



PREVENTATIVE MEASURES ANALYSIS:

A Preventive measure analysis (PMA) of the construction or renovation project described below has been undertaken in accordance with this Standard and incorporated into the project design development contract which includes drawings and specifications.

Reference:

*CSA Infection Control during Construction, Renovation, and Maintenance of Health Care Facilities -CAN/CSA-Z317.13-17

Brief description: (Completed by Project manager)

As part of the Bowmanville Redevelopment Project – Early Works, the project is proposing to complete the following work:

- Relocate Lambert House from current location (11 Mabel Bruce Way)
- Demolition of 3 Houses along Prince street on east side of the hospital
- Possible demolition of pad south of existing Lambert House
- Possible parking lot redevelopment

- Trees to be removed in preparation for construction
- Existing Lambert House site to be backfilled
- At new Lambert House location, work will include cutting back tree roots, excavating, footings and foundation construction, backfilling, site grading
- Hospital windows to be boarded as required
- Municipal and Regional Permits as required to allow Lambert House to travel along roadways
 - Signage removal, IT/Communication preparation work, lamp post removal
 - Decommissioning of all services (communication, hydro, IT, sewers, water etc) at existing location
 - Adding services at new location (communication, hydro, IT, sewers, water etc)
- Restoration and renovation work at the Lambert House at new location
- Removal and disposal of construction material
- Scaffolding, hoarding and fencing erection and teardown as required
- Temporary traffic and parking disruptions during construction
- Demolition of 3 Houses
 - Decommissioning of all services
 - Demolishing the building, signage and construction fencing/hoarding
 - Back Fill and parking redevelopment

*Work is being executed external to the Bowmanville Hospital (outside the hospital)

Preventative Measures Analysis (Completed by IPAC)

Population risk group	1, 2, 3, or 4	
Construction activity type	A, B, C, or D	
Preventative measure	I, II, III, or IV	

<u>Location of Construction:</u> Bowmanville Hospital site	<u>Project Start Date:</u> Oct 31, 2024	<u>Estimated Duration:</u> 2 years
<u>LHC Project Coordinator:</u> Maureen Wong	<u>Contractor</u>	<u>ICP:</u>
<u>PM's phone number:</u> 905.439.4819	<u>Contractor's phone number:</u>	<u>ICP's phone number:</u>

Background:

Construction can be a cause of hospital outbreaks that lead to significant infections. Workers need to be aware of the risks and the necessary precautions when they are working in a health care facility that has a large proportion of seriously ill and immunocompromised patients. Even non-patient care areas within the hospital can impact on patients, *e.g.*, contaminated air ducts, bandages, pharmacy supplies. Therefore, it is most important that the guidelines below are followed during construction. Please note that occasionally during construction, modifications are made to the original specifications. If these will change the level of construction activity, this assessment could need to be updated.

Table 1 **Population Risk Groups and Geographical Areas**
(See Clauses 5.3.2.4, 6.3.8.1, 6.5.2, 7.3.3.5, and 8.3.1.2.6 and Table 1.)

Population risk group	Typical areas
Group 1 Lowest risk	Office areas, Unoccupied wards, Public areas, Laundry and soiled linen sorting or storage areas, Physical plant workshops, Housekeeping rooms and closets
Group 2 Medium risk	Patient care areas, unless listed in Group 3 or Group 4, Outpatient clinics (except oncology and surgery), Admission and discharge units, Waiting rooms. Autopsy and morgue areas Occupational or Physical therapy areas remote from patient care areas
Group 3 Medium to high risk	Emergency (except trauma rooms), Diagnostic imaging, Labour and birthing rooms (without OR capability), Nurseries for healthy newborns, Nuclear medicine, Hydrotherapy, Echocardiography, Laboratories, General medical and surgical wards or units (includes all areas including soiled and clean utility rooms) Pediatric units, Geriatric units, Long-term care units, Food preparation, serving, and dining areas, Respiratory therapy, Clean linen handling and storage areas
Group 4 Highest risk	Intensive care units (ICU, PICU, NICU, etc.), Operating rooms (including prep induction, post-anaesthetic care unit (PACU), and scrub areas), Anaesthesia storage areas and workrooms, Oncology units and outpatient clinics, Transplant units and outpatient clinics, Inpatient units and outpatient clinics for patients with AIDS or other, immunodeficiency diseases, Dialysis units, Critical care nurseries Labour and delivery operating rooms, Cardiac catheterization and angiography Interventional radiology, Diagnostic Imaging, Cardiovascular and cardiology patient areas, Endoscopy, Pharmacy admixture rooms, Medical device reprocessing areas (wherever located), Central sterile supply, Clean and sterile storage, Burn care units, Animal rooms, Trauma rooms, Protective isolation rooms, Tissue culture laboratories, Bronchoscopy, Cystoscopy, Pacemaker insertion rooms Dental procedure rooms

Table 2 **Construction Activity Type**

Construction Activity type	Description
Type A	Inspection and non-invasive activities. These include, but are not limited to, <ul style="list-style-type: none"> a) activities that involve a single controlled opening in a wall or ceiling for minor work or visual inspection, that is accessed by <ul style="list-style-type: none"> i) removing no more than one ceiling tile; or ii) opening of an access panel on a wall or ceiling; b) painting (but not sanding) and wall covering; c) electrical trim work;

	<ul style="list-style-type: none"> d) minor plumbing work that disrupts the water supply to a localized patient care area (i.e., one room) for less than 15 min; and e) other maintenance activities that do not generate dust or require cutting of walls or access to ceilings other than as specified in item (a) above.
Type B	<p>Small-scale, short-duration (e.g., less than 2 h) activities that create minimal dust. These include, but are not limited to,</p> <ul style="list-style-type: none"> a) activities involving access to and use of chase spaces; b) cutting a small opening in a contained space where dust migration can be controlled, e.g., cutting of walls or ceilings to provide an access point for installing or repairing minor electrical work, ventilation components, telephone wires, or computer cables; c) sanding or repair of a small area of a wall; and d) plumbing work that disrupts the water supply of one or more patient care areas for less than 30 min.
Type C	<p>Activities that generate a moderate to high level of dust, cause a moderate service disruption, require demolition, require removal of a fixed facility component (e.g., a sink) or assembly (e.g., a countertop or cupboard), or cannot be completed in a single work shift. These include, but are not limited to,</p> <ul style="list-style-type: none"> a) activities that require sanding of a wall in preparation for painting or wall covering; b) removal of floor coverings, ceiling tiles, and casework; c) new wall construction; d) minor ductwork; e) electrical work above ceilings; f) major cabling activities; and g) plumbing work that disrupts the water supply of one or more patient care areas for more than 30 min, but less than 1 h.
Type D	<p>Activities that generate high levels of dust, activities that necessitate significant service disruptions, and major demolition and construction activities requiring consecutive work shifts to complete. These include, but are not limited to,</p> <ul style="list-style-type: none"> a) soil excavation; b) new construction that requires consecutive work shifts to complete; c) activities that involve heavy demolition or removal of a complete cabling system; or d) plumbing work that disrupts the water supply of more than one patient care area (i.e., two or more rooms) for 1 h or more.

Table 3 Construction Activity and Risk Group Matrix
Construction Activity Type†

Risk group*	Type A	Type B	Type C	Type D
Group 1	I	II	II	III/IV
Group 2	I	II	III	IV
Group 3	I	III	III/IV	IV
Group 4	I-III‡	III/IV	III/IV	IV

*CAN/CSA-Z317.13-17-(See Clauses 3.1, 6.5.1, 6.5.2, 7.1, 7.2.4.2, 7.5.3.1.)

Preventive measures checklist

Notes:

- 1) This informative Annex has been written in mandatory language to facilitate its use in HCF procedures.
- 2) The checklists in this Annex may be used in the implementation of preventive measures for the project. These should not be taken as comprehensive, as project-specific considerations could necessitate the addition or revision of specific items.
- 3) See Annex C for a sample preventive measures analysis form.

Preventative measures checklist					
Element		Compliance			Notes
		Yes	No	NA	
1.0	Level I measures				
1.1	High risk patients have been identified, who need to be temporarily moved away from work area or otherwise protected				
1.2	Patient care equipment and supplies have been removed or protected				
1.3	Work has been scheduled during periods of low user activity				
1.4	New materials are being kept clean and dry				
1.5	Methods are being used that minimize the generation and dispersion of dust (i.e., HEPA vacuums or drills)				
1.6	Water and/or ventilation systems have been identified that could be impacted				
1.7	Work areas are HEPA vacuumed and/or wet mopped as necessary throughout project and upon completion				
1.8	Plumbing is in accordance with CSA Z317.1				

Element		Compliance			Notes
		Yes	No	NA	
2.0	Level II measures - All Level I measures shall be implemented in addition to the following:				
2.1	Methods are being used that minimize dispersion of dust (i.e., HEPA vacuums or air handling units, poly barriers, drop sheets)				
2.2	Doors and openings are sealed with tape or poly				
2.3	HVAC system supply and return/exhaust air ducts are sealed or isolated				
2.4	Walk-off/tack mats are at entrance/exit to site and are being changed as needed				
2.5	Safe route is in place for transportation of clean/sterile supplies				
2.6	Traffic pattern has been established for construction workers that reduces and if possible avoids adverse impacts on care areas				
2.7	Proper debris removal procedures are in place (i.e., after hours removal, covered carts, carts wiped down before leaving site)				
2.8	Water lines in construction area are flushed for 10 min before patient occupancy				
2.9	Terminal clean is performed by housekeeping prior to patient occupancy				

Element		Compliance			Notes
		Yes	No	NA	
3.0	Level III and IV measures - All Level I and II measures shall be implemented in addition to the following:				
Before project begins					
3.1	Multidisciplinary team (MDT) meetings have been set up				
3.2	Essential services that could be disrupted have been identified				
3.3	Staff in the work area are aware of infection risks and are educated in risk mitigation measures as appropriate to their work activities				
3.4	ICRA form completed and signed by PM and ICP				
3.5	Process in place to ensure that any changes to project scope are reviewed with ICP/MDT				
3.6	Measures in place regarding plumbing system work and potential water disruptions: <ul style="list-style-type: none"> • Temperature limits established (CSA Z317.1) • Disruptions, if needed, have been scheduled during times of low user activity • Alternative potable water source available, if needed • Disinfection procedure completed on water systems affected by major plumbing activities (i.e., flushing, superheating, hyperchlorination) 				
3.7	Impermeable dust barrier erected from floor to the true ceiling, consisting of two layers of 6 mil poly and gypsum wallboard protective layer* <i>*According to Clause 6.6.1.2, the composition of the barrier may be modified where deemed appropriate by the MDT to suit time, space, or impact constraints. Alternative forms of construction or containment products may be used if they can be shown to provide an equivalent barrier.</i>				

3.8	<p>Anteroom (when required)*</p> <ul style="list-style-type: none"> • Large enough to enable materials to be moved through without having to open both doors at the same time • Barrier extends above false ceiling (either entrance or exit wall of the anteroom should be extended to the underside of the deck and any openings sealed) • Entry doors have gasketed frames and closers • Negative pressure: at least 2.5 Pa in anteroom relative to hospital zone • Walk-off tack mats at entry to anteroom door and inside anteroom <p>* Anterooms are required for Level IV work. For Level III/IV projects, the use of an anteroom is at the discretion of the MDT.</p>				
3.9	All seams/penetrations to work area are sealed (doors, plumbing, intake/exhaust vents, electrical outlets, screw heads, etc.), including those above false ceilings				
3.10	<p>Appropriate pressure differential established between work area and occupied areas:</p> <ul style="list-style-type: none"> • Minimum 7.5 Pa differential maintained • Pressure differential monitoring device in place and data logged • Device alarmed when deemed necessary by MDT 				
3.11	<p>Construction air handling unit(s) (CAHUs):</p> <ul style="list-style-type: none"> • Number of units needed to maintain necessary pressure differential for size of space has been calculated • HEPA filtration- DOP tested on site prior to start of project or within last 12 months (min.), with documentation • Filters changed as needed • Air is exhausted to the outside unless permitted by the multi-disciplinary team 				
3.12	Dedicated service elevator (if available) has been designated for use				
3.13	<p>Owner representatives, health care facility project managers, and key MDT members have taken the training provided by CSA Group, or equivalent, in the use and application of this Standard.</p> <p>Note: <i>The CSA training includes one day on the fundamental principles, and one day on implementation and practical application of this Standard.</i></p>				
3.14	Constructor's primary construction managers, project managers, and site superintendents have taken the training provided by CSA Group, or equivalent, in the use and				

	application of this Standard.				
3.15	Key subcontractors (HVAC, plumbing etc.) have taken the training provided by CSA Group, or equivalent, in the use and application of this Standard.				
3.16	Prime consultant and other key consultants (i.e., infection prevention and control) have taken the training provided by CSA Group, or equivalent, in the use and application of this Standard.				
During project					
3.17	Dust barrier integrity is inspected frequently and breaches are immediately repaired				
3.18	Dust suppression is being done within work area (water misting work surfaces, HEPA-filtered vacuums, walk-off sticky mats, etc.)				
3.19	HEPA vacuuming performed on mechanical and electrical equipment and interior cavities before installation of hard or T-bar ceiling, and the closing of walls				
3.20	Procedures and necessary equipment and PPE in place for construction workers to HEPA vacuum clothes or wear a containment suit prior to leaving construction area and entering patient care areas				
3.21	HVAC ductwork protected from dust and moisture (Standard specifies that ductwork must be stored in a clean area and ends sealed until installation)				
3.22	Dead leg water pipes in the plumbing system removed at the connection to the main line				
3.23	Building windows and doors kept closed and intake filters changed more frequently when excavation is taking place. Soil watered down as needed to minimize dust migration				

3.24	Determination of whether air sampling is needed has been made in consultation with the MDT prior to the start of work. If sampling to be done, provision has been made for <ul style="list-style-type: none"> • baseline sampling, • periodic or ongoing sampling during the work, and • procedures to follow if sampling results indicate that a problem exists 				
3.25	Members of the MDT conduct routine site visits throughout the project				
End of project					
3.26	If water lines are shut down or accessed during construction, they are flushed before reusing (minimum of 10 min). Consideration should be given to disinfecting water systems affected by major plumbing activities (superheating, hyperchlorination, etc.)				
3.27	Work area is thoroughly cleaned and barriers are cleaned before dismantling				
3.28	Air filters changed/cleaned as necessary in work areas and ventilation systems are functioning properly and are cleaned if contaminated during work activities				
3.29	Dust barriers/anterooms removed carefully to minimize dust migration				
3.30	Final visual inspection of the of the work area and terminal clean conditions achieved before patients are readmitted to the area				
3.31	Review is conducted after completion to assess the effectiveness of preventive measures and identify possible improvements				