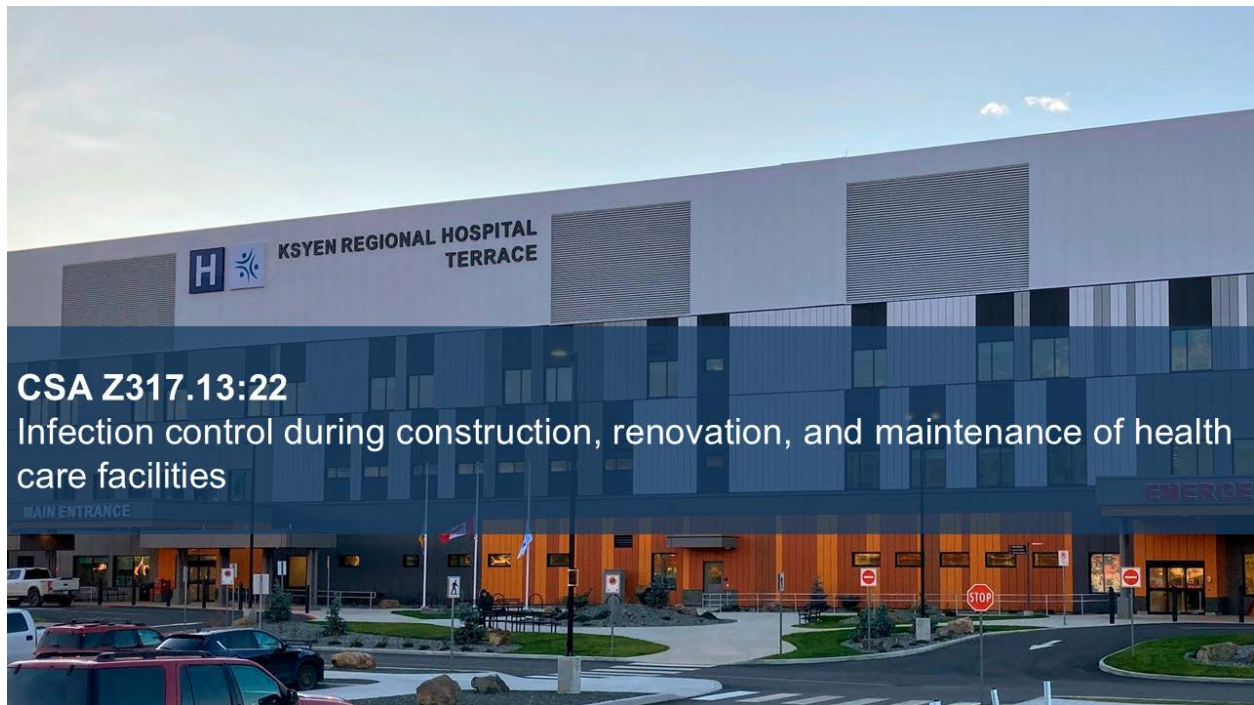


Construction Toolkit

Infection Prevention

February 2026



CSA Z317.13:22

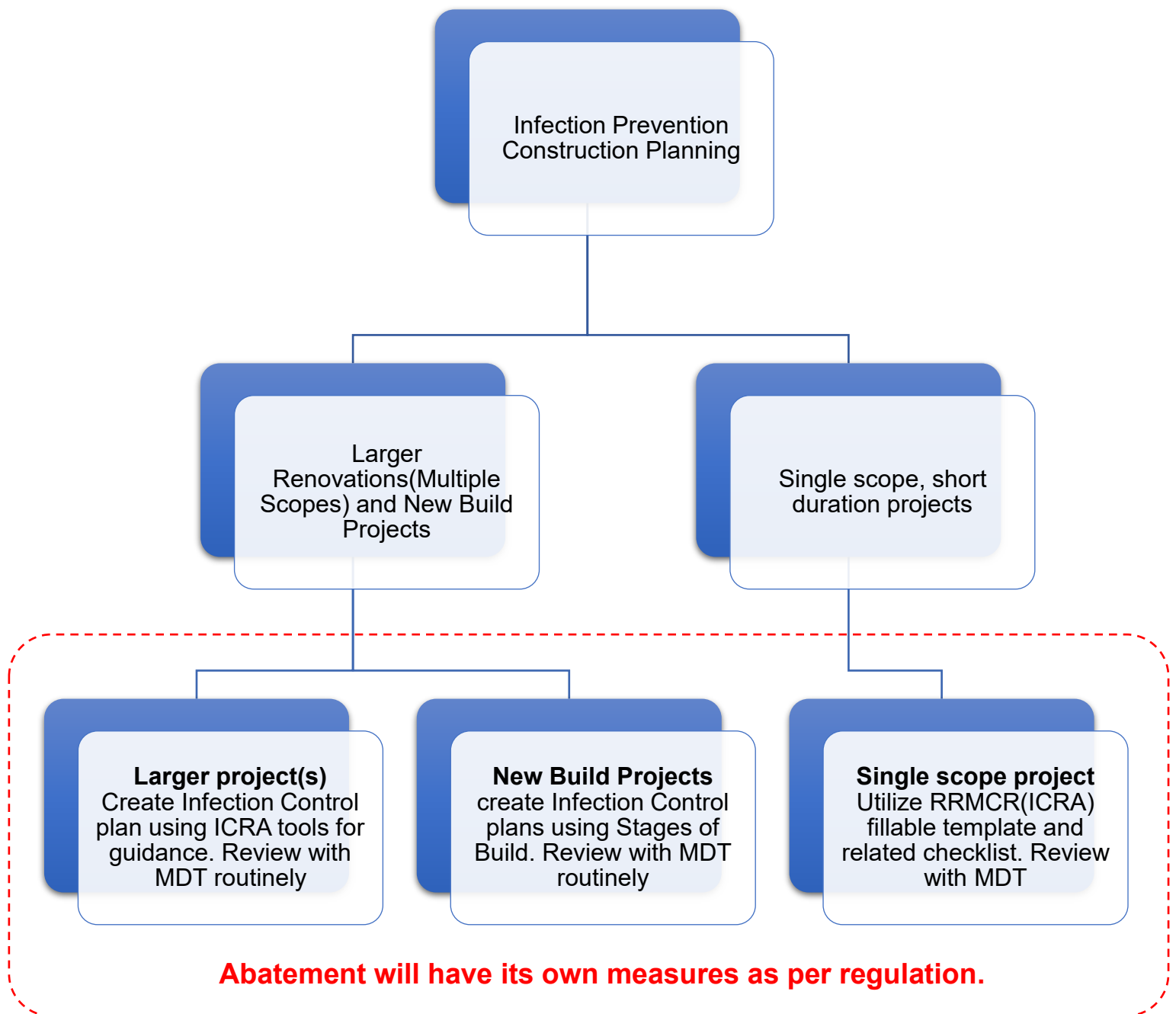
Infection control during construction, renovation, and maintenance of health care facilities



northern health
the northern way of caring

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Guidance based on CSA Z317.13-22 – Infection Control during Construction, Renovation and Maintenance of Health Care Facilities

Larger Renovations (Multiple Scopes) and New Build Projects

An Infection Control Plan should describe the procedures, processes, and safeguards used to maintain the appropriate infection prevention measures throughout the project.

Introduction:

- Project overview
- Estimated project duration
- Full scope of work including drawings, pictures, or diagrams

MDT (Multi-disciplinary Team) Members:

- Contractor project representatives (Project Manager, Site Superintendent)
- Plan administrator (Capital Planning)
- Consultants
- Infection Prevention Consultant (IPC)
- Facilities Maintenance and Operations
- Occupational Health and Safety
- Site Management Representative
- Environmental Services (EVS)

Communication and Reporting

- Project communications means and methods.
- Frequency of team meetings

Worker Education and Training

- CSA Group Standard Training (2 Day Course)
- Template (see [Appendix 1](#)) for Toolbox talks and PowerPoint Presentation (see [Appendix 2](#)) for onboarding staff provided for contractor to utilize if needed
- Infection Prevention available for additional education sessions
- Daily checklist templates (see [Appendix 7](#)) if needed.

ICRA (Infection Control Risk Assessment)

- Using the Infection Control Risk Assessment ICRA information (see [Appendix 3](#)) to describe type of construction activities to be completed by Contractor. For single scope, short duration projects a Risk Reduction Measures Construction Report (RRMCR) may be used. (See [Appendix 4](#) or [download form 10-414-7013](#)). An infection control plan should be used for multi-stage/long duration and new build projects.
- Review which Population Risk Groups will be affected. This will determine the level of preventative measures to be applied.
- Risk Reduction Preventive Measures levels 1-4 (see [Appendix 5a-d](#)) to utilize as guidance. List all that will apply to the project.

- Ceiling access requirements preventative measures (see [Appendix 6](#)) for review.
- Identify any interruptions with Heating, Ventilation, and Air Conditioning (HVAC), plumbing or water/dust intrusion.
- Detailed preventative measures shall include proper material handling and storage, hoarding layout, Combustion Air Handling Units (CAHU) placements and maintenance, differential monitoring and daily log sheet, daily site cleaning, contractors path through facility, elevator usage, debris removal path, construction clean process, and commissioning of systems
- **New Builds are separated into Stages 1-5. See [Appendix 10a-e](#).**

Monitoring Requirements

- Daily site monitoring of CAHU (Negative Air). Monitoring includes ensuring negative air differential as well as filter changes etc. recorded on daily checklist (see [Appendix 7](#)) and kept on site.
- Daily site clean with Hepa vacuum
- Walk-off mats changed regularly.
- Hoarding checked routinely for breaches and fixed immediately. Include procedure for unexpected disruption.
- Any interruptions to services such as water, HVAC, etc., immediately reported to MDT.

Plan Maintenance and Review

- Any updates, revisions, or changes to the Infection Control Plan (in scope or outlined measures) must be reviewed with MDT and Contractor for approval.

Cleaning

- Daily construction site cleaning with hepa vac, or damp or dry cloth, or damp mop ****Water only**** (See NH cleaning document: [Appendix 8](#))
- **All construction clean will be completed including hepa vac then with clean cloth and water only** if deeper clean is needed Consult with MDT and NH will supply appropriate cleaning product.
- Final construction clean shall be completed prior to removal of hoarding. (See [Appendix 9: Final Construction Cleaning Checklist](#)) speak with MDT regarding sufficient number of air exchanges needed prior to negative air being discontinued.

*****NH will arrange and provide NH terminal clean of spaces*****



Infection Prevention and Control measures during construction activities

Acknowledgement

- This presentation has been developed based on CSA Z317.13.22. guidelines.

Hand Hygiene

Why?

- Northern Health recognizes that hand hygiene is considered the most important and effective infection prevention and control measure to prevent the spread of Healthcare Associated Infections (HAIs).
- In Canada, 8,000 to 12,000 people die every year from HAIs. Global research indicates that hand hygiene improvements could potentially reduce HAI rates by 30 – 50%.
- 80% of common infections are spread by dirty hands. You can pick up and spread germs! Think about the things you have touched today.... germs can stay alive on surfaces a long period of time.

When?

Before:

- ♦ Entering a facility, ward, patient room or service room
- ♦ Glove Use
- ♦ Eating

After:

- ♦ Exiting a facility, ward, patient room or service room
- ♦ Glove use
- ♦ Contact with soiled equipment (toilet, hopper, etc.)
- ♦ Using the toilet
- ♦ Any time your hands are visibly dirty (dry wall dust, paint, grime, etc.)

How?

Alcohol Based Hand Rub (Quick and Easy)

- ♦ Press one full pump in the palm of your hand
- ♦ Rub hands together—don't forget the back of hands, between fingers, thumbs and wrist
- ♦ Rub until dry

Soap and Water (Visibly dirty hands)

- ♦ Wet hands with warm water
- ♦ Apply soap (1-2 squirts)
- ♦ Lather for 15 seconds—don't forget the back of hands, between fingers, thumbs and wrist
- ♦ Rinse well
- ♦ Pat hands dry with paper towel
- ♦ Turn tap off and open door with paper towel

YOU WILL TOUCH SOMEONE'S LIFE TODAY ... DO IT WITH CLEAN HANDS!

Construction and Renovations in Health Care Facilities

- Construction and renovations in a health care facility is very different from other construction projects. Special attention is required for work site safety and extra care is needed for the patient care environment.
- Dirt and debris can release various organisms into the health care facility. Therefore, proactive planning is very important before any construction work and diligent implementation of Infection Prevention controls is important.
- The most common construction related infections are from Legionella (bacteria found in water) and Aspergillus (a type of fungus).

Construction and Renovations continues...

- Prior to the start of any construction or renovation project, an Infection Prevention Risk Assessment needs to be performed. This is completed by the general contractor and project team which forms the MDT (Multi Disciplinary Team)
- An Infection Prevention Risk Assessment considers the location, the type and extent of the activity, the potential impact on areas above, below and adjacent to the work site.
- The level of patient risk is combined with construction activity, it defines the class of precautions needed. These classes are rated I to IV.
- Some projects have different work zones, which may have different class rating. It is important to go through the Risk Assessment for every work zone.

Part A: Types of Construction activity

Construction Activity (see Part A)	Population Risk Group (See Part B)
Type A: Inspection, non-invasive activities	Group 1: Lowest Risk
Type B: Small scale, short duration, minimal dust generating activities	Group 2: Medium Risk
Type C: Activities generating moderate-high levels of dust, requires more than one work shift to complete	Group 3: Medium to High Risk
Type D: Activities generating high levels of dust, major demolition and construction activities, requiring consecutive work shifts to complete	Group 4: Highest Risk

Infection Prevention Risk Assessment (ICRA) Matrix

Select Applicable Risk Group and Construction Activity:

Population risk group (from Part B)	Construction activity type (from Part A)			
	Type A	Type B	Type C	Type D
Group 1	I	II*	II	III
Group 2	II	II	III	IV
Group 3	II	III*	III	IV
Group 4	II	III*	IV	IV

* Denotes where a lower level might be used in accordance with Clause 7.5.CSA Z317.13.22

Part B: Population Risk Groups

Group 3 Medium to high risk	Emergency (except trauma rooms) Diagnostic imaging Labour and birthing rooms (without operating room 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 area Respiratory therapy Clean linen handling and storage areas Supply/material management handling and storage (e.g., central stores)
--------------------------------	--

Class I requires minimum precaution and Class IV requires maximum precautions. Once the class is determined, an infection prevention mitigation recommendation is made.

Did you know...

- The construction zone may need to be hoarded.
- The negative pressure should be maintained at -7.5 Pascals (-0.03 WC) within the construction zone for Class III and IV by using a certified portable HEPA equipped air filtration unit. (Construction Air Handling Unit or CAHU)



Did you know...

- Ensure continuous monitoring of negative pressure by using a differential monitoring device connected to an alarm data recorder.
- This device must be located on the adjacent or exterior wall of the hoarding no closer than 5 meters of the construction site entry.
- The hoarding shall be checked daily for any breaches. **Any breaches need to be fixed immediately.**



Last updated: Feb. 10, 2026

Sticky Mat

- Use of sticky mat is one method of controlling dust at the entrance and exit of the anteroom.
- Mats need to be changed daily or more often based on the use and the amount of dirt.



Did you know...

- **Within the hoarding area, ensure:**
 - windows, doors, plumbing penetrations, electrical outlets and air supply and return ducts are properly sealed with plastic/poly and taped.
 - the ventilation system in the hoarding area must be disabled/covered until project is completed.
- **Construction workers should be hepa vacuuming before leaving the work site** or wear appropriate personal protective equipment that is removed each time before entering patient care areas.

Storage of Construction materials

- Materials and tools should be stored appropriately. Outdoor materials should be stored in a way that protects from moisture and contamination and indoor materials should be stored in a designated area but never in stairwells, corridors or directly outside of exits.
- Construction materials shall be designed, handled, applied, and assembled using methods that will minimize the chance of contamination.
- All equipment and supplies must be cleaned and dried as per CSA Standards.
- A traffic pattern is to be designated for clean or sterile supplies that avoids the construction area.

Debris Removal

- Debris is removed at the end of the day via a designated route, when there is minimum patient traffic. Debris needs to be in a covered container.
- Before transporting, the wheels of the carts must be wiped down before entering occupied areas.
- There should be a designated elevator or pathways for transporting debris away from patient care areas.



Cleaning

- Clean and vacuum the construction zone **with a HEPA filtered vacuum daily** and as required.
- Dust barrier to stay until project is completed , construction clean completed and area is terminally cleaned and inspected, and sufficient construction zone air exchange is completed.

Questions?



PROJECT NAME: _____

Comments, Safety Suggestions, and Hazard Concerns from Workers: (must document two-way communication below)

[illegible]

19

[illegible]

RISK ASSESSMENT AND PREVENTION MEASURE REFERENCE FOR HOSPITAL

Construction Activity (see Part A)	Population Risk Group (See Part B)
Type A: Inspection, non-invasive activities	Group 1: Lowest Risk
Type B: Small scale, short duration. Minimal dust generating activities	Group 2: Medium Risk
Type C: Activities generating moderate -high levels of dust, can be completed in a single shift or continuous work shifts	Group 3: Medium to High Risk
Type D: Activities generating high levels of dust, major demolition and construction activities, requires consecutive work shifts to complete	Group 4: Highest Risk

If two types or groups are selected, select the higher level

E.g. Type A and Type B  Select Type B

E.g. Group 1 and Group 2  Select Group 2

PART A: TYPES OF CONSTRUCTION ACTIVITY

Construction activity type	Description
Type A	Inspection and non-invasive activities. These include, but are not limited to activities that involve a single controlled opening in a wall or ceiling within a single defined space for visual inspection, that is accessed by a) removing no more than one ceiling tile; or b) opening of an access panel on a wall or ceiling. Note: A single defined space refers to a continuous series of walls that extend the full height to the underside of the deck above. This definition is to ensure that multiple ceiling tiles within one area are not removed, above ceiling investigations are contained, and dust disturbance is minimized. Any existing holes or penetrations observed in the continuous series of walls shall be reported back to the MDT. A plan should be in place to deal with any existing holes or penetrations observed above the ceiling. Minor plumbing work that disrupts the water supply to a single fixture in a localized area (i.e. one room) for a short duration (e.g. less than 1 hour).
Construction activity type	Description
Type B	Small-scale, short-duration (e.g. less than 2 hour) activities that create minimal dust. These include, but are not limited to: 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. Plumbing work that disrupts the water supply of up to three fixtures for a short duration (e.g., less than 1 hour) or one fixture for 1 hour or more.
Type C	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), and can be completed in a single or contiguous work shifts. * These include, but are not limited to: 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. Plumbing work that disrupts the water supply of more than three fixtures for a short duration (e.g., less than 1 hour).
Type D	Activities that generate high levels of dust, activities that necessitate significant service disruptions, and heavy demolition and construction activities requiring consecutive work shifts to complete. These include, but are not limited to: a) soil excavation b) new construction that requires consecutive work shifts to complete; or c) activities that involve heavy demolition or removal of a complete cabling system. Plumbing work that disrupts the water supply of more than three fixtures for 1 hour or more.

* The intent of specifying continuous shifts at Type C construction activity is to highlight the importance of ongoing monitoring and constructor presence in the work area. Multiple shifts that occur one right after the other with hand-off of activities from the constructor's lead of the first shift to the constructor's lead of the subsequent shift ensure continuity of preventive measures. Time gaps between work periods (e.g., day shifts occurring on subsequent days with evening and night hours unattended) have the potential to increase risks and are not considered to fall under Type C construction activity.

Note: Type C and Type D Construction Activities both refer to demolition activities. Demolition activities can generate varying levels of dust or interruption to plumbing systems, which can create stagnation of water flow within piping. Both situations exacerbate the production and aerosolization of fungal or bacterial spores. Project MDT should determine intensity of demolition that they deem to fit within each construction activity type.

PART B: POPULATION RISK GROUPS AND GEOGRAPHICAL AREAS

Population Risk Group	Typical Areas
Group 1 Lowest risk	Office areas (i.e., non-clinical) Decanted patient care units (i.e. shell or decommissioned space)¹ Transient public areas (i.e., areas of pass through) not intersecting a patient care area²

RISK ASSESSMENT AND PREVENTION MEASURE

Reference for Hospital

	Laundry and soiled linen sorting or storage areas Loading dock (main area) Physical plant workshops Environmental Services (EVS) rooms and closets
Group 2 Medium risk	Patient care areas, unless listed in Group 3 or Group 4 Outpatient clinics (except oncology and surgery) Unoccupied patient care units (e.g., ambulatory care units during off-hours, decanted spaces that still house equipment in use)¹ Admission and discharge units Autopsy and morgue Occupational therapy and 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 operating room 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 area Respiratory therapy Clean linen handling and storage areas Supply/material management handling and storage (e.g., central stores)
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 Interventional or high-risk diagnostic imaging, e.g. • Cardiac catheterization and angiography • Interventional radiology • Endoscopy • Bronchoscopy • Cystoscopy Cardiovascular and cardiology patient areas Pharmacy admixture rooms Medical device reprocessing areas (wherever located), including sterile supply storage* Clean and sterile storage located in patient care areas Burn care units Animal rooms Trauma rooms Protective isolation rooms Tissue culture laboratories Pacemaker insertion rooms Dental procedure rooms
--	--

* Even during off hours

Notes:

1) *Decanted patient care areas refer to those areas that are shelled or decommissioned spaces. These spaces must also be decanted of equipment and supplies. This is distinct from unoccupied patient care areas that are active patient care areas, but work is being conducted during off-hours (i.e., no patients present).*

2) *Population risk group determination for public areas and waiting rooms shall be based on the population served.*

PART C: CONSTRUCTION ACTIVITY AND RISK GROUP MATRIX

Select Applicable Risk Group and Construction Activity:

Population risk group (from Part B)	Construction activity type (from Part A)			
	Type A	Type B	Type C	Type D
Group 1	I	II*	II	III
Group 2	II	II	III	IV
Group 3	II	III*	III	IV
Group 4	II	III*	IV	IV

* Denotes where a lower level might be used in accordance with Clause 7.5.CSA Z317.13.22

Note: Instructions for this Table:

- Refer to Part A to determine the construction activity type.
- Refer to part B to determine the population risk group.
- The intersection between the row (risk group) and column (activity type) shows the minimum preventive measure level that applies. A higher level of preventive measures may be used at the discretion of the MDT.
- Clause 7.5- CSA Z317.13.22 offers practical exceptions for short-term projects involving only ceiling access for investigation or minor work, provided that appropriate precautions are used.

Shaded areas indicate that a construction/renovation permit from IP&C is required.



Risk Reduction Measures Construction Report

Plant and property to complete

Construction location:	Project start date:	Estimated duration:
Name of Project Manager (PM):	Phone number:	
Contractor(s):	Phone number:	
Infection Prevention:	Phone number:	

Permit number: _____ Drawings/in-department description included: ☐ Yes ☐ No

Select applicable risk group and construction activity

Population risk group	Construction activity			
	Type A	Type B	Type C	Type D
Group 1	☐ I	☐ II*	☐ II	☐ III
Group 2	☐ II	☐ II	☐ III	☐ IV
Group 3	☐ II	☐ III*	☐ III	☐ IV
Group 4	☐ II	☐ III*	☐ IV	☐ IV

* Denotes where a lower level might be used in accordance with Clause 7.5. CSA Z317.13.22

- The intersection between the row (risk group) and column (activity type) shows the minimum preventive measure level that applies. A higher level of preventive measure may be used at the discretion of the MDT.
- CSA Clause 7.5 offers practical exceptions for short-term projects involving only ceiling access for investigation or minor work, provided that appropriate precautions are used.
- Shaded areas indicate that a construction/renovation permit is required.

Based on matrix construction activity, precaution will be class (please check): ☐ I ☐ II ☐ III ☐ IV
(See Risk Assessment and Prevention Measures Checklist for Hospital Construction and Renovation.)

Additional precautions:

Submitted by: _____ (Plant and property) Date: _____ Phone: _____

Reviewed and signed off by (MDT): Comments:	Date:

***Projects reviewed on the basis of available time, otherwise PMO will assume final review.**

Please complete the construction preventive measures exception on the next page



Risk reduction measures construction exception

This section is to be used if the preventive measures construction permit cannot be adhered to because:

- The facility design is such that the preventive measures cannot be met
- Unforeseen circumstances to prohibit preventive measures

The preventive measures cannot be met because:

Alternate ways to ensure patient safety:

CSA REQUIREMENTS for CEILING ACCESS

Does not apply where there is observable contamination i.e. stained and wet ceiling tiles – Consult [Infection Prevention](#)

Ceiling access for activities up to and including Construction Activity Type B and Population Risk Group 1 and 2

In Population Risk Group 1 areas	In Population Risk Group 2 areas
Preventive Measure I may be applied under following conditions: - The project requires only ceiling access for investigation or minor work and will be accomplished in a limited time as determined by the MDT (e.g. 30 min or less). - The construction activity is Type A or B and involves only access or minor work above a single ceiling tile or hatch in hard ceilings where dust migration can be controlled using a HEPA filtered vacuum, for minor electrical work or the repair of ventilation components, telephone wires, or computer cables. * This does not apply to pulling of cables or wires.	In population risk group 2, for the projects meeting the criteria in the left column; the following additional precautions shall apply: - Construction shall take place entirely inside a containment unit that is sealed tight to the ceiling if the area and contents cannot be contained by other means (e.g. closing the door). - There shall be no patients in the room or vicinity if work is occurring in corridor. - A HEPA filtered vacuum shall be applied at the point of removal of ceiling tile or hatch. - The back side of the tile and the area around the opening shall be vacuumed. - Worker's clothing, including boots, shall be HEPA vacuumed prior to exiting the containment unit. If disposable coveralls are used, they shall be removed and bagged before exiting the containment unit, followed by HEPA vacuuming as above. - Inside of the containment unit shall be HEPA vacuumed at the completion of work, prior to exit.

All adjacent areas must be considered. If adjacent area is a higher risk area, you must default to that area's requirements.

Ceiling access for activities up to and including Construction Activity Type C and Population Risk Group 3 or 4

In Population Risk Group 3 or 4 areas:

Preventive Measure II may be applied to projects under the following conditions:

- a. The project shall require only ceiling access for investigation or minor work and shall be accompanied in a limited time as determined by the MDT.
- b. The construction activity type is Type A or Type B and involves only access or minor work above a single ceiling tile or hatch in hard ceilings where dust migration can be controlled, including minor electrical work or the repair of ventilation components, telephone wires, or computer cables; and
- c. Type C activities (e.g. pulling of cables through walls or ceilings, medical gas or plumbing installations above the ceiling) may require additional preventive measures as established by the MDT, and based on the ICRA. A risk assessment shall be performed prior to Type C ceiling work that includes factors such as the specific population risk group in the vicinity, existing ceiling condition, method of cable pulling (i.e. pre-existing conduit, cable trays or free pull through the ceiling space), and means of dust mitigation (e.g. potential for the ceiling space be HEPA vacuumed prior to work). Care shall be taken to not disturb adjoining ceiling tiles.

The following precautions shall apply:

- a. Construction shall take place entirely inside a containment unit that is sealed tight to the ceiling and shall be equipped with a HEPA filtered CAHU with air exhausted to the outside of the enclosure.

Note: Changes to air movement might be a risk in certain high-risk areas (e.g., operating rooms). A risk assessment should be conducted by the MDT and constructor prior to work occurring.

- b. There shall be no patients in the room or vicinity if work is occurring in corridor.
- c. A HEPA filtered vacuum shall be applied at the point of removal of ceiling tile or hatch.
- d. The back side of the tile and the area around the opening shall be vacuumed.
- e. Worker's clothing, including boots, shall be HEPA vacuumed prior to exiting the containment unit. If disposable coveralls are used, they shall be removed and bagged before exiting the containment unit, followed by HEPA vacuuming as above.
- f. Inside of the containment unit shall be HEPA vacuumed at the completion of work, prior to exit.

Note: The intent is to capture dust at the point of work and prevent migration of dust to the surrounding area outside of the enclosure. Minimum negative pressure of -2.5 Pa should be used.

Recommendations for Risk Reduction Measures

Page 1 of 1

CLASS I	
Plant and Property Staff and Contractors:	
Dust Control	Use all methods that minimize generation and dispersion of dust such as: ☐ Inform healthcare staff of work being done in order to identify high risk patients who may require temporary relocation from construction area. ☐ Ensure patient care equipment and supplies are protected from dust exposure ☐ Covered containers required to transport construction supplies and equipment in the health care facility
Ceiling Access	☐ Immediately close access panels and replace displaced ceiling tiles; and if necessary clean the work area with a HEPA filtered vacuum cleaner ☐ Ceiling access exceptions may be appropriate however, consultation with multidisciplinary team (MDT) required. Clause does not apply in situations where there is observable contamination i.e. stained and wet ceiling tiles
Plumbing Activities	☐ Inform environmental services and healthcare staff to report any discolored water and/or water leaks to plant services ☐ Schedule water interruption during lower user activity (e.g. evenings if possible) ☐ Flush water lines prior to use. Determine the methods to be used to disinfect the water lines ☐ Water temperature meets health care facility requirements ☐ Plumbing materials used in the healthcare facility water systems shall be resistant to build-up of scale and corrosion, and shall not promote the growth of bacteria including Legionella ☐ Ensure faucet aerators are not installed or used and shall be removed from existing faucets ☐ Use of water diverter preferred for ceiling leaks in risk group 3 & 4 areas. ☐ Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures
Important Reminders	➤ Class II recommendations must be followed if dust is created during Type A construction activity ➤ If the project scope changes and more extensive work is required, the project Risk Class must be revised and the necessary controls implemented. Consultation with Infection Prevention, multidisciplinary team (MDT) and additional risk reduction measures analysis is required

Recommendations for Risk Reduction Measures

Page 1 of 2

CLASS II

Plant and Property Staff and Contractors:

Dust Control	Use all methods required to minimize generation and dispersion of dust such as: ☐ Use drop sheets to control dust ☐ Use a minimum of one layer (6 mil thickness) polyethylene sheeting that reaches from the floor to the ceiling, with the top, bottom, and side edges and joints sealed off to isolate the construction area from adjacent areas, or control cube/temporary containment unit may be utilized; ensure unit is clean pre and post use ☐ Protect the ceiling tiles with a polyethylene barrier or HEPA vacuum at completion of the dust generating activities ☐ Walk off dust mat at entrance to and exit from work areas ☐ Seal windows and unused doors with tape ☐ Seal air supply and return ducts in construction/renovation area ☐ Use dust capturing attachments to hose of the HEPA vacuum ☐ Control dust by water misting work surfaces while cutting or alternatively, use a utility knife ☐ Inform healthcare staff of work being done in order to identify high risk patients who may require temporary relocation from construction area ☐ Ensure patient care equipment and supplies are protected from dust exposure ☐ Construction workers to wear the appropriate personal protective equipment. ☐ Covered containers required to transport construction supplies and equipment to a designated pathway in the health care facility
Ceiling Access	☐ Ceiling access exceptions require consultation with the MDT. Clause is not permitted with stained and wet ceiling tiles ☐ Immediately close access panels and replace displaced ceiling tiles
Ventilation	☐ Disable or seal all potential sources of air leaks i.e. intake/exhaust vents, plumbing penetration, electrical outlets
Plumbing Activities	☐ Inform environmental services and healthcare staff to report any discolored water and/or water leaks to plant services. ☐ Schedule water interruption during lower user activity (e.g. evenings if possible) ☐ Flush water lines prior to use. Determine the methods to be used to disinfect the water lines ☐ Water temperature meets health care facility requirements

	☐ Plumbing materials used in the healthcare facility water systems shall be resistant to build up of scale and corrosion, and shall not promote the growth of bacteria including Legionella ☐ Ensure faucet aerators are not installed or used and shall be removed from existing faucets ☐ Use of water diverter preferred for ceiling leaks in risk group 3 & 4 areas. ☐ Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures to or Project Lead
Traffic Control	☐ In collaboration with the facility project manager, designate a traffic pattern for construction workers that avoids client care areas ☐ Determine a safe route for the transportation of clean and sterile supplies and equipment away from the construction area
Debris Removal	☐ Contain debris in covered container or cover with moistened sheet before transporting for disposal ☐ Transport debris via designated route
Clean up	☐ Facilities maintenance personnel notifies Environmental Services (EVS) to facilitate terminal cleaning of project zone
Important Reminders	➤ If the project scope changes and more extensive work is required, the project Risk Class must be revised, and the necessary controls implemented. Consultation with Infection Prevention and the multidisciplinary team (MDT) with an additional risk reduction measures analysis required.

CLASS III

Plant and Property Staff and Contractors:

Requirements prior to start-up of project

- ☐ The constructor's on-site team shall include at least one person with demonstrated knowledge and experience in Infection Prevention during construction. Workers not trained in infection prevention shall not work alone, shall work with trained personnel or be supervised.
- ☐ Risk Reduction Measures for Class 3 and 4 require Infection Prevention and project manager review and signature prior to work initiation.

Dust Control

Use all methods required to minimize generation and dispersion of dust such as:

- ☐ Inform healthcare staff of project in order to identify high risk patients who may require temporary relocation from construction area.
- ☐ Ensure patient care equipment and supplies protected from dust exposure. (May require nursing/department staff to remove/relocate supplies)
- ☐ Erect an impermeable dust barrier from true ceiling (includes area above false ceilings) to the floor consisting of two layers of 6 mL polyethylene and a gypsum wallboard layer. When deemed appropriate by the multidisciplinary team (MDT), the composition of the barrier may be modified to suit time, space, or impact constraints. The poly membrane shall be present under all circumstances.
- ☐ If ceiling tiles are not removed as part of project, they are to be protected with poly or cleaned using HEPA vacuum when dust generating activities are complete
- ☐ Place walk off dust mat at work areas entrance and exit.
- ☐ Ensure windows, doors, plumbing penetrations, electrical outlets and air supply and return ducts are properly sealed with plastic and taped within the construction / renovation area.
- ☐ Post Infection Prevention barrier warning signage.
- ☐ Post risk reduction measures on outside of barrier.
- ☐ Air ducts and spaces above ceilings should be HEPA vacuumed if necessary.
- ☐ Use dust capturing attachments to hose of the HEPA vacuum.
- ☐ Control dust by water misting work surfaces while cutting or alternatively use a utility knife.
- ☐ Construction workers to wear the appropriate personal protective equipment.
- ☐ Construction workers should be HEPA filter vacuumed before leaving the work site: or wear protective clothing that is removed each time; before entering client care areas.
- ☐ Cutting or coring of concrete slab requires a specific dust management plan (describe below):

Traffic Control	☐ Pulling wire/cables requires a specific dust management plan based on location of wires (ceiling track, conduit, etc.) and population risk group. Describe below: ☐ Place supplies and equipment in covered containers during transportation through the health care facility. ☐ All equipment and supplies must be clean and dry and meet the requirements detailed in the current CSA Z317 standards. ☐ In collaboration with the facility project manager designate a traffic pattern for construction workers and debris removal that avoids client care areas, and a traffic pattern for clean or sterile supplies that avoids the construction area.
Ceiling Access	☐ Ceiling access exceptions requires consultation with the MDT. Clause not permitted for stained and wet ceiling tiles. ☐ Immediately close access panels and replace displaced ceiling tiles.
Ventilation	☐ Disable the ventilation system in the construction/renovation area until project is completed. ☐ Monitor the need to change and/or clean filters in construction/ renovation area. ☐ Maintain differential negative pressure 7.5 Pa (0.03 WC) within the construction zone by using certified portable HEPA equipped air filtration units. ☐ Ensure continuous monitoring of negative pressure by using a differential monitoring device connected to an alarmed data recorder. The differential monitoring device must be located on the adjacent or exterior side of the barrier; no closer than five metres of the construction site entry. ☐ Monitoring equipment shall be maintained, zeroed and calibrated in accordance with manufacturers' instructions. ☐ The constructors shall record the pressure differentials in a log sheet daily ☐ Construction air handling unit (CAHU) must be performance verified, operated and maintained in accordance with CSA Z317 standards. ☐ Air exhausted from construction, maintenance, and repair areas must be HEPA filtered, preferably directly outside and away from intake vents. ☐ Exhaust air shall not be discharged into Risk Group 3 or 4 areas. (measures related to re-circulated air require approval from the MDT). ☐ If a HEPA filtered vacuum is used as a CAHU, it must meet the CAHU requirements specified in the CSA Z317 standards. ☐ Ensure ventilation system is functioning properly and is cleaned if contaminated by soil or dust after construction project is complete.
Plumbing Activities	☐ Inform environmental services and healthcare staff to report any discolored water and/or water leaks to Plant Services. ☐ Schedule water interruption during lower user activity (e.g. evenings if possible).

Debris Removal	☐ Flush water lines prior to use. Describe methods used to disinfect water lines. _____ ☐ Water temperature meets health care facility requirements. ☐ Plumbing materials used in the healthcare facility water systems shall be resistant to build-up of scale and corrosion, and shall not promote the growth of bacteria including Legionella. ☐ Ensure faucet aerators are not installed or used and shall be removed from existing faucets. ☐ Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures. ☐ Use of water diverter preferred for ceiling leaks in risk group 3 & 4 areas. ☐ Appropriate containers supplied by contractor. ☐ Remove debris at the end of the workday via designated route. Describe route: _____
Clean up	☐ Contain debris in covered container or cover with moistened sheet before transporting for disposal. Wipe wheels of bins/carts/etc. before entering occupied areas. ☐ Clean and vacuum construction zone with HEPA filtered vacuum daily and as required (construction clean). This includes adjacent areas outside construction zone. ☐ A final construction clean is required at end of project prior to the terminal clean by Environmental Services (EVS) department. ☐ Terminal clean to be completed by Environmental Services (EVS). ☐ Do not remove dust barrier(poly) until the project is complete and the area has been terminally cleaned and inspected by IP or delegate - plus air exchange completed within the project zone as determined by site MDT. ☐ Remove dust barrier carefully by the following methods: HEPA vacuum surfaces; remove barrier and HEPA vacuum again (if practical) and damp wipe surfaces; roll up poly construction side up. ☐ Facilities maintenance personnel notifies Environmental Services (EVS) to facilitate terminal cleaning of project zone (includes increased cleaning frequency of areas adjacent to the construction zone and final clean upon completion of project).
Important Reminders	➤ If the project scope changes and more extensive work is required, the project Risk Class must be revised and the necessary controls implemented – consultation with Infection Prevention multidisciplinary team (MDT) and additional risk reduction measures analysis is required. ➤ An MDT representative shall regularly visit the construction area to confirm that preventive measures are being followed. The frequency of their visits shall be determined by the MDT. Visits shall be documented and records retained as part of the risk management documentation for the construction project.

Recommendations for Risk Reduction Measures

Page 1 of 4

CLASS IV

Plant and Property Staff and Contractors:

Requirements prior to start-up of project

- ☐ The constructor's on-site team shall include at least one person with demonstrated knowledge and experience in Infection Prevention during construction. Workers not trained in Infection Prevention shall not work alone, shall work with trained personnel or be supervised
- ☐ Risk Reduction Measures for Class 3 and 4 require Infection Prevention and project manager review and signature prior to work initiation

Dust Control

Use all methods required to minimize generation and dispersion of dust such as:

- ☐ Inform healthcare staff of project in order to identify high-risk patients who may require temporary relocation from construction area
- ☐ Ensure patient care equipment and supplies protected from dust exposure. (May require nursing/department staff to remove/relocate supplies)
- ☐ Erect an impermeable dust barrier which includes an anteroom to the construction zone, from true ceiling (includes area above false ceilings) to the floor consisting of two layers of 6 mL polyethylene and a gypsum wallboard layer. When deemed appropriate by the multidisciplinary team, the composition of the barrier may be modified to suit time, space, or impact constraints. The poly membrane shall be present under all circumstances
- ☐ Place walk off dust mat both inside and outside the anteroom
- ☐ Ensure windows, doors, plumbing penetrations, electrical outlets and air supply and return ducts are properly sealed with plastic and taped within the construction / renovation area
- ☐ Post infection prevention barrier warning signage
- ☐ Post risk reduction measures on outside of barrier
- ☐ Air ducts and spaces above ceilings should be HEPA vacuumed if necessary
- ☐ Use dust capturing attachments to hose of the HEPA vacuum
- ☐ Control dust by water misting work surfaces while cutting or alternatively use a utility knife
- ☐ Construction workers to wear the appropriate personal protective equipment
- ☐ Construction workers should be HEPA filter vacuumed before leaving the work site or wear protective clothing that is removed each time before entering client care areas
- ☐ All equipment and supplies must be clean and dry and meet the requirements detailed in the current CSA Z317 standards

Traffic Control

- ☐ Cutting or coring of concrete slab requires a specific dust management plan (describe below):
-
-

- ☐ Pulling wire/cables requires a specific dust management plan based on location of wires (ceiling track, conduit, etc.) and population risk group. Describe below:
-
-
-

Ventilation

- ☐ Place supplies and equipment in covered containers during transportation through the health care facility
- ☐ In collaboration with the facility project manager designate a traffic pattern for construction workers and debris removal that avoids client care areas, and a traffic pattern for clean or sterile supplies that avoids the construction area

- ☐ Disable the ventilation system in the construction/renovation area until project is completed
- ☐ Monitor the need to change and/or clean filters in construction/renovation area
- ☐ Maintain differential negative pressure 7.5 Pa (0.03 WC) within the construction zone, and negative air pressure 2.5 Pa (0.01 WC) within the anteroom by using certified portable HEPA equipped air filtration units
- ☐ Ensure continuous monitoring of negative pressure by using differential monitoring device connected to an alarmed data recorder. The differential monitoring device must be located on the adjacent or exterior side of the barrier; no closer than five metres of the construction site entry
- ☐ Monitoring equipment shall be maintained, zeroed and calibrated in accordance with manufacturers' instructions
- The alarm set point for the differential pressure monitoring device shall be established by the MDT. In no case shall the alarm set points be set lower than 2.5 Pa with a maximum alarm delay of 90 seconds.
- ☐ The constructors shall record the pressure differentials in a log sheet daily
- ☐ Construction air handling unit (CAHU) must be performance verified, operated and maintained in accordance with CSA Z317 standards
- ☐ Air exhausted from construction, maintenance, and repair areas must be HEPA filtered, preferably directly outside and away from intake vents
- ☐ Exhaust air shall not be discharged into Risk Group 3 or 4 areas. (measures related to re-circulated air require approval from the MDT)
- ☐ If a HEPA filtered vacuum is used as a CAHU, it must meet the CAHU requirements specified in the CSA Z317 standards
- ☐ Ensure ventilation system is functioning properly and is cleaned if contaminated by soil or dust after construction project is complete

Plumbing Activities	☐ All opened ductwork must be sealed and remain sealed until installation and completion of connections and/or construction ☐ All plumbing & HVAC systems shall be supplied, installed & commissioned in accordance to CSA Z 317.1, CSA Z 317.2 & CAN/CSA Z 8001 ☐ Ensure ventilation systems are working properly in adjacent areas ☐ Inform environmental services and healthcare staff to report any discolored water and/or water leaks to Plant Services ☐ Schedule water interruption during lower user activity (e.g. evenings if possible) ☐ Flush water lines prior to use. Describe methods used to disinfect water lines. _____ ☐ Water temperature meets health care facility requirements. ☐ Use of water diverter preferred for ceiling leaks in risk group 3 & 4 areas. ☐ If there are concerns about Legionella, consider hyper-chlorinating stagnant potable water or superheating and flushing all stagnant lines before restoring or repressurizing the water system ☐ Disinfect domestic water systems (or sections) that have been stagnant in accordance to clause 6.8 ☐ The water lines in the construction area and adjacent client care areas shall be flushed prior to reuse ☐ Plumbing materials used in the healthcare facility water systems shall be resistant to build-up of scale and corrosion, and shall not promote the growth of bacteria including Legionella ☐ Ensure faucet aerators are not installed or used and shall be removed from existing faucets ☐ Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures
Debris Removal	☐ Appropriate containers supplied by contractor ☐ Remove debris at the end of the workday via designated route. Describe route (may include external chute): _____ ☐ Contain debris in covered container or cover with moistened sheet before transporting for disposal. Wipe wheels of bins/carts/etc. before entering occupied areas

Clean up	☐ Clean and vacuum work area with HEPA filtered vacuums daily and as required (construction clean). This includes adjacent areas outside the construction area ☐ A final construction clean is required at end of project prior to the terminal clean by Environmental Services (EVS) department ☐ Terminal clean to be completed by Environmental Services (EVS). ☐ Do not remove dust barrier until the project is complete and the area has been terminally cleaned and inspected by IP or delegate - plus air exchange is completed within the project zone as determined by site MDT ☐ Remove dust barrier carefully by the following methods: HEPA vacuum surfaces; remove barrier and HEPA vacuum again (if practical) and damp wipe surfaces; roll up poly construction side up ☐ Facilities maintenance personnel notifies Environmental Services (EVS) to facilitate terminal cleaning of project zone (includes increased cleaning frequency of areas adjacent to the construction zone and final clean upon completion of project)
Evaluation	☐ Evaluate Infection Prevention measures with other members of the planning team or delegate, to evaluate the effectiveness and identify problems at the end of the construction project ☐ Infection Prevention is consulted whenever problems arise that may result in additional infection risks
Important Reminders	➤ If the project scope changes and more extensive work is required, the project Risk Class must be revised and the necessary controls implemented – consultation with Infection Prevention multidisciplinary team (MDT) and additional risk reduction measures analysis is required ➤ An MDT representative shall regularly visit the construction area to confirm preventive measures followed. Frequency of visits will be determined by the MDT. Visits shall be documented and records retained as part of the risk management documentation for the construction project

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Neg air pressure (record)							
Inspect neg air machine							
Negative air HEPA filter changed/checked							
Clean site with HEPA vac/damp cloth or mop **Water only**							
Check hoarding for breaches and correct							
Walk off mats changed daily and as needed							
Debris removed in covered containers							

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Neg air pressure (record)							
Inspect neg air machine							
Neg air HEPA filter changed/check							
Clean site with HEPA vac/damp cloth or mop **Water Only**							
Check hoarding for breaches and correct							
Walk off mats changed daily and as needed							
Debris removed in covered containers							

NH Construction Cleaning Quick Guide

*This is a quick guide for construction cleaning only within health care facilities (HCFs), please refer to the class specific risk reduction measures checklist for a complete list of measures required.

Definitions:

MDT (multidisciplinary team) - a group comprising of representatives from various disciplines in the HCF that works with the project management team and others to ensure that the appropriate infection prevention and control measures are followed during the construction activities.

- includes administration, Infection Prevention, Facilities Maintenance, Environmental Services (EVS), and other personnel appropriate to the structure of the facility.

Construction Clean – an ongoing program of cleaning activities performed during construction to:

- a) maintain site cleanliness during the project through daily cleanup
- b) prevent dust and debris from being trapped in the fixtures, the ceiling, and other closed off spaces.
- c) maintain conditions that will facilitate the effective final cleaning of the site prior to hand off.
- d) All cleaning to be completed with clean water and clean cloths, if a deeper clean is needed consult with MDT and NH will supply appropriate cleaning product.

Final Construction Clean – Final clean completed by constructor once all construction has been completed, prior to removal of items such as hoarding. Cleaning is to be completed using clean water and a cloth.

Terminal Clean – the thorough cleaning of a clinical space by the health care facility following construction and before the space is used for patient care, medical equipment, or storage of sterile supplies, remove contaminating micro-organisms that could be acquired by subsequent occupants or staff.

Preventative Measure I

- If dust or contaminate produced, MDT to notify environmental services to have construction area and surroundings cleaned by environmental services.
- Dependant on the type and level of contamination, a terminal clean may be required as determined by the MDT.

Preventative Measure II

- Clean the construction area with a HEPA filter equipped vacuum cleaner and/or wet mop at the end of each day and on completion of construction.
- If ceiling tiles not protected by poly barrier, they are to be cleaned with HEPA vacuum at the end of dust-generating activities.
- If containment unit is utilized, it is to be cleaned before and after use.
- On completion of construction, MDT will notify EVS to complete a NH **terminal clean** of the area.

**NOTE: Depending on the project, NH terminal clean could be done more than once at the discretion of the MDT (e.g. before and after the hoarding is removed)*

Preventative Measure III

- Clean the construction area with a HEPA filter equipped vacuum cleaner and/or wet mop at the end of each day and as needed (e.g. when there is visible debris)
- Clean areas outside and immediately adjacent to the project entrances with a HEPA filter equipped vacuum cleaner daily and as needed (e.g. when there is visible debris)
- Environmental services to increase the frequency of cleaning in areas adjacent to the construction area while the project is underway.
- A **final construction clean** is required when construction is completed and includes HEPA vacuuming and using a damp cloth and water on the inside surfaces of the hoarding.
- When final construction clean is complete, MDT to notify environmental services to complete NH **terminal clean** in construction area.
- The NH **terminal clean** is to include damp wiping of inside surfaces of the hoarding.
- DO NOT remove hoarding until the NH **terminal clean** is confirmed complete by Infection Prevention or their delegate and required air exchanges are completed as determined by MDT.

**NOTE: Depending on the project, terminal clean could be done more than once at the discretion of the MDT (e.g. before and after the hoarding is removed).*

Preventative Measure IV

- Clean the construction area with a HEPA filter equipped vacuum cleaner and/or wet mop at the end of each day and as needed (i.e. when there is visible debris)
- Clean areas outside and immediately adjacent to the project entrances with HEPA filter equipped vacuum cleaner daily and as needed (i.e. when there is visible debris)
- Environmental services to increase the frequency of cleaning in areas adjacent to the construction area while the project is underway.
- A **final construction clean** is required when construction is completed and includes HEPA vacuuming of inside surfaces of the hoarding.
- When final construction clean is complete, MDT to notify environmental services to complete the NH **terminal clean** in construction area.
- The NH **terminal clean** is to include damp wiping of inside surfaces of the hoarding.
- DO NOT remove hoarding until the NH **terminal clean** is confirmed complete by Infection Prevention or their delegate, and required air exchanges are completed as determined by MDT

**NOTE: Depending on the project, NH terminal clean could be done more than once at the discretion of the MDT (e.g. before and after the hoarding is removed).*

***Infection prevention and control measures will be consistently monitored and reviewed at regularly scheduled meetings from the initial planning phase through to completion. The site MDT is to be included in initial planning, throughout the construction phase, and prior to completion of project.**

Final Construction clean checklist (above ceiling plane infrastructure)

Room# _____ Room Name: _____

The cleaning process shall be sequenced from higher to lower elevations so that dust is not aerosolized or brushed onto already clean surfaces. Contractor/Cleaning staff working above the ceiling plane shall do so in accordance with applicable requirements. Cleaning cloths shall be rinsed in clean water when soiled.

Caution should be used around sprayed insulation. This material should not be vacuumed or cleaned.

Note: COMPLETE USING CLEAN WATER AND A CLEAN CLOTH

Infrastructure	Cleaning process	Comments	Initial
Underside of ceiling	HEPA vacuum		
Steel beams	HEPA vacuum		
Steel joists	HEPA vacuum		
Ductwork {all 4 sides}	Damp cloth		
Ductwork insulated {all 4 sides}	Damp cloth		
Electrical conduit	Dry cloth		
Electrical shielded cable	Dry cloth		
Electrical junction boxes	Dry cloth		
Plumbing drain piping	Damp cloth		
Plumbing supply piping	Damp cloth		
Plumbing insulated piping	Damp cloth		
Cable tray wiring	Dry cloth		
Ceiling supported hangers	Damp cloth		
Ceiling supported support channels	Damp cloth		
Top surfaces of gypsum ceiling	HEPA vacuum		
Top surfaces of ceiling hatch	Damp cloth		
Top of low wall horizontal surface	Damp cloth		
Interior of low wall without cap	HEPA vacuum and long hose		
Top of exposed light fixture	Dry cloth		
Top of HVAC diffusers	Damp cloth		
Medical gas lines	Damp cloth		
Top of smoke or fire detectors	Damp cloth		
Supports for ceiling mounted equipment	Damp cloth		

Completed by: _____ Date: _____

When the room cleaning is complete, post this checklist on the entrance door

Checklist H.1 (Concluded)

Element		Compliance			Notes
		Yes	No	N/A	
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				

Checklist H.2 Construction clean checklist (below ceiling plane)

Area:		Room number:		
Description	Cleaning	Date	Time	Cleaner
Horizontal surfaces				
Counters	HEPA vacuum			
Shelves	HEPA vacuum			
Doors/frames	HEPA vacuum			
Reveals	HEPA vacuum			
Headwalls	HEPA vacuum			
Nook	Damp cloth			
Diffusers	Damp cloth			
Light lenses	Damp cloth			
Millwork				
Drawers	HEPA vacuum			
Desktop	Damp cloth			
Cupboards	HEPA vacuum			
Flooring				
Sheet vinyl	Damp mop			
Tile	Damp mop			
Concrete	HEPA vacuum			

Checklist H.2 (Concluded)

Area:			Room number:	
Description	Cleaning	Date	Time	Cleaner
Mechanical/electrical rooms				
Floors	HEPA vacuum			
Walls	Dry cloth			
Equipment	Dry cloth			
Cabinets	HEPA vacuum			
Washrooms				
Sink/Counter	Damp cloth			
Toilet	Damp cloth			
Shower walls	Damp cloth			
Floors	Damp mop			
Mirrors	Damp cloth			
Windows and sills	Damp cloth			

When the room cleaning is complete, post this checklist on the entrance door.

Northern Health will arrange Terminal Clean once final Construction clean has been completed.

Category 1 – New Location

Stage 1

Excavation, Foundation, Building Envelope

This stage starts with constructor mobilization to site through to site preparation, foundation work, erecting of structural frame, and installation of roofing and exterior wall systems.

- It encompasses all work up to such time that the building envelope has been substantially completed.

SHIPPING/HANDLING/STORAGE OF CONSTRUCTION MATERIALS

- ✓ Materials for temporary or permanent installation in the building interior shall be protected from exposure to dust and moisture during delivery to the site, storage, and construction. Storage spaces for these materials shall be humidity controlled where humidity is not greater than 60% and air temperature is between 16 -28 degrees Celsius.

DUST CONTROL

- ✓ Site and associated work areas shall be maintained in an organized and clean manner.
- ✓ Site shall be kept free of debris and built up material through regular sweeping, cleaning, and debris removal. Areas shall be swept at least daily and at completion of tasks.
- ✓ After concrete slab installation, walk off mats and boot scrubbers or boot wash stations or both, shall be provided at all designated access points to the buildings and shall be maintained daily.
- ✓ Concrete floors shall be swept with a non-hazardous sweeping compound that does not contain hazardous material when debris covers more than 10% of the open floor surface.

VENTILATION

- ✓ Once the construction area has been enclosed, ventilation to the construction zone should be filtered through MERV 8 pre-filter.
- ✓ Once perimeter walls and roof are installed and the building is considered weather tight, the constructor should recirculate air through Combustion Air Handling Units (CAHUs) in all parts of the facility.
- ✓ The constructor shall establish differential pressures of 2.5 kPa (0.03 bar) between stages of construction with cleaner areas of construction remaining on higher-pressure side of division. Use of differential pressure monitoring device connected to a continuously surveilled alarm will be used.

Category 1 – New Location

Stage 2

Walls and Ceilings

This stage is when the new construction is enclosed to the point where dust control and air flow management become practicably realistic. Generally, from when interior concrete slabs are finished and cured, to the time when the interior partition walls and interior rated wall assemblies are generally completed, primed, and first coat of paint applied. The exterior walls and roof should be completed by the end of this stage.

- Temporary heating, cooling, humidification, and directional air flow should be started at the beginning of Stage 2.
- It includes the installation of the sealed ducts, electrical conduit, piping is ongoing, and suspended ceiling systems are starting.

DUST CONTROL

- ✓ Work areas shall be kept free of debris and materials.
- ✓ Work areas shall be swept daily and with the completion of specific work task, with non-hazardous sweeping compound or HEPA vacuumed or both.
- ✓ A major site clean up should be performed at least once per week or more if required.
- ✓ All hidden cavities, including stud wall cavities, infrastructure above ceiling plane, plumbing, and duct chases shall be maintained clear of dust and debris and HEPA vacuumed at the time of installation and prior to enclosing.
- ✓ Inspections of hidden cavities shall be completed by MDT or a qualified worker appointed by the MDT and documented.
- ✓ Electrical and junction boxes shall be vacuumed out regularly and especially after final sanding, prior to drywall prime, as well as after any sanding or the prime and first finish coat.
- ✓ Infrastructure above the ceiling plane shall be vacuumed with HEPA filtered vacuum and damp wiped after they are installed. Installation sequence from higher to lower with surfaces in higher areas cleaned prior to lower being installed.
- ✓ Walls or physical barrier walls shall be established between construction areas at differing construction stages.
- ✓ At the end of this stage all ceiling spaces that are meant to be accessible shall be HEPA vacuumed and all areas that can be practically reached shall be damp wiped.
- ✓ A representative of the project MDT shall inspect the ceiling spaces prior to installation of the T-bar and again prior to ceiling tile installation.

VENTILATION CONTROL

- ✓ Construction ventilation shall ensure air movement from any Stage 2 area towards adjacent Stage 1 area with a differential air pressure of at least 2.5 Pa.
- ✓ Differential pressure monitoring devices shall be installed, maintained, and continuously monitored.
- ✓ Ventilation of enclosed work areas should include the use of CAHUs. If using outside air for ventilation, the air shall be filtered with a minimum MERV 8 filter.
- ✓ Exposed openings for supply air duct systems shall remain closed until continuous filtered air flow is provided without interruption.

HUMIDITY CONTROL

- ✓ Relative humidity shall be maintained below 60% and monitored/recorded every 4 hours using relative humidity monitoring device.

Category 1 – New Location

Stage 3

Interior Finishing

This stage of construction shall include the continuation of installation for sealed ducts, electrical conduit, piping, and suspended ceiling systems to the time when the acoustic ceiling is installed, final ductwork is complete, diffusers, flooring, and millwork are installed.

- At this point the areas are habitable but not appropriate for patient care.

DUST CONTROL

- ✓ Areas at stage 3 shall be isolated from any areas that are at earlier stages of construction. Such isolation may be accomplished through the use of negative air anteroom with polyethylene construction barrier wall systems and walk off mats OR by prohibiting traffic between stages.
- ✓ As building cavities (walls, ceiling spaces) are closed, all visible debris and soil shall be removed from these spaces and shall be HEPA vacuumed prior to closure. These spaces will be inspected by member of MDT or qualified worker appointed by MDT and shall be recorded with photos, date, time, and by whom.
- ✓ Finish materials that are likely to become contaminated by construction worker traffic or activities shall not be installed until construction traffic and activities are completed in the area or shall be protected from contamination if materials cannot be installed later.
- ✓ Work areas shall be kept free of debris and materials.
- ✓ Work areas will be HEPA vacuumed at the end of each day or at the end of each task performed by trades.
- ✓ Common areas will be scrubbed with a mechanical floor maintenance washer or vacuumed with a HEPA vacuum at least once per day or more frequently when needed.
- ✓ A site cleanup shall be performed at least once per week.
- ✓ Separate enclosures shall be provided for activities that generate a large amount of dust. (e.g. a cutting room) This space shall be isolated from the HVAC system and kept under a minimum differential air pressure of 2.5 Pa CAHUs or HEPA vacuum. Separation shall be with the use of 6 mil poly, with CAHUs, where used, vented to the outside of the building where practical. Where not practical to vent to the outside, inside may be used with precautions appropriate to the work area.
- ✓ All surfaces that will be covered by another material in final constructed condition shall be cleaned using vacuum or damp wiped method without solvents.
- ✓ All ventilation provided to construction areas should be filtered through a MERV 8 pre-filter at the intake.
- ✓ All vacuums shall be HEPA filter equipped, shall have HEPA filters installed at all times, and shall be leak tested in accordance with Clause 6.6.4.2.
- ✓ Electrical and junction boxes shall be vacuumed out regularly, especially after the final sand, and prior to the drywall prime, as well as sanding of the prime coat, where conducted. Electrical and mechanical terminal boxes shall be vacuumed out immediately prior to the installation of outlet cover plates.
- ✓ Infrastructure above the ceiling plane shall be vacuumed with a HEPA filtered vacuum and damp wiped after installation. Installation sequence from higher to lower with surfaces in higher areas cleaned prior to lower being installed.

- ✓ Demising walls/partitions or physical barrier walls shall be established between construction areas at differing construction stages.
- ✓ At the end of this construction stage, all ceiling spaces that are meant to be accessible shall be HEPA vacuumed, and all areas that can be safely reached shall be damp wiped or wiped with statically charged dust cloth.
- ✓ At the end of this construction stage, the project MDT shall inspect above ceiling to ensure meets IC plan and be recorded.
- ✓ Immediately after a Construction Type A task has been completed, access panels shall be closed and displaced tiles replaced.
- ✓ All areas shall be vacuumed prior to any area advancing to construction Stage 4.

VENTILATION CONTROL

- ✓ Construction ventilation systems shall ensure directional air flow from any Stage 3 area toward adjacent areas remaining at Stage 1-2 of construction.
- ✓ Differential pressure monitoring shall be installed to ensure the air movement.
- ✓ The constructor shall take care to protect return air systems by sealing return grilles so that no small particulate can enter the ductwork or disconnection of the return ductwork.

HUMIDITY CONTROL

- ✓ Relative humidity in Stage 3 of construction shall be maintained in the range of 30-60% and shall be monitored with relative humidity monitoring devices.

MONITORING

- ✓ Differential monitoring devices shall be equipped with or connected to an integral data recorder and shall report to a continuously surveilled location.

Category 1 – New Location

Stage 4

Final Finishing

This stage includes construction activities from when acoustic ceiling is installed and flooring is completed, final duct work is completed, diffusers and millwork have been installed, up to the point where the final construction clean has been completed by constructor.

- Dust producing activities have all been completed during stage 3 of construction, with stage 4 primarily involving non-dust producing activities.
- If dust producing activities become necessary, the area of activity should be separated from the work in stage 4 through the use of barrier walls and directional air flow using CAHUs.
- Stage 4 of construction includes the point where HVAC systems are energized. Commissioning validation and verification may occur during stage 4.
- Commissioning of all systems, installation of owner supplied equipment, and building flush should be completed by end of stage 4.

DUST CONTROL

- ✓ Areas at stage 4 shall be isolated from any areas at earlier stages of construction through the use of negative air anteroom with polyethylene construction barrier wall systems and walk off mats.
- ✓ Work areas shall be continuously kept free of debris and materials.
- ✓ Work areas shall be cleaned daily and at the completion of work tasks in the space. Areas with finished floors shall be cleaned after each construction activity with mechanical floor maintenance washer and wet wiped if necessary.
- ✓ Access to the area should be restricted to only those whose responsibilities require them to perform work or inspection in the area. This space shall be isolated from the HVAC system and kept under negative pressure via CAHUs or vacuums. Separation should be accomplished with the use of 6 mil poly.
- ✓ Transport construction material and equipment in clean covered or sealed containers
- ✓ Transport debris in covered container or cover with a clean sheet for disposal.

VENTILATION CONTROL

- ✓ The area shall be vented with the buildings HVAC system.
- ✓ Construction ventilation systems shall ensure air movement from any stage 4 area toward adjacent areas remaining in stages 1-3. Differential air monitoring devices shall be installed to ensure the air movement.
- ✓ The permanent air handling system shall not be used for exhausting air from dust-generating construction zones unless under specific conditions: (see Z317.13:22 Clause 8.3.2.5.2.4)
- ✓ The HVAC system shall be cleaned before it is commissioned in accordance with CSA 317.2:15.
- ✓ If commissioning activities are taking place after ceiling tiles are in place, ceiling tiles and hatches may be opened for limited times inside HCF occupied areas if: the final construction clean is complete, duct clean has taken place, hydronic system has been flushed, the area is isolated from other sections of the building, and no dust generating activities are taking place in the vicinity of the open ceiling tiles/hatch.

HUMIDITY CONTROL

- ✓ Relative humidity in stage 4 of construction shall be maintained in accordance with the final design parameters (generally 30-60%) and monitored with the use of relative humidity monitoring devices.

TRANSITIONAL CLEANING

- ✓ At the end of stage 4, a final construction clean shall be performed.
- ✓ Completed stage 4 areas shall be fully isolated from any areas at earlier construction stages.
- ✓ Walk off mats and boot covers shall be used at entrances to areas with finished floors installed.
- ✓ Access shall be limited to essential personal only.
- ✓ Work areas shall be cleaned immediately after any work is complete.

MDT DOCUMENTATION

- ✓ **At the end of the construction project, the constructor shall provide the project MDT with written confirmation of the following:**
 - a) **The HVAC system and ducts in the construction zone are clean.**
 - b) **The HVAC has been balanced.**
 - c) **Mechanical waste disposal systems have been tested and commissioned.**
 - d) **Disinfection of the plumbing system has been completed.**
 - e) **Final construction clean activities have been completed and verified.**

Category 1 – New Location

Stage 5

Completion and Follow-Up Activities

This stage includes any construction activities done following the final construction clean or substantial completion and before occupancy to address project deficiencies or warranty work performed after occupancy.

- The activities in this construction stage are generally deemed to be performed within an occupied HCF. For work prior to occupancy, a preventative measures analysis should be performed, and preventative measures put into place.
- Final commissioning activities may take place during stage 5 of construction.

DURING AND AFTER CONSTRUCTION ACTIVITIES

- ✓ Before substantial completion and occupancy, the constructor shall obtain an infection control deficiency checklist from the program team and, once all checklist items have been satisfied, have the completed deficiency work inspected by the consultant.
- ✓ Detailed inspections shall be performed by representatives of the project MDT to confirm that all checklist items have been satisfied.
- ✓ Any construction activity to be completed at Stage 5 of construction shall have a preventative measures analysis completed and preventative measures put in place. The preventative measures shall be accepted by the project MDT and the ICP as needed.
- ✓ The project MDT shall ensure that the final inspection to ensure that the ventilation system is clean and is functioning properly is conducted.
- ✓ **Infection prevention personal (or delegated alternate) shall ensure that the facility has been terminally cleaned by the HCF environmental services department before the building occupants are allowed to occupy the new space.**