

4

Building Entrances and Exits

4.0 SCOPE

This section provides requirements for public entrances, entrance lobbies, patient drop-offs, and staff entrances. Reduce the number of public entrances to the minimum number required. Entrance requirements for specific functional areas, such as emergency department, loading dock, and other service entrances for mission critical facilities, are covered in Chapter 5. Specific requirements for security devices and their locations can be found in Appendix A, Security Door Openings, and Appendix B, Security System Application Matrix.

4.1 PUBLIC ENTRANCES AND LOBBIES

Public access to the facility should be restricted to a single or limited number of entrances.

4.1.1 Entrances

4.1.1.1 Public entrances: All public entrances to the In-Patient, Out-Patient, and Long-Term Care Facility shall have a screening vestibule that may be used when VA requires individuals entering the building to pass through access control and screening prior to entering the building lobby.

4.1.1.2 Staff entrances Staff entrances shall be located independently of main entrance lobbies and be convenient to staff parking.

4.1.2 Screening Vestibules

The screening vestibule shall have sufficient space and be provided with power, telecommunications, and data connections for installation of access control and screening equipment that may be used should the need arise. Prevent access from

drop-off to lobby in a straight line of travel and provide sufficient size to accommodate several people with mobility aids.

4.1.3 Public Entrances

4.1.3.1 Location: Vehicles may not approach within 50 feet (15 meters) of the entrance.

4.1.3.2 Doors: Entrance doors to the lobby shall be visible to or monitored by the security personnel in the main lobby and the Security Control Center.

4.1.3.3 Access within the facility: Access from the lobby to elevators, stairways, and corridors shall be controlled through the use of electronic access control or mechanical locking devices, limiting access to specific floors and areas that house functions requiring restricted access.

- Install elevator call buttons requiring use of key cards or other electronic access control when they are located in restricted areas.

4.1.4 Access for Emergency Responders

The Fire Command Center (FCC) and secure house key box for emergency responders shall be located near an entrance door at a location approved by the Project Manager. The door associated with the FCC shall be controlled and monitored by CCTV.

4.1.5 Planning, Construction Details, and Materials

4.1.5.1 Structural: The entrance itself shall be constructed to fail in a way that subjects persons inside or nearby to as little hazard as possible. (See Chapter 6, Building Envelope and Chapter 7, Structural.)

- Protection of entrances and lobbies from vehicle ramming must be accomplished outside and in front of the entrance. (See Chapter 3, section 3.4 Vehicle Barriers.)
- If a covered drop-off area is provided, its supporting structure shall be independent of the main building and protected from intentional and unintentional damage by vehicles.
- Separate the public lobby from the adjacent hospital areas with partitions that extend to the underside of the floor above.

4.1.5.2 Façade: Glazing in the lobby area shall be laminated glass.

4.1.5.3 Doors and hardware: Exterior doors shall be in size, operation, and other characteristics in compliance with applicable regulatory requirements. If doors

are lockable, they shall comply with emergency egress requirements. Refer to Program Guide PG-18-14, *Room Finishes, Door and Hardware Schedule*, and Appendix A, Security Door Openings, for additional requirements.

- Glass for entrance doors shall be laminated.
- Entrance doors shall be capable of being remotely locked and unlocked from the reception desk in the main lobby.
- Public entrance doors may be manually or power operated and may be swinging doors, horizontal sliding doors (power operated only), or revolving doors.
- Staff entrance doors shall prevent unauthorized access.
- Long-Term Care Unit shall be provided with electronic or mechanical locks on exterior doors as well as visual monitoring and voice communication with connection to information desk or security office.
- Staff entrance door hardware shall include either mechanical or electronic locks.
- Means of egress doors that do not also function as entrances shall be provided with delayed action and alarmed emergency egress hardware.

4.1.5.4 Receptacles: Letter boxes and receptacles for trash and smoking paraphernalia shall not be located within 5 feet (1524 mm) of load-bearing elements. Those within 50 feet (15 m) of the building shall be designed to prevent depositing of explosive charges or to contain explosions with a charge weight (defined in the *Physical Security Design Standards Data Definitions*) as directed by the Project Manager and coordinated with the structural engineer.

4.1.6 Security Monitoring

All public entrances require security monitoring. At public entrances create a “hard line” in the screening vestibule between the entrance and the lobby by providing a guard station with capacity to screen patients, visitors, and packages when screening is required.

4.1.6.1 Security guard stations: Guard stations shall be located at building entrances available to the public. Guard stations shall be located where pedestrian traffic can be monitored and controlled by security personnel. If guard stations are located outside, they shall be protected from weather and capable of being secured when not in use.

- Guard stations that are incorporated into a Security Control Center shall be separated from public areas with UL Level 3 bullet resistant construction.

- Guard stations that are not incorporated into an SCC shall be provided with a desk and capacity to communicate directly with the SCC.
- An intercom shall be provided from the front door to the guard station reception desk and SCC.

4.1.6.2 Screening devices: At all public entrances, where it may be necessary to screen all people entering a building, provide a screening vestibule. Provide the required connections for temporary installation of metal detectors and package screening equipment and sufficient space for their installation.

- Locate screening equipment in a manner that will prevent passage into the building or facility without passing through the devices.
- When screening devices are not permanently installed, provide secure storage in close proximity to their installation location.
- Locate screening equipment so as not to restrict emergency egress.

4.1.6.3 Security devices: CCTV cameras shall be provided to monitor activities in the vestibules and lobbies of new and existing mission critical facilities and shall be located to provide views of approaching pedestrian and vehicular traffic, drop-off areas, building entrances, and departing pedestrian and vehicular traffic.

4.1.7 Existing Facility – Entrances and Lobbies

4.1.7.1 Covered drop-off: Protect columns with anti-ram barriers such as bollards and from explosive devices by installation of barriers that prevent detonation within 18 inches (457 mm).

4.1.7.2 Screening Vestibules: Where space permits, provide a screening vestibule with the required connections for temporary installation of metal detectors and package screening equipment and sufficient space for their installation and of sufficient size to accommodate several people with mobility aids. Where possible arrange screening vestibule to prevent access from drop-off to lobby in a straight line of travel.

4.1.7.3 Glazing: Glazing in the lobby area shall be laminated glass or fitted with anti-fragmentation film.

4.1.7.4 Access within the facility: Modify existing elevator call buttons to require electronic access control to register calls when elevators open directly into restricted areas.

4.2 PATIENT DROP-OFFS

Patient drop-offs shall be located at primary building entrances or other locations that will provide convenient access to services without hindering the flow of traffic. Patient drop-off areas shall not be located near staff-only entrances.

4.2.1 Vehicular Access

Drop-offs and staging areas for vehicles, including public transportation vehicles, shall be separated from the main building structure by at least 50 feet (15 meters).

4.2.2 Parking

Parking shall not be permitted in patient drop-off areas.

4.2.3 Existing Facility – Patient Drop-offs

Patient drop-offs for existing mission critical facilities shall meet the requirements of 4.2.1 and 4.2.2.

4.3 BUILDING EXITS AND LIFE SAFETY CONSIDERATIONS

Means of egress shall not be obstructed by installation of security devices such as guard stations, screening equipment, or other security devices.

Delayed egress and alarmed exits shall comply with applicable codes and regulations.

4.3.1 Site Requirements

Provide an unobstructed and adequately lighted path from each means of egress to a safe location outside the building.

- Where the means of egress is accessible to persons with disabilities, provide an accessible route to a safe location outside the building.
- Where means of egress lead to loading docks or other service areas, direct users away from hazardous and pathological waste storage, mailrooms, and other areas that may be the source of injury or contamination.
- Plan and locate egress paths so that they are not obstructed by with anti-ramming barriers or other similar devices.

4.3.2 Planning, Construction Details, and Materials

Construction of building exits shall be consistent with the requirements for adjacent building envelope elements.

- Where laminated glass is required in nearby window openings, glazing for exit doors shall also be laminated.
- Where adjacent portions of the building require blast resistant construction, construct the means of egress with a similar level of protection.
- Means of egress doors shall be of construction that makes unauthorized entry from the exterior difficult. Provide hardware that minimizes the opportunity for unauthorized entry by using components such as continuous hinges and astragals.

4.3.3 Security Monitoring

Where means of egress do not also function as access points for the building, provide card reader for authorized users and delayed action, alarmed egress hardware to indicate unauthorized use.

- Provide CCTV cameras at locations with alarmed exits, at loading docks, and other areas subject to pilferage.
- Install door status monitors at doors intended to be used only for emergency egress.

4.3.4 Existing Facility – Building Exits and Life Safety Considerations

Existing facilities shall meet the requirements of section 4.3.

Functional Areas

5.0 SCOPE

This section discusses the specific spatial functional areas, their relationships, and adjacencies based on physical security requirements. Major renovations of existing functional areas within existing facilities shall bring the functional area into compliance with the requirements of this section. Functional areas not undergoing major renovation shall be brought into compliance with the requirements of this section for existing facilities. Additional requirements are shown in Appendix A, Security Door Openings, and Appendix B, Security System Application Matrix.

5.1 AGENT CASHIER

In addition to the requirements of this section: Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities*, #234 *Fiscal Service* shall remain in full force and effect; the requirements of VA Handbook 0730 *Security and Law Enforcement*, Appendix B, as they apply to fiscal services shall also apply; and VA Program Guide (PG-18-3) *Design and Construction Procedures* apply.

5.1.1 Adjacencies

The agent cashier shall be located with the transaction window facing a corridor accessible to public and employees, but not opening to a lobby. There shall be no openings to the exterior of the building.

5.1.2 Entrances

The agent cashier space shall be accessed by a door to a corridor which is accessible only to employees of the facility.

5.1.3 Construction

The agent cashier space shall be fully enclosed in 1-hour fire resistive construction extending from structural slab to structure above.

5.1.3.1 Partitions and openings: Partitions and teller windows facing the public corridor shall be UL Level 3 ballistic construction and 15-minute forced entry construction, including partitions, doors, glazed openings, teller windows, and transaction trays.

- All surrounding partitions and walls, floor, and ceiling shall be permanently constructed and attached to each other. To provide visual evidence of attempted entry, all construction, to include above the false ceiling and below a raised floor, shall be done in such a manner as to provide visual evidence of unauthorized penetration.
- Partitions and walls shall be reinforced, slab-to-slab, with 9-gauge expanded metal. The expanded metal shall be spot welded every 6 inches (150 mm) to vertical and horizontal metal supports of 16-gauge or greater thickness that has been solidly and permanently attached to the true floor and true ceiling.

5.1.3.2 HVAC: All vents, ducts, and similar openings in excess of 96 square inches (620 cm²) that enter or pass through an agent cashier space shall be protected with either bars or grills. If one dimension of the duct measures less than six inches (150 mm) or duct is less than 96 square inches (620 cm²), bars are not required; however, all ducts must be treated to provide sufficient sound attenuation. If bars are used, they must be 1/2 inch (12.7 mm) diameter steel welded vertically and horizontally six (6) inches (150 mm) on center; if grills are used, they must be of 9-gauge expanded steel.

- Openings in construction above ceilings or below raised access floors shall be protected as above.

5.1.4 Security

5.1.4.1 CCTV: The agent cashier space and the transaction window shall be monitored by CCTV.

5.1.4.2 Duress alarm: A duress alarm shall be provided in a location not visible to customers at the transaction window.

5.1.4.3 Door: Entrance door shall be controlled and monitored as SDO 209.

5.1.5 Existing Facility – Agent Cashier

Existing agent cashier areas shall provide the security requirements of section 5.1.4.

5.2 CACHE

In addition to the requirements of this section: Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities*, #268 *Pharmacy Service* shall remain in full force and effect; the requirements of VA Handbook 0730 *Security and Law Enforcement, Appendix B*, as they apply to pharmacy drug storage shall also apply to caches; and VA Program Guide (PG-18-3) *Design and Construction Procedures* apply.

5.2.1 Adjacencies

Pharmacy caches located within the main facility shall be on a corridor leading to the loading dock, but no closer than 50 feet (15 m) to the loading dock or mailroom. Pharmacy caches may be located in a separate building from the main facility on the VA facility site, subject to these requirements.

5.2.2 Entrances

Doors and frames to caches shall be opaque hollow metal, and shall be controlled and monitored as follows.

- From exterior to cache with no door from cache to interior of main building – SDO 211.
- From an interior corridor to the cache – SDO 211.

5.2.3 Construction

Caches shall be enclosed in Class 1 fire rated construction with surrounding construction 15-minute forced-entry resistant. Exterior construction shall be reinforced masonry or equivalent.

5.2.3.1 Partitions and openings: Interior partitions shall comply with the following when separating a cache from other building spaces, including corridors.

- Walls, floor and ceiling shall be permanently constructed and attached to each other. All construction, to include above the false ceiling and below a raised floor, shall be done in such a manner as to provide visual evidence of unauthorized penetration.
- Walls shall be reinforced, slab-to-slab, with 9-gauge expanded metal. The expanded metal shall be spot welded every 6 inches (150 mm) to vertical and horizontal metal supports of 16-gauge or greater thickness that has been solidly and permanently attached to the true floor and true ceiling.
- No windows or skylights shall be permitted in caches.

5.2.3.2 HVAC: All vents, ducts, and similar openings in excess of 96 square inches (620 cm²) that enter or pass through a perimeter partition of the cache shall be protected with either bars or grills. If one dimension of the duct measures less than six inches (150 mm) or duct is less than 96 square inches (620 cm²), bars are not required; however, all ducts must be treated to provide sufficient sound attenuation. If bars are used, they must be 1/2 inch (12.7 mm) diameter steel welded vertically and horizontally six (6) inches (150 mm) on center; if grills are used, they must be of 9-gauge expanded steel.

- Openings in construction above ceilings or below raised access floors shall be protected as above.

5.2.3.3 Electrical: All lighting, security devices, and refrigerators within the cache shall be on emergency power.

5.2.4 Security

Entrance doors to the cache and vault doors, if any, within the cache shall be monitored by CCTV.

5.2.5 Existing Facility – Cache

Existing caches shall comply with the requirements of section 5.2.

5.3 CHILDCARE/DEVELOPMENT CENTER

This section supplements Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #420 Childcare/Development Center* which shall remain in full force and effect. Childcare/development centers shall also meet the licensure requirements of the jurisdiction in which they are located.

5.3.1 Adjacencies

If located within a portion of a main VA facility, such as a hospital, childcare/development centers shall be located on the ground floor away from main building entrance with separate access area for drop-off and pick-up.

5.3.2 Entrances

Doors shall be provided with an intercom to the reception desk with remote access from the desk.

5.3.2.1 Public entrances: Doors to childcare/development centers, including the main entrance and secondary entrances, shall be controlled and monitored as SDO 112.

5.3.2.2 Emergency exits: Emergency egress doors from childcare/development centers shall be controlled and monitored as SDO 104.

5.3.3 Construction

No additional physical security requirements.

5.3.4 Security

All entrances, including drop-off and pick-up areas, playgrounds, and other outdoor areas where children may be while at the childcare/development center shall be monitored by CCTV.

5.3.5 Existing Facility – Childcare/Development Center

Entrances and security for existing childcare/ development centers shall comply with the requirements of sections 5.3.2 and 5.3.4.

5.4 COMPUTER ROOM

This section applies to the main computer room. In addition to the requirements of this section, NFPA 75: *Protection of Electronic Computer/Data Processing Equipment* shall apply.

5.4.1 Adjacencies

The main computer room shall be located not closer than 50 feet (15 m) in any direction to main entrance lobbies, loading docks, and mailrooms, and in no case directly above or below such spaces.

5.4.2 Entrances

Entrance doors to the main computer room and other computer rooms shall be controlled and monitored as SDO 216.

5.4.3 Construction

Surrounding walls and partitions shall be 1-hour fire resistive construction and extend from slab to slab.

5.4.3.1 HVAC: All vents, ducts, and similar openings in excess of 96 square inches (620 cm²) that enter or pass through the perimeter of a computer room must be protected with either bars or grills. If one dimension of the duct measures less than six inches (150 mm) or duct is less than 96 square inches (620 cm²) bars are not required; however, all ducts must be treated to provide sufficient sound attenuation.

If bars are used, they must be 1/2 inch (12.7 mm) diameter steel welded vertically and horizontally six inches (150 mm) on center; if grills are used, they must be of 9-gauge expanded steel.

- Openings in construction above ceilings or below raised access floors shall be protected as above.

5.4.4 Security

All doors shall have motion-activated CCTV camera coverage on the egress side of the door.

5.4.5 Existing Facility – Computer Room

Existing main computer rooms shall comply with the requirements of section 5.4.

5.5 COOP SITE

The Continuity of Operations (COOP) program is set forth in Federal Preparedness Circular (FPC) 67 of April 30, 2001, and as amended. This section supplements VA Handbook 0320 *Comprehensive Emergency Management Program* which shall remain in full force and effect. This section sets forth the requirements for national COOP sites. This section does not cover requirements for facility emergency operations centers or emergency command centers.

5.5.1 Adjacencies

The COOP space shall be located on the ground floor of the VA facility remote from the main entrance, loading dock, and mailroom. The interior doors to the COOP shall open to corridors not used by the public, infrequently used by facility staff, and leading to a secondary building entrance.

5.5.1.1 Other functions: A COOP space may be used for other purposes when not in use as a COOP, provided it can be made ready for COOP occupancy within the time specified in FPC 67.

5.5.1.2 Location in building: The COOP shall be on an exterior wall or, if located entirely internally, have direct access to a dedicated exterior entrance.

5.5.1.3 Site considerations: COOPs shall be provided with doors for emergency egress and receipt of supplies that lead to an inconspicuous outdoor space adjacent to the building and remote from the main entrance and from the service yard.

- Visually screen the outdoor space for delivery of supplies by Government-controlled vehicles.

- The entrance to the COOP shall be convenient to the helicopter landing pad, if one is on site.
- The door to the COOP shall be protected from vehicle ramming with passive vehicle barriers preferably designed as part of the landscape.

5.5.2 Entrances

5.5.2.1 Exterior doors: The exterior entrance to the COOP shall be through an opaque pair of UL 3 ballistic/15-minute forced entry doors monitored on the outside of the doors by CCTV and shall be controlled and monitored as SDO 233.

- An intercom shall be provided at the exterior to communicate with a COOP security officer at a location to be determined by the Project Manager.
- The electric strike shall be able to be unlocked by the COOP security officer above.

5.5.2.2 Interior entry doors: The interior door(s) to the COOP shall be opaque single or double leaf 15-minute forced entry construction and shall be controlled and monitored as SDO 233.

- Interior entry into the COOP shall be monitored on the outside of the COOP by CCTV.
- An intercom shall be provided at the exterior to communicate with a COOP security officer at a location to be determined by the Project Manager.
- The electric strike shall be able to be unlocked by the COOP staff person above.

5.5.3 Construction

5.5.3.1 Exterior walls: Construction shall be reinforced masonry, or equivalent construction, and shall be windowless.

5.5.3.2 Interior construction: Interior partitions between the COOP and surrounding spaces shall be 15-minute forced entry construction and extend from slab to slab.

- Walls, floor, and ceiling shall be permanently constructed and attached to each other. All construction, to include above the false ceiling and below a raised floor, shall be done in such a manner as to provide visual evidence of unauthorized penetration.
- Walls shall be reinforced, slab-to-slab, with 9-gauge expanded metal. The expanded metal shall be spot welded every 6 inches (150 mm) to vertical

and horizontal metal supports of 16-gauge or greater thickness that has been solidly and permanently attached to the true floor and true ceiling.

- Partitions surrounding the COOP and all doors in them shall have a Noise Isolation Class (NIC) of not less than 53.

5.5.3.3 HVAC: All vents, ducts, and similar openings in excess of 96 square inches (620 cm²) that enter or pass through the perimeter of a COOP must be protected with either bars or grills. If one dimension of the duct measures less than six inches (150 mm) or duct is less than 96 square inches (620 cm²) bars are not required; however, all ducts must be treated to provide sufficient sound attenuation. If bars are used, they must be 1/2 inch (12.7 mm) diameter steel welded vertically and horizontally six inches (150 mm) on center; if grills are used, they must be of 9-gauge expanded steel.

- Openings in construction above ceilings or below raised access floors shall be protected as above.

5.5.4 Security

All COOP CCTV shall be monitored by the COOP security officer and the facility security personnel in the Security Control Center.

5.5.5 Additional Requirements

The Project Manager will provide specific functional program needs, including occupancy population.

5.5.5.1 Duration of operation: The COOP shall be capable of operating for not less than thirty days independent of the host facility. The following services shall be maintained.

- Heating and cooling
- Power and light
- Potable water
- Fire extinguishment
- Sewage disposal from toilets and food preparation
- Communications

5.5.5.2 Functional area: The following shall be included in the design.

- Toilets for both genders – fully accessible in accordance with ADA and UFAS.
- Shower and change room with locker/storage for personal items.

- Break room with food preparation area and storage space for tableware and flatware, utensils, and cooking needs shall be provided.
- Food supplies will be presumed to be purchased from local sources and brought to the COOP as needed. Short-term holding for refrigerated and other consumable supplies shall be provided.
- Emergency treatment space shall be provided, but treatment for all but the most minor medical needs shall be presumed to be available in the host facility.

5.5.6 Existing Facility – COOP Site

Existing COOP sites shall be upgraded to meet the requirements of section 5.5. A new COOP in an existing building shall comply with the requirements of section 5.5.

5.6 EMERGENCY DEPARTMENT

This section supplements Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #262 Ambulatory Care (Hospital Based)*.

5.6.1 Adjacencies

5.6.1.1 Vehicular Access: Only ambulances and emergency vehicles shall be allowed within 50 feet (15 meters) of the emergency department entrance. No other vehicles or traffic shall be allowed within 50 feet of the emergency department entrance.

- Drop-offs and staging areas for vehicles, including public transportation vehicles, shall be separated from the main building structure by at least 50 feet (15 meters).

5.6.1.2 Functional adjacencies: Provide direct observation of the waiting room from the Police Operations Room and direct access through a door controlled and monitored as SDO 204.

- Locate adjacent Police and Security Service Operations Room or as close thereto as feasible.
- Locate at least 50 feet (15 m) from loading docks, mailrooms, and public lobbies.

5.6.2 Entrances

Provide separate entrances for ambulatory patients and patients arriving by ambulance.

Provide space for screening of pedestrians (see 5.6.4 Security).

- Exterior doors: Entrances from the exterior shall be controlled and monitored as SDO 105 and SDO 106.
- Interior entry doors: Entrances from the emergency (urgent care) area to the main building shall be solid core wood or hollow metal and controlled and monitored as SDO 201.

5.6.2.1 Existing Facility –Entrances: Replace existing glass with laminated glass or install anti-fragmentation film on existing glass near the emergency department entrance.

5.6.3 Construction

5.6.3.1 Anti-ram barriers: Install stationary (passive) anti-ram barriers to prevent damage by vehicles approaching the emergency department entrance.

5.6.3.2 Façade: Provide laminated glass in doors and windows within 50 feet (15 m) of the emergency department entrance.

5.6.3.3 Construction separation: Separate treatment area and nurses' station from waiting area and entrances with full height construction.

5.6.3.4 HVAC: Locate all outdoor air intakes at least 100 feet (31 m) from ambulance parking areas.

5.6.4 Security

Provide a guard station and secondary SCC or direct connection to the SCC, with capacity to screen patients, visitors, and packages at the ambulatory patient entrance.

5.6.4.1 Exterior: Provide CCTV cameras capable of monitoring activity at the ambulance entrance and ambulance parking area and that display in the primary and secondary SCC.

5.6.4.2 CCTV Provide CCTV monitoring of ER Reception/waiting room and entrance from the exterior.

5.6.4.3 Intrusion detection: Provide door and lock status sensors and motion detectors in public toilets.

5.6.4.4 Duress alarm: Provide duress alarm for receptionist.

5.6.5 Existing Facility – Emergency Department

Existing emergency (urgent care) areas in existing buildings shall meet the requirements of sections 5.6.2 and 5.6.4.

5.7 EMERGENCY AND/OR STAND-BY GENERATOR ROOM

This section supplements Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #230 Engineering Service*.

5.7.1 Adjacencies

Emergency and/or stand-by generators and related switchgear may be located in a separate structure from the main building or within the main building.

5.7.1.1 Elevation: The generator room shall not be located at an elevation subject to flooding at any time. Refer to the FEMA flood map for information.

5.7.1.2 Location in building: If within a main building such as a medical center, the generator room shall not be located closer than 50 feet (15 m) of a loading dock/receiving area or mailroom, and shall not be located beneath such facilities.

5.7.1.3 HVAC: Areaways and louver openings serving the generator shall not open to the service yard for the loading dock.

5.7.2 Entrances

5.7.2.1 Exterior doors: Entrances from the exterior shall not open to the loading dock service yard. Doors shall be hollow metal and controlled and monitored as SDO 111.

5.7.2.1 Interior entry doors: Entrances from the interior of the building shall be 2-hour fire resistive construction and shall be controlled and monitored as SDO 228.

5.7.3 Construction

Emergency and/or stand-by generators and related switchgear shall be surrounded by 1-hour fire resistive construction.

5.7.4 Security

Generators shall be monitored in the SCC as well as at the engineering control center.

5.7.5 Existing Facility – Emergency and/or Stand-by Generator Room

Where generators are adjacent to loading docks, mailrooms, or other potentially hazardous locations or may be subject to damage due to structural collapse, a blast mitigation analysis shall be performed and mitigation measures of hardening or relocation shall be taken.

- Doors shall be controlled and generators shall be monitored as required by sections 5.7.2 and 5.7.4.

5.8 ENERGY CENTER/BOILER PLANT

In addition to the requirements of Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #230 Engineering Service*, the following shall be required.

5.8.1 Adjacencies

The energy center/boiler plant may be located within a main building or in an independent building. If in an independent building, see Chapter 3 for site planning requirements.

5.8.1.1 Elevation: The energy center/boiler plant, including emergency and/or stand-by generators and switchgear, and engineering control center, and access to fuel tanks, shall not be located at an elevation subject to flooding at any time. Refer to the FEMA flood map for information.

5.8.1.2 Location in building: If within a main building such as a medical center, the energy center/boiler plant shall not be located closer than 50 feet (15 m) of a loading dock/receiving area or mailroom and shall not be located beneath such facilities.

5.8.1.3 HVAC: Areaways and louver openings serving the energy center/boiler plant shall not open to the service yard for the loading dock and mailroom.

5.8.2 Entrances

The energy center/boiler plant shall not be entered from the service yard for the loading dock and/or mailroom.

- Doors from the exterior to the energy center shall be controlled and monitored as SDO 111.
- Doors from the energy center to the interior of a main building shall be controlled and monitored as SDO 228.

5.8.3 Construction

No additional physical security requirements.

5.8.4 Security

CCTV shall be provided to monitor any entrance to the energy center/boiler plant from the exterior.

5.8.5 Existing Facility – Energy Center/Boiler Plant

Access to the energy center/Boiler Plant shall be controlled and monitored as required by sections 5.8.2 and 5.8.4.

5.9 LOADING DOCK AND SERVICE ENTRANCES

5.9.1 Adjacencies

Loading docks shall be adjacent to, but structurally separate from, any VA facility.

5.9.1.1 Acceptable adjacencies: Loading docks may be located immediately adjacent the following areas.

- Service yard
- Trash containers
- Freight elevators
- Non-critical bulk storage
- Mailroom
- Non-critical support areas such as laundries and maintenance spaces.

5.9.1.2 Prohibited adjacencies: Loading docks shall not be located adjacent to or within 50 feet (15 m) of the following.

- COOP
- Fire Control Centers
- Security Control Center and Police Command Center
- Emergency or stand-by generators
- UPS
- Water storage – domestic and fire
- Main electrical switchgear

- Main utility service entrances
- Emergency egress from main building
- Childcare/development centers
- Flammable liquids or gas storage
- Outdoor air intakes

5.9.1.3 Coordination with vivarium: Research animals and animal pathological waste shall have separate loading dock facilities, but may be served by the same service yard as the general loading dock.

5.9.2 Entrances

Pedestrian doors, stairs, and ramps associated with loading docks shall be restricted to authorized personnel and be separated from the loading platform by not less than 4 feet (1.2 m) to discourage by-passing the entry door controls through the loading platform and other doors.

Provide electronic locks and door status monitors on doors serving loading docks.

- **Exterior doors:** Exterior pedestrian entrance doors and frames shall be constructed of heavy duty hollow metal and shall be controlled and monitored as SDO 107 and SDO 108.
- **Interior entry doors:** Doors and frames from the mailroom to the interior of the building shall be 2-hour fire resistive construction and controlled and monitored as SDO 228.

5.9.3 Construction

5.9.3.1 Structural: Structure shall be designed to sustain an explosion from a charge weight (defined in the *Physical Security Design Standards Data Definitions*) within the loading dock and receiving area as directed by the Project Manager.

5.9.3.2 Interior partitions: The loading dock and receiving area shall be separated from the corridors and spaces adjoining with reinforced masonry walls and doors of hollow metal construction controlled and monitored as SDO 228.

5.9.3.3 Secured storage: Provide secure storage areas for delivered items awaiting uncrating and distribution within the facility and for hazardous and pathological waste.

5.9.3.4 HVAC: Locate all outdoor air intakes at least 100 feet (31 m) horizontally and 30 feet (9 meters) vertically from parking areas or on roof away from the roof line.

5.9.3.5 HVAC: Air serving the loading dock and receiving areas shall not circulate to other parts of the building.

5.9.4 Security

A minimum of 400 ft² (37 m²) shall be provided within the receiving area for inspection and imaging of goods received.

5.9.4.1 Guard post: When a second guard post is provided for a building, it shall be located where the loading dock and associated doors can be seen and door status and other access control devices monitored by the guard.

- The guard's office may be near the loading dock supervisor or manager.
- Doors to the guard booth shall be controlled and monitored as SDO 114.

5.9.4.2 Exterior: Install CCTV cameras to provide surveillance of all loading dock areas, including the gate, vehicle inspection areas, service yard and various containers, parked vehicles, loading and unloading activities, and building entrances at the loading dock

5.9.4.3 CCTV: The loading dock, including vehicles parked at the dock, shall be monitored by CCTV.

5.9.4.4 Access control: Dock lift controls shall be secured with a card reader device to prevent unauthorized use for entry.

5.9.5 Additional Requirements

Loading docks shall be served from service yards enclosed by a secure fence or wall and power-operated sliding gate, controlled by card access device and/or remote release and operation by a guard, the dock manager, or other authorized person with intercom and CCTV ID.

5.9.5.1 Vehicle access: Vehicle access to the loading dock shall be restricted.

- Approaches to loading docks shall be configured to minimize the possibility of high speed approach by any type of vehicle.
- Where the entrance gate to a service yard is directly from a public right-of-way, deployable vehicle barriers shall be provided on the inside of the gate, and shall be integrated with gate controls.

- Provide an area for the inspection of delivery vehicles that will not interfere with the flow of traffic on public rights of way, the site, or the loading area.

5.9.5.2 Service yards: The yard shall be segregated from other vehicle and pedestrian traffic areas by screen walls.

- Delivery vehicle maneuvering and parking shall be within an enclosed service yard accessed by delivery vehicle roadways leading directly from the site perimeter.
- Trash, medical/pathological waste, and other containers, compactors, and other similar equipment shall be located within the enclosed service yard and under CCTV surveillance.

5.9.6 Existing Facility – Loading Dock and Service Entrances

Loading docks in existing facilities may remain in their original locations. Enclosed service yards as described in section 5.9.5.2 shall be provided. Existing loading docks shall meet the requirements of section 5.9.3.2 and the following.

5.9.6.1 Inspection area: A minimum of 400 ft² (37 m²) shall be provided within the receiving area for inspection and imaging of goods received.

5.9.6.2 Structural hardening: When located within the main building, structural columns passing through the loading dock and receiving area and floor slabs above the loading dock and receiving area shall be structurally hardened to sustain an explosion within the loading dock or receiving area from a charge weight (defined in the *Physical Security Design Standards Data Definitions*) as directed by the Project Manager.

5.9.6.3 Adjacencies: Research laboratories and vivariums in existing buildings may be served by existing loading docks; however, loading of animals and removal of animal pathological waste shall be screened from public view and shall be within a controlled access yard or area.

5.10 MAILROOM

5.10.1 Adjacencies

Mailrooms may be located in the main building or in a separate structure on the site shared with loading dock, storage, and other non-critical functions. Mailrooms within the main building shall be located on an exterior wall.

5.10.1.1 Location: Mailrooms within the main building shall be located on an exterior wall and adjacent to the loading dock.

5.10.1.2 Acceptable adjacencies: Mailrooms may be located immediately adjacent the following areas:

- Service yard
- Trash containers
- Loading dock
- Freight elevators
- Non-critical bulk storage
- Non-critical support areas such as laundries and maintenance spaces

5.10.1.3 Prohibited adjacencies: Mailrooms shall not be located adjacent to or within 50 feet (15 m) of the following.

- COOP
- Fire Control Centers
- Security Control Center and Police Command Center
- Emergency or stand-by generators
- UPS
- Water storage – domestic and fire
- Main electrical switchgear
- Main utility service entrances
- Emergency egress from the main building
- Childcare/development centers
- Flammable liquids or gas storage
- Outdoor air intakes

5.10.2 Entrances

5.10.2.1 Exterior doors: Exterior entrance doors and frames shall be constructed of heavy duty hollow metal and shall be controlled and monitored as SDO 111.

5.10.2.2 Interior entry doors: Doors and frames from the mailroom to the interior of the building shall be 2-hour fire resistive construction and controlled and monitored as SDO 203.

5.10.3 Construction

When located within the main building, structural columns passing through the mailroom and inspection area and floor slabs above them shall be structurally hardened to sustain an explosion within the mailroom or inspection area from a charge weight (defined in the *Physical Security Design Standards Data Definitions*) as directed by the Project Manager.

5.10.3.1 Mailboxes: Mailboxes, when provided, shall be in a separate room from the mailroom and inspection area, and shall comply with the mounting heights and other regulations of the US Postal Service.

5.10.3.2 Interior partitions: The mailroom shall be separated from the mailbox room, corridors, and spaces adjoining with reinforced masonry walls and doors of hollow metal construction.

5.10.4 Security

A minimum of 400 ft² (37 m²) shall be provided within the receiving area for inspection and imaging of mail received. This may be space shared with the loading dock inspection area.

5.10.4.1 CCTV: The mailroom, including the inspection area, and the exterior loading area serving the mailroom shall be monitored by CCTV.

5.10.5 Additional Requirements

Air serving the mailroom shall not circulate to other parts of the building.

5.10.6 Existing Facility – Mailroom

Existing mailrooms shall comply with the requirements of section 5.10.

5.11 PHARMACY

In addition to the requirements of this section: Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #268 Pharmacy Service* which shall remain in full force and effect; the requirements of VA Handbook 0730 *Security and Law Enforcement, Appendix B*, as they apply to pharmacy drug storage apply; and VA Program Guide (PG-18-3) *Design and Construction Procedures* apply.

5.11.1 Adjacencies

Deliveries to and shipments from pharmacies may be via the main loading dock and service yard. Pharmacies shall not be immediately adjacent the loading dock or mailroom.

5.11.2 Entrances

No additional physical security requirements.

5.11.3 Construction

No additional physical security requirements.

5.11.4 Security

Provide CCTV monitoring of pharmacy dispensing area, vault entrance, and controlled substance storage.

5.11.5 Existing Facility – Pharmacy

Existing pharmacies shall comply with the requirements of section 5.11.4.

5.12 POLICE OPERATIONS ROOM AND HOLDING ROOM

This section supplements the following documents which shall remain in full force and effect: Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #279 Police and Security Service* and VA Handbook 0730 *Security and Law Enforcement*.

5.12.1 Adjacencies

5.12.1.1 Police operations room: Shall be located, in accordance with VA Handbook 0730, on the first floor of the main patient care building adjacent to the highest potential trouble area, such as admissions, emergency or urgent care room, or lobby and shall be located to allow appropriate response and deployment to respond to a security related event.

5.12.1.2 Holding room: Shall be located within or adjacent to the police operations room.

- An additional holding room may be located within or adjacent to a perimeter screening facility.

5.12.2 Entrances

5.12.2.1 Police operations room: Doors shall be from a corridor used only by staff and shall be controlled and operated as SDO 204.

5.12.2.2 Holding room: Doors and frames shall be heavy gauge hollow metal steel construction and door hardware shall be 15-minute forced entry rated controlled and monitored as SDO 205.

5.12.3 Construction

5.12.3.1 Police operations room: When the police operations room is adjacent to or opens onto areas occupied by unscreened public, such as lobbies, emergency rooms, and public corridors, construction, including partitions from slab to slab, doors, windows, and other openings separating the unit from such spaces, shall be 1-hour fire resistive, UL level 3 ballistic-resistant.

5.12.3.2 Holding room: Construction of the holding room shall be 15-minute forced entry resistant and as follows.

- Walls shall be constructed of reinforced masonry extended to the underside of the structure above; drywall and steel stud construction shall not be used.
- Door frames shall be grouted solid and anchored into the masonry walls.
- An observation window consisting of reflective glass protected by clear polycarbonate shall be provided.
- The interrogation table shall be firmly anchored to the floor and to one wall.
- Shackle hasps shall be anchored to wall construction and be capable of resisting pullout of not less than 250 pounds (114 kg).

5.12.4 Security

CCTV surveillance shall be provided of the entire room through an opening glazed with transparent polycarbonate in a steel frame firmly anchored to the wall. If requested by the Project Manager, the CCTV camera shall be covert and use lenses made for the purpose.

5.12.5 Existing Facility – Police Operations Room and Holding Room

Existing police operations rooms and holding rooms in existing facilities, when a police operations room opens directly to other parts of the building, including corridors and elevator lobbies, partitions and control doors shall be constructed to separate the lobby as required by section 5.12.2 and 5.12.3.

5.13 RECORDS STORAGE AND ARCHIVES

In addition to the requirements of this section, Department of Veterans Affairs publication, *Essential Records Vulnerability Assessment* (October 2003) shall apply.

5.13.1 Adjacencies

Records storage rooms shall be located not nearer than 50 feet (15 m) in any direction

from main entrance lobbies, loading docks, and mailrooms and in no case directly above or below such spaces.

5.13.2 Entrances

Entrances to archival storage spaces, including book stacks, computer main frames, and valuable or historical records and collections shall be controlled and monitored as SDO 213.

- Emergency egress doors from archival storage spaces shall be controlled and monitored as SDO 104 and shall have motion-activated CCTV camera coverage of the egress side of the door with all device monitors at a central location within the archival or library area.

5.13.3 Construction

Records storage rooms shall comply with National Archives and Records Administration (NARA) *Facility Standards for Records Storage Facilities – Part 1228, Subpart K*.

- Where electronic media or data storage facilities are essentially computer rooms, the area shall comply with the requirements of section 5.4.

5.13.4 Security

Archives for rare and valuable artifacts and documents shall be provided with motion detectors and CCTV.

5.13.5 Existing Facility – Records Storage and Archives

Existing records storage facilities shall comply with sections 5.13.2 and 5.13.4.

5.14 RESEARCH LABORATORY AND VIVARIUM

This section supplements Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities, #278 Research and Development* which shall remain in full force and effect. The requirements of *Laboratory Security and Emergency Response Guidance for Laboratories Working with Select Agents* (CDC Biosafety in Microbiological and Biomedical Laboratories (BMBL) 4th Edition, Appendix F) shall apply to facilities storing and handling select agents. (Select agents shall be as defined in Title 42, CFR, Part 73, including pathogens and toxins regulated by both DHHS and USDA and non-overlap select agents of DHHS.) Veterinary Medical Unit vivarium spaces shall comply with AAALAC accreditation requirements.

5.14.1 Adjacencies

Laboratories and other spaces storing or using select agents may be in an independent building or within a building such as a medical center.

5.14.1.1 Shared occupancy: When located within a building with other occupancies, the laboratory shall be located on a corridor restricted to authorized employee use.

5.14.1.2 Select agents: Laboratories and other facilities using select agents shall be located no closer than 50 feet (15 m) from public lobbies, mailrooms, or loading docks.

5.14.2 Entrances

Research and vivarium entrances shall be located away from public areas.

5.14.2.1 Exterior doors: Entrances to the vivarium from the exterior of a building shall be controlled and monitored as SDO 102.

- Emergency egress doors from vivarium spaces shall be controlled and monitored as SDO 102. The door shall be covered by CCTV camera (recording only) from the vivarium side.

5.14.2.2 Interior entry and emergency egress doors: Entrances to the vivarium from non-vivarium uses of a building shall be controlled and monitored as SDO 222.

- Emergency egress doors from vivarium spaces shall be controlled and monitored as SDO 222. The door shall be covered by CCTV camera (recording only) from the vivarium side.
- Doors to rooms containing Select Agents shall be controlled and monitored as SDO 229.
- All laboratory and laboratory “neighborhood” doors from public corridors accessible to all building occupants (such as those used for emergency egress) shall be controlled and monitored as SDO 227.
- All doors from public corridors to shared support rooms such as cold rooms, dark rooms, instrument rooms, autoclave rooms, ice machines, and other equipment shall be controlled and monitored as SDO 227.
- Doors to any room used to store radioactive waste, ongoing experiments using radioactive materials, or similar use of radioactive materials shall be controlled and monitored as SDO 223.

- Doors to Irradiator facilities shall be controlled and monitored as SDO 223.
- Entries to the containment area for BSL-3 facilities shall be controlled and monitored as SDO 230.
- Doors from “dirty” corridors to “clean” corridors shall be provided with a sensor and alarm at a central point in the vivarium when such door is left open longer than 18 seconds.

5.14.2.3 Elevator entrances: Control of elevator access opening directly into the vivarium shall be by card reader device in the elevator cab, or, if the elevator is dedicated to vivarium use, at any landing from which the elevator can be called. The elevator entrance door at the vivarium shall be monitored by a CCTV camera in the space looking at the entrance.

5.14.3 Construction

5.14.3.1 Partitions: Storage rooms containing Category A select agents and irradiator rooms shall be enclosed by 15-minute forced entry-resistant construction as follows.

- Walls, floor, and ceiling shall be permanently constructed and attached to each other.
- All construction, to include above the false ceiling and below a raised floor, shall be done in such a manner as to provide visual evidence of unauthorized penetration.
- Walls shall be reinforced, slab-to-slab, with 9-gauge expanded metal. The expanded metal shall be spot welded every 6 inches (150 mm) to vertical and horizontal metal supports of 16-gauge or greater thickness that has been solidly and permanently attached to the true floor and true ceiling.

5.14.3.2 HVAC: All vents, ducts, and similar openings in excess of 96 square inches (620 cm²) that enter or pass through a perimeter partition must be protected with either bars or grills. If one dimension of the duct measures less than six inches (150 mm) or duct is less than 96 square inches (620 cm²) bars are not required. If bars are used, they must be 1/2 inch (12.7 mm) diameter steel welded vertically and horizontally six inches (150 mm) on center; if grills are used, they must be of 9-gauge expanded steel.

- Openings in construction above ceilings or below raised access floors shall be protected as above.

5.14.4 Security

5.14.4.1 CCTV: BSL-3 Laboratories and vivariums shall have CCTV coverage of internal laboratory spaces which shall be monitored by personnel within the containment area

- CCTV cameras shall be placed to monitor any loading dock or other animal receiving area if not already monitored as a part of a general loading/receiving area as provided in this chapter.
- All CCTV coverage of access to areas surrounding the containment area shall be monitored in the SCC.

5.14.4.2 Intercom: An intercom shall be provided at each entrance door to a designated office or work station in BSL-3 laboratories or vivariums.

5.14.4.3 Biometric: Biometric identification devices shall generally be located at the entrance to the ante room, but if the device is placed at the door from the ante room to the laboratory, it must be functional for personnel in biosafety garments.

5.14.4.4 Access control: Use of other access control systems within the vivarium, including those used for automated watering and/or environmental control and monitoring (such as Edstrom “Watchdog”), shall only be permitted by written authorization of the Project Manager.

5.14.5 Additional Requirements for Select Agent Storage

Facilities handling select agents shall be designed to afford maximum visibility of all areas for observation of use and handling of the select agents.

5.14.5.1 Storage: Storage of select agents (typically in refrigerators and/or freezers) shall be in a separate room.

5.14.5.2 Equipment: Refrigerators and freezers for storage of select agents shall be lockable and covered by CCTV (digitally recorded and monitored) placed to allow view of any person accessing the refrigerator or freezer.

5.14.6 Existing Facility – Research Laboratory and Vivarium

Existing laboratories and vivariums in existing facilities shall comply with the requirements of sections 5.14.2 and 5.14.4.

5.15 SECURITY CONTROL CENTER (SCC)

This section supplements the Program Guide (PG-18-9) *Space Planning Criteria for VA Facilities*, #279 *Police and Security Service* and VA Handbook 0730 *Security and Law Enforcement* which shall remain in full force and effect.

5.15.1 Adjacencies

The SCC shall be readily accessible to authorized personnel, but shall be inconspicuous and located in areas not frequented by the general public, and shall contain office space, support space, and monitoring equipment that is not visible to unauthorized personnel.

5.15.1.1 Main lobby: The SCC containing monitoring devices and security personnel shall not be adjacent to the main public lobby.

5.15.1.2 Fire command center: The SCC shall be adjacent the building fire command center (FCC) but shall not be accessible to persons using the FCC.

5.15.1.3 Police operations unit: The SCC may be connected to the police operations unit but the two areas shall be served by separate entrances and each area shall be fully functional without requiring access to the other.

5.15.1.4 Holding room: The SCC shall not include a holding room.

5.15.1.5 Back-up SCC: Where provided shall be at a remote location from the primary SCC and meet the requirements of section 5.15.

5.15.2 Entrances

The SCC shall be entered from a corridor beyond the control doors leading out of the lobby to the building interior. Doors to the SCC shall be controlled and monitored as SDO 204.

5.15.3 Construction

5.15.3.1 Partitions: The SCC shall be fully enclosed with UL Level 3 ballistic construction and 2-hour fire resistive construction, including partitions, doors, glazed openings, teller windows and transaction trays.

- Walls, floor, and ceiling shall be permanently constructed and attached to each other.
- All construction, to include above the false ceiling and below a raised floor, shall be done in such a manner as to provide visual evidence of unauthorized penetration.

- Walls shall be reinforced, slab-to-slab, with 9-gauge expanded metal. The expanded metal shall be spot welded every 6 inches (150 mm) to vertical and horizontal metal supports of 16-gauge or greater thickness that has been solidly and permanently attached to the true floor and true ceiling.
- Where raised access flooring is used for cable management in the SCC, all surrounding partitions shall be built from floor slab to ceiling slab or construction and sealed to an air tight condition.

5.15.3.2 HVAC: All vents, ducts, and similar openings in excess of 96 square inches (620 cm²) that enter or pass through a perimeter partition must be protected with either bars or grills. If one dimension of the duct measures less than six inches (150 mm) or duct is less than 96 square inches (620 cm²) bars are not required. If bars are used, they must be 1/2 inch (12.7 mm) diameter steel welded vertically and horizontally six inches (150 mm) on center; if grills are used, they must be of 9-gauge expanded steel.

- Openings in construction above ceilings or below raised access floors shall be protected as above.
- HVAC serving the SCC shall be independent of the system(s) serving the main lobby.

5.15.4 Additional Requirements

The entire SCC shall be on generator-backed power for 100% of its operating needs.

5.15.5 Existing Facility – Security Control Center (SCC)

Where the existing SCC does not meet the requirements of section 5.15, a secondary SCC that complies with the requirements of section 10.5.2.1 shall be provided.

Building Envelope

6.0 SCOPE

This section provides requirements for exterior walls other than load bearing walls; glazed façade fenestration and glazed atria; for roof structures, including skylights; and air intakes and exhausts servicing mission critical equipment but does not pertain to stacks and wall openings for non-critical equipment. These requirements are in addition to the requirements for conventional façade design, including the provisions for hurricane, earthquake, and any other extreme loading condition required by code. The magnitude of GP1, GP2, W1, and W2 are defined in the *Physical Security Design Standards Data Definitions* that shall be stored separate from this document.

Connecting corridor concourse and bridges and freestanding greenhouses shall be exempt from the requirements of Chapters 6 and 7. Physical security requirements for temporary buildings shall be determined on a case by case basis by the security staff having cognizance.

6.1 WALLS

6.1.1 Non-load Bearing Walls

Walls shall be designed to suffer damage but sustain a deformation no greater than L/30 in response to the calculated peak pressures and impulses resulting from the design level vehicle threat (W2) located at the stand-off distance, but no greater than GP2.

6.1.1.2 Supporting structure: Walls shall span from slab to slab and shall not be attached directly to gravity load bearing elements (such as columns and shear walls) unless an advanced analysis of the load bearing element demonstrates it can accept the maximum forces of the members framing into it without compromising its capacity.

6.1.1.3 Loads: Walls shall be able to accept the tributary loads transferred from glazed fenestration in addition to the design level pressures applied directly to their surface.

6.1.2 Existing Facility – Walls

No additional physical security requirements.

6.2 FENESTRATION

6.2.1 Façade Fenestration

All façade fenestration shall be designed to crack but fragments shall enter the occupied space and land on the floor no further than 10 feet (3 m) from the façade in response to the calculated peak pressures and impulses resulting from the design level vehicle threat (W2) located at the stand-off distance, but no greater than GP2.

6.2.1.1 Glass: Fenestration shall be constructed using debris mitigating materials such as laminated glass.

6.2.1.2 Glazing: The glass shall be restrained within the mullions with a sufficient bite or structural silicone adhesive to allow it to develop its post-damage capacity.

6.2.1.3 Mullions: The mullions shall be designed to accept the design level pressures while sustaining deformations no greater than $L/30$.

6.2.1.4 Curtainwall: Curtainwall framing members shall span from slab to slab and shall not be attached directly to gravity load bearing elements (such as columns and shear walls) unless an advanced analysis of the load bearing element demonstrates it can accept the maximum forces of the members framing into it without compromising its load bearing capacity.

6.2.2 Existing Facility – Fenestration

Façade fenestration shall be upgraded to meet the requirements of section 6.2.1. A mechanically anchored or wet glazed anti-shatter film may be used to satisfy the requirements of this section. The choice of film and the performance of the upgraded system shall be demonstrated using U.S. Government developed glass fragment hazard software. The means of attachment shall be based on the site specific features of the glass façade.

6.3 ATRIA

6.3.1 Atria

All vertical glass surfaces shall be designed to crack but fragments shall enter the occupied space and land on the floor no further than 10 feet (3 m) from the façade in response to the calculated peak pressures and impulses resulting from the design level vehicle threat (W2) located at the stand-off distance, but no greater than GP2.

6.3.1.1 Skylights: Skylights shall be designed to crack but remain in its frame in response to the calculated peak pressures and impulses resulting from the design level vehicle threat (W2) located at the stand-off distance, but no greater than GP2.

6.3.1.2 Glass: Atria shall be constructed using debris mitigating materials such as laminated glass.

6.3.1.3 Glazing: The glass shall be restrained within the mullions with a sufficient bite or structural silicone adhesive to allow it to develop its post-damage capacity.

6.3.1.4 Mullions: The mullions shall be designed to accept the design level pressures while sustaining deformations no greater than L/30.

6.3.1.5 Framing: Atria framing members shall be designed to continue carrying gravity loads while sustaining maximum allowable deformations.

6.3.2 Existing Facility – Atria

Atria shall be upgraded to meet the requirements of section 6.3.1. A mechanically anchored or wet glazed anti-shatter film may be used to satisfy the requirements of this section. The choice of film and the performance of the upgraded system shall be demonstrated using U.S. Government developed glass fragment hazard software. The means of attachment shall be based on the site specific features of the atria.

6.4 ROOFS

6.4.1 Roof Structure

Roof structure shall be designed to withstand the design level vehicle threat (W2) located at the stand-off distance, but no greater than GP2, while sustaining a deformation no greater than L/30. The blast loading shall take into account the presence of parapets, the diffusion of blast waves, and the spatial extent of the roof surface.

6.4.2 Skylights

Skylights shall be designed to crack but remain in its frame in response to the calculated peak pressures and impulses resulting from the design level vehicle threat (W2) located at the stand-off distance, but no greater than GP2.

6.4.2.1 Glazing: Skylight glass shall be restrained within the mullions with a sufficient bite or structural silicone adhesive to allow it to develop its post-damage capacity.

6.4.2.2 Mullions: The mullions shall be designed to accept the design level pressures while sustaining deformations no greater than L/30.

6.4.3 Penthouses Enclosing Mission Critical Equipment

Penthouse façade shall be designed to withstand the effects of hurricane wind loads and debris impact. Penthouse enclosures shall also be designed to resist the design level vehicle threat (W2) located at the stand-off distance to be consistent with the hardened intakes and exhausts, as described in section 6.5.1.

6.4.4 Existing Facility – Roofs

Skylights shall be upgraded to meet the requirements of section 6.4.

6.5 AIR INTAKES AND EXHAUSTS SERVICING MISSION CRITICAL EQUIPMENT

6.5.1 Intakes and Exhausts

Air intakes and exhausts shall be designed to minimize the blast over pressure admitted into critical spaces to the design level vehicle threat (W2) located at the stand-off distance by means of hardened plenums and structured baffles. The design shall deny a direct line of sight from the design level vehicle threat (W2) located at the stand-off distance to the critical infrastructure within.

6.5.1.1 Entrances and lobbies: Maintain positive pressure in lobbies and entrance areas.

- Locate all outdoor air intakes a minimum of 100 feet (31 m) from areas where vehicles may be stopped with their engines running.
- Locate all outdoor air intakes a minimum of 30 feet (9 meters) above finish grade or on roof away from the roof line.

6.5.1.1 Hurricane areas: Louvers in areas prone to hurricanes or wind-debris hazards shall be certified by the manufacturer to meet the following Florida Building Code tests: Uniform Static Air Pressure Test, Cyclic Wind Pressure Test, Large Missile Impact Test, and Wind Driven Rain Resistance Test.

6.5.2 Existing Facility – Air Intakes and Exhausts Servicing Mission Critical Equipment

Air intakes and exhausts shall be upgraded to minimize the extent of debris that may enter critical spaces in response to the design level vehicle threat (W2) located at the stand-off distance. Hardened plenums and structured baffles shall be installed when a major interior renovation is performed.

6.6 CALCULATION METHODS

All blast design and analysis, whether for new or existing construction, shall be performed in accordance with accepted methods of structural dynamics.

6.6.1 Design and Detailing

The performance of façade in response to blast loading is highly dynamic and often inelastic. Design and detailing of protected façade shall therefore be based on analytical methods that accurately represent the loads and response. Explosive test data, developed by an experienced testing facility approved by the U.S. Government (USG), may be used to supplement the analytical methods where a direct analytical representation is not feasible.

6.6.2 Blast Loads

Blast loads shall typically be developed using the semi-empirical relations of TM5-855 (CONWEP).

6.6.3 Dynamic Response

Dynamic structural response analyses shall be performed using either empirical data developed by an approved U.S. Government testing laboratory, simplified Single-Degree-of-Freedom (SDOF) analytical methods or advanced Finite Element Methods (FEM). Where simplified SDOF methods are used, the performance criteria shall be in accordance with established standards of practice developed by the USG. Where advanced FEM methods are used, the performance shall be demonstrated through interpretation of the calculated results.

