BUILDING OPERATION PLAN

LEED-EBOM

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Oakland, Ca.94612

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1.0 OVERVIEW

FACILITY DESCRIPTION

The original construction for 1537 Webster Street occurred in 1926 as a 2-story building. The building underwent renovations in 2007. The building is primarily used as office space with many structural and mechanical elements such as ducts, steel beams, and concrete columns left exposed. A large boardroom on the ground floor can accommodate as many as 75 people. The building's gross square footage is 14,000 square feet. The facility consists of the following:

- 2-story building, class A, air conditioned office building

The mechanical equipment serving the facility is summarized as follows:

- (4) Packaged roof top units (RTU) located on the roof
- (28) VAV Therma Fusers 1st and 2nd floor
- (1) A.O. Smith 60 gallon natural gas DHW heater
- (3) Exhaust Fans

The lighting systems are described as follows:

- The lighting control system controls interior, exterior, and exhaust fan on/off schedules. The lighting throughout the building area is composed of multiple types of fluorescent lamps. There is one skylight that provides natural lighting to the main stairwell and entry area. The primary space lighting on the first floor are 36 and 42 watt CFL's. The primary lighting for the second floor open office space and private offices is primarily composed of 4-foot fluorescent luminaries' lit with 28-watt T5 lamps. Interior lights are controlled with occupancy sensors.

The Building Operations Plan outlines the HVAC and domestic water equipment and operations for 1537 Webster Street. The objectives of this project are as follows:

- Establish specific operating guidelines for different equipment in the facility
- Document equipment and the sequences of operation,
- Satisfy the LEED-EB prerequisite for Existing Building Commissioning

This Building Operations Plan provides a summary of the building schedule and operation, equipment, and expectations for building performance.

The Building Operations Plan addressed the following systems:

- HVAC Systems
- Water Systems
- Lighting Systems
- Fire Life Safety Systems

2.0 LEED REQUIREMENTS

LEED-EBOM for Existing Buildings Reference Guide provides the guidelines for meeting the Energy and Atmosphere Prerequisite 1 Existing Building Commissioning. There are five requirements that must be met:

1. **Building Operating Plan:** Develop a comprehensive building operation plan that meets the requirements of current building usage, and addresses the heating system, cooling system, humidity control system, lighting system, safety systems and the building automation controls.
2. **Systems Narrative:** The systems narrative must include all the systems used to meet the operating conditions stated in the operating plan, including at minimum, heating, cooling, ventilation, lighting and any building controls systems.
3. **Sequence of Operations:** This is provided in a separate document.
4. **Preventative Maintenance:** Create a narrative of the preventive maintenance plan for equipment described in the systems narrative and document the preventive maintenance schedule during the performance period. The preventative maintenance plan is provided in section 4 and the maintenance schedule is provided in a separate document.
5. **Energy Audit:** Conduct an energy audit that meets the requirements of the ASHRAE Level I walk-through assessment. (This is addressed in a separate document.)

The following is a summary of how these requirements will be met:

1. This Building Operations Plan meets the requirements for the facility.
2. All non-functioning equipment will be documented and an implementation plan will be prepared to repair or upgrade the equipment in five years or less.

3.0 SPACE TYPES AND SCHEDULES

Space types in the facility consist of enclosed and open plan offices and conference rooms. Ancillary spaces include corridors, stair ways, lobbies, break rooms and restrooms. 1537 Webster Street is generally occupied 7:30 am to 6:00 pm, Monday through Friday. During the operating hours, the building is required to be conditioned.

The interior lighting enable on schedule is from 7am to 9pm Mondays through Friday. Occupancy sensors turn lighting on when spaces are occupied.

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3.1 Building Level Performance

3.1.1 Outside Air Introduction and Exhaust Systems

3.1.1.1 Outside Air Introduction

The packaged roof top units located on the roof of the building have full economizer capability. The RTUs outside air (OA) damper has a set minimum position to provide minimum ventilation air. The OA damper provides up to 50% outside air capability when outside ambient conditions can meet the cooling load of the building.

3.1.1.2 Exhaust Air Systems

There are three fractional horsepower exhaust fans: One for general exhaust, one for the elevator room and one serves the shower area.

3.1.2 Space Temperature

During occupied mode, the intended office space temperature is 72 °F. The existing space thermostats are programmed through the building automation system (BAS) to be adjusted within a +/-2°F range. The thermostats are not under a locked box and can be adjusted by the occupants.

3.1.3 Space Pressurization

The design pressurization requirements for the building are to be slightly positive. There are no active building pressure controls.

3.1.4 Air-side HVAC Systems

This section provides an overview of the air handling systems in the building that provide temperature control and ventilation.

The cooling system for the building consists of four roof top packaged AC units; three systems feature a gas heating mode and variable frequency drives. All four roof top units feature an outside air (OA) economizer with flow measuring stations to provide free cooling and ventilation see Table 3.1.

Table 3.1: Packaged DX Box Car Air Handler Units

Unit #	Manufacturer	Model / Type	# of Units	Heat Capacities / Efficiency	Supply Fan HP System FLA	Control
Roof						
AC-1	AAON	RM-013/ PRTU	1	Output: 132.2 MBH Eff.: 10.8 EER	7.5 HP 21 amps	BMS
AC-2	AAON	RM-006/PRTU	1	Output: 94.5 MBH Eff.: 11.8 EER	3 HP 34 amps	BMS
AC-3	AAON	RM-006/PRTU	1	Output: 51.2 MBH Eff.: 11.8 EER	3 HP 23 amps	BMS
AC-3	AAON	RM-A01/PRTU	1	N/A Eff.: 12.8 EER	1 HP 21 amps	BMS

There are two exhaust fans located on the roof, EF-1 for general exhaust and EF-2 that serves the elevator room with thermostatic temperature control. A third exhaust fan that serves the shower room is interlocked with the light switch.

3.1.5 Domestic Water Systems

Water Efficiency

The water fixtures throughout the building consist of the following types;

1. 7 Dual flush toilets rated at 1.1 and 1.6 gallons per flush.
2. 1 Waterless urinal.
3. 6 Low flow restroom faucets rated at 0.5 gallons per minute.
4. 2 Break rooms with faucets that rate at 2.5 gallons per minute.
5. 1 Shower

The domestic hot water is provided by one domestic extra high efficiency gas hot water heater.

3.1.6 Lighting Control Systems

The lighting control system controls interior, exterior, and exhaust fan on/off schedules. The lighting throughout the building area is composed of multiple types of fluorescent lamps and occupancy sensors.

4.0 HVAC SYSTEM MAINTENANCE PROGRAM

In accordance with LEED-EB Outside Air Introduction and Exhaust Systems (EQp1) this section outlines the requirement for addressing maintenance associated with indoor air quality. The intent is to "implement an operations and maintenance plan to maintain an uncontaminated HVAC system."

4.1.1 HVAC Filter Maintenance

Frequency: Change filters based on physical inspection and manufacturers recommendation that the pressure drop not exceed 1.0 inches water column.

Air filters are MERV rating 13 or better.

4.1.2 Mold Prevention

While the building does not reside in a humid climatic zone, presence of water can lead to mold development. Prevention of water infiltration is critical to maintaining a mold-free facility.

Recognizing areas where water accumulates is a key element to mold prevention. The following are areas of the facility that need to be inspected on an annual basis at a minimum or as noted.

- Landscape watering: inspect surrounding building areas noting areas of water accumulation and time period to dry (make special note of the building's northern exposure; monitor flow of water run-off.
- Rain: visually inspect all areas of the facility during rain and after rain to identify any problem areas with water penetration into the building, improper run-off flow or clogged drains, and excessive water accumulation.
- HVAC Condensate Drains: Condensate drains should be inspected during normal rounds.
- Plumbing Fixtures: Cleaning staff should notify building maintenance if water leaks or water accumulation is found anywhere in the facility.

4.1.2.1 Response Guidelines

Upon detection of water accumulation, leaking plumbing fixtures, areas that maintain moisture, clogged drains, and improper water flow should contact building maintenance so that the problem can be investigated. Building maintenance shall perform the following upon receiving notification of a potential problem:

- Document when the problem was reported
- Inspect the problem area to identify the problem source
- Take measures to resolve the problem or limit the damage until a solution can be provided.
- Remove all water within 24 hours
- Dry all building materials within 24-48 hours; discard/replace all building materials that cannot be dried.
- Document resolution or note if the problem requires continual monitoring
- Bring in a third party company to inspect if mold is suspected

4.1.3 Particulate Accumulation

4.1.3.1 General Housekeeping

Outside Air Intakes

All outside air intake areas of the facility shall be kept clear of debris and clear of any products that produce any level of odor. Included is the Make-Up Air Fan serving the parking garage.

Chemical Storage

Chemicals shall be stored in a clearly marked chemical storage closet with adequate ventilation to outside air that does not expose any building occupants.

Toilet Exhaust Fans

Annually, toilet exhaust fan shall be opened and wiped clean of dirt and tested for proper operation. The fan motor should run smoothly and balanced.

Facility Entry Areas

Facility entry areas (lobby, side, and back entry areas) shall maintain a method to minimize dirt from outside entering the facility. Entry mats shall be washed down on a monthly basis. Mats shall also be provided to absorb moisture on rainy days to maintain safety and minimize moisture from tracking into the facility.

4.1.4 Smoking Policy

The building has been designated non-smoking. Smoking is not allowed within 25 feet of the walking paths of building entry.