

RECOMMENDED TENANT CONSTRUCTION PLANS

June 2015

- I. CONSTRUCTION WASTE
MANAGEMENT PLAN**

- II. CONSTRUCTION INDOOR AIR
QUALITY MANAGEMENT PLAN**

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CODEGREEN
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CONSTRUCTION WASTE MANAGEMENT PLAN

I. OBJECTIVES

The objectives of this plan are to:

- Recycle, reuse or salvage at least 75%, by weight, of the waste generated as a result of demolition and construction activities for the project.
- Comply with the criteria and documentation requirements of “Materials and Resources Credit 2 - Construction Waste Management, Divert 75% from Landfill”, of the U.S. Green Building Council’s LEED-CI v2009 Rating System.

II. PLAN IMPLEMENTATION, OVERSIGHT AND ENFORCEMENT

- The Demolition/Construction Waste Management Plan will be managed by the general contractor / project manager; however, specific salvage and recycling activities will be performed by designated waste hauling contractors. The general contractor / project manager will provide oversight, coordination, and enforcement of all waste management activities on site.
- The general contractor / project manager will assemble (from contractors) copies of all tickets, receipts or other submittal information related to waste removal, salvage, and recycling.
- The general contractor / project manager will compile a log of the salvaged and recycled materials throughout the demolition and construction phases. The log will track the total amount of salvaged and recycled materials (by weight), the amount of material sent to landfills (by weight), and the overall salvage/recycling rate for the project. The log will be updated and presented to the Owner/Design team for review on a semi-monthly basis.
- The general contractor / project manager will designate one individual to coordinate and address issues that may arise related to the project’s demolition/construction waste management activities.

IV. WASTE MANAGEMENT MEASURES DURING DEMOLITION AND CONSTRUCTION

- During the demolition and site preparation phase, all salvage and recycling activities will be undertaken by the waste hauling vendor. The targeted materials, sorting methods, and required submittals are described below.
- During the construction phase, all salvage and recycling activities will be undertaken by the waste hauling vendor. The targeted materials, sorting methods, and required submittals are described below.
- Per Section II above, the general contractor / project manager will oversee and enforce the waste hauling vendor's salvage and recycling efforts, and will collect copies of all tickets, receipts or other submittal information. The general contractor / project manager will collect the waste hauling vendor's submittals and update the project waste recycling log.

LIST OF MATERIALS TARGETED FOR RECYCLING

- Metals from banding, ductwork, piping, rebar, roofing, other trim, structural steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
- Cardboard, paper, packaging
- Ceiling Grid
- Wallcovering
- Light Fixtures
- Concrete
- Bricks
- Concrete Masonry Units (CMU)
- Clean dimensional wood
- Clean, unpainted drywall
- Carpet and pad
- PVC piping
- Beverage containers

LIST OF MATERIALS NOT APPLICABLE TO LEED CALCULATIONS

- Land clearing debris (trees, shrubs, other plant materials)

- Excavated soils and rock
- Hazardous wastes

SORTING METHOD

- Construction and Demolition (C&D) waste debris to be collected on-site and waste sorting and recycling to be performed off-site at separation, diversion and recycling facility(ies). For example:

Off-site sorting and recycling will be implemented using the following process:

1. All demolition and construction waste material (mixed C&D waste) will be collected in mixed-waste containers on site and then trucked to a transfer station to be off-loaded by the waste hauling vendor for sorting and recycling.
2. Each container will be weighed to establish the total weight of the delivered material.
3. Each container will be sorted and weighed at the transfer station to assess its contents. Using this method, the waste hauling vendor will document all materials that will be recycled, as well as those that will be disposed of in landfills.
4. The general contractor / project manager will use the tickets and other documentation from the waste hauling vendor to compile and document the monthly and overall off-site recycling rate, per the "Submittals" section below.
5. Note – visual inspections are not permitted.

V. SUBMITTALS AND DOCUMENTATION

The general contractor / project manager will provide building management with calculations and supporting documentation to demonstrate end-of-project salvage/recycling rates meeting the requirement of at least 75% diversion from landfill.

1. The general contractor / project manager will record and document the total weight (in tons) of all demolition waste materials sent to the landfill.

2. The general contractor / project manager will record and document the total weight (in tons) of all demolition waste materials recycled or salvaged.
3. In addition, the general contractor / project manager will provide the name of the receiving facilities/companies that will be purchasing or accepting the recycled or salvaged materials. Receipts or other proof of facility reception of materials will be provided per Item 5 below.
4. For materials separated for recycling off-site, the general contractor / project manager will obtain a tickets and other related information from the waste hauling vendor stating the recycling rate of each dumpster, and the material types recycled. The waste hauling vendor will also provide a listing of the receiving facilities/companies that will be purchasing or accepting the recycled or salvaged materials.
5. The general contractor / project manager will submit monthly Waste Management Progress Reports to building management containing the following information:
 - Project title, name of company completing report, and dates of period covered by the report
 - Report on the disposal of all jobsite waste, including:
 - Reused or salvaged materials. For each material, the following information will be provided:
 1. Amount of material salvaged (in tons)
 2. The dates removed from the jobsite
 3. The Receiving Party
 - Recycled materials (sorted on-site). For each recycled material, the following information will be provided:
 1. Weight (in tons) of each type of recycled material
 2. The dates the dumpsters/containers were removed from the jobsite
 3. The Receiving Party
 - Comingled waste. The following information will be provided:
 1. Weight (in tons) of total waste taken off-site
 2. The dates the dumpsters/containers were removed from the jobsite
 3. The Receiving Party

4. A letter from Receiving Party that discloses the annual recycling rate percentages for that facility
- Landfilled materials. The following information will be provided:
 1. Weight (in tons) of waste
 2. The dates the dumpsters/containers were removed from the jobsite
 3. The identity of the transfer station or landfill
6. A total to-date diversion rate.
 7. Upon request of the Owner, one copy of all weight tickets and receipts.

FINAL CALCULATION OF C&D WASTE DIVERSION

- Final project-wide C&D waste diversion rate will be calculated as follows:

Total C & D Waste	x Tons	Total waste generated (tons)
Total Recycled	y Tons	Materials diverted from landfills, by salvage, reuse and recycling (tons)
Diversion Rate	y/x%	Percentage of project’s waste diverted from landfills

VI. MEETINGS AND COMMUNICATIONS

The Construction Waste Management Plan will be reviewed at the LEED Kick-Off Meeting prior to the mobilization and start-up of construction. Ongoing Plan issues will be recorded via project meeting minutes as the project progresses. Per Section III above, the general contractor / project manager will designate one individual on-site to coordinate and address issues that may arise related to the project’s demolition/construction waste management activities.

Construction Indoor Air Quality Management Plan

EQc3.1 Construction IAQ Management Plan – During Construction

Develop and implement and Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

1. During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3.
2. Protect stored on-site or installed absorptive materials from moisture damage.
3. If permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grille, as determined by ASHRAE 52.2-1999.
4. Replace all filtration media immediately prior to occupancy with **MERV (select 8 or 13)** filters.

EQc3.2 Construction IAQ Management Plan – Before Occupancy

Develop and implement and Indoor Air Quality (IAQ) Management Plan and implement it after all finishes have been installed and the building has been completely cleaned before occupancy.

Conduct baseline IAQ testing after construction ends and prior to occupancy, using testing protocols consistent with the EPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED Reference Guide for Green Interior Design and Construction, 2009 Edition.

OVERVIEW

The intent of this IAQ Plan is to:

1. Minimize exposure of construction workers to air pollutants;

2. Prevent air pollutants from collecting in building systems and on building materials; and
3. Prevent air pollutants caused by construction from migrating into occupied spaces.

For the purposes of this plan, air pollutants are defined as:

- Particulates;
- Volatile organic compounds;
- Formaldehyde;
- Combustion emissions;
- Airborne bacteria and micro-organisms; and
- Airborne inorganic compounds, such as ozone (from electric motors), metal fumes (from smoldering and welding), and ammonia and chlorine (from cleaning products).

The plan addresses all measures required by the U.S. Green Building Council's LEED-CI Rating System (Version 3) Credit EQ-3.1 (Construction IAQ Management Plan: During Construction) and Credit EQ-3.2 (Construction IAQ Management Plan: Before Occupancy.)

PROJECT ORGANIZATION

PERSONNEL AND RESPONSIBILITIES

The following personnel will have primary responsibility for executing and monitoring the Construction IAQ Management Plan. Responsibilities are defined as the following:

General Contractor

- Overall responsibility for the execution of the plan.
- Resolve disputes related to IAQ Management Plan execution and coordination.
- Appoint the IAQ Representative. The Representative shall be the (Field Superintendent)(Project Manager)(Other)

IAQ Representative

- Inform all construction personnel of the Construction IAQ Management Plan's goals and procedures. Provide opportunities for discussion and feedback to ensure that all construction personnel thoroughly understand the intent and detailed procedures of the IAQ Management Plan.

- Regularly tour the jobsite to supervise and ensure IAQ Management Plan compliance.
- Discuss ongoing measures to carry out the IAQ Management Plan at project coordination meetings and/or meetings organized to address Construction IAQ Management. Minutes shall be kept at these meetings for the Owner's records and for IAQ Management Plan documentation.
- Ensure that criteria for warnings and corrective actions due to poor or failed compliance with the Plan are clearly understood by all affected parties.
- Notify the (Field Superintendent)(Project Manager)(Other) if, in the Representative's opinion, the procedures and measures required to implement the IAQ Management Plan are not being adhered to.
- Generate and/or compile all IAQ Management Plan documentation.

Subcontractors

- Carry out requirements of the IAQ Management Plan under the direction of the Representative.
- Discuss measures to carry out the IAQ Management Plan at all meetings with the Construction Manager and with any other subcontractors performing work affected by the IAQ Management Plan.
- Sequence work and use work methods that confirm to the IAQ Management Plan requirements.
- Assume financial responsibility for costs resulting from poor or failed compliance with the IAQ Management Plan.
- IAQ Testing subcontractor will ensure testing is completed in compliance with the LEED-CI v2009 standard and provide all necessary documentation.

PLAN DOCUMENTATION

Primary copies of the documentation will be filed at the project site and/or at the office with the Construction Manager. Upon occupancy of the building (or earlier, if requested), the Owner will be provided with the following documentation package:

- The approved Construction IAQ Management Plan.
- Cut sheets for all filtration media used.
- Job progress photographs: at least 18 clear progress photographs evenly divided among 3 different occasions with 6 photos at each occasion. Photographs will show implementation of various measures required by the plan, and will be labeled to indicate the measure being shown. Photographs will have integral date stamps, and will be submitted in chronological order.
- IAQ Testing Report provided by IAQ Testing subcontractor.

REFERENCED STANDARDS

SMACNA IAQ Guidelines for Occupied Buildings under Construction, 1995, Sheet Metal and Air Conditioning National Contractors Association (SMACNA). The overall intent and some detailed recommendation found in these Guidelines is the basis for the Construction IAQ Management Plan.

ANSI/ASHRAE 52.2-1999; Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size. These define the testing to establish MERV ratings of filters.

General Specifications for the Cleaning of HVAC Systems, National Air Duct Cleaning Association, 1997, www.nadca.com (202-737-2926).

IEQcr3.1 CONTROL MEASURES

1. HVAC Protection

- During construction, provide MERV 8 filters for supply air intake when in use. Provide MERV 8 filters at the return air system openings when in use. Perform frequent maintenance when the HVAC system is being utilized and replace filters as they become loaded, prior to flush-out, and prior to occupancy. **Please refer to Table 1 – Air Filter Installation and Replacement Chart** on page 9 of this plan

- When performing construction activities that produce dust, such as drywall sanding, concrete cutting, masonry work, wood sawing or adding insulation, seal off the supply diffusers and return air system openings completely for the duration of the task. Utilize a wrapping or covering material that is durable and can last the duration of the project.
- Shut down and seal off the supply diffusers and return air ducts during any demolition operations.
- Whenever the HVAC system is not used during construction, seal off the supply diffusers and return air system openings to prevent the accumulation of dust and debris in the duct system.
- Do not use the mechanical rooms to store construction or waste materials. Keep rooms clean and neat.
- Provide periodic duct inspections during construction; if the ducts become contaminated due to inadequate protection, clean the ducts professionally in accordance with NADCA (National Air Duct Cleaning Association) standards.
- Keep unplaced HVAC materials elevated off the ground and away from high traffic areas to avoid damage, excessive dirt and dust and potential for water damage
- The General Contractor shall take photographs showing measures in place.

2. Source Control

- Use low VOC products as indicated by the specifications to reduce potential problems.
- Restrict traffic volume and prohibit idling of motor vehicles where emissions could be drawn into the building.
- Utilize electric or natural gas alternatives for gasoline and diesel equipment where possible and practical. Use low-sulfur diesel in lieu of regular diesel.
- Cycle equipment off when not being used or needed.
- Exhaust pollution sources to the outside with portable fan systems. Prevent exhaust from recirculating back into the building.
- Keep containers of wet products closed as much as possible. Cover or seal containers of waste materials that can release odor or dust.
- Protect stored on-site or installed absorptive building materials from weather and moisture; wrap with plastic and seal tight to prevent moisture absorption.
- Recover, isolate and ventilate containers containing toxic materials
- The General Contractor shall take photographs showing measures in place.

3. Pathway Interruption

- Provide dust curtains or temporary enclosures to prevent dust from migrating to other areas when applicable and when performing activities that create a lot of dust.
- Locate pollutant sources as far away as possible from supply ducts and areas occupied by workers when feasible. Supply exhaust systems that may have to be shut down or isolated during such activity.
- During construction, isolate areas of work to prevent contamination of clean or occupied areas. Pressure differentials may be utilized to prevent contaminated air from entering clean areas.
- Depending on weather, ventilation using 100% outside air will be used to exhaust contaminated air directly to the outside during installation of VOC emitting materials.
- Depressurize work areas to allow air pressure differential between under construction and completed areas to contain dust and odors that could potentially harm finished materials

4. Housekeeping

- Provide regular cleaning concentrating of HVAC equipment and building spaces to remove contaminants from the building prior to occupancy.
- All coils, air filters, fans and ductwork shall remain clean during installation and, shall be cleaned prior to performing the testing, adjusting and balancing of the systems. General contractor should provide photograph documentation to show these tasks have been completed
- Suppress and minimize dust with wetting agents or sweeping compounds. Utilize efficient and effective dust collecting methods such as a damp cloth, wet mop, or vacuum with particulate filters, or wet scrubber.
- Remove accumulations of water inside the building. Protect porous materials such as insulation and ceiling tile from exposure to moisture.
- Thoroughly clean all interior surfaces prior to replacing filters and running HVAC system for system balancing, commissioning and building flush-out.
- Provide photographs of the above activities during construction to document compliance.

5. Scheduling and Construction Activity Sequence

- Schedule high pollution activities that utilize high VOC level products (including paints, sealers, insulation, adhesives, caulking and cleaners) to

take place prior to installing highly absorbent materials (such as ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example). These materials will act as 'sinks' for VOCs, odors and other contaminants, and release them later after occupancy.

IEQcr3.2 IAQ Testing Requirements

Demonstrate that the contaminant maximum concentration levels listed below are not exceeded:

Contaminant	Maximum Concentration
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
Total volatile organic compounds (TVOCs)	500 micrograms per cubic meter
4-Phenylcyclohexene (4-PCH)*	6.5 micrograms per cubic meter
Carbon monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels
* This test is required only if carpets and fabrics with styrene butadiene rubber [SBR] latex backing are installed as part of the base building systems.	

For each sampling point where the maximum concentration limits are exceeded, conduct an additional flush-out with outside air and retest the noncompliant concentrations. Repeat until all requirements have been met. When retesting noncompliant building areas, take samples from the same locations as in the first test.

Conduct the air sample testing as follows:

- All measurements must be conducted prior to occupancy, but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.
- All interior finishes must be installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Movable furnishings such as workstations and partitions must be in place.
- The number of sampling locations will depend on the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilations system, the number of sampling points must not be less than 1 per 25,000 square feet or for each contiguous floor area, whichever is larger. Include areas with the least ventilation and greatest presumed source strength.
- Air samples must be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.