

6	IEQ	6.3	INDOOR AIR QUALITY	
		IEQ 5	CONSTRUCTION IAQ MANAGEMENT	
	EXCLUSIONS	Residential and similar buildings not provided with central air-conditioning and ventilation systems.		
	OBJECTIVE	Ensure that building ventilation systems are not contaminated as a result of residuals left over from construction activities.		
	CREDITS ATTAINABLE	2		
	PREREQUISITES	None.		
	CREDIT REQUIREMENT	<p>a) Construction IAQ management</p> <p>1 credit for implementing a Construction IAQ Management Plan.</p> <p>b) Filter replacement and flush-out</p> <p>1 credit for undertaking a building 'flush out' or 'bake out'; and replacement of all filters prior to occupancy.</p>		
	ASSESSMENT	<p>a) Construction IAQ management</p> <p>To demonstrate compliance, the Client shall submit a report prepared by a suitably qualified person documenting effective implementation of a Construction IAQ Management Plan appropriate to the scale and extent of the development including, but not limited to, the following:</p> <ul style="list-style-type: none"> <li>• a copy of the Plan;</li> <li>• evidence of measures showing protection of ducts, on-site storage or protection of installed absorptive materials, etc;</li> <li>• checklists, worksheets, notifications, deficiencies, resolutions, etc., related to construction IAQ issues;</li> <li>• documentation that demonstrates implementation of construction IAQ management measures during construction;</li> <li>• details of filtration media used during construction and installed immediately prior to occupancy; and</li> <li>• documentation for duct cleaning and testing.</li> </ul> <p>Where due attention has been paid to construction IAQ management as detailed in the checklist below, the credit shall be awarded.</p> <p>b) Filter replacement and flush-out</p> <p>The Client shall submit a report prepared by a suitably qualified person detailing the technical information for the filtration media used during construction and installed immediately prior to occupancy. The report shall also provide the detail of building flush-out procedures including actual dates of the flush-out.</p> <p>Where it can be demonstrated that filtration media used had a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ANSI/ASHRAE 52.2-2007[1] or equivalent performance specification, and a flush-out with new filtration media is being carried out after the completion of construction and prior to occupancy, the credit shall be awarded.</p> <p>The flushing duration shall be subject to calculation of the fresh air required to attain the IAQ certification 'good' class requirement. During</p>		
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1 American Society of Heating, Refrigerating and Air-conditioning Engineers. ANSI/ASHRAE Standard 52.2-2007. Method of Testing General Ventilation Air-cleaning Devices for Removal Efficiency by Particle Size. Atlanta, 1999. www.ashrae.org

## CHECK LIST

the flushing period, there should be no construction work done in the vicinity of the space being flushed, such that the flushing result may be reduced. After flushing, the space should be protected against any re-contamination.

Contract conditions for the project specifications should require a written Construction IAQ Management Plan which includes procedures meeting or exceeding the minimum requirements, as follows:

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- measures to protect the ventilation system components and air pathways against contamination during construction;
- cleaning procedures to be employed prior to the building being occupied, in the event that ventilation system components and air pathways are not adequately protected;
- control measures for HVAC system and component protection;
- contaminant source control; and
- interruption of moisture/pollutant pathways;

Events shall be scheduled to protect indoor air quality by:

- permitting adequate airing-out of new materials;
- sequencing the installation of finish materials; and
- proper curing of concrete before covering.

The Plan should specify the location, type, amount, sequence and timing of the various control measures, including emergency procedures, and the labour, materials and time required to implement them. The project construction documents should address the following:

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- an overview of tasks to be executed;
- a list of reference documents, including specifications, drawing list, and submittal drawings;
- a list of participants in the process and their responsibilities;
- a plan for management, communication and documentation;
- an outline of the scope of the IAQ Management Plan, including submittal review, inspection, and enforcement;
- the expected written work products, including checklists and worksheets; and
- a schedule of activities.

The project construction documents should require the contractor to:

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- designate a representative with daily responsibility for IAQ issues;
- include procedures related to the IAQ Management Plan on the agenda during regularly scheduled meetings;
- store building materials in a weather tight, clean area protected from dust, debris and moisture damage;
- keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. Identify the storage, disposal and housekeeping practices to be applied to building supplies and waste materials to protect HVAC systems from contamination;
- submit a construction schedule to prevent materials from acting as sinks for storage and subsequent release of contaminants emitted from finishes which have the potential for short-term off-gassing. In the schedule, the contractor should include appropriate allowances

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- for drying or curing times before installation of materials that have a fibrous or porous nature that tend to adsorb contaminants;
- provide adequate outside air continuously during installation of materials and finishes;
- replace all construction-related filtration media used on permanent HVAC equipment at substantial completion of the work;
- confirm that all air filters, casing, coils, fans and ducts are clean, before air quality testing; and
- ensure air ducts are clean by coordinating duct testing and cleaning procedures with the commissioning requirements.

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## BACKGROUND

Buildings, especially those with extensive ventilation systems, can suffer from indoor air pollution problems arising from residuals left in HVAC and mechanical ventilation systems. Proper management during construction, followed by cleaning and replacement strategies, can significantly reduce air pollution caused by construction. Designers should specify containment control strategies including protecting the HVAC systems, controlling pollutant sources, interrupting pathways for contamination, enforcing proper housekeeping and coordinating schedules to minimise disruption. The construction sequencing to install absorptive materials after the prescribed dry or cure time of wet finishes should be specified to minimise adverse impacts on indoor air quality. Materials directly exposed to moisture through precipitation, plumbing leaks, or condensation are susceptible to microbial contamination. Absorptive materials to be protected and sequenced during installation include: insulation, fabrics, ceiling tiles, and gypsum products. During construction the IAQ management should be monitored and reported.

The flush-out may begin only after all construction work and finishing is completed; all cleaning finalised and all fixed furniture installed. Final test and balancing should be completed and HVAC control should be functional, particularly if the occupants will be moving in during the second phase of flush-out.

The flush-out procedure may use the building's HVAC system, but alternatives are acceptable providing that they can comply with the air quantity, temperature and humidity requirements.

One approach uses temporary supply and exhaust systems placed into windows or window openings. EPA's indoor air quality for schools web site [2] provides information on exhaust and spot ventilation during construction activities that can be helpful for design teams who are considering using this approach.

Care must be taken to ensure the airflow is not short circuited, potentially leaving remote corners within the project spaces with less than adequate circulation, or other parts of the building with unanticipated increases, such as a stack effect up elevator shafts.

If the building's HVAC system is used, any temporary filters and duct coverings installed shall be removed. The filtration media shall be replaced with new media unless the system is configured such that filters filter only the outside air. The new filters installed prior to the start of flush-out must be MERV 13 or better [1].

Depending upon the season, outside air can be cold or humid. Appropriate internal temperature and relative humidity shall be maintained during flush-out procedure.

2 EPA, Controlling Pollutants and Sources; 5. Ventilation Techniques, <http://www.epa.gov/iaq/schooldesign/controlling.html#Air Out and Flush Out>

EU 9 Energy Efficient Appliances

EU 10 Testing and Commissioning

EU 12 Metering and Monitoring

#### Water Use

WU P1 Water Quality Survey

WU P2 Minimum Water Saving Performance

WU 1 Annual Water Use

WU 5 Water Efficient Appliances

#### Indoor Environmental Quality

IEQ P1 Minimum Ventilation Performance

IEQ 1 Security

IEQ 2 Plumbing and Drainage

IEQ 4 Waste Disposal Facilities

IEQ 5 Construction IAQ Management

#87. IEQ 5, For BEAM Plus New Buildings Version 1.1 and 1.2, how frequent should the records/evidence be submitted to demonstrate the implementation of IAQ management practice during construction?

The Applicant is required to submit one set of record in the Final Assessment to demonstrate the implementations of IAQ management practice during construction. Monthly records are not required.

(Released on 29 November 2019)

IEQ 6 Outdoor Sources of Air Pollution

IEQ 7 Indoor Sources of Air Pollution

IEQ 9 Increased Ventilation

IEQ 10 Background Ventilation

IEQ 11 Localised Ventilation

IEQ 12 Ventilation in Common Areas

IEQ 14 Thermal Comfort in Naturally Ventilated Premises

IEQ 15 Natural Lighting

IEQ 16 Interior Lighting in Normally Occupied Areas

IEQ 17 Interior Lighting in Areas Not Normally Occupied

IEQ 18 Room Acoustics

IEQ 19 Noise Isolation

IEQ 20 Background Noise

IEQ 21 Indoor Vibration

IEQ 22 Access for Persons with Disability

IEQ 23 Amenity Features

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Circular Letter No.: 2020.168 (Revision 1)

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Application: BEAM Plus NB Version 1.1 and 1.2

Effective Date: 28 January 2022

### **Updated Exclusion Clauses for IEQ Credits**

1. **Technical Circular Letter No. 2016.134 dated 09 August 2016 will be withdrawn on the effective date.**
2. This Circular Letter clarifies the exclusion clause for the following credits:

Credits	New Exclusions
IEQ P1 IEQ 9	Residential premises, or Premises designed to utilise natural ventilation and without any fresh air provision <sup>1</sup> .
IEQ 3	Residential premises, or Premises without any provision of air-conditioning equipment.
IEQ 5	Residential premises, or Premises without HVAC system.
IEQ 6	Residential premises, or Premises without any fresh air provision <sup>1</sup> .
IEQ 7a IEQ 7b	Residential premises without any interior decoration, or Premises without any fresh air provision <sup>1</sup> and interior decoration.
IEQ 10	Premises with fresh air provision <sup>1</sup> .
IEQ 11b	Residential premises, or Premises without any future tenant (for example, single owner occupier premises).
IEQ 12	Premises without any enclosed common area in the main circulation route.
IEQ 13a	Normally occupied premises <sup>2</sup> without any air-conditioning equipment installed and provided by the project proponent, or without any fresh air provision <sup>1</sup> .
IEQ 13b	Normally occupied premises <sup>2</sup> without any installation of air diffuser in the air-conditioning system.

<sup>1</sup> Fresh air provision means any fresh air equipment such as PAU, AHU, FAU, FAP, FAF, etc.; and/or premises with fresh air louvers, etc.

<sup>2</sup> Normally occupied premises are enclosed spaces / areas where people normally stay there for more than 1 hour per person per day on average.

Credits	New Exclusions
IEQ 14a	Normally occupied premises <sup>2</sup> with fresh air provision <sup>1</sup> .
IEQ 14b	Normally occupied premises <sup>2</sup> with fresh air provision <sup>1</sup> , or without any air-conditioning equipment installed and provided by the project proponent.
IEQ 16	Residential premises, hotels, apartment and premises where lighting installation will be provided by future tenant such as Retail and F&B <sup>3</sup> .
IEQ 21	Not normally occupied premises <sup>2</sup> .




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Chairperson of Standards Sub-committee

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<sup>3</sup> The clause “For premises to be fitted out by tenants, compliance shall be confirmed if the technical details and contractual arrangements with tenants in respect of lighting installation are deemed to meet the assessment criteria.” in BEAM Plus Manual IEQ 16 becomes not applicable.