Ambulance Emergency Drop-off Design Guidelines

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Introduction

An Emergency Department Ambulance Drop-Off Area is where patients arriving to the Emergency Department by ambulance are offloaded by paramedics and conveyed to the Emergency Department. The goal of the Emergency Department Ambulance Drop-Off Area is to facilitate the safe and swift unloading of patients, decontamination of individuals (patients and paramedics), conveyance of patients to the Emergency Department, and decontamination of vehicle interiors. Characteristics of the Ambulance Bay Drop-Off Area include:

- Controlled and secure environment.
- Safe treatment of patients in the bay if required.
- Safe and timely conveyance of patients from the ambulance to the Emergency Department.
- Streamline flows recognizing that multiple ambulances will likely be carrying out the same process simultaneously.
- Ensure infection prevention and control.
- Avoid potential trips and falls for staff.
- Ensure overall cleanliness and organization of the environment.

Design Guidelines

1. Vehicular Circulation – Ambulance Drop-Off Area Access and Egress by Vehicle

1.1 A direct and dedicated vehicle access and egress pathways shall be provided from the local street network to the ambulance drop-off bay area to ensure safe building access for emergency vehicles and to minimize conflicts with other traffic. The access and egress pathway shall accommodate:

- 1.1.1 Clear “Emergency Vehicle Use Only” signage.
- 1.1.2 Minimal turns accommodating ambulance turning radius and avoiding blind spots.
- 1.1.3 Sight lines to enable drivers to assess decontamination and drop-off area capacity before entry.
- 1.1.4 Dual drive lanes to ensure continuous vehicle flow if one lane is obstructed.
- 1.1.5 Eliminate speed bumps in the area and approaches from the main access street(s)

1.2 If emergency patients arriving by helicopter to the site must be conveyed from the helipad to the Emergency Department via ground ambulance, a direct and dedicated vehicle access pathway to the Ambulance Emergency Drop-Off area from the helipad, with equivalent considerations to 1.1, shall be provided.

1.3 Continuous monitoring of the access and egress areas outside of the garage is required but should not include coverage of areas where patients are offloaded or where patient decontamination may occur.

1.4 Separate vehicle areas shall be provided near the Emergency Department Entrance for police and ambulance vehicles:

- 1.4.1 Police vehicles should be able to access the ambulance drop-off area if necessary.

1.5 Public access to the Emergency Department shall be distinct from emergency vehicle access and shall be well-marked to facilitate entry from public roadways.

2. Emergency Department Exterior Decontamination Area Under Canopy

2.1 The emergency exterior decontamination area should be approximately 45 m from the ambulance bay (depending on the constraints of the structures involved). The distance between the decontamination area and the ambulance entrance shall be at least 9.5 m.

2.2 Boundaries of this area shall be defined on the paved ground surface with a yellow paint line and the word "DECON" painted within these boundaries and signage.

2.3 Decontamination area shall be provided with:

- 2.3.1 Semi-permanent or portable/collapsible structures (curtains, tents, etc.) that will provide shelter from the environment, privacy, and some containment of the contaminant/infectious agent.
- 2.3.2 Two or more temperature-controlled shower heads installed at least 2 m apart.
- 2.3.3 A duplex electrical outlet corresponds to each installed shower head but is at least 1.25 m from any shower.
- 2.3.4 A separate spigot for attachment of a hose.
- 2.3.5 Secured access to the HCF telephone system
- 2.3.6 Exterior lighting that meets applicable requirements for wet areas.
- 2.3.7 Requirements for access to additional PPE beyond what paramedics have available within vehicles shall be evaluated on a project-by-project basis. If not provided within the decontamination area, a transparent workflow to obtain additional PPE from the Emergency Department without bringing contaminants into the Emergency Department shall be established.

2.4 Exterior Decontamination Area Flooring and Drainage:

- 2.4.1 Provide a trench drain and grates through the centre of the Decontamination Area.
- 2.4.2 Drainage grates should be designed not to hinder the movement of stretchers or wheelchairs.
- 2.4.3 The trench drain shall be 102 mm (4") wide, H-20 loading, pre-engineered manufactured system, with a 139-152 mm (5-1/2" - 6") wide cast iron or ductile iron grate, installed to the manufacturer's recommendations.
- 2.4.4 The trench drain shall be pre-sloped according to the manufacturer's recommendations.
- 2.4.5 Throughout the Decontamination Area, the floor shall be sloped 1% toward the drain to ensure drainage.
- 2.4.6 The drainage system should drain to a containment facility below grade.
- 2.4.7 Floors should be finished with an easy-to-clean, anti-slip surface and impervious to oil and grease.

2.5 Access shall be provided by a secure exterior automatic pedestrian door from the Exterior Decontamination Area directly to interior decontamination facilities within the Emergency Department.

- 2.5.1 Overhead heat capabilities above the entrance to the Emergency Department internal decontamination area should be provided.

3 Ambulance Emergency Drop-Off Garage

3.1 The environment shall be designed so that ambulances can unload patients in a secure, environmentally controlled and fully conditioned space.

3.2 The garage shall be planned to accommodate a one-way flow of vehicles from access to egress and a one-way flow of patients from ambulance offload to the Emergency Department.

- 3.2.1 The area should also support a clean-to-dirty flow.

3.3 The garage shall accommodate separate functional areas indicated with ground painting:

- 3.3.1 Patient Offload Bays
- 3.3.2 Patient Transfer Aisle

3.3.3 Work Areas
3.3.4 Clean Supply Storage
3.3.5 Vehicle Thru Aisle

3.4 Overhead garage doors (access and egress) shall be provided with the following considerations:

3.4.1 Separate overhead doors should be provided for access and egress of ambulances. An optional secondary egress door should be evaluated on a project-by-project basis based on drop-off activity and site vehicle traffic flows.

3.4.2 Overhead doors should accommodate a clearance of 14'.

3.4.3 Overhead doors should open at a recommended speed of 50 inches per second and a minimum speed of 10 inches per second.

3.4.4. Access by lights or sirens or proximity reader to open overhead doors shall be possible from the exterior and interior to facilitate rapid movement. Garage doors should be able to be remotely opened and closed from the ambulance (consider radio operated by I/C channel.

3.4.5. Garage doors will have electronic sensors and close automatically from an adjustable timer.

3.4.6. Manual operation of the garage doors should be easy to operate and not require excessive force.

3.4.7. Garage doors should have windows and reflective covering (mirror) to protect privacy in the bays.

3.4.8. A red/green or stop/go traffic light should be located adjacent to the overhead garage doors (access and egress) to make it clear to paramedics approaching the garage of capacity within the garage.

3.4.9. The material of overhead doors should not be rigid to ensure that ambulances can access and egress the garage if overhead doors are inoperable.

3.4.10. The location of ambulance doors relative to the location of ambulance drop-off bays in the garage should ensure that vehicles are not required to initiate a turn into a stall prior to entering the garage area.

3.4.11. Signage will be present to not walk or drive under moving doors.

3.4.12. Exterior clearance posts painted yellow will be installed to protect the moving door frames on either side.

3.5. Secure [1]pedestrian doors (access and egress) should also be provided – enabling paramedics to access the garage on foot.

3.6. Within the Ambulance Emergency Drop-Off Garage, Patient Offload Bays shall be planned with the following considerations:

3.6.4. The Patient Offload Bays shall directly connect to a clearly delineated Patient Transfer Aisle that provides a direct connection to an automatic door connecting to a vestibule with direct proximity to an Emergency Department Nurse Triage Desk.

3.6.5. The Patient Offload Bays shall accommodate:

3.6.5.1. The average number of incoming ambulances expected on site, which can be assessed with an evaluation of daily patient drop-offs during peak hours, typical offload times and offload delays.

3.6.5.1.1. For ease of planning, a rule of thumb of 10 patient drop-offs per stall may be considered. However, this number should be validated during planning.

[1] With access by proximity reader.

3.6.5.2. Clearly delineated areas for the parking of ambulances and the unloading of patients so that paramedic drivers know where to park. The unloading area shall accommodate patient offload by stretcher.[2]

3.6.5.3. Infrastructure for EV charging should include:

3.6.5.3.1. At minimum, a 240V/80A (19.2 kW) AC Level 2 networked/smart charger in each bay.

3.6.5.3.2. An electrical load management system to balance charging across bays based on priority and need and prevent overload.

3.6.5.3.3. For futureproofing, an option to upgrade to Level 3 DC charging.

3.7. Within the Ambulance Emergency Drop-Off Garage, two work areas shall be provided.

3.7.1. One work area shall include a cleaning supply cabinet, hand hygiene sink, eyewash station, soap dispenser, stainless steel counter, hand sanitizing dispenser, mop sink, industrial separated sink[3], broom/mop metal bins: sharps dispensing bin, biohazard waste bin, garbage bin, laundry bins.

3.7.1.1. The layout of the work area shall accommodate a 1 m radius of clearance around the hand hygiene sink and a separate 1 m radius of clearance around the mop sink.

3.7.1.2. Adjacent to the work area, wall hooks and a hose should be provided for hanging and cleaning of ambulance equipment.

3.7.1.3. A trench drain, equivalent to 3.16, is required adjacent to the work area.

3.7.2. A second work area shall accommodate a stainless-steel adjustable height counter, power outlets and a hand sanitizing dispenser.

3.7.2.1. An in-hospital phone to call /activate assistance.

3.7.3. A water outlet with hose that can extend to the ambulances themselves should be made available to paramedics in the ambulance bay for cleaning purposes.

3.8. A clean supply storage room shall be provided within the Ambulance Emergency Drop-Off Garage.

3.8.1. A hand hygiene sink shall be provided directly adjacent to the entrance to the clean supply storage room. This sink may be a part of the designated work area.

3.8.2. The size of the room shall not be less than 11 square meters and shall accommodate sufficient supplies for an average one-week operating period.

3.8.3. The room shall be located with convenient access to the back of ambulances parked in Patient Offload Bays.

3.8.4. The room shall not be exposed to direct airflow from the hospital or garage HVAC system.

3.8.5. Storage within the supply room shall be located away from the window.

3.8.6. Flooring shall be of seamless, impermeable, non-slip materials and should be able to withstand rolling equipment and provide minimal rolling resistance.

3.8.7. If supplies are not broken down on delivery, provision shall be made for very high volumes of cardboard outside the clean supply storage room.

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[2] A review of lifting practices will be required for each project to ensure that lifting by paramedics is minimized.

[3] An industrial separated sink with hot and cold water for filling/emptying pails and cleaning large equipment.

3.8.8. Wire racks should be used for shelving to prevent dust accumulation.

3.9. Within the Ambulance Emergency Drop-Off Garage, a thru aisle shall be located with a direct adjacency to the Patient Offload Bays.

3.9.1. The width of the thru aisle shall accommodate safe and unobstructed passage of EHS ground ambulances to be evaluated on a project-by-project basis.

3.9.2. Turning radii shall accommodate the safe movement of vehicles in excess of typical EHS ground ambulance lengths to be evaluated on a project-by-project basis.

3.9.3. Space may be provided adjacent to the Emergency Department entrance within the thru aisle with direct access to a Nurse Triage desk where ambulances with code patients can park. However, this should not impede the ability of ambulances to egress the garage from Patient Offload Bays.

3.10. Throughout the Ambulance Emergency Drop-Off Garage, access to equipment shall not be impacted by ambulance parking or movement.

3.11. Paramedics and ambulance vehicles should be able to access and egress from any location in the Ambulance Emergency Drop-Off Garage without having to move other vehicles.[4]

3.11.1. There should be sufficient space for each parked ambulance to fully open/close all doors when the bay is full without colliding with walls, pillars, equipment or other ambulances and to load and unload stretchers from the ambulance rear doors.

3.12. The ventilation system within the Ambulance Emergency Drop-Off Garage should minimize staff and patient exposure to vehicle fumes and other air pollutants, and adequate ventilation for vehicle exhaust shall be provided[5].

3.13. If the healthcare facility is installing alarm buttons (code White activation), the garage and, where determined, the hallway triaging/ED Delay area for paramedics will be included.

3.14. Adequate lighting is required throughout the Ambulance Emergency Drop-Off Garage.

3.15. Within the Ambulance Emergency Drop-Off Garage, hand sanitizer dispensers shall be located at reasonable distances, at all pedestrian access and egress points, and at the entrance to the Emergency Department Nurse Triage Area.

3.16. All patient offload bays are required to be equipped with installed tracks for dedicated mechanical ceiling lift systems, with motor specifications to be determined during planning.

3.16.1. Appropriate and reasonably available lifting equipment must be provided in close proximity to the garage.

3.16.2. Equipment such as transfer boards or slider sheets should be in well-marked locations within the Emergency Department directly adjacent to the Ambulance Emergency Drop-Off Area Garage.

3.17. Ambulance Emergency Drop-off Area Garage Flooring and Drainage:

3.17.1. Drainage grates should be designed so as not to hinder the movement of stretchers or wheelchairs movement.

3.17.2. Provide trench drains and grates through the centre of the ambulance garage.

3.17.3. Each trench drain shall be 102 mm (4”) wide, H-20 loading, pre-engineered manufactured system, with a 139-152 mm (5-1/2” - 6”) wide cast iron or ductile iron grate, installed to the manufacturer’s recommendations.

3.17.4. The trench drain shall be pre-sloped according to the manufacturer’s recommendations.

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[4] In typical or average operating circumstances.

[5] Between the ambulance garage and emergency department, a negative pressure vestibule should be provided.

3.17.5. Throughout the garage, the concrete floor shall be sloped 1% toward the drain to ensure drainage.

3.17.6. Floors and walls should be finished with an easy-to-clean, anti-slip surface and impervious to oil and grease.

3.17.7. Access from the garage to the emergency department must involve a flat floor.

3.18. All electrical infrastructure within the Ambulance Emergency Drop-Off Garage should be operable by a backup generator within the hospital.

3.19. Paramedics will have the ability to move from the garage to hospital areas unimpeded, and the public and patients will not have access to the ambulance vehicle area(s).

4. Additional Ambulance Overflow Parking

4.1. Outside of the Ambulance Emergency Drop-Off Area Garage, additional ambulance overflow parking should be provided with the following considerations:

4.1.1. Ambulance overflow parking should be immediately adjacent to the ambulance garage area.

4.1.2. Provide additional capacity for ambulances kept on site for dispatch to outgoing assignments outside of but close to the Ambulance Emergency Drop-Off Garage and include vehicle (shore power) drop plugs for charging and heating ambulances.

4.1.3. Ambulance overflow parking should be marked with signage indicating "Emergency vehicle parking only."

4.1.4. Police, Sheriff, ambulance awaiting dispatch, and other emergency vehicles should use the ambulance overflow parking when required.

4.1.5. Overflow parking area design should not hamper egress from the Ambulance Emergency Drop-Off Area Garage.

4.1.6. The overflow parking area should have equivalent lighting to the inside of the Ambulance Emergency Drop-Off Area Garage.

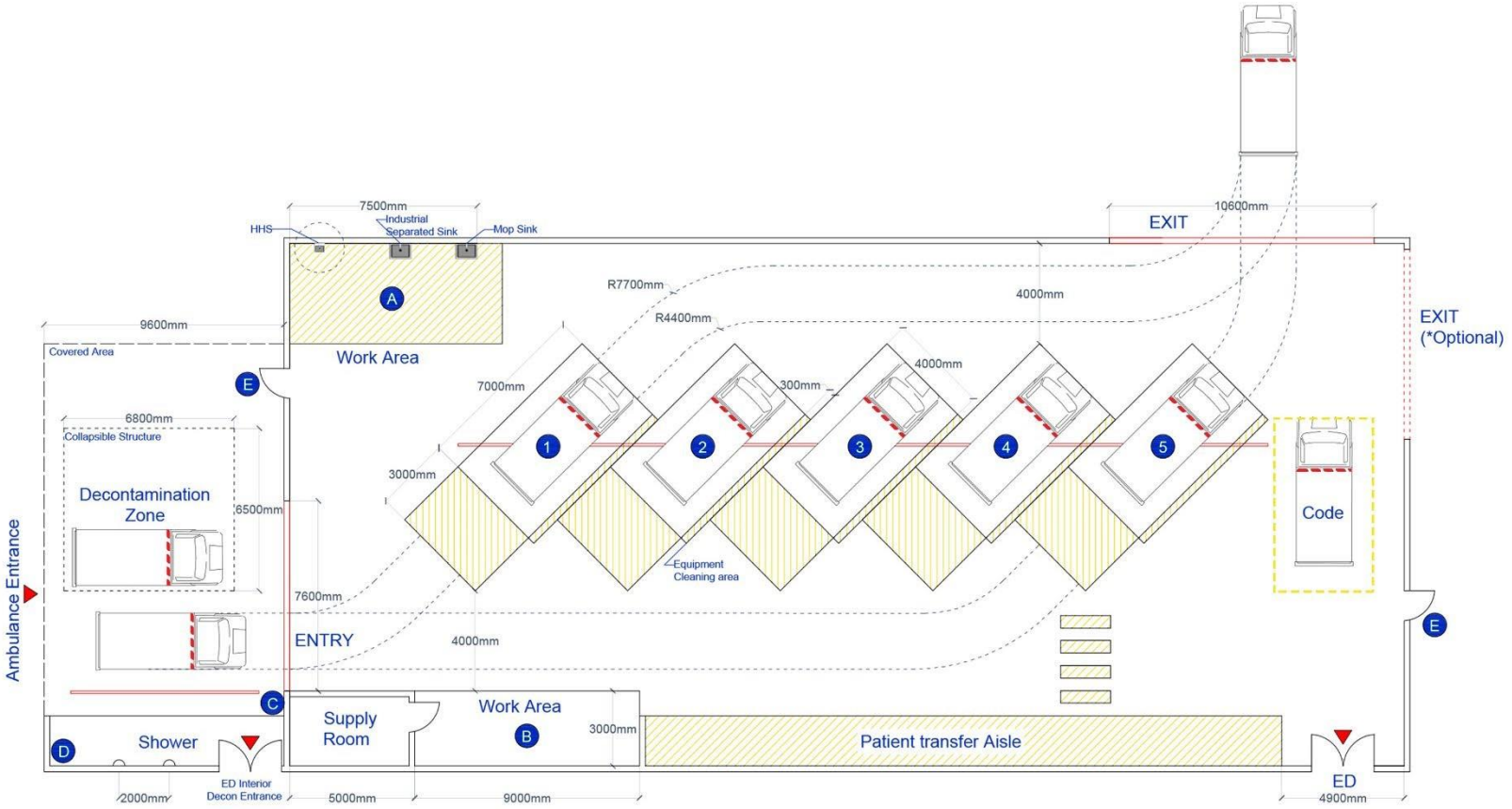
References:

PHSA Safe Patient Handling Standard. Effective Date November 22, 2016

CSA Z8000-18, Canadian Health Care Facilities

How Ideal Is Your Ambulance Bay? Canadian Paramedicine, September 2013

Ambulance Emergency Drop-Off Area Garage Indicative Planning Diagram



LEGEND

- (A) Work area accommodates a supply cabinets, hand hygiene sink, soap dispenser, stainless steel counter, hand sanitizing dispenser, mop sink, broom/mop, metal bins: sharps dispensing bin, biohazard waste bin, garbage bin
- (B) Work area accommodates stainless steel work surface at an adjustable height with plug ins, bulletin boards
- (C) Sensor to detect Ambulance Entry
- (D) Hose
- (E) Staff Entrance

Note: red lines indicates trench drains locations