

**MGM TOWER
CONSTELLATION PLACE, LLC
CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN**

Intent:

Reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

Requirements for construction of the tenant space as follows:

- During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3.
- Protect stored on-site or installed absorptive materials from moisture damage.
- If permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille. Replace all filtration media immediately prior to occupancy.
- Remove any contaminants that remain at the end of the construction period.

Requirements for pre-occupancy of the tenant space as follows:

Air Filtration

Option 1

General Contractor and Facility Engineer shall conduct a minimum 2 week building/tenant space flush out with new filtration media with 100% outside air. After the flush-out, replace the filtration media with new media, except for filters solely processing outside air.

OR

Option 2

General Contractor shall hire an independent air testing company to conduct a baseline indoor air quality test for the affected space(s) in the building that demonstrate(s) that the concentration levels for the chemical air contaminants are below specified levels. For each sampling point where the maximum concentration limits are exceeded conduct a partial building flush-out, for a minimum of two weeks, then retest the specific parameter(s) that were exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met.

Chemical Contaminant	Maximum Concentration
Formaldehyde	0.05 parts per million
Particulates (PM10)	20 micrograms per cubic meter above outside air conditions
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter
4-Phenylcyclohexene (4-PCH)	3 micrograms per cubic meter
Carbon Monoxide (CO)	9 parts per million

- Air samples shall be collected for every 25,000 square feet, or for each contiguous floor area, whichever is greater.
- Measurements to be conducted with the building ventilation system starting at normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout duration of the air testing.
- Building shall be fully finished and unoccupied. Furniture can be included in the testing if desired but it is not required.
- Test with time weight values of 4 hours with data logging.
- When re-testing non-complying building areas, take samples for the same locations as in first test.
- Copies of the IAQ testing results should describe the contaminant sampling and analytical methods, the locations and duration of contaminant samples, the field sampling log sheets and laboratory analytical data and the methods and results utilized to determine that the ventilation system was started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode through the duration of the air testing.

Project Strategies

In order to meet the requirements listed above, ALL SUBCONTRACTORS shall comply with the job site Indoor Air Quality (IAQ) management guidelines listed below. All superintendents and/or foremen will provide training to their employees to ensure that construction IAQ management procedures are understood and followed.

Pollution Source Control

1. Protect against moisture exposure: All absorptive building materials (including but not limited to carpet, drywall, ceiling tiles, and furnishings) shall be stored in a dry location and kept dry at all times.
2. Do not use moisture-damaged materials: Any porous or absorptive building materials that have been exposed to moisture shall be thoroughly dried before being installed. Any porous material that has remained wet longer than 48 hours, or shows any sign of mold shall be discarded and replaced.
3. Mitigate moisture intrusion: If it begins to rain or groundwater is coming into the building please notify superintendent immediately and relocate, cover, or protect all absorptive materials.
4. Use low-emitting products: No adhesive, sealant, caulking, primer, paint or other wet product substitution from the specifications is allowed unless authorized by Architect. All products used shall comply with volatile organic compound (VOC) requirements of the SCAQMD and LEED™.
5. Do not introduce pollutants into work areas: Once stud framing and drywall begin as well as the installation of the mechanical equipment, access to the building interior shall be limited to reduce the likeliness of contaminants entering the building.
6. No smoking is allowed in the building or tenant space at any time during or after construction.
7. Allow materials to off-gas prior to installation: Plastic, fabric, laminates, furnishings, millwork and assembled materials that are packaged or rolled-up shall be opened up and ventilated for a minimum of four days outside of the building. If feasible, Sub-contractors shall off-gas VOC laden products off-site. There is no covered space on-site to off-gas these materials.

HVAC Protection

1. Store HVAC equipment in a clean, dry location: Until HVAC system is fully installed; all HVAC equipment and ductwork components shall be covered and sealed or stored in a location where moisture and contaminants are not introduced.

2. Seal all HVAC inlets and outlets: Use of the HVAC system during construction is strictly prohibited until drywall construction is complete. All air inlets and outlets shall be sealed during construction until the system is ready for start-up.
3. Use temporary air filters: If HVAC system is operated before work is complete, temporary HVAC air filters will be installed at all return air inlets in order to protect ductwork and equipment from construction dust and debris. All temporary filtration media shall be rated as at least MERV 8. During construction, filters shall be inspected weekly and replaced as needed.
4. Avoid contaminated air entry: When dust is produced from heavy outside work, outside air supplies to building air handling systems shall be closed.

Pathway Interruption

1. Interruption of potential contaminant pathways will be implemented, as feasible, to prevent dust and other contaminants from migrating from work site to clean or occupied areas.
2. Dust curtains will be used to isolate construction activities that generate significant dust (such as drywall cutting).
3. Pollutant sources (including paint and chemical mixing) should be located as far away as feasible from storage of HVAC ductwork, absorptive materials, and general work areas.

Everyday Housekeeping

1. Minimize dust: Methods of minimizing dust from cut-off saws, drywall sanders, etc. shall be used. This means using dust collection systems on these tools and emptying them into receptacles located outside the building. Use damp rags, mops or vacuum cleaners to clean up dust as necessary within the job site.
2. Minimize dirt: Sweeping compounds shall be used to keep floors clean of dirt and dust. Floors shall be swept daily in the work areas or more frequently if required.
3. Keep work area clean and dry: If water leaks occur, promptly mop areas dry.
4. Seal containers containing VOCs: Containers of fuel, paints, finishes, and solvents shall be kept tightly sealed when not in use. These containers shall be stored outside the building and remain outside the building to the greatest extent possible.

Sequencing Work

1. Porous materials (drywall, carpet, ceiling tiles, etc.) should be installed after building is fully closed in.
2. Carpeting and furnishings shall not be installed until after interior paints and finishes have fully cured.

Reporting and Submittals

All Sub-contractors are responsible for reporting any problems with on site Construction Indoor Air Quality measures to the General Contractor.

General Contractor shall provide 18 photographs-six photographs taken on three different occasions during the construction period of IAQ management measures such as protection of ducts and on site stored or installed absorptive materials. Provide identification of the SMACNA approach featured by each photograph.

GC shall provide technical information on filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted.

GC shall provide documentation of post construction flush-out for Pre-Occupancy Option 1 OR
Measurement report for contaminant concentrations for Pre-Occupancy Option 2.