING

a. Traffic bearing membranes shall be applied over shell spaces or any rooms such as the mechanical/electrical room. This area shall receive a traffic coating that extends 2’ minimum beyond the limits of the room below.

b. Seal control joints, construction joints and coves with a two-component polyurethane sealant rated for traffic.

c. Provide membrane roofing over shell space areas, elevators and stair towers.

d. Provide a heavy-duty traffic coating membrane waterproofing system over future shell space area. Installation of the waterproofing should be by a manufacture’s certified installer.

e. Water repellent sealer: Install a low VOC, 100% solids penetrating concrete silane sealer to the roof level directly exposed to the exterior.

f. Provide below grade waterproofing behind walls and at the elevator pit(s), including waterstops at construction joints. Vapor barriers for the slab on grade shall be per the structural drawings and the geotechnical report.

g. Warranty periods:

   i) Traffic coatings shall be covered by a minimum 5+5 year joint and several warranty (manufacturer and installation contractor).

   ii) Sealers, sealants, and expansion joints shall be covered by a minimum five year joint and several warranty (manufacturer and installation contractor).

   iii) Roofing and split slab waterproofing system shall be covered by a minimum twenty year joint and several warranty (manufacturer and installation contractor). Refer to ASU Design Guidelines 07 50 00 Roofing Systems.
h. Refer to ASU Design Guidelines 07 13 00 Sheet Waterproofing and 07 50 00 Roofing Systems and 07 90 00 Sealants.

4.9 ROOMS

a. There should be one (1) electrical room within the parking structure.

b. A minimum 750 SF office space (with two offices one of which shall have a pass-through window) and storage area for parking management use shall be provided in the parking structure with a single employee restroom and custodial closet.

c. A minimum of two (2) IT/IDF rooms shall be provided on every floor.

d. Two card-access restrooms within the bike locker storage enclosure.

e. Storage rooms shall be provided in the areas under the ramps.

f. Space for future photovoltaic equipment room in or near the electrical room.

g. Refer to ASU Design Guidelines 08 Openings, 09 Finishes, 10 Specialties and 12 Furnishings.

4.10 DOORS AND HARDWARE

a. Hollow metal doors and frames with commercial grade hardware for all storage/mechanical/IDF rooms within the parking structure.

b. All doors shall have card reader access.

c. Refer to ASU Design Guidelines 08 11 00 Hollow Metal Doors and Frames, 08 11 16 Aluminum Doors and Frames, 08 70 00 Finish Hardware / Electronic Card System and 08 80 00 Glass and Glazing.

4.11 EQUIPMENT

a. Space shall be allocated for trash and recycling cans at each stair and elevator lobby on every level. The placement of trash and recycling cans should not encroach on the required egress widths or access to the stairs/elevators.

b. Fire extinguishers at each elevator bank and throughout garage to meet code spacing requirements.

c. Provide concrete-filled galvanized steel pipe bollards to protect equipment and establish safe areas for pedestrians.

d. Refer to ASU Design Guidelines 10 44 00 Fire Extinguishers.
5 ELECTRICAL

5.1 LIGHTING

a. LED fixtures should be used. Fixtures shall be Philips Gardo SVPG 168L (or approved equal). Refer to ASU Design Guidelines 26 50 00 Lighting.

b. Fixtures should be installed in a two row per bay configuration, unless photometric studies indicate that alternate configurations can meet the minimum and maximum lighting requirements.

c. Provide a point-by-point foot candle (fc) photometric analysis to illustrate the design intensity levels at each level of the parking structure.

d. Minimum, maximum, and uniformity levels of illumination shall be the greater of requirements from the Illuminating Engineering Society of North America (IESNA) RP-20 latest edition, or the following:

<table>
<thead>
<tr>
<th>Area</th>
<th>Minimum Lighting (fc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average maintained in driving aisles &amp; parking spaces (except the top level)</td>
<td>5</td>
</tr>
<tr>
<td>Minimum in driving aisles &amp; parking spaces</td>
<td>2</td>
</tr>
<tr>
<td>Average maintained at ingress/egress areas (daytime)</td>
<td>40</td>
</tr>
<tr>
<td>Minimum maintained at ingress/egress areas (daytime)</td>
<td>14</td>
</tr>
<tr>
<td>Maximum at ingress/egress (daytime)</td>
<td>100</td>
</tr>
<tr>
<td>Average maintained at ingress/egress (after dark)</td>
<td>20</td>
</tr>
<tr>
<td>Minimum at ingress/egress (after dark)</td>
<td>7</td>
</tr>
<tr>
<td>Maximum at ingress/egress (after dark)</td>
<td>50</td>
</tr>
<tr>
<td>Average maintained at entrance, exits, stairs, and elevator lobbies</td>
<td>20</td>
</tr>
<tr>
<td>Average maintained in occupied spaces</td>
<td>10</td>
</tr>
</tbody>
</table>

5.2 POWER DISTRIBUTION

a. Provide electrical convenience outlets on each floor spaced approximately 200’ apart that are secured with a cover and lock.

b. For durability and maintenance reasons, exposed conduits are preferred. If, however, ASU or the Designer overseeing the project wishes to use an encased conduit system then plastic conduit with a grounding wire should be considered.

c. Future shell space power requirements to be provided to designer during the design phase.

d. Backup power should be provided per ASU Project Guidelines and are to include the following elements:

i. Elevators
ii. Emergency lighting

iii. CCTV

iv. Future shell spaces

e. A lightning protection system shall be provided.

f. Refer to ASU Design Guidelines Division 26 Electrical and the ASU Electrical Reliability Standard.

6 PLUMBING

6.1 DRAINAGE

a. All floor surfaces shall be positively sloped for drainage by a minimum of 1 ¼% (preferably closer to 2%) in any direction at any point. Care must be taken in a precast system to consider the residual camber of double-tees. Furthermore, warping stresses of the members should be minimized. Proceeding with the pouring of CIP concrete or the fabrication of precast concrete members is acceptance of the design as being adequate to provide positive drainage of water after industry construction and fabrication tolerances are considered. Contractor shall be responsible to see that all water positively drains to the drainage system. Care must be also taken in areas of accessible parking spaces and aisles where the maximum slope is 2%.

b. Drainage shall be towards the interior of the parking structure so that no vertical risers are visible on the perimeter façade.

c. Areas with cast-in washes or cast-in-place toppings should also be accounted for when draining to floor drains. Completed system must allow water to drain to the drains, minimizing any standing water on the floors. Washes are preferred to curbs in all applications.

d. Scupper openings shall be provided at the base of the shear walls, where applicable, at each level to allow drainage through the wall to the adjacent area drain.

e. Drain heads should be large with large net free areas. Use sediment bucket where possible. Minimum 6” deck drain pipes with no 90-degree connections and no pipes less than 6” diameter.

f. Provide an easily accessible clean-out on the parking structure for the drainage system.

g. Provide lockable deck drain covers to prevent vandalism.

h. Future shell space plumbing.

i. Refer to ASU Design Guidelines 22 13 00 Facility Sewerage.

6.2 PIPING

a. Horizontal plumbing lines should not decrease the minimum head room design of the facility.

b. All vertical utility lines, including risers, shall be protected by a steel pipe guard designed to resist bumper impact.
c. All pipe insulation should be protected with aluminum jacket to prevent damage from birds.

d. All piping should be run vertically within the interior of the garage and it is not desired to have them run on the perimeter.

e. Refer to ASU Design Guidelines 22 10 00 Piping Standards, 22 30 00 Plumbing Systems and 22 13 00 Facility Sewerage.

6.3 HOSE BIBS

a. Provide 1 ½” diameter minimum wash down hose bibs on each floor. System shall be designed to be manually drained down prior to each winter.

b. Minimally spaced 100’.

6.4 PIPE PROTECTION

a. Provide galvanized bumper guards at all plumbing leaders, downspouts and exposed electrical conduit. Guards should allow maintenance of the elements but provide strike zone protection from 9” to 30” above finished floor.

6.5 CODE REVIEW

a. Review local code for separation of roof water from typical level water collection.

b. Review code for need for oil separators. Where required, install an alarm to alert the parking management team when cleaning is required.

7 FIRE PROTECTION

a. It is preferred to maintain an openly ventilated parking structure to use a dry standpipe system and minimize the need for an automatic fire sprinkler system or alarm system. Future adjacent shell building space shall plan for a full coverage wet fire protection system.

b. Locate Siamese connections near the vehicular entrance and fire hydrant in coordination with local fire department reviews.

c. Provide for fire or smoke detectors at elevator lobbies per applicable code.

d. Interior fire department connections shall not be obstructed by a parked vehicle. A minimum 3’-0” access aisle shall be provided to these connection points.

e. Hose connections and valves shall not protrude in such a way as to present a safety hazard to pedestrians.

f. Refer to ASU Design Guidelines 21 10 00 Fire Suppression.
8 MECHANICAL

a. It is preferred to maintain an openly ventilated parking structure to minimize the need for mechanical ventilation.

b. Provide packaged terminal HVAC equipment for specialized spaces within the proposed parking structure that require cooling, electric heaters for spaces that require heating only, and an exhaust fan and louver systems for ventilation as required.

c. Refer to ASU Design Guidelines 23 05 00 HVAC.

9 SAFETY AND SECURITY

9.1 CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

Design should consider passive security systems including, but not limited to, the following designs/components:

a. Openings shall be incorporated into any enclosures (other than electrical, IDF and storage rooms) or walls and stair towers to allow clear visibility not only from the inside out, but from the outside in.

b. Provide openness to allow maximum natural light.

c. Minimize interior walls or corners which might be perceived as areas where people can lurk, and which will also minimize sight line obstructions for drivers.

   i) Shear walls - Minimize length of shear walls at end turning bays to minimize the sight line obstructions. In addition, provide openings (as large as possible) in the shear walls.

d. Use a well-lit and well-distributed lighting system (see recommended illumination as stated in the lighting recommendations section).

9.2 BLUE PHONES / CCTV

a. Security phones (call for assistance or blue light) are to be located adjacent to each of the stair towers on each level. Call for assistance stations shall have blue or other acceptable lights. Each station, when activated, should allow for two-way communication. The system shall ring the local officials as coordinated with the Owner. The system should have a one-year warranty for full maintenance and service per ASU Design Standards.

b. Closed circuit television (CCTV) cameras should monitor each vehicular entry/exit location, each pedestrian entry/exit location, parking office and each stair/elevator lobby per ASU Camera Standards.

   i. Blue Lights require 2 cameras.

   ii. Rooftop cameras planned to mount PTZ cameras.
9.3 DATA / BUILDING INFORMATION SYSTEMS (BIS)

a. Fire alarm, CCTV, emergency intercoms, and PV monitoring should be integrated into the campus Facility Management System.

b. Accommodate capacity for future shell space data/BIS.

c. Refer to ASU Design Guidelines 25 51 00 Facility Management System and 28 30 00 Fire Alarm System Codes and Standards.

10 SUSTAINABILITY

ASU will pursue Parksmart Certification through the Green Business Certification, Inc. (GBCI). The Designer should incorporate sustainable elements into the design and construction of the building. Some sustainability elements are noted below:

a. Energy efficient lighting fixtures which should be on a single photocell sensor contact per floor, or other control mechanisms can be considered. These controls either dim the lights or switch off the lights during periods of low usage in the parking structure or when ambient light is enough on the perimeter to allow fixtures to dim or shut off by floor section.

b. Low VOC: Traffic coatings, sealers, and other materials shall contain less than 400 g/L of VOCs.

c. Incorporate fly ash (a waste by-product) into the concrete mix designs.

d. Provide parking spaces reserved for low emission, hybrid, and electric vehicles.

e. Accommodation for future installation of rooftop photovoltaic cells similar to existing campus parking structures.

f. Native or drought-tolerant plants.