**PART 1 – GENERAL**

The intent of this specification is to define CONTRACTOR requirements and actions to ensure the building Mechanical Systems are free of Volatile Organic Compounds (VOCs), moisture, dust, and/or mold/microbes prior to achieving substantial completion.

* 1. **SUMMARY**
1. Specification includes definition of:
2. CONTRACTOR requirements for temporary construction ventilation, dust protection, preconditioning of materials, protection of materials, sequencing, and duct protection.
3. Required duct cleaning to be performed by the CONTRACTOR to ensure good indoor air quality after occupancy.
4. Provisions of the General Conditions and Division 01 apply to this section. Sections that are referenced or related may include:
5. Section 01 11 25: Phasing of the Work
6. Section 01 31 13: Project Coordination
7. Section 01 32 13: Construction Project Schedule
8. Section 01 45 23: Testing and Inspection
9. Section 23 90 00: Test and Balance for HVAC
10. Section 01 50 00: Construction Facilities and Temporary Controls
11. Section 01 61 00: Materials and Equipment
12. Section 23 80 00: Heating, Ventilating, & Air Conditioning Equipment
13. Section 23 30 00: Air Distribution
14. Other related or referenced standards include:
15. ASHRAE 62.1 – 2004
16. ASHRAE 52.2 – 1999
17. CHPS Best Practices Manual – Volume III (2006 Edition)
18. VOC Emitting Materials. Provision of Specification Divisions 02-16 apply to this section. Sections that are referenced or related may include:
19. Section 04 01 05: Masonry Restoration and Cleaning
20. Section 06 10 60: Rough Carpentry
21. Section 06 17 30: Wood Chord Metal Joists
22. Section 06 18 00: Structural Glue Laminated Members
23. Section 06 20 00: Finish Carpentry
24. Section 07 90 00: Joint Sealants
25. Section 09 25 00: Gypsum Board
26. Section 09 65 66: Synthetic Athletic Flooring
27. Section 09 65 10: Rubber Flooring and Stair Covering
28. Section 09 65 19: Vinyl Composition Tile
29. Section 09 65 00: Resilient Sheet Flooring
30. Section 09 67 20: Epoxy Floor Coating
31. Section 09 68 00: Sheet Carpet
32. Section 09 69 00: Wood Flooring Restoration
33. Section 09 9 00: Painting
34. Section 09 96 60: Anti-Graffiti Coatings
35. Section 09 61 05: Concrete Vapor Emissions Treatment
36. VOC Emitting Furnishing and Equipment. Provisions of Specifications Divisions 02-28 apply to this section. Sections that are referenced or related may include:
37. Section 06 41 00: Casework only
38. Section 10 11 00: Visual Display Boards and Panels
39. Section 10 21 13.13: Solid Phenolic Toilet Partitions
40. Section 12 44 16: Cubicle and Shower Curtains
41. Section 11 61 43: Platform Curtains
42. Section 11 52 13: Projection Screens
43. Section 11 65 00: Athletic Equipment – protective wall padding only
44. Section 12 20 00: Venetian Blinds (Administration & Support)
45. Section 12 20 10: Window Darkening Venetian Blinds
46. Section 12 56 10: Folding Tables and Benches
47. Section 12 66 13: Telescoping Bleachers
48. Porous and Fibrous Materials. Provisions of Specifications Divisions 02-16 apply to this section. Sections that are referenced or related may include:
49. Section 07 21 00: Building Insulation – exposed batt only
50. Section 09 53 00: Acoustical Ceiling Systems – ceiling tiles only
51. Section 09 51 00: Acoustical Ceiling – Lay-in
52. Section 09 68 00: Sheet Carpet
	1. **SUBMITTALS**
53. CONTRACTOR is required to develop and submit to the Owner for review and approval a Construction Indoor Air Quality (IAQ) Plan using the blank form provided as Appendix A of this Specification. Plan shall be submitted within 20 days on NTP. Implementation of the approved IAQ Plan will be included in the project construction schedule.

**PART 2 – PRODUCTS** (Not Applicable)

**PART 3 - EXECUTION**

**3.01 QUALITY CONTROL**

 CONTRACTOR shall conduct inspections to confirm that measures proposed in the Construction IAQ Plan are followed during construction and be prepared to report on compliance with the Plan during the weekly progress meetings.

**3.02 PROJECT CONDITIONS**

A. During construction and prior to Substantial Completion (including Building Flush Out per 3.05.C), systems designed with particle filters shall not be operated at any time without filters in place. Filters used during construction shall have a minimum MERV rating of eight (8). Following construction, replace all filters per Section 23 80 00, Heating, Ventilating and Air Conditioning Equipment.

B. Following building enclosure (installation of walls, windows and doors), CONTRACTOR shall maintain continuous Temporary Construction Ventilation of all interior areas during installation of the VOC-Emitting Materials and VOC-Emitting Furnishings and Equipment, identified in Paragraphs 1.01.C and 1.01.D of this Specification, in those areas.

1. Temporary Construction Ventilation may be supplied via the building’s HVAC system and shall comply with the following requirements:

a. All return air grilles shall be sealed or temporary air filters (MERV 8) shall be installed.

 b. Provide air filters (MERV 8) to filter the outside air.

c. Provide a minimum of three (3) air changes per hour of outside air while maintaining the building interior temperature between 60° F and 85°F with the relative humidity not to exceed 60%. The Temporary Construction Ventilation specified requirements for building interior temperature and/or relative humidity may be exceeded only when the building HVAC unit is operating at 100% capacity.

2. Temporary Construction Ventilation may be supplied via temporary ducts and fans, sufficient to provide no less than three (3) air changes per hour, exhausted directly to the outside/outdoors while maintaining the building interior temperature between 60°F and 85°F with the relative humidity not to exceed 60%.

3. Maintain continuous Temporary Construction Ventilation for a minimum period of 72 hours after installation of the VOC-Emitting Materials unless otherwise indicated elsewhere in these Specifications.

C. Temporary Construction Ventilation shall also be provided for post-building-flush-out [post-occupancy] touch-up or punch list activities involving VOC-Emitting materials. Touch-up activities involving VOC-Emitting Materials shall not occur when students or staff is present.

D. Prior to installation, allow contractor-furnished/contractor-installed VOC-Emitting Furnishings and Equipment, identified in article 1.01.E of this Specification, to off-gas in dry, well-ventilated space for 14 calendar days.

 1. Remove containers and packaging to maximize off-gassing of VOCs.

2. Precondition products in ventilated warehouse or other ventilated building. Preconditioning at the project site is acceptable, provided that Temporary Construction Ventilation and Sequencing measures are taken as described in paragraphs 3.02.B and 3.03 of this Specification.

3. Products requiring preconditioning include, at minimum, contractor-furnished/contractor-installed VOC-Emitting Furnishings and Equipment that contain vinyl or other flexible plastics, resins, adhesives, foam rubber, and fiberboard with urea-formaldehyde binders. Products bearing CHPS-approved low VOC emitting certification (CHPS Low-Emitting Materials Table ([www.chps.net](http://www.chps.net)), Greenguard ([www.greenguard.org](http://www.greenguard.org)), Indoor Advantage Gold ([www.scscertified.com](http://www.scscertified.com)), Green Label Plus ([www.carpet-rug.com/](http://www.carpet-rug.com/)), or other Owner-approved certification shall be excluded from this preconditioning requirement.

**3.03 SEQUENCING**

A. Where VOC-Emitting Materials identified in article 1.01.C of this Specification are applied on-site, apply the VOC-Emitting Materials prior to installation of any Porous and Fibrous Materials identified in article 1.01.E of this Specification. Maintain the continuous Temporary Construction Ventilation requirements described above for a period of 72 hours before installation of porous and fibrous materials.

1. Where this sequencing requirement is not possible, protect porous materials with polyethylene vapor retarders. Tape all polyethylene edges to insure a complete seal. Maintain continuous ventilation per temporary construction ventilation requirements described above for a period of 72 hours before removing polyethylene.

B. Completion: Complete interior finish material installation prior to Building Flush-**Out as described in paragraph 3.05.C of this Specification.**

**3.04** **PROTECTION**

A. Moisture Protection

1. Protect all materials specified in articles 1.01.C, 1.01.D and 1.01.E from water intrusion or penetration.

2. Weatherproof enclosures shall be temporarily constructed to store and protect the materials from moisture sources.

3. Materials shall be covered to protect them from rain and other moisture sources and, if resting on the ground, shall use spacers to allow air to circulate between the ground and the materials.

4. Materials including porous or fibrous materials with visible mold and microbial growth shall not be installed.

a. Non-porous materials with minor visible mold and microbial growth shall be decontaminated.

b. Structural lumber showing visible signs of mold may be decontaminated, per Specification Section 06 10 00, Rough Carpentry, and installed.

B. Duct Protection

 1. Seal all ducts during transportation and deliver.

2. Seal all ducts during construction to prevent accumulation of dust and debris. If seals must be removed for temporary construction ventilation purposes, they shall be resealed upon conclusion of the required ventilation period. Remove seals prior to HVAC system start-up.

3. During dust producing activities in enclosed buildings (e.g. drywall installation and finishing, sanding, cutting, or grinding), CONTRACTOR shall turn HVAC ventilation system off and protect all HVAC system supply and return openings from dust infiltration. Separate dust-producing activities from the rest of the construction area using plastic sheathing. Provide temporary ventilation as required.

**3.05 CLEANING**

A. Just prior to substantial completion, vacuum all carpeted and soft surfaces with a Green Label certified vacuum. ([www.carpet-rug.com/](http://www.carpet-rug.com/)).

 B. Duct Cleanliness

1. Before shipment to site, remove oil film on sheet metal. Ducts shall be inspected to confirm that no oil film is present.

2. Just prior to Substantial Completion and prior to using any ducts to circulate air, insure that the ducts are free of dust and dirt.

C. Building Flush-Out

1. These Building Flush-Out procedures supersede those described in Section 01 45 23 – Testing and Balance.

2. Just prior to Substantial Completion, but following Test and Balance, flush out the building continuously (i.e. 24 hours per day), for fourteen (14) days using the building HVAC System, set for a minimum of 35% outdoor air while maintaining the building interior temperature between 60°F and 85°F with the relative humidity not to exceed 60%. The Temporary Construction Ventilation specified requirements for building interior temperature and/or relative humidity may be exceeded only when the building HVAC unit is operating at 100% capacity.

3. Building occupancy may occur after seven (7) days of the required fourteen (14) days of continuous building flush-out.

4. During building flush-out, when Contractor is required to perform touch-up or punch list activities involving VOC-Emitting Materials as described in paragraph 1.03 of this Specification, extend Building Flush-Out by a minimum of four (4) days continuously after touch-up or punch list activities at the maximum tempered outside air rate for 24 hours per day in the space where the touch-up or punch list activities occurred.

5. If Continuous Construction Ventilation is not possible, non-continuous flush-out must total an equivalent of fourteen (14) days.

6. Return ventilation system to normal operation following flush-out period to minimize energy consumption.

**END OF SECTION**

**CONSTRUCTION INDOOR AIR QUALITY (IAQ) PLAN**

The General Contractor shall complete and submit this Plan to the OAR no later than one hundred twenty (120) days after receipt of Notice to Proceed.

GENERAL CONTRACTOR:

Name: Title:

Telephone: Fax:

Email:

I have read and understood and will implement the following Construction IAQ Plan.

Signature: Date:

1. CONSTRUCTION VENTILATION (Per 3.02.A-C)

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| --- |
| List all project materials requiring Construction Ventilation per Specification Section 01 81 19. Attach additional sheet if necessary. Circle the following Temporary Construction Ventilation approach to be used.  |
| 3.02.B | Ventilation will be supplied via building’s HVAC system. * Return air grilles are sealed. Exhaust is provided via open windows or doors.

OR:* Return air grilles are used for exhaust. HVAC will provide a minimum 35% outside air. Air filters with a minimum MERV rating of 8 will be provided at return air grilles.
* Building HVAC will be turned off during dust generating activities.
 |
| 3.02.C | Ventilation will be accomplished via open windows, temporary ducts, and temporary fans ducted directly to the outdoors. * Supply air diffusers, return air grilles, and/or open ducts will be sealed. Make-up air will be provided through open windows or doors or other transfer air devices.
* HVAC system will provide make-up air. Return air grilles will be sealed.
 |
| Required | * Ventilation will provide no less than three air changes per hour.
* Ventilation will be continuous for a period no less than 72 hours after completion of installation of VOC emitting materials.
* All filters used during Construction Ventilation will be replaced prior to Substantial Completion.
 |

1. PRECONDITIONING (Per 3.02D)

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| List all project materials requiring Preconditioning per Specification Section 01 81 19. Attach additional sheet if necessary. Circle the following Precondition approach to be used.  |
| A | Preconditioning will occur in dry and well-ventilated offsite location. Where is the offsite location? |
| B | Preconditioning will occur onsite. Check the applicable approach.  Ventilation will be supplied via building’s HVAC system. See 3.02. B above.  Ventilation will be accomplished via open windows, temporary  ducts, and temporary fans. See 3.02.C above.  |
| Required | * Containers and packaging will be removed prior to Preconditioning.
* Preconditioning will occur for fourteen (14) continuous days prior to installation
 |

1. SEQUENCING (Per 3.03)

|  |
| --- |
| List all project porous and fibrous materials requiring Sequencing consideration per Specification Section 01305. Attach additional sheet if necessary.  |
| Required | * Previously installed Porous and Fibrous Materials located in a room where VOC-Emitting Materials are to be installed will be protected with polyethylene vapor retarder. Polyethylene will not be removed until completion of a 72-hour ventilation period.
* Installation of interior finish materials will complete fourteen (14) days prior to Substantial Completion.
 |

1. Protection (Per 3.04)

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| List all project materials requiring Protection per Specification Section 01 81 19. Attach additional sheet if necessary.  |
| Required | * Weatherproof enclosures shall be temporarily constructed to store and protect the materials from moisture sources. Materials shall be covered from rain and other moisture sources and if resting on the ground, use spacers to allow air to circulate between the ground and the materials.
* Materials including porous of Fibrous Materials with visible microbial growth shall not be installed.
* Materials that are not defined as Porous or Fibrous with visible microbial growth shall be decontaminated prior to installation. Lumber exhibiting a minor amount of “lumberyard mold” need not be discarded.
* Temporary ventilation will be provided during all dust producing activities. See Item I Construction Ventilation above. All supply air diffusers and return air grilles will be covered.
* Ducts will be sealed during transportation, delivery, and construction.
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